



REGIONE
MARCHE



PROVINCIA DI
FERMO

OGGETTO:

VERIFICA DI ASSOGGETTABILITA' A V.I.A.

(Richiesta di avvio del procedimento ai sensi dell'art. 20, parte II - titolo II, D.lgs. n° 152/2006 e dell'art. 8, capo II, Legge Regionale 26 marzo 2012 n° 3 alla luce della Sentenza della Corte Costituzionale n° 93/2013)

PROGETTO DI REVAMPING

DELL'IMPIANTO AUTORIZZATO AL TRATTAMENTO FINALIZZATO AL RECUPERO DI RIFIUTI
SPECIALI NON PERICOLOSI COSTITUITI DA PNEUMATICI FUORI USO (P.F.U.)

11. GESTIONE DELL'IMPIANTO



Gruppo di Lavoro

Dott. Adriano VECCHI (chimico)
Ing. Sergio RIZZI (consulente ambientale)
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Dott. Arch. Paolo STECA (Progettista)

LA DITTA



steca



DATA

settembre 2015

REVISIONE N.

-

CAUSALE:

PRIMA EMISSIONE

RELAZIONE TECNICA – PIANO DI GESTIONE

1. Identificazione dell'azienda:

STECA S.p.A.

Via Tenna 87/B - 63813 Monte Urano

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1.1 Identificazione dell'azienda:

L'impianto di Riciclaggio di Pneumatici Fuori Uso è ubicato in Contrada Campiglione n° 20 nella zona industriale EX-OMSA. L'impianto è stato progettato, costruito e gestito dalla STECA S.p.A. L'attività di stoccaggio e recupero di pneumatici fuori uso (codice CER 16.01.03) è attualmente autorizzata con Determinazione Dirigenziale della Provincia di Ascoli Piceno n.1007/GEN, 40/SA del 25/02/2009 e successive modifiche.

2. Stato autorizzativo dell'impianto

L'impianto di Riciclaggio di Pneumatici Fuori Uso è ubicato in Contrada Campiglione n° 20 nella zona industriale EX-OMSA. L'impianto è stato realizzato nel 2008 ed attualmente è autorizzato secondo i seguenti provvedimenti:

- **Determinazione dirigenziale Provincia di Fermo n.1007/GEN, n.40/SA del 25/02/2009**
“Art. 210 “Autorizzazione all’esercizio dell’attività di messa in riserva (R13) e trattamento (R3) di rifiuti speciali non pericolosi presso l’impianto sito in contrada Campiglione,20 nel Comune di Fermo. Scadenza autorizzazione 25 febbraio 2019” ;
- **Determinazione dirigenziale Provincia di Fermo n. 2102/GEN, n.97/SA del 21/04/2009**
“Autorizzazione per un impianto che svolge l’attività di recupero e preparazione per il riciclaggio di materiale plastico per la produzione di materie prime plastiche, resine sintetiche che da luogo ad emissioni in atmosfera” da ubicarsi in Contrada Campiglione n.20 del Comune di Fermo (aut.203/260)”. Scadenza autorizzazione 24/04/2024;
- **Determinazione dirigenziale Provincia di Fermo n.120/GEN,n.23/TARE del 22/09/2009**
“Art.210 Modifica dell’autorizzazione all’esercizio dell’attività di messa in riserva (R13) e trattamento (R3) di rifiuti speciali non pericolosi di cui alla determinazione dirigenziale n.1007/GEN del 25/02/2009 rilasciata dalla Provincia di Ascoli Piceno- Introduzione della linea di trattamento del materiale ferroso (R4)”;
- **Determinazione dirigenziale Provincia di Fermo n.96 del 17/02/2010, Registro settore n.14 del 17/02/2010**
“Art.210 Integrazione dell’autorizzazione all’esercizio” inserimento nuovo codice CER 07.02.99 (scarti di lavorazioni dei prodotti realizzati con granuli di gomma)”

- **Determinazione dirigenziale Provincia di Fermo Registro Generale n.170 del 24/02/2012 e Registro Settore n.14 del 24/02/2012**
“Art.124 D. Lgs 152/2006- Autorizzazione allo scarico di acque reflue industriali “Condominio Consorzio Calzaturiero Marchigiano” dell’insediamento industriale Ex-OMSA ubicato in C.da Campiglione,n°20 nel Comune di Fermo (fascicolo 9.7.6/14). Scadenza autorizzazione 24 febbraio 2016.
- **Determinazione Provincia di Fermo Registro Generale n.566 del 6/05/2011 e Registro Settore n.27 del 6/05/2011**
Art.208- Modifica autorizzazione all’esercizio. Variazione delle modalità di disinfezione sui cumuli di gomma contenute nella prescrizione di cui al punto 1, lettera c), della determinazione dirigenziale n. 1007/GEN del 25/02/2009.
- **Determinazione Provincia di Fermo Registro Generale n.988 del 15/07/2011 e Registro Settore n.44 del 15/07/2011**
“Modifica autorizzazione all’esercizio- Revoca determinazione n.35 del 1/6/2011 (Reg. Gen. n.704)
- **Determinazione Provincia di Fermo Registro Generale n.1436 del 24/10/2011 e Registro Settore n.76 del 24/10/2011**
“Approvazione modifica non sostanziale- Introduzione di un sistema di nebulizzazione di acqua posizionato sulla tramoggia di carico del trituratore PM150 al fine di limitare lo sviluppo del calore nel trituratore stesso aumentandone il rendimento”
- **Determinazione Provincia di Fermo Registro Generale n.196 del 22/02/2011 e Registro Settore n.28 del 22/02/2011**
“Concessione idrica per piccola derivazione di acqua per quindici anni, mediante 1 pozzo, ad uso irriguo in Contrada Campiglione, 20 nel Comune di Fermo ai sensi dell’art.12 della L.R. 05/2006
- **Registro n. 0039822 del 30/10/2012 della Provincia di Fermo**
“Variante non sostanziale alla concessione, ai sensi dell’art.22 della L.R. 05/2006.
- **Titolo Unico n.4 del 15/07/2013 Rif. Urb. n°5761 Pratica Edilizia n°2/SUAP/2013**
“Autorizzazione alla modifica all’esercizio delle operazioni di messa in servizio (R13) e trattamento (R3)- Qualifica del prodotto in gomma in uscita dal ciclo di lavorazione con granulometria inferiore a 20mm come materia prima”;

2.1 Descrizione dello stato autorizzato

L'impianto autorizzato dal 2009 per il recupero di pneumatici fuori uso identificati con il codice CER 16.01.03 può lavorare i seguenti tipi di pneumatici:

1. Pneumatici di autovettura estivi e invernali
2. Pneumatici di autocarro
3. Pneumatici di piccolo trattore

Tutte le tipologie sono costituite dai medesimi materiali quali gomma, acciaio e tela ma in percentuali diverse.

Solo in qualche caso sporadico viene conferito presso l'impianto il codice CER 07.02.99 "Rifiuti non specificati altrimenti della produzione, formulazione, fornitura ed uso di plastiche, gomme sintetiche e fibre artificiali".

I pneumatici in arrivo all'impianto vengono selezionati e stoccati per tipologie in cumuli sul piazzale antistante il fabbricato e poi condotti nelle macchine situate all'interno del capannone per il trattamento di separazione dei materiali e triturazione.

L'impianto di trattamento fornito dalla TIRES S.p.A. ed utilizzato fino ad oggi è costituito da quattro fasi principali di lavorazione con cui si ottiene la completa macinazione degli pneumatici:

- 1) *Fase di Stallonatura*
- 2) *Fase di Triturazione*
- 3) *Fase di Granulazione*
- 4) *Fase di Raffinazione*

L'attività di recupero risulta essere automatizzata e l'operatore si rende necessario solo per il carico manuale dei pneumatici sul nastro di alimentazione dell'impianto e per le operazioni di movimentazione dei rifiuti e delle materie prime.

I pneumatici che vanno ad alimentare l'impianto posseggono le seguenti caratteristiche:

Pneumatici di autovettura estivi	Tutti i pneumatici attualmente in commercio Possono essere lavorati senza l'obbligo di stallonatura
Pneumatici di autovettura invernali	Possono essere inseriti nell'impianto in rapporto 1/20 rispetto ai comuni pneumatici estivi
Pneumatici di autocarro	Devono essere <u>obbligatoriamente</u> stallonati prima di essere introdotti sul nastro di carico.
Pneumatici di piccolo trattore	Devono essere <u>obbligatoriamente</u> stallonati prima di essere introdotti sul nastro di carico. Può essere necessario tagliarli con la cesoia

I pneumatici dei trattori rispetto ai pneumatici di autovettura, contengono 10 volte tanto il contenuto di tela, per cui si caricano sul nastro in rapporto di 1 ogni 30 di auto.

I pneumatici invernali di autovettura sono realizzati con gomme sintetiche morbide che tendono ad avere un comportamento “incollante” per cui l’operatore, per evitare intasamenti dell’impianto, provvederà ad effettuare un carico sul nastro controllato.

La verifica visiva di eventuali corpi estranei all’interno dei pneumatici viene effettuata preliminarmente al conferimento all’impianto di frantumazione dalla piattaforma di stoccaggio ed una seconda volta dall’operatore prima del carico sul nastro di alimentazione.

Per ottenere qualità migliori e costanti di prodotto finito si miscelano 15 pneumatici di autovettura con un pneumatico di autocarro che attualmente non contiene fibra tessile e riduce l’eventuale presenza di impurità sul prodotto finito.

2.2 Brevi nozioni tecniche

Il prodotto della gomma vulcanizzata nella lavorazione meccanica subisce una alterazione chimica se viene superata la temperatura di 80°C.

Il processo di lavorazione oltre questi valori si renderebbe difficoltoso e pericoloso perché il materiale tende a de-vulcanizzare con conseguente possibilità di intasi delle camere di taglio.

Inoltre, trattandosi di pneumatici fuori uso contenenti fibra tessile quindi poliestere, il problema diventerebbe ancor più pericoloso perché il materiale tende a sciogliersi provocando anche l’autocombustione.

L’impianto mantiene la lavorazione del pneumatico a temperature inferiori ai 60°C nella 2° e 3° fase e 50°C nella 4° fase, evitando qualsiasi problema inerente.

Il processo di lavorazione è controllato dal PLC del rispettivo quadro tramite il quale la lavorazione del materiale viene automaticamente arrestata qualora di dovesse verificare una condizione anomala.

Un esempio di condizione anomala è quella dell’introduzione di pneumatici invernali o cosiddette “Gomme Termiche” in proporzioni elevate rispetto agli pneumatici estivi.

Come spiegato nella sessione di immissione degli pneumatici al punto di carico, l’introduzione di questi ultimi crea un innalzamento delle temperature di lavorazione; quindi si rende necessaria una corretta operatività nella selezione dei materiali che vengono introdotti.

2.3 Descrizione del processo produttivo autorizzato

Si riportano di seguito le fasi che caratterizzano le attività di recupero autorizzate

2.3.1 Fase di stallonatura

La fase di stallonatura consiste nell'eliminare il cordolo di acciaio armonico posto sul diametro interno dello pneumatico. Questo cordolo è composto, ad esempio per i pneumatici di autocarro, da una treccia di cavi armonici del diametro di 2/2.5 mm. Nell'insieme essi formano un anello del diametro di circa 20 mm.

L'estrazione dal pneumatico di questo anello consente di ridurre drasticamente le probabilità di rotture anomale dei taglienti senza pregiudicare il buon funzionamento dell'impianto.

La macchina in questione tramite l'utilizzo di un semplice pannello di comando posto nelle vicinanze del punto di immissione, consente all'operatore di movimentare i pneumatici per ottenere la stallonatura con 3 semplici operazioni:

- 1) *Centraggio Pneumatico*
- 2) *Posizionamento Ganci*
- 3) *Stallonatura*

La macchina è provvista anche di un sistema di cesoiamento x le trecce che non vengono perfettamente stallonate agevolando così l'operatore nell'operazione di scarico e carico. La capacità produttiva della macchina è di un massimale di 40 pneumatici di autocarro/ora mantenendo inalterate le condizioni di perfetta efficienza.

Per l'impianto sono sufficienti solo 20 pneumatici autocarro/ora per garantire le quantità massime che possono essere lavorate.

2.3.2 Fase di triturazione

La fase di triturazione è il primo trattamento significativo cui è sottoposto il pneumatico.

Il trituratore PM 100 è composto da un'unità di cesoiamento, da una centralina idraulica con una camera di taglio di dimensioni 80x130 cm.

I taglienti sono stati progettati per poter afferrare il copertone di autocarro tramite un uncino quindi poi triturarli tramite i due rotori.

Le lame in oggetto sono di spessore 75 mm il che significa che il prodotto che si otterrà dopo la macinatura sarà di 70/80 mm per una lunghezza di 30/40 cm.

Il possibile sovraccarico della macchina è gestito dalla centralina la quale, comandata dal rispettivo quadro elettrico, consente ai due rotori portalame di effettuare automaticamente delle inversioni di rotazione in modo da poter disimpegnare la camera di taglio da una sovrapposizione di eccessivo materiale. Il trituratore in oggetto ha una capacità produttiva di circa 8000 Kg/h; questa quantità viene utilizzata per il 25% dall'impianto ma consente di poter disporre di una struttura che nel tempo rimarrà inalterata e di una manutenzione lame con tempi a dir poco raddoppiati.

2.3.3 Fase di granulazione

La fase di granulazione consiste nel ridurre i pezzi triturati in granuli da 16/18 mm di diametro apparente. Questa fase rappresenta il cuore del funzionamento dell'impianto in cui avviene la separazione del metallo per il 99 % della sua presenza residua sul copertone.

La macchina denominata GR60/180 è costituita da un robusto rotore da 600 mm di diametro con alloggiati dei portalamme e da un corpo macchina in cui sono installati i portalamme fisse dx e sx.

Nella parte inferiore della macchina è stata inserita una griglia che consente al prodotto di fuoriuscire solo dopo aver raggiunto la pezzatura prestabilita.

Questa macchina viene completamente automatizzata dal corrispondente quadro utilizzando un PLC che ne rileva l'assorbimento istantaneo e gestisce così tutti i vari automatismi .

Sul visualizzatore sinottico possono essere individuati tutti i dati cui fa riferimento questa macchina impostati di default dal costruttore ma modificabili previo inserimento di una password da un operatore qualificato.

Il Granulatore in questione, alimentato con triturati da 70x70 mm, ha una capacità al punto di carico di circa 2000 Kg/h mantenendo la macchina nelle perfette condizioni di operatività.

In uscita si otterranno filamenti di acciaio armonico per un quantitativo di circa 500 Kg/h e 1500 Kg/h di granuli da 4/18 mm contenenti fibra tessile.

Inoltre la fase di granulazione dispone di un filtro abbattimento polveri che elimina le fibre tessili estratte nella macinazione.

I granuli e i rispettivi fili di acciaio armonico uscenti dalla griglia vengono trasportati tramite vibratore e nastro sotto il passaggio di un magnete posto ad adeguata altezza impostata dal costruttore; l'estrazione del metallo già separato dalla gomma avviene anche con l'ausilio di un tamburo magnetico posto in testa al nastro con cui vengono raccolti i filamenti più sottili che si adagiano sul tappeto.

I granuli, a questo punto deferrizzati, vengono inseriti nel silo mediante un trasporto pneumatico insonorizzato con cui viene raffreddato il prodotto per uno stoccaggio in sicurezza

All'interno del silo è stato alloggiato un magnete permanente che raccoglie eventuali filamenti di acciaio armonico non catturati dal sistema di deferrizzazione.

2.3.4 Fase di raffinazione

La fase di raffinazione consiste nel ridurre la sezione dei granuli ulteriormente in modo da poter separare il residuo di metallo e la fibra tessile.

Questa fase avviene mediante l'utilizzo di un Mulino Veloce concepito in grandi linee nello stesso modo del Granulatore; la differenza è nella velocità del rotore quasi triplicata.

La granulometria della gomma che si ottiene da questo passaggio è di 3 mm di diametro apparente. Il materiale tessile in uscita si presenta sotto forma di piccoli batuffoli.

Nel passaggio successivo alla macinazione, questi materiali vengono trasportati pneumaticamente ad un sistema di separazione tessile; questo processo è di fondamentale importanza perché determina la qualità del prodotto finito.

Il materiale misto gomma/fibra viene classificato in depressione d'aria per mezzo di macchinari fino al trasporto di granuli puliti presso un silo di stoccaggio contenente una piastra magnetica permanente utilizzata per poter eliminare il residuo di acciaio prima dell'imballo in big bags.

Il materiale tessile invece viene trasportato pneumaticamente all'esterno ove e' alloggiata una struttura che consente di immagazzinare il tessile tramite un cassone scarrabile.

Tutta l'aria necessaria al trasporto pneumatico viene convogliata ad un filtro autopulente posto all'esterno in cui vengono decantate le polveri residue dell'impianto ed immagazzinate in un saccone di raccolta.

L'aria filtrata viene poi espulsa in atmosfera secondo le norme ambientali.

2.3.5 Circuito di raffreddamento chiuso

Sia la fase di granulazione che di raffinazione necessitano di acqua di raffreddamento sulle macchine operanti nella macinazione.

Questa acqua è gestita da un circuito chiuso comprendente una cisterna da 9 m³, (utilizzata come polmone), e un CHILLER per il raffreddamento.

Le due fasi vengono controllate termicamente dal PLC dei rispettivi quadri controllando che durante la lavorazione non vi siano anomalie di funzionamento.

2.3.6 Quadro triturazione/deferrizzazione

L'impianto di Triturazione/Deferrizzazione attualmente e' composto da un trituratore a lame da 75 mm e da un Granulatore con griglia 18 mm. Il materiale uscente dalla griglia viene vagliato e deferrizzato mediante nastri magnetici.

L'intero impianto e' gestito in modo automatico dal quadro posto di fronte alla cabina del granulatore.

2.4 Descrizione delle caratteristiche quantitative e qualitative dei prodotti in uscita

Al termine del trattamento meccanico sopra descritto si ottengono le tre frazioni componenti degli pneumatici completamente separate:

4. la gomma, in granuli di 0,8-4,0 mm di diametro apparente e in polverino 0-0,8 mm di diametro apparente (55-60% in peso del rifiuto in ingresso), destinata al mercato come materia prima secondaria;
5. il materiale ferroso (Codice **CER 19.12.02**, 30-34% in peso del rifiuto in ingresso) destinato al recupero come **R13/R4**;
6. il materiale fibroso (Codice **CER 19.12.08**, 10-11% in peso del rifiuto in ingresso) destinato in discarica come **D15** o al recupero **R1**;

La granulazione è la fase che definisce la capacità di trattamento dell'impianto e corrisponde a 2000 kg/h e può lavorare 24 ore al giorno.

La gomma in granuli e in polverino viene stoccata in big bags. All'interno del fabbricato è prevista un'area destinata allo stoccaggio giornaliero provvisorio (circa 300 q.li) mentre è situata all'esterno l'area destinata allo stoccaggio del prodotto finito.

Il materiale ferroso proveniente dalla deferrizzazione viene raccolto in uno scarrabile all'interno del fabbricato mentre il materiale fibroso è stoccato in uno scarrabile posto all'esterno.

Considerando la capacità massima dell'impianto e supponendo 3 turni giornalieri (quindi macchine in moto 24 ore su 24), il quantitativo massimo trattabile giornalmente è pari a circa

48.000 kg/d ottenendo in media all'uscita 28.000 kg/d gomma in granuli, 14.000 kg/d di materiale ferroso e 6.000 kg/d di materiale fibroso.

Considerando circa 250 giorni lavorativi in un anno, trattamento annuo richiesto ed autorizzato è pari ad 12.000 tonnellate di pneumatici fuori uso.

2.4.1 Modalità di gestione e personale addetto.

L'impianto è dotato di idonea strumentazione di controllo, con automazione dei comandi tramite PLC che permette la marcia dell'impianto 24 ore al giorno e 365 giorni all'anno salvo interruzioni per anomalie e manutenzioni.

L'impianto viene gestito da 2-3 addetti per ogni turno che hanno compiti di gestione dei rifiuti in ingresso (controllo, pesa, messa in riserva), sorveglianza e ottimizzazione del processo, manutenzione delle apparecchiature elettromeccaniche, gestione delle materie recuperate e dei rifiuti in uscita e di immediato intervento in caso in condizioni di anomalia.

Solo per il processo di stallonatura e triturazione si rende necessario l'intervento diretto sulle macchine dell'operatore che sarà formato all'operazione di selezione, controllo e immissione degli pneumatici sul nastro di carico.

Le operazioni di manutenzione delle macchine vengono effettuate secondo le cadenze riportate dai manuali consegnati dalla ditta fornitrice delle apparecchiature.

Il personale operante presso l'impianto è formato per la prevenzione incendi e per interventi di primo soccorso.

Non sono utilizzati additivi di alcun genere. Solo per le acque del sistema di raffreddamento a ciclo chiuso sono addizionate con liquido antigelo (5-10 % in volume).

2.4.2 Descrizione dei sistemi di trattamento acque

Il processo di trattamento pneumatici non necessita di uso di acqua fuorché per il sistema di raffreddamento che è a ciclo chiuso. Si utilizza un sistema di nebulizzazione nelle giornate più calde sulla tramoggia di carico del tritratore PM150 con la funzione di abbassare, solo quanto necessario la temperatura delle lame di taglio. L'impianto è autorizzato dalla Provincia di Fermo con determinazione registro generale n.1436 del 24/10/2011.

In genere l'acqua nebulizzata viene completamente assorbita durante le operazioni di taglio, ma per tener conto di eventuali gocciolamenti, le eventuali acque vengono raccolte in una vasca e smaltite tramite ditte autorizzate secondo la normativa vigente.

Lo smaltimento delle acque reflue provenienti dai servizi igienico-sanitari del laboratorio avviene tramite un impianto di fitodepurazione. Le acque di scarico sono convogliate tramite tubazione in PVC ø125 in una vasca Imhoff dove sono sottoposte ad un primo trattamento e sono poi distribuite su un bacino di fitodepurazione composto da una guaina in EPDM impermeabile, uno strato di inerti per il drenaggio delle acque e uno strato di terreno vegetale dove saranno piantumate essenze vegetali sempreverdi atte alla depurazione. Le dimensioni del bacino sono di 20 mq circa.

Le acque di pioggia sono raccolte nei piazzali dal sistema di fognatura bianca e avviate all'impianto di trattamento di prima pioggia. L'impianto è costituito da: pozzetto scolmatore, sezione di

accumulo, disoleatore, apparecchiature elettromeccaniche. Il pozzetto scolmatore e la sezione di accumulo sono stati realizzati in modo tale da dividere le acque di prima pioggia (destinate al trattamento) dalle acque di seconda pioggia bypassate allo scarico. La sezione di accumulo da 36 mc è costituita da quattro bacini collegati tra loro, della capacità di 9 mc ciascuno, costruiti in anelli in calcestruzzo prefabbricato. La capacità di accumulo è tale da raccogliere i primi 5 mm (50 mc per ettaro) di pioggia che cade sulla superficie scolante dello stabilimento (circa 7.000 mq) e la perfetta tenuta è stata ottenuta mediante sigillatura di tutti i componenti e collegamenti. Nel bacino è installata una pompa di svuotamento che viene attivata automaticamente dal quadro elettrico tramite il segnale di una sonda rivelatrice di pioggia. Il disoleatore costruito in PE con filtro a coalescenza ha la capacità di trattare 3 l/s. Lo scarico viene effettuato nella rete fognaria della lottizzazione Ex-OMSA. E' attivo sul pozzetto fiscale un monitoraggio delle acque di scarico valutando oltre i parametri significati (Ph, Cloruri, Solfati, Nitrati, ammoniaca, COD, Solidi sospesi totali, idrocarburi, cadmio, piombo) anche i pesticidi (2 volte all'anno) e la tossicità (2 volte all'anno).

Sia la vasca Imhoff a monte del bacino di fitodepurazione che la sezione di stoccaggio delle acque di prima pioggia saranno regolarmente controllate; periodicamente verranno smaltiti i fanghi e sabbie raccolti sul fondo e gli idrocarburi separati nel disoleatore.

2.4.3 Descrizione dei sistemi di trattamento aria esistenti

Il trasporto della gomma avviene per mezzo di nastri trasportatori nella fase di triturazione e poi per mezzo di un sistema pneumatico dalla granulazione in poi. Il sistema pneumatico oltre ad una funzione di trasporto svolge anche una funzione di raffreddamento e di separazione dei materiali.

L'impianto d'aspirazione nella fase lavorativa si differenzia in diversi punti sotto elencati:

1. Impianto aspirazione/filtrazione tessile linea di Granulazione T1
2. Impianto Trasporto Granuli 18mm T2
3. Impianto Trasporto Granuli 3mm T3
4. Impianto Trasporto Granuli 3mm T4
5. Impianto Trasporto Tessile T5
6. Impianto Trasporto Tessile T6
7. Impianto Trasporto Granuli 3 mm T7
8. Impianto Trasporto Granuli 3 mm T8
9. Impianto Trasporto Polverino 0-0.8 mm T9
10. Gruppo filtrante Linea trasporto Granuli GF2,GF3

Le caratteristiche dei trasporti penumatici T1, T2, T3, T4, T5, T6, T7, T8, T9, dei filtri e gli aspiratori GF1, GF2, GF3 esistenti ed i rispettivi dispositivi di sicurezza installati sono riportati nel documento "*relazione tecnica piano di gestione*" presentata alla Provincia di Fermo con Prot. 775 del 8 gennaio 2009 allegata all'autorizzazione n°1007 del 25 febbraio 2009

3. Stato di progetto

L'azienda intende apportare delle migliorie all'impianto di recupero pneumatici fuori uso già autorizzato fin dal 2009.

L'elenco dello stato autorizzativo è riportato al paragrafo 2 "Stato autorizzativo dell'impianto".

Il progetto prevede la sostituzione di una parte dell'impianto con macchine più performanti dal punto di vista energetico ed il conseguente aumento della produttività che passa dai 12.000t/annue alle 24.000t/annue.

L'intervento non comporta modifiche al piazzale esterno, né alle quantità di stoccaggio temporaneo. All'esterno per garantire la perfetta qualità dei granulati in uscita è necessario adeguare i 3 punti di emissione con più performanti filtri a maniche.

3.1 Descrizione del nuovo processo produttivo

L'azienda con la sostituzione dell'impianto tecnologico di trattamento e recupero pneumatici fuori uso non intende apportare modifiche al processo produttivo caratterizzato sempre dalle seguenti 4 fasi:

- Fase di stallonatura
- Fase di triturazione
- Fase di granulazione
- Fase di raffinazione

Il processo è sempre di tipo meccanico a freddo senza l'utilizzo di nessun genere di additivo.

Verrà installato al termine del processo di recupero un impianto di polverizzazione (*Cracker Mill CM900*) che ha la funzione di trasformare i granuli in gomma di granulometria 0-0,4mm in materia prima seconda con granulometria minore. Con questa lavorazione si possono generare curve granulometriche specifiche in funzione delle richieste del mercato.

L'utilizzo del nuovo impianto di recupero pneumatici fuori uso comporta un miglioramento della qualità dei granuli in gomma per cui si possono stimare le seguenti percentuali di MPS ed rifiuti

Tipologia	percentuale
Granuli in gomma (0-0.8mm, 0.8-2.5mm, 2.5-4.0mm)	67%
Acciaio (codice CER 19.12.02)	25%
Fibre tessili (codice CER 19.12.08)	8%

Si ricorda che tali percentuali sono indicative e possono variare in funzione delle tipologie dei pneumatici in ingresso. A dimostrazione di ciò si ricorda che per esempio i pneumatici di autocarro contengono una percentuale di tela pari a 0.

Attualmente attraverso una convenzione con Ecopneus (principale consorzio che gestisce i PFU in Italia), il materiale tessile derivante dall'attività di recupero non viene più smaltito in discarica, ma viene recuperato in R1 per una percentuale pari a circa l'90%. Per quanto riguarda l'acciaio con l'installazione del nuovo impianto di pulizia si provvederà ad produrre materia prima seconda.

L'azienda si impegna all'attivazione dell'impianto ad ottenere la certificazione secondo il regolamento 333/2011 scaduto il 25 gennaio 2015.

Per completezza si riporta per ogni fase di lavorazione del processo le sigle delle principali macchine riportate nella tavola "planimetria stato di progetto".

Non si richiedono inoltre modifiche ai codici CER autorizzati che risultano essere:

- **16.01.03 Pneumatici fuori uso** (Determina. Prov. n.1007/GEN, n.40/SA del 25/02/2009)
- **07.02.99 Rifiuti non specificati altrimenti "scarti di lavorazione dei prodotti realizzati con granuli in gomma"** (Determina Prov. n. n.96 del 17/02/2010, Registro settore n.14 del 17/02/2010)

3.1.1. Fase di stallonatura

Non si intendono apportare modifiche a questa fase che risulta rimanere invariata rispetto a quanto già autorizzato. Si tratta sempre di un attività propedeutica alla fase di triturazione con la quale si elimina il cordolo di acciaio armonico posto sul diametro interno del pneumatico attraverso anche un sistema di cesoiamento delle trecce. In questo modo si limitano drasticamente le probabilità di rotture anomale dei taglienti senza pregiudicare il buon funzionamento dell'impianto. La macchina esistente (**ST1**) ha una capacità produttiva di 40 pneumatici di autocarro/ora sufficienti per l'alimentazione dell'impianto. Preliminarmente alla fase di stallonatura può essere necessario attraverso una cesoia (**CS1**) tagliare i pneumatici più grandi quali per esempio quelli di trattore o delle macchine movimento terra in parti più piccole. E' presente una seconda cesoia (**CS2**) di piccole dimensioni che viene utilizzata per piccole operazioni di taglio.

Durante le fasi di cesoiamento/tranciatura e stallonatura non si generano polveri per cui non sono necessari punti di aspirazione convogliata.



1Stallonatrice esistente



2: Cesoia esistente

3.1.2. Fase di triturazione

La fase di triturazione è il primo trattamento significativo cui è sottoposto il pneumatico.

Il precedente impianto denominato **PM 100** verrà sostituito da un sistema di triturazione fornito dalla Tires S.p.A. *Modulo "Energy"* di cui si riportano le caratteristiche principali:

<i>Scheda Tecnica modulo "Energy"- Trituratore TI-SAURUS 180</i>	
Materiale in ingresso	70% PFU auto; 30% PFU stallonati
Potenza installata	190Kw/h circa
Classe di rendimento	AAA (Energy Saving)
Potenza media assorbita	65-75Kw/h circa
Ore di funzionamento	24h
Lavorazione istantanea senza calibrazione 200-400mm	20.000-24.000 Kg/h*
Media produttiva senza calibrazione 200-400mm	12.000-16.000 Kg/h*
Lavorazione istantanea con calibrazione <100mm	7.000-8.000 Kg/h*
Media produttiva con calibrazione <100mm	4.000-6.000 Kg/h*
Capacità ci carico istantanea	12.000Kg/h
Capacità di produzione media	4.000-6.000 Kg/h
Tipologia di taglio	Netto, regolare
Durata taglio netto	1.250 Ton lavorate
Materiale in uscita	<100mm
Durata taglienti	2.000-2.500 ton lavorate
Tasselli lama	108 pezzi

*dipende dalla tipologia dei pneumatici e della velocità dei rotori che verrà impostata.

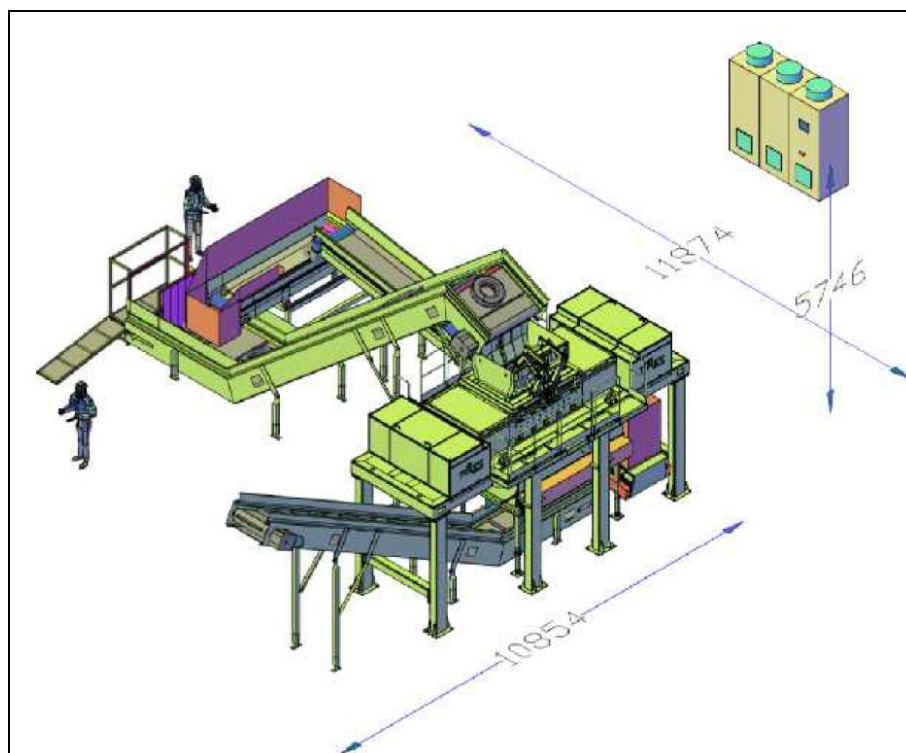
Il tritatore **Ti-Tausur 180 (T1)** è composto da una pedana di carico dei pneumatici, da un nastro di alimentazione al tritatore **(T3)** vero e proprio da cui si ottiene un ciabattato 100x100mm, un sistema di vagliatura ed un nastro di ricircolo **(T4-T5)** che fa ritornare in testa il materiale di dimensioni non idonee per la fase successiva di granulazione/Rasper.

La camera di macinazione per accelerare le operazioni di manutenzione è composta da un unico corpo in acciaio di dimensioni 1100x1500mm con 2 alberi contro-rotanti esagonali porta lame.

Il tritatore ha una capacità di produzione media per ciabattato 100x100mm di almeno **4t/h**.

Anche in questa fase di lavorazione, essendo i pneumatici non polverulenti ed essendo la pezzatura del materiale ancora grossolana, non vi è la separazione dei materiali fibrosi che restano intrappolati nella gomma e non vi sono emissioni significative di polveri che necessitano di aspirazione convogliata. L'impianto è dotato di sistema di raffreddamento ad acqua composto da n°2 gruppi ugelli di nebulizzazione cadauno da 0,33l/min con pressione massima di 2Bar. Il posizionamento dei nebulizzatori è riportato nella planimetria "*stato di progetto*". L'azienda costruttrice consiglia di utilizzare l'impianto solo con temperature di esercizio oltre i 40°C.

Ciascuna macchina ed impianto è controllato da un set di armadi elettrici con visualizzatori sinottici e PLC. Tutte le macchine sono protette da sensori e/o microinterruttori di sicurezza e fornite di marcature CE. Il modulo di tritrazione è un sistema automatico di facile gestione assistito da un singolo operatore.



3. Scheda di funzionamento del tritatore TI-TAURUS 180

<i>Schema di flusso sistema di triturazione</i>	
Fase:1	Ingresso pneumatici fuori uso 16.01.03 già stallonati
Fase:2	Triturazione pneumatici
Fase:3	Vagliatura triturato
Fase:4	Riciclo pezzatura grossolana
Fase:5	Uscita ciabattato <100mm



4: Modalità di triturazione dei pneumatici fuori uso

Si riporta di seguito un elenco dei macchinari del Modulo di triturazione “Energy”

Descrizione
<ul style="list-style-type: none"> - Trituratore TI-SAURUS 180 La camera di macinazione (1100x1500mm) è realizzata interamente in acciaio forgiato completamente lavorata di macchina utensile ed è costituita da: 2 alberi contro-rotanti esagonali porta-lame Lame a tassello in acciaio speciale integralmente temperato Quattro riduttori epicicloidali completi di motori elettrici Tenute meccaniche sugli alberi porta Il corpo macinante è costituito da un unico blocco per effettuare rapidamente le operazioni di manutenzione e/o sostituzione.
<ul style="list-style-type: none"> - Pedana di carico per pneumatici autocarro Pedana con accesso laterale per l'immissione per rotolamento del solo tipo pneumatico di autocarro. La pedana viene posta nella parte bassa del nastro di carico al fine di agevolare l'immissione del pneumatico di autocarro
<ul style="list-style-type: none"> - Nastro trasportatore di carico Tipo a gomma/catena rinforzate della larghezza di c.a. 1500mm costituito da: 1° tratto orizzontale per immissione pneumatico; 2° tratto obliquo per innalzamento sino alla tramoggia di carico del trituratore; 3° tratto inclinato in base alla tipologia del fabbricato

- Vaglio a dischi Particolare macchina che racchiude un sistema di calibrazione longitudinale in base alla velocità dei dischi: offre basso impatto di manutenzione, autopulente, senza vibrazioni e rumori eccessivi. Posizionato sotto al trituratore a caduta è dotato di due ampie finestre scorrevoli per la visione interna con facile apertura a scorrimento su guide in alluminio
- Nastro trasportatore riciclo 1 Tipo a gomma rinforzata della larghezza di c.a. 800mm costituito da un tratto con leggera inclinazione per poter distribuire il prodotto di riciclo sul nastro riciclo2
- Nastro trasportatore riciclo 2 Tipo a gomma rinforzata della larghezza di c.a. 800mm costituito da un tratto completamente orizzontale installato su appositi rulli di posizionamento, consente di poter traslare con un semplice gesto il prodotto di riciclo da una zona di taglio all'altra del trituratore.
- Nastro di scarico Tipo a gomma rinforzata della larghezza di c.a. 800mm costituito da: 1° tratto orizzontale sotto tramoggia vaglio a dischi 2° tratto obliquo per innalzamento al carico dell'eventuale container e/o tramoggia ciabattato per 2° fase di lavorazione
- Quadro elettrico trituratione Completo di PLC Siemens per sistema di controllo automatizzato di tutta la componentistica Full Inverter Technology con lo scopo di avere tutto il processo sotto controllo e di ottimizzare al massimo il risparmio energetico e la produttività di processo.

3.1.3 Fase di granulazione

La fase di granulazione consiste nel ridurre il ciabattato di dimensioni 100x100 proveniente dal Trituratore *Ti-Taurus 180* in granuli in gomma di 3 diverse granulometrie. Il nuovo impianto da installare è il **D5000T** con una capacità di caricamento istantanea fino a 5 Ton/h ed una produzione media di circa **4 Ton/h**.

La granulazione (Rasper) è la fase che definisce la capacità di trattamento dell'impianto e corrisponde a 4000Kg/h e può lavorare 24 ore al giorno.

Questa fase rappresenta il cuore del funzionamento dell'impianto in cui avviene la separazione del metallo e della fibra per il 99 % della sua presenza residua sul polverino. Per ottenere qualità così elevate sulla granulometria più grande (2,5-4,0mm) occorre anche la fase di raffinazione (*impianto qualità granulo*) descritta successivamente.

Il materiale ciabattato, di dimensioni 100x100 proveniente da trituratore, va a caricare la tramoggia di carico TBF di 5 m³ **(R1)** che ha la funzione di alimentare ad una velocità controllabile in continuo il Multi Purpose Rasper tipo MPR200T **(R3)**.

Il Rasper (granulatore) azionato da 2 motori elettrici di potenza 100Kw cadauno è costituito da 25 coltelli rotanti e 26 coltelli statici e griglia.

In questa fase attraverso il deferrizzatore magnetico DM1850 (R5) si separano i filamenti di acciaio armonico che vanno ad alimentare l'impianto di pulizia ferro tipo IL4000S, mentre i granuli contenenti ancora fibra tessile attraverso un vibrostratore (R6) vanno ad alimentare il silo tipo V4 (R8). Il silos di circa 4m³ ha lo scopo di dosare la quantità di prodotto in uscita dal Multi Purpose Rasper all'alimentazione del 1° Fine-Granulator tipo FG1504 (R9). In questa fase è presente il deferrizzatore magnetico DM2200 (R11) che provvede a separare l'acciaio residuo dal granulo ed un classificatore PC15T (R20) costituito da una griglia per la separazione del 40-50% del tessile presente nei granuli. Il materiale attraverso un deviatore (R16) passa ai 2 Fine-Granulator.

I 3 granulatori (R9, R13 e R14) di dimensioni 2100x2500x2900 hanno una lunghezza del rotore di 1425mm, una velocità di 430g/min e potenza di 110kW. La macchina è equipaggiata con 18 coltelli rotanti e 6 coltelli fissi ed ha una produzione media di 4 t/h cadauna.

I 3 fine-granulator verranno situati all'interno di un box che ha la funzione di insonorizzare l'ambiente lavorativo.

Al termine del processo di granulazione il materiale viene inviato ad un ulteriore classificatore tipo PC15V (R20) con lo scopo di rimuovere con efficacia, attraverso un sistema di griglie, la frazione tessile ancora presente nel granulato di gomma. E' presente un magnete a tamburo (R21) che ha la funzione di rimuovere eventuali residui di acciaio nei granuli in gomma. Attraverso trasporti pneumatici (R17, R18,R19) il materiale viene inviato ad un aspiratore tipo FP1500 (R24) con la funzione di separare la parte tessile dal granulato di gomma e classificare il materiale in funzione della sua granulometria. Dal classificatore eventuali residui di granuli in gomma con dimensioni maggiori di 4mm vengono re-inviati pneumaticamente (TP1) al silo di alimentazione del fine granulator.

Dal classificatore attraverso il trasportatore (TP6) si passa alla fase di insilaggio del granulo di gomma 0,8-2,5mm costituita da un piccolo silos (SLG1) e 2 Big-Bag (BBG1) che vengono riempiti attraverso un sistema di pesatura automatico costituito da 4 celle di carico ed un software nel quale si può programmare il peso massimo del singolo big-bag. Una volta che il big-bag è pieno ed è stato raggiunto il peso stabilito, il materiale attraverso un contatto elettronico può alimentare un piccolo buffer oppure passare al riempimento del secondo big-bag.

Per quanto riguarda il granulo in gomma di granulometria 0-0,8mm attraverso il classificatore si può con il trasportatore (TP4) passare direttamente alla fase di insilaggio (BBP). Viceversa con il trasportatore (TP5) può essere inviato al polverizzatore (P02) per effettuare un ulteriore lavorazione sulla materia prima e creare curve granulometriche particolari in funzione delle richieste di mercato. Il granulo in gomma di granulometria 2,5-4,0mm passa attraverso il classificatore all'impianto di raffinazione denominato "qualità granulo" costituito da un silo tipo SMV (Q2) ed una tavola di separazione C26 (Q3) progettata per separare eventuali materiali indesiderati (quali metalli e/o piccoli solidi presenti nel granulo).

Solo dopo questa ulteriore fase di raffinazione il granulo in gomma di granulometria 2,5-4,0mm passa alla fase di insilaggio (SLG1 e BBG2) attraverso il trasportatore pneumatico (TP3).

E' presente un sistema di trasporto pneumatico (TP2) che invia il materiale sopra-vaglio 4mm al silo di alimentazione del fine granulator.

Attraverso il trasporto pneumatico (TP7) il materiale può passare alla fase di polverizzazione per la trasformazione del granulo 2,5-4,0mm in 0-0,8mm, in funzione delle specifiche richieste del mercato.

Si ricorda inoltre che l'impianto è progettato anche per produrre un granulo di granulometria $\leq 20\text{mm}$. Il prodotto è stato autorizzato con Titolo Unico n.4 del 15/07/2013 Rif. Urb. n°5761 Pratica Edilizia n°2/SUAP/2013 denominato "Autorizzazione alla modifica all'esercizio delle operazioni di messa in servizio (R13) e trattamento (R3) - Qualifica del prodotto in gomma in uscita dal ciclo di lavorazione con granulometria inferiore a 20mm come materia prima".

Il materiale viene convogliato all'impianto di insilaggio denominato **(BBG3)** attraverso il trasportatore **R28**.

Si tratta di un prodotto intermedio che già si forma durante la lavorazione. La citata granulometria si ottiene attraverso le fasi di triturazione e granulazione, con le quali il materiale risulta essere già privo di acciaio e fibre di tessile.

Si riportano le caratteristiche principali dell'impianto di granulazione **tipo D5000T** :

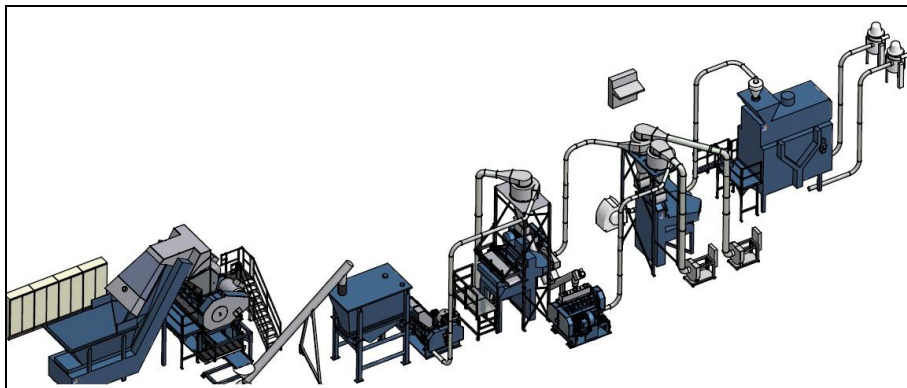
Posizione	descrizione
1.	Alimentatore TBF Alimenta a velocità controllabile in continuo il MPR. E' costituito da pareti laterali in robusta lamiera con struttura di supporto a formare una tramoggia di carico di circa 5m^3 ed un nastro trasportatore in acciaio e gomma di larghezza 1.220mm, comandato da un motore elettrico da 3.7/4.4Kw attraverso un controalbero robusto montato su riduttore. Dim. 6.1x2.3x5.4m Variazione velocità 50Hz 2.9-5.7m/min Consumo 4.00kW
2	Piattaforma di servizio (frontale) Da utilizzare durante i lavori di manutenzione sul MPR
3	Multi Purpose Rasper MPR200T Lunghezza rotore 2000mm, velocità rotore 144 giri/min azionato da 2 motori elettrici di potenza $2 \times 110\text{Kw}$ tramite trasmissione con cinghia a V fornito con 25 coltelli rotanti, 26 coltelli statici e griglia. La carcassa principale è equipaggiata di piastre di usura sostituibili, anelli di usura e altri componenti. Apertura motorizzata idraulicamente della parte superiore della tramoggia di alimentazione e dalla zona di alloggiamento griglia. La camera di taglio ha dimensioni pari a 600x2000mm. Il Rasper ha dimensioni di 2600x3800x4500mm ed un peso di 23.000Kg Consumo 220,00kW
4	Piattaforma di servizio (posteriore) Da utilizzare durante i lavori di manutenzione sul MPR
5	Deferrizzatore Magnetico DM1850 Per la rimozione del ferro dal granulato in gomma. Consumo 0.75kW
6	Vibroestrattore 800x5000mm consumi 3 kW
7	Trasportatore a coclea, girevole Diam 300x6500, 3 Kw
8	Silo tipo V4 con circa 4mc di volume Lo scopo di questo silo è di dosare la quantità di prodotto in uscita dal Multi Purpose Rasper fino alla massima capacità di alimentazione al Fine-Granulator. Consumo 2.4kW
9	Fine Granulator tipo FG1504

	<p>Con lunghezza rotore 1425mm, velocità rotore 430 g/min e potenza rotore 110kw. La macchina è equipaggiata con 18 coltelli rotanti e 6 coltelli fissi. Il granulatore FG è dotato di apertura idraulica della parte superiore e alloggiamento griglia per accesso rapido a coltelli, rotore e sostituzione/pulizia griglia. La capacità è superiore a 4500Kg/h. Le dimensioni del fine granulator sono 2100x2500x2900 con un peso di 7750Kg.</p> <p>Consumo 110,00 kW</p>
10	<p>Piattaforma di servizio (tipo mobile) Da utilizzare durante i lavori di manutenzione sul classificatore PC15</p>
11	<p>Deferrizzatore Magnetico tipo DM2200 Per rimozione ferro dal granulato. Consumo 1.1kW</p>
12	<p>Trasportatore pneumatico del materiale Al Classificatore PC15T 23.5kW. Consumo 23,50kW</p>
13	<p>Classificatore tipo PC15T Costituito da una griglia per la separazione tessile e una cassa nella parte inferiore. Le sfere in gomma impediscono in modo efficace l'intasamento della griglia. Le griglie sono facilmente sostituibili. L'area griglia è circa 2.4mq. Circa il 40-50% del tessile verrà rimosso dal Classificatore. Consumo motore 1.5kW</p>
14	<p>Fine granulator FG1504 Simile alla posizione 9 Consumo 110,00Kw</p>
15	<p>Fine granulator FG1504 Simile alla posizione 9 Consumo 110,00Kw</p>
16	<p>Deviatore Consumo 3,0Kw</p>
17-18	<p>N° 2 Trasportatore pneumatico del materiale Consumo 23,5Kw</p>
19	<p>Trasportatore pneumatico del materiale Consumo 6,5Kw</p>
20	<p>Classificatore tipo PC15V Questa macchina rimuoverà con efficacia la frazione tessile dal granulato in gomma. Consiste in 2 strati di griglie con casse nella parte inferiore disposte in verticale. Le griglie superiori con fori rotondi e una cassa cieca nella parte inferiore. Potenza Motore 0.75kw</p>
21	<p>Magnete a tamburo Per rimozione ferro. Consumo 0.55kW</p>
22	<p>Vibroestrattore 600x2000mm, consumo 0.55kW</p>
23	<p>Piattaforma di servizio Da utilizzare durante i lavori di manutenzione sull'aspiratore FP1500</p>
24	<p>Aspiratore tipo FP1500 Progettato per separare la parte tessile dal granulo in gomma prodotto e per classificare la gomma in tre frazioni in base alla dimensione. Area griglia totale 19m². Consumo</p>

	3.0kW.
25	Trasportatore pneumatico del materiale. Consumo 6,25kW
26	Trasportatore pneumatico del materiale. Consumo 6,25kW
27-28	Quadro di comando elettrico

L'impianto è dotato di un sistema di rilevamento scintilla MPR200 costituito da:

- 1 centralina rilevamento scintille, DC1
- 2 spark detection SND
- 2 spark detection SDD
- 2 sistemi di autospegnimento scintilla con 1 ugello
- 1 sistema di autospegnimento scintilla con 4 ugelli specifici per MPR
- 1 sistema Booster da 300l per alimentazione acqua a 4bar



5: Schema 3D con l'indicazione dei principali componenti dell'impianto D5000T



6. Schema 3D del Multi Purpose Rasper MPR200T



7:Immagine di un Multi Purpose Rasper MPR200T



8: Schema 3D del Fine Granulator tipo FG1504



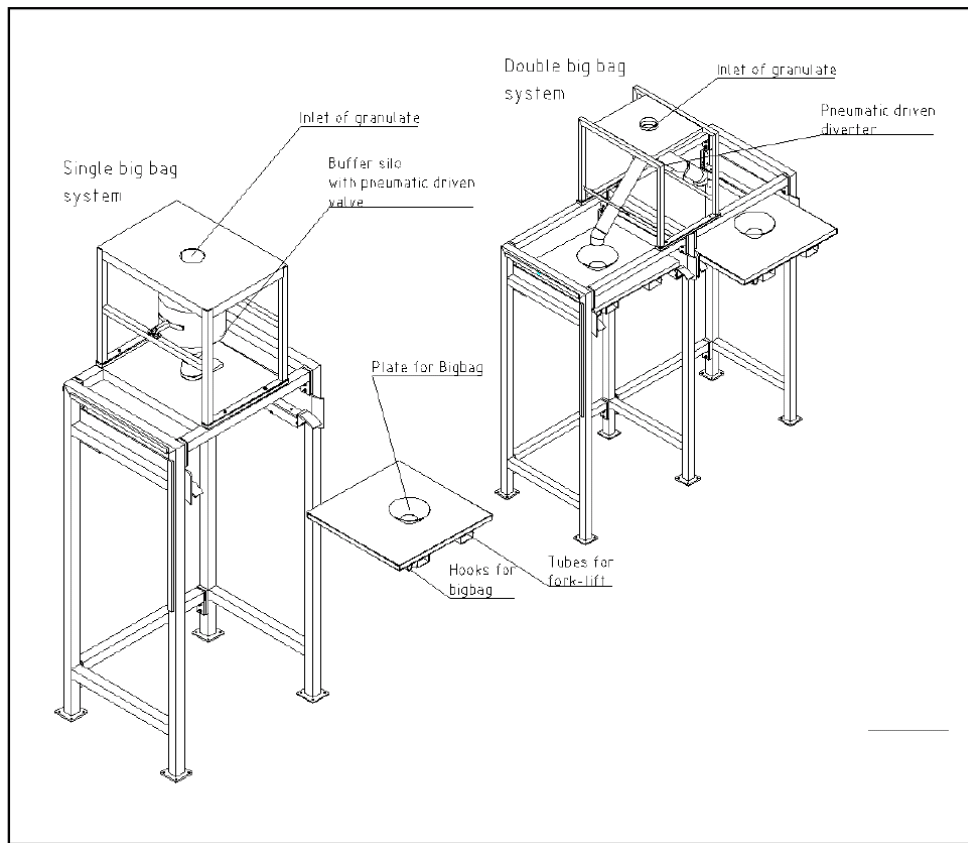
9 Immagine di un Fine Granulator tipo FG1504



10 Immagine di un Classificatore tipo PC15T



11 Immagine di un sistema di insilaggio con pesatura elettronica



12 Schema del sistema di insilaggio

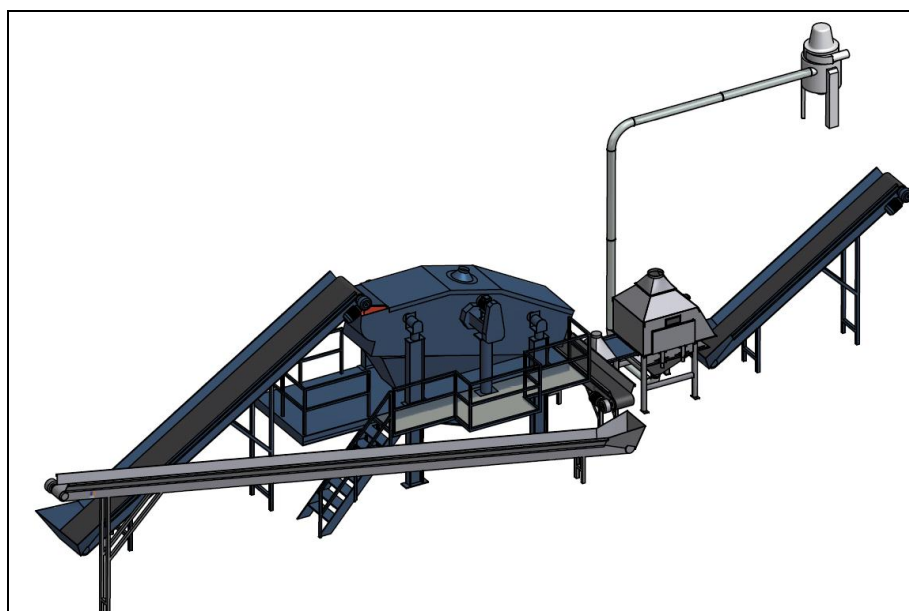
3.1.4 Impianto di pulizia acciaio in linea tipo IL4000S

Con questa tipologia di impianto si effettua la pulizia dei fili in acciaio contenenti il 15-20% di gomma e tessile provenienti dall'impianto di granulazione D5000T dove è installato il Multi Purpose Rasper con griglia da diam.12mm. Si ottiene un acciaio pulito con densità di 300 Kg/m³ e purezza almeno del 98%. La capacità media di produzione è pari a **2,5-3,0 Ton/h.**

Il materiale proveniente dal deferrizzatore (R5) alimenta la macchina di pulizia flex Screener KRL/ED 1000x4 (PF3) attraverso rulli di diverso diametro distaccano la frazione elastomerica dal filamento per frizione e strappo. Con una tramoggia (PF5) ed un vibroestrattore con griglia (PF6) si aspira la parte tessile, mentre con il deferrizzatore magnetico a tamburo (PF7) si separa l'acciaio dal granulo. In questo modo i filamenti in acciaio non vengono ulteriormente ridotti, ma mantengono una lunghezza compresa tra i 20mm ed i 50mm e utilizzabili nelle fonderie.

Al termine del trattamento di pulizia si ottiene una materia prima seconda di ottima qualità senza la necessità di ulteriori lavorazioni, che viene stoccata attraverso il trasportatore (PF7) nel cassone esterno.

Posizione	descrizione
1	Trasportatore alimentatore Diam. 160 800x8500mm. Consumo 3.0 kW
2	Piattaforma di servizio per il pulitore acciaio
3	Pulitore acciaio Bivitec KRL/ED 1000x4 Consumo 7.5kW
4	Trasportatore Diam. 160 400x3000mm. Consumo 1,1 kW
5	Tramoggia per aspirazione parte tessile
6	Vibroestrattore Con griglia 800x4000. Consumo 1,5kW
7	Deferrizzatore magnetico a tamburo Consumo 2,3kW
8	Trasportatore alimentatore Diam. 160 800x5000mm. Consumo 1,5 kW
9	Trasportatore pneumatico del materiale Consumo 20,70 kW
10	Trasportatore ricircolo della frazione intermedia
11	Quadro elettrico

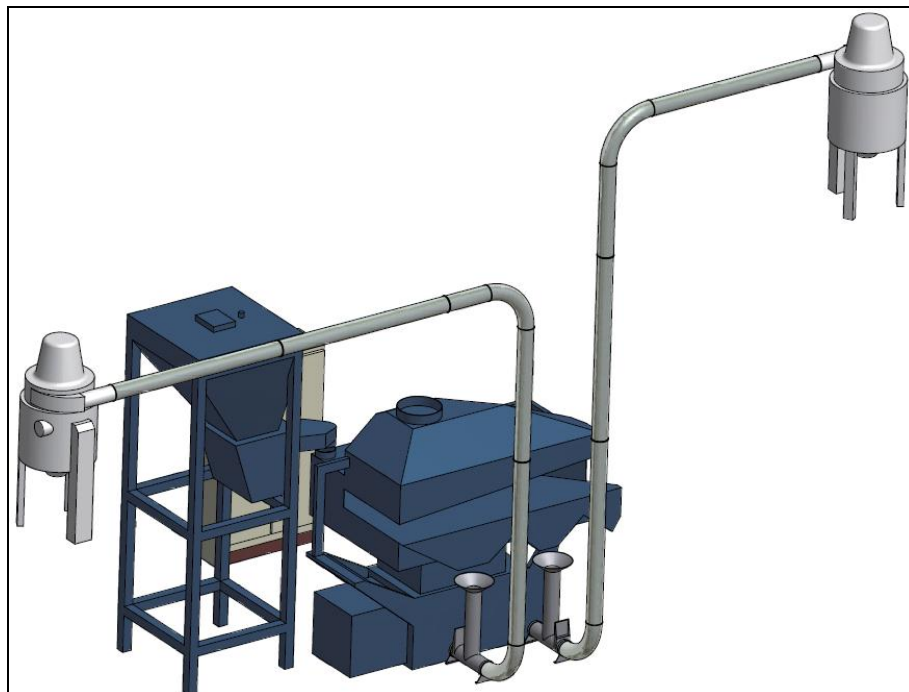


13. Schema 3D impianto pulizia acciaio in linea tipo IL4000S

3.1.5 Fase qualità granulo 2,5-4,0mm

In questa fase si migliorano le caratteristiche delle granulometrie attraverso l'eliminazione delle impurità presenti nei granulati e l'ottenimento di un granulato nero di ottima qualità con una purezza del 99%. Con l'impianto *qualità granulo* si ha una produzione media di **1,5-2,0 Ton/h**.

L'impianto è costituito da un piccolo silos (Q2), un trasporto pneumatico (Q1) ed una tavola di separazione C26 (Q3) che ha la funzione di allontanare le eventuali impurità solide presenti nel granulo. In questa fase il granulo in gomma pulito può essere inviato attraverso il trasportatore pneumatico (TP3) all'insilaggio, all'impianto di polverizzazione attraverso il trasportatore pneumatico (TP7) ed eventualmente il sopra-vaglio 4mm in testa all'impianto di raffinazione attraverso il trasporto pneumatico (TP2).



14: Schema 3D dell'impianto qualità granulo 2.5-4mm

Posizione	Descrizione impianto di raffinazione 2.5 -4.0mm
1	Trasportatore pneumatico del materiale consumo 6.25kW
2	Silo tipo SMV Consumo 0,40kW
3	Tavola di separazione C26 Progettata per separare pietre e metalli dal granulo in gomma. Il prodotto dalla tavola di separazione viene diviso in 4 frazioni di uscita, polveri, metalli e pietre, granulo in gomma, frazione intermedia. La superficie della tavola è 2,15m ² . La potenza dei motori della tavola e del ventilatore è 1.5+15.0kW
4	Trasportatore pneumatico del materiale consumo 6.25kW
5	Quadro di comando elettrico

3.1.6 Fase di polverizzazione materia prima seconda. Impianto tipo E2000P

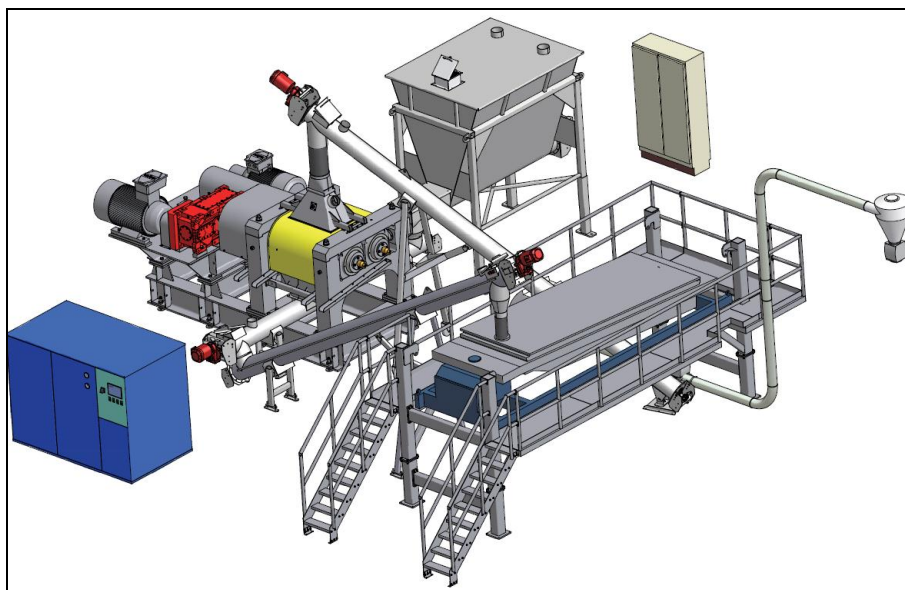
In questa fase in funzione delle richieste specifiche curve granulometriche richieste dal mercato si effettua una ulteriore lavorazione sulla materia prima seconda.

Si può alimentare il polverizzatore con il granulo in gomma di granulometria 0-0,8mm attraverso il Trasportatore pneumatico (TP5) oppure con il granulo 2,5-4,0mm attraverso il (TP7). E' presente un silos di dimensioni pari a 6 mc (P01) che ha la funzione di alimentare costantemente il polverizzatore (P02). Il materiale in ingresso all'impianto risulta essere già materia prima seconda con purezza pari al 99%.

E' presente una griglia Rotex (P06) con un sistema di trasportatori a coclea (P05, P06) che trasportano il materiale dal polverizzatore alla griglia

Si riporta di seguito un esempio della capacità produttiva, ma si ricorda che essa varia in funzione della curva granulometrica. Si può stimare una produttività media per curve granulometriche standard di circa 1 Ton/ora. Al termine del processo di polverizzazione potrebbe essere necessario in funzione della specifica curva granulometrica, quindi con un utilizzo saltuario, effettuare una vagliatura finale (P09) ed attraverso 2 trasportatori a coclea (P04) procedere ad insilaggio (BBG1M).

Capacità produttiva	Granulometria in uscita	
2,0-2,5 Ton/ora	10 mesh	2,00 mm
1,5-2,0 Ton/ora	20 mesh	0,84 mm
1-1,5 Ton/ora	30 mesh	0,59 mm
600-800Kg/ora	40 mesh	0,42 mm
500Kg/ora	50 mesh	0,30 mm



15. Schema 3D dell'impianto di polverizzazione tipo E2000P

Posizione	Descrizione impianto di raffinazione 0-0,8mm
1	Silo con trasportatore a coclea 6 m³. Consumo 2,2kW
2	Polverizzatore (cracker Mill) CM900. Consumo 350kW
3	Impianto di raffreddamento (chiller) 50-150 Consumo 20kW
4	Trasportatore a coclea 1 Diam. 330X5000mm. Consumo 2,2Kw
5	Trasportatore a coclea 2 Diam. 330X7500mm girevole. Consumo 5,5Kw
6	Griglia Rotex. Consumo 2,2kW
7	Trasportatore pneumatico del materiale. Consumo 6,25kW
8	Trasportatore a coclea 3 Diam. 330X7500mm. Consumo 5,5Kw
9	Quadro elettrico

L'impianto di polverizzazione della MPS comporta un elevato consumo di energia elettrica (390kW) non riconducibile all'attività di recupero del rifiuto, poiché si tratta di una lavorazione effettuata sulla materia prima seconda.

L'impianto di polverizzazione viene utilizzato in funzione delle richieste del mercato per cui può accadere che per alcuni periodi dell'anno non venga utilizzato.

3.1.7 Raffinazione del rifiuto tessile proveniente dall'attività di recupero PFU

Con l'intento di limitare la produzione del rifiuto tessile, l'azienda intende installare in prossimità del cassone di scarico un impianto che effettua una ulteriore raffinazione e separa gli ultimi quantitativi di granuli presenti sul rifiuto 19.12.08.

Il principio di funzionamento consiste nel vorticare la fibra tessile mediante delle tacche poste a misura stabilita dal tamburo, che ne genera una caduta per forza di gravità durante il moto rotazionale. Durante questa caduta e l'impatto all'interno del tamburo avviene il distacco delle parti granulari in gomma che fuoriescono dalla rete staccante posta all'esterno del tamburo stesso.

Il materiale di scarico dai 2 cicloni esistenti vengono convogliati nella Trommel 4010 (8) con lo scopo di separare il granulo residuo che viene raccolto in una vaschetta (9) ed rinviato di nuovo attraverso le tubazioni di convoglio al classificatore (R13).

Viene installato un nuovo ciclone (3) di diametro 700mm con la funzione di scaricare attraverso la valvola stellare (2) il prodotto tessile nel cassone scarrabile. Il trasferimento del prodotto tessile avviene tramite una tramoggia di scarico cocleata (7) ed una tubazione a circuito chiuso di diametro 180mm.

Sono presenti opportuni sensori che controllano i seguenti parametri e bloccano la macchina:

- Assenza di materiali in ingresso
- Livello massimo di tela stoccata nel container
- Anomalie varie

Per la gestione dell'impianto si stima l'impiego di un operatore con il compito di supervisione e di sostituzione dello scarrabile pieno

Linea di raffreddamento

Il processo di recupero pneumatici fuori uso non prevede l'ausilio di linee di raffreddamento, se non per la macchina di lavorazione della materia prima. (Impianto tipo E2000P "Polverizzatore" P02). Nella planimetria dello stato di progetto è indicata il posizionamento della linea di raffreddamento che parte dal Chiller.

Trattamento delle acque esterne

Non sono presenti variazioni, rispetto a quanto descritto precedentemente.

Si ricorda che i tombini delle acque meteoriche "ex-Omsa" nell'area stoccaggio dei pneumatici fuori uso sono chiusi.

Descrizione delle caratteristiche quantitative e qualitative dei prodotti in entrata ed uscita al nuovo impianto di trattamento recupero pneumatici fuori.

In seguito al progetto di Revamping dell'impianto di recupero pneumatici fuori uso si effettua la sostituzione di una parte dell'impianto con macchine più performanti dal punto di vista energetico ed il conseguente aumento della produttività che passa dai 12.000t/annue alle 24.000t/annue. L'intervento non comporta modifiche al piazzale esterno, né alle quantità di stoccaggio temporaneo che rimangono invariate.

Al termine del trattamento meccanico dei pneumatici fuori uso si ottengono come precedentemente riportato le seguenti 3 frazioni completamente separate:

Tipologia	percentuale
Granuli in gomma (0-0.8mm, 0.8-2.5mm, 2.5-4.0mm)	68%
Acciaio (codice CER 19.12.02)	4%
Acciaio MPS	20%
Fibre tessili (codice CER 19.12.08)	8%

Il processo di recupero dei pneumatici fuori uso rimane dunque invariato per cui si ottengono le 3 tipologie di materia prima seconda già autorizzate nella Determina dirigenziale n°1007/GEN n.40/SA del 25/02/2009 ed il cippato autorizzato con Titolo Unico n.4 del 15/07/2013 Rif. Urb. n°5761 Pratica Edilizia n°2/SUAP/2013:

- Granuli in gomma 2,5-4,0mm (**43%**)
- Granuli in gomma 0,8-2,5mm (**20%**)
- Polverino di gomma 0-0,8mm (**5%**)
- Cippato ≤ 20 mm (**in funzione delle richieste di mercato**)

Dalle attuali richieste del mercato si stima inoltre una percentuale di granulo 2,5-4,0mm ulteriormente lavorato attraverso la fase di polverizzazione e trasformato in polverino di gomma 0-0,8mm pari al **25%**. Le materie prime seconde vengono stoccate in big-bag e stoccate sia all'interno dello stabilimento che all'esterno., sempre nel rispetto di quanto riportato nel CPI rilasciato dai VV.FF.

Si ricorda che i granulati in gomma (polverino, granuli, cippato) cessano di essere rifiuto quando vengono soddisfatte le condizioni specificate nell'art. 184 ter del D.Lgs. 152/2006:

- a) I granulati vengono comunemente utilizzati come materia prima per i seguenti scopi:
Ingegneria civile: I granulati vengono utilizzati in sostituzione di inerti minerali per la realizzazione di fondazioni stradali/ferroviarie, rilevati stradali alleggeriti e bacini di ritenzione delle acque piovane; le proprietà drenanti, immarcescibili, antivibranti, termoisolanti ed il basso peso specifico del materiale derivanti da PFU ne rendono l'applicazione in tali impieghi particolarmente vantaggiosa.

Superfici sportive: I materiali sono utilizzati come materiale da intaso per campi in erba artificiale, piste da atletica, pavimentazioni anti-trauma e superfici equestri. Le proprietà drenanti del materiale, unite alla capacità elastica di assorbire gli urti rendono il granulato di PFU particolarmente adatto a tali impieghi.

Materiali per l'isolamento: Il granulato in gomma, legato poi da resine poliuretatiche, viene utilizzato per produrre pannelli insonorizzanti, tappetini anti-calpestio, membrane impermeabilizzanti, materiali anti-vibranti ed antisismici particolarmente apprezzati per le proprietà elastiche del materiale.

Manufatti: Il granulo in gomma viene utilizzato per la produzione di elementi di arredo urbano quali dossi artificiali, delimitatori di traffico, cordoli, mattonelle in gomma.

Materiali per pacciamatura: Il granulato rivestito con resine poliuretatiche e colorato in diverse tonalità viene utilizzato come sostituto della corteccia di conifere per la pacciamatura di giardini pubblici e privati, aiuole spartitraffico, totatorie, ecc.

- b) Attualmente il mercato italiano richiede i granuli in gomma principalmente per usi sportivi (campi da calcio e superfici sportive) ed applicazioni di ingegneria civile. In quantità minori, ma con richieste in aumento il granulato viene utilizzato come materia prima per manufatti, pavimenti anti-trauma, isolamenti acustici ed antivibranti e materiali per l'arredo urbano.
- c) I granulati soddisfano i requisiti tecnici richiesti dalla norma CEN TS 14243/2010. Si ricorda che l'azienda oltre ad essere certificata ISO 9001:08 e 14001:04 ed EMAS è in possesso della certificazione di prodotto secondo il disciplinare Ecopneus e Remade in Italy. Si riporta di seguito il piano di controllo con il quale si tengono sotto controllo i requisiti delle materie prime seconde prodotte.

Parametro	Periodicità	Limite e/o Tolleranza	Note
Densità del materiale (Kg/m ³)	<i>Semestrale</i>		<i>ASTM D 5603/01</i>
Granulometria del materiale	<i>Semestrale</i>	<i>>10</i>	<i>ASTM D 5644/01</i>
Contenuto metallo libero	<i>Semestrale</i>	<i>< 0,05%</i>	<i>CEN/TS 14243:2010</i>
Contenuto di fibre tessili	<i>Semestrale</i>	<i>< 0,05%</i>	<i>CEN/TS 14243:2010</i>
Contenuto di SOV- Test di cessione in acido acetico 0,5M	<i>Semestrale</i>		
Contenuto di IPA-Test di cessione in acido acetico 0,5M	<i>Semestrale</i>		
Residuo secco a 550°C	<i>Annuale</i>		<i>METODO INTERNO</i>
Carbon Black	<i>Su richiesta</i>		<i>ISO 11358</i>
Natural Rubber (NR)	<i>Su richiesta</i>		<i>ISO 11358</i>
SBR	<i>Su richiesta</i>		<i>ISO 11358</i>
Gomme IIR,XIIR e BR	<i>Su richiesta</i>		<i>ISO 11358</i>

- d) L'utilizzo dei granuli in gomma non comporta impatti negativi sull'ambiente e sulla salute umana. Il progetto di revamping comporta un miglioramento energetico con una riduzione dei consumi energetici in funzione

Dall'attività di recupero come già riportato precedentemente si generano le seguenti tipologie di rifiuti quali

- Rifiuti Tessili codice CER 19.12.08 (8%)
- Metalli Ferrosi (acciaio stallonato) codice CER 19.12.02 (4%)
- Metalli ferrosi MPS (20%)
- Rifiuti misti codice CER 19.12.12 (1%)

In seguito all'installazione dell'impianto di pulizia acciaio in linea (tipo IL4000S) si ha un riduzione della produzione di Acciaio armonico come rifiuto, poiché il materiale in uscita è materia prima seconda. Viene stoccato in un cassone all'esterno del capannone coperto dalle intemperie.

Durante le operazioni di manutenzione dell'impianto di pulizia ferro o a seguito di controlli di qualità del grado di purezza del ferro in accordo con il regolamento 333/2011 non conformi può essere necessario smaltire il materiale anche come rifiuto (codice CER 19.12.02 "metalli ferrosi" Destino R13). Risulta essere difficoltoso valutare con precisione tali quantitativi.

I metalli ferrosi (codice CER 19.12.02) vengono stoccati in 2 cassoni esterni.

Attualmente attraverso una convenzione con Ecopneus, il materiale tessile derivante dall'attività di recupero non viene più smaltito in discarica, ma viene recuperato in R1 per una percentuale pari a circa l'90%. Solo in 10% viene smaltito in discarica (destino D15). Lo stoccaggio della tela avviene in cassoni scarrabili. Per ottimizzare le operazioni di trasporto dei cassoni di 19.12.08 si richiede un deposito temporaneo di 4 cassoni posizionati all'esterno e una cassone per lo scarico della tela derivante dall'attività di recupero.

Si riporta di seguito una tabella riassuntiva dei rifiuti lavorati/prodotti

RIFIUTI LAVORATI			
Codice CER	%	Quantitativi (t)	Operazioni di recupero/smaltimento
16.01.03 "pneumatici fuori uso"		23.985	R13-R3
07.02.99 "rifiuti in gomma"		15	R13-R3
<i>Totale rifiuti lavorati</i>		24.000	
MATERIE PRIME SECONDE PRODOTTE			
MPS granuli in gomma	68	16.320	
MPS "metalli ferrosi"	20	4.800	
<i>Totale MPS</i>		21.120	
RIFIUTI PRODOTTI			
Codice CER	%	Quantitativi (t)	Operazioni di recupero/smaltimento
19.12.08 "prodotti tessili"	8	1.920	R1 (90%) 1728t D15 (10%) 192t
19.12.02 "metalli ferrosi"	4	960	R13-R4 960t
19.12.12 "rifiuti misti"	1	240	D15
<i>Totale rifiuti prodotti</i>		3.120	

I rifiuti misti codice CER 19.12.12 sono stati stimati in 1% del lavorato e considerato come perdita di produzione.

Dalla valutazione della tabella si evince come da 24.000t di rifiuti si generano circa 21.120t di materie prime a cui si sottrae i 240t di rifiuti misti, quindi 20.880t (87%) e 3.120t di rifiuti (13%) di cui solo 192t a smaltimento (D15).

Da questa valutazione si massima si evince come dai 24.000t di rifiuti lavorati si generano solo 432t (circa 2%) di rifiuti da smaltire in discarica.

Si riportano in allegato i manuali d'uso delle principali macchine del nuovo impianto. Il manuale completo verrà fornito solo in versione elettronica.

ALLEGATI

- a. SCHEDA TECNICA TRITURATORE TIRES *“Impianto riciclaggio pneumatici fuori uso- Energy” con caratteristiche e dichiarazione di conformità del fabbricante;*
- b. MANUALE D'USO ELDAN MULTI PURPOSE RASPER “MPR200T”;
- c. MANUALE D'USO ELDAN” FINE-GRANULATOR FG1504”;
- d. MANUALE D'USO POLVERIZZATORE ELDAN “CRACKER MILL”;
- e. MANUALE D'USO DELLA MACCHINADI PULIZIA ACCIAIO “BIVITEC”;
- f. CONFERMA CARATTERISTICHE ELDAN IMPIANTO PULIZIA ACCIAIO
- g. CORRETTA CONDUZIONE DELL'IMPIANTO DI PULIZIA TESSILE;
- h. DICHIARAZIONI DI CONFORMITA' IMPIANTI ELDAN
- i. ELENCO RUMOROSITA' IMPIANTO ELDAN

Nominativo e recapiti del tecnico che ha redatto la relazione tecnica.

Arch. Steca Paolo

c/o Steca Spa, via Tenna 87/b 63813 Monte Urano

Tel 0734.84.18.08 Fax 0734.84.12.37 E-mail: info@steca.it

Nominativo e recapiti del referente per le problematiche ambientali all'interno dello stabilimento.

Ing.. Daniele Diletti

c/o Steca Spa, via Tenna 87/b 63813 Monte Urano

Tel 0734.84.18.08 Fax 0734.84.12.37 E-mail: info@steca.it

Impianto riciclaggio pneumatici fuori uso “ENERGY”

Protetto da brevetto ITALIA –FRANCIA – USA-CANADA



Egredi Sig.
Ing Paolo Steca
Dott. Federico Steca
Steca S.p.A.
Via Tenna 87/B
Monte Urano (FM)

Oggetto : Offerta n. 60/15 FF.mm del 01/07/2015

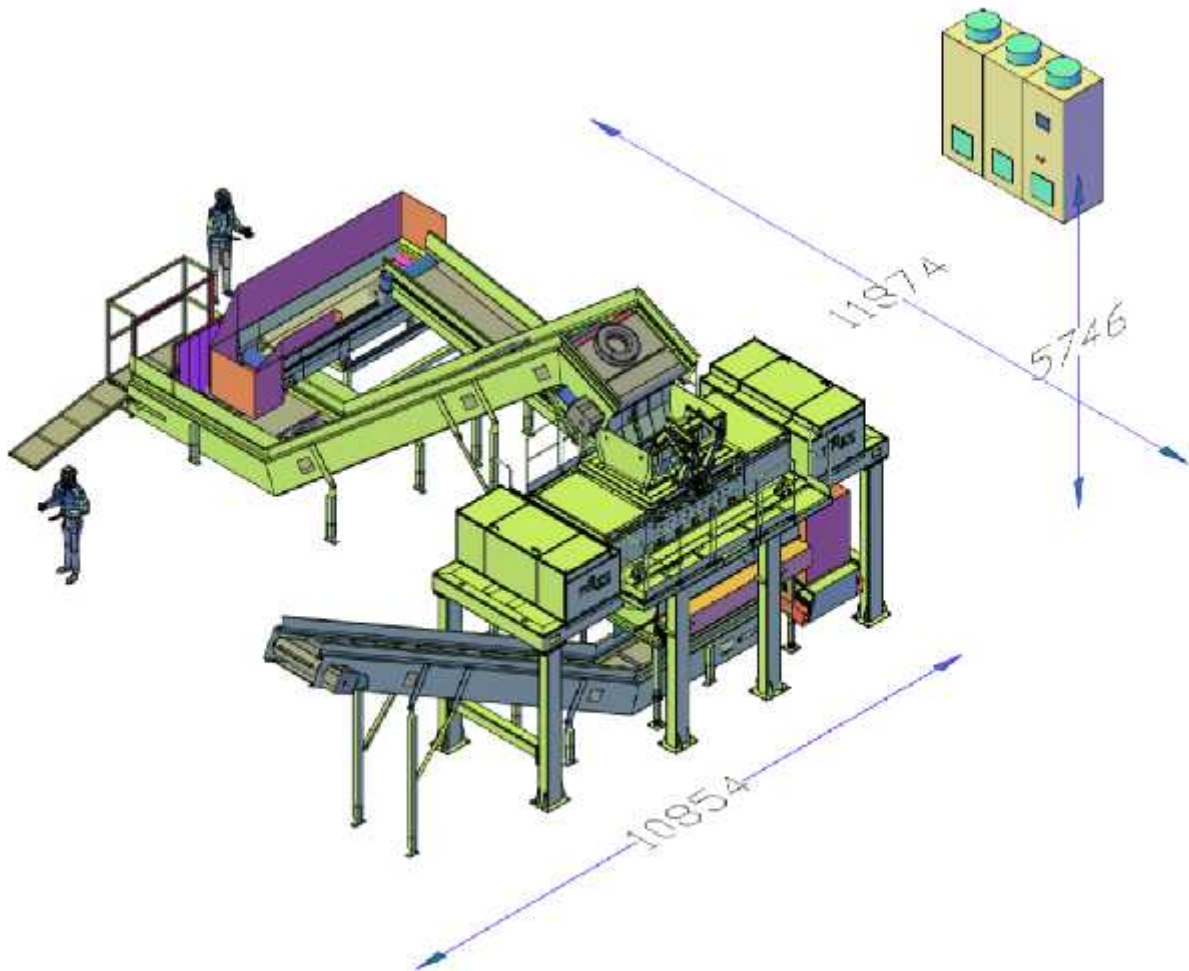
Come da Vs. gentile richiesta, siamo a formularVi ns. migliore offerta per la fornitura di un impianto di riciclaggio pneumatici fuori uso modello "**ENERGY**" avente le caratteristiche in essa indicate.

A Vs. completa disposizione per eventuali chiarimenti.

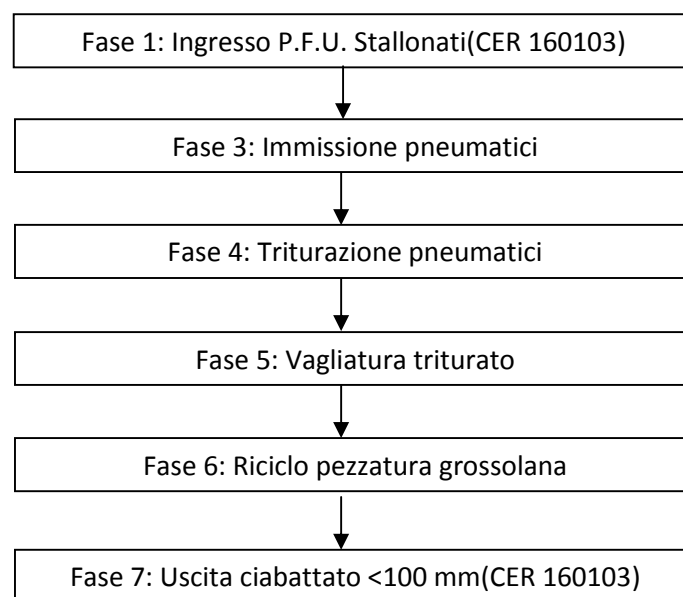
Distinti saluti,

TIRES S.p.A.
Legale Rappresentante
Francesco Fazzini

Modulo "Energy"



Schema del flusso di lavoro Modulo "ENERGY"



Scheda Tecnica Modulo "ENERGY"

Materiale in ingresso:	70% pfu auto, 30% pfu camion stallonati
Potenza installata:	circa 190 kW/h
Potenza media assorbita:	circa 65<>75 kW/h
Turni di lavoro giornalieri:	3 (x 8 ore a turno).
Sistema d'imballo:	sfuso
Personale necessario per conduzione impianto	2 persone per turno
Capacità di carico istantanea:	circa 12.000 Kg/h
Capacità di produzione media	4.000<>6000 kg/h
Tipologia di Taglio	Netto,Regolare (x utilizzo cementeria)
Durata taglio netto	1.250 Ton lavorate
Materiali in uscita	Ciabattato < 100 mm
Durata taglienti	2.000-2.500 Ton lavorate
Riaffilabilità taglienti	Per sempre con "full spare part service"
Acquisto set nuovo taglienti di ricambio	Una volta solo all'acquisto dell'impianto

Nota: Le caratteristiche del prodotto in uscita di cui sopra sono da esempio. E' possibile effettuare delle variazioni in accordo con il fornitore in sede di ordine se necessario.

- I dati sono influenzabili dalle condizioni delle lame e dai pneumatici immessi.
- Per garantire la massima efficienza delle macchine, la composizione dei pneumatici al punto di carico deve essere di 1 pneumatico di autocarro ogni 5-8 pneumatici d'auto.
- Se necessario, le macchine sono dotate di sistemi di raffreddamento ad acqua.
- Ciascuna macchina e impianto è controllato da un set di armadi elettrici con visualizzatori sinottici e PLC. Tutte le macchine sono protette da sensori e/o microinterruttori di sicurezza.
- Le macchine sono fornite con marcatura CE.
- Per garantire una corretta conduzione dell'impianto, i pneumatici al carico devono essere esenti da:
 - prodotti organici
 - prodotti inerti (plastiche varie)
 - corpi estranei (ferrosi, sassi, vetro, acciaio, piombo, rame ceramiche ecc.).

Descrizione Modulo "Energy"

Modulo di Triturazione

Il modulo di triturazione della TIRES SPA è un sistema automatico di facile gestione assistito da un singolo operatore. Quest'ultimo colloca i pneumatici sul nastro di carico che alimenta un tritratore bi-albero.

I pneumatici pre-triturati possono alimentare le fasi di lavorazione successive o essere immessi direttamente sul mercato. Proprio per la richiesta di mercato, in particolare delle cementerie, la TIRES ha realizzato questo modulo di alta qualità che permette di avere un taglio netto e regolare e una costanza di produzione.

Il **Modulo Energy** della TIRES SPA inoltre è ritenuto il più all'avanguardia per quanto riguarda il recupero dello pneumatico sotto forma di ciabattato, sia sotto il profilo Energetico (**70 Kg/kWh medi**), che per il basso costo di manutenzione. Proprio sotto l'aspetto energetico, tale macchina consente di risparmiare annualmente con una produzione di riferimento di 15.000 ton/annue, circa **150.000 kW/h** rispetto alle macchine di ultima generazione presenti sul mercato mondiale, con un ritorno dell'investimento dimezzato rispetto allo standard di sette anni.



Le caratteristiche sopra menzionate, permettono di ottenere un piano di ammortamento dimezzato rispetto a qualsiasi altra tecnologia attualmente presente sul mercato internazionale.

Inoltre, la costruzione dell'intero corpo macinante, **privo di qualsiasi saldatura** e con sezione a spaccato superiore, ne fanno un punto di forza e di alta qualità per i professionisti del settore, che conoscono le problematiche meccaniche e l'accessibilità agli organi di movimento.

Dati Tecnici Tritratore TI-SAURUS 180

Potenza installata:	180 kW	
Classe Rendimento	AAA (Energy Saving)	
Tasselli Lama	108 Pezzi	
Produttività		
Lavorazione	Senza Calibrazione 200<->400 mm	Calibrazione <100x100 mm
Lavorazione istantanea	20.000<->24.000 Kg/h*	7000<->8.000 Kg/h*
Media produttiva	12.000<->16.000 Kg/h*	4000<->6.000 Kg/h*
* Dipende dalla tipologia dello pneumatico e dalla velocità dei rotori che verrà impostata.		

POS 1: Elenco macchinari Modulo ENERGY

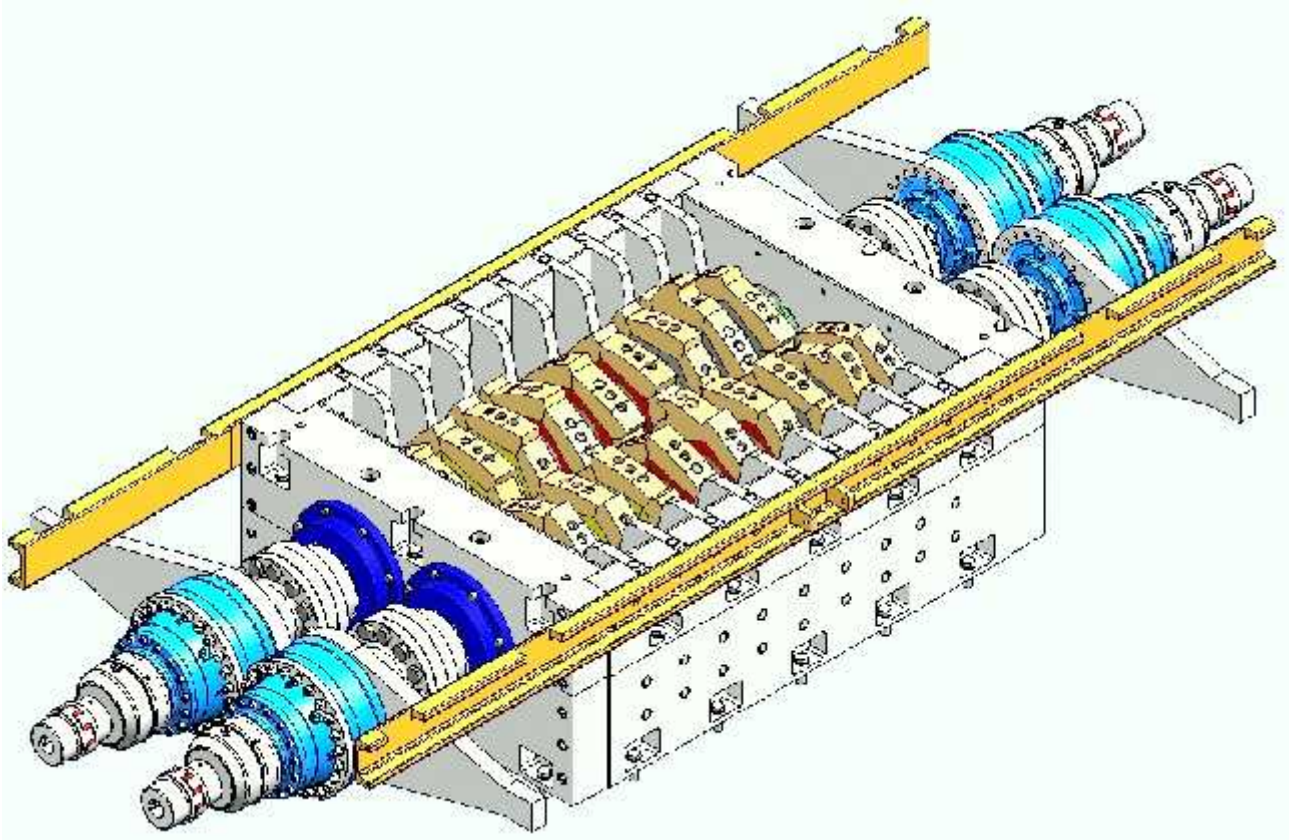
Descrizione	Q.tà
<p>Trituratore TI-SAURUS 180</p> <p>La camera di macinazione (1100x1500 mm) è realizzata interamente in acciaio forgiato completamente lavorata di macchina utensile ed è costituita da:</p> <ul style="list-style-type: none"> - due alberi contro-rotanti esagonali porta-lame; - lame a tassello in acciaio speciale integralmente temperato; - quattro riduttori epicicloidali completi di motori elettrici - tenute meccaniche sugli alberi porta-lame per l'isolamento degli organi meccanici; - piastre antiusura bullonate su tutto il perimetro interno della macchina - Spintore pneumatico per pneumatico di autocarro 	01
<p>Pedana di carico x Pneumatici Autocarro</p> <p>Pedana con accesso laterale per l'immissione per rotolamento del solo tipo pneumatico di autocarro. La pedana viene posta nella parte bassa del Nastro di carico al fine di agevolare l'immissione dello Pneumatico di Autocarro.</p>	01
<p>Nastro trasportatore Carico: tipo a Gomma/Catena Rinforzata della larghezza di c.a.1500 mm.</p> <p>Caratteristica principale: 1^ tratto orizzontale per immissione pneumatico; 2^ tratto obliquo per innalzamento sino alla tramoggia di carico del trituratore ed eventuale 3^ tratto inclinato in base alla tipologia del fabbricato(definito dalla TIRES all'atto del progetto esecutivo impianto)</p>	01
<p>Vaglio a Dischi: particolare macchina che racchiude un sistema di calibratura longitudinale in base alla velocità dei dischi: offre basso impatto di manutenzione, autopulente, senza vibrazioni e rumori eccessivi. Posizionato sotto al trituratore a caduta, evita il danneggiamento dei classici nastri trasportatori; inoltre è corredata di due ampie finestre scorrevoli contenenti Lexan per la visione interna con facile apertura a scorrimento su guide in alluminio. La macchina, rispetto alle precedenti versioni sul mercato, non contiene trasmissione a catena per i rulli a dischi, fornendo quindi affidabilità di lavoro nel tempo. La macchina, come in tutto il know-how brevettato TIRES, è completamente automatizzata e non necessita salvo rare eccezioni l'utilizzo dell'operatore per disimpegnare la camera di selezione.</p>	01
<p>Nastro Trasportatore Riciclo 1: tipo a Gomma Rinforzata della larghezza di c.a.800 mm</p> <p>Caratteristica principale: tratto con leggera inclinazione per poter distribuire il prodotto di riciclo sul Nastro Riciclo 2.</p>	01
<p>Nastro Trasportatore Riciclo 2: tipo a Gomma Rinforzata della larghezza di c.a. 800 mm</p> <p>Caratteristica principale: tratto completamente orizzontale installato su appositi rulli di posizionamento, consente di poter traslare con un semplice gesto il prodotto di riciclo da una zona di taglio all'altra nel trituratore, quindi di poter ri-aumentare la produttività al momento che il tagliente di una zona è usurato. Così facendo si mantiene anche per ritardo di tempo di manutenzione una produzione elevata.</p>	01
<p>Nastro di scarico: tipo a Gomma Rinforzata della larghezza di c.a.800 mm</p> <p>Caratteristica Principale: 1^ tratto orizzontale sotto tramoggia vaglio a dischi; 2^ tratto obliquo per innalzamento al carico dell' eventuale container e/o tramoggia ciabattato per seconda fase di lavorazione.</p>	01
<p>Quadro elettrico Triturazione: completo di PLC Siemens per sistema di controllo automatizzato di tutta la componentistica Full Inverter Technology. Tale tecnologia Elettrica consente di poter avere tutto il processo sotto controllo e di ottimizzare al massimo il risparmio energetico e la produttività di processo. Il quadro è previsto con ingresso LAN per consentire il Tele-service a distanza dai programmatori TIRES.</p>	01

Parti di Ricambio Ordinari di usura (TI-SAURUS 180)

Full Spare Part Service (TI-SAURUS 180) (ogni c.a. 2000 ton lavorate.)	€ 14.200,00
Set di piastre antiusura (72 pezzi) (da sostituire ogni 2000-5000 ore di lavoro)* (* Dipende dall'utilizzo +/- aggressivo della macchina in produzione ovvero se alimentata in media produttiva o in sovraccarichi istantanei.)	€ 4.780,00

POS 2: Integrazione Corpo Macinante Trituratore (TI-SAURUS 180)

A salvaguardia di consentire una efficienza produttiva costante e sicura, offriamo un intero corpo macinante che consentirà, con tempi estremamente ridotti, di sostituire tutto il blocco corpo macinante e rientrare velocemente in produzione. In tal modo la manutenzione di smontaggio delle lame potrà essere effettuata con tempi più lunghi con la macchina a terra.



POS 3: Reso impianto Triturazione usato anno 2008

La presente offerta prevede anche il ritiro di tutta l'impiantistica attualmente in funzione allo stato funzionante comprendente:

ITEM	Macchina usata
1	Nastro Carico Tapparella Metallica del Trituratore H150 Finlane
2	H150 Finlane completo di lame, centralina idraulica, quadro di comando.
3	Nastro di carico gomma/catena H100 Finlane
4	H100 Finlane completo di lame, centralina idraulica, quadro di comando.
5	Nastro di carico gomma/catena Vaglio a Dischi
6	Vaglio a dischi
7	Nastro di riciclo in gomma
8	N° 3 Set macinanti usati trituratori

Termini e Condizioni di Vendita

Riepilogo composto da:	Prezzo in € iva esclusa
POS 1 :Modulo Energy	520.000,00
POS 2: Intero corpo macinante completo di lame e riduttori	
POS 3: Reso Impianto Triturazione usato anno 2008	
Totale offerta	

La presente offerta non è trattabile ed è esclusivamente legata alla conferma dell'offerta N° 059-2015 riguardante l'ampliamento raffinazione.

I prezzi sono conformi alla normativa Incoterms 2010. I prezzi sono fissati in valuta "EUR". Tutti i prezzi sono soggetti a correzioni dovute alle variazioni dei prezzi di mercato.

CONSEGNA

Entro 20-24 settimane lavorative dalla data di ricevimento dell'acconto (esclusi i mesi di agosto e dicembre).

RESA

F.co Stabilimento Steca S.p.A.

TRASPORTO

Incluso.

PAGAMENTO :

- **30%** alla firma del contratto per sviluppo costruttivo di tutti i particolari e programmazione produzione;
- **60%** alla consegna;
- **10%** dalla data di sottoscrizione del verbale di collaudo e comunque entro e non oltre 30 giorni dalla data di fine installazione delle macchine;

MONTAGGIO

Incluso.

COLLAUDO

Entro due settimane dal fine installazione elettrica da parte di un'azienda di fiducia del cliente.

GARANZIE

E' prevista una garanzia di 12 mesi (o 3000 ore di lavorazione impianto), a partire dalla data di spedizione. La garanzia copre la riparazione o la sostituzione di componenti difettosi, a giudizio esclusivo del produttore dei componenti risultati difettosi, per materiale, o progetto o costruzione, che in caso di sostituzione verranno resi franco fabbrica.

La garanzia non copre le parti soggette ad usura durante il funzionamento e durante il normale processo di lavorazione.

La garanzia non copre le parti elettriche ed elettroniche, in quanto influenzabili da diversi fattori esterni (es. agenti atmosferici ecc.).

La garanzia decade automaticamente ed il costruttore viene sollevato da qualsiasi responsabilità nel caso in cui l'utilizzatore apporti alla macchine qualsiasi modifica.

La garanzia decade altresì quando l'utilizzatore effettui un uso improprio della macchine o non osservi le disposizioni del costruttore.

VALIDITA'

La validità dei prezzi esposti nella presente offerta, è di 60 giorni dalla data di emissione dell'offerta stessa.

Esclusioni

I servizi e i materiali sotto indicati sono esclusi dalla fornitura.

1. **Opere civili.** La progettazione e realizzazione delle opere civili necessarie all'ancoraggio e all'installazione dei macchinari, dei trasporti pneumatici, del piping (tubazioni) e dei cavi e canaline elettriche.
2. **Certificazioni e relazioni di calcolo.** Nella documentazione tecnica fornita con l'ordine non è compresa qualsiasi certificazione o relazione di calcolo. I documenti richiesti dagli organi competenti sono a carico e cura del compratore.
3. **Pozzetti per le acque reflue.** Le canaline ed i pozzetti di raccolta delle acque reflue utilizzate nel processo e per il raffreddamento dei macchinari
4. **Utilities.** Tutte le reti per la fornitura di energia elettrica, acqua industriale, aria compressa e vapore inclusi i relativi dispositivi di sicurezza e di regolazione fino al limite di batteria delle singole macchine, utenze, quadri di comando indicati sui ns. disegni.
5. **Camini per emissioni in atmosfera.** Qualora non espressamente indicato in offerta le macchine non sono dotate di camini per emissioni in atmosfera. Il compratore dovrà verificare presso gli enti competenti se sono necessarie specifiche autorizzazioni e a propria cura chiedere e procedere al loro rilascio.
6. **Insonorizzazione.** Qualora non espressamente indicato nel riepilogo offerta, le macchine non sono dotate di sistemi di abbattimento rumore; si consiglia al cliente di provvedere ad abbattere il rumore delle macchine entro i limiti di legge.
7. **Abbattimento polveri.** Qualora non espressamente indicato in offerta le macchine non sono dotate di sistemi di abbattimento, recupero o tenuta polveri. Si può verificare, in caso di processo di alcuni materiali, una produzione di polveri.
8. **Messa a terra delle macchine.** Le predisposizioni delle macchine ed i collegamenti dell'impianto di messa a terra.
9. **Fluidi di primo riempimento.** Le macchine sono fornite prive dei fluidi di primo riempimento che saranno forniti e posti a cura e spese del cliente secondo ns. indicazioni. In particolare sono da riempire: i riduttori, le centraline oleo-dinamiche, i gruppi frigoriferi ecc.
10. **Sicurezza degli impianti di lavoro.** Sono esclusi tutti i dispositivi richiesti per l'adeguamento dell'area di lavoro alle norme e leggi vigenti: sistemi di protezione e protezione da incendi, protezione da scariche atmosferiche, impianti di riscaldamento, impianti di ventilazione e estrazione fumi e polveri, dispositivi per la riduzione complessiva del livello sonoro, dispositivi individuali di protezione, e impianti di illuminazione.
11. **Mezzi ed attrezzature di sollevamento.** Tutti i mezzi e le attrezzature atti allo scarico, al sollevamento ed al posizionamento dei macchinari quali gru, carrelli elevatori, paranchi, funi, cinghie e ganci dovranno essere reperiti a carico del compratore.
12. **Collettori per fluidi di servizio.** I collettori per fluidi di servizio quali aria compressa, acqua industriale dal punto di produzione al reparto e dai collettori di reparto alle macchine.
13. **Mezzi di scarico macchinari.** Mezzi di sollevamento e di trasporto per il posizionamento delle macchine saranno messi a disposizione dall' "acquirente".
14. **Sistema di raffreddamento:** ove non espressamente indicato in offerta il sistema di raffreddamento delle macchine deve essere effettuato a carico e cura del cliente o tramite utilizzo di acqua con scarico poi nelle acque reflue: in questo caso è necessario ottenerne l'autorizzazione dagli organi di competenza; oppure tramite un circuito chiuso: questo sistema deve comprendere un frigorifero industriale (CHILLER) da almeno 100 KWT per il raffreddamento.
15. **Cabina elettrica.**
16. **Allacciamenti elettrici.** I cavi elettrici e le canaline necessarie per il collegamento tra le singole utenze ed il quadro elettrico.

Condizioni Generali di Vendita

Art. 1 - PROPOSTA, CONFERME, ANTICIPI.

La sottoscrizione della proposta da parte del compratore è vincolante in modo irrevocabile per quest'ultimo, mentre è riservata all'insindacabile giudizio del venditore, l'accettazione o meno della stessa, salvo l'obbligo della restituzione della somma anticipata, nel caso che la proposta venga respinta. Gli impegni presi dai nostri Rappresentanti, Agenti, Impiegati e Incaricati, e le proposte di acquisto del venditore a titolo d'indennità, nel caso in cui l'ordinazione fosse revocata dal compratore, salvo eventuali maggiori danni. Gli anticipi sono sempre infruttiferi.

Art. 2 - PREZZI.

I prezzi s'intendono al netto d'imposte, per contanti e per resa franco Monteprandone (AP). Il prezzo è quello in vigore al momento della consegna. In caso di pagamento dilazionato, saranno a carico del compratore il costo di eventuali cambiali, gli interessi nella misura pattuita e ogni altro onere.

Art. 3 - CONSEGNA.

La consegna della merce è pattuita presso la nostra sede di Monteprandone (AP). Il termine di consegna viene enunciato a titolo puramente indicativo: il venditore non incorrerà in nessuna responsabilità per il caso di spedizione della merce oltre il termine predetto. La consegna s'intende eseguita a ogni effetto con la comunicazione (data anche col semplice invio di fattura) che le cose vendute sono a disposizione del compratore, oppure che sono state consegnate al vettore per l'invio a destino. Dal momento della consegna restano a carico del compratore tutti i rischi e le spese inerenti. Per il ritiro della merce da parte del compratore è stabilito il termine essenziale e perentorio di giorni 10 dalla sua messa a disposizione. In caso di mancato ritiro, entro tale termine è facoltà del venditore considerare il contratto risolto per l'inadempienza del compratore con tutte le conseguenze di legge e l'anticipo versato sarà acquisito dal venditore a titolo d'indennità fatti salvi maggiori danni. In ogni caso di risoluzione del contratto, il venditore non potrà essere tenuto che alla restituzione delle somme ricevute. Resta esplicitamente concordato che fino al saldo definitivo di ogni partita la **TIRES S.p.A.** conserva il riservato dominio e quindi la proprietà assoluta su tutto quanto è oggetto della fornitura.

Art. 4 - PAGAMENTI.

I pagamenti s'intendono fatti nel luogo del venditore. Il compratore dovrà effettuare, per l'intero importo, i pagamenti relativi alle fatture della merce a lui destinata alle casse del venditore prima della consegna e spedizione della merce, nella valuta convenuta e con le modalità intese. L'eventuale accettazione, da parte del venditore dei pagamenti fatti ai suoi incaricati non costituirà deroga al principio del pagamento nel luogo del venditore. Il ritardato pagamento comporta automaticamente, a carico del compratore, la decorrenza degli interessi di mora in misura pari alle prime rate in vigore più 2 punti percentuali, senza pregiudizio di ogni altro diritto della **TIRES S.p.A.**, la quale è autorizzata anche ad emettere tratte a vista con spese per ogni importo il cui pagamento non avvenisse alla scadenza stabilita in contratto o in fattura. Il mancato pagamento, nei termini contrattuali stabiliti, farà cessare ogni obbligo di garanzia da parte della **TIRES S.p.A.** e le darà diritto ad esigere, senza obbligo di declaratoria giudiziale, l'immediato pagamento di tutto il prezzo ancora dovuto, restando il compratore decaduto dal beneficio del termine per le eventuali cambiali non scadute che così diverranno di pieno diritto subito esigibili: oppure l'immediata risoluzione di diritti del contratto con l'applicazione della clausola di riservato dominio e con l'obbligo del compratore di restituire le macchine fornite. Il presente paragrafo costituisce clausola risolutiva espressa e il compratore dichiara di rinunciare alla comunicazione di cui all'Art. 1456 secondo comma civile, cosicché la clausola risolutiva espressa diverrà operativa con la semplice notifica di atti ingiunzionali che si rendessero eventualmente necessari. I versamenti effettuati andranno a beneficio del venditore a titolo d'indennità salvo maggiori danni e ciò in deroga a quanto previsto dall'Art. 1526 CC.

Art. 5 - SPEDIZIONI.

Le spedizioni sono fatte per conto, rischio e a spese del compratore.

Art. 6 - COLLAUDI E MONTAGGI.

I macchinari vengono collaudati dalla **TIRES S.p.A.** prima della consegna o della spedizione e il compratore potrà assistervi personalmente o per mezzo di un suo incaricato. Non valendosi di tale facoltà il compratore accetta incondizionatamente la fornitura, salvo le garanzie di cui all'Art.7. A richiesta la **TIRES S.p.A.** potrà mettere a disposizione del compratore suo personale specializzato alle condizioni stabilite. Il compratore dovrà mettere tale persona specializzata in condizioni di svolgere un lavoro continuo e dovrà fornirgli la manovalanza, gli aiuti e i mezzi d'opera necessari. Inoltre è tenuto a provvedere un opportuno locale per la custodia del materiale e degli attrezzi che si considereranno in deposito necessari presso di lui. I montatori sono muniti di rapporto settimanale che il compratore è tenuto a firmare.

Art. 7 - GARANZIA.

Il macchinario nuovo e le attrezzature nuove vengono garantire per un massimo di dodici mesi consecutivi dalla data di consegna, mediante sostituzione o riparazione gratuita, a scelta del venditore, dei pezzi di fabbricazione riscontrati quali difettosi a seguito di prova a carico del compratore. Sono esclusi dalla garanzia: i difetti e i guasti dovuti a trascurata manutenzione, a manovre errate, a usura normale ed in particolare le parti di macchine normalmente soggette a ricambio periodico. Per componenti forniti da altri fabbricanti, verrà riconosciuta la garanzia solo entro i limiti concessi dai fabbricanti stessi. Le spese di mano d'opera, viaggio, vitto e alloggio e diarie, restano a carico del compratore. La garanzia verrà a cessare anteriormente ai dodici mesi in caso di superamento delle 2.500 ore di lavoro.

La garanzia verrà altresì a cessare anteriormente qualora il contatore venga manomesso, le macchine siano affidate a meccanici o conduttori non sufficientemente affidabili; la garanzia cesserà qualora il macchinario sia rivenduto dal primo

compratore utilizzatore a terzi in quanto la garanzia è finalizzata ad assistere specificamente il primo compratore, nonché in caso di morosità e qualora i guasti al macchinario siano provocati da incuria, trattamento errato, inosservanza delle norme di manutenzione da parte del compratore, nonché in caso di deterioramento causato da incidenti o anche da modifiche e applicazioni non autorizzate. La sostituzione dei pezzi e le riparazioni non interrompono il decorso del termine di garanzia; per i nuovi pezzi valgono i termini di scadenza della garanzia globale del macchinario. In nessuno dei casi previsti dal presente articolo, il compratore può pretendere la risoluzione del contratto o un risarcimento di danni per il periodo d'inoperosità della macchina. Salvo diversa pattuizione scritta, nessuna garanzia è concessa per le macchine usate e comunque, nel caso sia concessa, le eventuali parti da sostituire saranno rimpiazzate con altre usate o ricondizionate.

La garanzia decade automaticamente ed il venditore viene sollevato da qualsiasi responsabilità nel caso in cui il compratore apporti alla macchina qualsiasi modifica che ne alteri la condizione in cui essa viene consegnata e accettata.

Art. 8 - TASSE, IMPOSTE ED ALTRI ONERI.

Le tasse, le imposte e gli altri oneri e comunque tutti gli oneri presenti e futuri inerenti la presente vendita, nonché l'uso delle merci vendute, sono ad esclusivo carico del compratore. Le spese di registrazione, trascrizione e tutte le eventuali altre spese inerenti e conseguenti il presente contratto, sono a carico del compratore.

Art. 9 - RECLAMI.

Eventuali reclami e contestazioni da parte del compratore devono essere comunicati alla **TIRES S.p.A.** a mezzo di lettera raccomandata entro 8 gg, dal ricevimento della merce, a pena di decadenza. Qualunque reclamo, protesta o denuncia di vizi non daranno diritto al compratore di sospendere e ritardare i pagamenti.

Art. 10 - ASSICURAZIONI.

Il compratore si impegna, pena la risoluzione del contratto per suo fatto e colpa salvo i maggiori danni, a coprire le forniture con assicurazione di adeguato valore contro ogni rischio a favore del venditore fino alla totale estinzione del pagamento.

Art. 11 - RISERVATO DOMINIO.

Fino al saldo definitivo di ogni partita, il venditore conserva per patto espresso, che costituisce condizione essenziale del contratto di vendita, il riservato dominio e quindi la proprietà assoluta su tutto quanto è oggetto della fornitura, e pertanto:

- 1) Tali macchinari non potranno essere ceduti né prestati o comunque, sotto qualsiasi forma, consegnati dal compratore a terzi per nessuna ragione o uso;
- 2) L'uso e la conservazione dei macchinari stessi saranno ad esclusivo rischio e pericolo del compratore, anche per il caso fortuito o di forza maggiore, lo stesso compratore dovrà denunciare al venditore, entro 24 ore, con raccomandata R.R., tutte le azioni esecutive, pignoramenti o sequestri nonché ogni variazione di domicilio, permettendo eventuali visite di controllo da parte di incaricati della società;
- 3) Il compratore ha l'obbligo di presentarsi, a semplice richiesta, a compiere tutti gli adempimenti atti a sanzionare il diritto di proprietà del venditore sui macchinari, anche di fronte a terzi. In caso di rifiuto o di ritardo da parte del compratore ad effettuare tali adempimenti, il venditore potrà, a proprio insindacabile giudizio, provvedere ad essi per conto, in vece ed a spese del compratore, quale mandatario speciale e senza obbligo del rendiconto a tale l'uopo costituita espressamente dal compratore con la sola sottoscrizione del presente atto da parte del compratore;
- 4) La trascrizione prevista dall'Art. 1524 secondo comma c.c. sarà effettuata a cura del venditore ed a spese del compratore, a carico del quale resteranno del pari tutti gli oneri fiscali inerenti o comunque connessi al rapporto contrattuale in esame;
- 5) Rinnovazione: l'eventuale rinnovo, anche solo parziale, degli effetti di cui al presente contratto, non estingua il privilegio della **TIRES S.p.A.** verso il compratore.

Art. 12 - PRIVILEGIO.

Sino al saldo definitivo di quanto dovuto, il venditore, alternativamente a quanto indicato al n. 12, conserva privilegio ex Art. 2762 C.C. in relazione al prezzo non pagato al momento dell'acquisto. Il compratore riconosce pertanto che:

- 1) Tali macchinari non potranno essere ceduti né affittati né prestati o comunque, sotto qualsiasi forma, consegnati dal compratore a terzi per nessuna ragione o uso;
- 2) L'uso e la conservazione dei macchinari stessi saranno ad esclusivo rischio e pericolo del compratore, anche per il caso fortuito o di forza maggiore, lo stesso compratore dovrà denunciare al venditore, entro 24 ore, con raccomandata R.R., tutte le azioni esecutive, pignoramenti o sequestri nonché ogni variazione di domicilio, permettendo eventuali visite di controllo da parte di incaricati della società;
- 3) La trascrizione prevista dall'Art. 1524 secondo comma c.c. sarà effettuata a cura del venditore ed a spese del compratore, a carico del quale resteranno del pari tutti gli oneri fiscali inerenti o comunque connessi al rapporto contrattuale in esame;
- 4) Rinnovazione: l'eventuale rinnovo, anche solo parziale, degli effetti di cui al presente contratto, non estingua il privilegio della **TIRES S.p.A.** verso il compratore.

Art. 13 - FORO COMPETENTE.

Per qualsiasi contestazione, comunque dipendente da questo contratto o colleganti con il medesimo, ed anche in ipotesi di continenza o connessione di cause ove il venditore sia convenuto, è esclusivamente competente il foro di ASCOLI PICENO. Anche la vendita a mezzo tratta o cambiale non sposta la competenza.

Dichiariamo di aver attentamente letto e di approvare tutte le condizioni generali di vendita poste in calce.

Data Firma 01-07-2015

TIRES S.p.A.
Fazzini Francesco

STECA S.p.A
Federico Steca

IMPIANTO DI TRITURAZIONE PNEUMATICI FUORI USO "ENERGY"

Caratteristiche modulo "Energy"

Il modulo di triturazione della TIRES SPA è un sistema automatico di facile gestione assistito da uno a due operatori. Quest'ultimo colloca i pneumatici sul nastro di carico che alimenta un tritratore bi-albero.

I pneumatici pre-triturati possono alimentare le fasi di lavorazione successive o essere immessi direttamente sul mercato.

Materiale in ingresso:	70% pfu auto, 30% pfu camion stallonati
Potenza installata:	circa 190 kW/h
Potenza media assorbita:	circa 65<>75 kW/h
Turni di lavoro giornalieri:	3 (x 8 ore a turno).
Personale necessario per conduzione impianto	2 persone per turno
Capacità di produzione media oraria	4.000<>6000 kg/h
Materiali in uscita	Ciabattato < 100 mm
Rumorosità	Inferiore a 85 db(A) ad una distanza di 7 mt.
Sistema di raffreddamento	N°2 gruppi ugelli di nebulizzazione cadauno da 0,33 l/min, pressione Max 2 Bar. L'utilizzo viene consigliato solo a temperature di esercizio oltre i 40° C .



DIN EN ISO 9001:2008
Certificato n. 20 100 82003223

DICHIARAZIONE DI CONFORMITA' DEL FABBRICANTE
SECONDO LA DIRETTIVA MACCHINE 2006/42/CE

Il Fornitore

TIRES SpA

Nella persona del suo legale rappresentante **FAZZINI FRANCESCO**

DICHIARA che il

Tipo

IMPIANTO DI TRITURAZIONE

Modello

ENERGY

è conforme

Ai requisiti essenziali della Direttiva Macchine 2006/42/CE tipo A

Ai requisiti essenziali del Decreto Legislativo n. 17 del 27 gennaio 2010

Ai requisiti essenziali della Direttiva Bassa Tensione 2006/95/CE

Ai requisiti essenziali del Decreto Legislativo n. 194 del 6 novembre 2007

Ai requisiti essenziali della Direttiva 2004/108/CE

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ELDAN Multi Purpose Rasper MPR200T

Serial number : 50259
Delivery date : April 2014
Customer : Oris Prom

**Manual for MPR200T
(Pos. 13)**

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1. INTRODUCTION

- 1.1 Congratulations on your purchase of an ELDAN machine. Like many customers who have gone before you, you have just entered into what we hope will be a long and beneficial partnership with us.
- 1.2 To ensure that you get the very best from your machine, we give you this manual, which forms an indispensable part of your operation.

Please read it carefully as you will find it contains the necessary information to **install, set, operate** and **maintain** the machine in a safe and efficient manner.

- 1.3 You will notice that we suggest safe operation before efficient operation, not because we don't think the machine is efficient but because we feel it is important for everybody that the machine is operated safely.

To reinforce this you will see in the text the symbol . The section on safety explains what this means, but for the purpose of this introduction,

wherever you see  as part of an instruction, it is essential that you carry out the instruction exactly as specified and that you do not attempt to overlook the safety element in any way.

- 1.4 Should you require clarification regarding any of the information or should you wish to purchase further copies of this manual, please contact your ELDAN agent or contact us direct.

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2. SAFETY INSTRUCTIONS

It is a condition that the person, who is going to operate the machine, has been educated or is familiar with machines of the same type.



Ordinary safety rules: The ordinary safety rules of the country in question must always be obeyed.

Before starting, check that:



All protection devices are placed correctly.



Check conveyors for left tools, screws, bolts, etc.



The operator must be absolutely certain that no service, repair or any other kind of work on the machine is being undertaken before starting the machine.



The machine is to be adjusted according to the directions in the manual.



Check the starting procedure in the manual.

During operation:



Do not feed objects into the machine, which may cause damage to the machine.

Safety during operation:



Never try to remove jammed material or foreign bodies in the rotor house, etc. until it has been checked that the machine is fully isolated electrically. This means turn off and lock all main switches before working on the machine.



When the machine is not delivered with special silencing equipment, operators must carry earplugs or hearing protectors.

Before the operator begins greasing/maintenance work on the machine the following precautions should be followed:



In case of stops for maintenance, damage etc. turn off and lock all main switches before working on the machine. Repair and maintenance work must not be carried out before the machine has been brought to a complete stop.



After the machine has been stopped there is a caster time of approx. 1 minute. Do not touch rotor and other rotating parts before the machine has been brought to a complete stop.



Working on the machine, opening of inspection doors or removing protection screens and safety devices while the machine is operating, is absolutely prohibited and highly dangerous.



When opening or closing the machine nobody but the operator must be on or near the machine.

Personal security when carrying out service:



Electrical installations and repairs must only be carried out by authorised personnel.



The processing area must be satisfactory illuminated so that there are no dark corners. Illumination must however not be dazzling. The supply must not be taken from the machine as this must be disconnected during service work.



It is dangerous to climb the machine. Always use a platform or a step-ladder where service from the ground is not possible.



Dust masks are necessary when cleaning the machine.



Use gloves for hand protection by maintenance work etc. The machine can be very hot after continuous operation.



When replacing the knives the use of safety glasses is necessary because of the danger of splinters when the knives are exposed to strokes and bumps.



Oil leaks from hydraulic tubes or pipes may come with such force that the oil may penetrate the skin. In such cases a doctor's help should be sought immediately in order to prevent severe infections.

3. MACHINE INFORMATION

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3.0 Equipment description of MPR200T

This machine is a heavy duty Rasper ideally suited to the harsh environment of tyre shredding.

To ensure its durability the main housing is fitted with replaceable wear plates and the rotor is manufactured from wear resistant and hardened steel.

Other features include a quick-change knife system and a rotor, which is easily removed.

To enable the screen to be easily cleaned or changed, the screen fits into a hydraulically operated swinging cradle that allows it to be lowered from the cutting chamber in a matter of seconds.

The transmission system is a combination of 2 motors placed on each side of the machine, and a belt drive between the motors and the rotor shaft. The number of belts in each side is 10 pieces.

Mechanical overload protection is provided by friction clutches.

The main housing is constructed with double skinned walls. The wear plates are mounted on the inside of the inner skin and the main bearings are mounted on the outside of the outer skin.

In the case that material such as dust, rubber granulates etc. does get forced between the wear plates, the material falls into the void between the skins rather than into the rotor bearings. For further protection of the bearings a wiper has been mounted between the skins.

Should the rotor and flywheel be stalled by extreme overload, a differential speed detector protects the transmission.

The Rasper is equipped with a Service Platform to enable service and maintenance work to be carried out with ease.

3.1 Input definition:

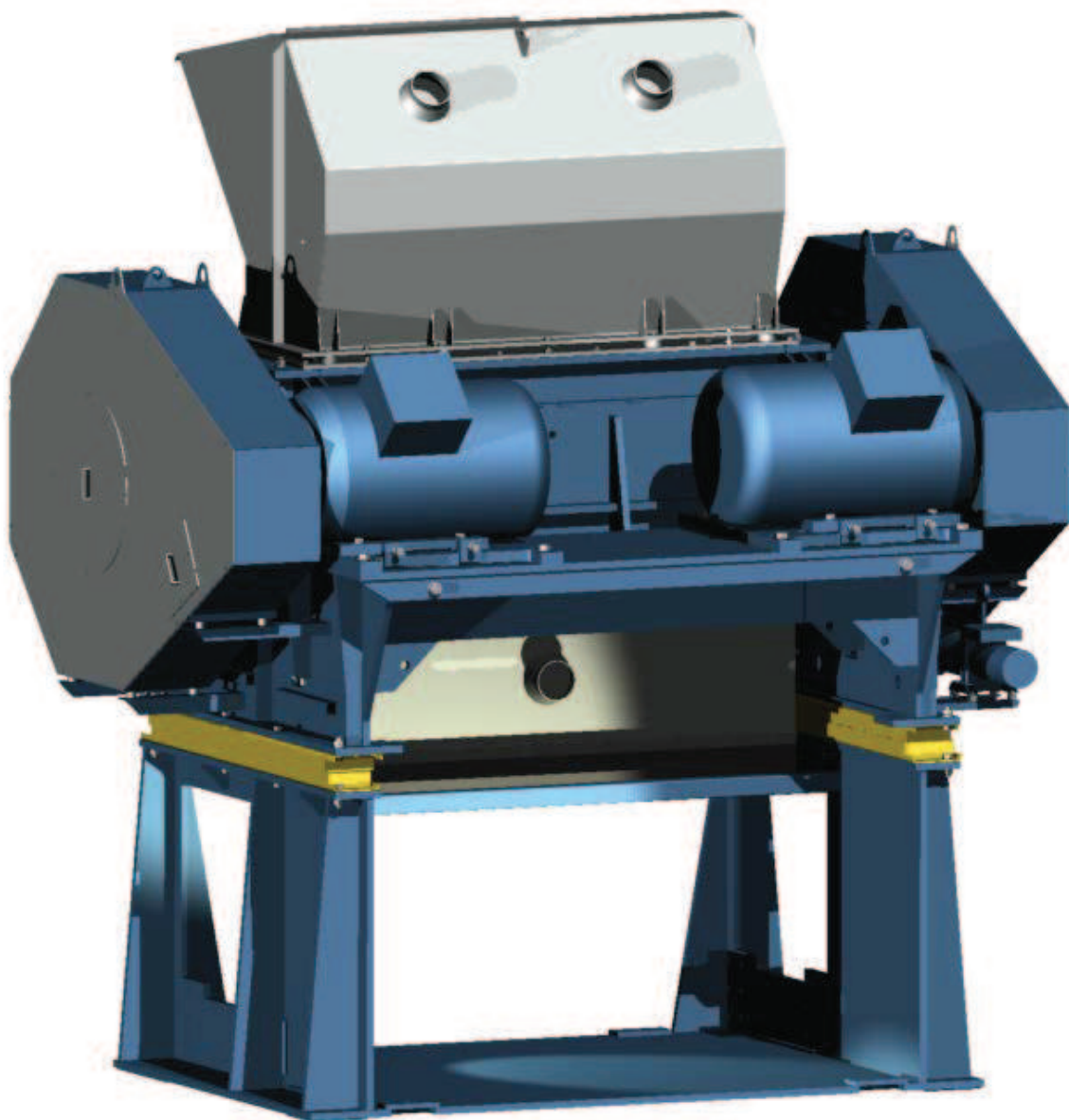
The MPR200T has been designed to process whole steel radial car tyres up to a size of max tyre height of 250 and max. tyre diameter of 800 mm or pre-shredded car, light truck and truck tyres with a max. chunk size of 300 mm.

Should other kinds of input material than the above mentioned be used as input material this will be at the customer's own risk.

3.2 Technical Specifications for MPR200T

Rotor length:-	2000 mm
Rotor diameter:-	400 mm
Cutting diameter:-	506 mm
R.P.M. of rotor:-	144
Cutting speed:-	3,82 m/sec
Knives:-	25 flying 26 static
Motor:-	2x110 kW 734 rpm, 50 Hz.
Gear type:-	Heavy duty planet gear
Belt drive:-	2x10 pcs SPC, length 5600 mm
Transmission ratio:-	5,1:1
Total weight:-	Approx. 24.000 kg
Machine weight:-	11500 kg
Weight of inlet hopper:-	2300 kg
Weight of flywheel cover:-	500 kg/each
Motor for hopper lift:-	P = 0,75 kW
Total width:-	3350 mm
Total height:-	4350 mm
Total length:-	3000 mm
Inlet height:-	3810 mm

Figure 1



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4.0 Introduction

In this section the safety equipment for the MPR200T will be described.

It is important that the instructions are followed very carefully to avoid damage to the operator and the machine.

4.1 Main switch

The machine is equipped with a main switch, which can be locked. The main switch disconnects all voltage to the machine and it is placed on the electrical cabinet.

4.2 Emergency stops

The machine is equipped with two emergency stops. One is placed on the machine and one is placed on the electrical cabinet.

The function of the emergency stops is as follows:

- 1) When activated all voltage to the machine as well as inlet and outlet conveyors is disconnected immediately.
- 2) An emergency stop can only be reset deliberately. This does not mean that the machine starts automatically, but only that it is possible to start the machine again.

4.3 Safety switch

The MPR200T is equipped with a safety system, which protects the operator from the rotating parts of the machine during maintenance work.

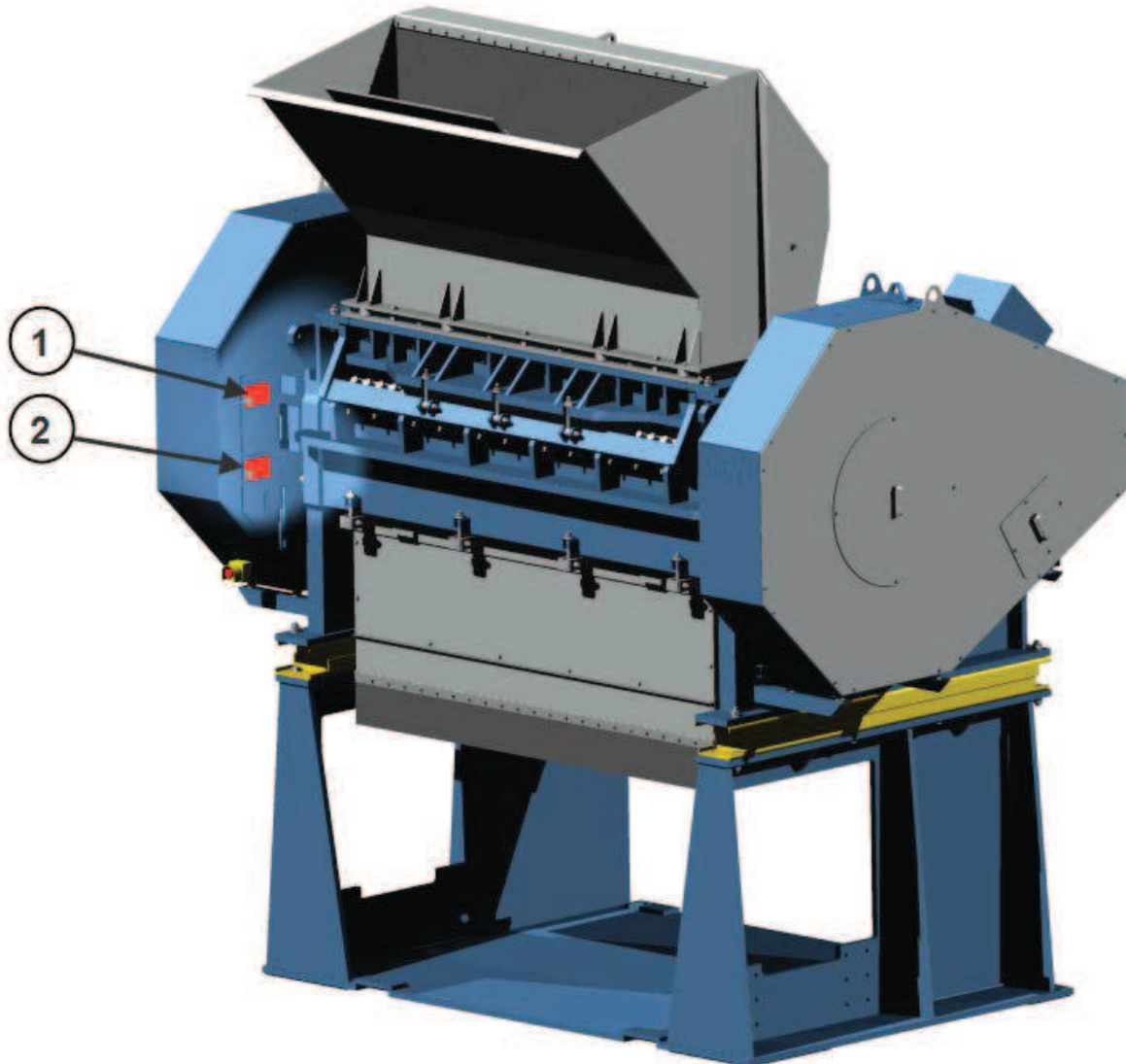
The greatest advantage of the system is that it also protects the operator from the caster, which appears after the machine has been shut down electrically.

The machine is equipped with a number of switches, which should be liberated before hoppers, upper part etc. can be opened, see Figure 2.

The safety switch can be liberated, when the machine has been brought to a complete stop and the service key on the electrical cabinet is in zero-position.

Note: After stop a certain period of time must pass, before the switches can be liberated.

Figure 2



4.4 Service switch

When operating the machine, the switch should be in Position "1".

By repair, maintenance and cleaning the service switch should be set to Position "0" and removed.

The hydraulic pumping unit for opening of upper part with hopper as well as screen can only be operated with the service switch in zero-position. Once the upper part with hopper or screen is opened the hydraulic pump must be switched off. At the same time the main switch must be disconnected and locked.

Note: After the machine has been stopped a fixed period of time will have to pass, before the switches can be released.

4.5 Fire equipment for MPR200T

The water spraying system

The Rasper is equipped with a water spraying system with the purpose of reducing the fire risk, but also with the purpose of lubricating/cooling in the rotor housing.

When processing tyre material in the MPR200T quite an amount of rubber and textile dust is liberated and this is quite inflammable.

During operation sparks are produced in the rotor housing. Therefore a water spraying system is required to moisten the dusty air in the rotor housing thus reducing the risk of the sparks from setting fire to the dust.

Water nozzles have been placed in the inlet hopper of the Rasper and between the sidewalls of the Rasper. The water spraying system operates under normal water pressure and the connection is placed on the side of the Rasper. The water pressure is adjusted by means of a handle, which is also placed on the side of the Rasper.

The water supply is controlled electrically by means of a magnet valve placed on the water supply of the machine. This means that the water supply is activated/stopped when the machine is either started up/shut down.



When processing tyres the water spraying system must always be connected!

The pressure is adjusted in such a way that there is always a fine mist of water steam in the rotor housing and between the sidewalls.

It is recommended to clean the water nozzles for dirt once a week.

4.6 Fire Hazard.



Please observe the risk of fire, which is always present when processing inflammable scrap. Please make the necessary precautions to prevent a situation to occur which may cause a fire i.e. secure following:

- that your scrap does not contain explosives or flammable liquids.
- that your equipment is always in an optimal condition.
- that you operate your equipment according to the written or verbal instructions.
- that you use skilled and experienced labour.
- that your facilities are clean and tidy.
- that you have taken all possible measures of fire-extinguishing.
- that you have involved the advisory support of the Fire-department in this process.

Eldan Recycling A/S rejects any responsibility for fires, which occur in connection with the process.

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5.0 Introduction

Within this section we have set out the necessary information to ensure the safe and correct method of installing the machine. Set out below is the instructions and guide lines to describe how the operation should be undertaken.

5.1 Lifting points

The machine shall be lifted/transported by means of a crane. On the main machine there are mounted lifting hooks for this purpose. Lifting hooks/places are shown on the following drawing, Figure 3 - Pos. 1.

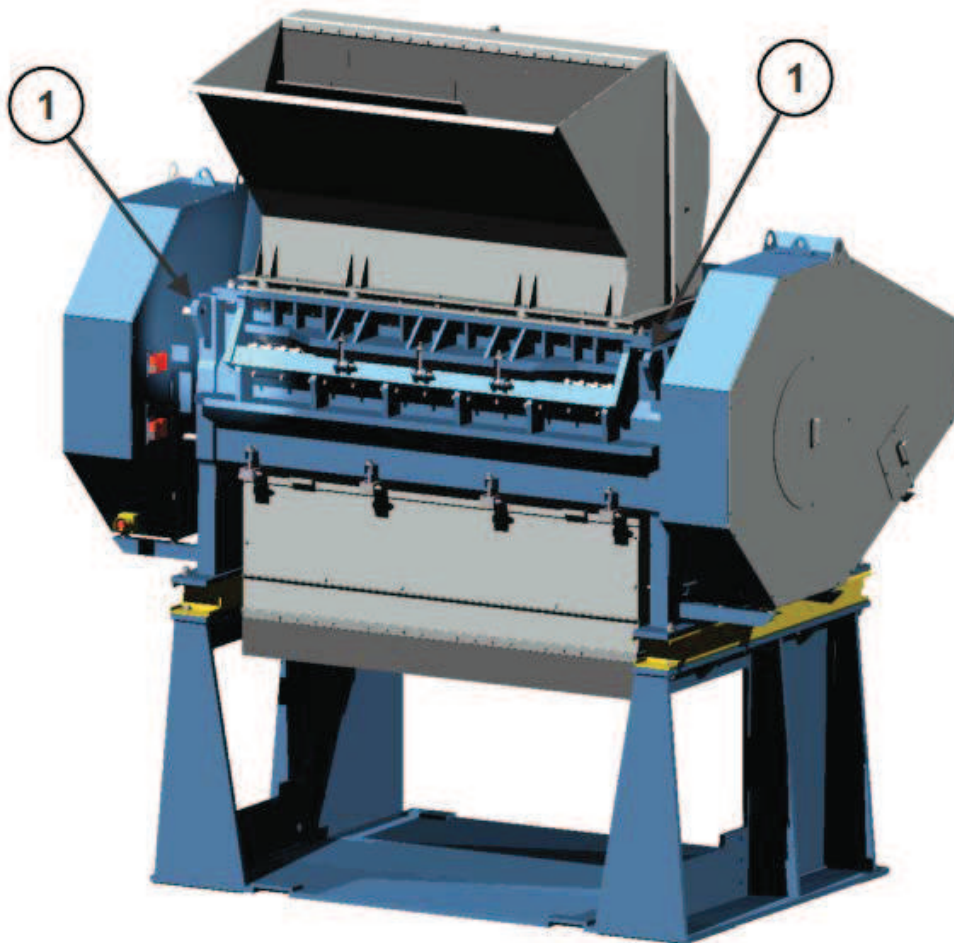


Figure 3

Other machine parts are lifted by forklift/strap. The strap is placed suitable regarding the centre of gravity.

If you are in any doubt regarding safe lifting, seek advice from a specialist lifting company.

5.2 Gravity and weight statement

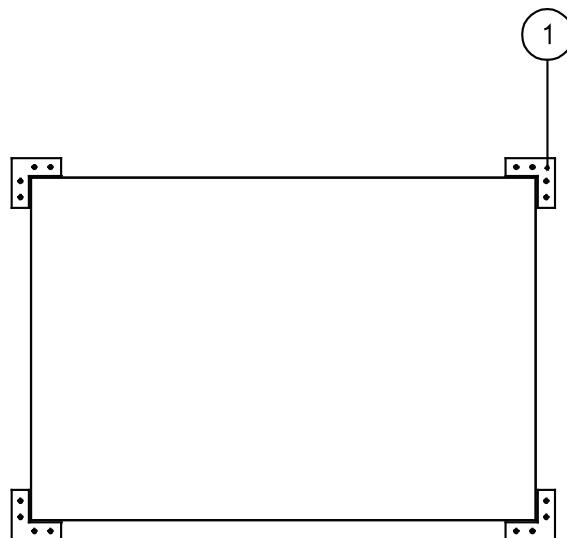
The gravity point of this machine is approx. 2,3 meters from the ground and it weighs approx. 22000 kg in total / inlet hopper approx. 2000 kg/ fly-wheel cover approx. 500 kg and the flywheel approx. 2000 kg.

5.3 Recommended floor fixing methods

When fixing the machine it is essential that the base is flat and level. If this is not possible it will be necessary to level the floor.

When final placing of the machine is known the machine is fastened to the floor by means of the enclosed clamps and expansion bolts, Figure 4 - Pos. 1.

Figure 4



5.4 Dimensions of clearance needed for service and maintenance

To be able to carry out service and maintenance work on the machine in a safe and efficient way it will be necessary with a clearance of minimum 1-meter around the machine.

5.5 Power and service details and requirements

For electrical tools and lightening during mounting and maintenance of the machine it is necessary to have a separate power supply, as the machine must be disconnected and locked during this kind of work on the machine.

5.6 Test before starting

Rotating direction of the motor:

Before the machine starts operating, it is necessary to inspect the motor to ensure it is rotating in the right direction. A painted arrow on the fan cover indicates this. If the motor rotates in the wrong direction, an authorised electrician should alter the direction of rotation.

Rotating direction of the rotor:

To check the setting of this machine, it is necessary to rotate the rotor, to see if the setting is correct. This can be done manually by turning the clutch between the motor and the reduction gear



Remember the machine should be turned off and all main switches should be locked before working on the machine.

5.7 Foundations

Under the machine a certain depth of reinforced concrete is necessary to avoid vibration damages etc.

Under this machine it is necessary to cast a foundation of reinforced concrete in depth of 400 mm. The foundation needs a supporting surface of compacted sand basis.

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6.0 Introduction

Within this section we have set out the setting instructions for the machine.

To enable you to get the best from your ELDAN machine it is essential that it is set correctly.

Correct setting will make operation easier and will minimise maintenance. Incorrect setting will cause unnecessary breakdown and frustration over product quality.

We therefore strongly recommend that setting becomes part of your operational procedure.

6.1 Safety information

Before the operator begins greasing/maintenance work on the machine the following precautions should be followed:



The main switch must be disconnected and locked before any kind of maintenance, service or repair is carried out.



By greasing and maintenance of the machine, the machine should be brought to a complete stop and the main switches disconnected and locked.



After the machine has been stopped there is a caster time of approx. 1 minute. Do not touch rotor, flywheel etc. before these are completely stopped. Maintenance and repair etc. must not be carried out before the rotating parts of the machine have stopped completely.



When opening/closing the machine absolutely nobody, but the operator must be in or near the machine.

Personal security when carrying out service work:



It is dangerous to climb the machine. Use either a platform or a stepladder where service from the ground is impossible.



The processing area must be satisfactory illuminated so that there are no dark corners. Illumination must, however, not be dazzling. The supply must not be taken from the machine as this must be disconnected.



Use gloves for hand protection by maintenance work etc. The machine can be very hot after continuous operation.



When cleaning the machine it is necessary to use dust masks.



When replacing the knives the use of safety glasses is necessary because of the danger of splinters when the knives are exposed to strokes and bumps.



Oil leaks from hydraulic tubes or pipes may come with such a force that the oil may penetrate the skin. In such cases a doctor's help should be sought immediately in order to prevent severe infections.

When the operator has finished the greasing/maintenance work on the machine the following precautions should be followed:



Before connecting the main current, check that nobody is working on the machine.



Before starting the machine check that all protection devices works and are correctly adjusted.



Before starting the machine check that no persons or foreign bodies are inside the rotor housing or on the inlet conveyor (or any other kind of feeding device).

6.2 Opening the upper part with hopper



Disconnect the main current by maintenance work, repair etc.



Lock the main switch by maintenance work, repair etc.



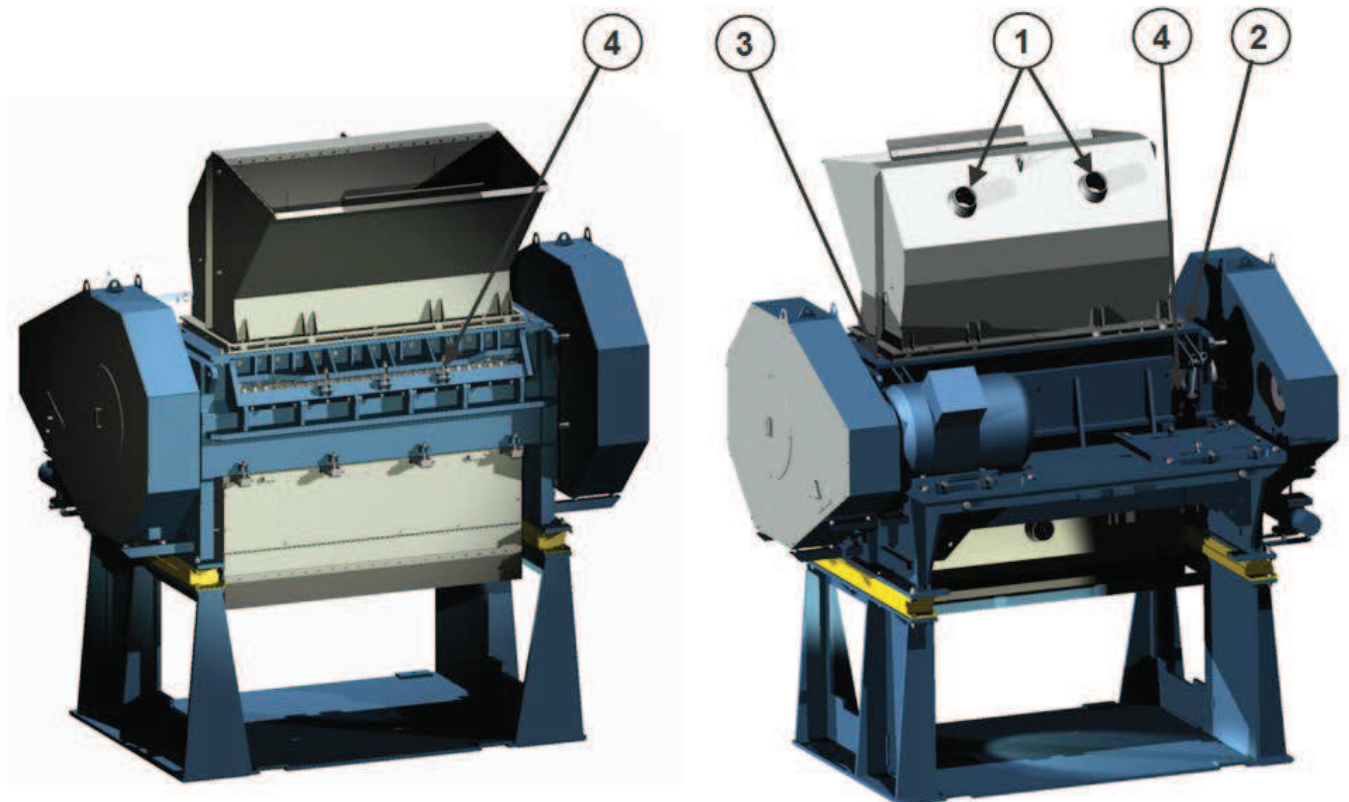
When opening/closing the machine the operator must be absolutely sure that nobody is on or near the machine.



It is dangerous to climb on machinery. For this operation a platform or stepladder should be used.

- 1) Disconnect the dust tube from the inlet hopper. This is done by releasing the quick release chip connecting the hopper to the pipe work, Figure 5 – Pos. 1.
- 2) Liberate the safety switch before opening the hopper and upper part.
- 3) The 4 bolts placed at the top of the Rasper, Figure 5 - Pos. 2 and 3 are loosened by means of a 46 mm spanner.
- 4) The 3 eyebolts, Figure 5 - Pos. 4, are loosened and tipped out of the mounting.
- 5) Turn on the hydraulic lifting pump by turning the start/stop button on the control panel.
- 6) Raise the hopper and the upper part by operating the hydraulic valve lever on the side of the Rasper, Figure 5 - Pos. 6.
- 7) When the hopper has moved to its limit, turn off the hydraulic pump.
- 8) Lock the inlet hopper with the locking pin, Figure 5 - Pos. 5.

Figure 5



Secure the top part and hopper against unintended closing by inserting the lock pin placed on the hinged side of the housing.

6.3 Cleaning the Rasper and surrounding areas

To enable the easy retrieval of washers and small bolts and to ensure absolute cleanliness when refitting the blades, we recommend that the Rasper housing and rotor, together with the floor around the Rasper is cleaned properly.

6.4 Information regarding adjustment/exchange of knives

When considering the setting of the MPR200T, the normal setting is with regard to the knives and involves either

- replacing the knives

or

- setting the clearance between flying knives and static knives.

NB: By exchange of knives it is essential that all knives are replaced at the same time.

Set out in the 2 below checklists the order, in which these operations should be undertaken, is shown. The remainder of this section sets out the explanation as to how each operation should be undertaken.



The main switch must be turned off and locked

SETTING PLAN

KNIFE CLEARANCE SETTING

Order:

- 1) Release the safety switch for upper part
- 2) Open the upper part hydraulically and lock it in open position
- 3) Remove all loose material
- 4) Reset knife clearance
- 5) Recheck all bolts
- 6) Close the upper part hydraulically
- 7) Lock the safety switch for upper part
- 8) Sweep or vac the floor

KNIFE REPLACEMENT

Order:

- 1) Release safety switch for outlet hopper

- 2) Remove the outlet hopper
- 3) Open the screen holder hydraulically
- 4) Remove the screen from the screen holder
- 5) Remove all loose material
- 6) Liberate the safety switch for the upper part
- 7) Open the upper part hydraulically and lock the upper part in open position
- 8) Remove static knives and flying knives
- 9) Clean all knife seats
- 10) Refit static and flying knives and set the knife clearance
- 11) Recheck all bolts
- 12) Close the upper part and lock the safety switch
- 13) Refit the screen in the screen holder
- 14) Close the screen holder hydraulically
- 15) Refit outlet hopper
- 16) Lock the safety switch for outlet hopper
- 17) Sweep or vac floor



Knife replacement means that all knives need to be replaced.



When setting the Rasper it is essential to use gloves for hand protection.

6.5 Exchange of the static knives



Disconnect the main current by maintenance work, repair etc.



Lock the main switch by maintenance work, repair etc.



It is absolutely prohibited and highly dangerous to open the machine before it has been brought to a complete stop.



When opening/closing the machine the operator must be absolutely sure that nobody is on or near the machine.



Use gloves for hand protection by maintenance work etc. The machine can be very hot after continuous operation.



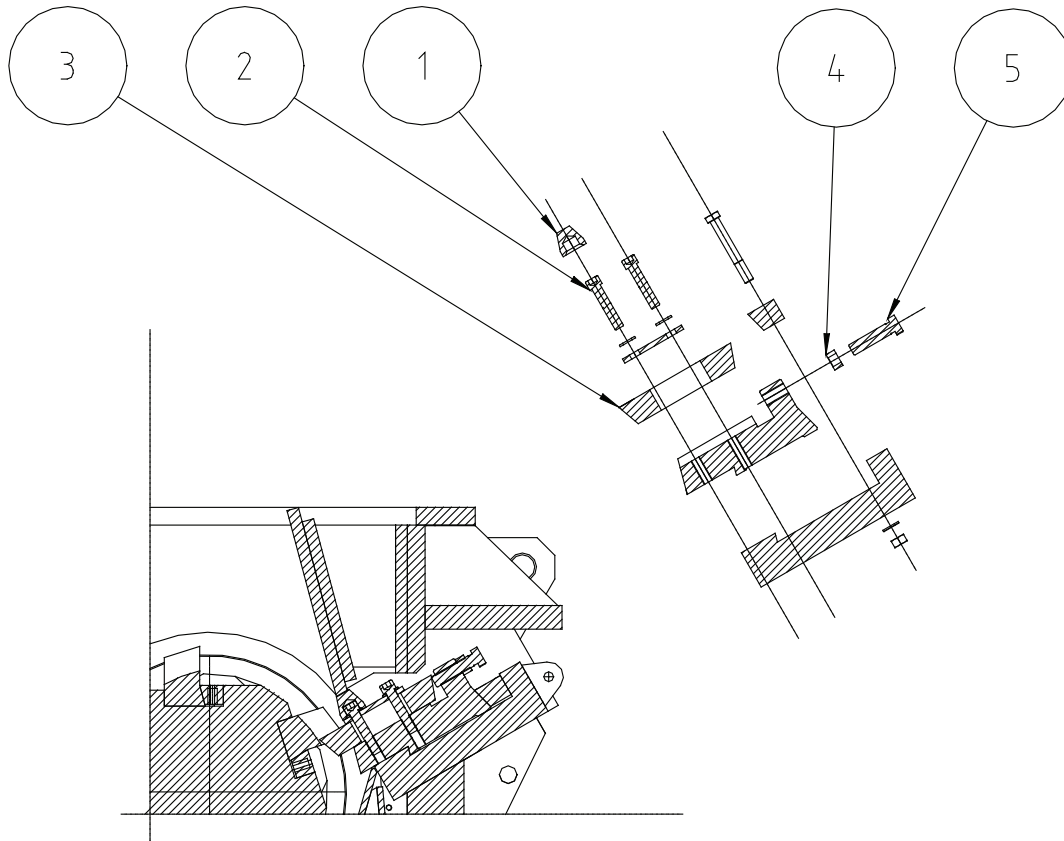
When replacing the knives the use of safety glasses is necessary, because of the danger of splinters when the knives are exposed to strokes and bumps.

From Figure 6 it can be seen that the static knife assembly consists of a row of single knives, separately adjusted.

All knives can be exchanged without removing the knife holder.

The following instructions explain the whole procedure and the checklist details what steps should be taken for each knife set.

Figure 6



- 1) Remove the caps for the knife bolts Figure 6 - Pos. 1.
- 2) Before adjusting it is checked that the counter nuts, Figure 6 - Pos. 4, and that the adjusting bolts, Figure 6 - Pos. 5, are loose.
- 3) Undo the knife retaining bolts Figure 6 - Pos. 2, using a 14 mm Allen key socket and remove the knives, Figure 6 - Pos. 3.
- 4) Clean the knife holder and knife.
- 5) Fit the knife in place and insert the bolts.
- 6) Adjust knife and tighten the knife bolts.

Mount the caps above the knife bolts

Remove knife bolts

When the knife bolts are removed it is very **important** that the locking washers are removed as a pair.

Clean knife holder and knife

Before mounting of the knives it is essential that both knife and knife location surfaces are cleaned carefully. **This is required to ensure that the knife sits firmly on the knife holder.**



Do not attempt to remove granulate with your fingers. The granulate can be sharp and easily cause cuts and other injuries.



When cleaning the machine it is necessary to use a dust mask.

Mounting of knife and knife bolts

The knife is installed in the knife holder and is pushed back towards the adjusting screw. The knife bolts with locking washers are inserted and they are tightened sufficiently to just hold the knife in place.

The adjusting bolts are pushed so far back that there is no risk of contact between the flying and static knives.

It is important that each bolt has a set of 2 locking washers and that the washers are inserted correctly with the toothed faces together, see Figure 7.

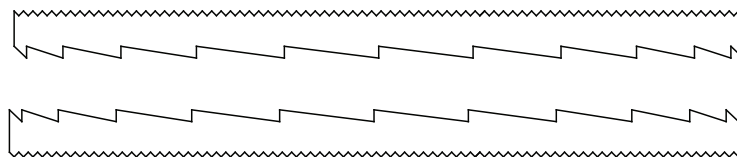


Figure 7

It is recommended to grease the bolts with cu-grease or similar.

Above procedure is repeated for every static knife.

If the distance between the static and flying knives is correct (see 6.8), tightening of the knife bolts can now take place. **The knife bolts must be tightened with a torque of 320 Nm.**

Note: It is very important that the cassette for the static knives is in order. If this is not the case it must be exchanged immediately.

6.6 Exchange of the flying knives



Disconnect the main current by maintenance work, repair etc.



Lock the main switch by maintenance work, repair etc.



It is absolutely prohibited and highly dangerous to open the machine before it has been brought to a complete stop.



When starting the machine, check that no persons or foreign bodies are inside the rotor housing or on the inlet conveyor (or any other kind of feeding device).



Use gloves for hand protection by maintenance work etc. The machine can be very hot after continuous operation.



When replacing the knives the use of safety glasses is necessary, because of the danger of splinters when the knives are exposed to strokes and bumps.

Order removing 60mm flying knives:

- 1) Remove the wedge fixing bolts, Figure 8 - Pos. 2.
- 2) Tighten wedge-jacking screws, Figure 8 - Pos. 1.
- 3) Remove the wedge, Figure 8 - Pos. 5.
- 4) Remove the flying knife, Figure 8 - Pos. 3.
- 5) Clean the knife location slot.
- 6) Insert the new flying knife.
- 7) Insert the wedge.
- 8) Tighten the fixing bolts.

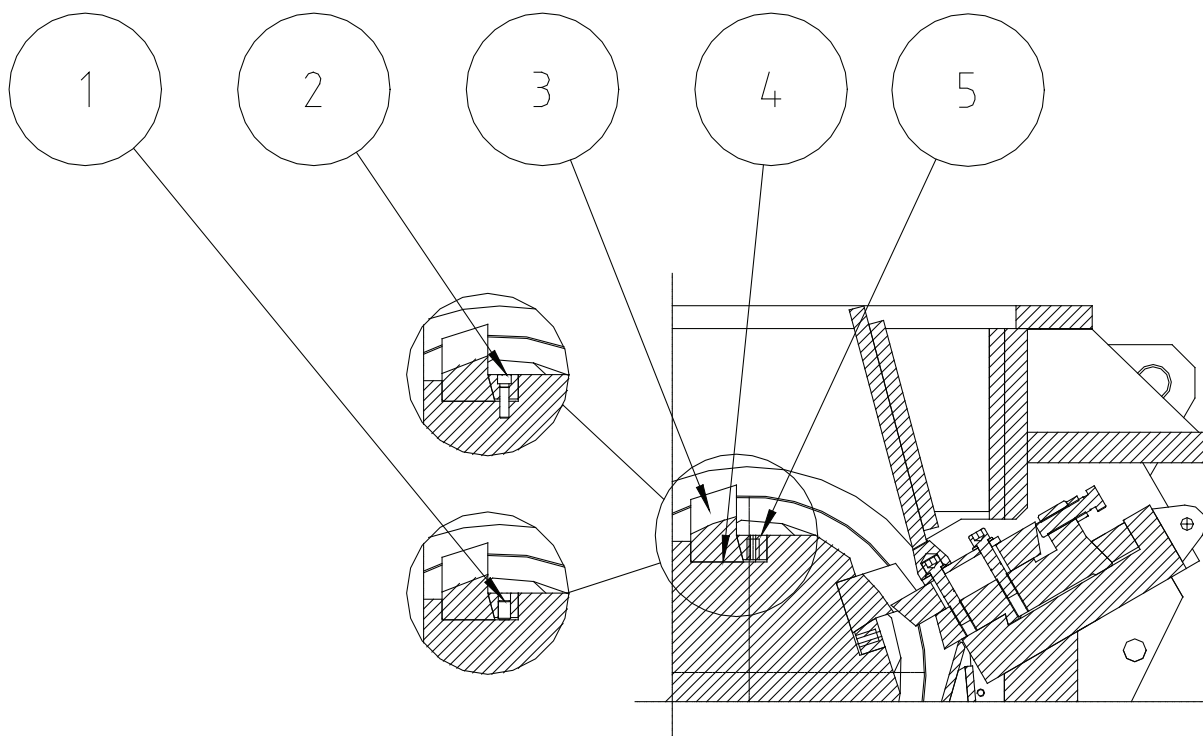


Figure 8

Order removing 25mm flying knives:

- 1) Remove the fixing bolts, Figure 9 - Pos. 3
- 2) Remove the flying knife, Figure 9 - Pos. 1
- 3) Clean the knife holder, Figure 9 - Pos. 2
- 4) Insert the new flying knife
- 5) Tighten the fixing bolts

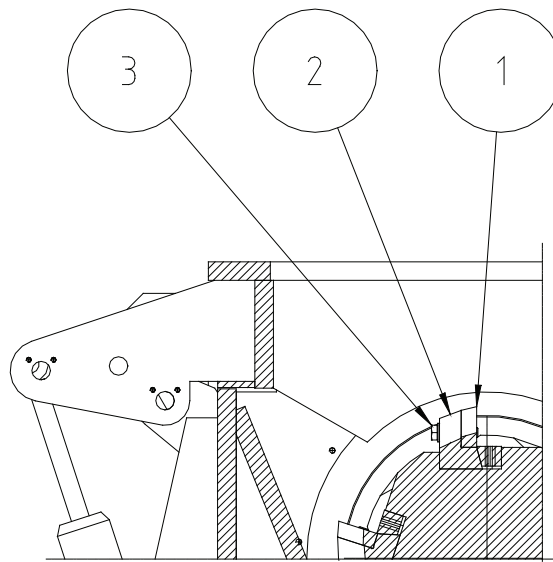


Figure 9

Remove knife Bolts

- ad 1 Care should be taken, when removing the bolts, to ensure that the locking washers are also removed as a pair, Figure 7.

Remove the flying knife

- ad 2 The knife is best removed from the top of the Rasper. To keep the rotor in balance and thus keep it easy to turn, the knives should be removed and replaced with a new one in one operation.

Cleaning the knife holder

- ad 3 Before attempting to refit the knife, **it is essential that the location in the holder, Figure 9 - Pos. 4, is scrupulously clean to ensure that the knife sits firmly on the holder.**

Insert new knife

ad 4 The knife should now be set in place and the fixing bolts complete with washers inserted. It is recommended that the bolts are greased.

The fixing bolts should be tightened progressively with a final tightening to 320 Nm.

This process should be repeated for every knife.

6.7 Adjustment of the distance between static and flying knives



Use gloves for hand protection by maintenance work etc. The machine can be very hot after continuous operation.



When replacing the knives the use of safety glasses is necessary, because of the danger of splinters when the knives are exposed to strokes and bumps.

The knife clearance is set by adjusting the gap between the flying and static knives.

Since the flying knives, Figure 8 - Pos. 3 and Figure 9 – Pos. 1, are all the same size and their fixing is not adjustable, all the adjustment is done by moving the static knife Figure 6- Pos. 3.

To set the clearance, turn the rotor **by hand** until one of the flying knives is in line with the static knife that you wish to set.

The bolts, Figure 6 - Pos. 3, are loosened and the knife holder is pushed forward with the adjustment bolt, Figure 6 - Pos. 7, until the gap between the static and the flying knives is 0,5-0,8 mm.

Tighten the bolts for the knife holder slightly. When all static knives are adjusted, turn the rotor **by hand** in order to ensure that all knives in the row are having the right clearance.

The knife fixing bolts can now be tightened using a 14-mm Allen key socket to a torque of 320 Nm.

Having got the setting correct and having tightened the knife bolts with the correct torque, the counter nuts on the adjustment bolts are tightened.

This operation should be repeated for all of the static knives.

6.8 Dismounting and mounting of knife holders for 25mm flying knives



Use gloves for hand protection by maintenance work etc. The machine can be very hot after continuous operation.

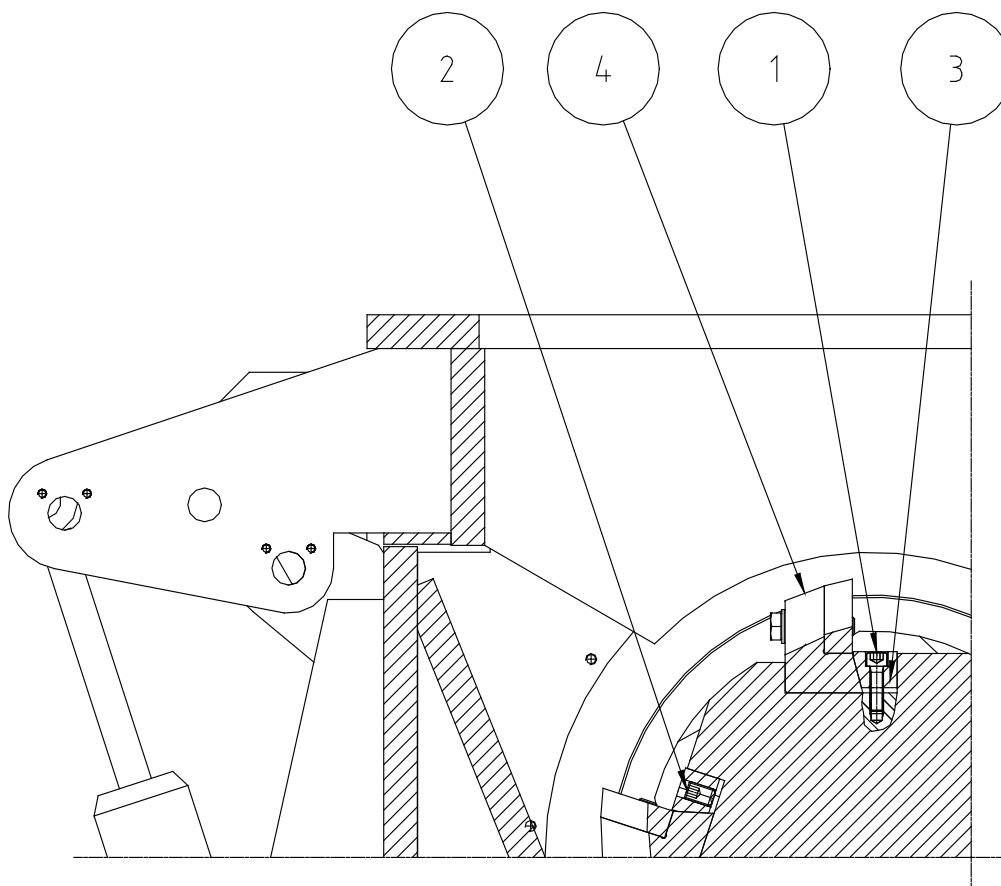


When replacing the knives the use of safety glasses is necessary, because of the danger of splinters when the knives are exposed to strokes and bumps.



It is important that all location surfaces are carefully cleaned.

Figure 10



- 1) Remove the wedge fixing bolts (Figure 10 – Pos 1)
- 2) Tighten wedge-jacking screws (Figure 10 - Pos. 2)

- 3) Remove wedge (Figure 10 - Pos. 3)
- 4) Remove knife holder (Figure 10 - Pos. 4)
- 5) Clean knife holder location slot
- 6) Insert new knife holder
- 7) Wedge jacking screws back
- 8) Insert wedge
- 9) Tighten fixing bolts

Remove wedge fixing bolts

- 1) The wedge retaining bolts are removed from the top, using a 10-mm Allen key.
- 2) To keep the rotor in balance and thus keep it easy to turn, the knife holder should be removed and replaced with a new one in one operation.

Remove the wedge

The wedge is loosened by tightening the 2 wedge jacking screws, using an 8-mm Allen key or socket. To assist removal, it may be necessary to tap the front and back of the knife with a soft faced hammer. Once loose the wedge and knife holder can be lifted out

Cleaning the knife location

Before attempting to refit the knife holder, **it is essential that the location in the location slot in the rotor is scrupulously clean to ensure that the knife holder sits firmly.**

Insert new knife holder/wedge

Before inserting the knife holder and wedge, ensure that the wedge jacking screws are screwed back above the bottom surface of the wedge.

To assist future removal, the knife holders should be lightly oiled using a general lubricating oil along the face, which touches the wedge.

The knife holder and wedge should now be set in place and the fixing bolts inserted. It is also recommended that the bolts are greased.

The wedge fixing bolts are tightened progressively to a final torque of 120 Nm.

6.9 Checking

Before attempting to reassemble the machine 3 checks should be made:

- 1) The rotor should be turned **by hand** to ensure that it turns freely without anything touching.
- 2) All of the bolts should be rechecked to ensure that they are tightened correctly.
- 3) It is recommended that the bolts are tightened regularly.

6.10 Closing the upper part with hopper



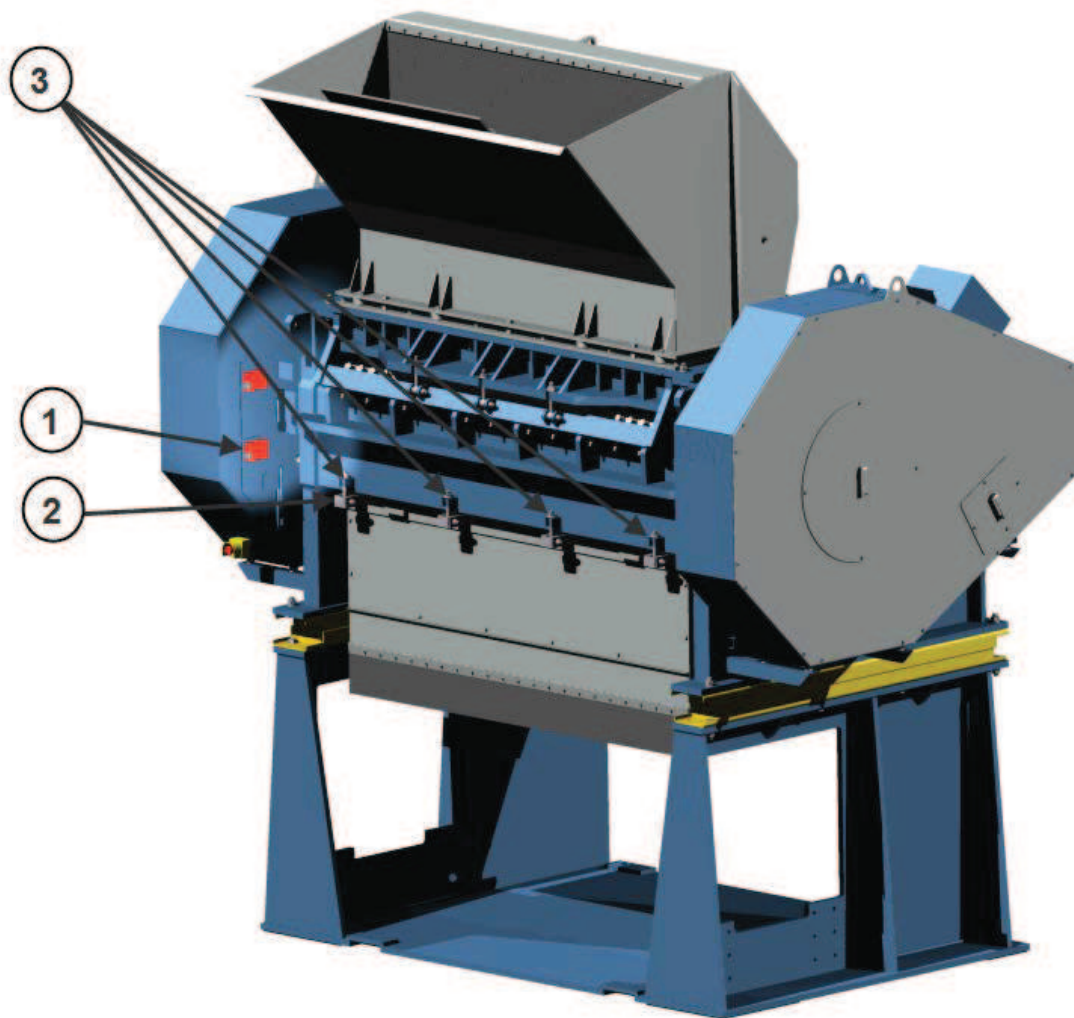
When opening/closing the machine absolutely nobody, but the operator must be in or near the upper part, rotor housing and movable parts.

Clean all closing parts of the upper and under part of the rotor housing before closing the machine.

- 1) Remove the lock pins.
- 2) Turn on the hydraulic pump by turning the start/stop button on the control panel.
- 3) Close the hopper and the upper part of the housing by operating the hydraulic valve lever on the side of the Rasper.
- 4) When the hopper and the upper part have moved to its limit, turn off the hydraulic pump.
- 5) The 4 retaining bolts on top of the Rasper are put in place and tightened with a 46-mm spanner. It is very important that the upper part is 100% tightened against the rotor housing as the machine may otherwise be damaged.
- 6) The 2 eyebolts are placed in the mounting again and are tightened. Mount the dust pipe
- 7) Connect the safety switch.

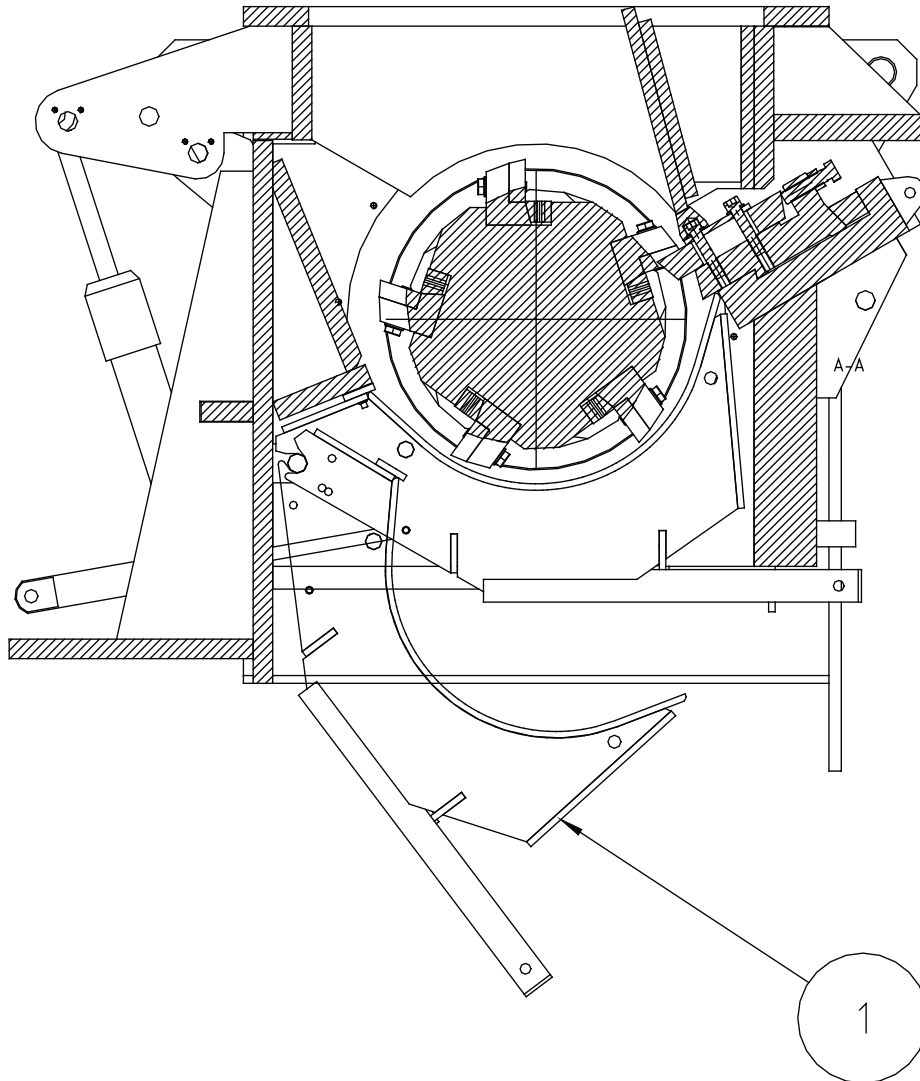
6.11 Removing the discharge hopper and the screen

Figure 11



- 1) Release the safety switch, Figure 11 – Pos. 1, before removing the front plate.
- 2) Remove the retaining bolts, Figure 11 – Pos. 2, using a 17-mm spanner and remove the front plate.
- 3) The 4 eyebolts, Figure 11 – Pos. 3, are loosened.
- 4) Turn on the hydraulic motor by turning on the start/stop button on the control panel.
- 5) The screen holder, Figure 12 – Pos. 1, can now be lowered by means of the hydraulic control handle, which is placed on the side of the machine.

Figure 12



- 6) When the screen holder has been correctly lowered, the hydraulic motor must be turned off again.
- 7) The screen is a two-piece screen, which not are fixed in the screen holder. See figure 13.
- 8) The screens, Figure 13 – Pos. 1, are removed.
- 9) Dismount the wear plate, Figure 13 – Pos. 4, if it is worn.

Figure 13

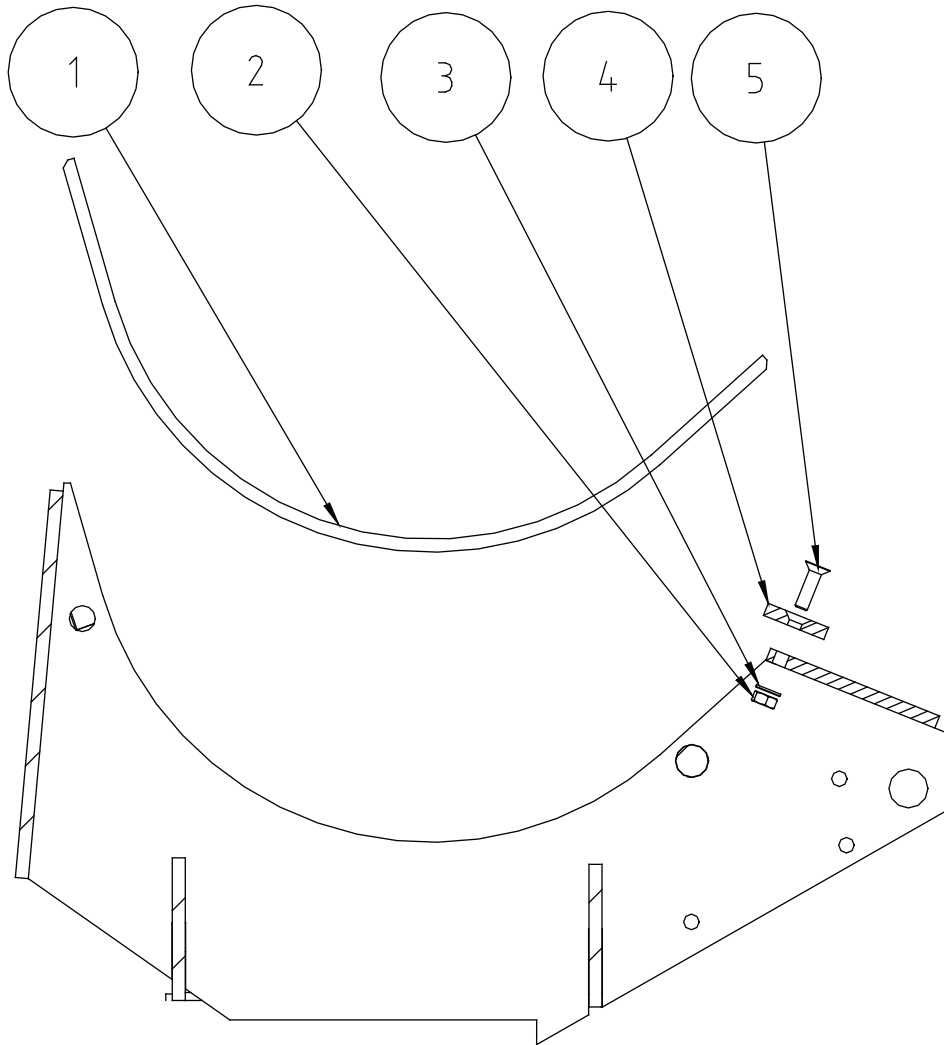
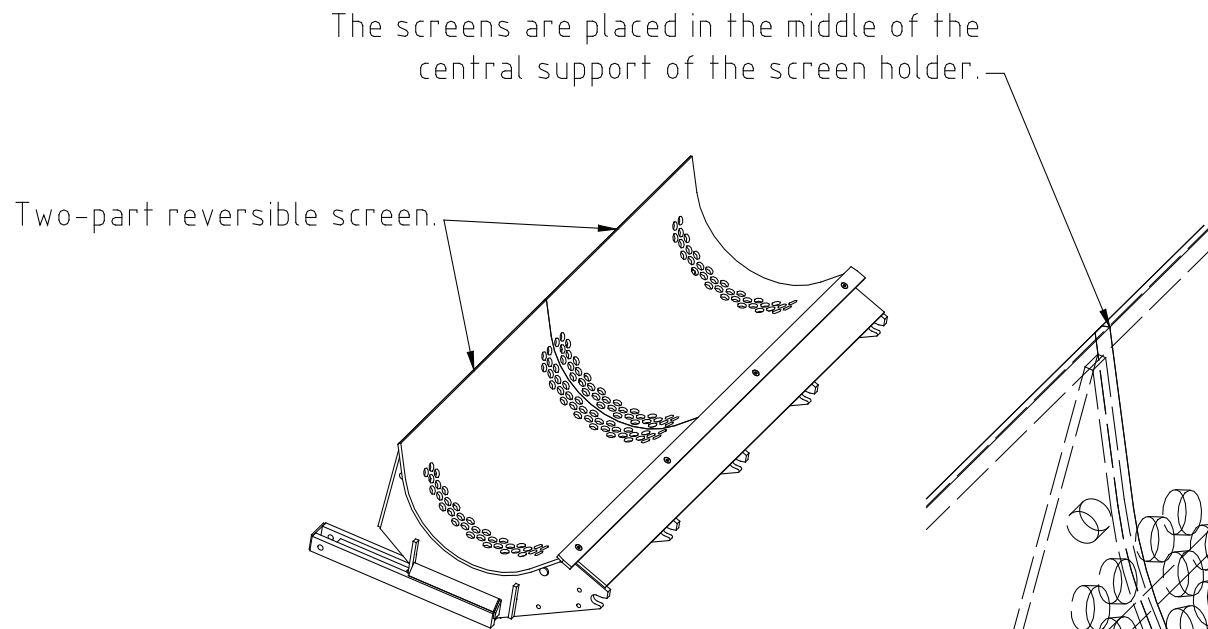


Figure 14



The two-piece screen plates weighs each approx. 30 kg each and should be lifted by 2 per-sons

6.12 Mounting of the screen and discharge hopper



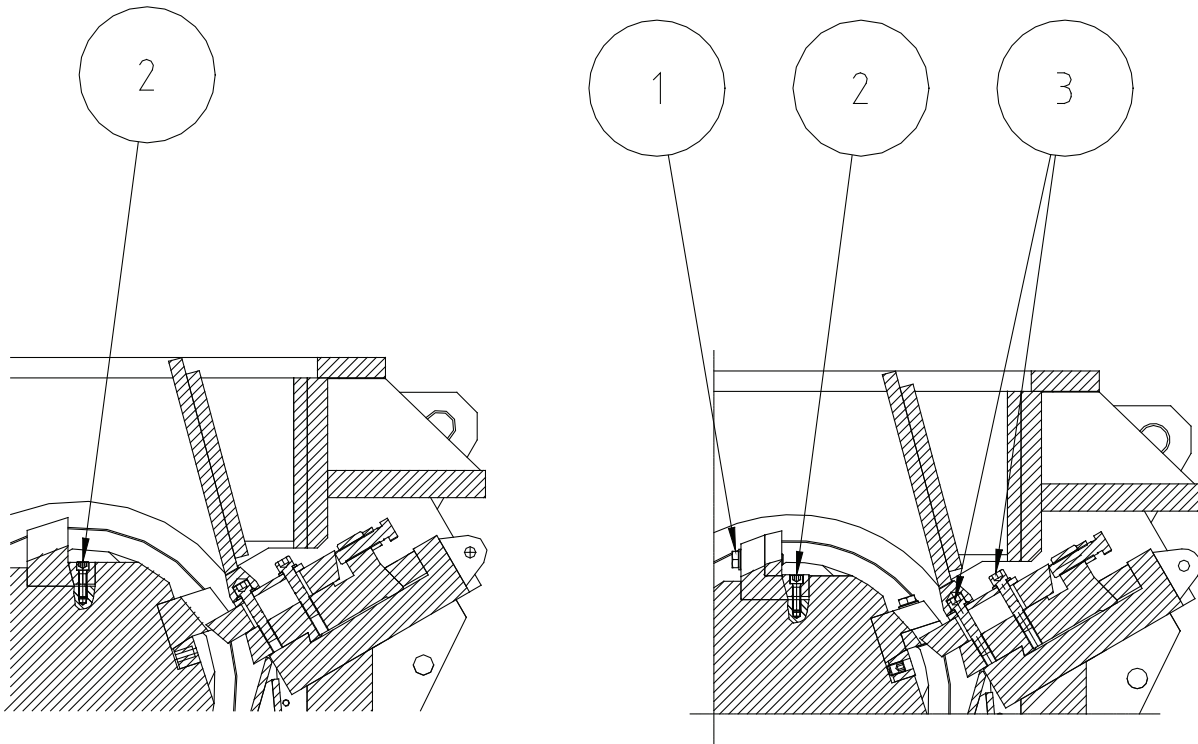
The screen support must be carefully cleaned before the screen plate is installed.

- 1) The two-piece screen plates are placed in the screen holder. It is very important that the screen plate fit 100% in the screen holder and it is also important that possible deformations in the screen holder are removed before the screen plate is mounted.
- 2) The two screen plates must be adjacent and placed in the middle of the central supports of the screen holder. See Figure 14.
- 3) If necessary, mount a new wear plate.
- 4) The hydraulic pump is connected.
- 5) The screen holder can now be raised by means of the hydraulic control handle, which is placed on the side of the machine.
- 6) When the screen holder has been correctly closed, the hydraulic pump is turned off again.
- 7) The two lock nuts are inserted again and tightened with a 30-mm spanner. It is very important that the screen holder is 100% closed.

- 8) Slide in the outlet hopper and refit by inserting and tightening the 2 bolts using a 17 mm spanner.
- 9) Lock the safety switch.

6.13 Torque

Figure 15



Description	Type	Quality	Torque Nm	Remarks
Screw/Flying knife holder (wedge)	MC12	12.9	120	Figure 15 - Pos. 2
Screw/Flying knife	M16	12.9	320	Figure 15 - Pos. 1
Screw/static knives	MC16	12.9	320	Figure 15 - Pos. 3

To ensure accurate setting the following conditions should be met:

1. The bolts must be untreated.
2. The bolts must be greased with cu-grease or similar

Never dip the bolts in oil, as this will create a risk that the torque settings may be greater than intended thus exposing the bolts to too great tension.

It is very important that the above is respected, because it may otherwise cause damage to the knives and other vital parts.

6.14 Motor

The machine is furnished with 2 pcs. 110 kW motors.

It is very important that the motor is connected so that it has the correct direction of rotation, which is shown by an arrow on the belt guard.

Check the direction of rotation:

Start the motor for one brief second, just enough to turn the motor. This way it is possible to check whether the motor has the correct direction of rotation (as shown by the arrow). The direction of rotation must only be altered by authorised personnel.

7. OPERATION

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7.0 Introduction

To enable you to get the best from your ELDAN machine it is essential that it is operated correctly.

Therefore the operational manual tells you about start and stop procedures, the function and operation of the control desk. The operation procedures tell you about safety statements and operation information.

7.1 Safety statements



Before starting the machine, check that all protection devices works and are correctly adjusted.



When lifting/transporting the machine use the lifting hooks placed on the machine.



Before starting the machine check that no persons or foreign bodies are inside the rotor housing or on the inlet conveyor (or any other kind of feeding device)



When opening/closing the machine absolutely nobody, but the operator must be in or near the upper part, the rotor housing and movable parts.



When opening/closing the machine the operator must be absolutely sure that nobody is on or near the machine.



When starting the machine, check that no persons or foreign bodies are inside the rotor housing or on the inlet conveyor (or any other kind of feeding device)



In emergency situations use the emergency stops.



Oil leaks from hydraulic tubes or pipes may come with such a force that the oil may penetrate the skin.



Attention: after the machine has been stopped there is a caster time of approx. 1 minute. Do not touch rotor, flywheel etc. before these are completely stopped. Maintenance work, repair etc. must not be carried out before the rotating parts of the machine have stopped completely.



It is absolutely prohibited and highly dangerous to open the machine before it has been brought to a complete stop.



It is absolutely prohibited for unauthorised personnel to work with current-carrying wires even though the main switch has been turned off and locked.



Disconnect the main current by maintenance work, repair etc.



Lock the main switch by maintenance work, repair etc.



Before connecting the main current, check that nobody is working on the machine.



Before starting the motor, check that the motor rotates in the correct direction. This is indicated by an arrow on the motor. The direction of rotation must only be altered by authorised personnel.



Use gloves for hand protection by maintenance work etc. The machine can be very hot after continuous operation.



It is recommended to use earplugs or hearing protectors to avoid damage of the hearing.



Check that the alarm signal always works.



There is danger of explosion and fire if the electrical cabinet is not kept free of dust.



When replacing the knives the use of safety glasses is necessary because of the danger of splinters when the knives are exposed to strokes and bumps.



When cleaning the machine it is necessary to use dust masks.

7.2 Operational procedure

With regard to information in connection with the operational procedure, please see the separate operational manual.

7.3 Useful information regarding the process

Selection of screen

The selection of screens depends on the size of the fractions required as output for the concerned machine or the required input for the subsequent machine.

In general the choice of screens will depend on:

1. Start product

By processing of material from car tyres smaller screens should be used than by processing of material from truck tyres.

In truck tyres the main part of the steel is concentrated in the bead wire whereas the main part of the steel in car tyres is concentrated in the tread.

2. Use of end-product

Ex: An Ø30 mm screen is used for "chips", which are used as fuel for blast furnaces.

An Ø20 mm screen is used for granulate which is used as support for road surfaces.

An Ø15 mm screen is used for granulate which should be granulated further. With a screen in this size 90-98% of the steel in the input is liberated and the steel can then be removed by means of a magnet.

3. Capacity Kg/H

The larger the screens, the higher the capacity.

4. Purity of the granulate, % textile and wire

The larger the screens, the less steel will be liberated from the granulate and the more rubber will be tied to the steel which is taken out after the machine.

The smaller the screens, the more steel is liberated from the granulate. This is an advantage if the machine is part of a complete plant because the wear will be concentrated in this machine with regard to the steel in the input.

5. Size of the fractions

The knives have to be set if:

- The use of ampere is rising, but the material flow is the same.
- The conveyors are constantly stopping (operational manual)
- The granules are not cut through but "grated".
- The capacity is degressive.

It is recommended to adjust the knives after 8 hours of operation and then as required.

The sharp edges of the knives disappear rather quickly and it is therefore recommended to adjust the clearance between the knives after a couple of hours operation. This way it will be possible to obtain max. capacity on the machines.

Subsequent the knives should be adjusted as described above and in "Maintenance Directions".

7.4 Steel and dust outlet

Steel outlet:

The Overband Magnet is mounted after the MPR200T. The separator has to be installed in a level above the granulate flow depending on the amount of steel which is to be removed.

Dust outlet:

On the MPR200T there is mounted dust suction on the inlet hopper.

7.5 Safety statement regarding emergency stops

What happens when an emergency stop is activated:

When an emergency stop is activated this means that the machine as well as all transports in and out of the machine will stop.

The main power will be cut off, if an emergency stop is activated, Figure 16 – Pos. 1.

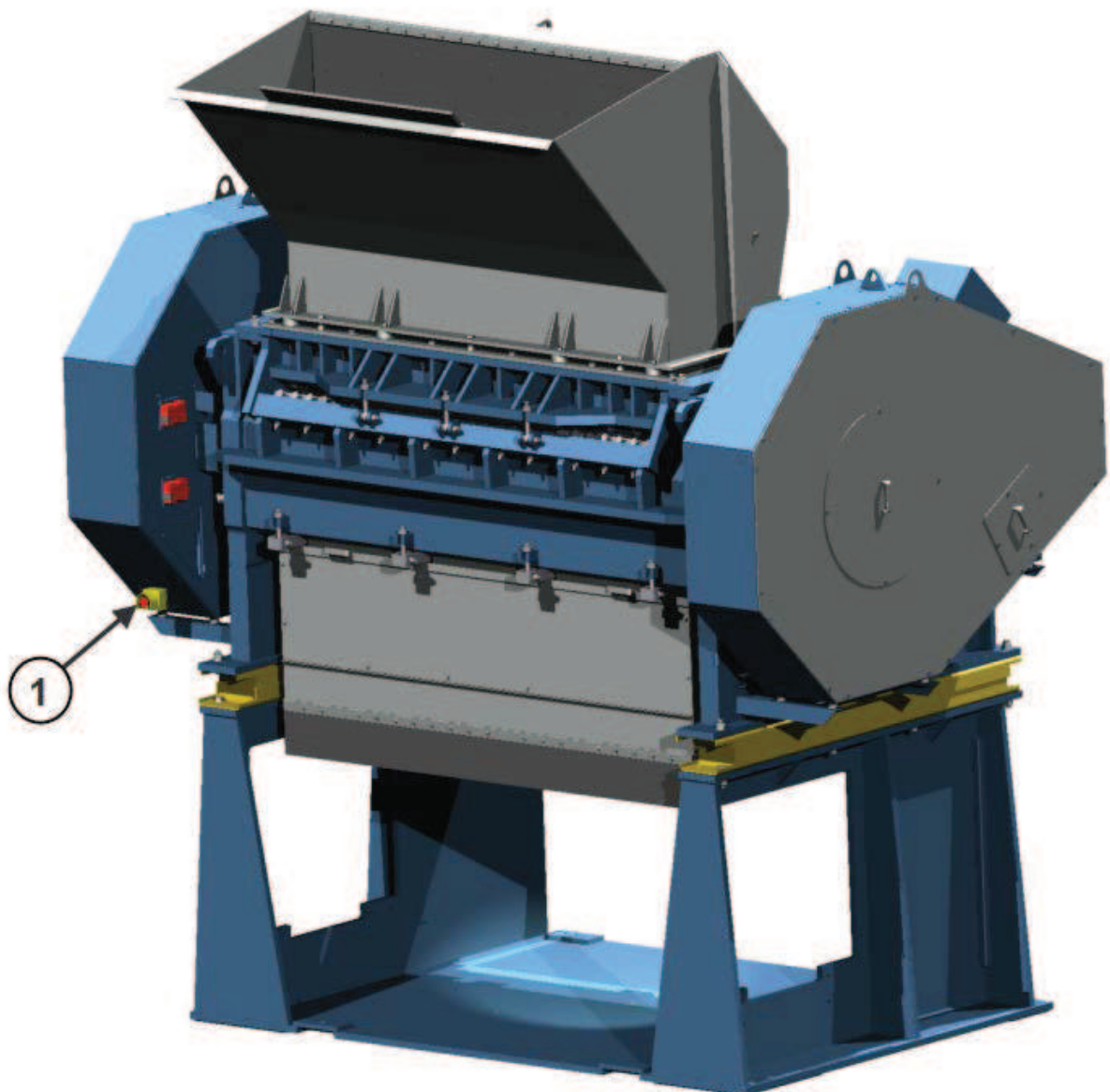


Figure 16

8. MAINTENANCE

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8.6	Welding of rotor	66

8.0 Introduction

Before the operator begins greasing/maintenance works on the machine the following precautions should be followed:



By greasing and maintenance of the machine, the machine should be brought to a complete stop and the main switches disconnected and locked.



After the machine has been stopped there is a caster time of approx. 1 minute. Do not touch rotor, flywheel etc. before these are completely stopped. Maintenance and repair etc. must not be carried out before the rotating parts of the machine have stopped completely.



When opening/closing the machine absolutely nobody, but the operator must be in or near the machine.

Personal security when carrying out service work:



It is dangerous to climb the machine. Use either a platform or a stepladder where service from the ground is impossible.



The processing area must be satisfactory illuminated so that there are no dark corners. Illumination must, however, not be dazzling. The supply must not be taken from the machine as this must be disconnected.



Use gloves for hand protection by maintenance work etc. The machine can be very hot after continuous operation.



When cleaning the machine it is necessary to use dust masks.



When replacing the knives the use of safety glasses is necessary because of the danger of splinters when the knives are exposed to strokes and bumps.



Oil leaks from hydraulic tubes or pipes may come with such a force that the oil may penetrate the skin. In such cases a doctor's help should be sought immediately in order to prevent severe infections.

When the operator has finished the greasing/maintenance work on the machine the following precautions should be followed:



Before connecting the main current, check that nobody is working on the machine.



Before starting the machine check that all protection devices works and are correctly adjusted.



Before starting the machine check that no persons or foreign bodies are inside the rotor housing or on the inlet conveyor (or any other kind of feeding device).

8.1 Maintenance directions

The below description should only be regarded as a guide line, because the values will depend on the specific type of input material such as steel content, size of the input material and method of feeding etc.

Besides the daily maintenance, a weekly maintenance for replacement of knives etc. is recommended. This could for instance be in the weekends.

ELDAN recommends as follows by processing of tyres:

- Tightening of knife bolts after 24 processing hours and then as required.
- Clean the screen and the rotor housing for steel wire after every 40 processing hours.
- Adjustment of knives.
 - 1) the first time after approx. 8 processing hours
and
 - 2) then after every 40 tons of input material or as required
- It is important that the exchange of knives is not merely based on the values stated in the manual. These values are only meant as guide lines and the customer should instead build up his own experience for the exchange of wear parts in reference to the specific production. The maximum values must, however, not be exceeded.
- Clean the rotor housing and the clearance between the side walls for dust with a vacuum cleaner.
- The water nozzles in the inlet hopper should be cleaned once a week or as required.

The adjustment of knives is very important, because the bigger the clearance between the knives is the more the knife costs will increase. This means that when the distance between the knives is too big the material is not cut but "grated", the steel in the tyres is then drawn down between the knives instead of being cut and this increases the wear on the knives. It further means that the capacity is degressive and the use of ampere is rising.

Further the fire risk will increase the bigger the clearance between the knives is, because the steel wire will be pulled down between the knives instead of being cut. The steel wire will then

become stuck in the rotor housing and the screen and they will get red-hot during the process and can easily set fire to the dust. Adjustment/change of knives and cleaning of the machine is therefore very important.

8.2 Lubrication scheme summary

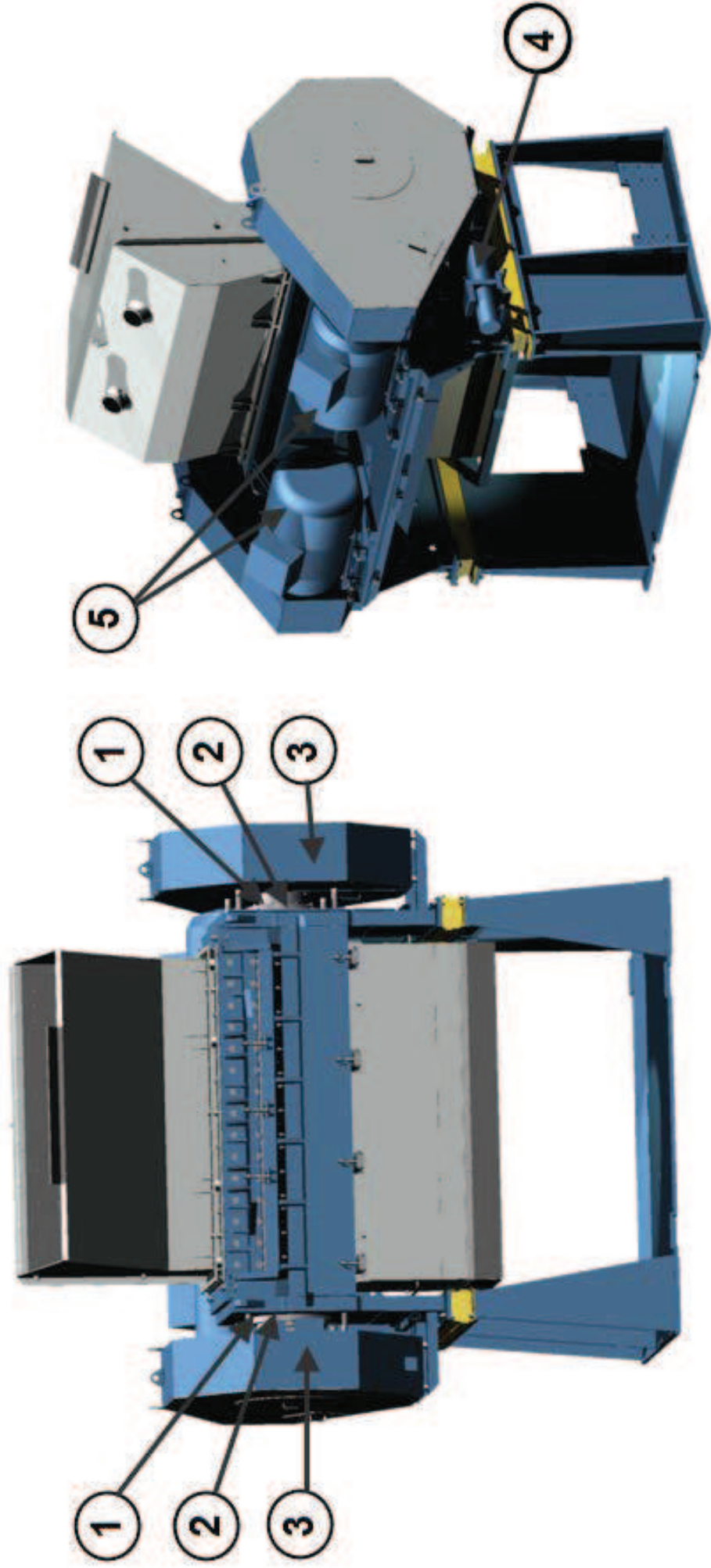
<u>Machine</u>	<u>Job</u>	<u>Interval</u>	<u>Quantity</u>	<u>Product/type</u>
MPR200T:				
Main bearings Figure 17 - Pos. 1	F	100 H	30 g/each	Shell Albida Grease EP2
Thrust bearing Figure 17 - Pos. 2	F	100 H	15 g	Shell Albida Grease EP2
Slide bearing/couplings Figure 17 - Pos. 3	F	**	5 g/each	Shell Albida Grease EP2
Hydraulic system Figure 17 - Pos. 4	O	*	6 L	Shell Tellus T46/68
Motors with grease nipple Figure 17 - Pos. 7	F	1000 H	5 g/each	Shell Albida Grease EP2

Job code: F = Grease O = oil
Interval code: H = hours U = weekly M = monthly
Quantity code: L = litres
Quantity code: g = grams

- * Refilled as required/exchanged minimum once a year
- ** When the clutch slide
- *** Refilled as required/exchanged after every 2000 hours.
- **** Exchange the oil after 200 hours of operation and then after minimum every 2000 hours.

It is very important that the above items are lubricated in accordance with the mentioned specifications and that they are checked at a regular basis and refilled if necessary.
SHELL's products are recommended - otherwise a similar product.

Figure 17



8.3 Adjustment of clutch

See Figure 18

When:

The clutch should be adjusted after the first 24 processing hours and then for every 250 processing hours.

The clutch should be adjusted every time there has been an overload and it has come to a complete stop of the rotor.

The clutch should be adjusted if the machine is running with very high load, which means that it reaches the overload SETTING POINT many times/hour (between 10-50 overloads/hour).

How:

The counter nuts Figure 18, Pos. 2 are loosened.

The clutch bolts, Figure 18 Pos. 1, are tightened progressively in the order shown on Figure 18. The order for the tightening is repeated until all bolts have been tightened alike.

The final tightening for Figure 18 should be 65 Nm.

The counter nuts Figure 18, Pos. 2 are tightened again.

CLUTCH FOR FLYWHEEL

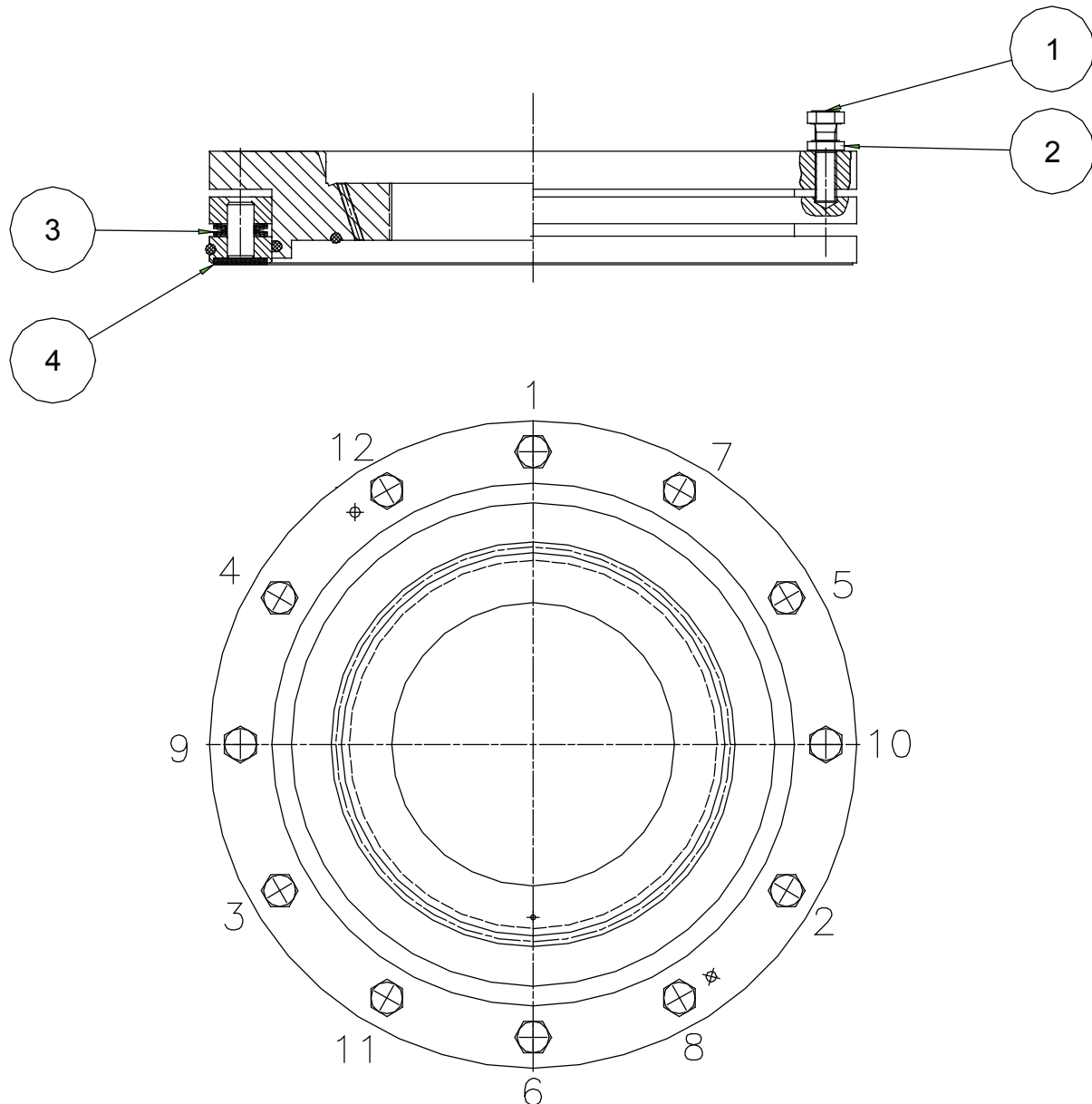


Figure 18

Pos.1	Bolts (tightened with 65 Nm)
Pos.2	Counter nut
Pos.3	Spring
Pos.4	Friction lining

8.4 Adjustment of belt drive

TENSION OF THE BELT DRIVE

By a load of 68 N corresponding to 6,8 kg or 15 pound force the tension of the belts must be adjusted so the deflection of the belts is 17,5 mm.

The belts must be adjusted regularly

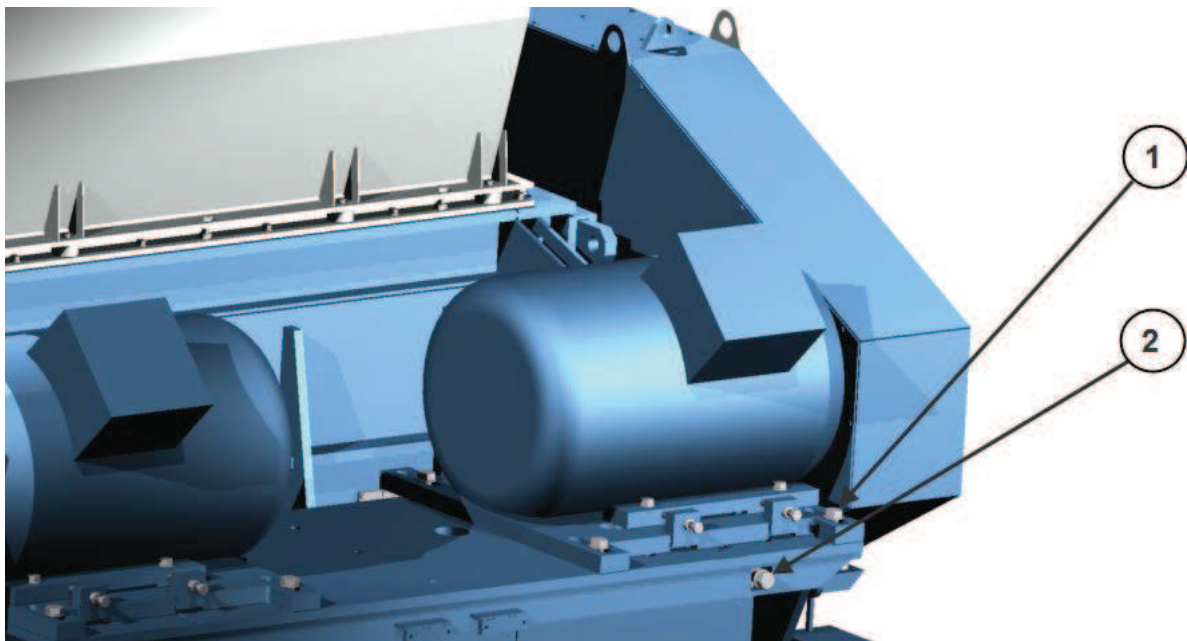
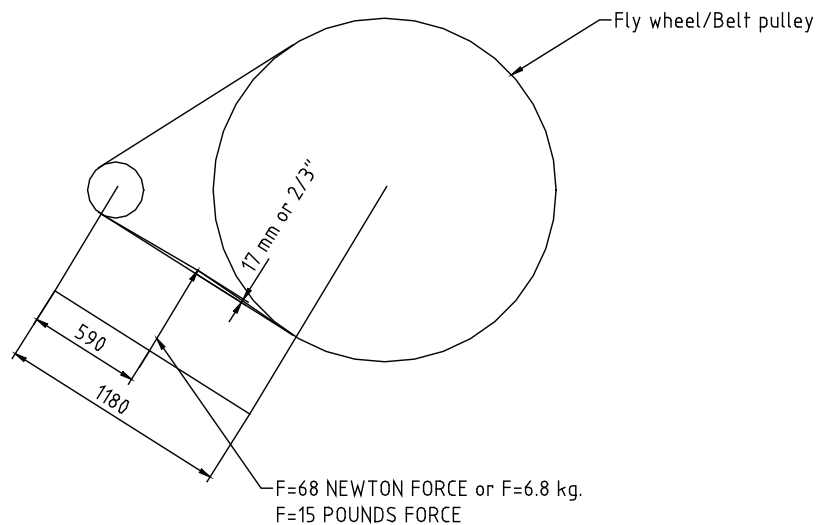


Figure 19

Loosen the 4 bolts, Figure 19 – Pos 1, and to adjust the belts tighten or loosen the bolt, Figure 19 – Pos 2. When the above mentioned tension is achieved tighten the 4 bolts, Figure 19 – Pos. 1

8.5 Grinding of knives

Flying knife - 60mm

As the knives are extremely hard, it is recommended to have the knives ground by a specialist. When grinding the knives it is essential to cool the knives so much that the structure and strength is unchanged after grinding.

Damage due to incorrect grinding is at the customer's own risk.

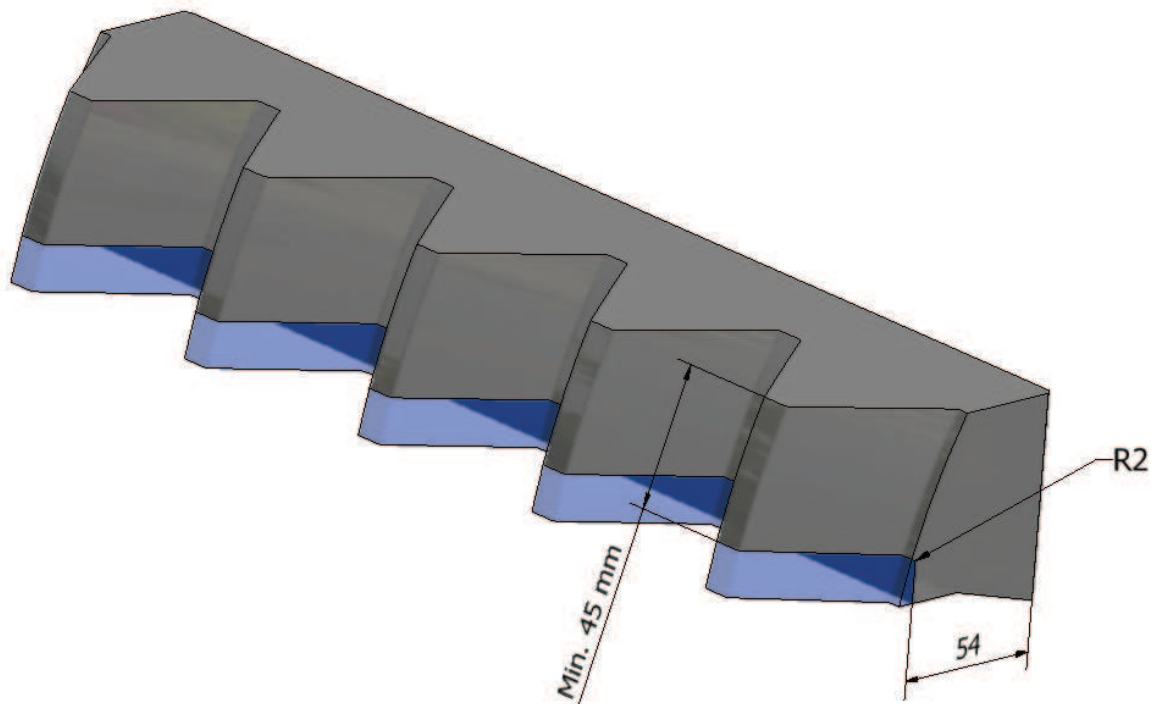


Figure 20

The knives should be ground as shown on the marked areas, however, not further down than the indicated measures.

The knife bolts should be adjusted for every 24 hours operation or as required. The bolts should be tightened to a torque of 320 Nm.

If the knives are ground more than stated on above sketch it will be at the customer's own risk.

Flying knife – 25mm

As the knives are extremely hard, it is recommended to have the knives ground by a specialist. When grinding the knives it is essential to cool the knives so much that the structure and strength is unchanged after grinding.

Damage due to incorrect grinding is at the customer's own risk.

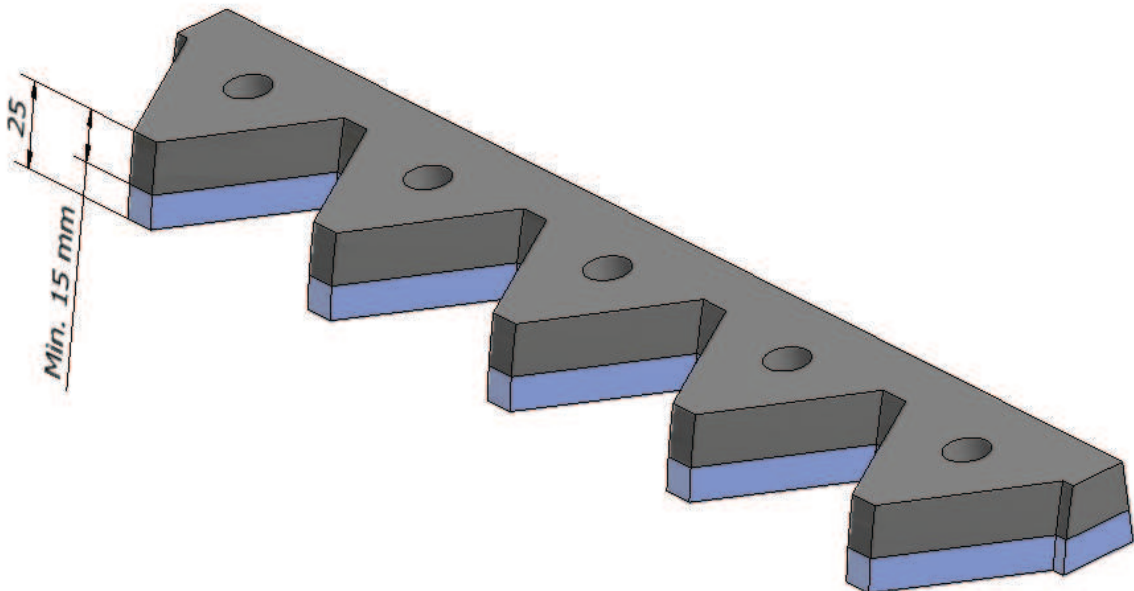


Figure 21

The knives should be ground as shown on the marked areas, however, not further down than the indicated measures.

The knife bolts should be adjusted for every 24 hours operation or as required. The bolts should be tightened to a torque of 320 Nm.

If the knives are ground more than stated on above sketch it will be at the customer's own risk.

Static knives

As the knives are extremely hard, it is recommended to have the knives ground by a specialist. When grinding the knives it is essential to cool the knives so much that the structure and strength is unchanged after grinding.

Damage due to incorrect grinding is at the customer's own risk.

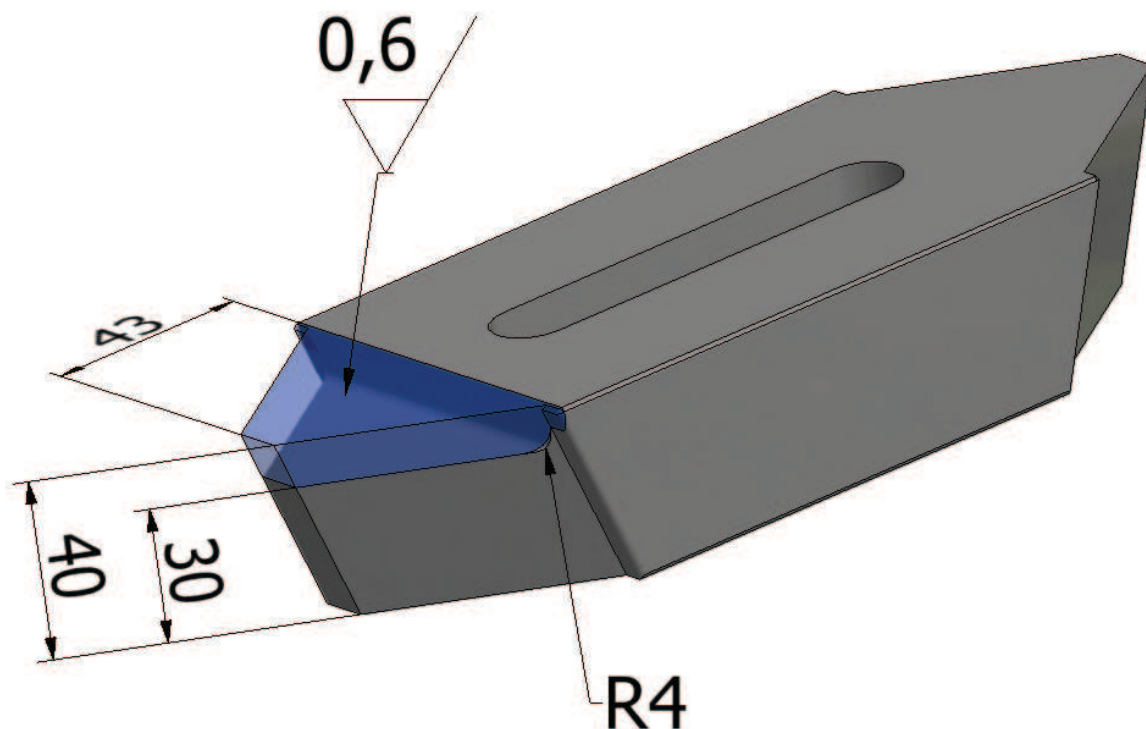


Figure 22

The knife bolts should be tightened after every 24 hours operation or as required. The bolts should be tightened to a torque of 320 Nm.

The knives should be ground as shown on the sketch, however not further down than the indicated measures. Max. 10 mm must be ground of the knives

If the knives are ground more than stated on above sketch it will be at the customer's own risk.

8.6 Welding of rotor

Eldan is using an Oerlikon rod fluxofil 58 or equivalent.

The rotor has to be preheated to at least 80 degrees centigrade before welding; this is to prevent the weld and the rotor from cracking.

Eldan recommends starting the welding after a day's production, then the rotor is already warm.

Important: be sure that the welding current is not at any time going thru the bearing.

Keep the ground cable at the rotor when welding on the rotor, if not sparks will occur between the bearing roll and the pan of the bearing and the bearing is destroyed forever.

Eldan recommend a 1,2 mm welding rod.

9. SPARE PARTS

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9.2	Spare parts stock level recommendations	69

9.0 Introduction

Here at ELDAN we recognise that the availability of spare parts is essential to the smooth running of your machine.

We have therefore set out in this section an understanding of the ELDAN philosophy regarding spare parts, recommendations regarding the spare parts stock-holding that you should have together with a list of spare parts available.

9.1 Spare parts philosophy

To ensure the best service possible to you, the customer, and to allow you to plan your spare parts purchase ELDAN have grouped spare parts into 4 categories:-

- a) Wear-parts which are produced continually and which can be delivered prompt ex stock with the only reservation that we might deplete the stock due to heavy demand faster than we can produce.
- b) Vital spare parts (excluding rotors) for standard equipment, which will be stocked according to the monthly stock-list. Reproduction will start when we reach minimum stocking level.
- c) Normal spare parts, which are not necessarily stocked but can be delivered within 2 working weeks.
- d) Spare parts for special products are not necessarily stocked and delivery times will be individually advised by the production department.

9.2 Spare parts stock level recommendations

To enable the plant to be operated normally, it is essential that a minimum stock-holding of consumable spares is maintained. For this plant the essential spares are:-

MPR200T

2 set	knives	1 set on stock 1 set to be ground
1 set	Knife bolts/nuts and washers	
2 each	Screen plates	

Name: MPR200T
 Drawing nr.: 48035
 Part No.: 48035
 Order No.: 50259

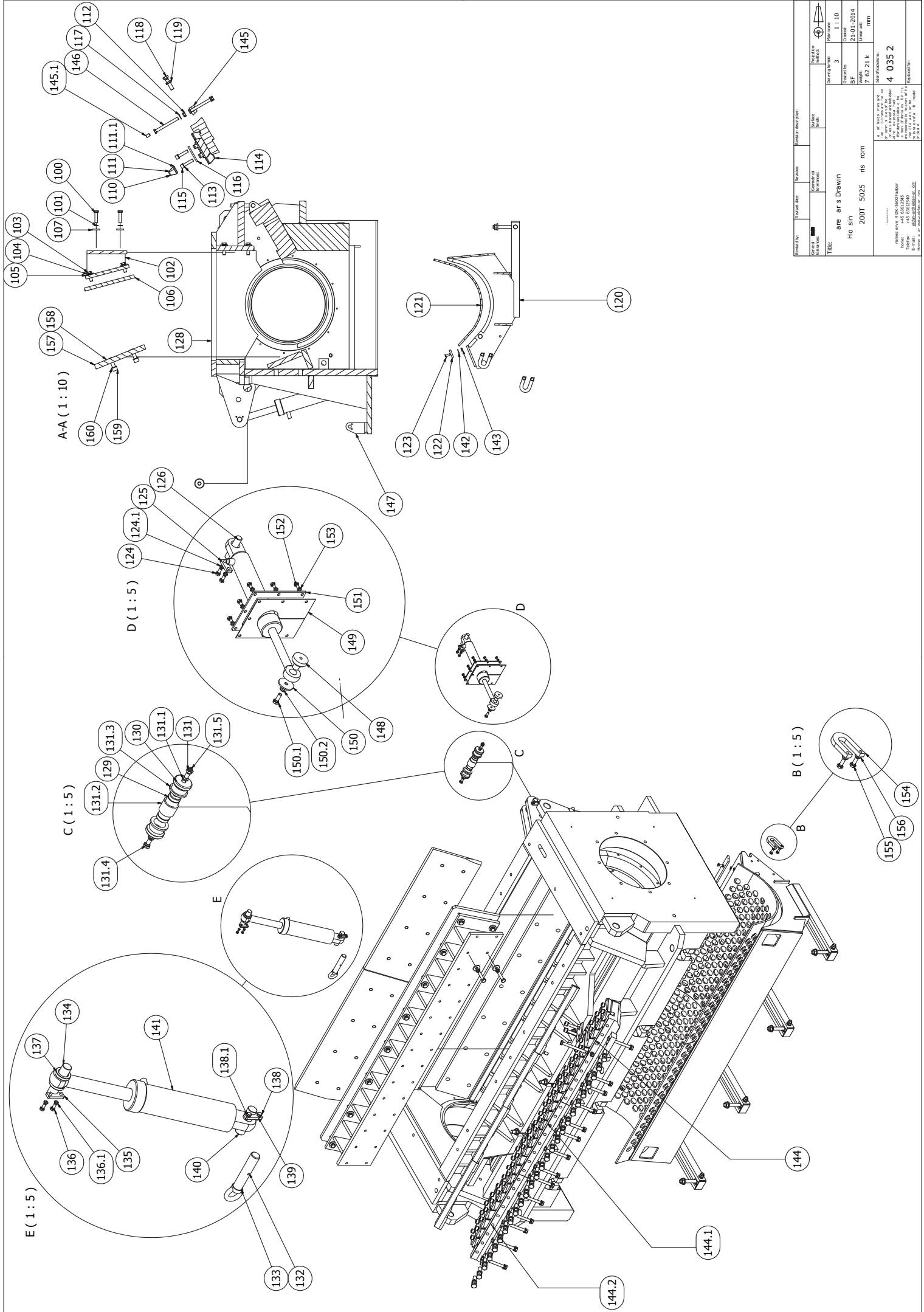
Pos. No.	Item	Description	Quantity	Unit
001	25353	Stand - MPR200	1,00	stk
002	25362	Outlet hopper - MPR200	1,00	stk
003	23042	Safety switch - MPR	1,00	stk
004	1639	Flange nut M24 DIN 6923 8.8 EL-Z	5,00	Stk
005	39588	Eye bolt M24x150	5,00	stk
006	1255	Bolt M20*110 DIN 931 - kv. 8.8 EL-Z	5,00	Stk
007	1455	Disc spring 50/20,4 X 2	40,00	Stk
008	1597	Self-locking nut M20 DIN 985 - kv. 8.8 EL-Z	5,00	Stk
009.1	48218	Inlet hopper for TBF	1,00	stk
010	1116	Set screw M20x40 DIN 933 - 8.8 EL-Z	12,00	Stk
011	1715	Lock washer ø20 - Nordlock	12,00	Stk
013	1269	Bolt M24x100 DIN 931 - kv. 8.8 EL-Z	2,00	Stk
014	14235	Set screw M24x120 DIN 933 - 8.8 EL-Z	2,00	Stk
015	1639	Flange nut M24 DIN 6923 8.8 EL-Z	4,00	Stk
016	1659	Facet washer ø24 DIN 125B EL-Z	2,00	Stk
017	36099	Flywheel guard (right) - MPR120/160/200	1,00	stk
018	1479	Vibration absorber AD4030 black	10,00	Stk
019	1650	Facet washer ø8 DIN 125B EL-Z	14,00	Stk
020	1006	Set screw M8x20 DIN 933 - 8.8 EL-Z	14,00	Stk
021	22208	Shield holder - MPR160	4,00	stk
022	8468	Screw MSP8x30 DIN 916-45H	4,00	Stk
023	36064	Flywheel guard - MPR160	1,00	stk
024	1479	Vibration absorber AD4030 black	10,00	Stk
025	1650	Facet washer ø8 DIN 125B EL-Z	14,00	Stk
026	1006	Set screw M8x20 DIN 933 - 8.8 EL-Z	14,00	Stk
027	22208	Shield holder - MPR160	4,00	stk
028	8468	Screw MSP8x30 DIN 916-45H	4,00	Stk
029	39436	Rotor housing - MPR200	1,00	stk
030	1340	Screw MC10x20 DIN 912 - kv. 8.8	2,00	Stk
031	1653	Facet washer ø10 DIN 125B EL-Z	2,00	Stk
032	39463	Base - MPR200	1,00	stk
033	1306	Eye bolt M20x140 DIN 444B - 4.6 EL-Z	3,00	Stk
034	1637	Flange nut M20 DIN 6923 8.8 EL-Z	3,00	Stk
035	1224	Bolt M16x110 DIN 931 - kv. 8.8 EL-Z	3,00	Stk
036	1448	Disc spring 34/16,3x1,5	24,00	Stk
037	1596	Self-locking nut M16 DIN 985 - kv. 8.8 EL-Z	3,00	Stk
038	1524	Anchor bolt M16x175 MSA-Simplex	8,00	Stk
039	2866	Clamping device	4,00	Stk
040	40975	Vibration absorber (set) - MPR	1,00	stk
041	40975	Vibration absorber (set) - MPR	1,00	stk
043	42198	Electric motor 110 kW SIE 315 8-C B3 pos. L	1,00	stk
044	1269	Bolt M24x100 DIN 931 - kv. 8.8 EL-Z	4,00	Stk
045	1717	Lock washer ø24 - Nordlock	4,00	Stk
046	1699	Steel washer Ø25/60x7 DIN 6340	4,00	Stk
047	1131	Set screw M20* 120 DIN 933 - 8.8 EL-Z	8,00	Stk
048	1614	Lock nut M20 DIN 439B-04 EL-Z	8,00	Stk
049	1272	Bolt M30*100 DIN 931 - kv. 8.8 EL-Z	8,00	Stk
050	1720	Lock washer ø30 - Nordlock	8,00	Stk
051	13131	Steel washer Ø31/68x10 DIN 6340	8,00	Stk
052	33746	Plate for motor console - MPR	2,00	stk
053	42197	Electric motor 110 kW SIE 315 8-C B3 pos. R	1,00	stk
054	1269	Bolt M24x100 DIN 931 - kv. 8.8 EL-Z	4,00	Stk
055	1717	Lock washer ø24 - Nordlock	4,00	Stk
056	1699	Steel washer Ø25/60x7 DIN 6340	4,00	Stk

Pos. No.	Item	Description	Quantity	Unit
057	22293	V-belt pulley SPC 300-10	1,00	stk
058	25555	Split bushing 4545-90	1,00	stk
059	22292	V-belt SPC 5600	10,00	stk
060	22292	V-belt SPC 5600	10,00	stk
061	25555	Split bushing 4545-90	1,00	stk
062	22293	V-belt pulley SPC 300-10	1,00	stk
064	1142	Set screw M24x100 DIN 933 - 8.8 EL-Z	2,00	Stk
064	1266	Bolt M24*90 DIN 931 - kv. 8.8 EL-Z	4,00	Stk
065	1568	Nut M24 DIN 934 - kv. 8.8 EL-Z	4,00	Stk
067	1479	Vibration absorber AD4030 black	2,00	Stk
067.1	1474	Vibration absorber	2,00	Stk
068	1006	Set screw M8x20 DIN 933 - 8.8 EL-Z	8,00	Stk
069	1650	Facet washer ø8 DIN 125B EL-Z	16,00	Stk
070	15611	Water system HR202T	1,00	Stk
071	22953	Vibration absorber AD2015 white	4,00	stk
072	992	Set screw M6x16 DIN 933 - 8.8 EL-Z	6,00	Stk
073	1648	Facet washer ø6 DIN 125B EL-Z	4,00	Stk
075	21200	Fitting for lubricating device	1,00	stk
076	21201	Fitting for lubricating device	1,00	stk
078	34767	Bolt for motor console - MPR	2,00	stk
080	39734	Set of grease nipples - MPR200	1,00	stk
100	1211	Bolt M16x60 DIN 931 - kv. 8.8 EL-Z	30,00	Stk
101	1714	Lock washer ø16 - Nordlock	30,00	Stk
102	25451	Backstop - Console - MPR200	1,00	stk
103	7716	Set screw M16x50 DIN 933 - 8.8 EL-Z	16,00	Stk
104	1714	Lock washer ø16 - Nordlock	16,00	Stk
105	1696	Steel washer Ø17/45x6 DIN 6340	16,00	Stk
106	25454	Wear plate for backstop - MPR200	1,00	stk
107	1696	Steel washer Ø17/45x6 DIN 6340	30,00	Stk
110	31467	Cap I=584, right	1,00	stk
111	31461	Cap I=584, left	1,00	stk
111.1	31460	Cap I=584, center	2,00	stk
112	1596	Self-locking nut M16 DIN 985 - kv. 8.8 EL-Z	15,00	Stk
113	1714	Lock washer ø16 - Nordlock	52,00	Stk
114	2734	Knife HR static marked 10 with slip	26,00	Stk
115	1399	Screw MC16x75 DIN 912 - kv. 12.9	52,00	Stk
116	39679	Fixing plate for static knife	26,00	stk
117	1657	Facet washer ø16 DIN 125B EL-Z	15,00	Stk
118	1126	Set screw M20x80 DIN 933 - 8.8 EL-Z	26,00	Stk
119	1614	Lock nut M20 DIN 439B-04 EL-Z	26,00	Stk
120	34088	Screen holder - MPR200	1,00	stk
122	25514	Wear plate for screenholder - MPR200	1,00	stk
123	2874	Screw MK10x30 DIN 7991 - kv. 10.9	5,00	Stk
124	1006	Set screw M8x20 DIN 933 - 8.8 EL-Z	2,00	Stk
124.1	1705	Lock washer ø8 - Nordlock	2,00	Stk
125	3178	Tab washer 50x20x8 ø10-30	1,00	Stk
126	3259	Spline shaft Ø20x88	1,00	Stk
127	15122	Washer ø51/ø33x14,5	4,00	Stk
128	39524	Upper part - MPR200	1,00	stk
129	39579	Shaft/hinge - Upper part	2,00	stk
130	39580	Washer ø60x12	4,00	stk
131	6542	Screw for grease nipple M12*25	2,00	Stk
131.1	1710	Lock washer ø12 - Nordlock	4,00	Stk
131.2	39582	Slide bearing ø50/40x40 (Bronze)	2,00	stk
121	28167	Screen ø15 set MPR200 Hardox T=10	1,00	sc
131.3	39583	Slide bearing ø50/40x25 (Bronze)	4,00	stk
132	1375	Split pin ø6x60	1,00	Stk
133	39591	Security pin ø30	1,00	stk
134	4211	Spline shaft Ø30*125	2,00	Stk
135	3177	Tab washer 60x20x8 Ø10-40	2,00	Stk

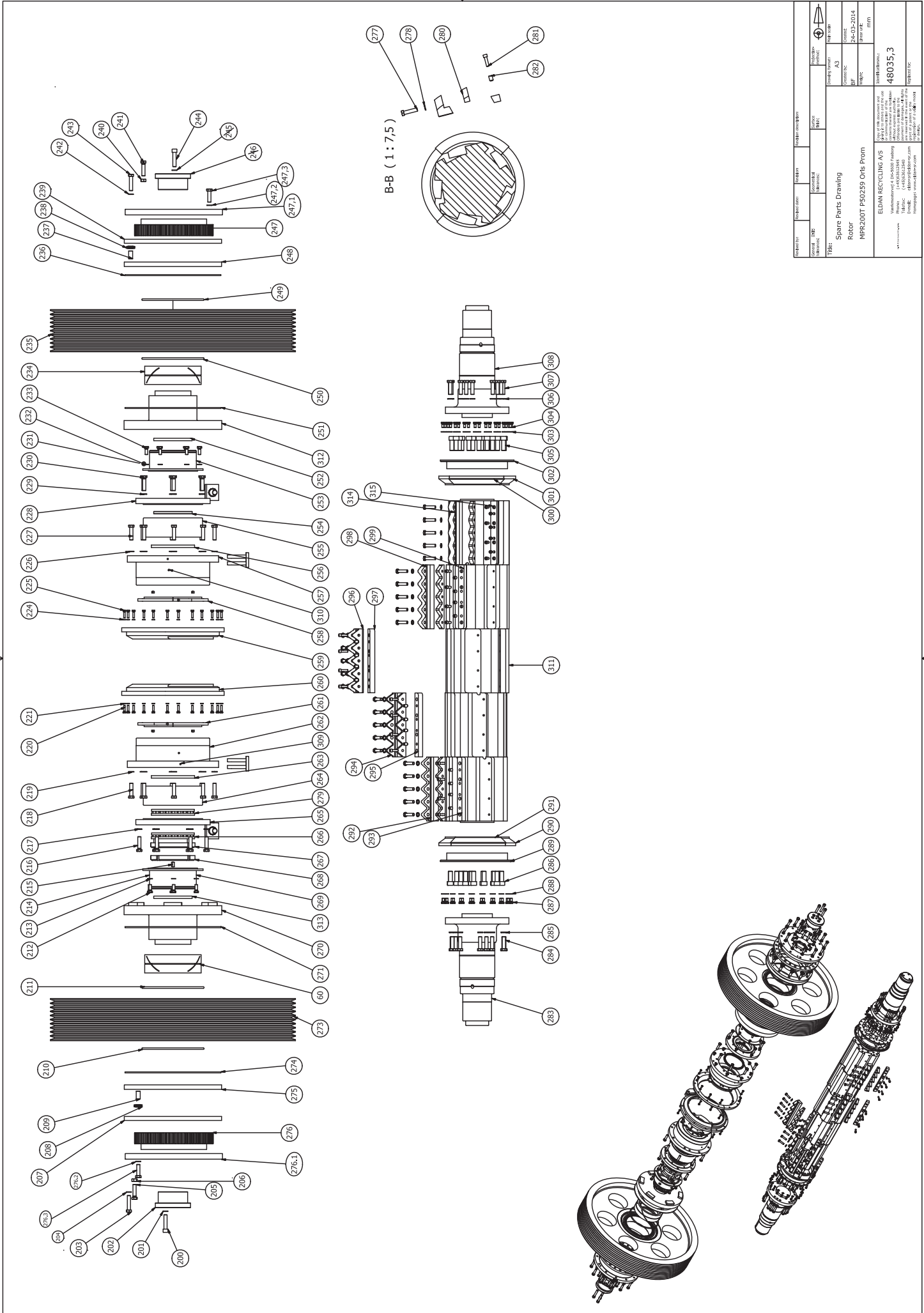
Pos. No.	Item	Description	Quantity	Unit
136	1006	Set screw M8x20 DIN 933 - 8.8 EL-Z	4,00	Stk
136.1	1705	Lock washer ø8 - Nordlock	4,00	Stk
137	39751	Spacing ring	4,00	stk
138	1006	Set screw M8x20 DIN 933 - 8.8 EL-Z	4,00	Stk
138.1	1705	Lock washer ø8 - Nordlock	4,00	Stk
139	3177	Tab washer 60x20x8 Ø10-40	2,00	Stk
140	35011	Shaft with groove ø30*100	2,00	stk
141	26939	Set of hydraulic - HR/HPG/MPR200	1,00	se
142	1653	Facet washer ø10 DIN 125B EL-Z	5,00	Stk
143	1556	Nut M10 DIN 934 - kv. 8.8 EL-Z	5,00	Stk
144	43087	Cassette Right	1,00	stk
144.1	43088	Cassette Center	1,00	stk
145	3250	Wedge clamp for knife holder	5,00	Stk
144,2	43089	Cassette Left	1,00	stk
145.1	1501	Screw MSP16x25 DIN 916 - 45H	10,00	Stk
146	37103	Bolt M16*170 DIN 931 - 10.9 EL-Z	15,00	stk
147	34773	Fitting for cylinder	2,00	stk
148	3392	Tap for Screenholder HR	2,00	Stk
149	11046	Rubber covering	2,00	Stk
151	11041	Fittings	2,00	Stk
152	1003	Set screw M8x15 DIN 933 - 8.8 EL-Z	14,00	Stk
153	1650	Facet washer ø8 DIN 125B EL-Z	14,00	Stk
154	3390	Lock fittings for screen holder	7,00	Stk
155	1037	Set screw M10x30 DIN 933 - 8.8 EL-Z	10,00	Stk
156	1653	Facet washer ø10 DIN 125B EL-Z	10,00	Stk
157	39483	Wear plate, right	1,00	stk
158	39484	Wear plate, left	1,00	stk
159	1404	Screw MC20x65 DIN 912 - kv. 12.9	16,00	Stk
160	1715	Lock washer ø20 - Nordlock	16,00	Stk
200	1410	Screw MC20x100 DIN 912 - kv. 12.9	3,00	Stk
201	1715	Lock washer ø20 - Nordlock	3,00	Stk
202	2630	Lock washer for flywheel	1,00	Stk
203	1244	Bolt M20x90 DIN 931 - kv. 8.8 EL-Z	12,00	Stk
204	1715	Lock washer ø20 - Nordlock	12,00	Stk
205	1122	Set screw M20x70 DIN 933 - 8.8 EL-Z	12,00	Stk
206	1614	Lock nut M20 DIN 439B-04 EL-Z	12,00	Stk
207	29050	Clutch flange	1,00	stk
208	35861	Disc spring 50/25,4x3 DIN 2093	48,00	stk
209	2172	Steering pivot ø25x50	12,00	Stk
210	22611	O-ring Ø10 - NBR SH 70	1,00	stk
210.1	22334	V-ring V-450A	1,00	stk
211	22611	O-ring Ø10 - NBR SH 70	1,00	stk
211.1	22334	V-ring V-450A	1,00	stk
212	1077	Set screw M16x30 DIN 933 - 8.8 EL-Z	6,00	Stk
213	1714	Lock washer ø16 - Nordlock	6,00	Stk
215	1496	Screw MSP12x30 DIN 916 - 45H	2,00	Stk
216	1239	Bolt M20x70 DIN 931 - kv. 8.8 EL-Z	6,00	Stk
217	1715	Lock washer ø20 - Nordlock	6,00	Stk
218	1243	Bolt M20x75 DIN 931 - kv. 8.8 EL-Z	8,00	Stk
219	1715	Lock washer ø20 - Nordlock	8,00	Stk
220	1169	Bolt M10*40 DIN 931 - 8.8 EL-Z	12,00	Stk
066	44592	Lasercut item pl.10 S355JO	1,00	stk
221	1707	Lock washer ø10 - Nordlock	12,00	Stk
224	1707	Lock washer ø10 - Nordlock	12,00	Stk
225	1169	Bolt M10*40 DIN 931 - 8.8 EL-Z	12,00	Stk
226	1715	Lock washer ø20 - Nordlock	8,00	Stk
227	1243	Bolt M20x75 DIN 931 - kv. 8.8 EL-Z	8,00	Stk
228	3094	Flange for adjustment	1,00	Stk
229	1715	Lock washer ø20 - Nordlock	6,00	Stk
230	1239	Bolt M20x70 DIN 931 - kv. 8.8 EL-Z	6,00	Stk

Pos. No.	Item	Description	Quantity	Unit
232	1714	Lock washer \varnothing 16 - Nordlock	6,00	Stk
233	1077	Set screw M16x30 DIN 933 - 8.8 EL-Z	6,00	Stk
234	2987	Slide bearing - flywheel side	1,00	Stk
235	21668	Flywheel \varnothing 1600	1,00	stk
236	6432	Friction facing \varnothing 599+0-1/ \varnothing 501+1-0*6,5	1,00	Stk
237	2172	Steering pivot \varnothing 25x50	12,00	Stk
238	35861	Disc spring 50/25,4x3 DIN 2093	48,00	stk
239	29050	Clutch flange	1,00	stk
240	1614	Lock nut M20 DIN 439B-04 EL-Z	12,00	Stk
241	1122	Set screw M20x70 DIN 933 - 8.8 EL-Z	12,00	Stk
242	1715	Lock washer \varnothing 20 - Nordlock	12,00	Stk
243	1244	Bolt M20x90 DIN 931 - kv. 8.8 EL-Z	12,00	Stk
244	1410	Screw MC20x100 DIN 912 - kv. 12.9	3,00	Stk
245	1715	Lock washer \varnothing 20 - Nordlock	3,00	Stk
246	2630	Lock washer for flywheel	1,00	Stk
247	29019	Hub for clutch	1,00	stk
247,1	29042	Flange for hub	1,00	stk
247,2	1715	Lock washer \varnothing 20 - Nordlock	12,00	Stk
247,3	8264	Bolt M20*70 DIN 931 - kv. 12.9	12,00	Stk
248	29023	Holder for friction lining	1,00	stk
249	22611	O-ring \varnothing 10 - NBR SH 70	1,00	stk
249.1	22334	V-ring V-450A	1,00	stk
250	22611	O-ring \varnothing 10 - NBR SH 70	1,00	stk
250.1	22334	V-ring V-450A	1,00	stk
251	6432	Friction facing \varnothing 599+0-1/ \varnothing 501+1-0*6,5	1,00	Stk
252	602	Rubber sealing ring 210/240x15	1,00	Stk
253	3134	Bearing cap for thrust bearing	1,00	Stk
254	3098	Spacing ring \varnothing 240/220x20	1,00	Stk
255	677	Spherical roller bearing 23144.B.MB.C3	1,00	Stk
256	606	Rubber sealing ring 240/270x15	1,00	Stk
257	3095	Bearing housing	1,00	Stk
258	21608	Wiper - sealing ring - MPR/HR	1,00	se
259	22699	Split wear ring	1,00	stk
260	22699	Split wear ring	1,00	stk
261	21608	Wiper - sealing ring - MPR/HR	1,00	se
262	3095	Bearing housing	1,00	Stk
263	606	Rubber sealing ring 240/270x15	1,00	Stk
264	677	Spherical roller bearing 23144.B.MB.C3	1,00	Stk
265	3094	Flange for adjustment	1,00	Stk
266	700	Thrust ball bearing 51144FP	1,00	Stk
267	2990	Shaft Lock nut	1,00	Stk
268	2989	Shaft Lock nut 2 M12	1,00	Stk
269	3134	Bearing cap for thrust bearing	1,00	Stk
270	22339	Hub plate for flywheel \varnothing 1600	1,00	stk
271	6432	Friction facing \varnothing 599+0-1/ \varnothing 501+1-0*6,5	1,00	Stk
272	2987	Slide bearing - flywheel side	1,00	Stk
273	21668	Flywheel \varnothing 1600	1,00	stk
274	6432	Friction facing \varnothing 599+0-1/ \varnothing 501+1-0*6,5	1,00	Stk
275	29023	Holder for friction lining	1,00	stk
276	29019	Hub for clutch	1,00	stk
276,1	29042	Flange for hub	1,00	stk
276,2	1715	Lock washer \varnothing 20 - Nordlock	12,00	Stk
276,3	8264	Bolt M20*70 DIN 931 - kv. 12.9	12,00	Stk
277	21056	Bolt M16x65 DIN 931 - 12.9	125,00	stk
278	1714	Lock washer \varnothing 16 - Nordlock	125,00	Stk
279	700	Thrust ball bearing 51144FP	1,00	Stk
280	2731	Knife HR flying marked 10 t=25	25,00	Stk
281	1361	Screw MC12x45 DIN 912 - kv. 12.9	100,00	Stk
282	1501	Screw MSP16x25 DIN 916 - 45H	100,00	Stk
283	16551	Axle journal with spline - flywheel side	1,00	Stk

Pos. No.	Item	Description	Quantity	Unit
284	1243	Bolt M20x75 DIN 931 - kv. 8.8 EL-Z	15,00	Stk
285	1715	Lock washer \varnothing 20 - Nordlock	15,00	Stk
286	1412	Screw MC24x65 DIN 912 - kv. 12.9	20,00	Stk
287	20157	Set screw M12*25 DIN 931 - kv.12.9	20,00	stk
288	1710	Lock washer \varnothing 12 - Nordlock	20,00	Stk
289	16555	Ring for wearsegment	1,00	Stk
290	21311	Wearsegment - high with bulb	2,00	stk
291	35533	Wearsegment with 2 cuts	2,00	stk
292	3181	Knife holder HR flying R0	5,00	Stk
293	3253	Wedge HR for flying knife L	5,00	Stk
294	3183	Knife holder HR flying RL	5,00	Stk
295	3253	Wedge HR for flying knife L	5,00	Stk
296	3184	Knife holder HR flying RR+L	5,00	Stk
297	3253	Wedge HR for flying knife L	5,00	Stk
298	3184	Knife holder HR flying RR+L	5,00	Stk
299	3252	Wedge HR for flying knife R	5,00	Stk
300	35533	Wearsegment with 2 cuts	2,00	stk
301	21311	Wearsegment - high with bulb	2,00	stk
302	16555	Ring for wearsegment	1,00	Stk
303	1710	Lock washer \varnothing 12 - Nordlock	20,00	Stk
304	20157	Set screw M12*25 DIN 931 - kv.12.9	20,00	stk
305	1412	Screw MC24x65 DIN 912 - kv. 12.9	20,00	Stk
306	1715	Lock washer \varnothing 20 - Nordlock	15,00	Stk
307	1243	Bolt M20x75 DIN 931 - kv. 8.8 EL-Z	15,00	Stk
308	16551	Axle journal with spline - flywheel side	1,00	Stk
311	46053	Rotor MPR200	1,00	stk
312	21501	Hub plate for flywheel - MPR	1,00	stk
313	602	Rubber sealing ring 210/240x15	1,00	Stk
314	3181	Knife holder HR flying R0	5,00	Stk
315	3252	Wedge HR for flying knife R	5,00	Stk



DRAFTER: CHECKER: APPROVED: DATE:	REVISION: REVISION: REVISION: REVISION:	MODEL IDENTIFICATION: NAME: CODE: PART NO.:	SCALE: 1:10	SHEET NO.: 3	TOTAL SHEETS: 4
FILE: are ar s Drawin Ho sin 200T 5025 ris rom			DATE: 21-01-2014	UNIT: mm	DRAWING NO.: 4 035 2
APPROVED BY: NAME: PHONE: E-MAIL: ADDRESS:					



REP/ART NO:	REVISION:	DATE:	SCALE:	UNIT:	TOP VIEW
24835	001	2014-04-04	1:1	mm	
TITLE:					
Spare Parts Drawing					
Rotor					
MPR200T PSD259 Ors Prom					
DRAWN BY:					
CHECKED BY:					
APPROVED BY:					
MATERIAL:					
PART NO:					
48035_3					
ELDMAN RECYCLING A/S					
Korsbølvej 4, 8260 Ålborg					
Tlf: +45 96 30 30 30					
Fax: +45 96 30 30 31					
E-mail: info@eldman.com					
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10. DISPOSAL OF THE MPR200T

By disposal of the MPR200T there are only a few environmental conditions that should be observed.

The oil should be drained off the hydraulic system before the MPR200T is disposed of.



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ELDAN FINE-GRANULATOR FG1504

Serial number : 49860
Delivery date : October 2010
Customer : TMZ Tyre Recycling Ltd



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1. INTRODUCTION

- 1.1 Congratulations on your purchase of an ELDAN machine. Like many customers who have gone before you, you have just entered into what we hope will be a long and beneficial partnership with us.
- 1.2 To ensure that you get the very best from your machine, we give you this manual which forms an indispensable part of your operation.

Please read it carefully as you will find it contains the necessary information to **install, set, operate** and **maintain** the machine in a safe and efficient manner.
- 1.3 You will notice that we suggest safe operation before efficient operation, not because we don't think the machine is efficient but because we feel it is important for everybody that the machine is operated safely.

To reinforce this you will see in the text the symbol . The section on safety explains what this means, but for the purpose of this introduction, wherever you see  as part of an instruction, it is essential that you carry out the instruction exactly as specified and that you do not attempt to overlook the safety element in any way.

- 1.4 Should you require clarification regarding any of the information or should you wish to purchase further copies of this manual, please contact your ELDAN agent or contact us direct.

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Homepage: www.eldan-recycling.com

2. SAFETY INSTRUCTIONS

The operator shall be fully qualified for operating this type of machine.

Before starting, check that:



All protection devices are placed correctly.



Check conveyors for left tools, screws, bolts, etc.



The operator must be absolutely certain that no service, repair or any other kind of work on the machine is being undertaken before starting the machine.



The machine is to be adjusted according to the directions in the manual.



Check the starting procedure in the manual.

During operation:



In case of stops for maintenance, damage etc. turn off and lock all main switches before working on the machine.



Working on the machine, opening of inspection doors or removing protection screens and safety devices while the machine is operating, is absolutely prohibited and highly dangerous.



Never try to remove jammed material or foreign bodies in the rotor house, etc. until it has been checked that the machine is fully isolated electrically. This means turn off and lock all main switches before working on the machine.



Do not feed objects into the machine, which may cause damage to the machine.



Replacement and mounting of knives, etc. should be carried out in accordance with the instructions in the manual.

Safety during operation:



Oil leaks from hydraulic tubes or pipes may come with such force that the oil may penetrate the skin. In such cases a doctor's help should be sought immediately in order to prevent severe infections.



When the machine is not delivered with special silencing equipment, we recommend that the operators carry earplugs or hearing protectors.



Electrical installations and repairs must only be carried out by authorised personnel.



Ordinary safety rules: The ordinary safety rules of the country in question must always be obeyed.

Personal security when carrying out service:



When replacing the knives etc. the use of safety glasses is necessary because of the danger of splinters when the knives etc. are exposed to strokes and bumps.



Dust masks are necessary when cleaning the machine.



The processing area must be satisfactory illuminated so that there are no dark corners when carrying out service work. The illumination must however not be dazzling. The power must be taken from a separate power supply as the machine must be turned off and locked.



Ordinary safety rules: The ordinary safety rules of the country in question must always be obeyed.

3. MACHINE DESCRIPTION

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3.0 Technical description of the Fine-Granulator FG1504

This machine is a Fine-Granulator ideally suited to the harsh environment of tyre and cable granulation.

The design of the Fine-Granulator pays special attention to the user friendliness of operating the machine, meaning easy opening and replacement/cleaning in few minutes by means of a hydraulic hand pump. Other features include a quick knife change system and the method of screen change has been designed to save time.

To ensure its durability the main housing is fitted with replaceable wear plates and the rotor is manufactured from wear resistant steel. Further it is very easy to exchange the rotor.

Should the rotor and flywheel be stalled by extreme overload, the transmission is protected by a thermal relay placed in the electrical cabinet.

3.1 Definition of input material

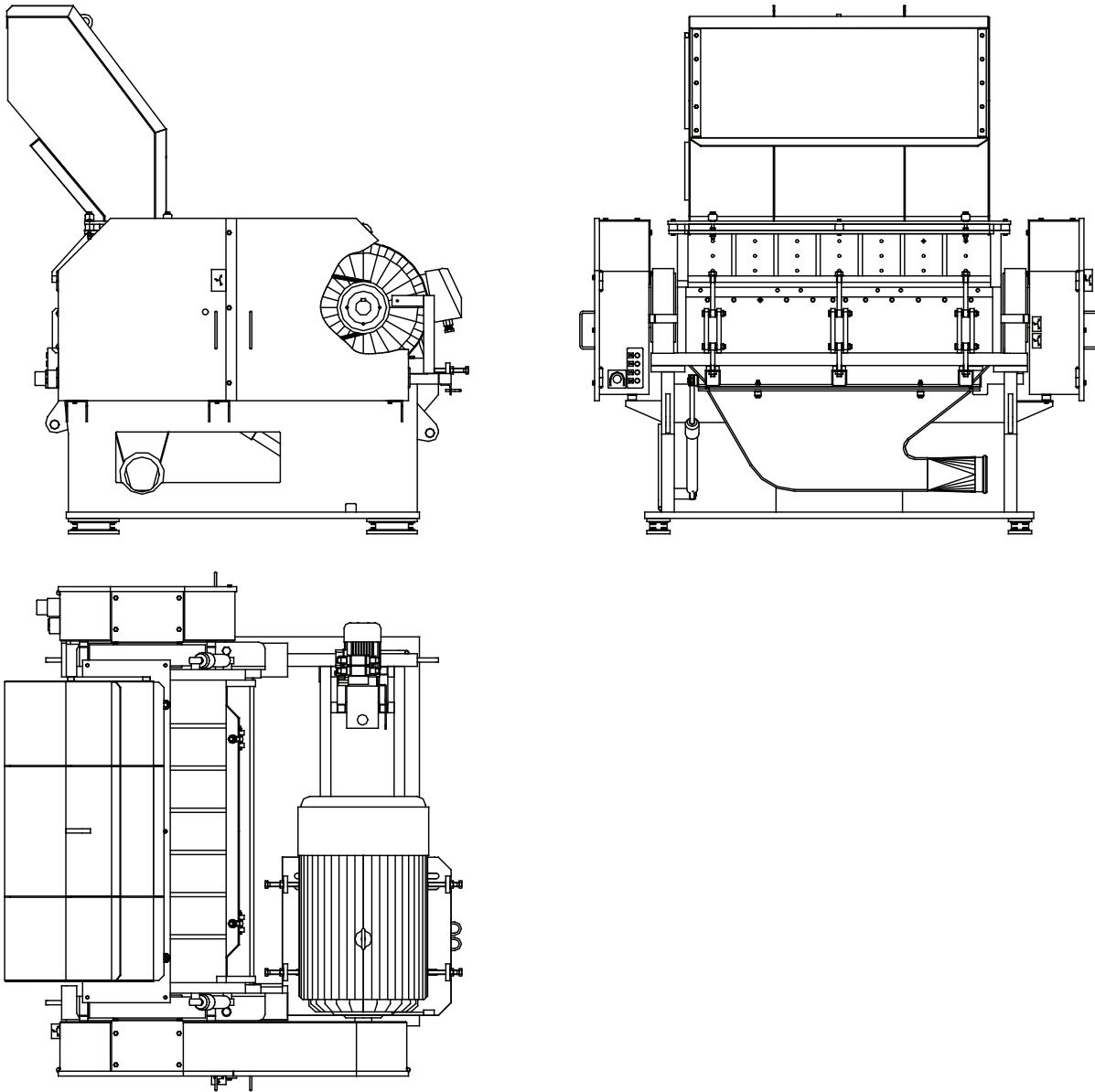
The Fine-Granulator FG1504 has been designed to process rough granulate from for instance a Multi Purpose Rasper. The rough granulate can consist of tyre or cable granulate.

If the machine is used for processing of other types of material than the above-mentioned it will be at the customer's own risk.

3.2 Technical Specification

Rotor length:-	1425 mm
Rotor diameter:-	430 mm
Rotor rpm:-	430 rpm
Cutting speed:-	9,45 m/sec
Number of static knives:-	6
Number of flying knives:-	18
Motor size/revolution:-	110 kW or 132 kW, 4 Pol 50/60 Hz
Number of V-belts:-	8
Weight:-	6750 kg
Total height:-	2565 mm
Total width:-	2460 mm
Total length:-	2416 mm

Figure 1



4. SAFETY EQUIPMENT

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4.0 Introduction

In this section the safety equipment for the Fine-Granulator FG1504 will be described.

It is important that the instructions are followed very carefully to avoid damage to the operator and the machine.

4.1 Main switch

The machine is equipped with a main switch, which can be locked. The main switch disconnects all voltage to the machine and it is placed on the electrical cabinet.

4.2 Emergency stops

The machine is equipped with two emergency stops. One is placed on the machine and one is placed on the electrical cabinet.

The function of the emergency stops is as follows:

- 1) When activated all voltage to the machine is disconnected immediately.
- 2) An emergency stop can only be reset deliberately. This does not mean that the machine starts automatically, but only that it is possible to start the machine again.

4.3 Safety switch

The Fine-Granulator is equipped with a safety system, which protects the operator from the rotating parts of the machine during maintenance work.

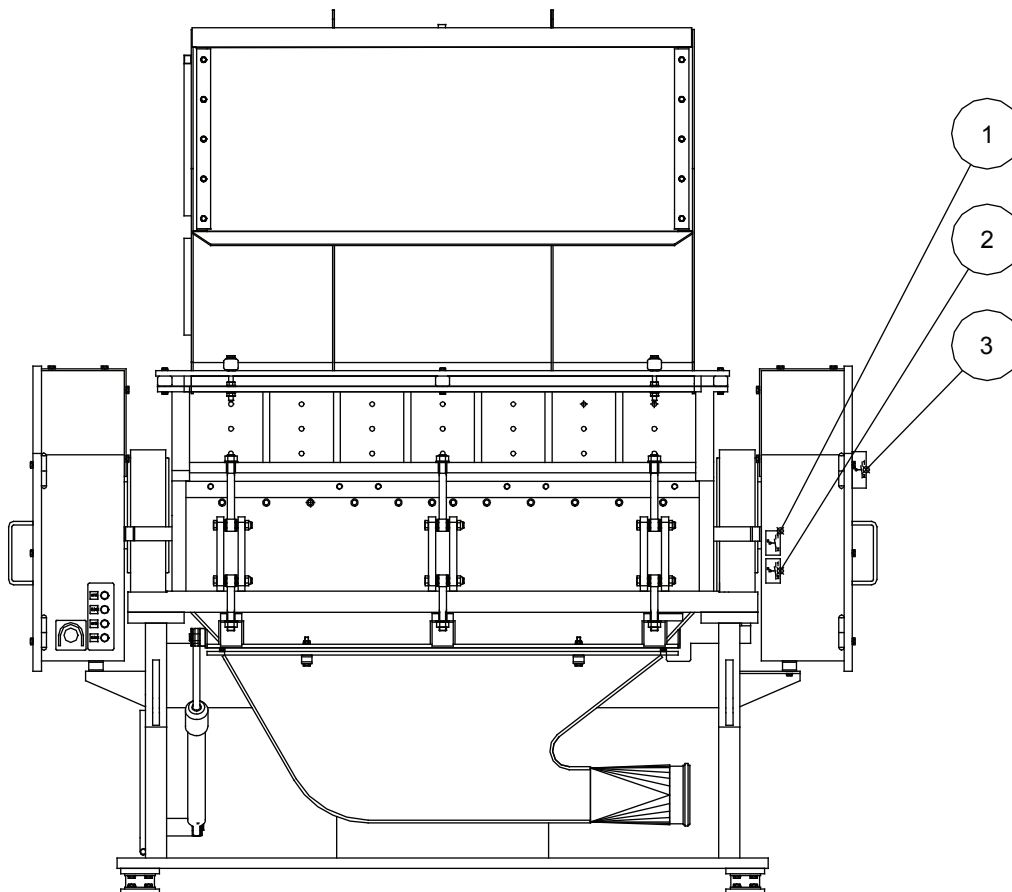
The greatest advantage of the system is that it also protects the operator from the caster, which appears after the machine has been shut down electrically.

The machine is equipped with a number of switches, which should be liberated before hoppers, upper part etc. can be opened.

The safety switch can be opened, when the machine has been brought to a complete stop and the service key on the electrical cabinet is in zero-position.

NB: After stop a certain period of time must pass, before the switches can be liberated.

Figure 2



4.4 Service switch

When operating the machine the switch should be in Position "1".

By repair, maintenance and cleaning the service switch should be set to Position "0" and removed.

The hydraulic pumping unit for opening of upper part with hopper as well as screen can only be operated with the service switch in zero-position.

4.5 Fire Hazard.



Please observe the risk of fire, which is always present when processing inflammable scrap. Please make the necessary precautions to prevent a situation to occur which may cause a fire i.e. secure following:

- that your scrap does not contain explosives or flammable liquids.
- that your equipment is always in an optimal condition.
- that you operate your equipment according to the written or verbal instructions.
- that you use skilled and experienced labour.
- that your facilities are clean and tidy.
- that you have taken all possible measures of fire-extinguishing.
- that you have involved the advisory support of the Fire-department in this process.

Eldan Recycling A/S rejects any responsibility for fires, which occur in connection with the process.

5. INSTALLATION

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5.4	Dimensions and clearance needed for service and maintenance	16
5.5	Power and service details and requirements	16
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5.0 Introduction

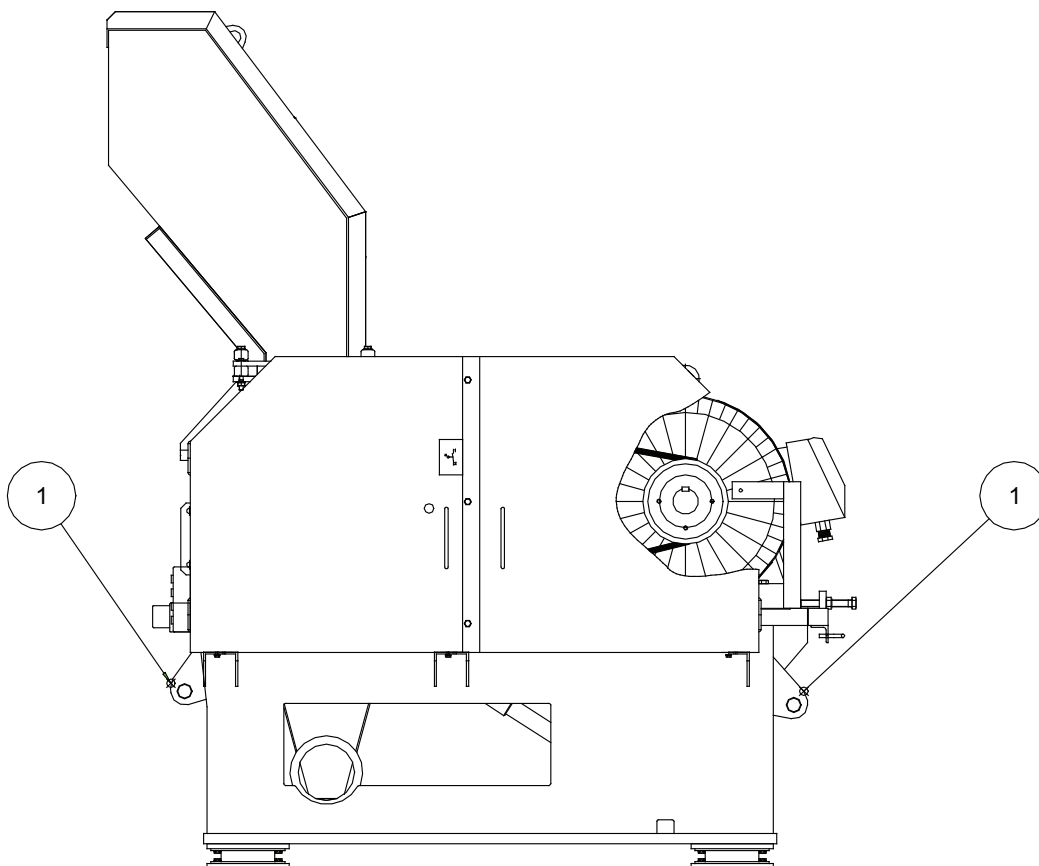
Within this section we have set out the necessary information to ensure the safe and correct method of installing the machine. Set out below are the instructions and guide lines to describe how the operation should be undertaken.

5.1 Lifting points

The machine shall be lifted/transported by means of a crane. On the main machine there are mounted 4 lifting hooks for this purpose, Figure 3 - Pos. 1.

If you are in any doubt regarding safe lifting, seek advice from a specialist lifting company.

Figure 3



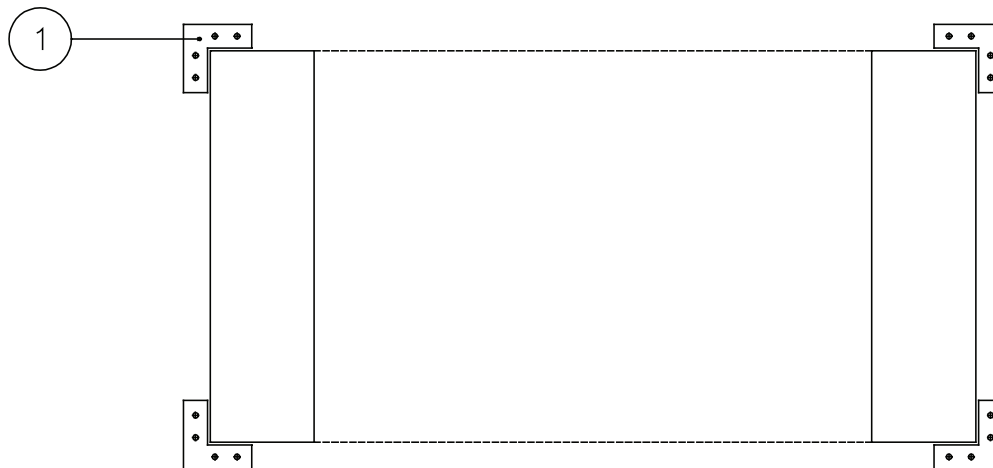
5.2 Gravity and weight statements

The gravity point of this machine is approx. 1,3 meters from the ground and it weighs approx. 6750 kg.

5.3 Recommended floor fixing methods

The machine is retained to its position by means of angle bars, Pos. 1, as shown on Figure 4.

Figure 4



5.4 Dimensions and clearance needed for service and maintenance

To be able to carry out service and maintenance work on the machine in a safe manner a clearance of min. 1 meter around the machine is required.

5.5 Power and service details and requirements

By mounting, repair, maintenance as well as for lightening a separate power supply will be required as the machine should be disconnected and locked when this kind of work is undertaken.

5.6 Test before starting

Before the machine starts operating, it is necessary to inspect the motor to ensure it is rotating in the right direction. This is indicated by a painted arrow on

the motor cover. If the direction of rotation is not correct, it should be altered by authorised personnel.



Remember that the main switch must be disconnected and locked, before any work is carried out.

5.7 Foundations

Under the machine a certain depth of reinforced concrete is necessary to avoid vibration damages etc.

Under this machine it is necessary to cast a foundation of reinforced concrete in depth of 200 mm. The foundation needs a supporting surface of compacted sand basis.

6. SETTING THE FINE-GRANULATOR FG1504

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6.0 Introduction

Within this section we have set out the setting instructions for the machine.

To enable you to get the best from your ELDAN machine it is essential that it is set correctly.

Correct setting will make operation easier and will minimise maintenance. Incorrect setting will cause unnecessary break-down and frustration over product quality.

We therefore strongly recommend that setting becomes part of your operational procedure.

6.1 Safety information

Before the operator begins greasing/maintenance work on the machine the following precautions should be followed:



By greasing and maintenance of the machine, the machine should be brought to a complete stop and the main switches disconnected and locked.



After the machine has been stopped there is a caster time of approx. 1-2 minutes. Do not touch rotor, flywheel etc. before these have stopped completely. Maintenance and repair etc. must not be carried out before the rotating parts of the machine have stopped completely.



When opening/closing the machine absolutely nobody, but the operator must be in or near the machine.



Use gloves for hand protection by maintenance work etc. The machine can be very hot after continues operation.



When replacing the knives etc. the use of safety glasses is necessary because of the danger of splinters when the knives etc. are exposed to strokes and bumps.



When cleaning the machine it is necessary to use dust masks.

When the operator has finished the greasing/maintenance work on the machine the following precautions should be followed:



Before connecting the main current, check that nobody is working on the machine.



Before starting the machine check that all protection devices works and are correctly adjusted.



Before starting the motor, check that the motor rotates in the right direction. This is indicated with an arrow on the motor cover. If the direction of rotation is to be altered this must only be carried out by authorised personnel.



Before starting the machine check that no persons or foreign bodies are inside the rotor housing or on the inlet conveyor (or any other kind of feeding device).

6.2 Opening the hopper and upper part

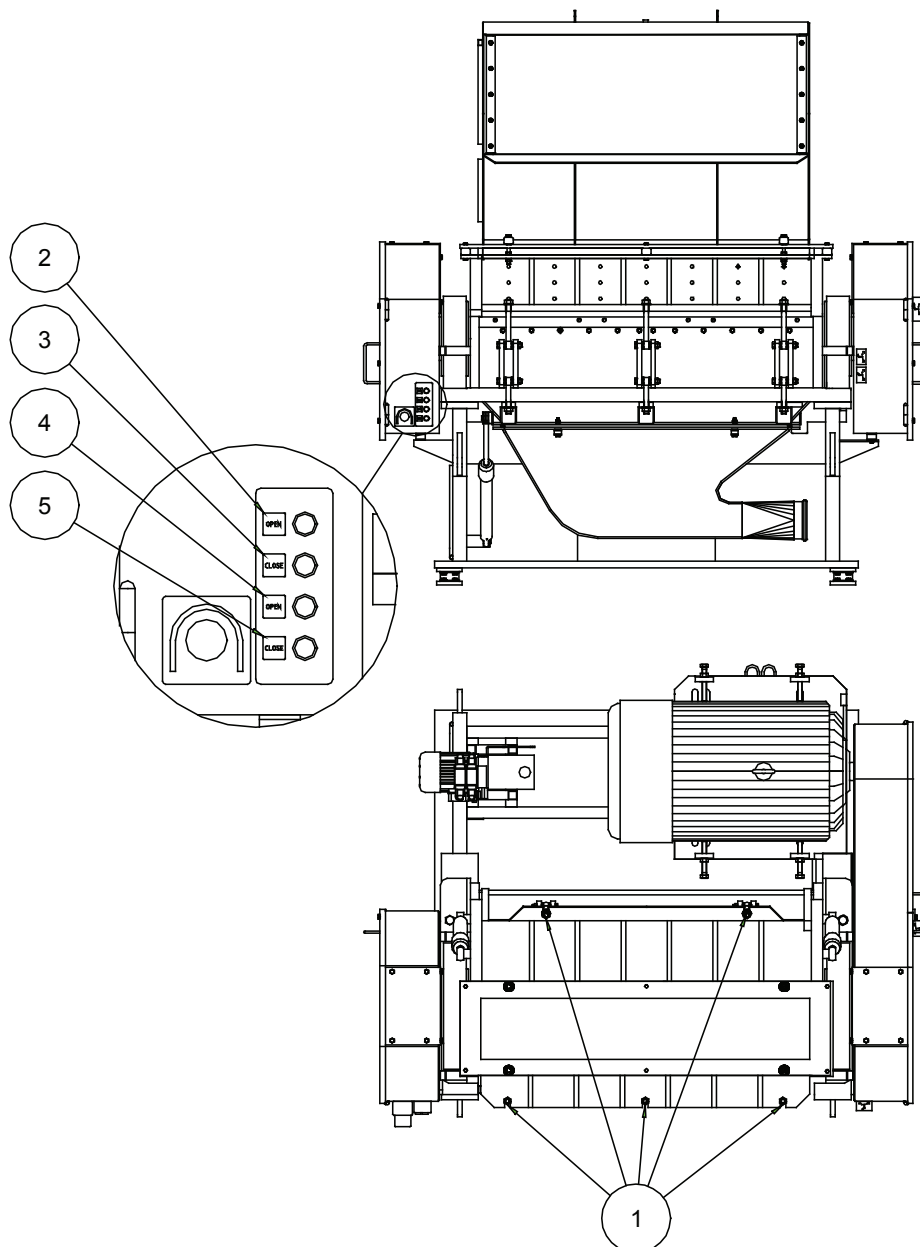


When opening/closing the machine the operator must be absolutely sure that nobody is on or near the machine.



It is dangerous to climb on machinery. For this operation a platform or stepladder should be used.

Figure 5



1. Turn the service switch on the operating panel to SERVICE MODE by using the key on the operating panel.
2. Release the safety switches for the upper part with inlet hopper and screen with discharge hopper.
3. Undo the 5 eyebolts, Figure 5 - Pos. 1, by means of the 30-mm special spanner.

4. Start the hydraulic pump on the operating panel.
5. The upper part with inlet hopper can now be opened by pressing the button “UPPER PART – OPEN”, Figure 5 - Pos. 2.
6. Secure the top part and hopper against unintended closing by inserting the lock pin placed on the hinged side of the housing.
7. Stop the hydraulic pump on the operating panel.
8. Disconnect the main current by maintenance work, repair etc.
9. Lock the main switch during maintenance work, repair etc.

6.3 Setting up platform

A service platform will not be required for this machine.

6.4 Cleaning the Fine-Granulator and the surrounding areas

To enable the easy retrieval of washers and small bolts and to ensure absolute cleanliness when refitting the knives, we recommend that the Granulator housing and rotor, together with the floor around the Granulator are cleaned properly.

6.5 Setting plan for Fine-Granulator FG1504

When considering the setting of the Fine-Granulator FG1504, the normal setting is with regard to the knives and involves either replacing the knives or setting the clearance between flying knives and static knives.

Set out below is the order in which these operations should be undertaken. The remainder of this section sets out the explanation as to how each operation should be undertaken.



The main switch must be turned off and locked

SETTING PLAN



When setting the Granulator it is essential to use gloves for hand protection.

Setting of knife clearance

1. Release the safety switch for upper part with inlet hopper, screen and discharge hopper.
2. Opening the upper part with inlet hopper as well as screen and discharge hopper
3. Set the knife clearance
4. Recheck all bolts
5. Closing the upper part with inlet hopper as well as screen and discharge hopper
6. Reconnect the safety switch for upper part with inlet hopper, screen and discharge hopper.
7. Sweep or vac the floor



Knife replacement means that all knives need to be replaced

Exchange of knives

1. Release the safety switch for upper part with inlet hopper, screen and discharge hopper.
2. Opening of the upper part with inlet hopper as well as screen and discharge hopper.
3. Remove clamping strip and static knives
4. Remove clamping strip and flying knives
5. Clean all knife seats
6. Clean and check all clamping strips
7. Adjust the flying knives in the gauge
8. Mount flying and static knives
9. Tighten all bolts slightly
10. Set the knife clearance
11. Tighten all bolts
12. Turn the rotor by hand
13. Close the upper part with inlet hopper as well as screen and discharge hopper

14. Reconnect the safety switch for upper part with inlet hopper, screen and discharge hopper.
15. Sweep or vac the floor.

6.6 Remove the static knives

From Figure 6 it can be seen that the static knives are mounted onto the two knife holders Pos. 1.

The following instructions explain the whole procedure and explain what steps should be taken.

- 1) Loosen the counter nuts, Figure 6 - Pos. 2, for the adjusting bolts, Figure 6 - Pos. 3, using a 30-mm spanner and wind the bolts 2 turns counter-clockwise.
- 2) Undo the knife bolts, Figure 6 - Pos. 4, using a 17-mm Allen key. Remove the washers, Figure 6 - Pos. 5, the clamping strips, Figure 6 - Pos. 6, and the knives, Figure 6 - Pos. 7.

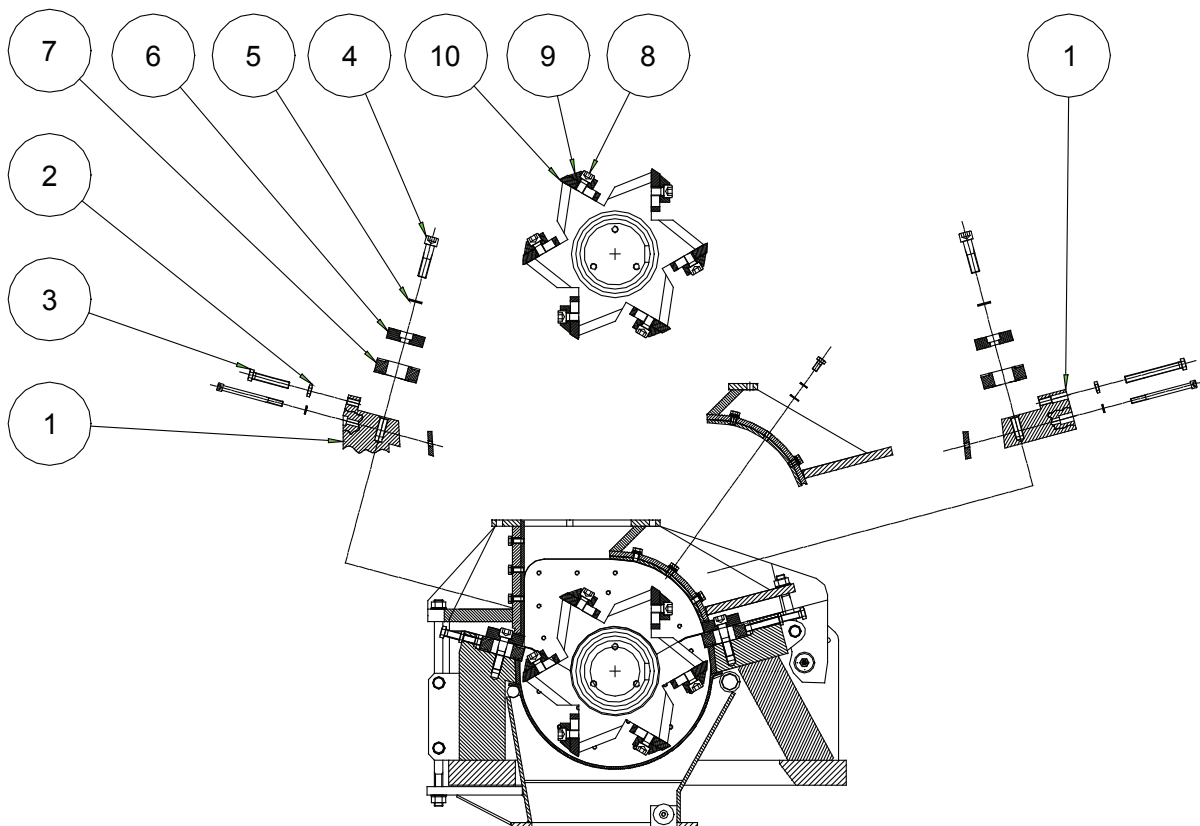


Figure 6

6.7 Remove the flying knives

From Figure 6 it can be seen that the flying knives are mounted directly onto the rotor.

The following instructions explain the whole procedure and what steps should be taken:

1. Remove the knife bolts, Figure 6 - Pos. 8, by using a 17-mm Allen key.
2. Remove the clamping strips, Figure 6 - Pos. 9, and the knife, Figure 6 - Pos. 10.



When exchanging the knives it is important that the diametrically opposite knives are exchanged at the same time to avoid any unbalance in the rotor.

6.8 Mounting of static knives

The static knives have 4 cutting edges allowing the knives to be turned 4 times before sharpening is required. The knives are installed in the lower part of the Granulator, Figure 6 - Pos. 7.

Each knife is fastened with a clamping strip and 4 Allen bolts MC20 x 80.

The cutting edge of the knives is oblique which means that the cutting edge of the knives falls towards the middle. Note that the knife in front, Figure 7 - Pos. 1, has the cutting edge above and the knife at the back, Figure 7 - Pos. 2, has the cutting edge below.

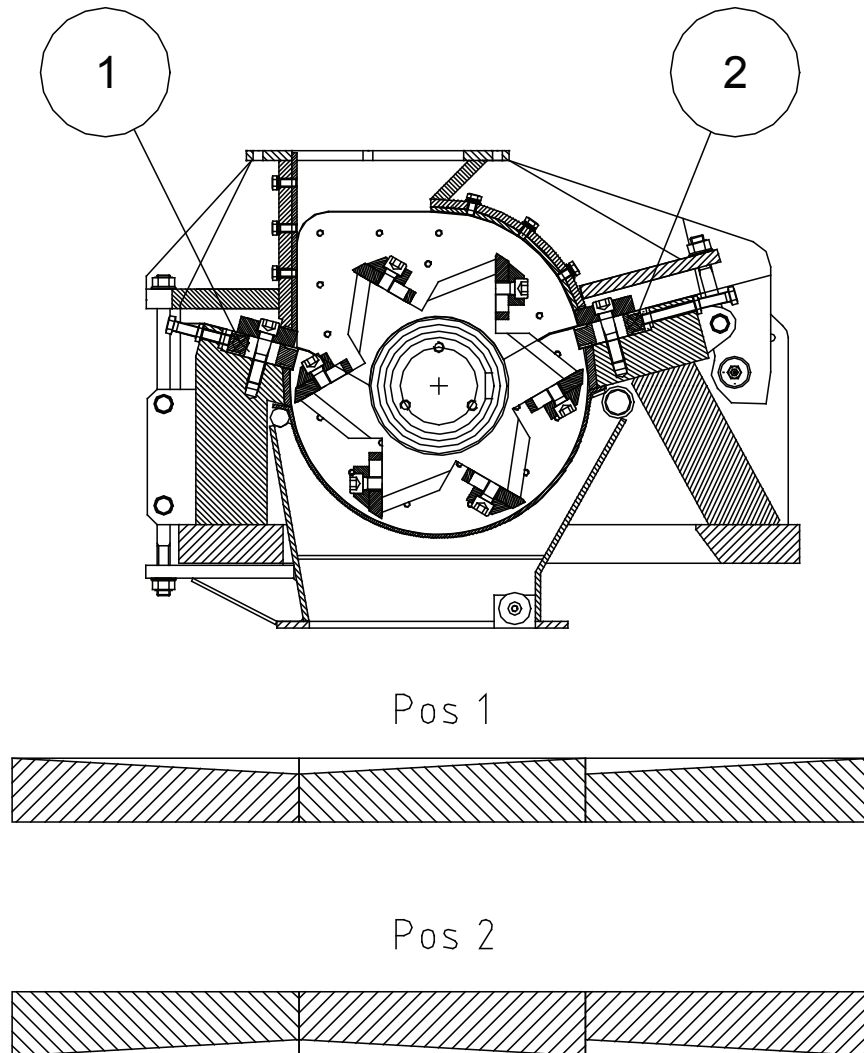


Figure 7

Figure 7 - Pos. 1 Knife in front seen from the rotor housing

Figure 7 - Pos. 2 Knife in the back seen from the rotor housing

The knives must be in a straight line and the knife bolts must be slightly tightened.

6.9 Mounting of flying knives and adjustment of the distance between static and flying knives

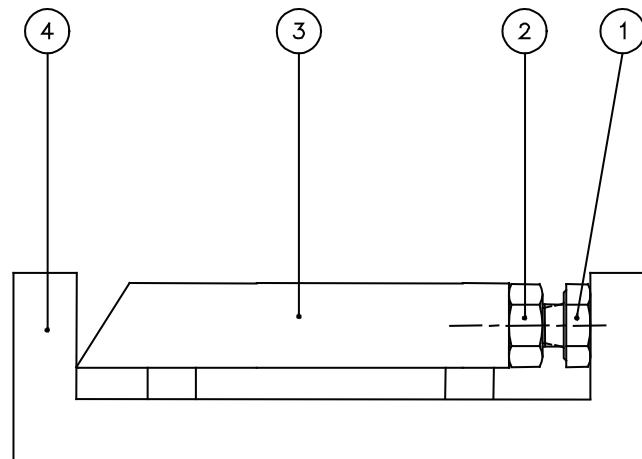


Figure 8

1. Mount the adjusting screw and counter nut, Figure 8 - Pos. 1 & 2, in the knife, Figure 8 - Pos. 3, 2 per knife.
2. Set the adjusting screws using the special setting gauge, Figure 8 - Pos. 4.
3. Place the knife in the gauge as shown on Figure 8. Use two 17-mm spanners for adjustment.
4. When the cutting edge of the knife touches the long side of the gauge, the adjusting bolts, Figure 8 - Pos. 1, are turned back until they slightly touch the opposite side in the gauge. The bolts are kept in position using a 17-mm spanner, while the counter nut is tightened.
The knife is correctly adjusted when it is a little tight to lift out of the gauge.
5. Clean all knife locations before attempting to mount the knife. It is essential that the location slot in the rotor is completely clean to ensure that the knife sits 100% firmly on the bottom of the slot.
6. Place the knives in the rotor in such a way that the heads of the bolts Figure 9 - Pos. 1, just touch the fixing points, Figure 9 - Pos. 2.

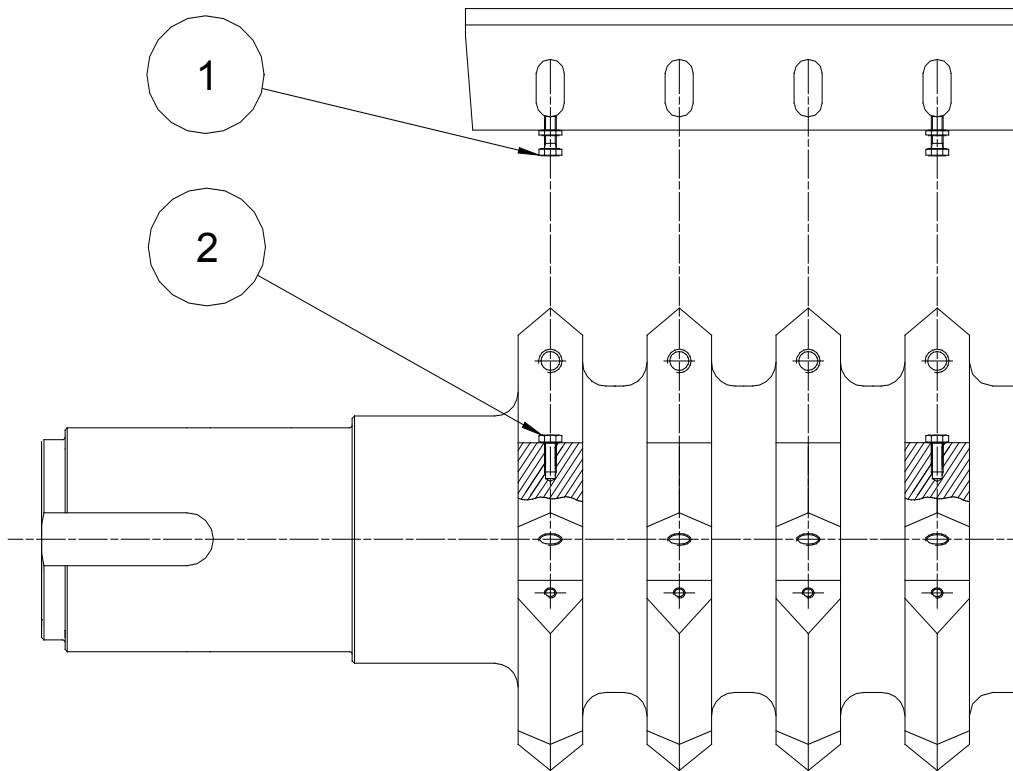


Figure 9

7. Place the clamping strip against the knife. Insert the washers and bolts and tighten sufficiently to keep the knife in place. Insert the knife diametrically opposite to keep the rotor in balance.
8. When all knives have been mounted, tighten to a torque of 400 Nm using a torque wrench.
9. The static knives are adjusted singly against the flying knives by means of the adjusting screw, Figure 6 - Pos. 3. The distance between the static and flying knives must be 0,2 mm. When all static knives have been adjusted, the bolts are tightened to a torque of 400 Nm.



Regular control of correct knife clearance, condition of the knives together with control of the position of the adjusting screws may prevent damage to knives and rotor.

6.10 Checking

Before attempting to reassemble the Granulator 3 checks should be made:

- 1) The rotor should be turned **by hand** to ensure that it turns freely without any knives touching each other.
- 2) All of the bolts should be rechecked to ensure that they are tightened correctly.
- 3) **All bolts should be retightened after every 50 operational hours.**

6.11 Closing the hopper with upper part



When opening/closing the machine absolutely nobody, but the operator must be in or near the upper part, rotor housing and movable parts.

Clean all closing parts of the upper part and lower part of the Granulator housing before closing the Granulator.

- 1) Connect the main current
- 2) Start the hydraulic pump on the operating panel.
- 3) The safety pin Ø16 is removed and the hopper can be closed by pressing the button “UPPER PART – CLOSE”.
- 4) Stop the hydraulic pump.
- 5) When the upper part has been closed, the 5 eyebolts in their clamp fittings are tightened with a 30 mm key.
- 6) Lock the safety switch for the upper part and inlet hopper.
- 7) Turn the service switch back to OPERATING MODE.

6.12 Opening the discharge hopper and dismantling the screen

- 1) Turn the service switch on the operating panel to SEVICE MODE by using the key on the operating panel.
- 2) Release the safety switch for upper part with inlet hopper, screen and discharge hopper..
- 3) Release the eyebolt, Figure 10– Pos. 1, by using a 30-mm special spanner.
- 4) Start the hydraulic pump on the operating panel.
- 5) By pressing the button “SCREEN – OPEN”, the hopper is swung down.

- 6) Stop the hydraulic pump.
- 7) Disconnect the main current by maintenance work, repair etc.
- 8) The screen, which is still connected to the discharge hopper, can now be taken out and removed.

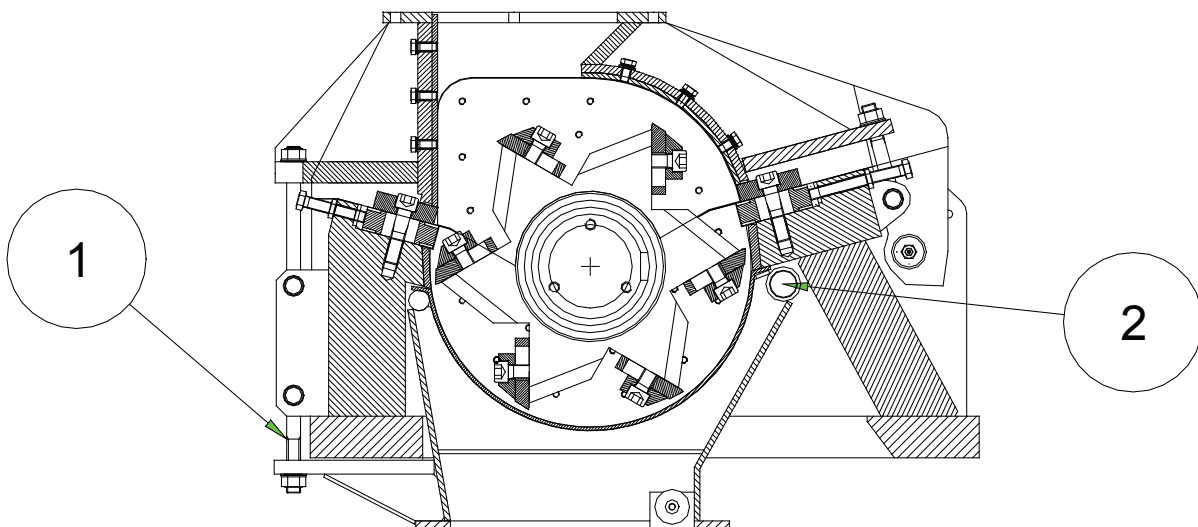


Figure 10

6.13 Mounting of the screen and closing the discharge hopper



The screen and discharge hopper support must be carefully cleaned before the screen plate and discharge hopper are installed.

- 1) Place the screen plate in the screen holder.
- 2) Connect the main current.
- 3) Start the hydraulic pump on the operating panel.
- 4) Press the button “SCREEN – CLOSE” to lift the discharge hopper and place the eyebolts in the fitting clamps. The eyebolts can now be tightened until the discharge hopper is completely closed.
- 5) Stop the hydraulic pump on the operating panel.
- 6) Reconnect the safety switch.
- 7) Turn the service switch back to OPERATING MODE.

6.14 Torque

Description	Type	Quality	Torque Nm
Bolts/flying knives	MC20x70	12.9	400
Bolts/static knives	MC20x80	12.9	400

To ensure accurate setting the following conditions should be met:

1. The bolts must be untreated.
2. The bolts must be greased with cu-grease or similar.

Never dip the bolts in oil, as this will create a risk that the torque settings may be greater than intended thus exposing the bolts to too great tension.

It is very important that the above is respected, because it may otherwise cause damage to the knives and other vital parts.

7. OPERATION

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7.0 Introduction

To enable you to get the best from your ELDAN machine it is essential that it is operated correctly.

Therefore the operational manual tells you about start and stop procedures, the function and operation of the control desk.

7.1 Safety statements



Before starting the machine, check that all protection devices work and are correctly mounted.



When lifting/transporting the machine, use the lifting hooks placed on the machine.



Before starting the machine check that no persons or foreign bodies are inside the rotor housing or on the inlet conveyor (or any other kind of feeding device)



When opening/closing the machine absolutely nobody, but the operator must be in or near the upper part, the rotor housing and other movable parts.



When starting the machine, check that no persons or foreign bodies are inside the rotor housing or on the inlet conveyor (or any other kind of feeding device)



In emergency situations use the emergency stops.



Oil leaks from hydraulic tubes or pipes may come with such a force that the oil may penetrate the skin.



Attention: after the machine has been stopped there is a caster time of approx. 1-2 minutes. Do not touch rotor, flywheel etc. before these are completely stopped. Maintenance work, repair etc. must not be carried out before the rotating parts of the machine have stopped completely.



It is absolutely prohibited and highly dangerous to open the machine before it has been brought to a complete stop.



It is absolutely prohibited for unauthorised personnel to work with current-carrying wires even though the main switch has been disconnected and locked.



Disconnect the main current by maintenance work, repair etc.



Lock the main switch by maintenance work, repair etc.



Before connecting the main current, check that nobody is working on the machine.



Before starting the motor, check that the motor rotates in the correct direction. This is indicated with an arrow on the motor cover. The motor will be destroyed if the direction of rotation is not correct.



It is recommended to use gloves for hand protection by maintenance work etc. The machine can be very hot after continuous operation.



It is recommended to use earplugs or hearing protectors to avoid damage of the hearing.



Check that the alarm signals always work.



There is danger of explosion and fire if the electrical cabinet is not kept free of dust.



When replacing the knives the use of safety glasses is necessary because of the danger of splinters when the knives are exposed to strokes and bumps.



When cleaning the machine it is necessary to use dust masks.

7.2 Operational procedure

With regard to information in connection with the operational procedure, please see the separate operational manual.

7.3 Useful information regarding the process

Selection of screen

The selection of screens depends on the size of the fractions required as output for the concerned machine or the required input for the subsequent machine.

In general the choice of screens will depend on:

1. Start product
2. Use of end-product
3. Capacity Kg/H
4. Purity of the granulate
5. Size of the fractions

Larger fractions

The larger screen, the more capacity.

The knives have to be set if:

- The use of ampere is rising, but the material flow is the same.
- The conveyors are constantly stopping (operational manual)
- The granulate is not cut through but "grated".
- The capacity is degressive

It is recommended to adjust the knives after 8 hours of operation and then as required.

Subsequent the knives should be adjusted as described above and in "Maintenance Directions".

7.4 Safety information with regard to emergency stops

What happens when an emergency stop is activated:

When an emergency stop is activated, the main current will be disconnected and the machine and inlet/outlet transport are stopped. Emergency stop, Figure 11- Pos. 1.

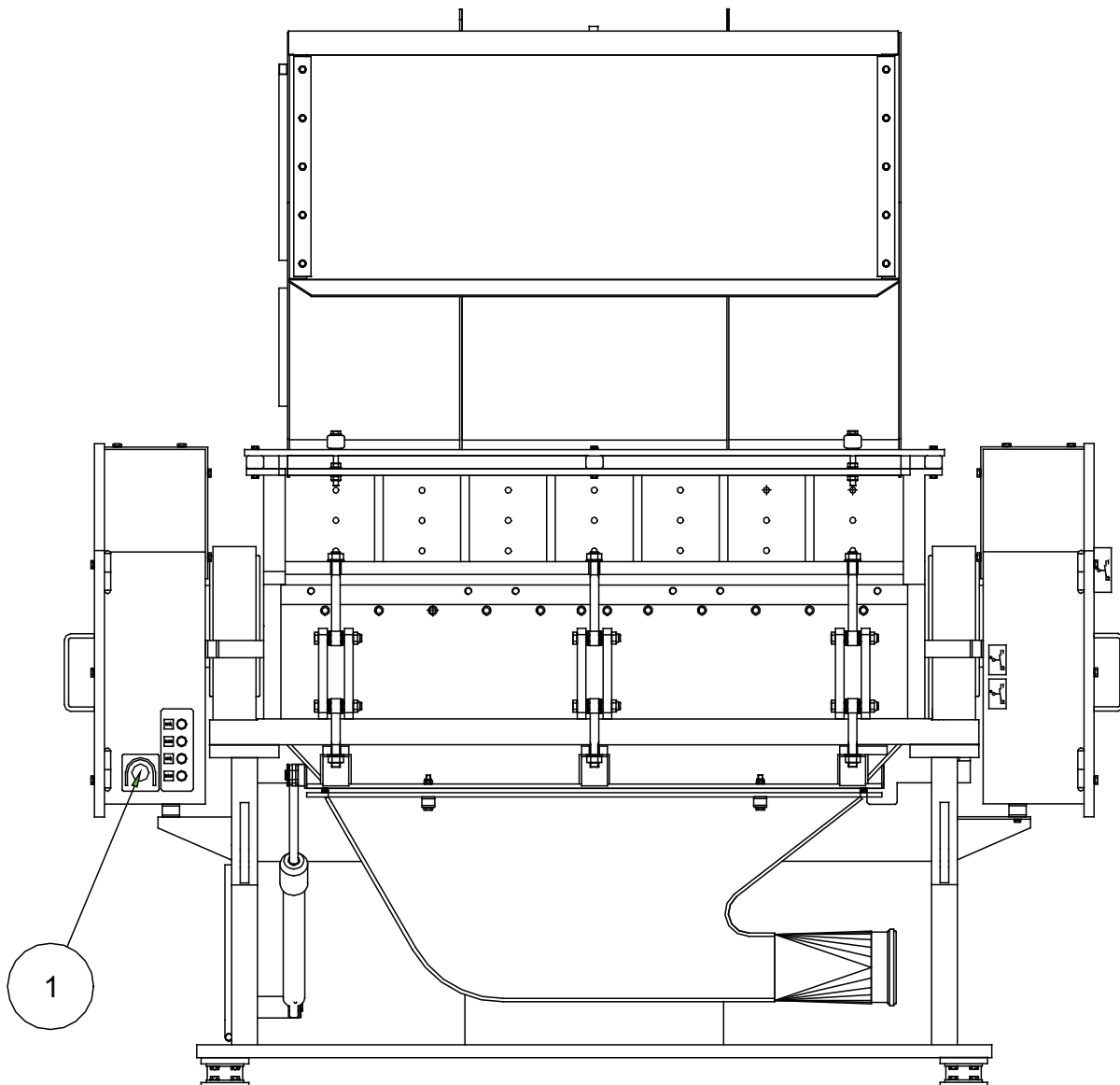


Figure 11

8. MAINTENANCE

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8.3	Adjustment of v-belts.....	44
8.4	Grinding of knives	45

8.0 Introduction

Before the operator begins greasing/maintenance work on the machine the following precautions should be followed:



By greasing and maintenance of the machine, it must be brought to a complete stop and the main switches disconnected and locked.



After the machine has been stopped there is a caster time of approx. 1-2 minutes. Do not touch rotor, flywheel etc. before these are completely stopped. Maintenance and repair etc. must not be carried out before the rotating parts of the machine have stopped completely.



When opening/closing the machine absolutely nobody, but the operator must be near the machine.



Use gloves for hand protection by maintenance work etc. The machine can be very hot after continuous operation.



When replacing the knives the use of safety glasses is necessary because of the danger of splinters when the knives are exposed to strokes and bumps.



When cleaning the machine it is necessary to use dust masks.

When the operator has finished the greasing/maintenance work on the machine the following precautions should be followed:



Before connecting the main current, check that nobody is working on the machine.



Before starting the machine check that all protection devices work and are correctly adjusted.



Before starting the motor, check that the motor rotates in the right direction. This is indicated with an arrow on the motor cover. The motor will be destroyed if the direction of rotation is not correct. The direction of rotation must only be altered by authorised personnel.



Before starting the machine check that no persons or foreign bodies are inside the rotor housing or on the inlet conveyor (or any other kind of feeding device).

8.1 Maintenance directions

The below description should only be regarded as a guide line, because the values will depend on the specific type of input material such as steel content, size of the input material and method of feeding etc.

ELDAN recommend:

- Tightening of knife bolts at a regular basis.
- Clean the screen and the rotor housing for steel wire at a regular basis
- Adjustment of knives
 - 1) the first time after approx. 8 processing hoursand
 - 2) then as required

The adjustment of knives is very important, because the bigger the clearance between the knives is the higher the heat development. If the distance between the knives gets too big the material will be grated instead of cut.

Adjustment/change of knives and cleaning of the machine is therefore very important.

8.2 Lubrication scheme summary

<u>Machine</u>	<u>Job</u>	<u>Interval</u>	<u>Quantity</u>	<u>Product/type</u>
Fine-Granulator FG1504				
Hinges	F	500 h	5 g/each	Shell Albida Grease EP2
Main bearings	F	500 h	50 g/each	Shell Albida Grease EP2
Hydraulic system	O	*	2 L	Shell Tellus T46
Motors:				
With grease nipple	F	600 h	5 g/each	Shell Albida Grease EP2

* To be refilled as required/exchanged at least once a year.

Job code: F = Grease O = oil

Interval code: H = hours

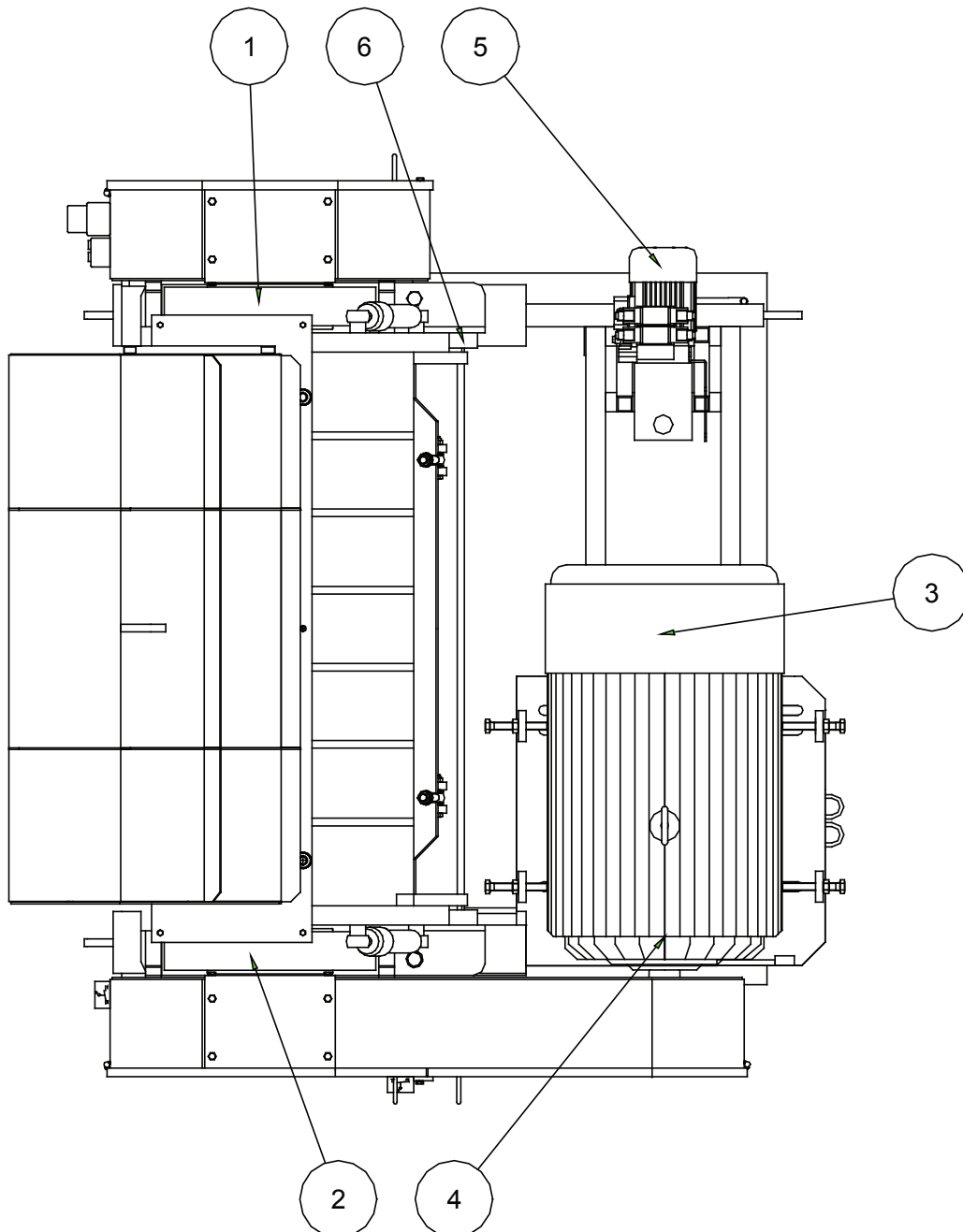
Quantity code: L = litres

Quantity code: g = grams

SHELL's products are recommended - otherwise a similar product.

Greasing/oil filling

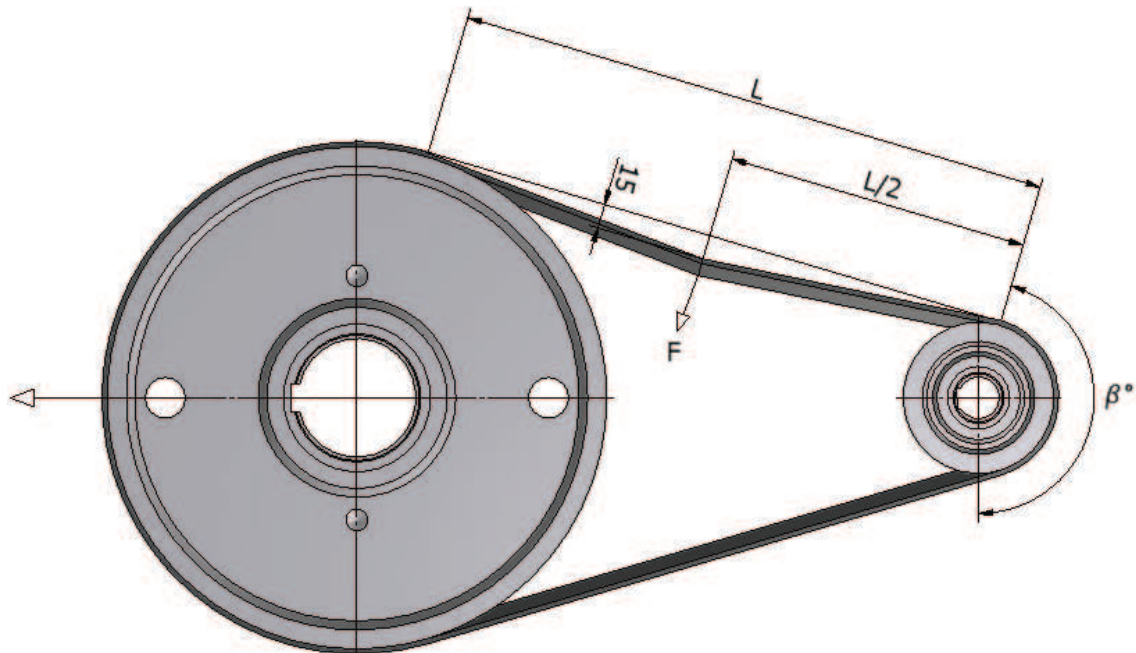
Figure 12



- Pos. 1 & 2 Main bearings
- Pos. 3 & 4 Electrical motor
- Pos. 5 Hydraulic station
- Pos. 6 Hinges

8.3 Adjustment of v-belts

Figure 13



When starting a new machine and later by change of v-belts, the v-belts should be adjusted after 2 hours of operation. This will increase the life of the v-belts considerably.

Correct adjustment

When you at a distance of $L/2$ (see Figure 13) press with 7,0 kp/belt, it should be possible to press down the belt 15 mm. If this is possible the belt has been correctly adjusted.

8.4 Grinding of knives

The knives should be ground on a surface grinder with cooling liquid added as dry grinding will temper the knife-edge.

In lack of an angle adjustable fixing table, it is possible to construct a tool (Figure 15) for fixing the knives in the angle prescribed in Figure 14.

In order to avoid unbalance in the rotor, it is very important that the flying knives are ground and mounted in such a way that all 6 flying knives in each section are of the same width.

When the knives are ground one by one the below procedure should be followed:

The most worn knife is to be chosen visually and ground until the edge is sharp and smooth. Then the rest of the knives are ground down to the same width as that of the first ground knife.

Figure 14 - Flying knife

Figure 15 - Grinding gauge

Figure 16 - Static knife

Figure 14

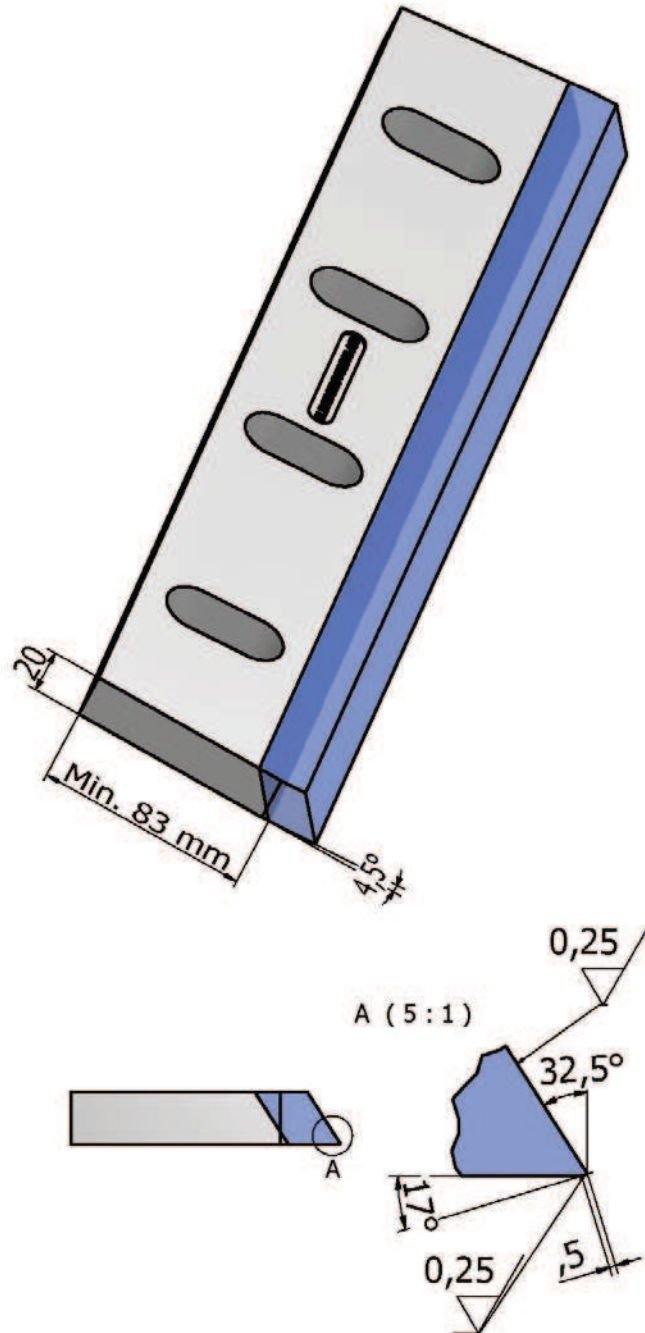


Figure 15

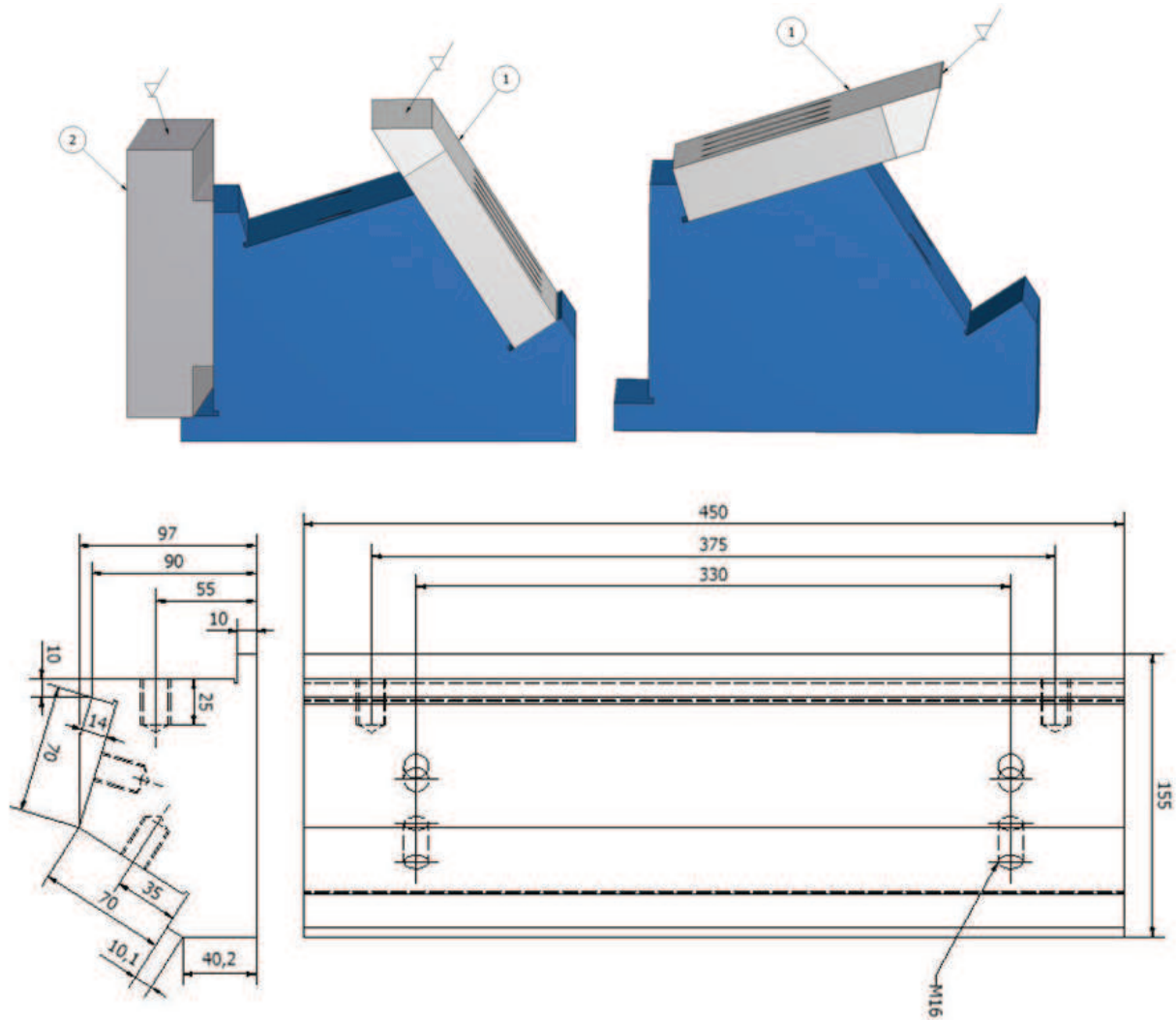
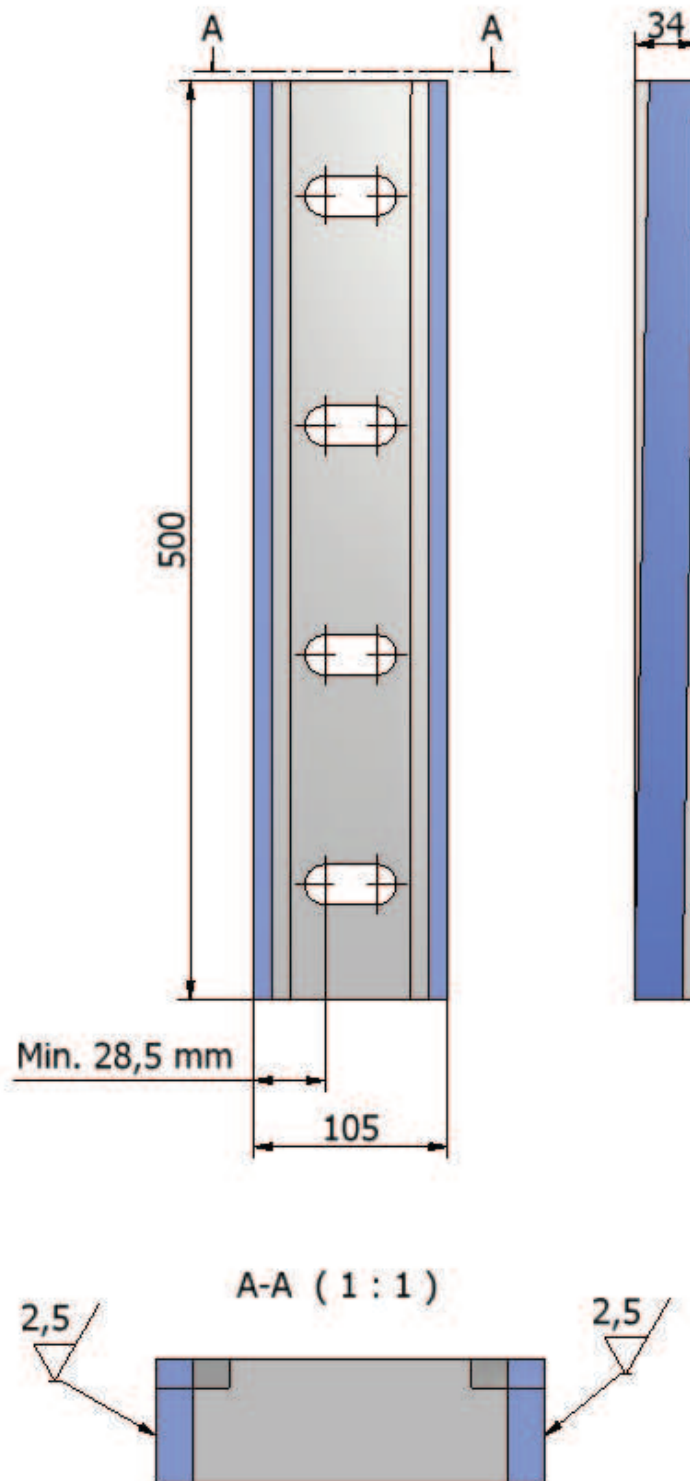


Figure 16



9. SPARE PARTS

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9.0 Introduction

Here at ELDAN we recognise that the availability of spare parts is essential to the smooth running of your machine.

We have therefore set out in this section an understanding of the ELDAN philosophy regarding spare parts, recommendations regarding the spare parts stock-holding that you should have together with a list of spare parts available.

9.1 Spare parts philosophy

To ensure the best service possible to you, the customer, and to allow you to plan your spare parts purchase ELDAN have grouped spare parts into 4 categories:-

- a) Wear-parts which are produced continually and which can be delivered prompt ex stock with the only reservation that we might deplete the stock due to heavy demand faster than we can produce.
- b) Vital spare parts (excluding rotors) for standard equipment, which will be stocked according to the monthly stock-list. Reproduction will start when we reach minimum stocking level.
- c) Normal spare parts, which are not necessarily stocked but can be delivered within 2 working weeks.
- d) Spare parts for special products are not necessarily stocked and delivery times will be individually advised by the production department.

9.2 Spare parts stock level recommendations

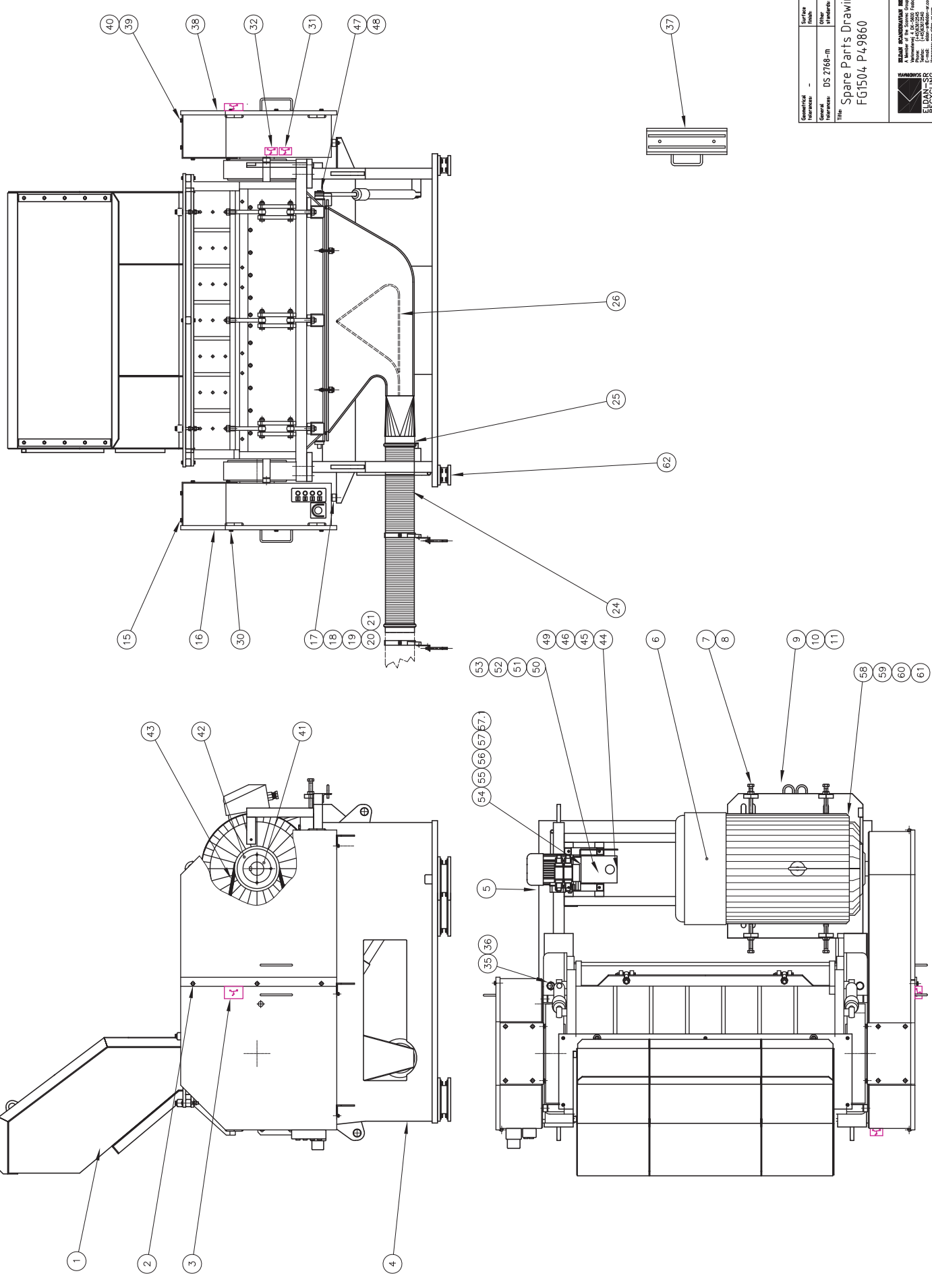
To enable the plant to be operated normally, it is essential that a minimum stock-holding of consumable spares is maintained. For this plant the essential spares are:-

Name: FG1504, pos. no. 14
 Drawing nr.: 38429
 Part No.: 38429
 Order No.: 49860

Pos. No.	Item	Description	Quantity	Unit
001	21957	Inlet hopper - FG1504	1,00	stk
002	1037	Set screw M10x30 DIN 933 - 8.8 EL-Z	3,00	Stk
003	15733	Safety switch system	1,00	Stk
004	23303	Stand with rubber shock absorber - FG1504	1,00	stk
005	15341	Set of hydraulic - FG1504	1,00	Stk
006	373	Electric motor 110,0 kW	1,00	Stk
007	1132	Set screw M20x150 DIN 933 - 8.8 EL-Z	4,00	Stk
008	1614	Lock nut M20 DIN 439B-04 EL-Z	4,00	Stk
009	1650	Facet washer ø8 DIN 125B EL-Z	4,00	Stk
010	6341	Clamp ø45	2,00	Stk
011	1553	Nut M8 DIN 934 - kv. 8.8 EL-Z	4,00	Stk
015	1037	Set screw M10x30 DIN 933 - 8.8 EL-Z	8,00	Stk
016	6373	Flywheel guard - FG1500	1,00	Stk
017	1003	Set screw M8x15 DIN 933 - 8.8 EL-Z	14,00	Stk
018	1650	Facet washer ø8 DIN 125B EL-Z	16,00	Stk
019	1474	Vibration absorber	9,00	Stk
020	1009	Set screw M8x25 DIN 933 - 8.8 EL-Z	1,00	Stk
021	8468	Screw MSP8x30 DIN 916-45H	3,00	Stk
024	15992	Vibration damping, outlet hopper FG1502	1,00	Sz
025	1484	Clutch OK160	1,00	Stk
026	15616	Outlet hopper - FG1504	1,00	Stk
030	1037	Set screw M10x30 DIN 933 - 8.8 EL-Z	3,00	Stk
031	15733	Safety switch system	1,00	Stk
032	15733	Safety switch system	1,00	Stk
035	1139	Set screw M24x70 DIN 933 - 8.8 EL-Z	8,00	Stk
036	1717	Lock washer ø24 - Nordlock	8,00	Stk
037	2648	Knife setting gauge	1,00	Stk
038	6374	V-belt shield	1,00	Stk
039	1037	Set screw M10x30 DIN 933 - 8.8 EL-Z	8,00	Stk
040	1670	Spring washer ø10 DIN 128A EL-Z	8,00	Stk
041	4539	Split bushing 3535-80	1,00	Stk
042	25580	V-belt pulley SPB 217-8	1,00	stk
043	4723	V-belt XPB 3550	8,00	Stk
044	1474	Vibration absorber	4,00	Stk
045	1006	Set screw M8x20 DIN 933 - 8.8 EL-Z	4,00	Stk
046	1650	Facet washer ø8 DIN 125B EL-Z	8,00	Stk
047	1658	Facet washer ø20 DIN 125B EL-Z	2,00	Stk
048	14702	Lock ring ø20 DIN 471	2,00	Stk
049	1003	Set screw M8x15 DIN 933 - 8.8 EL-Z	4,00	Stk
050	15426	Bracket for electric box for hyd. system	1,00	Stk
051	1006	Set screw M8x20 DIN 933 - 8.8 EL-Z	4,00	Stk
052	1668	Spring washer ø8 DIN 128A EL-Z	4,00	Stk
053	1553	Nut M8 DIN 934 - kv. 8.8 EL-Z	4,00	Stk
054	15417	Bracket for hydraulic unit	1,00	Stk
055	1009	Set screw M8x25 DIN 933 - 8.8 EL-Z	4,00	Stk
056	1668	Spring washer ø8 DIN 128A EL-Z	4,00	Stk
057	1553	Nut M8 DIN 934 - kv. 8.8 EL-Z	4,00	Stk
057.1	33866	Set screw M10*55 DIN 933 - 8.8 EL-Z	2,00	stk
058	22348	Bolt M24*140 DIN 931 - 8.8 EL-Z	4,00	stk
059	1699	Steel washer Ø25/60x7 DIN 6340	8,00	Stk
060	1717	Lock washer ø24 - Nordlock	4,00	Stk
061	1568	Nut M24 DIN 934 - kv. 8.8 EL-Z	4,00	Stk
101	1061	Set screw M12x35 DIN 933 - 8.8 EL-Z	21,00	Stk
101,1	1654	Facet washer ø12 DIN 125B EL-Z	21,00	Stk

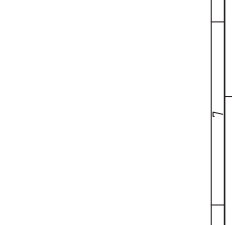
Pos. No.	Item	Description	Quantity	Unit
102	1710	Lock washer \varnothing 12 - Nordlock	21,00	Stk
103	13820	Wear plate upper part FG1502	1,00	Stk
104	13832	Wear plate knife bar FG1502, right	1,00	Stk
105	2782	Knife FG static marked 03	3,00	Stk
106	4726	Clamping strip L=464 FG1500/1502	2,00	Stk
107	4727	Clamping strip FG1500	1,00	Stk
108	1409	Screw MC20x80 DIN 912 - kv. 12.9	12,00	Stk
109	1710	Lock washer \varnothing 12 - Nordlock	12,00	Stk
110	1374	Screw MC12x150 DIN 912 - kv. 12.9	12,00	Stk
111	1563	Nut M16 DIN 934 - kv. 8.8 EL-Z	6,00	Stk
112	1110	Set screw M16x90 DIN 933 - 8.8 EL-Z	6,00	Stk
113	13823	Wear plate semicircle FG1502	1,00	Stk
114	1691	Steel washer \varnothing 13/35*5 DIN 6340	21,00	Stk
115	1710	Lock washer \varnothing 12 - Nordlock	21,00	Stk
116	1059	Set screw M12x30 DIN 933 - 8.8 EL-Z	21,00	Stk
117	1409	Screw MC20x80 DIN 912 - kv. 12.9	12,00	Stk
118	4727	Clamping strip FG1500	1,00	Stk
119	4726	Clamping strip L=464 FG1500/1502	2,00	Stk
120	2782	Knife FG static marked 03	3,00	Stk
121	4725	Wear plate - knife bar FG1500/1502	1,00	Stk
122	1710	Lock washer \varnothing 12 - Nordlock	12,00	Stk
123	1374	Screw MC12x150 DIN 912 - kv. 12.9	12,00	Stk
124	1610	Lock nut M16 DIN 439B-04 EL-Z	6,00	Stk
125	14124	Set screw M16x140 DIN 933	6,00	Stk
126	1637	Flange nut M20 DIN 6923 8.8 EL-Z	3,00	Stk
127	1308	Eye bolt M20*200 DIN 444B - 4.6 EL-Z	3,00	Stk
128	1224	Bolt M16x110 DIN 931 - kv. 8.8 EL-Z	3,00	Stk
129	1448	Disc spring 34/16,3x1,5	24,00	Stk
130	1596	Self-locking nut M16 DIN 985 - kv. 8.8 EL-Z	3,00	Stk
131	1224	Bolt M16x110 DIN 931 - kv. 8.8 EL-Z	3,00	Stk
132	1448	Disc spring 34/16,3x1,5	24,00	Stk
133	1596	Self-locking nut M16 DIN 985 - kv. 8.8 EL-Z	3,00	Stk
134	1306	Eye bolt M20x140 DIN 444B - 4.6 EL-Z	3,00	Stk
135	1637	Flange nut M20 DIN 6923 8.8 EL-Z	3,00	Stk
136	13763	Screen holder FG1502	1,00	Stk
137	25051	Screen \varnothing 9 FG1502	1,00	stk
137,1	13863	Screen \varnothing 8 FG1502	1,00	Stk
138	1637	Flange nut M20 DIN 6923 8.8 EL-Z	2,00	Stk
139	1306	Eye bolt M20x140 DIN 444B - 4.6 EL-Z	2,00	Stk
140	1224	Bolt M16x110 DIN 931 - kv. 8.8 EL-Z	2,00	Stk
141	1448	Disc spring 34/16,3x1,5	16,00	Stk
142	1596	Self-locking nut M16 DIN 985 - kv. 8.8 EL-Z	2,00	Stk
143	1456	Screw MK12x30 DIN 7991 - kv. 10.9	2,00	Stk
144	4730	Washer \varnothing 50/ \varnothing 12,5*8	1,00	Stk
145	2829	Shaft for hinge	2,00	Stk
146	23530	Washer \varnothing 50/12,5	4,00	stk
147	6542	Screw for grease nipple M12*25	2,00	Stk
148	4732	Grease nipple M6 straight	2,00	Stk
149	13807	Wear plate upper part side FG1502	2,00	Stk
150	13810	Wear plate lower part side FG1502	2,00	Stk
151	13831	Wear bar knife bar FG1502, left	1,00	Stk
152	4738	Wear plate - knife bar FG1500/1502	1,00	Stk
153	1715	Lock washer \varnothing 20 - Nordlock	12,00	Stk
154	1715	Lock washer \varnothing 20 - Nordlock	12,00	Stk
155	21935	Rotor housing - Upper part - FG1504	1,00	stk
156	21934	Rotor housing - Lower part - FG1504	1,00	stk
157	13825	Shaft for screen holder FG1502	1,00	Stk
158	1456	Screw MK12x30 DIN 7991 - kv. 10.9	2,00	Stk
159	4730	Washer \varnothing 50/ \varnothing 12,5*8	1,00	Stk
160	1077	Set screw M16x30 DIN 933 - 8.8 EL-Z	1,00	Stk

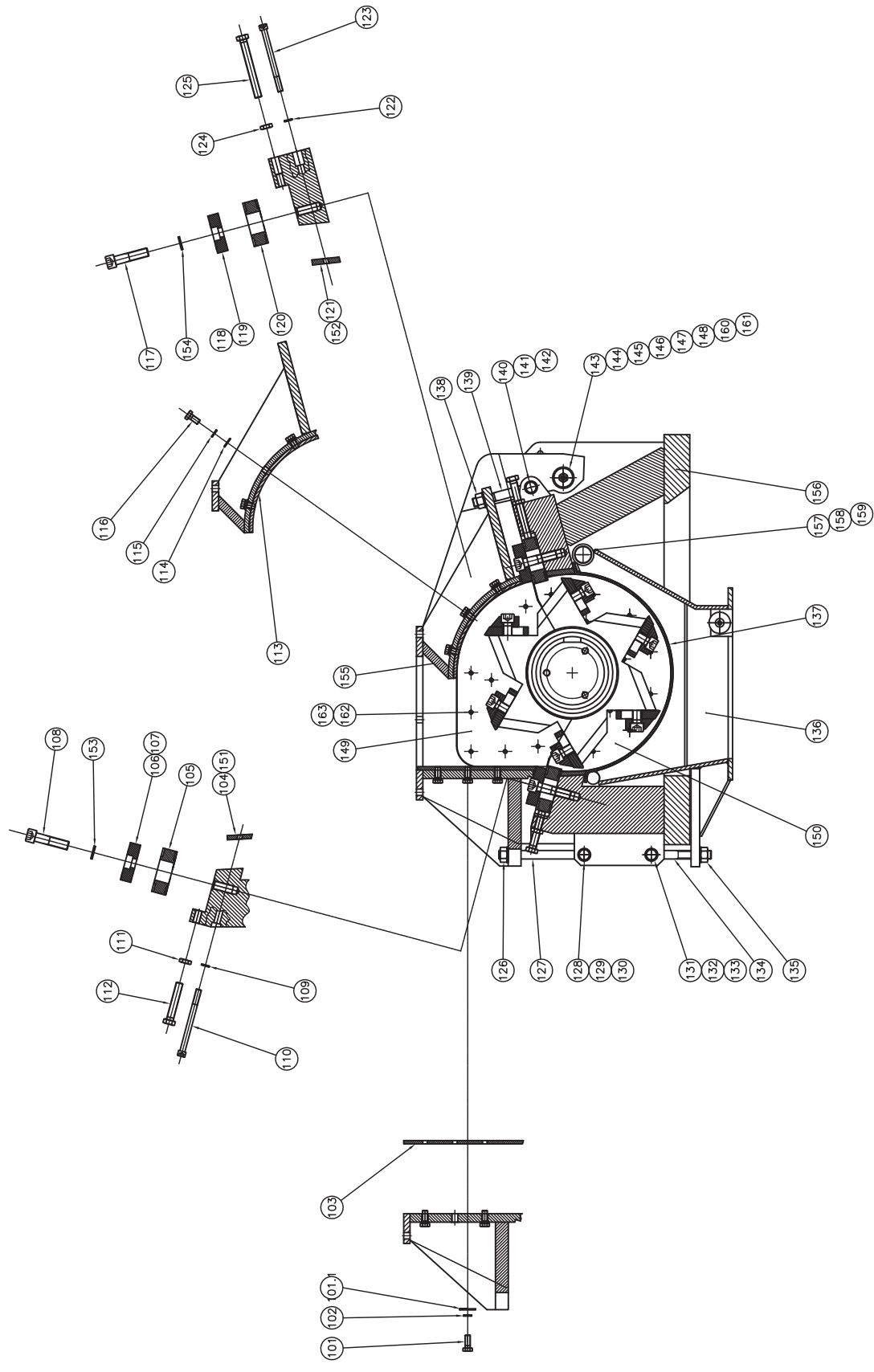
Pos. No.	Item	Description	Quantity	Unit
161	1610	Lock nut M16 DIN 439B-04 EL-Z	1,00	Stk
162	1169	Bolt M10*40 DIN 931 - 8.8 EL-Z	56,00	Stk
163	1670	Spring washer ø10 DIN 128A EL-Z	56,00	Stk
201	1402	Screw MC20x60 DIN 912 - kv. 12.9	3,00	Stk
202	1715	Lock washer ø20 - Nordlock	3,00	Stk
203	4744	Washer for flywheel/pulley	1,00	Stk
204	4743	Flywheel - FG1500/1502	1,00	Stk
205	601	Rubber sealing ring 190/220 * 15	1,00	Stk
206	1353	Screw MC12x25 DIN 912 - kv. 12.9	10,00	Stk
207	4741	Bearing cap	1,00	Stk
208	4739	Distance bushing/bearing	1,00	Stk
209	13639	Bearing 23034 E1AM	1,00	Stk
210	4740	Bearing housing FG1500	1,00	Stk
211	819	Grease nipple 1/4" straight	1,00	Stk
212	4741	Bearing cap	1,00	Stk
213	1353	Screw MC12x25 DIN 912 - kv. 12.9	10,00	Stk
214	601	Rubber sealing ring 190/220 * 15	1,00	Stk
215	4742	Sealing ring Ø231/212*5,2 PUR	1,00	Stk
216	4742	Sealing ring Ø231/212*5,2 PUR	1,00	Stk
217	1678	Spring washer ø24 DIN 128A EL-Z	4,00	Stk
218	1414	Screw MC24x100 DIN 912 - kv. 12.9	4,00	Stk
219	2645	Parallel key 16*28*80	1,00	Stk
220	2874	Screw MK10x30 DIN 7991 - kv. 10.9	1,00	Stk
221	4067	Parallell key 22*40*125 1*round	1,00	Stk
222	4742	Sealing ring Ø231/212*5,2 PUR	1,00	Stk
223	4742	Sealing ring Ø231/212*5,2 PUR	1,00	Stk
224	601	Rubber sealing ring 190/220 * 15	1,00	Stk
225	1353	Screw MC12x25 DIN 912 - kv. 12.9	10,00	Stk
226	4741	Bearing cap	1,00	Stk
227	819	Grease nipple 1/4" straight	1,00	Stk
228	4740	Bearing housing FG1500	1,00	Stk
229	13639	Bearing 23034 E1AM	1,00	Stk
230	4739	Distance bushing/bearing	1,00	Stk
231	4741	Bearing cap	1,00	Stk
232	1353	Screw MC12x25 DIN 912 - kv. 12.9	10,00	Stk
233	601	Rubber sealing ring 190/220 * 15	1,00	Stk
234	6428	Flywheel FG1500/1502	1,00	Stk
235	4744	Washer for flywheel/pulley	1,00	Stk
236	1715	Lock washer ø20 - Nordlock	3,00	Stk
237	1402	Screw MC20x60 DIN 912 - kv. 12.9	3,00	Stk
238	4067	Parallell key 22*40*125 1*round	1,00	Stk
239	2874	Screw MK10x30 DIN 7991 - kv. 10.9	1,00	Stk
240	2645	Parallel key 16*28*80	1,00	Stk
241	1414	Screw MC24x100 DIN 912 - kv. 12.9	4,00	Stk
242	1678	Spring washer ø24 DIN 128A EL-Z	4,00	Stk
243	4745	Rotor FG1500/1502	1,00	Stk
245	1151	Set screw M10*1*35 DIN 961 - 8.8	36,00	Stk
246	1618	Lock nut M10x1 DIN 439B-04	36,00	Stk
247	2781	Knife FG flying marked 03	18,00	Stk
248	2647	Clamping strip for flying knives	18,00	Stk
249	1715	Lock washer ø20 - Nordlock	72,00	Stk
250	1407	Screw MC20x70 DIN 912 - kv. 12.9	72,00	Stk
251	1672	Spring washer ø12 DIN 128A EL-Z	10,00	Stk
252	1672	Spring washer ø12 DIN 128A EL-Z	10,00	Stk
253	1672	Spring washer ø12 DIN 128A EL-Z	10,00	Stk
254	1672	Spring washer ø12 DIN 128A EL-Z	10,00	Stk



Particulars	First Angle
General	Linear
Unit	mm
Drawing format	High scale
AI	1:10
Company	Created by
TPE	C 09-08-2010
Revised by	Revised by
Identification	Revision
38429,1	
Revised for	

General Reference
 DS 2768-m
Title
 Spare Parts Drawing
 FG1504 P49860





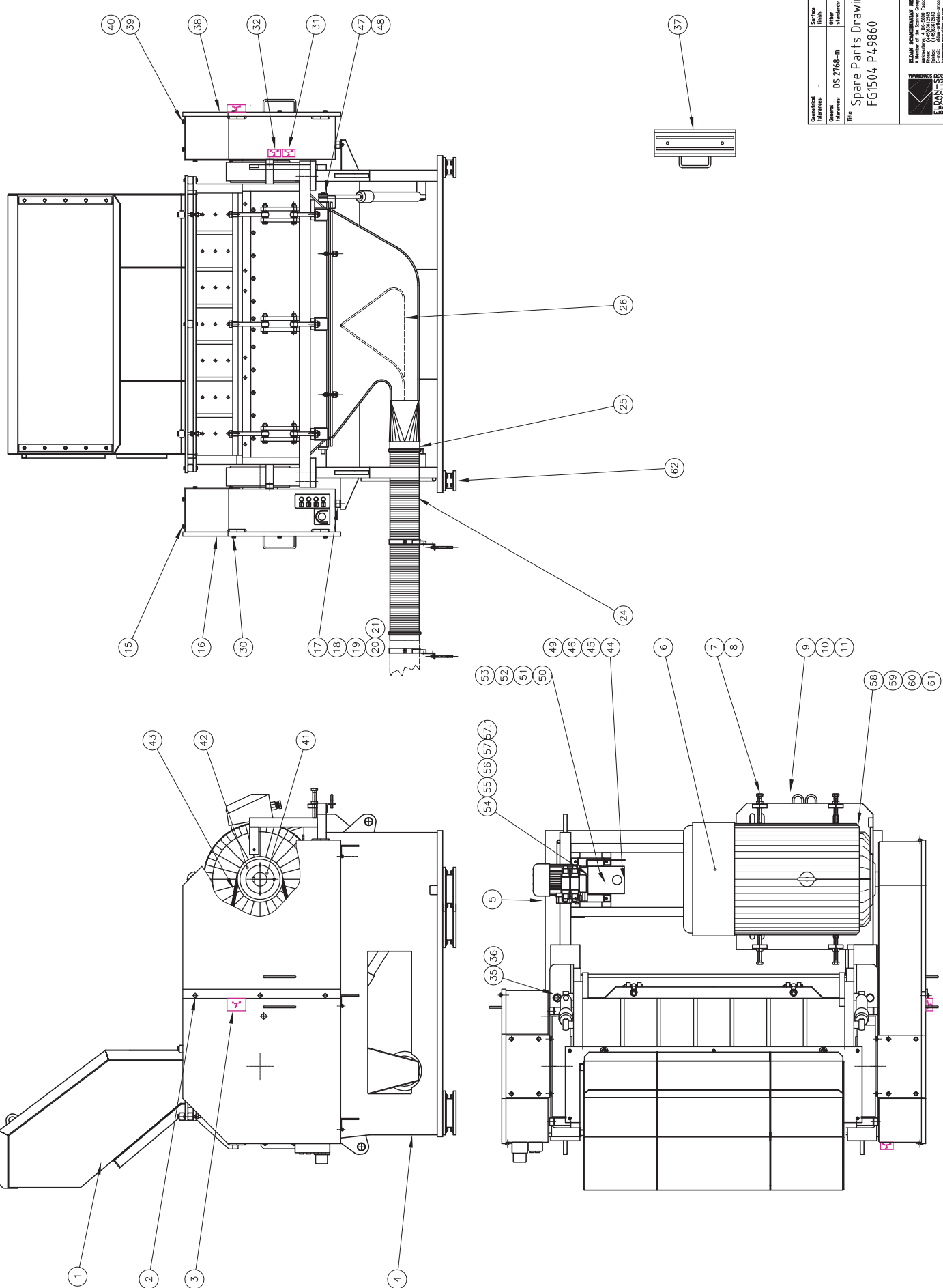
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General Information	Other Information	Layer	DM
Material	DS 2768-m	Drawing sheet	A1
Title		Created by	TPE
Spare Parts Drawing		Checked by	DM
FG1504 Housing		Released by	DM
P49860		Manufactured	38429,2

Name: FG1504, pos. no. 19
 Drawing nr.: 38558
 Part No.: 38558
 Order No.: 49860

Pos. No.	Item	Description	Quantity	Unit
001	21957	Inlet hopper - FG1504	1,00	stk
002	1037	Set screw M10x30 DIN 933 - 8.8 EL-Z	3,00	Stk
003	15733	Safety switch system	1,00	Stk
004	23303	Stand with rubber shock absorber - FG1504	1,00	stk
005	15341	Set of hydraulic - FG1504	1,00	Stk
006	373	Electric motor 110,0 kW	1,00	Stk
007	1132	Set screw M20x150 DIN 933 - 8.8 EL-Z	4,00	Stk
008	1614	Lock nut M20 DIN 439B-04 EL-Z	4,00	Stk
009	1650	Facet washer ø8 DIN 125B EL-Z	4,00	Stk
010	6341	Clamp ø45	2,00	Stk
011	1553	Nut M8 DIN 934 - kv. 8.8 EL-Z	4,00	Stk
015	1037	Set screw M10x30 DIN 933 - 8.8 EL-Z	8,00	Stk
016	6373	Flywheel guard - FG1500	1,00	Stk
017	1003	Set screw M8x15 DIN 933 - 8.8 EL-Z	14,00	Stk
018	1650	Facet washer ø8 DIN 125B EL-Z	16,00	Stk
019	1474	Vibration absorber	9,00	Stk
020	1009	Set screw M8x25 DIN 933 - 8.8 EL-Z	1,00	Stk
021	8468	Screw MSP8x30 DIN 916-45H	3,00	Stk
024	15992	Vibration damping, outlet hopper FG1502	1,00	Sz
025	1484	Clutch OK160	1,00	Stk
026	15616	Outlet hopper - FG1504	1,00	Stk
030	1037	Set screw M10x30 DIN 933 - 8.8 EL-Z	3,00	Stk
031	15733	Safety switch system	1,00	Stk
032	15733	Safety switch system	1,00	Stk
035	1139	Set screw M24x70 DIN 933 - 8.8 EL-Z	8,00	Stk
036	1717	Lock washer ø24 - Nordlock	8,00	Stk
037	2648	Knife setting gauge	1,00	Stk
038	6374	V-belt shield	1,00	Stk
039	1037	Set screw M10x30 DIN 933 - 8.8 EL-Z	8,00	Stk
040	1670	Spring washer ø10 DIN 128A EL-Z	8,00	Stk
041	4539	Split bushing 3535-80	1,00	Stk
042	25580	V-belt pulley SPB 217-8	1,00	stk
043	4723	V-belt XPB 3550	8,00	Stk
044	1474	Vibration absorber	4,00	Stk
045	1006	Set screw M8x20 DIN 933 - 8.8 EL-Z	4,00	Stk
046	1650	Facet washer ø8 DIN 125B EL-Z	8,00	Stk
047	1658	Facet washer ø20 DIN 125B EL-Z	2,00	Stk
048	14702	Lock ring ø20 DIN 471	2,00	Stk
049	1003	Set screw M8x15 DIN 933 - 8.8 EL-Z	4,00	Stk
050	15426	Bracket for electric box for hyd. system	1,00	Stk
051	1006	Set screw M8x20 DIN 933 - 8.8 EL-Z	4,00	Stk
052	1668	Spring washer ø8 DIN 128A EL-Z	4,00	Stk
053	1553	Nut M8 DIN 934 - kv. 8.8 EL-Z	4,00	Stk
054	15417	Bracket for hydraulic unit	1,00	Stk
055	1009	Set screw M8x25 DIN 933 - 8.8 EL-Z	4,00	Stk
056	1668	Spring washer ø8 DIN 128A EL-Z	4,00	Stk
057	1553	Nut M8 DIN 934 - kv. 8.8 EL-Z	4,00	Stk
057.1	33866	Set screw M10*55 DIN 933 - 8.8 EL-Z	2,00	stk
058	22348	Bolt M24*140 DIN 931 - 8.8 EL-Z	4,00	stk
059	1699	Steel washer Ø25/60x7 DIN 6340	8,00	Stk
060	1717	Lock washer ø24 - Nordlock	4,00	Stk
061	1568	Nut M24 DIN 934 - kv. 8.8 EL-Z	4,00	Stk
101	1061	Set screw M12x35 DIN 933 - 8.8 EL-Z	21,00	Stk
101,1	1654	Facet washer ø12 DIN 125B EL-Z	21,00	Stk

Pos. No.	Item	Description	Quantity	Unit
102	1710	Lock washer \varnothing 12 - Nordlock	21,00	Stk
103	13820	Wear plate upper part FG1502	1,00	Stk
104	13832	Wear plate knife bar FG1502, right	1,00	Stk
105	2782	Knife FG static marked 03	3,00	Stk
106	4726	Clamping strip L=464 FG1500/1502	2,00	Stk
107	4727	Clamping strip FG1500	1,00	Stk
108	1409	Screw MC20x80 DIN 912 - kv. 12.9	12,00	Stk
109	1710	Lock washer \varnothing 12 - Nordlock	12,00	Stk
110	1374	Screw MC12x150 DIN 912 - kv. 12.9	12,00	Stk
111	1563	Nut M16 DIN 934 - kv. 8.8 EL-Z	6,00	Stk
112	1110	Set screw M16x90 DIN 933 - 8.8 EL-Z	6,00	Stk
113	13823	Wear plate semicircle FG1502	1,00	Stk
114	1691	Steel washer \varnothing 13/35*5 DIN 6340	21,00	Stk
115	1710	Lock washer \varnothing 12 - Nordlock	21,00	Stk
116	1059	Set screw M12x30 DIN 933 - 8.8 EL-Z	21,00	Stk
117	1409	Screw MC20x80 DIN 912 - kv. 12.9	12,00	Stk
118	4727	Clamping strip FG1500	1,00	Stk
119	4726	Clamping strip L=464 FG1500/1502	2,00	Stk
120	2782	Knife FG static marked 03	3,00	Stk
121	4725	Wear plate - knife bar FG1500/1502	1,00	Stk
122	1710	Lock washer \varnothing 12 - Nordlock	12,00	Stk
123	1374	Screw MC12x150 DIN 912 - kv. 12.9	12,00	Stk
124	1610	Lock nut M16 DIN 439B-04 EL-Z	6,00	Stk
125	14124	Set screw M16x140 DIN 933	6,00	Stk
126	1637	Flange nut M20 DIN 6923 8.8 EL-Z	3,00	Stk
127	1308	Eye bolt M20*200 DIN 444B - 4.6 EL-Z	3,00	Stk
128	1224	Bolt M16x110 DIN 931 - kv. 8.8 EL-Z	3,00	Stk
129	1448	Disc spring 34/16,3x1,5	24,00	Stk
130	1596	Self-locking nut M16 DIN 985 - kv. 8.8 EL-Z	3,00	Stk
131	1224	Bolt M16x110 DIN 931 - kv. 8.8 EL-Z	3,00	Stk
132	1448	Disc spring 34/16,3x1,5	24,00	Stk
133	1596	Self-locking nut M16 DIN 985 - kv. 8.8 EL-Z	3,00	Stk
134	1306	Eye bolt M20x140 DIN 444B - 4.6 EL-Z	3,00	Stk
135	1637	Flange nut M20 DIN 6923 8.8 EL-Z	3,00	Stk
136	13763	Screen holder FG1502	1,00	Stk
137	13859	Screen \varnothing 5 FG1504	1,00	Stk
137,1	13856	Screen \varnothing 4 FG1504 T=4	1,00	Stk
137,2	21240	Screen \varnothing 3,25 FG1502/1504 T=2	1,00	stk
138	1637	Flange nut M20 DIN 6923 8.8 EL-Z	2,00	Stk
139	1306	Eye bolt M20x140 DIN 444B - 4.6 EL-Z	2,00	Stk
140	1224	Bolt M16x110 DIN 931 - kv. 8.8 EL-Z	2,00	Stk
141	1448	Disc spring 34/16,3x1,5	16,00	Stk
142	1596	Self-locking nut M16 DIN 985 - kv. 8.8 EL-Z	2,00	Stk
143	1456	Screw MK12x30 DIN 7991 - kv. 10.9	2,00	Stk
144	4730	Washer \varnothing 50/ \varnothing 12,5*8	1,00	Stk
145	2829	Shaft for hinge	2,00	Stk
146	23530	Washer \varnothing 50/12,5	4,00	stk
147	6542	Screw for grease nipple M12*25	2,00	Stk
148	4732	Grease nipple M6 straight	2,00	Stk
149	13807	Wear plate upper part side FG1502	2,00	Stk
150	13810	Wear plate lower part side FG1502	2,00	Stk
151	13831	Wear bar knife bar FG1502, left	1,00	Stk
152	4738	Wear plate - knife bar FG1500/1502	1,00	Stk
153	1715	Lock washer \varnothing 20 - Nordlock	12,00	Stk
154	1715	Lock washer \varnothing 20 - Nordlock	12,00	Stk
155	21935	Rotor housing - Upper part - FG1504	1,00	stk
156	21934	Rotor housing - Lower part - FG1504	1,00	stk
157	13825	Shaft for screen holder FG1502	1,00	Stk
158	1456	Screw MK12x30 DIN 7991 - kv. 10.9	2,00	Stk
159	4730	Washer \varnothing 50/ \varnothing 12,5*8	1,00	Stk

Pos. No.	Item	Description	Quantity	Unit
160	1077	Set screw M16x30 DIN 933 - 8.8 EL-Z	1,00	Stk
161	1610	Lock nut M16 DIN 439B-04 EL-Z	1,00	Stk
162	1169	Bolt M10*40 DIN 931 - 8.8 EL-Z	56,00	Stk
163	1670	Spring washer ø10 DIN 128A EL-Z	56,00	Stk
201	1402	Screw MC20x60 DIN 912 - kv. 12.9	3,00	Stk
202	1715	Lock washer ø20 - Nordlock	3,00	Stk
203	4744	Washer for flywheel/pulley	1,00	Stk
204	4743	Flywheel - FG1500/1502	1,00	Stk
205	601	Rubber sealing ring 190/220 * 15	1,00	Stk
206	1353	Screw MC12x25 DIN 912 - kv. 12.9	10,00	Stk
207	4741	Bearing cap	1,00	Stk
208	4739	Distance bushing/bearing	1,00	Stk
209	13639	Bearing 23034 E1AM	1,00	Stk
210	4740	Bearing housing FG1500	1,00	Stk
211	819	Grease nipple 1/4" straight	1,00	Stk
212	4741	Bearing cap	1,00	Stk
213	1353	Screw MC12x25 DIN 912 - kv. 12.9	10,00	Stk
214	601	Rubber sealing ring 190/220 * 15	1,00	Stk
215	4742	Sealing ring Ø231/212*5,2 PUR	1,00	Stk
216	4742	Sealing ring Ø231/212*5,2 PUR	1,00	Stk
217	1678	Spring washer ø24 DIN 128A EL-Z	4,00	Stk
218	1414	Screw MC24x100 DIN 912 - kv. 12.9	4,00	Stk
219	2645	Parallel key 16*28*80	1,00	Stk
220	2874	Screw MK10x30 DIN 7991 - kv. 10.9	1,00	Stk
221	4067	Parallell key 22*40*125 1*round	1,00	Stk
222	4742	Sealing ring Ø231/212*5,2 PUR	1,00	Stk
223	4742	Sealing ring Ø231/212*5,2 PUR	1,00	Stk
224	601	Rubber sealing ring 190/220 * 15	1,00	Stk
225	1353	Screw MC12x25 DIN 912 - kv. 12.9	10,00	Stk
226	4741	Bearing cap	1,00	Stk
227	819	Grease nipple 1/4" straight	1,00	Stk
228	4740	Bearing housing FG1500	1,00	Stk
229	13639	Bearing 23034 E1AM	1,00	Stk
230	4739	Distance bushing/bearing	1,00	Stk
231	4741	Bearing cap	1,00	Stk
232	1353	Screw MC12x25 DIN 912 - kv. 12.9	10,00	Stk
233	601	Rubber sealing ring 190/220 * 15	1,00	Stk
234	6428	Flywheel FG1500/1502	1,00	Stk
235	4744	Washer for flywheel/pulley	1,00	Stk
236	1715	Lock washer ø20 - Nordlock	3,00	Stk
237	1402	Screw MC20x60 DIN 912 - kv. 12.9	3,00	Stk
238	4067	Parallell key 22*40*125 1*round	1,00	Stk
239	2874	Screw MK10x30 DIN 7991 - kv. 10.9	1,00	Stk
240	2645	Parallel key 16*28*80	1,00	Stk
241	1414	Screw MC24x100 DIN 912 - kv. 12.9	4,00	Stk
242	1678	Spring washer ø24 DIN 128A EL-Z	4,00	Stk
243	4745	Rotor FG1500/1502	1,00	Stk
245	1151	Set screw M10*1*35 DIN 961 - 8.8	36,00	Stk
246	1618	Lock nut M10x1 DIN 439B-04	36,00	Stk
247	2781	Knife FG flying marked 03	18,00	Stk
248	2647	Clamping strip for flying knives	18,00	Stk
249	1715	Lock washer ø20 - Nordlock	72,00	Stk
250	1407	Screw MC20x70 DIN 912 - kv. 12.9	72,00	Stk
251	1672	Spring washer ø12 DIN 128A EL-Z	10,00	Stk
252	1672	Spring washer ø12 DIN 128A EL-Z	10,00	Stk
253	1672	Spring washer ø12 DIN 128A EL-Z	10,00	Stk
254	1672	Spring washer ø12 DIN 128A EL-Z	10,00	Stk

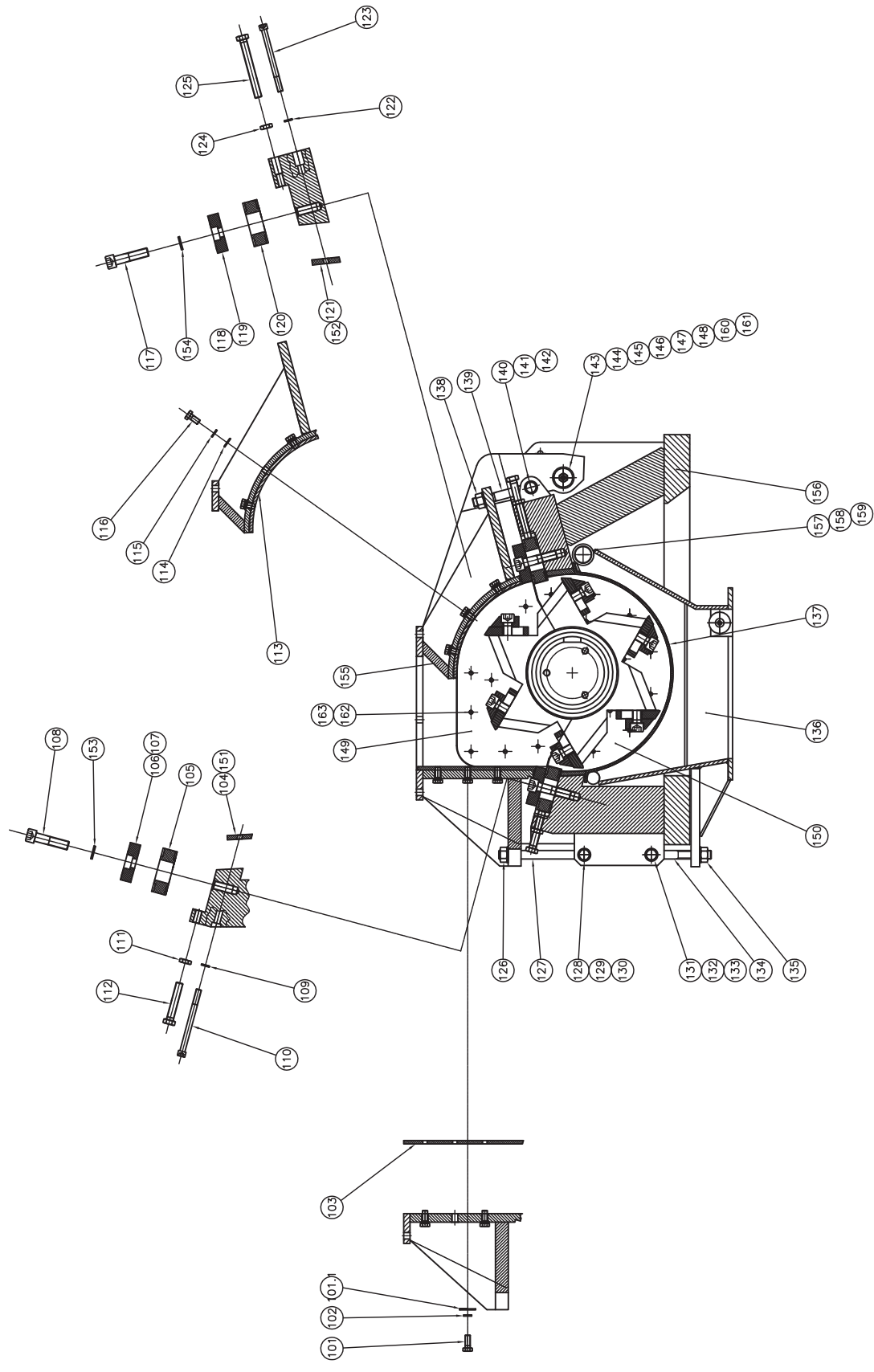



Particulars	First Angle
General	Linear
Scale	mm
Drawing Unit	mm
Drawing Date	10-08-2019
Drawing No.	38558.1
Drawn by	TPE
Checked by	
Revised by	
Revised for	
Identification	38558.1
Revised for	

Spare Parts Drawing
FG1504 P49860

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A Member of the Same Group
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Phone: 03-6201500
E-mail: sales@eldan.com
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Geometrical Information	Service fields	Projection method	First Angle
Material	Other	Layer	DWG
Code	Material	Scale	1:1
Designation	Material	Created by	TPE
Title		Checked by	Revised by
Spare Parts Drawing		Created by	Revised by
FG1504 Housing		Checked by	Revised by
P49860		Created by	Revised by
 ELAN REPAIRING A member of the ELAN Group ELAN Group Ltd 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200 www.elan-repairing.com		Manufacture No.	38558.2
		Revised No.	

Fine-Granulator FG1504

2 set	Knives	<p>1 set installed in the machine 1 set on stock 1 set to be ground</p> <p>1 set of knives consists of: 18 flying knives 6 static knives</p>
1 set	Knife bolts/nuts	<p>1 set consists of: 72 bolts MC20 x 70, quality 12.9 24 bolts MC20 x 80, quality 12.9</p>
2 each	Screen plates	
8 each	V-belts	

9.3 Choice of screen for the Granulator

By processing of cables

For maximum efficiency of granulation and quality of processing, it is important to choose the correct screen size for the Granulator.

By choosing a screen size, which is too large, some of the granulate will come out without being separated into copper and insulation. This situation will be even more noticeable, when processing thin cable. The granulate and the insulation will be entangled in each other due to the wrong choice of screen.

By choosing a screen size, which is too small the Granulator will be overheated. In addition the knives, the screen, the wear plates etc. will suffer from premature wear.

By processing of tyres

For maximum efficiency of granulation and quality of processing, it is important to choose the correct screen size for the Granulator.

The screen size is determining for how much textile will be liberated from the rubber. The smaller the screen size, the more textile will be liberated.

By choosing a screen size, which is too small the Granulator will be overheated. In addition the knives, the screen, the wear plates etc. will suffer from premature wear.

10. DISPOSAL OF THE FINE-GRANULATOR FG1504

By disposal of the Fine-Granulator FG1504 there are only a few environmental conditions which should be observed.

The oil should be drained off

- the hydraulic system for opening of upper part
approx. 2 litres Shell Tellus T46

before the Fine-Granulator FG1504 is disposed of.



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ELDAN Cracker Mill

Serial number : 50259
Delivery date : April 2014
Customer : Oris Prom

**Manual for Cracker Mill
(Pos. 102)**

Eldan Cracker Mill CM900

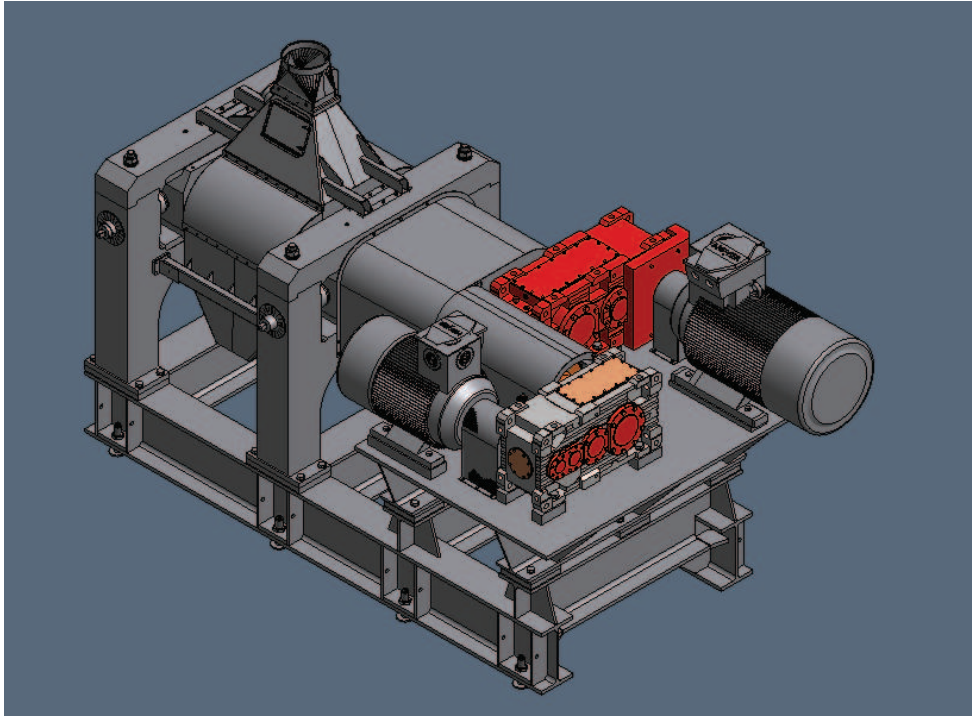




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1. INTRODUCTION

- 1.1 Congratulations on your purchase of an ELDAN machine. Like many customers who have gone before you, you have just entered into what we hope will be a long and beneficial partnership with us.
- 1.2 To ensure that you get the very best from your machine, we give you this manual which forms an indispensable part of your operation.
Please read it carefully as you will find it contains the necessary information to **install, set, operate** and **maintain** the machine in a safe and efficient manner.
- 1.3 You will notice that we suggest safe operation before efficient operation, not because we don't think the machine is efficient but because we feel it is important for everybody that the machine is operated safely.

To reinforce this you will see in the text the symbol  The section on safety explains what this means, but for the purpose of this introduction,

wherever you see  as part of an instruction, it is essential that you carry out the instruction exactly as specified and that you do not attempt to overlook the safety element in any way.

- 1.4 Should you require clarification regarding any of the information or should you wish to purchase further copies of this manual, please contact your ELDAN agent or contact us direct.

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2. SAFETY INSTRUCTIONS

It is a condition that the person, who is going to operate the machine, has been educated or is familiar with machines of the same type.

Before starting, check that:



All protection devices are placed correctly.



Check conveyors for left tools, screws, bolts, etc.



The operator must be absolutely certain that no service, repair or any other kind of work on the machine is being undertaken before starting the machine.



The machine is to be adjusted according to the directions in the manual.



Check the starting procedure in the manual.

During operation:



In case of stops for maintenance, damage etc. turn off and lock all main switches before working on the machine.



Working on the machine, opening of inspection doors or removing protection screens and safety devices while the machine is operating, is absolutely prohibited and highly dangerous.



Never try to remove jammed material or foreign bodies in the rotor house, etc. until it has been checked that the machine is fully isolated electrically. This means turn off and lock all main switches before working on the machine.



Do not feed objects into the machine, which may cause damage to the machine.



Replacement and mounting of knives, etc. should be carried out in accordance with the instructions in the manual.

Safety during operation:



Oil leaks from hydraulic tubes or pipes may come with such force that the oil may penetrate the skin. In such cases a doctor's help should be sought immediately in order to prevent severe infections.



When the machine is not delivered with special silencing equipment, we recommend that the operators carry earplugs or hearing protectors.



Electrical installations and repairs must only be carried out by authorised personnel.



Ordinary safety rules: The ordinary safety rules of the country in question must always be obeyed.

Personal security when carrying out service:



When replacing the knives the use of safety glasses is necessary because of the danger of splinters when the knives are exposed to strokes and bumps.



Dust masks are necessary when cleaning the machine.



The processing area must be satisfactory illuminated so that there are no dark corners when carrying out service work. Illumination must however not be dazzling. The power must, however, be taken from a separate power supply as the machine must be turned off and locked.



Ordinary safety rules: The ordinary safety rules of the country in question must always be obeyed.

3. MACHINE INFORMATION

3.0	Description of Cracker Mill CM900	7
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3.2	Technical specification for Cracker Mill CM900	8

3.0 Description of Cracker Mill CM900

The Eldan Cracker Mill CM900 is a machine designed for producing rubber powder from granule from old tyres. It consists of 2 parallel individually driven rolls. The rolls counter rotate in different and adjustable speeds (ratio) creating a friction between them. This friction generates tearing forces that breaks and tear the rubber apart.

3.1 Application

The Eldan Cracker Mill CM 900 processes already granulated rubber from car and truck tyres to powder. The input material should be free from foreign objects such as f.ex. stones, sand and steel. The granule should have a size between 1 – 8 mm

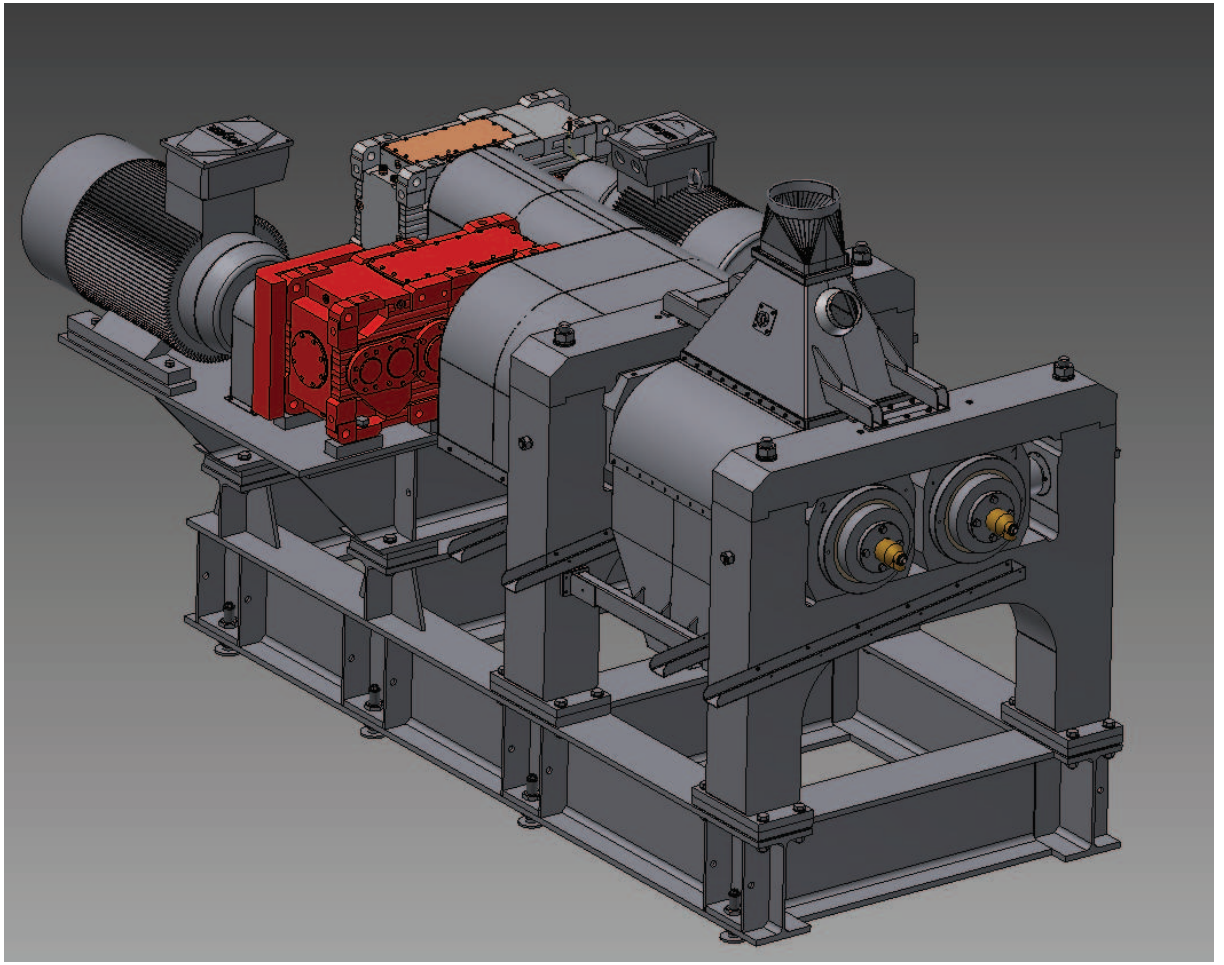
Eldan cannot take responsibility for damages on the Eldan Cracker Mill CM900, which has been caused by foreign bodies/objects.

Should other kinds of input material than the above-mentioned be used as input material, this will be at the customer's own risk.

3.2 Technical specification for Cracker Mill CM900

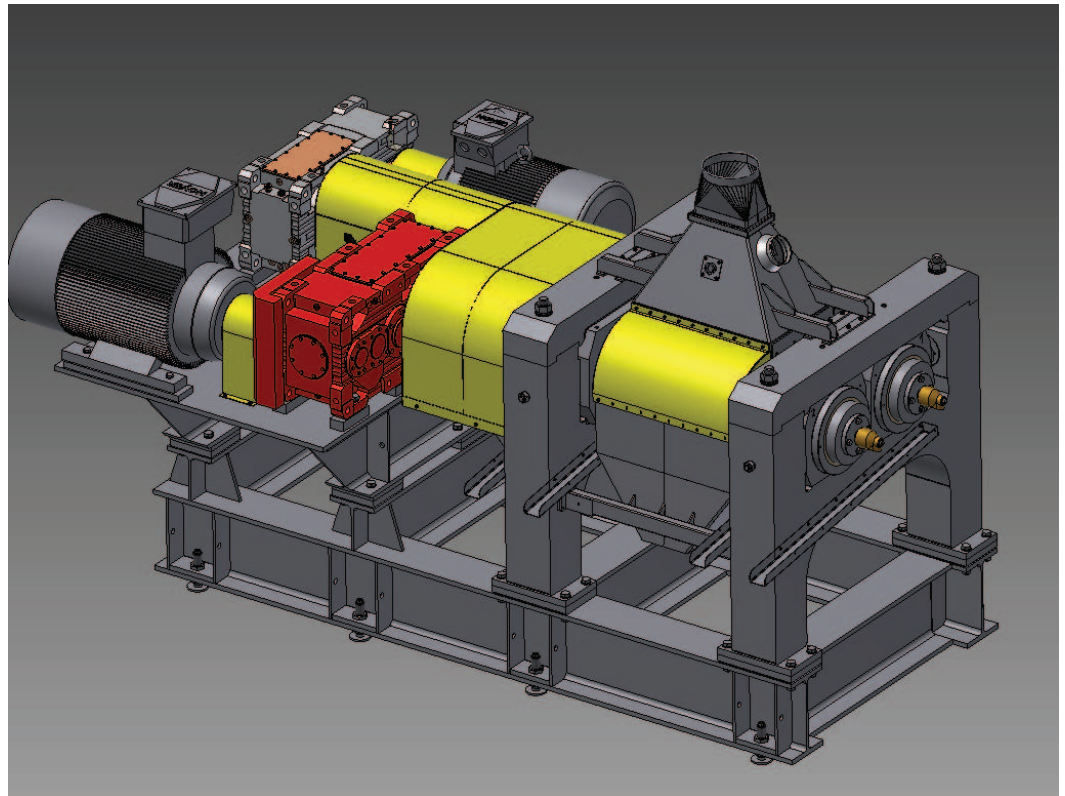
Rotor length:-	900 mm (36")
Rotor diameter:-	610 mm
Drive:-	
Rotor 1	
Electrical motor	110 kW
Gear	I=23,10
Rotor 2	
Electrical Motor	250 kW
Gear	I=22,32
Weight:-	Appr. 29000 kg
Length:	4300 mm
Width:	2000 mm
Height:	3300 mm

Figure 1



4. SAFETY EQUIPMENT

The machine is equipped with safety guards around rotating parts. These parts should not be removed during operation.



5. UNLOADING AND INSTALLATION

5.0	Introduction.....	12
5.1	Lifting points	12
5.3	Recommended floor fixing methods	14
5.4	Dimensions and clearance needed for service and maintenance.....	17
5.5	Power and service details and requirements	17
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5.0 Introduction

Within this section we have set out the necessary information to ensure the safe and correct method of installing the machine. Set out below are the instructions and guide lines to describe how the operation should be undertaken.

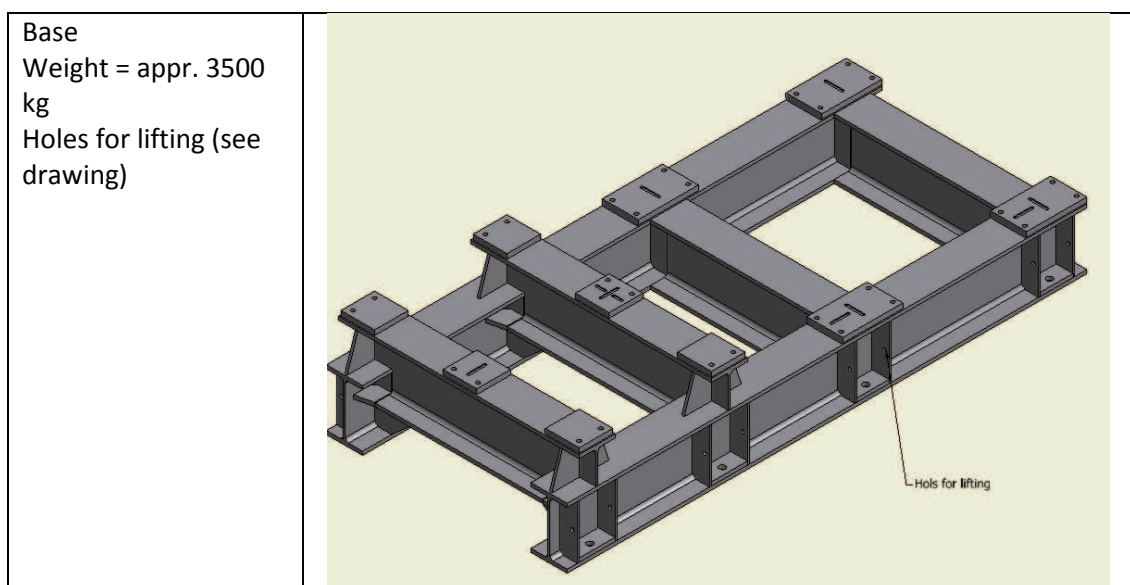
5.1 Lifting points for the heavy parts

The machine parts shall be lifted/transported by means of a crane using lifting hooks in the holes, which are produced for this purpose, Figure 2. For some specimens a fork lift should be used.

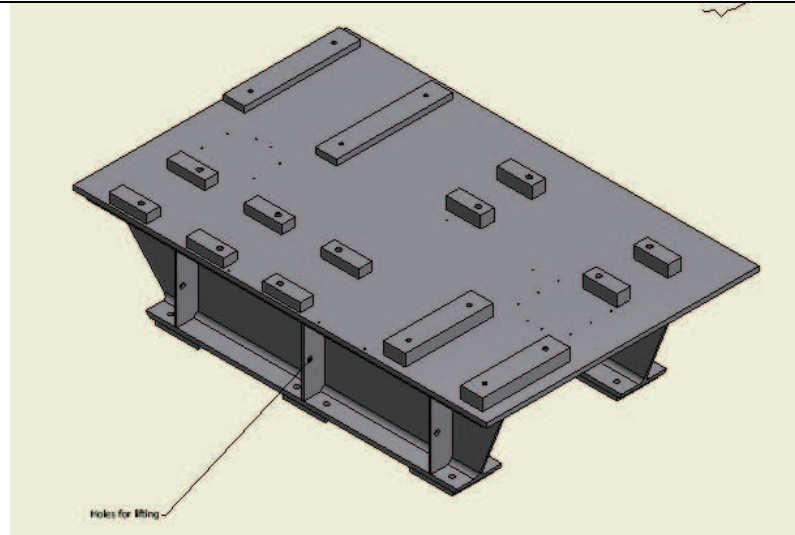
The machine is heavy pieces of steel fabrication and must therefore be treated cautiously when being unloaded and transported.

If you are in any doubt regarding safe lifting, seek advice from a specialist lifting company.

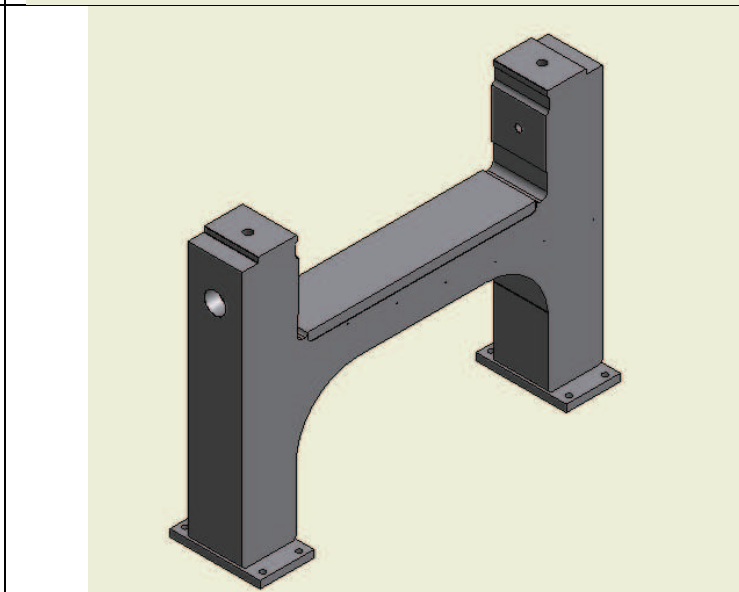
Figure 2

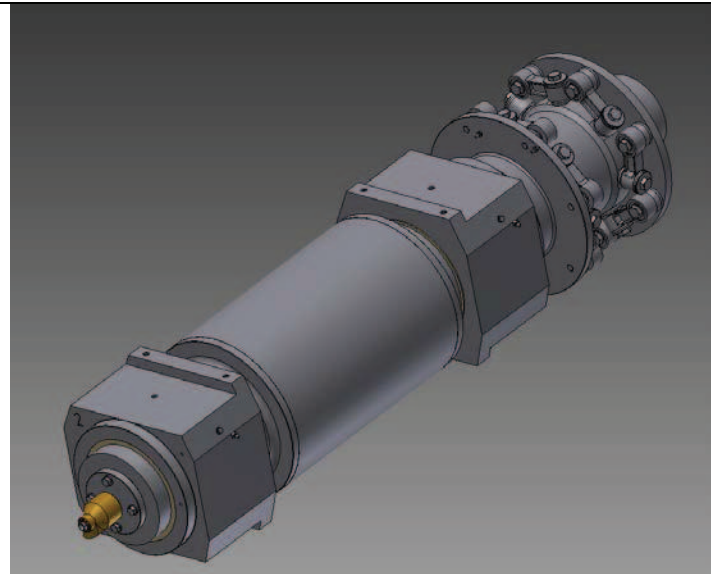


Motor Gear Console
Weight = appr. 3000
kg
Holes for lifting (See
drawing)



Support for Roller
2 pcs (not alike)
Weight = appr, 3000
kg
2 off M52x5 holes on
top
Or use fork lift

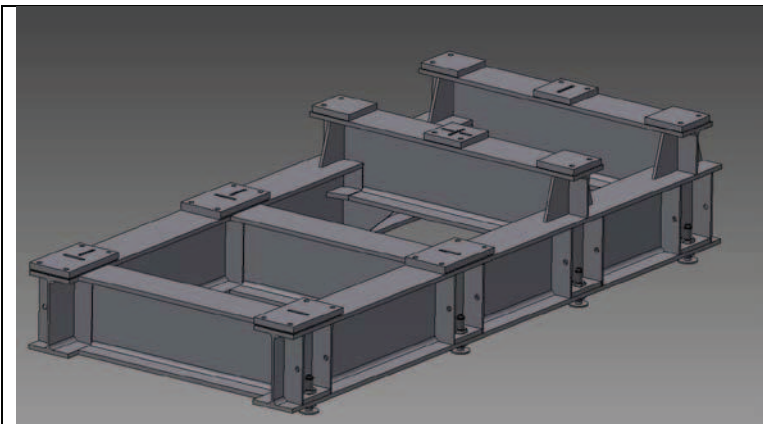


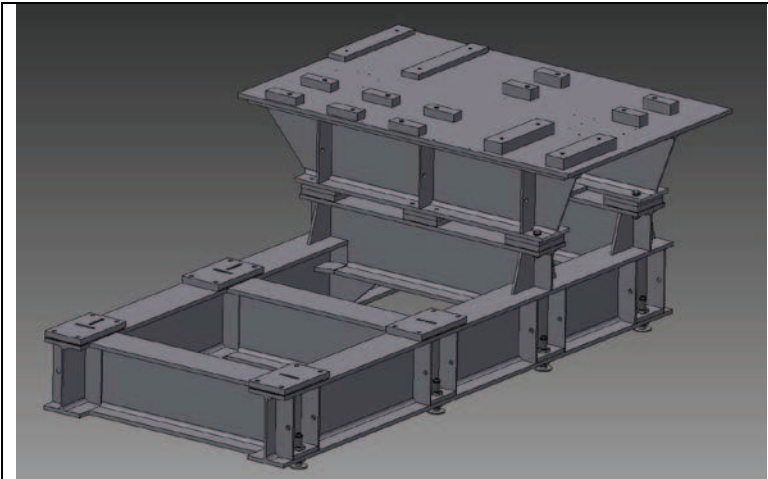
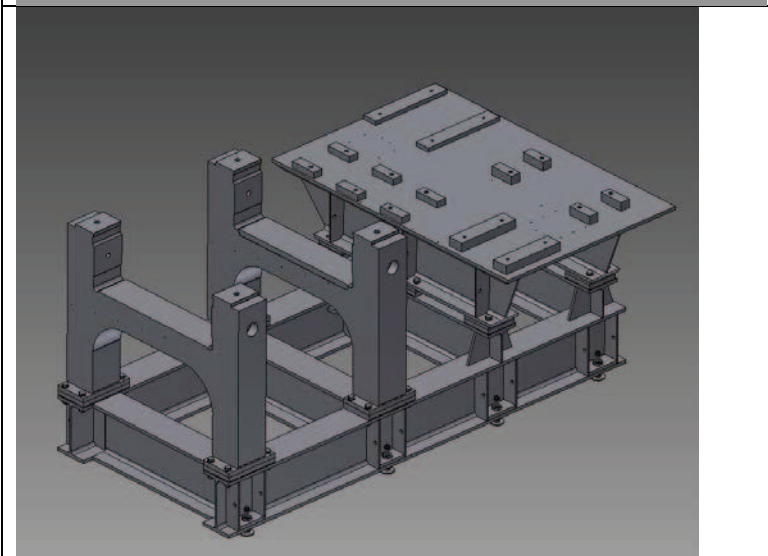
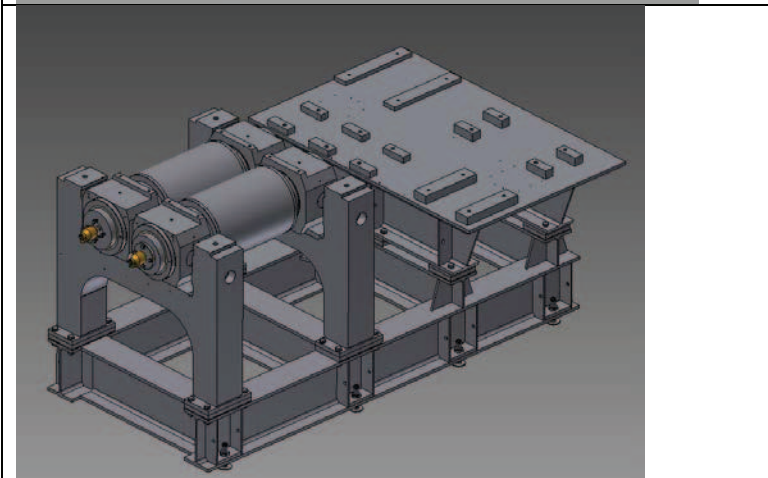
<p>Roller with bearing 2 Pcs (not alike) Weight = appr. 4100 kg/pcs</p>	
<p>Gear and motors: Big motor = 1800 kg Small motor = 900 kg Big gear = 1800 kg Small gear = 1300 kg</p>	

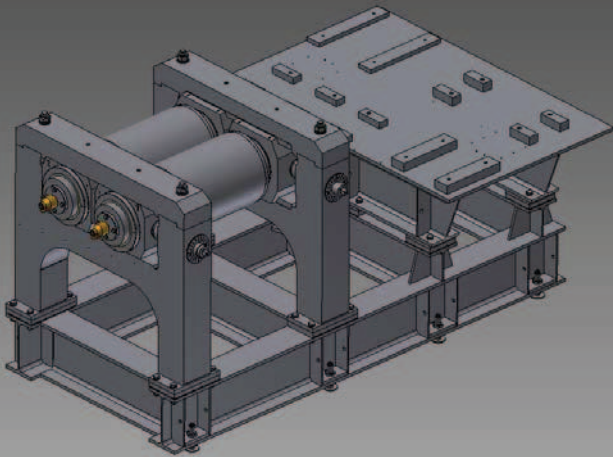
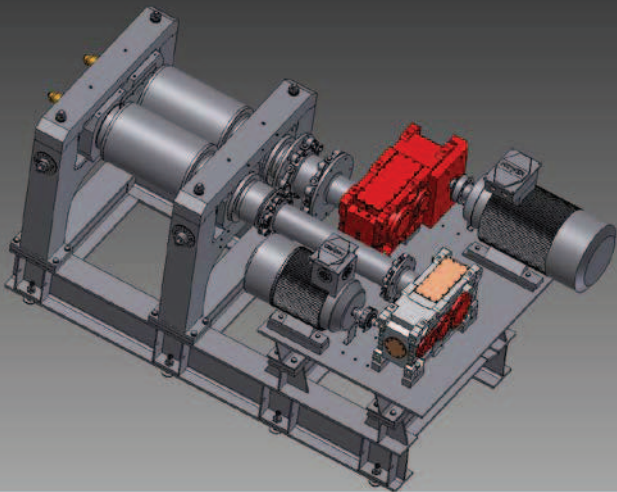
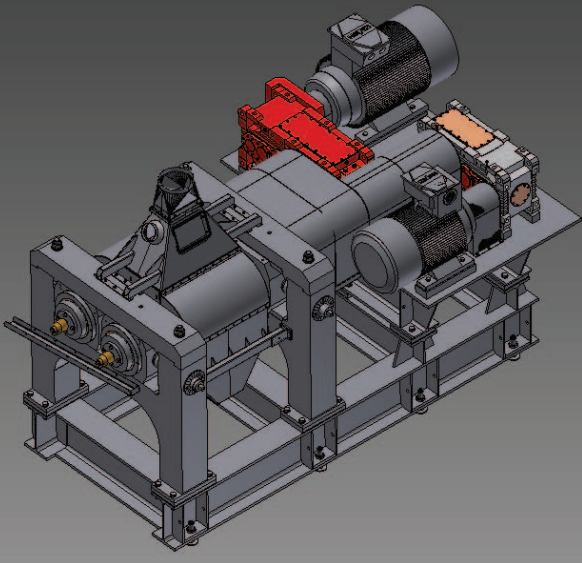
5.2. Recommended sequence for assembly

The sequence for assembling the CM900 can be seen in Figure 3.

Figure 3

	<p>Place the base for the CM900 on a flat and horizontal surface. By means of the machine feet the base is put into level. The evenness is checked by a appropriate measuring device (bubble level)</p>
--	---

	<p>Place the foundation for the drive onto the base. Tighten it with the M30 bolt and nuts</p>
	<p>Place the supports for the rollers and fix them with bolts and nuts</p>
	<p>Place the rollers with bearing and bearing housing onto the supports</p>

	<p>Mount the header for the supports</p>
	<p>Mount couplers, gears and motors</p>
	<p>Mount the hoppers and the safety guards.</p>

5.3 Dimensions and clearance needed for service and maintenance

To be able to carry out service and maintenance work on the machine in a safe manner a clearance of min. 1 meter around the machine is required.

5.4 Power and service details and requirements

Power supply necessary for mounting, servicing and operating the machine.

For electricity for several electrically driven tools and for lightening from mains a separate power supply will be required as the machine should be disconnected and locked when undertaking this kind of work.

5.5 Test before starting

It is essential that all guards and hatches are secured and tightened. Any foreign object between the rollers will cause damage of the rollers



The main switch must be turned off and locked before working on the machine.

5.6 Foundations

Under the machine a certain depth of reinforced concrete is necessary to avoid vibration damages etc.

Under this machine it is necessary to cast a foundation of reinforced concrete in depth of 400 mm. The foundation needs a supporting surface of compacted sandbasis.

6. OPERATION OF CRACKER MILL CM900

6.1. Precautions

It is essential that the lubricant system is working properly. Check that grease is reaching all 4 bearings.

Furthermore, it is important that the grease is of right quality. The machine is delivered with Grease Shell Gadus S2 V 220 2.

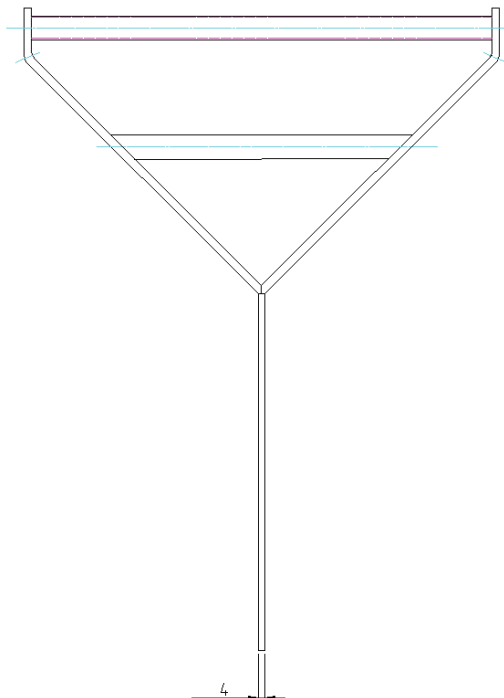
Verify that all safety guards are installed. Furthermore the cooling system should be ready.

Never operate the CM with the rolls un-parallel or in contact with each other.

6.2. Roll alignment - Initial start up

Check the motor rotation by “jogging” the motors.

Adjust the thrust screws to have the rollers as parallel as possible, and a distance of approximately 5 mm between them.



Above 2 distance tools (4 mm section) is placed between the rollers.

Using the thrust screws, the rolls are moved towards each other. If possible the 2 screws are operated at the same time. Otherwise each screws are turned only $\frac{1}{4}$ of a round at the time.

When the rollers touch the plate, only touch - not with load, the gauge at the screws are set to "0". After removing the distance tools, the rollers are parallel and with a distance of 4 mm. The thrust screws has a pitch of 4 mm / round, meaning after 1 round the rollers will have a distance of 0. After this operation the "0" point is defined.

Before the new CM900 can be loaded and run production, it has to be run at without and at low load for a while. This initial start up will prepare the slide bearings for the high load. If bearings later on is changed, the same initial start up has to be followed.

- Rolls are adjusted to distance 1 mm
- Roller speed is set to 55 rpm on fast roll and 8 rpm on slow roll
- Greasing is set to 1 shot per minute
- Open the supply of cooling water
- CM starts up, and runs for 10 h in this position

If the temperature has stabilized after 10 h, granulate can be added to the machine. It must be expected that the temperature on the fast roller bearings is higher (appr. 5°C) than on the slow.

Before adding granulate to the system, the speed should be reduced to 32 rpm resp. 3 rpm in order to keep the rollers covered with granulate

After 30 hours of production in this set up, and with stabile bearing temperature, the initial start up procedure is finalized.

6.3. Operation - production

The rollers are set to distance 0.

Open supply of cooling water.

Greasing is set to one shot per minute

Start up the machine and bring both rotors to equal rpm. Begin slowly (over 1-2 hours) to feed in material until a pile of material is laying over the rollers (500 mm) and covers the rollers completely.

Start increasing the ratio by slowing down the roller with the small motor. Try to optimize the current on the big motor. This should also reflect in optimizing the negative current on the small motor.

This setting is optimal regarding output capacity and power consumption.

Always monitor the temperature on the bearings. If a sudden rise in temperature happens on the bearings, stop the in feed material, and wait for temperature reduction until material input can be raised.

Typical roller speed for production of 30 mesh by input 0-4 mm granulate is 55 rpm/8 rpm.

If a single bearing starts to overheat, grease can manually be lead to this bearing.

6.4 Operation – shut down

The Cracker Mill should never be stopped when the motors are loaded.

Stop the infeed of material, and wait until the cracker mill is empty.

Keep the rollers running as well as the cooling water for a period of 2 hours, or until the rollers have reached ambient temperature.

The machine and the cooler can now be turned off.

7. MAINTENANCE

Bearings:

The bearings for the rollers are made from brass, and there functionality is very depending on continuously supply off grease from the integrated greasing system.

Daily check amount of grease in drum and check that all 4 bearings are greased automatically.

Gear boxes:

The gear boxes are provided with a pin for oil level control. Check the level once a month.

The oil should be changed first time after 500 h operation

See separate manual for gears

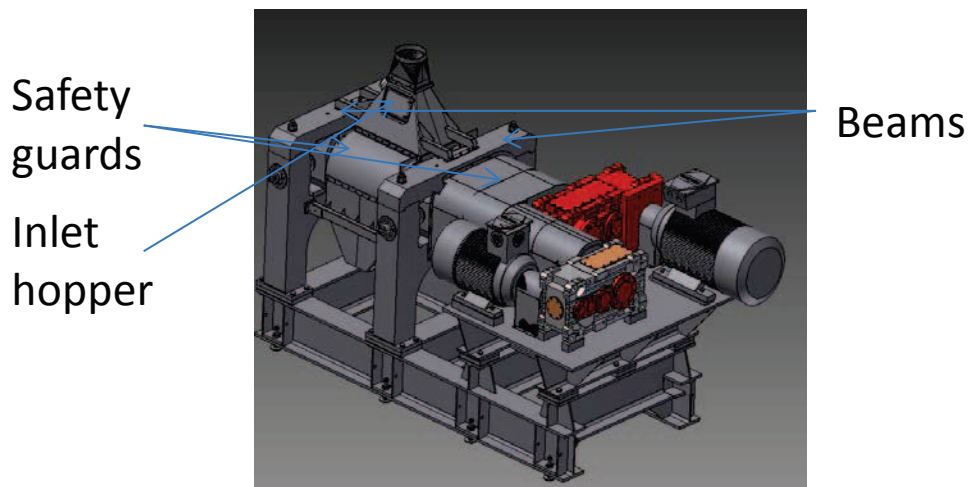
The bearings on the gear should be greased by means of the nipples on the gear. This should be done monthly.

See separate manual for gears.

Rollers:

Typically the roller should be removed and re furnished (grinding and profile milling) at least once a year, depending on production hours and load.

Before the rollers with bearings can be lifted out, guards, inlet hopper and beams over bearing housing has to be removed.



Remove the safety guard that covers the rollers and is mounted between the inlet and outlet hopper. When the 20 pcs of M8 screws are removed the guards are free and can be removed. 32 kg each

Remove the safety guards over the drive axles. (from gear to rollers)

Release the inlet hopper from its in feed device (screw conveyor) and the aspiration tube Ø160 mm. Furthermore the level sensor in the hopper should be removed.

The 2 x 6 M12 screws that is holding the inlet hopper can now be unscrewed and the hopper can be removed by means of a crane or fork lift (appr. 150 kg)

The beams over the bearing should be released for any hoses or cables. The 2 x 2 M52 nuts on top of the beams are removed by a 80 mm spanner. The beams are mounted with M30 eye bolts in the threads on top of the beams. The beams can now be lifted up and removed (900 kg each).

Before the rollers with bearing and bearing housings can be lifted they have to be liberated from the other equipment.

The long drive axle has to be supported by means of a 250 mm high wooden block or similar. Afterwards the 7 pcs of M20 bolts are removed and the axle can be liberated from the flange.

The short axle does not need to be supported. By removing the 7 pcs M24 bolts the axle is liberated.

The 2 thrust screws that is pressing the rollers together is turned backwards ... appr. 4 rounds, until the load pin in the bearings can be screwed out of the bearing (2 x 4 MK12 screws) and removed.

Greasing nipples and temperature sensors on each bearing housing are removed.

Bearing housing 2 and 4 are kept in place with a M36 bolt. These bolts are removed by a 55 mm spanner.

The 4 cooling water hoses are removed. The thin hoses can be removed by a 32 mm spanner and the thick with a 55 mm spanner.

The rollers with bearing housings can now be removed by installing 2 pcs M20 eye bolts in each housing. Weight is appr. 3500 kg per roller.

The rollers should be placed on a wooden surface and be prevented from rolling.

The cooling tubes can now be removed by after removing the 4 pcs M16 unbraco bolts in the end of each roller. When removing the tubes, water will probably come out.

The flanges for the drive axles are removed on both roller by removing the 10 UNC7/8 bolts.

Bearing housing with bearing van now be removed from the rollers. Weight of bearing and housing is appr. 250 kg.

The rollers are now ready for refurbishing.

8. Mounting of Rollers

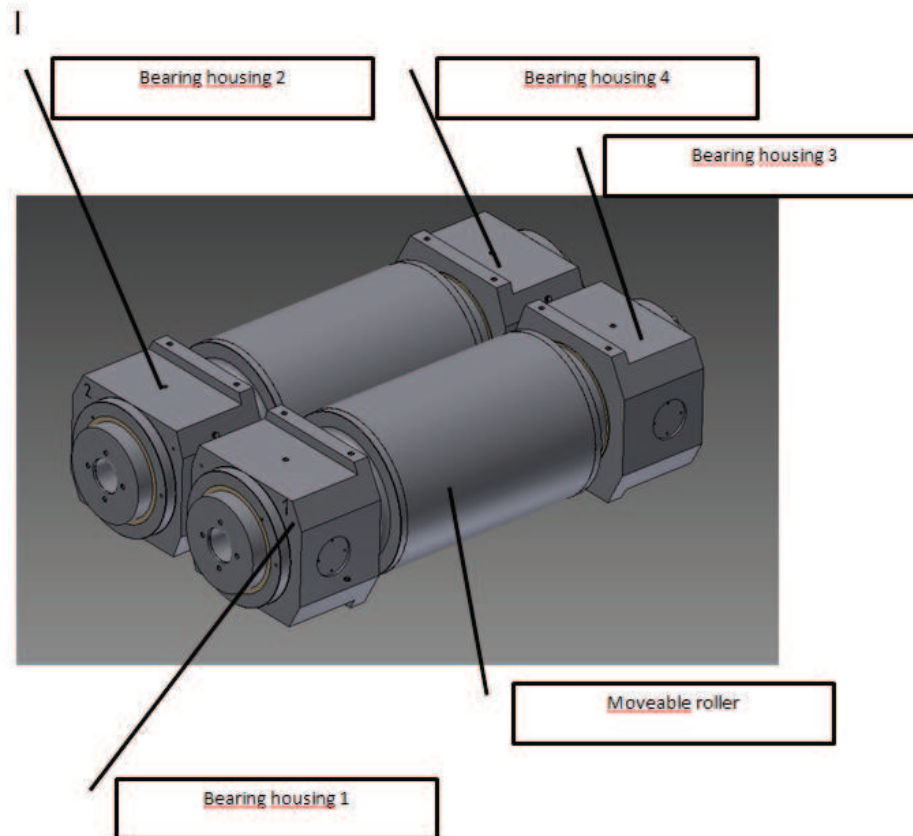
Before the rollers are mounted it very important, that the surface area for the bearings are totally free from dirt and rust. The clean surfaces are greased. Use the grease that meant for greasing during processing.

Mounting of rollers with bearing and bearing housing

The bearing housing with bearings are mounted on the rollers. Each bearing housing with bearing is unique.

Housing marked 1 and 3 on moveable roller and 2 and 4 on fixwe roller.

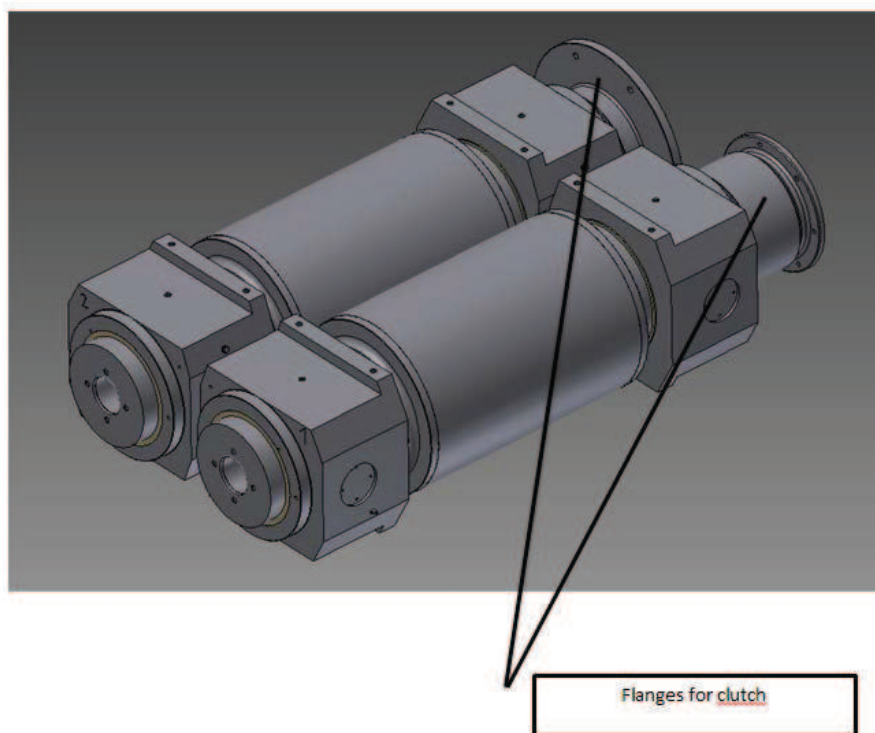
See below:



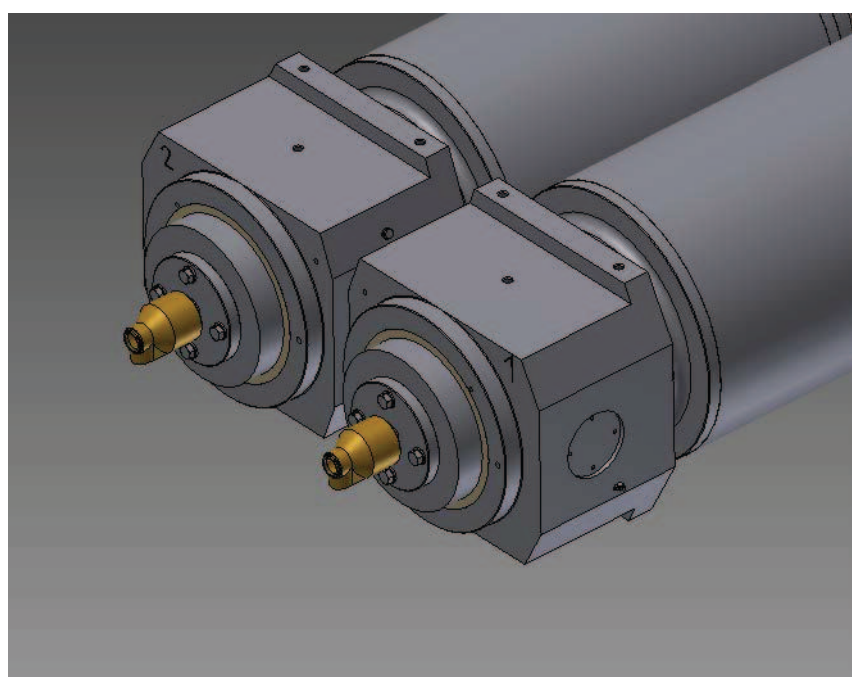
The bearing housing has a weight of appr. 250 kg each. The houses are lifted and positioned in front of the rollers and by moving the crane horizontal the bearing and housing is slid in over the rollers. See position on above sketch.

The 2 flanges for the clutch are now mounted. The 10 7/8" bolts are all tightened progressively to 765 Nm

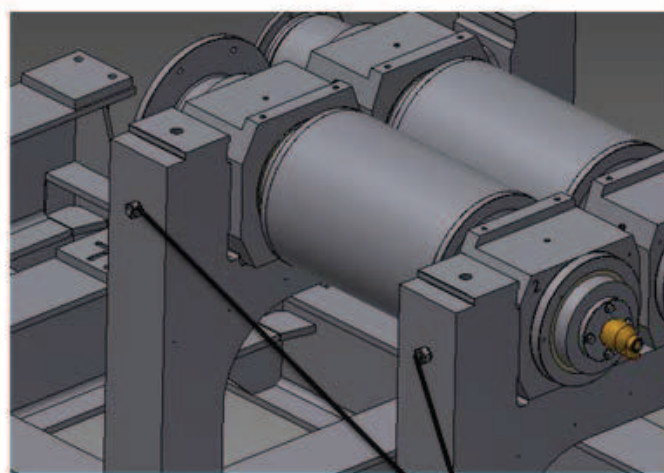
See below



Temperature sensors (1 in each housing) and the tubes/swivel for cooling water is now mounted:

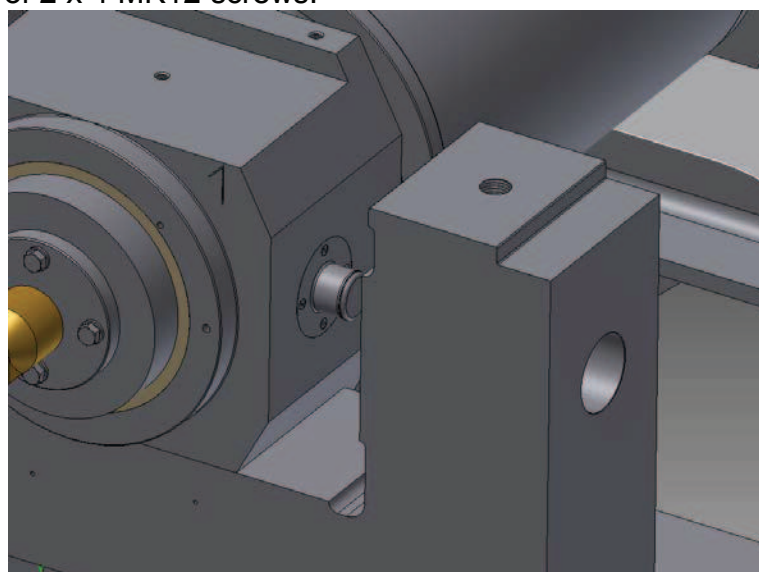


The rollers with bearing housing can now by means of a crane be placed on the brackets for the rollers.
Each roller has a weight of appr. 3500kg. Make sure that the seat for the bearing houses is clean. The greasing nipples are now screwed into on the bearing houses. Bearing house 2 and 4 are fastened by means of threaded bar and nuts M36. See below:

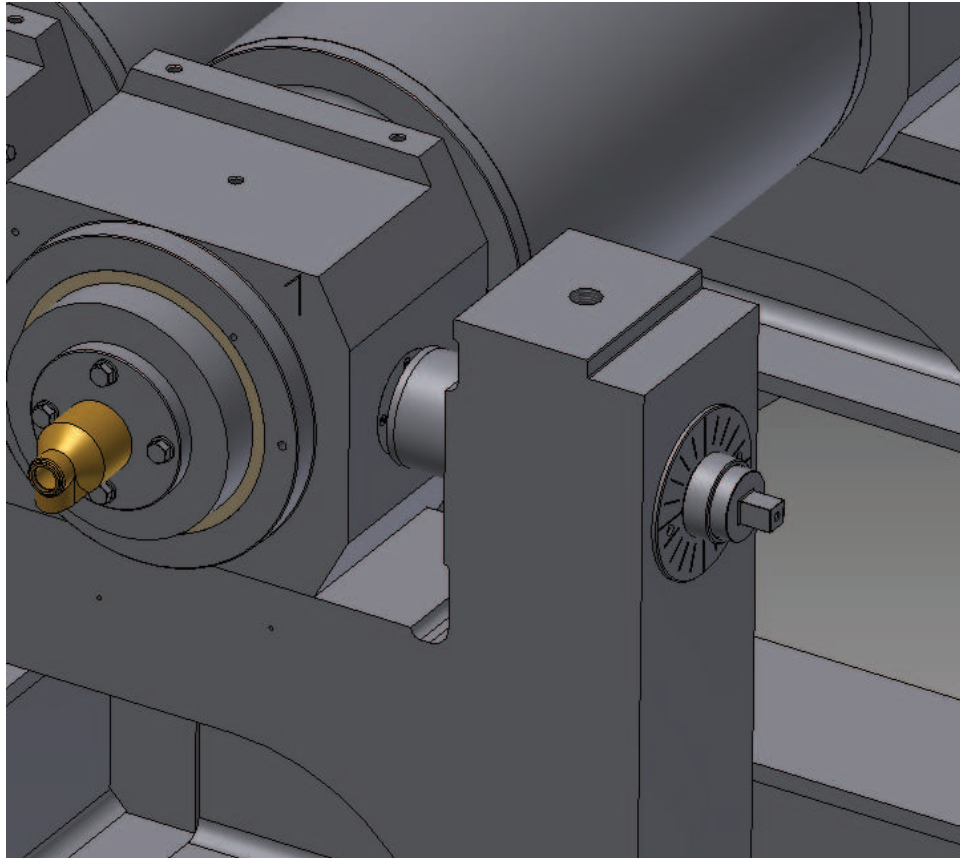


M36 for fixing bearing 2 and 4

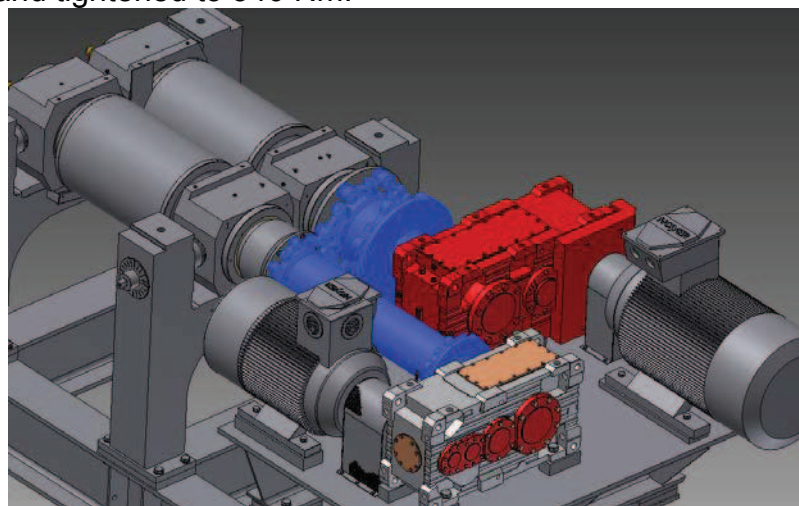
The pin on below picture is placed on bearing housing 1 and 3 by means of 2 x 4 MK12 screws:



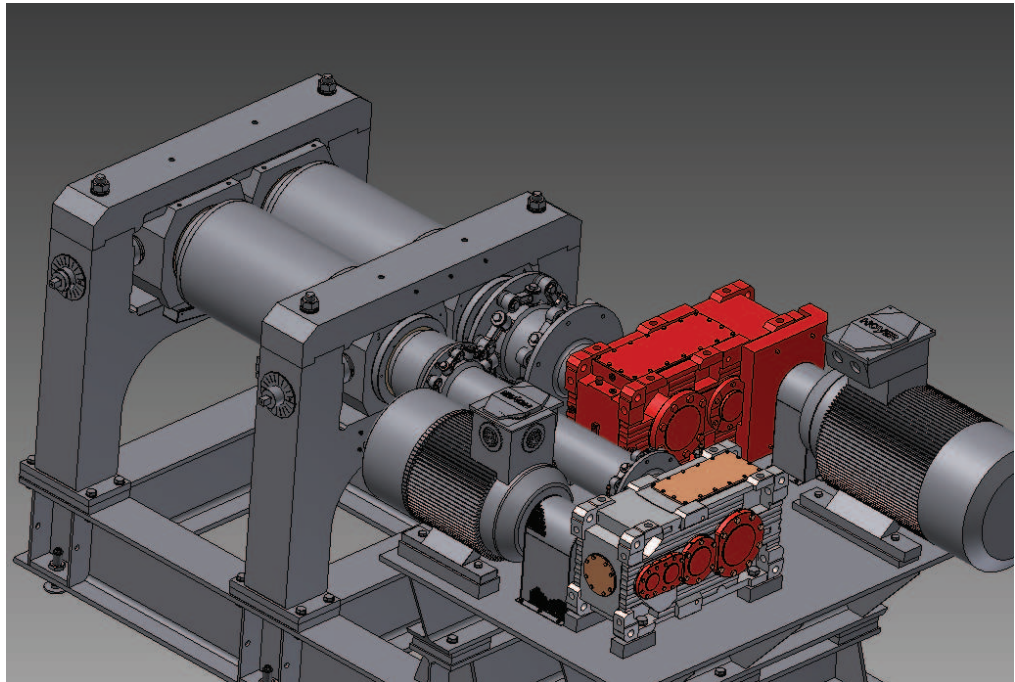
And the rest of the adjusting screw system is mounted loose (no tightening):



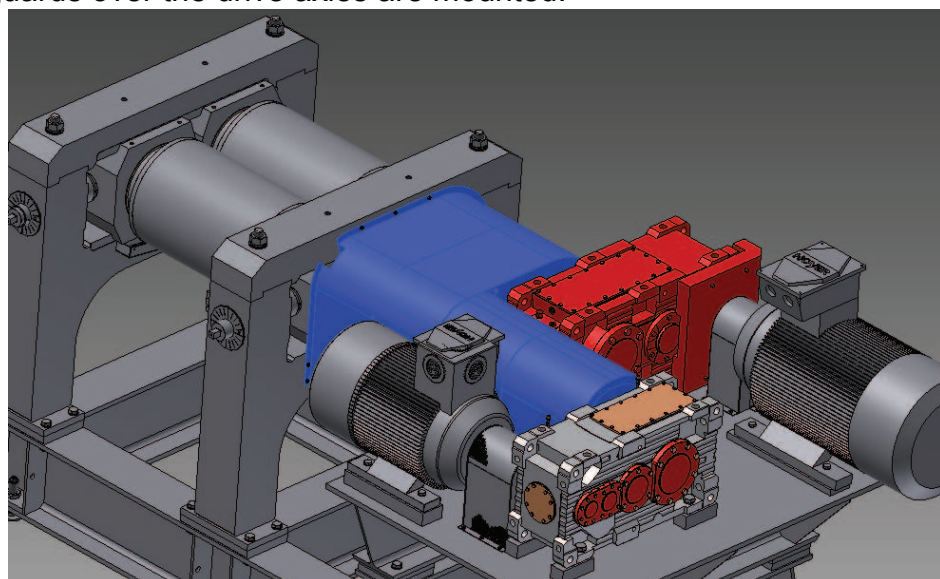
The long and the short drive axle are now mounted to the brackets of the rollers. The short axle is mounted by means of 7 pcs M24 bolts and tightened to 580 Nm. The long axle is mounted with 7 pcs M20 bolts and tightened to 340 Nm.



By means of M30 eye bolts, the upper beams (appr. 800 kg each) are lifted into place over the bearings. 2x2 pin bolts M52 is tightened into the lower support of the rollers, and the beams are fastened with M52 nuts with washers using a 80 mm spanner.



Grease hoses and cooling water hoses are mounted, and the safety guards over the drive axes are mounted:



9. DISPOSAL OF THE CRACKER MILL

By disposal of the Cracker Mill CM900 there is only a few environmental conditions which should be observed.

The oil should be drained off the gears

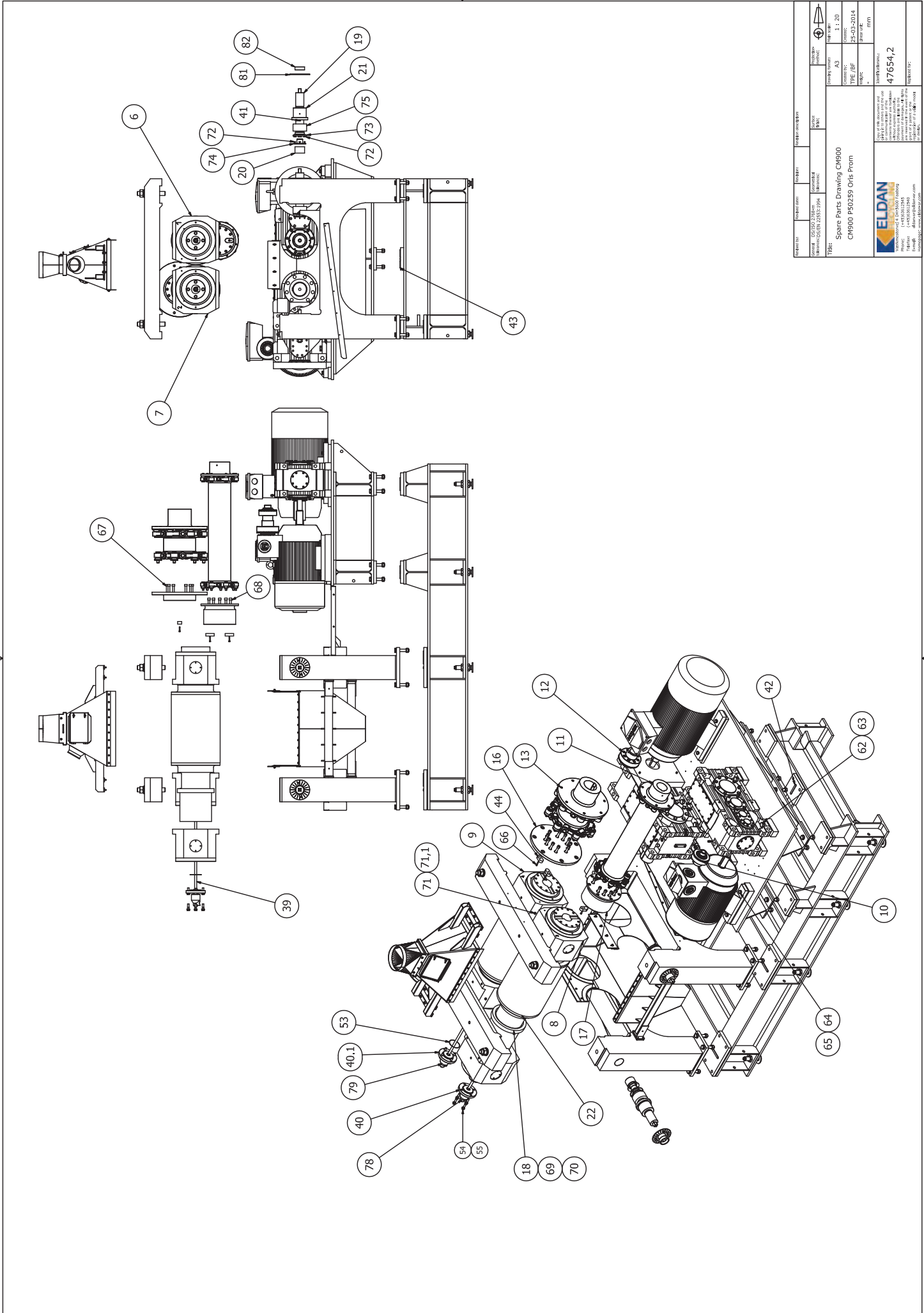
Gear Oil total appr. (140 l litres)

before the Cracker Mill is disposed of.

Name: CM900
 Drawing nr.: 47654
 Part No.: 47654
 Order No.: 50259

Pos. No.	Item	Description	Quantity	Unit
001	39915	Base frame - CM900	1,00	stk
002	39886	Support for CM900	1,00	stk
003	41475	Support for CM900	1,00	stk
004	39941	Motor/gear console	1,00	stk
005	39848	Bar	1,00	stk
006	39943	Bearing housing 1 - CM900	1,00	stk
007	41584	Bearing housing 2 - CM900	1,00	stk
008	41585	Bearing housing 3 - CM900	1,00	stk
009	41586	Bearing housing 4 - CM900	1,00	stk
010	41603	Clutch Centaflex	1,00	stk
011	41604	Clutch Centaflex	1,00	stk
012	41605	Clutch Centaflex	1,00	stk
013	41606	Clutch Centaflex	1,00	stk
014,1	45283	Electric motor 110 kW	1,00	stk
014c	41607	Helical gear	1,00	stk
015	41608	Helical gear	1,00	stk
015,1	45284	Electric motor 250 kW	1,00	stk
016	41433	Adapter for clutch	1,00	stk
017	41434	Adapter for clutch	1,00	stk
018	39944	Bearing for CM900	4,00	stk
019	41480	Threaded rod Tr100x4	2,00	stk
020	41465	Bushing $\varnothing 120/\varnothing 102 \times 80$	2,00	stk
021	41446	Helicoil TR100x4	2,00	stk
022	27202	Spare Roll for CM36" DD	2,00	stk
023	41627	Bolt M52x350	4,00	stk
024	41649	Nut M52 DIN 934 - 8.8 EL-Z	4,00	stk
025	41653	Spring washer $\varnothing 52$ DIN 128A EL-Z	4,00	stk
026	41654	Facet washer $\varnothing 52$ DIN 125B EL-Z	4,00	stk
027	41626	Threaded rod M36x400	2,00	stk
028	1721	Lock washer $\varnothing 36$ - Nordlock	2,00	Stk
029	1574	Nut M36 DIN 934 - kv. 8.8 EL-Z	2,00	Stk
030	41442	Adjustment bolt for base frame	8,00	stk
031	41666	Bolt M30*170 DIN 931 - 8.8 EL-Z	12,00	stk
032	1664	Facet washer $\varnothing 30$ DIN 125B EL-Z	12,00	Stk
033	1720	Lock washer $\varnothing 30$ - Nordlock	12,00	Stk
034	1570	Nut M30 DIN 934 - kv. 8.8 EL-Z	12,00	Stk
035	1279	Bolt M30*160 DIN 931 - kv. 8.8 EL-Z	16,00	Stk
036	1664	Facet washer $\varnothing 30$ DIN 125B EL-Z	16,00	Stk
037	1720	Lock washer $\varnothing 30$ - Nordlock	16,00	Stk
038	1570	Nut M30 DIN 934 - kv. 8.8 EL-Z	16,00	Stk
039	44254	Pipe $\varnothing 26 \times 2 \times 2000$	2,00	stk
040	44255	Flange/water cooling of roll	1,00	stk
040,1	45945	Flange/water cooling of roll	1,00	stk
040,2	48524	Adapter for flange	2,00	stk
040,3	44389	O-ring $\varnothing 135 \times 5$ Nitril, SH70	2,00	stk
041	4778	Grease nipple 1/8" 90°	2,00	Stk
042	44260	Parallel key 22*14*160 2*rundet	8,00	stk
043	16271	Paralel key 22x14x90	2,00	Stk
044	41728	Parallel key 50.8x32x105.8	4,00	stk
045	44271	Plate	3,00	stk
046	44318	Cover	1,00	stk
047	44319	Plate	2,00	stk
048	44320	Cover	1,00	stk
049	44336	Cover	1,00	stk

Pos. No.	Item	Description	Quantity	Unit
050	44351	Cover	1,00	stk
051	44362	Bottom plate for cover	1,00	stk
052	44383	Bar	1,00	stk
053	44389	O-ring ø135x5 Nitril, SH70	2,00	stk
054	44391	Screw UNC ¾x65 Cyl.Head 12.9	8,00	stk
055	1658	Facet washer ø20 DIN 125B EL-Z	8,00	Stk
056	1006	Set screw M8x20 DIN 933 - 8.8 EL-Z	24,00	Stk
057	1650	Facet washer ø8 DIN 125B EL-Z	24,00	Stk
058	1034	Set screw M10x20 DIN 933 - 8.8 EL-Z	12,00	Stk
059	1653	Facet washer ø10 DIN 125B EL-Z	12,00	Stk
060	1036	Set screw M10x25 DIN 933 - 8.8 EL-Z	7,00	Stk
061	1653	Facet washer ø10 DIN 125B EL-Z	7,00	Stk
062	10230	Set screw M36x100 DIN 933- 8.8 EL-Z	10,00	Stk
063	1721	Lock washer ø36 - Nordlock	10,00	Stk
064	1717	Lock washer ø24 - Nordlock	8,00	Stk
065	1142	Set screw M24x100 DIN 933 - 8.8 EL-Z	8,00	Stk
066	1351	Screw MC10x50 DIN 912 - kv. 12.9	4,00	Stk
067	44396	Screw UNC 7/8"x4.2" Cyl.Head. 12.9	10,00	stk
068	44397	Screw UNC 7/8"x9.2" Cyl.Head 12.9	10,00	stk
069	1342	Screw MC10x30 DIN 912 - kv. 12.9	4,00	Stk
070	1707	Lock washer ø10 - Nordlock	4,00	Stk
071	1051	Set screw M12x15 DIN 933 - 8.8 EL-Z	4,00	Stk
071,1	1654	Facet washer ø12 DIN 125B EL-Z	4,00	Stk
072	1456	Screw MK12x30 DIN 7991 - kv. 10.9	20,00	Stk
073	44399	Locking flange	2,00	stk
074	44402	Punch for securing	2,00	stk
075	44404	Lock bushing	2,00	stk
076	45096	Inlet hopper	1,00	stk
077	45145	Outlet hopper	1,00	stk
078	45752	Duoflow Rotating Unions D557-130-198	1,00	stk
079	45753	Duoflow Rotating Unions D557-130-199	1,00	stk
080	46099	Eye nut M8 DIN 582 EL-Z	10,00	stk
081	46139	Disc	2,00	stk
082	46141	Ring for disc	2,00	stk
083	46205	Cover for roller	1,00	stk
083.1	47990	Shield for roller	1,00	stk
084	1006	Set screw M8x20 DIN 933 - 8.8 EL-Z	10,00	Stk
085	1650	Facet washer ø8 DIN 125B EL-Z	10,00	Stk
086	1705	Lock washer ø8 - Nordlock	10,00	Stk
087	48726	Part of locking flange	2,00	stk
100	45743	Ratchet spanner 41 BV 36	2,00	stk
100	46041	Grease Gadus S2 V 220 2	180,00	kg
101	46042	Oil Omala S2 G320 - Gear	209,00	l



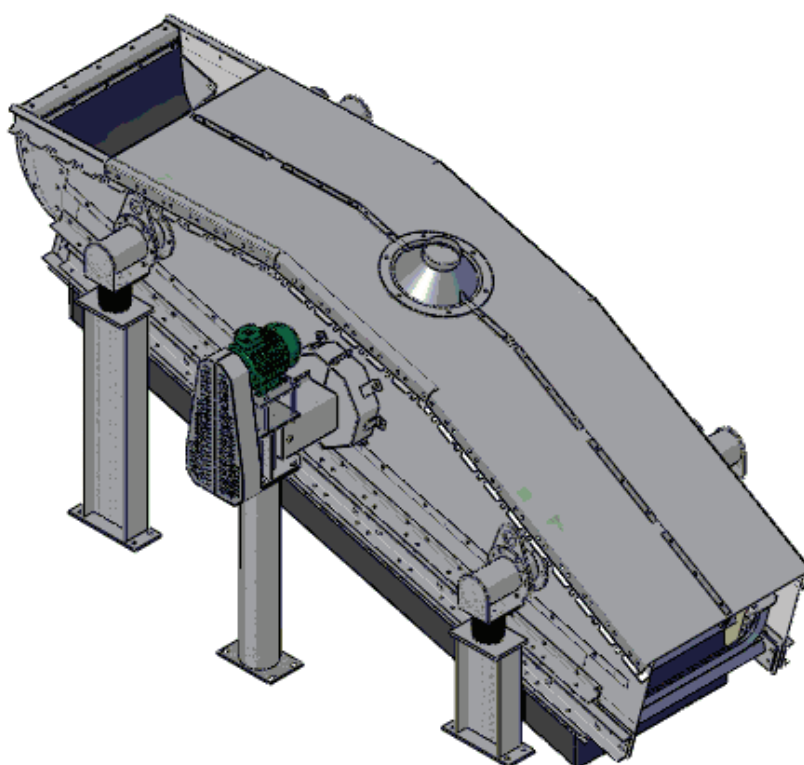
Part No:	Part Name:	Rev:	Scale:	Unit:
020102220000	CH900	01	1:1	mm
020102220000	CH900	01	1:1	mm
Title:				
Spare Parts Drawing CH900				
CH900 P50259 Oris Prom				
Drawn by:	Checked by:	Approved by:	Scale:	Unit:
AS			1:1	mm
TRF / BF	25-03-2014			
020102220000	020102220000	020102220000	020102220000	020102220000
ELDAN S.p.A. - Via S. Maria 10 - 37060 San Giovanni Lupatoto (PD) - Italy Tel: +39 049 9200000 - Fax: +39 049 9200001 Email: info@eldan.com - www.eldan.com				
Part No: 47654,2 Description:				

Operating instruction manual

SCREENING MACHINE “BIVITEC”

Type: KR / KRL / KRLI / KRLV / KRV

(Translation of the German original)



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February 2010

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REVISION HISTORY

Issue date – October 2005

Incorporation of results of risk analysis – February 2010

1 GENERAL INFORMATION

1.1 Copyright

Copyright © 2010 Binder+Co AG Gleisdorf, all rights reserved.

The contents of this publication may not be reproduced or passed on to third parties in part or in its entirety in any form without previous written approval.

1.2 Manufacturer

Manufactured by:

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Fax: +43 - 3112 - 800 - 400

E-Mail: service@binder-co.at

1.3 Purpose of this manual

This operating manual is for all operators, providing them with the necessary information for the machine's operation and maintenance.

It contains important **warning and safety instructions** which must be observed by the user. Various operating and maintenance procedures are described in this manual – the figures serve to illustrate these procedures and are only examples.

This manual is to be kept permanently accessible at the place of installation of the machine. It also contains additional information about the maintenance work that must be carried out at certain intervals.

We request you to strictly adhere to the following instructions for operation and maintenance.

The manufacturer's liability of any kind is invalidated if these operating instructions are not observed.

1.4 User

The operating instructions are intended for qualified, instructed and trained staff who are responsible for the technical work on the machine and service.

1.5 Translation

If there are discrepancies in the translated text, the original of the operating manual (German) should be consulted for clarification or the manufacturer should be contacted.

1.6 Proper Use

The machine has been manufactured according to recognised safety-technical regulations. Nevertheless, danger to the life and limb of the user or third parties or impairment of the plant and other property can arise during its use.

The machine is designed exclusively for the operating data quoted by the purchaser and included in the datasheets. The maximum operating data is the quoted concession data. Different use or use which exceeds the above, such as the use of different media or operating at overload, are designated non-intended use. The manufacturer is not liable for damage resulting from this. The risk is entirely that of the operator.

Use for any other purpose, or use in any other way will be considered inappropriate and will invalidate any warranty claims. See also the supplementary relevant contractual stipulations.

Intended use includes the complete reading of this operating instruction manual and the compliance with all instructions included therein - in particular the safety instructions. It also means carrying out all inspection and maintenance work at the specified intervals.

If the machine is not operated in compliance with this stipulation, then safe operation cannot be guaranteed.

For all personal injury and material damage arising from non-intended use, the operator, not the manufacturer, is exclusively and fully responsible!

The safety, operational and maintenance instructions listed in the documentation referring to the individual components must be taken into account.

If more detailed information is required or if special problems arise, which are not addressed in this description, Binder+Co or the commissioned maintenance personnel must be contacted immediately in order to acquire additional information.

The machine is not for the manufacture or processing of foodstuffs. The machine must not be operated in explosive atmospheres. No flammable or explosive materials must be processed in the machine.

1.7 Qualified personnel

The machine may only be operated by qualified personnel who have reached the legally-stipulated age. They must be familiar with all the warnings in accordance with operating regulation.

Qualified personnel are persons who, due to their training, experience, education and knowledge of the standards, regulations and operating conditions, have been appointed by those responsible for plant safety to perform the required duties, and who know how to identify potential dangers and take measures to prevent them. (Definition as stated in IEC 364)

Persons who are concerned with the transport, installation, commissioning, operation and maintenance of the machine/plant must have read and understood the operating instruction manual, in particular the chapter covering safety, operation, safety instructions for relevant activities, and the component suppliers.

The machine may only be installed, operated, maintained and serviced by trained, instructed and authorised persons. You must make sure that only the personnel commissioned to do so are active on the machine!

Only suitably trained and qualified persons who have instructed appropriately concerning the possible health and safety risks may have access to the machine.

Recently employed personnel in education, training or instruction may only operate and service the machine themselves after adequate theoretical instruction and under the supervision of an experienced person.

Expert personnel evidenced by (e.g.):

- Welders with testing in accordance with EN 287-1
- Expert personnel for hydraulic and pneumatic work in accordance with EN 982 and EN 983
- Qualified experts with experience in the field of heating power stations
- Certified electricians as defined in EN 60204-1
- Qualified personnel for programming safety-related (E/E/EP) electrical/electronic/programmable electronic systems as defined in EN 61508-3
- Personnel with appropriate competence for working on pressurised devices as defined in pressure equipment directive 97/23/EG
- Persons authorised to work with radiation sources as defined in national regulations
- Chemical officer for the use of dangerous fluids and chemicals

1.8 Disposal

The operator is responsible for the disposal of the components of the machine in accordance with the legal regulations. The environmental guidelines of the specific country must be observed.

1.9 Warranty and liability

The machine may only be used and operated by personnel who possess the qualifications necessary to comply with the required safety measures during use and operation. In addition, the personnel must have studied and understood the contents of this operating manual.

The machine must only be operated with the accessories and expendable items supplied or approved by us.

All warranty and liability claims pertaining to personal injuries and material damage shall be ruled out if they can be attributed to one or more of the following causes:

- Unintended or any use of the machine for other than that defined in 'Intended use'
- Conveying materials other than the specified materials and hazardous materials
- Inappropriate operation, operational faults, inappropriate maintenance and repair of the machine or parts thereof
- Operating the machine with defective safety equipment or improperly fitted or non-functioning safety and protection equipment, and with safety equipment not incorporated into the safety system
- Non-observance of the operating instruction manual
- Non-compliance with the instructions in the operating manual regarding operating, maintaining and repairing the machine
- Unilateral constructional modifications and changes to the machine
- Unauthorised changes have been made to functional parameters
- Insufficient inspection of plant components subject to wear and tear
- Improper repairs
- Major disasters due to the effects of foreign bodies or force majeure
- Damage caused by the use of non-genuine spare parts and accessories

We reserve the right to make technical changes within the framework of further development of the machine referred to in this operating instructions. Thus, no claims can be based on the details and specifications of these operating instructions. These should be considered as guidelines, and in no way affect the care to be taken when using the machine.

We would like to stress that any spare parts and accessories not supplied by us were also not tested or approved by us. In exceptional cases, we may approve the installation of such components. In this case, permission is always given in writing and must be obtained before use!

In certain circumstances, the installation and use of third party products can adversely affect the structural characteristics of the machine, or damage the machine, or affect the safety of personnel, machine or other property.

2 SAFETY

2.1 Introduction

A significant aspect when operating machines is accident prevention. The operator must be informed about the possible dangers when operating the plant. In order to prevent any dangers, it is essential to follow the safety instructions given in the operating manual.

Besides the operational safety instructions mentioned below, you should also pay attention to the general as well as the safety and accident prevention regulations on-site.

In addition, the legal safety regulations, accident prevention regulations, and special trade regulations should be followed in all cases.

The applicable regulations applicable in the country where the machine is erected must always be complied with.

Before the start of operations, it should be ensured that each person assigned with the transport, storage, installation, operation and maintenance of the machine has read and understood these operating instructions.


The machine has been constructed according to the most current technical standards and is operationally safe. However, it can present hazards if it is operated improperly by uninstructed personnel.





Before the first commissioning, the operator of the machine is bound to assure the safety condition of the machine including its safety installations. This inspection must also be carried out at regular intervals during operation. Faults and unintended changes in the machine and any defects that occur must be corrected immediately.

The on-site safety officers and the installation management must be consulted.

The buyer, operator and owner are responsible for ensuring that the plant, machines and components produced and supplied by Binder+Co are operated and maintained in such a way that they comply with the legislation on health and safety at work, all national and local legal regulations and directives, and the national safety standards.

2.2 Explanation of signs and instructions

Pictogram	SIGNAL WORD
	<p>Nature and source of the danger</p> <p>Possible consequence(s) of non-observance.</p> <ul style="list-style-type: none"> • Measure(s) to deflect the danger.



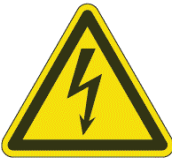


Pictogram	Signal word	Meaning
Example:  General danger	DANGER	Immediate threatening danger for people. If this danger is not avoided, death or severe injury can result.
 Specific danger e.g. electric shock	WARNING	Possible dangerous situation for people. If this situation is not avoided, death or severe injury may result.
 Specific danger e.g. electric shock	CAUTION	Possibly damaging situation for the plant or the surroundings of the plant. If this situation is not avoided, the plant or something in the surroundings of the plant could be damaged.
	ATTENTION	Instruction or useful information regarding use of the.


2.3 Danger symbols and warning instructions

Instruction, warning and prohibition signs must be observed and followed.

They must be checked for legibility and completeness at regular intervals and must not be removed.


The following information, warning, and prohibition signs are attached to the machine:

		Where attached	How often
	“Danger of being drawn in”	Guard cover on the V-belt drive on the drive unit	1x
	“Protective covers should not be removed”	Protection covers over the drive unit	6x
	Warning of dangerous voltage! Death or serious injuries	Motor terminal box	1x
	Warning! Trip hazard!	Inspection doors - on multi-deck machines	1x
	“Warning - danger of hand injuries”	Inspection doors - on multi-deck machines	1x

WARNING	
	Danger points not identified and illegible information signs!
	<p>Injuries, death, damage.</p> <ul style="list-style-type: none"> • Mark the danger points using danger or instruction signs! • Keep the danger and instruction signs in a legible condition by cleaning! • Replace signs which are illegible!

2.4 Safety information

2.4.1 General safety information

DANGER	
	<p>Failure to follow safety instructions.</p> <p>Death or serious injuries</p> <ul style="list-style-type: none">• Follow the safety instructions.• Before start-up, read the operating manual!• Keep the operating instruction manual close to the machine!• Observe the safety instructions on the machine and in the operating instruction manual!• Clean the safety instructions on the machine!• Replace safety signs that have become illegible by new ones!

- The machine should be operated only when fully assembled, with all accessories (original condition).
- If abnormal changes are noticed in the original condition, they must be reported by the operator to the responsible authority.
- Unauthorised modifications and changes to the machine by the operator that affect the safety of the machine are not allowed and discharges Binder+Co AG from any liability.
- The machine must be examined once per shift for externally identifiable damage and defects.
- Appropriate personal protective equipment (e.g. safety gloves, protective goggles, dust respirator, safety shoes etc.) are always to be used when cleaning and maintaining the machine.
- After maintenance and repair work the operator is obliged to make sure that the machine, including its safety equipment, is in a proper condition.

2.4.2 Personal responsibility


- The responsibilities of personnel must be clearly defined for transport, storage, assembly, start-up, operation and maintenance, so that safety is not affected when they are handling the machine.

2.4.3 Safety information regarding transport, assembly, start-up

- The plant/machine should be transported and set up using suitable equipment only (hoist, lifting device).
- It is forbidden to stand under suspended loads!
- The machine should be installed in such a way as to provide room for repair and servicing work. Good accessibility via ladders and platforms must be guaranteed.
- The entire machine, including its safety devices, is to be checked before the initial start-up.


2.4.4 Safety instructions during operation

The machine may only be operated with properly mounted, functional safety and protection equipment. The safety devices must not be dismantled or made ineffective.

	DANGER
	<p>Danger from unexpectedly wide swing-out during start-up and run-out! Death or serious injuries</p> <ul style="list-style-type: none"> • Never reach into the open spaces between firmly fixed and vibrating components while the machine is in operation! • There is risk of injury during the start up phase and, especially, the shutdown stage due to greater oscillation amplitudes!


2.4.5 Noise hazards

- The noise protection insulation devices attached to the plant must be kept in place during operation.

	WARNING
	<p>Noise emission from the material being sieved! Hearing damage, deafness.</p> <ul style="list-style-type: none"> • Wear ear protection where the noise emission is > 80 dB(A)!

- When exceeding the maximum statutory sound levels, relevant protective equipment should be used to avoid impairing hearing.

2.4.6 Danger from product dust

WARNING	
	<p>Product dust being emitted!</p> <p>Danger to health by excessive aspiration of dust.</p> <ul style="list-style-type: none">• The details of the product to be processed in the safety datasheet must be observed!• Use personal protection equipment (dust respirator mask)!

2.4.7 Dangers due to residual energy

You must take account of the fact that, even after switching off or when the plant is at a standstill, various forms of energy could be present in certain machine parts - such as, for example:

- in machine parts that are raised or running down
- in power lines


2.4.8 Working on electrical equipment

- All electrical work must only be carried out by trained and authorised electricians in accordance with the latest standard.
- Where specified, plant components on which inspections, maintenance or repairs are to be carried out, must be de-energised (safely disconnected from the power supply). The disconnected components must first be checked to ensure they are free of voltage, then grounded and short-circuited. Any adjacent parts which are at voltage must be insulated!
- Electrical equipment must be checked regularly (earthing measures, etc.). Loose connections must be retightened, damaged lines and cables should be replaced immediately.
- The electrical connections must be adequately protected. If the insulation of the connecting cable is damaged and if the cover of the terminal box at the drive motors is missing, there is danger of death due to electric shock.
- The switchgear cabinet and all electricity supply units should be kept closed at all times. Access should be allowed only for authorised personnel, using a key or special tool.
- When carrying out any work of current-conducting plant components or lines there must always be a second person present who can switch off the main switch in the event of an emergency.
- Electrical equipment should never be cleaned with water or similar fluids.

2.4.9 Safety instructions for special operating conditions

- Certain specific electronic switching processes are affected negatively in their functionality by dust, smoke and moisture. The safety of the machine is affected by this. Dust, smoke and moisture must be kept away from machine parts, as far as possible, that are sensitive to these factors.
- Fluids should not be allowed to get into electrical or electronic components. If this does happen, however, an expert technician must immediately separate the affected component from the mains and perfect function must be checked. If there is any doubt concerning the functionality of the component it must be replaced by a new part.

2.4.10 Safety devices / machine protection

DANGER	
	<p>Danger arising from missing or incorrectly fitted safety equipment (e.g. inspection apertures, protection covers, out-of-balance exciters or drive unit)!</p> <p>Death or serious injuries</p> <ul style="list-style-type: none">• The safety equipment on the machine must not be modified, covered, removed or otherwise taken out of commission or it must not have its functional efficiency influenced negatively!

- Repair and maintenance work on safety equipment must only be carried out with the agreement (release for work) of the operation management and by approved expert personnel.
- The safety devices must not be dismantled or decommissioned.
- Inspections of the safety devices should be scheduled (at least once per year), and after inspection they should also be checked to ensure they are working correctly.
- Appropriate personal protective equipment (e.g. safety gloves, protective goggles, dust respirator, safety shoes etc.) are always to be used when cleaning and maintaining the machine.
- The material feed must be securely isolated during the repair work!


2.4.11 Sprinkling (optional)

- In the case of sprinkling the customer must provide an isolating element (e.g. isolating ball-cock in the water supply to the sprinkler).


2.4.12 Other dangers

- You must take care to ensure cleanliness at the workplace.
- Escape routes must not be blocked (e.g. by storage of objects).
- You must observe the transport instructions issued by the manufacturer.
- Use the slinging points stipulated by the manufacturer.
- Adequate lighting (hand lamps) must be provided for repair work and maintenance work.
- Care must be taken to wear personal protection equipment (e.g. protection cap in accordance with EN 812, safety shoes in accordance with EN ISO 20345-346, etc.).


2.4.13 External persons


WARNING	
	<p>Unauthorised persons! Injuries, death, damage.</p> <ul style="list-style-type: none">• Keep unauthorised persons away from the machine!• Affix prohibition sign “Access prohibited to unauthorised persons”!

2.5 Machine-Related Safety Information

	DANGER
	<p>Danger from slipping, tripping and falling over during service and maintenance work in the machine!</p> <p>Death or serious injuries</p> <ul style="list-style-type: none"> • Chutes/hoppers underneath must be covered! • The service and maintenance personnel must be secured by means of safety belts or safety harnesses.

There is risk of injury during the start up phase and, especially, the shutdown stage of the machine due to greater vibration amplitudes!

	DANGER
	<p>Accessing unprotected danger zone!</p> <p>Death or serious injuries</p> <ul style="list-style-type: none"> • Never reach into the open spaces between firmly fixed and vibrating components while the machine is in operation!

	CAUTION!
	<p>Operating the machine without sieve mats!</p> <p>Operating without sieve mat results in a higher vibration amplitude and mechanical destruction of the rubber block</p> <ul style="list-style-type: none"> • The machine should only be operated with fitted sieve mats! <p>Changes to the oscillation system!</p> <p>Damage to plant components</p> <ul style="list-style-type: none"> • Changes to the vibration system must only be carried out by trained personnel from Binder + Co AG or under their special instruction!

2.6 Safety and protective equipment

The following safety devices and protective equipment are mounted on the machine and must not be dismantled or decommissioned:


- Protective coverings for the unbalance masses
- Protective coverings for cardan shaft and v-belt

2.7 Safety instructions


The machine must only be put into operation by those people who were trained beforehand, instructed and authorised accordingly.

Moreover, the operator is also bound to instruct new operational and maintenance personnel, stressing on the explanation of all security information.


Personnel instruction must also be appropriately recorded.


WARNING	
	<p>Work by untrained personnel!</p> <p>Injuries, death, damage caused by inappropriate activities.</p> <ul style="list-style-type: none"> • Work on the plant only by qualified and experienced personnel! • Inform personnel about the machine functions, safety regulations and residual risks! • Newly hired personnel must be trained!

In addition to the operating instruction manual and the binding applicable regulations in the country of use and at the site of installation concerning accident prevention, the recognised technical regulations for safe and technically correct working must be observed.

CAUTION!	
	<p>Follow the national safety regulations!</p> <p>There could be regulations in your state which are not listed in the operating instruction manual.</p> <ul style="list-style-type: none"> • Observe the official regulations applicable in your state before commissioning!




The operating manual contains important information that allows safe and economic operation.

DANGER	
	<p>The operating instruction manual must be continuously available at the site of installation!</p> <p>Death, severe injury, damage to the machine.</p> <ul style="list-style-type: none"> • Arrange an easily-accessible location for the operating instruction manual!

DANGER	
	<p>Observe the operating instruction manual for bought-out parts!</p> <p>Death, severe injury, damage to the machine.</p> <ul style="list-style-type: none"> • Observe the operating instruction manuals for bought-out items!

2.8 Residual risks

The following residual risks must be taken into account during intended and technically-correct use:

	<p style="text-align: center;">DANGER</p> <p>Operating the plant when bridging out the EMERGENCY STOP!</p> <p>Death or serious injuries</p> <ul style="list-style-type: none">• EMERGENCY STOP function of the plant must not be bridged out!• The machine must be incorporated in the EMERGENCY STOP chain of the plant!
	<p style="text-align: center;">DANGER</p> <p>Missing, defective or bridged-out safety equipment and machine parts!</p> <p>Death or serious injuries</p> <ul style="list-style-type: none">• Function of the safety equipment to be checked at regular intervals!• Replace faulty safety device and plant components immediately!
	<p style="text-align: center;">DANGER</p> <p>Switching on by unauthorised or untrained persons!</p> <p>Death or serious injuries</p> <ul style="list-style-type: none">• The machine must be secured using lockable switches!

3 DESCRIPTION OF MACHINE

3.1 Technical Description

This operating instruction manual describes a frequently manufactured execution variant of the BIVITEC sieve machine. You will find, below, a list of other execution variants.

3.1.1 Versions

- Type KR, KRL, KRLI / KRLV / KRV
- Standard
- “Banana”
- with / without sprinkler system
- with / without covering sheet / dust hood

3.1.2 Screening area

- Oxhorn
- Standard
- Single deck
- Double deck
- Two and a half deck
- Triple deck
- Four deck

3.1.3 Built-in components

- Sieve mats
- Screen covering
- Perforated sheets
- Bar grates
- Wear plates
- False floor

3.1.4 Drives

- Unbalance drive
 - Grease lubrication
 - Oil lubrication
- Double unbalance drive
 - Grease lubrication
 - Oil lubrication

3.2 Functional description

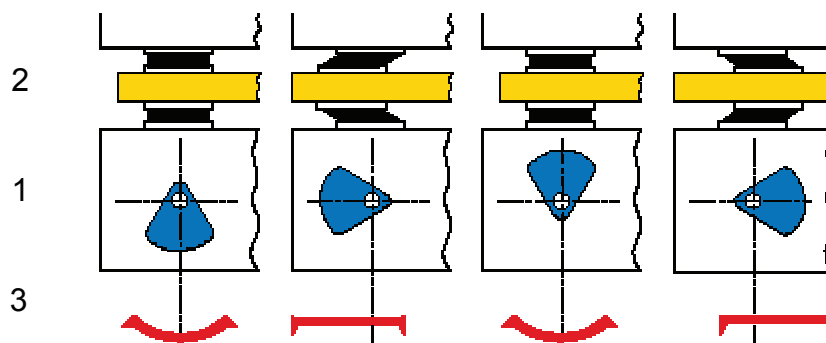
In order to ensure the function of the screening, considerably more acceleration rates need to be transferred to material which is difficult to screen than normal. The BIVITEC screening machines with double vibration principle from a single drive were developed to deal with this task.

The basis of the development of the BIVITEC screening machines was the conventional rotary vibrator.

A single drive provides two vibration movements, using resonance. The dynamic sieve mats are tensioned and released to achieve high acceleration values. The screen covering is operated at an extension value that is matched to the specific material to be screened to ensure a long service life.

Two weights vibrating with equal frequency move relative to each other and compress or tension the sieve mats. The linear momentum of both vibrating weights is adjustable and allows optimum operation of the machine. All necessary parameters can be adjusted according to the material to be screened before each operation.

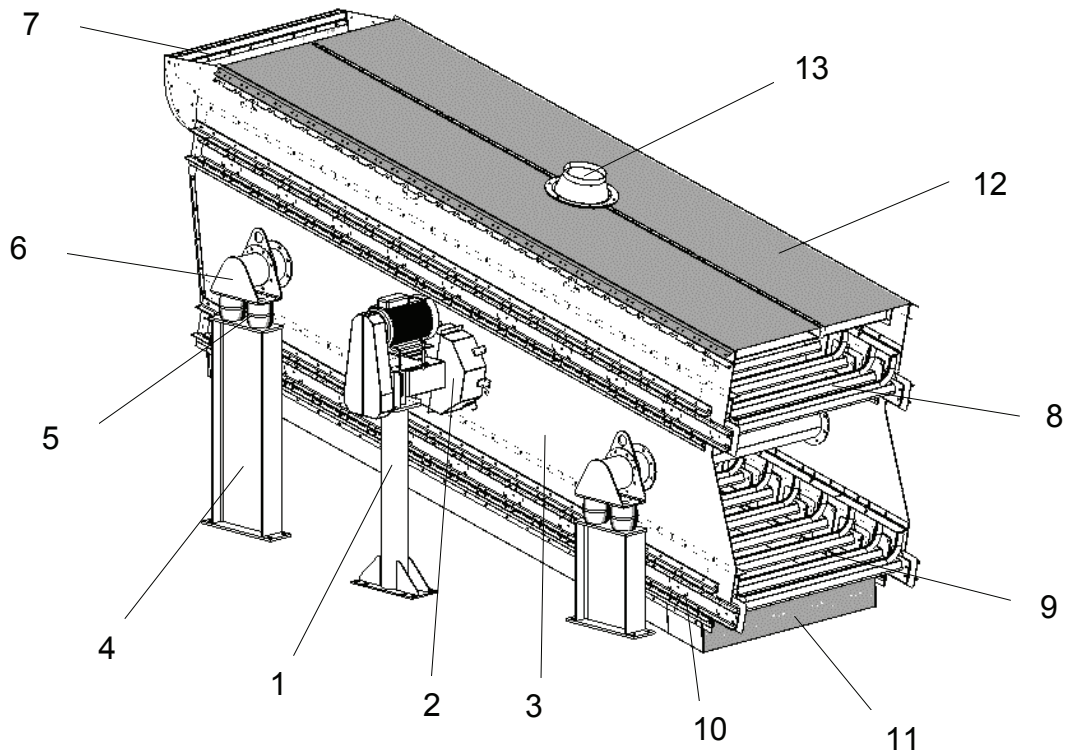
The dual vibration principle used by BIVITEC screening machines results from a fundamental oscillation and an overlaid vibration. The basic vibration performs a circular movement which is instigated by a rotary vibrator. The overlaid vibration describes an elliptic motion and is started by the fundamental oscillation.



- | | |
|-----------------------|--|
| 1 - Vibration mass 1: | Rotary amplitudes adjustable $2a = 4-7 \text{ mm}$ |
| 2 - Vibration mass 2: | Ellipse $2a = 12-18 \text{ mm}$ |
| 3 - Screen covering | exhibits hang down or mat extension |

3.3 Overview of the assemblies

(Picture of symbol)



Key:

- 1 Drive Unit
- 2 Unbalance drive
- 3 Screen box
- 4 Support
- 5 Rubber springs
- 6 Spring brackets
- 7 Material feed
- 8 Sieve netting (upper deck)
- 9 Sieve netting (lower deck)
- 10 Connecting rod with rubber block
- 11 Rubber apron
- 12 Dust cover
- 13 Extraction connecting piece (optional)

3.4 Technical Data

System	AB-ELDAN_III
Order item:	XMSV 1941
Order Number:	29048-20
Serial No.:	SbT 1210

Type	KRL
Type / Design	KRL / ED 1000x4
Weight [kg]	3286
Length [mm]	4951
Width [mm]	1936
Height [mm]	1615
Screening area [m ²]	4,0
Inclination [°]	15°

Drive system	
Type of motor [-]	MEM0074E02 / IEC 132 M4 B3, IP55
Preset unbalance [%]	86 / 60°
Power rating [kW]	7,5
Speed [rpm]	797
Voltage / Frequency [V/Hz]	400 / 50

Amplitude	
Circular - Amplitude [mm]	5 / 7
Linear - Amplitude [mm]	15

Lubrication	Grease lubrication (see lubrication instructions)
--------------------	--

Built-in components	
Designation [-]	Sieve mats
Upper deck [-]	12 in number # 45 x 6, 1 in number blind

Charge material	
Designation [-]	Shredded Tires
Feeding capacity [t/h]	1-2
Grain size [mm]	0 – 40

3.5 Name plate

binder+co		
Quality Check <i>Quality Check</i>	Type <i>Type</i>	KRL/ED 1000x4
	Serial No.: <i>Serial No.</i>	SbT 1210
Q3	Baujahr <i>Year of Construction</i>	2010
	Auftrag Nr. <i>Order No.</i>	29048
CE	Power rating <i>Capacity</i>	
A-8200 Gleisdorf, Austria Service-Hotline: +43-3112-800-200 Fax: ext. 400, service@binder-co.at www.binder-co.com		EN ISO 9001


4 TRANSPORTATION AND STORAGE


4.1 Transportation


Any damages in transit must be reported immediately to our shipping department

After the test run, the machine is dismantled and supplied in the following delivery parts:

- Complete screen box (optionally, with dismantled spring brackets - only in the event of possibly exceeding the allowed transportation width)
- Drive unit with bearings
- Motor with v-belt pulley
- Support construction
- Accessories (e.g. cardan shaft, "marsh mallows", rubber seals, v-belt,..)

WARNING	
	<p>Work by untrained personnel!</p> <p>Injury, death, damage due to incorrect action</p> <ul style="list-style-type: none"> • Inform personnel about risks, safety stipulations and function of the machine! • Work on the machine only by qualified and trained personnel! • Newly hired personnel must be trained!

DANGER	
	<p>Use of unsuitable lifting equipment!</p> <p>Death, severe injury or damage to machine parts is possible.</p> <ul style="list-style-type: none"> • Use only lifting devices that meet the legal requirements. • Hoists, lifting devices and means of transport must ensure sufficient load capacity and safety. • Loads must be lifted only by the loading equipment provided! <p>Persons standing under suspended loads!</p> <p>Death, serious injuries</p> <ul style="list-style-type: none"> • Standing under suspended loads is strictly forbidden!

	WARNING
	<p>Using damaged lifting equipment and slinging equipment!</p> <p>Injuries, death, damage.</p> <ul style="list-style-type: none"> • Damaged lifting equipment and slinging equipment must be replaced!


Use designated lifting eye bolts for hoisting the machine!

Optionally, the spring brackets must be assembled with the lifting eye hooks before unloading. (for fixing bolt tightening torques, see technical appendix)

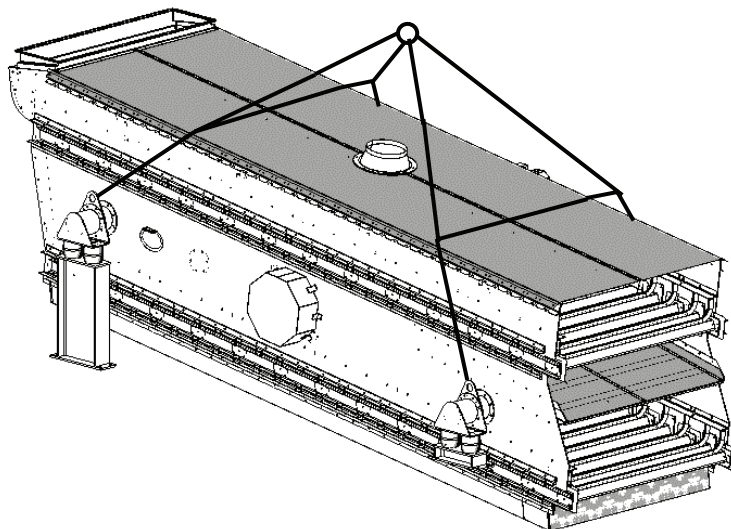
The unloading and transportation of the machine should be carried out by competent personnel only. In doing so, ensure that the hoisting ropes or chains do not damage machine parts. Lift the machine slowly and uniformly. This will prevent machine from deforming.

Please see the chart in the chapter “technical data” for the permissible maximum weight.


The customer confirms the completeness of the delivery in accordance with the packing list by signing the delivery note / letter of consignment. Thus, after receipt, the customer becomes responsible for the completeness of the supplied and stored machines and plant components respectively.

	WARNING
	<p>Using safe lifting equipment and slinging equipment!</p> <p>Injuries, death, damage.</p> <ul style="list-style-type: none"> • Splitting chains less than 45° to the horizontal is not permitted!


(Picture of symbol)



4.2 Storage

WARNING	
	<p>Storing the plant in unsuitable locations!</p> <p>Damage to the machine parts.</p> <ul style="list-style-type: none">• Ensure proper foundations and/or ground conditions!

The storage of machines and plant components can also take place outdoors. However it is imperative that all machines and plant components are protected against moisture and other environmental influences. (minimum temperature +5 °C).


CAUTION!	
	<p>Storage for more than 3 months!</p> <p>Possible machine damage.</p> <ul style="list-style-type: none">• It is imperative that Binder+Co are contacted in the event of storage of more than 3 months because special measures are necessary!

Transportation covering must not be removed.

Any damages in transit must be reported immediately to our shipping department

All electrical parts, for example, the motor, the frequency converter, the electrical control cabinet, are to be stored in a dry, clean internal space!


5 INSTALLATION

DANGER	
	<p>Danger from slipping, tripping and falling over during installation, service and maintenance work in the area of the machine!</p> <p>Death or serious injuries</p> <ul style="list-style-type: none"> • With installation, service, and maintenance work above head height you must use the provided or other safety-relevant access help and working platforms. Do not use machine parts as climbing aids! • When working high up use a safety restraining belt and/or safety equipment! • Walking on the dust covers is prohibited!

Before starting the installation, you must check whether the foundations or support structure are in accordance with the foundation drawings and/or the stipulations, with particular observance of the dynamic loads.


The loading details can be seen on the layout drawing of the machine.

Instructions for safe production of screwed connections and the tightening torques are quoted in the accompanying document "Tightening torques for screwed connections".

WARNING	
	<p>Work by untrained personnel!</p> <p>Injuries, death, damage caused by inappropriate activity.</p> <ul style="list-style-type: none"> • Inform personnel about risks, safety stipulations and function of the machine! • Work on the machine only by qualified and trained personnel! • Newly hired personnel must be trained!

- Align and install the support structure on the bed-plate or steel structure according to the general layout drawing (any possible unevenness is to be levelled with packer plates)
- Attach "marsh mallows" to the support structure
- Fit the machine
- Install the drive unit (including engine, v-belt, cardan shaft)
- Attach all safety devices
- Install the material feed and material discharge
- Establish all connections (electricity, water...)
- Install the sprinkler system (optional)


- Check that all fixing bolts are secure (see the technical appendices)
- Check all lubrication points for adequate lubrication as per the lubrication instructions (see the technical appendices)

	DANGER
	<p>Danger of squashing between the machine and the surrounding components (e.g. chutes!)</p> <p>Death, severe injury, damage to the machine.</p> <ul style="list-style-type: none"> • The plant operator must provide suitable equipment for product guiding for the feeding and discharge openings of the machine, which prevent direct contact with the product to be processed!

5.1 Installation of the chutes and feeding equipment (optional)

The transfer chutes and feeding equipment is only supplied with the machine as an option.


These are normally provided by the customer or they make them themselves. In doing so, you must ensure that the feeder chutes are designed so that the material being fed is distributed evenly over the full width!

	DANGER
	<p>Danger of non-observance of the safety instructions when the chutes and feeder units are self-designed or self-made!</p> <p>Death or serious injuries</p> <ul style="list-style-type: none"> • The chutes and feeder units must be designed in such a way that no feed material can escape from the machine! • Measures must be taken to make it impossible to reach in during operation or to fall in during maintenance work! • The safety distances must be checked by the safety officer. If there are deviations from the safety standards, appropriate corrective measures must be taken!

6 ELECTRICAL EQUIPMENT AND CONTROL SYSTEM

Switching equipment must be executed in accordance with valid standards (electrical equipment of machines, general requirements such as safety, functional capability and maintenance of the electrical equipment).

Plant electrics and control system must be provided by the customer or by the plant builder.

DANGER	
	<p>Warning of dangerous voltage! Death or serious injuries</p> <ul style="list-style-type: none"> • Before electrical connection, the data quoted on the motor identification plate must be checked. The connections must be made in accordance with the existing mains voltage! • Work must only be carried out when there is no electrical voltage present! • Only specialised electrical staff should carry out electrical connections. Work on the machine's electrical equipment must only be carried out in accordance with the electro-technical regulations by a qualified electrician or trained personnel under the guidance and supervision of a qualified electrician. • Earthing is the responsibility of the operator! • The grounding devices should be inspected regularly. • The grounding connection should lead from the busbar. • The main switch cabinet must always be kept closed. Access for authorised personnel only!

6.1 Motor connection


Three-phase AC squirrel cage motors are used to drive the vibrating machines. Our motors are equipped with 3 cold conductors as standard. We recommend using a heavy-duty start-up relay (Class 20).

The following power supply applies to the machine:

- See Chapter "Technical Data"

Connection to the mains must be carried out in accordance with the motor type plate.

The direction of rotation of the motor is in the direction of feed of the product!

DANGER	
	<p>Observe the operating instruction manual for bought-out parts (motors)! Death, severe injury, damage to the machine.</p> <ul style="list-style-type: none"> • Observe the operating instruction manuals for bought-out items!

In order to connect the motor properly, pay attention to the following:

- the instructions in the terminal box on the motor
- the instructions in the instruction handbook for the motor (see the technical appendix)
- the technical data on the motor type plate

Pay attention to the proper routing of the motor supply line!

The motor is connected either via:


- a manually actuated switch or
- an automatic control system

The motor protective equipment must be adjusted to the rated current of the motor.


The motor must be linked in the EMERGENCY STOP chain of the system.

The motor and machine must be earthed.

Protection of the drive from electrical overload must be carried out in accordance with the applicable standards. (The electrical equipment must be provided by the plant builder or by the operator.)

	DANGER
	<p>Danger from inappropriate emergency stop systems!</p> <p>Death or serious injuries</p> <ul style="list-style-type: none">• The machine must be linked in the emergency stop chain of the entire plant of the operator!


7 COMMISSIONING


WARNING	
	<p>Commissioning by untrained personnel!</p> <p>Injuries, death, damage caused by inappropriate activity.</p> <ul style="list-style-type: none">• Inform personnel about risks, safety stipulations and function of the machine!• Work on the machine only by qualified and trained personnel!• Newly hired personnel must be trained!• The plant builder is responsible for ensuring that the access to the machine is only possible by qualified and instructed personnel!

Before commissioning, check:

- Proper and complete installation of all sieve mats
- Check the direction of rotation of the drive (in the conveyor direction)
- Check the tension of the v-belts
- Check the alignment and freedom of movement of the cardan shaft
- Check all protective coverings
- Check the clearance of the screen box to fixed facilities. The distance should be at least 80 mm

8 OPERATION

	DANGER
	<p>Danger from unexpectedly wide swing-out during start-up and run-out!</p> <p>Death or serious injuries</p> <ul style="list-style-type: none"> • Never reach into the open spaces between firmly fixed and vibrating components while the machine is in operation! • There is risk of injury during the start up phase and, especially, the shutdown stage due to greater oscillation amplitudes!

	CAUTION!
	<p>Operating the machine without sieve mats!</p> <p>Damage to the machine.</p> <ul style="list-style-type: none"> • Operation without sieve mats results in a higher vibration amplitude and mechanical destruction of the rubber block elements!

The protection covers and inspection doors (on multi-deck machines) must remain closed and bolted during operation.

The material must only be fed in after starting up the machine.

8.1 Start Up

The starting of the screen ensues by the automatic control at the control desk.

Check for the correct starting sequence during the initial start.

The machines of the plant have to be put into operation in opposite direction to the material flow (i.e. material discharge conv. – screening machine – feed).

8.2 Normal Operation

The need of power during the start is higher than during continuous operation. Premature feeding should be avoided.

8.3 Interruption of operation

Regular

Material feed must first be stopped during a scheduled interruption of operation. The machine must be completely empty before shutting down.

The machine must be started according to the sequence stipulated in the equipment description or the program description.

Unscheduled

During an unscheduled shutdown of the machine, e.g. emergency stop, power failure or other events, carry out the following checks:

- Checking the machine for possible damage
- Unacceptable material accumulation due to late interruption of the material feed (max. double the normal layer thickness is allowed)

Before restarting, the causes for the unscheduled machine shutdown are to be clarified and all faults and errors are to be rectified!

Starting the machine is permitted under observation if the material overload permits. With greater overloading the various different material transfer points must be emptied before re-starting.

The individual plant components must be started according to the sequence indicated in the plant description.

8.4 Shutting Down

The material feed must be stopped before shutting down the machine. During normal operation, the machine must be run completely empty before shutting down.

Advantages:

- Easier start up
- Possibility of checking the screen elements for wear


8.5 Breakdowns


The following table shows possible malfunctions that can occur during operation.


Fault	Cause	Solution
no starting of screen	No power to motor Slip of V-belts	Check wiring and terminals Tension V-belt
clattering noises in the screen box	loose wear plates or screening frames	retighten the bolts
Change of the bearing noise (during grease lubrication)	Insufficient grease bearing is dirty bearing is damaged	regrease bearing Clean the bearing Replace bearing
Change of the bearing noise (during oil lubrication)	lack of oil Insufficient grease bearing is dirty bearing is damaged	change oil regrease bearing Clean the bearing Replace bearing
Bearing runs hot	lack of oil Insufficient grease bearing is dirty bearing is damaged	change oil regrease bearing Clean the bearing Replace bearing
Unequal amplitudes of screen box	Material feed on just one side or build up of material on the sieve box or sieve deck fatigue or fracture of a rubber spring	Clean material feed or sieve box or sieve deck replace rubber spring
Increasing fines	clogged sieves	clean sieves
Large grains with fine material	damaged sieves or lateral sealing	replace damaged parts


Please do not hesitate to contact Binder+Co AG "Service Hotline" if other faults occur (see enclosure).


9 MAINTENANCE AND SERVICING


DANGER	
	<p>Failure to follow safety instructions.</p> <p>Death or serious injuries</p> <ul style="list-style-type: none">• Follow the safety instructions.• Before start-up, read the operating manual!• Keep the operating instruction manual close to the machine!• Observe the safety instructions on the machine and in the operating instruction manual!• Always wear the personal protective equipment when working!


DANGER	
	<p>Danger from slipping, tripping and falling over during service and maintenance work in the machine!</p> <p>Death or serious injuries</p> <ul style="list-style-type: none">• With installation, service, and maintenance work above head height you must use the provided or other safety-relevant access help and working platforms. Do not use machine parts as climbing aids!• During service and maintenance work on the machine, the chutes/hoppers underneath must be closed to ensure that it is not possible to fall into or down them. The service and maintenance personnel must be secured by means of safety belts or safety harnesses.• Walking on the dust covers is prohibited!

DANGER	
	<p>Danger from inadvertent start-up!</p> <p>Death or serious injuries</p> <ul style="list-style-type: none"> • Set the main switch to "0" and secure the plant against re-starting - use a lockable main switch, before starting maintenance and service work! • The service personnel must have their own padlock with matching key in order to be able to lock the customer's main switch when working on the machine! • Access control is effected by the issue of keys, keep the keys in a suitable location! • As a matter of principle, all maintenance and adjustment work must only be performed in idle mode by personnel trained for this purpose. • Appropriate personal protective equipment (e.g. safety gloves, protection helmet, dust respirator, safety shoes etc.) are always to be used when cleaning and maintaining the machine. • Before starting the maintenance and service work, you must ensure that the water supply to the optional sprinkler has not been opened in error or by unauthorised persons!

DANGER	
	<p>Danger from unexpected start-up of the machine as a result of faulty components (e.g. constantly switched PLC output / thyristor / semiconductor / softstarter / FU , contactor contacts sticking...) or remote start from the control console / switching control room / automatic.....!</p> <p>Death or serious injuries</p> <ul style="list-style-type: none"> • Set the main switch to "0" and secure against re-starting - lockable main switch when working and executing repair work and for troubleshooting! (The main switch for the electricians must be provided by the plant builder or by the operator. • Execution in accordance with the applicable standards as Stop Category "0", Performance Level "c" or "SIL1"!

WARNING	
	<p>Danger from contamination and feed material!</p> <p>Injuries, damage.</p> <ul style="list-style-type: none"> • Appropriate personal protective equipment (e.g. safety gloves, protection helmet, dust respirator, etc.) are always to be used when cleaning and maintaining the machine.

	WARNING
	<p>Danger from material feed! Injuries, death, damage caused by inappropriate activity.</p> <ul style="list-style-type: none"> • The material feed must be securely isolated during the repair work!

	DANGER
	<p>Warning of dangerous voltage! Death or serious injuries</p> <ul style="list-style-type: none"> • Only specialised electrical staff should carry out electrical connections. • The grounding devices should be inspected regularly. • The main switch cabinet must always be kept closed. Access for authorised personnel only! <p>Risk of electrocution! Death or serious injuries</p> <ul style="list-style-type: none"> • Never use steam or water jets to clean electrical parts!

9.1 General information

Maintenance is limited mainly to checks, plant cleaning, and lubrication and replacement of damaged or worn parts.

In order to trace the maintenance and servicing measures, all maintenance, servicing and repair works carried out as well as all faults that occurred must be documented using the enclosed machine and plant production log (see technical appendix).

9.2 Service and maintenance intervals

The instructions covering service and maintenance intervals must be followed.

9.2.1 Daily inspection and maintenance

- Check the leak-tightness of the material transfer unit
- Check the machine for change in sound (e.g. due to loose parts)
- Clean the plant components (drive, material channels, etc.)
- Check the screening panels for damage and wear

9.2.2 Weekly inspection and maintenance

- Check the v-belt drive for damage and correct tension
- Motor: dust deposits affect the cooling system and must therefore be removed
- Check the rubber block and rubber springs for brittleness and cracks
- Check the wear linings (fixings, wear) on the material feed

9.2.3 Monthly inspection and maintenance

- Oscillating amplitude in the screening box (see “inspection of the oscillating amplitude”)


9.2.4 Service interval

We recommend that you submit the whole machine periodically for a comprehensive service by Binder+Co AG.

Please see the appointment (year and month) for the next service on the service sticker fixed to the machine.



9.3 Lubrication

	CAUTION!
	<p>Incorrect lubricant selection!</p> <p>Possible bearing damage.</p> <ul style="list-style-type: none"> • Only use the lubricants specified in the lubricating instructions!

The machine must be regularly lubricated according to the specified regulations in the lubrication instructions (see technical appendices). The suitable lubricants are listed in the lubricant charts (see technical appendices)

- Do not use lubricants of a lower quality than those indicated in these instructions.
- The products listed in our lubricants table are a sample of products produced by a number of renowned companies that have subsidiaries worldwide. You can, of course, use products produced by other companies as long as these are of the same quality and fulfil the same requirements.
- The quantity of lubricant specified in the instructions is a guideline quantity. The actual required quantity can vary slightly.
- It cannot be ruled out that operating conditions may occur for the machines, which could not be foreseen during the planning phase. In these cases, lubrication of the machines concerned must be adapted immediately to the conditions (shortening the lubrication interval).

As standard, the unbalance drive mechanisms are lubricated with grease. Optionally, there are also unbalance drive mechanisms with oil lubrication:

9.3.1 Grease lubrication

During initial lubrication, the bearing cavities should be completely smeared with grease. Special care should be taken to apply the correct quantity of grease, because an overfilled bearing will cause churning, and consequently greater heating of the bearing. The integrated bearings are perfectly sealed to the connecting pipe by means of Nilos rings. Now, if new grease is inserted via the lubrication line and through the bearing housings, the used grease is pressed outwards and excess grease is expelled via the labyrinth rings. Lubrication on the bearing covers serves only for refilling and cleaning the grease chambers between the labyrinth rings and the bearings. The sealed grease reservoirs inhibit the penetration of dirt and water.


9.3.2 Oil lubrication

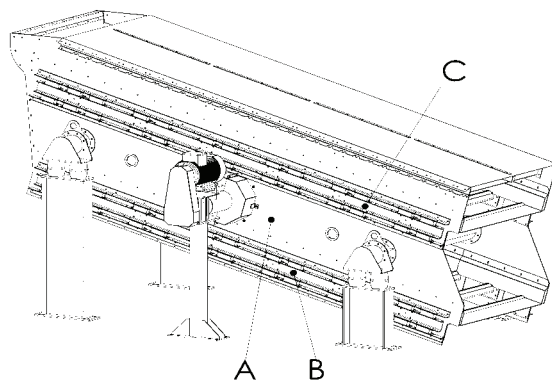
With the optional oil lubrication the bearings are lubricated with oil, where the connecting pipe serves as oil reservoir. The exact oil volume can be taken from the lubrication instructions (see technical enclosure). The oil level should be checked at regular intervals (oil level check). When changing oil, used oil is discharged into the connecting pipe by means of the locking screw.

Lubrication on the bearing covers serves only for refilling and cleaning the grease chambers between the labyrinth rings and the bearings. The sealed grease reservoirs inhibit the penetration of dirt and water.

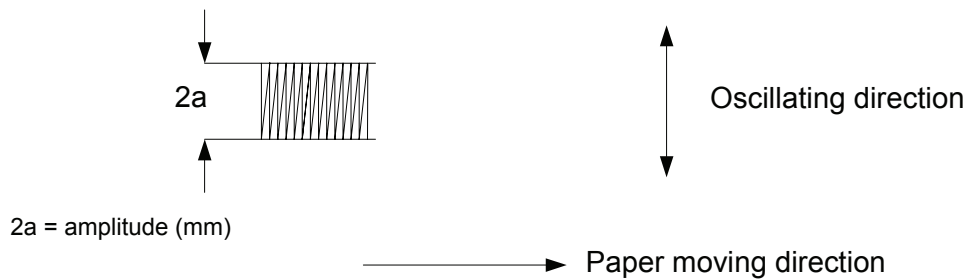
9.4 Checking of the Oscillating Amplitude

Oscillating amplitude of the screen box is to be inspected on both sides, at least monthly. The oscillating amplitude inspection is to be carried out in the idle mode.

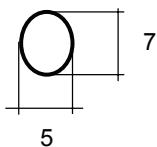
	CAUTION!
	<p>Modifications to the oscillation system!</p> <p>Damage to the machine parts.</p> <ul style="list-style-type: none"> Changes to the vibration system must only be carried out by trained personnel from Binder + Co AG or under their special instruction!



To check the vibration amplitudes, a (short!) pencil (a short one!) to a magnet, and place it at the check point on the vibration structure. A piece of paper which is attached to a box is slowly run past the pencil at right angles to the direction of vibration, thus providing a graphic representation of the vibration amplitude, as shown.

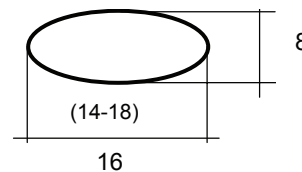


A Sieve box



(dimensions in mm)

B, C Push rod



9.4.1 Causes of variations in the vibration amplitude

A deviation of the amplitude of more than 1 mm to the given values of the data sheet on the opposing sides of the check points may result from following reasons:

- Dirt and material caking on or in the machine
- Variation of mains frequency
- Slip of V-belts
- Wear of the sieve mats
- Increase in the ambient temperature
- Fatigue or brittleness of the rubber block

To avoid subsequent failures the fault is to be removed as soon as possible.

9.4.2 Measures to be taken in the event of vibration amplitude variations

Dirt or material caking

- Removal of material caking

Variation of frequency

- Checking and changing of line frequency

Slip of V-belts

- Checking of v-belt tension (see section 9.5)
- Worn out v-belts are the cause of damaged v-belt pulleys and vice-versa

Wear of the sieve mats

- Check the sieve mats and change if need be

Increase in the ambient temperature

- Installation of additional rubber blocks

Fatigue or brittleness of rubber blocks

- Rubber blocks must be checked regularly for performance, cleanliness, damage, cracks and brittleness
- Change if necessary (see section 9.6)

Cardan Shaft

- Repair or replacement of universal drive shaft

9.4.3 Correction of the vibration amplitude variation at the connecting rod

If the measures detailed in Chapter 9.4.2 do not have any effect, the vibration amplitude variation can be adjusted by removing or installing rubber blocks at the connecting rod.

If the vibration amplitude (amplitude according to the inspection sheet plus 1 mm) which is documented on delivery of the machine is exceeded, additional rubber blocks are installed on the connecting rod.

If the vibration amplitude (amplitude according to the inspection sheet plus 1 mm) which is documented on delivery of the machine is not reached, rubber blocks are removed from the connecting rod.


The rubber blocks can be installed or removed in pairs (in each case, on the left and right hand side of the machine).

Any location can be chosen for the installation, but the position must be the same on the left and right hand side.

You will find instructions for installing and removing the rubber blocks in section 9.6

A vibration amplitude measurement must be carried out every time after installing or removing a pair of rubber blocks.

9.4.4 Adjustment of unbalance masses

	CAUTION!
	<p>Adjustment of the unbalance weights</p> <p>Damage to the machine parts.</p> <ul style="list-style-type: none"> Adjustment of the unbalance masses must only be carried out by trained personnel from BINDER + CO AG or under their special instruction!

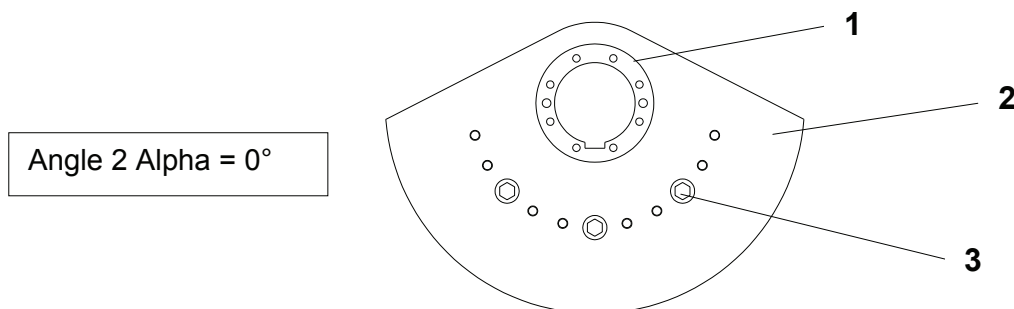
On both of the ends of the shafts of the drive there is an adjustable unbalance mass consisting of two segment plates of the same thickness (optionally, an additional thin segment can be installed). The base segment (1) is welded to a hub and connected firmly to the shaft of the drive using a feather key.

The other segment (2) is bolted to the base segment (1) with three fastening bolts in each case (3). Optionally, an additional narrow weight can be used that is always installed between the base segment and the other wide segment. The other segment can be rotated in 15° steps relative to the base segment, in accordance with the hole pitch in the base segment. Thus, different work torques or centrifugal forces arise.

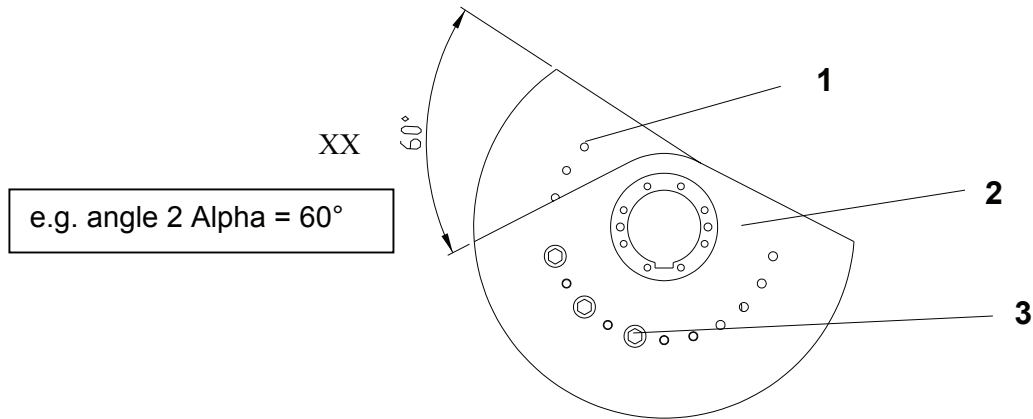
The discs with the central hexagon screw and also the coupling flange on the cardan shaft must not be loosened for the adjustment.

For the adjustment, the three fastening screws (3) of the unbalance masses are loosened and the outer segment is skewed against the inner base segment by the same angle 2 Alpha (x) (see acceptance certificate for the unbalance adjustment during delivery).

If all segments are laid out congruently ($2 \text{ Alpha} = 0^\circ$), the adjusted unbalance is 100 % (see illustration)




If the outer segment is skewed by the angle $2\ \text{Alpha} = xx$, the adjusted unbalance is reduced to $xx\ \%$ (e.g. $2\ \text{Alpha} = 60^\circ$ - the adjusted unbalance is then $86.6\ \%$; see figure or table below)



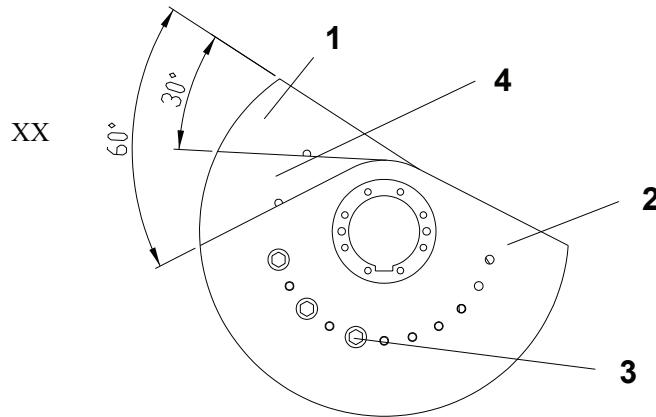
Adjustment possibilities with 2 unbalance masses of equal thickness according to the following tables and the resulting unbalance:

with 2 unbalance masses of equal thickness (2 weights)	
2 Alpha in [°]	Unbalance in [%]
0	100
15	99,1
30	96,6
45	92,4
60	86,6
75	79,3
90	70,7
105	60,9
120	50

	CAUTION!
	<p>Adjustment of the unbalance weights</p> <p>Damage to the machine parts.</p> <ul style="list-style-type: none"> The unbalance masses must be set the same on both sides of the machine!


Optional:

Optionally, an additional narrow weight (4) can be used which is always installed between the base segment and the other wide segment. The setting angle of the additional weight is always 30°!




Adjustment possibilities with 2 unbalance masses of equal thickness and with an additional weight according to the following tables and the resulting unbalance:

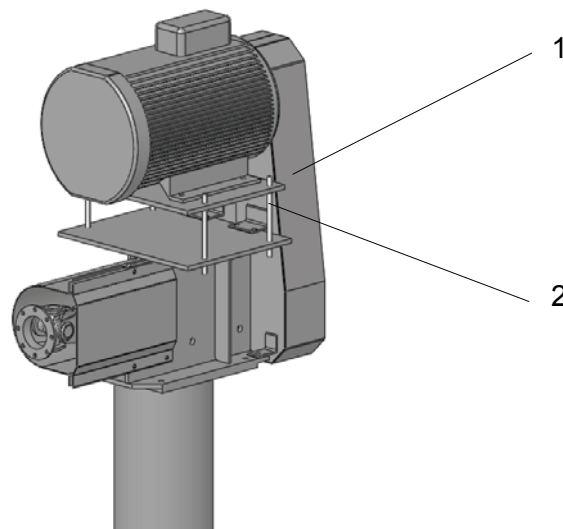
with 2 unbalance masses of equal thickness and with 1 additional weight (3 weights)	
2 Alpha in [°]	Unbalance in [%]
0	100
15	99,1
30	97,2
45	93,7
60	88,8
75	82,8
90	75,6
105	67,4
120	58,3

	CAUTION!
	<p>Adjustment of the unbalance weights</p> <p>Damage to the machine parts.</p> <ul style="list-style-type: none"> The unbalance masses must be set the same on both sides of the machine!

9.5 V-belt replacement

	DANGER
	<p>Crushing, trapping or pulling-in hazard!</p> <p>Death or serious injuries</p> <ul style="list-style-type: none"> • Set the main switch to “0” and secure the plant against re-starting - use a lockable main switch, before starting maintenance and service work!

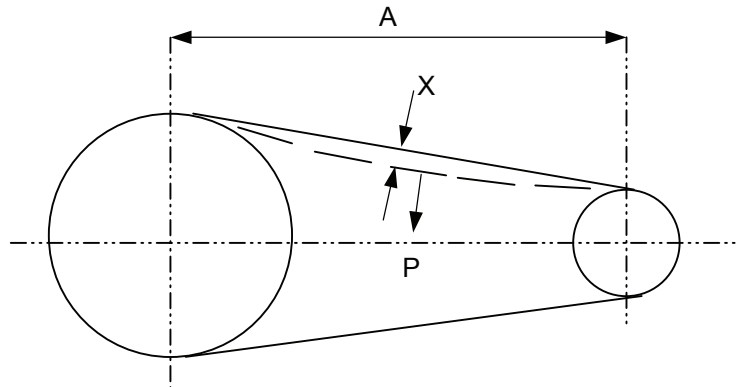
	CAUTION!
	<p>Faulty or worn V-belts!</p> <p>Malfunction of the machine.</p> <ul style="list-style-type: none"> • Always change all the V-belts! • Pay attention to the same marking! • Do not use any belt wax or spray.



- Remove the v-belt guard (item 1)
- Slacken the v-belt tension (lower the motor – loosen item 2)
- Remove old v-belts
- Install new v-belts
- Tighten v-belts (raise the motor - item 2)
- Check the alignment of the V-belt pulleys with a straightedge or thin cord.
- Check tension of v-belts
- Fit the v-belt guard (item 2)

The correct tension is given in the following table:

A = Centre distance
 P = Test load
 X = Indentation depth



V-belt profile	Motor pulleys \varnothing	Test force P [N]	Deflection mm/100 A
SPB	140 – 200	75	3,7
	224 - 400		2,7

Example:

SPB profile, motor pulley $d = 180$ mm, centre distance $A = 670$ mm, test force $P = 75$ N

Deflection $X = 3.7 \times (670/100) = 25$ mm

9.6 Installing and Dismantling Rubber Blocks

9.6.1 Installing rubber blocks

- Compress the rubber block on one side with a screw clamp
- Position the compressed side of the rubber block correctly



- Make a fixing hole using a drift or spike
- Leave the drift in the hole
- Release the screw clamp



- Tap the rubber block into the installation position with a hammer



- Align all the holes using a second mandrel

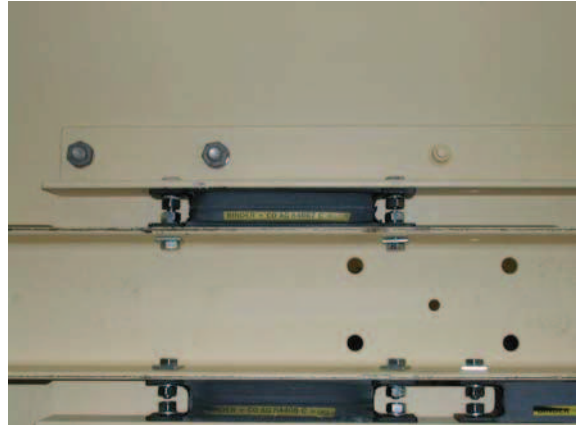


- Fit and tighten all bolts



9.6.2 Dismantling the rubber block

- Loosen and remove all bolts



- Press out the rubber block on one side with a drift



- Plug the drift into a fixing hole and knock out the impulse rubber with a hammer



9.7 Changing Screening Components

9.7.1 Changing sieve mats

Preparation:

- Prepare the tools for the dismantling and installation of sieve mats - plastic mallet, mounting device, spray bottle with water
- Remove dirt caked on the sieve netting

Dismantling sieve mats:

- Locally hammer the middle clamping strip deeper at the edge of the sieve mat - use the mounting tool provided for this purpose.
- Hold the sieve mat edge and pull it out by hand.
- Remove the central clamping rail from the clamping piece.



Installation of sieve mats:

- Clean the clamps
- Mark the centre of the sieve mats and the centre of the clamps with a pen
- Place the sieve mats in the clamping pieces, align centrally and bend up in the ox-horn area.
- Check the gap between the end of the sieve mat and the cover plate (if there is no gap the cover plate can be adjusted using the slotted holes)
- Moisten the gap between the sieve mats with water (anti-friction agent)
- Drive in the middle clamping strip evenly - starting from the centre of the sieve mats - with a plastic hammer, the central clamping strip must not be over-stretched during the installation
- Any extra length of the central clamping rails must be cut to the correct length before fitting to the edge of the sieve mat.



Mechanical damage and contact of the sieve mats with any oil and grease should be avoided (pay attention when changing the oil in the unbalance exciter). All clamping strips must be checked to ensure they fit tightly

9.7.2 Replacing the screen covering (PU plug-in system)

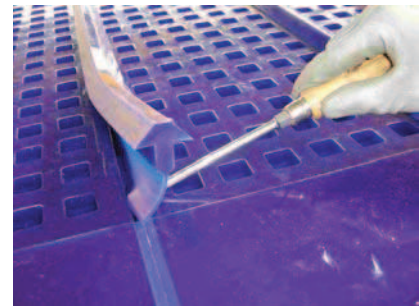
For even wear, it is recommendable to change the screen covering from the front (material feed) to the back. In addition, all clamping rails must be checked for tight fitting. Mechanical damage and any contact of all kinds of oil and grease with the screen covering should be avoided. All clamping strips must be checked to ensure they fit tightly

Preparation:

- Prepare the tools required for removal and fitting the sieve coverings – a hammer, appropriate screwdriver
- Remove dirt caked on the sieve netting

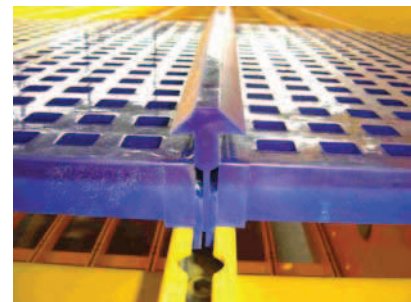
Removing the screen coverings:

- Push the screwdriver between the fixing profile and the screen coverings.
- Remove the fixing profile.
- Loosen the screen covering and pull it out by hand



Fitting the screen coverings:

- Clean the clamps
 - Insert the screen covering in the clamping piece.
 - Introduce the fixing profile between the screen coverings.
-
- Tap the fixing profile in position with a hammer. The fixing profile must not be stretched during installation.



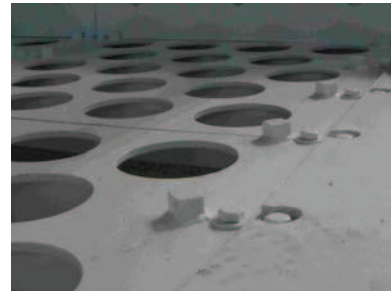
9.7.3 Repacing the perforated plates

Preparation:

- Prepare the tools required for removal and installation of the perforated plates - torque wrench, crane, lifting tackle
- Remove dirt caked on the sieve netting

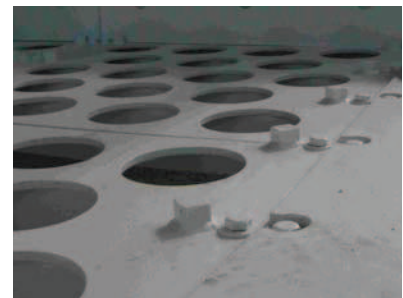
Removing the perforated plates:

- Loosen and remove the bolts
- Removal of the perforated plates with a crane



Installing the perforated plates:

- Cleaning the threaded holes
- Introducing the perforated plates
- Tighten the bolts with a torque wrench (see technical enclosure: tightening torques for bolted connections)



9.7.4 Wear blinding

In prevent damages, all wearing plates and chutes have to be checked for proper fastening.

In order to prevent damage to the structure, the wear blinding should be checked weekly and should be changed after heavy wear.

9.8 Spare parts

A supply of the most important spare and wearing plates is an important condition for the continuous operation and operational readiness of the machine.

We recommend that all those parts which are labelled as wearing plates in the parts list should be stored as spares.

The size of the spare parts stock should be determined based on the desired availability of the machines and plant, in agreement with the spare parts department of Binder+Co AG.

Please use the enclosed list of items and diagrams when ordering spare parts and wearing plates.


The following data should be given when ordering spare parts and wearing parts:

- Tracking number
- Item number
- Order number
- Quantity
- Description/item

9.9 Bearing Replacement

General:

It is recommended that the manufacturer should carry out any repairs as well as bearing replacements.

	CAUTION!
	<p>Independently carried out repairs! Damage to the machine parts.</p> <ul style="list-style-type: none">• Binder+Co AG cannot accept liability if unauthorised repairs are carried out!

10 TECHNICAL ENCLOSURES (SEE APPENDIX)

10.1 Lubrication instructions

10.2 Motor

10.3 Cardan shaft

10.4 Machinery and equipment journal

10.5 Tightening torques for bolted connections

11 INSPECTION DOCUMENTATION (SEE APPENDIX)

11.1 Declaration of conformity

11.2 Test certificate

11.3 Final test report

12 PARTS LISTS AND DRAWINGS (SEE ATTACHED)

12.1 Parts lists

12.2 Drawings

The following lubrication instruction points are extremely important and should be complied with exactly, in order to ensure optimum unit servicing:

1. Do not use any lubricants of a quality lower than that specified in our instructions.
2. The products listed in the lubrication chart represent a variety from the product lines of renowned, international companies. Products manufactured by other companies can be used of course, if these products are of the same quality and meet the same requirements.
3. The lubricant amounts listed in the instruction should be taken as guidelines: the amounts actually required will often vary slightly.
4. It cannot be ruled out that the unit will experience operating conditions that were not foreseeable during the design stage. In such cases the unit lubrication schedule should be immediately adapted to the actual operating conditions (more frequent lubrication).

Lubrication

The drive units of the unbalance drives are lubricated with grease. The cavities in the bearings should be completely filled with grease during the initial lubrication. Pay attention to the proper amount of grease, because if the bearing is too full this can lead to increased resistance and consequently to higher bearing temperatures. The housing spaces on both sides of the bearing should remain free, so that excess grease can fill the empty cavities during the warm-up phase. The installed bearings are sealed with Nilos rings on the connection pipe side. The lubrication nipples are for subsequent filling of the bearing (upper nipple) and the bearing cover (lower nipple).

ATTENTION: Before lubricated are cleaning the lubrication nipple.

When lubricating the bearings (1st lubrication phase) excess grease can escape outward through the labyrinth seal. When lubricating the bearing cover (2nd lubrication phase) any impurities should be pushed out of the labyrinth seal and prevent contamination by dirt and water.

Adding grease to the bearings should be carried out at an interval of approx. 50 operating hours by a few short pumps of grease into the bearing via the lubrication nipple. Depending on the actual operating conditions it may be necessary to lubricate the bearings significantly more frequently (on a daily basis).

For bearing lubrication a lithium-complex grease as per KP2N-20 (DIN 51502) should be used (see lubrication chart).

The following lubrication instruction has been prepared to present a summary of all key unit lubrication information (amounts, lubrication interval schedules).

Product / Machine:

Screening machine BIVITEC KRL/ED 1000X4

Customer / Plant:

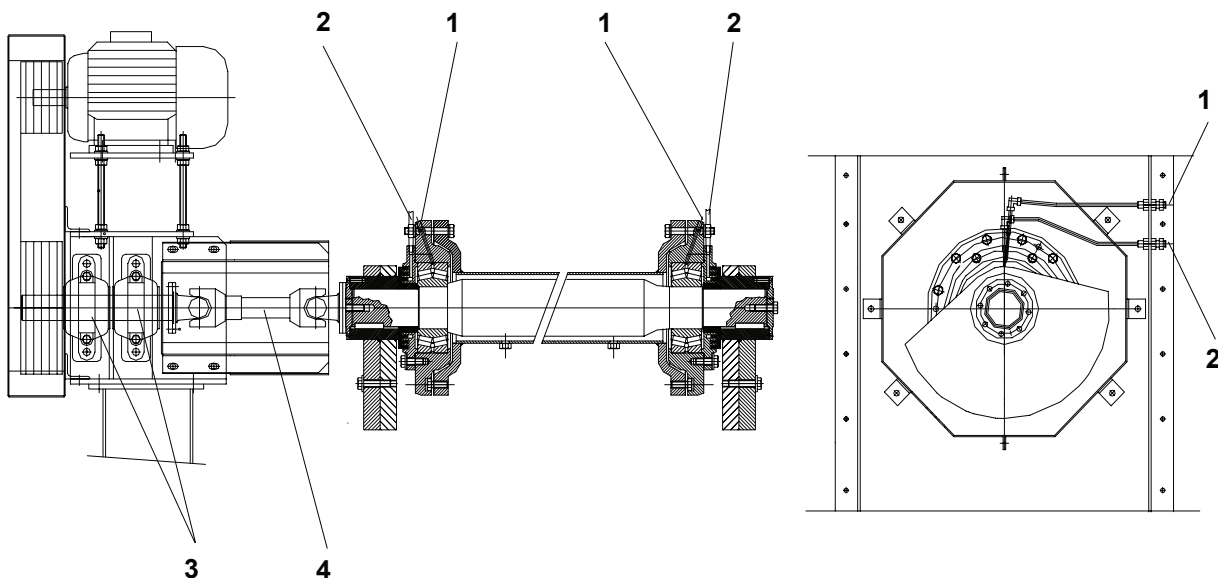
AB-ELDAN_III

Order No.:

29048-20

Component / Part:

Drive unit – Unbalance exciter / Grease (Bearing 22314)



No.	Machine part	Pce.	Lubrication point		Lubricant ¹ Designation (DIN)	Quantity of lubricant ²		Lubricating-interval	
			Number	Type ³		Prim.- Lubrication	Re- Lubrication	Re- lubric ⁴	Change ⁴
1	Bearing	2	2	S	KP 2 N-20	150	5	50	
2	Bearing cover	2	2	S	KP 2 N-20	50	10	50	
3	Bearing	2	2	S	KP 2 N-20	160	15	150	
4	Cardan shaft	1	2	S	See installation and maintenance for cardan shaft				

Explanation:

¹ see Lubricant chart / ² Quantity of lubricant: Grease in gram (g) / Oil in liter

³ Type of lubrication:

- S** = Grease nipple
- T** = Splash lubrication
- Z** = Central lubrication
- F** = Grease filling
- N** = Atomised spray lubrication
- P** = Lubrication by brush; spray etc
- Ö** = Power transmission oil filling
- L** = Maintenance-free / Permanent lubrication

⁴ Lubricating intervals in operating hours

Möglicher Lagerschaden durch falsche Schmierstoffwahl! Verwenden Sie nur die in den Schmieranweisungen angegebenen Schmierstoffe!		Incorrect lubricants might cause damage to bearings! Only use the lubricants listed in the lubrication instructions!					
Schmiermittel / Lubricant	Bezeichnung nach DIN 51502 Designation	Basis Base	Hersteller / Manufacturer				BEMERKUNGEN Remarks
			SHELL ¹⁾	ESSO	MOBIL	BP	
Produkt / Typenbezeichnung / Type / Lubricant							
Öl / Oil	CLP 100	M	OMALA OIL 100	SPARTAN EP 100	MOBILGEAR 627	ENERGOL GR-XP 100	OPTIGEAR 100
Öl / Oil	CLP 150	M	OMALA OIL 150	SPARTAN EP 150	MOBILGEAR 629	ENERGOL GR-XP 150	OPTIGEAR 150
Öl / Oil	CLP PG 150	S	OMALA OIL HD 150	SPARTAN SYNTHETIC EP150	MOBILGEAR SHC 150	Energyn HTX 150	Synthetic X 150
Öl / Oil	CLP HC 220	S	OMALA OIL HD 220	SPARTAN SYNTHETIC EP220	MOBILGEAR SHC 630	Energyn HTX 220	Synthetic X 220
Öl / Oil	CLP PG 220	S	TIVELA S 220	Glycolube 220	Glygole 30	Energyn SG-XP 220	Optiflex A 220
Öl / Oil	CLP 220	M	OMALA OIL 220	SPARTAN EP 220	MOBILGEAR 630	ENERGOL GR-XP 220	OPTIGEAR 220
Öl / Oil	CLP 460	M	OMALA OIL 460	SPARTAN EP 460	MOBILGEAR 634	ENERGOL GR-XP 460	OPTIGEAR BM 460
Öl / Oil	CLP 680	M	OMALA OIL 680	SPARTAN EP 680	MOBILGEAR 636	ENERGOL GR-XP 680	OPTIGEAR BM 680
Fett / Grease	K 2 K-20	Li	ALVANIA RL 2	UNIREX N2	MOBILUX EP2	ENERGREASE LS EP	OLISTA LONGTIME 2
Fett / Grease	KP 2 N-20	Li / Kplx	ALBIDA EP2	BEACON EP2	GREASE HP 222	ENERGREASE LC2	LONGTIME PD 2

Basis: Basisöl / Base oil: M = Mineralisch / Mineral
 S = Synthetisch / Synthetically
 Li = Lithium
 Li / Kplx = Lithium / Komplex

1)..... Binder – Standard / Binder Standard

La ELDAN conferma che l'impianto Riciclaggio pneumatici Steca, disegno 6 - 0408 (in allegato) è in grado di produrre filo di acciaio con purezza di circa 98%.

Questo è possibile montando una griglia più piccola nel MPR200T, dimensione \varnothing 12 mm e regolando più propriamente il vaglio Bivitec.

Descrizione della parte di pulizia dell'acciaio dell'impianto riciclaggio pneumatici Steca, layout 6 - 04048 item 1 - 6 e 101 - 110

Item 1 – 6: i ciabattati di gomma in ingresso sono alimentati attraverso il silo TBF all'interno del MPR200T montato con una griglia \varnothing 12 mm. Nel MPR200T i ciabattati di gomma sono ridotti in cippato in gomma e il filo di acciaio rilasciato.

Il nastro magnete DM1850, rimuove la maggior parte del filo rilasciato. Il filo di acciaio contiene gomma + la parte tessile, da pulire nel seguente sistema di pulizia fili di acciaio:

Item 101 – 110: Sistema di pulizia fili in acciaio. In questo sistema il filo di acciaio è prima vagliato

(vagli i gomma, apertura del filo); il sopra vaglio è rispedito indietro nel TBF attraverso i trasportatori.

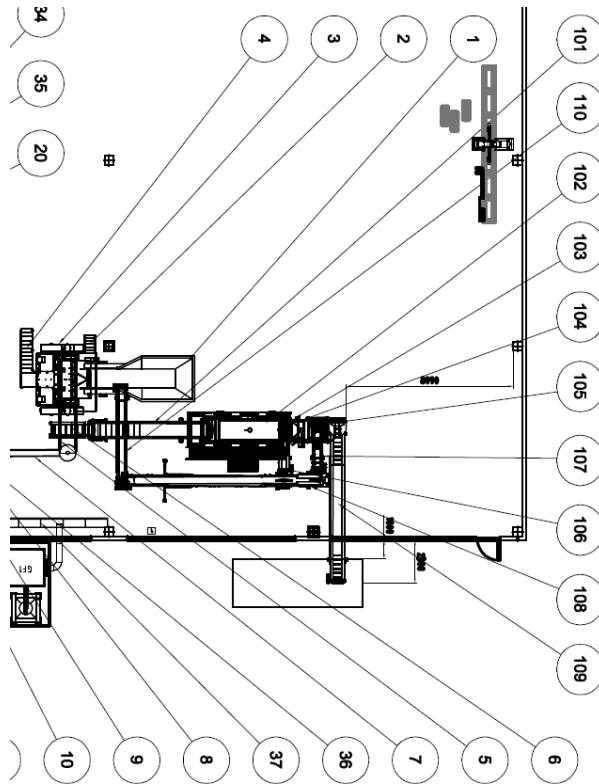
Inoltre, il filo di acciaio viene pulito rilasciando la parte tessile per mezzo del flusso d'aria nel vaglio Bivitec ed inoltre nella successiva unità di separazione.



NME s.r.l.

Infine, il filo è pulito sul sistema magnete a doppio tamburo, dove la gomma viene separata dal filo di acciaio. Il filo di acciaio pulito viene trasportato in un container, attraverso un nastro trasportatore.

Disegno:



NME s.r.l.

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ELDAN confirm that the Steca Tyre Recycling Plant, layout 6 – 0408 (enclosed) is able to produce an approx. 98% clean steel wire product.

This is possible by mounting a smaller screen in the MPR200T, size Ø12 mm and by properly setting of the Bivitec screener.

Description of the Steel Cleaning part of the Steca tyre recycling plant, layout 6 – 0408 item 1 – 6 and 101 - 110

Item 1 – 6: The input rubber shreds are fed via the silo TBF into the MPR200T mounted with Ø12 mm screen. In the MPR200T the rubber shreds are reduced to rubber chips and released steel wire.

The overband magnet DM1850, remove most of the released steel wire. The steel wire contains rubber + textile, to be cleaned out on the following steel wire cleaning system:

Item 101 – 110: Steel wire cleaning system. In this system the steel wire is first sized screened (rubber screens, punching/ opening the wire), oversize sent back in the TBF via conveyors.

Further, the steel wire is cleaned for loose textile by air stream in the Bivitec screener and further in the next coming textile separation unit.

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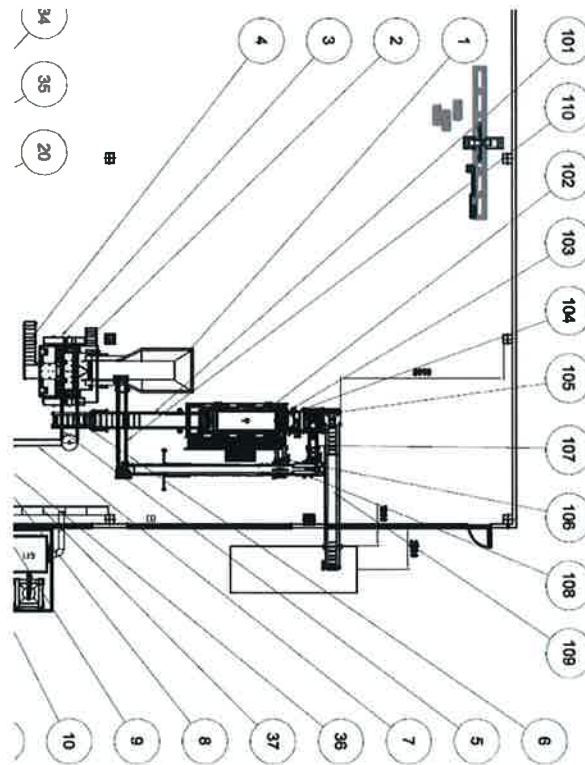
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Finally, the steel wire is cleaned on the double drum magnet system, where left over loose rubber is separated out from the steel wire.

The cleaned steel wire is transported out in a container, via a conveyor belt.

Sketch:



Best regards,
Bjorn Laursen



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Processo e norme di comportamento per la corretta conduzione dell'impianto di pulizia tessile

La TIRES e il suo staff tecnico hanno studiato la realizzazione di un processo che sia in grado di pulire la fibra tessile proveniente dal recupero dei pneumatici fuori uso rendendo questo materiale adatto ad essere trasformato in materia prima secondaria

L'impianto fornito dalla Picena Macchine srl e' stato realizzato tenendo conto sia delle tecnologie oggi esistenti a livello di automazione, sia della facile operatività con cui può essere condotto l'impianto.

L'impianto complessivo è costituito da:

- una lavatrice a secco a tamburo denominato TROMMEL;
- una tramoggia cocleata per il raggruppamento del materiale granulare in gomma alloggiata sotto il tamburo;
- un trasferimento pneumatico denominato TPT01 per il recupero dei granulari in gomma sino al silos di lavorazione;
- un trasferimento pneumatico denominato TP02 per il recupero e la decantazione della fibra negli appositi container da 30 m³ corredato di traliccio per sopraelevazione della fibra tessile a caduta da 4 m.

Descrizione processo produttivo:

Il principio di funzionamento consiste nel vorticare la fibra tessile mediante delle tacche poste a misura stabilita all'interno del tamburo, che ne genera una caduta per forza di gravità durante il moto rotazionale.

Durante questa caduta e l'impatto all'interno del tamburo avviene il distacco delle parti granulari in gomma che fuoriescono dalla rete staccante posta all'esterno del tamburo stesso. La rete staccante sarà realizzata in due tipologie: una con diametro foro 6 mm ed una con diametro foro 10 mm; questo perché nel primo tratto onde evitare che parte di materiale tessile in sbattimento fuoriesca dalla rete e possa ritornare all'impianto di separazione. Quest'ultimo punto consiste in una caduta dentro una tramoggia cocleata che raggrupperà tutto il materiale recuperato per l'aspirazione tramite trasporto pneumatico; questo consente di poter raffreddare e confluire il granulo in gomma recuperato sino al punto di re-immissione del processo di raffinazione in miscela con granuli ancora da trattare posti in un silos.

La componente tessile, dopo l'attraversamento della rete staccante da 10 mm, cadrà per forza di gravità tramite la tramoggia di scarico in un'ulteriore trasporto pneumatico che consentirà poi di poter rilevare il materiale sino ad una altezza prestabilita da un traliccio portante il ciclone e la rotocella, dove all'interno di esso e posto a piano terra sarà raccolta in un container da 30 m³.

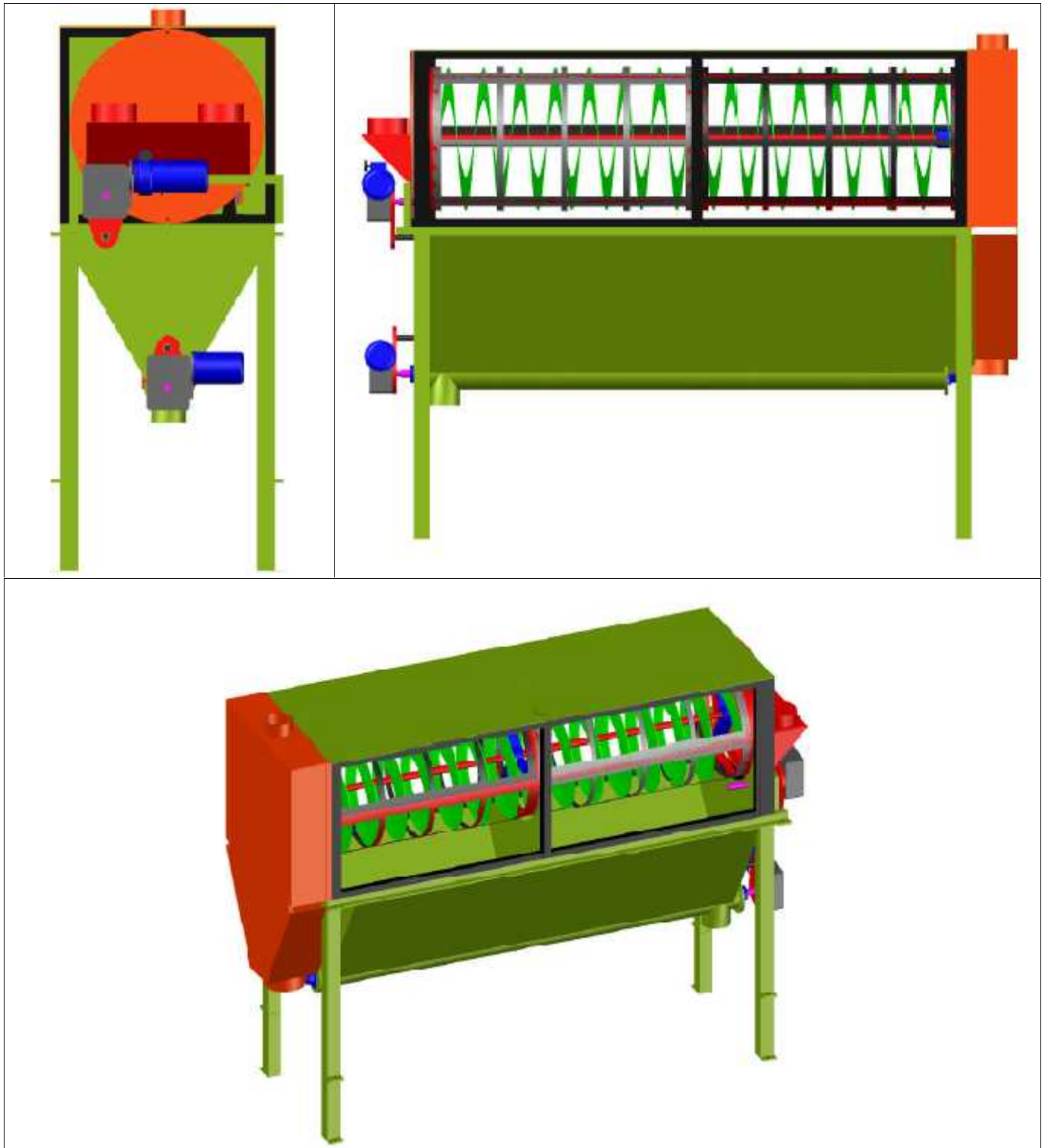


Figura 01 - Modello 3D macchinario pulizia tela

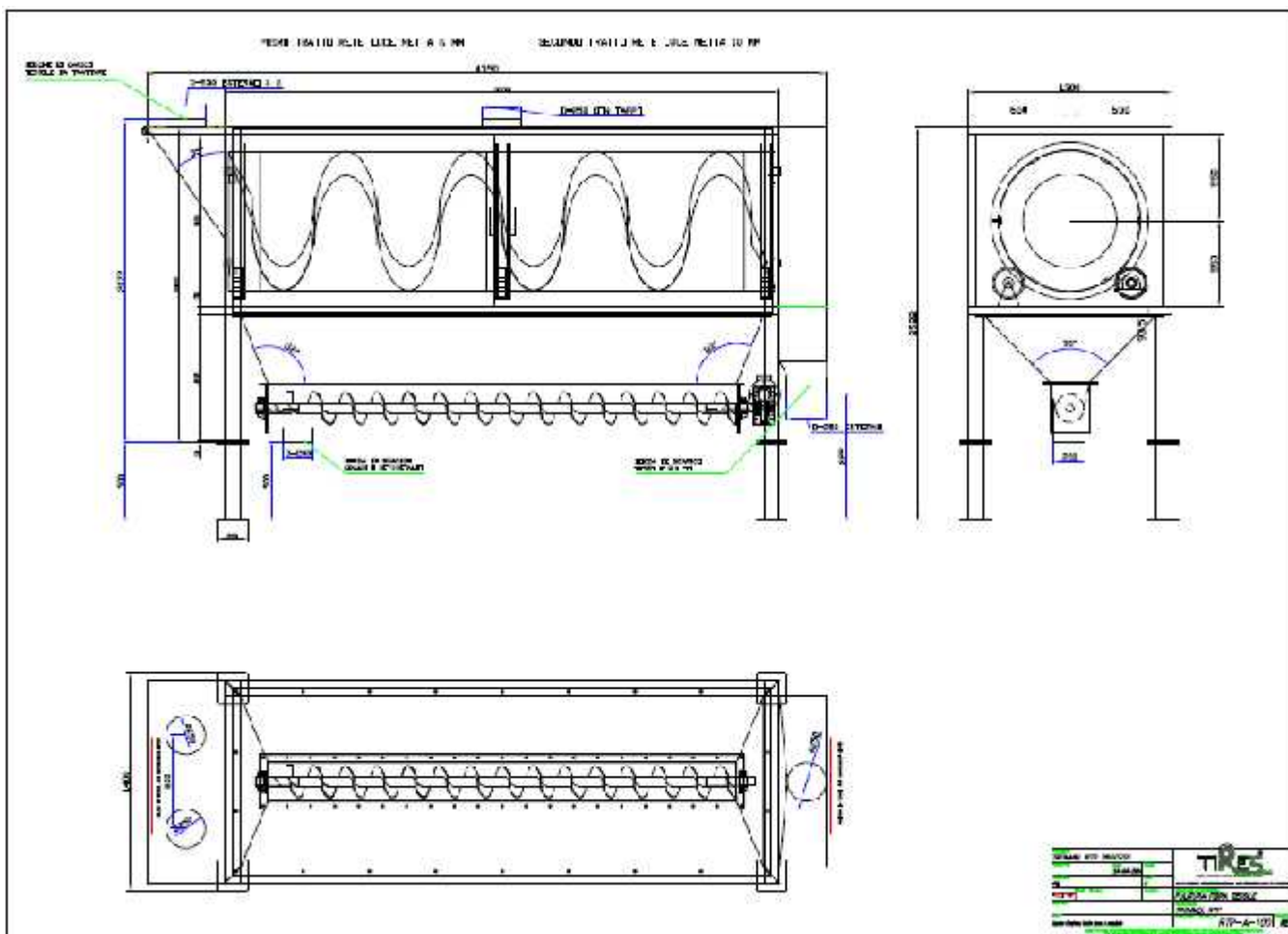


Figura 02 - Disegni tecnici del TROMMEL per la pulizia della tela

Le stazioni operative dell'intero processo di pulitura della fibra tessile sono per la fase di studio dedicate alla supervisione del ciclo produttivo con controlli periodici alla camera interna del tamburo; ovviamente per tale fase occorrerà che l'intero processo sia arrestato. Verificate le eventuali criticità e perfezionato il sistema, l'impianto prototipale potrà proseguire il suo moto in automatico con il processo complessivo mediante la supervisione sporadica di un operatore che controllerà i flussi in uscita in caduta nel container da 30 m³.

Il nuovo macchinario sarà inserito a valle del processo attuale Steca spa, in particolare dopo la fase di granulazione, si tratta di un aggiornamento dell'impianto di raffinazione, con l'inserimento del TROMMEL per la raffinazione del materiale tessile. Il quale come ampiamente descritto in precedenza consente di ripulire la tela dalle particelle di gomma (polverino o granulo) rimaste intrappolate al suo interno e quindi recuperare la componente di valore da quello che ad oggi rappresenta un rifiuto ed di conseguenza un costo per l'azienda.

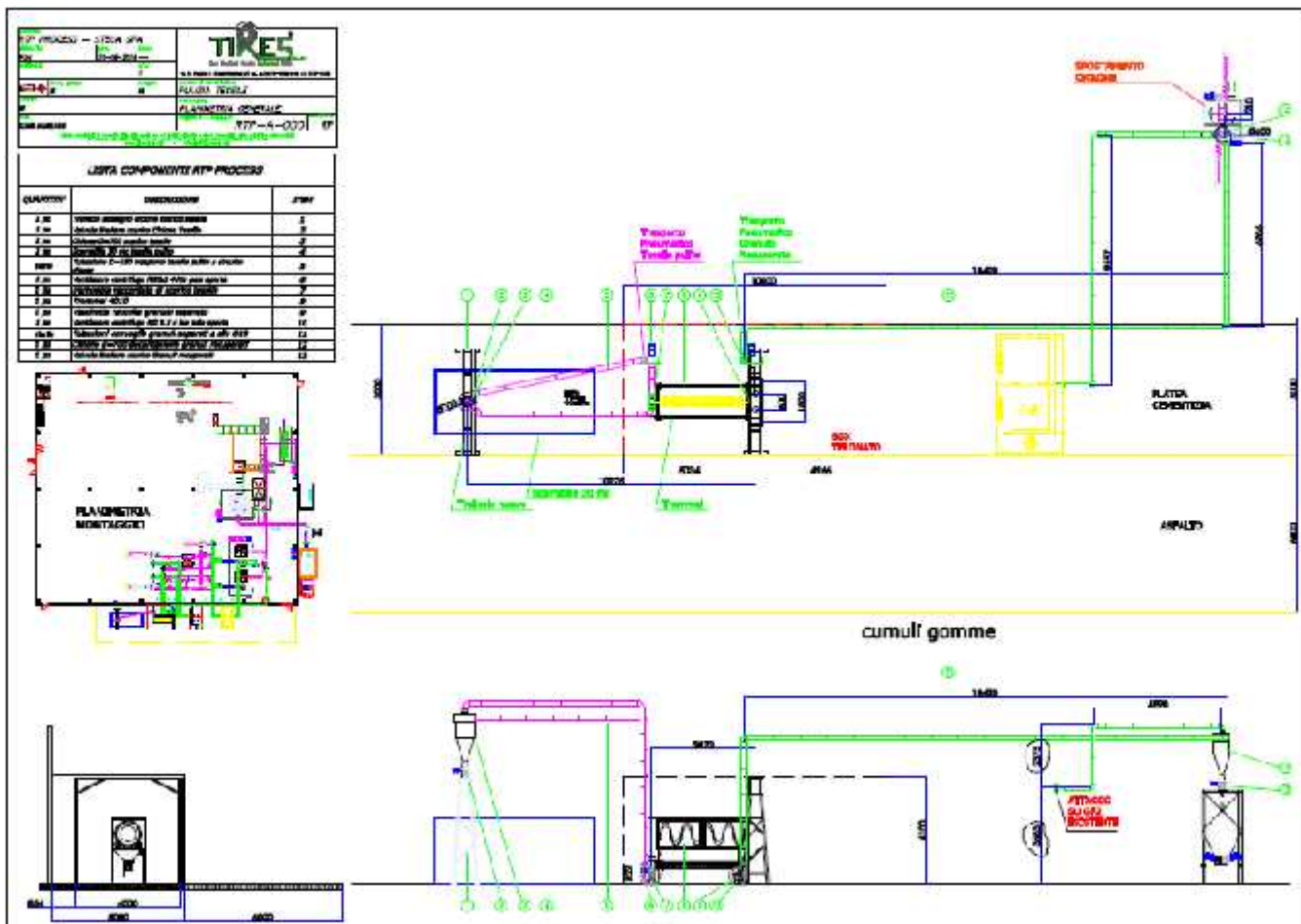


Figura 03 – Layout disposizione TROMMEL per la pulizia della tela

L’impianto di pulitura della fibra tessile sarà il primo processo che dovrà essere avviato al momento dell’accensione del reparto di raffinazione esistente.

Saranno installati in un quadro elettrico a parete, degli avviamenti magneto-termici per far sì che l’intero processo sia in automatico con l’estrazione della fibra tessile proveniente dall’impianto di frantumazione degli pneumatici. L’avviamento verrà comandato da un unico tasto di accensione che impegnerà i seguenti motori elettrici:

- Rotocella Recupero Granuli Silos G18 0.75 kW
- Ventilatore Recupero Granuli Silos G18 4 kW
- Rotocella Recupero Scarico Tessile 0.75 kW
- Ventilatore Recupero Tessile 4 kW
- Rotocella Recupero Carico Tessile (opzionale) 0.75 kW
- Coclea Tramoggia di scarico 1.5 kW
- Tamburo Trommel 2.2 kW

Come si evidenzia dalla figura 03 che riporta i particolari della macchina ed il suo posizionamento all’interno del ciclo produttivo della STECA, l’impianto sarà installato all’esterno della struttura coperto da un box telonato.

La tela in uscita dall’impianto esistente, verrà convogliata in opportuni cicloni la immettono nella nuova macchina (TROMMEL) che processa il materiale e ne separa le componenti: tela pulita e granuli.

La componente tela pulita sarà raccolta in uno scarrabile e mentre la componente granuli di gomma verrà reimmessa nell'impianto per il suo recupero.

La macchina sarà completamente automatizzata; saranno inseriti opportuni sensori che controllano i vari livelli:

- Assenza di materiale in ingresso – azione conseguente: blocca la macchina
- Raggiunto livello massimo di tela di scarto stoccata nel container - azione conseguente: blocca la macchina e segnalazione sonora – azione conseguente: blocca la macchina
- Anomalie varie – azione conseguente: blocca la macchina

Per la sua gestione si stima l'impiego di un solo operatore il cui compito è limitato alla supervisione e sostituzione dello scarrabile quando questo risulta pieno.

Per ciascun turno di lavoro, di 8 ore, si stima l'impiego di XX ore/uomo di personale per gestire il sistema.

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EC DECLARATION OF CONFORMITY FOR MACHINERY EC Machinery Directive 2006/42/EC - Annex II, sub A



Manufacturer: ELDAN RECYCLING A/S
Address: VÆRKMESTERVEJ 4
DK-5600 FAABORG

Herewith declares that

ELDAN TYRE PLANT, D5000T-IL4000S-QUG MAIN-E2000P

SERIAL NO.: 50453

YEAR OF CONSTRUCTION: 2015

at delivery time is in conformity with relevant provisions of the Machinery Directive (Directive 2006/42/EC), as amended, and with national implementing legislation.

And that the following (parts/clauses of) harmonised standards have been applied:

EN/ISO 12100:2010

EN 60204-1:2006

ISO 13849-1:2006

EN/ISO 13857:2008

EN 954-1:1999

EN ISO 14122-1:2010

The electrical components are selected from components which are in accordance with the Low Voltage Directive 2006/95/EC and EMC directive 2004/108/EC and installed accordingly.

Electronic components are installed according to instructions from the supplier.

If the machinery/safety components have been modified without written release by manufacturer this declaration becomes invalid.

According to ABEK 612 §8 sek.2 and Directive 2006/42/EU article 2, this machine/plant is ready for being used only after the following precautions have been taken:

Fire hazard is present when recycling some materials. Install a fire protection system supplied by a professional company in your country, prior to taking the machine/plant into use.

ELDAN RECYCLING A/S

FAABORG, 1/10 2015

A blue ink signature of Toni Reftman.

Toni Reftman – Managing Director

A blue ink signature of Lars M. Eriksen.

Lars M. Eriksen - Plant Manager

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Manufacturer: ELDAN RECYCLING A/S
Address: VÆRKMESTERVEJ 4
DK-5600 FAABORG

Herewith declares that

ELDAN MULTI PURPOSE RASPER MPR200T

SERIAL NO.: 50453

YEAR OF CONSTRUCTION: 2015

at delivery time is in conformity with relevant provisions of the Machinery Directive (Directive 2006/42/EC), as amended, and with national implementing legislation.

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ELDAN RECYCLING A/S

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Manufacturer: ELDAN RECYCLING A/S
Address: VÆRKMESTERVEJ 4
DK-5600 FAABORG

Herewith declares that

ELDAN FINE GRANULATOR FG1504

SERIAL NO.: 50453

YEAR OF CONSTRUCTION: 2015

at delivery time is in conformity with relevant provisions of the Machinery Directive (Directive 2006/42/EC), as amended, and with national implementing legislation.

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FAABORG, 1/10 2015

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Toni Reftman – Managing Director

A blue ink signature of Lars M. Eriksen.

Lars M. Eriksen - Plant Manager

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Manufacturer: ELDAN RECYCLING A/S
Address: VÆRKMESTERVEJ 4
DK-5600 FAABORG

Herewith declares that

ELDAN CRACKER MILL CM900

SERIAL NO.: 50453

YEAR OF CONSTRUCTION: 2015

at delivery time is in conformity with relevant provisions of the Machinery Directive (Directive 2006/42/EC), as amended, and with national implementing legislation.

And that the following (parts/clauses of) harmonised standards have been applied:

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EN 60204-1:2006

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Noise levels for a Tyre Recycling Plant, main machines

Super Chopper SC1412T/ SC2118T:	approx. 90 – 95 dB(A)
Cooler for Super Chopper Hydraulic station:	approx. 95 – 100 dB(A)
Multi Purpose Rasper MPR120/ MPR160/ MPR200:	approx. 100 – 105 dB(A)
Fine Granulator: FG952/ FG1504:	approx. 100 – 105 dB(A)
Pneumatic Material transport for Fine Granulators:	approx. 105 - 110 dB(A)
Pneumatic Granulate transports:	approx. 85 – 90 dB(A)
Ventilator for Central Filter System:	approx. 100 – 105 dB(A)
Cracker Mill:	approx. 85 – 90 dB(A)

The above mentioned values are given with a margin of +/- 5 dB(A) within the normal working areas of the machines.

The noise level will depend on the actual surroundings. The distance to and the type of material for the floor, the walls and the roof will reflect the noise.