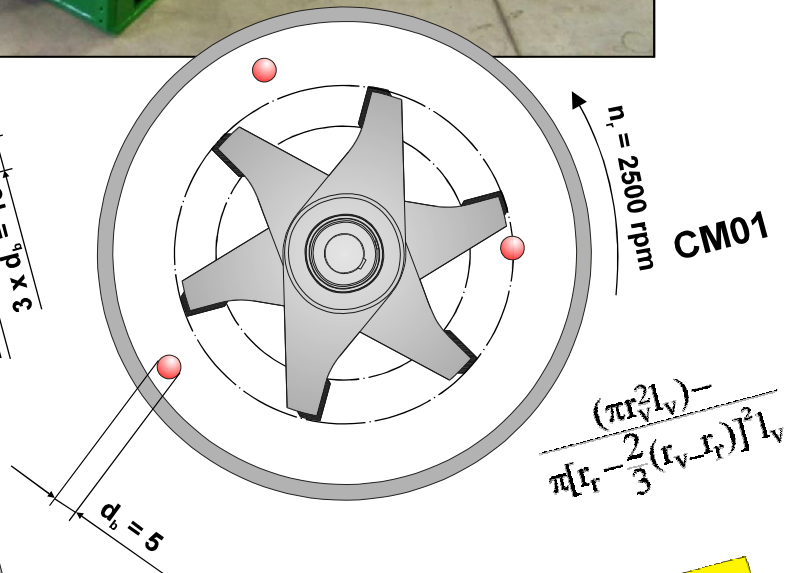
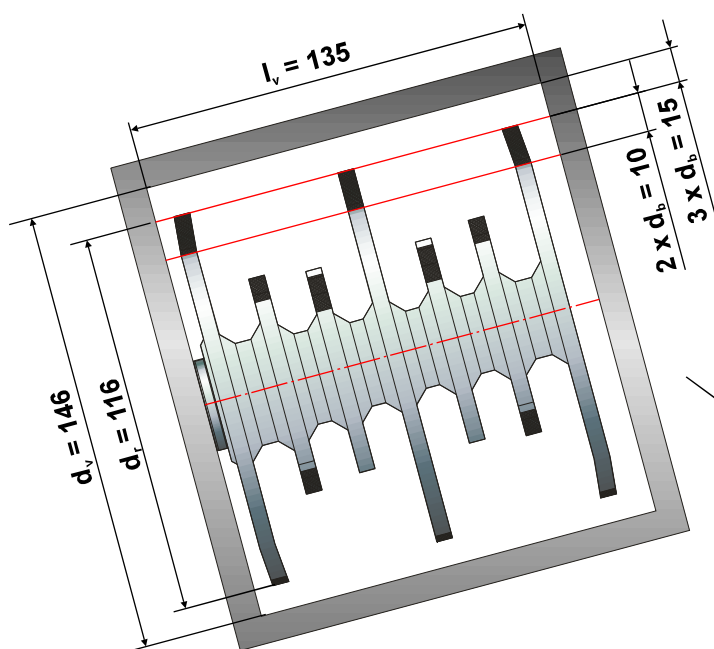
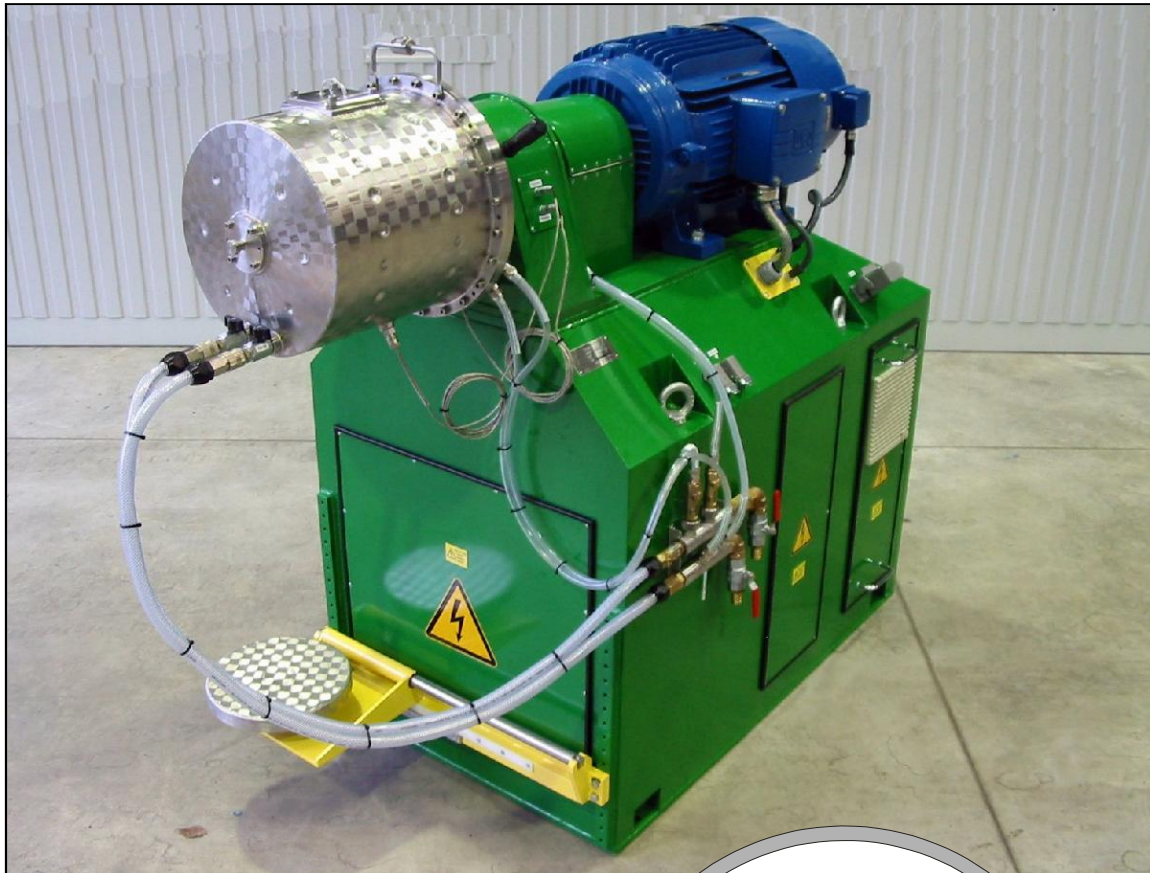


Simoloyer®



$$\frac{(\pi r_v^2 l_v) - \pi [r_r - \frac{2}{3}(r_v - r_r)]^2 l_v}{\pi [r_r - \frac{2}{3}(r_v - r_r)]^2 l_v}$$

ball size to avoid blocking:
 $d_v - d_r > 5 d_b$
 advice:
 $d_v - d_r > 6 d_b$

k_d density of the ball packet
 when accelerated
 V velocity of the balls

Minima filling ratio hypothesis > impact via ball blades
 $V_b \geq (\pi r_v^2 l_v) - \pi [r_r - \frac{2}{3}(r_v - r_r)]^2 l_v k_d v_b \rightarrow 0.83 \text{ dm}^3$



www.zoz.de - info@zoz.de

Applications

High Energy Milling (HEM)
Mechanical Alloying (MA)
Reactive Milling (RM)
High Kinetic Processing (HKP)
Mechano Chemistry (MC)

Products

Nanocrystalline Materials
Amorphous Materials
ODS Alloys
Iron and oxide based magnetics
CMC, CCC, MMC ...

Technical Specifications

- grinding chamber capacity 0.3 to 900 litres
- drive power 2.7 to 220kW
- quick grinding unit replacement
- atmosphere: air, inert gas or vacuum
- batch/auto-batch or (semi-)continuous processing
- efficient heating/cooling system of grinding unit

distributed by:

Advantages

- high and homogeneous kinetic energy of ball impacts
- no dead zones due to gravity
- charging, processing and discharging under controlled atmosphere (vacuum or inert gas by means of an air-lock)
- direct scaling up without change of system



Simoloyer® CM01

type of Simoloyer	power	volume of grinding chamber in litres W[x]	scale	common powder load
CM [xx]	[kW]	W[x]		example Cu-flake
01	2,7	1 and 2	lab	200 g
08	16,6	5 and 8	lab (industry)	800 g
20	22	10 and 20	lab (industry)	2 kg
100	60	100	industry (lab)	20 kg
400	220	400	industry	100 kg
900	500	900	industry	250 kg

font bold = standard grinding unit * see table below for details

example Simoloyer : **CM20** example grinding unit: **W20-20lm**



Simoloyer® CM20

type of grinding-unit Wxx(x)-* for Simoloyer CM01-CM900	
1m	standard (cooling circuits for vessel, pre-seal unit and flange)
1k	extreme bi-conical shape of grinding chamber
1m-s1	additional tangential ports for (semi)-continuous operation
1m-s2	second mainport (P01a/P01b) for auto-batch configuration
1m-su	additional sample port
1h	cooling system for pre-seal unit and flange, heat-sheets at vessel
1mc	HTB configuration (modular type c with separate cooling of ports, piping for HT 150°C)
1m*	cooling system for pre-seal unit, double jacket for flange & vessel (heating/cooling by e.g. oil, water)
SiN	vessel with lining Si ₃ N ₄ , rotor with bulk blades Si ₃ N ₄ (cooling system as type W01-xlm)
THM	vessel with lining WC-Co, rotor with bulk blades WC-Co

* alternative modular cooling jacket, further types o inquiry



Simoloyer® CM100s2



equipment,
e.g. air-lock DN40



carrier gas discharging unit TGD20a



experimental unit VS01a for
semi-continuous processing

MALTOZ®

Simoloyer® Operating Program

- Cycle-Operation (discontinuous processing)
- controlable process temperature
- controlable milling power/energy input
- full record of milling history



types of grinding units



W01-2lm (standard)



W01-2lm-SiN



W01-2lh



W01-2lm-s1



W01-2l (transparent)

technical data subject to alterations