

PELLETIZING TECHNOLOGY

BY CEMTEC

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- MECHANICAL ASPECTS OF PLOUGHSHEAR MIXERS
- MECHANICAL ASPECTS OF PELLETIZING DISCS
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COMPANY HISTORY





1990 The company is founded by Franz Plochberger under the name of CEMENTAS GmbH in Enns (Upper Austria) to serve the South American and European cement and industrial minerals industries needs.

1995 The first CEMENTAS mill is put into operation.

1997 CEMENTAS GmbH is renamed as CEMTEC Cement and Mining Technology GmbH.

1998 First CEMTEC AG mill.
Supply of an iron ore drying drum Ø 4,6 x 25,0 m.

2003 Order for a cement grinding plant on turnkey basis with a capacity of 140 t/h.

2004 CEMTEC fabricates 28 mills in 2004.

2008 Relocation of all departments to Enns harbor area

2013 Commissioning of a grinding circuit for 1300 t/h with
1x SAG-mill ø10,36×6,17m (2×7,5MW)
1x Ball mill ø8,2×14m; (2×9MW)

2014 Orders for 8 turn-key cement grinding terminals in West Africa

2016 Turnover >100 M€

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COMPANY STRUCTURE

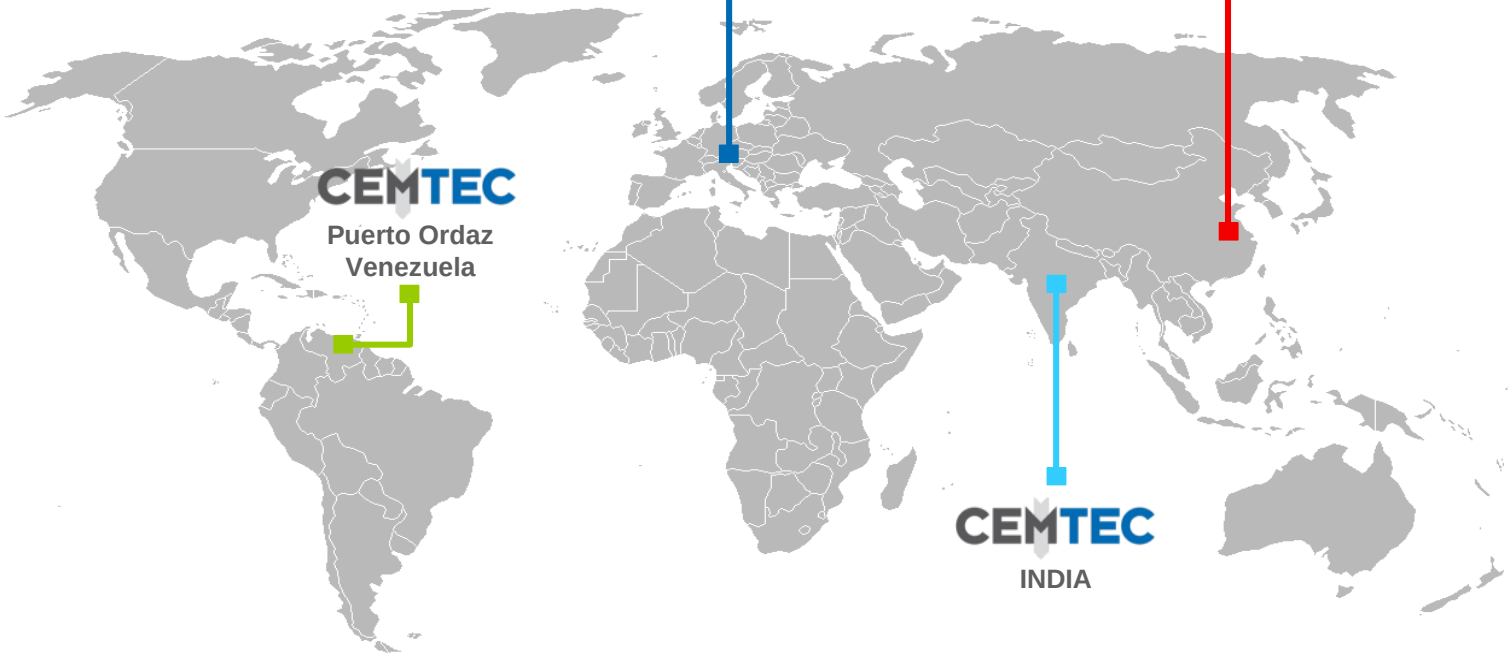
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TURNOVER
70 – 120 Mio €

STAFF
290 EMPLOYEES

R&D INVEST
≈ 1 Mio € / YEAR





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PRODUCT PORTFOLIO

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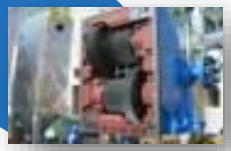
TURNKEY PROJECTS





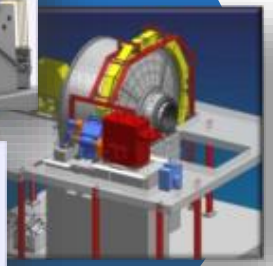


SPARE PARTS



GRINDING







SEPARATORS



DRYERS





PELLETIZING

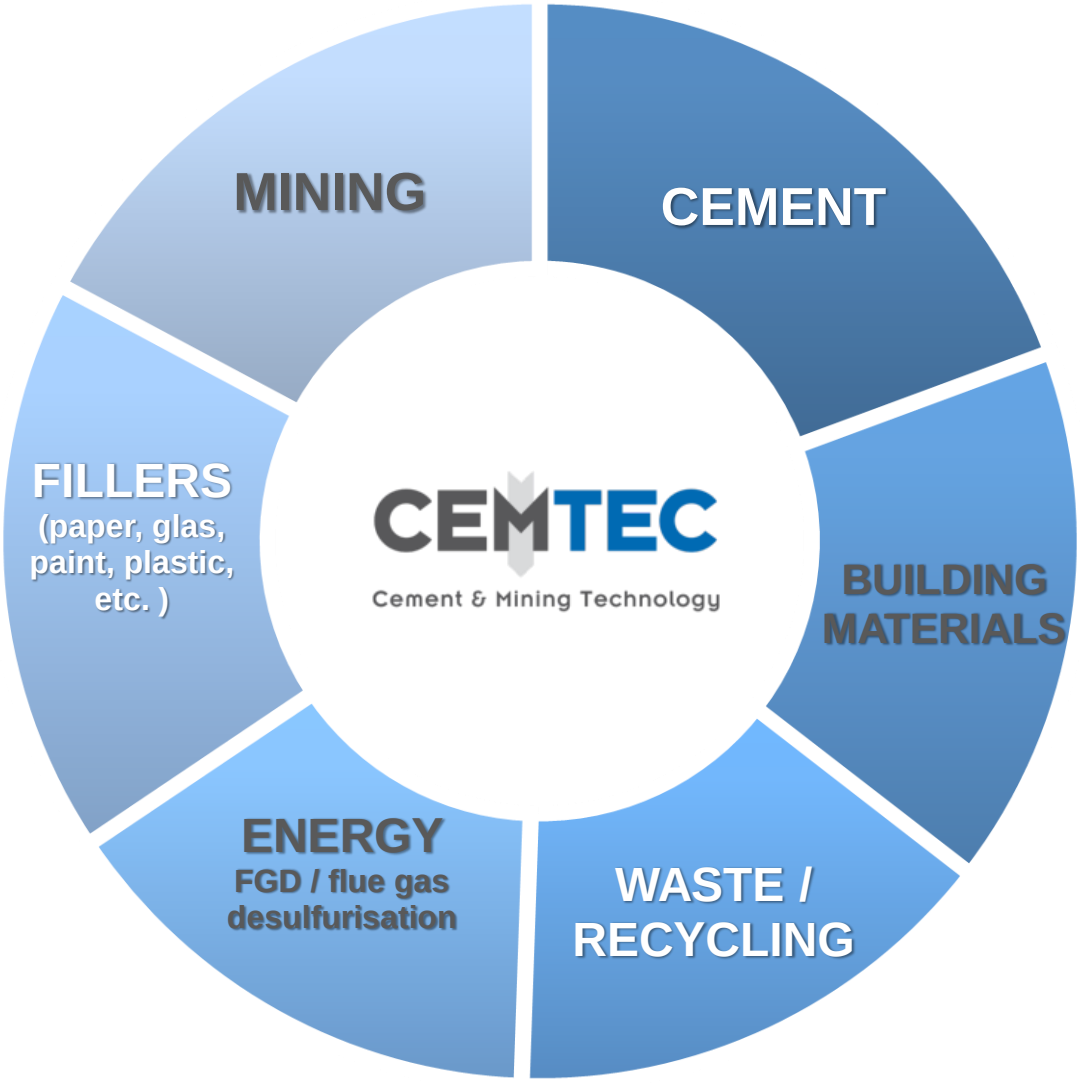




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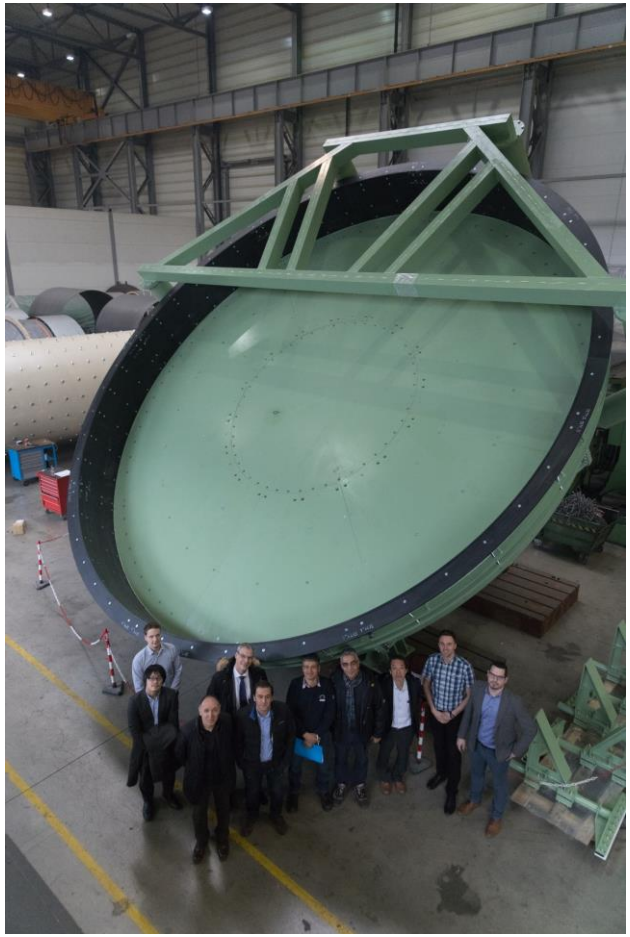
DIVERSIFIED INDUSTRIES

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MILESTONES SINCE 1990



- **SOLD** MILLS

TOTAL:	350 pcs.
CEMENT INDUSTRY:	70 pcs.

- **SOLD** PELLETIZING DISCS

IRON ORE:	47 pcs.
FERTILIZER / OTHERS:	12 pcs.

- **SOLD** DRYERS

TOTAL:	31 pcs.

- **SOLD** TURN KEY PLANTS

CEMENT:	16 pcs.
FGD:	33 pcs.
MINING AND PELLETIZING:	64 pcs.

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GLOBAL CUSTOMERS

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BOREALIS















































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Background and Motivation

- **Iron ore industry**
  - Iron ore qualities are decreasing
  - Increased demand for grinding ores to finer grades
  - For use in blast furnace beneficiated iron ores have to be pelletized
- **Fertilizer industry**
  - Increasing demand for agglomerates
  - Different compositions of chemical and organic fertilizers





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Pre-Mixing

- Cemtec features a combination of mixing and pelletizing
- High intensity ploughshare mixers are preparing seed pellets



Industrial minerals and fertilizer mixer



Iron ore ploughshare mixer

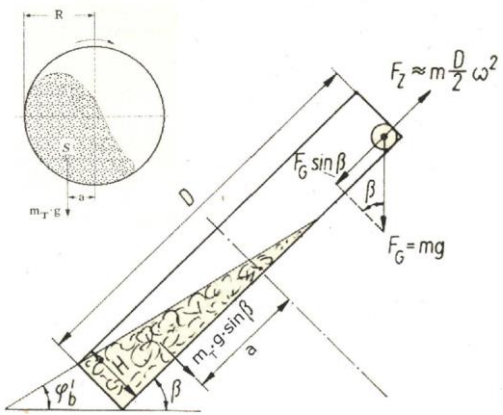
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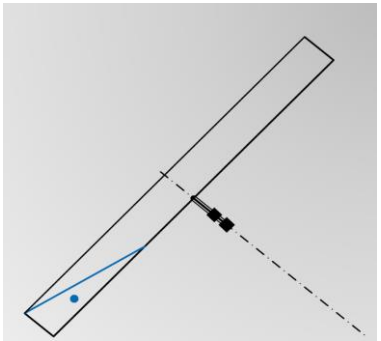
- Pelletizing discs equipped with multiple adjustment possibilities are able to produce high quality agglomerates



Main parameters:

- Disc diameter
- Disc angle
- Wall height
- Disc speed
- Location of water and material feed





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THE ART OF PELLETIZING III

- Cemtec's pilot plant
- More than 150 different materials were pelletized during last 10 years
- Based on results industrial processes are sized and performance guarantees are established





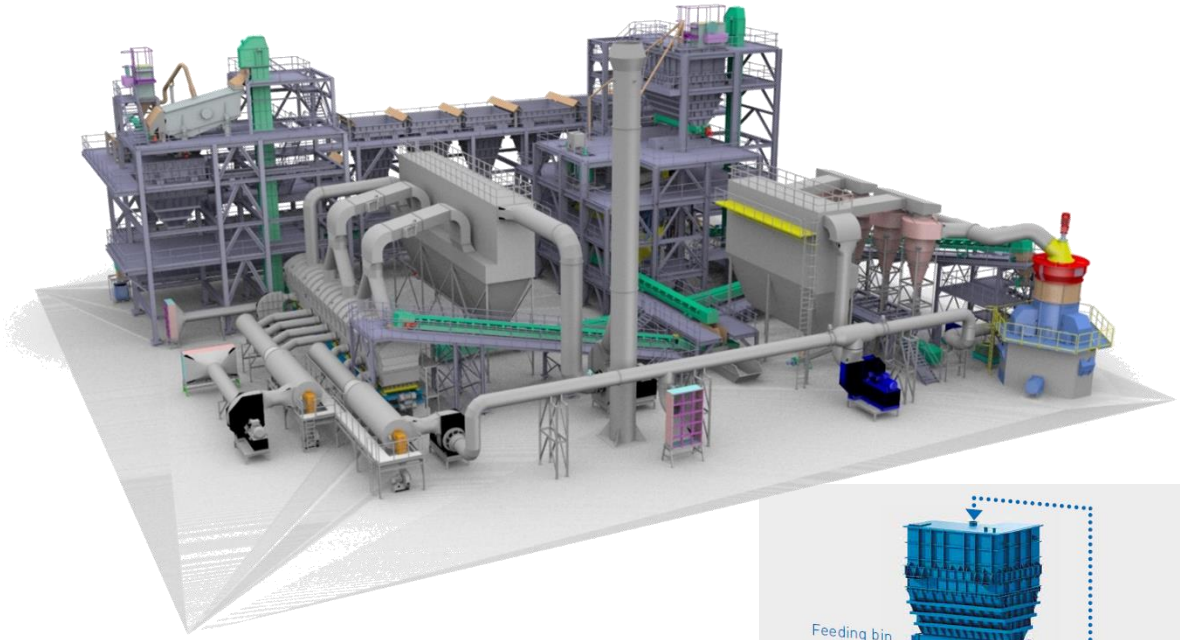


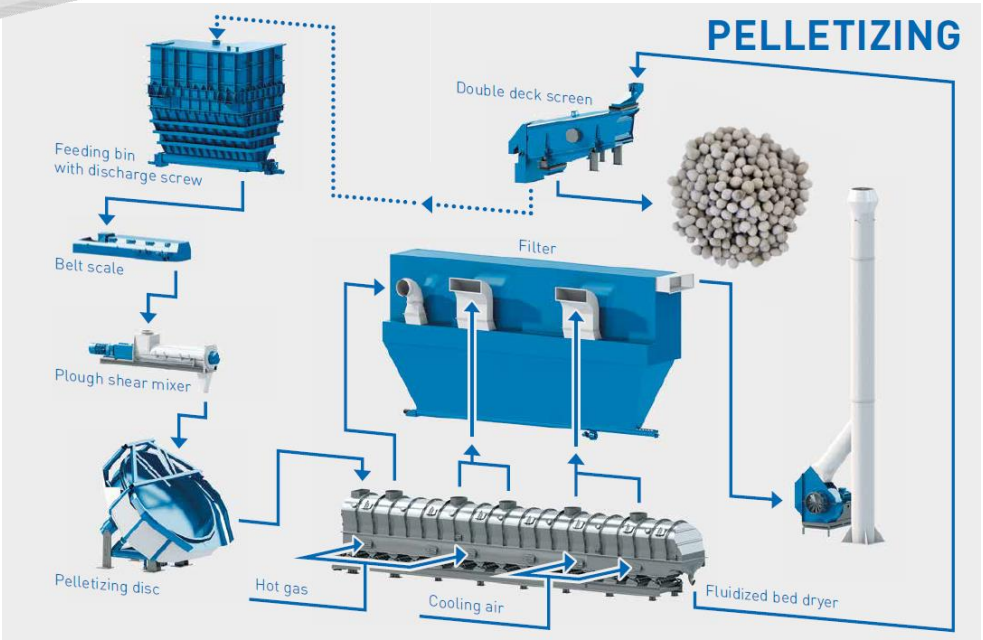


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PROCESS DESIGN

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MECHANICAL ASPECTS OF PLOUGHSHEAR MIXERS

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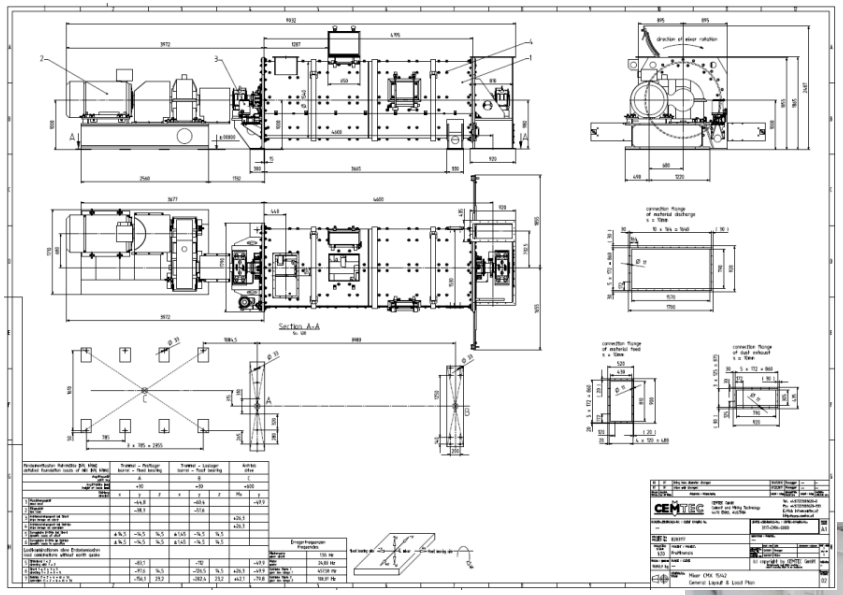




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MECHANICAL ASPECTS OF PLOUGHSHEAR MIXERS

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MECHANICAL ASPECTS OF PLOUGHSHEAR MIXERS

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CMX 18/50-400	
Diameter	1,8 m
Length	5 m
Volume	12,72 m³
L/D	2,78
Power	400 kW
specific volume power	31,4 kW/m³
specific capacity	10,5 m³/m³
Capacity	400 tph
Filling degree	30 %
Filling cross section	0,76 m²
Filling volume	3,82 m³

CMX 16/46-315	
Diameter	1,65 m
Length	4,6 m
Volume	9,84 m³
L/D	2,79
Power	315 kW
specific volume power	32,0 kW/m³
specific capacity	10,5 m³/m³
Capacity	310 tph
Filling degree	30 %
Filling cross section	0,64 m²
Filling volume	2,95 m³

CMX 15/42-250	
Diameter	1,5 m
Length	4,2 m
Volume	7,42 m³
L/D	2,80
Power	250 kW
specific volume power	33,7 kW/m³
specific capacity	10,4 m³/m³
Capacity	230 tph
Filling degree	30 %
Filling cross section	0,53 m²
Filling volume	2,23 m³

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MECHANICAL ASPECTS OF PLOUGHSHEAR MIXERS

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CMX 13/38-200

Diameter	1,35 m
Length	3,8 m
Volume	5,44 m³
L/D	2,81
Power	200 kW
specific volume power	36,8 kW/m³
specific capcity	10,4 m³/m³
Capacity	170 tph
Filling degree	30 %
Filling cross section	0,43 m²
Filling volume	1,63 m³

CMX 12/33-132

Diameter	1,2 m
Length	3,3 m
Volume	3,73 m³
L/D	2,75
Power	132 kW
specific volume power	35,4 kW/m³
specific capcity	10,4 m³/m³
Capacity	116 tph
Filling degree	30 %
Filling cross section	0,34 m²
Filling volume	1,12 m³

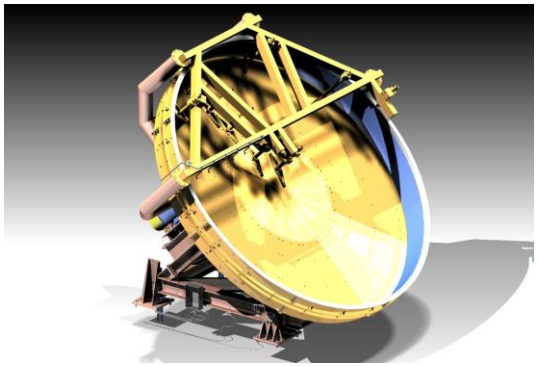
CMX 10/30-90

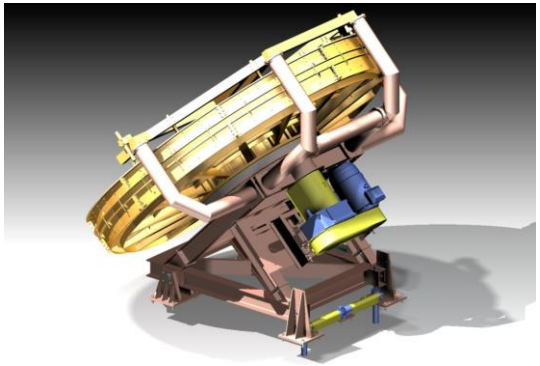
Diameter	1,05 m
Length	3 m
Volume	2,60 m³
L/D	2,86
Power	90 kW
specific volume power	34,6 kW/m³
specific capcity	9,6 m³/m³
Capacity	75 tph
Filling degree	30 %
Filling cross section	0,26 m²
Filling volume	0,78 m³

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MECHANICAL ASPECTS OF Ø7,5M PELLETIZING DISCS

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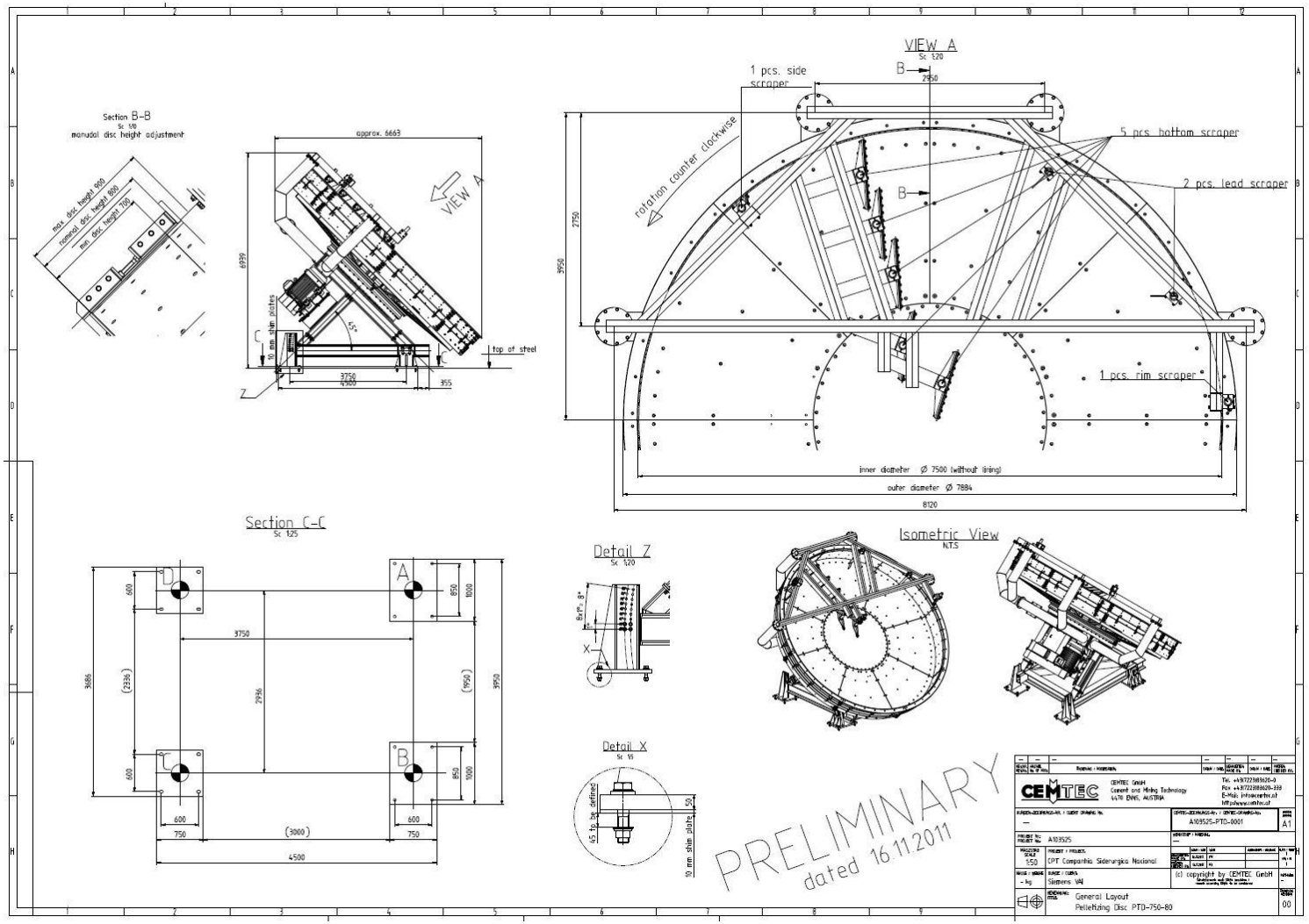


Nominal design capacity	150-200	t/h
Moisture content	8-12	%
Adjustable disc speed	5-10	rpm
Disc diameter	7.500	mm
Disc depth (adjustable manual)	630-900	mm
Disc slope (adjustable)	45-53	°
Direction of roation	both	
Lubrication system	centralized / spraying	
Main drive speed nom.	1500	rpm
Installed main drive power	250	kW
Lining material	UHMW-PE	
Total weight of disc	approx. 48 t	

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MECHANICAL ASPECTS OF Ø7,5M PELLETIZING DISCS

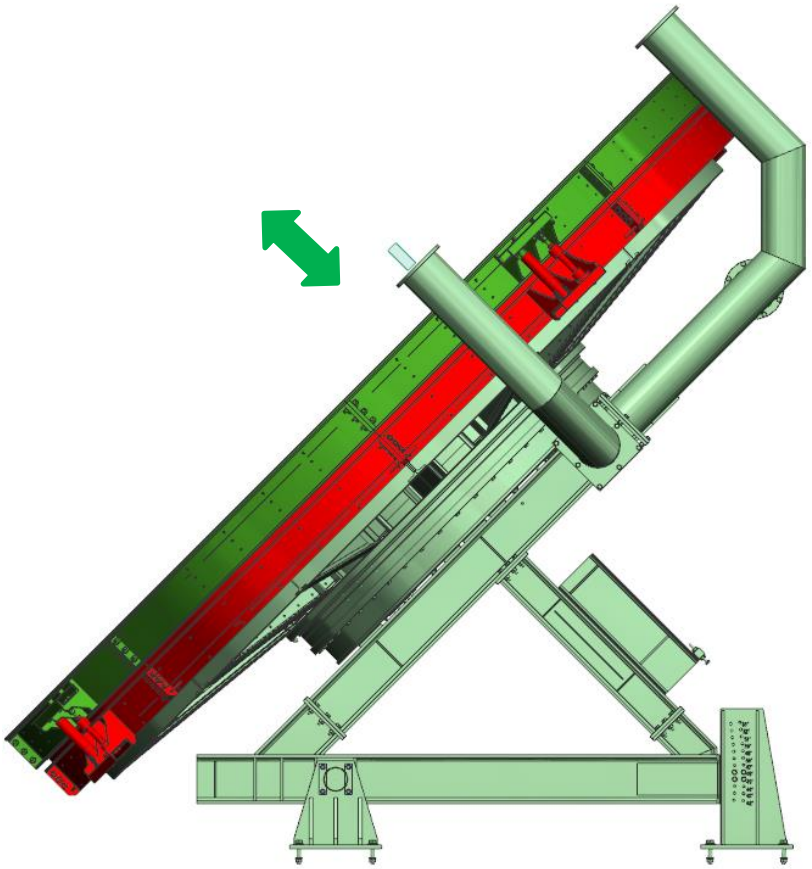
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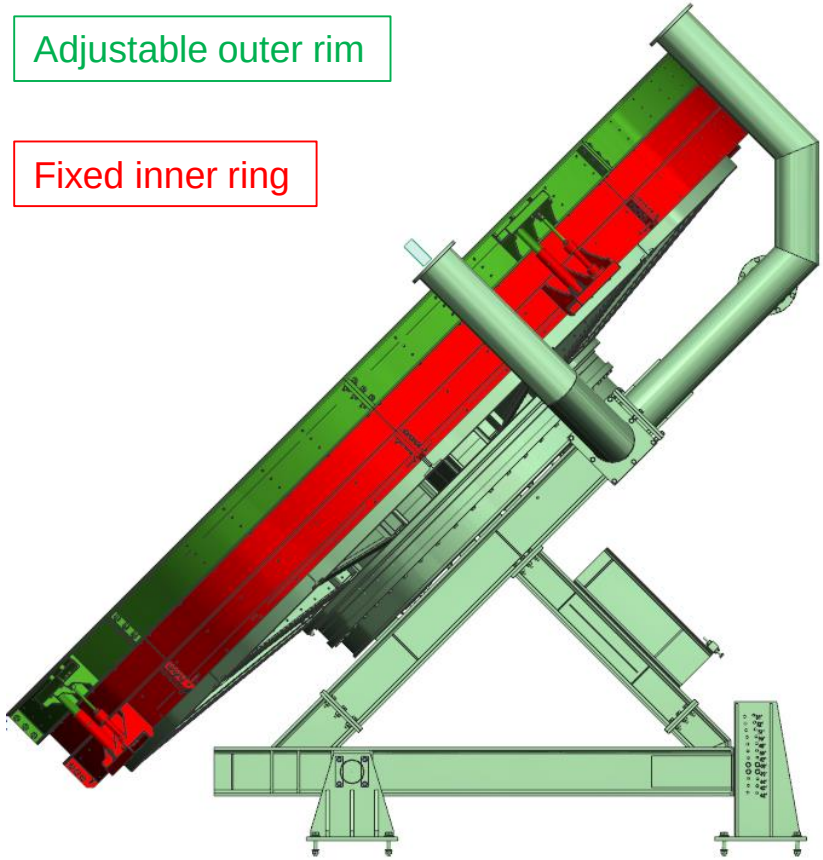
Disc height adjustment

The height of the disc is able to be adjusted with a defined stroke



Adjustable outer rim

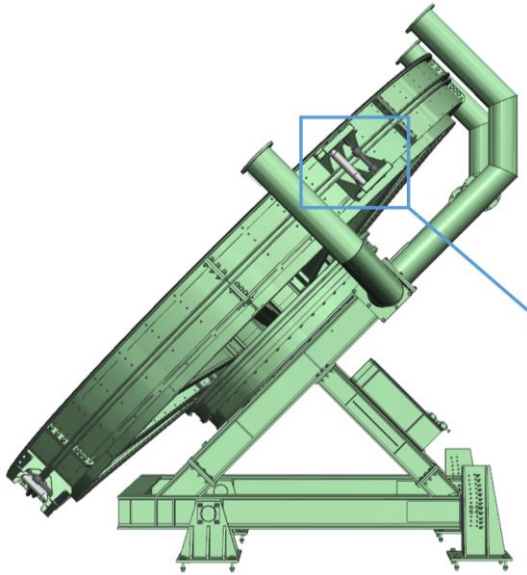
Fixed inner ring

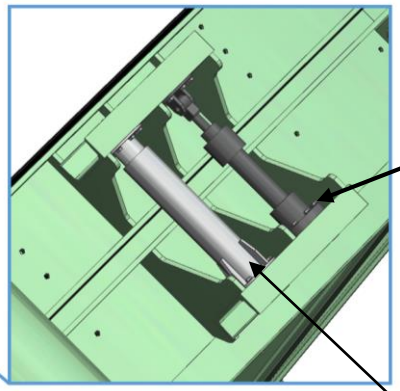


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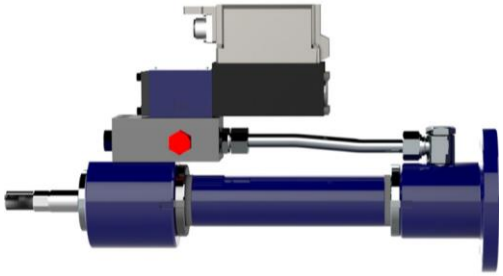
MECHANICAL ASPECTS OF Ø7,5M PELLETIZING DISCS

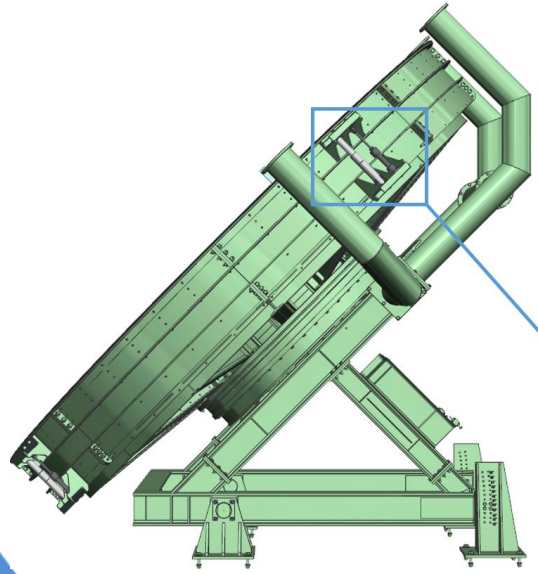
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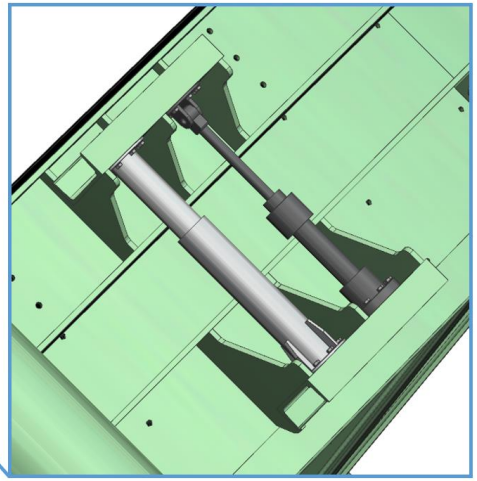




Hydraulic servo cylinder including displacement measuring system



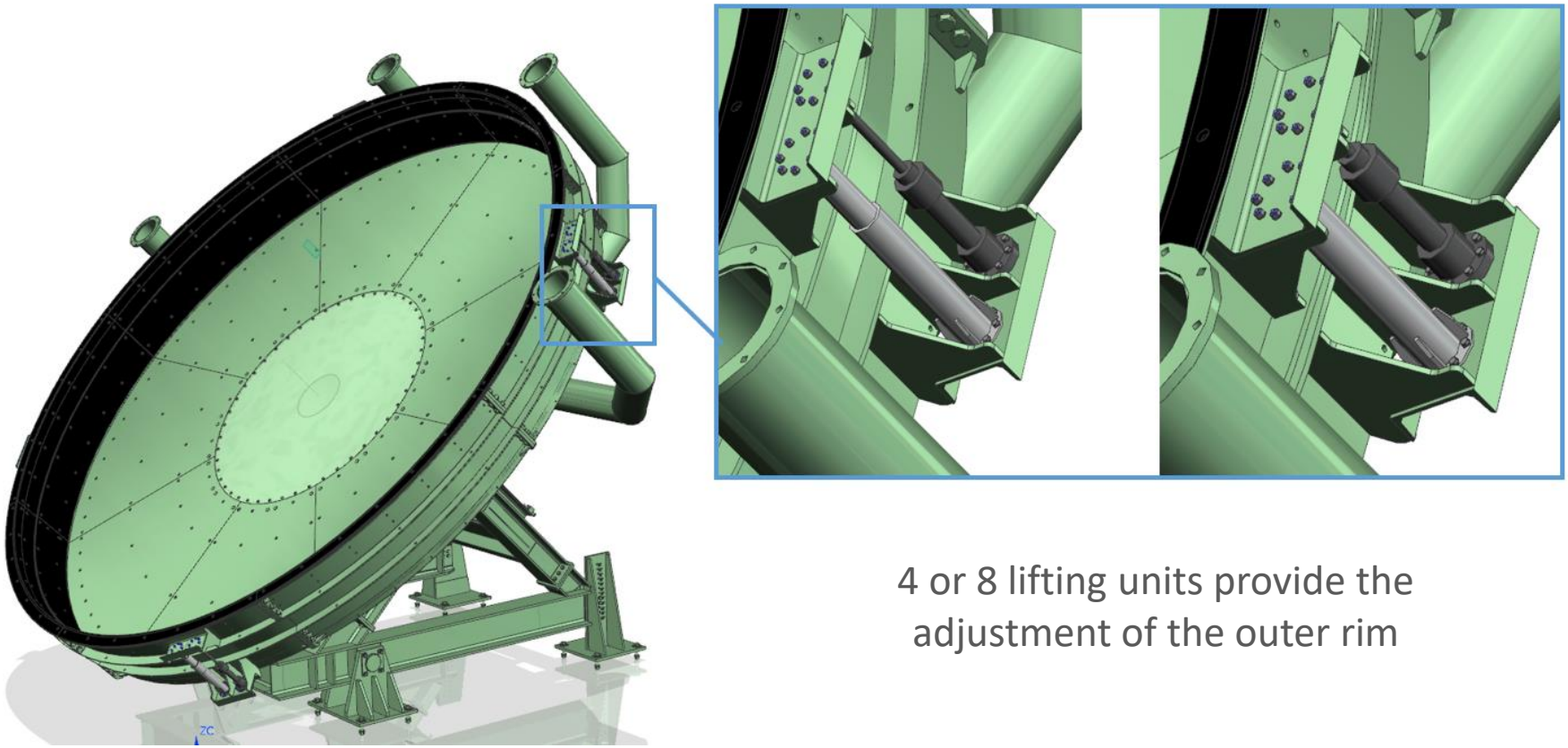




Guide cylinder

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Lifting unit

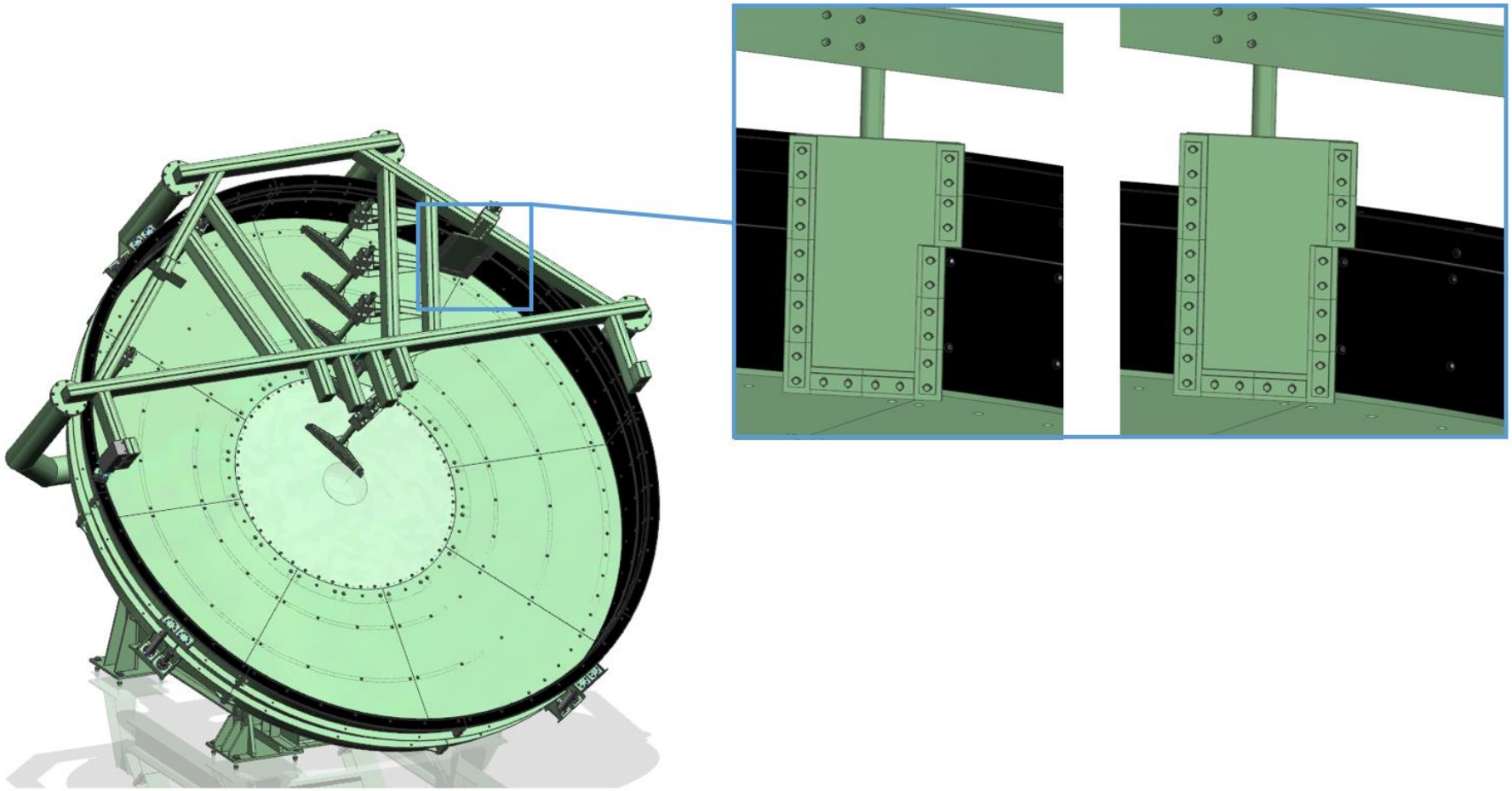


4 or 8 lifting units provide the adjustment of the outer rim

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Sidewall Scraper

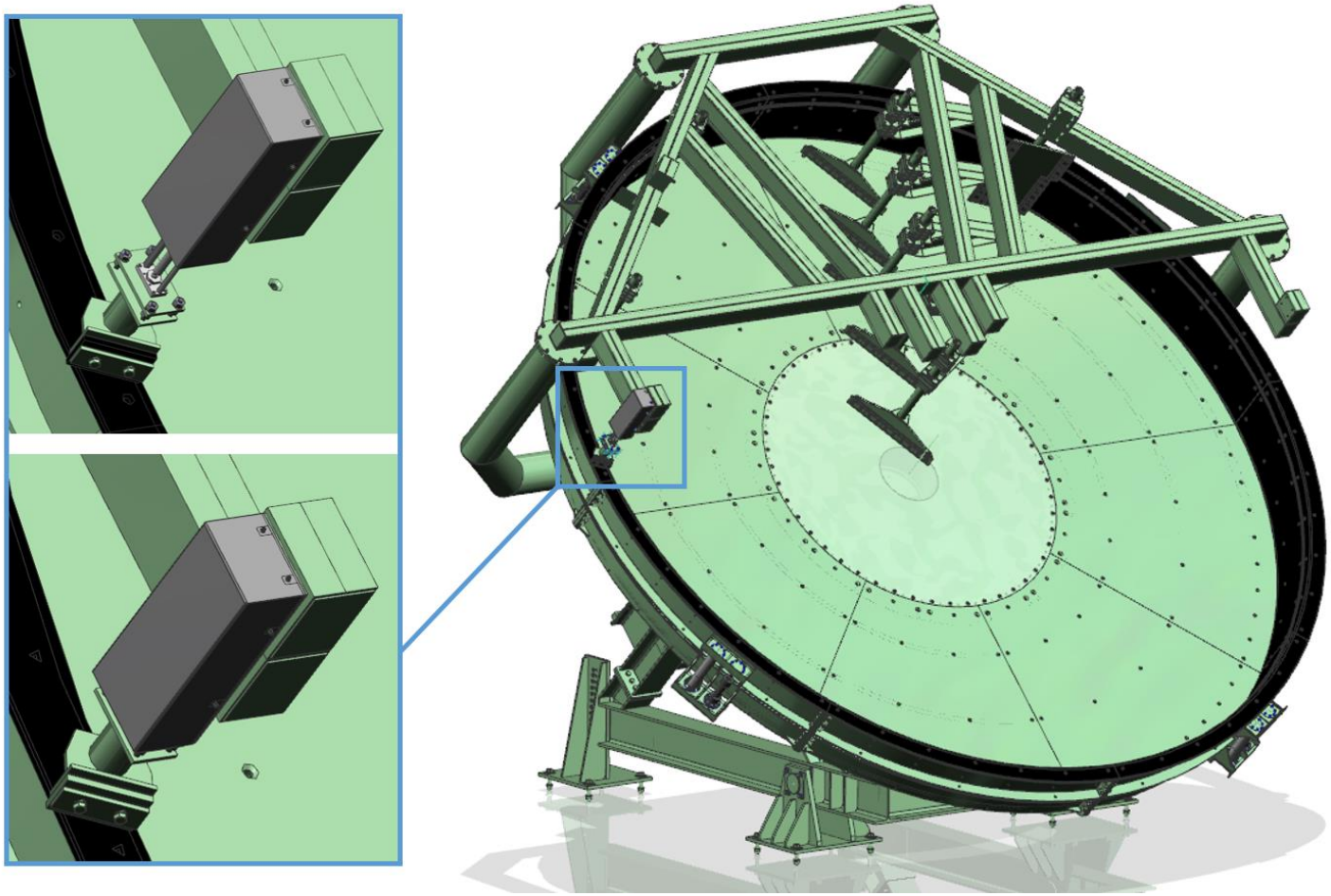
Sidewall scraper follows the adjustment of the outer rim



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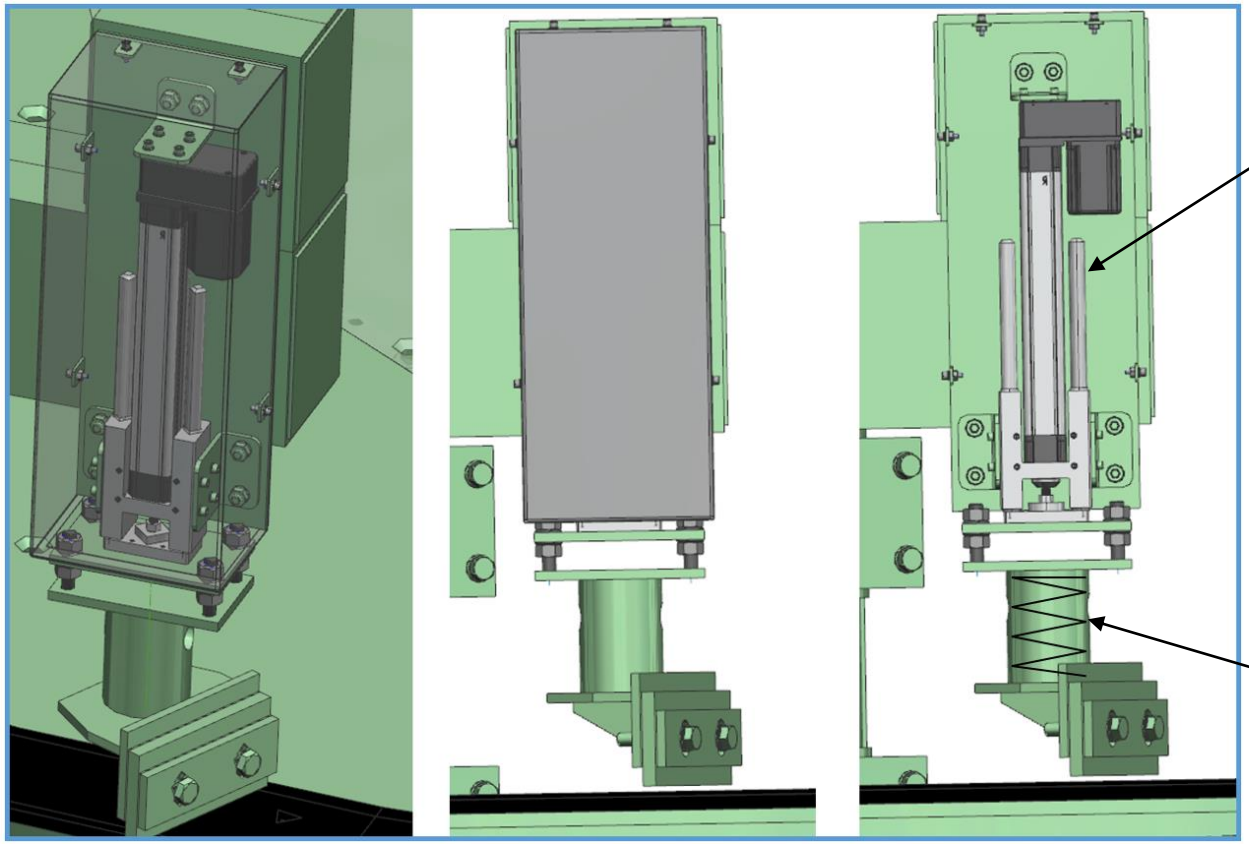
Rim Scraper

Rim scraper follows the adjustment of the outer rim



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MECHANICAL ASPECTS OF Ø7,5M PELLETIZING DISCS



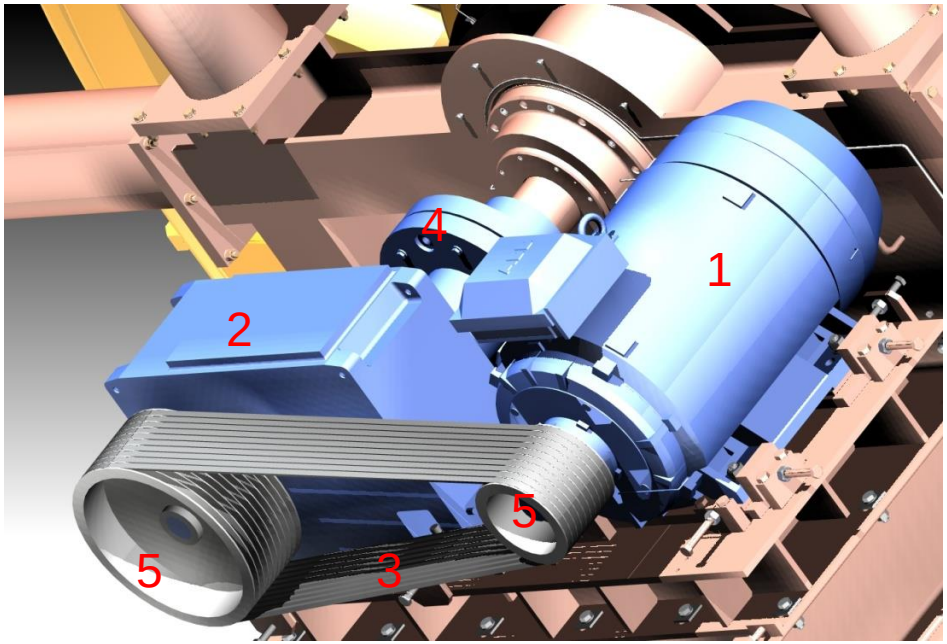
Electric cylinder with displacement measuring system

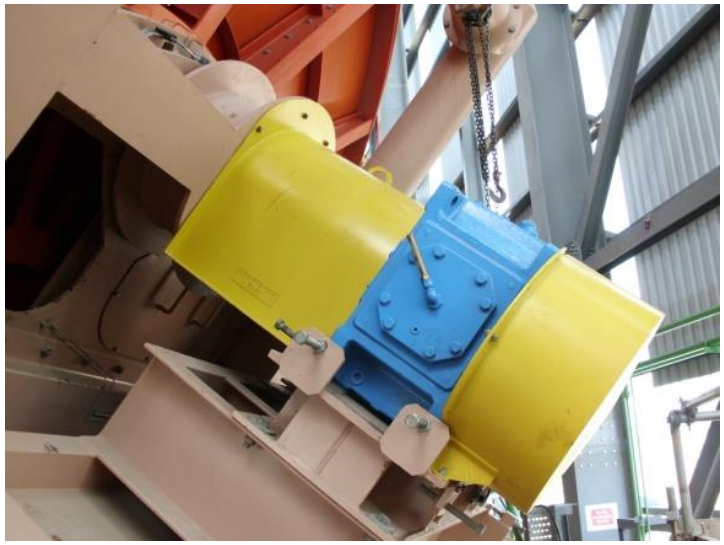
Additional spring for compensating tolerances

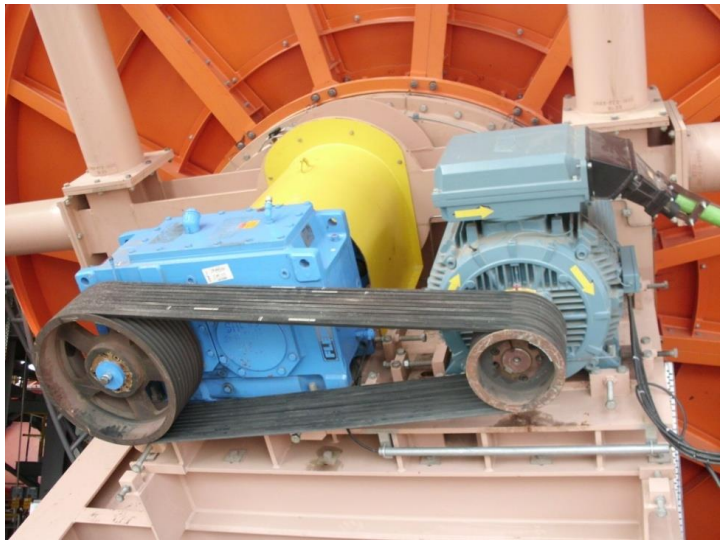
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MECHANICAL ASPECTS OF Ø7,5M PELLETIZING DISCS

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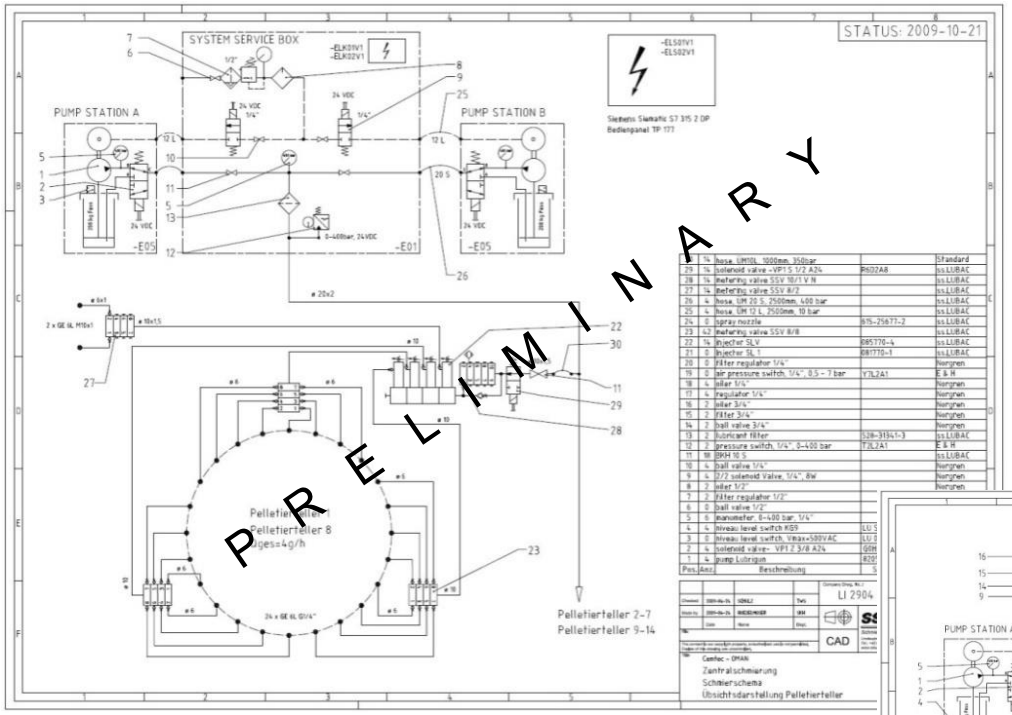


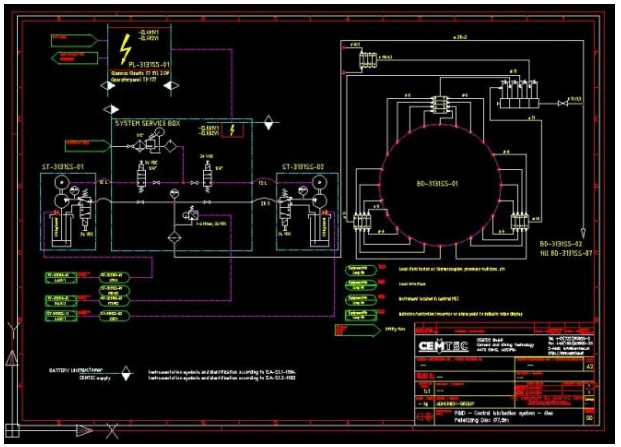
1……. main motor
2……. gear box
3……. V-belts
4……. main coupling
5……. belt pulleys

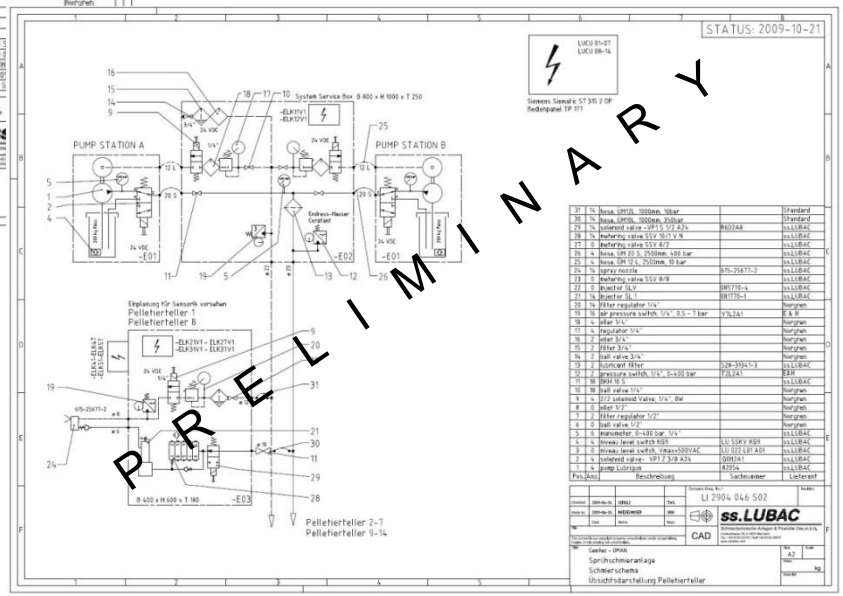
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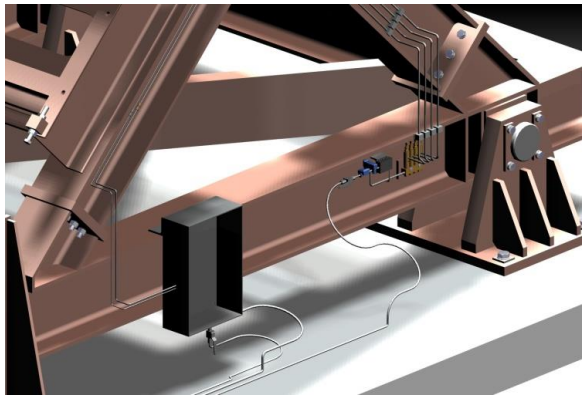
MECHANICAL ASPECTS OF Ø7,5M PELLETIZING DISCS

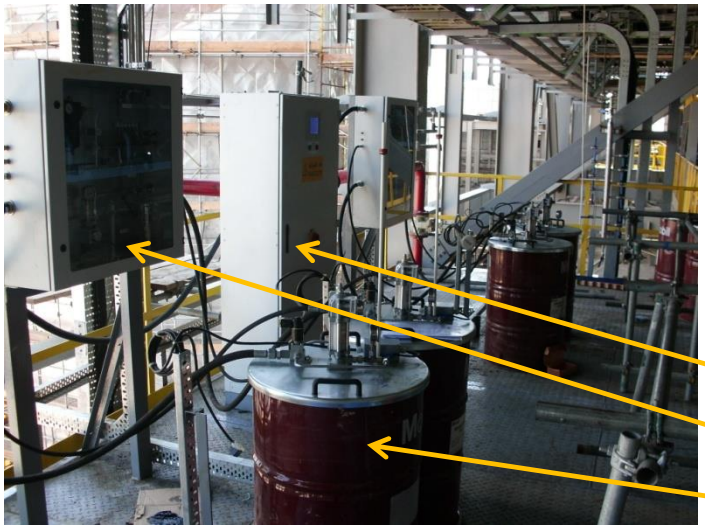
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SPRAYING LUBRICATION
- gear rim
- pinion
- spray nozzle





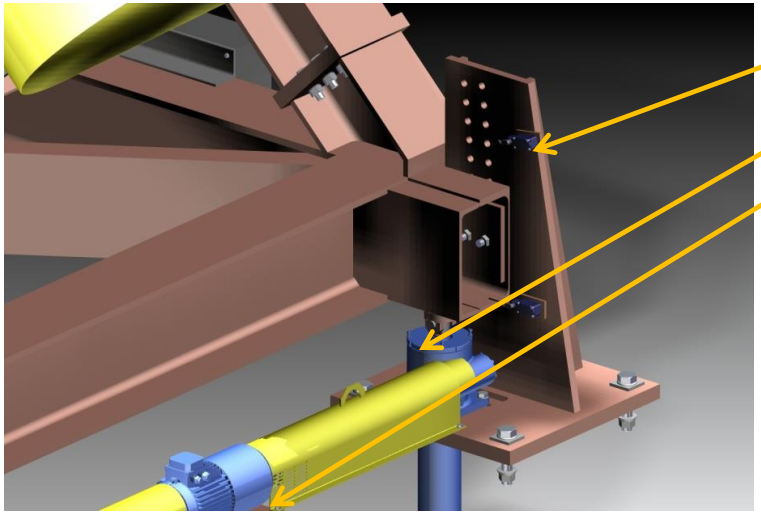


CENTRAL LUBRICATION
- control cabinet
- system service box
- barrel pump

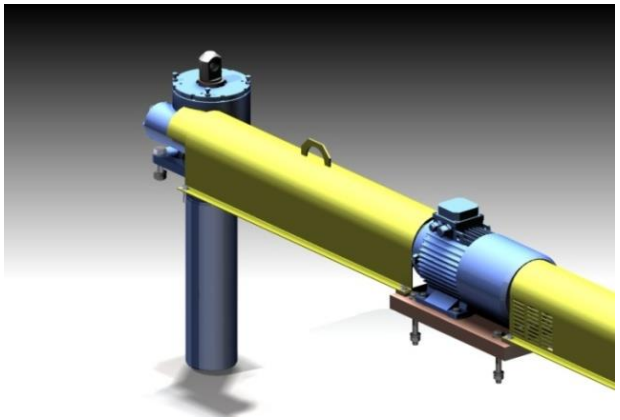
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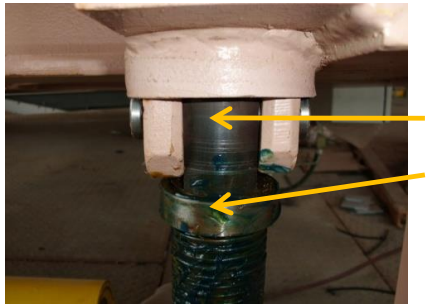
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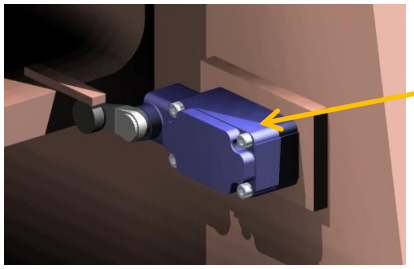


- level switch
- screw jack
- slope motor





- connection point
- spindle



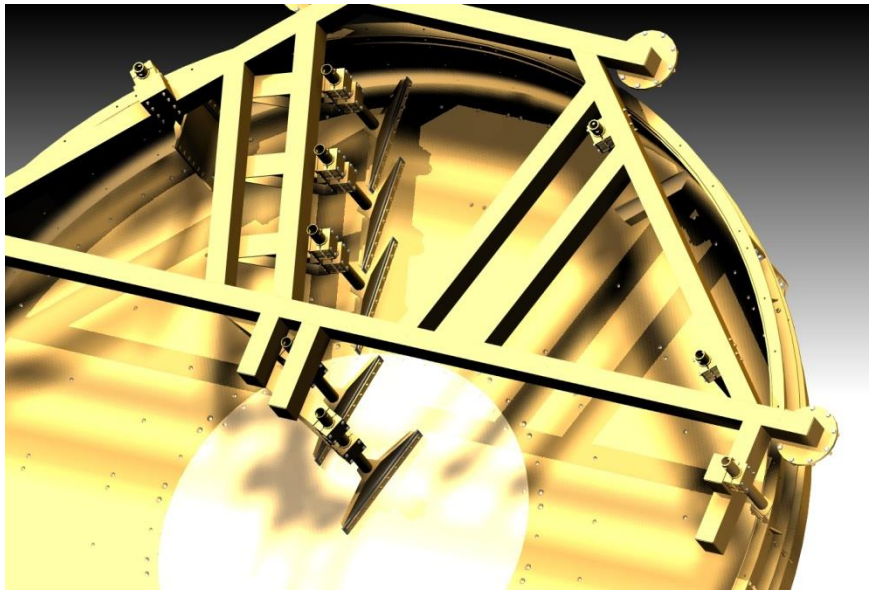
- level switch



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MECHANICAL ASPECTS OF Ø7,5M PELLETIZING DISCS

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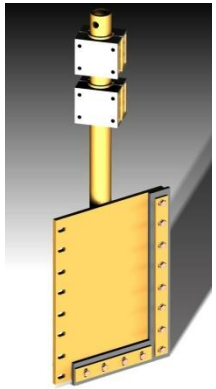
The scrapers are equipped with silicon carbide ceramic plates.



bottom scraper



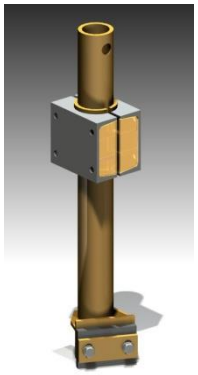
side scraper



lead plate



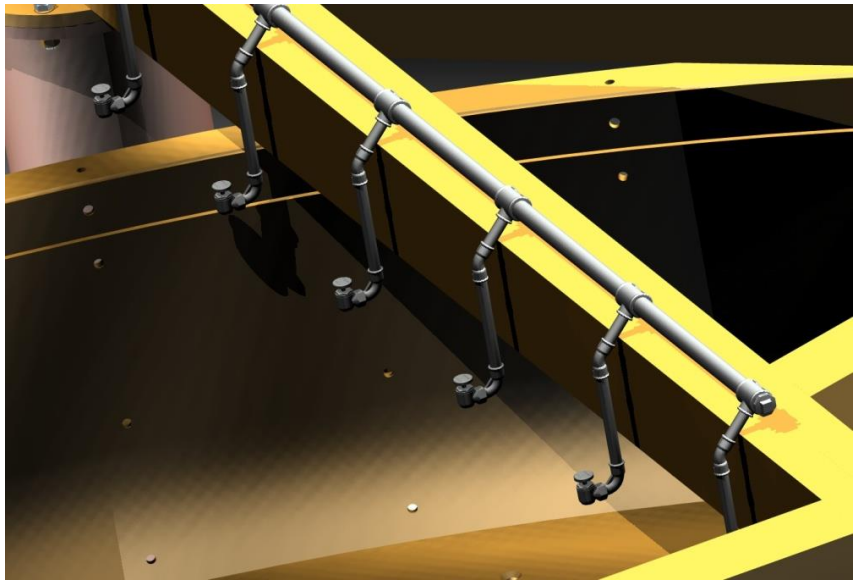
rim scraper



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MECHANICAL ASPECTS OF Ø7,5M PELLETIZING DISCS

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Tangential-flow hollow cone nozzles

- uniform hollow cone spray pattern
- adjustable flow rate







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MECHANICAL ASPECTS OF Ø7,5M PELLETIZING DISCS

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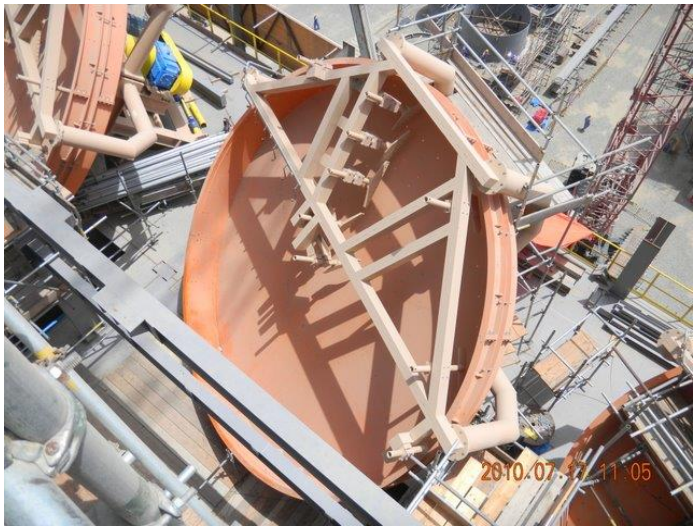


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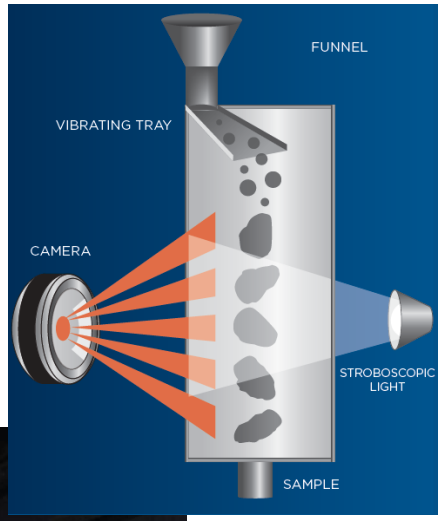




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PARTICLE SIZE MONITORING

- In cooperation with Microtrac
- Enables real time analysis of pellet size
- Optical based well proven system
- Representative sampling on discharge
- Possibility to control table settings
  - Disc inclination
  - Disc speed
  - Side wall height





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REFERENCES

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Characteristics of the pelletizer													
place of installation	installed amount	Automated system for adjusting the height of the side wall (specify range, mm)	The system for changing the plate angle in real time (range), °	work in automatic mode, yes/no	Control system for the particle-size-distribution of raw pellets, yes / no	raw material (pelletizer feed)	plate diameter, m	output, t/h	Strength of raw pellets, kg/ok	class content 10 -12,5 mm, %	class content 10 -14 mm, %	Range of plate rotation speed, rtm	weight, t
Nigeria	6	no	manually adjusting 42-53°	no	no	Iron ore	7,5	150	not defined	product size 70% between 9-16 mm		0-11	47
Venezuela	4	no	manually adjusting 42-53°	no	no	Iron ore	7,5	150	not defined	product size 70% between 9-16 mm		0-11	47
Saudi Arabia	4	no	manually adjusting 42-53°	no	no	Iron ore	7,5	150	not defined	product size 70% between 9-16 mm		0-11	47
Oman	14	yes for one item test wise	motorized 42-53°	yes	no	Iron ore	7,5	110	not defined	product size 70% between 9-16 mm		0-11	48
India	2	no	motorized 42-60°	yes	no	Iron ore	7,5	150	not defined	product size 70% between 9-16 mm		0-11	48
India	6	no	motorized 42-60°	yes	no	Iron ore	7,5	150	not defined	product size 70% between 9-16 mm		0-11	48
China	1	no	hydraulic adjustment 42-63°	yes	no	MoO3	2	2,1	> 2,0	product size 80% between 2-10mm		0-20	5
Germany	1	no	manually adjusting 42-53°	yes	no	White lime hydrate	4	24	> 2,0	product size 80% between 2-12mm		0-20	16
Turkey	2	no	hydraulic adjustment 42-60°	yes	no	Fertilizer	4	21	> 2,0	product size 80% between 2-8mm		0-20	16
Belgium	1	no	hydraulic adjustment 42-60°	yes	no	CaCO3	4,5	21	> 2,0	product size 80% between 2-6mm		0-20	17
Poland	1	no	hydraulic adjustment 42-60°	yes	no	Lime hydrate	4,5	21	> 2,0	product size 80% between 2-8mm		0-20	17
Austria	1	no	hydraulic adjustment 42-60°	yes	no	Limestone	3	12	> 2,0	product size 3-6mm		10-20	10
Austria	1	no	hydraulic adjustment 42-63°	yes	no	Iron ore	1,2	0,5	not defined	Various		8-37	1
Austria	1	no	hydraulic adjustment 42-63°	yes	no	Various	1,2	0,5	not defined	Various		8-37	1
Greece	1	no	hydraulic adjustment 42-63°	yes	no	Limestone	3	8-15	> 2,0	product size 80% between 2-6mm		0-20	10
Brazil	1	no	hydraulic adjustment 45-60°	yes	no	Limestone	4,5	21	> 2,0	product size 80% between 2-6mm		0-20	23
New Zealand	1	no	hydraulic adjustment 45-60°	yes	no	Limestone	4,5	21	> 2,0	product size 80% between 2-6mm		0-20	23
Austria	1	no	hydraulic adjustment 42-63°	yes	no	Iron oxide	1,2	0,5	not defined	100% > 2mm		8-37	1
Iran	9	no	manually adjusting 42-53°	no	no	Iron ore	7,5	42-210	not defined	product size 67% between 9-16 mm		0-11	44

Additional:
Provide materials confirming the above listed parameters (photo, video, drawings);
Availability of patent documentation for technical solutions of these parameters (attach copies);
Availability of a certificate of international quality system (attach copies)

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BASIC DATA:

21 tph Grinding and Pelletizing plant in **Turkey**

Disc diameter: 4,0 m

Pellet size: 2 - 8 mm

Automatic disc angle adjustment

Raw material: Fertilizer





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BASIC DATA:

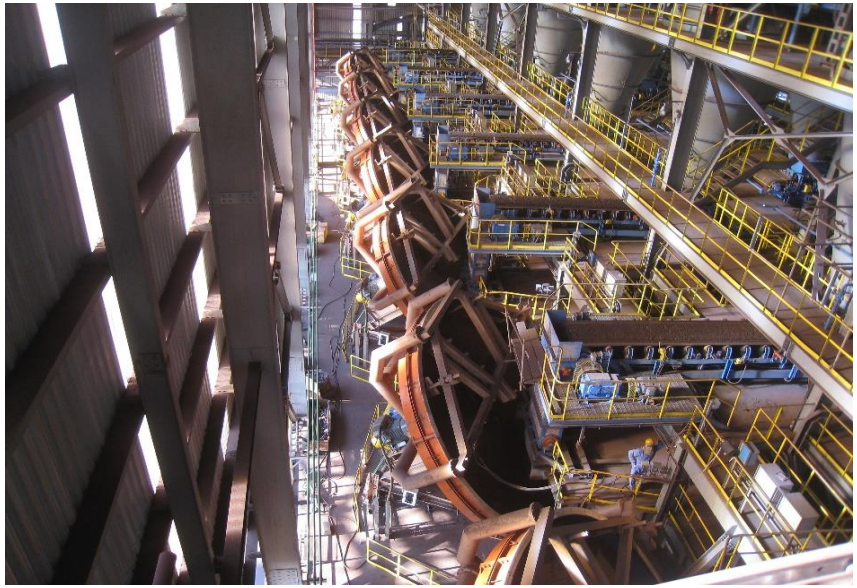
110 tph Pelletizing discs in **Oman**

Disc diameter: 7,5 m

Pellet size: 9 - 16 mm

Automatic disc angle adjustment

Raw material: Iron Ore





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BASIC DATA:

150 tph Pelletizing discs in **Iran**

Disc diameter: 7,5 m

Pellet size: 9 - 16 mm

manual disc angle adjustment

Raw material: Iron Ore





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WHY CEMTEC?



IN-HOUSE PILOT PLANT
Preferred way of sizing

CONSTRUCTION DEPARTMENT
In-house engineering and process calculation

ALMOST UNLIMITED MANUFACTURING FACILITIES
Workshops in Austria and Hungary

LOGISTIC WITH ROAD-, RAIL- AND WATERWAY CONNECTION
Transports of oversized and over heavy components all over the world

CEMTEC SUPERVISORS IN FIELD
Comprehensive support for assembly and start up of CEMTEC equipment

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THANK YOU !