



iTec Swiss in a nutshell

- *innovative Swiss engineering company - Starting out with more than 30 years of experience*
- *operating globally in the field of specialised construction*
- *batch and continuous mixing and compounding technology*
- *Our top quality machines and plants are employed in sensitive industries like the automotive and aerospace industry.*
- *We also offer our services as general contractor in planning, design and assembly of entire plants.*
- *Our services include the construction of the machines, process automation, raw material handling and post processing steps.*
- *We can cover greenfield development and we can implement our equipment solutions into existing infrastructure.*
- *With our swiss-made technology you achieve superior quality for your products.*

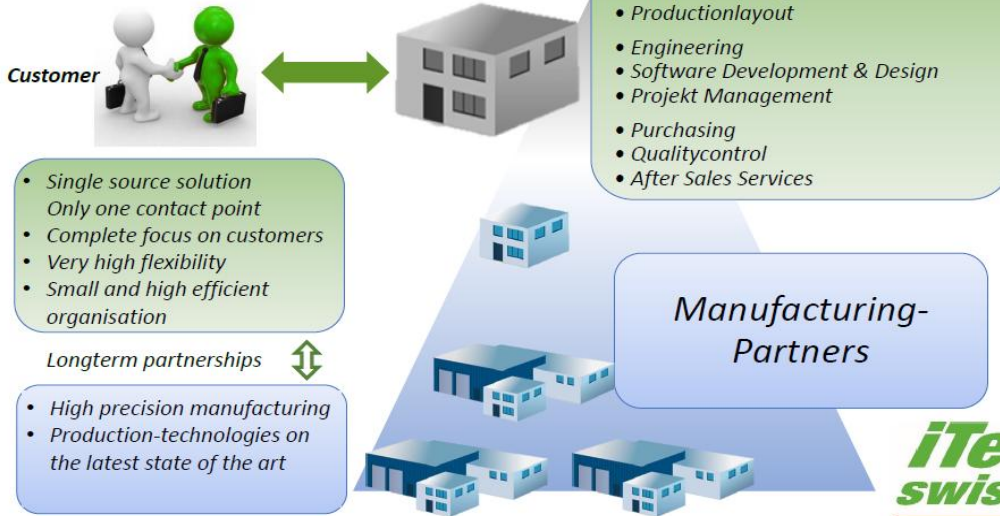
Ingtec Technik Project Network



Plant Engineering – Mechanical Engineering – Technical Engineering

iTec Swiss, Your partner for challenging tasks and implementations.

iTec Swiss Project-Network



Labor Dispermill Discovery



Planetary Kneader Vertical PKV

From the lab- up to the production equipment,
from the simple Dissolver to the high complexity of a production site



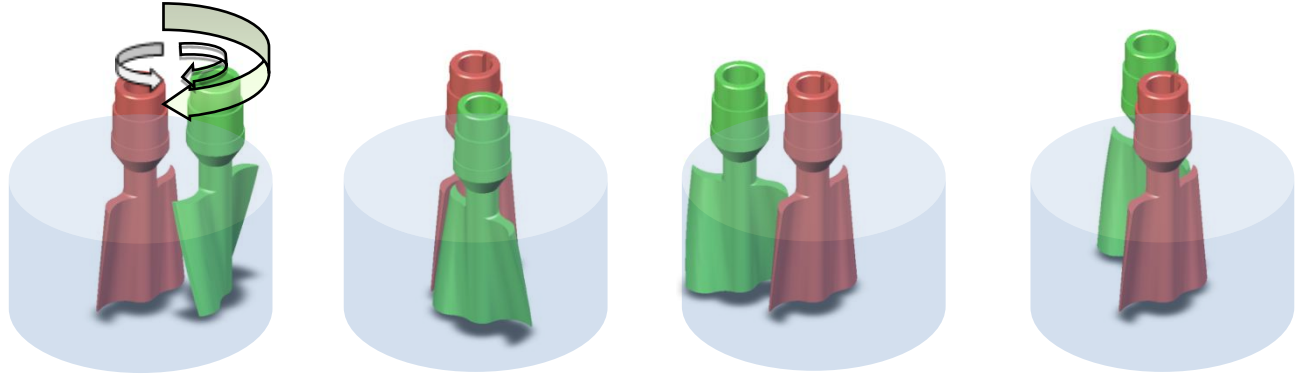
Multimix
Labor Reaktor-Planetary-Mixer



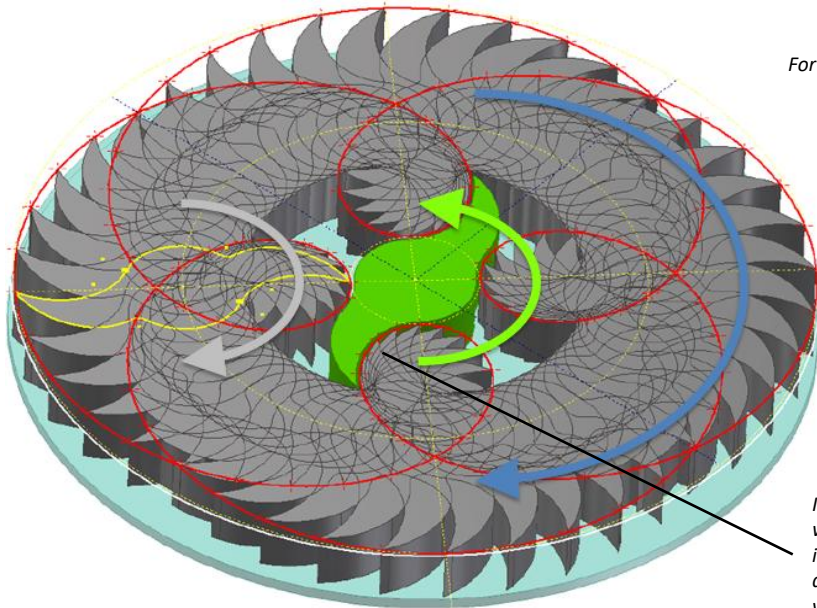
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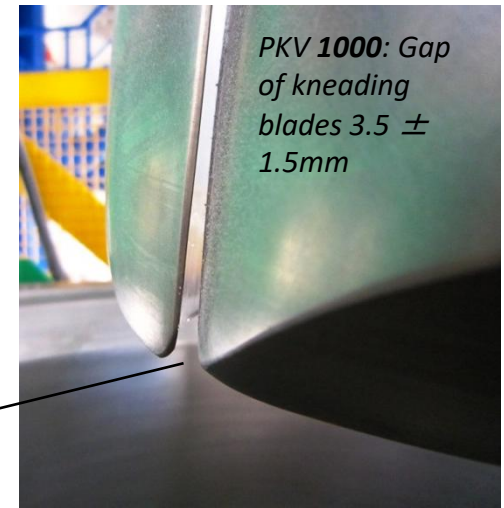
PKV: Movement of kneading blades



For simplicity of illustration, the central blade is shown stationary.



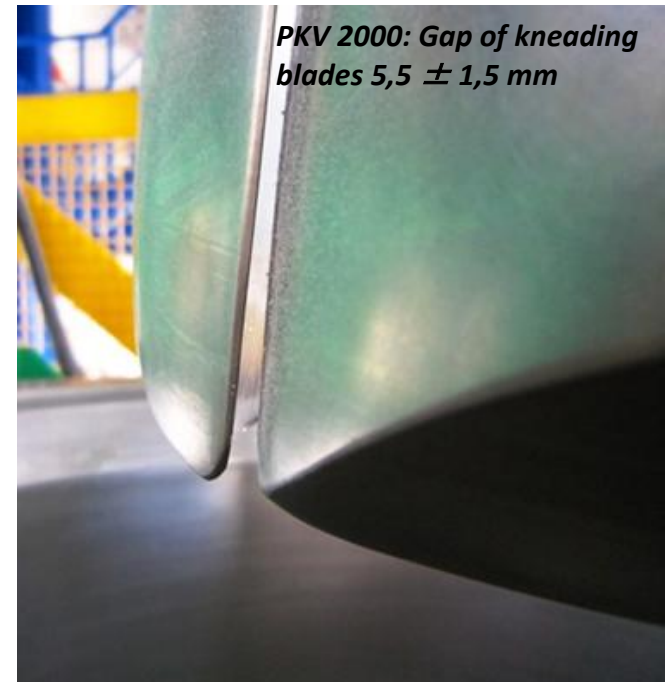
Intensive shear is created when the blades intermesh with each other and the wall of the mixing vessel

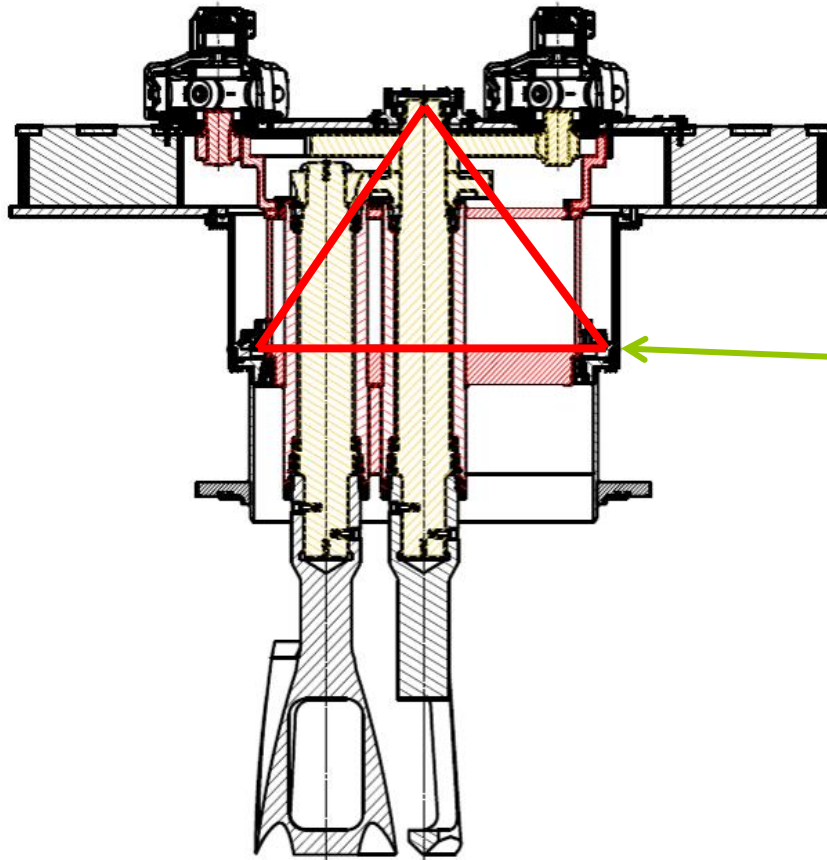


PKV 1000: Gap of kneading blades $3.5 \pm 1.5\text{mm}$

Clearances

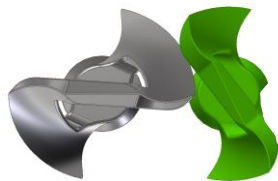
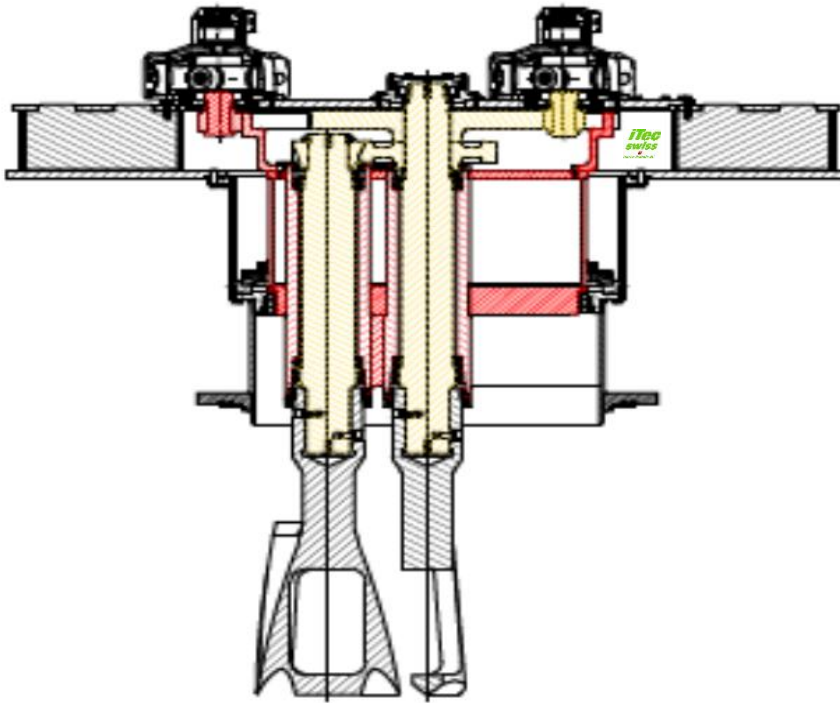
Clearances, Ingtec-standard	
Gap between:	
Blade tip to trough wall	5,5 ± 1,5mm
Between blades	5,5 ± 1,5mm
Bottom edge of blade to trough bottom	5,5 ± 1,5mm



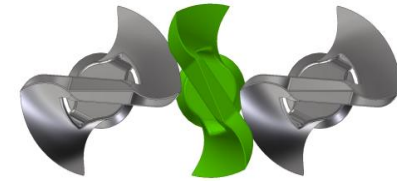
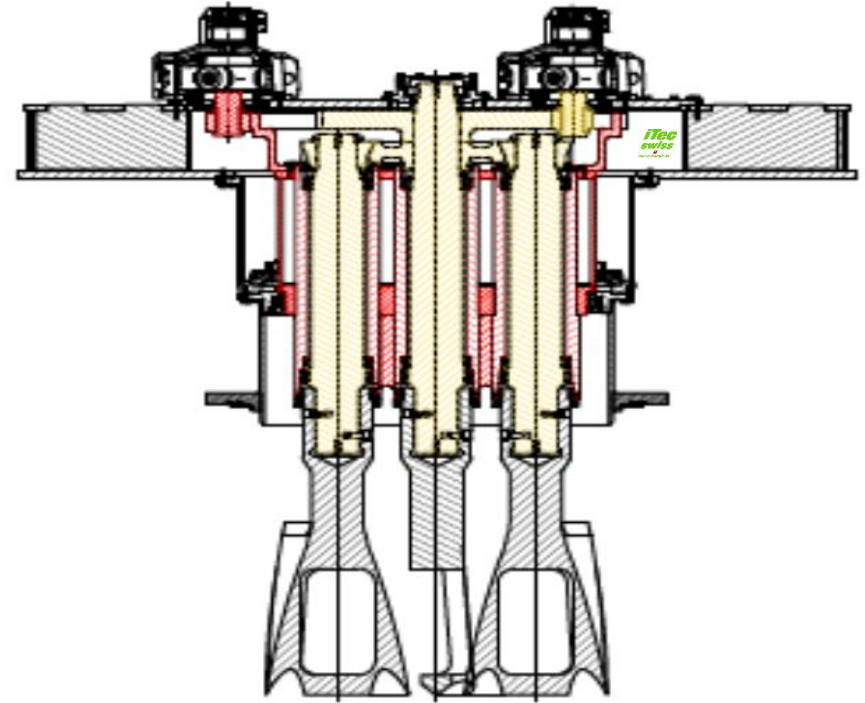


Comments:

- Compact design
- Few components, therefore less wear
- Lifetime grease package, hence low maintenance (no oil, thus no leakage risk)
- High precision main bearing instead of plain bearing (iron bushing)
- Infinitely variable speed control
- High precision vacuum seals
- Vacuum applied only in the product chamber (not in the gear)
- Ball- and roller bearings made of standard series, thus fast delivery
- Extremely robust 3-point bearing support
- Transmission of high torques
- Gear class: 1, high precision gear box with high accuracy gear sets, with test record
- Greases feature a long lifetime



2 up to 2000 litres



above 2000 litres

Insight into the Manufacturing Quality at iTec Swiss – Kneaders

The manufacturing quality plays a decisive important key-roll within the product range of iTec Swiss.



Special coating as an additional wear protection



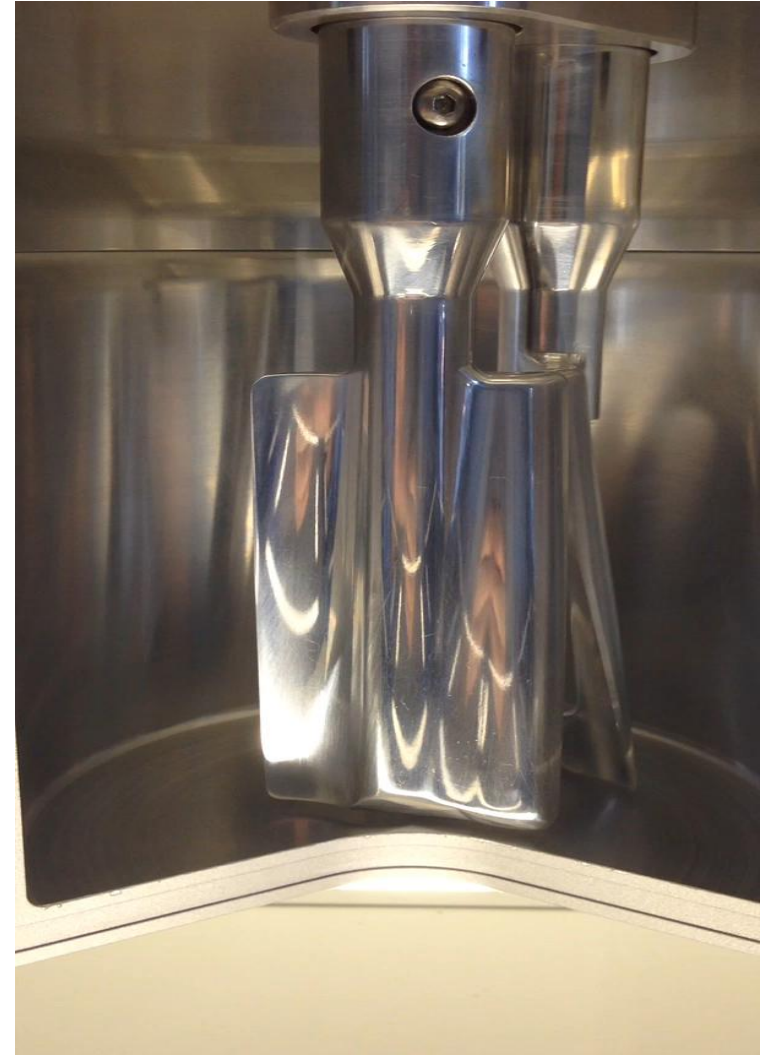
Measurement of gap distance between the two shovel



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Velocity
0.30
0.23
0.15
0.08
0.00
[m s⁻¹]



Time Value = 0 [s]



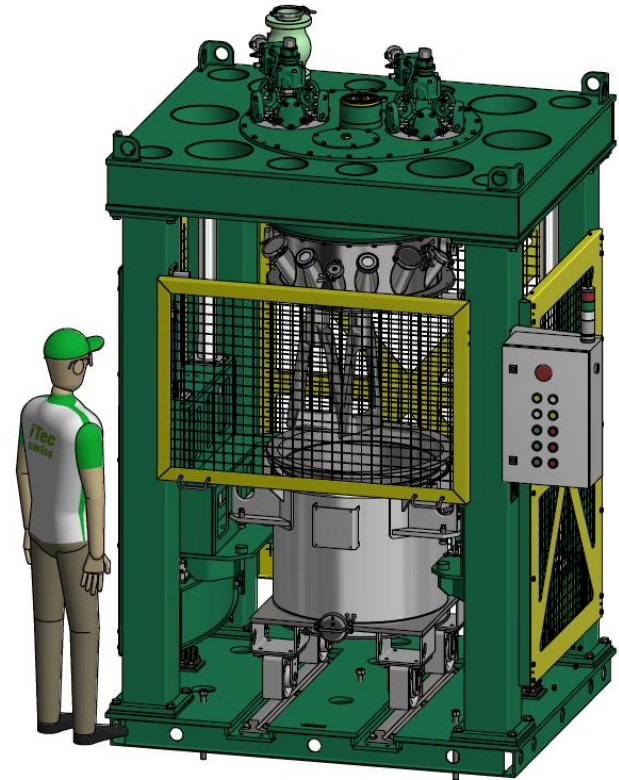


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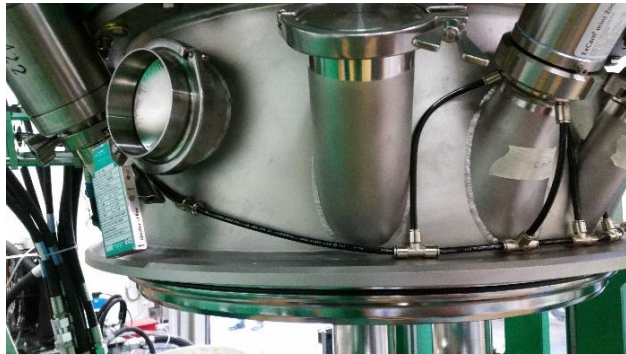
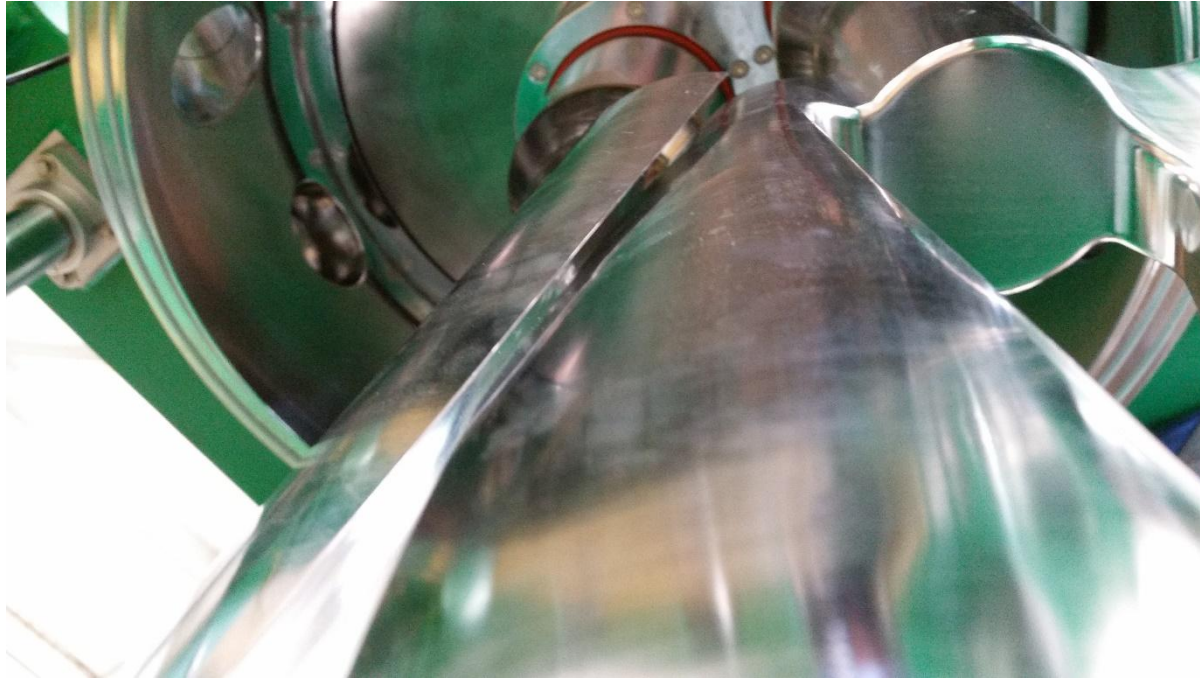




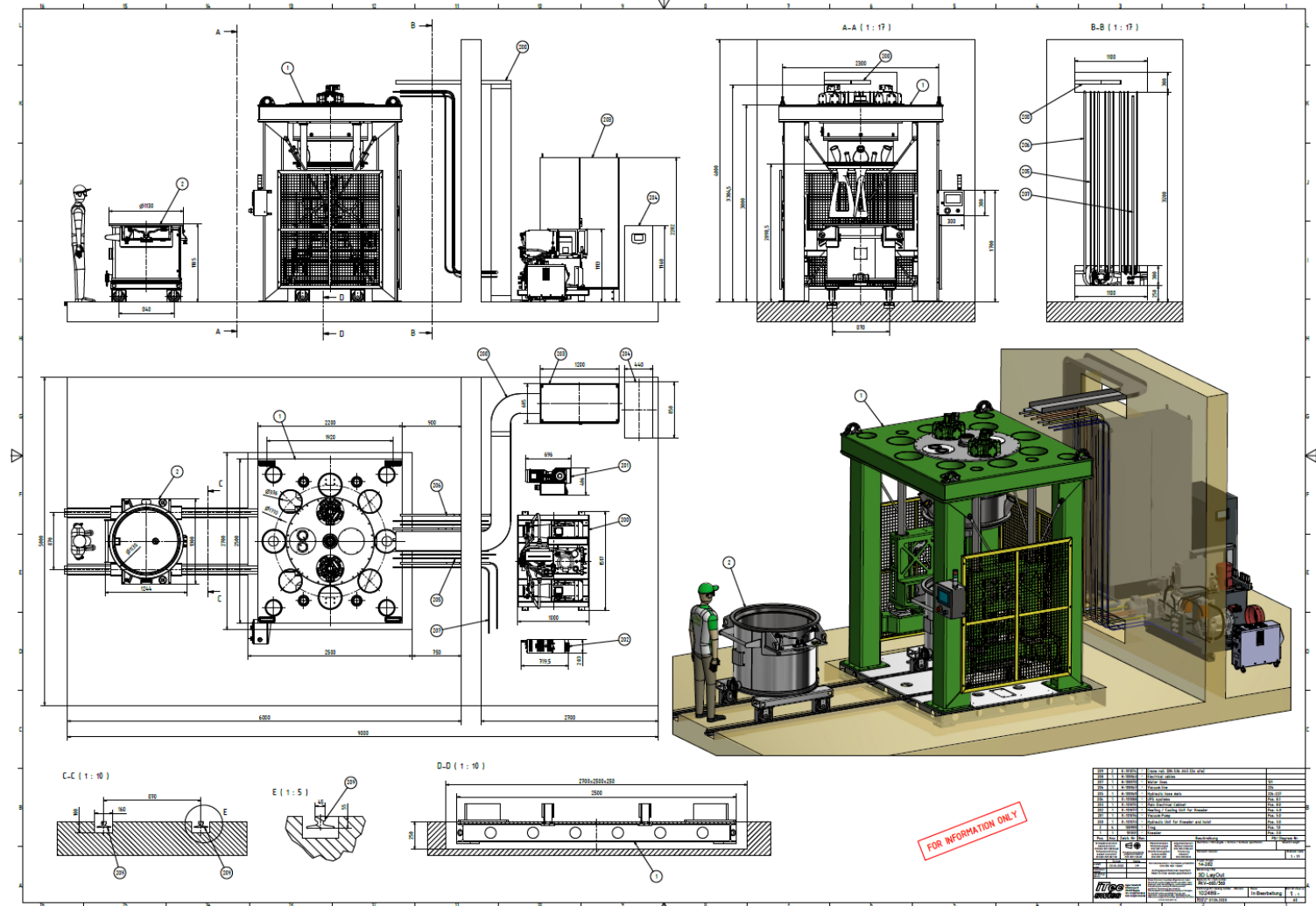
Schweißkonstruktion welded structure DIN EN ISO 15002-02 Bauartprüfung welded construction DIN EN ISO 15002-02	 Projektionsmethode projection method DIN EN ISO 12802	Mittelkriterien middle criteria DIN ISO 12715 Oberflächengüte surface quality DIN ISO 1302	Allgemeine Allgemeine DIN ISO 12715 Technische Technische DIN ISO 15002	Oberfläche / Oberfläche - Surface / Surface specifications Herstell / Hersteller Gewicht / weight
Datum 02.07.2019	Name JTI	Konstruktions- / Konstruktion Konstruktion / Konstruktion DIN EN ISO 12715	Projekt / Projekt 19-863c PKV-100	Maßstab / scale 1 : 11
Version 02.07.2019	Auftragskriterien beschreiben Order criteria description DIN EN ISO 12715	Konstruktions- / Konstruktion Konstruktion / Konstruktion DIN EN ISO 12715	Bezeichnung / The Kneader	Blatt / Sheet 1 - 1
iTec swiss	iTec swiss	iTec swiss	Zeichnungsnummer / Drawing number: Revision 19-863c, 190 - 1, 0	Blatt / Sheet 1 - 1
iTec swiss	iTec swiss	iTec swiss	Datum / Date 02.07.2019	Blatt / Sheet 1 - 1















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Specification and Capacity



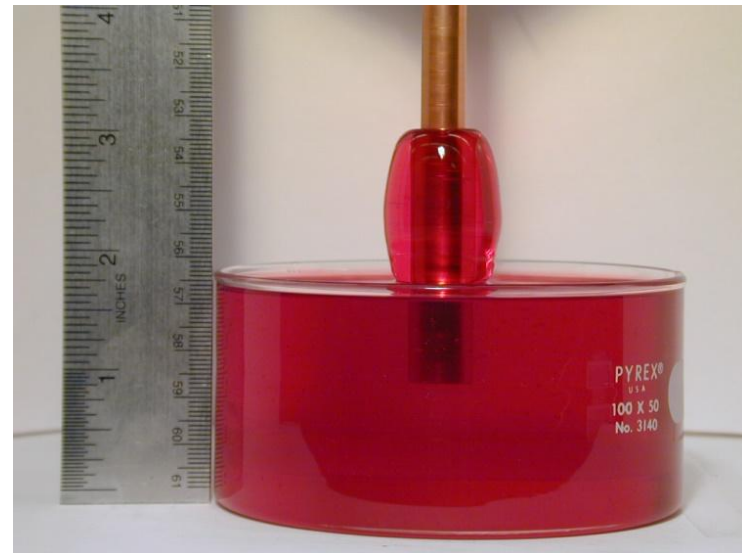
PKV 2000 Capacity

Total: 2'000 Liter

Usable Volume, optionally:

50% 1'000 Liter

60% 1'200 Liter





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Dimension, weight and installed Capacity

PKV 2000 Main Dimension

L X W x H, approx: 3200 x 2750 x 4465
[mm]

PKV 2000 Weight:

Kneader, net, approx.: 14,100 kg

Trough, net, approx.: 2,500 kg

Installed capacity hydraulic drive:

Central drive, approx.: 75 kW

Planetary drive, approx.: 75/90 kW



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Specification and Capacity



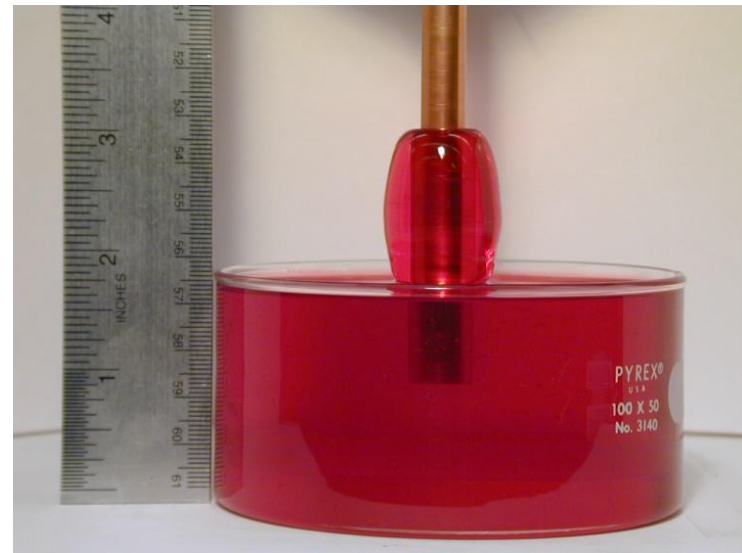
PKV 5000 Capacity

Total: 5'000 Liter

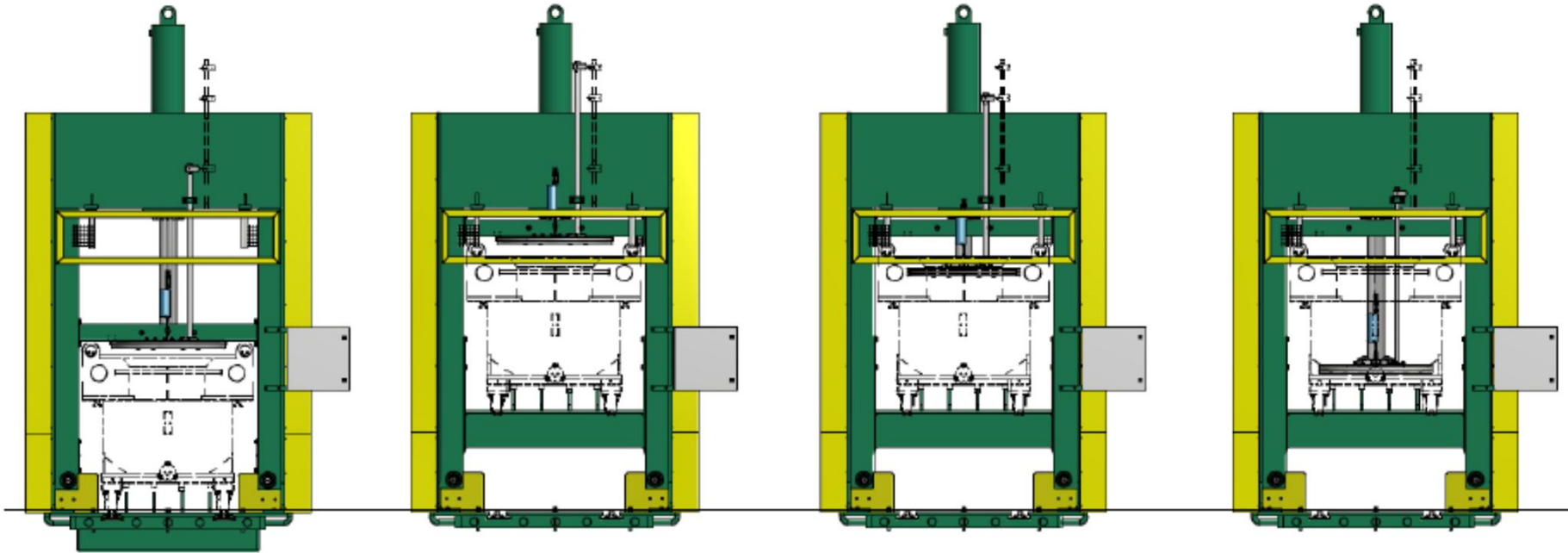
Usable Volume, optionally:

50% 2'500 Liter

60% 3'000 Liter

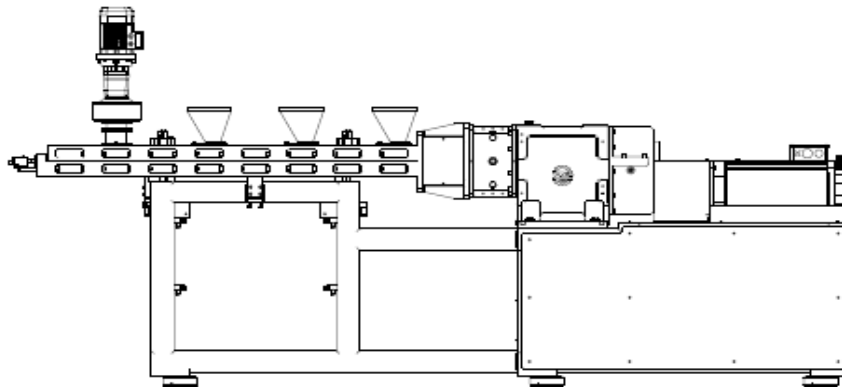


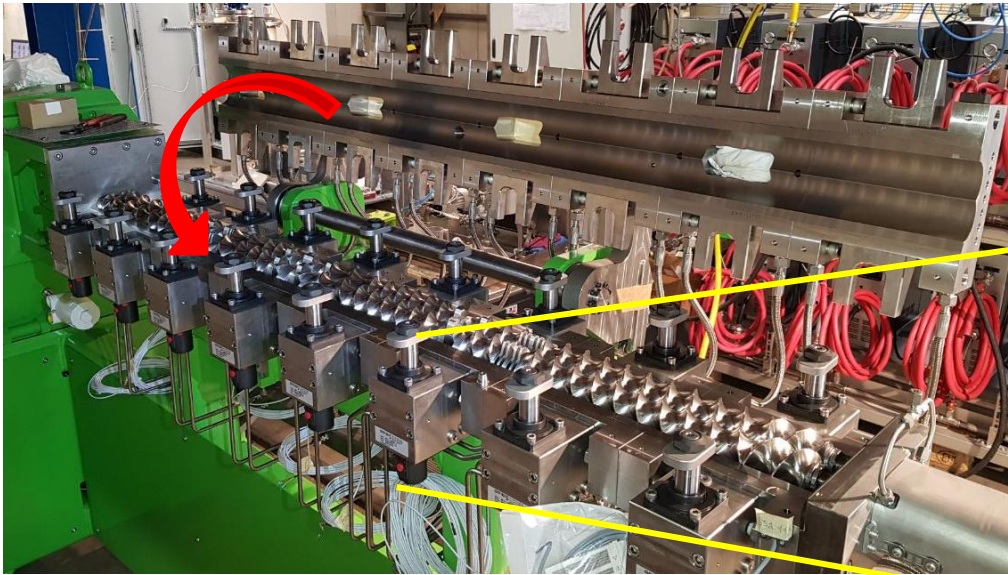
- Discharge press
- Twin Screw Extruder
- Trough cleaning machine
- 3D Feeding Technology for:
 - solid raw materials
 - liquid raw materials
 - Control
- Extra troughs
- Mover for troughs
- Steel structure





Type	Screw- Ø mm	Flight depth	Screw speed rpm	Output in kg/h	Drive power kW	Torque Nm	Axis height mm
IPE-TS 20	20	7.5	200	10 – 20	3,6	2 x 80	1140
IPE-TS 60	60	13.1	200	50 – 100	50,0	2 x 1100	1200
IPE-TS 98	98	21.7	200	100 – 220	100,0	2 x 4200	1400
IPE-TS 125	125	27.5	200	220 – 500	220,0	2 x 10000	1400

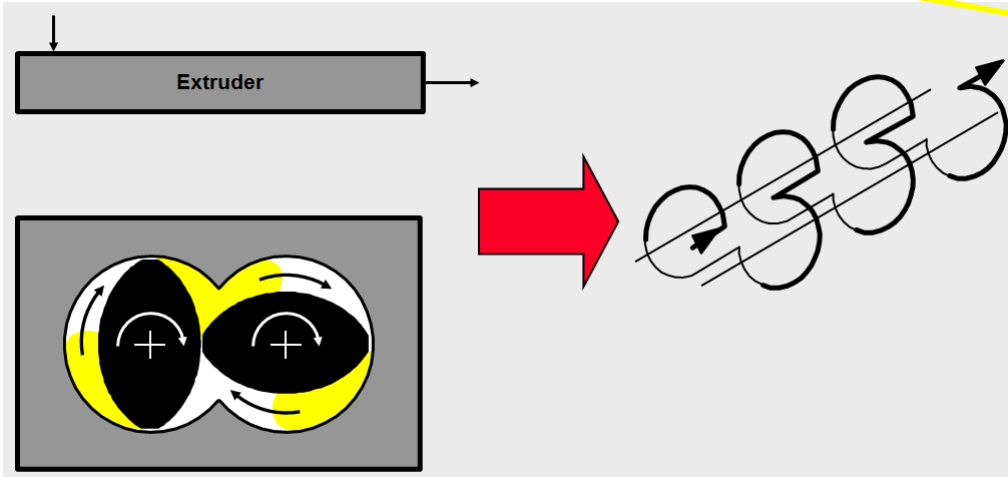




Twin Screw Extruder suitable for high-viscous materials with folding half barrel design

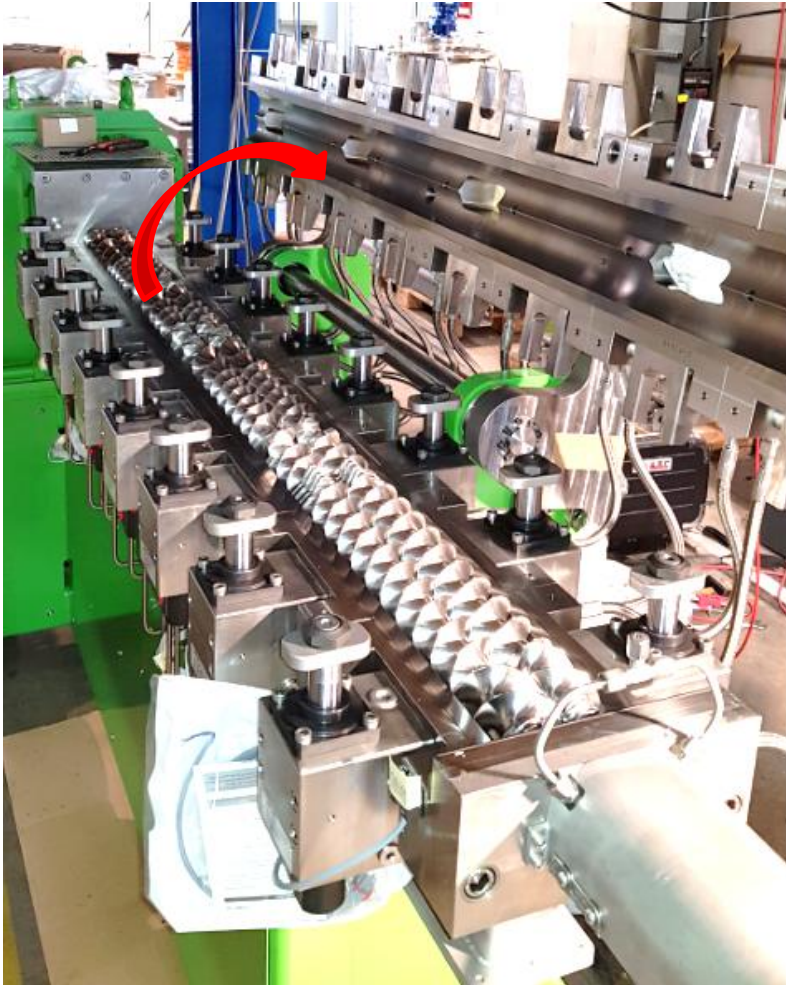


Flow Pattern of the material inside the corotating Twin Screw Extruder









Open twin-screw-extruder



Silos with filling station,
for manual and for automated refill.



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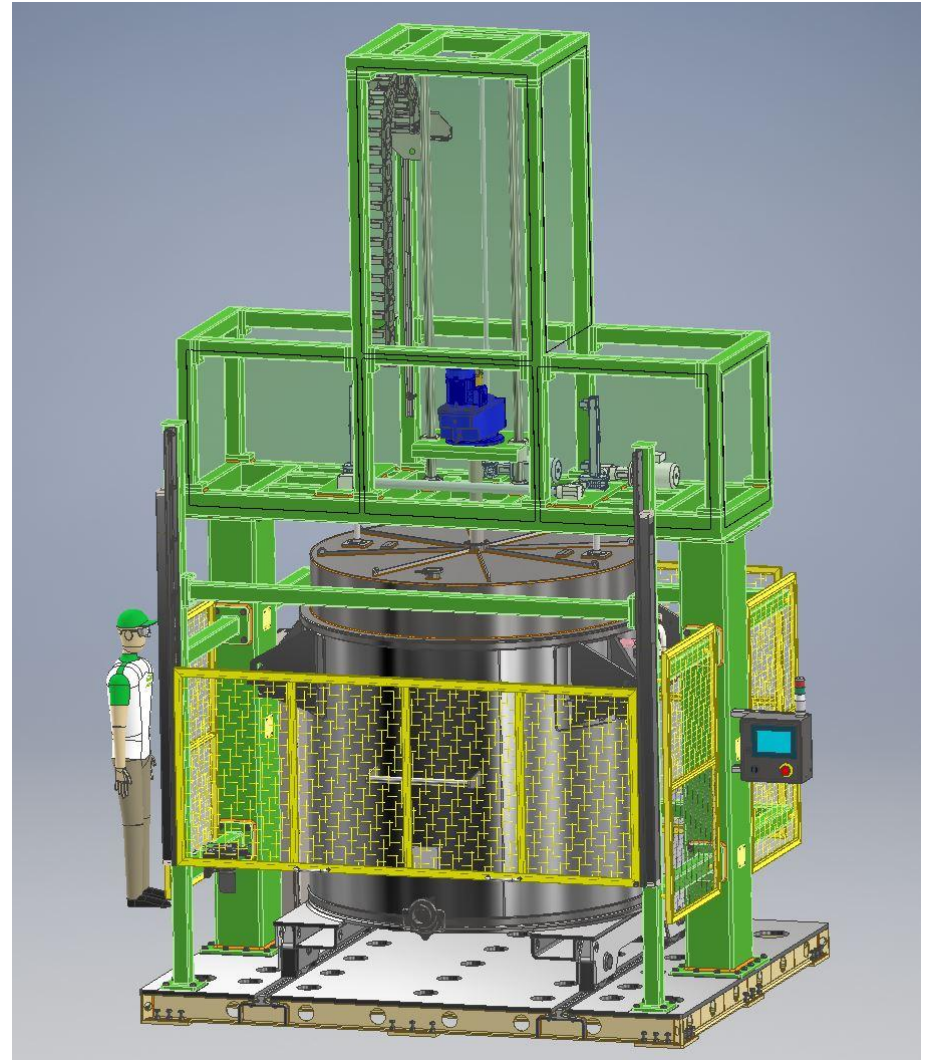


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Troughs Washing Station



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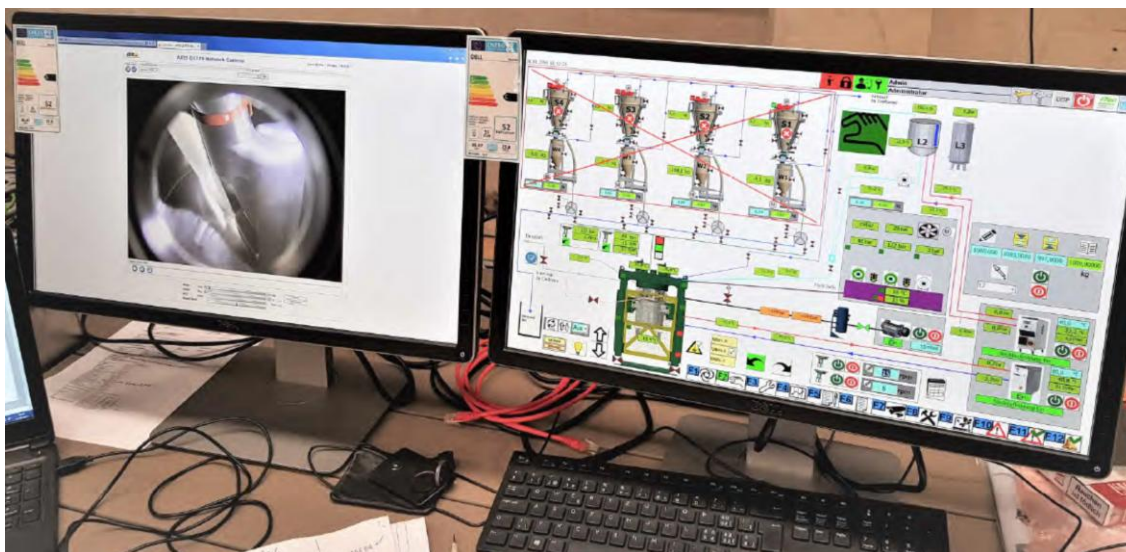






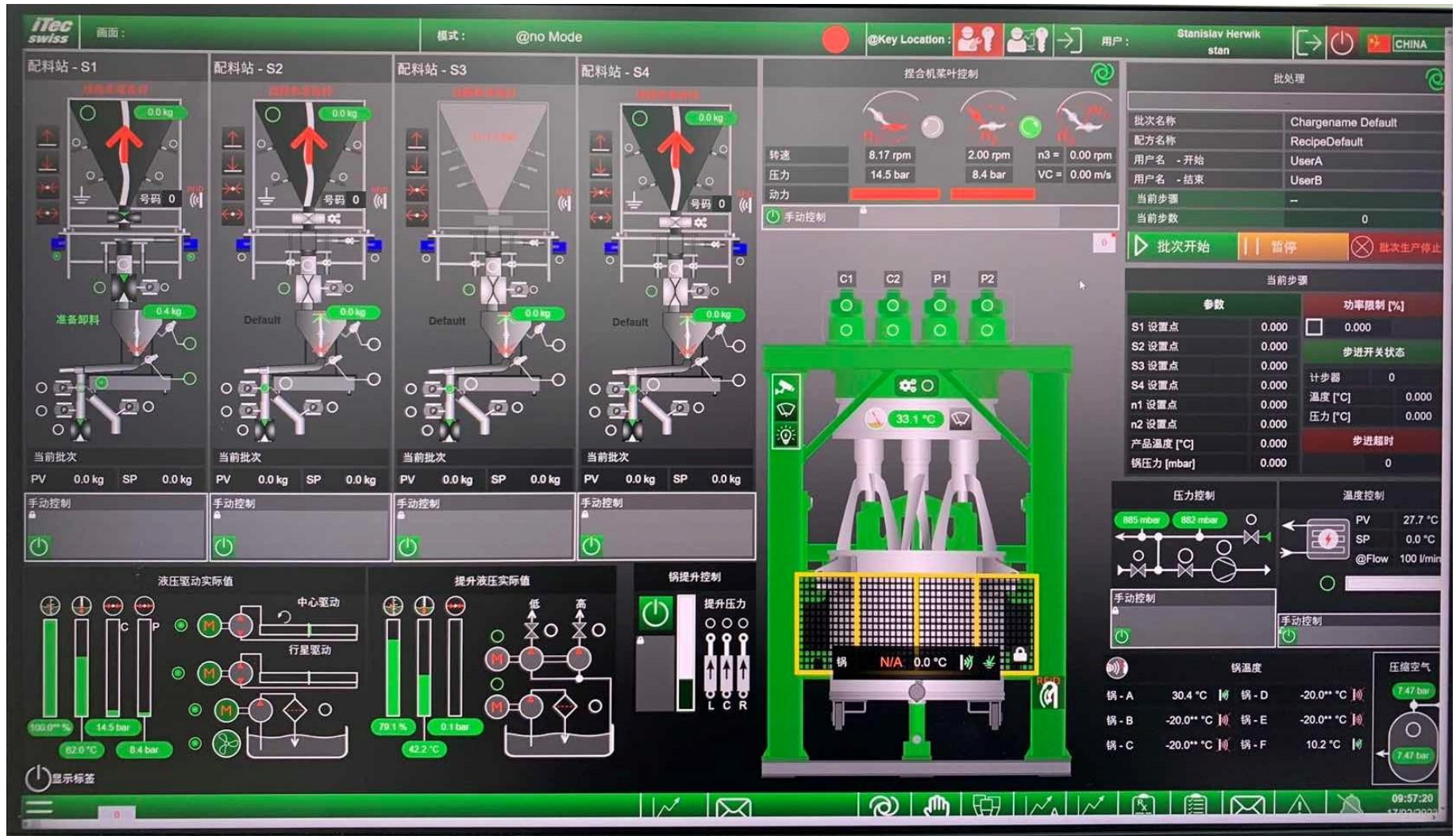
PLC with visualisation

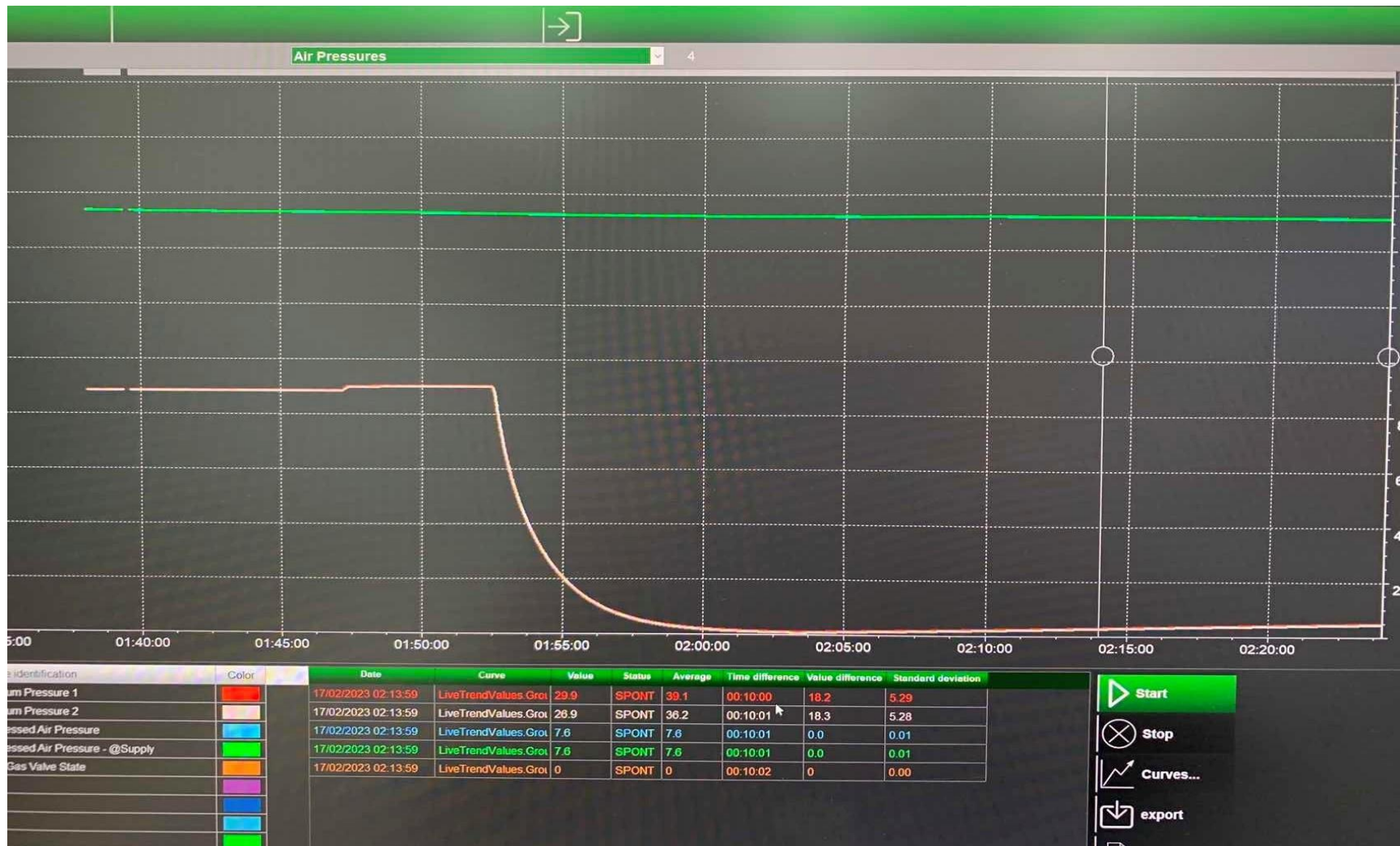
Control in Remote Control Room



Local Panel









BATCH PROTOCOL

Recipe name:

Batch started by at the

Batch finished by at the

Signatures / comments:

Checked:

Date:



Extruder temperature zones

Zone:	Setpoint:	Actual value:
Temperature Zone 1:	10.000 °C	0.000 °C
Temperature Zone 2:	20.000 °C	0.000 °C
Temperature Zone 3:	30.000 °C	0.000 °C
Temperature Zone 4:	40.000 kg	0.000 °C
Temperature Zone 5:	50.000 °C	0.000 °C
Temperature Zone 6:	60.000 °C	0.000 °C
Temperature Zone 7:	70.000 °C	0.000 °C
Temperature Zone 8:	70.000 °C	0.000 °C
Temperature Zone 9:	0.000 °C	0.000 °C

General parameters

Parameters:	Setpoint:	Actual value:
Extruder stop time	15 S	15 S
Extruder feed speed:	0 %	0 kg
Extruder lead time:	10 S	10 S
Ramp-up time:	11 S	11 S
Component Value:	11 S	11 S

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Power failure:

The UPS maintains the PLC system for a limited time (about 15 minutes as standard depending on process).

In the case of a power return, the interrupted processes (recipe procedure, kneading blade rotation, temperature control, vacuum) are not automatically restarted, but remain in a powerless state.

These processes must be restarted by the user.



Maintenance	Interval
Visual inspection of the kneader for visible damage	1 x per week
Visual inspection of the bearing points and guides	1 x per week
Check screws for tightness and if necessary tighten	1 x per week
Cleaning the air filter of the vacuum pump	1 x per week
Check / drauin FRL compressed air	1 x per week
Vacuum oil level	1 x monthly or in accordance with manufacturer
UPS-Check system battery life	1 x monthly or in accordance with manufacturer
Lubricate grease nipple for large slewing ring with our lubricate plan	After 250 operating hours, then every 1000 hours
Gearing grease of the planetary gear (gear lubrication holes)	After 250 operating hours, then every 1000 hours
Oil from the hydraulic unit for stroke and kneader driving	500 operating hours after first filling, then every 2000 operating hours or min. 1x per year (see hydraulic diagram for kneader driving)
Oil filters for hydraulic unit of stroke and kneader driving	500 operating hours after first filling, then every 2000 operating hours or min. 1x per year (see hydraulic diagram for kneader driving))
Lubricate grease nipples for bearings of the planetary gear with our lubricate plan	Every 1000 operating hours
Change the air filter of the vacuum pump	Every 4 months
Lubrication of the guide carriage of the lifting device via grease nipple with our lubricate plan	Every 6 months
Filter elements dust filter	After 1 month, then semi-annually
Kneading trough seal	If necessary, according to the spare parts list
Please refer to the instruction manual of the thermostats for the maintenance of the temperature control unit	Annex C
We recommend a general overhaul of the system after 3 years	3 Years

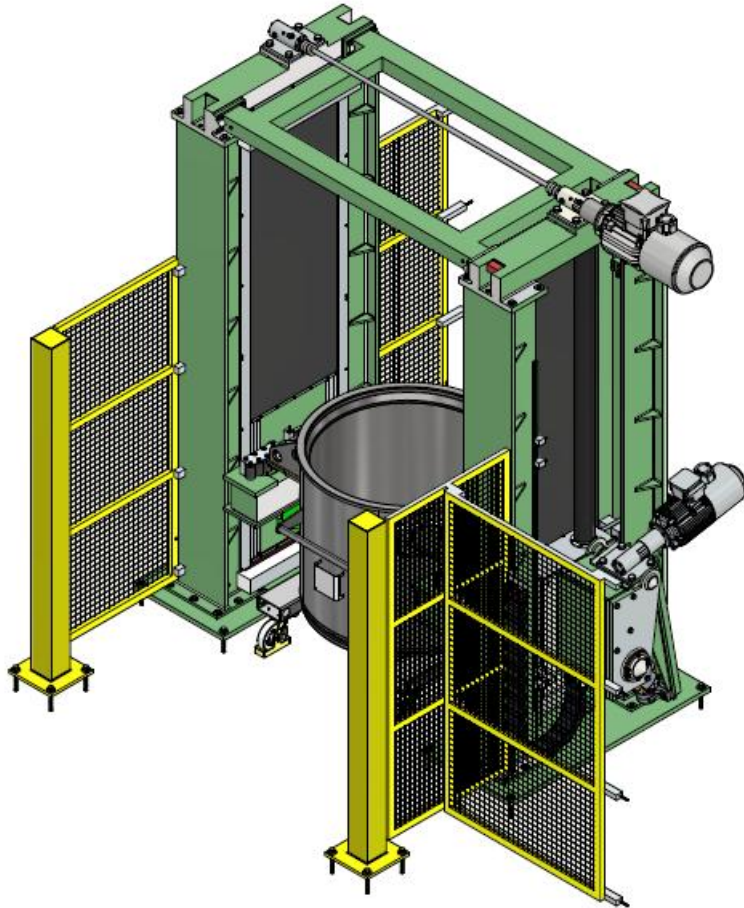
Wear-Measurement of Bearing (long-term security)

A patented integrated wear measuring device (so called IWM) offers an online examination of the maximum tolerated axial clearance of the bearing.

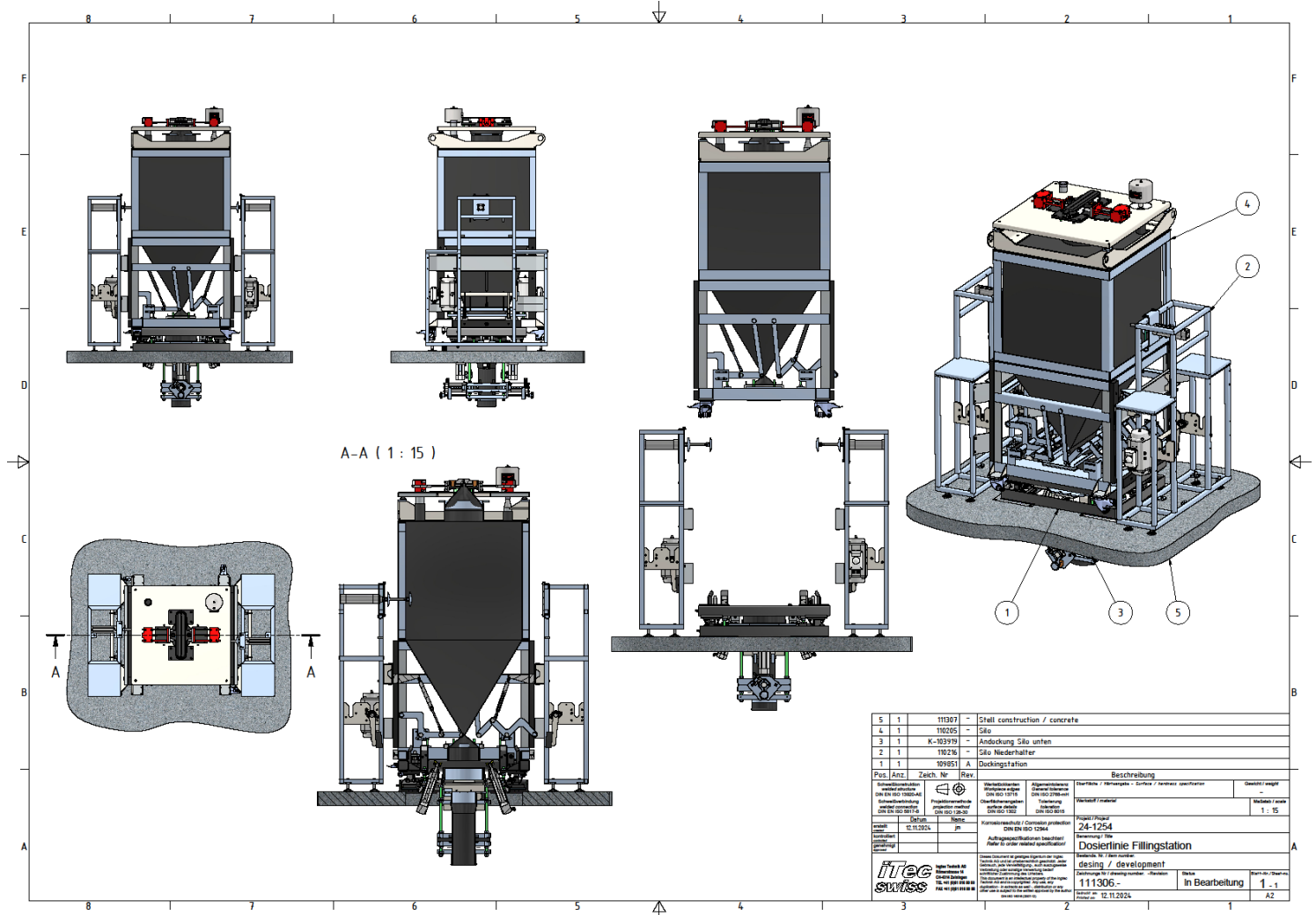
Operation interruptions are **not** necessary. Service personnel can measure the current wear rate at any time by manual actuation on the measuring unit.

A signal indicates when the maximum wear is reached.

By using this IWM the costs for the maintenance personnel are minimised.









Barrel tilting station



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**Thank you for your kind
attention.**

iTec Swiss Team

