

Cryogenic media-blast deflashing

Cryogenic drum deflashing

Washing & drying system

Cold-temperature media-blast deflashing

Cryogenic deflashing - „ICE COLD“ remove burr process reliable

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AW Maschinen- und Anlagentechnik

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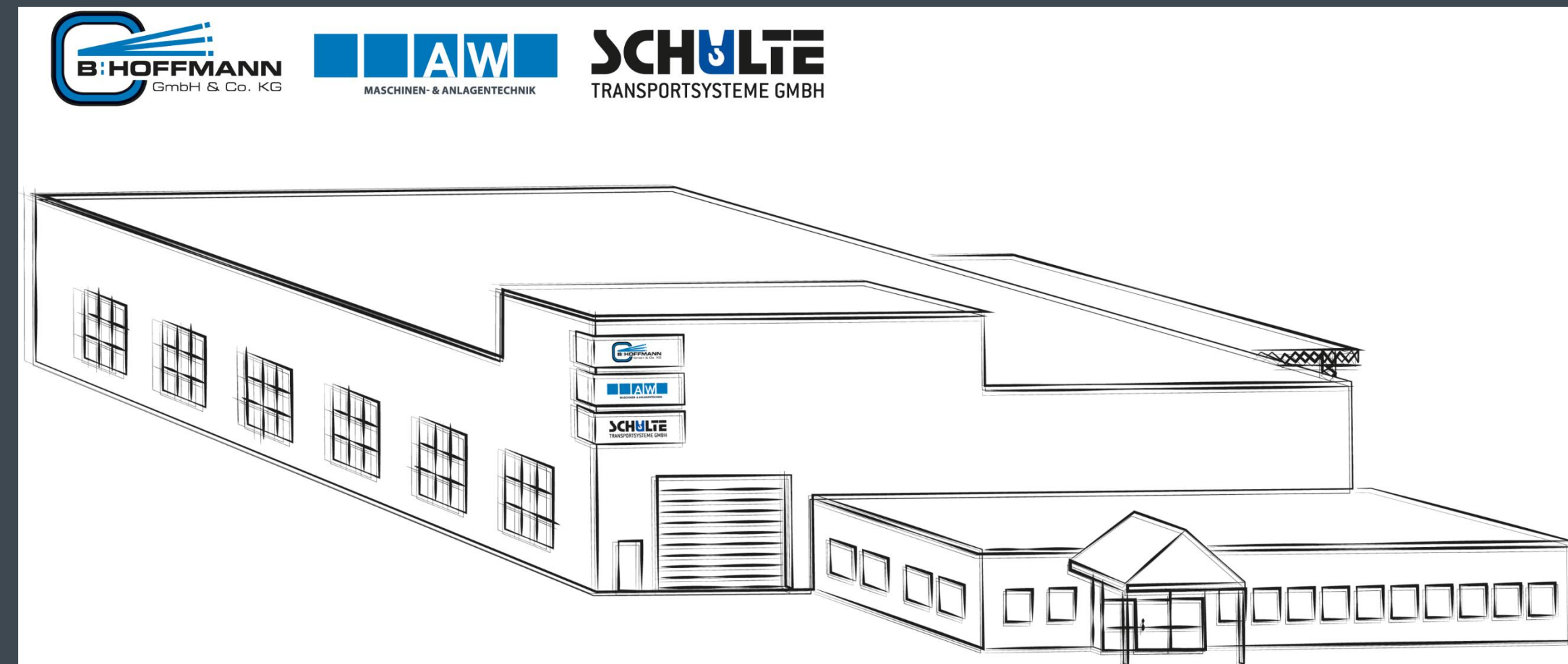


WHO IS AW ?

Owner-managed company in South Westphalia

28 employees

Company group with 8 Mio. €
sales volume



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WHAT IS CRYOGENIC DEFLASHING ?

Cryogenic (greek for frost/ice) subscribe fabrics, processes and characteristics with extemly deep temperatures

Cooling medium ist Liquid Nitrogen at $-195,8^{\circ}\text{C}$

Cryogenic drum deflashing (possibly with steel balls)

Cryogenic media-blast deflashing with granules



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For what parts ?

Parts with burr in different materials

Elastomere (Rubber)

Kunststoffe (Thermoplasts and Duroplasts)

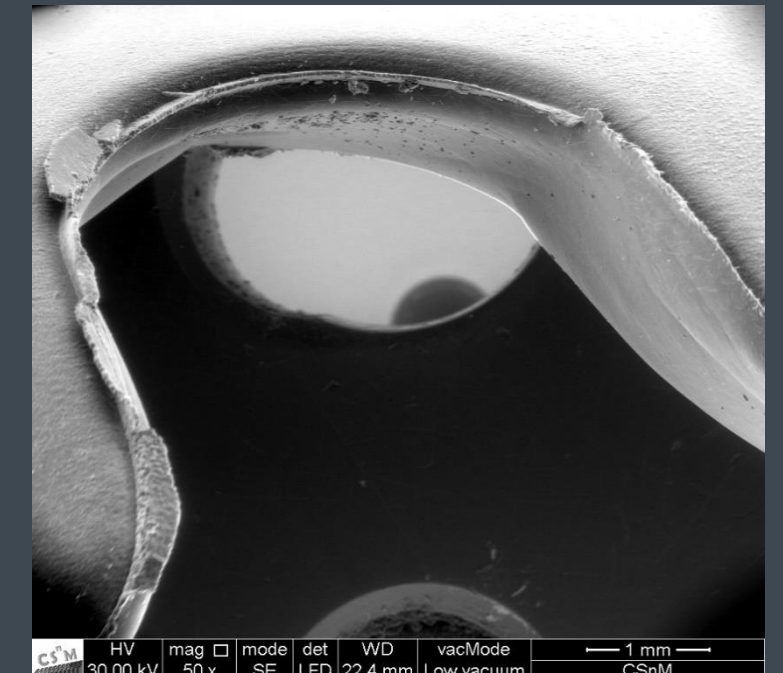
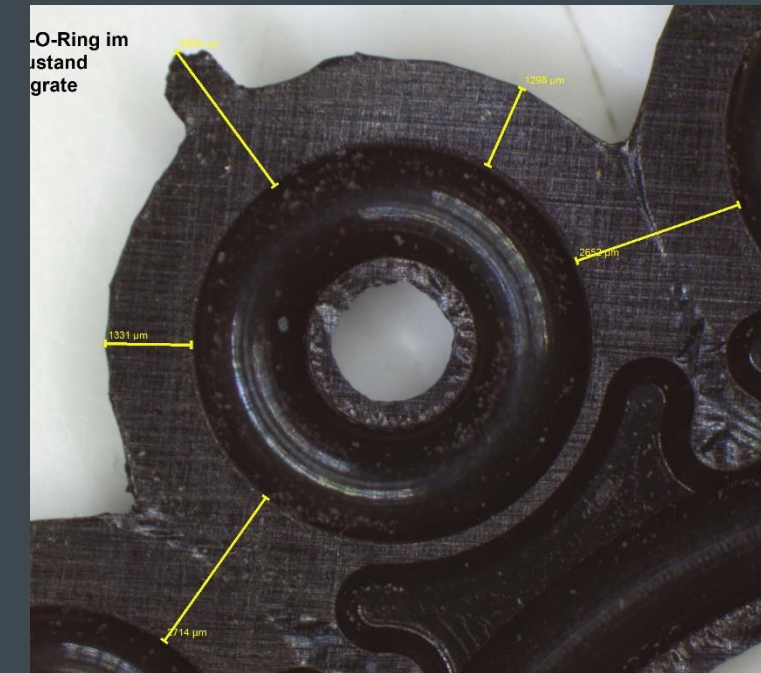
Fibre Reinforced Plastics

Zinc

Aluminium

Magnesium

Polyurethane



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FOR WHAT PARTS ?



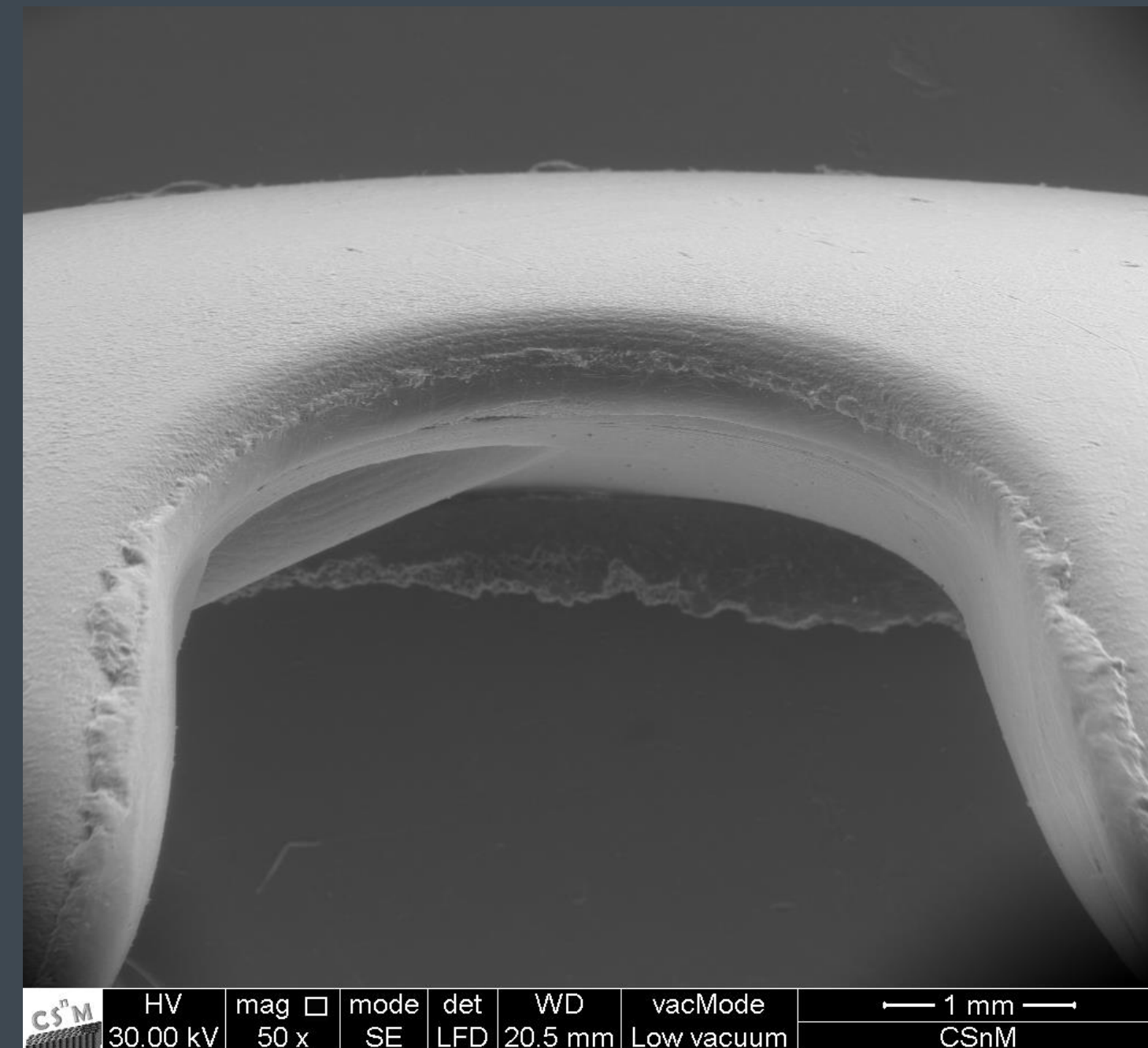
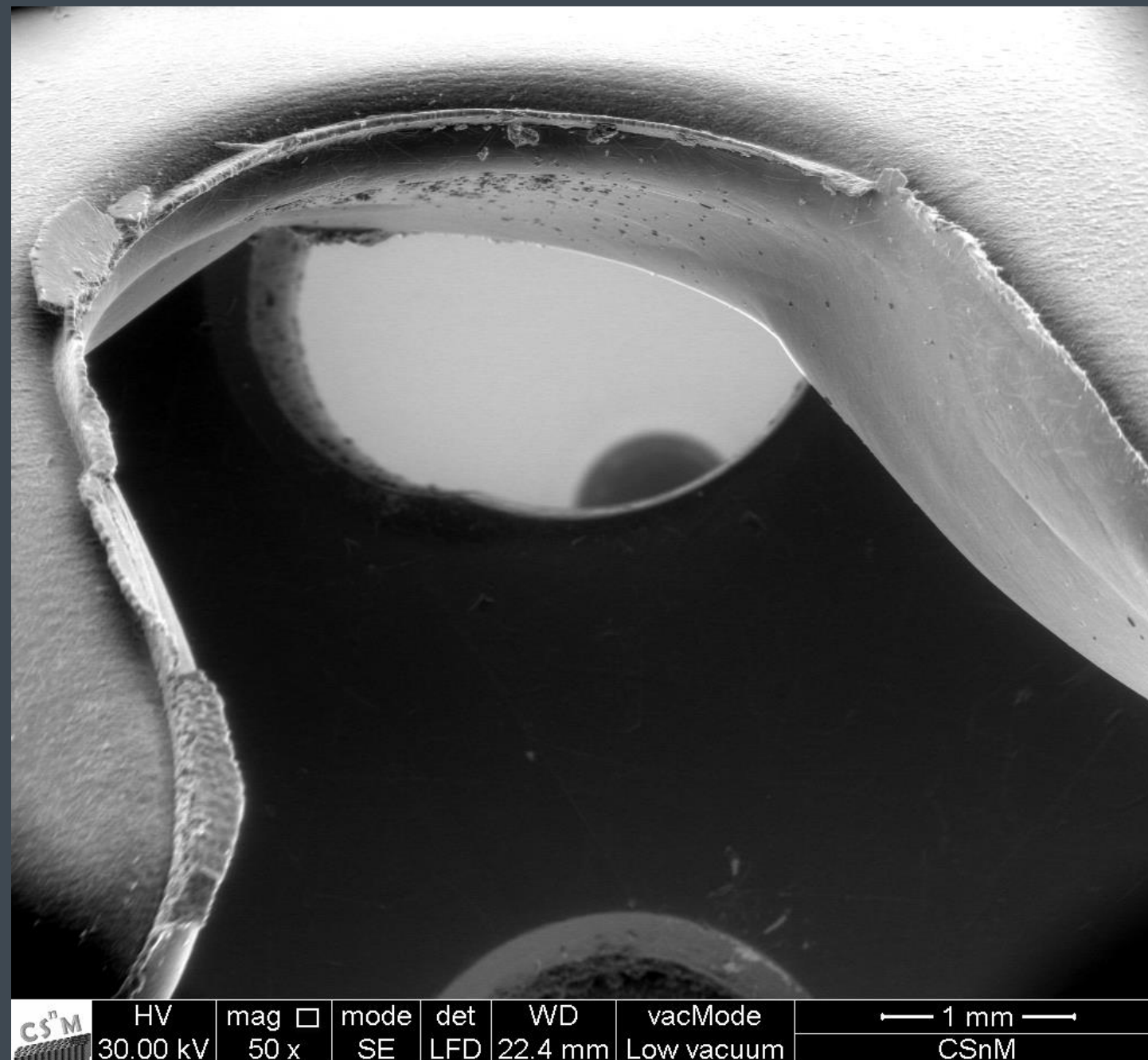
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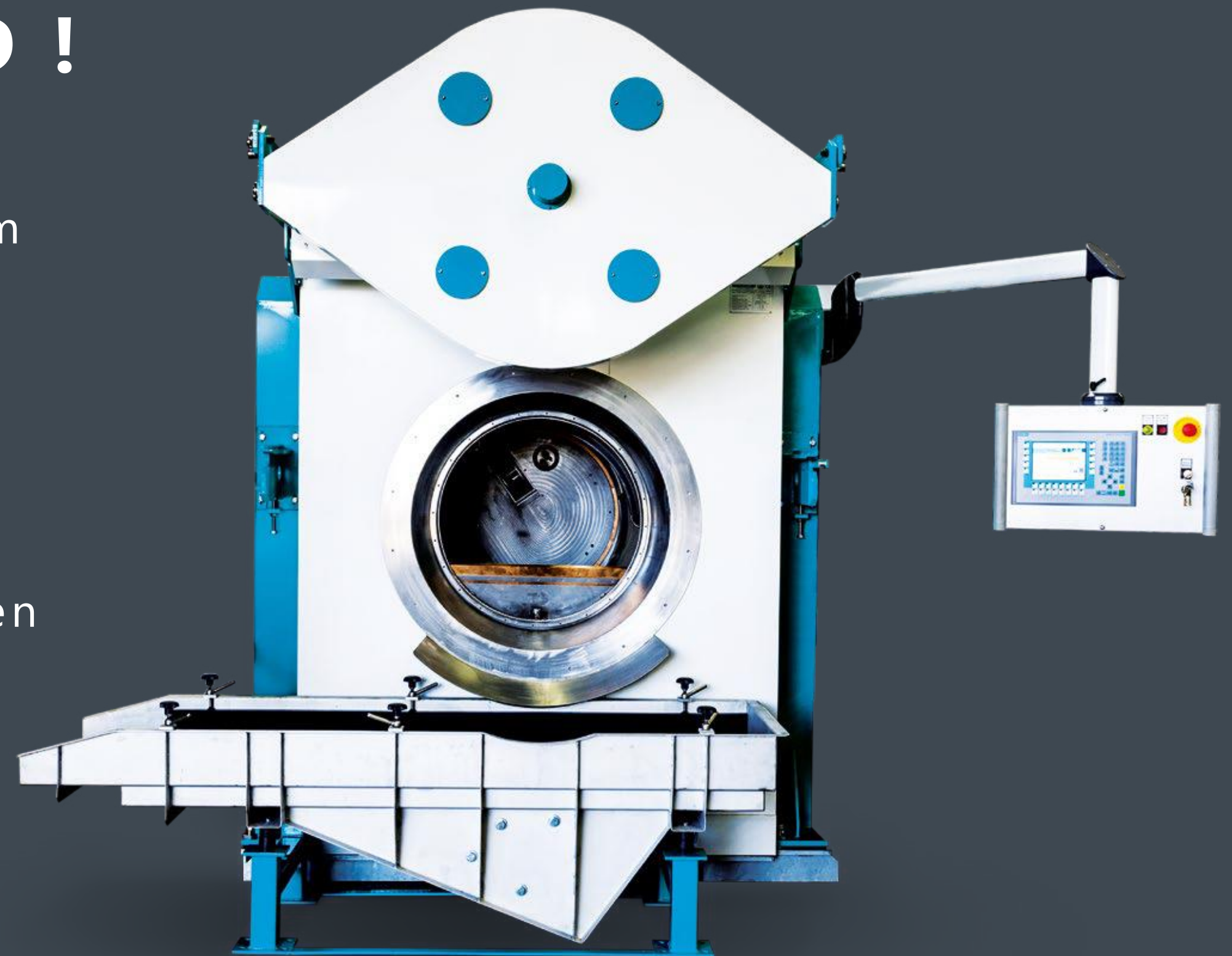
Cold-temperature media-blast deflashing

HERE IT IS GETTING COLD !

Parts as bulk goods in to an insulated drum with integrated perforated basket

Closing of the loading door

Cool down of the burrs with Liquid Nitrogen (LN2 at -196°C)*



*(at 5 bar with -179°C)

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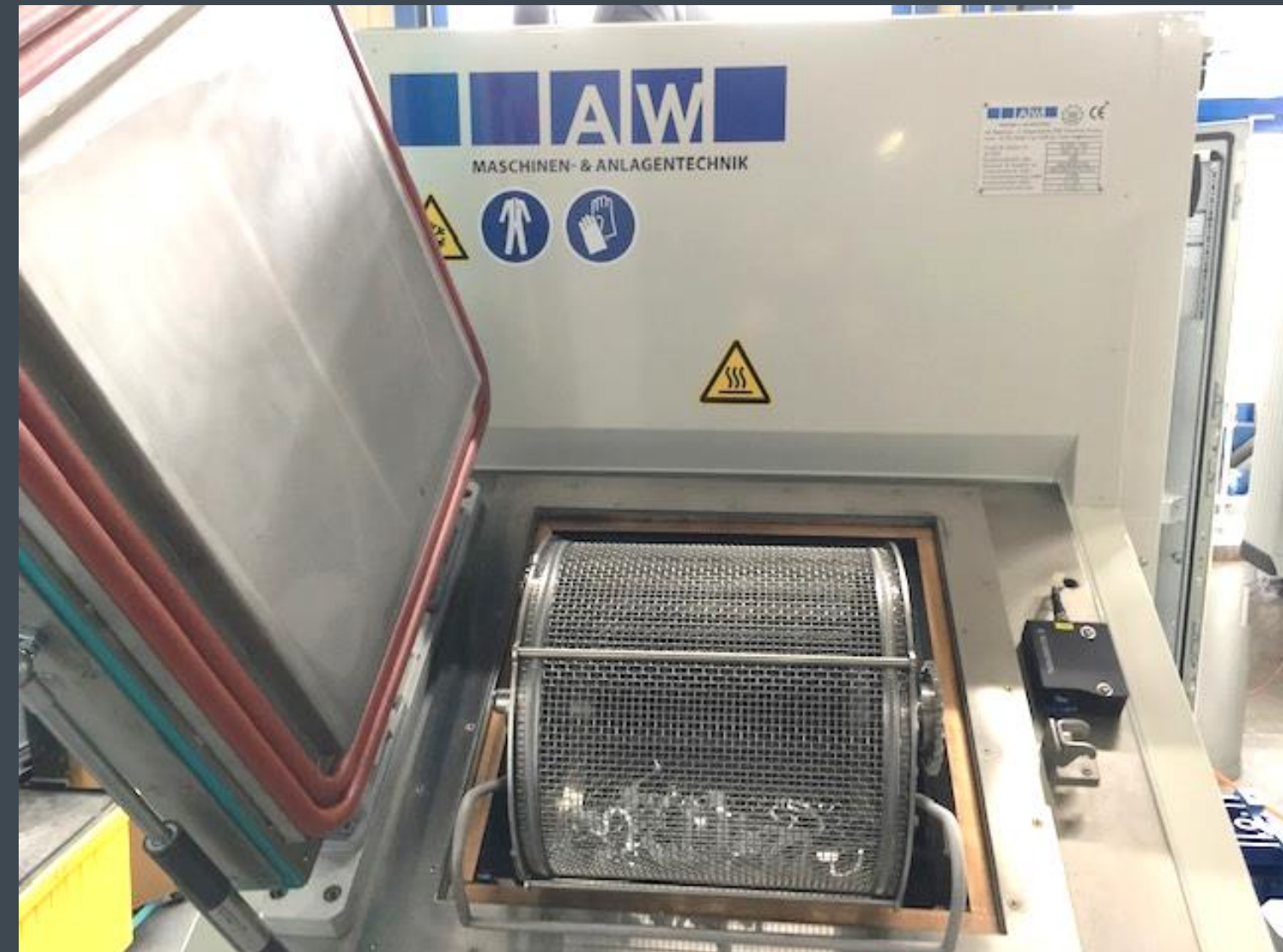
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HERE IT IS GETTING COLD !

Alternatively parts with burr in changeable basket or in a rack

Parts are mixed in the drum or basket

Changeable basket or frame needs to be cool down for every batch



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HERE IT IS GETTING COLD !

Use of the vapouration enthalpy of the liquid nitrogen to cool down the burrs

Measuring of the temperature indirect in the process chamber

Temperature settings depending on material and geometry appr. at -20°C bis -115°C

Burrs get brittle, surface get hard and part core stays elastic



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REMOVE THE BURR !

Removing of the burr happens according tumbling of the parts in the drum and the relativ movements of the parts to each other

Removing of the burr happens according balsting of shot-media (granules)

Speed of the shot media up to 167m/sec

Up to 1,5t granules / h



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REMOVE THE BURR !

As shot-media we use Polycarbonate

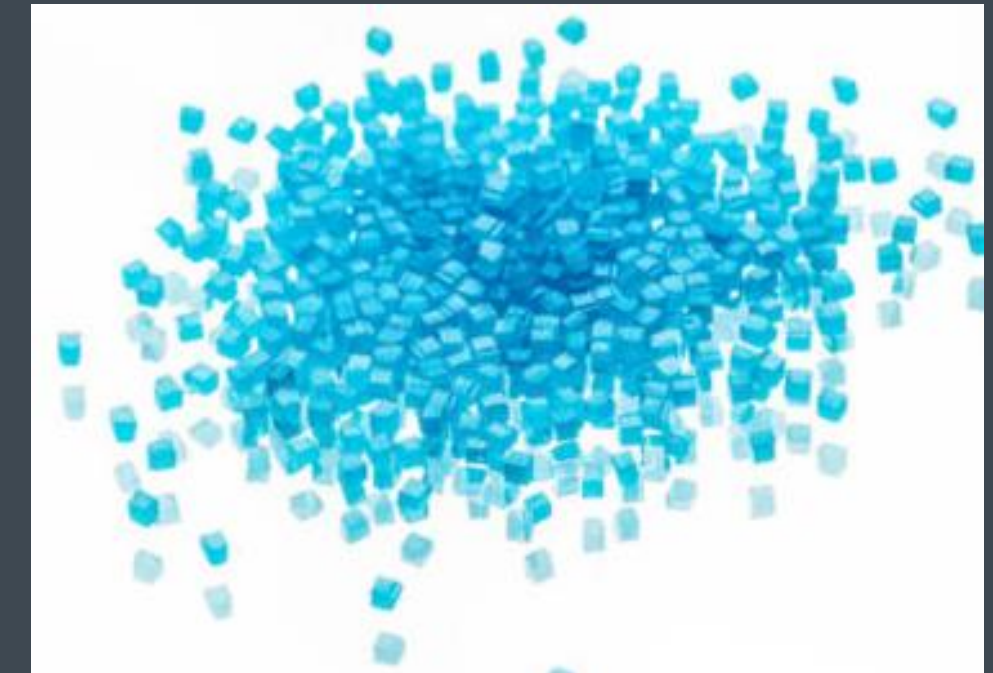
No water absorption

Grnaules size 0,3mm / 0,5mm / 0,75mm / 1mm / 1,5mm

Grnaules shape cylindrical or cubic

Amount of granules to be controled by the machine

Internal granules sieve unit



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THE PART STAYS ALLRIGHT !

Consistent material characteristics

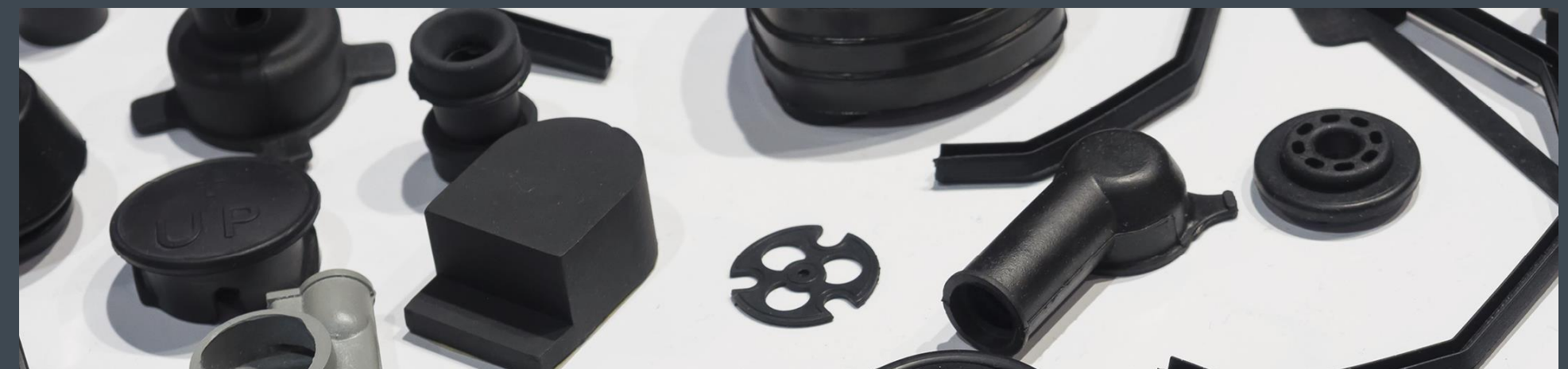
No change of the surface structure

Maintains the shape – no warping

Unchanged component dimensions

Parts with integrated electronics possible
to be processed

No edge rounding



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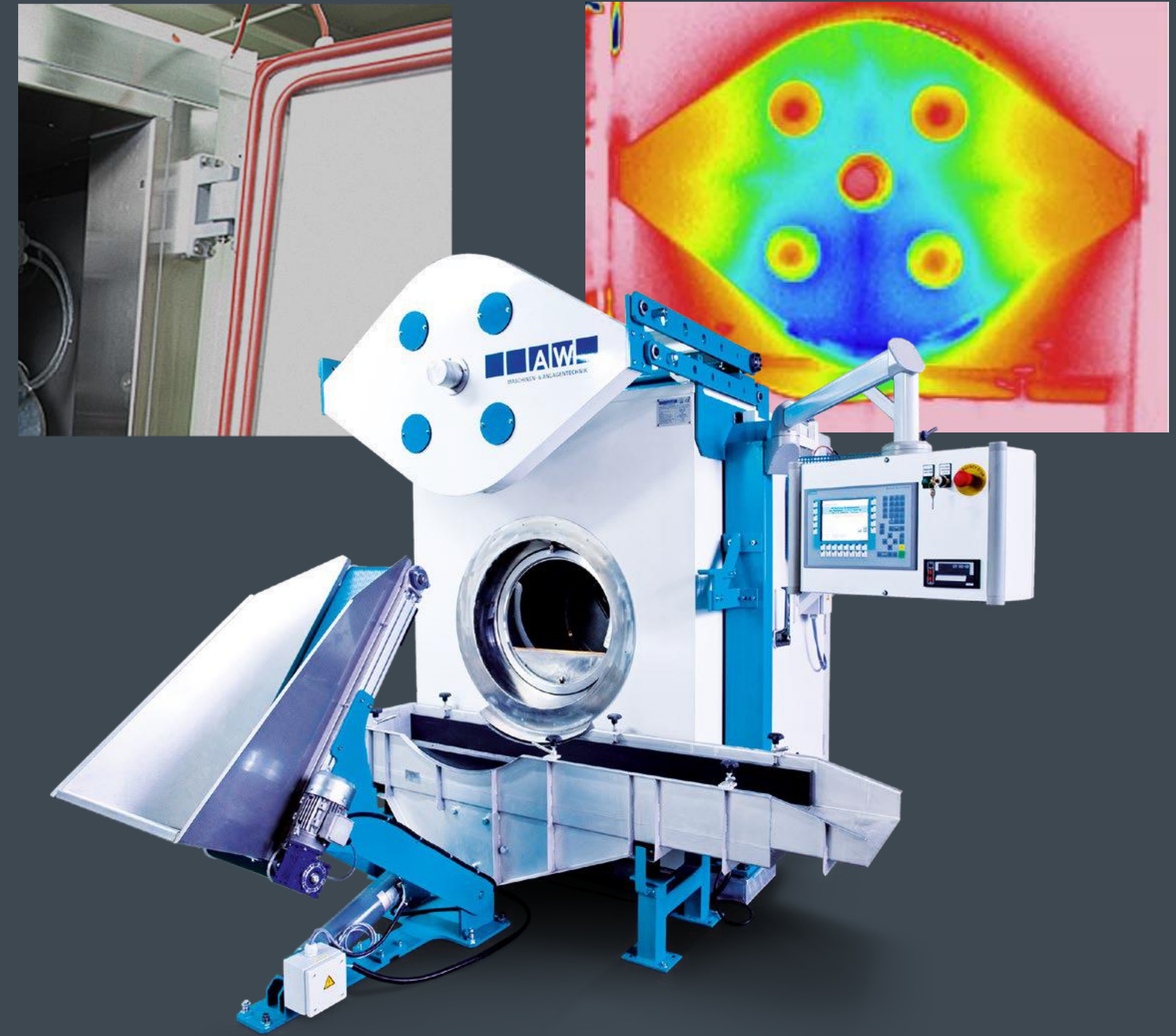
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WELL DRESSED !

Challenge is to handle the humidity, which can condensate and forms ice in the machine and the shot-media

With a 120mm insulation of the machine and a combined fridge unit for dehumidification a 3-shift operation for 6 days a week is feasible

Process drum is also insulated



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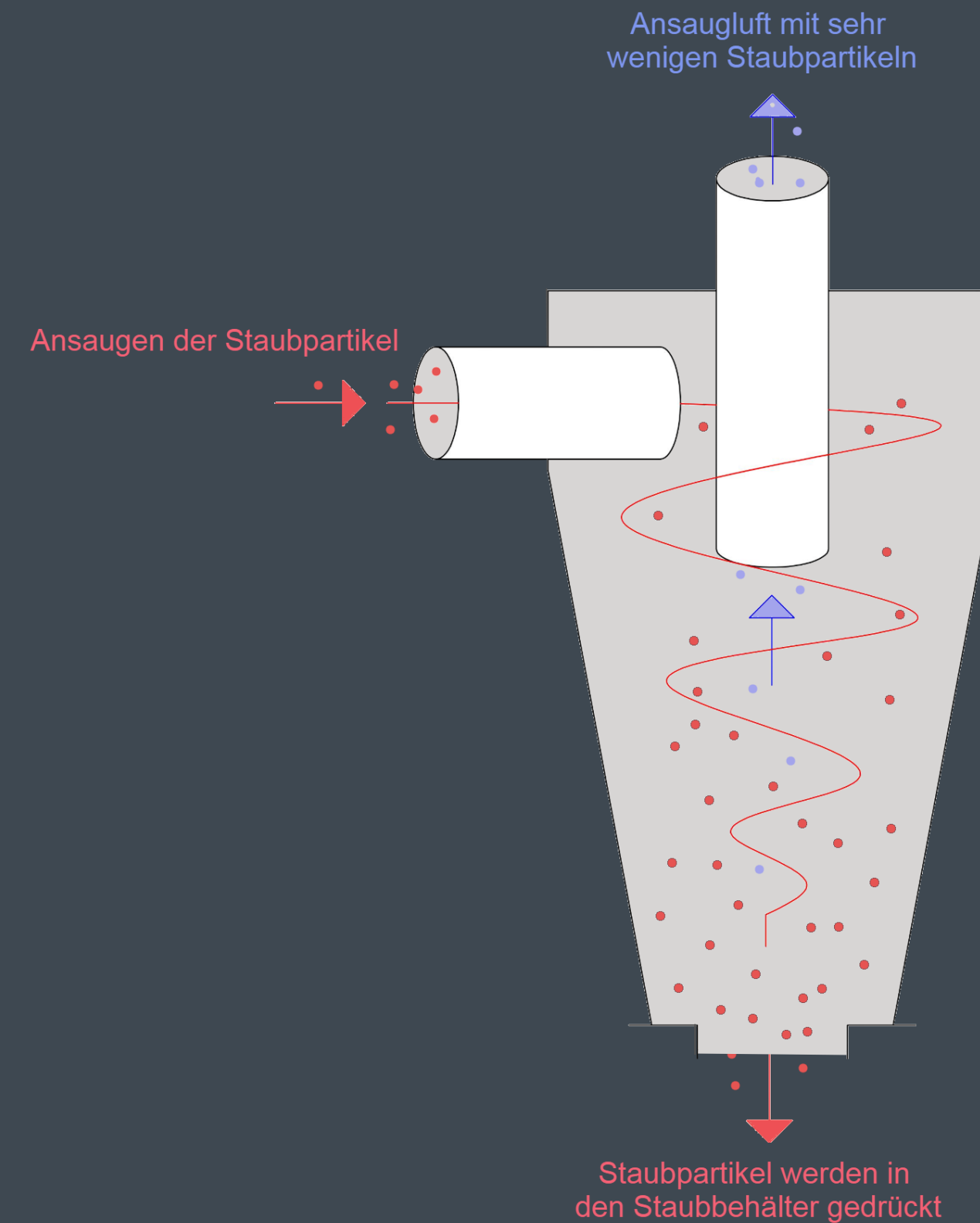
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DEDUSTED !

Burr elements and wear of the shot-media building dust

1 liter of LN2 evaporates to 691 Liter of N2-gas

Integrated two-stage cyclone dedusting



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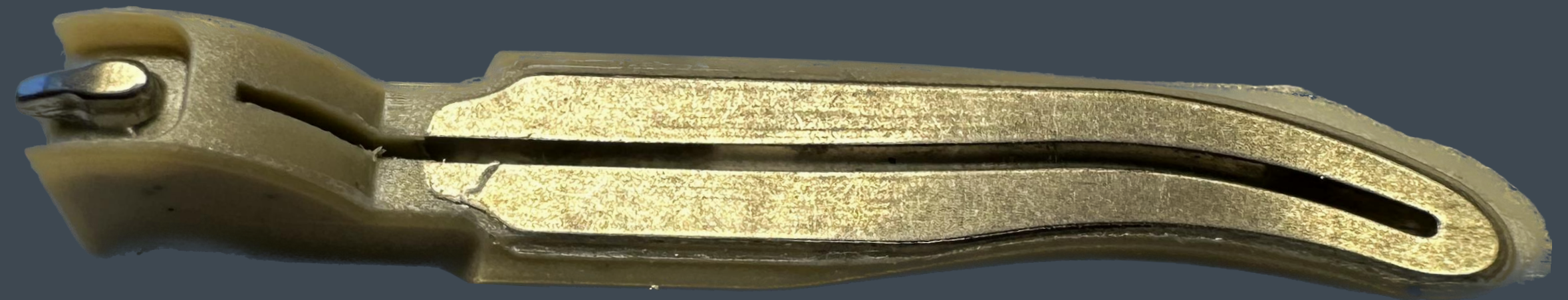
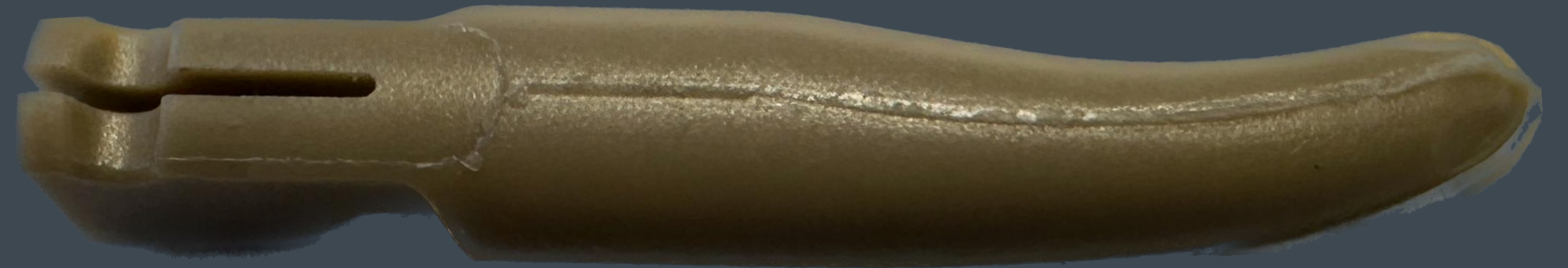
WHAT IS POSSIBLE ?

Process parameter as example:

Metall-plastic part

Outside: PEEK90GL30 natur

Inside: 17-4PH (stainless steel)



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WHAT IS POSSIBLE ?

PROCESS PARAMETER

Temperature

Tumbling speed

Time of cooling

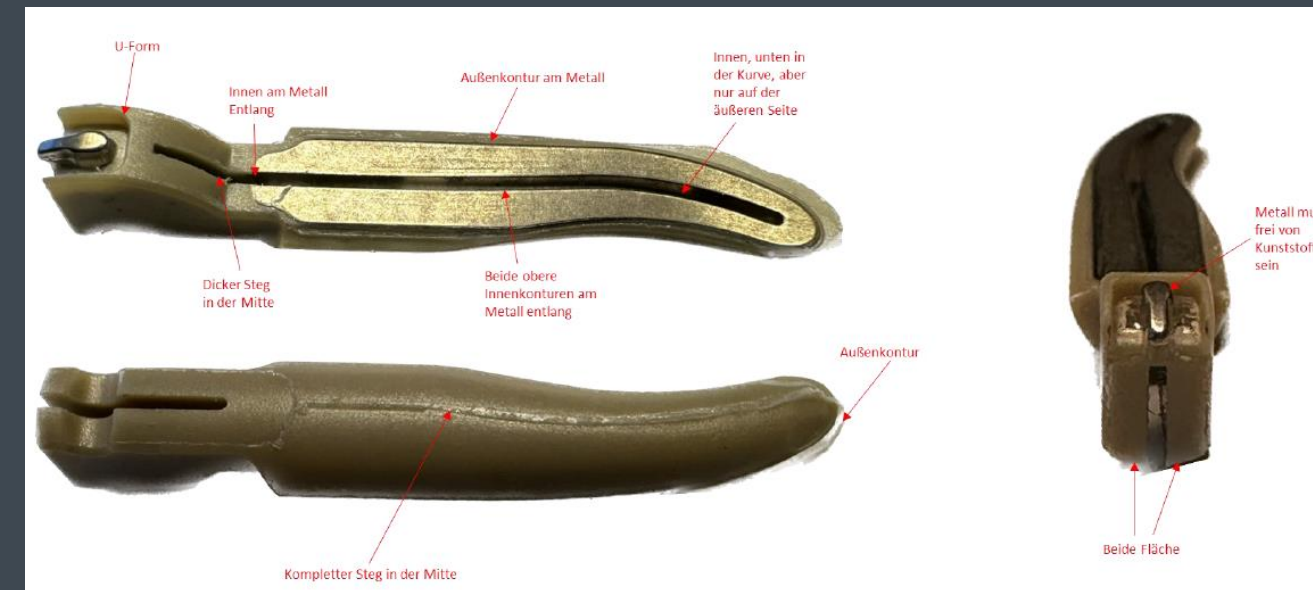
Time of tumbling

Time of blasting

Speed of the shot-media

Size of the shot media

Time of separation



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WHAT IS POSSIBLE?

PROCESS PARAMETER

Entgratungsparameter Aktuell Benutzer: awadmin
16.09.2023 11:18:04 Artikelnummer: GLWFM-8085-155

Artikelnummer: GLWFM-8085-155

Parameter	Current Value	Target Value
Beschickungszeit	0 min : 0 s	0 min : 0 s
Vorkühlen, Trommel Aus	0 min : 0 s	0 min : 0 s
Vorkühlen, Trommel Ein	0 min : 0 s	0 min : 0 s
Kühlzeit	2 min : 0 s	0 min : 0 s
Strahlzeit	2 min : 0 s	0 min : 0 s
Separierzeit	0 min : 45 s	0 min : 0 s
Temperatur Trommel	-20 °C	14 °C
Drehzahl Trommel	20 min ⁻¹	0 min ⁻¹
Drehzahl Schleuderrad	2000 min ⁻¹ Mitte	0 min ⁻¹ 0,0 A
Entleerzeit	0 min : 0 s	0 min : 0 s
Entleerdrehzahl	0 min ⁻¹	0 min ⁻¹
Vibrationssieb Extern Zeit	0 min : 0 s	0 min : 0 s
Vibrationssieb Extern %	0 %	0 %

Granulatüberwachung
Füllstand min : ■

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WHAT IS POSSIBLE ?

Process time including loading
and unloading = 4min

Filling volume AWS08 = 8 liter



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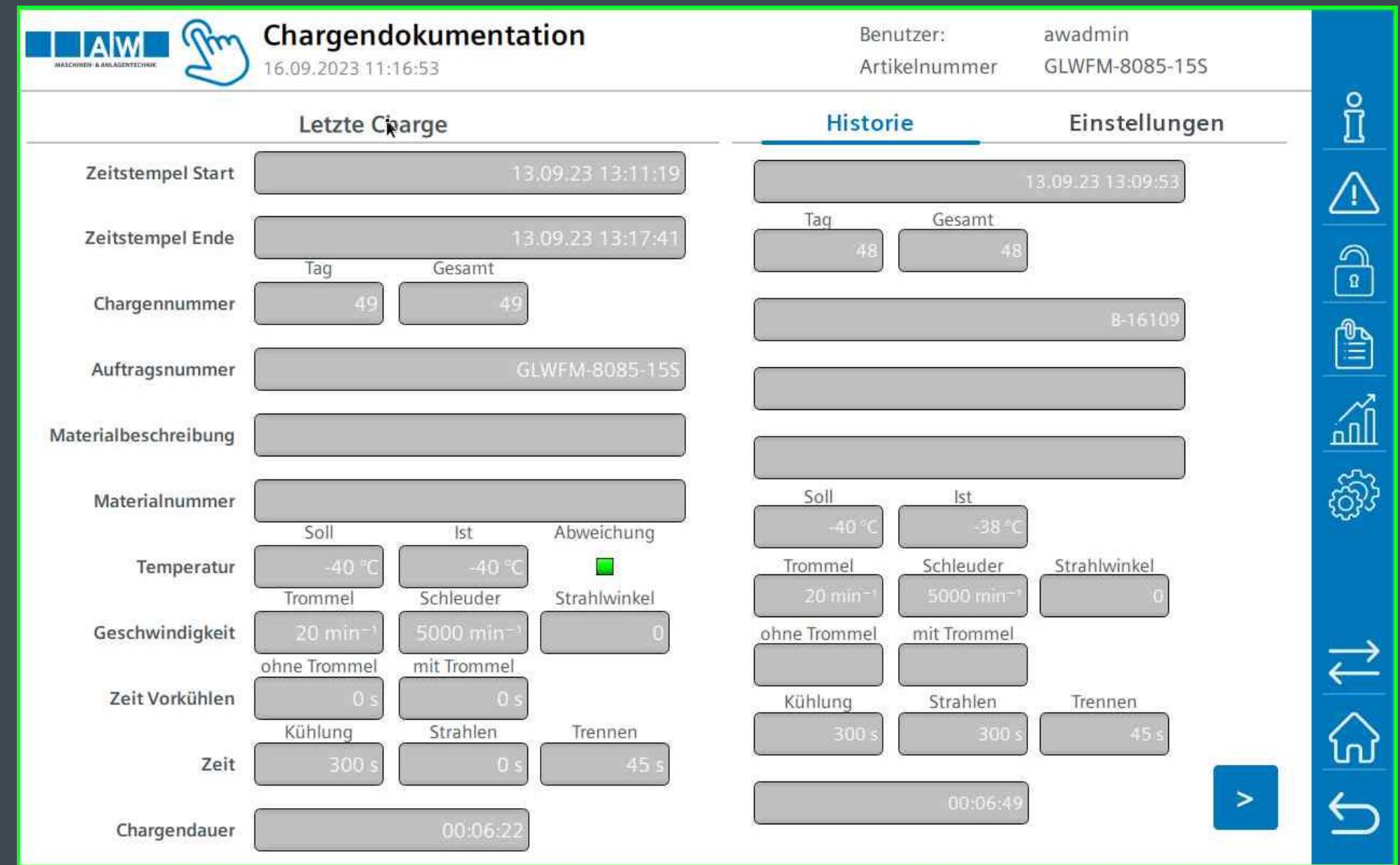
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DOCUMENTATION !

Process documentation per batch
protocoll

OPC-UA connection

Central receipt organisation



Chargendokumentation
16.09.2023 11:16:53

Benutzer: awadmin
Artikelnummer: GLWFM-8085-155

Letzte Charge			Historie		Einstellungen	
Zeitstempel Start	13.09.23 13:11:19		13.09.23 13:09:53			
Zeitstempel Ende	13.09.23 13:17:41					
Chargennummer	Tag: 49	Gesamt: 49	Tag: 48	Gesamt: 48		
Auftragsnummer	GLWFM-8085-155				B-16109	
Materialbeschreibung						
Materialnummer						
Temperatur	Soll: -40 °C	Ist: -40 °C	Abweichung: ■	Soll: -40 °C	Ist: -38 °C	
Geschwindigkeit	Trommel: 20 min ⁻¹	Schleuder: 5000 min ⁻¹	Strahlwinkel: 0	Trommel: 20 min ⁻¹	Schleuder: 5000 min ⁻¹	Strahlwinkel: 0
	ohne Trommel: 0 s	mit Trommel: 0 s		ohne Trommel: 0 s	mit Trommel: 0 s	
Zeit Vorkühlen	Kühlung: 300 s	Strahlen: 0 s	Trennen: 45 s	Kühlung: 300 s	Strahlen: 300 s	Trennen: 45 s
	Zeit: 300 s	0 s	45 s	00:06:49		
Chargendauer	00:06:22					

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EQUIPMENT !

Automatisation

Wash and dryer systems

Sample treatment in our demo area

Box handling / layout planing

Special solutions



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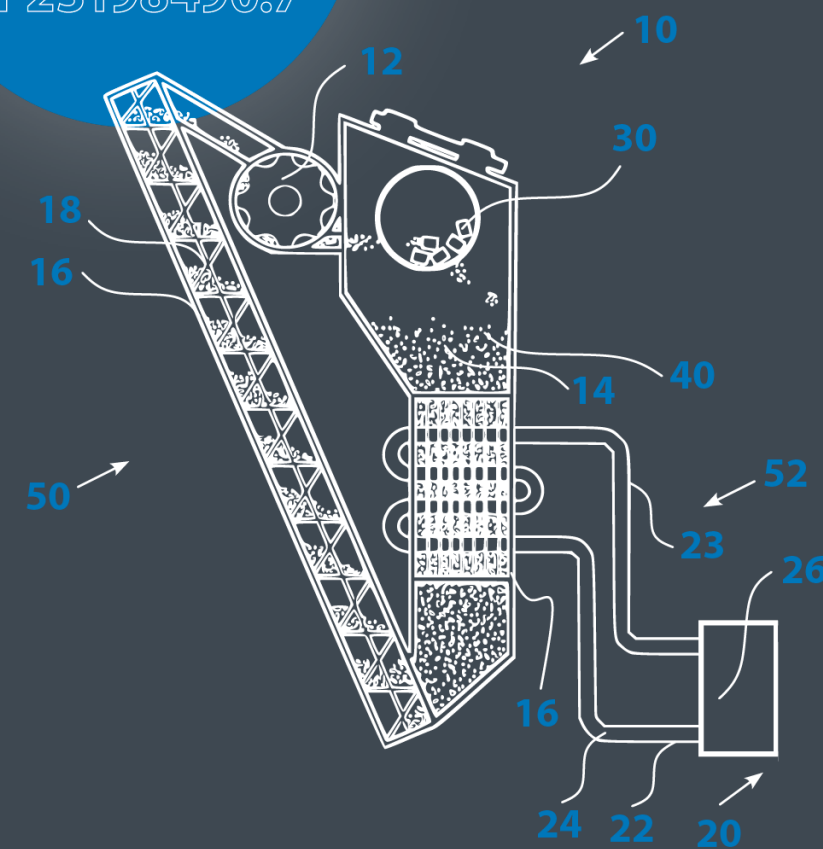
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NEW DEVELOPMENT – apply for a patent (EP23198490.7)

COLD-TEMPERATURE-MEDIA-BLAST-DEFLASHING

**ZUM EUROPA-
PATENT
ANGEMELDET.
EP23198490.7**



Media-blast deflashing down to -40°C without LN2

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Thank you !

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