Perfekte Oberflächen. Weltweit.

Mass-Finishing

Basic processes and technologies

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Definition and Discription

Nearly every industrial made workpiece will cause a step of grinding or deburring during the manufacturing process

Mass-Finishing in the industrial use are grinding processes with use of grinding stones or granules.

The workpieces will be put into barrels or containers.
This containers are filled with this grinding stones –we will call them chips - water and additives.
Some processes get done dry.

Generated through the movement of the working-container or/and the movement of the workpieces, the grinding process starts.

Depending on the way of movement, the processes are specified:

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Mass-Finishing with Tumblers

Tumblers are vibratoy barrels which are flexible mounted with springs.
The movement of the barrel is proceed by unbalance-motors.

The complete content will oszillate after starting of the process.

The different mass moments of inertia will cause the movement and the pressure bewtween chips and workpieces.

This is the reason, why small and light workpieces can not be really addapted to this process.
Or the running time will be extremely long.

Advantages and Disadvantages

- ❖ Heavy loads are possible
- ❖ Systems for move-trough processes are available

- – No light and/or small workpieces
- – Long running times neccessary
- – Exchange of chips is complex and expensive
- – Separation of chips and workpieces is complicated

Barrel-Finishing

This is one of the oldest systems.

A barrel, in further times from wood, now made from steel, is covered at the inside with rubber or a special Polyurethane.

- ❖ Slow movement allows to treat very thin and long workpieces

- – Not enough pressure and speed to grind hard materials
- – No change of water during process time – no rinsing/cleaning of the workpieces

Centrifugal Disc Finishing

This technologie was develloped for short running times and light workpieces.

The number of rpm of the basic disc in the container causes working times, which are factor 10 and more quicker than before.

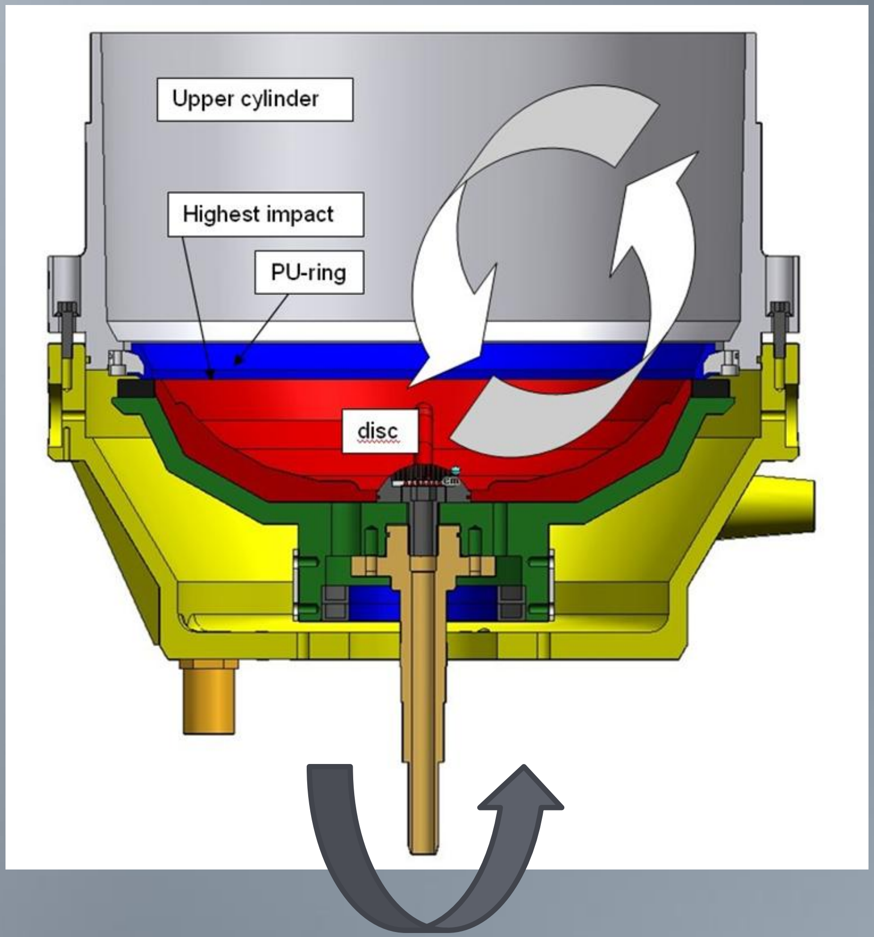
This open system allows also to insert stops and rinsing times during the operation.

You can work in steps;

- Degreasing
- Grinding
- Polishing

can be done without changing media or/and the container.

Movement:



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All this shown processes causes more ore less heavy damages between the workpieces.
If you have to avoid this, you have to work with only one single part in the machine, ore you can use one of the following processes.

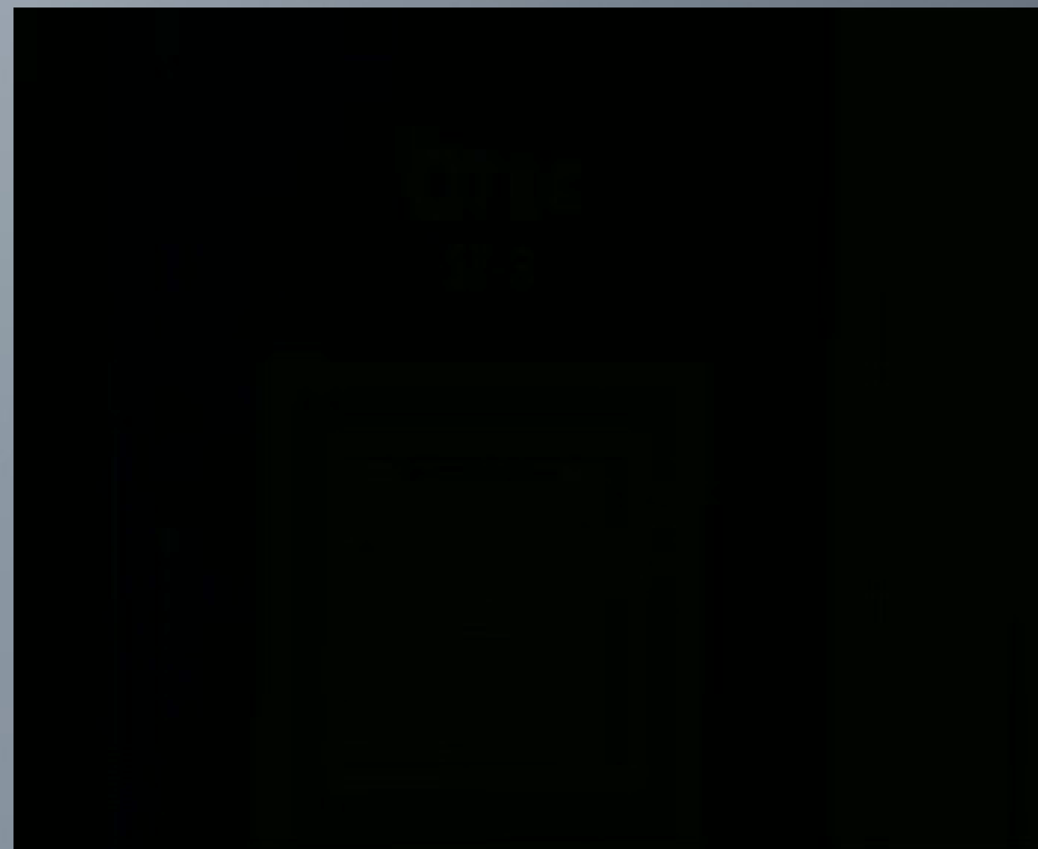
Drag-Grinding or

Drag-Finishing:

- Charges up to 60 WP's
- Process-time: 30 min. up to 3 h

Streamfinishing:

- up to 6 Workpieces
- easily integratable in automatic working lines
- very short running times: 5 sec. up to 20 min.



Comparision: DF/SF

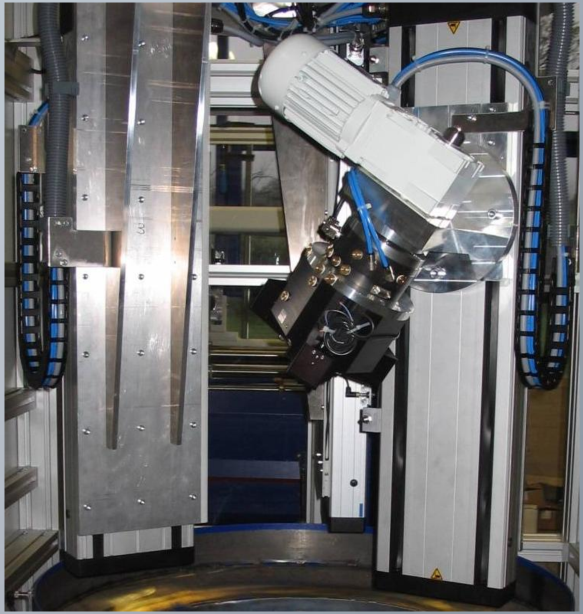
	DF	SF
Movement	Interaction of 3 rotations: Rotor, holder, workpiece-selfrotation	• container-rotation • workpiece-movement
Pressure	• immersion-depth • acceleration/decelacartion depending at the programmend speed • V max: appr. 2 m/s	• fentrifugal force 10 g • Immersion-depth • angle of attack • V max: appr. 15 m/s
	• distance of the container wall and bottom • dry or wet process	

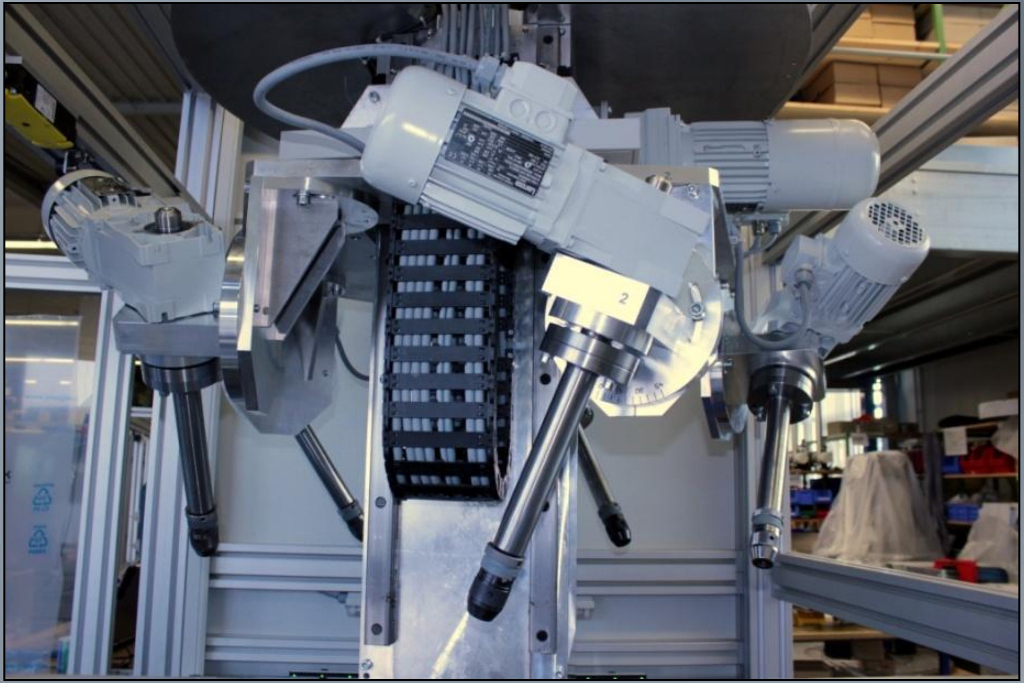
DF-wet single-machine

DF-3 S2
twin machine

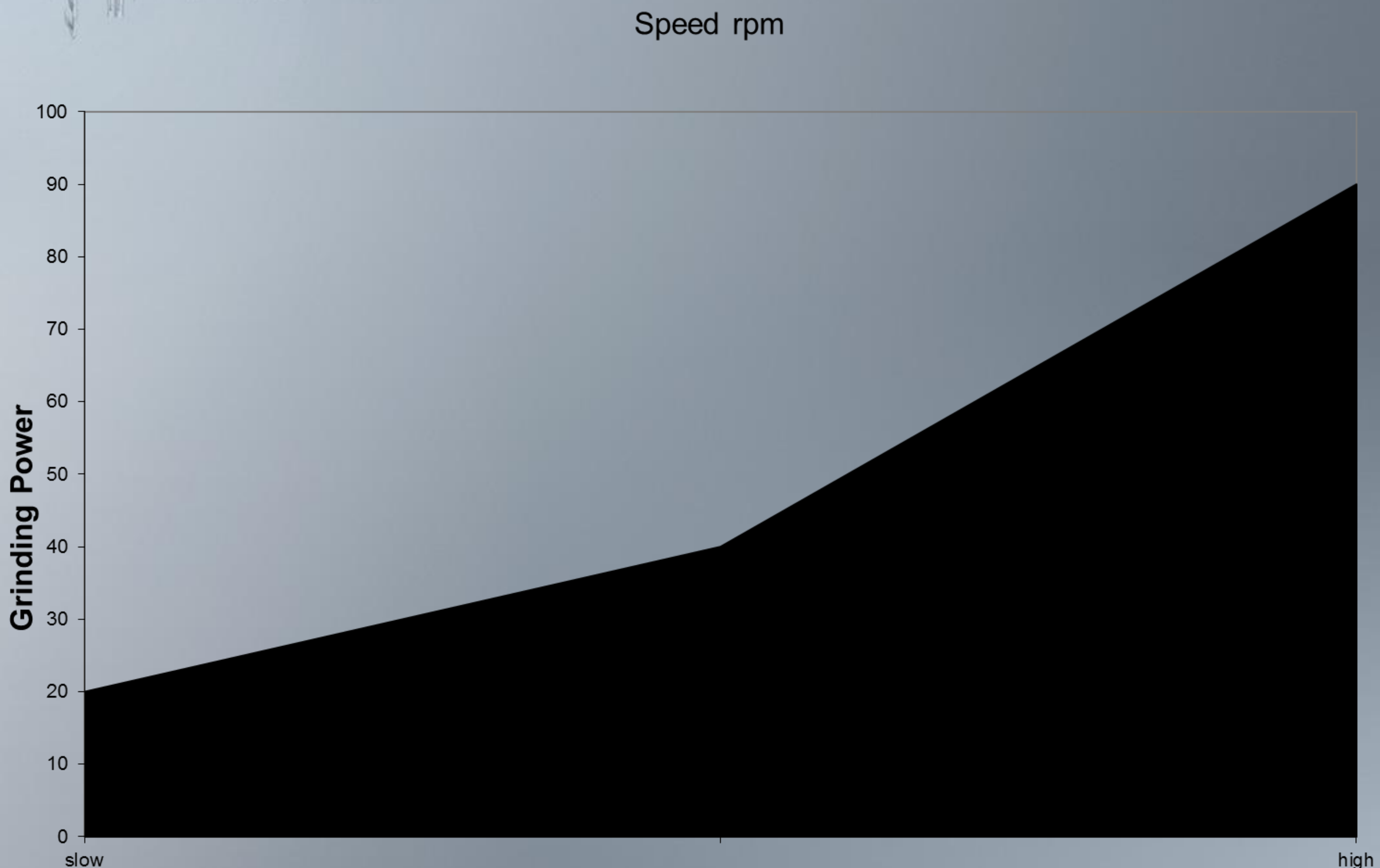
grinding and polishing in 2 steps

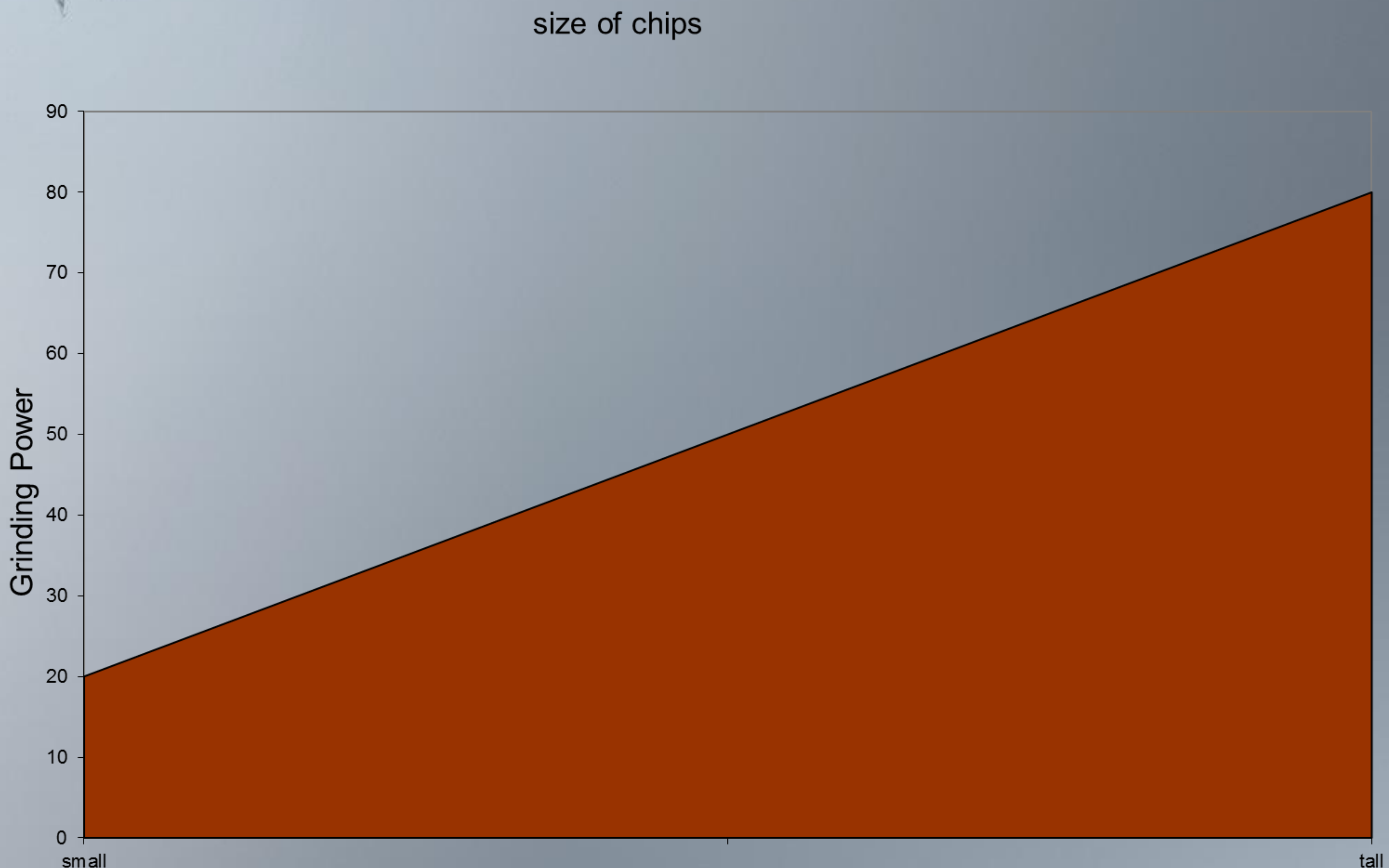
SF- applications





Following parameters as an influence on the result of the mass-finishing processes:


Speed rpm
Grinding Power
100
90
80
70
60
50
40
30
20
10
0
slow
high


size of chips
Grinding Power
90
80
70
60
50
40
30
20
10
0
small
tall

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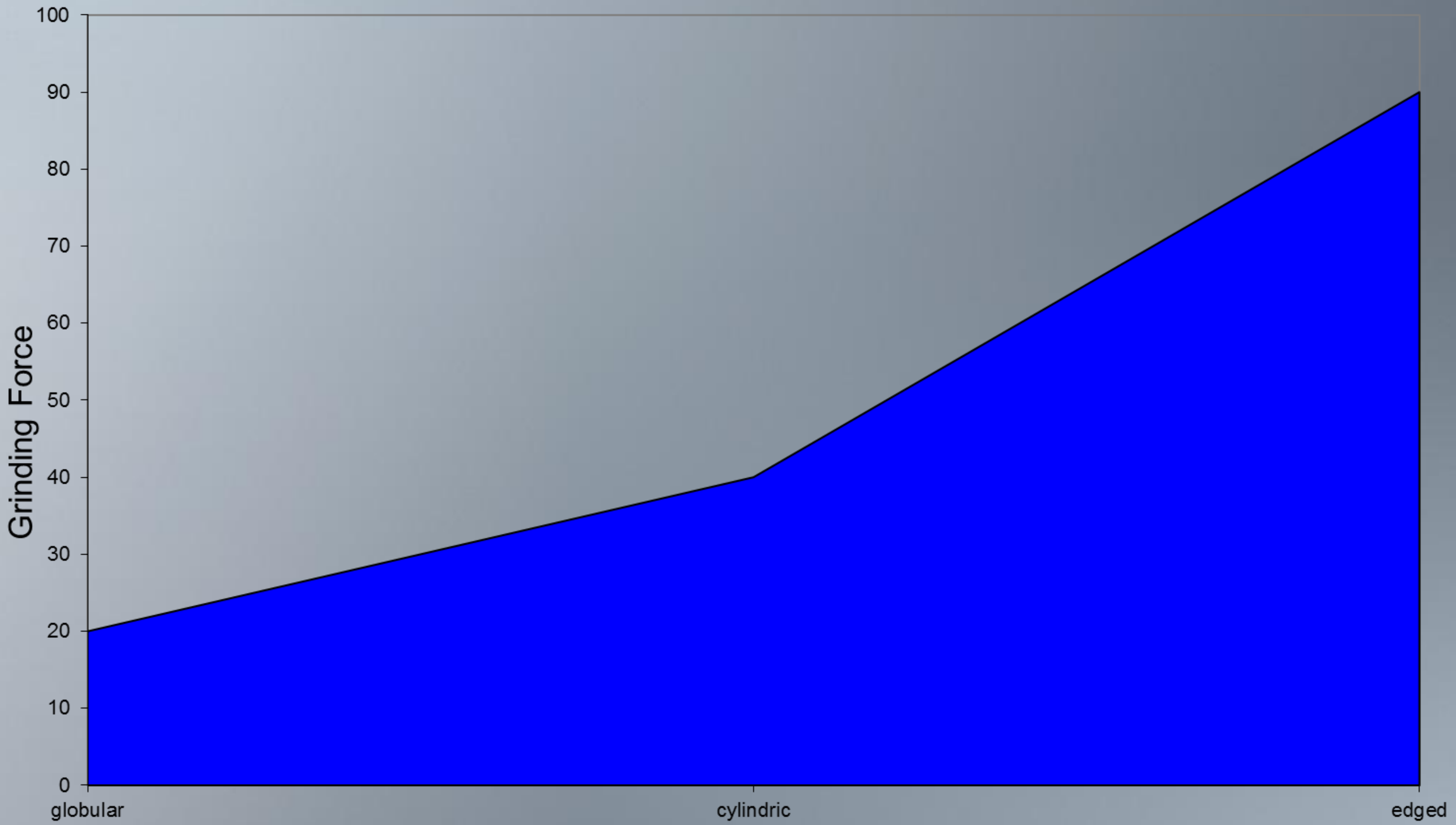
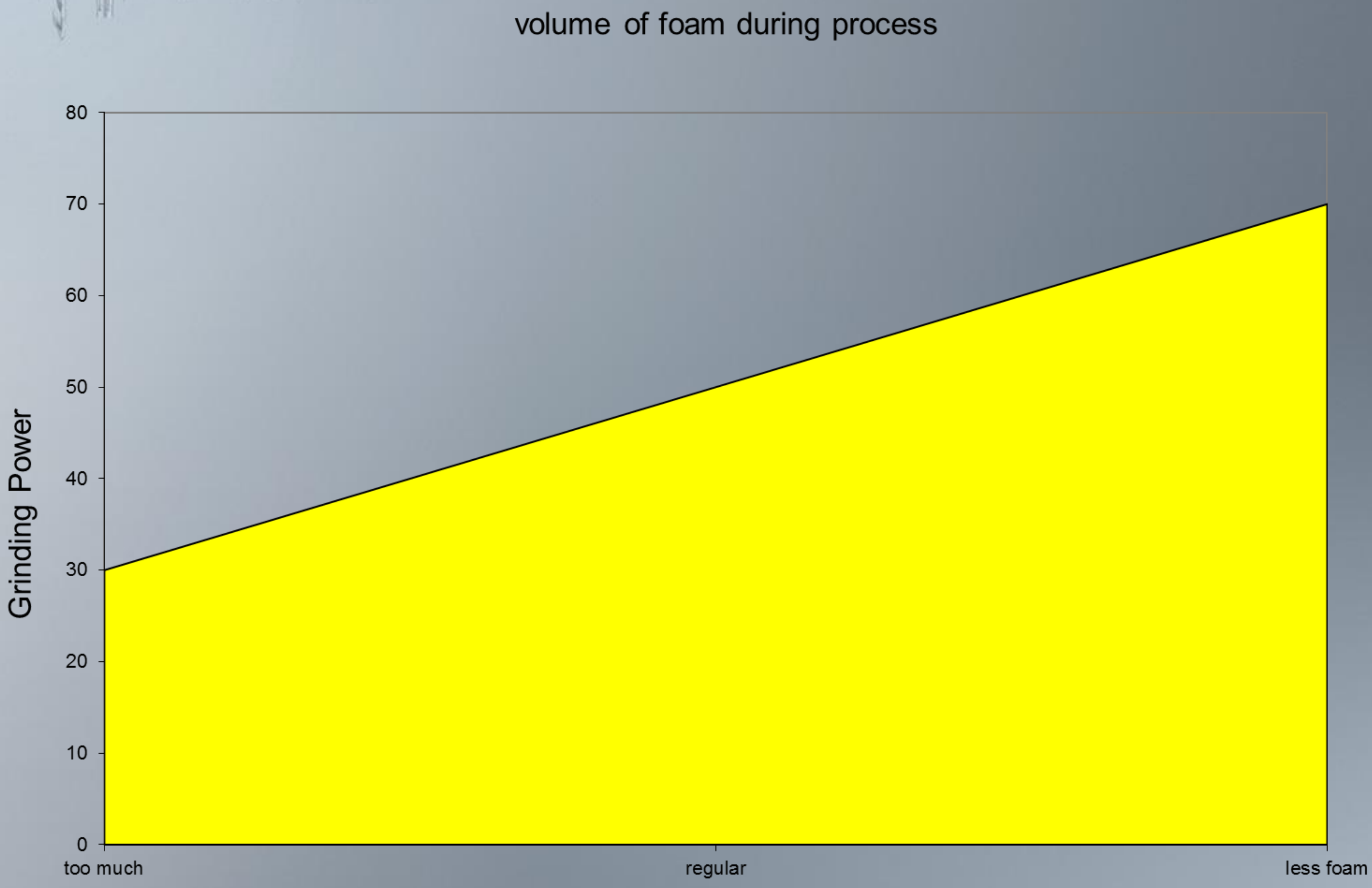
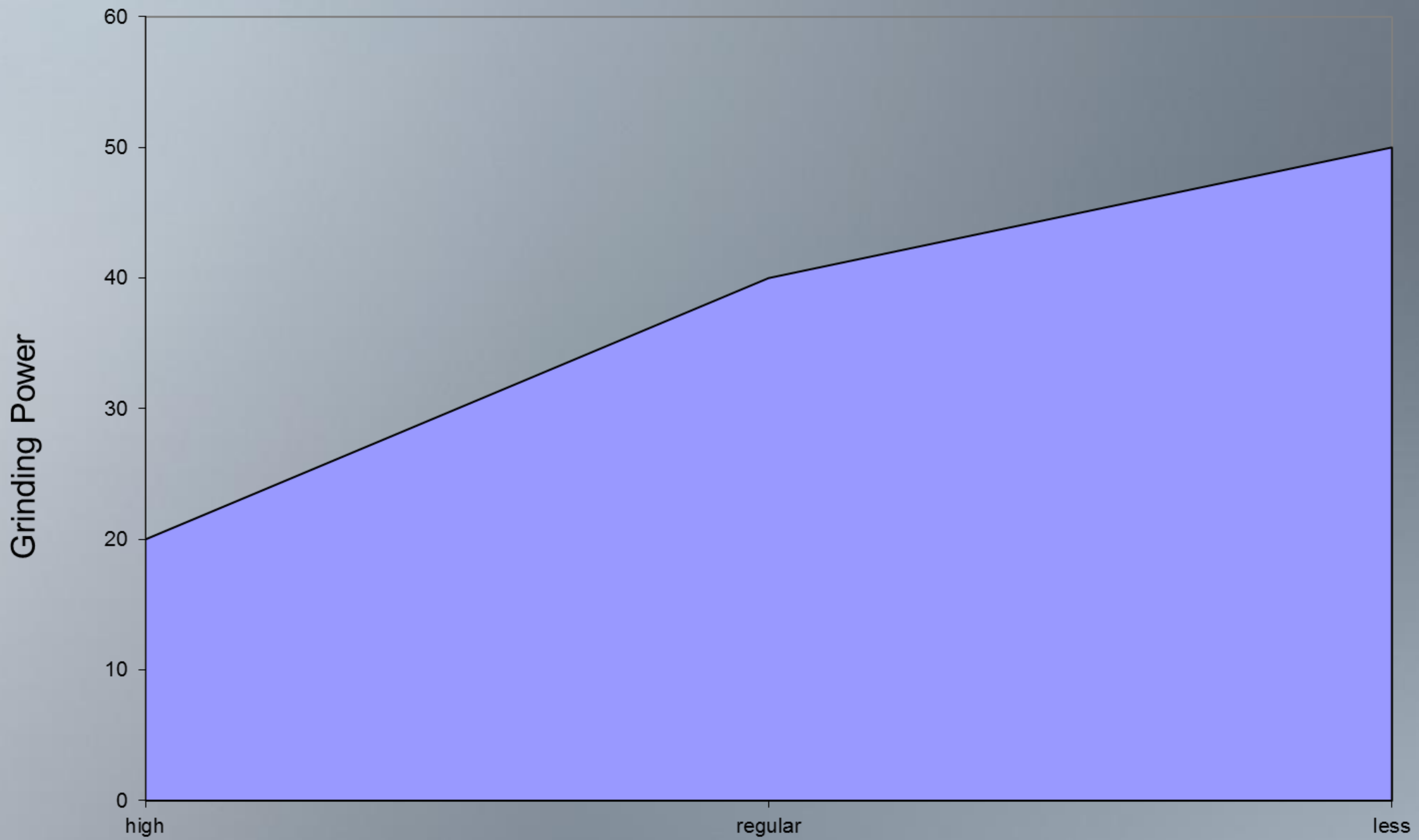
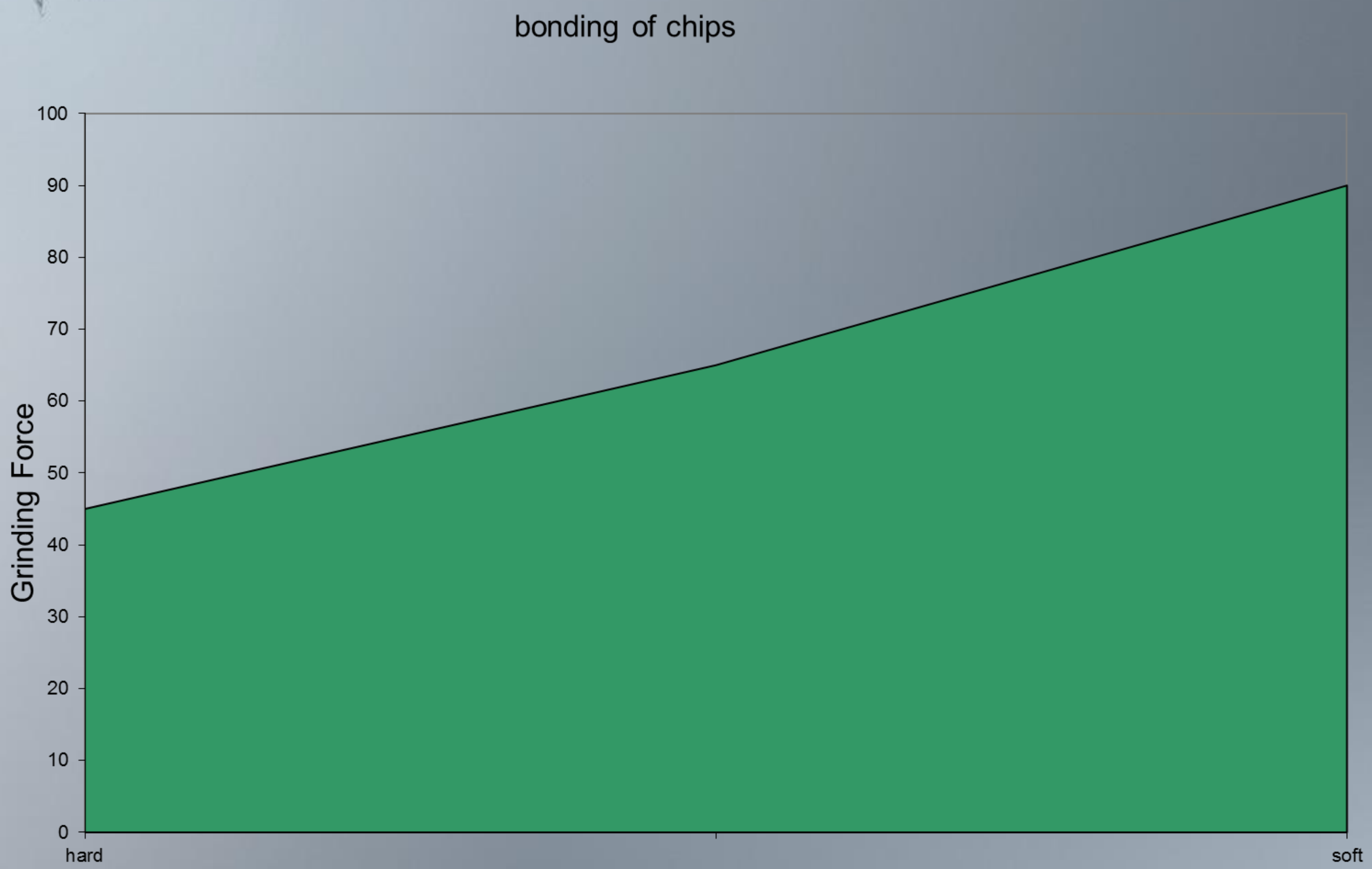
geometry of chips

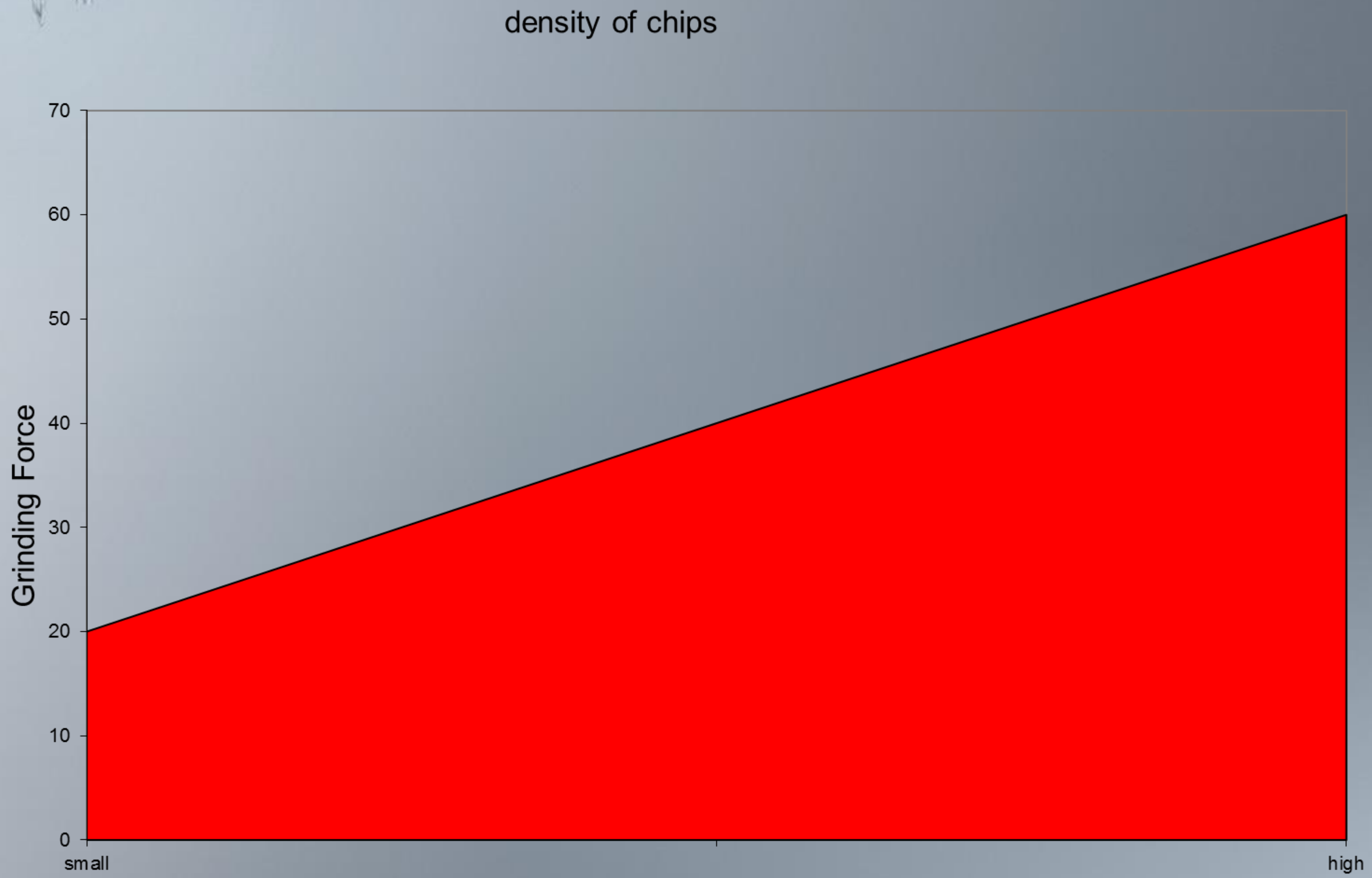



volume of foam during process
Grinding Power
80
70
60
50
40
30
20
10
0
too much
regular
less foam

waterlevel during process




bonding of chips
Grinding Force
100
90
80
70
60
50
40
30
20
10
0
hard
soft


density of chips
Grinding Force
70
60
50
40
30
20
10
0
small
high

Werkstückname: **Knochenplatten**
Industrie: Medizinische Industrie
Versuchsaufgabe: Schleifen und polieren
Material: Edelstahl
Beschichtet ☐
Herstellungsverfahren: Frästeil

Maschine	Stp.	Zeit	Bearbeitung	Media	Compound	U/min
CF 1x18-I	1	1,5 h	Nassschleifen	DS 10/10 Keramikschleifkörper	SC 15 Compound	280
CF 1x18-I	2	2 h	Nassschleifen	KM 10/PM 10 Kunststoffschleifkö	SC 15 Compound	260
CF 1x18-I	3	30 min.	Nasspolieren	ZSP 3/5 Porzellanpolierkörper	SC 25 Compound	260

Protocol No. 15690

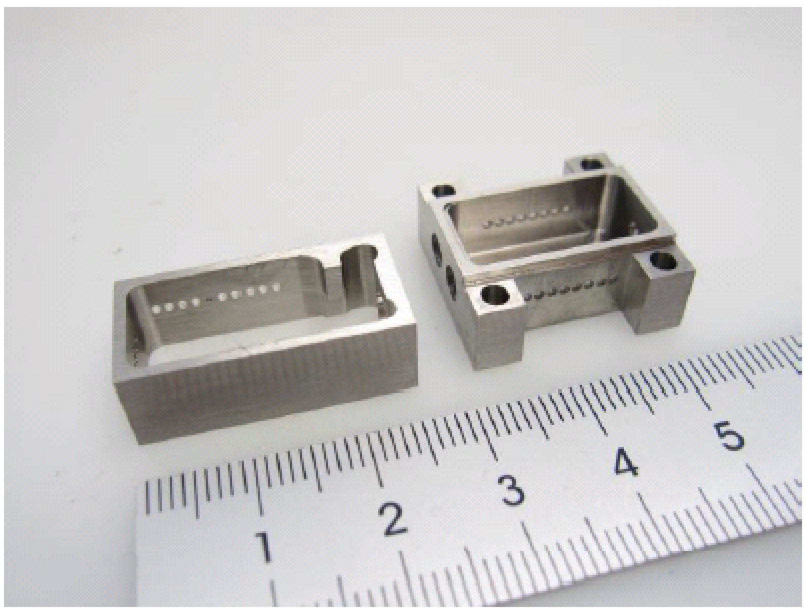
Sample name: **turned and machined parts**
Industry: Metall industry
Process required: deburring
Material: Stainless steel
Manufacturing process turned and machined part

Machine	Stp.	Time	Process	Media	Compound	Speed
CF 1x18-I	1	30 min.	wet grinding	DS 3/3 ceramic grinding chips	SC 15 compound	230

Protocol No. 16076

Sample name: **Milled part**
Industry: Metall industry
Process required: deburring
Material: Stainless steel
Manufacturing process milled parts

Machine	Stp.	Time	Process	Media	Compound	Speed
CF 1x18-I	1	2 h	wet grinding	DZS 6/6 ceramic grinding chips	SC 15 compound	225



Protocol No. 15580

Sample name: **stampings**
Industry: Metall industry
Process required: deburring
Material: Steel
Manufacturing process pressed, drawn, bent part

Machine	Stp.	Time	Process	Media	Compound	Speed
CF 1x18-I	1	2 h	wet grinding	SS 4/10 ceramic grinding chips	SC 15 compound	330

Protocol No. 16513

Sample name: **connerctor**
Industry: Metall industry
Process required: deburring
Material: Brass
Manufacturing process turned and machined part

Machine	Stp.	Time	Process	Media	Compound	Speed
CF 1x18-I	1	15 min.	wet grinding	PM 10 plastic grinding chips	SC 5 compound	200

Protocol No. 14087

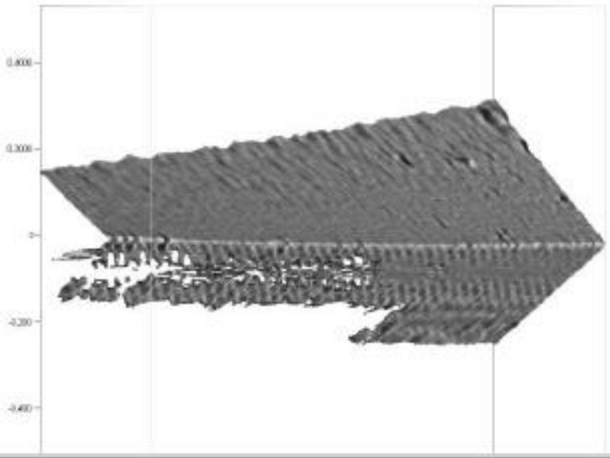
Sample name: **cast parts**
Industry: Metall industry
Process required: deburring
Material: Die-cast zinc
Manufacturing process casting

Machine	Stp.	Time	Process	Media	Compound	Speed
CF 1x18-I	1	30 min.	wet grinding	ZSS 3/10 ceramic grinding chips	SC 15 compound	330
CF 1x18-I	1	30 min.	wet grinding	ZSS 3/10 ceramic grinding chips	SC 15 compound	330

Protocol No. 13928

Sample name: **burs, cutters**
Industry: tool industry
Process required: rounding
Material: Carbide
Manufacturing process grinded parts

Machine	Stp.	Time	Process	Media	Compound	Speed
DF-3/4 To	1	7 min.	dry polishing	QZ 1-3 microfinish media	HL 5 oil	40



Protokoll-Nr.: 20648

Werkstückname: **Tellerrad**
Industrie: Autoindustrie
Versuchsaufgabe: Polieren
Material: Stahl
Beschichtet ☐
Herstellungsverfahren: geschliffene Teile

Maschine	Stp.	Zeit	Bearbeitung	Media	Compound	U/min
SF 3	1	20 min.	Nasspolieren	QZ 1-3W Mikrofinish-Schleifkp.	SC 15 Compound	80

Thanks for your attention!

Any questions?