

MaxiMill HFC

The High Feed Cutting System



hard material matters

MaxiMill HFC

The High Feed Cutting System



- 1. Overview**
- 2. Product**
- 3. Application**

1. Overview product benefits:



4 Cutting edges



Maximum chip removal rate

Max. economy

Feedrates up to
 f_z 3mm/t possible

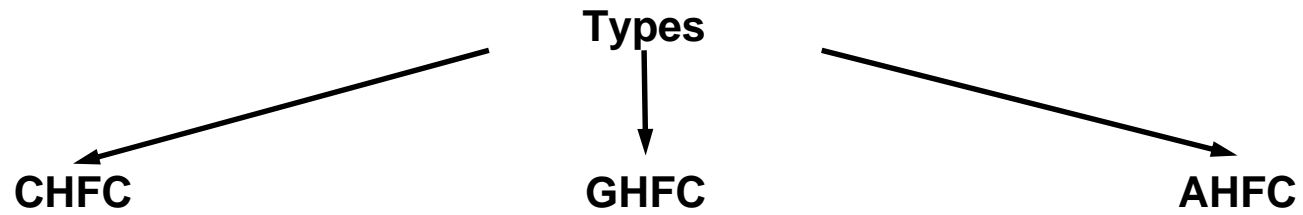
Soft cutting and reduced vibration
-> max spindle protection

Compact and
stable construction



Main cutting forces in **axial direction**, only little radial load

1.1 Product overview:



- Tool diameter **16** – 100 mm
- Insert size **06**; 09; 12

2. Product:



2.1 Product features Tool:

FEM- optimized cutter body



hard & tough



Tapered coolant
exit hole for
MQL/air/lubricant



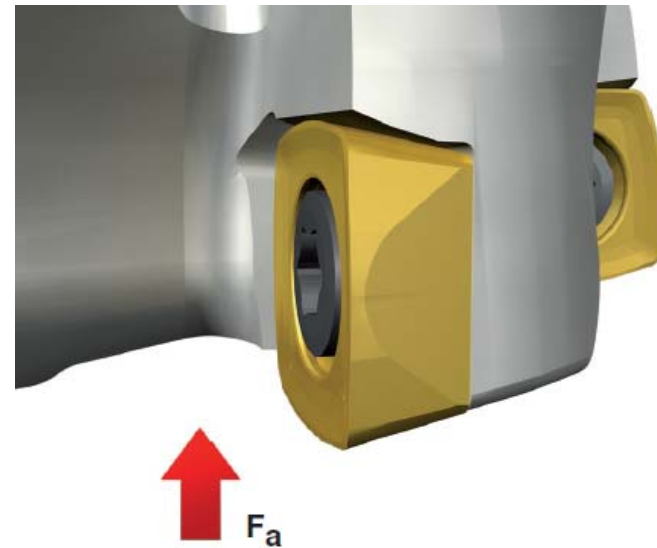
Optimized chip pockets to
guarantee good chip
evacuation !



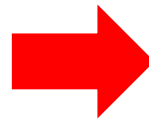
2.2 Product features tool:

Mounting position:

- The cutting forces are mainly in the axial direction
- Soft cutting and reduced cutting noise



Even with long overhang lengths there is almost no vibration



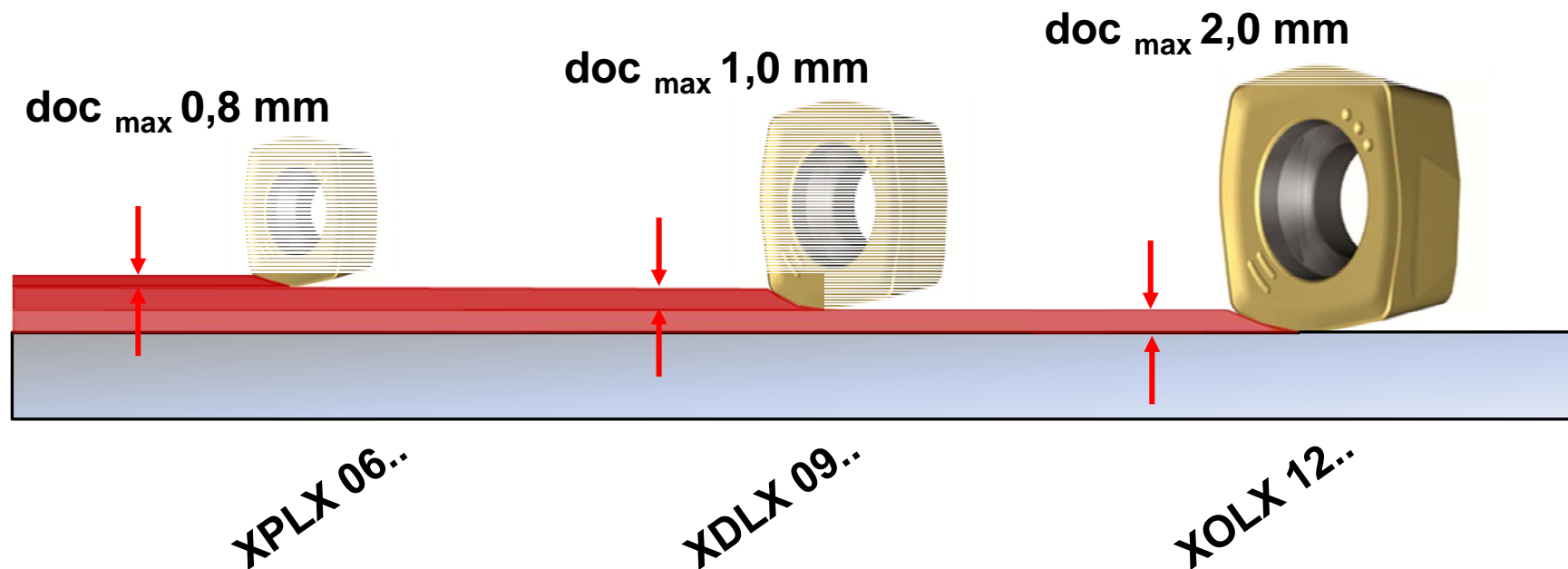
Little stress on the machine spindle

2.2 Product features insert:



Depth of cut:

- Insert size 06; 09; 12



NEW! AMB - Stuttgart 2012:

Program extension HFC...

➔ **New insert size:**

HFC-06

CHFC Ø 16; 20; 25; 32

GHFC Ø 16; 20; 25; 32

XPLX **060305SR-M50** CTP1235

XPLX **060305ER-F40** CTC5235

➔ **New chip groove:**

HFC-12

XOLX **120410SR-R50** CTP1235

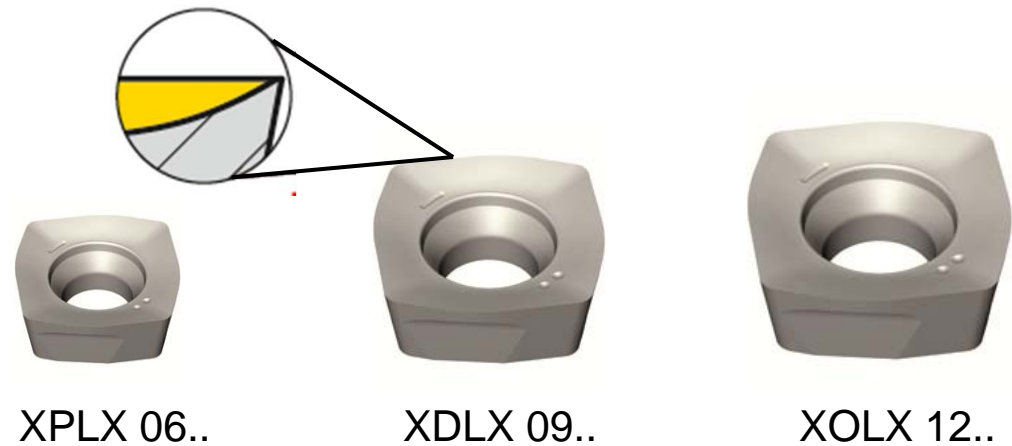


2.2 Product features insert:



Geometry -F...

- For finishing
- Very soft cutting
- instable conditions



Chip groove	Chip groove code	Material	Machining situation and stability				Machining type
			○	○	◐	◑	
-F40	•	Ti ▼ ▼ ▼	✓	✓			F

2.2 Product features insert:



Geometry -M...

- Universal
- First choice for all steels
- Balance between stability and soft cutting action



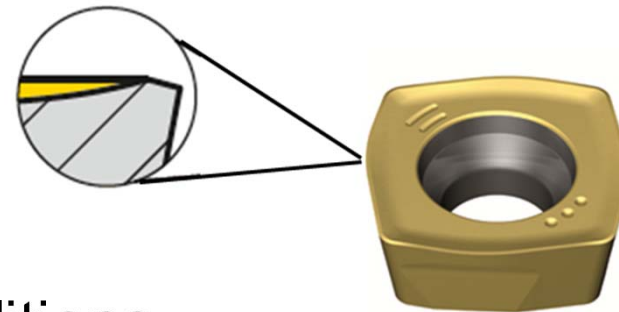
Chip groove	Chip groove code	Material	Machining situation and stability				Machining type F / M / R
			○	○	◐	◑	
-M50	●	▼ ▼ ▼		✓	✓		M

2.2 Product features insert:



Geometry -R...

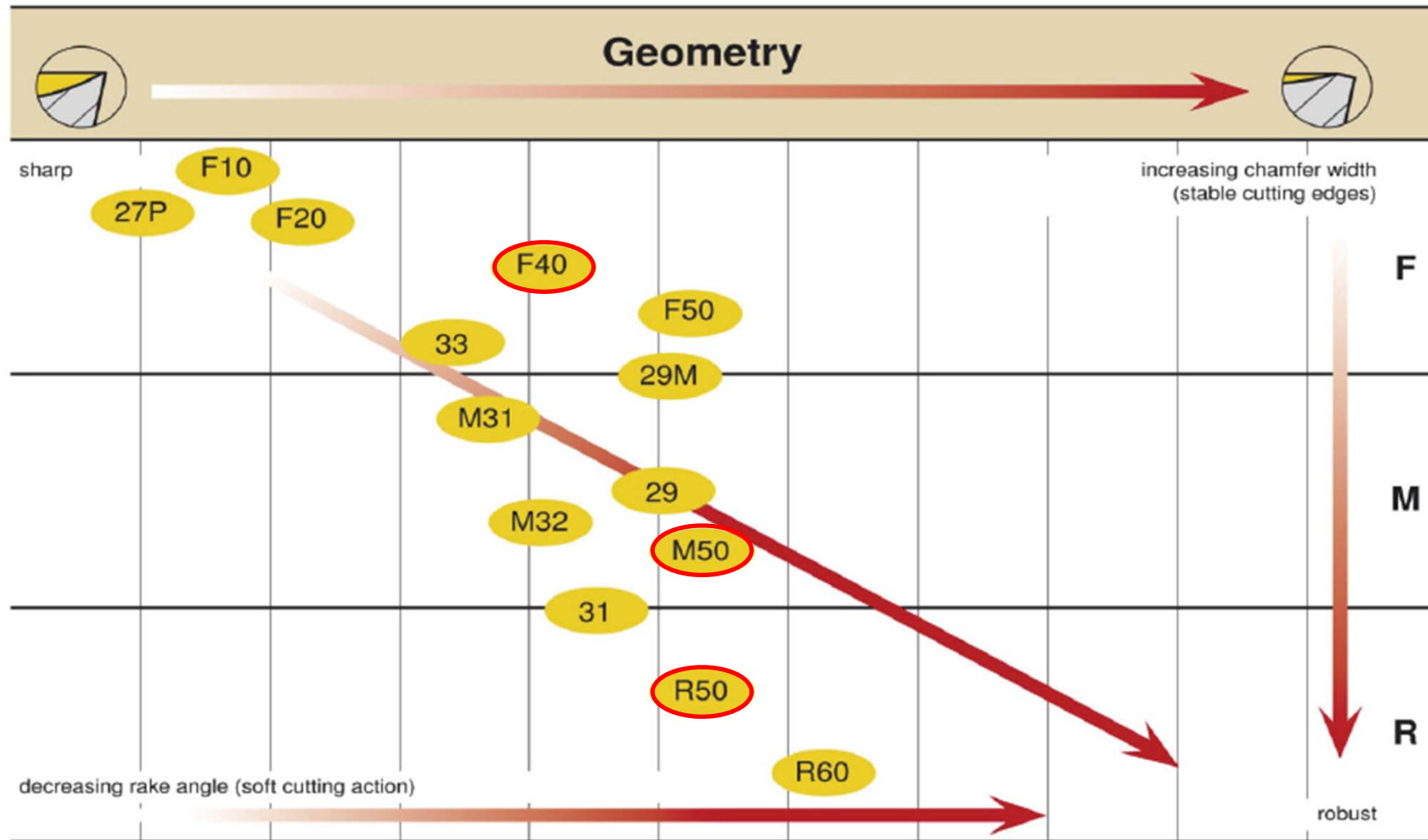
- Mainly for roughing
- Robust cutting edge
- Very good stability
- For severely interrupted cut and generally difficult application conditions



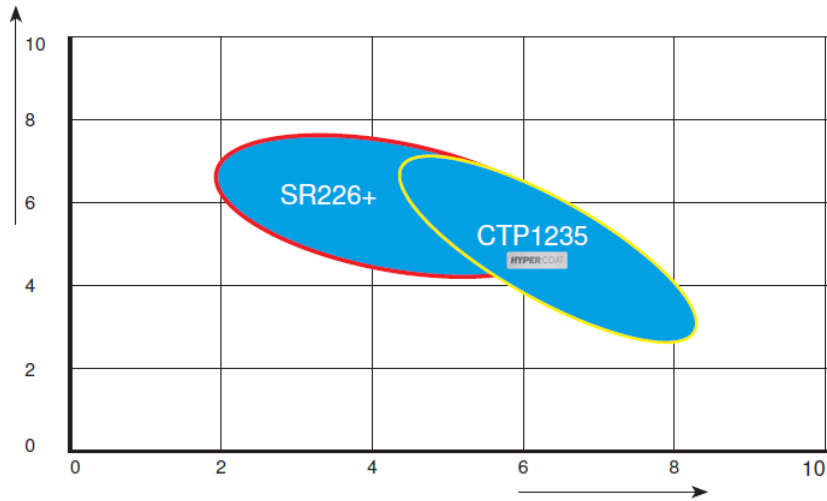
XOLX 12..

Chip groove	Chip groove code	Material	Machining situation and stability				Machining type F / M / R
			○	○	◐	◑	
-R50	●	▼ ▼ ▼			✓	✓	R

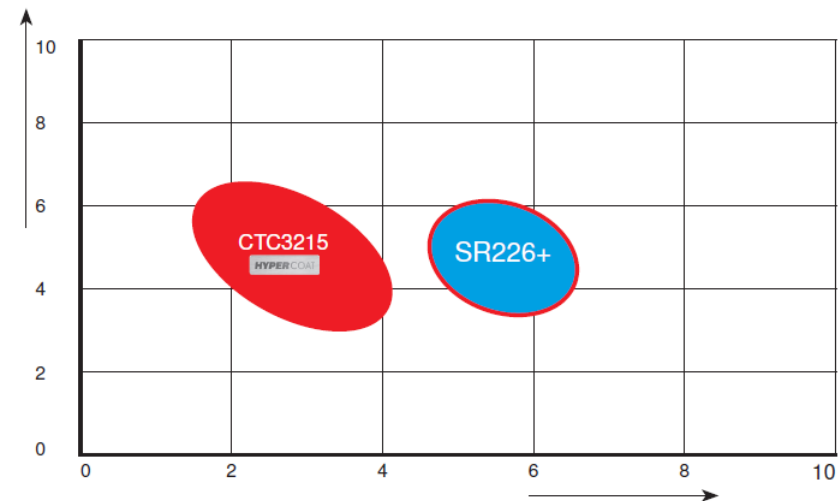
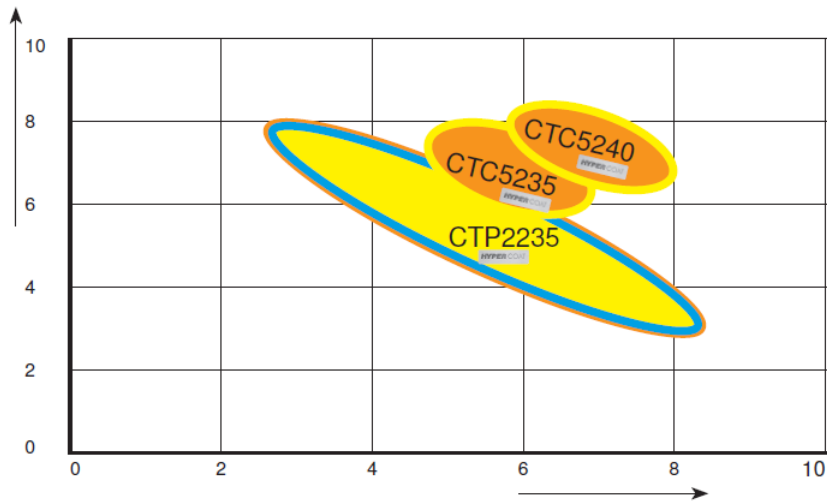
2.2 Product features insert:



2.2 Product features insert:



- MasterGuide:**
- Steel
 - Stainless
 - Cast iron
 - Non ferrous metals
 - Heat resistant
 - Heat resistant materials
 - Hard materials

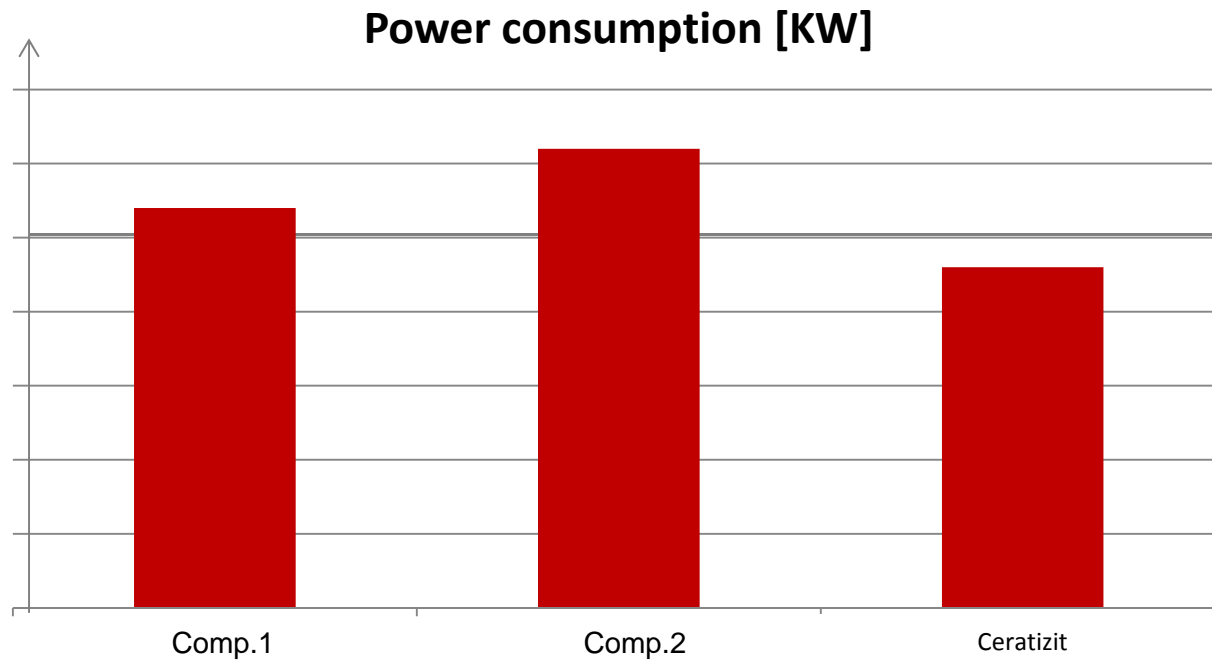


2.3 Product highlights:



Power consumption in comparison to benchmark

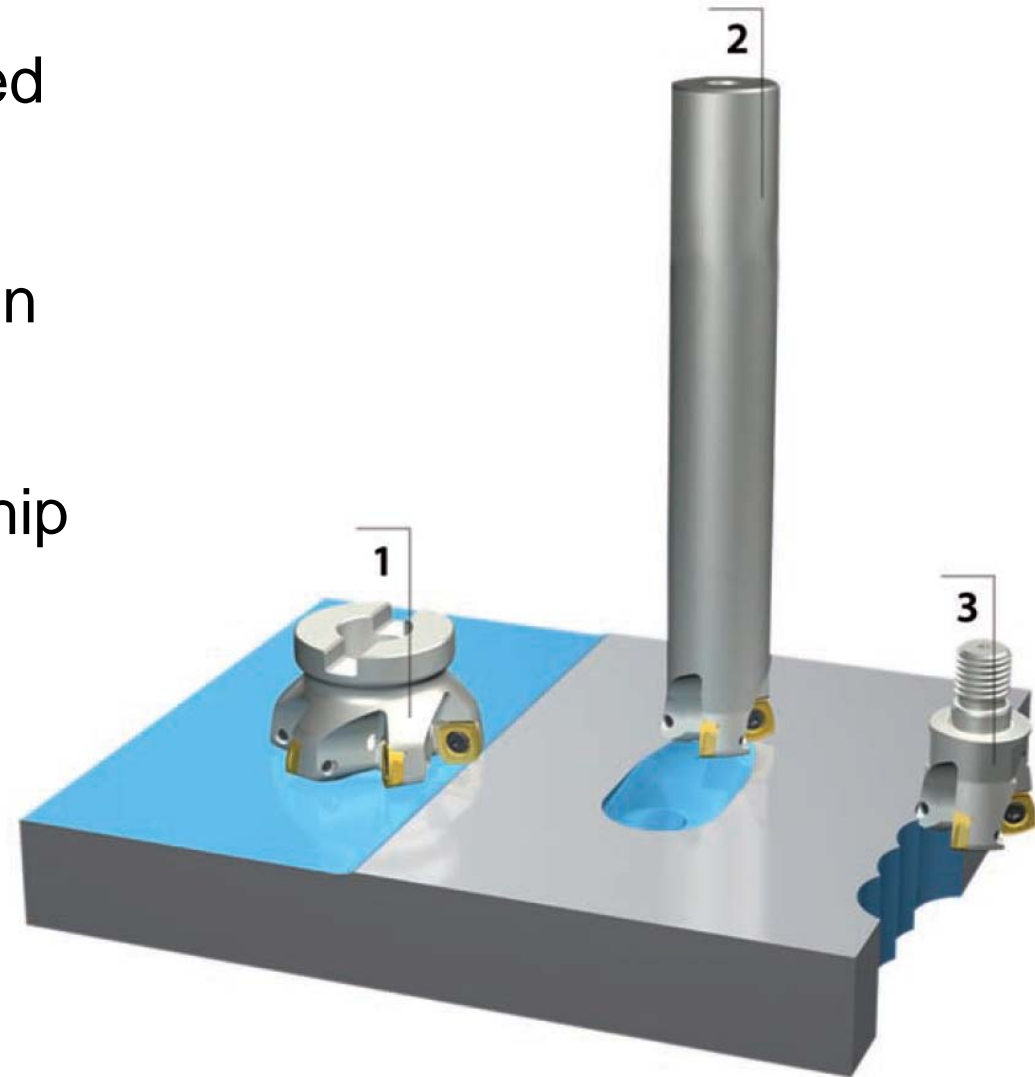
Producer	Spindle power [KW]	Vc [rev/min]	doc [mm]	fz [mm]	Tool \emptyset
Comp. 1	2.7	200	2	1,5	50
Comp.2	3.1	200	2	1,5	52
CERATIZIT	2.3	200	2	1,5	52



3. Application overview:




- ① **Face Milling** with max. feed rate (-> 3mm per tooth)
- ② **Ramping** for the production of deep pockets
- ③ **Plunge milling** for max. chip removal

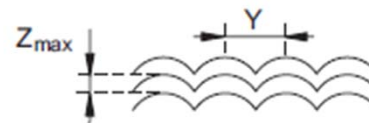
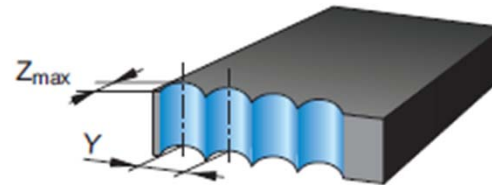
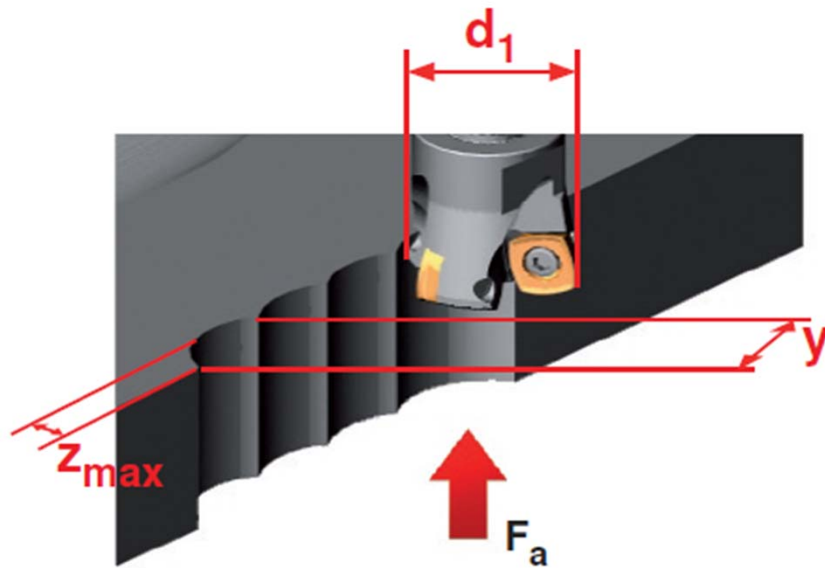


3.1 Application data:

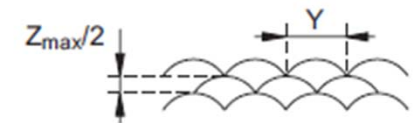


- ➔ high chip removal rate
- ➔ main cutting forces in **axial direction**, only little radial load

engagement data when plunge milling					
	Z_{max}	f			y
		initial	min.	max.	
[mm]					$<.07 \times d_1$
XDLX 09	7,5	0,1	0,08	0,15	
XOLX 12	10	0,15	0,10	0,20	



Tool offset with max. overlap



Tool offset for unstable conditions

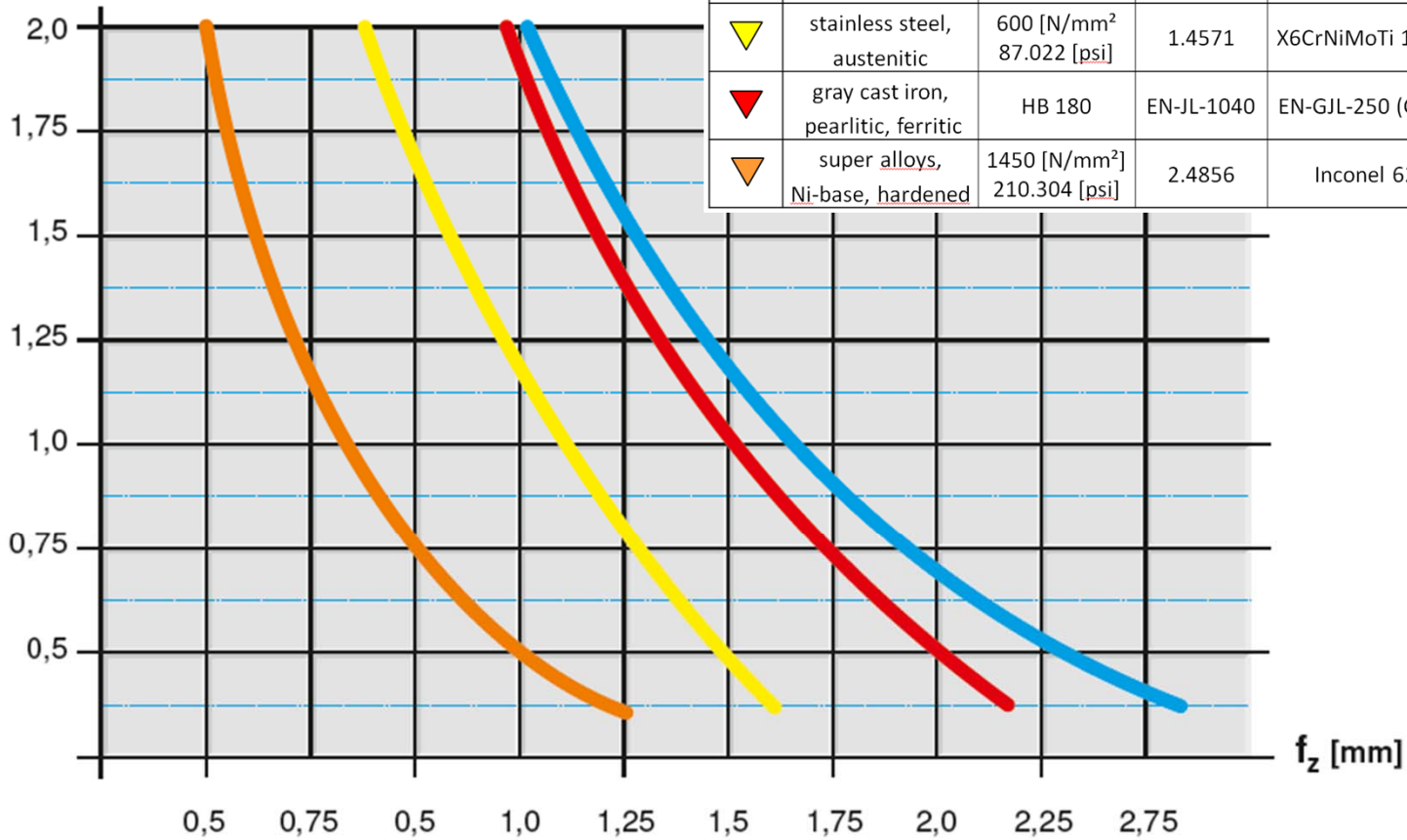
3.2 Starting parameters:

(at optimal conditions)



a_p [mm]

12



example materials					
	Description	Strength	Material-Nr.	DIN EN	AISI
	high alloyed steel	1000 [N/mm ²] 145.037 [psi]	1.2312	40CrMnMoS 8-6	P20+S
	stainless steel, austenitic	600 [N/mm ²] 87.022 [psi]	1.4571	X6CrNiMoTi 1712 2	316 Ti
	gray cast iron, pearlitic, ferritic	HB 180	EN-JL-1040	EN-GJL-250 (GG25)	A48-40B
	super alloys, Ni-base, hardened	1450 [N/mm ²] 210.304 [psi]	2.4856	Inconel 625	Alloy 625

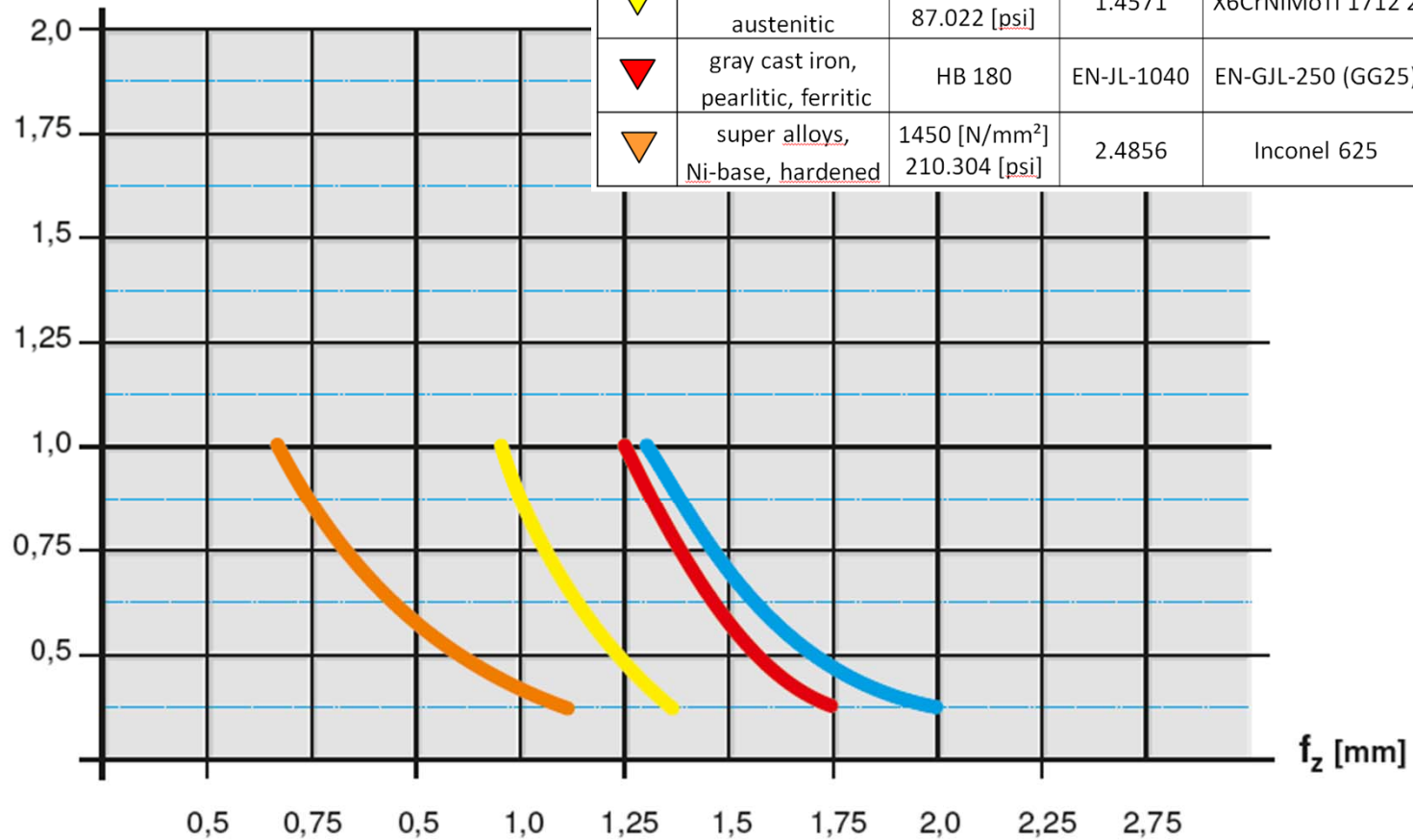
3.2 Starting parameters:

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a_p [mm]

09



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	super alloys, Ni-base, hardened	1450 [N/mm ²] 210.304 [psi]	2.4856	Inconel 625	Alloy 625

3.3 Success stories: „Case studies“



Problems / criteria:

Machining Time

Result:


Reduction of Machining Time from 33 hours to 15 hours

Reducing the cost of the tool 19%

Reducing the cost of the procedure 53%



Work piece:	Die for Axle Sleeve
Material:	1.2367
Properties/hardness:	45 - 48 HRC
Machine:	HSM MAKINO MCB 1210 A40
Tool:	CHFC.32.R.02-12
Insert:	XOLT 120410SR-M50
Grade:	CTP 1235
Competitor:	SANDVIK500.00.9200.N169-RCMT1204

Cutting data:		CERATIZIT	Competitor
v_c	[m/min]	121	36
v_f	[mm/min]	1684	360
f_z	[mm]	0,70	0,4
a_p	[mm]	0,70	0,8
a_e	[mm]	15	35
		AIR	AIR


3.3 Success stories: „Case studies“



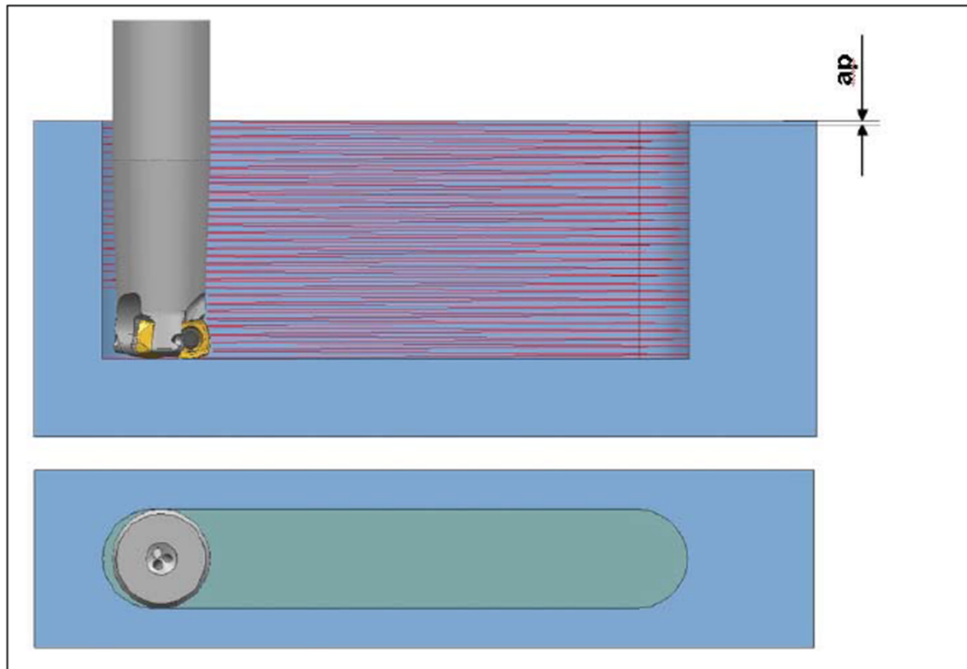
Problems / criteria:
 Producing 3 x 680mm long through slots with U-drill too time consuming.
 Vibrations due to high cutting forces

Result:
 Change to plunge milling process.
 Machining time/piece reduced by 80%
 Productivity increase of 400% 

Work piece:	Planet wheel Ø800 x 300 x 30 mm
Material:	St.52-3 / 1.0570 / Fe 510
Properties/hardness:	490-630 N/mm ²
Machine:	Quaser with arbor BT50
Tool:	CHFC.32.R.02-12
Insert:	XOLT 120410SR-M50
Grade:	CTP 1235
Competitor:	U-Drill Ø32mm, 3xD

Cutting data:		CERATIZIT	Competitor
v_c	[m/min]	180	100-120
v_f	[mm/min]	500	60-120
f_z	[mm]	0,14	0,06-0,10
a_p	[mm]		
a_e	[mm]	10	
		Dry	

3.3 Success stories: „Case studies“




Problems / criteria:

- High machining time
- High machining costs
- Lifetime of the spindle

Result:

- Machining time reduced by 70%
- Machining costs reduced by 71%
- Set-up costs reduced by 50%
- Productivity increased by 230%
- Three times the lifetime of the motor- spindle

Workpiece:	Cylinder
Material:	Steel 42 CrMo 4
Properties/hardness:	
Machine:	Turn-milling machine (motor- spindle)
Tool:	CHFC.25.R.03-09-A-50 (z = 3)
Insert:	XOLT 120410SR-M50
Grade:	CTP1235
Competitor:	End mill with APKT 1003 (z = 3)

Cutting data:		CERATIZIT	Competitor
v_c	[m/min]	180	90
v_f	[mm/min]	6879	516
f_z	[mm]	1,0	0,15
a_p	[mm]	1	4
a_e	[mm]	25	25
		emulsion	emulsion

Customer benefits



low power consumption
max. chip removal



Soft cutting and reduced vibration
-> max spindle protection



Rough milling of faces
-> **min. cutting time** with max. tool life

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2 Innovative and flexible thinking matters!

