

Technical information

Art.-Nr. 1.388 / 1 - example inox

VHM - INOX-Hochleistungsfräser

Art.-Nr. 1.388 **Flutes**





















Tool recommendation











Capabilities











Successful in difficult materials like Inox, titanium, Inconel und Nimonic. Uneven partition, uneven helix, form flute and polished highend coating.

Competitive advantages and profitability

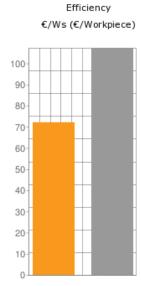
competition to Hoffmann Tisi and WNT Monstermill

Example application

1.388.160.10 Art.-Nr.:

Material: Rust and acid constant steels <700 N/mm² (<205 HB)

	Inov	/atools -	Roughing
D1	16,00	mm	Diameter
z	4		Flutes
ae	16,000	mm	Row pitch
ар	16,000	mm	Cutting depth
vc	67,18	m/min	Cutting speed
n	1336	U/min	Rotation speed
fz	0,05886	mm	Feed per tooth
vf	314,66	mm/min	Feed rate
Q	80,55254000	cm³/min	Material removal rate
hm	0,03747	mm	Middle chipping thickness
K/M	80	€/std	Machine hourly cost
K/W	62	€	Tool cost
Т	32	min	Tool life
٧	1792	cm³	Processing volume
Tb	22,25	min	Process time
€/Ws	72,78	€	Cost workpiece



Competitor: bekannt

Art.-Nr.:

		Calcula	ator
D1	16,00	mm	Diameter
z	4		Flutes
ae	16	mm	Row pitch
ар	16	mm	Cutting depth
vc	100	m/min	Cutting speed
n	1989	U/min	Rotation speed
fz	0,05	mm	Feed per tooth
vf	397,89	mm/min	Feed rate
Q	101,85916358	cm³/min	Material removal rate
hm	0,03183	mm	Middle chipping thickness
K/M	80	€/std	Machine hourly cost
K/W	62	€	Tool cost
Т	13	min	Tool life
٧	1792	cm³	Processing volume
Tb	17,59	min	Process time
€/Ws	107,34	€	Cost workpiece



Cutting data and application recommendations

Art.-Nr. 1.388 / 1 - example inox

	Caption: Ideal			D1	D1	D1	D1	D1	D1	D1	D1	D1	D1	D1	D1	D1	D1
ap: 1,00 ae:1,00	Good			6,00	8,00	10,00	16,00	20,00									
Limited applicable					12,00												
Material		vc m/min	φ Grad	fz mm	fz mm	fz mm	fz mm	fz mm	fz mm	fz mm	fz mm	fz mm	fz mm	fz mm	fz mm	fz mm	fz mr
General steels <500 N/mm²	(<150 HB)	230	55	0,035	0,045	0,075	0,100	0,120									
General steels <700 N/mm²	(<205 HB)	210	50	0,035	0,045	0,075	0,100	0,120									
General steels <850 N/mm²	(<25 HRC)	175	48	0,035	0,045	0,075	0,100	0,120									
Tempering steel <850 N/mm²	(<25 HRC)	160	50	0,035	0,045	0,075	0,100	0,120									
Tempering steel <1000 N/mm		140	45	0,025	0,032	0,052	0,070	0,084									
Tempering steel <1400 N/mm²		90	40	0,025	0,032	0,052	0,070	0,084									
Tempered steels 45-55 HRC (14																	
Tempered steels 55-60 HRC (>																	
Tempered steels 60-65 HRC	,																
Cast Iron < 180HB		190	50	0,035	0,045	0,075	0,100	0,120									
Malleable cast Iron		140	40	0,035	0,045	0,075	0,100	0,120									
Cast Iron with nodular graphite		140	40	0,035	0,045	0,075	0,100	0,120									
Aluminium long-chipping					,	,	,										
Aluminium short-chipping																	
Aluminium alloyed over >8% S																	
Copper, brass, bronze, red bras:																	
copper, brass, bronze, red bras: Plastics - thermoplast	•																
Plastics - thermoplast																	
GFK/CFK (fibreglass/carbon fibr	o plactice)																
Graphite	e plastics)																
Rust and acid constant steels <	700 N/mm3 (< 20)	95	50	0,025	0,032	0,052	0,070	0,084									
			30	0,025	0,032	0,052	0,070	0,084									
Rust and acid constant steels >		35	35	0,015	0,025	0,032	0,052	0,070									
Inconel, Hastelloy, Nimonic, Mon	ei	50	35	0,015	0,025	0,032	0,052	0,070									
Titanium				-,	-,	-,	-,	-,									
Finishing	Caption:																
Finishing	Caption: Ideal			D1	D1	D1	D1	D1	D1	D1	D1	D1	D1	D1	D1	D1	D
ap: 1,00	Ideal Good			D1 6,00	D1 8,00	D1 10,00	D1 16,00	D1 20,00	D1	D1	D1	D1	D1	D1	D1	D1	D
_	Ideal Good Applicab	le							D1	D1	D1	D1	D1	D1	D1	D1	D:
ap: 1,00	Ideal Good	le applicab		6,00	8,00	10,00 12,00	16,00	20,00									
ap: 1,00	Ideal Good Applicab	le	φ			10,00			fz mm	fz mm	D1	fz mm	D1 fz mm	D1	fz mm	fz mm	fz
ap: 1,00 ae:0,50 Material	Ideal Good Applicab Limited	le applicab vc	φ	6,00 fz	8,00 fz	10,00 12,00 fz	16,00 fz	20,00 fz mm	fz	fz	fz	fz	fz	fz	fz	fz	fz
ap: 1,00 ae:0,50 Material General steels <500 N/mm²	Ideal Good Applicab Limited	le applicab vc m/min	φ Grad	6,00 fz mm 0,035	8,00 fz mm 0,045	10,00 12,00 fz mm 0,075	16,00 fz mm 0,100	20,00 fz mm 0,120	fz	fz	fz	fz	fz	fz	fz	fz	fz mr
ap: 1,00 ae:0,50 Material General steels <500 N/mm² General steels <700 N/mm²	Ideal Good Applicab Limited (<150 HB) (<205 HB)	vc m/min 230	φ Grad 55	6,00 fz mm 0,035 0,035	fz mm 0,045	10,00 12,00 fz mm 0,075 0,075	16,00 fz mm 0,100 0,100	20,00 fz mm 0,120 0,120	fz	fz	fz	fz	fz	fz	fz	fz	fz
ap: 1,00 ae: 0,50 Material General steels <500 N/mm² General steels <700 N/mm² General steels <850 N/mm²	Ideal Good Applicab Limited: (<150 HB) (<205 HB) (<25 HRC)	vc m/min 230 210	φ Grad 55 50 48	6,00 fz mm 0,035 0,035	fz mm 0,045 0,045	10,00 12,00 fz mm 0,075 0,075	16,00 fz mm 0,100 0,100	fz mm 0,120 0,120 0,120	fz	fz	fz	fz	fz	fz	fz	fz	fz
ap: 1,00 ae: 0,50 Material General steels <500 N/mm² General steels <700 N/mm² General steels <850 N/mm² Tempering steel <850 N/mm²	Ideal Good Applicab Limited: (<150 HB) (<205 HB) (<25 HRC) (<25 HRC)	vc m/min 230 210 175	φ Grad 55 50 48 50	6,00 fz mm 0,035 0,035 0,035	8,00 fz mm 0,045 0,045 0,045	10,00 12,00 fz mm 0,075 0,075 0,075	fz mm 0,100 0,100 0,100	fz mm 0,120 0,120 0,120 0,120	fz	fz	fz	fz	fz	fz	fz	fz	fz
ap: 1,00 ae: 0,50 Material General steels <500 N/mm² General steels <700 N/mm² General steels <850 N/mm² Tempering steel <850 N/mm² Tempering steel <1000 N/mm	(<150 HB) (<205 HB) (<25 HRC) (<32 HRC)	vc m/min 230 210 175 160	φ Grad 55 50 48 50 45	6,00 fz mm 0,035 0,035 0,035 0,035	8,00 fz mm 0,045 0,045 0,045 0,032	10,00 12,00 fz mm 0,075 0,075 0,075 0,075	fz mm 0,100 0,100 0,100 0,100 0,100	fz mm 0,120 0,120 0,120 0,120 0,084	fz	fz	fz	fz	fz	fz	fz	fz	fz
ap: 1,00 ae: 0,50 Material General steels <500 N/mm² General steels <700 N/mm² General steels <850 N/mm² Tempering steel <850 N/mm² Tempering steel <1000 N/mm²	(<150 HB) (<205 HB) (<25 HRC) (<32 HRC) 2 (<32 HRC)	vc m/min 230 210 175 160 140 90	φ Grad 55 50 48 50	6,00 fz mm 0,035 0,035 0,035	8,00 fz mm 0,045 0,045 0,045 0,032	10,00 12,00 fz mm 0,075 0,075 0,075 0,075	fz mm 0,100 0,100 0,100	fz mm 0,120 0,120 0,120 0,120 0,120	fz	fz	fz	fz	fz	fz	fz	fz	fz
ap: 1,00 ae: 0,50 Material General steels <500 N/mm² General steels <700 N/mm² General steels <850 N/mm² Tempering steel <850 N/mm² Tempering steel <1000 N/mm² Tempering steel <1400 N/mm²	(<150 HB) (<205 HB) (<25 HRC) (<32 HRC) 2 (<32 HRC) 2 (<44 HRC)	vc m/min 230 210 175 160 140 90	φ Grad 55 50 48 50 45	6,00 fz mm 0,035 0,035 0,035 0,035	8,00 fz mm 0,045 0,045 0,045 0,032	10,00 12,00 fz mm 0,075 0,075 0,075 0,075	fz mm 0,100 0,100 0,100 0,100 0,100	fz mm 0,120 0,120 0,120 0,120 0,120	fz	fz	fz	fz	fz	fz	fz	fz	fz
ap: 1,00 ae: 0,50 Material General steels <500 N/mm² General steels <700 N/mm² General steels <850 N/mm² Tempering steel <850 N/mm³ Tempering steel <1000 N/mm³ Tempering steel <1400 N/mm³ Tempered steels 45-55 HRC (14)	(<150 HB) (<205 HB) (<25 HRC) (<32 HRC) 2 (<32 HRC) 2 (<44 HRC)	vc m/min 230 210 175 160 140 90	φ Grad 55 50 48 50 45	6,00 fz mm 0,035 0,035 0,035 0,035	8,00 fz mm 0,045 0,045 0,045 0,032	10,00 12,00 fz mm 0,075 0,075 0,075 0,075	fz mm 0,100 0,100 0,100 0,100 0,100	fz mm 0,120 0,120 0,120 0,120 0,120	fz	fz	fz	fz	fz	fz	fz	fz	fz
ap: 1,00 ae: 0,50 Material General steels <500 N/mm² General steels <700 N/mm² General steels <850 N/mm² Tempering steel <850 N/mm² Tempering steel <1000 N/mm² Tempering steel <1400 N/mm² Tempering steel <1400 N/mm² Tempered steels 45-55 HRC (14) Tempered steels 55-60 HRC (>	(<150 HB) (<205 HB) (<25 HRC) (<32 HRC) 2 (<32 HRC) 2 (<44 HRC)	vc m/min 230 210 175 160 140	φ Grad 55 50 48 50 45 40	fz mm 0,035 0,035 0,035 0,035 0,035 0,025	fz mm 0,045 0,045 0,045 0,045 0,032	10,00 12,00 fz mm 0,075 0,075 0,075 0,075 0,052	fz mm 0,100 0,100 0,100 0,100 0,070	fz mm 0,120 0,120 0,120 0,120 0,120 0,084 0,084	fz	fz	fz	fz	fz	fz	fz	fz	fa
ap: 1,00 ae: 0,50 Material General steels <500 N/mm² General steels <700 N/mm² General steels <850 N/mm² Tempering steel <850 N/mm² Tempering steel <1000 N/mm³ Tempering steel <1400 N/mm³ Tempered steels 45-55 HRC (14 Tempered steels 65-60 HRC (> Tempered steels 60-65 HRC Cast Iron <180 HB	(<150 HB) (<205 HB) (<25 HRC) (<32 HRC) 2 (<32 HRC) 2 (<44 HRC)	vc m/min 230 210 175 160 140 90	φ Grad 55 50 48 50 45 40	fz mm 0,035 0,035 0,035 0,035 0,025 0,025	fz mm 0,045 0,045 0,045 0,032 0,032	10,00 12,00 fz mm 0,075 0,075 0,075 0,052 0,052	fz mm 0,100 0,100 0,100 0,070 0,070	fz mm 0,120 0,120 0,120 0,120 0,084 0,084	fz	fz	fz	fz	fz	fz	fz	fz	fa
ap: 1,00 ae: 0,50 Material General steels <500 N/mm² General steels <700 N/mm² General steels <850 N/mm² Tempering steel <850 N/mm² Tempering steel <1000 N/mm² Tempering steel <1400 N/mm³ Tempered steels 45-55 HRC (14 Tempered steels 55-60 HRC (> Tempered steels 60-65 HRC Cast Iron <180HB Malleable cast Iron	(<150 HB) (<205 HB) (<25 HRC) (<32 HRC) 2 (<32 HRC) 2 (<44 HRC)	le vc m/min 230 210 175 160 140 90 190 140	φ Grad 55 50 48 50 45 40	fz mm 0,035 0,035 0,035 0,025 0,025	8,00 fz mm 0,045 0,045 0,045 0,032 0,032 0,032	10,00 12,00 fz mm 0,075 0,075 0,075 0,052 0,052	fz mm 0,100 0,100 0,100 0,070 0,070 0,070	fz mm 0,120 0,120 0,120 0,120 0,084 0,084	fz	fz	fz	fz	fz	fz	fz	fz	f
ap: 1,00 ae: 0,50 Material General steels <500 N/mm² General steels <700 N/mm² General steels <850 N/mm² Tempering steel <850 N/mm² Tempering steel <1000 N/mm Tempering steel <1400 N/mm³ Tempered steels 45-55 HRC (14) Tempered steels 55-60 HRC (> Tempered steels 60-65 HRC Cast Iron <180 HB Malleable cast Iron Cast Iron With nodular graphite	(<150 HB) (<205 HB) (<25 HRC) (<32 HRC) 2 (<32 HRC) 2 (<44 HRC)	vc m/min 230 210 175 160 140 90	φ Grad 55 50 48 50 45 40	fz mm 0,035 0,035 0,035 0,035 0,025 0,025	fz mm 0,045 0,045 0,045 0,032 0,032	10,00 12,00 fz mm 0,075 0,075 0,075 0,052 0,052	fz mm 0,100 0,100 0,100 0,070 0,070 0,070	fz mm 0,120 0,120 0,120 0,120 0,084 0,084	fz	fz	fz	fz	fz	fz	fz	fz	f
ap: 1,00 ae: 0,50 Material General steels <500 N/mm² General steels <700 N/mm² General steels <850 N/mm² Tempering steel <850 N/mm² Tempering steel <1000 N/mm² Tempering steel <1400 N/mm² Tempered steels 45-55 HRC (14) Tempered steels 55-60 HRC (>1000 N/mm² Tempered steels 60-65 HRC Cast Iron <180 HB Malleable cast Iron Cast Iron with nodular graphite Aluminium long-chipping	(<150 HB) (<205 HB) (<25 HRC) (<32 HRC) 2 (<32 HRC) 2 (<44 HRC)	le vc m/min 230 210 175 160 140 90 190 140	φ Grad 55 50 48 50 45 40	fz mm 0,035 0,035 0,035 0,025 0,025	8,00 fz mm 0,045 0,045 0,045 0,032 0,032 0,032	10,00 12,00 fz mm 0,075 0,075 0,075 0,052 0,052	fz mm 0,100 0,100 0,100 0,070 0,070 0,070	fz mm 0,120 0,120 0,120 0,120 0,084 0,084	fz	fz	fz	fz	fz	fz	fz	fz	f
ap: 1,00 ae: 0,50 Material General steels <500 N/mm² General steels <700 N/mm² General steels <850 N/mm² Tempering steel <850 N/mm² Tempering steel <1000 N/mm³ Tempering steel <1400 N/mm³ Tempered steels 45-55 HRC (14) Tempered steels 55-60 HRC (> Tempered steels 60-65 HRC Cast Iron <180 HB Malleable cast Iron Cast Iron with nodular graphite Aluminium long-chipping	Ideal Good Applicab Limited: (<150 HB) (<205 HB) (<25 HRC) (<25 HRC) 2 (<32 HRC) 3 (<44 HRC) 000-2000 N/mm²)	le vc m/min 230 210 175 160 140 90 190 140	φ Grad 55 50 48 50 45 40	fz mm 0,035 0,035 0,035 0,025 0,025	8,00 fz mm 0,045 0,045 0,045 0,032 0,032 0,032	10,00 12,00 fz mm 0,075 0,075 0,075 0,052 0,052	fz mm 0,100 0,100 0,100 0,070 0,070 0,070	fz mm 0,120 0,120 0,120 0,120 0,084 0,084	fz	fz	fz	fz	fz	fz	fz	fz	f
ap: 1,00 ae: 0,50 Material General steels <500 N/mm² General steels <700 N/mm² General steels <850 N/mm² Tempering steel <850 N/mm² Tempering steel <1000 N/mm² Tempering steel <1400 N/mm² Tempered steels 45-55 HRC (14) Tempered steels 55-60 HRC (> Tempered steels 60-65 HRC Cast Iron <180 HB Malleable cast Iron Cast Iron with nodular graphite Aluminium long-chipping Aluminium short-chipping Aluminium alloyed over >8% 5	Ideal Good Applicab Limited: (<150 HB) (<205 HB) (<205 HRC) (<25 HRC) 2 (<32 HRC) 2 (<44 HRC) 2000 N/mm²)	le vc m/min 230 210 175 160 140 90 190 140	φ Grad 55 50 48 50 45 40	fz mm 0,035 0,035 0,035 0,025 0,025	8,00 fz mm 0,045 0,045 0,045 0,032 0,032 0,032	10,00 12,00 fz mm 0,075 0,075 0,075 0,052 0,052	fz mm 0,100 0,100 0,100 0,070 0,070 0,070	fz mm 0,120 0,120 0,120 0,120 0,084 0,084	fz	fz	fz	fz	fz	fz	fz	fz	fa
ap: 1,00 ae: 0,50 Material General steels <500 N/mm² General steels <700 N/mm² General steels <850 N/mm² Tempering steel <850 N/mm² Tempering steel <1000 N/mm² Tempering steel <1400 N/mm³ Tempered steels 45-55 HRC (14) Tempered steels 60-65 HRC Cast iron <180 HB Malleable cast iron Cast iron with nodular graphite Aluminium long-chipping Aluminium alloyed over >8% S Copper, brass, bronze, red brass	Ideal Good Applicab Limited: (<150 HB) (<205 HB) (<205 HRC) (<25 HRC) 2 (<32 HRC) 2 (<44 HRC) 2000 N/mm²)	le vc m/min 230 210 175 160 140 90 190 140	φ Grad 55 50 48 50 45 40	fz mm 0,035 0,035 0,035 0,025 0,025	8,00 fz mm 0,045 0,045 0,045 0,032 0,032 0,032	10,00 12,00 fz mm 0,075 0,075 0,075 0,052 0,052	fz mm 0,100 0,100 0,100 0,070 0,070 0,070	fz mm 0,120 0,120 0,120 0,120 0,084 0,084	fz	fz	fz	fz	fz	fz	fz	fz	f
ap: 1,00 ae: 0,50 Material General steels <500 N/mm² General steels <700 N/mm² General steels <850 N/mm² Tempering steel <850 N/mm² Tempering steel <1000 N/mm³ Tempering steel <1400 N/mm³ Tempered steels 45-55 HRC (14 Tempered steels 55-60 HRC (> Tempered steels 60-65 HRC Cast Iron <180 HB Malleable cast Iron Cast Iron with nodular graphite Aluminium long-chipping Aluminium short-chipping Aluminium alloyed over >8% S Copper, brass, bronze, red brass	Ideal Good Applicab Limited: (<150 HB) (<205 HB) (<205 HRC) (<25 HRC) 2 (<32 HRC) 2 (<44 HRC) 2000 N/mm²)	le vc m/min 230 210 175 160 140 90 190 140	φ Grad 55 50 48 50 45 40	fz mm 0,035 0,035 0,035 0,025 0,025	8,00 fz mm 0,045 0,045 0,045 0,032 0,032 0,032	10,00 12,00 fz mm 0,075 0,075 0,075 0,052 0,052	fz mm 0,100 0,100 0,100 0,070 0,070 0,070	fz mm 0,120 0,120 0,120 0,120 0,084 0,084	fz	fz	fz	fz	fz	fz	fz	fz	f
ap: 1,00 ae: 0,50 Material General steels <500 N/mm² General steels <700 N/mm² General steels <850 N/mm² Tempering steel <850 N/mm³ Tempering steel <1000 N/mm³ Tempering steel <1400 N/mm³ Tempered steels 45-55 HRC (14 Tempered steels 55-60 HRC (> Tempered steels 60-65 HRC Cast Iron <180HB Malleable cast Iron Cast Iron with nodular graphite Aluminium long-chipping Aluminium short-chipping Aluminium alloyed over >8% S Copper, brass, bronze, red brass Plastics - thermoplast	Ideal Good Applicab Limited: (<150 HB) (<205 HB) (<25 HRC) (<25 HRC) 2 (<32 HRC) 2 (<32 HRC) 2000 N/mm²) 2000 N/mm²)	le vc m/min 230 210 175 160 140 90 190 140	φ Grad 55 50 48 50 45 40	fz mm 0,035 0,035 0,035 0,025 0,025	8,00 fz mm 0,045 0,045 0,045 0,032 0,032 0,032	10,00 12,00 fz mm 0,075 0,075 0,075 0,052 0,052	fz mm 0,100 0,100 0,100 0,070 0,070 0,070	fz mm 0,120 0,120 0,120 0,120 0,084 0,084	fz	fz	fz	fz	fz	fz	fz	fz	f
ap: 1,00 ae: 0,50 Material General steels <500 N/mm² General steels <700 N/mm² General steels <850 N/mm² Tempering steel <850 N/mm² Tempering steel <1000 N/mm³ Tempering steel <1000 N/mm³ Tempered steels 45-55 HRC (14) Tempered steels 55-60 HRC (> Tempered steels 60-65 HRC Cast Iron <180 HB Malleable cast Iron Cast Iron with nodular graphite Aluminium long-chipping Aluminium short-chipping Aluminium alloyed over >8% S Copper, brass, bronze, red brass Plastics - thermoplast Plastics - duroplast GFK/CFK (fibreglass/carbon fibr	Ideal Good Applicab Limited: (<150 HB) (<205 HB) (<25 HRC) (<25 HRC) 2 (<32 HRC) 2 (<32 HRC) 2000 N/mm²) 2000 N/mm²)	le applicab vc m/min 230 210 175 160 140 90	φ Grad 55 50 48 50 45 40	fz mm 0,035 0,035 0,035 0,025 0,025	8,00 fz mm 0,045 0,045 0,045 0,032 0,032 0,032	10,00 12,00 fz mm 0,075 0,075 0,075 0,052 0,052	fz mm 0,100 0,100 0,100 0,070 0,070 0,070	fz mm 0,120 0,120 0,120 0,120 0,084 0,084	fz	fz	fz	fz	fz	fz	fz	fz	f
ap: 1,00 ae: 0,50 Material General steels <500 N/mm² General steels <700 N/mm² General steels <850 N/mm² Tempering steel <850 N/mm² Tempering steel <1000 N/mm³ Tempering steel <1400 N/mm³ Tempered steels 45-55 HRC (14) Tempered steels 55-60 HRC (> Tempered steels 60-65 HRC Cast Iron <180 HB Malleable cast Iron Cast Iron with nodular graphite Aluminium long-chipping Aluminium short-chipping Aluminium alloyed over >8% S Copper, brass, bronze, red brass Plastics - thermoplast Plastics - duroplast GFK/CFK (fibreglass/carbon fibr	Ideal Good Applicab Limited: (<150 HB) (<205 HB) (<25 HRC) (<25 HRC) 2 (<32 HRC) 3 (<44 HRC) 2000 N/mm²) 2000 N/mm²)	le vc m/min 230 210 175 160 140 90 140 140	φ Grad 55 50 48 50 45 40 40	6,00 fz mm 0,035 0,035 0,035 0,025 0,025 0,035 0,035	8,00 fz mm 0,045 0,045 0,045 0,032 0,032 0,032	10,00 12,00 fz mm 0,075 0,075 0,075 0,052 0,052 0,075 0,075	fz mm 0,100 0,100 0,100 0,070 0,070 0,100 0,100	20,00 fz mm 0,120 0,120 0,120 0,084 0,084 0,120 0,120 0,120	fz	fz	fz	fz	fz	fz	fz	fz	fa
ap: 1,00 ae: 0,50 Material General steels <500 N/mm² General steels <700 N/mm² General steels <850 N/mm² Tempering steel <850 N/mm² Tempering steel <1000 N/mm² Tempering steel <1400 N/mm² Tempering steel <1400 N/mm² Tempered steels 45-55 HRC (14) Tempered steels 60-65 HRC Cast Iron <180 HB Malleable cast Iron Cast Iron with nodular graphite Aluminium long-chipping Aluminium short-chipping Aluminium alloyed over >8% S Copper, brass, bronze, red brass: Plastics - thermoplast Plastics - duroplast GFK/CFK (fibreglass/carbon fibr Graphite Rust and acid constant steels <	Ideal Good Applicab Limited: (<150 HB) (<205 HB) (<25 HRC) (<25 HRC) 2 (<32 HRC) 3 (<44 HRC) 2000 N/mm²) Too N/mm²	le applicab vc m/min 230 210 175 160 140 90 140 140	φ Grad 55 50 48 50 45 40 50 40 50	6,00 fz mm 0,035 0,035 0,035 0,025 0,025 0,035 0,035	8,00 fz mm 0,045 0,045 0,045 0,032 0,032 0,045 0,045	10,00 12,00 fz mm 0,075 0,075 0,075 0,052 0,075 0,075 0,075	fz mm 0,100 0,100 0,100 0,070 0,070 0,100 0,100 0,100	20,00 fz mm 0,120 0,120 0,120 0,084 0,084 0,120 0,120 0,120 0,120	fz	fz	fz	fz	fz	fz	fz	fz	fa
ap: 1,00 ae: 0,50 Material General steels <500 N/mm² General steels <700 N/mm² General steels <850 N/mm² Tempering steel <850 N/mm² Tempering steel <1000 N/mm³ Tempering steel <1400 N/mm³ Tempered steels 45-55 HRC (14) Tempered steels 55-60 HRC (> Tempered steels 60-65 HRC Cast Iron <180 HB Malleable cast Iron Cast Iron with nodular graphite Aluminium long-chipping Aluminium short-chipping Aluminium alloyed over >8% S Copper, brass, bronze, red brass Plastics - thermoplast Plastics - duroplast GFK/CFK (fibreglass/carbon fibr	Ideal Good Applicab Limited: (<150 HB) (<205 HB) (<25 HRC) (<25 HRC) 2 (<32 HRC) 3 (<44 HRC) 2000 N/mm²) Too N/mm²	le applicab vc m/min 230 210 175 160 140 90 140 140	φ Grad 55 50 48 50 45 40 40	6,00 fz mm 0,035 0,035 0,035 0,025 0,025 0,035 0,035	8,00 fz mm 0,045 0,045 0,045 0,032 0,032	10,00 12,00 fz mm 0,075 0,075 0,052 0,052 0,075 0,075 0,075	16,00 fz mm 0,100 0,100 0,070 0,070 0,100 0,100 0,100 0,100 0,070 0,070 0,070	20,00 fz mm 0,120 0,120 0,120 0,084 0,084 0,120 0,120 0,120 0,120	fz	fz	fz	fz	fz	fz	fz	fz	f