



### **Technical information**

Art.-Nr. 831 / 1 - example tempering steel

### VHM - Schaftfräser Starmax 3G

Art.-Nr. 831

Flutes





















Tool recommendation



















Highend HPC mill for higher alloyed steel, maximum removal rate and stability. Optimal machine parameters and cutting data required. We recommend DIN6535HB chucking. Uneven partition, uneven helix, profile flute for better chip outlet, stronger core, polished highend coating and plasted shank for higher holding force. Next generation of article 731,732,733.

## Competitive advantages and profitability

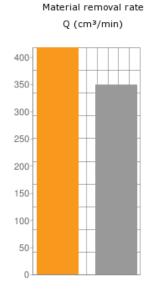
No competitors are known.

## **Example application**

Art.-Nr.: 831.160.10

Tempering steel <850 N/mm² (<25 HRC) Material:

Inovatools – Roughing										
D1	16,00	mm	Diameter							
z	4		Flutes							
ae	16,000	mm	Row pitch							
ар	16,000	mm	Cutting depth							
vc	162,63	m/min	Cutting speed							
n	3236	U/min	Rotation speed							
fz	0,12613	mm	Feed per tooth							
vf	1632,44	mm/min	Feed rate							
Q	417,90417000	cm³/min	Material removal rate							
hm	0,08030	mm	Middle chipping thickness							
K/M		€/std	Machine hourly cost							
K/W		€	Tool cost							
Т		min	Tool life							
٧		cm³	Processing volume							
Tb		min	Process time							
€/Ws		€	Cost workpiece							



Competitor: Inovatools Art.-Nr.: 831.160.10

Calculator										
D1	16,00	mm	Diameter							
z	4		Flutes							
ae	8	mm	Row pitch							
ар	16	mm	Cutting depth							
vc	230	m/min	Cutting speed							
n	4576	U/min	Rotation speed							
fz	0,15	mm	Feed per tooth							
vf	2745,42	mm/min	Feed rate							
Q	351,41411435	cm³/min	Material removal rate							
hm	0,09549	mm	Middle chipping thickness							
K/M		€/std	Machine hourly cost							
K/W		€	Tool cost							
Т		min	Tool life							
٧		cm³	Processing volume							
Tb		min	Process time							
€/Ws		€	Cost workpiece							



# **Cutting data and application recommendations**

Art.-Nr. 831 / 1 - example tempering steel

Roughing Caption:  Ideal ap: 1,00 Good ae:1,00 Applicable				D1	D1	D1	D1	D1	D1	D1	D1	D1	D1	D1	D1	D1	D1
		ole	3,00	4,00	5,00 6,00	7,00	10,00 until 13,00	16,00		25,00 fz	fz	fz	fz	fz	fz	fz	
Limited appl Material				fz	fz	9,00 fz											
Material		m/min		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mr
General steels <500 N/mm²	(<150 HB)	177	55	0,013	0,025	0,044	0,059	0,092	0,126	0,151	0,168						
General steels <700 N/mm²	(<205 HB)	170	50	0,013	0,025	0,044	0,059	0,092	0,126	0,151	0,168						
General steels <850 N/mm²	(<25 HRC)	166	48	0,013	0,025	0,044	0,059	0,092	0,126	0,151	0,168						
Tempering steel <850 N/mm²	(<25 HRC)	163	50	0,013	0,025	0,044	0,059	0,092	0,126	0,151	0,168						
Tempering steel <1000 N/mm²	(<32 HRC)	148	45	0,013	0,025	0,044	0,059	0,092	0,126	0,151	0,168						
Tempering steel <1400 N/mm²	(<44 HRC)	85	40	0,008	0,013	0,021	0,027	0,044	0,059	0,071	0,077						
Tempered steels 45-55 HRC (1	400-2000 N/mi	-															
Tempered steels 55-60 HRC (>	2000 N/mm²)																
Tempered steels 60-65 HRC																	
Cast iron <180HB		177	50	0,013	0,025	0,044	0,059	0,092	0,126	0,151	0,168						
Malleable cast iron			40	0,013	0,025	0,044	0,059	0,092	0,126	0,151	0,168						
Cast iron with nodular graphite			40	0,013	0,025	0,044	0,059	0,092	0,126	0,151	0,168						
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	e plastics)																
Graphite																	
Rust and acid constant steels <	700 N/mm² (<2	85	50	0,008	0,013	0,021	0,027	0,044	0,059	0,071	0,077						
Rust and acid constant steels >									-								
Inconel, Hastelloy, Nimonic, Mo																	
Titanium	illei																
ricalifulli																	
Finishing	Caption			D1	D1	D1	D1	D1	D1	D1	D1	D1	D1	D1	D1	D1	D:
4.00	Ideal				01						01						
ap: 1,00 ae:0,50	Good			3,00	4,00	5,00	7,00	10,00	14,00	18,00	25,00						
	Applical Limited		ble			6,00	9,00	until 13,00	16,00	20,00							
		vc	Φ	fz	fz	fz	fz	fz	fz	fz	fz	fz	fz	fz	fz	fz	fz
Material		m/min		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mr
General steels <500 N/mm²	(<150 HB)	250	55	0,015	0,030	0,052	0,070	0,110	0,150	0,180	0,200						
General steels <700 N/mm²	(<205 HB)	240	50	0,015	0,030	0,052	0,070	0,110	0,150	0,180	0,200						
	(<25 HRC)	235	48	0,015	0,030	0,052	0,070	0,110	0,150	0,180	0,200						
Tempering steel <850 N/mm²	(<25 HRC)	230	50	0,015	0,030	0,052	0,070	0,110	0,150	0,180	0,200						
Tempering steel <1000 N/mm²		210	45	0,015	0,030	0,052	0,070	0,110	0,150	0,180	0,200						
Tempering steel <1400 N/mm²		120	40	0,009	0,015	0,025	0,032	0,052	0,070	0,084	0,091						
Tempered steels 45-55 HRC (1																	
Tempered steels 55-60 HRC (>																	
Tempered steels 60-65 HRC		250	50	0,015	0,030	0,052	0,070	0,110	0,150	0,180	0,200						
Tempered steels 60-65 HRC Cast iron <180HB			50 40						0,150								
Tempered steels 60-65 HRC Cast iron <180HB Malleable cast iron	·	210	40	0,015	0,030	0,052	0,070	0,110	0,150	0,180	0,200						
Tempered steels 60-65 HRC Cast iron <180HB Malleable cast iron Cast iron with nodular graphite				0,015	0,030	0,052	0,070	0,110		0,180	0,200						
Tempered steels 60-65 HRC Cast iron <180HB Malleable cast iron Cast iron with nodular graphite Aluminium long-chipping		210	40	0,015	0,030	0,052	0,070	0,110	0,150	0,180	0,200						
Tempered steels 60-65 HRC Cast iron <180HB Malleable cast iron Cast iron with nodular graphite Aluminium long-chipping Aluminium short-chipping		210	40	0,015	0,030	0,052	0,070	0,110	0,150	0,180	0,200						
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		210	40	0,015	0,030	0,052	0,070	0,110	0,150	0,180	0,200						
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		210	40	0,015	0,030	0,052	0,070	0,110	0,150	0,180	0,200						
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		210	40	0,015	0,030	0,052	0,070	0,110	0,150	0,180	0,200						
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	5	210	40	0,015	0,030	0,052	0,070	0,110	0,150	0,180	0,200						
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  Plastics - duroplast  GFK/CFK (fibreglass/carbon fibr	5	210	40	0,015	0,030	0,052	0,070	0,110	0,150	0,180	0,200						
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  Plastics - duroplast  GFK/CFK (fibreglass/carbon fibr	e plastics)	210	40	0,015	0,030	0,052	0,070	0,110	0,150	0,180	0,200						
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  Plastics - duroplast  GFK/CFK (fibreglass/carbon fibr  Graphite  Rust and acid constant steels <	s e plastics) 700 N/mm² (<2	210	40	0,015	0,030	0,052	0,070	0,110	0,150	0,180	0,200						
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  Plastics - duroplast  GFK/CFK (fibreglass/carbon fibr  Graphite  Rust and acid constant steels <	s e plastics) 700 N/mm² (<2 700 N/mm² (>2	210	40	0,015	0,030	0,052	0,070	0,110	0,150	0,180	0,200						
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