

# **INOTECH** Data sheets

#### **Technical information**

#### VHM - Schruppfräser PRIMUS

Art.-Nr. 251

**Flutes** 3

























Tool recommendation







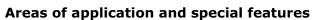












HPC roughing cutter PRIMUS with internal cooling, vario twist, micro geometry and Ta-C coating.

# Competitive advantages and profitability

Highest removal rate with up to vc=750m/min.

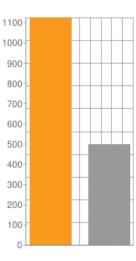
# **Example application**

Art.-Nr.: 25112010

Aluminium long-chipping Material:

	Ino	vatools –	Roughing
D1	12,00	mm	Diameter
z	3		Flutes
ae	12,000	mm	Row pitch
ар	12,000	mm	Cutting depth
vc	530,33	m/min	Cutting speed
n	14067	U/min	Rotation speed
fz	0,18500	mm	Feed per tooth
vf	7807,31	mm/min	Feed rate
Q	1124,25305000	cm³/min	Material removal rate
hm	0,11777	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: Art.-Nr.:

		Calcul	ator
D1	12,00	mm	Diameter
z	3		Flutes
ae	12	mm	Row pitch
ар	12	mm	Cutting depth
vc	438,40	m/min	Cutting speed
n	11629	U/min	Rotation speed
fz	0,1	mm	Feed per tooth
vf	3488,70	mm/min	Feed rate
Q	502,37280000	cm³/min	Material removal rate
hm	0,06366	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. 251 / 1 - Aluminium

Roughing Caption:		D1	D1	D1	D1	D1	D1	D1	D1	D1	D1	D1	D1	D1	D1	
ap: 1,00 Good			6,00	8,00	10,00	12,00	16,00	20,00								
ae: 1,00 Applicab				0,00	10,00	12,00	16,00	20,00								
Material	vc vc	Ф	fz	fz	fz	fz	fz	fz	fz	fz	fz	fz	fz	fz	fz	fz
Material	m/mir	n Grad	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
General steels <500 N/mm² (<150 HB)																
General steels <700 N/mm² (<205 HB)																
Tempering steel <850 N/mm² (<25 HRC																
Tempering steel <1000 N/mm² (<32 HR																
Tempering steel <1400 N/mm² (<44 HR																
Hardened steel 45-55 HRC (1400-2000																
Hardened steel 55-60 HRC (>2000 N/m	im²)															
Hardened steel 60-65 HRC																
Cast iron <180HB																
Malleable cast iron																
Cast iron with nodular graphite	530	70	0,092	0,118	0.151	0,185	0.225	0,294								
Aluminium long-chipping		65	0,092	0,118		0,185		-								
Aluminium short-chipping	495 247	45	0,055	0,071	0,084	0,101										
Aluminium alloyed over >8% S		55	0,038	0,042	0,046	0,050	0.063	-								
Copper, brass, bronze, red brass  Plastics - thermoplast		90	0,038	0,046	0,059	-	0,003	0,101								
Plastics - thermopiast  Plastics - duroplast	283		2,030	2,0 10	-,000	2,000	2,070	-,								
GFK/CFK (fibreglass/carbon fibre plastics	s)															
Graphite	»)															
Rust and acid constant steels <700 N/m	m² (<2(															
Rust and acid constant steels >700 N/m																
Inconel, Hastelloy, Nimonic, Monel	(* 2															
Titanium																
Finishing	Caption:		D1	D1	D1	D1	D1	D1	D1	D1	D1	D1	D1	D1	D1	D1
Ideal																
0 E0	Good Applicable		6,00	8,00	10,00	12,00	16,00	20,00								
		ted applicable														
L.				-	_		fz	fz	fz	fz	fz	fz	fz	fz	fz	fz
	vc	φ	fz	fz	fz	fz	12									mm
Material	vc	φ Grad	fz mm	fz mm	fz mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
	vc							mm	mm	mm	mm	mm	mm	mm	mm	
Material General steels <500 N/mm² (<150 HB) General steels <700 N/mm² (<205 HB)	vc m/mir							mm	mm	mm	mm	mm	mm	mm	mm	
Material General steels <500 N/mm² (<150 HB) General steels <700 N/mm² (<205 HB) Tempering steel <850 N/mm² (<25 HRC	vc m/min							mm	mm	mm	mm	mm	mm	mm	mm	
Material General steels <500 N/mm² (<150 HB) General steels <700 N/mm² (<205 HB) Tempering steel <850 N/mm² (<25 HRC Tempering steel <1000 N/mm² (<32 HR	vc m/mir							mm	mm	mm	mm	mm	mm	mm	mm	
Material  General steels <500 N/mm² (<150 HB)  General steels <700 N/mm² (<205 HB)  Tempering steel <850 N/mm² (<25 HRC)  Tempering steel <1000 N/mm² (<32 HRC)  Tempering steel <1400 N/mm² (<44 HR	vc m/mir							mm	mm	mm	mm	mm	mm	mm	mm	
Material  General steels <500 N/mm² (<150 HB)  General steels <700 N/mm² (<205 HB)  Tempering steel <850 N/mm² (<25 HRC)  Tempering steel <1000 N/mm² (<32 HRC)  Tempering steel <1400 N/mm² (<44 HR)  Hardened steel 45-55 HRC (1400-2000	vc m/mir c) RC) RC)							mm	mm	mm	mm		mm	mm	mm	
Material  General steels <500 N/mm² (<150 HB)  General steels <700 N/mm² (<205 HB)  Tempering steel <850 N/mm² (<25 HRC)  Tempering steel <1000 N/mm² (<32 HRC)  Tempering steel <1400 N/mm² (<44 HR)  Hardened steel 45-55 HRC (1400-2000 Hardened steel 55-60 HRC (>2000 N/m	vc m/mir c) RC) RC)							mm	mm	mm	mm		mm	mm	mm	
Material  General steels <500 N/mm² (<150 HB)  General steels <700 N/mm² (<205 HB)  Tempering steel <850 N/mm² (<25 HRC)  Tempering steel <1000 N/mm² (<32 HRC)  Tempering steel <1400 N/mm² (<44 HR)  Hardened steel 45-55 HRC (1400-2000)  Hardened steel 55-60 HRC (>2000 N/m)  Hardened steel 60-65 HRC	vc m/mir c) RC) RC)							mm	mm	mm	mm	mm	mm	mm	mm	
Material  General steels <500 N/mm² (<150 HB)  General steels <700 N/mm² (<205 HB)  Tempering steel <850 N/mm² (<25 HRC)  Tempering steel <1000 N/mm² (<32 HRC)  Tempering steel <1400 N/mm² (<44 HRC)  Hardened steel 45-55 HRC (1400-2000)  Hardened steel 55-60 HRC (>2000 N/m)  Hardened steel 60-65 HRC  Cast iron <180 HB	vc m/mir c) RC) RC)							mm	mm	mm	mm	mm	mm	mm	mm	
Material  General steels <500 N/mm² (<150 HB)  General steels <700 N/mm² (<205 HB)  Tempering steel <850 N/mm² (<25 HRC)  Tempering steel <1000 N/mm² (<32 HRC)  Tempering steel <1400 N/mm² (<44 HRC)  Hardened steel 45-55 HRC (1400-2000)  Hardened steel 55-60 HRC (>2000 N/m  Hardened steel 60-65 HRC  Cast iron <180 HB  Malleable cast iron	vc m/mir c) RC) RC)							mm	mm	mm	mm	mm	mm	mm	mm	
Material  General steels <500 N/mm² (<150 HB)  General steels <700 N/mm² (<205 HB)  Tempering steel <850 N/mm² (<25 HRC)  Tempering steel <1000 N/mm² (<32 HRC)  Tempering steel <1400 N/mm² (<44 HR)  Hardened steel 45-55 HRC (1400-2000)  Hardened steel 55-60 HRC (>2000 N/m)  Hardened steel 60-65 HRC  Cast iron <180HB  Malleable cast iron  Cast iron with nodular graphite	vc m/mir c) RC) RC) 0 N/mm <sup>2</sup>	Grad	mm	mm	mm	mm	mm		mm							
Material  General steels <500 N/mm² (<150 HB)  General steels <700 N/mm² (<205 HB)  Tempering steel <850 N/mm² (<25 HRC)  Tempering steel <1000 N/mm² (<32 HRC)  Tempering steel <1400 N/mm² (<44 HR)  Hardened steel 45-55 HRC (1400-2000 N/m)  Hardened steel 55-60 HRC (>2000 N/m)  Hardened steel 60-65 HRC  Cast iron <180HB  Malleable cast iron  Cast iron with nodular graphite  Aluminium long-chipping	vc m/mir c) RC) RC) 0 N/mm <sup>2</sup> im <sup>2</sup> )	70	mm 0,110	mm 0,140	mm	mm	mm 0,280	0,350	mm	mm	mm		mm	mm	mm	
Material  General steels <500 N/mm² (<150 HB)  General steels <700 N/mm² (<205 HB)  Tempering steel <850 N/mm² (<25 HRC)  Tempering steel <1000 N/mm² (<32 HRC)  Tempering steel <1400 N/mm² (<44 HRC)  Hardened steel 45-55 HRC (1400-2000 N/m)  Hardened steel 60-65 HRC  Cast iron <180HB  Malleable cast iron  Cast iron with nodular graphite  Aluminium long-chipping	VC m/min	70 65	0,110 0,110	0,140 0,140	0,180 0,180	0,220 0,220	0,280 0,280	0,350	mm	mm	mm		mm	mm	mm	
Material  General steels <500 N/mm² (<150 HB)  General steels <700 N/mm² (<205 HB)  Tempering steel <850 N/mm² (<25 HRC)  Tempering steel <1000 N/mm² (<32 HRC)  Tempering steel <1400 N/mm² (<44 HRC)  Hardened steel <45-55 HRC (1400-2000 N/m)  Hardened steel 60-65 HRC  Cast iron <180 HB  Malleable cast iron  Cast iron with nodular graphite  Aluminium long-chipping  Aluminium short-chipping	VC m/min	70 65 45	0,110 0,110 0,065	0,140 0,085	0,180 0,100	0,220 0,220 0,120	0,280 0,280	0,350 0,350 0,200	mm	mm	mm		mm	mm	mm	
Material  General steels <500 N/mm² (<150 HB)  General steels <700 N/mm² (<205 HB)  Tempering steel <850 N/mm² (<25 HRC)  Tempering steel <1000 N/mm² (<32 HRC)  Tempering steel <1400 N/mm² (<44 HRC)  Hardened steel 45-55 HRC (1400-2000 N/m  Hardened steel 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	vc m/mir RC) RC) D N/mm <sup>2</sup> am <sup>2</sup> ) 750 700 350 250	70 65 45 55	0,110 0,110 0,065 0,045	0,140 0,140 0,085 0,050	0,180 0,180 0,055	0,220 0,220 0,120 0,060	0,280 0,280 0,150 0,075	0,350 0,350 0,200 0,090	mm	mm	mm		mm	mm	mm	
Material  General steels <500 N/mm² (<150 HB)  General steels <700 N/mm² (<205 HB)  Tempering steel <850 N/mm² (<25 HRC)  Tempering steel <1000 N/mm² (<32 HRC)  Tempering steel <1400 N/mm² (<44 HRC)  Hardened steel 45-55 HRC (1400-2000 N/m  Hardened steel 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	VC m/min	70 65 45	0,110 0,110 0,065 0,045	0,140 0,140 0,085 0,050	0,180 0,100	0,220 0,220 0,120 0,060	0,280 0,280 0,150 0,075	0,350 0,350 0,200 0,090	mm	mm	mm		mm	mm	mm	
Material  General steels <500 N/mm² (<150 HB)  General steels <700 N/mm² (<205 HB)  Tempering steel <850 N/mm² (<25 HRC)  Tempering steel <1000 N/mm² (<32 HRC)  Tempering steel <1400 N/mm² (<44 HRC)  Hardened steel 45-55 HRC (1400-2000 N/m  Hardened steel 55-60 HRC (>2000 N/m  Hardened steel 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	750 700 350 400	70 65 45 55	0,110 0,110 0,065 0,045	0,140 0,140 0,085 0,050	0,180 0,180 0,055	0,220 0,220 0,120 0,060	0,280 0,280 0,150 0,075	0,350 0,350 0,200 0,090	mm	mm	mm		mm	mm	mm	
Material  General steels <500 N/mm² (<150 HB)  General steels <700 N/mm² (<205 HB)  Tempering steel <850 N/mm² (<25 HRC)  Tempering steel <1000 N/mm² (<32 HRC)  Tempering steel <1400 N/mm² (<44 HRC)  Hardened steel 45-55 HRC (1400-2000 N/m  Hardened steel 55-60 HRC (>2000 N/m  Hardened steel 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 fibre plastics	750 700 350 400	70 65 45 55	0,110 0,110 0,065 0,045	0,140 0,140 0,085 0,050	0,180 0,180 0,055	0,220 0,220 0,120 0,060	0,280 0,280 0,150 0,075	0,350 0,350 0,200 0,090	mm	mm	mm			mm	mm	
Material  General steels <500 N/mm² (<150 HB)  General steels <700 N/mm² (<205 HB)  Tempering steel <850 N/mm² (<25 HRC)  Tempering steel <1000 N/mm² (<32 HRC)  Tempering steel <1400 N/mm² (<44 HRC)  Hardened steel 45-55 HRC (1400-2000 N/m)  Hardened steel 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 fibre plastics  Graphite	750 700 350 400	70 65 45 55	0,110 0,110 0,065 0,045	0,140 0,140 0,085 0,050	0,180 0,180 0,055	0,220 0,220 0,120 0,060	0,280 0,280 0,150 0,075	0,350 0,350 0,200 0,090	mm	mm				mm		
Material  General steels <500 N/mm² (<150 HB)  General steels <700 N/mm² (<205 HB)  Tempering steel <850 N/mm² (<25 HRC)  Tempering steel <1000 N/mm² (<32 HRC)  Tempering steel <1400 N/mm² (<34 HRC)  Hardened steel 45-55 HRC (1400-2000 N/m)  Hardened steel 55-60 HRC (>2000 N/m)  Hardened steel 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 fibre plastics  Graphite  Rust and acid constant steels <700 N/m	750 750 700 350 250 400	70 65 45 55	0,110 0,110 0,065 0,045	0,140 0,140 0,085 0,050	0,180 0,180 0,055	0,220 0,220 0,120 0,060	0,280 0,280 0,150 0,075	0,350 0,350 0,200 0,090	mm	mm				mm		
Material  General steels <500 N/mm² (<150 HB)  General steels <700 N/mm² (<205 HB)  Tempering steel <850 N/mm² (<25 HRC)  Tempering steel <1000 N/mm² (<32 HRC)  Tempering steel <1400 N/mm² (<44 HRC)  Hardened steel 45-55 HRC (1400-2000)  Hardened steel 55-60 HRC (>2000 N/m  Hardened steel 60-65 HRC  Cast iron <180 HB  Malleable cast iron	750 750 700 350 250 400	70 65 45 55	0,110 0,110 0,065 0,045	0,140 0,140 0,085 0,050	0,180 0,180 0,055	0,220 0,220 0,120 0,060	0,280 0,280 0,150 0,075	0,350 0,350 0,200 0,090	mm	mm				mm		