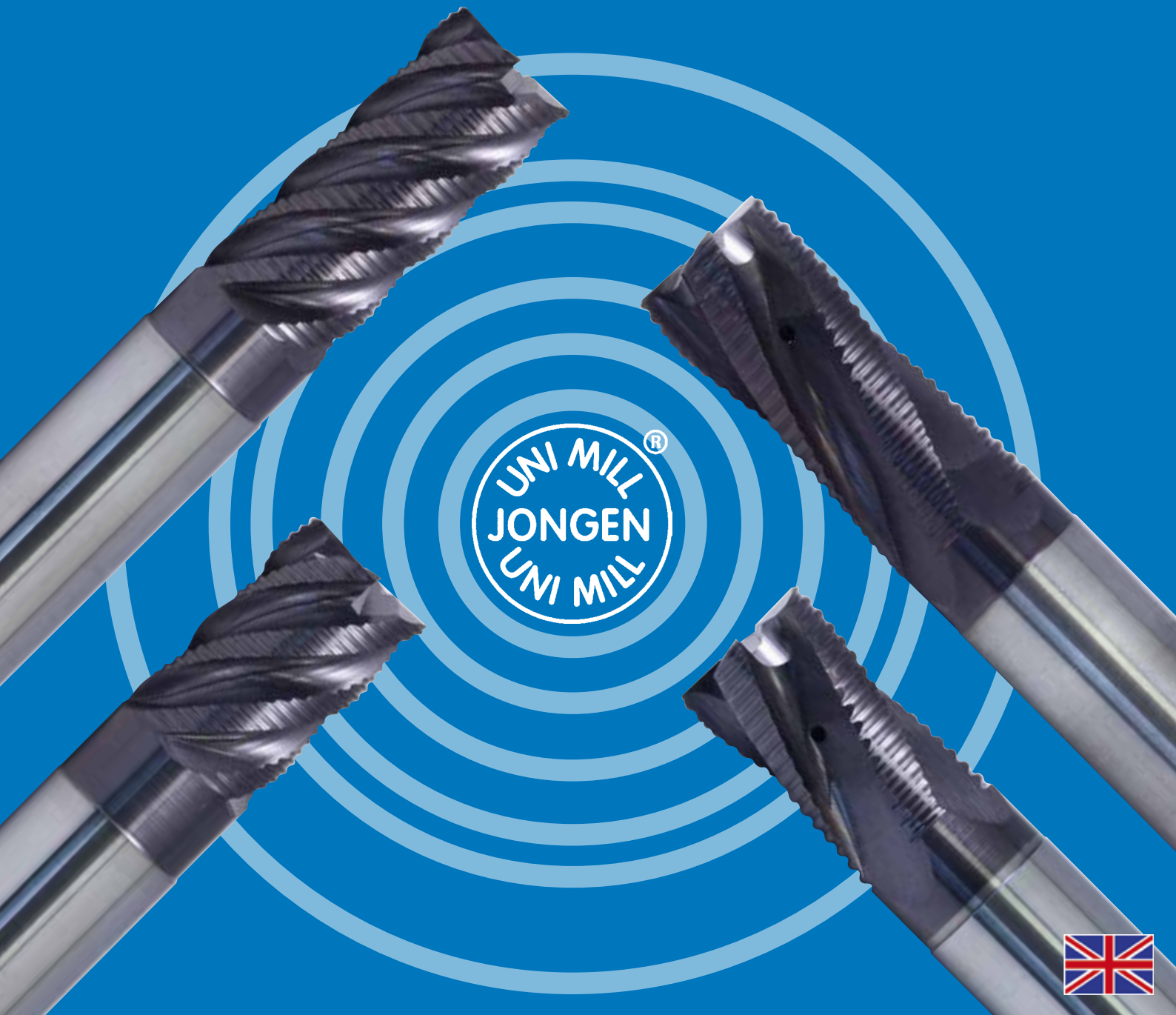
Jongen Werkzeugtechnik

VHM .46W & VHM .47W
VHM .48W & VHM .49W

The Power Roughing Cutters



The Tools

These Jongen UNI-MILL hard metal roughing cutters have been especially designed for roughing all usual steel types such as tool steel, high grade or low grade steel as well as structural steel etc.

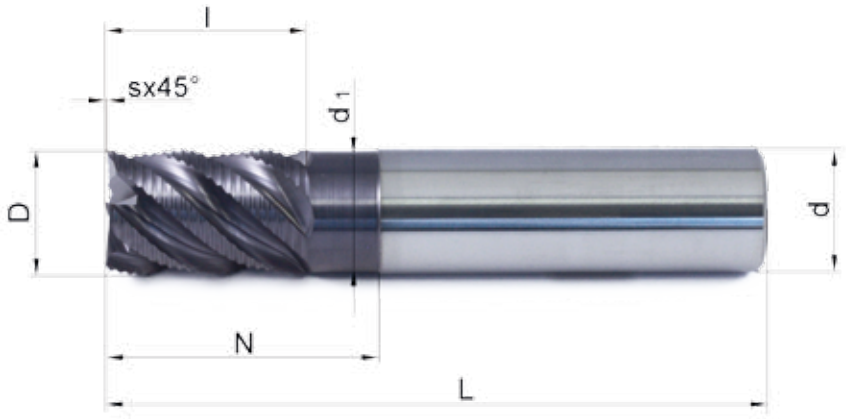
These tools are distinguished by smooth running of machine and highest productivity.

Product characteristics	Advantages	VHM .46W VHM .47W	VHM .48W VHM .49W
Flat-shaped shank-type roughing cutter	Universally applicable for maintaining highest cutting volume	✓	✓
Symmetric knurled profile adapted to tool diameter as well as number of flutes	Highest productivity by long tool life	✓	✓
Different number of flutes	Improved adjustment in terms of different operations and materials e.g. wide pitch for stainless steels	✓	✓
Coolant passages starting from ø 6mm	Optimal cooling of cutting edge Benefit to chip flow	✗	✓
Spiral-slot angle variable depending on diameter	Optimal design technology of every tool	✗	✓
Spiral-slot angle 45°	Soft cutting manner	✓	✗
Stable tool-core geometry	Highest tool stability and long tool life	✗	✓
Central cutting edge operating in the middle	Applicable for boring	✓	✓

Product characteristics	Advantages	VHM .46W VHM .47W	VHM .48W VHM .49W
Optimized macro geometry	Optimal designed geometry for high stability and long tool life	✓	✓
Optimized micro geometry	Reduction of micro-eruptions for long tool life	✓	✓
Champfer on cutting edge	Stabilised cutting edge for longer tool life	✓	✓
Negative chamfer on the main cutting edge	Highest cutting-edge stability	✓	✘
Available in different length versions	Universally applicable, full slot milling up to 2 x ø	✓	✓
End mill with increasing neck length up to norm clamping length	Universally applicable for all milling operations	✓	✓
Coupling made to DIN 6535-B (weldon)	Stable tool holder	✓	✓
Hard metal	Finest-grain carbide type K10-K20, extremely high tenacity with excellent wearing properties	✓	✓
Coating	TiAlN-Nanocomposit coating Very smooth coating surface High hot hardness and oxidation stability	✓	✓
Hard metal + coating = Type TS35	Long tool life with high cutting parameter, universally applicable	✓	✓
Regrinding capability of the tools	High cost-benefit factor	✓	✓

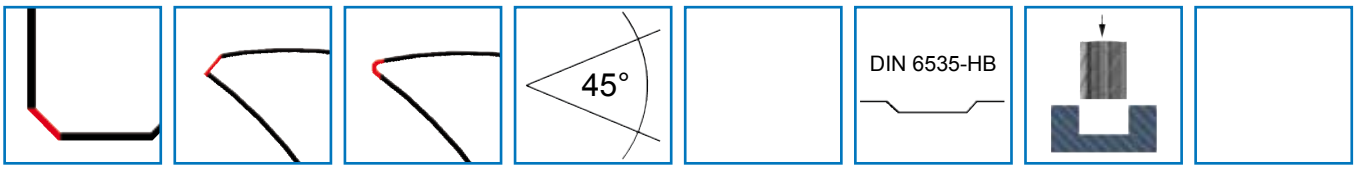
...made by JONGEN!

Technical Data VHM .46W



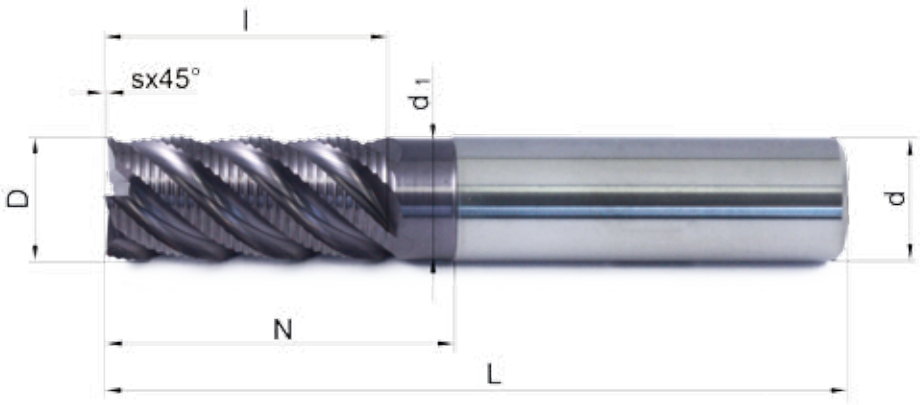
Tolerance D

ø6,0-20,0= $^{-0,03}_{-0,06}$



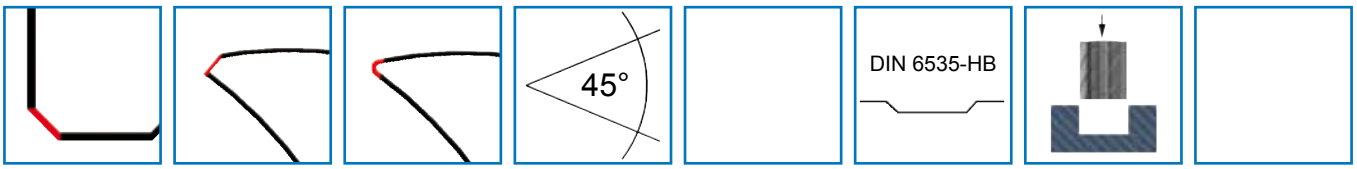
Order-No.	D	s	l	N	d_1	d_{h6}	L	Z
VHM 446W-06 TS35	6	0,4 x 45°	9	15	5,5	6	55	4
VHM 446W-08 TS35	8	0,4 x 45°	12	20	7,5	8	59	4
VHM 446W-10 TS35	10	0,4 x 45°	15	25	9,5	10	67	4
VHM 446W-12 TS35	12	0,5 x 45°	18	28	11,5	12	74	4
VHM 546W-16 TS35	16	0,5 x 45°	24	34	15,5	16	83	5
VHM 546W-20 TS35	20	0,5 x 45°	30	40	19,5	20	93	5

Technical Data VHM .47W



Tolerance D

ø6,0-20,0= $^{-0,03}_{-0,06}$



Order-No.	D	s	l	N	d_1	d_{h6}	L	Z
VHM 447W-06 TS35	6	0,4 x 45°	15	21	5,5	6	58	4
VHM 447W-08 TS35	8	0,4 x 45°	20	26	7,5	8	64	4
VHM 447W-10 TS35	10	0,4 x 45°	25	31	9,5	10	73	4
VHM 447W-12 TS35	12	0,5 x 45°	30	38	11,5	12	84	4
VHM 547W-16 TS35	16	0,5 x 45°	35	43	15,5	16	93	5
VHM 547W-20 TS35	20	0,5 x 45°	45	53	19,5	20	104	5

Cutting Data Recommendations VHM .46W & VHM .47W

Material	Hardness	Depth of cut	Cutting speed	ø 6+8	ø 10+12	ø 16+20
		a_e [mm]	V_c [m/min]	f_z [mm]	f_z [mm]	f_z [mm]
Structural steel Unalloyed steel	<180 HB	-0,25D	160 (140-180)	0,07 (0,06-0,10)	0,11 (0,10-0,14)	0,15 (0,14-0,18)
		-0,5D		0,06 (0,04-0,08)	0,08 (0,06-0,10)	0,11 (0,09-0,13)
		-0,75D		0,05 (0,03-0,07)	0,07 (0,05-0,09)	0,09 (0,07-0,11)
		>0,75D-1D		0,04 (0,02-0,06)	0,06 (0,04-0,08)	0,08 (0,06-0,10)
Tool steel Heat-treatable steel Alloyed steel	180-350 HB	-0,25D	120 (90-130)	0,07 (0,06-0,10)	0,11 (0,10-0,14)	0,15 (0,14-0,18)
		-0,5D		0,06 (0,06-0,08)	0,08 (0,06-0,10)	0,11 (0,09-0,13)
		-0,75D		0,05 (0,03-0,07)	0,07 (0,05-0,09)	0,09 (0,07-0,11)
		>0,75D-1D		0,04 (0,02-0,06)	0,06 (0,04-0,08)	0,08 (0,06-0,10)
Stainless steel High grade steel High alloyed steel	<270 HB	-0,25D	120 (90-130)	0,07 (0,06-0,10)	0,11 (0,10-0,14)	0,15 (0,14-0,18)
		-0,5D		0,06 (0,06-0,08)	0,08 (0,06-0,10)	0,11 (0,09-0,13)
		-0,75D		0,05 (0,03-0,07)	0,07 (0,05-0,09)	0,09 (0,07-0,11)
		>0,75D-1D		0,04 (0,02-0,06)	0,06 (0,04-0,08)	0,08 (0,06-0,10)

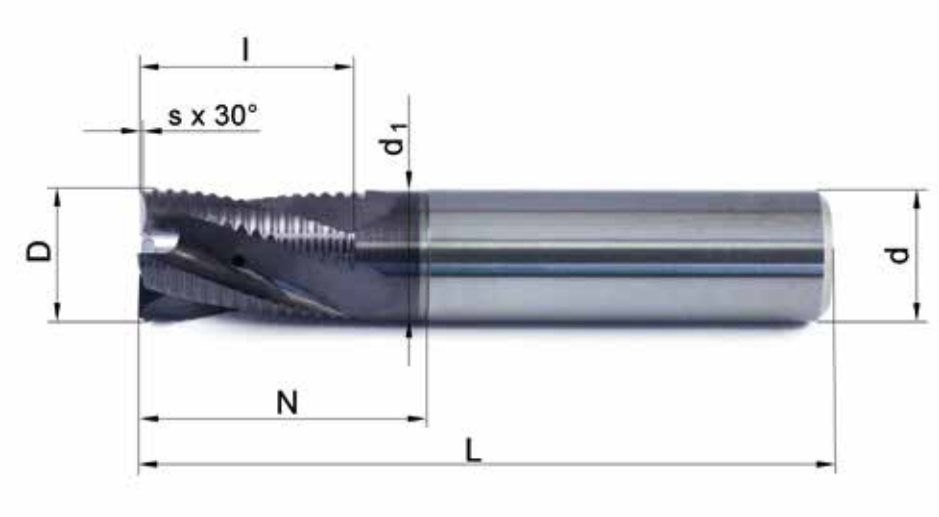
The above-mentioned data are standard values that may vary depending on processing, type of machine and material grade. For processing use a machine with the highest preciseness and rigidity. Should the available cutting speed be lower of that given in the table, reduce feed rate proportionally.

Cutting Data Recommendations VHM .46W & VHM .47W

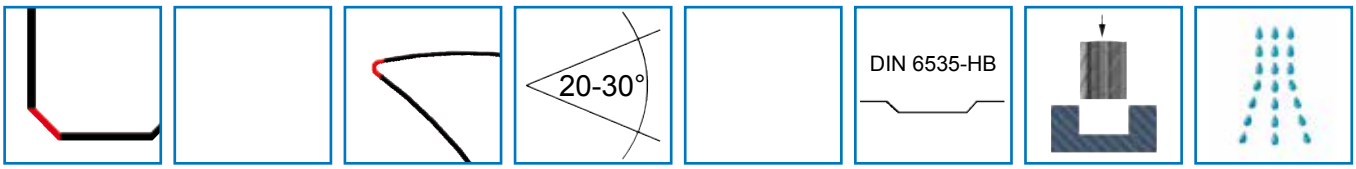
Material	Hardness	Depth of cut	Cutting speed	ø 6+8	ø 10+12	ø 16+20
		a_e [mm]	V_c [m/min]	f_z [mm]	f_z [mm]	f_z [mm]
Heat resisting super alloys Titanium alloys		-0,25D	50 (40-80)	0,07 (0,06-0,09)	0,11 (0,10-0,12)	0,15 (0,14-0,18)
		-0,5D		0,06 (0,05-0,08)	0,08 (0,07-0,09)	0,11 (0,09-0,13)
		-0,75D		0,05 (0,04-0,06)	0,07 (0,06-0,08)	0,09 (0,07-0,11)
		>0,75D-1D		0,04 (0,03-0,05)	0,06 (0,05-0,07)	0,08 (0,06-0,10)
Grey cast iron	<800 N/mm²	-0,25D	160 (150-170)	0,10 (0,08-0,14)	0,13 (0,12-0,18)	0,18 (0,16-0,22)
		-0,5D		0,08 (0,06-0,10)	0,11 (0,09-0,13)	0,14 (0,12-0,16)
		-0,75D		0,07 (0,05-0,09)	0,09 (0,07-0,11)	0,12 (0,10-0,14)
		>0,75D-1D		0,06 (0,04-0,08)	0,08 (0,06-0,10)	0,10 (0,08-0,12)
Globular graphite cast iron	<350 N/mm²	-0,25D	140 (130-150)	0,10 (0,08-0,14)	0,13 (0,12-0,18)	0,18 (0,16-0,22)
		-0,5D		0,08 (0,06-0,10)	0,11 (0,09-0,13)	0,14 (0,12-0,16)
		-0,75D		0,07 (0,05-0,09)	0,09 (0,07-0,11)	0,12 (0,10-0,14)
		>0,75D-1D		0,06 (0,04-0,08)	0,08 (0,06-0,10)	0,10 (0,08-0,12)

The above-mentioned data are standard values that may vary depending on processing, type of machine and material grade. For processing use a machine with the highest preciseness and rigidity. Should the available cutting speed be lower of that given in the table, reduce feed rate proportionally.

Technical Data VHM .48W



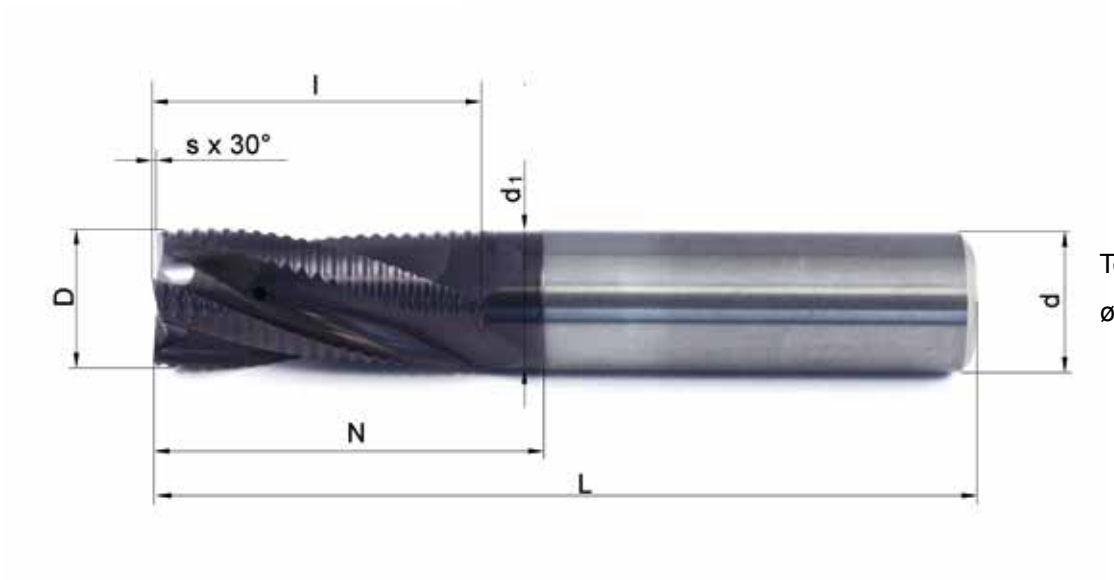
Tolerance D:
ø4,0-20,0 = $^{-0,03}_{-0,07}$



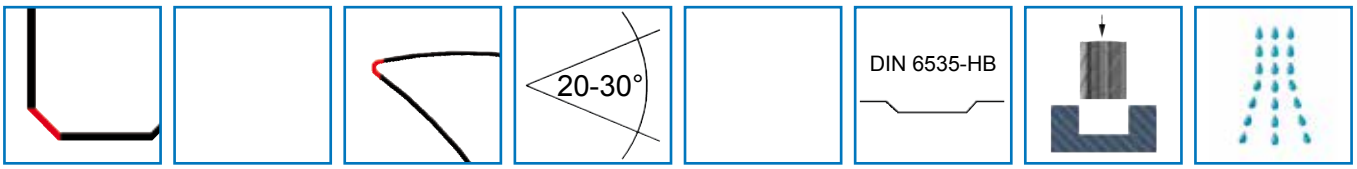
Order-No.	D	s	l	N	d_1	d_{h6}	L	Z	CP
VHM 348W-04 TS35	4	0,20 x 30°	5	9	3,8	6	55	3	×
VHM 348W-05 TS35	5	0,20 x 30°	7	12	4,8	6	55	3	×
VHM 348W-06 TS35	6	0,20 x 30°	9	15	5,8	6	55	3	✓
VHM 348W-08 TS35	8	0,25 x 30°	12	20	7,8	8	59	3	✓
VHM 348W-10 TS35	10	0,30 x 30°	15	25	9,7	10	67	3	✓
VHM 348W-12 TS35	12	0,30 x 30°	18	28	11,7	12	74	3	✓
VHM 448W-06 TS35	6	0,20 x 30°	9	15	5,8	6	55	4	✓
VHM 448W-08 TS35	8	0,25 x 30°	12	20	7,8	8	59	4	✓
VHM 448W-10 TS35	10	0,30 x 30°	15	25	9,7	10	67	4	✓
VHM 448W-12 TS35	12	0,30 x 30°	18	28	11,7	12	74	4	✓
VHM 448W-16 TS35	16	0,35 x 30°	24	34	15,6	16	83	4	✓
VHM 448W-20 TS35	20	0,40 x 30°	30	40	19,5	20	93	4	✓
VHM 548W-16 TS35	16	0,45 x 30°	24	34	15,6	16	83	5	✓
VHM 548W-20 TS35	20	0,50 x 30°	30	40	19,5	20	93	5	✓

CP = Coolant passages

Technical Data VHM .49W



Tolerance D:
ø4,0-20,0 = $^{-0,03}_{-0,07}$



Order-No.	D	s	l	N	d_1	d_{h6}	L	Z	CP
VHM 349W-04 TS35	4	0,20 x 30°	9	14	3,8	6	58	3	×
VHM 349W-05 TS35	5	0,20 x 30°	12	18	4,8	6	58	3	×
VHM 349W-06 TS35	6	0,20 x 30°	15	21	5,8	6	58	3	✓
VHM 349W-08 TS35	8	0,25 x 30°	20	26	7,8	8	64	3	✓
VHM 349W-10 TS35	10	0,30 x 30°	25	31	9,7	10	73	3	✓
VHM 349W-12 TS35	12	0,30 x 30°	30	38	11,7	12	84	3	✓
VHM 449W-06 TS35	6	0,20 x 30°	15	21	5,8	6	58	4	✓
VHM 449W-08 TS35	8	0,25 x 30°	20	26	7,8	8	64	4	✓
VHM 449W-10 TS35	10	0,30 x 30°	25	31	9,7	10	73	4	✓
VHM 449W-12 TS35	12	0,30 x 30°	30	38	11,7	12	84	4	✓
VHM 449W-16 TS35	16	0,35 x 30°	35	43	15,6	16	93	4	✓
VHM 449W-20 TS35	20	0,40 x 30°	45	53	19,5	20	104	4	✓
VHM 549W-16 TS35	16	0,45 x 30°	35	43	15,6	16	93	5	✓
VHM 549W-20 TS35	20	0,50 x 30°	45	53	19,5	20	104	5	✓

CP = Coolant passages

Cutting Data Recommendations VHM .48W & VHM .49W

Material	Hardness	Depth of cut	Cutting speed	ø 4+5	ø 6+8	ø 10+12	ø 16+20
		a_e [mm]	V_c [m/min]	f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]
Structural steel Unalloyed steel	<180 HB	-0,25D	160 (140-180)	0,05 (0,04-0,08)	0,07 (0,06-0,1)	0,11 (0,1-0,14)	0,15 (0,14-0,18)
		-0,5D		0,04 (0,03-0,06)	0,06 (0,04-0,08)	0,08 (0,06-0,1)	0,11 (0,09-0,13)
		-0,75D		0,03 (0,02-0,05)	0,05 (0,03-0,07)	0,07 (0,05-0,09)	0,09 (0,07-0,11)
		>0,75D-1D		0,03 (0,02-0,05)	0,04 (0,02-0,06)	0,06 (0,04-0,08)	0,08 (0,06-0,1)
Tool steel Heat-treatable steel Alloyed steel	180-350 HB	-0,25D	120 (90-150)	0,05 (0,04-0,08)	0,07 (0,06-0,1)	0,11 (0,1-0,14)	0,15 (0,14-0,18)
		-0,5D		0,04 (0,03-0,06)	0,06 (0,06-0,08)	0,08 (0,06-0,1)	0,11 (0,09-0,13)
		-0,75D		0,03 (0,02-0,06)	0,05 (0,03-0,07)	0,07 (0,05-0,09)	0,09 (0,07-0,11)
		>0,75D-1D		0,03 (0,02-0,06)	0,04 (0,02-0,06)	0,06 (0,04-0,08)	0,08 (0,06-0,1)
Stainless steel High grade steel High alloyed steel	<270 HB	-0,25D	120 (60-160)	0,05 (0,04-0,08)	0,07 (0,06-0,1)	0,11 (0,1-0,14)	0,15 (0,14-0,18)
		-0,5D		0,04 (0,03-0,06)	0,06 (0,06-0,08)	0,08 (0,06-0,1)	0,11 (0,09-0,13)
		-0,75D		0,03 (0,02-0,06)	0,05 (0,03-0,07)	0,07 (0,05-0,09)	0,09 (0,07-0,11)
		>0,75D-1D		0,03 (0,02-0,06)	0,04 (0,02-0,06)	0,06 (0,04-0,08)	0,08 (0,06-0,1)

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Cutting Data Recommendations VHM .48W & VHM .49W

Material	Hardness	Depth of cut	Cutting speed	ø 4+5	ø 6+8	ø 10+12	ø 16+20
		a_e [mm]	V_c [m/min]	f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]
Heat resisting super alloys Titanium alloys		-0,25D	50 (40-80)	0,05 (0,04-0,08)	0,07 (0,06-0,1)	0,11 (0,1-0,14)	0,15 (0,14-0,18)
		-0,5D		0,04 (0,02-0,06)	0,06 (0,06-0,08)	0,08 (0,06-0,1)	0,11 (0,09-0,13)
		-0,75D		0,03 (0,02-0,05)	0,05 (0,03-0,07)	0,07 (0,05-0,09)	0,09 (0,07-0,11)
		>0,75D-1D		0,03 (0,02-0,05)	0,04 (0,02-0,06)	0,06 (0,04-0,08)	0,08 (0,06-0,1)
Grey cast iron	<800 N/mm²	-0,25D	160 (150-170)	0,09 (0,08-0,12)	0,10 (0,08-0,14)	0,13 (0,12-0,18)	0,18 (0,16-0,22)
		-0,5D		0,07 (0,05-0,09)	0,08 (0,06-0,1)	0,11 (0,09-0,13)	0,14 (0,12-0,16)
		-0,75D		0,06 (0,04-0,08	0,07 (0,05-0,09)	0,09 (0,07-0,11)	0,12 (0,1-0,14)
		>0,75D-1D		0,05 (0,03-0,07)	0,06 (0,04-0,08)	0,08 (0,06-0,1)	0,10 (0,08-0,12)
Globular graphite cast iron	<350 N/mm²	-0,25D	140 (120-160)	0,09 (0,08-0,12)	0,10 (0,08-0,14)	0,13 (0,12-0,18)	0,18 (0,16-0,22)
		-0,5D		0,07 (0,05-0,09)	0,08 (0,06-0,1)	0,11 (0,09-0,13)	0,14 (0,12-0,16)
		-0,75D		0,06 (0,04-0,08)	0,07 (0,05-0,09)	0,09 (0,07-0,11)	0,12 (0,1-0,14)
		>0,75D-1D		0,05 (0,03-0,07)	0,06 (0,04-0,08)	0,08 (0,06-0,1)	0,10 (0,08-0,12)

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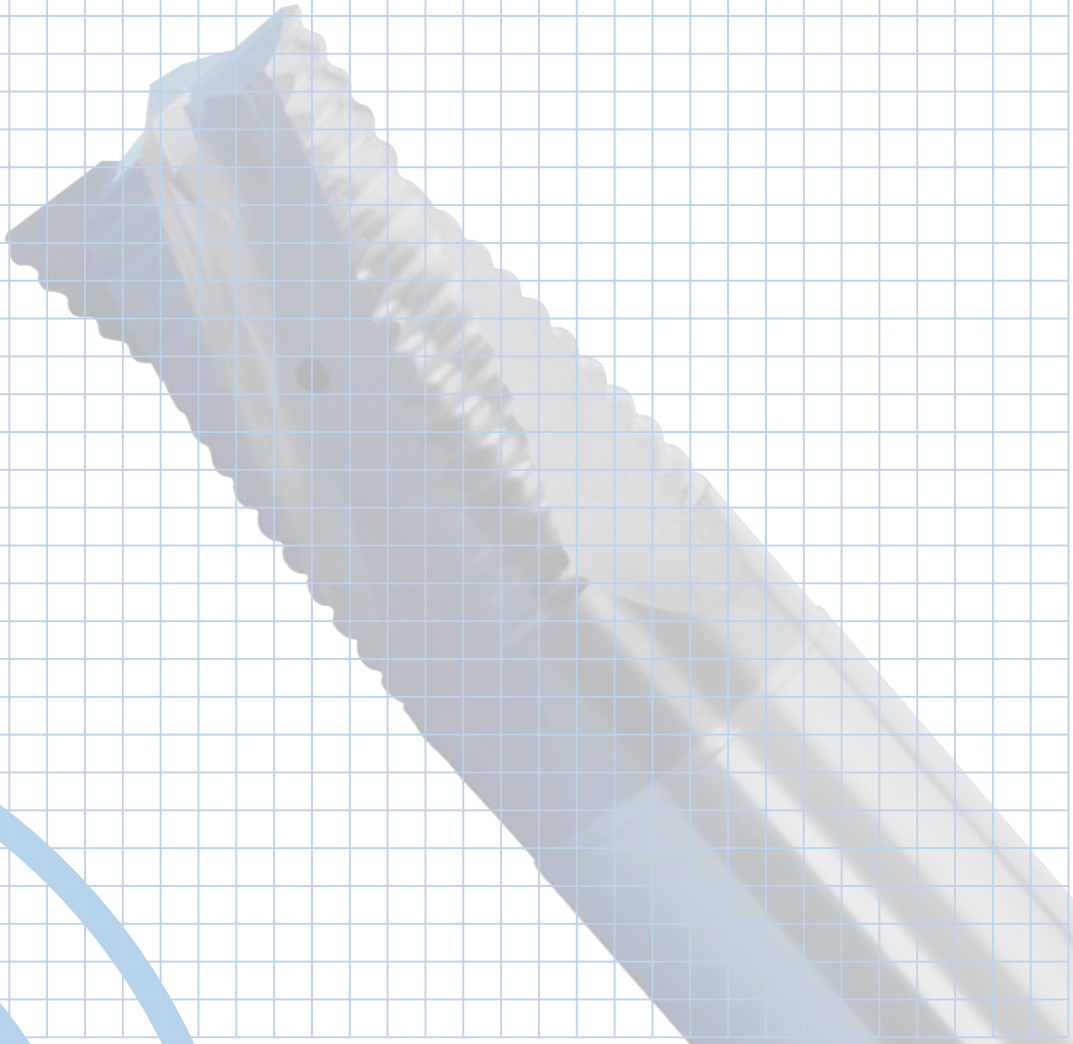
Notes



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