

Step Milling System Type B31

ap max. 12,0mm
eff. 6 cutting edges

Products from



Willich



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for



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and the



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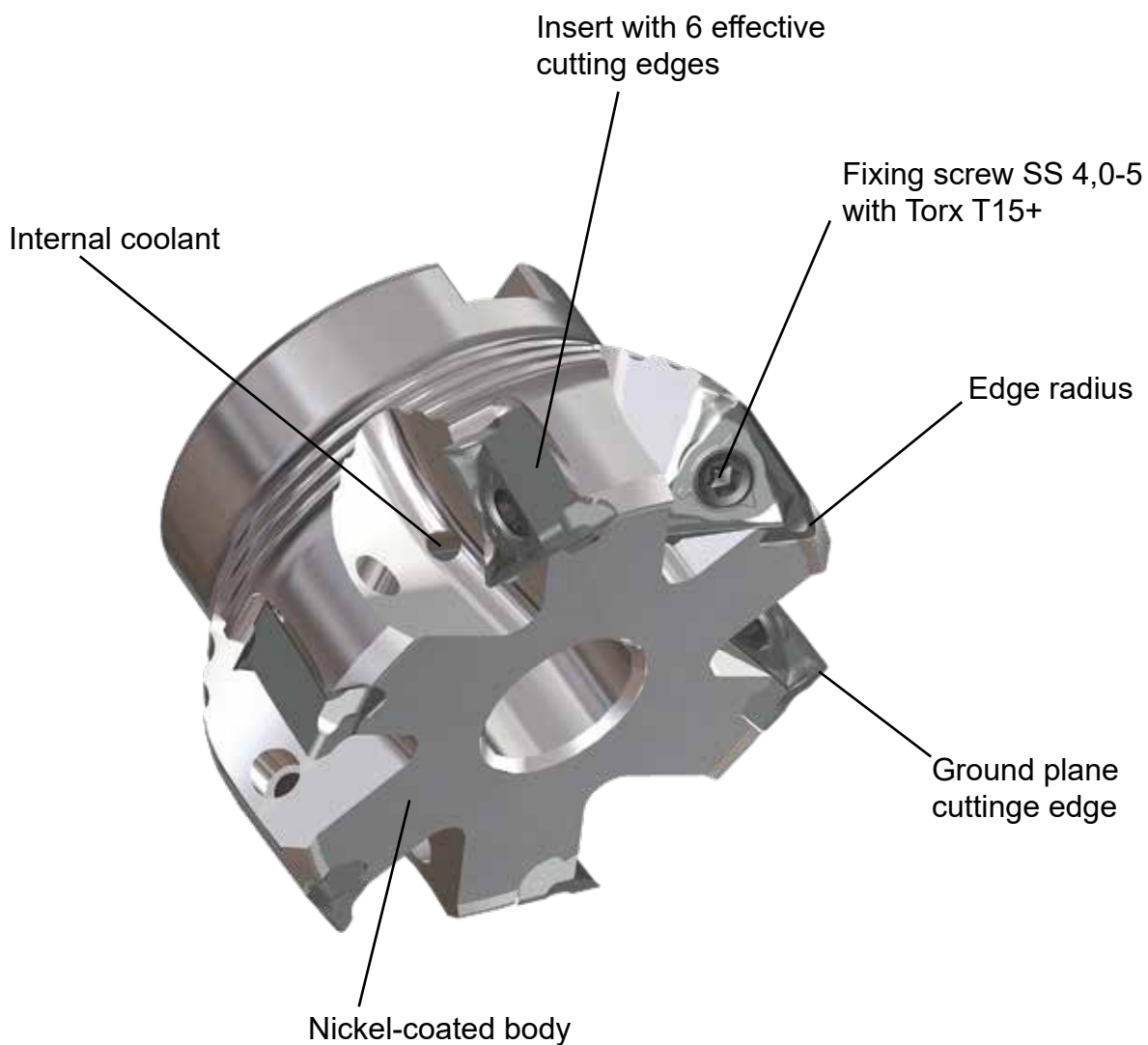
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THE TOOL

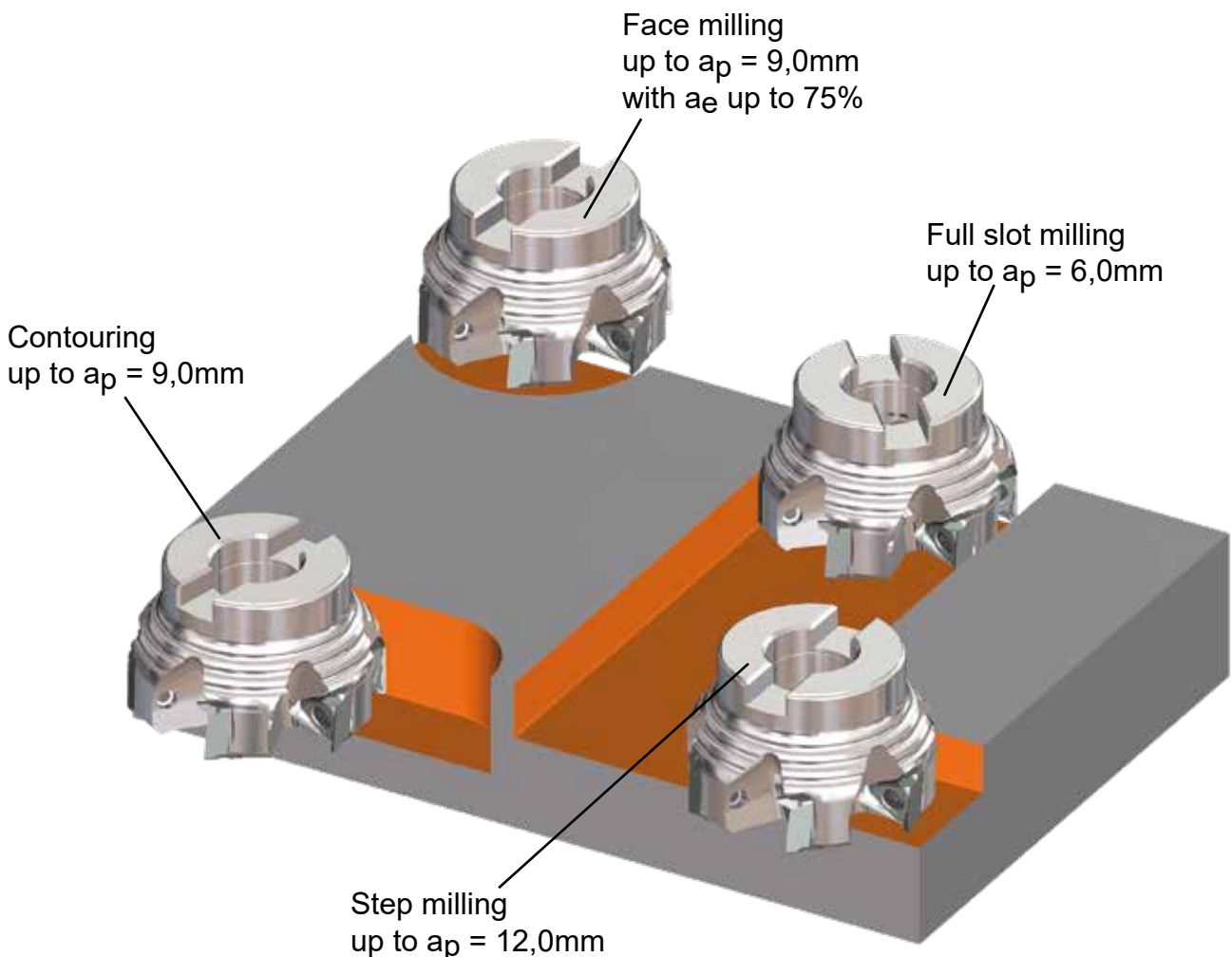
The milling tool type B31 has been developed especially for the machining of step-, slot- and face milling operations, in terms of roughing and finishing steels, high grade steels, cast iron, difficult to mill materials, as well as non-ferrous metals and aluminum.

These tools are available as shell type mills, with diameter range from 40 to 160 mm, in standard and closed tooth pitch.



PERFORMANCE CRITERIA

- High productivity thanks to 6 effective cutting edges
- High chip removal rate by an axial depth of cut of up to 12 mm
- A high surface quality and precision is given by the ground plane chamfer of the insert type JMB31-723, respectively by the periphery ground insert type JMB31-823
- Axial depth of cut of up to 9 mm ensure almost step-free side walls
- The optimal coordinated cutting edge with cutting materials grant high tool lives
- The tools are made of solid and additionally tempered tool steel and can therefore withstand highest charges
- Nickel-coated surfaces of the tool cause high resistance against reweldings and corrosions
- Shell type mills are made to DIN 8030-A
- All tools include internal coolant passages
- All tools are available in standard and closed tooth pitch, offering a great choice for all usual machining processes



THE INSERTS

- **JMB31-723R..** : Precision ground insert with chip breaker and ground plane chamfer, chamfered and rounded cutting edge.
JMB31-823R08: Periphery ground insert with a polished chip former groove
- Axial depth of cut max. 12,0mm
- Edge radiuses R 0,8 or 1,2

JMB31-723R08



JMB31-723R12

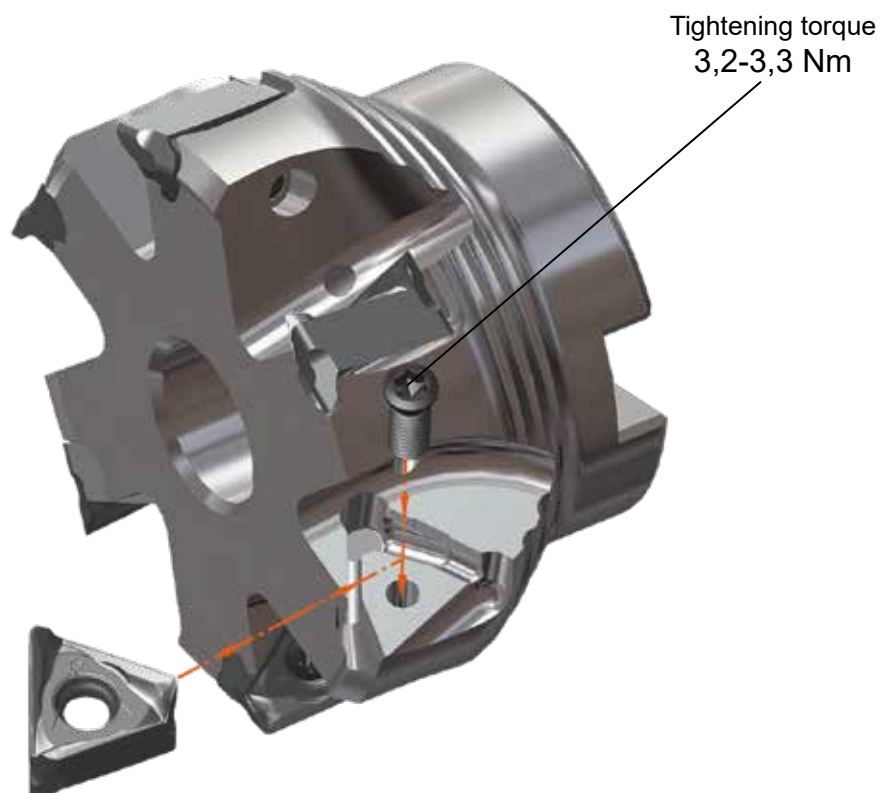


JMB31-823R08



- Application areas are: all standard steel types and high grade steels, difficult to mill materials, cast iron, as well as non-ferrous metals and aluminium.

Inserts' fitting



Following carbide qualities are offered:

HC45



Code 41, DIN-ISO 513 Classification P30-P35, M25-M30, K20-K30

Very tough fine grain quality with a thick HIPIMS-coating for middle - high cutting speeds and high feed rates. This quality is suitable for dry milling and can also be adopted with cooling. Application areas are roughing and finishing of almost all steels such as structural steel, tool steel, heat-treatable steel as well as unalloyed, low alloyed and high alloyed steel, and also cast-qualities such as grey cast iron, globular graphite cast iron etc..

HC30



Code 52, DIN-ISO 513 Classification P20-P30, M25-M30, S20-S30

Hard wearing and tough finest grain carbide with HIPIMS-coating for middle cutting speeds and middle feed rates. This quality is suitable for dry milling and can also be adopted with cooling. Application areas are roughing and finishing high grade steel as well as high alloyed materials.

XC35



Code 46, DIN-ISO 513 Classification P20-P30, M20-M30, S15-S25

Wear resistant and tough finest grain hard metal quality with HIPIMS-coating. On the basis of the experience gained wet machining is preferably to be adopted with this quality; however the dry processing is also possible. XC35 has been especially developed for processing stainless steel, duplex steel and high-alloyed materials, but also for titanium etc.

HC20



Code 53, DIN-ISO 513 Classification K15-K20, H15-H20

Very hard wearing fine grain carbide with HIPIMS-coating for middle – high cutting speeds with high feed rates. This quality is suitable for dry milling and can also be adopted with cooling. Application areas are roughing and finishing of cast iron materials, e.g. grey-, tempered-, vermicular-, graphite- and globular graphite cast iron.

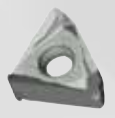
HT20



Code 32, DIN-ISO 513 Classification K15-K20, H15-H20

Very hard wearing fine grain carbide with an AlTiN- Nanocomposit-coating for middle – high cutting speeds with high feed rates. This quality is suitable for dry milling and can also be adopted with cooling. Application areas are roughing and finishing of cast iron materials, e.g. grey-, tempered-, vermicular-, graphite- and globular graphite cast iron.

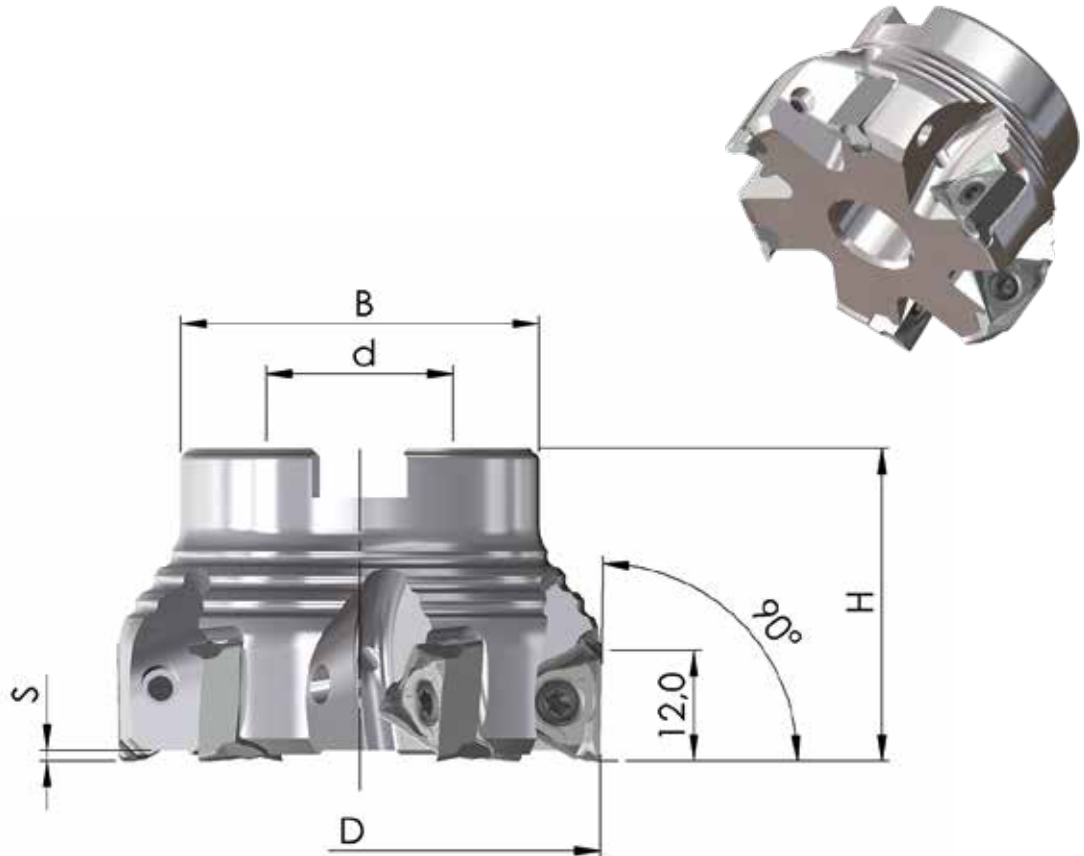
K15M



Code 8, DIN-ISO 513 Classification N20-N25

Very hard wearing fine grain carbide, for high cutting speeds with high feed rates. This quality is suitable for dry milling and can also be adopted with cooling. Application areas are roughing and finishing nonferrous heavy materials and aluminium up to a Si-content of approx. 8%








TECHNICAL DATA



Order No.	D	H	d	B	S	Z	MS
90PP-040-723-3	40	40	16	38	1,3	3	DS 12
90PP-050-723-4	50	40	22	46	1,3	4	DS 20
90PP-063-723-5	63	40	22	46	1,3	5	MS 10x25-912
90PP-080-723-6	80	50	27	58	1,3	6	MS 12x35-912
90PP-100-723-7	100	50	32	78	1,3	7	MS 16x35-6912
90PP-125-723-9	125	50	40	90	1,3	9	MS 20x50-7991
90PP-160-723-11	160	50	40	90	1,3	11	MS 20x50-7991
Close tooth pitch:							
90PP-050-723-5	50	40	22	46	1,3	5	DS 20
90PP-063-723-6	63	40	22	46	1,3	6	MS 10x25-912
90PP-080-723-7	80	50	27	58	1,3	7	MS 12x35-912
90PP-100-723-9	100	50	32	78	1,3	9	MS 16x35-6912
90PP-125-723-11	125	50	40	90	1,3	11	MS 20x50-7991
90PP-160-723-13	160	50	40	90	1,3	13	MS 20x50-7991




MS= Central screw

Inserts

			HC45 (code 41)	HC30 (code 52)	XC35 (code 46)	HC20 (code 53)	HT20 (code 32)	K15M (code 8)
	JMB31-723R08 U  IK 10,8x8,87 R0,8	Order- No.	B31A-WY41	B31A-XO52	B31A-GZ46		B31A-RN32	
	JMB31-723R12 U  IK 10,8x8,87 R1,2	Order- No.	B31A-LU41	B31A-OX52	B31A-UX46	B31A-BY53		
	JMB31-823R08 U  IK 10,8x8,87 R0,8	Order- No.						B31D-YA08
			10	10	10	10	10	10

Key to symbols see catalogue page XV-39

Spare Parts

	SS 4,0-5	tightening torque 3,2-3,3 Nm	Fixing screw
	T 15+	Screw driver	
	100 g	Heavy duty grease	



PARAMETERS STEP MILLING

Material	Hardness	Quality	Depth of cut [mm]	Vc [m/min.]	Feed rate per tooth									
					f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]		
P	Structural steel, Unalloyed steel	<180 HB	HC45 (HC30)	-0,25 D -0,50 D -0,75 D >0,75 D - 1 D	-12,0 -12,0 -9,0 -6,0	250 (200-350)	Feed rate per tooth							
							f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]
P	Tool steel, Heat-treatable steel, Alloyed steel	180-350 HB	HC45 (HC30)	-0,25 D -0,50 D -0,75 D >0,75 D - 1 D	-12,0 -12,0 -9,0 -6,0	220 (160-280)	Feed rate per tooth							
							f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]
M	Stainless-steel, High grade steel, High alloyed steel	<270 HB	XC35 HC30	-0,25 D -0,50 D -0,75 D >0,75 D - 1 D	-12,0 -12,0 -9,0 -6,0	240 (140-300)	Feed rate per tooth							
							f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]
S	Heat-resistant super alloys, Titan alloys	XC35	-0,25 D -0,50 D -0,75 D >0,75 D - 1 D	-12,0 -12,0 -9,0 -6,0	60 (40-200)	Feed rate per tooth								
						f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]	
K	Grey cast iron	<800 N/mm ²	HT20	-0,25 D -0,50 D -0,75 D >0,75 D - 1 D	-12,0 -12,0 -9,0 -6,0	250 (180-350)	Feed rate per tooth							
							f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]
K	Globular graphite cast iron	<350 N/mm ²	HT20 (HC45)	-0,25 D -0,50 D -0,75 D >0,75 D - 1 D	-12,0 -12,0 -9,0 -6,0	200 (130-280)	Feed rate per tooth							
							f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]
Aluminium, Non-ferrous metals	< 12% Si	K15M	-0,25D -0,5D -0,75D >0,75D-1D	-12 -12 -9 -6	500 (500-1000)	Feed rate per tooth								
						f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]	f_z [mm]	

The above mentioned data are standard values. Up and down corrections are admitted depending on the machine type, tool and holding fixture.

Errors and omissions excepted.