

44001

Set of Burrs, HSS Quality (Shank Ø 6 mm)

HSS



Use

For steel and cast steel, alloyed and unalloyed.

Quality

HSS.

Note:

Burr shapes see cat.-no. 44002.

Set contents

2	Burrs cylindrical 6 x 16 / 12 x 25 mm,
1	Burr helical 12 x 25 mm,
2	Burrs spherical 4 x 3 / 12 x 10 mm,
1	Burr tear-drop 12 x 20 mm,
1	Burr pointed arc 12 x 30 mm,
1	Burr flame-shaped 12 x 30 mm,
1	Burr lobed 6 x 20 mm,
1	Burr pointed taper 6 x 18 mm.



44001

Serration	Cutting speed m/min	Type	44001	...
10-piece	3	60 - 180	in the case	201

44002

HSS Burrs (Shank Ø 6 mm)

HSS



Type

Serration 3.

Use

For steel and cast steel, alloyed and unalloyed.

Recommended working speed $v_c = 60-180$ m/min.Quality
HSS.

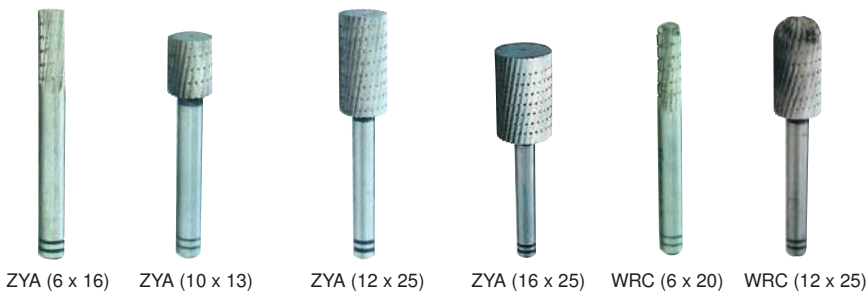
Note:

Available on request:

Serration 1 = for light metals (long-chipping), light metal alloys, lead, tin, plastics, (thermoplastics & thermosets), fibre, rubber wood.

Serration 2 = for light metals (short-chipping), bronze, copper, electrolytic copper, red brass, bronze, zinc, magnesium alloys (electron).

Serration 5 = for fine processing of steel and cast steel, alloyed and unalloyed as well as non-lubricating non-ferrous metals.



ZYA (6 x 16) ZYA (10 x 13) ZYA (12 x 25) ZYA (16 x 25) WRC (6 x 20) WRC (12 x 25)



KUD (4,5 x 4) KUD (8 x 7) KUD (12 x 10) KUD (16 x 14) TRE (16 x 25) SPG (6 x 18)



SPG (12 x 30) SPG (16 x 30) B (12 x 30) beam (6 x 20) KEL (10 x 20) STM (10 x 20) STM (12 x 30)



Serration 1

Serration 2
with chip breakerSerration 3
with chip breaker

Serration 5

44002

Shape	Head diameter Ø x -length mm	Overall length mm	44002	...
Cylindrical (ZYA)	6 x 16	56		103
Cylindrical (ZYA)	10 x 13	53		105
Cylindrical (ZYA)	12 x 25	65		106
Cylindrical (ZYA)	16 x 25	65		107
Helical (WRC)	6 x 20	60		116
Helical (WRC)	12 x 25	65		119
Spherical (KUD)	4,5 x 4	60		123
Spherical (KUD)	8 x 7	60		126
Spherical (KUD)	12 x 10	60		128
Spherical (KUD)	16 x 14	60	#	129

Shape	Head diameter Ø x -length mm	Overall length mm	44002	...
Tear-drop (TRE)	16 x 25	60		132
Pointed arc (SPG)	6 x 18	58		133
Pointed arc (SPG)	12 x 30	70		136
Pointed arc (SPG)	16 x 30	70		137
Flame-shaped (B)	12 x 30	70	#	140
Lobbed	6 x 20	60		143
Round taper (KEL)	10 x 20	60	#	145
Pointed taper (SKM)	10 x 20	60		152
Pointed taper (SKM)	12 x 30	70		154





Use recommendations

- HSS burrs must be used at low speeds as compared with carbide burrs.

- For application situations where high speeds are not available.
 - For soft materials, HSS burrs are the economical alternative to hard metal burrs.

- The ductility of the -high-performance, high-speed steel (HSS) results in high stability of the tooth cutting edges.

Serration aluminium



Serration 1 without chip deflector



Serration 2 with chip deflector



Serration 3 with chip deflector



Serration 5 without chip deflector



	Material groups	Processing case	Serration	Cutting speed	
Steel and cast steel materials	Untempered, non heat-treated steels to 1200 N/mm ² (< 38 HRC)	Construction steels, carbon steels, tool steels, unalloyed steels, case-hardened steels, cast steel	Coarse machining = high stock removal	2	60 - 80 m/min
			Fine machining e.g. deburring	3 3 5	60 - 80 m/min 80 - 100 m/min 60 - 80 m/min
	Rust and acid-resistant steels	Austenitic and ferritic high-grade steels	Coarse machining = high stock removal	1	60 - 80 m/min
			Fine machining e.g. deburring	1 2	80 - 100 m/min 60 - 80 m/min
Non-ferrous metals	Soft non-ferrous metals	Al alloys, brass, copper, zinc	Coarse machining = high stock removal	Al 1	200 - 300 m/min 200 - 300 m/min
			Fine machining e.g. deburring	2	200 - 250 m/min
Cast iron materials		Grey cast iron, nodular graphite cast iron	Coarse machining = high stock removal	2 3	60 - 80 m/min 60 - 80 m/min
			Fine machining e.g. deburring	3 5	80 - 100 m/min 80 - 100 m/min
			Coarse machining = high stock removal	Al	200 - 300 m/min
Others / plastics		Fibre-reinforced thermoplastics and thermoset plastics, rubber, wood	Coarse machining = high stock removal	1	200 - 300 m/min
			Fine machining e.g. deburring	1 2	250 - 300 m/min 200 - 250 m/min

Example:

HSS burr, serration 2,
 tool diameter 12 m.
 Coarse machining of untempered, non heat-treated steels.
 Cutting speed: 60 - 80 m/min
Rotational speed range: 1,600 - 2,200 rpm

Ø mm	Cutting speeds m/min					
	60	80	100	200	250	300
	rational speed rpm					
1.6	12,000	16,000	19,900	39,800	49,800	59,700
2.3	8,400	11,100	13,900	27,700	34,600	41,600
3.2	6,000	8,000	10,000	19,900	24,900	29,900
4.0	4,800	6,400	8,000	16,000	19,900	23,900
5.0	3,900	5,100	6,400	12,800	16,000	19,100
6.0	3,200	4,300	5,400	10,700	13,300	16,000
7.0	2,800	3,700	4,600	9,100	11,400	13,700
8.0	2,400	3,200	4,000	8,000	10,000	12,000
10.0	2,000	2,600	3,200	6,400	8,000	9,600
12.0	1,600	2,200	2,700	5,400	6,700	8,000
14.0	1,400	1,900	2,300	4,600	5,700	6,900
16.0	1,200	1,600	2,000	4,000	5,000	6,000



Abrasive Tools / Separating Tools

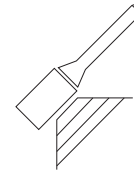
44007 - 44010

HSS Burrs Cylindrical (ZYAS)

HSS



With face-cutting serration.



44007 - 44010

Head Ø x -length mm	Total length mm	Shank Ø mm	Serration 1		Serration 2		Serration 3		Serration 5	
			44007	...	44008	...	44009	...	44010	...
6 x 16	60	6			#				#	
10 x 13	53	6			#				#	
12 x 25	65	6							#	
16 x 25	65	6								

44012 - 44014

HSS Burrs, Helical (WRC)

HSS



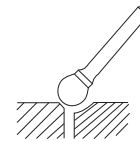
44012 - 44014

Head Ø x -length mm	Total length mm	Shank Ø mm	Serration 1		Serration 2		Serration 3	
			44012	...	44013	...	44014	...
6 x 16	60	6			#			
8 x 20	60	6						
12 x 25	65	6			#			

44019

HSS Burrs, Spherical (KUD)

HSS



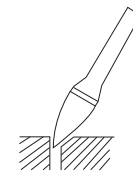
44019

Head Ø x -length mm	Overall length mm	Shank Ø mm	Serration 3	
			44019	...
8 x 7	55	6		
12 x 10	51	6		
16 x 14	54	6	#	

44027 - 44030

HSS Burrs, Pointed Arc (SPG)

HSS



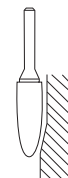
44027 - 44030

Head Ø x -length mm	Total length mm	Shank Ø mm	Serration 1		Serration 2		Serration 3		Serration 5	
			44027	...	44028	...	44029	...	44030	...
6 x 18	60	6	#						#	
12 x 30	70	6								
16 x 30	70	6								

44034

HSS Burrs, Flame-Shaped (B)

HSS



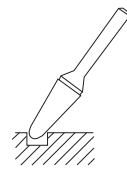
44034

Head Ø x -length mm	Overall length mm	Shank Ø mm	Serration 3	
			44034	...
12 x 30	70	6		



44038 - 44039 HSS Burrs, Rounded Taper (KEL)

HSS

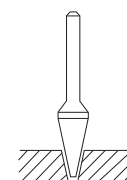


44038 - 44039

Head Ø x -length mm	Total length mm	Shank Ø mm	Serration 2 44038	...	Serration 3 44039	...
10 x 20	60	6	#	201	#	201

44043 - 44044 HSS Burrs, Pointed Taper (STM)

HSS



44043 - 44044

Head Ø x -length mm	Total length mm	Shank Ø mm	Serration 2 44043	...	Serration 3 44044	...
10 x 20	60	6		202		202
12 x 25	65	6		203	#	203

Info

(Solid) carbide burrs cat.-no. 44093 - 44226

VHM



Type

With straight shank, right-hand helix, right-hand cut.

Serration 2

Recommended cutting speed
Vc = 400 - 800 m/min.

Serration 3 (Al)

Recommended cutting speed
Vc = 600 - 960 m/min.

Serration 5

Increased tooth angle especially for heavy-duty applications, e.g. in the foundry industry, shipyards and in heavy industry.
Recommended cutting speed
Vc = 500 - 960 m/min.
Advantage over serration 6: 40% longer service life.

Serration 6

Multi-purpose use, maximum machining.
Recommended cutting speed
Vc = 500 - 960 m/min.

Serration 6 (TiAlN)

Like serration 6, however longer service life through TiAlN coating.

Note:

Additional dimensions, serration (e.g. diamond tipped serration) and other types (e.g. double-end cutter or burrs with extra long shank) available on request.

Warning:

Always comply with the recommended **cutting speed or working speed** (insufficient rpm is the most frequent cause of tooth break)! Just as important is the selection of the **right shape** (see application diagrams for cat.-no. 44102 cont.) and the **size of the burr**. In order to avoid stronger vibrations, **max. 33%** of the cutting edges should remove stock simultaneously.

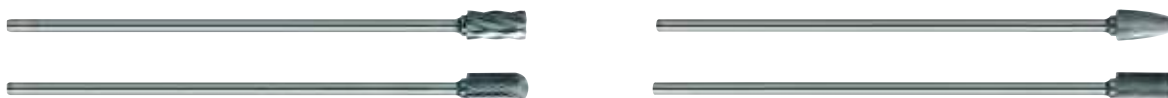
Head Ø mm	Working speed	
	max.	recommended
2	100,000	50,000 - 80,000
3	100,000	50,000 - 75,000
4	100,000	50,000 - 75,000
6	70,000	35,000 - 53,000
8	55,000	28,000 - 42,000
10	50,000	25,000 - 38,000
12	40,000	20,000 - 30,000
15	30,000	15,000 - 23,000
20	20,000	10,000 - 15,000
25	15,000	7,000 - 11,000

Serration	2	3 (Al)	5	6	6 (TiAlN)
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Application range	2	3 (Al)	5	6	6 (TiAlN)
Aluminium, Al alloys	-	x	-	-	-
Bronze, copper, brass	x	-	-	-	-
Carbon	-	-	-	-	-
Fibreglass	-	x	-	-	-
Cast iron	x	-	x	x	x
Hard rubber	-	x	-	-	-
HSS-E (Co)	x	-	-	x	x
Plastics	-	x	-	-	-
Magnesium, alloys	-	-	-	-	-
Stainless steels	x	-	-	x	x
Weld seams	x	-	x	x	x
High-strength steels	x	-	-	x	x
Steel, nickel-chromium	x	-	-	x	x
Titanium alloys	x	-	-	x	x
Zinc alloys	-	x	-	-	-

Burrs with extra-long shank available on request



44093

Solid carbide burrs set (shank Ø 3 mm)

VHM

ATORN®

Type

Dimensions = Head Ø x head length mm.

Set contents 44093 101

Serration 2

- 1 Burr cylindrical 3 x 12 mm,
- 1 Burr helical 3 x 12 mm,
- 1 Burr spherical 3 x 3 mm,
- 1 Burr tear-drop 3 x 6 mm,
- 1 Burr round arc 3 x 12 mm,
- 1 Burr pointed arc 3 x 12 mm,
- 1 Burr flame-shaped 3 x 6 mm,
- 1 Burr round taper 3 x 12 mm,
- 1 Burr pointed taper 3 x 11 mm,
- 1 Burr angled 3 x 3 mm.

Set contents 44093 102

Serration 2

- of each 2 Burrs cylindrical 3 x 12 mm,
 - of each 2 Burrs helical 3 x 12 mm,
 - of each 2 Burrs spherical 3 x 3 mm,
 - of each 2 Burrs tear-drop 3 x 6 mm,
 - of each 2 Burrs round arc 3 x 12 mm,
- Serration 6
- of each 2 Burrs cylindrical 3 x 12 mm,
 - of each 2 Burrs helical 3 x 12 mm,
 - of each 2 Burrs spherical 3 x 3 mm,
 - of each 2 Burrs tear-drop 3 x 6 mm,
 - of each 2 Burrs round arc 3 x 12 mm.



44093 101

Contents	Serration	Type	44093	...
10-piece	2	in case		101
20-piece	2 und 6	in case		102

44096

Solid Carbide/Carbide Burr Set (Shank Ø 6 mm)

VHM

ATORN®

Type

Dimensions = Head Ø x head length mm.

Set contents 44096 101

Serration 3 (aluminium)

- 1 Burr cylindrical 12 x 25 mm,
- 1 Burr helical 12 x 25 mm,
- 1 Burr round arc 12 x 25 mm,
- 1 Burr round taper 12 x 28 mm.

Set contents 44096 104

Serration 6

- 1 Burr cylindrical 6 x 18 mm,
- 1 Burr helical 6 x 18 mm,
- 1 Burr spherical 6 x 6 mm,
- 1 Burr tear-drop 6 x 10 mm,
- 1 Burr round arc 6 x 18 mm,
- 1 Burr pointed arc 6 x 18 mm.

Set contents 44096 107

Serration 5

- 1 Burr cylindrical 12 x 25 mm,
- 1 Burr helical 12 x 25 mm,
- 1 Burr round arc 12 x 25 mm,
- 1 Burr pointed arc 12 x 25 mm,
- 1 Burr round taper 12 x 28 mm.

Set contents 44096 105

Serration 6

- 1 Burr cylindrical 12 x 25 mm,
- 2 Burrs helical 10 x 20 / 12 x 25 mm,
- 1 Burr spherical 12 x 12 mm,
- 1 Burr tear-drop 10 x 15 mm,
- 2 Burrs round arc 10 x 20 / 12 x 25 mm,
- 1 Burr pointed arc 10 x 20 mm.

Set contents 44096 102

Serration 6

- 1 Burr cylindrical 10 x 20 mm,
- 1 Burr helical 10 x 20 mm,
- 1 Burr round arc 10 x 20 mm,
- 1 Burr pointed arc 10 x 20 mm.

Set contents 44096 108

Serration 6

- 2 Burrs cylindrical 10 x 20 / 12 x 25 mm,
- 2 Burrs helical 10 x 20 / 12 x 25 mm,
- 1 Burr spherical 12 x 10 mm,
- 1 Burr tear-drop 10 x 16 mm,
- 1 Burr round arc 12 x 25 mm,
- 2 Burrs pointed arc 10 x 20 / 12 x 25 m,
- 1 Burr round taper 12 x 30 mm.

Set contents 44096 103

Serration 6

- 1 Burr cylindrical 12 x 25 mm,
- 1 Burr helical 12 x 25 mm,
- 1 Burr round arc 12 x 25 mm,
- 1 Burr pointed arc 12 x 25 mm.

Set contents 44096 106

Serration 6 TiAlN

- 1 Burr cylindrical 10 x 20 mm,
- 1 Burr helical 12 x 25 mm,
- 1 Burr round arc 12 x 25 mm,
- 1 Burr pointed arc 10 x 20 mm,
- 1 Burr round taper 12 x 28 mm.



44096 107



44096 105



44096 106

Contents	Serration	Coating	Type	44096	...
4-piece	(Al) 3	-	in case		101
5-piece	5	-	in case		107
4-piece	6	-	in case		102
4-piece	6	-	in case	#	103
6-piece	6	-	in case		104
8-piece	6	-	in case		105
10-piece	6	-	in case		108 NEW
5-piece	6	TiAlN	in case		106



Solid Carbide / Carbide Burrs

44102 - 44106

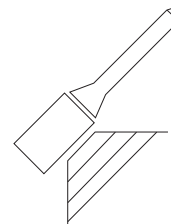
Solid Carbide / Carbide Burrs, Cylindrical (ZYA)

VHM

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44102 - 44106

Head Ø x -length mm	Shank Ø mm	Serration 2		Serration 3 (Al)		Serration 6	
		44102	...	44103	...	44106	...
3 x 14	3		102				102
6 x 5	3	#	103			#	103
6 x 12	3		104				104
6 x 18	6		106	#	106		106
8 x 20	6		107	#	107		107
10 x 20	6		109		109		109
12 x 25	6		113	#	113		113
15 x 25	6		114	#	114		114
15 x 25	8	#	121	#	121	#	121



44115 - 44117

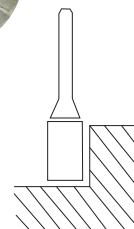
Solid Carbide / Carbide Burrs, Cylindrical (ZYA-S)

VHM

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With face-cutting serration.

Head Ø x -length mm	Shank Ø mm	Serration 5		Serration 6		Serration 6/TiAlN	
		44115	...	44116	...	44117	...
6 x 18	6				106		
8 x 20	6				107		
10 x 20	6				109		109
12 x 25	6		112		112		



44115 - 44117



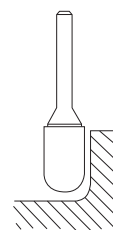
44122 - 44127

Solid Carbide / Carbide Burrs, Helical (WRC)

VHM

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Head Ø x -length mm	Shank Ø mm	Serration 2		Serration 3 (Al)		Serration 5		Serration 6		Serration 6/TiAlN	
		44122	...	44123	...	44125	...	44126	...	44127	...
2 x 11	3	#	101						101		
3 x 12	3		102						102		
6 x 12	3		104						104		
6 x 18	6		106		106				106		
8 x 20	6		107						107		
10 x 20	6		108	#	108				108		
12 x 25	6		111		111		111		111		111
15 x 25	6								113		
12 x 25	8								118		
15 x 25	8							#	120		



44122 - 44127



44132 - 44136

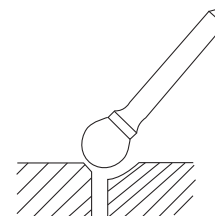
Solid Carbide / Carbide Burrs, Spherical (KUD)

VHM

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44132 - 44136

Head Ø x -length mm	Shank Ø mm	Serration 2		Serration 3 (Al)		Serration 6	
		44132	...	44133	...	44136	...
3 x 3	3		102				102
4 x 4	3		103				103
6 x 6	3		104				104
6 x 6	6		106				106
8 x 8	6		107				107
10 x 10	6	#	108		108		108
12 x 12	6		109	#	109		109
15 x 15	6		110	#	110		110



44142 - 44146

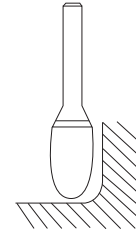
Solid Carbide / Carbide Burrs, Tear-Drop (TRE)

VHM

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Head Ø x -length mm	Shank Ø mm	Serration 2		Serration 3 (Al)		Serration 6	
		44142	...	44143	...	44146	...
3 x 6	3	#	101			#	101
6 x 10	3	#	102			#	102
6 x 10	6	#	103				103
8 x 15	6	#	104				104
10 x 15	6	#	105				105
12 x 20	6		106	#	106		106
15 x 25	6	#	107				107
15 x 25	8	#	111	#	111		

44142 - 44146



Abrasive Tools/
Separating Tools

44152 - 44157

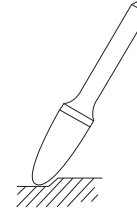
Solid Carbide / Carbide Burrs, Round Arc (RBF)

VHM

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Head Ø x -length mm	Shank Ø mm	Serration 2		Serration 3 (Al)		Serration 5		Serration 6		Serration 6/TiAlN	
		44152	...	44153	...	44155	...	44156	...	44157	...
3 x 8	3	#	101							101	
3 x 12	3		102							102	
6 x 12	3		103							103	
6 x 18	6		104							104	
8 x 20	6	#	105		#	105				105	
10 x 20	6		106		#	106				106	
12 x 25	6		108		108		108		108		# 108
15 x 25	6	#	110		#	110				110	
12 x 25	8		116		#	116			#	116	

44152 - 44157



44162 - 44167

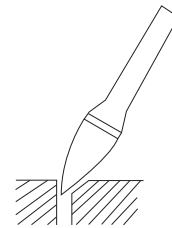
Solid Carbide / Carbide Burrs, Pointed Arc (SPG)

VHM

ATORN®

Head Ø x -length mm	Shank Ø mm	Serration 2		Serration 5		Serration 6		Serration 6/TiAlN	
		44162	...	44165	...	44166	...	44167	...
3 x 6	3	#	101					101	
3 x 12	3		102					102	
6 x 12	3		103					103	
6 x 18	6		104					104	
8 x 20	6	#	105					105	
10 x 20	6	#	106					106	106
12 x 25	6		108		108			108	
15 x 25	6		110			#		110	
12 x 25	8					#		116	

44162 - 44167



44172 - 44176

Solid Carbide / Carbide Burrs, Flame-Shaped (H)

VHM

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Head Ø x -length mm	Shank Ø mm	Serration 2		Serration 6	
		44172	...	44176	...
3 x 6	3		101		101
8 x 20	6	#	102		102
12 x 32	6		103		103
15 x 35	8		107	#	107

44172 - 44176



Solid Carbide / Carbide Burrs

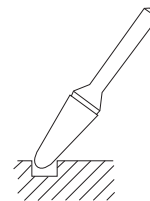
44182 - 44187

Solid Carbide / Carbide Burrs, Rounded Taper (KEL)

VHM

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44182 - 44187



Head Ø x -length mm	Shank Ø mm	Serration 2		Serration 3 (Al)		Serration 5		Serration 6		Serration 6/TiAIN	
		44182	...	44183	...	44185	...	44186	...	44187	...
3 x 12	3		101						101		
6 x 18	6	#	103						103		
10 x 26	6		105	#	105				105		
12 x 28	6		106	#	106		106		106		106
15 x 33	6	#	107	#	107				107		

44192 - 44196

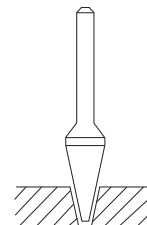
Solid Carbide / Carbide Burrs, Countersink (STM)

VHM

ATORN[®]

44192 - 44196

Head Ø x -length mm	Shank Ø mm	Serration 2		Serration 6	
		44192	...	44196	...
3 x 8	3		101	#	101
3 x 11	3		102		102
3 x 15	3		103		103
6 x 12	3		104		104
6 x 20	6		105		105
10 x 20	6		106		106
12 x 25	6	#	107		107
16 x 25	6	#	108		108



44202 - 44206

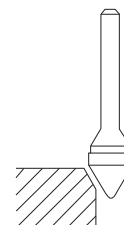
Solid Carbide / Carbide Burrs, Countersink 60° (KSJ)

VHM

ATORN[®]

44202 - 44206

Head Ø x -length mm	Shank Ø mm	Serration 2		Serration 6	
		44202	...	44206	...
3 x 2,5	3	#	101		101
6 x 4	6	#	102	#	102
10 x 8	6	#	103		103
12 x 11	6	#	104	#	104
15 x 14	6		105	#	105



44212 - 44216

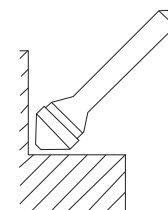
Solid Carbide / Carbide Burrs, Countersink 90° (KSK)

VHM

ATORN[®]

44212 - 44216

Head Ø x -length mm	Shank Ø mm	Serration 2		Serration 6	
		44212	...	44216	...
3 x 1,5	3	#	101		101
6 x 3	6	#	102		102
10 x 5	6		103		103
12 x 6	6	#	104		104
15 x 8	6		105		105



44222 - 44226

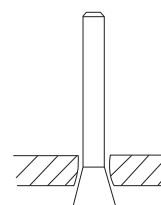
Solid Carbide / Carbide Angle Burrs (WKN)

VHM

ATORN[®]

44222 - 44226

Head Ø x -length mm	Shank Ø mm	Serration 2		Serration 6	
		44222	...	44226	...
3 x 4	3	#	101		101
6 x 6	3	#	102		102
10 x 10	6				104
12 x 12	6	#	105		





With PFERD carbide burrs materials of almost any strength can be machined. This is possible through the optimal match of tooth shape, number of teeth, angle of twist, angle of rake and concentricity. The precise concentricity of PFERD carbide burrs

- protects the operator's health during the work procedure,
 - reduces wear of the drive unit,
 - allows chatter-free work,
 - prevents chatter marks.
- The high dimensional stability of the carbide burrs enables
- use on robots and
 - multiple re-sharpenings.

Implementation principle:
The harder the material, the finer the serration.

Note:
Other dimensions and serrations, as well as carbide burrs with special shank shapes and -lengths and special serrations available on request.

Serration aluminium Serration 1 Serration 3 PLUS Serration 4 Serration 5



	Material groups	Processing case	Serration	Cutting speed
Steel and cast steel materials	Untempered, non heat-treated steels to 1200 N/mm ² (<38 HRC)	Construction steels, carbon steels, tool steels, unalloyed steels, case-hardened steels, cast steel	Coarse machining = high stock removal	1 600 - 900 m/min
				3PLUS 450 - 600 m/min
	Tempered, heat-treated steels over 1200 N/mm ² (>38 HRC)	Tool steels, tempered steels, alloy steels, cast steels	Coarse machining = high stock removal	3PLUS 250 - 350 m/min
				4 250 - 350 m/min
Stainless steels	Rust and acid-resistant steels	Austenitic and ferritic high-grade steels	Coarse machining = high stock removal	1 300 - 450 m/min
				3PLUS 250 - 350 m/min
		Fine machining e.g. deburring	4 250 - 350 m/min	
			5 350 - 450 m/min	
Non-ferrous metals	Soft non-ferrous metals	Al alloys, brass, copper, zinc	Coarse machining = high stock removal	Al 600 - 900 m/min
				1 600 - 900 m/min
	Hard non-ferrous metals	Bronze, titanium/titanium alloys, extremely hard Al alloys (high Si-proportion)	Coarse machining = high stock removal	4 250 - 350 m/min
	Materials with very high-temperature strength	Nickel-based alloys, Ni-Co alloys (jet engine and turbine construction)	Coarse machining = high stock removal	3PLUS 300 - 450 m/min
			Fine machining e.g. deburring	4 300 - 450 m/min
		5 350 - 500 m/min		
Cast iron materials		Grey cast iron, nodular graphite cast iron	Coarse machining = high stock removal	1 600 - 900 m/min
				3PLUS 450 - 600 m/min
Others / plastics		Fibre-reinforced thermoplastics and thermoset plastics, hard rubber	Coarse machining = high stock removal	Al 500 - 900 m/min
			Fine machining e.g. deburring	Al 500 - 900 m/min

Example:

Carbide burr, serration 3 PLUS, tool diameter 12 m. Coarse machining of untempered, non heat-treated steels.

Cutting speed: 450 - 600 m/min

Rotational speed range: 12,000 - 16, 000 rpm

Ø mm	Cutting speeds m/min							
	250	300	350	400	450	500	600	900
	rotational speed rpm							
2	40,000	48,000	56,000	64,000	72,000	80,000	95,000	143,000
3	27,000	32,000	37,000	42,000	48,000	53,000	64,000	95,000
4	20,000	24,000	28,000	32,000	36,000	40,000	48,000	72,000
6	13,000	16,000	19,000	21,000	24,000	27,000	32,000	48,000
8	10,000	12,000	14,000	16,000	18,000	20,000	24,000	36,000
10	8,000	10,000	11,000	13,000	14,000	16,000	19,000	29,000
12	7,000	8,000	9,000	11,000	12,000	13,000	16,000	24,000
16	5,000	6,000	7,000	8,000	9,000	10,000	12,000	18,000
20	4,000	5,000	6,000	6,000	7,000	8,000	10,000	14,000
25	3,000	4,000	4,000	5,000	6,000	6,000	8,000	11,000

Abrasive Tools/
Separating Tools



Carbide Burrs

44233

Sets of Burrs, Carbide Quality (Shank Ø 3 mm)

HM



Type
Dimensions = Head Ø x head length mm.

Set contents

- 4 Burrs cylindrical 2 x 10 / 3 x 13 / 6 x 7 / 6 x 13 mm,
- 1 Burr flame-shaped 3 x 7 mm,
- 2 Burrs helical 2 x 10 / 3 x 13 mm,
- 1 Burr angled 3 x 7 mm,
- 2 Burrs tear-drop 3 x 7 / 6 x 10 mm,
- 1 Burr spherical 4 x 3 mm,
- 1 Burr pointed taper 6 x 13 mm,
- 2 Burrs round arc 3 x 7 / 6 x 13 mm,
- 1 Burr pointed arc 3 x 7.



44233

Contents	Serration	Type	44233	...
15-piece	5	in transparent box		101

44234

Sets of Burrs, Carbide Quality (Shank Ø 6 mm)

HM



Type
High chip removal capacity thanks to aggressive teeth geometry, long service life.
Dimensions = Head Ø x head length mm.

Use
For structural steel, structural steel, non-ferrous metals For quick, aggressive metal cutting applications on surfaces and in solid stock. Special gripping

capacity in edge use, e.g. when deburring. Exceptionally well suited for working on welds.

Set contents

- 2 Burrs cylindrical 6 x 16 / 12 x 25 mm,
- 2 Burrs spherical 10 x 9 / 12 x 10 mm,
- 2 Burrs helical 6 x 18 / 12 x 25 mm,
- 2 Burrs pointed arc 6 x 18 / 12 x 25 mm,
- 1 Burr round arc 6 x 18 mm,
- 1 Burr round taper 12 x 30 mm.



44234

Contents	Serration	Cutting speed m/min	Type	44234	...
10-piece	Combi cut	450 - 700	in plastic box		101

44238 - 44240

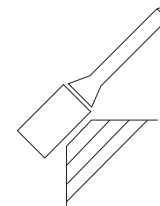
Carbide Burrs, Cylindrical (ZYA)

HM



ISO 7755/2+DIN 8033-2.

Head Ø x -length mm	Shank Ø mm	Total length mm	Serration 3 Plus		Serration 4		Serration 5	
			44238	...	44239	...	44240	...
6 x 16	6	55		106		106	#	106
8 x 20	6	60		107	#	107		
10 x 20	6	60	#	109		109		
12 x 25	6	65		111	#	111		
16 x 25	6	65	#	113	#	113		



44238 - 44240

44243 - 44245

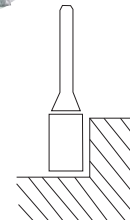
Carbide Burrs, Cylindrical (ZYA-S)

HM



ISO 7755/2+DIN 8033-2.
With face-cutting serration.

Head Ø x -length mm	Shank Ø mm	Total length mm	Serration 3 Plus		Serration 5		
			44243	...	44245	...	
2 x 10	3	40		101	#	101	
3 x 13	3	43		102		102	
4 x 13	6	55		#	103	#	103
6 x 13	3	43		105		105	
6 x 16	6	55		106		106	
8 x 20	6	60		107			
10 x 20	6	60		109			
12 x 25	6	65		111			



44243 - 44245

44250 - 44252

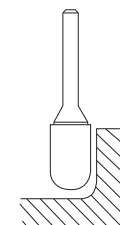
Carbide Burrs, Helical (WRC)

HM



ISO 7755/3+DIN 8033-3.

Head Ø x -length mm	Shank Ø mm	Total length mm	Serration 3 Plus		Serration 4		Serration 5	
			44250	...	44251	...	44252	...
2 x 10	3	40	#	101	#	101		
3 x 13	3	43		102		102		102
6 x 13	3	43		104	#	104	#	104
6 x 16	6	55		105		105	#	105
8 x 20	6	60		107	#	107		
10 x 20	6	60		109		109		
12 x 25	6	65		113		113		



44250 - 44252

Abrasive Tools / Separating Tools

44257 - 44259

Carbide Burrs, Spherical (KUD)

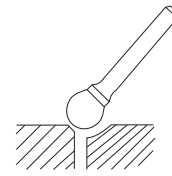
HM



ISO 7755/4+DIN 8033-8.

Head Ø x -length mm	Shank Ø mm	Total length mm	Serration 3 Plus		Serration 4		Serration 5	
			44257	...	44258	...	44259	...
3 x 2	3	33			101	#	101	
4 x 3	3	34			102	#	102	#
6 x 5	3	35			104	#	104	
6 x 5	6	45	#		105	#	105	
8 x 7	6	47			106	#	106	#
10 x 9	6	49	#		107	#	107	
12 x 10	6	51	#		108	#	108	

44257 - 44259



44263 - 44265

Carbide Burrs, Round Arc (RBF)

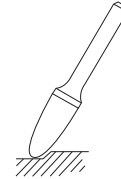
HM



DIN 8033-10.

Head Ø x -length mm	Shank Ø mm	Total length mm	Serration 3 Plus		Serration 5	
			44263	...	44265	...
6 x 13	3	43			102	102

44263 - 44265



44268 - 44270

Carbide Burrs, Pointed Arc (SPG)

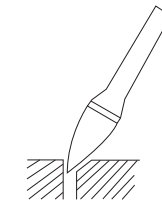
HM



ISO 7755/7+DIN 8033-9.

Head Ø x -length mm	Shank Ø mm	Total length mm	Serration 3 Plus		Serration 4		Serration 5	
			44268	...	44269	...	44270	...
3 x 13	3	43			102	#	102	102
6 x 13	3	43			103		103	103
6 x 18	6	55			104	#	104	104
10 x 20	6	60	#		105	#	105	
12 x 25	6	65	#		107	#	107	
16 x 25	6	70	#		111	#	111	

44268 - 44270



44272 - 44273

Carbide Burrs, Flame-Shaped (B)

HM

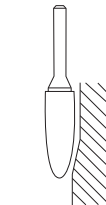


Serration 3 Plus

Serration 5

Head Ø x -length mm	Shank Ø mm	Total length mm	Serration 3 Plus		Serration 5	
			44272	...	44273	...
6 x 13	3	43				102
12 x 30	6	70			104	

44272 - 44273



44283 - 44285

Carbide Burrs, Pointed Taper (STM)

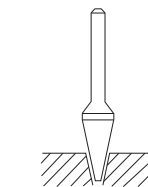
HM



ISO 7755/11+DIN 8033-4.

Head Ø x -length mm	Shank Ø mm	Total length mm	Serration 3 Plus		Serration 5	
			44283	...	44285	...
6 x 13	3	43			103	103
6 x 18	6	55			104	104
10 x 20	6	60			105	
12 x 25	6	65			106	

44283 - 44285



44289

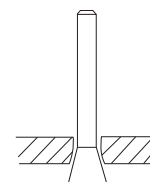
Carbide Angle Burrs (WKN)

HM

ISO 7755/12+DIN 8033-7.
With face-cutting serration.

Head Ø x -length mm	Shank Ø mm	Total length mm	Serration 5	
			44289	...
3 x 7	3	37		101

44289





44293 - 44294 Carbide Burrs for GRP and CFRP



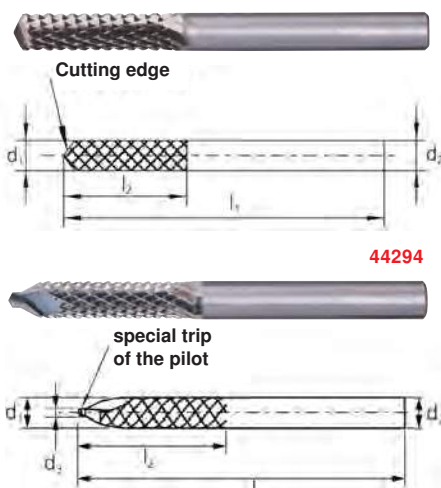
Use
 For the processing of
 - GRP (glass-fibre reinforced plastics)
 - CFRP (carbon-fibre reinforced plastics)

Serration FVK
 Coarse metal cutting applications = high stock removal
 Preferred for edging and contour milling of fibre-reinforced plastics GRP and CFRP, suitable for hard rubber and thermoplastics. Can be used on machine tools and manual implementation due to the high concentricity.

Serration FVKS
 Fine machining = less material removal
 Similar to serration FVK. Due to the special tooth design, suitable for use on machines and robots with high feed rates, quite milling behaviour, generates a smooth cut edge.

44293
Use
 The special **cutting edge of the drill bit (BS)** enables plunging into solid material, i.e. drilling and milling in one work step.

44294
Use
 The special **tip of the pilot drill bit (ZBS)** enables plunging into solid material, i.e. drilling and milling in one work step. It is especially suited for manual use. The tip of the pilot drill bit allows safe pre-drilling under virtually all surface conditions.



Serration	d ₂ mm	d ₃ mm	d ₁ x l ₂ mm	l ₁ mm	speed RPM at 500 m/min*	speed RPM at 900 m/min*	with BS 44293	...	with ZBS 44294	...
FVK	6	-	6 x 25	65	27.000	48.000	#	101		
FVK	6	2,5	6 x 30	65	27.000	48.000			#	101
FVK	8	-	8 x 25	65	20.000	36.000	#	102		
FVK	8	3,0	8 x 30	65	20.000	36.000			#	102
FVKS	6	-	6 x 25	65	27.000	48.000	#	201		
FVKS	6	2,5	6 x 30	65	27.000	48.000			#	201
FVKS	8	-	8 x 25	65	20.000	36.000	#	202		
FVKS	8	3,0	8 x 30	65	20.000	36.000			#	202

*Cutting speed

44299 Extensions for drive spindles



Use
 - With spindle extensions, the shanks of grinding and milling tools can be extended
 - They enable use on hard-to-reach places
 - The extension for drive spindles is clamped into the collet of the machine (compressed air or electric drive) or into the handpiece of the flexible shaft
 - Spindle extensions are an economical alternative to special manufacturing of burrs and grinding points with long shaft

Safety advice:
Attention! When using spindle extensions, the relevant safety regulations and the accident prevention regulations must be complied with.
 For tasks with large shaft lengths it is strictly necessary to introduce the tool into the workpiece (e.g. bores, tubes, channels or grooves) before switching on the drive unit. Under no circumstances should the extension with tool run free outside of the workpiece.

There is increased danger if this instruction is not complied with! Under unfavourable boundary conditions there is a possibility of snapping off the extension with clamped in tool. **The extension is only for suitable for manual use** in conjunction with suitable compressed air/electrical drive units or flexible shaft handpieces for tools with **standard shanks**. In combination with a appropriate tool that is approved for the speed, it is accommodated in the chatter-free collet of the devices. It must not be clamped in on the transition radius under any circumstances.
The clamping in of a second extension or of tools with over-long shanks is prohibited.



Max. permissible speed RPM	Trunnion mount (motor/handpiece) Ø mm	Tool-receptacle mm	total-length mm	Trunnion mount Length mm	Spindle Ø max. mm	incl. collet chuck Ø mm	44299	...
44.000	8	3	78	30	9,5	3	#	101
20.000	SPG 6	6	104	Special	12,0	6	#	102
20.000	8	6	120	30	12,0	6	#	103
20.000	SPG 6	6	129	Special	12,0	6	#	104
20.000	8	6	144	30	12,0	6	#	105
10.000	6	3	150	30	11,5	-	#	106
10.000	8	6	150	30	13,5	-	#	107

