HSS SMART STEP stepped twist drill bit

Stepped drill bit with unique SMART STEP technology and dynamically curved rake between the individual step transitions for extremely fast and comfortable use in all common materials with a material thickness of up to 3.5 mm.

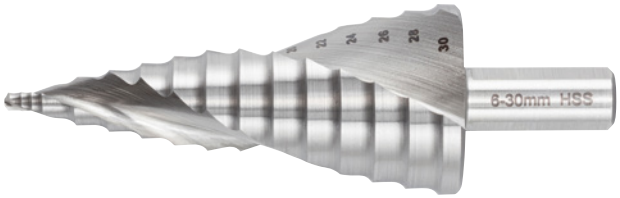

Illustration only

Dynamically curved rake between each step transition

- Significantly longer service life compared to conventional stepped drill bits
- Significantly faster drilling compared to conventional stepped drill bits
- Little effort required
- Quiet, perfectly controlled drilling process
- Greatly reduced formation of burrs

SMART STEP technology

- Up to 3x faster drilling compared to conventional stepped drill bits
- Precision drilling without centring or centre punching
- No warping of sheet metal
- Easy to drill holes or enlarge an existing drill hole
- No rattling or catching in the material
- Precise, circular drilling without tearing or splintering

Deep ground spiral groove

Excellent chip removal

3-flat shank

- No spinning in the drill chuck: faster, more comfortable working
- Optimal power transmission
- Protects the drill chuck from damage
- Little effort required to open and close the drill chuck

Sustainable product packaging made of 100 % PCR (recycled plastic from household waste), 100 % recyclable and Cradle to Cradle Certified® Bronze

Available exclusively from Würth

Surface	Uncoated
Material to be processed	Steel, Cast metal, Non-ferrous metal, Plastic, Wood

Min./max. drill diameter	Shank diameter	Shaft length	Length	Shank style	Art. no.	P. Qty.
3.5-20 mm	1/4 in	26 mm	73.5 mm	Hexagon bit holder, shape E, DIN3126	**0694 450 421**	1

CI01_7501031225, Rev: 0.60, State: 27. 10. 2023

Min./max. drill diameter	Shank diameter	Shaft length	Length	Shank style	Art. no.	P. Qty.
4-20 mm	8 mm	24 mm	71.5 mm	3-face shank	**0694 450 420**	1
4-12 mm	6 mm	24 mm	67.5 mm	3-face shank	**0694 450 412**	1
6-39 mm	10 mm	24 mm	97 mm	3-face shank	**0694 450 639**	1
6-37 mm	10 mm	24 mm	95.5 mm	3-face shank	**0694 450 637**	1
6-30 mm	10 mm	24 mm	97 mm	3-face shank	**0694 450 630**	1
6.5-40.5 mm	10 mm	24 mm	125 mm	3-face shank	**0694 450 640**	1

Art. no.	Number of steps	Diameter of the drilling area [mm]
0694450412	9	4.0/5.0/6.0/7.0/8.0/9.0/10.0/11.0/12.0
0694450420	9	4.0/6.0/8.0/10.0/12.0/14.0/16.0/18.0/20.0
0694450421	9	4.0/6.0/8.0/10.0/12.0/14.0/16.0/18.0/20.0
0694450630	13	6.0/8.0/10.0/12.0/14.0/16.0/18.0/20.0/22.0/24.0/26.0/28.0/30.0
0694450639	12	6.0/9.0/12.0/15.0/18.0/21.0/24.0/27.0/30.0/33.0/36.0/39.0
0694450640	16	6.5/8.5/10.5/12.5/14.5/16.5/18.5/20.5/23.5/25.5/28.0/30.5/32.5/35.5/38.5/40.5
0694450637	12	6.0/9.0/12.5 (PG7)/15.2 (PG9)/18.6 (PG11)/20.4 (PG13.5)/22.5 (PG16)/26.0/28.3 (PG21)/30.5/34.0/37.0 (PG29)

Cutting values

For dia. 4.0-12.0 and dia. 4.0-20.0						
Material designation	**Tensile strength**	**v_c**	**n**			
			dia. 4.0-12.0 art. 0694450412		**dia. 4.0-20.0 art. 0694450421**	
			Drilling (1st drilling step)	**to**	**Drilling (1st drilling step)**	**to**
Steels						
General structural steels	≤ 700 N/mm²	23	1800	600	1800	360
Unalloyed quenched and tempered steels	≤ 700 N/mm²	23	1800	600	1800	360
	≤ 900 N/mm²	19	1500	500	1500	300
Low-alloy quenched and tempered steels	≤ 700 N/mm²	23	1800	600	1800	360
	≤ 900 N/mm²	19	1500	500	1500	300
Alloyed quenched and tempered steel	≤ 1,200 N/mm²	18	1400	470	1400	280
Nitriding steels	≤ 1,200 N/mm²	18	1400	470	1400	280
Tool steels	≤ 850 N/mm²	18	1400	470	1400	280
High-speed steels	≤ 1,200 N/mm²	18	1400	470	1400	280
Cast metals						
Cast iron	≤ 350 HB	15	1200	400	1200	250
Spheroidal graphite and malleable iron	≤ 350 HB	15	1200	400	1200	250
Non-ferrous metals						
Aluminium	≤ 450 N/mm²	22	1700	580	1700	350
Aluminium alloys	≤ 450 N/mm²	22	1700	580	1700	350
Low-alloy copper	≤ 400 N/mm²	19	1500	500	1500	300
Short-chipping brass	≤ 850 N/mm²	22	1700	580	1700	350

Cutting values

For dia. 4.0-12.0 and dia. 4.0-20.0						
Material designation	**Tensile strength**	**v_c**	**n**			
			dia. 4.0-12.0 art. 0694450412		**dia. 4.0-20.0 art. 0694450421**	
			Drilling (1st drilling step)	**to**	**Drilling (1st drilling step)**	**to**
Long-chipping brass	≤ 850 N/mm²	22	1700	580	1700	350
Plastics						
Thermosetting plastics		19	1500	500	1500	300
Thermoplastic plastics		19	1500	500	1500	300

Cutting values

For dia. 6.0-30.0 and dia. 6.0-37.0						
Material designation	**Tensile strength**	**v_c**	**n**			
			dia. 6.0-30.0 art. 0694450630		**dia. 6.0-37.0 art. 0694450637**	
			Drilling (1st drilling step)	**to**	**Drilling (1st drilling step)**	**to**
Steels						
General structural steels	≤ 700 N/mm²	23	1200	240	1200	200
Unalloyed quenched and tempered steels	≤ 700 N/mm²	23	1200	240	1200	200
	≤ 900 N/mm²	19	1000	200	1000	150
Low-alloy quenched and tempered steels	≤ 700 N/mm²	23	1200	240	1200	200
	≤ 900 N/mm²	19	1000	200	1000	150
Alloyed quenched and tempered steel	≤ 1,200 N/mm²	18	950	190	950	150
Nitriding steels	≤ 1,200 N/mm²	18	950	190	950	150
Tool steels	≤ 850 N/mm²	18	950	190	950	150
High-speed steels	≤ 1,200 N/mm²	18	950	190	950	150
Cast metals						
Cast iron	≤ 350 HB	15	1000	150	1000	120
Spheroidal graphite and malleable iron	≤ 350 HB	15	1000	150	1000	120
Non-ferrous metals						
Aluminium	≤ 450 N/mm²	22	1200	230	1200	190
Aluminium alloys	≤ 450 N/mm²	22	1200	230	1200	190
Low-alloy copper	≤ 400 N/mm²	19	1000	200	1000	150
Short-chipping brass	≤ 850 N/mm²	22	1200	230	1200	190
Long-chipping brass	≤ 850 N/mm²	22	1200	230	1200	190
Plastics						
Thermosetting plastics		19	1000	200	1000	150
Thermoplastic plastics		19	1000	200	1000	150

Cutting values

For dia. 6.0-39.0 and dia. 6.0-40.5						
Material designation	**Tensile strength**	**v_c**	**n**			
			dia. 6.0-39.0 art. 0694450639		**dia. 6.0-40.5 art. 0694450640**	
			Drilling (1st drilling step)	**to**	**Drilling (1st drilling step)**	**to**
Steels						
General structural steels	≤ 700 N/mm²	23	1200	190	1200	180
Unalloyed quenched and tempered steels	≤ 700 N/mm²	23	1200	190	1200	180
	≤ 900 N/mm²	19	1000	150	1000	150
Low-alloy quenched and tempered steels	≤ 700 N/mm²	23	1200	190	1200	180
	≤ 900 N/mm²	19	1000	150	1000	150
Alloyed quenched and tempered steel	≤ 1,200 N/mm²	18	950	140	950	140
Nitriding steels	≤ 1,200 N/mm²	18	950	140	950	140
Tool steels	≤ 850 N/mm²	18	950	140	950	140
High-speed steels	≤ 1,200 N/mm²	18	950	140	950	140
Cast metals						
Cast iron	≤ 350 HB	15	1000	120	1000	120
Spheroidal graphite and malleable iron	≤ 350 HB	15	1000	120	1000	120
Non-ferrous metals						
Aluminium	≤ 450 N/mm²	22	1200	180	1200	170
Aluminium alloys	≤ 450 N/mm²	22	1200	180	1200	170
Low-alloy copper	≤ 400 N/mm²	19	1000	150	1000	150
Short-chipping brass	≤ 850 N/mm²	22	1200	180	1200	170
Long-chipping brass	≤ 850 N/mm²	22	1200	180	1200	170
Plastics						
Thermosetting plastics		19	1000	150	1000	150
Thermoplastic plastics		19	1000	150	1000	150

Key
v_c = cutting speed [m/min]
n = rotation speed [rpm]
The suggested cutting values are reference values and must be adapted to the respective conditions.

Details/Application

- The ideal tool for machining sheet metal.
- Centring, spot drilling, boring and deburring of sheet metal, tubes and profiles in one operation, for use on both hand drills and stationary equipment.
- Ideal for use in electrical trade, plumbing and heating systems, automotive workshops, mechanical engineering, switch cabinet manufacturing or container and equipment engineering.

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Instructions

- Ensure that there is sufficient coolant/lubricant
- Observe the rotation speed table
- Do not push during boring. The stepped drill bit automatically retracts into the sheet metal

Related products	Art. no.
Drilling and cutting foam CUT+COOL	**0893 050 007**
CUT+COOL Perfect drilling and cutting oil	**0893 050 008**
Cut and Cool Perfect drilling/cutting paste	**0893 050 010**

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