

Tungsten-carbide burrs

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Product line marking

The product lines are illustrated by star symbols at the top of the table; please refer to page **14** and **15**.



Technical Information



Quality

LUKAS carbide burrs are manufactured using high quality types of carbide and modern CNC automatic grinding machines in order to guarantee precision and repeatability of angle, profile and twist. Carbide burrs manufactured to your drawings or details assist in solving your particular stock removal problem.

Application

The best results are obtained by selecting the recommended cut and speed. Please refer to the cutting speeds in the table on page **21** or to the table illustrating the various cuts on page **21**.

Power tools

Electric and pneumatic power tools are used; the bearings should be in good condition and the collets running true. Vibration and chatter will cause premature wear and tooth breakage. High pressure will reduce tool life and decrease tool efficiency.

Shanks

For safety reasons the largest possible shank diameter should always be selected from the table. Other shank diameters and lengths are available on request. A selection of burrs with extra long shanks appears on page **37** and **38**.

Robot application

LUKAS tungsten carbide burrs are precision tools, and have produced excellent results when used in conjunction with industrial robots. We can also develop the optimal burr for your particular application.

Coatings

The reasons for producing cutting tools with hard coatings such as TiN, TiCN, TiALN and LTE are as follows:

- to increase tool life
- to reduce machining forces
- to improve chip removal

The increase in tool life is mainly the result of the considerably higher surface hardness of the coating in comparison to the base material of the tool itself. In addition, due to the high chemical stability, it minimizes the reaction between the cutting edge of the tool and the chip to be removed. The reduction of machining forces and the improvement in chip removal are achieved through a reduction in the friction between the free cutting zone of the tool and workpiece on the one hand, and the cutting edge of the tool and the chip removed on the other. The reduction in friction depends on the coating improving the surface finish and as previously described by largely avoiding any chemical reaction. Our engineers would be pleased to help you in the selection of the correct coating. Please note the different possibilities on page **22**.

Special tools

Tungsten carbide burrs manufactured to your design or drawing guarantee the LUKAS high quality standard, and can therefore assist in solving your particular machining problem.

Packaging

We use plastics-packaging; please select the respective packing unit from our product lists.

Recommendations for use

Select the cut to suit the material to be machined. Please kindly follow the principle: **The harder the material, the finer the cut!** The correct selection of speed is the basis of achieving optimum machining results and long tool-life; please refer to the adjoining table. On the following pages you will find some assistance to choose the right speed for your process. Use the highest possible speed within the indicated area. Too low a speed results in vibration, chipping and premature wear! Reduce the speed of the burrs only when using in large arc angles or when using on low heat conducting materials.

Never let the shank and head change their colour to blue. For safety reasons, extended shanks should also be run at low speed. The power of your machine should be compatible with the machining process. A reduction in RPM due to lack of power – particularly common with pneumatic tools – should be avoided.

Collets must run true. Run-out and vibration will result in chipping and premature wear.

For the same reasons, take care that the machine bearings are in perfect condition. To avoid vibration and shank breakage, select the shortest shank overhang possible.

Materials and shapes

Tungsten-carbide burrs for the use on:

| Application | Cut | | | Page |
|--|-----|--------|---------------------|------|
| Stationary machines | | Z7 | TiAlN coating | 23 |
| Inox and Steel | | Z42 | Inox/Steel | 24 |
| Steel | | Z7 | Steel | 25 |
| Aluminium | | Z9 | Alu | 27 |
| Grey cast iron | | | Cast | 28 |
| Lightweight construction and plastic materials | | | Composite | 30 |
| Wood and pattern construction materials | | | Wood | 32 |
| Fine surfaces | | ZF 1-3 | Rotery files | 33 |
| Precision components | | - | Miniature Burrs | 34 |
| Pattern construction materials | | Z5 | Small Burrs | 35 |
| difficult to access areas | | - | extra-long shank | 37 |
| High-Speed-Cutting | | - | Single cutting edge | 39 |

Tungsten-carbide burrs with the shape:

| Shape | | Shape | | Page |
|--------------------------------------|--|-------|---------|------|
| Cylindrical | | ZYA | 7755/2 | 40 |
| Cylindrical round nose | | WRC | 7755/3 | 43 |
| Spherical | | KUD | 7755/4 | 46 |
| Oval | | TRE | 7755/5 | 49 |
| Arch round nose | | RBF | 7755/6 | 50 |
| Arch pointed nose | | SPG | 7755/7 | 52 |
| Flame | | - | 7755/8 | 54 |
| Internal | | - | - | 54 |
| Counter sink | | KSJ | 7755/9 | 55 |
| Conical round nose | | KEL | 7755/10 | 55 |
| Conical pointed nose | | SKM | 7755/11 | 57 |
| Inverted cone | | WKN | 7755/12 | 58 |
| Burrs for radius trimming (external) | | - | - | 59 |
| Burrs for radius trimming (internal) | | - | - | 60 |
| Tool-Set | | - | - | 61 |
| Power Tools | | - | - | 369 |

Three steps to your optimum burr:



- 1 Select the **material** and **machining mode** (coarse to fine) from the table and
- 2 read off the recommended **cut** and **cutting speed**.
- 3 Determine the appropriate speed for your power tool in the second table.

Recommendations for use of tungsten carbide burrs

| 1 | | | 2 | | |
|---------------------|---|-------------------------------|----------------|--------------------------------------|---|
| Material | LUKAS material group (see also fold-out tab) | Strength [N/mm ²] | Machining | Cut | Recommended cutting speed v_c [m/min] |
| Steel, cast steel | 1 Steel and cast steel | < 800 | coarse | Z3, Z7 Steel, ZX | 500–700 |
| | | | medium | Z5, Z42 Inox/Steel | 300–500 |
| | | | fine | ZF3 | 500–700 |
| | 2 Alloyed / hardened & tempered steels | 800 to 1200 | coarse | Z7 Steel, ZX | 400–600 |
| | | | medium | Z5 | 300–400 |
| | | | fine | ZF3 | 400–600 |
| | 3 Tool Steels | > 1200 | coarse | Z7 Steel, Z4 | 300–500 |
| | | | medium | Z5 | 300–400 |
| | | | fine | ZF3 | 400–600 |
| Stainless steel | 4 Rust / acid / heat-resistant steel and cast steel | to 800 | coarse | Z2, Z6 | 400–500 |
| | | | medium | Z3, Z7 Steel, Z4, Z5, Z42 Inox/Steel | 300–500 |
| | | | fine | ZF3 | 400–600 |
| Cast metal | 5 Cast iron | 150 to 300 | coarse | Cast, Z6 | 400–600 |
| | | | medium | Z7 Steel | 300–500 |
| | 300 to 450 | coarse | Cast, Z7 Steel | 300–500 | |
| | | medium | Z5 | 300–500 | |
| | | fine | ZF3 | 400–700 | |
| | | | | | |
| Non-ferrous metal 1 | 6 Aluminium, magnesium and copper alloys | to 450 | coarse | Z9 Alu | 600–1000 |
| | | | medium | Z1 | 500–900 |
| | Brass, bronze, titanium | to 450 | coarse | Z9 Alu, Z1 | 400–800 |
| | | | medium | Z2 | 400–600 |
| | | up to 450 | fine | ZF3 | 500–600 |
| | | | | | |
| Non-ferrous metal 2 | 7 Titanium and nickel alloys | to 900 | coarse | Z6 | 300–500 |
| | | | medium | Z7 Steel | 300–400 |
| | | | fine | ZF3 | 500–700 |
| | | 900 to 1500 | coarse | Z4 | 300–400 |
| | medium | | Z5 | 400–500 | |
| | fine | | ZF3 | 400–600 | |
| | | | | | |
| | Plastics and wood | 8 Plastic / wood / rubber | 20 to 400 | coarse | Composite, Z1, Z9 Alu |
| fine | | | | Composite, Wood | 500–900 |
| 400 to 1000 | | | coarse | Composite, Z1 | 500–800 |
| | | | fine | Composite, Z2, Wood | 400–800 |

Tip: Page 19 contains a complete overview of the shapes for your chosen milling tool.

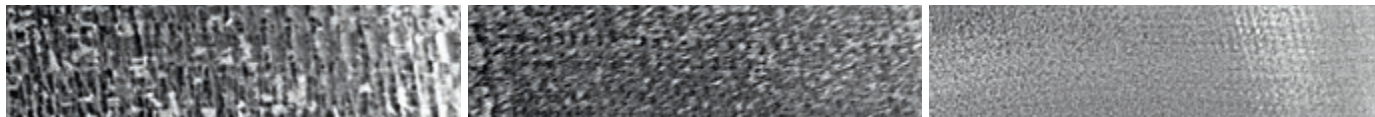
Machining



coarse

medium

fine



Rotational speeds for milling tools

based on the tool diameter and cutting speed





| 3 | | | | | | | | | |
|---|-------|--------------------------|--------|--------|--------|---------|---------|---------|---------|
| Recommended cutting speed v_c [m/min] | | | | | | | | | |
| | | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 |
| | | Rotational speed [min-1] | | | | | | | |
| Tool diameter [mm] | 2 | 48.000 | 64.000 | 80.000 | 95.000 | 111.000 | 127.000 | 143.000 | 159.000 |
| | 3 | 32.000 | 42.000 | 53.000 | 64.000 | 74.000 | 85.000 | 95.000 | 106.000 |
| | 4 | 24.000 | 32.000 | 40.000 | 48.000 | 56.000 | 64.000 | 72.000 | 80.000 |
| | 6 | 16.000 | 21.000 | 27.000 | 32.000 | 37.000 | 42.000 | 48.000 | 53.000 |
| | 8 | 12.000 | 16.000 | 20.000 | 24.000 | 28.000 | 32.000 | 36.000 | 40.000 |
| | 10 | 10.000 | 13.000 | 16.000 | 19.000 | 22.000 | 25.000 | 29.000 | 32.000 |
| | 12 | 8.000 | 11.000 | 13.000 | 16.000 | 19.000 | 21.000 | 24.000 | 27.000 |
| | 16 | 6.000 | 8.000 | 10.000 | 12.000 | 14.000 | 16.000 | 18.000 | 20.000 |
| 20 | 5.000 | 6.000 | 8.000 | 10.000 | 11.000 | 13.000 | 14.000 | 16.000 | |

Cuts

| | | | | | |
|--|----------------|---|--|------------------------|---|
| | Z 9 Alu | Very coarse single cut with faceting for soft materials | | Z 42 Inox/Steel | Robust faceted toothing for steel and stainless steel |
| | Z 1 | Coarse cut for soft materials | | Z 4 | Fine cross cut for hard materials |
| | Z 2 | Robust single cut for high stock removal | | Z 6 | Fine cross cut for hard materials |
| | Z 3 | Medium single cut | | Z 7 Steel | Medium cross cut |
| | Z 5 | Very fine single cut for high-quality surfaces | | Cast | Fine cross cut especially to machine the inside of the bore |
| | Z F | Very fine cross cut | | Com-posite | Cross cut for machining plastic |
| | Wood | Rasp cut for pattern construction | | Z X | Universal cross cut for practically every application |

Coatings



| Coatings | Specification (LUKAS) | Properties | Friction on steel (dry) |
|---|---|--|-------------------------|
|  | TiN (Titanium nitride) | general purpose coating for steel and cast iron, high toughness | 0,65–0,70 µm |
|  | TiCN (Titanium carbon nitride) | wear-resistant coating for fine deburring process. Suited to applications with higher thermal and shock loads. | 0,10–0,20 µm |
|  | TiAlN (Titanium aluminium nitride (see page 23)) | high performance coating with a high degree of hardness and low heat conductivity; therefore suitable for high thermal and mechanical applications | 0,30–0,35 µm |
|  | LTE (hard coating carbon-based) | Special coating with lotus-effect for long chip and smearing non-ferrous metals, particularly aluminium alloys. Excellent sliding friction properties reducing loading on cutting edges. | 0,10–0,20 µm |

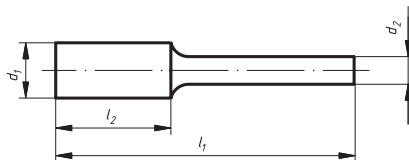
The reasons for producing cutting tools with hard coatings are as follows:

- to increase tool life
- to reduce machining forces
- to improve chip removal

Tungsten-carbide burrs with TiAlN-coating*



★★★



Ordering example: A10010616608TIAL1

Further dimensions, cuts and shank lengths on request.



PG 1

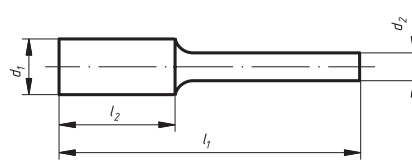
| Product number | Description | Shape | Cut | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for | | | | | | | | |
|-------------------|--------------|----------|----------|-------------------|-------------------|-------------------|-------------------|-------------------------|---|---|---|---|---|---|---|---|
| | | | | | | | | Information on page 438 | | | | | | | | |
| A10010616608TIALN | HFA 0616.06 | | Z7 Steel | 6 | 16 | 6 | 50 | 1 | 2 | 3 | 5 | 7 | | ■ | 1 | |
| A10010820608TIALN | HFA 0820.06 | | Z7 Steel | 8 | 20 | 6 | 60 | 1 | 2 | 3 | 5 | 7 | | ■ | 1 | |
| A10011020608TIALN | HFA 1020.06 | | Z7 Steel | 10 | 20 | 6 | 60 | 1 | 2 | 3 | 5 | 7 | | ■ | 1 | |
| A10010616608TIAL1 | HFAS 0616.06 | | Z7 Steel | 6 | 16 | 6 | 50 | 1 | 2 | 3 | 5 | 7 | | ■ | 1 | |
| A10010820608TIAL1 | HFAS 0820.06 | | Z7 Steel | 8 | 20 | 6 | 60 | 1 | 2 | 3 | 5 | 7 | | ■ | 1 | |
| A10011020608TIAL1 | HFAS 1020.06 | | Z7 Steel | 10 | 20 | 6 | 60 | 1 | 2 | 3 | 5 | 7 | | ■ | 1 | |
| A10011225608TIAL1 | HFAS 1225.06 | | Z7 Steel | 12 | 25 | 6 | 65 | 1 | 2 | 3 | 5 | 7 | | ■ | 1 | |
| A10020616608TIALN | HFC 0616.06 | | Z7 Steel | 6 | 16 | 6 | 50 | 1 | 2 | 3 | 5 | 7 | | ■ | 1 | |
| A10020820608TIALN | HFC 0820.06 | | Z7 Steel | 8 | 20 | 6 | 60 | 1 | 2 | 3 | 5 | 7 | | ■ | 1 | |
| A10021020608TIALN | HFC 1020.06 | | Z7 Steel | 10 | 20 | 6 | 60 | 1 | 2 | 3 | 5 | 7 | | ■ | 1 | |
| A10021225608TIALN | HFC 1225.06 | | Z7 Steel | 12 | 25 | 6 | 65 | 1 | 2 | 3 | 5 | 7 | | ■ | 1 | |
| A10030606608TIALN | HFD 0605.06 | | Z7 Steel | 6 | 5 | 6 | 50 | 1 | 2 | 3 | 5 | 7 | | ■ | 1 | |
| A10030808608TIALN | HFD 0807.06 | | Z7 Steel | 8 | 7 | 6 | 47 | 1 | 2 | 3 | 5 | 7 | | ■ | 1 | |
| A10031010608TIALN | HFD 1009.06 | | Z7 Steel | 10 | 9 | 6 | 49 | 1 | 2 | 3 | 5 | 7 | | ■ | 1 | |
| A10031210608TIALN | HFD 1210.06 | | Z7 Steel | 12 | 10 | 6 | 50 | 1 | 2 | 3 | 5 | 7 | | ■ | 1 | |
| A10031614608TIALN | HFD 1614.06 | | Z7 Steel | 16 | 14 | 6 | 54 | 1 | 2 | 3 | 5 | 7 | | ■ | 1 | |
| A10100618608TIALN | HFF 0618.06 | | | Z7 Steel | 6 | 18 | 6 | 50 | 1 | 2 | 3 | 5 | 7 | | ■ | 1 |
| A10101225608TIALN | HFF 1225.06 | | | Z7 Steel | 12 | 25 | 6 | 65 | 1 | 2 | 3 | 5 | 7 | | ■ | 1 |
| A10101630608TIALN | HFF 1630.06 | Z7 Steel | | 16 | 30 | 6 | 70 | 1 | 2 | 3 | 5 | 7 | | ■ | 1 | |
| A10040618608TIALN | HFG 0618.06 | | Z7 Steel | 6 | 18 | 6 | 50 | 1 | 2 | 3 | 5 | 7 | | ■ | 1 | |
| A10041020608TIALN | HFG 1020.06 | | Z7 Steel | 10 | 20 | 6 | 60 | 1 | 2 | 3 | 5 | 7 | | ■ | 1 | |
| A10041225608TIALN | HFG 1225.06 | | Z7 Steel | 12 | 25 | 6 | 65 | 1 | 2 | 3 | 5 | 7 | | ■ | 1 | |
| A10041630608TIALN | HFG 1630.06 | Z7 Steel | 16 | 30 | 6 | 70 | 1 | 2 | 3 | 5 | 7 | | ■ | 1 | | |
| A10090820608TIALN | HFH 0820.06 | | Z7 Steel | 8 | 20 | 6 | 60 | 1 | 2 | 3 | 5 | 7 | | ■ | 1 | |
| A10091230608TIALN | HFH 1230.06 | | Z7 Steel | 12 | 30 | 6 | 70 | 1 | 2 | 3 | 5 | 7 | | ■ | 1 | |
| A10071020608TIALN | HFL 1020.06 | | Z7 Steel | 10 | 20 | 6 | 60 | 1 | 2 | 3 | 5 | 7 | | ■ | 1 | |
| A10071230608TIALN | HFL 1230.06 | | Z7 Steel | 12 | 30 | 6 | 70 | 1 | 2 | 3 | 5 | 7 | | ■ | 1 | |
| A10051020608TIALN | HFM 1020.06 | | Z7 Steel | 10 | 20 | 6 | 60 | 1 | 2 | 3 | 5 | 7 | | ■ | 1 | |

*High performance coating with a high degree of hardness and low heat conductivity; therefore suitable for high thermal and mechanical applications; very low friction value.

The reasons for producing Tungsten-carbide burrs with AlN-coating are as follows:

- to increase tool life
- to reduce machining forces
- to improve chip removal

Tungsten-carbide burrs, Z42 Inox/Steel



Ordering example: A10010616620

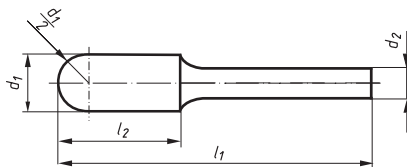
Further dimensions, cuts and shank lengths on request



| Product number | Description | Shape | Cut | similar to DIN 8033 | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for | | | | Information on page 438 | | | | PG 1 | 📦 |
|----------------|-------------|-------|----------------|---------------------|-------------------|-------------------|-------------------|-------------------|-----------------|---|---|---|-------------------------|---|---|---|------|---|
| | | | | | | | | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | | |
| A10010616620 | HFA 0616.06 | | Z42 Inox/Steel | ZYA 0616 | 6 | 16 | 6 | 50 | 1 | 2 | 3 | 4 | | | | | ■ | 1 |
| A10010820620 | HFA 0820.06 | | Z42 Inox/Steel | ZYA 0820 | 8 | 20 | 6 | 60 | 1 | 2 | 3 | 4 | | | | | ■ | 1 |
| A10011020620 | HFA 1020.06 | | Z42 Inox/Steel | ZYA 1020 | 10 | 20 | 6 | 60 | 1 | 2 | 3 | 4 | | | | | ■ | 1 |
| A10011225620 | HFA 1225.06 | | Z42 Inox/Steel | ZYA 1225 | 12 | 25 | 6 | 65 | 1 | 2 | 3 | 4 | | | | | ■ | 1 |
| A10020616620 | HFC 0616.06 | | Z42 Inox/Steel | WRC 0616 | 6 | 16 | 6 | 50 | 1 | 2 | 3 | 4 | | | | | ■ | 1 |
| A10020820620 | HFC 0820.06 | | Z42 Inox/Steel | WRC 0820 | 8 | 20 | 6 | 60 | 1 | 2 | 3 | 4 | | | | | ■ | 1 |
| A10021020620 | HFC 1020.06 | | Z42 Inox/Steel | WRC 1020 | 10 | 20 | 6 | 60 | 1 | 2 | 3 | 4 | | | | | ■ | 1 |
| A10021225620 | HFC 1225.06 | | Z42 Inox/Steel | WRC 1225 | 12 | 25 | 6 | 65 | 1 | 2 | 3 | 4 | | | | | ■ | 1 |
| A10030605620 | HFD 0605.06 | | Z42 Inox/Steel | KUD 0605 | 6 | 5 | 6 | 50 | 1 | 2 | 3 | 4 | | | | | ■ | 1 |
| A10030807620 | HFD 0807.06 | | Z42 Inox/Steel | KUD 0807 | 8 | 7 | 6 | 47 | 1 | 2 | 3 | 4 | | | | | ■ | 1 |
| A10031009620 | HFD 1009.06 | | Z42 Inox/Steel | KUD 1009 | 10 | 9 | 6 | 49 | 1 | 2 | 3 | 4 | | | | | ■ | 1 |
| A10031210620 | HFD 1210.06 | | Z42 Inox/Steel | KUD 1210 | 12 | 10 | 6 | 51 | 1 | 2 | 3 | 4 | | | | | ■ | 1 |
| A10100618620 | HFF 0618.06 | | Z42 Inox/Steel | RBF 0618 | 6 | 18 | 6 | 50 | 1 | 2 | 3 | 4 | | | | | ■ | 1 |
| A10100820620 | HFF 0820.06 | | Z42 Inox/Steel | — | 8 | 20 | 6 | 60 | 1 | 2 | 3 | 4 | | | | | ■ | 1 |
| A10101020620 | HFF 1020.06 | | Z42 Inox/Steel | RBF 1020 | 10 | 20 | 6 | 60 | 1 | 2 | 3 | 4 | | | | | ■ | 1 |
| A10101225620 | HFF 1225.06 | | Z42 Inox/Steel | RBF 1225 | 12 | 25 | 6 | 65 | 1 | 2 | 3 | 4 | | | | | ■ | 1 |
| A10040618620 | HFG 0618.06 | | Z42 Inox/Steel | SPG 0618 | 6 | 18 | 6 | 50 | 1 | 2 | 3 | 4 | | | | | ■ | 1 |
| A10040820620 | HFG 0820.06 | | Z42 Inox/Steel | — | 8 | 20 | 6 | 60 | 1 | 2 | 3 | 4 | | | | | ■ | 1 |
| A10041020620 | HFG 1020.06 | | Z42 Inox/Steel | SPG 1020 | 10 | 20 | 6 | 60 | 1 | 2 | 3 | 4 | | | | | ■ | 1 |
| A10041225620 | HFG 1225.06 | | Z42 Inox/Steel | SPG 1225 | 12 | 25 | 6 | 65 | 1 | 2 | 3 | 4 | | | | | ■ | 1 |
| A10050618620 | HFM 0618.06 | | Z42 Inox/Steel | SKM 0618 | 6 | 18 | 6 | 50 | 1 | 2 | 3 | 4 | | | | | ■ | 1 |
| A10050820620 | HFM 0820.06 | | Z42 Inox/Steel | — | 8 | 20 | 6 | 60 | 1 | 2 | 3 | 4 | | | | | ■ | 1 |
| A10051020620 | HFM 1020.06 | | Z42 Inox/Steel | SKM 1020 | 10 | 20 | 6 | 60 | 1 | 2 | 3 | 4 | | | | | ■ | 1 |
| A10051225620 | HFM 1225.06 | | Z42 Inox/Steel | SKM 1225 | 12 | 25 | 6 | 65 | 1 | 2 | 3 | 4 | | | | | ■ | 1 |

- The new Z42 inox/steel tungsten carbide burr quickly and reliably removes the two important materials, stainless steel and steel.
- The robust tooth geometry with facet profile prevents eruptions and guarantees high material removal rates in the long run. This saves you time and setup costs.
- Thanks to the optimised chip breaker, you can now cut even more ergonomically, at the same time achieving a better finish than before.
- You can now reduce your expenditure for stockkeeping and logistics. Prevent incorrect use through unequivocal tool marking and the use of only few variants.

Tungsten-carbide burrs Steel



Ordering example: A10010616608

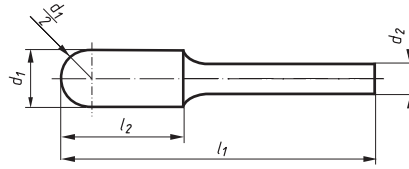
Further dimensions, cuts and shank lengths on request



PG 1

| Product number | Description | Shape | Cut | similar to DIN 8033 | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for | | | |
|-------------------------|-------------|----------|----------|---------------------|-------------------|-------------------|-------------------|-------------------|-----------------|--|---|---|
| Information on page 438 | | | | | | | | | | | | |
| A10010616608 | HFA 0616.06 | | Z7 Steel | ZYA 0616 | 6 | 16 | 6 | 50 | 1 2 3 5 7 | | | 1 |
| A10010820608 | HFA 0820.06 | | Z7 Steel | ZYA 0820 | 8 | 20 | 6 | 60 | 1 2 3 5 7 | | | 1 |
| A10011013608 | HFA 1013.06 | | Z7 Steel | ZYA 1013 | 10 | 13 | 6 | 53 | 1 2 3 5 7 | | | 1 |
| A10011020608 | HFA 1020.06 | | Z7 Steel | ZYA 1020 | 10 | 20 | 6 | 60 | 1 2 3 5 7 | | | 1 |
| A10011025608 | HFA 1025.06 | | Z7 Steel | ZYA 1025 | 10 | 25 | 6 | 65 | 1 2 3 5 7 | | | 1 |
| A10011225608 | HFA 1225.06 | | Z7 Steel | ZYA 1225 | 12 | 25 | 6 | 65 | 1 2 3 5 7 | | | 1 |
| A10011625608 | HFA 1625.06 | | Z7 Steel | ZYA 1625 | 16 | 25 | 6 | 65 | 1 2 3 5 7 | | | 1 |
| A10020616608 | HFC 0616.06 | | Z7 Steel | WRC 0616 | 6 | 16 | 6 | 50 | 1 2 3 5 7 | | | 1 |
| A10020820608 | HFC 0820.06 | | Z7 Steel | WRC 0820 | 8 | 20 | 6 | 60 | 1 2 3 5 7 | | | 1 |
| A10021020608 | HFC 1020.06 | | Z7 Steel | WRC 1020 | 10 | 20 | 6 | 60 | 1 2 3 5 7 | | | 1 |
| A10021020808 | HFC 1020.08 | | Z7 Steel | WRC 1020 | 10 | 20 | 8 | 60 | 1 2 3 5 7 | | | 1 |
| A10021025608 | HFC 1025.06 | | Z7 Steel | WRC 1025 | 10 | 25 | 6 | 65 | 1 2 3 5 7 | | | 1 |
| A10021225608 | HFC 1225.06 | | Z7 Steel | WRC 1225 | 12 | 25 | 6 | 65 | 1 2 3 5 7 | | | 1 |
| A10021225808 | HFC 1225.08 | | Z7 Steel | WRC 1225 | 12 | 25 | 8 | 65 | 1 2 3 5 7 | | | 1 |
| A10021625608 | HFC 1625.06 | Z7 Steel | WRC 1625 | 16 | 25 | 6 | 65 | 1 2 3 5 7 | | | 1 | |
| A10030606608 | HFD 0605.06 | | Z7 Steel | KUD 0605 | 6 | 5 | 6 | 50 | 1 2 3 5 7 | | | 1 |
| A10030808608 | HFD 0807.06 | | Z7 Steel | KUD 0807 | 8 | 7 | 6 | 47 | 1 2 3 5 7 | | | 1 |
| A10031010608 | HFD 1009.06 | | Z7 Steel | KUD 1009 | 10 | 9 | 6 | 49 | 1 2 3 5 7 | | | 1 |
| A10031212608 | HFD 1210.06 | | Z7 Steel | KUD 1210 | 12 | 10 | 6 | 51 | 1 2 3 5 7 | | | 1 |
| A10031210808 | HFD 1210.08 | | Z7 Steel | KUD 1210 | 12 | 10 | 8 | 51 | 1 2 3 5 7 | | | 1 |
| A10031616608 | HFD 1614.06 | | Z7 Steel | KUD 1614 | 16 | 14 | 6 | 54 | 1 2 3 5 7 | | | 1 |
| A10032020608 | HFD 2018.06 | | Z7 Steel | KUD 2018 | 20 | 18 | 6 | 58 | 1 2 3 5 7 | | | 1 |
| A10060610608 | HFE 0610.06 | | Z7 Steel | TRE 0610 | 6 | 10 | 6 | 50 | 1 2 3 5 7 | | | 1 |
| A10060813608 | HFE 0813.06 | | Z7 Steel | TRE 0813 | 8 | 13 | 6 | 53 | 1 2 3 5 7 | | | 1 |
| A10061220608 | HFE 1220.06 | | Z7 Steel | TRE 1220 | 12 | 20 | 6 | 60 | 1 2 3 5 7 | | | 1 |
| A10061625608 | HFE 1625.06 | | Z7 Steel | TRE 1625 | 16 | 25 | 6 | 65 | 1 2 3 5 7 | | | 1 |
| A10100618608 | HFF 0618.06 | | Z7 Steel | RBF 0618 | 6 | 18 | 6 | 50 | 1 2 3 5 7 | | | 1 |
| A10100820608 | HFF 0820.06 | | Z7 Steel | --- | 8 | 20 | 6 | 60 | 1 2 3 5 7 | | | 1 |
| A10101020608 | HFF 1020.06 | | Z7 Steel | RBF 1020 | 10 | 20 | 6 | 60 | 1 2 3 5 7 | | | 1 |
| A10101225608 | HFF 1225.06 | | Z7 Steel | RBF 1225 | 12 | 25 | 6 | 65 | 1 2 3 5 7 | | | 1 |
| A10101225808 | HFF 1225.08 | | Z7 Steel | RBF 1225 | 12 | 25 | 8 | 65 | 1 2 3 5 7 | | | 1 |
| A10101230608 | HFF 1230.06 | | Z7 Steel | RBF 1230 | 12 | 30 | 6 | 70 | 1 2 3 5 7 | | | 1 |
| A10101630608 | HFF 1630.06 | | Z7 Steel | RBF 1630 | 16 | 30 | 6 | 70 | 1 2 3 5 7 | | | 1 |
| A10040618608 | HFG 0618.06 | | Z7 Steel | SPG 0618 | 6 | 18 | 6 | 50 | 1 2 3 5 7 | | | 1 |
| A10040820608 | HFG 0820.06 | | Z7 Steel | --- | 8 | 20 | 6 | 60 | 1 2 3 5 7 | | | 1 |
| A10041020608 | HFG 1020.06 | | Z7 Steel | SPG 1020 | 10 | 20 | 6 | 60 | 1 2 3 5 7 | | | 1 |

Tungsten-carbide burrs Steel



Ordering example: A10010616608

Further dimensions, cuts and shank lengths on request

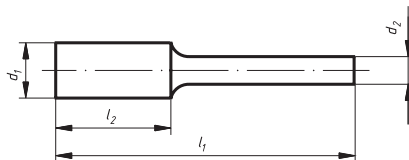


PG 1

| Product number | Description | Shape | Cut | similar to DIN 8033 | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for Information on page 438 | | | | | | |
|----------------|-------------|----------|----------|---------------------|-------------------|-------------------|-------------------|-------------------|---|---|---|---|---|---|---|
| A10041220608 | HFG 1220.06 | | Z7 Steel | SPG 1220 | 12 | 20 | 6 | 60 | 1 | 2 | 3 | 5 | 7 | ■ | 1 |
| A10041225608 | HFG 1225.06 | | Z7 Steel | SPG 1225 | 12 | 25 | 6 | 65 | 1 | 2 | 3 | 5 | 7 | ■ | 1 |
| A10041230608 | HFG 1230.06 | | Z7 Steel | SPG 1230 | 12 | 30 | 6 | 70 | 1 | 2 | 3 | 5 | 7 | ■ | 1 |
| A10041630608 | HFG 1630.06 | | Z7 Steel | SPG 1630 | 16 | 30 | 6 | 70 | 1 | 2 | 3 | 5 | 7 | ■ | 1 |
| A10090820608 | HFH 0820.06 | | Z7 Steel | | 8 | 20 | 6 | 60 | 1 | 2 | 3 | 5 | 7 | ■ | 1 |
| A10091230608 | HFH 1230.06 | | Z7 Steel | | 12 | 30 | 6 | 70 | 1 | 2 | 3 | 5 | 7 | ■ | 1 |
| A10091635608 | HFH 1635.06 | | Z7 Steel | | 16 | 35 | 6 | 75 | 1 | 2 | 3 | 5 | 7 | ■ | 1 |
| A10070820608 | HFL 0820.06 | | Z7 Steel | --- | 8 | 20 | 6 | 60 | 1 | 2 | 3 | 5 | 7 | ■ | 1 |
| A10071020608 | HFL 1020.06 | | Z7 Steel | KEL 1020 | 10 | 20 | 6 | 60 | 1 | 2 | 3 | 5 | 7 | ■ | 1 |
| A10071225608 | HFL 1225.06 | | Z7 Steel | KEL 1225 | 12 | 25 | 6 | 65 | 1 | 2 | 3 | 5 | 7 | ■ | 1 |
| A10071230608 | HFL 1230.06 | | Z7 Steel | KEL 1230 | 12 | 30 | 6 | 70 | 1 | 2 | 3 | 5 | 7 | ■ | 1 |
| A10071630608 | HFL 1630.06 | Z7 Steel | KEL 1630 | 16 | 30 | 6 | 70 | 1 | 2 | 3 | 5 | 7 | ■ | 1 | |
| A10050618608 | HFM 0618.06 | | Z7 Steel | SKM 0618 | 6 | 18 | 6 | 50 | 1 | 2 | 3 | 5 | 7 | ■ | 1 |
| A10050820608 | HFM 0820.06 | | Z7 Steel | --- | 8 | 20 | 6 | 60 | 1 | 2 | 3 | 5 | 7 | ■ | 1 |
| A10051020608 | HFM 1020.06 | | Z7 Steel | SKM 1020 | 10 | 20 | 6 | 60 | 1 | 2 | 3 | 5 | 7 | ■ | 1 |
| A10051225608 | HFM 1225.06 | | Z7 Steel | SKM 1225 | 12 | 25 | 6 | 65 | 1 | 2 | 3 | 5 | 7 | ■ | 1 |

Further shapes and dimensions in the tables from page 40.

Burrs for machining non-ferrous metals, Z9 Alu



Ordering example: A10010313309

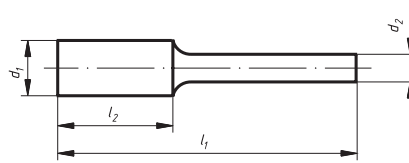
Further dimensions, cuts and shank lengths on request



PG 1

| Product number | Description | Shape | Cut | similar to DIN 8033 | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for Information on page 438 | | | | | |
|----------------|-------------|-------|--------|---------------------|-------------------|-------------------|-------------------|-------------------|--|--|---|---|---|---|
| A10010313309 | HFA 0313.03 | | Z9 Alu | ZYA 0313 | 3 | 13 | 3 | 40 | | | 6 | 8 | ■ | 1 |
| A10010616609 | HFA 0616.06 | | Z9 Alu | ZYA 0616 | 6 | 16 | 6 | 50 | | | 6 | 8 | ■ | 1 |
| A10011225609 | HFA 1225.06 | | Z9 Alu | ZYA 1225 | 12 | 25 | 6 | 65 | | | 6 | 8 | ■ | 1 |
| A10011225809 | HFA 1225.08 | | Z9 Alu | ZYA 1225 | 12 | 25 | 8 | 65 | | | 6 | 8 | ■ | 1 |
| A10011625609 | HFA 1625.06 | | Z9 Alu | ZYA 1625 | 16 | 25 | 6 | 65 | | | 6 | 8 | ■ | 1 |
| A10011625809 | HFA 1625.08 | | Z9 Alu | ZYA 1625 | 16 | 25 | 8 | 65 | | | 6 | 8 | ■ | 1 |
| A10020313309 | HFC 0313.03 | | Z9 Alu | WRC 0313 | 3 | 13 | 3 | 40 | | | 6 | 8 | ■ | 1 |
| A10020616609 | HFC 0616.06 | | Z9 Alu | WRC 0616 | 6 | 16 | 6 | 50 | | | 6 | 8 | ■ | 1 |
| A10020820609 | HFC 0820.06 | | Z9 Alu | WRC 0820 | 8 | 20 | 6 | 60 | | | 6 | 8 | ■ | 1 |
| A10021225609 | HFC 1225.06 | | Z9 Alu | WRC 1225 | 12 | 25 | 6 | 65 | | | 6 | 8 | ■ | 1 |
| A10021225809 | HFC 1225.08 | | Z9 Alu | WRC 1225 | 12 | 25 | 8 | 65 | | | 6 | 8 | ■ | 1 |
| A10021625609 | HFC 1625.06 | | Z9 Alu | WRC 1625 | 16 | 25 | 6 | 65 | | | 6 | 8 | ■ | 1 |
| A10030403309 | HFD 0403.03 | | Z9 Alu | KUD 0403 | 4 | 3 | 3 | 34 | | | 6 | 8 | ■ | 1 |
| A10030605609 | HFD 0605.06 | | Z9 Alu | KUD 0605 | 6 | 5 | 6 | 50 | | | 6 | 8 | ■ | 1 |
| A10031212609 | HFD 1210.06 | | Z9 Alu | KUD 1210 | 12 | 10 | 6 | 50 | | | 6 | 8 | ■ | 1 |
| A10031616609 | HFD 1614.06 | | Z9 Alu | KUD 1614 | 16 | 14 | 6 | 54 | | | 6 | 8 | ■ | 1 |
| A10031616809 | HFD 1614.08 | | Z9 Alu | KUD 1614 | 16 | 14 | 8 | 54 | | | 6 | 8 | ■ | 1 |
| A10061225809 | HFE 1225.08 | | Z9 Alu | TRE 1225 | 12 | 25 | 8 | 65 | | | 6 | 8 | ■ | 1 |
| A10061625809 | HFE 1625.08 | | Z9 Alu | TRE 1625 | 16 | 25 | 8 | 65 | | | 6 | 8 | ■ | 1 |
| A10100313309 | HFF 0313.03 | | Z9 Alu | RBF 0313 | 3 | 13 | 3 | 40 | | | 6 | 8 | ■ | 1 |
| A10100618609 | HFF 0618.06 | | Z9 Alu | RBF 0618 | 6 | 18 | 6 | 50 | | | 6 | 8 | ■ | 1 |
| A10101225609 | HFF 1225.06 | | Z9 Alu | RBF 1225 | 12 | 25 | 6 | 65 | | | 6 | 8 | ■ | 1 |
| A10101225809 | HFF 1225.08 | | Z9 Alu | RBF 1225 | 12 | 25 | 8 | 65 | | | 6 | 8 | ■ | 1 |
| A10101630609 | HFF 1630.06 | | Z9 Alu | RBF 1630 | 16 | 30 | 6 | 70 | | | 6 | 8 | ■ | 1 |
| A10101630809 | HFF 1630.08 | | Z9 Alu | RBF 1630 | 16 | 30 | 8 | 70 | | | 6 | 8 | ■ | 1 |
| A10040313309 | HFG 0313.03 | | Z9 Alu | SPG 0313 | 3 | 13 | 3 | 40 | | | 6 | 8 | ■ | 1 |

Burrs for machining non-ferrous metals, Z9 Alu



Ordering example: A10010313309

Further dimensions, cuts and shank lengths on request



PG 1

| Product number | Description | Shape | Cut | similar to DIN 8033 | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for | | | | | | |
|----------------|-------------|-------|--------|---------------------|-------------------|-------------------|-------------------|-------------------|-----------------|-------------------------|--|---|---|---|---|
| | | | | | | | | | | Information on page 438 | | | | | |
| A10070820609 | HFL 0820.06 | | Z9 Alu | --- | 8 | 20 | 6 | 60 | | | | 6 | 8 | ■ | 1 |
| A10071020609 | HFL 1020.06 | | Z9 Alu | KEL 1020 | 10 | 20 | 6 | 60 | | | | 6 | 8 | ■ | 1 |
| A10071225609 | HFL 1225.06 | | Z9 Alu | KEL 1225 | 12 | 25 | 6 | 65 | | | | 6 | 8 | ■ | 1 |
| A10071230609 | HFL 1230.06 | | Z9 Alu | KEL 1230 | 12 | 30 | 6 | 70 | | | | 6 | 8 | ■ | 1 |
| A10071230809 | HFL 1230.08 | | Z9 Alu | KEL 1230 | 12 | 30 | 8 | 70 | | | | 6 | 8 | ■ | 1 |
| A10072040809 | HFL 2040.08 | | Z9 Alu | KEL 2040 | 20 | 40 | 8 | 80 | | | | 6 | 8 | ■ | 1 |
| A10050618609 | HFM 0618.06 | | Z9 Alu | SKM 0618 | 6 | 18 | 6 | 50 | | | | 6 | 8 | ■ | 1 |

Z9 Alu – the burr for aluminium and non-ferrous metals

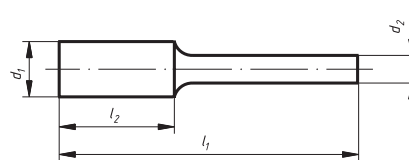
Ideal for

- Machining
- Chamfering
- Deburring

Advantages:

- High removal rate
- No clogging
- Long tool life

Tungsten-carbide burrs Cast



Ordering example: A10010616621

Further dimensions, cuts and shank lengths on request



PG 1

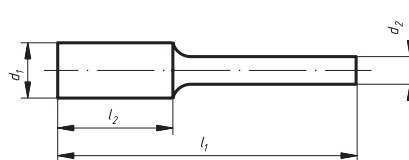
| Product number | Description | Shape | Cut | similar to DIN 8033 | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for | | | | | | |
|----------------|-------------|-------|------|---------------------|-------------------|-------------------|-------------------|-------------------|-----------------|-------------------------|--|---|--|---|---|
| | | | | | | | | | | Information on page 438 | | | | | |
| A10010616621 | HFA 0616.06 | | Cast | ZYA 0616 | 6 | 16 | 6 | 50 | | | | 5 | | ■ | 1 |
| A10010820621 | HFA 0820.06 | | Cast | ZYA 0820 | 8 | 20 | 6 | 60 | | | | 5 | | ■ | 1 |
| A10011020621 | HFA 1020.06 | | Cast | ZYA 1020 | 10 | 20 | 6 | 60 | | | | 5 | | ■ | 1 |

Tungsten-carbide burrs Cast



Ordering example: A10010616621

Further dimensions, cuts and shank lengths on request



PG 1

| Product number | Description | Shape | Cut | similar to DIN 8033 | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for | | | | |
|----------------|-------------|-------|------|---------------------|-------------------|-------------------|-------------------|-------------------|-----------------|---|--|---|---|
| A10011225621 | HFA 1225.06 | | Cast | ZYA 1225 | 12 | 25 | 6 | 65 | | 5 | | ■ | 1 |
| A10020616621 | HFC 0616.06 | | Cast | WRC 0616 | 6 | 16 | 6 | 50 | | 5 | | ■ | 1 |
| A10020820621 | HFC 0820.06 | | Cast | WRC 0820 | 8 | 20 | 6 | 60 | | 5 | | ■ | 1 |
| A10021020621 | HFC 1020.06 | | Cast | WRC 1020 | 10 | 20 | 6 | 60 | | 5 | | ■ | 1 |
| A10021225621 | HFC 1225.06 | | Cast | WRC 1225 | 12 | 25 | 6 | 65 | | 5 | | ■ | 1 |
| A10030605621 | HFD 0605.06 | | Cast | KUD 0605 | 6 | 5 | 6 | 50 | | 5 | | ■ | 1 |
| A10030807621 | HFD 0807.06 | | Cast | KUD 0807 | 8 | 7 | 6 | 47 | | 5 | | ■ | 1 |
| A10031009621 | HFD 1009.06 | | Cast | KUD 1009 | 10 | 9 | 6 | 49 | | 5 | | ■ | 1 |
| A10031210621 | HFD 1210.06 | | Cast | KUD 1210 | 12 | 10 | 6 | 51 | | 5 | | ■ | 1 |
| A10040618621 | HFG 0618.06 | | Cast | SPG 0618 | 6 | 18 | 6 | 50 | | 5 | | ■ | 1 |
| A10040820621 | HFG 0820.06 | | Cast | --- | 8 | 20 | 6 | 60 | | 5 | | ■ | 1 |
| A10041020621 | HFG 1020.06 | | Cast | SPG 1020 | 10 | 20 | 6 | 60 | | 5 | | ■ | 1 |
| A10041225621 | HFG 1225.06 | | Cast | SPG 1225 | 12 | 25 | 6 | 65 | | 5 | | ■ | 1 |
| A10060610621 | HFE 0610.06 | | Cast | TRE 0610 | 6 | 10 | 6 | 50 | | 5 | | ■ | 1 |
| A10060813621 | HFE 0813.06 | | Cast | TRE 0813 | 8 | 13 | 6 | 53 | | 5 | | ■ | 1 |
| A10061016621 | HFE 1016.06 | | Cast | TRE 1016 | 10 | 16 | 6 | | | 5 | | ■ | 1 |
| A10061220621 | HFE 1220.06 | | Cast | TRE 1220 | 12 | 20 | 6 | 60 | | 5 | | ■ | 1 |
| A10100618621 | HFF 0618.06 | | Cast | RBF 0618 | 6 | 18 | 6 | 50 | | 5 | | ■ | 1 |
| A10100820621 | HFF 0820.06 | | Cast | --- | 8 | 20 | 6 | 60 | | 5 | | ■ | 1 |
| A10101020621 | HFF 1020.06 | | Cast | RBF 1020 | 10 | 20 | 6 | 60 | | 5 | | ■ | 1 |
| A10101225621 | HFF 1225.06 | | Cast | RBF 1225 | 12 | 25 | 6 | 65 | | 5 | | ■ | 1 |

Cast – the burr for cast material

Ideal for

- Fetting
- Deburring
- Beveling

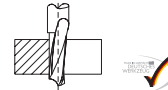
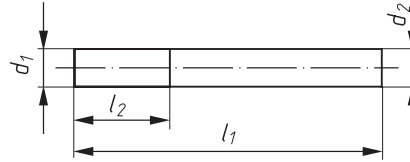
Advantages:

- High stock removal capability
- Long tool life
- Smooth running and ergonomical

HM-burr Composite Coarse



Ordering example: A10180315323



PG 1

| Product number | Description | Cut | l_1 mm | d_1 mm | l_2 mm | d_2 mm | recommended for Information on page 438 | | |
|----------------|-------------|------------------|----------|----------|----------|----------|--|---|-----|
| A10180315323 | HFAS 0315.0 | Composite Coarse | 42 | 3 | 15 | 3 | | 8 | ■ 1 |
| A10180625623 | HFAS 0625.0 | Composite Coarse | 64 | 6 | 25 | 6 | | 8 | ■ 1 |
| A10180828823 | HFAS 0828.0 | Composite Coarse | 73 | 8 | 28 | 8 | | 8 | ■ 1 |

Composite – the burr for fibre-reinforced materials

Thanks to the special fish-tail tothing the burrs can also be used for drilling and face milling. Due to the extra-long cutting element sawing operations will be possible and tool life will increase. The coarse cut (coarse) is perfectly suited for stationary use.

Ideal for

- Drilling
- Milling
- Sawing

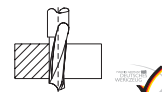
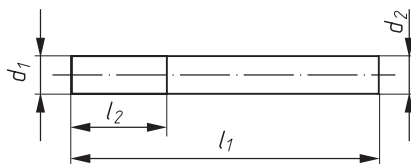
Advantages:

- Extra-long cutting element
- Long tool life
- High profitability

HM-burr Composite Fine



Ordering example: A10180625624



PG 1

| Product number | Description | Cut | l ₁ mm | d ₁ mm | l ₂ mm | d ₂ mm | recommended for Information on page 438 | | | | | |
|----------------|--------------|----------------|-------------------|-------------------|-------------------|-------------------|--|--|--|---|---|---|
| A10180625624 | HFAS 0625.06 | Composite Fine | 64 | 6 | 25 | 6 | | | | 8 | ■ | 1 |
| A10180828824 | HFAS 0828.08 | Composite Fine | 73 | 8 | 28 | 8 | | | | 8 | ■ | 1 |
| A101810301024 | HFAS 1030.10 | Composite Fine | 77 | 10 | 30 | 10 | | | | 8 | ■ | 1 |

Composite – the burr for fibre-reinforced materials

Thanks to the special fish-tail toothing the burrs can also be used for drilling and face milling. Due to the extra-long cutting element sawing operations will be possible and tool life will increase. The coarse cut (coarse) is perfectly suited for stationary use.

Ideal for

- Drilling
- Milling
- Sawing

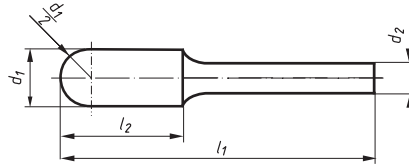
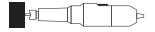
Advantages:

- Extra-long cutting element
- Long tool-life
- High profitability

Tungsten-carbide Rasp burrs wood



Ordering example: A10021225618



PG 1

| Product number | Description | Shape | Cut | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for Information on page 438 | | | | | |
|----------------|-------------|-------|------|-------------------|-------------------|-------------------|-------------------|--|--|--|---|---|---|
| A10021225618 | HFC 1225.06 | | Wood | 12 | 25 | 6 | 65 | ① | | | ⑧ | ■ | 1 |
| A10031210618 | HFD 1210.06 | | Wood | 12 | 10 | 6 | 50 | ① | | | ⑧ | ■ | 1 |
| A10061220618 | HFE 1220.06 | | Wood | 12 | 20 | 6 | 60 | ① | | | ⑧ | ■ | 1 |
| A10100618618 | HFF 0618.06 | | Wood | 6 | 18 | 6 | 58 | ① | | | ⑧ | ■ | 1 |
| A10100820618 | HFF 0820.06 | | Wood | 8 | 20 | 6 | 60 | ① | | | ⑧ | ■ | 1 |

Wood – the milling cutter for wood and light-weight materials

Rasp burrs for wood are manufactured from fine grit tungsten carbide and achieve a service life far exceeding that of comparable HSS or stippled burrs. A rough cutting geometry means that, even where only light force is applied, the burrs are very efficient during cutting, achieving a high level of stock removal. In particular when working on wood and other materials for pattern construction the desired shapes can be achieved fast and accurately. Burrs and material remain cool and do not overheat.

Ideal for

- chamfering
- modelling
- smoothing

Advantages:

- very fast due to large rake angle
- long tool life thanks to carbide
- quiet, vibration-free running

Range of application:

- pattern construction and wood
- mold and cores
- soft materials

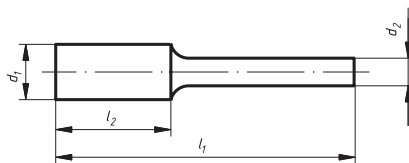
Example using Rasp burr for wood



Tungsten-carbide rotary files



Ordering example: A100106166140001



PG 1

| Product number | Description | Shape | Cut | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for Information on page 438 | | |
|------------------|--------------|-------|-----|-------------------|-------------------|-------------------|-------------------|--|---|---|
| A100106166150001 | HFAS 0616.06 | | ZF2 | 6 | 16 | 6 | 50 | ① ② ③ ④ ⑤ ⑦ | ■ | 1 |
| A100106166140001 | HFAS 0616.06 | | ZF3 | 6 | 16 | 6 | 50 | ① ② ③ ④ ⑤ ⑦ | ■ | 1 |
| A100112256160001 | HFAS 1225.06 | | ZF1 | 12 | 25 | 6 | 65 | ① ② ③ ④ ⑤ ⑦ | ■ | 1 |
| A100112256150001 | HFAS 1225.06 | | ZF2 | 12 | 25 | 6 | 65 | ① ② ③ ④ ⑤ ⑦ | ■ | 1 |
| A10020616614 | HFC 0616.06 | | ZF3 | 6 | 16 | 6 | 50 | ① ② ③ ④ ⑤ ⑦ | ■ | 1 |
| A10021225616 | HFC 1225.06 | | ZF1 | 12 | 25 | 6 | 65 | ① ② ③ ④ ⑤ ⑦ | ■ | 1 |
| A10021225615 | HFC 1225.06 | | ZF2 | 12 | 25 | 6 | 65 | ① ② ③ ④ ⑤ ⑦ | ■ | 1 |
| A10031009615 | HFD 1009.06 | | ZF2 | 10 | 9 | 6 | 49 | ① ② ③ ④ ⑤ ⑦ | ■ | 1 |
| A10040618615 | HFG 0618.06 | | ZF2 | 6 | 18 | 6 | 50 | ① ② ③ ④ ⑤ ⑦ | ■ | 1 |
| A10040618614 | HFG 0618.06 | | ZF3 | 6 | 18 | 6 | 50 | ① ② ③ ④ ⑤ ⑦ | ■ | 1 |
| A10041230616 | HFG 1230.06 | | ZF1 | 12 | 30 | 6 | 70 | ① ② ③ ④ ⑤ ⑦ | ■ | 1 |
| A10041230615 | HFG 1230.06 | | ZF2 | 12 | 30 | 6 | 70 | ① ② ③ ④ ⑤ ⑦ | ■ | 1 |
| A10041230614 | HFG 1230.06 | | ZF3 | 12 | 30 | 6 | 70 | ① ② ③ ④ ⑤ ⑦ | ■ | 1 |
| A10051225615 | HFM 1225.06 | | ZF2 | 12 | 25 | 6 | 65 | ① ② ③ ④ ⑤ ⑦ | ■ | 1 |

The micro-serration of the new tungsten carbide rotary files is based on the cutting geometry of a file and thus prevents clogging, even when removing soft materials.

The precision cut is achieved on CNC grinding machines, thus ensuring perfect concentricity and chatter-free working. The burrs remain sharp for a long time as a result, achieving a clean surface finish free of chatter marks. Rotary files are available in numerous sizes and shapes and three different cuts ranging from ZF1 (coarse) to ZF3 (fine). This means that the conditions of use can be optimised for each application with the result of the best surface finish. This means that the conditions of use can be optimised for each application with the result of the best surface finish.

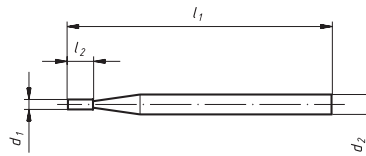
Properties:

- Optimum surface finishes, owing to fine serration
- Long service life, owing to tungsten carbide
- No clogging

Particularly suitable for:

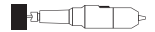
- Perfect surface finishes
- Composite materials
- Bores

Miniature burrs with multi-purpose cut



Ordering example: A10010104312

Further dimensions, cuts and shank lengths on request



PG 1

| Product number | Description | Shape | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for Information on page 438 | | | | | |
|------------------|--------------|-------|----------------------|----------------------|----------------------|----------------------|--|---|---|---|---|---|
| A10010104312 | HFA 01004.03 | | 1 | 4 | 3 | 40 | 2 | 3 | 4 | 7 | ■ | 1 |
| A100101043120001 | HFA 01504.03 | | 1,5 | 4 | 3 | 40 | 2 | 3 | 4 | 7 | ■ | 1 |
| A10010204312 | HFA 02004.03 | | 2 | 4 | 3 | 40 | 2 | 3 | 4 | 7 | ■ | 1 |
| A10020104312 | HFC 01004.03 | | 1 | 4 | 3 | 40 | 2 | 3 | 4 | 7 | ■ | 1 |
| A100201043120001 | HFC 01504.03 | | 1,5 | 4 | 3 | 40 | 2 | 3 | 4 | 7 | ■ | 1 |
| A10020204312 | HFC 02004.03 | | 2 | 4 | 3 | 40 | 2 | 3 | 4 | 7 | ■ | 1 |
| A10030101312 | HFD 01001.03 | | 1 | 0,9 | 3 | 40 | 2 | 3 | 4 | 7 | ■ | 1 |
| A100301013120001 | HFD 01501.03 | | 1,5 | 1,35 | 3 | 40 | 2 | 3 | 4 | 7 | ■ | 1 |
| A10030202312 | HFD 02002.03 | | 2 | 1,8 | 3 | 40 | 2 | 3 | 4 | 7 | ■ | 1 |
| A10060104312 | HFE 01504.03 | | 1,5 | 4 | 3 | 40 | 2 | 3 | 4 | 7 | ■ | 1 |
| A10100104312 | HFF 01504.03 | | 1,5 | 4 | 3 | 40 | 2 | 3 | 4 | 7 | ■ | 1 |
| A10040104312 | HFG 01504.03 | | 1,5 | 4 | 3 | 40 | 2 | 3 | 4 | 7 | ■ | 1 |
| A10050104312 | HFM 01504.03 | | 1,5 | 4 | 3 | 40 | 2 | 3 | 4 | 7 | ■ | 1 |

Application:

- tool manufacture
- precision engineering
- jewellery industry
- turbine manufacture

Materials to be processed:

- stainless steel
- non-ferrous metals
- zinc die casting
- soft ceramics
- titanium alloys

Useful hints:

- choose shortest overhang
- concentric running of the collet chuck is very important
- recommended speed: 70.000 rpm

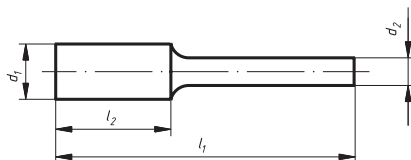
Advantages:

- high dimensional accuracy
- minimal runout
- multi-purpose cut
- micro grain carbide
- precision ground cutting edges

Power Tool:

- We recommend our pneumatic grinder AMIN 72-013 GD, page 381

Miniature burrs in cut 5, shank 3 mm



Ordering example: A10010204300

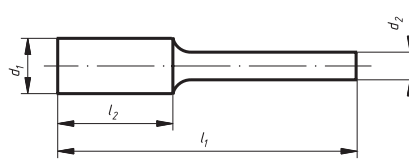
Further dimensions, cuts and shank lengths on request



PG 1

| Product number | Description | Shape | Cut | similar to DIN 8033 | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for Information on page 438 | | | | | | | | |
|------------------|--------------|-------|-----|---------------------|-------------------|-------------------|-------------------|-------------------|--|---|---|---|--|---|--|---|---|
| A10010210305 | HFA 0210.03 | | Z5 | ZYA 0210 | 2 | 10 | 3 | 40 | 1 | 2 | 3 | 4 | | 7 | | ■ | 1 |
| A10010313305 | HFA 0313.03 | | Z5 | ZYA 0313 | 3 | 13 | 3 | 40 | 1 | 2 | 3 | 4 | | 7 | | ■ | 1 |
| A10010607305 | HFA 0607.03 | | Z5 | ZYA 0607 | 6 | 7 | 3 | 37 | 1 | 2 | 3 | 4 | | 7 | | ■ | 1 |
| A10010613305 | HFA 0613.03 | | Z5 | ZYA 0613 | 6 | 13 | 3 | 43 | 1 | 2 | 3 | 4 | | 7 | | ■ | 1 |
| A100102103050001 | HFAS 0210.03 | | Z5 | ZYA-S 0210 | 2 | 10 | 3 | 40 | 1 | 2 | 3 | 4 | | 7 | | ■ | 1 |
| A100103133050001 | HFAS 0313.03 | | Z5 | ZYA-S 0313 | 3 | 13 | 3 | 40 | 1 | 2 | 3 | 4 | | 7 | | ■ | 1 |
| A100106073050001 | HFAS 0607.03 | | Z5 | ZYA-S 0607 | 6 | 7 | 3 | 37 | 1 | 2 | 3 | 4 | | 7 | | ■ | 1 |
| A100106133050001 | HFAS 0613.03 | | Z5 | ZYA-S 0613 | 6 | 13 | 3 | 43 | 1 | 2 | 3 | 4 | | 7 | | ■ | 1 |
| A10020210305 | HFC 0210.03 | | Z5 | WRC 0210 | 2 | 10 | 3 | 40 | 1 | 2 | 3 | 4 | | 7 | | ■ | 1 |
| A10020313305 | HFC 0313.03 | | Z5 | WRC 0313 | 3 | 13 | 3 | 40 | 1 | 2 | 3 | 4 | | 7 | | ■ | 1 |
| A10020613305 | HFC 0613.03 | | Z5 | WRC 0613 | 6 | 13 | 3 | 43 | 1 | 2 | 3 | 4 | | 7 | | ■ | 1 |
| A10030303305 | HFD 0302.03 | | Z5 | KUD 0302 | 3 | 2 | 3 | 40 | 1 | 2 | 3 | 4 | | 7 | | ■ | 1 |
| A100304043050001 | HFD 0403.03 | | Z5 | KUD 0403 | 4 | 3 | 3 | 34 | 1 | 2 | 3 | 4 | | 7 | | ■ | 1 |
| A10030606305 | HFD 0605.03 | | Z5 | KUD 0605 | 6 | 5 | 3 | 35 | 1 | 2 | 3 | 4 | | 7 | | ■ | 1 |
| A10060307305 | HFE 0307.03 | | Z5 | TRE 0307 | 3 | 7 | 3 | 40 | 1 | 2 | 3 | 4 | | 7 | | ■ | 1 |
| A10060610305 | HFE 0610.03 | | Z5 | TRE 0610 | 6 | 10 | 3 | 40 | 1 | 2 | 3 | 4 | | 7 | | ■ | 1 |
| A10100307305 | HFF 0307.03 | | Z5 | RBF 0307 | 3 | 7 | 3 | 40 | 1 | 2 | 3 | 4 | | 7 | | ■ | 1 |
| A10100313305 | HFF 0313.03 | | Z5 | RBF 0313 | 3 | 13 | 3 | 40 | 1 | 2 | 3 | 4 | | 7 | | ■ | 1 |
| A10100613305 | HFF 0613.03 | | Z5 | RBF 0613 | 6 | 13 | 3 | 43 | 1 | 2 | 3 | 4 | | 7 | | ■ | 1 |
| A10040307305 | HFG 0307.03 | | Z5 | SPG 0307 | 3 | 7 | 3 | 40 | 1 | 2 | 3 | 4 | | 7 | | ■ | 1 |
| A10040313305 | HFG 0313.03 | | Z5 | SPG 0313 | 3 | 13 | 3 | 40 | 1 | 2 | 3 | 4 | | 7 | | ■ | 1 |
| A10040613305 | HFG 0613.03 | | Z5 | SPG 0613 | 6 | 13 | 3 | 43 | 1 | 2 | 3 | 4 | | 7 | | ■ | 1 |
| A10090307305 | HFH 0307.03 | | Z5 | | 3 | 7 | 3 | 40 | 1 | 2 | 3 | 4 | | 7 | | ■ | 1 |

Miniature burrs in cut 5, shank 3 mm



Ordering example: A10010204300

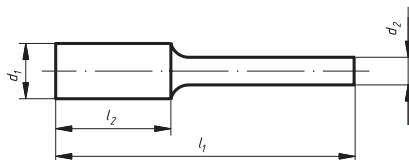
Further dimensions, cuts and shank lengths on request



PG 1

| Product number | Description | Shape | Cut | similar to DIN 8033 | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for Information on page 438 | | | | | | | | |
|------------------|--------------|-------|-----|---------------------|-------------------|-------------------|-------------------|-------------------|--|---|---|---|--|---|--|---|---|
| A10090613305 | HFH 0613.03 | | Z5 | | 6 | 13 | 3 | 43 | ① | ② | ③ | ④ | | ⑦ | | ■ | 1 |
| A10010204300 | HFI 0204.03 | | Z1 | | 2,5 | 4 | 3 | 40 | | | ③ | ④ | | ⑦ | | ■ | 1 |
| A10010408300 | HFI 0408.03 | | Z1 | | 4 | 8 | 3 | 50 | | | ③ | ④ | | ⑦ | | ■ | 1 |
| A10050307305 | HFM 0307.03 | | Z5 | SKM 0307 | 3 | 7 | 3 | 40 | ① | ② | ③ | ④ | | ⑦ | | ■ | 1 |
| A10050311305 | HFM 0311.03 | | Z5 | SKM 0311 | 3 | 11 | 3 | 40 | ① | ② | ③ | ④ | | ⑦ | | ■ | 1 |
| A10050613305 | HFM 0613.03 | | Z5 | SKM 0613 | 6 | 13 | 3 | 43 | ① | ② | ③ | ④ | | ⑦ | | ■ | 1 |
| A10120307305 | HFN 0307.03 | | Z5 | WKN 0307 | 3 | 7 | 3 | 40 | ① | ② | ③ | ④ | | ⑦ | | ■ | 1 |
| A10120607305 | HFN 0607.03 | | Z5 | WKN 0607 | 6 | 7 | 3 | 37 | ① | ② | ③ | ④ | | ⑦ | | ■ | 1 |
| A101203073050001 | HFNS 0307.03 | | Z5 | WKN-S 0307 | 3 | 7 | 3 | 40 | ① | ② | ③ | ④ | | ⑦ | | ■ | 1 |
| A101206073050001 | HFNS 0607.03 | | Z5 | WKN-S 0607 | 6 | 7 | 3 | 37 | ① | ② | ③ | ④ | | ⑦ | | ■ | 1 |

Burrs with extended shank length (shank length 200 mm)



Ordering example: A10011225603200

Further dimensions, cuts and shank lengths on request

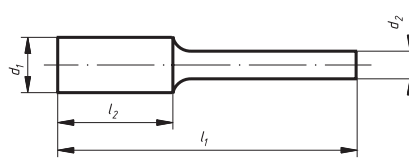


PG 1

| Product number | Description | Shape | Cut | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for | | | |
|-----------------|---------------|-------|----------|-------------------|-------------------|-------------------|-------------------|-----------------|-------------------------|---|---|
| | | | | | | | | | Information on page 438 | | |
| A10011225603200 | HFA 1225.06 L | | Z3 | 12 | 25 | 6 | 225 | ① ② ③ ④ | ⑦ | ■ | 1 |
| A10011225608200 | HFA 1225.06 L | | Z7 Steel | 12 | 25 | 6 | 225 | ① ② ③ ④ | ⑦ | ■ | 1 |
| A10020616603200 | HFC 0616.06 L | | Z3 | 6 | 16 | 6 | 216 | ① ② ③ ④ | ⑦ | ■ | 1 |
| A10020616608200 | HFC 0616.06 L | | Z7 Steel | 6 | 16 | 6 | 216 | ① ② ③ ⑤ | ⑦ | ■ | 1 |
| A10020820603200 | HFC 0820.06 L | | Z3 | 8 | 20 | 6 | 220 | ① ② ③ ④ | ⑦ | ■ | 1 |
| A10020820608200 | HFC 0820.06 L | | Z7 Steel | 8 | 20 | 6 | 220 | ① ② ③ ⑤ | ⑦ | ■ | 1 |
| A10021020608200 | HFC 1020.06 L | | Z7 Steel | 10 | 20 | 6 | 220 | ① ② ③ ⑤ | ⑦ | ■ | 1 |
| A10021225608200 | HFC 1225.06 L | | Z7 Steel | 12 | 25 | 6 | 225 | ① ② ③ ⑤ | ⑦ | ■ | 1 |
| A10030605603200 | HFD 0605.06 L | | Z3 | 6 | 5 | 6 | 205 | ① ② ③ ④ | ⑦ | ■ | 1 |
| A10030605608200 | HFD 0605.06 L | | Z7 Steel | 6 | 5 | 6 | 205 | ① ② ③ ⑤ | ⑦ | ■ | 1 |
| A10030807603200 | HFD 0807.06 L | | Z3 | 8 | 7 | 6 | 207 | ① ② ③ ④ | ⑦ | ■ | 1 |
| A10030807608200 | HFD 0807.06 L | | Z7 Steel | 8 | 7 | 6 | 207 | ① ② ③ ⑤ | ⑦ | ■ | 1 |
| A10031009603200 | HFD 1009.06 L | | Z3 | 10 | 9 | 6 | 209 | ① ② ③ ④ | ⑦ | ■ | 1 |
| A10031009608200 | HFD 1009.06 L | | Z7 Steel | 10 | 9 | 6 | 209 | ① ② ③ ⑤ | ⑦ | ■ | 1 |
| A10031210603200 | HFD 1210.06 L | | Z3 | 12 | 10 | 6 | 210 | ① ② ③ ④ | ⑦ | ■ | 1 |
| A10031210608200 | HFD 1210.06 L | | Z7 Steel | 12 | 10 | 6 | 210 | ① ② ③ ⑤ | ⑦ | ■ | 1 |
| A10031210803200 | HFD 1210.08 L | | Z3 | 12 | 10 | 8 | 210 | ① ② ③ ④ | ⑦ | ■ | 1 |
| A10031210808200 | HFD 1210.08 L | | Z7 Steel | 12 | 10 | 8 | 210 | ① ② ③ ⑤ | ⑦ | ■ | 1 |
| A10061220603200 | HFE 1220.06 L | | Z3 | 12 | 20 | 6 | 220 | ① ② ③ ④ | ⑦ | ■ | 1 |
| A10061220608200 | HFE 1220.06 L | | Z7 Steel | 12 | 20 | 6 | 220 | ① ② ③ ⑤ | ⑦ | ■ | 1 |
| A10061220808200 | HFE 1220.08 L | | Z7 Steel | 12 | 20 | 8 | 220 | ① ② ③ ⑤ | ⑦ | ■ | 1 |
| A10100618603200 | HFF 0618.06 L | | Z3 | 6 | 18 | 6 | 218 | ① ② ③ ④ | ⑦ | ■ | 1 |
| A10100618608200 | HFF 0618.06 L | | Z7 Steel | 6 | 18 | 6 | 218 | ① ② ③ ⑤ | ⑦ | ■ | 1 |
| A10101230808200 | HFF 1230.08 L | | Z7 Steel | 12 | 30 | 8 | 230 | ① ② ③ ⑤ | ⑦ | ■ | 1 |
| A10040618603200 | HFG 0618.06 L | | Z3 | 6 | 18 | 6 | 218 | ① ② ③ ④ | ⑦ | ■ | 1 |
| A10040618608200 | HFG 0618.06 L | | Z7 Steel | 6 | 18 | 6 | 218 | ① ② ③ ⑤ | ⑦ | ■ | 1 |
| A10041230808200 | HFG 1230.08 L | | Z7 Steel | 12 | 30 | 8 | 230 | ① ② ③ ⑤ | ⑦ | ■ | 1 |
| A10091020603200 | HFH 1020.06 L | | Z3 | 10 | 20 | 6 | 220 | ① ② ③ ④ | ⑦ | ■ | 1 |
| A10091020608200 | HFH 1020.06 L | | Z7 Steel | 10 | 20 | 6 | 220 | ① ② ③ ⑤ | ⑦ | ■ | 1 |

| Safety instructions: Recommended operating speed for major exposed shank lengths | Reduced speeds for Tungsten-carbide burrs with extra long shank (150/200 mm) | | | | | |
|--|--|---------------------|--------|-------|-------|-------|
| | For a safe use it will be necessary to hold the tool to the workpiece before starting the machine and/or insert it into the boreholes or ducts. Contact with the workpiece must be ensured until the machine is deactivated. If permanent contact with the workpiece cannot be ensured, the machine should run at idling speed.. | Tool diameter d1 mm | 6 | 8 | 10 | 12 |
| Shank diameter d2 mm | | 6 | 6 | 6 | 6 | 8 |
| Permitted idling speed without workpiece contact (1/min) | | 4.000 | 3.200 | 2.800 | 2.200 | 3.600 |
| Permitted reduced operating speed with workpiece contact (1/min) | | 13.000 | 10.000 | 8.000 | 7.000 | 7.000 |

Burrs with extended shank length (shank length 150 mm)



Ordering example: A10020820622150

Further dimensions, cuts and shank lengths on request



PG 1

| Product number | Description | Shape | Cut | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for Information on page 438 | | |
|-----------------|--------------------|-------|-----|-------------------|-------------------|-------------------|-------------------|--|---|---|
| A10020820622150 | HFC 0820.06 BASE-X | | ZX | 8 | 20 | 6 | 170 | ① ② ③ ④ ⑤ ⑦ | ■ | 1 |
| A10021020622150 | HFC 1020.06 BASE-X | | ZX | 10 | 20 | 6 | 170 | ① ② ③ ④ ⑤ ⑦ | ■ | 1 |
| A10021225622150 | HFC 1225.06 BASE-X | | ZX | 12 | 25 | 6 | 175 | ① ② ③ ④ ⑤ ⑦ | ■ | 1 |
| A10030807622150 | HFD 0807.06 BASE-X | | ZX | 8 | 7 | 6 | 157 | ① ② ③ ④ ⑤ ⑦ | ■ | 1 |
| A10031009622150 | HFD 1009.06 BASE-X | | ZX | 10 | 9 | 6 | 159 | ① ② ③ ④ ⑤ ⑦ | ■ | 1 |
| A10100820622150 | HFF 0820.06 BASE-X | | ZX | 8 | 20 | 6 | 170 | ① ② ③ ④ ⑤ ⑦ | ■ | 1 |
| A10101225622150 | HFF 1225.06 BASE-X | | ZX | 12 | 25 | 6 | 175 | ① ② ③ ④ ⑤ ⑦ | ■ | 1 |

Safety instructions: Recommended operating speed for major exposed shank lengths

For a safe use it will be necessary to hold the tool to the workpiece before starting the machine and/or insert it into the boreholes or ducts. Contact with the workpiece must be ensured until the machine is deactivated. If permanent contact with the workpiece cannot be ensured, the machine should run at idling speed.

Reduced speeds for Tungsten-carbide burrs with extra long shank (150/200 mm)

| | | | | | |
|--|--------|--------|-------|-------|-------|
| Tool diameter d1 mm | 6 | 8 | 10 | 12 | 12 |
| Shank diameter d2 mm | 6 | 6 | 6 | 6 | 8 |
| Permitted idling speed without workpiece contact (1/min) | 4.000 | 3.200 | 2.800 | 2.200 | 3.600 |
| Permitted reduced operating speed with workpiece contact (1/min) | 13.000 | 10.000 | 8.000 | 7.000 | 7.000 |

Tools for stationary use



PG 1

Differential drill, radius mill, shank-end mill, die mill, profile mill

delivery on request

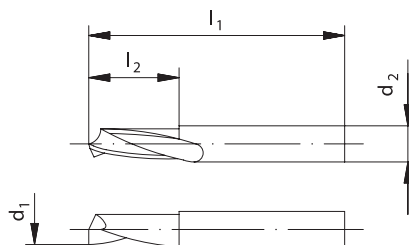
Range of application:

- Tool construction
- Turbine construction
- Aerospace industry
- General machine building

In addition to rotary burrs, we also produce tungsten carbide milling tools in special shapes and sizes for stationary application.

We supply these milling cutters with a diameter **of 20 mm** maximum diameter and with a maximum length **of 250 mm**; they differ from our extensive standard range by the shape, tool material and geometry (rake, clearance and helix angles).

Engraving cutters of solid carbide single flute type



Ordering example: A13150030337102

Further dimensions, cuts and shank lengths on request.

Unless otherwise specified, the tolerances are as DIN 7468



PG 1

| Product number | Description | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for | Information on page 438 | | | | |
|-----------------|-------------|-------------------|-------------------|-------------------|-------------------|-----------------|-------------------------|---|---|---|---|
| A13150030337102 | HGE 0207.03 | 2 | 7 | 3 | 40 | | | 6 | 8 | ■ | 1 |
| A13150030337103 | HGE 0307.03 | 3 | 7 | 3 | 40 | | | 6 | 8 | ■ | 1 |

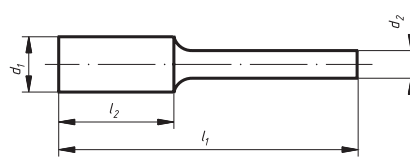
Application:

Very well suited for the machining of light metals, non-ferrous metals, plastics and for high-speed-machining of aluminium parts. Cutters with mirror finished flute allow for ideal chip removal and avoid clogging.

Recommended cutting speeds

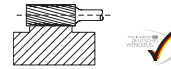
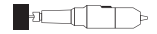
| Main group of materials | Sub-group | Hardness (HB) | Strength (N/mm ²) | Optimal cutting speed (m/min) |
|-------------------------|---|---------------|-------------------------------|-------------------------------|
| Aluminium, Magnesium | Al, Mg non alloyed | ≤ 100 | ≤ 350 | ≤ 400 |
| | Al alloyed Si < 0,5% | ≤ 150 | ≤ 500 | ≤ 400 |
| | Al alloyed Si ≥ 0,5 < 10 % | ≤ 120 | ≤ 400 | ≤ 100 |
| | Al alloyed Si ≥ 10 %, Mg-all., Al-Whisker | ≤ 120 | ≤ 400 | ≤ 70 |
| Plastics | Thermoplastics | - | - | ≤ 150 |
| | Thermo-setting plastics | - | - | - |

Shape A, Cylindrical



Ordering example: A10010210305

Further dimensions, cuts and shank lengths on request



PG 1

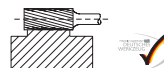
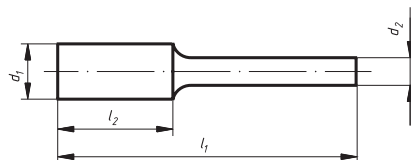
| Product number | Description | Cut | similar to DIN 8033 | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for | | |
|-------------------------|-------------|----------------|---------------------|-------------------|-------------------|-------------------|-------------------|-----------------|-------|-----|
| Information on page 438 | | | | | | | | | | |
| A10010210305 | HFA 0210.03 | Z5 | ZYA 0210 | 2 | 10 | 3 | 40 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10010313303 | HFA 0313.03 | Z3 | ZYA 0313 | 3 | 13 | 3 | 40 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10010313304 | HFA 0313.03 | Z4 | ZYA 0313 | 3 | 13 | 3 | 40 | ② ③ ④ | ⑦ ⑧ | ■ 1 |
| A10010313305 | HFA 0313.03 | Z5 | ZYA 0313 | 3 | 13 | 3 | 40 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10010313308 | HFA 0313.03 | Z7 Steel | ZYA 0313 | 3 | 13 | 3 | 40 | ① ② ③ | ⑤ ⑦ | ■ 1 |
| A10010313309 | HFA 0313.03 | Z9 Alu | ZYA 0313 | 3 | 13 | 3 | 40 | | ⑥ ⑧ | ■ 1 |
| A10010413603 | HFA 0413.06 | Z3 | ZYA 0413 | 4 | 13 | 6 | 50 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10010413608 | HFA 0413.06 | Z7 Steel | ZYA 0413 | 4 | 13 | 6 | 50 | ① ② ③ | ⑤ ⑦ | ■ 1 |
| A10010607305 | HFA 0607.03 | Z5 | ZYA 0607 | 6 | 7 | 3 | 37 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10010613305 | HFA 0613.03 | Z5 | ZYA 0613 | 6 | 13 | 3 | 43 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10010613308 | HFA 0613.03 | Z7 Steel | ZYA 0613 | 6 | 13 | 3 | 43 | ① ② ③ | ⑤ ⑦ | ■ 1 |
| A10010616602 | HFA 0616.06 | Z2 | ZYA 0616 | 6 | 16 | 6 | 50 | ① | ⑤ ⑥ ⑧ | ■ 1 |
| A10010616603 | HFA 0616.06 | Z3 | ZYA 0616 | 6 | 16 | 6 | 50 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10010616604 | HFA 0616.06 | Z4 | ZYA 0616 | 6 | 16 | 6 | 50 | ② ③ ④ | ⑦ ⑧ | ■ 1 |
| A10010616605 | HFA 0616.06 | Z5 | ZYA 0616 | 6 | 16 | 6 | 50 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10010616608 | HFA 0616.06 | Z7 Steel | ZYA 0616 | 6 | 16 | 6 | 50 | ① ② ③ | ⑤ ⑦ | ■ 1 |
| A10010616609 | HFA 0616.06 | Z9 Alu | ZYA 0616 | 6 | 16 | 6 | 50 | | ⑥ ⑧ | ■ 1 |
| A10010616620 | HFA 0616.06 | Z42 Inox/Steel | ZYA 0616 | 6 | 16 | 6 | 50 | ① ② ③ ④ | | ■ 1 |
| A10010616621 | HFA 0616.06 | Cast | ZYA 0616 | 6 | 16 | 6 | 50 | | ⑤ | ■ 1 |
| A10010820603 | HFA 0820.06 | Z3 | ZYA 0820 | 8 | 20 | 6 | 60 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10010820604 | HFA 0820.06 | Z4 | ZYA 0820 | 8 | 20 | 6 | 60 | ② ③ ④ | ⑦ ⑧ | ■ 1 |
| A10010820605 | HFA 0820.06 | Z5 | ZYA 0820 | 8 | 20 | 6 | 60 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10010820608 | HFA 0820.06 | Z7 Steel | ZYA 0820 | 8 | 20 | 6 | 60 | ① ② ③ | ⑤ ⑦ | ■ 1 |
| A10010820620 | HFA 0820.06 | Z42 Inox/Steel | ZYA 0820 | 8 | 20 | 6 | 60 | ① ② ③ ④ | | ■ 1 |
| A10010820621 | HFA 0820.06 | Cast | ZYA 0820 | 8 | 20 | 6 | 60 | | ⑤ | ■ 1 |
| A10011013603 | HFA 1013.06 | Z3 | ZYA 1013 | 10 | 13 | 6 | 53 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10011013608 | HFA 1013.06 | Z7 Steel | ZYA 1013 | 10 | 13 | 6 | 53 | ① ② ③ | ⑤ ⑦ | ■ 1 |
| A10011020603 | HFA 1020.06 | Z3 | ZYA 1020 | 10 | 20 | 6 | 60 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10011020604 | HFA 1020.06 | Z4 | ZYA 1020 | 10 | 20 | 6 | 60 | ② ③ ④ | ⑦ ⑧ | ■ 1 |
| A10011020608 | HFA 1020.06 | Z7 Steel | ZYA 1020 | 10 | 20 | 6 | 60 | ① ② ③ | ⑤ ⑦ | ■ 1 |
| A10011020620 | HFA 1020.06 | Z42 Inox/Steel | ZYA 1020 | 10 | 20 | 6 | 60 | ① ② ③ ④ | | ■ 1 |
| A10011020621 | HFA 1020.06 | Cast | ZYA 1020 | 10 | 20 | 6 | 60 | | ⑤ | ■ 1 |
| A10011025604 | HFA 1025.06 | Z4 | ZYA 1025 | 10 | 25 | 6 | 65 | ② ③ ④ | ⑦ ⑧ | ■ 1 |
| A10011025608 | HFA 1025.06 | Z7 Steel | ZYA 1025 | 10 | 25 | 6 | 65 | ① ② ③ | ⑤ ⑦ | ■ 1 |
| A10011025803 | HFA 1025.08 | Z3 | ZYA 1025 | 10 | 25 | 8 | 65 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10011225603 | HFA 1225.06 | Z3 | ZYA 1225 | 12 | 25 | 6 | 65 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10011225604 | HFA 1225.06 | Z4 | ZYA 1225 | 12 | 25 | 6 | 65 | ② ③ ④ | ⑦ ⑧ | ■ 1 |

Shape A, Cylindrical



Ordering example: A10010210305

Further dimensions, cuts and shank lengths on request



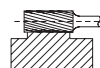
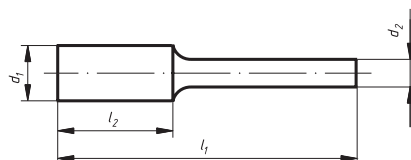
PG 1

| Product number | Description | Cut | similar to DIN 8033 | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for Information on page 438 | | |
|----------------|-------------|----------------|---------------------|-------------------|-------------------|-------------------|-------------------|--|---|---|
| A10011225605 | HFA 1225.06 | Z5 | ZYA 1225 | 12 | 25 | 6 | 65 | ① ② ③ ④ ⑦ | ■ | 1 |
| A10011225608 | HFA 1225.06 | Z7 Steel | ZYA 1225 | 12 | 25 | 6 | 65 | ① ② ③ ⑤ ⑦ | ■ | 1 |
| A10011225609 | HFA 1225.06 | Z9 Alu | ZYA 1225 | 12 | 25 | 6 | 65 | ⑥ ⑧ | ■ | 1 |
| A10011225620 | HFA 1225.06 | Z42 Inox/Steel | ZYA 1225 | 12 | 25 | 6 | 65 | ① ② ③ ④ | ■ | 1 |
| A10011225621 | HFA 1225.06 | Cast | ZYA 1225 | 12 | 25 | 6 | 65 | ⑤ | ■ | 1 |
| A10011225804 | HFA 1225.08 | Z4 | ZYA 1225 | 12 | 25 | 8 | 65 | ② ③ ④ ⑦ ⑧ | ■ | 1 |
| A10011225809 | HFA 1225.08 | Z9 Alu | ZYA 1225 | 12 | 25 | 8 | 65 | ⑥ ⑧ | ■ | 1 |
| A10011625603 | HFA 1625.06 | Z3 | ZYA 1625 | 16 | 25 | 6 | 65 | ① ② ③ ④ ⑦ | ■ | 1 |
| A10011625608 | HFA 1625.06 | Z7 Steel | ZYA 1625 | 16 | 25 | 6 | 65 | ① ② ③ ⑤ ⑦ | ■ | 1 |
| A10011625609 | HFA 1625.06 | Z9 Alu | ZYA 1625 | 16 | 25 | 6 | 65 | ⑥ ⑧ | ■ | 1 |
| A10011625809 | HFA 1625.08 | Z9 Alu | ZYA 1625 | 16 | 25 | 8 | 65 | ⑥ ⑧ | ■ | 1 |

Shape A, Cylindrical BASE-X



Ordering example: A10010313322



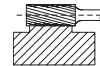
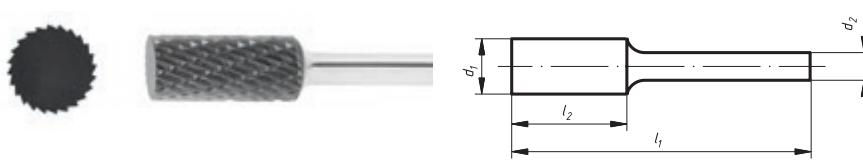
PG 1

| Product number | Description | Cut | similar to DIN 8033 | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for Information on page 438 | | |
|----------------|--------------------|-----|---------------------|-------------------|-------------------|-------------------|-------------------|--|---|----|
| A10010313322 | HFA 0313.03 BASE-X | ZX | ZYA 0313 | 3 | 13 | 3 | 40 | ① ② ③ ④ ⑤ ⑦ | ■ | 10 |
| A10010616622 | HFA 0616.06 BASE-X | ZX | ZYA 0616 | 6 | 16 | 6 | 50 | ① ② ③ ④ ⑤ ⑦ | ■ | 10 |
| A10010820622 | HFA 0820.06 BASE-X | ZX | ZYA 0820 | 8 | 20 | 6 | 60 | ① ② ③ ④ ⑤ ⑦ | ■ | 10 |
| A5001082062214 | HFA 0820.06 BASE-X | ZX | ZYA 8020 | 8 | 20 | 1/4" | 60 | ① ② ③ ④ ⑤ ⑦ | ■ | 10 |
| A10011020622 | HFA 1020.06 BASE-X | ZX | ZYA 1020 | 10 | 20 | 6 | 60 | ① ② ③ ④ ⑤ ⑦ | ■ | 10 |
| A5001102062214 | HFA 1020.06 BASE-X | ZX | ZYA 1020 | 10 | 20 | 1/4" | 60 | ① ② ③ ④ ⑤ ⑦ | ■ | 10 |

Shape A, Cylindrical BASE-X



Ordering example: A10010313322



PG 1

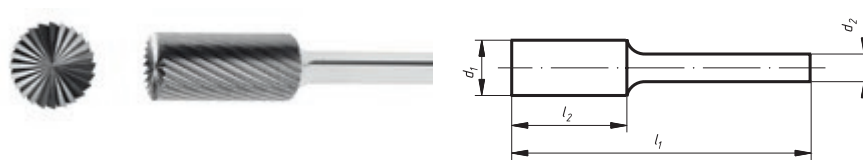
| Product number | Description | Cut | similar to DIN 8033 | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for Information on page 438 | | |
|----------------|--------------------|-----|---------------------|-------------------|-------------------|-------------------|-------------------|---|---|---|
| A10011225622 | HFA 1225.06 BASE-X | ZX | ZYA 1225 | 12 | 25 | 6 | 65 | ① ② ③ ④ ⑤ ⑦ | ■ | 5 |
| A5001122562214 | HFA 1225.06 BASE-X | ZX | ZYA 1225 | 12 | 25 | 1/4" | 65 | ① ② ③ ④ ⑤ ⑦ | ■ | 5 |

Shape A, Cylindrical, with end cut



Ordering example: A100102103050001

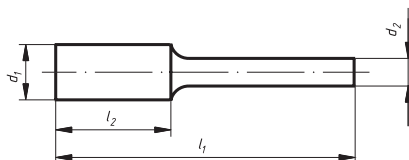
Further dimensions, cuts and shank lengths on request



PG 1

| Product number | Description | Cut | similar to DIN 8033 | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for Information on page 438 | | |
|------------------|--------------|----------|---------------------|-------------------|-------------------|-------------------|-------------------|---|---|---|
| A100102103050001 | HFAS 0210.03 | Z5 | ZYA-S 0210 | 2 | 10 | 3 | 40 | ① ② ③ ④ ⑦ | ■ | 1 |
| A100103133030001 | HFAS 0313.03 | Z3 | ZYA-S 0313 | 3 | 13 | 3 | 40 | ① ② ③ ④ ⑦ | ■ | 1 |
| A100103133040001 | HFAS 0313.03 | Z4 | ZYA-S 0313 | 3 | 13 | 3 | 40 | ② ③ ④ ⑦ ⑧ | ■ | 1 |
| A100103133050001 | HFAS 0313.03 | Z5 | ZYA-S 0313 | 3 | 13 | 3 | 40 | ① ② ③ ④ ⑦ | ■ | 1 |
| A100103133080001 | HFAS 0313.03 | Z7 Steel | ZYA-S 0313 | 3 | 13 | 3 | 40 | ① ② ③ ⑤ ⑦ | ■ | 1 |
| A100104136030001 | HFAS 0413.06 | Z3 | ZYA-S 0413 | 4 | 13 | 6 | 50 | ① ② ③ ④ ⑦ | ■ | 1 |
| A100104136080001 | HFAS 0413.06 | Z7 Steel | ZYA-S 0413 | 4 | 13 | 6 | 50 | ① ② ③ ⑤ ⑦ | ■ | 1 |
| A100106073050001 | HFAS 0607.03 | Z5 | ZYA-S 0607 | 6 | 7 | 3 | 37 | ① ② ③ ④ ⑦ | ■ | 1 |
| A100106133050001 | HFAS 0613.03 | Z5 | ZYA-S 0613 | 6 | 13 | 3 | 43 | ① ② ③ ④ ⑦ | ■ | 1 |
| A100106133080001 | HFAS 0613.03 | Z7 Steel | ZYA-S 0613 | 6 | 13 | 3 | 43 | ① ② ③ ⑤ ⑦ | ■ | 1 |
| A100106166030001 | HFAS 0616.06 | Z3 | ZYA-S 0616 | 6 | 16 | 6 | 50 | ① ② ③ ④ ⑦ | ■ | 1 |
| A100106166040001 | HFAS 0616.06 | Z4 | ZYA-S 0616 | 6 | 16 | 6 | 50 | ② ③ ④ ⑦ ⑧ | ■ | 1 |
| A100106166050001 | HFAS 0616.06 | Z5 | ZYA-S 0616 | 6 | 16 | 6 | 50 | ① ② ③ ④ ⑦ | ■ | 1 |
| A100106166080001 | HFAS 0616.06 | Z7 Steel | ZYA-S 0616 | 6 | 16 | 6 | 50 | ① ② ③ ⑤ ⑦ | ■ | 1 |
| A100108206030001 | HFAS 0820.06 | Z3 | ZYA-S 0820 | 8 | 20 | 6 | 60 | ① ② ③ ④ ⑦ | ■ | 1 |
| A100108206040001 | HFAS 0820.06 | Z4 | ZYA-S 0820 | 8 | 20 | 6 | 60 | ② ③ ④ ⑦ ⑧ | ■ | 1 |
| A100108206050001 | HFAS 0820.06 | Z5 | ZYA-S 0820 | 8 | 20 | 6 | 60 | ① ② ③ ④ ⑦ | ■ | 1 |
| A100108206080001 | HFAS 0820.06 | Z7 Steel | ZYA-S 0820 | 8 | 20 | 6 | 60 | ① ② ③ ⑤ ⑦ | ■ | 1 |

Shape A, Cylindrical, with end cut



Ordering example: A100102103050001

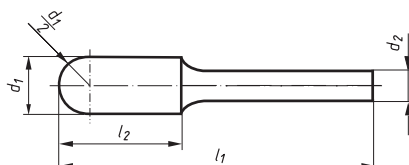
Further dimensions, cuts and shank lengths on request



PG 1

| Product number | Description | Cut | similar to DIN 8033 | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for Information on page 438 | | |
|------------------|--------------|----------|---------------------|-------------------|-------------------|-------------------|-------------------|---|---|---|
| A100110136030001 | HFAS 1013.06 | Z3 | ZYA-S 1013 | 10 | 13 | 6 | 53 | ① ② ③ ④ ⑦ | ■ | 1 |
| A100110136080001 | HFAS 1013.06 | Z7 Steel | ZYA-S 1013 | 10 | 13 | 6 | 53 | ① ② ③ ⑤ ⑦ | ■ | 1 |
| A100110206030001 | HFAS 1020.06 | Z3 | ZYA-S 1020 | 10 | 20 | 6 | 60 | ① ② ③ ④ ⑦ | ■ | 1 |
| A100110206040001 | HFAS 1020.06 | Z4 | ZYA-S 1020 | 10 | 20 | 6 | 60 | ② ③ ④ ⑦ ⑧ | ■ | 1 |
| A100110206080001 | HFAS 1020.06 | Z7 Steel | ZYA-S 1020 | 10 | 20 | 6 | 60 | ① ② ③ ⑤ ⑦ | ■ | 1 |
| A100110256040001 | HFAS 1025.06 | Z4 | ZYA-S 1025 | 10 | 25 | 6 | 65 | ② ③ ④ ⑦ ⑧ | ■ | 1 |
| A100110256080001 | HFAS 1025.06 | Z7 Steel | ZYA-S 1025 | 10 | 25 | 6 | 65 | ① ② ③ ⑤ ⑦ | ■ | 1 |
| A100112256030001 | HFAS 1225.06 | Z3 | ZYA-S 1225 | 12 | 25 | 6 | 65 | ① ② ③ ④ ⑦ | ■ | 1 |
| A100112256040001 | HFAS 1225.06 | Z4 | ZYA-S 1225 | 12 | 25 | 6 | 65 | ② ③ ④ ⑦ ⑧ | ■ | 1 |
| A100112256050001 | HFAS 1225.06 | Z5 | ZYA-S 1225 | 12 | 25 | 6 | 65 | ① ② ③ ④ ⑦ | ■ | 1 |
| A100112256080001 | HFAS 1225.06 | Z7 Steel | ZYA-S 1225 | 12 | 25 | 6 | 65 | ① ② ③ ⑤ ⑦ | ■ | 1 |
| A100112258040001 | HFAS 1225.08 | Z4 | ZYA-S 1225 | 12 | 25 | 8 | 65 | ② ③ ④ ⑦ ⑧ | ■ | 1 |
| A100112258080001 | HFAS 1225.08 | Z7 Steel | ZYA-S 1225 | 12 | 25 | 8 | 65 | ① ② ③ ⑤ ⑦ | ■ | 1 |
| A100116256030001 | HFAS 1625.06 | Z3 | ZYA-S 1625 | 16 | 25 | 6 | 65 | ① ② ③ ④ ⑦ | ■ | 1 |
| A100116256080001 | HFAS 1625.06 | Z7 Steel | ZYA-S 1625 | 16 | 25 | 6 | 65 | ① ② ③ ⑤ ⑦ | ■ | 1 |

Shape C, Cylindrical round nose



Ordering example: A10020210305

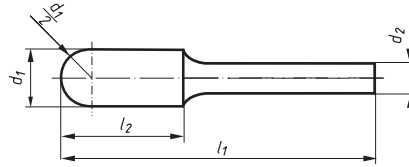
Further dimensions, cuts and shank lengths on request



PG 1

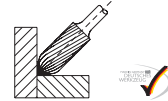
| Product number | Description | Cut | similar to DIN 8033 | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for Information on page 438 | | |
|----------------|-------------|----------|---------------------|-------------------|-------------------|-------------------|-------------------|---|---|---|
| A10020210305 | HFC 0210.03 | Z5 | WRC 0210 | 2 | 10 | 3 | 40 | ① ② ③ ④ ⑦ | ■ | 1 |
| A10020210308 | HFC 0210.03 | Z7 Steel | WRC 0210 | 2 | 10 | 3 | 40 | ① ② ③ ⑤ ⑦ | ■ | 1 |
| A10020313302 | HFC 0313.03 | Z2 | WRC 0313 | 3 | 13 | 3 | 40 | ① ⑤ ⑥ ⑧ | ■ | 1 |
| A10020313303 | HFC 0313.03 | Z3 | WRC 0313 | 3 | 13 | 3 | 40 | ① ② ③ ④ ⑦ | ■ | 1 |
| A10020313304 | HFC 0313.03 | Z4 | WRC 0313 | 3 | 13 | 3 | 40 | ② ③ ④ ⑦ ⑧ | ■ | 1 |

Shape C, Cylindrical round nose



Ordering example: A10020210305

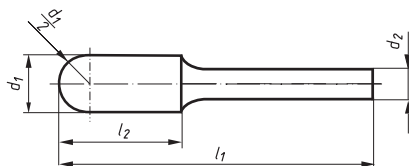
Further dimensions, cuts and shank lengths on request



PG 1

| Product number | Description | Cut | similar to DIN 8033 | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for | | |
|-------------------------|-------------|----------------|---------------------|-------------------|-------------------|-------------------|-------------------|-----------------|-------|-----|
| Information on page 438 | | | | | | | | | | |
| A10020313305 | HFC 0313.03 | Z5 | WRC 0313 | 3 | 13 | 3 | 40 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10020313308 | HFC 0313.03 | Z7 Steel | WRC 0313 | 3 | 13 | 3 | 40 | ① ② ③ ⑤ | ⑦ | ■ 1 |
| A10020313309 | HFC 0313.03 | Z9 Alu | WRC 0313 | 3 | 13 | 3 | 40 | | ⑥ ⑧ | ■ 1 |
| A10020413603 | HFC 0413.06 | Z3 | WRC 0413 | 4 | 13 | 6 | 50 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10020413604 | HFC 0413.06 | Z4 | WRC 0413 | 4 | 13 | 6 | 50 | ② ③ ④ | ⑦ ⑧ | ■ 1 |
| A10020413608 | HFC 0413.06 | Z7 Steel | WRC 0413 | 4 | 13 | 6 | 50 | ① ② ③ ⑤ | ⑦ | ■ 1 |
| A10020613305 | HFC 0613.03 | Z5 | WRC 0613 | 6 | 13 | 3 | 43 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10020613308 | HFC 0613.03 | Z7 Steel | WRC 0613 | 6 | 13 | 3 | 43 | ① ② ③ ⑤ | ⑦ | ■ 1 |
| A10020616601 | HFC 0616.06 | Z1 | WRC 0616 | 6 | 16 | 6 | 50 | | ⑥ ⑧ | ■ 1 |
| A10020616602 | HFC 0616.06 | Z2 | WRC 0616 | 6 | 16 | 6 | 50 | ① | ⑤ ⑥ ⑧ | ■ 1 |
| A10020616603 | HFC 0616.06 | Z3 | WRC 0616 | 6 | 16 | 6 | 50 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10020616604 | HFC 0616.06 | Z4 | WRC 0616 | 6 | 16 | 6 | 50 | ② ③ ④ | ⑦ ⑧ | ■ 1 |
| A10020616605 | HFC 0616.06 | Z5 | WRC 0616 | 6 | 16 | 6 | 50 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10020616608 | HFC 0616.06 | Z7 Steel | WRC 0616 | 6 | 16 | 6 | 50 | ① ② ③ ⑤ | ⑦ | ■ 1 |
| A10020616609 | HFC 0616.06 | Z9 Alu | WRC 0616 | 6 | 16 | 6 | 50 | | ⑥ ⑧ | ■ 1 |
| A10020616620 | HFC 0616.06 | Z42 Inox/Steel | WRC 0616 | 6 | 16 | 6 | 50 | ① ② ③ ④ | | ■ 1 |
| A10020616621 | HFC 0616.06 | Cast | WRC 0616 | 6 | 16 | 6 | 50 | | ⑤ | ■ 1 |
| A10020820603 | HFC 0820.06 | Z3 | WRC 0820 | 8 | 20 | 6 | 60 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10020820604 | HFC 0820.06 | Z4 | WRC 0820 | 8 | 20 | 6 | 60 | ② ③ ④ | ⑦ ⑧ | ■ 1 |
| A10020820605 | HFC 0820.06 | Z5 | WRC 0820 | 8 | 20 | 6 | 60 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10020820606 | HFC 0820.06 | Z6 | WRC 0820 | 8 | 20 | 6 | 60 | ② ③ ④ | ⑦ ⑧ | ■ 1 |
| A10020820608 | HFC 0820.06 | Z7 Steel | WRC 0820 | 8 | 20 | 6 | 60 | ① ② ③ ⑤ | ⑦ | ■ 1 |
| A10020820609 | HFC 0820.06 | Z9 Alu | WRC 0820 | 8 | 20 | 6 | 60 | | ⑥ ⑧ | ■ 1 |
| A10020820620 | HFC 0820.06 | Z42 Inox/Steel | WRC 0820 | 8 | 20 | 6 | 60 | ① ② ③ ④ | | ■ 1 |
| A10020820621 | HFC 0820.06 | Cast | WRC 0820 | 8 | 20 | 6 | 60 | | ⑤ | ■ 1 |
| A10021020603 | HFC 1020.06 | Z3 | WRC 1020 | 10 | 20 | 6 | 60 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10021020604 | HFC 1020.06 | Z4 | WRC 1020 | 10 | 20 | 6 | 60 | ② ③ ④ | ⑦ ⑧ | ■ 1 |
| A10021020605 | HFC 1020.06 | Z5 | WRC 1020 | 10 | 20 | 6 | 60 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10021020606 | HFC 1020.06 | Z6 | WRC 1020 | 10 | 20 | 6 | 60 | ② ③ ④ | ⑦ ⑧ | ■ 1 |
| A10021020608 | HFC 1020.06 | Z7 Steel | WRC 1020 | 10 | 20 | 6 | 60 | ① ② ③ ⑤ | ⑦ | ■ 1 |
| A10021020620 | HFC 1020.06 | Z42 Inox/Steel | WRC 1020 | 10 | 20 | 6 | 60 | ① ② ③ ④ | | ■ 1 |
| A10021020621 | HFC 1020.06 | Cast | WRC 1020 | 10 | 20 | 6 | 60 | | ⑤ | ■ 1 |
| A10021020804 | HFC 1020.08 | Z4 | WRC 1020 | 10 | 20 | 8 | 60 | ② ③ ④ | ⑦ ⑧ | ■ 1 |
| A10021020808 | HFC 1020.08 | Z7 Steel | WRC 1020 | 10 | 20 | 8 | 60 | ① ② ③ ⑤ | ⑦ | ■ 1 |
| A10021025608 | HFC 1025.06 | Z7 Steel | WRC 1025 | 10 | 25 | 6 | 65 | ① ② ③ ⑤ | ⑦ | ■ 1 |
| A10021225601 | HFC 1225.06 | Z1 | WRC 1225 | 12 | 25 | 6 | 65 | | ⑥ ⑧ | ■ 1 |
| A10021225602 | HFC 1225.06 | Z2 | WRC 1225 | 12 | 25 | 6 | 65 | ① | ⑤ ⑥ ⑧ | ■ 1 |

Shape C, Cylindrical round nose



Ordering example: A10020210305

Further dimensions, cuts and shank lengths on request



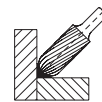
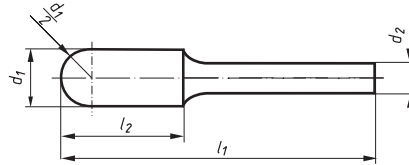
PG 1

| Product number | Description | Cut | similar to DIN 8033 | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for Information on page 438 | | |
|----------------|-------------|----------------|---------------------|-------------------|-------------------|-------------------|-------------------|---|-----|-----|
| A10021225603 | HFC 1225.06 | Z3 | WRC 1225 | 12 | 25 | 6 | 65 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10021225604 | HFC 1225.06 | Z4 | WRC 1225 | 12 | 25 | 6 | 65 | ② ③ ④ | ⑦ ⑧ | ■ 1 |
| A10021225605 | HFC 1225.06 | Z5 | WRC 1225 | 12 | 25 | 6 | 65 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10021225606 | HFC 1225.06 | Z6 | WRC 1225 | 12 | 25 | 6 | 65 | ② ③ ④ | ⑦ ⑧ | ■ 1 |
| A10021225608 | HFC 1225.06 | Z7 Steel | WRC 1225 | 12 | 25 | 6 | 65 | ① ② ③ | ⑤ ⑦ | ■ 1 |
| A10021225609 | HFC 1225.06 | Z9 Alu | WRC 1225 | 12 | 25 | 6 | 65 | | ⑥ ⑧ | ■ 1 |
| A10021225620 | HFC 1225.06 | Z42 Inox/Steel | WRC 1225 | 12 | 25 | 6 | 65 | ① ② ③ ④ | | ■ 1 |
| A10021225621 | HFC 1225.06 | Cast | WRC 1225 | 12 | 25 | 6 | 65 | | ⑤ | ■ 1 |
| A10021225803 | HFC 1225.08 | Z3 | WRC 1225 | 12 | 25 | 8 | 65 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10021225808 | HFC 1225.08 | Z7 Steel | WRC 1225 | 12 | 25 | 8 | 65 | ① ② ③ | ⑤ ⑦ | ■ 1 |
| A10021225809 | HFC 1225.08 | Z9 Alu | WRC 1225 | 12 | 25 | 8 | 65 | | ⑥ ⑧ | ■ 1 |
| A10021625603 | HFC 1625.06 | Z3 | WRC 1625 | 16 | 25 | 6 | 65 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10021625608 | HFC 1625.06 | Z7 Steel | WRC 1625 | 16 | 25 | 6 | 65 | ① ② ③ | ⑤ ⑦ | ■ 1 |
| A10021625609 | HFC 1625.06 | Z9 Alu | WRC 1625 | 16 | 25 | 6 | 65 | | ⑥ ⑧ | ■ 1 |
| A10021625803 | HFC 1625.08 | Z3 | WRC 1625 | 16 | 25 | 8 | 65 | ① ② ③ ④ | ⑦ | ■ 1 |

Shape C, Cylindrical round nose BASE-X



Ordering example: A10020313322



PG 1

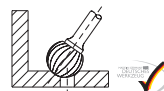
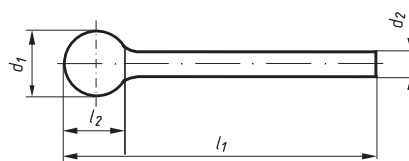
| Product number | Description | Cut | similar to DIN 8033 | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for Information on page 438 | | |
|-----------------|--------------------|-----|---------------------|-------------------|-------------------|-------------------|-------------------|---|---|----|
| A10020313322 | HFC 0313.03 BASE-X | ZX | WRC 0313 | 3 | 13 | 3 | 40 | ① ② ③ ④ ⑤ ⑦ | ■ | 10 |
| A10020613322 | HFC 0613.03 BASE-X | ZX | WRC 0613 | 6 | 13 | 3 | 43 | ① ② ③ ④ ⑤ ⑦ | ■ | 10 |
| A10020616622 | HFC 0616.06 BASE-X | ZX | WRC 0616 | 6 | 16 | 6 | 50 | ① ② ③ ④ ⑤ ⑦ | ■ | 10 |
| A5002061662214 | HFC 0616.06 BASE-X | ZX | WRC 0616 | 6 | 16 | 1/4" | 50 | ① ② ③ ④ ⑤ ⑦ | ■ | 10 |
| A10020820622 | HFC 0820.06 BASE-X | ZX | WRC 0820 | 8 | 20 | 6 | 60 | ① ② ③ ④ ⑤ ⑦ | ■ | 10 |
| A5002082062214 | HFC 0820.06 BASE-X | ZX | WRC 0820 | 8 | 20 | 1/4" | 60 | ① ② ③ ④ ⑤ ⑦ | ■ | 10 |
| A10020820622150 | HFC 0820.06 BASE-X | ZX | WRC 0820 | 8 | 20 | 6 | 170 | ① ② ③ ④ ⑤ ⑦ | ■ | 1 |
| A10021020622 | HFC 1020.06 BASE-X | ZX | WRC 1020 | 10 | 20 | 6 | 60 | ① ② ③ ④ ⑤ ⑦ | ■ | 10 |
| A5002102062214 | HFC 1020.06 BASE-X | ZX | WRC 1020 | 10 | 20 | 1/4" | 60 | ① ② ③ ④ ⑤ ⑦ | ■ | 10 |
| A10021020622150 | HFC 1020.06 BASE-X | ZX | WRC 1020 | 10 | 20 | 6 | 170 | ① ② ③ ④ ⑤ ⑦ | ■ | 1 |
| A10021225622 | HFC 1225.06 BASE-X | ZX | WRC 1225 | 12 | 25 | 6 | 65 | ① ② ③ ④ ⑤ ⑦ | ■ | 5 |
| A5002122562214 | HFC 1225.06 BASE-X | ZX | WRC 1225 | 12 | 25 | 1/4" | 65 | ① ② ③ ④ ⑤ ⑦ | ■ | 5 |
| A10021225622150 | HFC 1225.06 BASE-X | ZX | WRC 1225 | 12 | 25 | 6 | 175 | ① ② ③ ④ ⑤ | ■ | 1 |

Shape D, Spherical



Ordering example: A10030303302

Further dimensions, cuts and shank lengths on request



PG 1

| Product number | Description | Cut | similar to DIN 8033 | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for Information on page 438 | | |
|-----------------|-------------|----------|---------------------|-------------------|-------------------|-------------------|-------------------|---|---|---|
| A10030303302 | HFD 0302.03 | Z2 | KUD 0302 | 3 | 2 | 3 | 40 | ① ⑤ ⑥ ⑧ | ■ | 1 |
| A10030303303 | HFD 0302.03 | Z3 | KUD 0302 | 3 | 2 | 3 | 40 | ① ② ③ ④ ⑦ | ■ | 1 |
| A10030303304 | HFD 0302.03 | Z4 | KUD 0302 | 3 | 2 | 3 | 40 | ② ③ ④ ⑦ ⑧ | ■ | 1 |
| A10030303305 | HFD 0302.03 | Z5 | KUD 0302 | 3 | 2 | 3 | 40 | ① ② ③ ④ ⑦ | ■ | 1 |
| A10030303308 | HFD 0302.03 | Z7 Steel | KUD 0302 | 3 | 2 | 3 | 40 | ① ② ③ ⑤ ⑦ | ■ | 1 |
| A10030403309 | HFD 0403.03 | Z9 Alu | KUD 0403 | 4 | 3 | 3 | 34 | ⑥ ⑧ | ■ | 1 |
| A10030403050001 | HFD 0403.03 | Z5 | KUD 0403 | 4 | 3 | 3 | 34 | ① ② ③ ④ ⑦ | ■ | 1 |
| A10030403080001 | HFD 0403.03 | Z7 Steel | KUD 0403 | 4 | 3 | 3 | 34 | ① ② ③ ⑤ ⑦ | ■ | 1 |
| A10030404603 | HFD 0403.06 | Z3 | KUD 0403 | 4 | 3 | 6 | 50 | ① ② ③ ④ ⑦ | ■ | 1 |

Shape D, Spherical

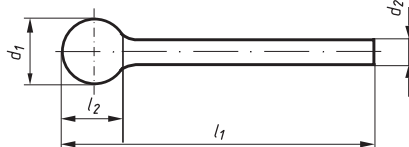


Ordering example: A10030303302

Further dimensions, cuts and shank lengths on request

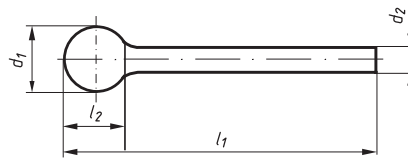


PG 1



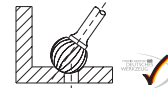
| Product number | Description | Cut | similar to DIN 8033 | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for | Information on page 438 | | |
|----------------|-------------|----------------|---------------------|-------------------|-------------------|-------------------|-------------------|-----------------|-------------------------|---|---|
| A10030404604 | HFD 0403.06 | Z4 | KUD 0403 | 4 | 3 | 6 | 50 | 2 3 4 | 7 8 | ■ | 1 |
| A10030404608 | HFD 0403.06 | Z7 Steel | KUD 0403 | 4 | 3 | 6 | 50 | 1 2 3 5 | 7 | ■ | 1 |
| A10030605609 | HFD 0605.06 | Z9 Alu | KUD 0605 | 6 | 5 | 6 | 50 | | 6 8 | ■ | 1 |
| A10030605620 | HFD 0605.06 | Z42 Inox/Steel | KUD 0605 | 6 | 5 | 6 | 50 | 1 2 3 4 | | ■ | 1 |
| A10030605621 | HFD 0605.06 | Cast | KUD 0605 | 6 | 5 | 6 | 50 | | 5 | ■ | 1 |
| A10030606305 | HFD 0605.03 | Z5 | KUD 0605 | 6 | 5 | 3 | 35 | 1 2 3 4 | 7 | ■ | 1 |
| A10030606308 | HFD 0605.03 | Z7 Steel | KUD 0605 | 6 | 5 | 3 | 35 | 1 2 3 5 | 7 | ■ | 1 |
| A10030606603 | HFD 0605.06 | Z3 | KUD 0605 | 6 | 5 | 6 | 50 | 1 2 3 4 | 7 | ■ | 1 |
| A10030606604 | HFD 0605.06 | Z4 | KUD 0605 | 6 | 5 | 6 | 50 | | 2 3 4 7 8 | ■ | 1 |
| A10030606605 | HFD 0605.06 | Z5 | KUD 0605 | 6 | 5 | 6 | 50 | 1 2 3 4 | 7 | ■ | 1 |
| A10030606608 | HFD 0605.06 | Z7 Steel | KUD 0605 | 6 | 5 | 6 | 50 | 1 2 3 5 | 7 | ■ | 1 |
| A10030807620 | HFD 0807.06 | Z42 Inox/Steel | KUD 0807 | 8 | 7 | 6 | 47 | 1 2 3 4 | | ■ | 1 |
| A10030807621 | HFD 0807.06 | Cast | KUD 0807 | 8 | 7 | 6 | 47 | | 5 | ■ | 1 |
| A10030808603 | HFD 0807.06 | Z3 | KUD 0807 | 8 | 7 | 6 | 47 | 1 2 3 4 | 7 | ■ | 1 |
| A10030808604 | HFD 0807.06 | Z4 | KUD 0807 | 8 | 7 | 6 | 47 | | 2 3 4 7 8 | ■ | 1 |
| A10030808605 | HFD 0807.06 | Z5 | KUD 0807 | 8 | 7 | 6 | 47 | 1 2 3 4 | 7 | ■ | 1 |
| A10030808608 | HFD 0807.06 | Z7 Steel | KUD 0807 | 8 | 7 | 6 | 47 | 1 2 3 5 | 7 | ■ | 1 |
| A10031009620 | HFD 1009.06 | Z42 Inox/Steel | KUD 1009 | 10 | 9 | 6 | 49 | 1 2 3 4 | | ■ | 1 |
| A10031009621 | HFD 1009.06 | Cast | KUD 1009 | 10 | 9 | 6 | 49 | | 5 | ■ | 1 |
| A10031010603 | HFD 1009.06 | Z3 | KUD 1009 | 10 | 9 | 6 | 49 | 1 2 3 4 | 7 | ■ | 1 |
| A10031010604 | HFD 1009.06 | Z4 | KUD 1009 | 10 | 9 | 6 | 49 | | 2 3 4 7 8 | ■ | 1 |
| A10031010605 | HFD 1009.06 | Z5 | KUD 1009 | 10 | 9 | 6 | 49 | 1 2 3 4 | 7 | ■ | 1 |
| A10031010608 | HFD 1009.06 | Z7 Steel | KUD 1009 | 10 | 9 | 6 | 49 | 1 2 3 5 | 7 | ■ | 1 |
| A10031210620 | HFD 1210.06 | Z42 Inox/Steel | KUD 1210 | 12 | 10 | 6 | 51 | 1 2 3 4 | | ■ | 1 |
| A10031210621 | HFD 1210.06 | Cast | KUD 1210 | 12 | 10 | 6 | 51 | | 5 | ■ | 1 |
| A10031210808 | HFD 1210.08 | Z7 Steel | KUD 1210 | 12 | 10 | 8 | 51 | 1 2 3 5 | 7 | ■ | 1 |
| A10031212603 | HFD 1210.06 | Z3 | KUD 1210 | 12 | 10 | 6 | 51 | 1 2 3 4 | 7 | ■ | 1 |
| A10031212604 | HFD 1210.06 | Z4 | KUD 1210 | 12 | 10 | 6 | 51 | | 2 3 4 7 8 | ■ | 1 |
| A10031212605 | HFD 1210.06 | Z5 | KUD 1210 | 12 | 10 | 6 | 51 | 1 2 3 4 | 7 | ■ | 1 |
| A10031212608 | HFD 1210.06 | Z7 Steel | KUD 1210 | 12 | 10 | 6 | 51 | 1 2 3 5 | 7 | ■ | 1 |
| A10031212609 | HFD 1210.06 | Z9 Alu | KUD 1210 | 12 | 10 | 6 | 50 | | 6 8 | ■ | 1 |
| A10031212804 | HFD 1210.08 | Z4 | KUD 1210 | 12 | 10 | 8 | 51 | | 2 3 4 7 8 | ■ | 1 |
| A10031616603 | HFD 1614.06 | Z3 | KUD 1614 | 16 | 14 | 6 | 54 | 1 2 3 4 | 7 | ■ | 1 |
| A10031616604 | HFD 1614.06 | Z4 | KUD 1614 | 16 | 14 | 6 | 54 | | 2 3 4 7 8 | ■ | 1 |
| A10031616608 | HFD 1614.06 | Z7 Steel | KUD 1614 | 16 | 14 | 6 | 54 | 1 2 3 5 | 7 | ■ | 1 |
| A10031616609 | HFD 1614.06 | Z9 Alu | KUD 1614 | 16 | 14 | 6 | 54 | | 6 8 | ■ | 1 |
| A10031616803 | HFD 1614.08 | Z3 | KUD 1614 | 16 | 14 | 8 | 54 | 1 2 3 4 | 7 | ■ | 1 |

Shape D, Spherical



Ordering example: A10030303302

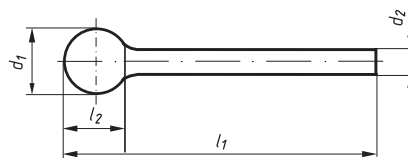
Further dimensions, cuts and shank lengths on request



PG 1

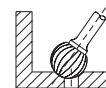
| Product number | Description | Cut | similar to DIN 8033 | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for | | | | | | |
|----------------|-------------|----------|---------------------|-------------------|-------------------|-------------------|-------------------|-----------------|---|---|---|---|---|---|
| A10031616809 | HFD 1614.08 | Z9 Alu | KUD 1614 | 16 | 14 | 8 | 54 | | 6 | 8 | ■ | 1 | | |
| A10032020603 | HFD 2018.06 | Z3 | KUD 2018 | 20 | 18 | 6 | 58 | 1 | 2 | 3 | 4 | 7 | ■ | 1 |
| A10032020608 | HFD 2018.06 | Z7 Steel | KUD 2018 | 20 | 18 | 6 | 58 | 1 | 2 | 3 | 5 | 7 | ■ | 1 |
| A10032020803 | HFD 2018.08 | Z3 | KUD 2018 | 20 | 18 | 8 | 58 | 1 | 2 | 3 | 4 | 7 | ■ | 1 |

Shape D, Spherical BASE-X



Ordering example: A10030403322

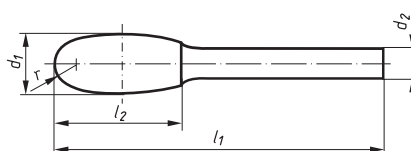
Further dimensions, cuts and shank lengths on request



PG 1

| Product number | Description | Cut | similar to DIN 8033 | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for | | | | | | | |
|-----------------|--------------------|-----|---------------------|-------------------|-------------------|-------------------|-------------------|-----------------|---|---|---|---|---|---|----|
| A10030403322 | HFD 0403.03 BASE-X | ZX | KUD 0403 | 4 | 3 | 3 | 34 | 1 | 2 | 3 | 4 | 5 | 7 | ■ | 10 |
| A10030605322 | HFD 0605.03 BASE-X | ZX | KUD 0605 | 6 | 5 | 3 | 35 | 1 | 2 | 3 | 4 | 5 | 7 | ■ | 10 |
| A10030807622 | HFD 0807.06 BASE-X | ZX | KUD 0807 | 8 | 7 | 6 | 47 | 1 | 2 | 3 | 4 | 5 | 7 | ■ | 10 |
| A10030807622150 | HFD 0807.06 BASE-X | ZX | KUD 0807 | 8 | 7 | 6 | 157 | 1 | 2 | 3 | 4 | 5 | 7 | ■ | 1 |
| A10031009622 | HFD 1009.06 BASE-X | ZX | KUD 1009 | 10 | 9 | 6 | 49 | 1 | 2 | 3 | 4 | 5 | 7 | ■ | 10 |
| A10031009622150 | HFD 1009.06 BASE-X | ZX | KUD 1009 | 10 | 9 | 6 | 159 | 1 | 2 | 3 | 4 | 5 | 7 | ■ | 1 |
| A5003100962214 | HFD 1009.06 BASE-X | ZX | KUD 1009 | 10 | 9 | 1/4" | 49 | 1 | 2 | 3 | 4 | 5 | 7 | ■ | 10 |
| A10031210622 | HFD 1210.06 BASE-X | ZX | KUD 1210 | 12 | 10 | 6 | 51 | 1 | 2 | 3 | 4 | 5 | 7 | ■ | 5 |
| A5003121062214 | HFD 1210.06 BASE-X | ZX | KUD 1210 | 12 | 10 | 1/4" | 51 | 1 | 2 | 3 | 4 | 5 | 7 | ■ | 5 |

Shape E, Oval



Ordering example: A10060307303

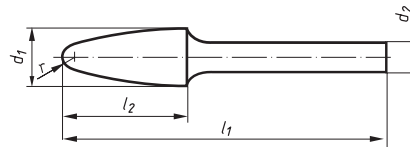
Further dimensions, cuts and shank lengths on request



PG 1

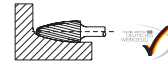
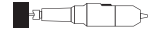
| Product number | Description | Cut | similar to DIN 8033 | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for | Information on page 438 | | |
|----------------|-------------|----------|---------------------|-------------------|-------------------|-------------------|-------------------|-----------------|-------------------------|---|---|
| A10060307303 | HFE 0307.03 | Z3 | TRE 0307 | 3 | 7 | 3 | 40 | 1 2 3 4 | 7 | ■ | 1 |
| A10060307305 | HFE 0307.03 | Z5 | TRE 0307 | 3 | 7 | 3 | 40 | 1 2 3 4 | 7 | ■ | 1 |
| A10060307308 | HFE 0307.03 | Z7 Steel | TRE 0307 | 3 | 7 | 3 | 40 | 1 2 3 5 | 7 | ■ | 1 |
| A10060610305 | HFE 0610.03 | Z5 | TRE 0610 | 6 | 10 | 3 | 40 | 1 2 3 4 | 7 | ■ | 1 |
| A10060610308 | HFE 0610.03 | Z7 Steel | TRE 0610 | 6 | 10 | 3 | 40 | 1 2 3 5 | 7 | ■ | 1 |
| A10060610603 | HFE 0610.06 | Z3 | TRE 0610 | 6 | 10 | 6 | 50 | 1 2 3 4 | 7 | ■ | 1 |
| A10060610604 | HFE 0610.06 | Z4 | TRE 0610 | 6 | 10 | 6 | 50 | 2 3 4 | 7 8 | ■ | 1 |
| A10060610608 | HFE 0610.06 | Z7 Steel | TRE 0610 | 6 | 10 | 6 | 50 | 1 2 3 5 | 7 | ■ | 1 |
| A10060610621 | HFE 0610.06 | Cast | TRE 0610 | 6 | 10 | 6 | 50 | 5 | | ■ | 1 |
| A10060813603 | HFE 0813.06 | Z3 | TRE 0813 | 8 | 13 | 6 | 53 | 1 2 3 4 | 7 | ■ | 1 |
| A10060813604 | HFE 0813.06 | Z4 | TRE 0813 | 8 | 13 | 6 | 53 | 2 3 4 | 7 8 | ■ | 1 |
| A10060813608 | HFE 0813.06 | Z7 Steel | TRE 0813 | 8 | 13 | 6 | 53 | 1 2 3 5 | 7 | ■ | 1 |
| A10060813621 | HFE 0813.06 | Cast | TRE 0813 | 8 | 13 | 6 | 53 | 5 | | ■ | 1 |
| A10061016621 | HFE 1016.06 | Cast | TRE 1016 | 10 | 16 | 6 | 56 | 5 | | ■ | 1 |
| A10061220603 | HFE 1220.06 | Z3 | TRE 1220 | 12 | 20 | 6 | 60 | 1 2 3 4 | 7 | ■ | 1 |
| A10061220604 | HFE 1220.06 | Z4 | TRE 1220 | 12 | 20 | 6 | 60 | 2 3 4 | 7 8 | ■ | 1 |
| A10061220608 | HFE 1220.06 | Z7 Steel | TRE 1220 | 12 | 20 | 6 | 60 | 1 2 3 5 | 7 | ■ | 1 |
| A10061220621 | HFE 1220.06 | Cast | TRE 1220 | 12 | 20 | 6 | 60 | 5 | | ■ | 1 |
| A10061225803 | HFE 1225.08 | Z3 | TRE 1225 | 12 | 25 | 8 | 65 | 1 2 3 4 | 7 | ■ | 1 |
| A10061225809 | HFE 1225.08 | Z9 Alu | TRE 1225 | 12 | 25 | 8 | 65 | | 6 8 | ■ | 1 |
| A10061625608 | HFE 1625.06 | Z7 Steel | TRE 1625 | 16 | 25 | 6 | 65 | 1 2 3 5 | 7 | ■ | 1 |
| A10061625803 | HFE 1625.08 | Z3 | TRE 1625 | 16 | 25 | 8 | 65 | 1 2 3 4 | 7 | ■ | 1 |
| A10061625809 | HFE 1625.08 | Z9 Alu | TRE 1625 | 16 | 25 | 8 | 65 | | 6 8 | ■ | 1 |

Shape F, Arch round nose



Ordering example: A10100307303

Further dimensions, cuts and shank lengths on request



PG 1

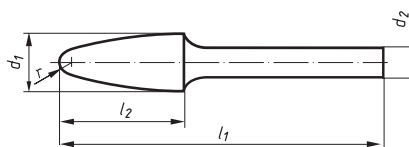
| Product number | Description | Cut | similar to DIN 8033 | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for | | |
|-------------------------|-------------|----------------|---------------------|-------------------|-------------------|-------------------|-------------------|-----------------|-----|-----|
| Information on page 438 | | | | | | | | | | |
| A10100307303 | HFF 0307.03 | Z3 | RBF 0307 | 3 | 7 | 3 | 40 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10100307304 | HFF 0307.03 | Z4 | RBF 0307 | 3 | 7 | 3 | 40 | ② ③ ④ | ⑦ ⑧ | ■ 1 |
| A10100307305 | HFF 0307.03 | Z5 | RBF 0307 | 3 | 7 | 3 | 40 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10100313305 | HFF 0313.03 | Z5 | RBF 0313 | 3 | 13 | 3 | 40 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10100313308 | HFF 0313.03 | Z7 Steel | RBF 0313 | 3 | 13 | 3 | 40 | ① ② ③ | ⑤ ⑦ | ■ 1 |
| A10100313309 | HFF 0313.03 | Z9 Alu | RBF 0313 | 3 | 13 | 3 | 40 | | ⑥ ⑧ | ■ 1 |
| A10100613305 | HFF 0613.03 | Z5 | RBF 0613 | 6 | 13 | 3 | 43 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10100613308 | HFF 0613.03 | Z7 Steel | RBF 0613 | 6 | 13 | 3 | 43 | ① ② ③ | ⑤ ⑦ | ■ 1 |
| A10100618603 | HFF 0618.06 | Z3 | RBF 0618 | 6 | 18 | 6 | 50 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10100618604 | HFF 0618.06 | Z4 | RBF 0618 | 6 | 18 | 6 | 50 | ② ③ ④ | ⑦ ⑧ | ■ 1 |
| A10100618605 | HFF 0618.06 | Z5 | RBF 0618 | 6 | 18 | 6 | 50 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10100618608 | HFF 0618.06 | Z7 Steel | RBF 0618 | 6 | 18 | 6 | 50 | ① ② ③ | ⑤ ⑦ | ■ 1 |
| A10100618609 | HFF 0618.06 | Z9 Alu | RBF 0618 | 6 | 18 | 6 | 50 | | ⑥ ⑧ | ■ 1 |
| A10100618620 | HFF 0618.06 | Z42 Inox/Steel | RBF 0618 | 6 | 18 | 6 | 50 | ① ② ③ ④ | | ■ 1 |
| A10100618621 | HFF 0618.06 | Cast | RBF 0618 | 6 | 18 | 6 | 50 | | ⑤ | ■ 1 |
| A10100820603 | HFF 0820.06 | Z3 | --- | 8 | 20 | 6 | 60 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10100820608 | HFF 0820.06 | Z7 Steel | --- | 8 | 20 | 6 | 60 | ① ② ③ | ⑤ ⑦ | ■ 1 |
| A10100820620 | HFF 0820.06 | Z42 Inox/Steel | --- | 8 | 20 | 6 | 60 | ① ② ③ ④ | | ■ 1 |
| A10100820621 | HFF 0820.06 | Cast | --- | 8 | 20 | 6 | 60 | | ⑤ | ■ 1 |
| A10101020603 | HFF 1020.06 | Z3 | RBF 1020 | 10 | 20 | 6 | 60 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10101020604 | HFF 1020.06 | Z4 | RBF 1020 | 10 | 20 | 6 | 60 | ② ③ ④ | ⑦ ⑧ | ■ 1 |
| A10101020606 | HFF 1020.06 | Z6 | RBF 1020 | 10 | 20 | 6 | 60 | ② ③ ④ | ⑦ ⑧ | ■ 1 |
| A10101020608 | HFF 1020.06 | Z7 Steel | RBF 1020 | 10 | 20 | 6 | 60 | ① ② ③ | ⑤ ⑦ | ■ 1 |
| A10101020620 | HFF 1020.06 | Z42 Inox/Steel | RBF 1020 | 10 | 20 | 6 | 60 | ① ② ③ ④ | | ■ 1 |
| A10101020621 | HFF 1020.06 | Cast | RBF 1020 | 10 | 20 | 6 | 60 | | ⑤ | ■ 1 |
| A10101225601 | HFF 1225.06 | Z1 | RBF 1225 | 12 | 25 | 6 | 65 | | ⑥ ⑧ | ■ 1 |
| A10101225603 | HFF 1225.06 | Z3 | RBF 1225 | 12 | 25 | 6 | 65 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10101225604 | HFF 1225.06 | Z4 | RBF 1225 | 12 | 25 | 6 | 65 | ② ③ ④ | ⑦ ⑧ | ■ 1 |
| A10101225608 | HFF 1225.06 | Z7 Steel | RBF 1225 | 12 | 25 | 6 | 65 | ① ② ③ | ⑤ ⑦ | ■ 1 |
| A10101225609 | HFF 1225.06 | Z9 Alu | RBF 1225 | 12 | 25 | 6 | 65 | | ⑥ ⑧ | ■ 1 |
| A10101225620 | HFF 1225.06 | Z42 Inox/Steel | RBF 1225 | 12 | 25 | 6 | 65 | ① ② ③ ④ | | ■ 1 |
| A10101225621 | HFF 1225.06 | Cast | RBF 1225 | 12 | 25 | 6 | 65 | | ⑤ | ■ 1 |
| A10101225803 | HFF 1225.08 | Z3 | RBF 1225 | 12 | 25 | 8 | 65 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10101225808 | HFF 1225.08 | Z7 Steel | RBF 1225 | 12 | 25 | 8 | 65 | ① ② ③ | ⑤ ⑦ | ■ 1 |
| A10101225809 | HFF 1225.08 | Z9 Alu | RBF 1225 | 12 | 25 | 8 | 65 | | ⑥ ⑧ | ■ 1 |
| A10101230603 | HFF 1230.06 | Z3 | RBF 1230 | 12 | 30 | 6 | 70 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10101230608 | HFF 1230.06 | Z7 Steel | RBF 1230 | 12 | 30 | 6 | 70 | ① ② ③ | ⑤ ⑦ | ■ 1 |

Shape F, Arch round nose



Ordering example: A10100307303

Further dimensions, cuts and shank lengths on request



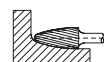
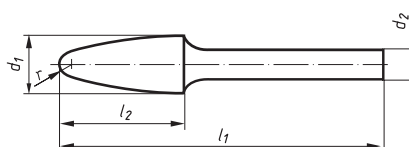
PG 1

| Product number | Description | Cut | similar to DIN 8033 | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for Information on page 438 | | |
|----------------|-------------|----------|---------------------|-------------------|-------------------|-------------------|-------------------|--|---|---|
| A10101630608 | HFF 1630.06 | Z7 Steel | RBF 1630 | 16 | 30 | 6 | 70 | ① ② ③ ⑤ ⑦ | ■ | 1 |
| A10101630609 | HFF 1630.06 | Z9 Alu | RBF 1630 | 16 | 30 | 6 | 70 | ⑥ ⑧ | ■ | 1 |
| A10101630803 | HFF 1630.08 | Z3 | RBF 1630 | 16 | 30 | 8 | 70 | ① ② ③ ④ ⑦ | ■ | 1 |
| A10101630809 | HFF 1630.08 | Z9 Alu | RBF 1630 | 16 | 30 | 8 | 70 | ⑥ ⑧ | ■ | 1 |

Shape F, Arch round nose BASE-X



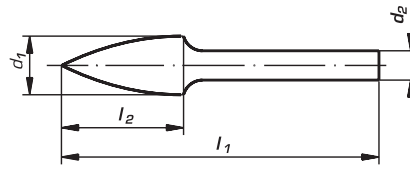
Ordering example: A10100313322



PG 1

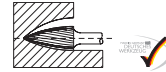
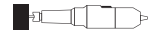
| Product number | Description | Cut | similar to DIN 8033 | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for Information on page 438 | | |
|-----------------|--------------------|-----|---------------------|-------------------|-------------------|-------------------|-------------------|--|---|----|
| A10100313322 | HFF 0313.03 BASE-X | ZX | RBF 0313 | 3 | 13 | 3 | 40 | ① ② ③ ④ ⑤ ⑦ | ■ | 10 |
| A10100618622 | HFF 0618.06 BASE-X | ZX | RBF 0618 | 6 | 18 | 6 | 50 | ① ② ③ ④ ⑤ ⑦ | ■ | 10 |
| A10100820622 | HFF 0820.06 BASE-X | ZX | — | 8 | 20 | 6 | 60 | ① ② ③ ④ ⑤ ⑦ | ■ | 10 |
| A10100820622150 | HFF 0820.06 BASE-X | ZX | — | 8 | 20 | 6 | 170 | ① ② ③ ④ ⑤ ⑦ | ■ | 1 |
| A5010082062214 | HFF 0820.06 BASE-X | ZX | — | 8 | 20 | 1/4" | 60 | ① ② ③ ④ ⑤ ⑦ | ■ | 10 |
| A10101020622 | HFF 1020.06 BASE-X | ZX | RBF 1020 | 10 | 20 | 6 | 60 | ① ② ③ ④ ⑤ ⑦ | ■ | 10 |
| A5010102062214 | HFF 1020.06 BASE-X | ZX | RBF 1020 | 10 | 20 | 1/4" | 60 | ① ② ③ ④ ⑤ ⑦ | ■ | 10 |
| A10101225622 | HFF 1225.06 BASE-X | ZX | RBF 1225 | 12 | 25 | 6 | 65 | ① ② ③ ④ ⑤ ⑦ | ■ | 5 |
| A5010122562214 | HFF 1225.06 BASE-X | ZX | RBF 1225 | 12 | 25 | 1/4" | 65 | ① ② ③ ④ ⑤ ⑦ | ■ | 5 |
| A10101225622150 | HFF 1225.06 BASE-X | ZX | — | 12 | 25 | 6 | 175 | ① ② ③ ④ ⑤ ⑦ | ■ | 1 |

Shape G, Arch pointed nose



Ordering example: A10040307305

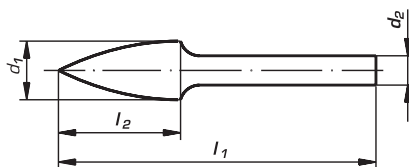
Further dimensions, cuts and shank lengths on request



PG 1

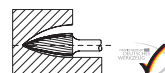
| Product number | Description | Cut | similar to DIN 8033 | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for | | |
|-------------------------|-------------|----------------|---------------------|-------------------|-------------------|-------------------|-------------------|-----------------|-------|-----|
| Information on page 438 | | | | | | | | | | |
| A10040307305 | HFG 0307.03 | Z5 | SPG 0307 | 3 | 7 | 3 | 40 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10040307308 | HFG 0307.03 | Z7 Steel | SPG 0307 | 3 | 7 | 3 | 40 | ① ② ③ ⑤ | ⑦ | ■ 1 |
| A10040313303 | HFG 0313.03 | Z3 | SPG 0313 | 3 | 13 | 3 | 40 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10040313304 | HFG 0313.03 | Z4 | SPG 0313 | 3 | 13 | 3 | 40 | ② ③ ④ | ⑦ ⑧ | ■ 1 |
| A10040313305 | HFG 0313.03 | Z5 | SPG 0313 | 3 | 13 | 3 | 40 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10040313308 | HFG 0313.03 | Z7 Steel | SPG 0313 | 3 | 13 | 3 | 40 | ① ② ③ ⑤ | ⑦ | ■ 1 |
| A10040313309 | HFG 0313.03 | Z9 Alu | SPG 0313 | 3 | 13 | 3 | 40 | | ⑥ ⑧ | ■ 1 |
| A10040613305 | HFG 0613.03 | Z5 | SPG 0613 | 6 | 13 | 3 | 43 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10040613308 | HFG 0613.03 | Z7 Steel | SPG 0613 | 6 | 13 | 3 | 43 | ① ② ③ ⑤ | ⑦ | ■ 1 |
| A10040618601 | HFG 0618.06 | Z1 | SPG 0618 | 6 | 18 | 6 | 50 | | ⑥ ⑧ | ■ 1 |
| A10040618602 | HFG 0618.06 | Z2 | SPG 0618 | 6 | 18 | 6 | 50 | ① | ⑤ ⑥ ⑧ | ■ 1 |
| A10040618603 | HFG 0618.06 | Z3 | SPG 0618 | 6 | 18 | 6 | 50 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10040618604 | HFG 0618.06 | Z4 | SPG 0618 | 6 | 18 | 6 | 50 | ② ③ ④ | ⑦ ⑧ | ■ 1 |
| A10040618605 | HFG 0618.06 | Z5 | SPG 0618 | 6 | 18 | 6 | 50 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10040618608 | HFG 0618.06 | Z7 Steel | SPG 0618 | 6 | 18 | 6 | 50 | ① ② ③ ⑤ | ⑦ | ■ 1 |
| A10040618620 | HFG 0618.06 | Z42 Inox/Steel | SPG 0618 | 6 | 18 | 6 | 50 | ① ② ③ ④ | | ■ 1 |
| A10040618621 | HFG 0618.06 | Cast | SPG 0618 | 6 | 18 | 6 | 50 | | ⑤ | ■ 1 |
| A10040820603 | HFG 0820.06 | Z3 | — | 8 | 20 | 6 | 60 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10040820608 | HFG 0820.06 | Z7 Steel | — | 8 | 20 | 6 | 60 | ① ② ③ ⑤ | ⑦ | ■ 1 |
| A10040820620 | HFG 0820.06 | Z42 Inox/Steel | — | 8 | 20 | 6 | 60 | ① ② ③ ④ | | ■ 1 |
| A10040820621 | HFG 0820.06 | Cast | — | 8 | 20 | 6 | 60 | | ⑤ | ■ 1 |
| A10041020603 | HFG 1020.06 | Z3 | SPG 1020 | 10 | 20 | 6 | 60 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10041020604 | HFG 1020.06 | Z4 | SPG 1020 | 10 | 20 | 6 | 60 | ② ③ ④ | ⑦ ⑧ | ■ 1 |
| A10041020605 | HFG 1020.06 | Z5 | SPG 1020 | 10 | 20 | 6 | 60 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10041020608 | HFG 1020.06 | Z7 Steel | SPG 1020 | 10 | 20 | 6 | 60 | ① ② ③ ⑤ | ⑦ | ■ 1 |
| A10041020620 | HFG 1020.06 | Z42 Inox/Steel | SPG 1020 | 10 | 20 | 6 | 60 | ① ② ③ ④ | | ■ 1 |
| A10041020621 | HFG 1020.06 | Cast | SPG 1020 | 10 | 20 | 6 | 60 | | ⑤ | ■ 1 |
| A10041220603 | HFG 1220.06 | Z3 | SPG 1220 | 12 | 20 | 6 | 60 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10041220608 | HFG 1220.06 | Z7 Steel | SPG 1220 | 12 | 20 | 6 | 60 | ① ② ③ ⑤ | ⑦ | ■ 1 |
| A10041225602 | HFG 1225.06 | Z2 | SPG 1225 | 12 | 25 | 6 | 65 | ① | ⑤ ⑥ ⑧ | ■ 1 |
| A10041225603 | HFG 1225.06 | Z3 | SPG 1225 | 12 | 25 | 6 | 65 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10041225604 | HFG 1225.06 | Z4 | SPG 1225 | 12 | 25 | 6 | 65 | ② ③ ④ | ⑦ ⑧ | ■ 1 |
| A10041225608 | HFG 1225.06 | Z7 Steel | SPG 1225 | 12 | 25 | 6 | 65 | ① ② ③ ⑤ | ⑦ | ■ 1 |
| A10041225620 | HFG 1225.06 | Z42 Inox/Steel | SPG 1225 | 12 | 25 | 6 | 65 | ① ② ③ ④ | | ■ 1 |
| A10041225621 | HFG 1225.06 | Cast | SPG 1225 | 12 | 25 | 6 | 65 | | ⑤ | ■ 1 |
| A10041225803 | HFG 1225.08 | Z3 | SPG 1225 | 12 | 25 | 8 | 65 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10041230602 | HFG 1230.06 | Z2 | SPG 1230 | 12 | 30 | 6 | 70 | ① | ⑤ ⑥ ⑧ | ■ 1 |

Shape G, Arch pointed nose



Ordering example: A10040307305

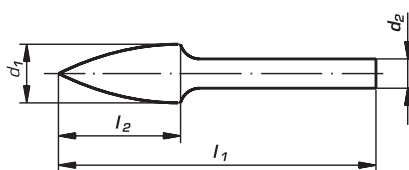
Further dimensions, cuts and shank lengths on request



PG 1

| Product number | Description | Cut | similar to DIN 8033 | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for | Information on page 438 | | |
|----------------|-------------|----------|---------------------|-------------------|-------------------|-------------------|-------------------|-----------------|-------------------------|---|---|
| A10041230603 | HFG 1230.06 | Z3 | SPG 1230 | 12 | 30 | 6 | 70 | ① ② ③ ④ | ⑦ | ■ | 1 |
| A10041230604 | HFG 1230.06 | Z4 | SPG 1230 | 12 | 30 | 6 | 70 | ② ③ ④ | ⑦ ⑧ | ■ | 1 |
| A10041230605 | HFG 1230.06 | Z5 | SPG 1230 | 12 | 30 | 6 | 70 | ① ② ③ ④ | ⑦ | ■ | 1 |
| A10041230608 | HFG 1230.06 | Z7 Steel | SPG 1230 | 12 | 30 | 6 | 70 | ① ② ③ ⑤ | ⑦ | ■ | 1 |
| A10041630603 | HFG 1630.06 | Z3 | SPG 1630 | 16 | 30 | 6 | 70 | ① ② ③ ④ | ⑦ | ■ | 1 |
| A10041630604 | HFG 1630.06 | Z4 | SPG 1630 | 16 | 30 | 6 | 70 | ② ③ ④ | ⑦ ⑧ | ■ | 1 |
| A10041630608 | HFG 1630.06 | Z7 Steel | SPG 1630 | 16 | 30 | 6 | 70 | ① ② ③ ⑤ | ⑦ | ■ | 1 |
| A10041630803 | HFG 1630.08 | Z3 | SPG 1630 | 16 | 30 | 8 | 70 | ① ② ③ ④ | ⑦ | ■ | 1 |

Shape G, Arch pointed nose BASE-X



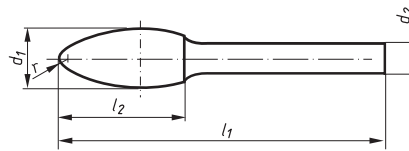
Ordering example: A10040313322



PG 1

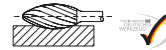
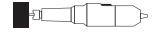
| Product number | Description | Cut | similar to DIN 8033 | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for | Information on page 438 | | |
|----------------|--------------------|-----|---------------------|-------------------|-------------------|-------------------|-------------------|-----------------|-------------------------|---|----|
| A10040313322 | HFG 0313.03 BASE-X | ZX | SPG 0313 | 3 | 13 | 3 | 40 | ① ② ③ ④ ⑤ | ⑦ | ■ | 10 |
| A10040613322 | HFG 0613.03 BASE-X | ZX | SPG 0613 | 6 | 13 | 3 | 43 | ① ② ③ ④ ⑤ | ⑦ | ■ | 10 |
| A10040820622 | HFG 0820.06 BASE-X | ZX | SPG 0820 | 8 | 20 | 6 | 60 | ① ② ③ ④ ⑤ | ⑦ | ■ | 10 |
| A5004082062214 | HFG 0820.06 BASE-X | ZX | SPG 8020 | 8 | 20 | 1/4" | 60 | ① ② ③ ④ ⑤ | ⑦ | ■ | 10 |
| A10041020622 | HFG 1020.06 BASE-X | ZX | SPG 1020 | 10 | 20 | 6 | 60 | ① ② ③ ④ ⑤ | ⑦ | ■ | 10 |
| A5004102062214 | HFG 1020.06 BASE-X | ZX | SPG 1020 | 10 | 20 | 1/4" | 60 | ① ② ③ ④ ⑤ | ⑦ | ■ | 10 |
| A10041225622 | HFG 1225.06 BASE-X | ZX | SPG 1225 | 12 | 25 | 6 | 65 | ① ② ③ ④ ⑤ | ⑦ | ■ | 5 |
| A5004122562214 | HFG 1225.06 BASE-X | ZX | SPG 1225 | 12 | 25 | 1/4" | 65 | ① ② ③ ④ ⑤ | ⑦ | ■ | 5 |
| A10041230622 | HFG 1230.06 BASE-X | ZX | SPG 1230 | 12 | 30 | 6 | 65 | ① ② ③ ④ ⑤ | ⑦ | ■ | 5 |
| A5004123062214 | HFG 1230.06 BASE-X | ZX | SPG 1230 | 12 | 30 | 1/4" | 70 | ① ② ③ ④ ⑤ | ⑦ | ■ | 5 |

Shape H, Flame



Ordering example: A10090307305

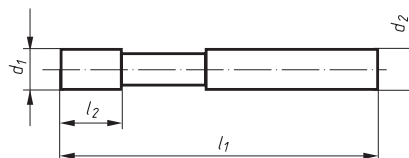
Further dimensions, cuts and shank lengths on request



PG 1

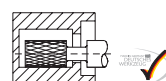
| Product number | Description | Cut | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for Information on page 438 | | |
|----------------|-------------|----------|-------------------|-------------------|-------------------|-------------------|--|---|---|
| A10090307305 | HFH 0307.03 | Z5 | 3 | 7 | 3 | 40 | ① ② ③ ④ ⑦ | ■ | 1 |
| A10090613301 | HFH 0613.03 | Z1 | 6 | 13 | 3 | 43 | ⑥ ⑧ | ■ | 1 |
| A10090613302 | HFH 0613.03 | Z2 | 6 | 13 | 3 | 43 | ① ⑤ ⑥ ⑧ | ■ | 1 |
| A10090613303 | HFH 0613.03 | Z3 | 6 | 13 | 3 | 43 | ① ② ③ ④ ⑦ | ■ | 1 |
| A10090613304 | HFH 0613.03 | Z4 | 6 | 13 | 3 | 43 | ② ③ ④ ⑦ ⑧ | ■ | 1 |
| A10090613305 | HFH 0613.03 | Z5 | 6 | 13 | 3 | 43 | ① ② ③ ④ ⑦ | ■ | 1 |
| A10090613308 | HFH 0613.03 | Z7 Steel | 6 | 13 | 3 | 43 | ① ② ③ ⑤ ⑦ | ■ | 1 |
| A10090820602 | HFH 0820.06 | Z2 | 8 | 20 | 6 | 60 | ① ⑤ ⑥ ⑧ | ■ | 1 |
| A10090820603 | HFH 0820.06 | Z3 | 8 | 20 | 6 | 60 | ① ② ③ ④ ⑦ | ■ | 1 |
| A10090820604 | HFH 0820.06 | Z4 | 8 | 20 | 6 | 60 | ② ③ ④ ⑦ ⑧ | ■ | 1 |
| A10090820608 | HFH 0820.06 | Z7 Steel | 8 | 20 | 6 | 60 | ① ② ③ ⑤ ⑦ | ■ | 1 |
| A10091230603 | HFH 1230.06 | Z3 | 12 | 30 | 6 | 70 | ① ② ③ ④ ⑦ | ■ | 1 |
| A10091230604 | HFH 1230.06 | Z4 | 12 | 30 | 6 | 70 | ② ③ ④ ⑦ ⑧ | ■ | 1 |
| A10091230608 | HFH 1230.06 | Z7 Steel | 12 | 30 | 6 | 70 | ① ② ③ ⑤ ⑦ | ■ | 1 |
| A10091230803 | HFH 1230.08 | Z3 | 12 | 30 | 8 | 70 | ① ② ③ ④ ⑦ | ■ | 1 |
| A10091635608 | HFH 1635.06 | Z7 Steel | 16 | 35 | 6 | 75 | ① ② ③ ⑤ ⑦ | ■ | 1 |

Shape I, Internal burr with multi-purpose cut



Ordering example: A10010204300

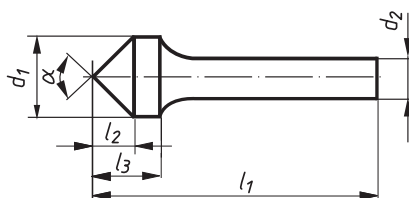
Further dimensions, cuts and shank lengths on request



PG 1

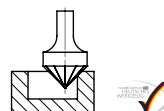
| Product number | Description | Cut | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for Information on page 438 | | |
|----------------|-------------|-----|-------------------|-------------------|-------------------|-------------------|--|---|---|
| A10010204300 | HFI 0204.03 | ZI | 2,5 | 4 | 3 | 40 | ③ ④ ⑦ | ■ | 1 |
| A10010408300 | HFI 0408.03 | ZI | 4 | 8 | 3 | 50 | ③ ④ ⑦ | ■ | 1 |
| A10010810600 | HFI 0810.06 | ZI | 8 | 10 | 6 | 65 | ③ ④ ⑦ | ■ | 1 |

Shape J, Pointed nose



Ordering example: A10080660603

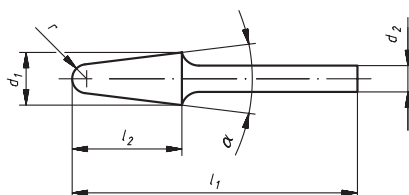
Further dimensions, cuts and shank lengths on request



PG 1

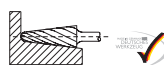
| Product number | Description | Cut | similar to DIN 8033 | d ₁ mm | l ₂ mm | l ₃ mm | d ₂ mm | l ₁ mm | α | recommended for Information on page 438 | | |
|----------------|-------------|-----|---------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-----|--|---|-----|
| A10080660603 | HFJ 0605.06 | Z3 | KSJ 0605 | 6 | 5 | - | 6 | 50 | 60° | 1 2 3 4 | 7 | ■ 1 |
| A10081060603 | HFJ 1013.06 | Z3 | KSJ 1008 | 10 | 9 | 13 | 6 | 53 | 60° | 1 2 3 4 | 7 | ■ 1 |
| A10081090603 | HFJ 1010.06 | Z3 | KSK 1005 | 10 | 5 | 10 | 6 | 50 | 90° | 1 2 3 4 | 7 | ■ 1 |
| A10081660603 | HFJ 1616.06 | Z3 | KSJ 1613 | 16 | 14 | 16 | 6 | 56 | 60° | 1 2 3 4 | 7 | ■ 1 |
| A10081690603 | HFJ 1613.06 | Z3 | KSK 1608 | 16 | 8 | 13 | 6 | 53 | 90° | 1 2 3 4 | 7 | ■ 1 |
| A10081690803 | HFJ 1613.08 | Z3 | KSK 1608 | 16 | 8 | 13 | 8 | 53 | 90° | 1 2 3 4 | 7 | ■ 1 |

Shape L, Conical round nose



Ordering example: A10070820603

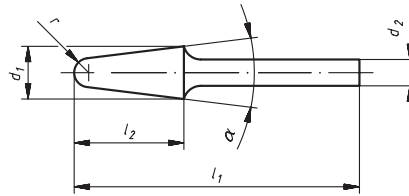
Further dimensions, cuts and shank lengths on request



PG 1

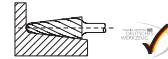
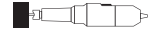
| Product number | Description | Cut | similar to DIN 8033 | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | r mm | α | recommended for Information on page 438 | | |
|----------------|-------------|----------|---------------------|-------------------|-------------------|-------------------|-------------------|------|-----|--|-----|-----|
| A10070820603 | HFL 0820.06 | Z3 | --- | 8 | 20 | 6 | 60 | 1,5 | 14° | 1 2 3 4 | 7 | ■ 1 |
| A10070820608 | HFL 0820.06 | Z7 Steel | --- | 8 | 20 | 6 | 60 | 1,5 | 14° | 1 2 3 5 | 7 | ■ 1 |
| A10070820609 | HFL 0820.06 | Z9 Alu | --- | 8 | 20 | 6 | 60 | 1,5 | 14° | 6 8 | | ■ 1 |
| A10071020603 | HFL 1020.06 | Z3 | KEL 1020 | 10 | 20 | 6 | 60 | 2,9 | 14° | 1 2 3 4 | 7 | ■ 1 |
| A10071020608 | HFL 1020.06 | Z7 Steel | KEL 1020 | 10 | 20 | 6 | 60 | 2,9 | 14° | 1 2 3 5 | 7 | ■ 1 |
| A10071020609 | HFL 1020.06 | Z9 Alu | KEL 1020 | 10 | 20 | 6 | 60 | 2,9 | 14° | 6 8 | | ■ 1 |
| A10071225603 | HFL 1225.06 | Z3 | KEL 1225 | 12 | 25 | 6 | 65 | 3,3 | 14° | 1 2 3 4 | 7 | ■ 5 |
| A10071225604 | HFL 1225.06 | Z4 | KEL 1225 | 12 | 25 | 6 | 65 | 3,3 | 14° | 2 3 4 | 7 8 | ■ 1 |
| A10071225608 | HFL 1225.06 | Z7 Steel | KEL 1225 | 12 | 25 | 6 | 65 | 3,3 | 14° | 1 2 3 5 | 7 | ■ 1 |
| A10071225609 | HFL 1225.06 | Z9 Alu | KEL 1225 | 12 | 25 | 6 | 65 | 3,3 | 14° | 6 8 | | ■ 1 |
| A10071225803 | HFL 1225.08 | Z3 | KEL 1225 | 12 | 25 | 8 | 65 | 3,3 | 14° | 1 2 3 4 | 7 | ■ 1 |
| A10071230601 | HFL 1230.06 | Z1 | KEL 1230 | 12 | 30 | 6 | 70 | 2,6 | 14° | 6 8 | | ■ 1 |
| A10071230603 | HFL 1230.06 | Z3 | KEL 1230 | 12 | 30 | 6 | 70 | 2,6 | 14° | 1 2 3 4 | 7 | ■ 1 |
| A10071230604 | HFL 1230.06 | Z4 | KEL 1230 | 12 | 30 | 6 | 70 | 2,6 | 14° | 2 3 4 | 7 8 | ■ 1 |

Shape L, Conical round nose



Ordering example: A10070820603

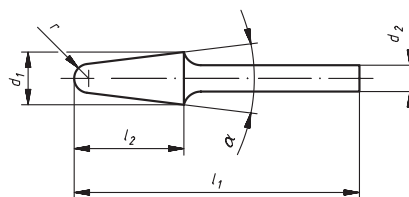
Further dimensions, cuts and shank lengths on request



PG 1

| Product number | Description | Cut | similar to DIN 8033 | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | r mm | α | recommended for Information on page 438 | | |
|----------------|-------------|----------|---------------------|-------------------|-------------------|-------------------|-------------------|------|-----|--|---|---|
| A10071230605 | HFL 1230.06 | Z5 | KEL 1230 | 12 | 30 | 6 | 70 | 2,6 | 14° | ① ② ③ ④ ⑦ | ■ | 1 |
| A10071230608 | HFL 1230.06 | Z7 Steel | KEL 1230 | 12 | 30 | 6 | 70 | 2,6 | 14° | ① ② ③ ⑤ ⑦ | ■ | 1 |
| A10071230609 | HFL 1230.06 | Z9 Alu | KEL 1230 | 12 | 30 | 6 | 70 | 2,6 | 14° | ⑥ ⑧ | ■ | 1 |
| A10071230804 | HFL 1230.08 | Z4 | KEL 1230 | 12 | 30 | 8 | 70 | 2,6 | 14° | ② ③ ④ ⑦ ⑧ | ■ | 1 |
| A10071230809 | HFL 1230.08 | Z9 Alu | KEL 1230 | 12 | 30 | 8 | 70 | 2,6 | 14° | ⑥ ⑧ | ■ | 1 |
| A10071630603 | HFL 1630.06 | Z3 | KEL 1630 | 16 | 30 | 6 | 70 | 4,8 | 14° | ① ② ③ ④ ⑦ | ■ | 1 |
| A10071630608 | HFL 1630.06 | Z7 Steel | KEL 1630 | 16 | 30 | 6 | 70 | 4,8 | 14° | ① ② ③ ⑤ ⑦ | ■ | 1 |
| A10072040809 | HFL 2040.08 | Z9 Alu | KEL 2040 | 20 | 40 | 8 | 80 | 5,5 | 14° | ⑥ ⑧ | ■ | 1 |

Shape L, Conical round nose BASE-X



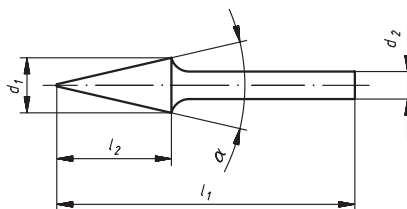
Ordering example: A10071230622



PG 1

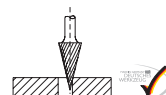
| Product number | Description | Cut | similar to DIN 8033 | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | r mm | α | recommended for Information on page 438 | | |
|----------------|--------------------|-----|---------------------|-------------------|-------------------|-------------------|-------------------|------|-----|--|---|---|
| A10071230622 | HFL 1230.06 BASE-X | ZX | KEL 1230 | 12 | 30 | 6 | 70 | 2,6 | 14° | ① ② ③ ④ ⑤ ⑦ | ■ | 5 |
| A5007123062214 | HFL 1230.06 BASE-X | ZX | KEL 1230 | 12 | 30 | 1/4" | 70 | 2,6 | 14° | ① ② ③ ④ ⑤ ⑦ | ■ | 5 |

Shape M, Conical pointed nose



Ordering example: A10050307303

Further dimensions, cuts and shank lengths on request



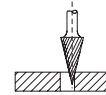
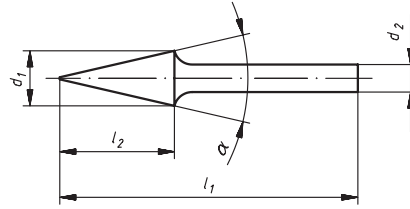
PG 1

| Product number | Description | Cut | similar to DIN 8033 | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for Information on page 438 | | |
|----------------|-------------|----------------|---------------------|-------------------|-------------------|-------------------|-------------------|--|-----|-----|
| A10050307303 | HFM 0307.03 | Z3 | SKM 0307 | 3 | 7 | 3 | 40 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10050307305 | HFM 0307.03 | Z5 | SKM 0307 | 3 | 7 | 3 | 40 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10050307308 | HFM 0307.03 | Z7 Steel | SKM 0307 | 3 | 7 | 3 | 40 | ① ② ③ ⑤ | ⑦ | ■ 1 |
| A10050311305 | HFM 0311.03 | Z5 | SKM 0311 | 3 | 11 | 3 | 40 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10050311308 | HFM 0311.03 | Z7 Steel | SKM 0311 | 3 | 11 | 3 | 40 | ① ② ③ ⑤ | ⑦ | ■ 1 |
| A10050613305 | HFM 0613.03 | Z5 | SKM 0613 | 6 | 13 | 3 | 43 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10050613308 | HFM 0613.03 | Z7 Steel | SKM 0613 | 6 | 13 | 3 | 43 | ① ② ③ ⑤ | ⑦ | ■ 1 |
| A10050618603 | HFM 0618.06 | Z3 | SKM 0618 | 6 | 18 | 6 | 50 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10050618604 | HFM 0618.06 | Z4 | SKM 0618 | 6 | 18 | 6 | 50 | ② ③ ④ | ⑦ ⑧ | ■ 1 |
| A10050618605 | HFM 0618.06 | Z5 | SKM 0618 | 6 | 18 | 6 | 50 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10050618608 | HFM 0618.06 | Z7 Steel | SKM 0618 | 6 | 18 | 6 | 50 | ① ② ③ ⑤ | ⑦ | ■ 1 |
| A10050618609 | HFM 0618.06 | Z9 Alu | SKM 0618 | 6 | 18 | 6 | 50 | ⑥ | ⑧ | ■ 1 |
| A10050618620 | HFM 0618.06 | Z42 Inox/Steel | SKM 0618 | 6 | 18 | 6 | 50 | ① ② ③ ④ | | ■ 1 |
| A10050820603 | HFM 0820.06 | Z3 | --- | 8 | 20 | 6 | 60 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10050820608 | HFM 0820.06 | Z7 Steel | --- | 8 | 20 | 6 | 60 | ① ② ③ ⑤ | ⑦ | ■ 1 |
| A10050820620 | HFM 0820.06 | Z42 Inox/Steel | --- | 8 | 20 | 6 | 60 | ① ② ③ ④ | | ■ 1 |
| A10051020603 | HFM 1020.06 | Z3 | SKM 1020 | 10 | 20 | 6 | 60 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10051020604 | HFM 1020.06 | Z4 | SKM 1020 | 10 | 20 | 6 | 60 | ② ③ ④ | ⑦ ⑧ | ■ 1 |
| A10051020608 | HFM 1020.06 | Z7 Steel | SKM 1020 | 10 | 20 | 6 | 60 | ① ② ③ ⑤ | ⑦ | ■ 1 |
| A10051020620 | HFM 1020.06 | Z42 Inox/Steel | SKM 1020 | 10 | 20 | 6 | 60 | ① ② ③ ④ | | ■ 1 |
| A10051020803 | HFM 1020.08 | Z3 | --- | 10 | 20 | 8 | 60 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10051225601 | HFM 1225.06 | Z1 | SKM 1225 | 12 | 25 | 6 | 65 | | ⑥ ⑧ | ■ 1 |
| A10051225603 | HFM 1225.06 | Z3 | SKM 1225 | 12 | 25 | 6 | 65 | ① ② ③ ④ | ⑦ | ■ 1 |
| A10051225604 | HFM 1225.06 | Z4 | SKM 1225 | 12 | 25 | 6 | 65 | ② ③ ④ | ⑦ ⑧ | ■ 1 |
| A10051225608 | HFM 1225.06 | Z7 Steel | SKM 1225 | 12 | 25 | 6 | 65 | ① ② ③ ⑤ | ⑦ | ■ 1 |
| A10051225620 | HFM 1225.06 | Z42 Inox/Steel | SKM 1225 | 12 | 25 | 6 | 65 | ① ② ③ ④ | | ■ 1 |
| A10051225803 | HFM 1225.08 | Z3 | SKM 1225 | 12 | 25 | 8 | 65 | ① ② ③ ④ | ⑦ | ■ 1 |

Shape M, Conical pointed nose BASE-X



Ordering example: A10050311322



PG 1

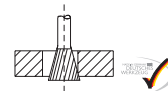
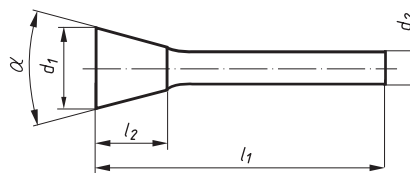
| Product number | Description | Cut | similar to DIN 8033 | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | α | recommended for Information on page 438 | | |
|----------------|--------------------|-----|---------------------|-------------------|-------------------|-------------------|-------------------|-----|---|---|----|
| A10050311322 | HFM 0311.03 BASE-X | ZX | SKM 0311 | 3 | 11 | 3 | 40 | 14° | ① ② ③ ④ ⑤ ⑦ | ■ | 10 |
| A10050618622 | HFM 0618.06 BASE-X | ZX | SKM 0618 | 6 | 18 | 6 | 50 | 16° | ① ② ③ ④ ⑤ ⑦ | ■ | 10 |
| A5005061862214 | HFM 0618.06 BASE-X | ZX | SKM 0618 | 6 | 18 | 1/4" | 50 | 16° | ① ② ③ ④ ⑤ ⑦ | ■ | 10 |
| A10051020622 | HFM 1020.06 BASE-X | ZX | SKM 1020 | 10 | 20 | 6 | 60 | 27° | ① ② ③ ④ ⑤ ⑦ | ■ | 10 |
| A5005102062214 | HFM 1020.06 BASE-X | ZX | SKM 1020 | 10 | 20 | 1/4" | 60 | 27° | ① ② ③ ④ ⑤ ⑦ | ■ | 10 |
| A10051225622 | HFM 1225.06 BASE-X | ZX | SKM 1225 | 12 | 25 | 6 | 65 | 26° | ① ② ③ ④ ⑤ ⑦ | ■ | 5 |
| A5005122562214 | HFM 1225.06 BASE-X | ZX | SKM 1225 | 12 | 25 | 1/4" | 65 | 26° | ① ② ③ ④ ⑤ ⑦ | ■ | 5 |

Shape N, Inverted cone



Ordering example: A10120307305

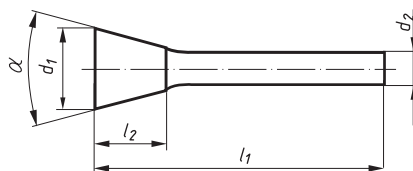
Further dimensions, cuts and shank lengths on request



PG 1

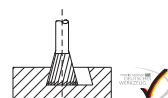
| Product number | Description | Cut | similar to DIN 8033 | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | α | recommended for Information on page 438 | | |
|----------------|-------------|----------|---------------------|-------------------|-------------------|-------------------|-------------------|-----|---|---|---|
| A10120307305 | HFN 0307.03 | Z5 | WKN 0307 | 3 | 7 | 3 | 40 | 10° | ① ② ③ ④ ⑦ | ■ | 1 |
| A10120307308 | HFN 0307.03 | Z7 Steel | WKN 0307 | 3 | 7 | 3 | 40 | 10° | ① ② ③ ⑤ ⑦ | ■ | 1 |
| A10120607305 | HFN 0607.03 | Z5 | WKN 0607 | 6 | 7 | 3 | 37 | 10° | ① ② ③ ④ ⑦ | ■ | 1 |
| A10120607604 | HFN 0607.06 | Z4 | WKN 0607 | 6 | 7 | 6 | 50 | 10° | ② ③ ④ ⑦ ⑧ | ■ | 1 |
| A10120607605 | HFN 0607.06 | Z5 | WKN 0607 | 6 | 7 | 6 | 50 | 10° | ① ② ③ ④ ⑦ | ■ | 1 |
| A10121013603 | HFN 1013.06 | Z3 | WKN 1013 | 10 | 13 | 6 | 53 | 10° | ① ② ③ ④ ⑦ | ■ | 1 |
| A10121013604 | HFN 1013.06 | Z4 | WKN 1013 | 10 | 13 | 6 | 53 | 10° | ② ③ ④ ⑦ ⑧ | ■ | 1 |
| A10121213603 | HFN 1213.06 | Z3 | WKN 1213 | 12 | 13 | 6 | 53 | 20° | ① ② ③ ④ ⑦ | ■ | 1 |
| A10121213604 | HFN 1213.06 | Z4 | WKN 1213 | 12 | 13 | 6 | 53 | 20° | ② ③ ④ ⑦ ⑧ | ■ | 1 |
| A10121613803 | HFN 1613.08 | Z3 | WKN 1613 | 16 | 13 | 8 | 53 | 20° | ① ② ③ ④ ⑦ | ■ | 1 |
| A10122013604 | HFN 2013.06 | Z4 | --- | 20 | 13 | 6 | 53 | 30° | ① ② ③ ⑤ ⑦ | ■ | 1 |

Shape N, Inverted cone with end cut



Ordering example: A101203073050001

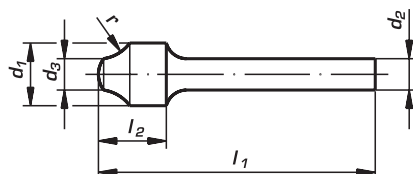
Further dimensions, cuts and shank lengths on request



PG 1

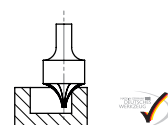
| Product number | Description | Cut | similar to DIN 8033 | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | α | recommended for Information on page 438 | | |
|------------------|--------------|----------|---------------------|-------------------|-------------------|-------------------|-------------------|-----|--|---|---|
| A101216138030001 | HFNS 1613.08 | Z3 | WKN-S 1613 | 16 | 13 | 8 | 53 | 20° | 1 2 3 5 7 | ■ | 1 |
| A101203073050001 | HFNS 0307.03 | Z5 | WKN-S 0307 | 3 | 7 | 3 | 40 | 10° | 1 2 3 4 7 | ■ | 1 |
| A101203073080001 | HFNS 0307.03 | Z7 Steel | WKN-S 0307 | 3 | 7 | 3 | 40 | 10° | 1 2 3 5 7 | ■ | 1 |
| A101206073050001 | HFNS 0607.03 | Z5 | WKN-S 0607 | 6 | 7 | 3 | 37 | 10° | 1 2 3 4 7 | ■ | 1 |
| A101210136030001 | HFNS 1013.06 | Z3 | WKN-S 1013 | 10 | 13 | 6 | 53 | 10° | 1 2 3 4 7 | ■ | 1 |
| A101212136030001 | HFNS 1213.06 | Z3 | WKN-S 1213 | 12 | 13 | 6 | 53 | 20° | 1 2 3 4 7 | ■ | 1 |
| A101216136040001 | HFNS 1613.06 | Z4 | WKN-S 1613 | 16 | 13 | 6 | 53 | 20° | 2 3 4 7 8 | ■ | 1 |
| A101216138030001 | HFNS 1613.08 | Z3 | WKN-S 1613 | 16 | 13 | 8 | 53 | 20° | 1 2 3 5 7 | ■ | 1 |

Shape R, Trimming burr (external)



Ordering example: A10140812603

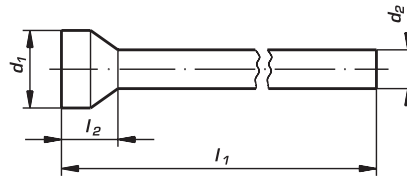
Further dimensions, cuts and shank lengths on request



PG 1

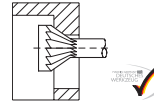
| Product number | Description | Cut | d ₁ mm | d ₃ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for Information on page 438 | | |
|----------------|-------------|-----|-------------------|-------------------|-------------------|-------------------|-------------------|--|---|---|
| A10140812603 | HFR 0812.06 | Z3 | 8 | 3 | 12 | 6 | 52 | 1 2 3 4 7 | ■ | 1 |
| A10141015603 | HFR 1015.06 | Z3 | 10 | 2 | 15 | 6 | 55 | 1 2 3 4 7 | ■ | 1 |
| A10141215603 | HFR 1215.06 | Z3 | 12 | 6 | 15 | 6 | 55 | 1 2 3 4 7 | ■ | 1 |
| A10141215803 | HFR 1215.08 | Z3 | 12 | 6 | 15 | 8 | 55 | 1 2 3 4 7 | ■ | 1 |
| A10141315603 | HFR 1315.06 | Z3 | 13 | 3 | 15 | 6 | 55 | 1 2 3 4 7 | ■ | 1 |
| A10141315605 | HFR 1315.06 | Z5 | 13 | 3 | 15 | 6 | 55 | 1 2 3 4 7 | ■ | 1 |
| A10141315803 | HFR 1315.08 | Z3 | 13 | 3 | 15 | 8 | 55 | 1 2 3 4 7 | ■ | 1 |

HFT Backward deburring tool



Ordering example: A10170504303

Further dimensions, cuts and shank lengths on request



PG 1

| Product number | Description | Cut | d ₁ mm | l ₂ mm | d ₂ mm | l ₁ mm | recommended for Information on page 438 | | | |
|----------------|-------------|-----|-------------------|-------------------|-------------------|-------------------|--|---|---|---|
| A10170504303 | HFT 0504.03 | Z3 | 5 | 4 | 3 | 40 | ① ② ③ ④ | ⑦ | ■ | 1 |
| A10170705303 | HFT 0705.03 | Z3 | 7 | 5 | 3 | 40 | ① ② ③ ④ | ⑦ | ■ | 1 |
| A10171006603 | HFT 1006.06 | Z3 | 10 | 6 | 6 | 60 | ① ② ③ ④ | ⑦ | ■ | 1 |
| A10171207603 | HFT 1207.06 | Z3 | 12 | 7 | 6 | 65 | ① ② ③ ④ | ⑦ | ■ | 1 |
| A10171610603 | HFT 1610.06 | Z3 | 16 | 10 | 6 | 70 | ① ② ③ ④ | ⑦ | ■ | 1 |
| A10171610803 | HFT 1610.08 | Z3 | 16 | 10 | 8 | 120 | ① ② ③ ④ | ⑦ | ■ | 1 |
| A10171811803 | HFT 1811.08 | Z3 | 18 | 11 | 8 | 120 | ① ② ③ ④ | ⑦ | ■ | 1 |

Safety instructions:

Reduced speed for burrs with a total length l₁=120 mm: max. 11.000 rpm.

Applications:

- Reverse deburring of bores at difficult to access areas, for example in pipes, containers and construction components
- Reverse chamfering of bores

Advantages:

- Defined 45° bevel
- For different bore diameters
- Variable chamfer width
- Quick work result

Tool-Sets F10 S3 and F10 S6



Ordering example: A1039000509

10 pieces



PG 1

| Product number | Description | Image | Cut | Shank Ø mm | 1 piece each | recommended for Information on page 438 | | |
|----------------|-------------|-------|----------|------------|--|--|---|---|
| A10390010 | F10 S3 | | Z7 Steel | 3 | HFA 0313, HFA 0613, HFC 0313, HFC 0613, HFD 0302, HFD 0605, HFG 0313, HFG 0613, HFM 0613, HFF 0313 | ① ② ③ ⑤ ⑦ | ■ | 1 |
| A1039001006 | F10 S6 | | Z7 Steel | 6 | HFAS 0616, HFAS 1225, HFC 0616, HFC 1225, HFD 0605, HFD 1210, HFG 0618, HFG 1225, HFF 0820, HFF 1225 | ① ② ③ ⑤ ⑦ | ■ | 1 |

Tool-Sets F5 S3 and F10 S6



Ordering example: A1039000509

5 pieces and 10 pieces



PG 1

| Product number | Description | Image | Cut | Shank Ø mm | 1 piece each | recommended for Information on page 438 | | |
|----------------|-------------|-------|----------------|------------|--|--|---|---|
| A1039001020 | Assortment | | Z42 Inox/Steel | 6 | HFA 0616, HFA 1225, HFC 0616, HFC 1225, HFD 0605, HFD 1210, HFG 0618, HFG 1225, HFF 0618, HFF 1225 | ① ② ③ ④ | ■ | 1 |
| A1039000509 | Assortment | | Z9 Alu | 3 | HFA 0313, HFC 0313, HFD 0403, HFF 0313, HFG 0313 | ⑥ ⑧ | ■ | 1 |
| A10390005096 | Assortment | | Z9 Alu | 6 | HFA 0616, HFC 0616, HFM 0618, HFF 0618, HFD 0605 | ⑥ ⑧ | ■ | 1 |

Tool-set, BASE-X, F5 S6



Ordering example: A10390053

5 pieces



| Product number | Description | Image | Cut | Shank Ø mm | 1 piece each | recommended for | | | | | | | PG 1 | | |
|----------------|---------------------------|-------|-----|------------|--|-------------------------|---|---|---|---|---|--|------|---|---|
| | | | | | | Information on page 438 | | | | | | | | | |
| A10390053 | F5 S3 Tool-sets BASE-X | | ZX | 3 | HFA 0313, HFC 0313, HFD 0605, HFF 0313, HFG 0313 | ① | ② | ③ | ④ | ⑤ | ⑦ | | | ■ | 1 |
| A10390056 | F5 S6 Tool-sets BASE-X | | ZX | 6 | HFA 1225, HFC 1225, HFD 1210, HFF 1225, HFG 1225 | ① | ② | ③ | ④ | ⑤ | ⑦ | | | ■ | 1 |

Tools for hand-held and floor-stand application



PG 1

Trimming burr

delivery on request

Range of application:

- General machine building
- shipbuilding

Tools for stationary use



PG 1

Differential drill, radius mill, shank-end mill, die mill, profile mill

delivery on request

Range of application:

- Tool construction
- Turbine construction
- Aerospace industry
- General machine building

In addition to rotary burrs, we also produce tungsten carbide milling tools in special shapes and sizes for stationary application.

We supply these milling cutters with a diameter **of 20 mm** maximum diameter and with a maximum length **of 250 mm**; they differ from our extensive standard range by the shape, tool material and geometry (rake, clearance and helix angles).