ADD engineering

COMPOSITE TOOLS

FOR HONEYCOMB

& PANEL MACHINING

Germany | India | Russia

Composite tools - Panel

Shank tools with end teeth designed for profiling and drilling operations in sandwich panels.

Enables extremely high feed rates due to the special tooth configurations.

Composite tools for special applications

The use of a high precision honeycomb core is growing not only in the aeronautical and space industries, but also in the automotive industries.

ADD Engineering has developed a wide range of special tools to satisfy the tough requirements of honeycomb machining applications. Our collection of tools for the machining of honeycomb and other composite materials consists of eight different tooling systems: CORECUT, POCKET CUT, VALVE TYPE CUTTER, PROFILE CUT, FOAM CUT, PANEL CUT, DECORING CUT and FIBER CUT.

Composite tools - Honeycomb

Comprehensive and flexible tooling system, mainly for the machining of honeycomb material with 5-axis CNC-machines.

Composite tools - CFRP/GFRP

Solid Carbide routers for the machining of uni- and multi-directional layers as well as woven fabrics made out of CFRP (carbon-fiber-reinforced plastic) or GFRP (glass-fiber-reinforced plastic).

Tools for the machining of composite materials

The use of a high precision honeycomb core is growing not only in the aeronautical and space industries, but also in the nautical and automobile industries.

The honeycomb industry has developed well beyond the use of meta-aramid honeycombs combined with phenolic resin, such as Nomex. There are various metallic and non-metallic composite materials in combination with coatings, adhesive bonding and potting compounds in use today. These materials present many machining challenges for those needing to shape a honeycomb core.

Neuhäuser Präzisionswerkzeuge GmbH has developed a wide range of special tools to satisfy the tough requirements of honeycomb machining applications.

Our collection of tools for the machining of honeycomb and other composite materials consists of eight different tooling systems:

1 CORECUT

Comprehensive and flexible tooling system, mainly for the machining of honeycomb material with 5-axis CNC-machines. Different types of front-end tools and shredders can be combined to suit the demands of your specific application.

2 POCKET CUT

Shank tools with axial and radial teeth. Ideal for the machining of pockets and slots in honeycomb materials. Available with three different tooth geometries to suit your applications.

3 VALVE TYPE CUTTER

Tool combination of circular knife or saw blade and a valve-shaped shank. Ideal for cut-off operations and chamfering in any kind of honeycomb material.

4 PROFILE CUT

Shank tools designed for profiling complicated honeycomb parts and structures.
The tools are available in centre cutting and ball nose end teeth. Plunge cuts into the honeycomb material are possible.

5 FOAM CUT

End Mills especially designed for the machining of technical foams. These cutters have axial and radial teeth. To create smooth radiuses as well as sharp edges on the parts the FOAM CUT tools are in both ball nose and square end available.

6 PANEL CUT

Shank tools with end teeth designed for profiling and drilling operations in sandwich panels. Enables extremely high feed rates due to the special tooth configurations.

7 DECORING CUT

Shank tools to undercut composite sandwich panels. Especially designed to drill perfectly clean holes and to undercut the panel skins in one step.

8 FIBER CUT

Solid Carbide routers for the machining of uni- and multi-directional layers as well as woven fabrics made out of CFRP (carbon-fiber-reinforced plastic) or GFRP (glass-fiber-reinforced plastic).

9 SPECIALS

Besides the standard tools for honeycomb applications introduced in the previous chapters there is a wide range of special tools engineered for specific applications. Those tools are available on demand and get produced according to your particular needs.

CORECUT

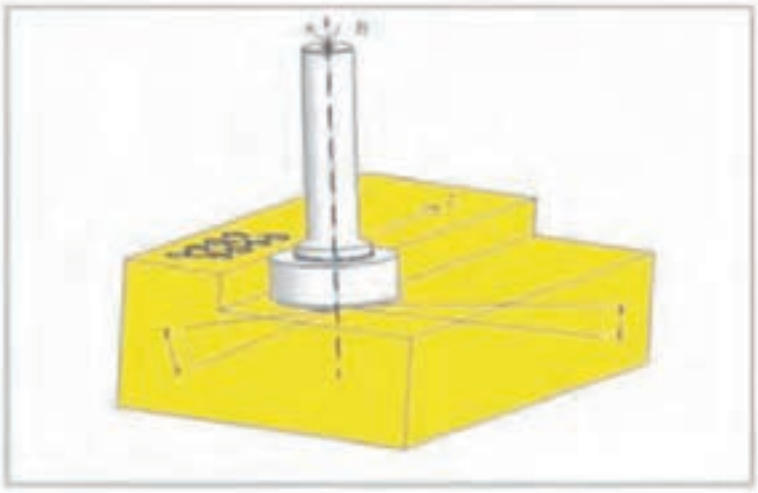
Tooling System for Honeycomb Applications

Introduction

The CORECUT Tooling System was designed for the various machining applications that arise in the 5-axis milling process of honeycomb materials. A high degree of flexibility is achieved by using different combinations of front-end tools, shredders and shanks to create the perfect solutions for the demanding requirements of honeycomb machining. The flexibility of the system makes it ideal for all kinds of honeycomb materials in use today.

While the front-end tool cuts the material and allows excellent surface finishes, the shredder crushes the cut-off material to powder, which can be evacuated by air. This way, the removed material cannot interfere with the machining process. Without the shredder, the material being removed may wrap around the rotating shaft and damage the material, or even pull the entire work piece off the machine table.

For the typical application of CORECUT tools in 5-axis machines, the spindle should be tilted between 1.5° to 3.5° in the feed direction, and another 0.5° to 1.5° sideways (see figure). This way the machining forces point towards the machine table and best results can be achieved. For 3-axis machines where tilting the spindle is not possible, we recommend the POCKET CUT tools.



The most important dimension of composite cutters is the outer diameter of the front-end tool, which is relevant for programming. Therefore, we have named the CORECUT Tool Systems in correspondence with this dimension as stated in millimeters.

For small diameters, the CORECUT Tools combine a shank shredder and a front-end tool, which is available in either solid carbide or HSSCo (High Speed Steel Cobalt). For larger diameters, the CORECUT Tools combine a front-end tool, a shredder and a shank.

There are various tooth geometries for the shredders. These geometries are designed to produce maximum cutting performance with the best surface finishes. Additionally, performance and tool life are increased through the application of an appropriate coating: a single PVD coating (Physical Vapor Deposition) for wear protection, or a PVD multi-layer coating to prevent sticking as well.

In the following section, the individual components are described in detail. The tables give an overview for which tool systems the component is available.

Components and Applications

Front-End Tools

HSS Cobalt Wavy Cutter

These front-end knives are made of HSS Cobalt powdered metal (PM). With their special wavy teeth, they are best suited for NOMEX honeycomb applications.

Availability for CORECUT	10	12.7	19.05	25.4	38.1	45	50.8	63
HSSCo Wavy Cutter					•	•	•	•

Solid Carbide Wavy Cutter

These wavy cutters are made of solid carbide and have a multi-layer coating. This material and coating combination provides maximum tool life and thus increases cost-efficiency and reduces machining time. They are also suitable for highly abrasive materials, like heavy KEVLAR or Carbon Fiber honeycombs.

Availability for CORECUT	10	12.7	19.05	25.4	38.1	45	50.8	63
Solid Carbide Wavy Cutter						•		•

Circular Knives

These front-end knives made of solid carbide have a plain sharp cutting edge. The high quality solid carbide assures a long tool life.

For small outer diameters, the knives have a thread and can easily be mounted on the corresponding shank shredder using a screw driver or a coin.

Knives with larger outer diameter have an arbor hole and are mounted on to the shredder or shank using the corresponding mounting screw.

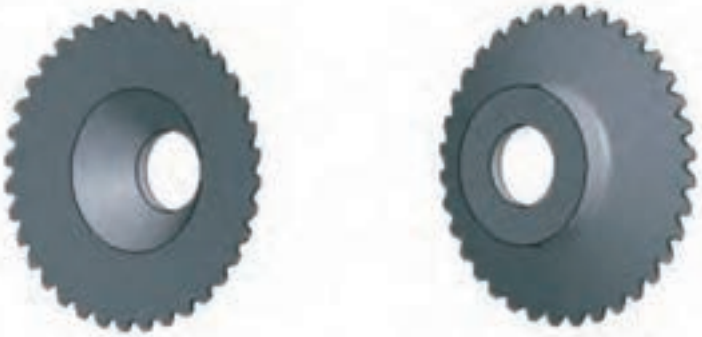
The circular knives made of solid carbide are available in an uncoated version and with a PVD multi-layer coating. The coating reduces wear to a minimum and prevents sticking of resin, adhesive and aluminum material.

Its main application is the machining of NOMEX honeycomb material. For aluminum material, we recommend the coated version.

Besides the front-end knives out of solid carbide, there is a version made out of HSS cobalt powdered metal (PM), which is covered with a PVD multi-layer coating. It is characterized by its extremely sharp cutting edge and unbeatable cutting capability.

Availability for CORECUT	10	12.7	19.05	25.4	38.1	45	50.8	63
Solid carbide, uncoated				•	•	•	•	•
Solid carbide, coated	•	•	•	•	•	•	•	•
HSSCo, coated			•					

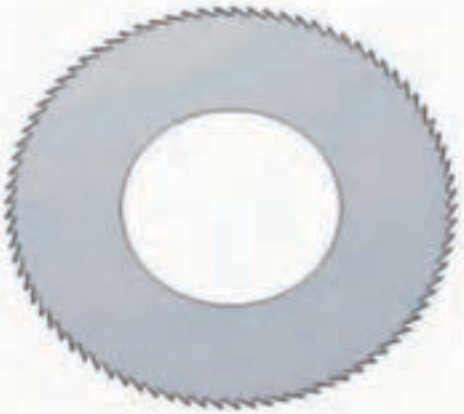
Solid Carbide Knife with Teeth



The solid carbide knife with teeth is created to machine lightweight honeycombs. The special teeth interrupt the cut and prevent a pushing of the cell walls in that way.

Availability for CORECUT	10	12.7	19.05	25.4	38.1	45	50.8	63
Solid Carbide Knife with teeth				•				

HSS Cobalt Saw Blade



These saw blades are made out of HSS Cobalt and have helical teeth with a width of 0.3 mm (approx. 0.0118"). They are mounted on a shank using the corresponding mounting set, described further below (see section Accessories).

They are designed to give the best surface finish on the most difficult fine core shapes in fragile honeycomb structures.

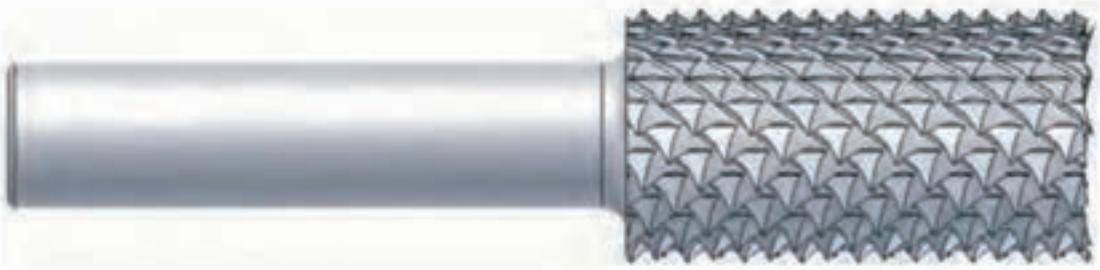
Especially thin core layers with smooth and low angles, combined with large cell sizes create machining problems. This tool concept is then often the only possible choice for the 5-axis milling of meta- and para-aramide fiber honeycombs (for example NOMEX and KEVLAR) or Aluminium and Carbon honeycomb.

Availability for CORECUT	10	12.7	19.05	25.4	38.1	45	50.8	63
HSS Cobalt Saw					•	•	•	•

Shredders

The CORECUT tool family offers a wide range of shredder tools. They differ in outer diameter, in maximum cutting depth or in tooth geometries.

For small outer diameters (up to CORECUT 25.4) the shredders are designed as shank shredders.



For larger outer diameters (from CORECUT 38.1) the shredders have an arbor hole and a similar shape like plain milling cutters.

They are mounted onto the separately available shank, and thus can easily be exchanged.

All shredders are made out of HSS cobalt powdered metal (PM). Depending on the application, different tooth geometries are available, which allow for maximum performance and best surface finishes. Besides the universal diamond-shaped teeth, there is a special tooth shape for the machining of meta-aramid fiber honeycombs (like NOMEX). To reduce wear and increase tool life, it has a PVD coating.

The diamond-shaped teeth are best for the machining of any meta- or para-aramid fiber honeycomb material. This patented tooth geometry is designed especially for all advanced KEVLAR, Aluminum, Carbon Fiber and NOMEX honeycomb applications. The tools with diamond-shaped teeth have a PVD multi-layer coating. With its wear resistance, it increases the tool life significantly, and it prevents sticking of resin, adhesive and aluminum material.

Teeth for Nomex

Fine diamond-shaped teeth - patented -

Coarse diamond-shaped teeth - patented -

Teeth for Nomex, helix 5°

Some of the plain milling cutter-like shredders (CORECUT 45 and 63) are available in the common short version as well as in a long version. The short version allows for a cutting depth up to approx. 17 mm (0.67"). The long version allows for a cutting depth up to approx. 31 mm (1.22"). According to that, there are also short and long versions of shanks. So please make sure, that you choose the right shank length to match your shredder!

short version

long version

Availability for CORECUT	10	12.7	19.05	25.4	38.1	45	50.8	63
Teeth for Nomex	•	•	•	•	•	•	•	•
Teeth for Nomex, flat helix				•				
Fine diamond-shaped teeth			•	•				
Coarse diamond-shaped teeth			•	•	•	•*	•	•*

Accessories

In this section, you will find the shanks for the CORECUT system and the mounting set for the HSS Cobalt saw blades mentioned above.

Shanks

Controx shanks are made out of HSS and ground to h6 tolerance to fit shrinking chucks. All shanks are available in sets, each containing a shank, a suitable mounting screw and wrench. All parts are deliverable as spare parts as well.

There are shanks in various diameters – metric and imperial. For CORECUT 45 and CORECUT 63 short and long versions of shanks are deliverable. The short versions are suitable for the shredders with a cutting depth up to approx. 17 mm (0.67"; short version). The long versions are suitable for shredders for cutting depths up to approx. 31 mm (1.22", long version).

short version

long version

The shanks for CORECUT 38.1 and CORECUT 45 (short version) are identical and thus may be used with shredders and front-end tools of either size.

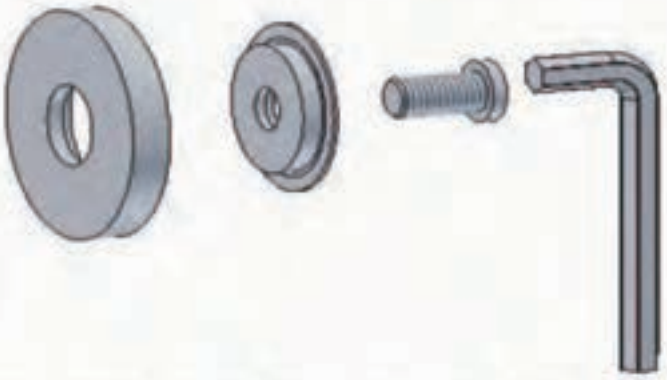
Also the shanks CORECUT 50.8 und CORECUT 63 (short version) are identical.

Availability for CORECUT	10	12.7	19.05	25.4	38.1	45	50.8	63
Shank ø 1/2"					•	•*	•	•*
Shank ø 5/8"					•	•*	•	•*
Shank ø 16mm					•	•*	•	•*
Shank ø 20mm					•	•*	•	•*

* also available as long version

Mounting Set for HSSCo Saw Blade

This mounting set is necessary for the usage of the above mentioned HSS Cobalt saw blades of the CORECUT system and assures accurate fitting. It consists of a centering washer (to assure centered position of the saw), a spring washer (to clamp the saw blade in hollow position), a screw and corresponding wrench. The individual parts can also be ordered separately.



Availability for CORECUT	10	12.7	19.05	25.4	38.1	45	50.8	63
Mounting set					•	•	•	•

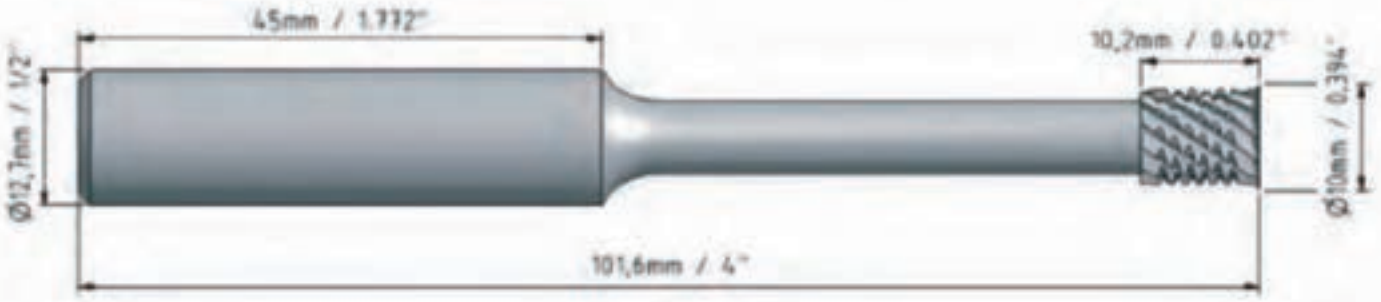
Corecut 10

Front-End Tools		Cutting Dia		Overall Width	Arbor Dia	Mat.	Item #
Solid carbide knife with thread, AWAC3-coated	mm	10	± 0,1	9	M4	SC	7125-010-009-23-00
	inch	0,394	± 0,004	0,354	M4		

SC=Solid Carbide

Shank shredders		Cutting Dia		LOC	OAL	Shank Dia		Mat.	Item #
Shank shredder, AWC2-coated	mm	8,9	± 0,1	10	101,6	12,7	h6	PM	7300-008-010-05-00
	inch	0,35	± 0,004	0,394	4	1/2	-0,0005		

PM=HSSCo Powdered Metal



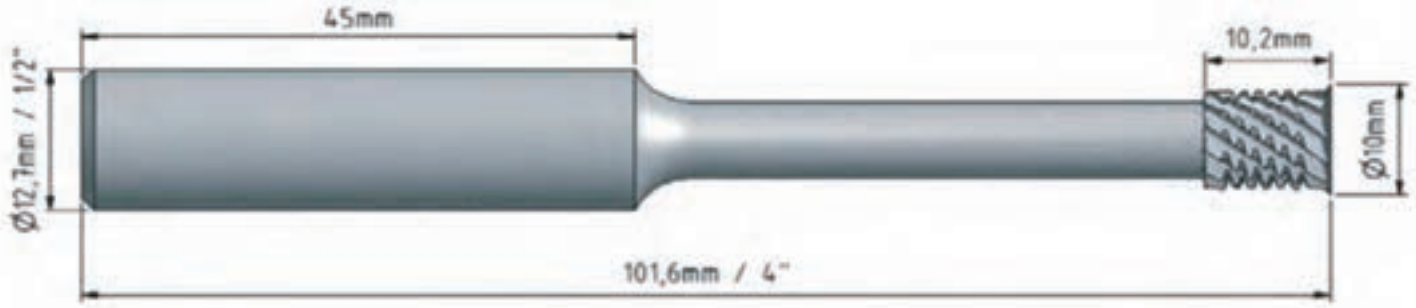
Corecut 12.7 (1/2")

Front-End Tools		Cutting Dia		Overall Width	Arbor Dia	Mat.	Item #
Solid carbide knife with thread, AWAC3-coated	mm	12,7	± 0,1	11	M5	SC	7125-012-011-23-00
	inch	1/2	± 0,004	0,433	M5		

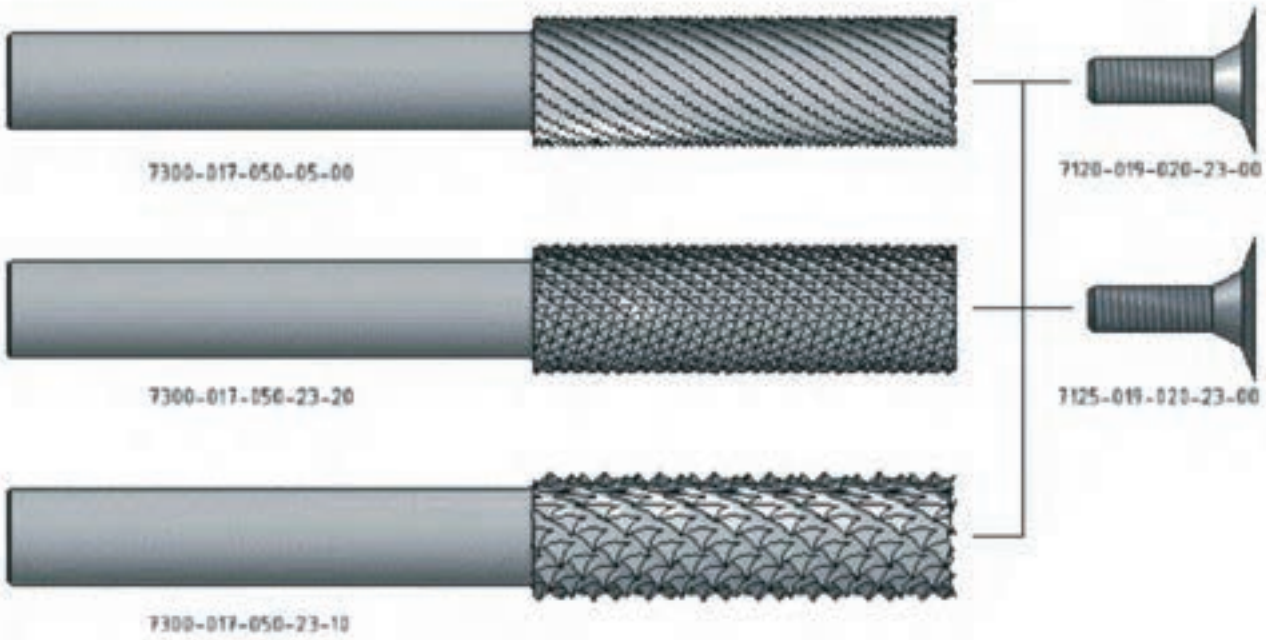
SC=Solid Carbide

Shank shredders		Cutting Dia		LOC	OAL	Shank Dia		Mat.	Item #
Shank shredder, AWC2-coated	mm	11,9	± 0,1	10	101,6	12,7	h6	PM	7300-011-010-05-00
	inch	0,469	± 0,004	0,394	4	1/2	-0,0005		

PM=HSSCo Powdered Metal



Corecut 19.05 (3/4")

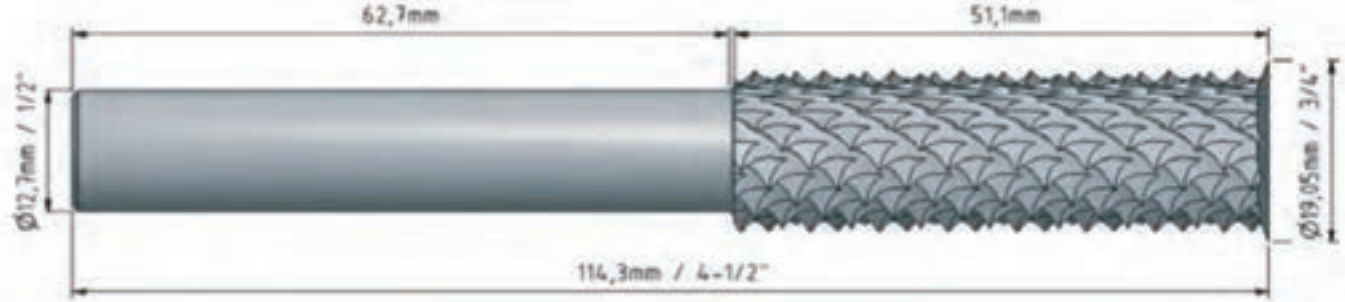


Front-End Tools		Cutting Dia		Overall Width	Arbor Dia	Mat.	Item #
HSS cobalt knife with thread, AWAC3-coated	mm	19,05	± 0,1	20	M6	PM	7120-019-020-23-00
	inch	3/4	± 0,004	0,787	M6		
Solid carbide knife with thread, AWAC3-coated	mm	19,05	± 0,1	20	M6	SC	7125-019-020-23-00
	inch	3/4	± 0,004	0,787	M6		

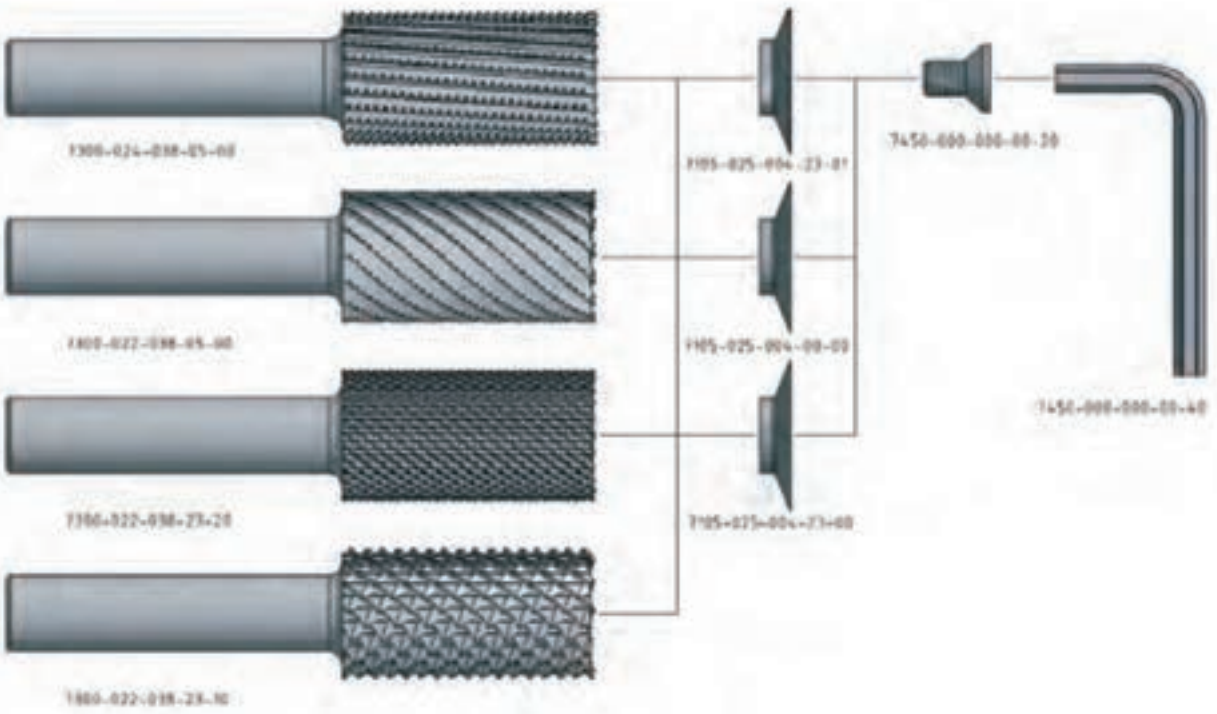
SC=Solid Carbide

Shank shredders		Cutting Dia		LOC	OAL	Shank Dia		Mat.	Item #
Shredder Nomex Toothing, AWC2-coated	mm	17	± 0,2	50,8	114	12,7	h6	PM	7300-017-050-05-00
	inch	0,669	± 0,008	2	4,49	1/2	-0,0005		
Shredder fine diamond-shaped teeth, AWAC3-coated	mm	17	± 0,2	50,8	114	12,7	h6	PM	7300-017-050-23-20
	inch	0,669	± 0,008	2	4,49	1/2	-0,0005		
Shredder coarse diamond-shaped teeth, AWAC3-coated	mm	17	± 0,2	50,8	114	12,7	h6	PM	7300-017-050-23-10
	inch	0,669	± 0,008	2	4,49	1/2	-0,0005		

PM=HSSCo Powdered Metal



Corecut 25.4 (1")



Front-End Tools		Cutting Dia		Overall Width	Arbor Dia	Mat.	Item #
Solid carbide knife, uncoated	mm	25,4	± 0,1	4,5	6,5	SC	7105-025-004-00-00
	inch	1	± 0,004	0,177	0,256		
Solid carbide knife, AWAC3-coated	mm	25,4	± 0,1	4,5	6,5	SC	7105-025-004-23-00
	inch	1	± 0,004	0,177	0,256		
Solid carbide knife with teeth, AWAC3-coated	mm	25,4	± 0,1	4,5	6,5	SC	7105-025-004-23-01
	inch	1	± 0,004	0,177	0,256		

SC=Solid Carbide

Shank shredders		Cutting Dia		LOC	OAL	Shank Dia		Mat.	Item #
Set with shredder with Nomex Toothing AWC2-coated, incl. screw and wrench	mm	22,225	± 0,2	38,1	88,9	12,7	h6	PM	7400-022-038-05-00
	inch	7/8	± 0,008	1 1/2	3 1/2	1/2	-0,0005		
Set with shredder with fine diamond-shaped teeth, AWAC3-coated, incl. screw and wrench	mm	22,225	± 0,2	38,1	88,9	12,7	h6	PM	7400-022-038-23-20
	inch	7/8	± 0,008	1 1/2	3 1/2	1/2	-0,0005		
Set with shredder with coarse diamond-shaped teeth, AWAC3-coated, incl. screw and wrench	mm	22,225	± 0,2	38,1	88,9	12,7	h6	PM	7400-022-038-23-10
	inch	7/8	± 0,008	1 1/2	3 1/2	1/2	-0,0005		
Set with shredder with Nomex Toothing, helix 5°, AWC2-coated, incl. screw and wrench	mm	24,638	± 0,2	38,1	88,9	12,7	h6	PM	7400-024-038-05-00
	inch	0,97	± 0,008	1 1/2	3 1/2	1/2	-0,0005		

PM=HSSCo Powdered Metal

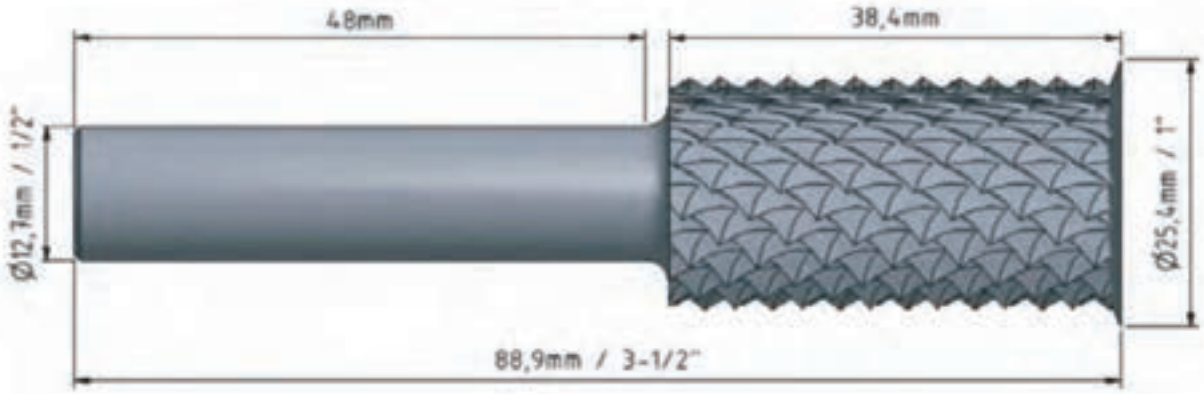
Shank shredders		Cutting Dia		LOC	OAL	Shank Dia		Mat.	Item #
Shredder with Nomex Toothing, AWC2-coated *	mm	22,225	± 0,2	38,1	88,9	12,7	h6	PM	7300-022-038-05-00
	inch	7/8	± 0,008	1 1/2	3 1/2	1/2	-0,0005		
Shredder with fine diamond-shaped teeth, AWAC3-coated *	mm	22,225	± 0,2	38,1	88,9	12,7	h6	PM	7300-022-038-23-20
	inch	7/8	± 0,008	1 1/2	3 1/2	1/2	-0,0005		
Shredder with coarse diamond-shaped teeth, AWAC3-coated *	mm	22,225	± 0,2	38,1	88,9	12,7	h6	PM	7300-022-038-23-10
	inch	7/8	± 0,008	1 1/2	3 1/2	1/2	-0,0005		
Shredder with Nomex Toothing, helix 5°, AWC2-coated *	mm	24,638	± 0,2	38,1	88,9	12,7	h6	PM	7300-024-038-05-00
	inch	0,97	± 0,008	1 1/2	3 1/2	1/2	-0,0005		

PM=HSSCo Powdered Metal

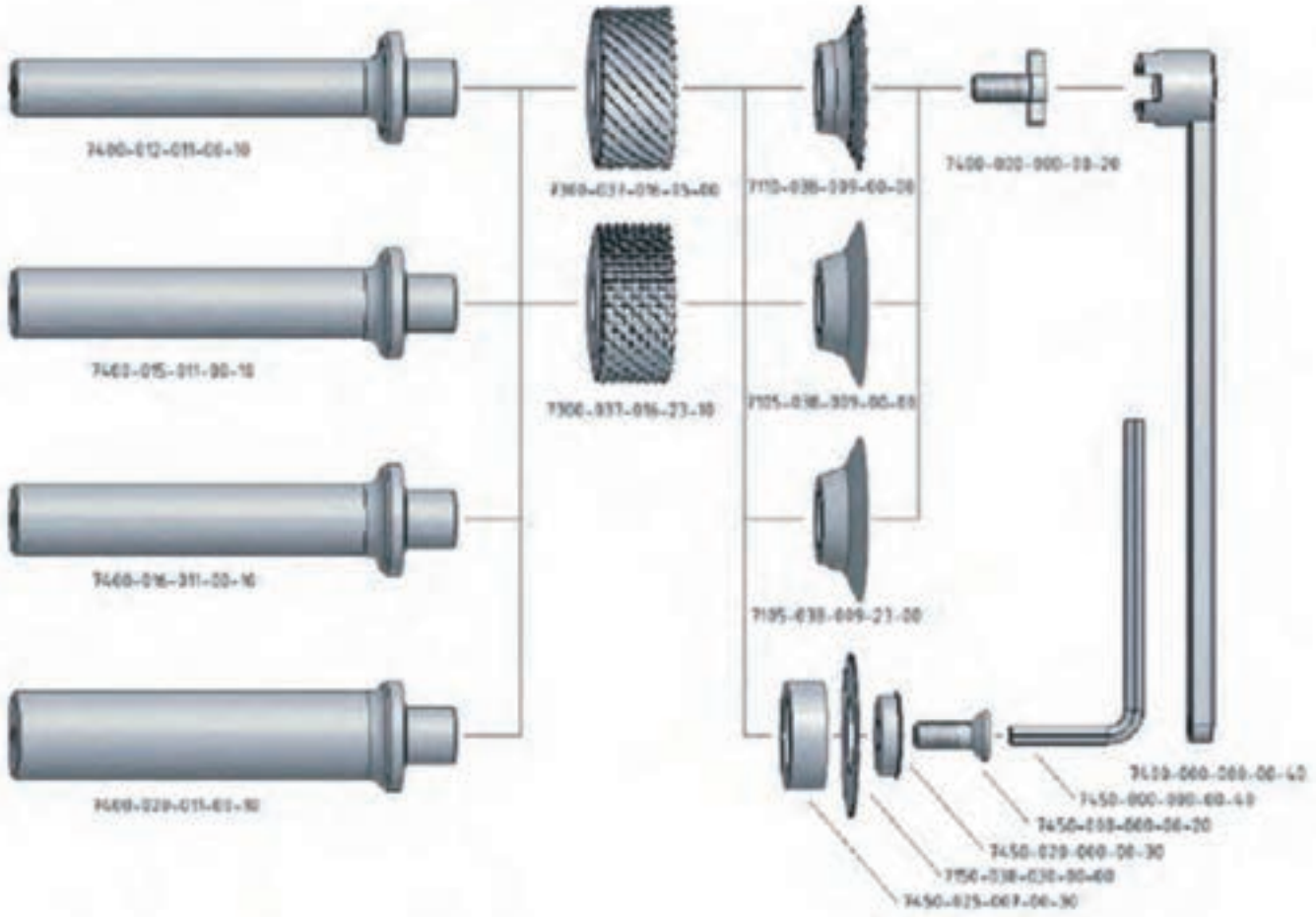
* Single components for the shank sets

Accessories	Mat.	Item #
Screw *	Steel	7450-000-000-00-20
Allen wrench (SW 4) *	Steel	7450-000-000-00-40

* Single components for the shank sets



Corecut 38.1 (1 1/2")



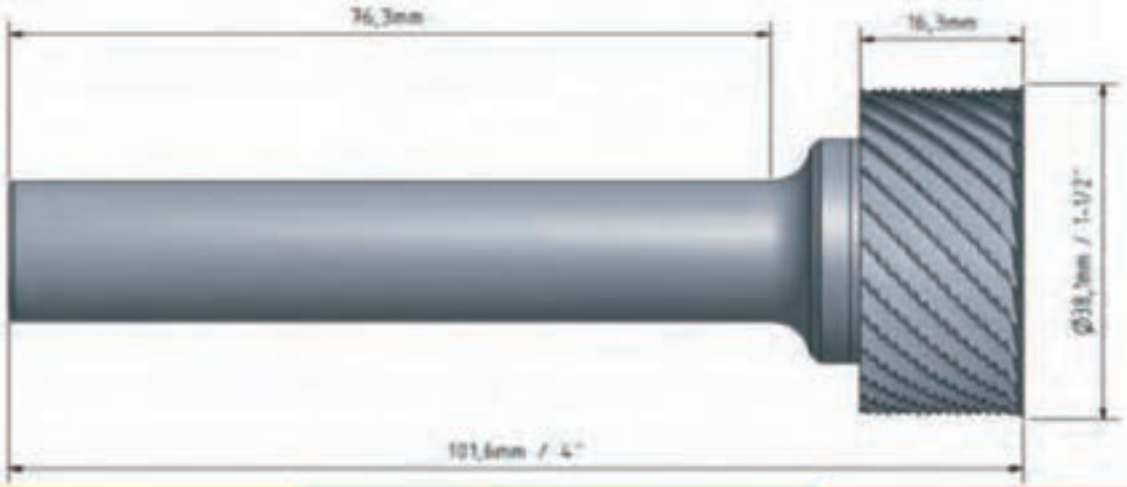
Front-End Tools		Cutting Dia		Overall Width	Arbor Dia		Mat.	Item #
HSS Cobalt wavy cutter, uncoated, T=20	mm	38,1	± 0,1	9	13	H7	PM	7110-038-009-00-00
	inch	1 1/2	± 0,004	0,354	0,5118	+0,0008		
Solid carbide knife, polished, uncoated	mm	38,1	± 0,1	9	13	H7	SC	7105-038-009-00-00
	inch	1 1/2	± 0,004	0,354	0,5118	+0,0008		
Solid carbide knife, polished, AWAC3-coated	mm	38,1	± 0,1	9	13	H7	SC	7105-038-009-23-00
	inch	1 1/2	± 0,004	0,354	0,5118	+0,0008		
Saw blade, helical toothing T=80 *	mm	38,1	± 0,1	0,3	22	H7	HSSCo	7150-038-030-00-00
	inch	1 1/2	± 0,004	0,0118	0,8661	+0,0008		

* requires a mounting set (see accessories)

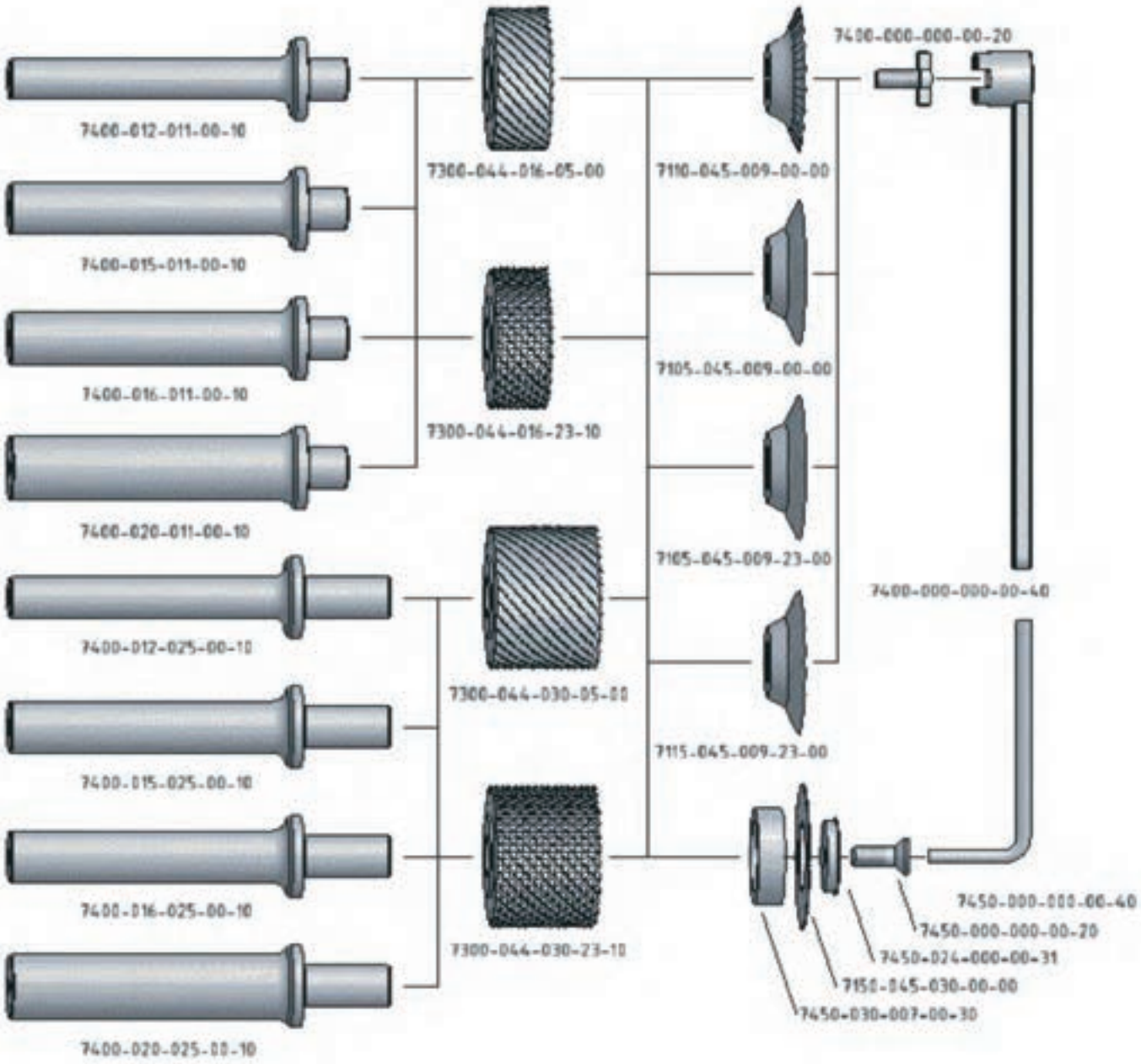
Shredders		Cutting Dia		LOC	Arbor Hole Dia		Mat.	Item #
Shredder with teeth for Nomex, AWC2-coated	mm	37	± 0,2	16	13	H6	PM	7300-037-016-05-00
	inch	1,457	± 0,008	0,63	0,5118	+0,0005		
Shredder with diamond-shaped teeth, AWAC3-coated	mm	37	± 0,2	16	13	H6	PM	7300-037-016-23-10
	inch	1,457	± 0,008	0,63	0,5118	+0,0005		

Accessories		Shank Dia		Arbor Dia		Overall Length	Mat.	Item #
Shank set, ø 1/2" (incl. screw and wrench)	mm	12,7	h6	13	-0,011	96,2	HSS	7400-012-011-00-00
	inch	1/2	-0,0005	0,5118	-0,0005	3,787		
Shank set, ø 5/8" (incl. screw and wrench)	mm	15,875	h6	13	-0,011	96,2	HSS	7400-015-011-00-00
	inch	5/8	-0,0005	0,5118	-0,0005	3,787		
Shank set, ø 16mm (incl. screw and wrench)	mm	16	h6	13	-0,011	96,2	HSS	7400-016-011-00-00
	inch	0,63	-0,0005	0,5118	-0,0005	3,787		
Shank set, ø 20mm (incl. screw and wrench)	mm	20	h6	13	-0,011	96,2	HSS	7400-020-011-00-00
	inch	0,7874	-0,0005	0,5118	-0,0005	3,787		
Shank* ø 1/2"	mm	12,7	h6	13	-0,011	96,2	HSS	7400-012-011-00-10
	inch	1/2	-0,0005	0,5118	-0,0005	3,787		
Shank* ø 5/8"	mm	15,875	h6	13	-0,011	96,2	HSS	7400-015-011-00-10
	inch	5/8	-0,0005	0,5118	-0,0005	3,787		
Shank* ø 16 mm	mm	16	h6	13	-0,011	96,2	HSS	7400-016-011-00-10
	inch	0,63	-0,0005	0,5118	-0,0005	3,787		
Shank* ø 20 mm	mm	20	h6	13	-0,011	96,2	HSS	7400-020-011-00-10
	inch	0,7874	-0,0005	0,5118	-0,0005	3,787		
Screw *							Steel	7400-000-000-00-20
Wrench *							Steel	7400-000-000-00-40
Mounting set for saw blade (incl. 2 washers, screw, wrench)							HSS	7450-038-030-00-00
Centering washer **	mm	25		7,9		13	HSS	7450-025-007-00-30
	inch	0,984		0,311		0,512		
Spring washer **	mm	20		0,3		7	HSS	7450-020-000-00-30
	inch	0,7874		0,0118		0,276		
Screw **							Steel	7450-000-000-00-20
Allen wrench (SW 4) **							Steel	7450-000-000-00-40
½"-Torque wrench adapter for screw*							Steel	7450-000-000-00-52
Reduction for torque wrench adapter from ½" to 3/8"*							Steel	7450-000-000-00-54

* Single components for the shank sets
** Single components for the mounting set for the saw blade
All CORECUT 38.1-shanks may also be used with the CORECUT 45-system (short version).



Corecut 45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7450-000-000-00-20
7450-024-000-00-31
7150-045-030-00-00
7450-030-007-00-30

Front-End Tools		Cutting Dia		Overall Width	Arbor Dia		Mat.	Item #
HSS Cobalt wavy cutter, uncoated, T=20	mm	45	± 0,1	9	13	H7	PM	7110-045-009-00-00
	inch	1,77	± 0,004	0,354	0,5118	+0,0008		
Solid carbide wavy cutter, polished, AWAC3-coated	mm	45	± 0,1	9	13	H7	SC	7115-045-009-23-00
	inch	1,77	± 0,004	0,354	0,5118	+0,0008		
Solid carbide knife, polished, uncoated	mm	45	± 0,1	9	13	H7	SC	7105-045-009-00-00
	inch	1,77	± 0,004	0,354	0,5118	+0,0008		
Solid carbide knife, polished, AWAC3-coated	mm	45	± 0,1	9	13	H7	SC	7105-045-009-23-00
	inch	1,77	± 0,004	0,354	0,5118	+0,0008		
Saw blade, helical teeth T=85 *	mm	45	± 0,1	0,3	22	H7	HSSCo	7150-045-030-00-00
	inch	1,77	± 0,004	0,0118	0,8661	+0,0008		

* requires a mounting set (see accessories)

Shredders		Cutting Dia		LOC	Arbor Hole Dia		Mat.	Item #
Shredder, short version, with teeth for Nomex, AWC2-coated	mm	44	± 0,2	16	13	H6	PM	7300-044-016-05-00
	inch	1,732	± 0,008	0,63	0,5118	+0,0005		
Shredder, short version, diamond-shaped teeth, AWAC3-coated	mm	44	± 0,2	16	13	H6	PM	7300-044-016-23-10
	inch	1,732	± 0,008	0,63	0,5118	+0,0005		
Shredder, long version, with teeth for Nomex, AWC2-coated	mm	44	± 0,2	30	13	H6	PM	7300-044-030-05-00
	inch	1,732	± 0,008	1,181	0,5118	+0,0005		
Shredder, long version, diamond-shaped teeth, AWAC3-coated	mm	44	± 0,2	30	13	H6	PM	7300-044-030-23-10
	inch	1,732	± 0,008	1,181	0,5118	+0,0005		

PM=HSSCo Powdered Metal

Accessories		Shank Dia		Arbor Dia		OAL	Mat.	Item #
Shank set, ø 1/2", short version*** (incl. screw and wrench)	mm	12,7	h6	13	-0,011	96,2	HSS	7400-012-011-00-00
	inch	1/2	-0,0005	0,5118	-0,0005	3,787		
Shank set, ø 5/8", short version*** (incl. screw and wrench)	mm	15,875	h6	13	-0,011	96,2	HSS	7400-015-011-00-00
	inch	5/8	-0,0005	0,5118	-0,0005	3,787		
Shank set, ø 16mm, short version*** (incl. screw and wrench)	mm	16	h6	13	-0,011	96,2	HSS	7400-016-011-00-00
	inch	0,63	-0,0005	0,5118	-0,0005	3,787		
Shank set, ø 20mm, short version*** (incl. screw and wrench)	mm	20	h6	13	-0,011	96,2	HSS	7400-020-011-00-00
	inch	0,7874	-0,0005	0,5118	-0,0005	3,787		
Shank *, ø 1/2", short version***	mm	12,7	h6	13	-0,011	96,2	HSS	7400-012-011-00-10
	inch	1/2	-0,0005	0,5118	-0,0005	3,787		
Shank *, ø 5/8", short version***	mm	15,875	h6	13	-0,011	96,2	HSS	7400-015-011-00-10
	inch	5/8	-0,0005	0,5118	-0,0005	3,787		

Front-End Tools		Cutting Dia		Overall Width	Arbor Dia		Mat.	Item #
HSS Cobalt wavy cutter, uncoated, T=20	mm	45	± 0,1	9	13	H7	PM	7110-045-009-00-00
	inch	1,77	± 0,004	0,354	0,5118	+0,0008		
Solid carbide wavy cutter, polished, AWAC3-coated	mm	45	± 0,1	9	13	H7	SC	7115-045-009-23-00
	inch	1,77	± 0,004	0,354	0,5118	+0,0008		
Solid carbide knife, polished, uncoated	mm	45	± 0,1	9	13	H7	SC	7105-045-009-00-00
	inch	1,77	± 0,004	0,354	0,5118	+0,0008		
Solid carbide knife, polished, AWAC3-coated	mm	45	± 0,1	9	13	H7	SC	7105-045-009-23-00
	inch	1,77	± 0,004	0,354	0,5118	+0,0008		
Saw blade, helical teeth T=85 *	mm	45	± 0,1	0,3	22	H7	HSSCo	7150-045-030-00-00
	inch	1,77	± 0,004	0,0118	0,8661	+0,0008		

* requires a mounting set (see accessories)

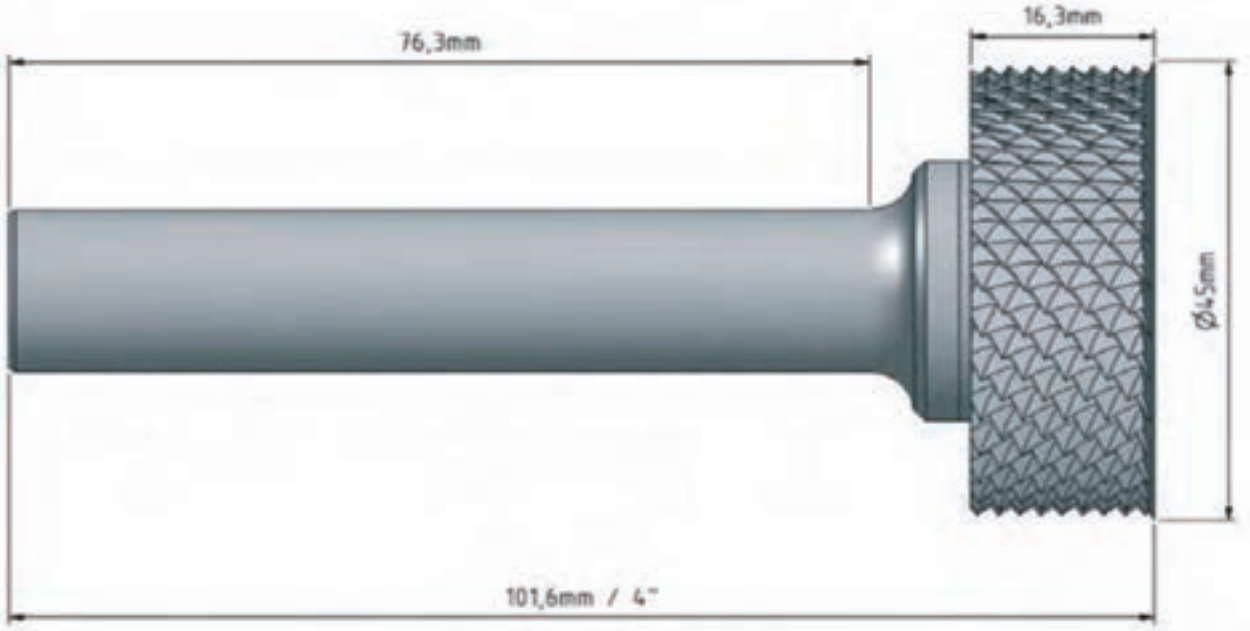
Shredders		Cutting Dia		LOC	Arbor Hole Dia		Mat.	Item #
Shredder, short version, with teeth for Nomex, AWC2-coated	mm	44	± 0,2	16	13	H6	PM	7300-044-016-05-00
	inch	1,732	± 0,008	0,63	0,5118	+0,0005		
Shredder, short version, diamond-shaped teeth, AWAC3-coated	mm	44	± 0,2	16	13	H6	PM	7300-044-016-23-10
	inch	1,732	± 0,008	0,63	0,5118	+0,0005		
Shredder, long version, with teeth for Nomex, AWC2-coated	mm	44	± 0,2	30	13	H6	PM	7300-044-030-05-00
	inch	1,732	± 0,008	1,181	0,5118	+0,0005		
Shredder, long version, diamond-shaped teeth, AWAC3-coated	mm	44	± 0,2	30	13	H6	PM	7300-044-030-23-10
	inch	1,732	± 0,008	1,181	0,5118	+0,0005		

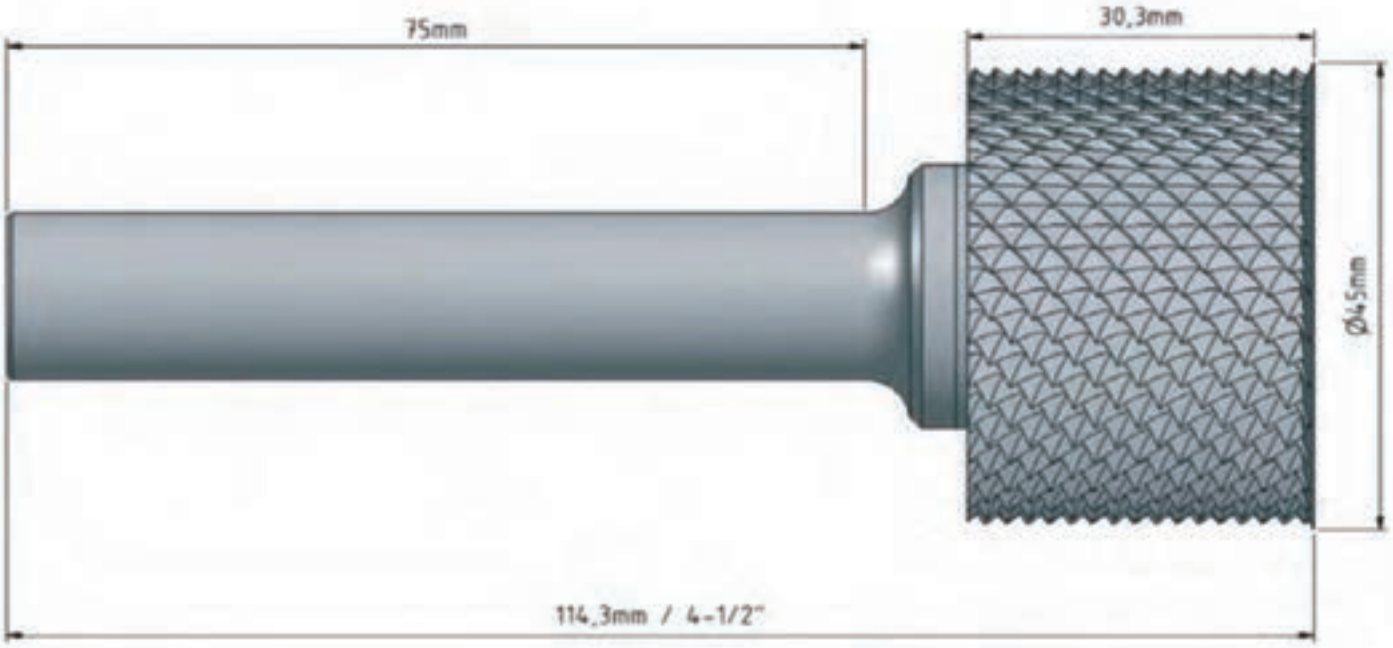
PM=HSSCo Powdered Metal

Accessories		Shank Dia		Arbor Dia		OAL	Mat.	Item #
Shank set, ø 1/2", short version*** (incl. screw and wrench)	mm	12,7	h6	13	-0,011	96,2	HSS	7400-012-011-00-00
	inch	1/2	-0,0005	0,5118	-0,0005	3,787		
Shank set, ø 5/8", short version*** (incl. screw and wrench)	mm	15,875	h6	13	-0,011	96,2	HSS	7400-015-011-00-00
	inch	5/8	-0,0005	0,5118	-0,0005	3,787		
Shank set, ø 16mm, short version*** (incl. screw and wrench)	mm	16	h6	13	-0,011	96,2	HSS	7400-016-011-00-00
	inch	0,63	-0,0005	0,5118	-0,0005	3,787		
Shank set, ø 20mm, short version*** (incl. screw and wrench)	mm	20	h6	13	-0,011	96,2	HSS	7400-020-011-00-00
	inch	0,7874	-0,0005	0,5118	-0,0005	3,787		
Shank *, ø 1/2", short version***	mm	12,7	h6	13	-0,011	96,2	HSS	7400-012-011-00-10
	inch	1/2	-0,0005	0,5118	-0,0005	3,787		
Shank *, ø 5/8", short version***	mm	15,875	h6	13	-0,011	96,2	HSS	7400-015-011-00-10
	inch	5/8	-0,0005	0,5118	-0,0005	3,787		

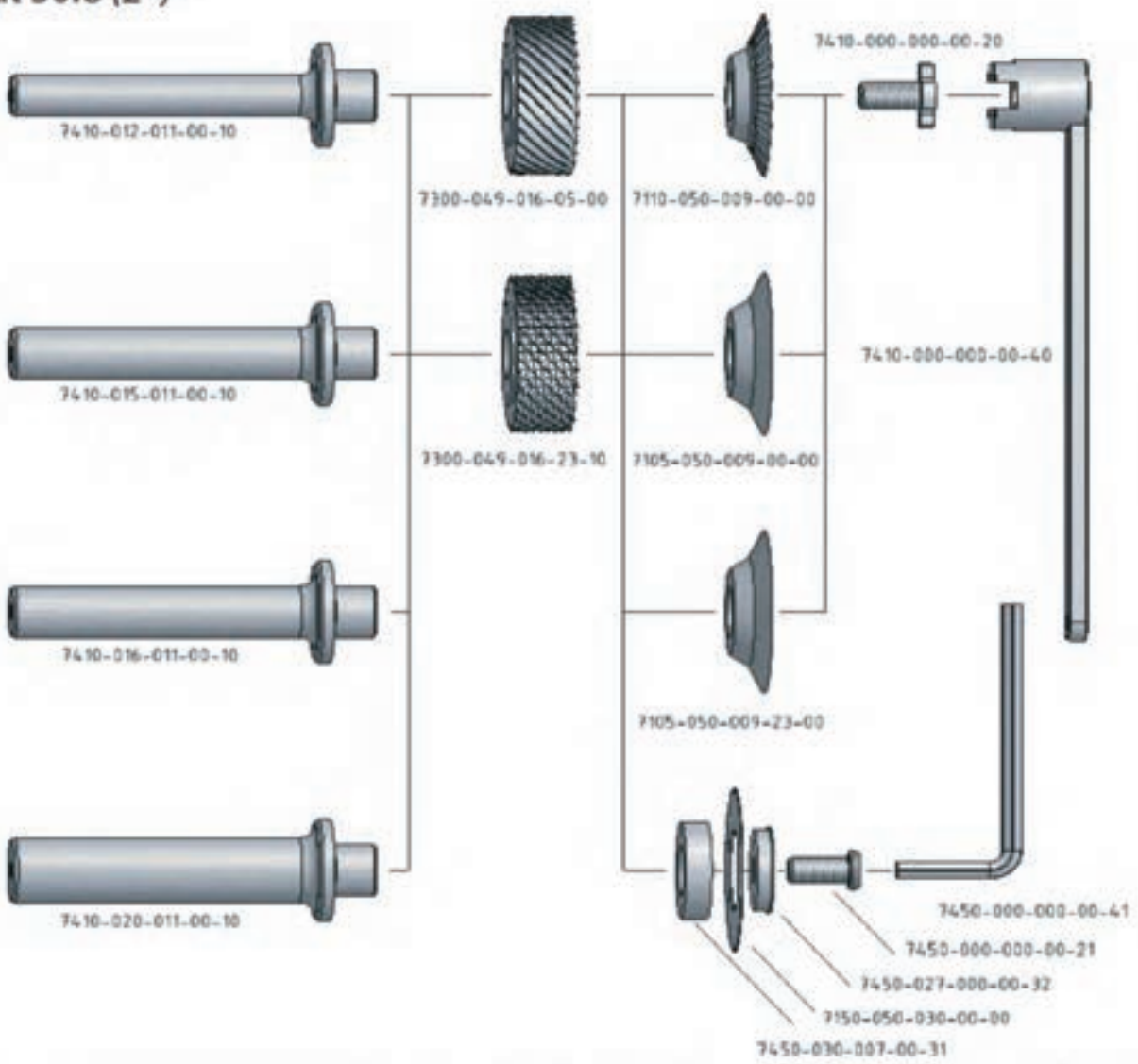
Accessories		Shank Dia		Arbor Dia		OAL	Mat.	Item #
Shank *, ø 16mm, short version***	mm	16	h6	13	-0,011	96,2	HSS	7400-016-011-00-10
	inch	0,63	-0,0005	0,5118	-0,0005	3,787		
Shank *, ø 20mm, short version***	mm	20	h6	13	-0,011	96,2	HSS	7400-020-011-00-10
	inch	0,7874	-0,0005	0,5118	-0,0005	3,787		
Shank set, ø 1/2", long version**** (incl. screw and wrench)	mm	12,7	h6	13	-0,011	108,4	HSS	7400-012-025-00-00
	inch	1/2	-0,0005	0,5118	-0,0005	4,268		
Shank set, ø 5/8", long version**** (incl. screw and wrench)	mm	15,875	h6	13	-0,011	108,4	HSS	7400-015-025-00-00
	inch	5/8	-0,0005	0,5118	-0,0005	4,268		
Shank set, ø 16mm, long version**** (incl. screw and wrench)	mm	16	h6	13	-0,011	108,4	HSS	7400-016-025-00-00
	inch	0,63	-0,0005	0,5118	-0,0005	4,268		
Shank set, ø 20mm, long version**** (incl. screw and wrench)	mm	20	h6	13	-0,011	108,4	HSS	7400-020-025-00-00
	inch	0,7874	-0,0005	0,5118	-0,0005	4,268		
Shank *, ø 1/2", long version****	mm	12,7	h6	13	-0,011	108,4	HSS	7400-012-025-00-10
	inch	1/2	-0,0005	0,5118	-0,0005	4,268		
Shank *, ø 5/8", long version****	mm	15,875	h6	13	-0,011	108,4	HSS	7400-015-025-00-10
	inch	5/8	-0,0005	0,5118	-0,0005	4,268		
Shank *, ø 16mm, long version****	mm	16	h6	13	-0,011	108,4	HSS	7400-016-025-00-10
	inch	0,63	-0,0005	0,5118	-0,0005	4,268		
Shank *, ø 20mm, long version****	mm	20	h6	13	-0,011	108,4	HSS	7400-020-025-00-10
	inch	0,7874	-0,0005	0,5118	-0,0005	4,268		
Screw *							Steel	7400-000-000-00-20
Wrench *							Steel	7400-000-000-00-40
Mounting set for saw blade (incl. 2 washers, screw, wrench)							HSS	7450-045-030-00-00
Centering washer **	mm	30		7,6		13	HSS	7450-030-007-00-30
	inch	1,181		0,2992		0,5118		
Spring washer **	mm	24		0,3		7	HSS	7450-024-000-00-31
	inch	0,945		0,0118		0,276		
Screw **							Steel	7450-000-000-00-20
Allen wrench (SW 4) **							Steel	7450-000-000-00-40
½"-Torque wrench adapter for screw*							Steel	7450-000-000-00-52
Reduction for torque wrench adapter from ½" to 3/8"*							Steel	7450-000-000-00-54

* Single components for the shank sets
** Single components for the mounting set for the saw blade
*** suitable for short version shredder tools; may also be used with Corecut 38.1 (1½")
**** suitable for long version shredder tools


76,3mm
16,3mm
Ø45mm
101,6mm / 4"


75mm
30,3mm
Ø45mm
114,3mm / 4-1/2"

Corecut 50.8 (2")



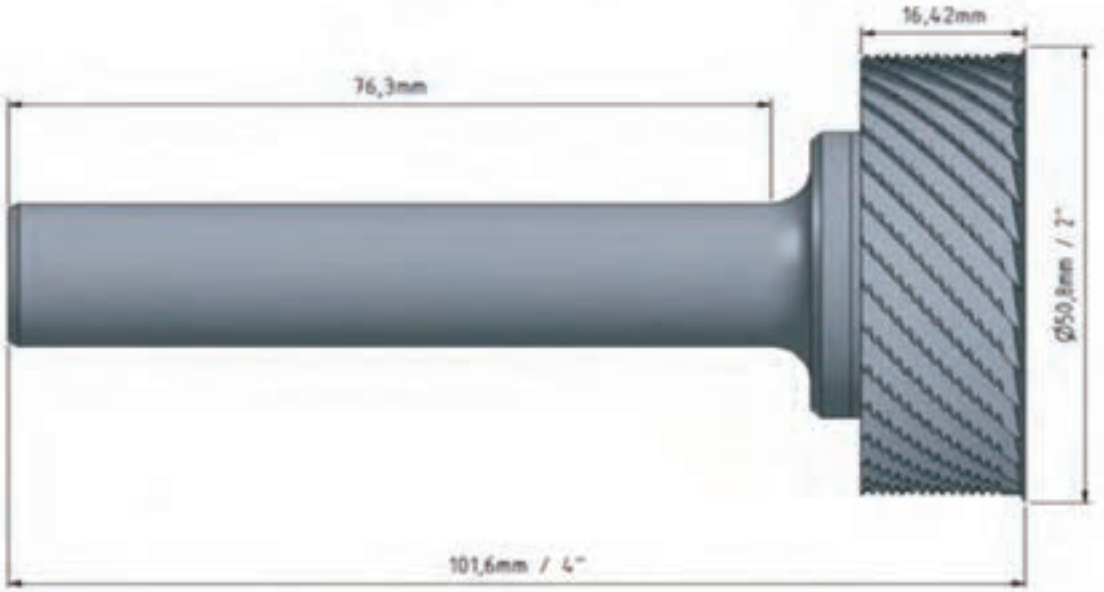
Front-End Tools		Cutting Dia		Overall Width	Arbor Dia		Mat.	Item #
HSS Cobalt wavy cutter, uncoated, T=24	mm	50,8	± 0,1	9	16	H7	PM	7110-050-009-00-00
	inch	2	± 0,004	0,354	0,63	+0,0008		
Solid carbide knife, polished, uncoated	mm	50,8	± 0,1	9	16	H7	SC	7105-050-009-00-00
	inch	2	± 0,004	0,354	0,63	+0,0008		
Solid carbide knife, polished, AWAC3-coated	mm	50,8	± 0,1	9	16	H7	SC	7105-050-009-23-00
	inch	2	± 0,004	0,354	0,63	+0,0008		
Saw blade, helical toothing T=90 *	mm	50,8	± 0,1	0,3	25,4	H7	HSSCo	7150-050-030-00-00
	inch	2	± 0,004	0,0118	1	+0,0008		

* requires a mounting set (see accessories)

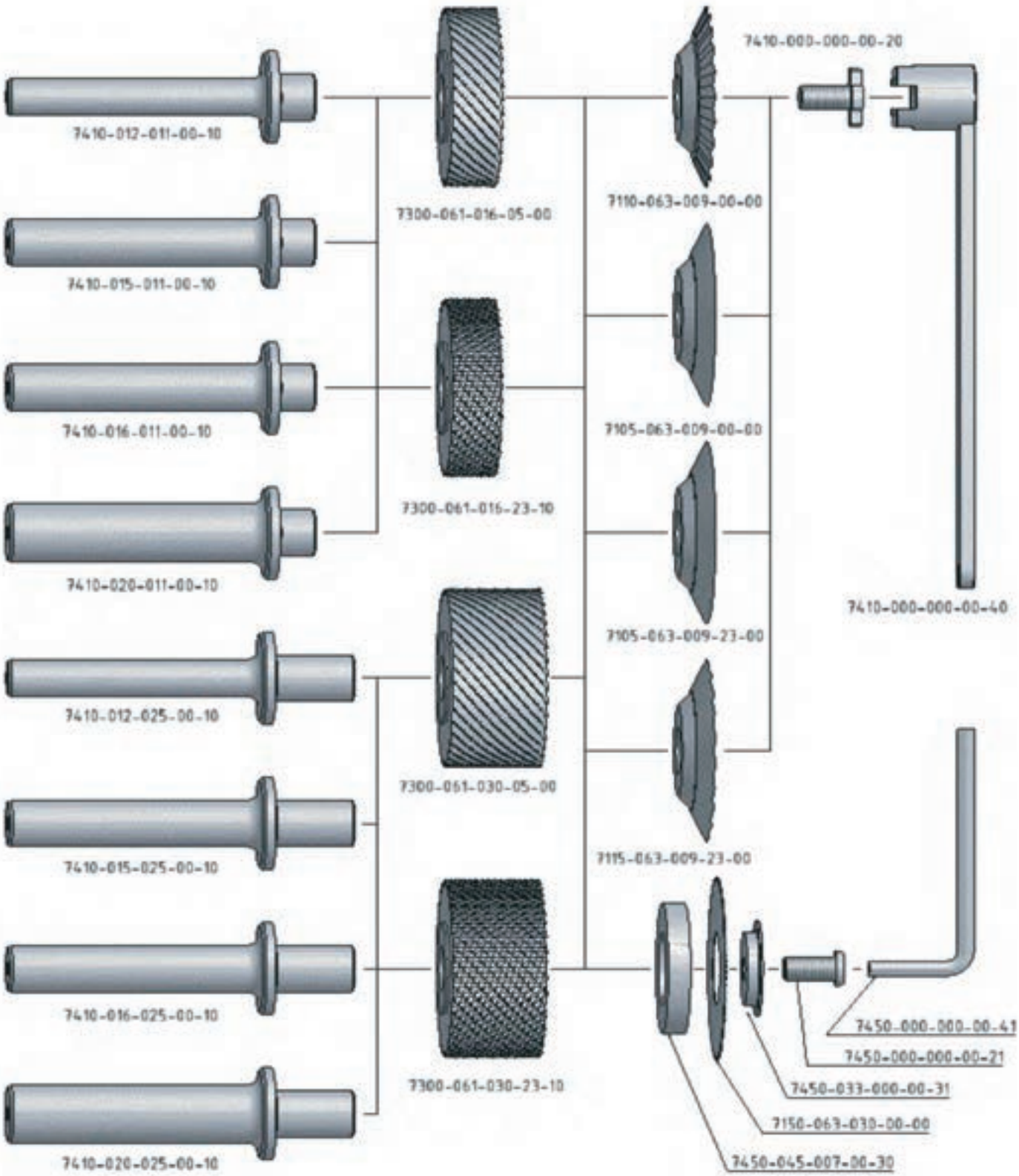
Shredders		Cutting Dia		LOC	Arbor Hole Dia		Mat.	Item #
Shredder with teeth for Nomex, AWC2-coated	mm	49	± 0,2	16	16	H6	PM	7300-049-016-05-00
	inch	1,929	± 0,008	0,63	0,63	+0,0005		
Shredder with diamond-shaped teeth, AWAC3-coated	mm	49	± 0,2	16	16	H6	PM	7300-049-016-23-10
	inch	1,929	± 0,008	0,63	0,63	+0,0005		

Accessories		Shank Dia		Arbor Dia		OAL	Mat.	Item #
Shank set, ø 1/2" (incl. screw and wrench)	mm	12,7	h6	16	-0,011	96,2	HSS	7410-012-011-00-00
	inch	1/2	-0,0005	0,63	-0,0005	3,787		
Shank set, ø 5/8" (incl. screw and wrench)	mm	15,875	h6	16	-0,011	96,2	HSS	7410-015-011-00-00
	inch	5/8	-0,0005	0,63	-0,0005	3,787		
Shank set, ø 16mm (incl. screw and wrench)	mm	16	h6	16	-0,011	96,2	HSS	7410-016-011-00-00
	inch	0,63	-0,0005	0,63	-0,0005	3,787		
Shank set, ø 20mm (incl. screw and wrench)	mm	20	h6	16	-0,011	96,2	HSS	7410-020-011-00-00
	inch	0,7874	-0,0005	0,63	-0,0005	3,787		
Shank* ø 1/2"	mm	12,7	h6	16	-0,011	96,2	HSS	7410-012-011-00-10
	inch	1/2	-0,0005	0,63	-0,0005	3,787		
Shank* ø 5/8"	mm	15,875	h6	16	-0,011	96,2	HSS	7410-015-011-00-10
	inch	5/8	-0,0005	0,63	-0,0005	3,787		
Shank* ø 16 mm	mm	16	h6	16	-0,011	96,2	HSS	7410-016-011-00-10
	inch	0,63	-0,0005	0,63	-0,0005	3,787		
Shank* ø 20 mm	mm	20	h6	16	-0,011	96,2	HSS	7410-020-011-00-10
	inch	0,7874	-0,0005	0,63	-0,0005	3,787		
Screw *							Steel	7410-000-000-00-20
Wrench *							Steel	7410-000-000-00-40
Mounting set for saw blade (incl. 2 washers, screw, wrench)							HSS	7450-050-030-00-00
Centering washer **							HSS	7450-030-007-00-31
Spring washer **							HSS	7450-027-000-00-32
Screw **							Steel	7450-000-000-00-21
Allen wrench (SW 5) **							Steel	7450-000-000-00-41
½"-Torque wrench adapter for screw*							Steel	7450-000-000-00-53
Reduction for torque wrench adapter from ½" to 3/8"*							Steel	7450-000-000-00-54

* Single components for the shank sets
** Single components for the mounting set for the saw blade
All CORECUT 50.8-shanks may also be used with the CORECUT 63-system (short version)



Corecut 63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7450-033-000-00-31
7150-063-030-00-00
7450-045-007-00-30

Front-End Tools		Cutting Dia		Overall Width	Arbor Dia		Mat.	Item #
HSS Cobalt wavy cutter, uncoated, T=22	mm	63	± 0,1	9	16	H7	PM	7110-063-009-00-00
	inch	2,48	± 0,004	0,354	0,63	+0,0008		
Solid carbide wavy cutter, polished, AWAC3-coated	mm	63	± 0,1	9	16	H7	SC	7115-063-009-23-00
	inch	2,48	± 0,004	0,354	0,63	+0,0008		
Solid carbide knife, polished, uncoated	mm	63	± 0,1	9	16	H7	SC	7105-063-009-00-00
	inch	2,48	± 0,004	0,354	0,63	+0,0008		
Solid carbide knife, polished, AWAC3-coated	mm	63	± 0,1	9	16	H7	SC	7105-063-009-23-00
	inch	2,48	± 0,004	0,354	0,63	+0,0008		
Saw blade, helical teeth T=100 *	mm	63	± 0,1	0,3	25,4	H7	HSSCo	7150-063-030-00-00
	inch	2,48	± 0,004	0,0118	1	+0,0008		

* requires a mounting set (see accessories)

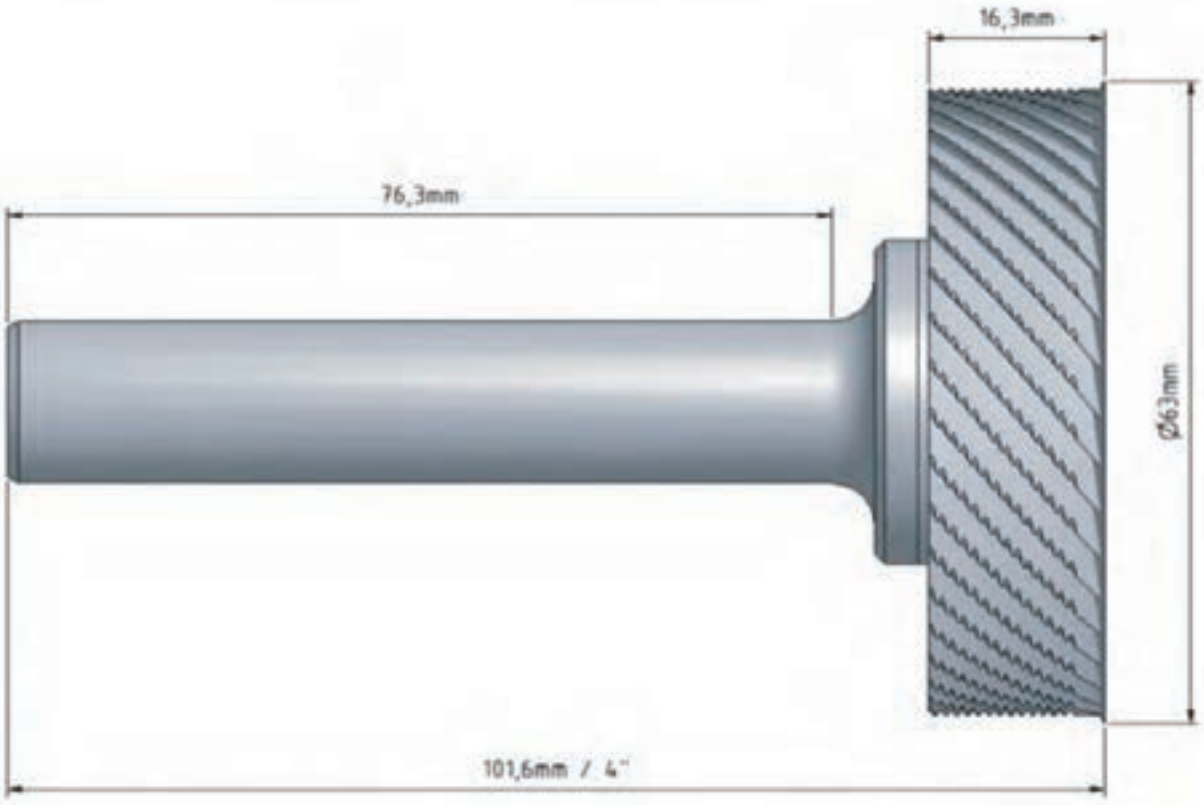
Shredders		Cutting Dia		LOC	Arbor Hole Dia		Mat.	Item #
Shredder, short version, with teeth for Nomex, AWC2-coated	mm	61,5	± 0,2	16	16	H6	PM	7300-061-016-05-00
	inch	2,421	± 0,008	0,63	0,63	+0,0005		
Shredder, short version, diamond-shaped teeth, AWAC3-coated	mm	61,5	± 0,2	16	16	H6	PM	7300-061-016-23-10
	inch	2,421	± 0,008	0,63	0,63	+0,0005		
Shredder, long version, with teeth for Nomex, AWC2-coated	mm	61,5	± 0,2	30	16	H6	PM	7300-061-030-05-00
	inch	2,421	± 0,008	1,181	0,63	+0,0005		
Shredder, long version, diamond-shaped teeth, AWAC3-coated	mm	61,5	± 0,2	30	16	H6	PM	7300-061-030-23-10
	inch	2,421	± 0,008	1,181	0,63	+0,0005		

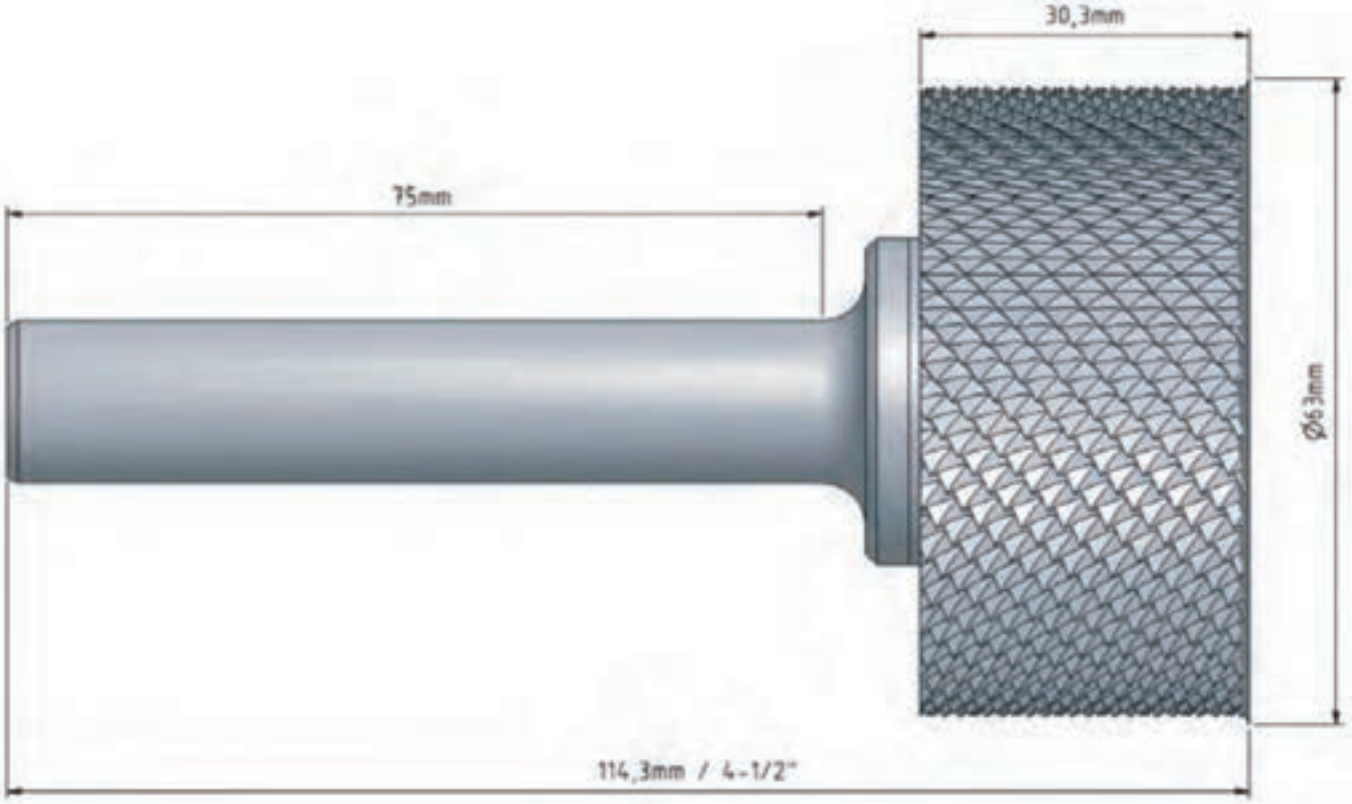
PM=HSSCo Powdered Metal

Accessories		Shank Dia		Arbor Dia		OAL	Mat.	Item #
Shank set, ø 1/2", short version*** (incl. screw and wrench)	mm	12,7	h6	16	-0,011	96,2	HSS	7410-012-011-00-00
	inch	1/2	-0,0005	0,63	-0,0005	3,787		
Shank set, ø 5/8", short version*** (incl. screw and wrench)	mm	15,875	h6	16	-0,011	96,2	HSS	7410-015-011-00-00
	inch	5/8	-0,0005	0,63	-0,0005	3,787		
Shank set, ø 16mm, short version*** (incl. screw and wrench)	mm	16	h6	16	-0,011	96,2	HSS	7410-016-011-00-00
	inch	0,63	-0,0005	0,63	-0,0005	3,787		
Shank set, ø 20mm, short version*** (incl. screw and wrench)	mm	20	h6	16	-0,011	96,2	HSS	7410-020-011-00-00
	inch	0,7874	-0,0005	0,63	-0,0005	3,787		
Shank *, ø 1/2", short version***	mm	12,7	h6	16	-0,011	96,2	HSS	7410-012-011-00-10
	inch	1/2	-0,0005	0,63	-0,0005	3,787		
Shank *, ø 5/8", short version***	mm	15,875	h6	16	-0,011	96,2	HSS	7410-015-011-00-10
	inch	5/8	-0,0005	0,63	-0,0005	3,787		

Accessories		Shank Dia		Arbor Dia		OAL	Mat.	Item #
Shank *, ø 16mm, short version***	mm	16	h6	16	-0,011	96,2	HSS	7410-016-011-00-10
	inch	0,63	-0,0005	0,63	-0,0005	3,787		
Shank *, ø 20mm, short version***	mm	20	h6	16	-0,011	96,2	HSS	7410-020-011-00-10
	inch	0,7874	-0,0005	0,63	-0,0005	3,787		
Shank set, ø 1/2", long version**** (incl. screw and wrench)	mm	12,7	h6	16	-0,011	108,4	HSS	7410-012-025-00-00
	inch	1/2	-0,0005	0,63	-0,0005	4,268		
Shank set, ø 5/8", long version**** (incl. screw and wrench)	mm	15,875	h6	16	-0,011	108,4	HSS	7410-015-025-00-00
	inch	5/8	-0,0005	0,63	-0,0005	4,268		
Shank set, ø 16mm, long version**** (incl. screw and wrench)	mm	16	h6	16	-0,011	108,4	HSS	7410-016-025-00-00
	inch	0,63	-0,0005	0,63	-0,0005	4,268		
Shank set, ø 20mm, long version**** (incl. screw and wrench)	mm	20	h6	16	-0,011	108,4	HSS	7410-020-025-00-00
	inch	0,7874	-0,0005	0,63	-0,0005	4,268		
Shank *, ø 1/2", long version****	mm	12,7	h6	16	-0,011	108,4	HSS	7410-012-025-00-10
	inch	1/2	-0,0005	0,63	-0,0005	4,268		
Shank *, ø 5/8", long version****	mm	15,875	h6	16	-0,011	108,4	HSS	7410-015-025-00-10
	inch	5/8	-0,0005	0,63	-0,0005	4,268		
Shank *, ø 16mm, long version****	mm	16	h6	16	-0,011	108,4	HSS	7410-016-025-00-10
	inch	0,63	-0,0005	0,63	-0,0005	4,268		
Shank *, ø 20mm, long version****	mm	20	h6	16	-0,011	108,4	HSS	7410-020-025-00-10
	inch	0,7874	-0,0005	0,63	-0,0005	4,268		
Screw *							Steel	7410-000-000-00-20
Wrench *							Steel	7410-000-000-00-40
Mounting set for saw blade (incl. 2 washers, screw, wrench)							HSS	7450-063-030-00-00
Centering washer **							HSS	7450-045-007-00-30
Spring washer **							HSS	7450-033-000-00-31
Screw **							Steel	7450-000-000-00-21
Allen wrench (SW 5) **							Steel	7450-000-000-00-41
½"-Torque wrench adapter for screw*							Steel	7450-000-000-00-53
Reduction for torque wrench adapter from ½" to 3/8"*							Steel	7450-000-000-00-54

* Single components for the shank sets
** Single components for the mounting set for the saw blade
*** suitable for short version shredder tools; may also be used with Corecut 50.8 (2")
**** suitable for long version shredder tools


16,3mm
76,3mm
Ø63mm
101,6mm / 4"


30,3mm
75mm
Ø63mm
114,3mm / 4-1/2"

2 POCKET CUT

Shank tools with axial and radial teeth. Ideal for the machining of pockets and slots in honeycomb materials. Available with three different tooth geometries to suit your applications.

POCKET CUT

Tooling System for Honeycomb Applications

Introduction

The POCKET CUT tools are designed for machining pockets, slots, and plunge applications in honeycomb. With the combination of axial and radial teeth, it is the perfect tool for 3-axis machines, where the spindle can not be tilted. Its unique front teeth design allows for crisp cell cuts in pockets on 3-axis machines. They can also be used on 5-axis machines. The cutters different mantle designs offer an optimized cell-waste crushing process.

All shredder end mills are made out of HSS Cobalt Powdered Metal (PM). Additionally, performance and tool life are increased using an appropriate coating: The PVD coating (Physical Vapor Deposition) for wear protection or the multi-layer PVD coating to prevent sticking as well.

Three different tooth types are available to satisfy your requirements and provide a perfect solution for any honeycomb material.

Components and Applications

Teeth for "Nomex"

7350-015-031-05-00

The teeth of this POCKET CUT tool are designed especially for meta-aramid fiber honeycombs (like NOMEX). Its PVD coating reduces wear and increases tool life.

Fine diamond-shaped teeth

7350-015-031-23-20

The fine diamond shaped teeth of this tool are designed for all advanced KEVLAR, Aluminum, Carbon Fiber and NOMEX honeycomb applications. The patented tooth geometry is optimized for machining any meta- or para-aramid fiber honeycomb material. The high tooth density produces the best surface finishes also on very dense honeycombs.

The tool is coated with a multi-layer PVD coating. With its wear resistance, it increases the tool life significantly. The multi-layer coating prevents sticking of resin, adhesive and aluminum material.

Coarse diamond-shaped teeth

7350-015-031-23-10

Like the POCKET CUT tool mentioned above, this one also has diamond shaped teeth, but the patented tooth geometry is coarse and designed for roughing. It reduces machining times and still allows an acceptable surface finish in peripheral cuts in the majority of materials.

The tool has a PVD multi-layer coating for maximum performance and tool life.

Pocket Cut

Pocket Cut		Cutting Dia		LOC	OAL	Shank Dia		Mat.	Item #
Pocket Cut with teeth for Nomex, AWC2- coated	mm	15,875	± 0,1	31,75	95,25	12,7	h6	PM	7350-015-031-05-00
	inch	5/8	± 0,004	1 1/4	3 3/4	1/2	-0,0005		
Pocket Cut, fine diamond-shaped teeth, AWAC3-coated	mm	15,875	± 0,1	31,75	95,25	12,7	h6	PM	7350-015-031-23-20
	inch	5/8	± 0,004	1 1/4	3 3/4	1/2	-0,0005		
Pocket Cut, coarse diamond-shaped teeth, AWAC3-coated	mm	15,875	± 0,1	31,75	95,25	12,7	h6	PM	7350-015-031-23-10
	inch	5/8	± 0,004	1 1/4	3 3/4	1/2	-0,0005		

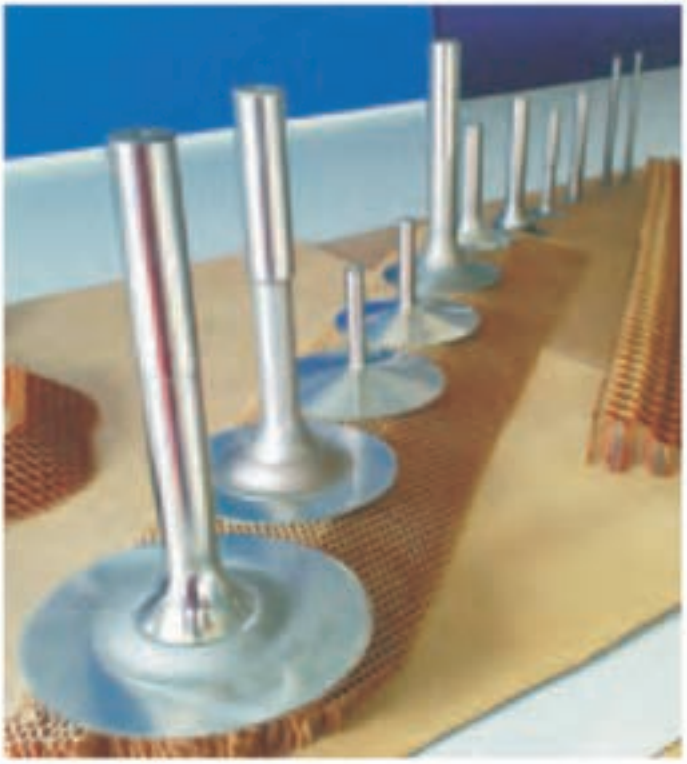
3 VALVE TYPE CUTTER

Tool combination of circular knife or saw blade and a valve-shaped shank. Ideal for cut-off operations and chamfering in any kind of honeycomb material.

VALVE TYPE CUTTER

Tooling System for Honeycomb Applications

Introduction



The VALVE TYPE CUTTERS are designed for cut-off and chamfering operations in all types of honeycomb materials. Smooth chamfers can be machined on thick honeycomb sheets in one operation. All VALVE TYPE tools are designed for applications where a shredder is not absolutely necessary (see also CORECUT system).

The VALVE TYPE CUTTERS combine a front-end tool and a shank. The shanks were especially developed for these tools and make this system very flexible. The shape of the shanks assures a good evacuation of the cut-off material. The front-end tools can easily be replaced.

VALVE TYPE CUTTERS with an outer diameter of 50.8 mm (2 inch) and 100 mm (approx. 4 inch) are available. The most important dimension of composite cutters is the outer diameter of the front-end tool. Therefore, we have named the VALVE TYPE Tool Systems in correspondence with this dimension as stated in millimeters.
In the following section the individual components are described in detail. The table gives an overview for which tool systems the component is available.

Components and Applications

Front-End Tools

Solid carbide knife

These solid carbide knives have a polished plain cutting edge. The high quality solid carbide assures a long tool life. The knife is available in an uncoated version and with a combined PVD-multi-layer coating, which reduces wear and prevents sticking of resin, adhesive and aluminum material.

These knives can be used for a lot of applications in all kinds of aramid and metallic honeycombs.

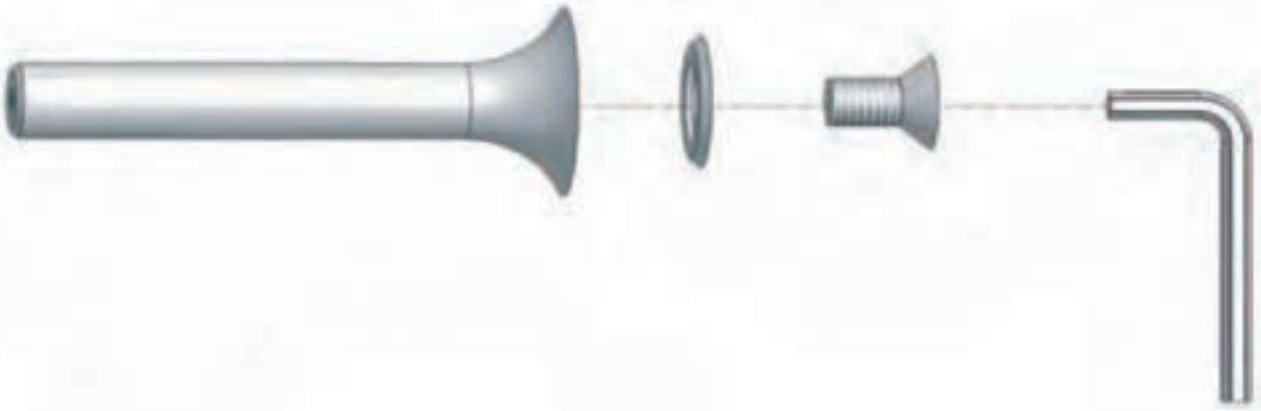
Availability	Valve Type 50.8	Valve Type 100
Solid carbide knife, uncoated	•	
Solid carbide knife, coated	•	

Saw blade

The saw blade made of HSS has patented helical GN-Teeth. They reduce cutting forces and assure the best surface finish even when processing most fragile honeycomb structures. It can be used for a lot of applications in all kinds of aramid and metallic honeycombs. Also for creating core layers with extreme smooth and low angles combined with large cell sizes, it is the ideal choice. Its hollow shape prevents noise during the machining process.

Availability	Valve Type 50.8	Valve Type 100
HSS saw blade		•

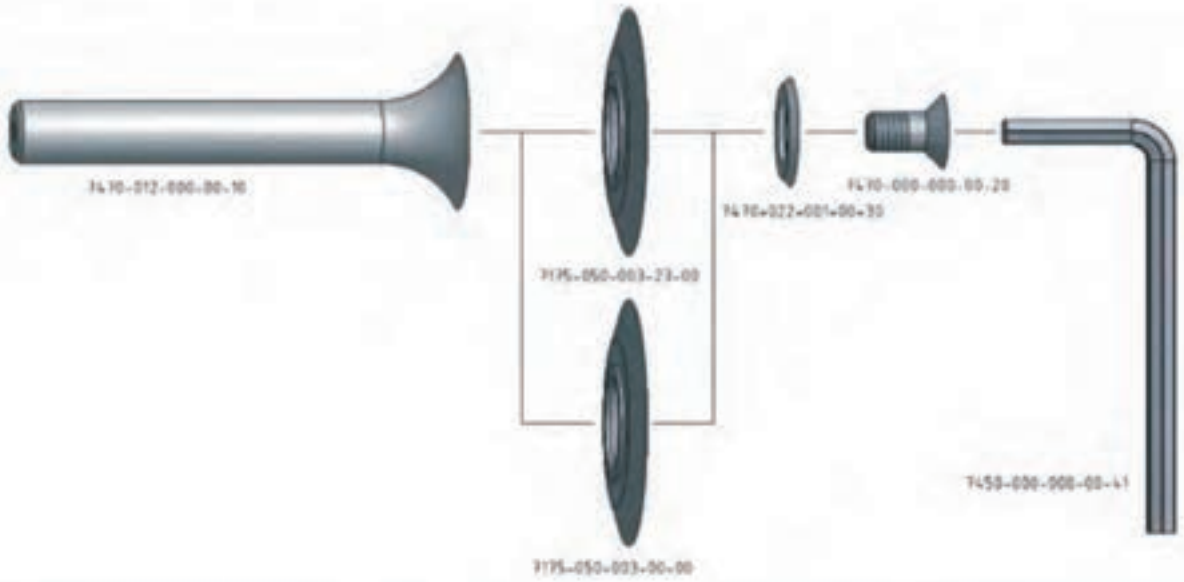
Accessories



The above mentioned knives and saw blades are mounted on a hardened shank made of HSS. All shanks are ground to h6 tolerance to fit shrinking chucks. They are available as sets, each containing a shank, a required fitting ring or washers, a suitable mounting screw and wrench. All parts are deliverable as single parts as well.

Availability	Valve Type 50.8	Valve Type 100
Shank ø 1/2"	•	•
Shank ø 5/8"		•
Shank ø 16 mm		•

Valve Type Cutter 50.8

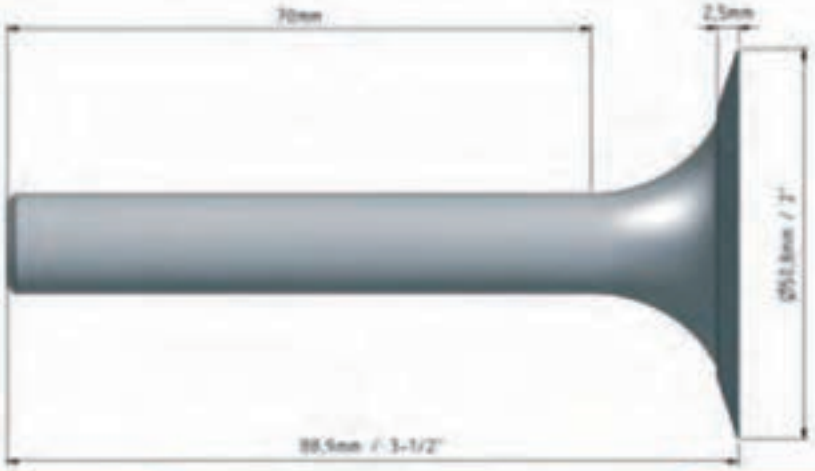


Front-End Tools		Cutting Dia		Overall Width	Arbor Dia		Mat.	Item #
Solid carbide knife, uncoated	mm	50,8	± 0,2	3,3	19,05	H7	SC	7175-050-003-00-00
	inch	2	± 0,008	0,1299	3/4	+0,0008		
Solid carbide knife, AWAC3-coated	mm	50,8	± 0,2	3,3	19,05	H7	SC	7175-050-003-23-00
	inch	2	± 0,008	0,1299	3/4	+0,0008		

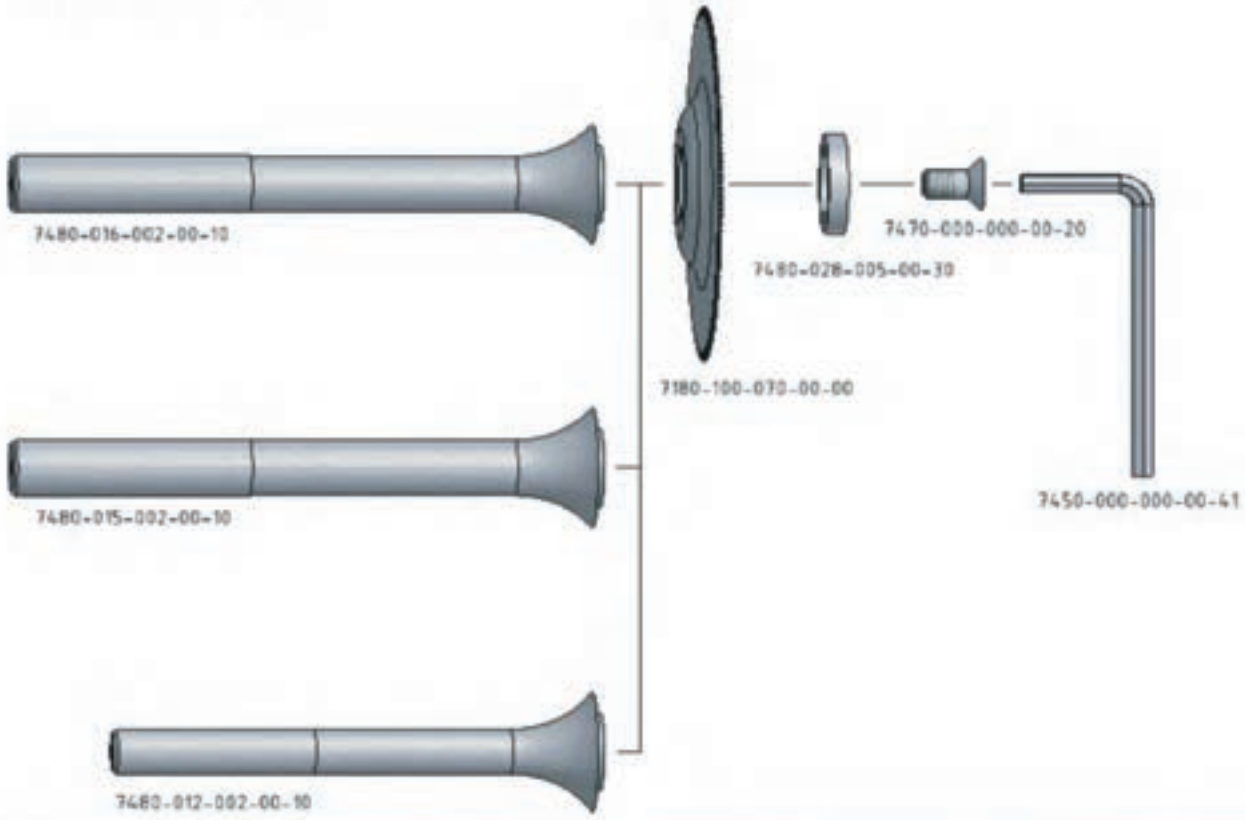
SC=Solid Carbide

Accessories		Shank Dia		Arbor Dia		OAL	Mat.	Item #
Shank-Set ø 1/2" (incl. fitting ring, mounting screw, wrench)	mm	12,7	h6	32	-0,5+0,1	86,4	HSS	7470-012-000-00-00
	inch	1/2	-0,0005	1,2598	-0,02+0,004	3,4016		
Shank * ø 1/2"	mm	12,7	h6	32	-0,5+0,1	86,4	HSS	7470-012-000-00-10
	inch	1/2	-0,0005	1,2598	-0,02+0,004	3,4016		
Fitting ring *							HSS	7470-022-001-00-30
Mounting screw *							Steel	7470-000-000-00-20
Allen wrench (SW 5) *							Steel	7450-000-000-00-41

* Single components for shank sets



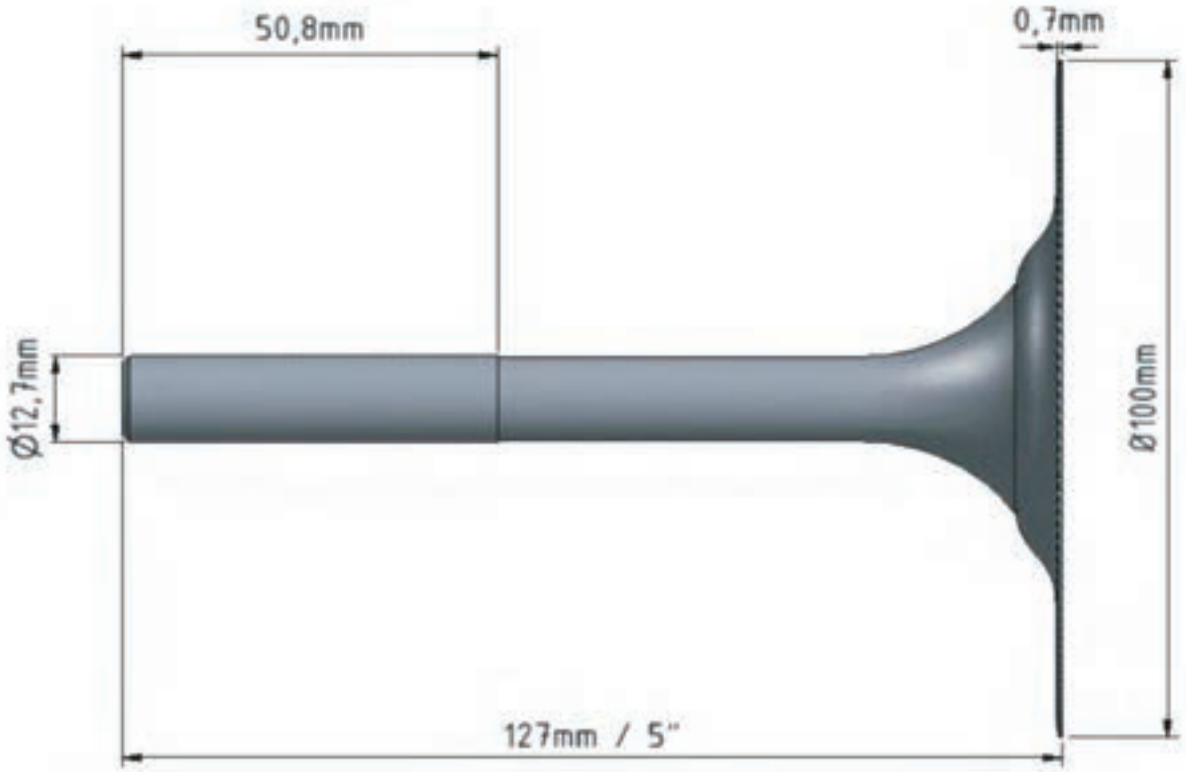
Valve Type Cutter 100

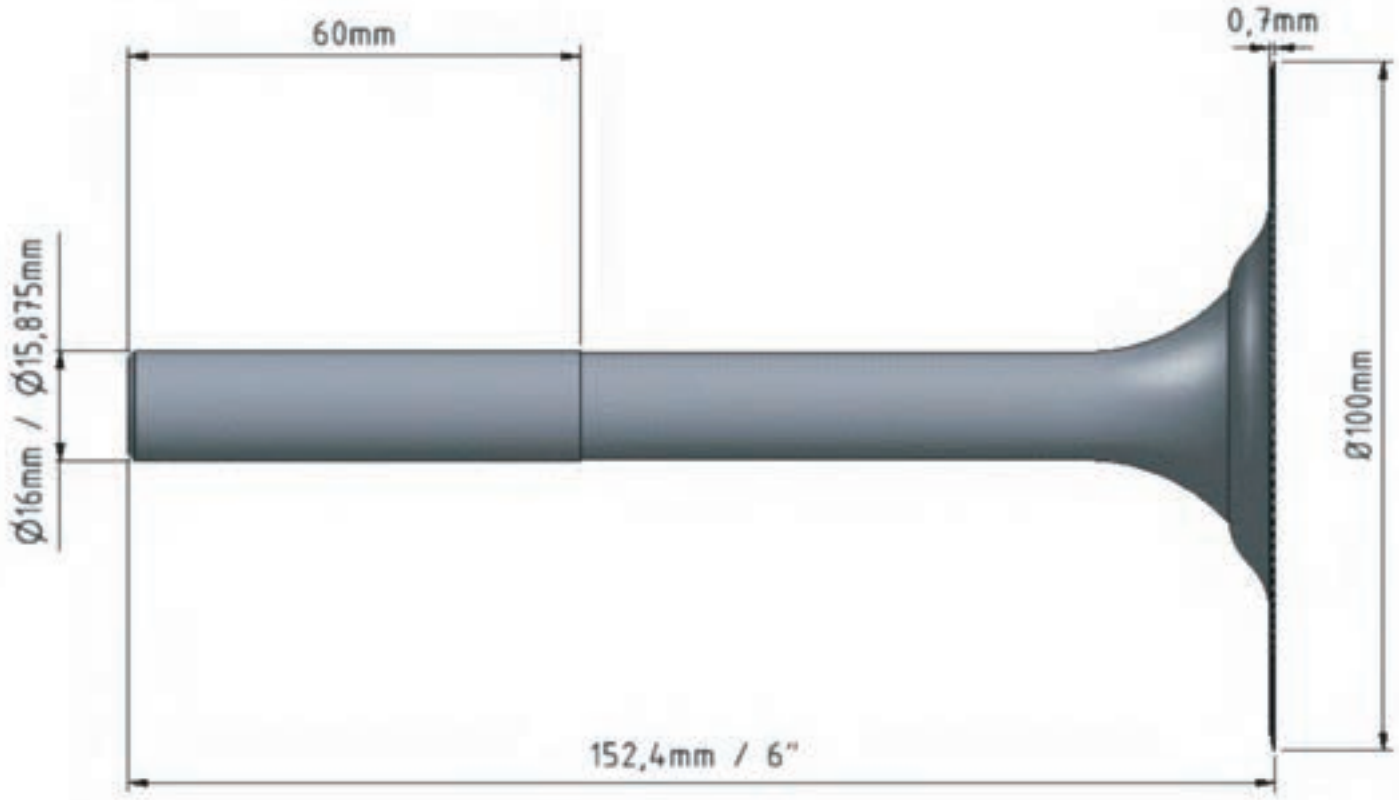


Front-End Tools		Cutting Dia		Overall Width	Arbor Dia		Mat.	Item #
Saw blade, T=160	mm	100	± 0,6	0,7	22	H7	HSS	7180-100-070-00-00
	inch	3,937	± 0,025	0,0276	0,8661	+0,0008		

Accessories		Shank Dia		Arbor Dia		OAL	Mat.	Item #
Shank-Set ø 1/2" (incl. mounting washer, screw, wrench)	mm	12,7	h6	22	h6	122,8	HSS	7480-012-002-00-00
	inch	1/2	-0,0005	0,8661	-0,0006	4,835		
Shank* ø 1/2"	mm	12,7	h6	22	h6	122,8	HSS	7480-012-002-00-10
	inch	1/2	-0,0005	0,8661	-0,0006	4,835		
Shank-Set ø 5/8" (incl. mounting washer, screw, wrench)	mm	15,875	h6	22	h6	148,2	HSS	7480-015-002-00-00
	inch	5/8	-0,0005	0,8661	-0,0006	5,8346		
Shank* ø 5/8"	mm	15,875	h6	22	h6	148,2	HSS	7480-015-002-00-10
	inch	5/8	-0,0005	0,8661	-0,0006	5,8346		
Shank-Set ø 16mm (incl. mounting washer, screw, wrench)	mm	16	h6	22	h6	148,2	HSS	7480-016-002-00-00
	inch	0,63	-0,0005	0,8661	-0,0006	5,8346		
Shank* ø 16 mm	mm	16	h6	22	h6	148,2	HSS	7480-016-002-00-10
	inch	0,63	-0,0005	0,8661	-0,0006	5,8346		
Mounting washer *							HSS	7480-028-005-00-30
Screw *							Steel	7470-000-000-00-20
Allen wrench (SW 5) *							Steel	7450-000-000-00-41

* Single components for shank sets


50,8mm
0,7mm
Ø12,7mm
Ø100mm
127mm / 5"


60mm
0,7mm
Ø16mm / Ø15,875mm
Ø100mm
152,4mm / 6"

4 PROFILE CUT

Shank tools designed for profiling complicated honeycomb parts and structures.

The tools are available in centre cutting and ball nose end teeth. Plunge cuts into the honeycomb material are possible.

PROFILE CUT

Tool for Honeycomb Applications

Introduction

The PROFILE CUT tools are specially designed for the profiling of complicated honeycomb parts and structures whereby plunging operations are possible because of the center cutting end teeth. These tools are also available with ball nose to facilitate a smooth radius. With their combination of radial and axial teeth the PROFILE CUTs are optimized for the application on 3-axis machines which only allow a tilted spindle head in one direction or not at all. Of course they can also be used on five-axis milling machines.

All PROFILE CUT tools are made out of high quality solid carbide. They are coated with our patented PVD multi-layer coating.

The customer can choose between two end teeth geometries to meet his special requests. We present the best solution for every application. On request we also design variations to the catalog concepts, for example with left hand helical teeth or left hand cutting teeth.

Components and Applications

Profile Cut with center cutting end teeth

The tooth geometry of this PROFILE CUT tool was specially designed to machine meta-aramid-fiber honeycombs (like Nomex).

Center cutting axial teeth allow for a plunge cut into a honeycomb part.

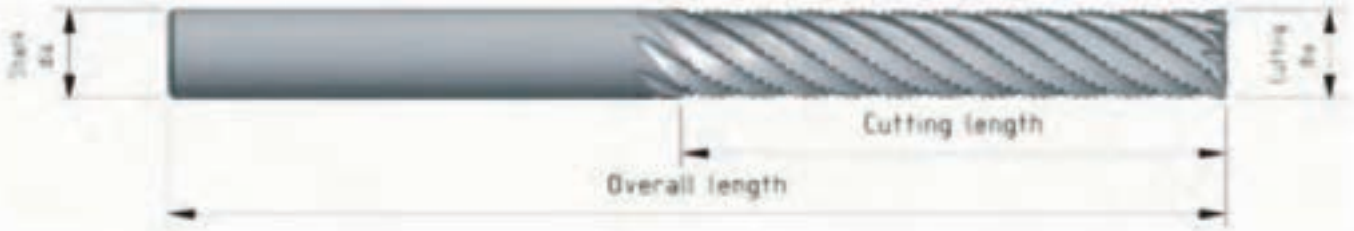
Profile Cut with ball nose

This PROFILE CUT has the same radial type of toothing as the above-mentioned cutter.

The radial "ball nose" allows a smooth radius in the bottom of your honeycomb parts.

Profile Cut

Profile Cut		Cutting dia.		LOC	OAL	Shank dia.		Mat.	Item #
Profile Cut, CC, AWAC3-coated	mm	3,175	± 0,1	25,4	76,2	3,175	h6	SC	7365-003-025-23-30
	inch	1/8	± 0,004	1	3	1/8	-0,0005		
Profile Cut, CC, AWAC3-coated	mm	3,175	± 0,1	53,975	76,2	3,175	h6	SC	7365-003-053-23-30
	inch	1/8	± 0,004	2 1/8	3	1/8	-0,0005		
Profile Cut, CC, AWAC3-coated	mm	4,7625	± 0,1	25,4	76,2	4,7625	h6	SC	7365-004-025-23-30
	inch	3/16	± 0,004	1	3	3/16	-0,0005		
Profile Cut, CC, AWAC3-coated	mm	6,35	± 0,1	19,05	76,2	6,35	h6	SC	7365-006-019-23-30
	inch	1/4	± 0,004	3/4	3	1/4	-0,0005		
Profile Cut, CC, AWAC3-coated	mm	6,35	± 0,1	25,4	76,2	6,35	h6	SC	7365-006-025-23-30
	inch	1/4	± 0,004	1	3	1/4	-0,0005		
Profile Cut, CC, AWAC3-coated	mm	9,525	± 0,1	25,4	76,2	9,525	h6	SC	7365-009-025-23-30
	inch	3/8	± 0,004	1	3	3/8	-0,0005		
Profile Cut, CC, AWAC3-coated	mm	9,525	± 0,1	50,8	101,6	9,525	h6	SC	7365-009-050-23-30
	inch	3/8	± 0,004	2	4	3/8	-0,0005		
Profile Cut, CC, AWAC3-coated	mm	12,7	± 0,1	50,8	101,6	12,7	h6	SC	7365-012-050-23-30
	inch	1/2	± 0,004	2	4	1/2	-0,0005		
Profile Cut, CC, AWAC3-coated	mm	12,7	± 0,1	76,2	152,4	12,7	h6	SC	7365-012-076-23-30
	inch	1/2	± 0,004	3	6	1/2	-0,0005		
Profile Cut, CC, AWAC3-coated	mm	19,05	± 0,1	76,2	152,4	19,05	h6	SC	7365-019-076-23-30
	inch	3/4	± 0,004	3	6	3/4	-0,0005		
Profile Cut, CC, AWAC3-coated	mm	25,4	± 0,1	50,8	101,6	25,4	h6	SC	7365-025-050-23-30
	inch	1	± 0,004	2	4	1	-0,0005		
Profile Cut, CC, AWAC3-coated	mm	25,4	± 0,1	76,2	152,4	25,4	h6	SC	7365-025-076-23-30
	inch	1	± 0,004	3	6	1	-0,0005		



Profile Cut		Cutting dia.		LOC	OAL	Shank dia.		Mat.	Item #
Profile Cut, BN, AWAC3-coated	mm	6,35	± 0,1	50,8	152,4	6,35	h6	SC	7365-006-050-23-31
	inch	1/4	± 0,004	2	6	1/4	-0,0005		
Profile Cut, BN, AWAC3-coated	mm	12,7	± 0,1	76,2	152,4	12,7	h6	SC	7365-012-076-23-31
	inch	1/2	± 0,004	3	6	1/2	-0,0005		

5 FOAM CUT

End Mills especially designed for the machining of technical foams. These cutters have axial and radial teeth. To create smooth radiuses as well as sharp edges on the parts the FOAM CUT tools are in both ball nose and square end available.

FOAM CUT

Tool for Foam Applications

Introduction

The FOAM CUT tools are designed to machine solid foams and foam potted honeycombs. One version with ball nose geometry is predestined for the machining of filigreed parts on five-axis machines. To realize sharp edges, the FOAM CUT is also available with square end. These high performance cutters have aggressive tooth geometry with high rake angles and wide flutes to allow easy chip evacuation and unparalleled feed rates.

The unequal tooth pitch prevents vibrations and enables an excellent surface finish.

All FOAM CUT tools are made out of HSS Cobalt Powdered Metal (PM). Additionally, performance and tool life is increased using an appropriate coating: A patented multi-layer PVD coating for wear protection and to prevent sticking as well.

Components and Applications

Foam Cut with ball nose

Foam Cut with square end

The FOAM CUT teeth are designed for the machining of pure foam and for the machining of foam potted honeycombs. Big flute spacing facilitates the chip flow and meets all requirements of feed.

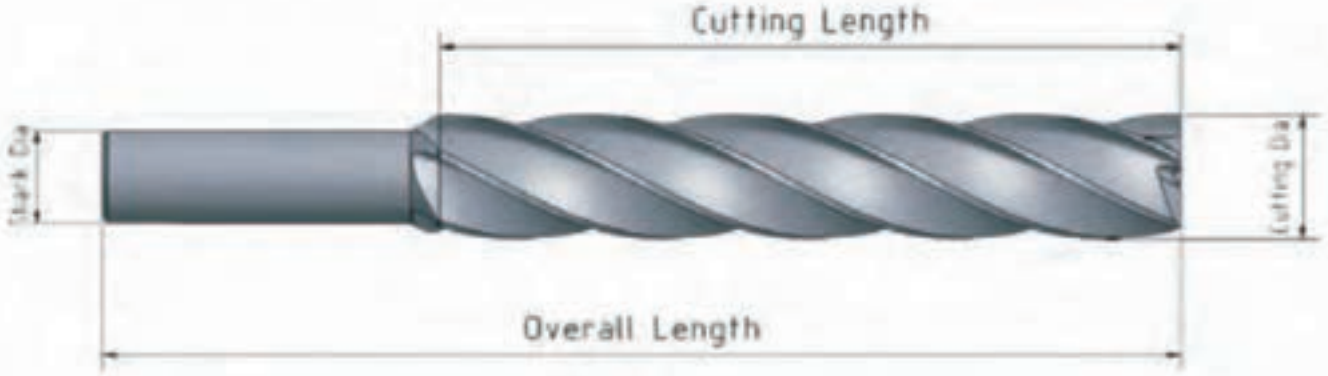
The hemisphere formed ball nose enables a filigreed machining on 3- or 5-axis-machines with every continual junction. Center cutting end teeth allow plunging into solid material with no problem.

The patented multi-layer PVD coating prevents sticking and reduces wear of the cutting edges and guarantees maximum performance and a significantly increased tool life.

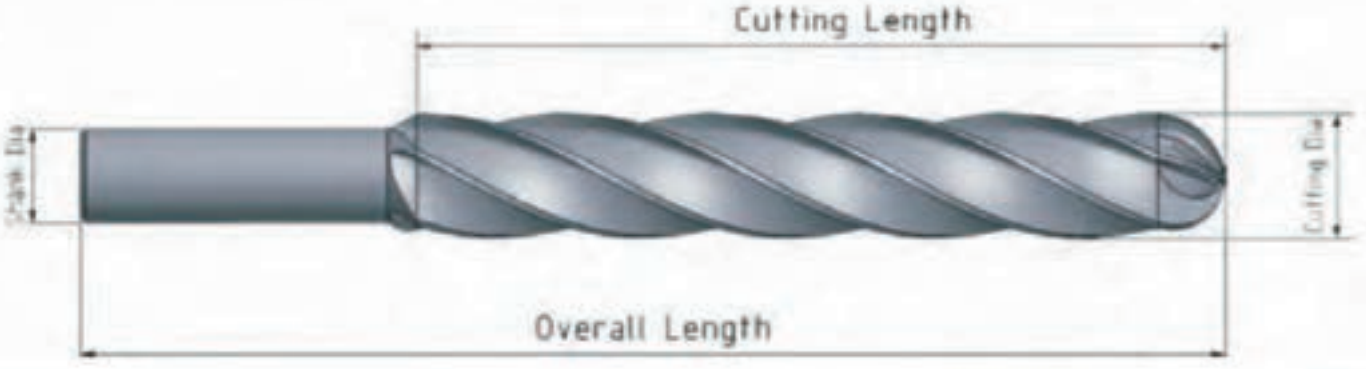
600 IPM at a cutting speed of about 590000 IPM are possible without problems.

Foam Cut

Foam Cut		Cutting Dia		LOC	OAL	Shank Dia		Mat.	Item #
Foam Cut CC, AWAC3-coated	mm	6,35	± 0,1	38,1	101,6	6,35	h6	PM	7360-006-038-23-31
	inch	1/4	± 0,004	1 1/2	4	1/4	-0,0005		
Foam Cut CC, AWAC3-coated	mm	12,7	± 0,1	76,2	127	12,7	h6	PM	7360-012-076-23-31
	inch	1/2	± 0,004	3	5	1/2	-0,0005		
Foam Cut CC, AWAC3-coated	mm	19,05	± 0,1	101,6	158,75	19,05	h6	PM	7360-019-101-23-31
	inch	3/4	± 0,004	4	6 1/4	3/4	-0,0005		
Foam Cut CC, AWAC3-coated	mm	25,4	± 0,1	152,4	215,9	19,05	h6	PM	7360-025-152-23-31
	inch	1	± 0,004	6	8 1/2	3/4	-0,0005		



Foam Cut		Cutting Dia		LOC	OAL	Shank Dia		Mat.	Item #
Foam Cut BN, AWAC3-coated	mm	6,35	± 0,1	38,1	101,6	6,35	h6	PM	7360-006-038-23-30
	inch	1/4	± 0,004	1 1/2	4	1/4	-0,0005		
Foam Cut BN, AWAC3-coated	mm	12,7	± 0,1	76,2	127	12,7	h6	PM	7360-012-076-23-30
	inch	1/2	± 0,004	3	5	1/2	-0,0005		
Foam Cut BN, AWAC3-coated	mm	19,05	± 0,1	101,6	158,75	19,05	h6	PM	7360-019-101-23-30
	inch	3/4	± 0,004	4	6 1/4	3/4	-0,0005		
Foam Cut BN, AWAC3-coated	mm	25,4	± 0,1	152,4	215,9	19,05	h6	PM	7360-025-152-23-30
	inch	1	± 0,004	6	8 1/2	3/4	-0,0005		



6 PANEL CUT

Shank tools with end teeth designed for profiling and drilling operations in sandwich panels. Enables extremely high feed rates due to the special tooth configurations.

PANEL CUT

Tool for Panel Applications

Introduction

The PANEL CUT tools are specially designed for the machining of composite lightweight panels. With the PANEL CUT it is possible to drill perfectly clean holes through sandwich panels without any delamination on the glass or carbon fiber skins or flagging of the honeycomb in between. It is also the ideal tool for profiling operations where the PANEL CUT achieves outstanding results. The honeycomb structure between the skins gets removed cleanly without any flagging.

The outstanding advantage of the PANEL CUT is the possibility of extremely high feed rates while still establishing a clean surface finish. With feed rates of up to 10.000 mm/minute you are able to maximize your productivity.

Components and Applications

Panel Cut with center cutting end teeth

7345-006-015-00-01

7345-006-031-00-01

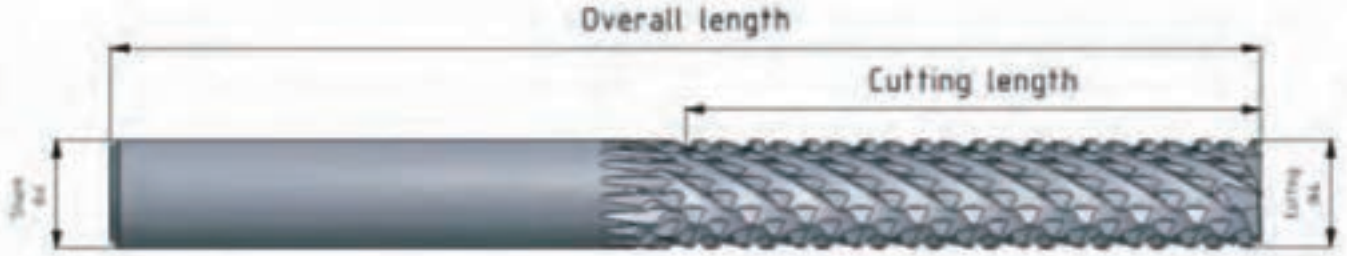
7345-012-031-00-01

The special tooth design of the PROFILE CUT increases tool life due to stabilized tips. It also enables extremely high feed rates and reduces machining times of sandwich panels remarkably. The sophisticated tool geometry of the PANEL CUT allows a precise machining of composite panels and a high quality surface finish of the skins.

Panel Cut

Panel Cut		Cutting dia.		LOC	OAL	Shank dia.		Mat.	Item #
Panel Cut, CC	mm	6.35	± 0.1	15.875	63.5	6.35	h6	SC	7345-006-015-00-01
	inch	1/4	± 0.005	5/8	2-1/2	1/4	-0.0005		
Panel Cut, CC	mm	6.35	± 0.1	31.75	63.5	6.35	h6	SC	7345-006-031-00-01
	inch	1/4	± 0.005	1-1/4	2-1/2	1/4	-0.0005		
Panel Cut, CC	mm	12.7	± 0.1	31.75	76.2	12.7	h6	SC	7345-012-031-00-01
	inch	1/2	± 0.005	1-1/4	3	1/2	-0.0005		

SC=Solid Carbide



7 DECORING CUT

Shank tools to undercut composite sandwich panels. Especially designed to drill perfectly clean holes and to undercut the panel skins in one step.

DECORING CUT

Tool for Panel Applications

Introduction

The DECORING CUT is specially engineered for the machining of composite lightweight panels.

It is the ideal solution to drill holes into the panel and to undercut the skins. This is often necessary to achieve a better bonding between insert, potting and panel. Undercutting of the outside profile contour is often done to be able to epoxy the out edge of the part to achieve a better stability and surface finish. With its end teeth the DECORING CUT enables to first drill the hole and then undercut the panel without a tool change. Thereby it removes and pulverizes the material instead of just compressing it and eliminates the core "spring back".

The DECORING CUT is made out of Solid Carbide or HSS Cobalt Powdered Metal (PM) and coated with our patented PVD multi-layer coating. It is available in different dimensions depending on the panel width and necessary undercut depth.

Please contact us on any special sizes needed we understand that there are many insert sizes needed.

Components and Applications

Decoring Cut to undercut sandwich panels

The DECORING CUT with its sophisticated tooth geometry is suitable for plunging and undercutting of the skins in composite sandwich panels like no other tool. We recommend the Solid Carbide version if plunging is a main part of the work due to a longer tool life. For mainly undercutting operations, the HSS Cobalt Powdered Metal PANEL CUT is suitable.

The DECORING CUT has a PVD multi-layer coating for maximum performance and tool life.

The tools are available from stock in different dimensions. Please choose the cutting length depending on the panel width. Please take the details from the chart in the following technical specifications.

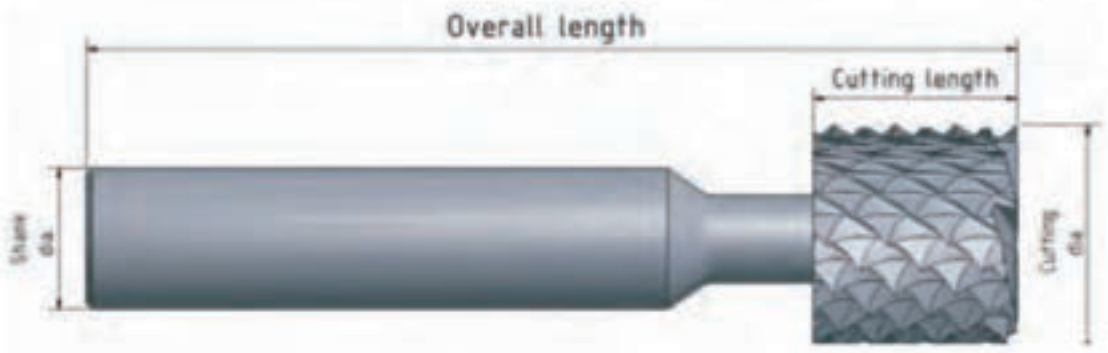
Decoring Cut

Decoring Cut		Cutting dia.		LOC	OAL	Shank dia.		Neck dia.	Panel width	Mat.	Item #
Decoring Cut, AWAC3-coated	mm	11,113	±0,2	5,08	68,5	12,7	h6	3,556	6,35	SC	7335-011-005-23-01
	inch	7/16	±0.005	0.2	2.7	1/2	-0.0005	0.14	1/4		
Decoring Cut, AWAC3-coated	mm	11,113	±0,2	11,43	74,5	12,7	h6	3,556	12,7	SC	7335-011-011-23-01
	inch	7/16	±0.005	0.45	2.93	1/2	-0.0005	0.14	1/2		
Decoring Cut, AWAC3-coated	mm	11,51	±0,2	5,08	68,5	12,7	h6	3,556	6,35	SC	7335-011-005-23-02
	inch	0.453	±0.005	0.2	2.7	1/2	-0.0005	0.14	1/4		
Decoring Cut, AWAC3-coated	mm	11,51	±0,2	11,43	74,5	12,7	h6	3,556	12,7	SC	7335-011-011-23-02
	inch	0.453	±0.005	0.45	2.93	1/2	-0.0005	0.14	1/2		
Decoring Cut, AWAC3-coated	mm	12,7	±0,2	5,08	68,5	12,7	h6	3,556	6,35	SC	7335-012-005-23-01
	inch	1/2	±0.005	0.2	2.7	1/2	-0.0005	0.14	1/4		
Decoring Cut, AWAC3-coated	mm	12,7	±0,2	11,43	74,5	12,7	h6	3,556	12,7	SC	7335-012-011-23-01
	inch	1/2	±0.005	0.45	2.93	1/2	-0.0005	0.14	1/2		
Decoring Cut, AWAC3-coated	mm	14,224	±0,2	5,08	68,5	12,7	h6	4,572	6,35	SC	7335-014-005-23-01
	inch	0.56	±0.005	0.2	2.7	1/2	-0.0005	0.18	1/4		
Decoring Cut, AWAC3-coated	mm	14,224	±0,2	11,43	74,5	12,7	h6	4,572	12,7	SC	7335-014-011-23-01
	inch	0.56	±0.005	0.45	2.93	1/2	-0.0005	0.18	1/2		
Decoring Cut, AWAC3-coated	mm	14,99	±0,2	5,08	68,5	12,7	h6	4,572	6,35	SC	7335-014-005-23-02
	inch	0.59	±0.005	0.2	2.7	1/2	-0.0005	0.18	1/4		
Decoring Cut, AWAC3-coated	mm	14,99	±0,2	11,43	74,5	12,7	h6	4,572	12,7	SC	7335-014-011-23-02
	inch	0.59	±0.005	0.45	2.93	1/2	-0.0005	0.18	1/2		

SC=Solid Carbide

Decoring Cut		Cutting dia.		LOC	OAL	Shank dia.		Neck dia.	Panel width	Mat.	Item #
Decoring Cut, AWAC3-coated	mm	20.638	±0,2	5.08	68.5	12.7	h6	7.938	6.35	PM	7330-020-005-23-01
	inch	13/16	±0.005	0.2	2.7	1/2	-0.0005	5/16	1/4		
Decoring Cut, AWAC3-coated	mm	20.638	±0,2	11.43	74.5	12.7	h6	7.938	12.7	PM	7330-020-011-23-01
	inch	13/16	±0.005	0.45	2.93	1/2	-0.0005	5/16	1/2		
Decoring Cut, AWAC3-coated	mm	20.638	±0,2	17.78	81	12.7	h6	7.938	19.05	PM	7330-020-017-23-01
	inch	13/16	±0.005	0.7	3.19	1/2	-0.0005	5/16	3/4		

PM=HSSCo Powdered Metal



8 FIBER CUT

Solid Carbide routers for the machining of uni- and multi-directional layers as well as woven fabrics made out of CFRP (carbon-fiber-reinforced plastic) or GFRP (glass-fiber-reinforced plastic).

FIBER CUT

Tool for CFRP/GFRP Applications

Introduction

The FIBER CUT is specially designed for the machining of uni- and multi-directional layers as well as woven fabrics made out of CFRP (carbon-fiber-reinforced plastic) or GFRP (glass-fiber-reinforced plastic).

It is the perfect solution for various milling operations in highly abrasive carbon- and glass fiber materials. The FIBER CUT is available with and without center cutting end teeth. End cutting must be selected when plunging operations are required. The sophisticated tool geometry enables a clean cut and avoids fraying issues and delamination. The best surface finish usually gets accomplished by machining in a conventional milling direction. Due to the aggressive cutting edge geometry the FIBER CUT is able to work under very high feed rates.

The FIBER CUT tools are made out of high-quality Solid Carbide (SC) and are available in many different dimensions as well as with or without end teeth. Special dimensions available per customers request.

Components and Applications

Fiber Cut with center cutting end teeth

Fiber Cut without center cutting end teeth

The aggressive geometry of the FIBER CUT generates a minimal amount of cutting forces. Thereby the condition of the special ground surface reduces adhesion and leads to an increased tool life. The combination of all of these features in the FIBER CUT tool enables high feed rates and significant boost in productivity.

Fiber Cut

Fiber Cut		Cutting dia.		LOC	OAL	Shank dia.		Mat.	Item #
Fiber Cut with end teeth	mm	6,35	-0,1	15,875	76,2	6,35	h6	SC	7375-006-015-00-01
	inch	1/4	-0,004	5/8	3	1/4	-0,0005		
Fiber Cut with end teeth	mm	6,35	-0,1	31,75	76,2	6,35	h6	SC	7375-006-031-00-01
	inch	1/4	-0,004	1-1/4	3	1/4	-0,0005		
Fiber Cut with end teeth	mm	6	-0,1	20	58	6	h6	SC	7375-006-020-00-01
	inch	0,236	-0,004	0,787	2,283	0,236	-0,0005		
Fiber Cut with end teeth	mm	9,525	-0,1	31,75	76,2	9,525	h6	SC	7375-009-031-00-01
	inch	3/8	-0,004	1-1/4	3	3/8	-0,0005		
Fiber Cut with end teeth	mm	10	-0,1	30	72	10	h6	SC	7375-010-030-00-01
	inch	0,394	-0,004	1,181	2,874	0,394	-0,0005		
Fiber Cut with end teeth	mm	12	-0,1	30	84	12	h6	SC	7375-012-030-00-01
	inch	0,472	-0,004	1,181	3,307	0,472	-0,0005		
Fiber Cut with end teeth	mm	12,7	-0,1	31,75	76,2	12,7	h6	SC	7375-012-031-00-01
	inch	1/2	-0,004	1-1/4	3	1/2	-0,0005		

SC=Solid Carbide

Fiber Cut		Cutting dia.		LOC	OAL	Shank dia.		Mat.	Item #
Fiber Cut without end teeth	mm	6,35	-0,1	15,875	76,2	6,35	h6	SC	7375-006-015-00-02
	inch	1/4	-0,004	5/8	3	1/4	-0,0005		
Fiber Cut without end teeth	mm	6,35	-0,1	31,75	76,2	6,35	h6	SC	7375-006-031-00-02
	inch	1/4	-0,004	1-1/4	3	1/4	-0,0005		
Fiber Cut without end teeth	mm	6	-0,1	20	58	6	h6	SC	7375-006-020-00-02
	inch	0,236	-0,004	0,787	2,283	0,236	-0,0005		

SC=Solid Carbide

9 SPECIALS

Besides the standard tools for honeycomb applications introduced in the previous chapters there is a wide range of special tools engineered for specific applications. Those tools are available on demand and get produced according to your particular needs.

SPECIALS

Tools for Honeycomb Applications

General Information

Besides the standard tools for honeycomb applications introduced in the previous chapters, which are available from stock, there is a wide range of special tools engineered for specific applications. Those tools are available on demand and get produced according to your particular needs.

Let us know about your machining needs, we look forward to designing the appropriate tools for your application and material.

Examples

9.1 Hollow drills to machine honeycomb structures

An example for a composite tooling special is a hollow drill. These tools are used to drill or punch through honeycomb structures. The advantages in comparison to a cutting tool are the clean cut of the cell wall and the avoidance of dust. Hollow drills can be used to create perfect holes and pockets in honeycomb. They are also suitable for contour operations when you need a perfect finish without any flagging.

This tool is also produced in a modified version with teeth to remove resin overlaps in carbon elements.

Do not hesitate contacting us to talk about your concrete application and our solution with a special hollow drill engineered to your needs and requirements.

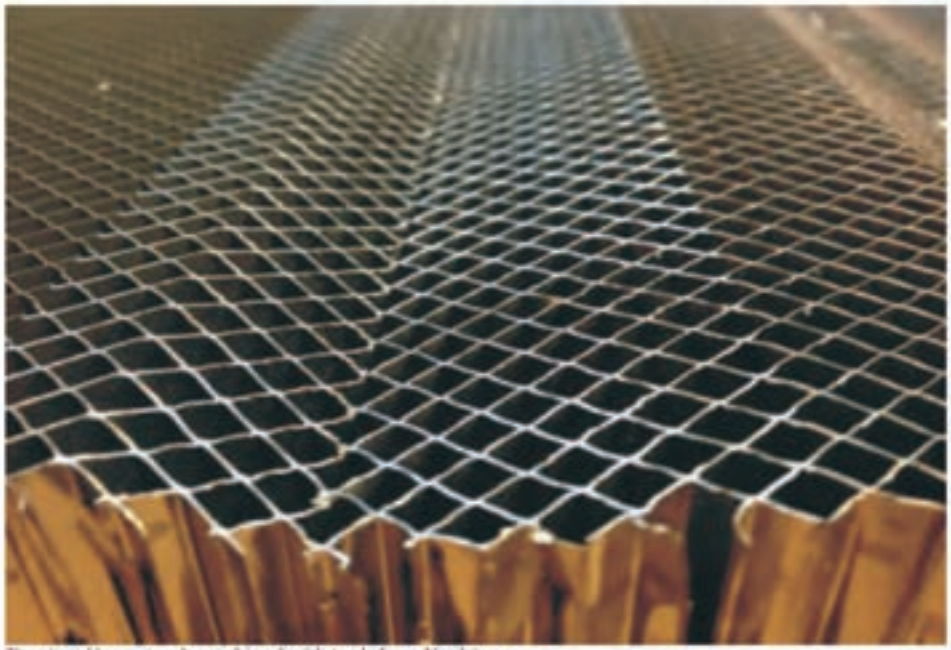
9.2 Tools for the machining of titanium and stainless steel honeycomb core structures

The CORECUT tooling system in chapter 1 is ideal for machining Nomex, Kevlar and Aluminum honeycomb. With the addition of a new shredder and knife combination, this system can also be used to machine titanium and stainless steel honeycomb core structures.

The welded titanium honeycomb and the stainless steel honeycomb are extremely strong and machining with the usual tools is not possible. Especially for the titanium honeycomb, the reduction of friction to avoid heat is an essential subject. If extreme heat is produced, the material may burn.

We have developed the first engineered special tooling combination for this purpose enabling the machining on 5-axis machines. The tool geometry as well as the parameters are completely different from the usual standards in the machining of composites.

Please contact for further details.



Titanium Honeycomb machined with tools from Neuhäuser

ADD engineering