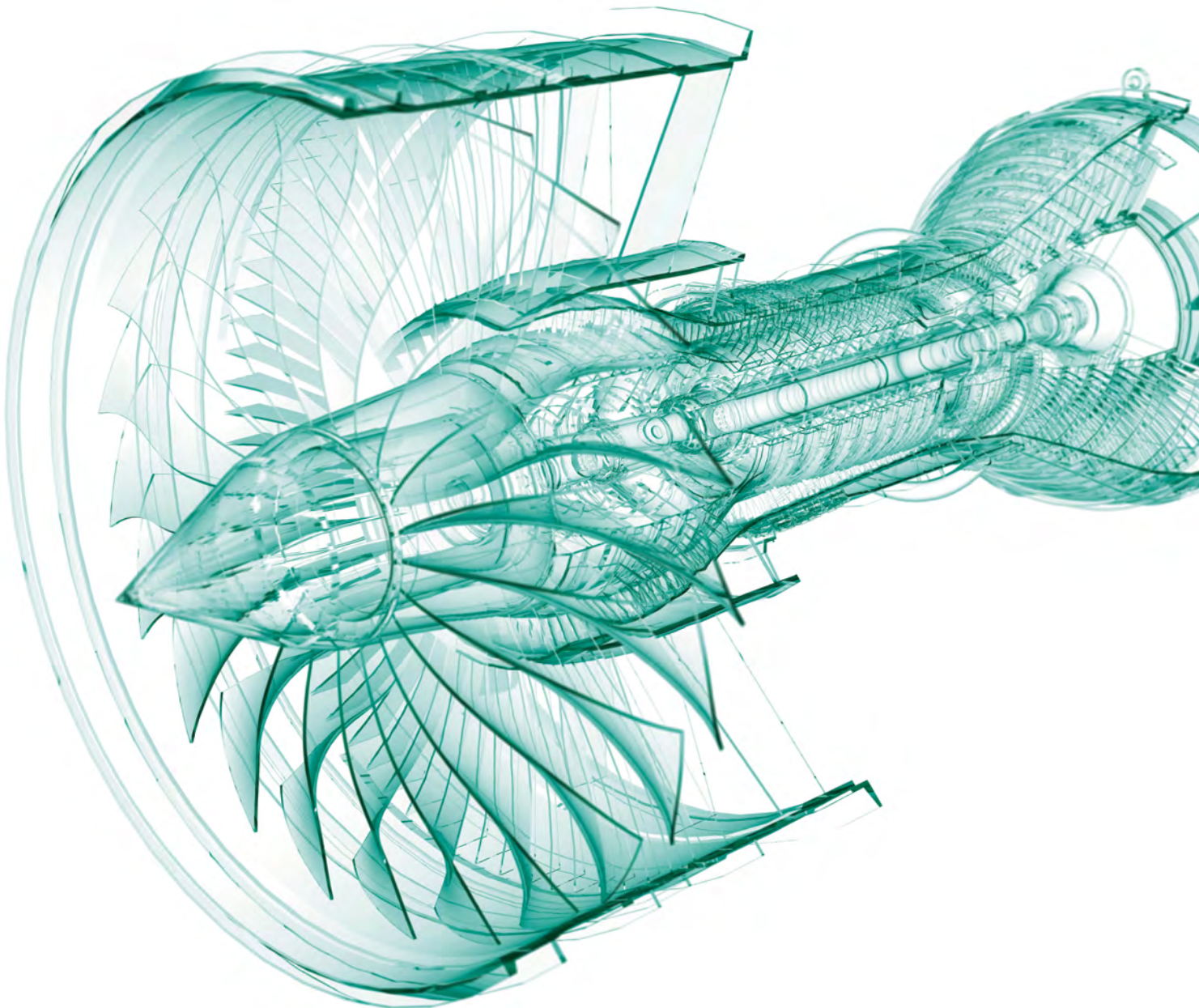




**Threading tools for materials
that are difficult to machine**



Hard materials need a strong tool

The requirements for components that are used in various industries have increased over the past few years: their design is getting more compact and the component is getting lighter. The materials that are used need to have a high strength, corrosion resistance and wear resistance.

The guiding principle behind this development originates from society and politics and is equally valid for the industry: protecting the environment and thus reducing the energy consumption.

The consequences can be seen in every aspect of our everyday production: Not only the production

process, but also the machining of the materials often presents a challenge.

Threading therefore needs to deal with:

- high cutting forces,
- extremely high heat generation on the tool's cutting edge,
- difficult chip formation and removal

and, as a result, with:

- low cutting parameters and,
- longer machining time.

Through using special geometries, we are able to counteract high cutting forces and adhesive wear. In the production of our

tools we use base substrates which distinguish themselves by a high resistance to wear and torsion. Thanks to the optimized tool surface combined with the specifically adapted coating we are able to reduce the friction and therefore the heat generation on the tool's cutting edge.

Threading is usually the last step in the production process and the components that need to be machined are therefore valuable. Our products are known for a high reproducibility and a constantly high tool life: BASS brings together quality and efficiency – for your success.

VARIO SH TICN SR



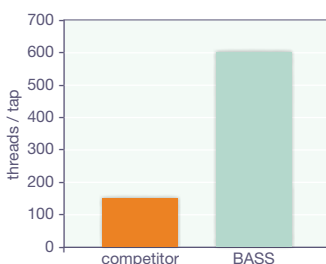
VARIANT TIH TICN



VARIANT NI TICN



AVANT TIH13 TICN



APPLICATION EXAMPLE: PUMP INDUSTRY

operating conditions	
material designation:	GX5CrNiMo13-11-2
material number:	1.4408
hole type:	blind hole
thread depth:	30 mm
dimension:	M16 ISO2/6H
machine:	machining center
cooling lubricant:	emulsion 5%
cutting speed v_c :	10 m/min

300% increase in tool life with the catalog tool DOMINANT MHST45 HL. The HL-coating ensures a good chip removal so that no chips adhere to the tool. This is why the machine can be operated without any troubles and the machine does not need to be stopped to remove the chips.

Tough performers

Materials that are difficult to machine comprise a wide spectrum: ranging from nickel alloys and titanium alloys to acid and corrosion resistant or high-strength steels. Special alloys are additionally part of this spectrum.

The properties that the produced components are supposed to have, for example a high strength, make the machining more difficult. Nickel alloys like Hastelloy®, Inconel®, Monel® or Nimonic® are not only temperature resistant and strong but also tough in challenging environments. One disadvantage, however, can be seen in the machining process: nickel

alloys are also known for their strong thermal and mechanical stress on tools.

The lighter weight titanium alloys have similar properties. The TiAl6V4 is a prominent example. The low heat conductivity which makes the machining difficult is typical for this group of materials.

The designation corrosion and acid resistant steels speaks for its properties. On the other hand, however, materials like Duplex, Super Duplex or 1.4848 also tend to have a worse machinability due to their hardness and the preceding heat treatment.

Whenever there is talk about high-strength steels, the designation Hardox® is mentioned. With its high degree of wear resistance, an extreme toughness and high hardness it represents this group of materials. It is obvious that these properties adversely affect the machining. Long chips make the machining of threads even more difficult.

Special alloys such as Ampco® are always optimized for a special application whereas the machining is dependent on the respectively used alloy component.

AVANT NI13 TICN



DOMINANT MHST45 HK HL



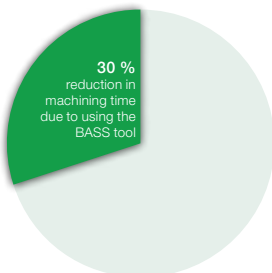
DOMINANT MHST45 KA HK HL



GFS N / GFS TIH



APPLICATION EXAMPLE: AEROSPACE INDUSTRY



operating conditions	
material designation:	Inconel® 718
material number:	2.4668
hardness:	38–45 HRC
hole type:	through hole
dimension:	UNJC3/8"-16 3BX
machine:	machining center
cooling lubricant:	emulsion 6 %
cutting speed v_c :	21 m/min

The use of a BASS milling cutter reduced the processing time per thread by 30%. In addition, the process reliability was improved. The tool has a lower wear and causes less vibrations compared to the previously used competitor's tool.

Threads are everywhere

In the aerospace industry threads do not only connect components, but virtually entire continents and people worldwide. They perform reliably, especially in engine and chassis components.

But also many miles below the sea level, in the offshore industry, threads are required to withstand a lot. Being part of the drilling head, they carve their way deep into the seabed and withstand wind and weather far out at sea.

Whereas threads are challenged from outside in the offshore industry, it is the inside robustness of the threads that is put to the test in the far-reaching fluid technology.

Fluids like acids permanently pose a challenge to pumps, pipelines, valves and fittings.

In order to be able to stand up to this challenge, the used materials are strong and demand the same in return from the threading tool.

In heat exchangers in the oil and gas industry, threads get in touch with both hot and cold fluids. Also gas turbines and pressure vessels as parts of power stations require a special material that can deal with pressure and heat.

Both forms of stress can also be found in the automotive industry in turbo chargers and exhaust elbows. This is why these are the properties that substantially influence the machining of threads.

In the pharmaceutical and chemical industry, it is the absolute resistance of the materials that

makes the production of threads more difficult. However, the merging of the materials is required to make high quality centrifuges or powerful milling plants out of the individual components.

Meanwhile, thanks to modern medical technology, threads have found their way into the human body. They can be found in implants, bone splints and prostheses.

In the special machine manufacturing, the processing is as individual as the components. From complex agitators to recycling plants, threads establish the shortest detachable connection between the customer's request and your high-performance product.

BFW



GFK



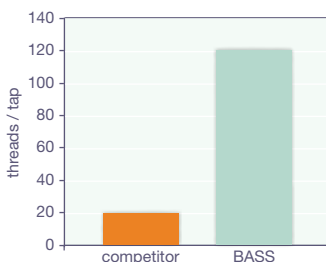
AFK



HST SYNCHRO



APPLICATION EXAMPLE: SPECIAL MACHINE MANUFACTURING



operating conditions	
material designation:	56NiCrMoV7
material number:	1.2714 tempered (R _m : 1,350 N/mm ²)
hole type:	blind hole
thread depth:	30 mm
dimension:	M16 6HX
machine:	machining center
cooling lubricant:	emulsion 8 %
cutting speed v _c :	5 m/min

Through its stable geometry, the AVANT TIH13 is very wear-resistant and the ideal choice for tempered steels. In comparison to the competitor's tool BASS was able to increase the tool life by 500%.

Our catalog tools for materials that are difficult to machine

Through hole

VARIANT TIH TICN				VARIANT NI TICN			
thread type	nominal Ø		tolerance	thread type	nominal Ø		tolerance
	from	to			from	to	
M	2 mm	16 mm	6HX				
MF	10 mm	20 mm	6HX				
MJ	3 mm	12 mm	4HX	MJ	3 mm	12 mm	4HX
UNJC	No4	1/2"	3BX	UNJC	No4	1/2"	3BX
UNJF	No4	1/2"	3BX	UNJF	No4	1/2"	3BX

Blind hole

AVANT TIH13 TICN				AVANT NI13 TICN			
thread type	nominal Ø		tolerance	thread type	nominal Ø		tolerance
	from	to			from	to	
M	3 mm	16 mm	6HX				
MF	10 mm	20 mm	6HX				
MJ	3 mm	12 mm	4HX	MJ	3 mm	12 mm	4HX
UNJC	No4	1/2"	3BX	UNJC	No4	1/2"	3BX
UNJF	No4	1/2"	3BX	UNJF	No4	1/2"	3BX

DOMINANT MHST45 HK HL				DOMINANT MHST45 KA HK HL			
thread type	nominal Ø		tolerance	thread type	nominal Ø		tolerance
	from	to			from	to	
M	3 mm	16 mm	6HX	M	5 mm	10 mm	6HX

Our DOMINANT is also available in chamfer forms C / 2-3 and E / 1.5-2.

Through and blind hole

VARIO SH TICN SR			
thread type	nominal Ø		tolerance
	from	to	
M	4	16	6HX



For further information - also with regard to thread milling and clamping technology - please see our latest catalog under www.bass-tools.com/en/service/downloads

Performance Connects

We are also your partner when it comes to individual solutions for materials that are difficult to machine. Innovative, flexible, fast.



S AVANT 1 TIH10 SKR TICN SL VHM

BASS

TECHNIK FÜR GEWINDE



www.bass-tools.com

BASS GmbH & Co. KG
Technik für Gewinde
Bass-Strasse 1
97996 Niederstetten
Deutschland · Germany

Tel.: +49 7932 892-0
Fax: +49 7932 892-87
E-Mail: info@bass-tools.com