

Online Information

www.heule.com/en/spotfacing-tool/bsf



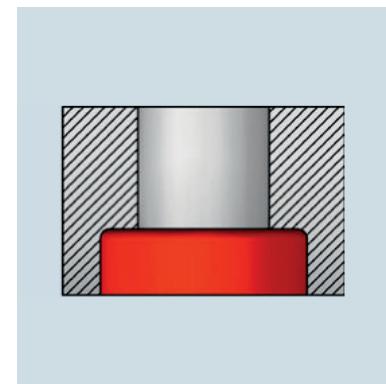
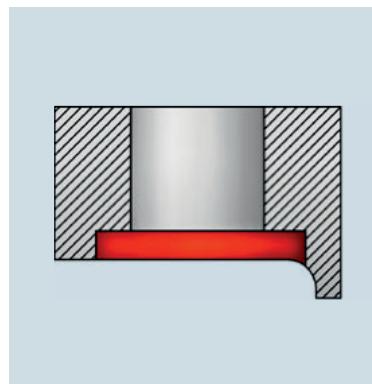
BSF

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BSF

Competitive back spotfacing and counterboring tool
for counterbores up to 2.3 x bore diameter.



BSF – The Competitive Back Counterbore Tool



Back Spotfacing up to 2.3 x Bore Diameter

The surprisingly simple BSF tool concept allows back spotfacing or back counterboring in **ONE OPERATION** without turning the workpiece. The robust tool is distinguished by its simplicity and high process capability.

The blade swings out into the working position by the rotation of the spindle. The retraction of the blade is controlled by activating the internal coolant of the machine. Alternatively, there is also the option of activating using compressed air.

Characteristics and Advantages



- The BSF tool is designed for automatic operation and is immediately ready for service. It works without an anti-rotation device, nor change of turning direction or any machine adaptions.



- The simple swing mechanism combined with the internal coolant pressure system (min. 20 bar, max 50 bar) is granting that neither chips nor dirt remain sticking. Activation by air or microlubrication is available depending on the project. Activation with compressed air (min. 6 bar) is optionally available.



- The tool change is very simple. Also the other tool components are replaced quickly.

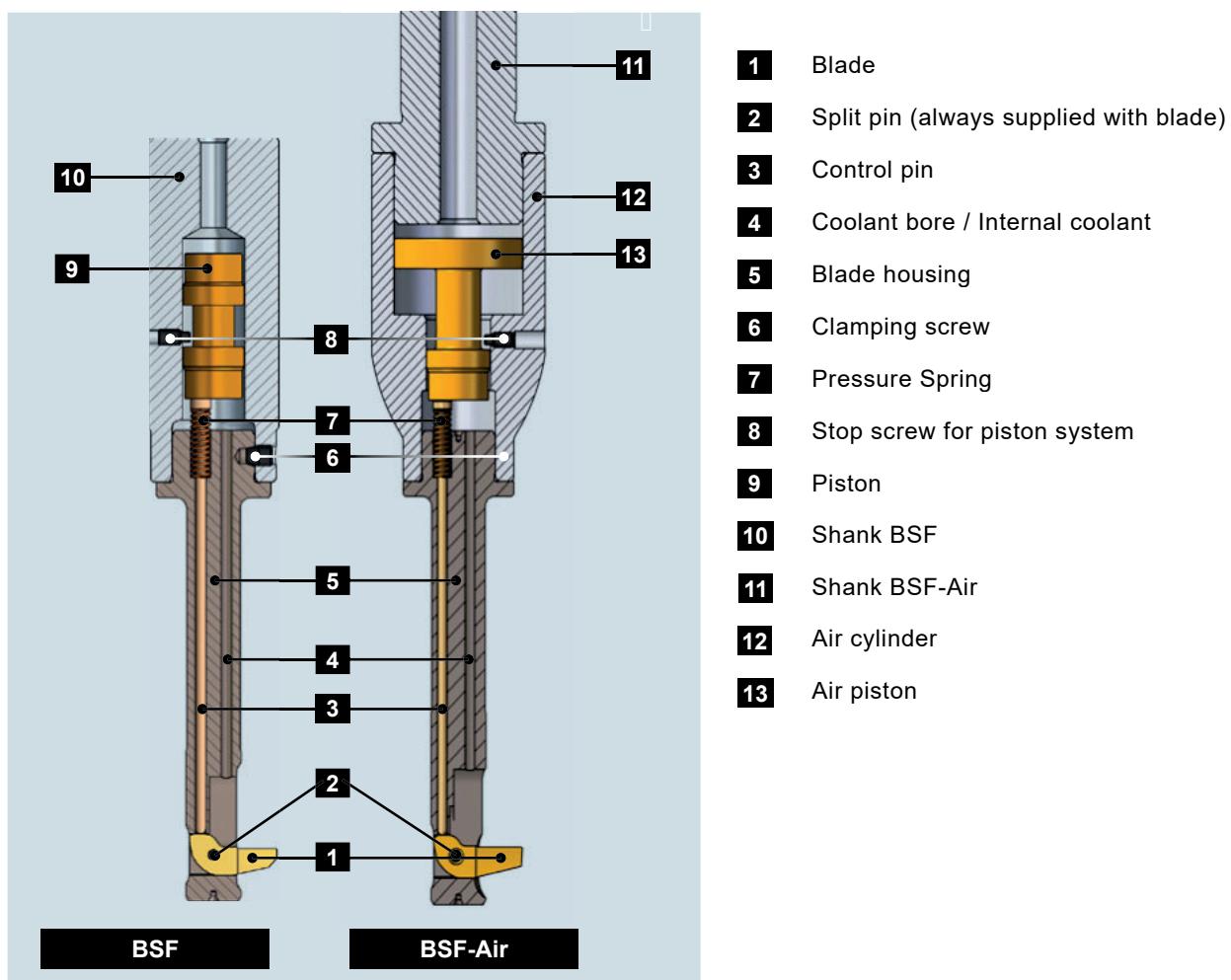
- The tool works vertically and horizontally.

- Standard range with steps of 0.5 mm from bore diameter Ø6.5 mm to Ø21.0 mm.

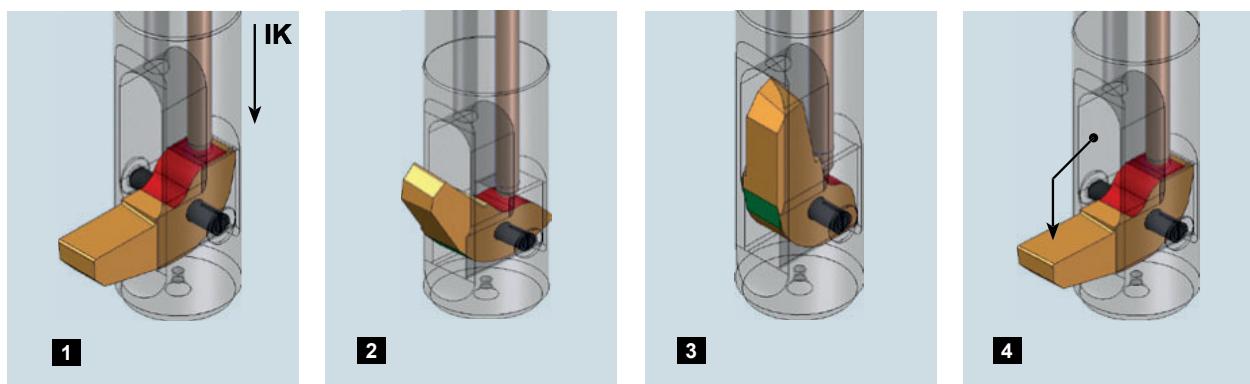
- Blades are elaborated in carbide for all dimensions, with different coatings.

- Chips and dirt are flushed out of the blade windows thanks to a specifically developed tool geometry. Thus, a high process reliability is granted.

Tool Description



Blade Working Principle

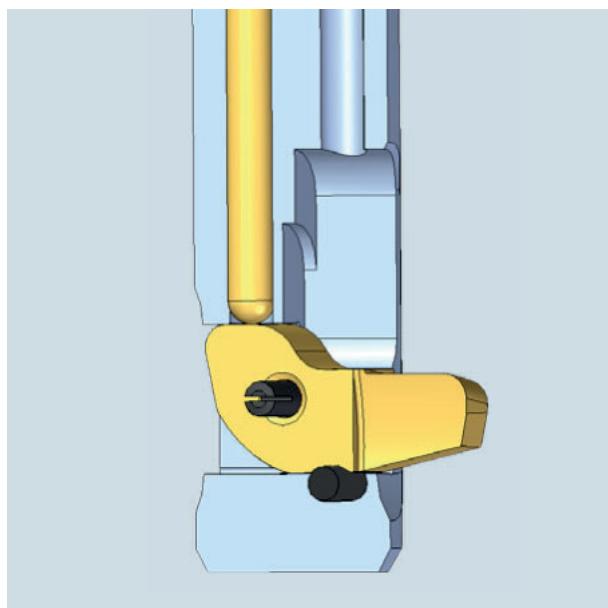


1 The internal coolant or the air supply builds up pressure on the piston (see tool description position 9). The blade is rotated into the blade housing by the control pin which presses on the red surface.

2 During the blade movement, the pressure surface of the blade pivots away and the control pin – still under coolant pressure / air pressure – presses against the blade curve and forces the blade to fully retract.

3 The control pin holds the blade in the retracted position and the tool may be moved in the axial direction (z-axis).

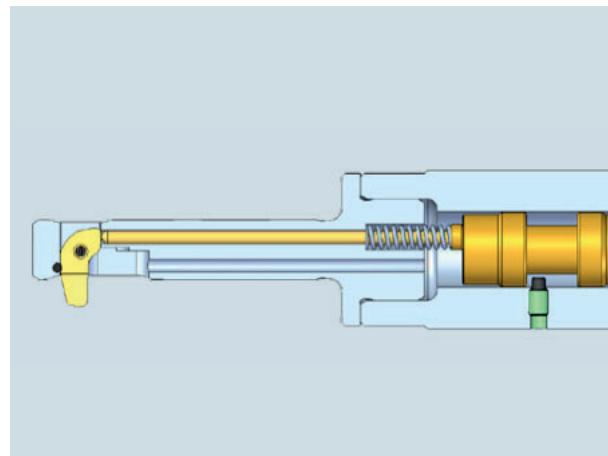
4 When switching off the coolant pressure / air pressure and starting the spindle rotation applying the recommended activation speed, the blade swings out into the working position.



BSF-P tolerance range +/-0.1 mm

The standard version of the BSF tool has established itself in the market as an economical all-round back counterboring tool. The BSF-P range addition enables new applications. The BSF-P offers an increased counterboring accuracy with a tolerance band of 0.2 mm (+/-0.1 mm).

The application possibilities are identical to those of the standard tools. The visual identification marks of the BSF-P system addition are the interlocking bolt in the blade housing as well as the additional groove on the blade itself.



Function of the BSF-P

- The BSF-P version ensures play-free, radial interlocking of the blade during the machining process.
- The blade on the BSF-P version is eroded. With this new version, additional customer-specific requirements can be assessed during a technical feasibility study.

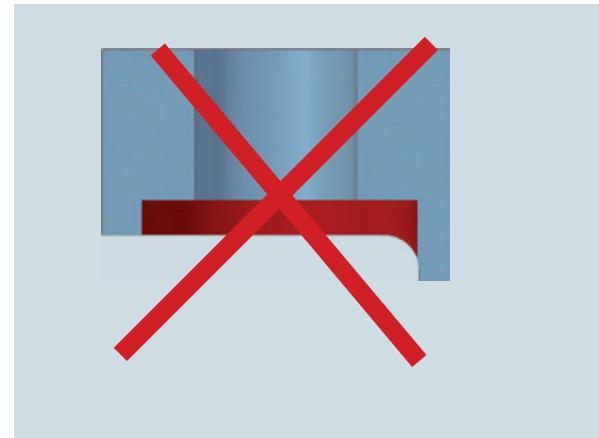
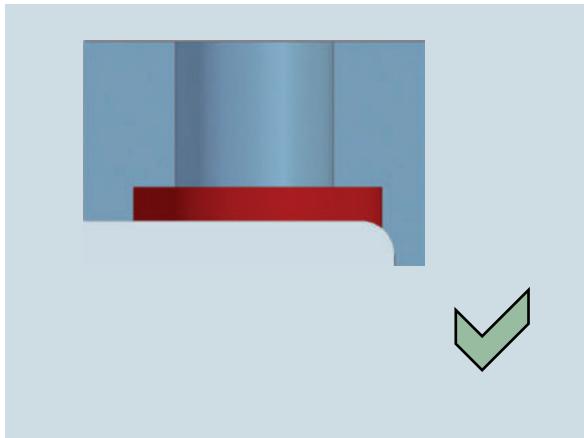


Compatibility BSF-P to BSF standard version

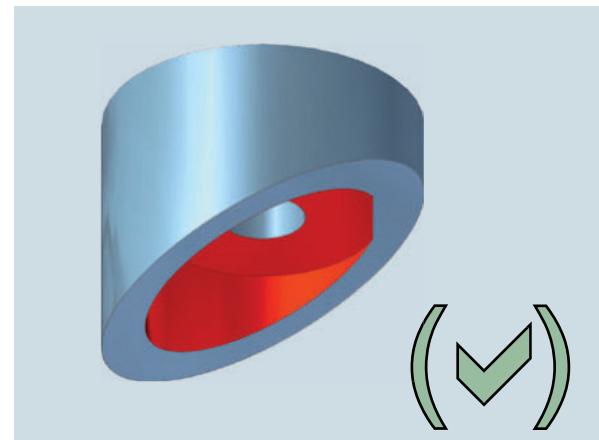
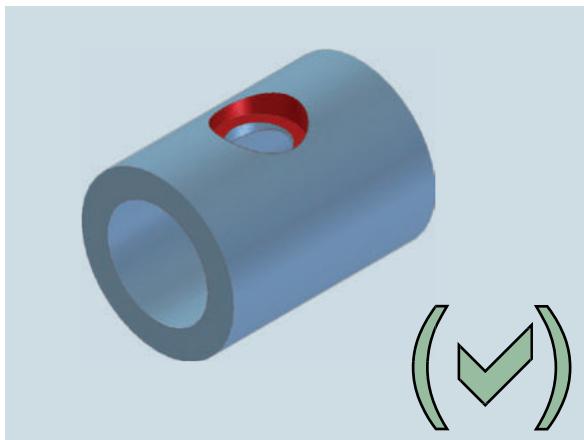
- The BSF-P is technically compatible with the BSF standard tool range.
- Blade housing and blades of the BSF-P version can also be assembled on the shank of the standard BSF tools.
- The BSF-P version is not classified as a standard product. Please send enquiries for BSF-P to HEULE together with application data and drawings of the workpiece.

Maximum Slope

Partly interrupted cut (sloping surface) of up to 20° is permitted. Machining an interrupted cut must be carried out without internal cooling (IC) / air pressure.



Machining possible under certain conditions. Technical advice is needed on machining capabilities.



Machining a fully interrupted cut (i.e. groove/slot) can lead to blade and even tool breakage.



BSF Range Summary

The standardized tool portfolio consists of tools with blades starting from bore diameter Ø6.5 mm up to bore diameter Ø21.0 mm. The attainable back spot facings in this range are 2.3 times the bore diameter as maximum. The right combination of tool and blade is relevant for the function. Therefore, always select blades out of the same series as the tool.

Should the standardized product range not meet your requirements, please do contact HEULE Werkzeug AG. We will gladly accept technical challenges.



Bore Ø	Back Spot Face Ø	Series
6.5 mm to 7.0 mm	9.5 mm to 16.5 mm	Series A
7.5 mm to 8.5 mm	11.0 mm to 20.0 mm	Series B
9.0 mm to 10.0 mm	13.5 mm to 23.0 mm	Series C
10.5 mm to 11.5 mm	15.5 mm to 26.5 mm	Series D
12.0 mm to 14.0 mm	18.0 mm to 32.5 mm	Series E
14.5 mm to 17.0 mm	21.5 mm to 39.5 mm	Series F
17.5 mm to 21.0 mm	26.0 mm to 49.0 mm	Series G

Part No.:
Tool without blade

Offset
Working length NL
Bore-Ø d
Series
Activation

BSFA - D - 1050 / 050 - 12.0

Part No.:
Blade

Offset
Material / Coating
Series
M for Blade

BSF - M - D - 1A - 12.0

Activation

The BSF tools operate with coolant activation (IC) as standard. If the machine only has air cooling, the version "A" for air must be selected (see explanation p. 170).

Series

The BSF standard tool system is divided into 7 series (A-G). The series allows a simple tool and blade selection to avoid mistakes when determining blades.

Bore diameter d

The bore diameter is the key parameter for the standardized BSF program. The series corresponds with the bore ranges.

Counterbore diameter D

The counterbore diameter is calculated by adding the offset value of the tool to the offset value of the blade.

Shank system

BSF-tools are executed by default with a cylindrical shank. If requested, they can also be produced with a Weldon shank or a Whistle Notch shank. In this case, please add the suffix "-HB" to the tool part number for a Weldon shank, respectively "-HE" for a Whistle Notch shank.

without suffix = Cylindrical shank (Standard)

HB = Weldon

HE = Whistle Notch

Specific example with Weldon shank:

BSF-D-1050/050-12.0 - HB

Explanation how to choose your tool and blade

Please choose your tool with the tables from page 171 on. Look up your bore-Ø first before you decide which counterbore-Ø you need. After these steps you will be able to take your tool and blade number out of the table.

All BSF tools will be supplied without blades. The blade must be determined and ordered separately.

Blade selection / Designation

The part number of the required blade can be taken from the tool table or it can be determined by using the BSF Tool Selector on www.heule.com.

Series

The series steps of the blades are identical with the tool series. For example : an "E" series blade must be chosen for an "E" series tool.

Offset value

The counterbore-Ø can be calculated by adding offset value of the tool to the offset value of the blade, for example $12.0 + 12.0 = \text{counterbore-Ø } 24.0$ (see above / please refer also to the example on page 201).

Material / Coating

Blade material and coating depend on the application. The standardized blades will be selected accordingly.

Material:

1 = Carbide blade

Coating:

All blades are made of carbide.

The two available coatings are:

A = general (i.e. steel, titanium)

D = Aluminium

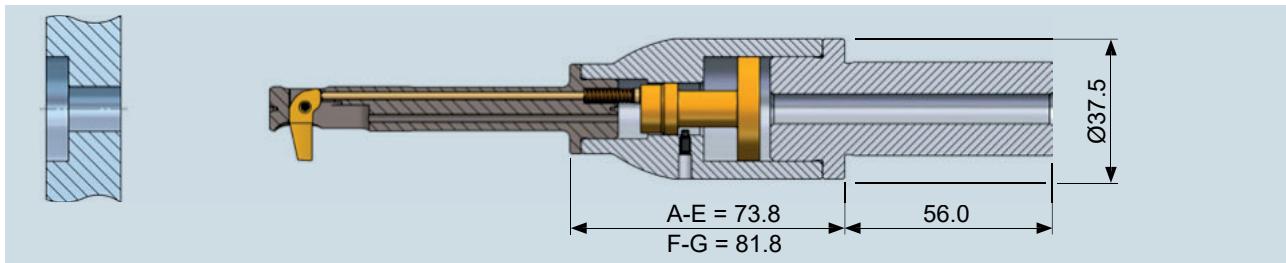


Bild: BSF-Air - Option for use on machines without internal coolant

Due to the alternative technical design of the shaft section, the BSF offers the option of activating the blade with compressed air. This can be implemented with all standard tools. The application possibilities are therefore identical to those of the standard tools.

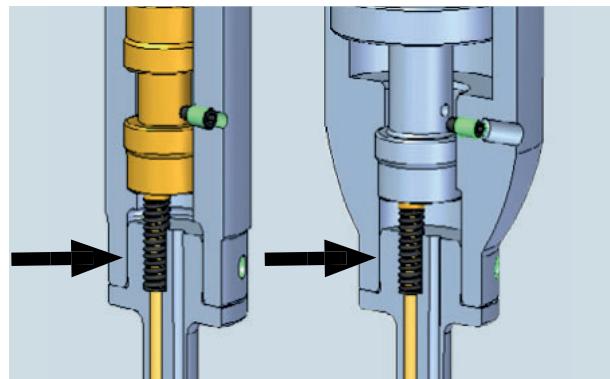
The activation forces are reliable from 6 bar, which is comparable to 20 bar internal coolant. The reaction time for the blade activation is usually 1 - 2 seconds, depending on the speed of the pressure build-up in the pneumatic system.

Field of application

- This shaft version is used when the application-specific requirement of activation with compressed air at 6 bar is mandatory.
- High process reliability and repeatability are ensured by using this tool option.
- Existing tools can be converted to air activation if required.

Compatibility with standard BSF

- The shaft of the standard range is fully compatible with the air-activated version.
- The adaptation to the blade housing is identical to the standard range.
- **IMPORTANT:** The BSF with air activation cannot be activated with coolant. Due to the specific shaft design, this will immediately lead to a malfunction.



Conversion kit standard BSF to BSF-Air

Blade housing series A-E for shaft Ø20 mm	
Shaft type	Article-No.
Cylindrical	BSF-O-0001
Weldon	BSF-O-0001 HB
Whistle Notch	BSF-O-0001 HE

Blade housing series F-G for shaft Ø20 mm	
Shaft type	Article-No.
Cylindrical	BSF-O-0004
Weldon	BSF-O-0004 HB
Whistle Notch	BSF-O-0004 HE

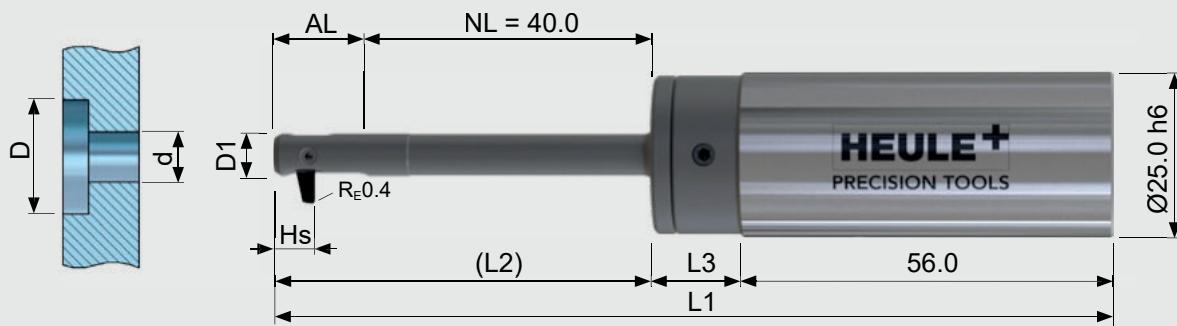
Blade housing series A-E for shaft Ø25 mm	
Shaft type	Article-No.
Cylindrical	BSF-O-0002
Weldon	BSF-O-0002 HB
Whistle Notch	BSF-O-0002 HE

Blade housing series F-G for shaft Ø25 mm	
Shaft type	Article-No.
Cylindrical	BSF-O-0005
Weldon	BSF-O-0005 HB
Whistle Notch	BSF-O-0005 HE

Blade housing series A-E for shaft Ø32 mm	
Shaft type	Article-No.
Cylindrical	BSF-O-0003
Weldon	BSF-O-0003 HB
Whistle Notch	BSF-O-0003 HE

Blade housing series F-G for shaft Ø32 mm	
Shaft type	Article-No.
Cylindrical	BSF-O-0006
Weldon	BSF-O-0006 HB
Whistle Notch	BSF-O-0006 HE

BSF Tool for Bore-Ø 6.5 to 7.0 mm



Tool Table

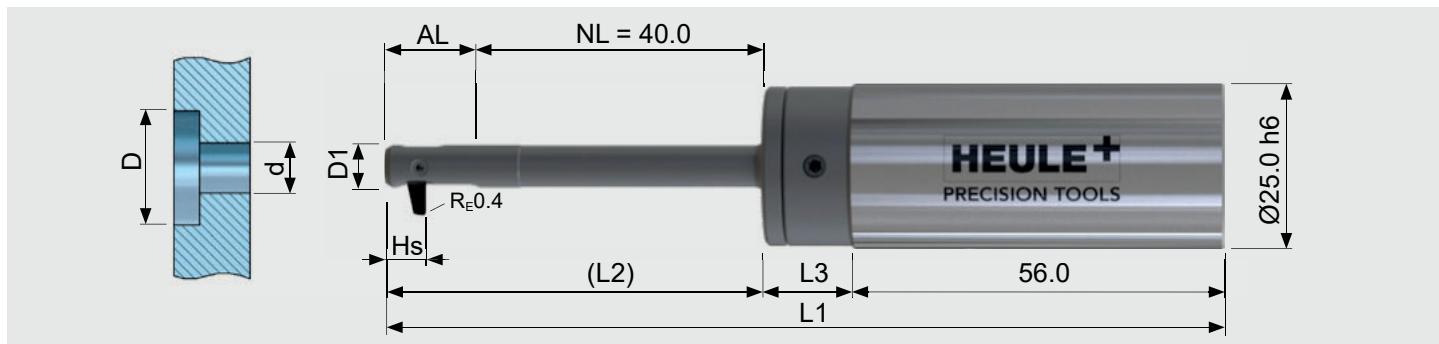
Bore-Ø d	Tool.-Ø d1	Counter- bore-Ø D	AL	HS	L1	L2	L3	Tool without Blade	Blade ¹
								Part No.	Part No.
6.50	6.40	9.50	14.25	6.15	127.75	58.25	13.50	BSF-A-0650/040-6.5	BSF-M-A-1A-3.0
		10.00						BSF-A-0650/040-7.0	
		10.50						BSF-A-0650/040-7.5	
		11.00						BSF-A-0650/040-6.5	BSF-M-A-1A-4.5
		11.50						BSF-A-0650/040-7.0	
		12.00						BSF-A-0650/040-7.5	
		12.50						BSF-A-0650/040-6.5	BSF-M-A-1A-6.0
		13.00						BSF-A-0650/040-7.0	
		13.50						BSF-A-0650/040-7.5	
		14.00						BSF-A-0650/040-6.5	BSF-M-A-1A-7.5
7.00	6.90	10.00	15.00	6.15	127.75	58.25	13.50	BSF-A-0700/040-7.0	BSF-M-A-1A-3.0
		10.50						BSF-A-0700/040-7.5	
		11.00						BSF-A-0700/040-8.0	
		11.50						BSF-A-0700/040-7.0	BSF-M-A-1A-4.5
		12.00						BSF-A-0700/040-7.5	
		12.50						BSF-A-0700/040-8.0	
		13.00						BSF-A-0700/040-7.0	BSF-M-A-1A-6.0
		13.50						BSF-A-0700/040-7.5	
		14.00						BSF-A-0700/040-8.0	
		14.50						BSF-A-0700/040-7.0	BSF-M-A-1A-7.5
15.00	15.50	15.00						BSF-A-0700/040-7.5	
		15.50						BSF-A-0700/040-8.0	
		16.00						BSF-A-0700/040-7.0	BSF-M-A-1A-9.0
		16.50						BSF-A-0700/040-7.5	

¹⁾A = Coating for steel alloys, titanium and Inconel / D = Coating for aluminium alloys (please see page 169)

ORDERING INFORMATION

- Standard shank for tool part number without any addition: Cylindrical shank.
With addition: "-HB" = Weldon shank, "-HE" = Whistle Notch shank (please see page 169)
- For tools with air activation (please see page 170) add "A" to the article number (e.g. BSFA-A-0650/040-6.5)
- Attention: The blades for the tool need to be ordered separately.

BSF Tool for Bore-Ø 7.5 to 8.0 mm



Tool Table

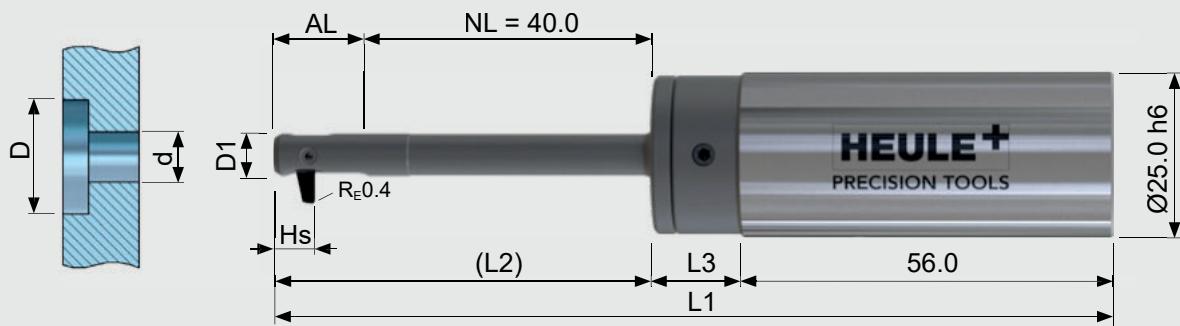
Bore-Ø d	Tool.-Ø d1	Counter- bore-Ø D	AL	HS	Tool without Blade			Blade ¹	
					L1	L2	L3	Part No.	Part No.
7.50	7.40	11.00	11.00	17.00	7.55	130.50	61.00	13.50	BSF-B-0750/040-7.5
		11.50							BSF-M-B-1A-3.5
		12.00							BSF-B-0750/040-8.0
		12.50							BSF-B-0750/040-8.5
		13.00							BSF-M-B-1A-5.0
		13.50							BSF-B-0750/040-8.0
		14.00							BSF-B-0750/040-8.5
		14.50							BSF-M-B-1A-6.5
		15.00							BSF-B-0750/040-8.0
		15.50							BSF-B-0750/040-8.5
8.00	7.90	12.00	12.00	11.50					BSF-M-B-1A-8.0
		12.50	12.50	11.50					BSF-B-0800/040-7.5
		13.00	13.00	12.00					BSF-M-B-1A-9.5
		13.50	13.50	12.00					BSF-B-0800/040-8.0
		14.00	14.00	12.00					BSF-B-0800/040-8.5
		14.50	14.50	12.00					BSF-M-B-1A-6.5
		15.00	15.00	12.00					BSF-B-0800/040-9.0
		15.50	15.50	12.00					BSF-B-0800/040-9.0
		16.00	16.00	13.00					BSF-M-B-1A-8.0
		16.50	16.50	13.00					BSF-B-0800/040-8.5
8.00	7.90	17.00	17.00	13.00					BSF-B-0800/040-9.0
		17.50	17.50	13.00					BSF-M-B-1A-9.5
		18.00	18.00	13.00					BSF-B-0800/040-8.0
		18.50	18.50	13.00					BSF-B-0800/040-8.5
									BSF-B-0800/040-9.0

¹⁾A = Coating for steel alloys, titanium and Inconel / D = Coating for aluminium alloys (please see page 169)

ORDERING INFORMATION

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- With addition: "-HB" = Weldon shank, "-HE" = Whistle Notch shank (please see page 169)
- For tools with air activation (please see page 170) add "A" to the article number (e.g. BSFA-B-0750/040-7.5)
- Attention: The blades for the tool need to be ordered separately.

BSF Tool for Bore-Ø 8.5 mm



Tool Table

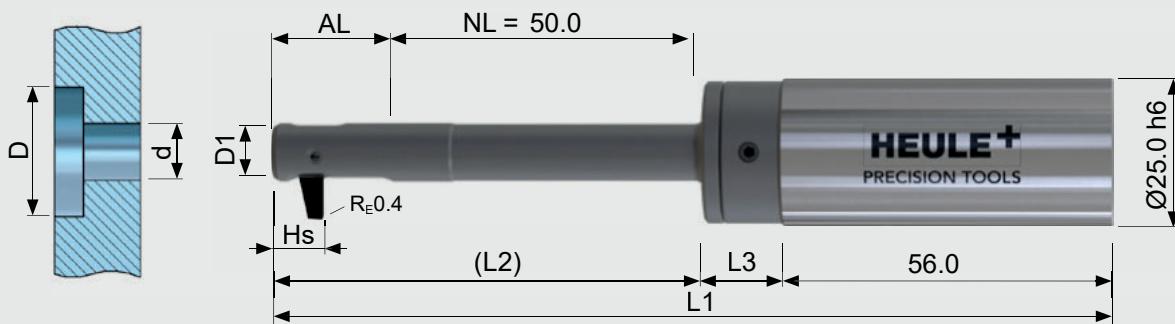
Bore-Ø d	Tool.-Ø d1	Counter- bore-Ø D	AL	HS	L1	L2	L3	Tool without Blade	Blade ¹
								Part No.	Part No.
8.50	8.40	12.00	17.75	7.55	131.25	61.75	13.50	BSF-B-0850/040-8.5	BSF-M-B-1A-3.5
		12.50						BSF-B-0850/040-9.0	
		13.00						BSF-B-0850/040-9.5	
		13.50						BSF-B-0850/040-8.5	BSF-M-B-1A-5.0
		14.00						BSF-B-0850/040-9.0	
		14.50						BSF-B-0850/040-9.5	
		15.00						BSF-B-0850/040-8.5	BSF-M-B-1A-6.5
		15.50						BSF-B-0850/040-9.0	
		16.00						BSF-B-0850/040-9.5	
		16.50						BSF-B-0850/040-8.5	BSF-M-B-1A-8.0
		17.00						BSF-B-0850/040-9.0	
		17.50						BSF-B-0850/040-9.5	
		18.00						BSF-B-0850/040-8.5	BSF-M-B-1A-9.5
		18.50						BSF-B-0850/040-9.0	
		19.00						BSF-B-0850/040-9.5	
		19.50						BSF-B-0850/040-8.5	BSF-M-B-1A-11.0
		20.00						BSF-B-0850/040-9.0	

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ORDERING INFORMATION

- Standard shank for tool part number without any addition: Cylindrical shank.
- With addition: "-HB" = Weldon shank, "-HE" = Whistle Notch shank (please see page 169)
- For tools with air activation (please see page 170) add "A" to the article number (e.g. BSFA-B-0750/040-7.5)
- Attention: The blades for the tool need to be ordered separately.

BSF Tool for Bore-Ø 9.0 to 9.5 mm



Tool Table

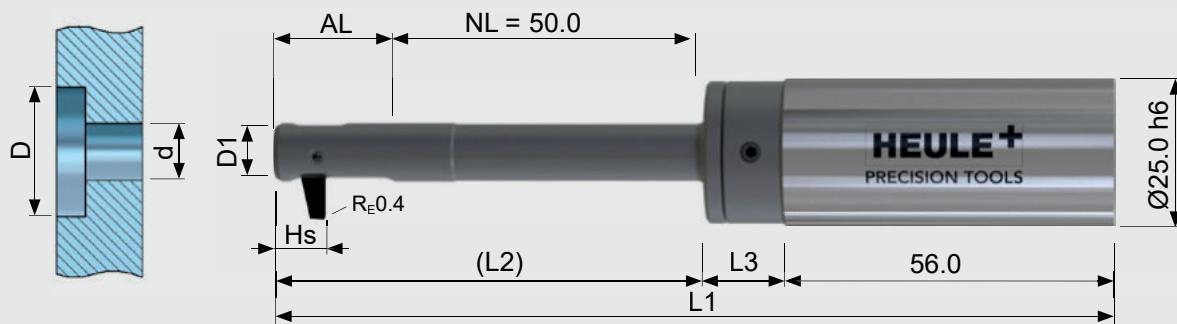
Bore-Ø d	Tool.-Ø D1	Counter- bore-Ø D	AL	HS	Tool without Blade			Blade ¹	Part No.
					L1	L2	L3		
9.00	8.90	13.50	13.50	20.25	8.55	143.75	74.25	13.50	BSF-C-0900/050-9.5
			14.00						BSF-M-C-1A-4.0
			14.50						BSF-C-0900/050-10.0
		15.00	15.00					BSF-C-0900/050-9.5	BSF-M-C-1A-5.5
			15.50					BSF-C-0900/050-10.0	
			16.00					BSF-C-0900/050-10.5	
			16.50					BSF-C-0900/050-9.5	BSF-M-C-1A-7.0
		17.00	17.00					BSF-C-0900/050-10.0	
			17.50					BSF-C-0900/050-10.5	
			18.00					BSF-C-0900/050-9.5	BSF-M-C-1A-8.5
			18.50					BSF-C-0900/050-10.0	
			19.00					BSF-C-0900/050-10.5	
9.50	9.40	19.50	19.50					BSF-C-0900/050-9.5	BSF-M-C-1A-10.0
			20.00					BSF-C-0900/050-10.0	
			20.50					BSF-C-0900/050-10.5	
		21.00	21.00					BSF-C-0900/050-9.5	BSF-M-C-1A-11.5
			21.50					BSF-C-0950/050-10.0	BSF-M-C-1A-4.0
			22.00					BSF-C-0950/050-10.5	
			22.50					BSF-C-0950/050-11.0	
		23.00	23.00					BSF-C-0950/050-10.0	BSF-M-C-1A-5.5
			23.50					BSF-C-0950/050-10.5	
			24.00					BSF-C-0950/050-11.0	
			24.50					BSF-C-0950/050-10.0	BSF-M-C-1A-7.0
		25.00	25.00					BSF-C-0950/050-10.5	
			25.50					BSF-C-0950/050-11.0	
			26.00					BSF-C-0950/050-10.0	BSF-M-C-1A-8.5
			26.50					BSF-C-0950/050-10.5	
		27.00	27.00					BSF-C-0950/050-11.0	
			27.50					BSF-C-0950/050-10.0	BSF-M-C-1A-10.0
			28.00					BSF-C-0950/050-10.5	
			28.50					BSF-C-0950/050-11.0	
		29.00	29.00					BSF-C-0950/050-10.0	BSF-M-C-1A-11.5
			29.50					BSF-C-0950/050-10.5	

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ORDERING INFORMATION

- Standard shank for tool part number without any addition: Cylindrical shank.
- With addition: "-HB" = Weldon shank, "-HE" = Whistle Notch shank (please see page 169)
- For tools with air activation (please see page 170) add "A" to the article number (e.g. BSFA-C-0900/050-9.5)
- Attention: The blades for the tool need to be ordered separately.

BSF Tool for Bore-Ø 10.0 mm



Tool Table

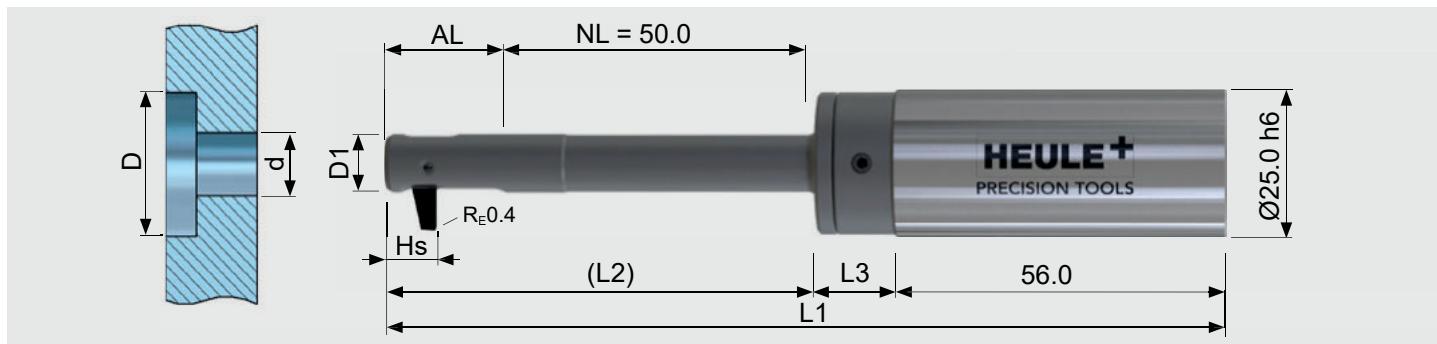
Bore-Ø d	Tool.-Ø D1	Counter-bore-Ø D	AL	HS	L1	L2	L3	Tool without Blade	Blade ¹
								Part No.	Part No.
10.00	9.90	14.50	20.25	8.55	143.75	74.25	13.50	BSF-C-1000/050-10.5	BSF-M-C-1A-4.0
		15.00						BSF-C-1000/050-11.0	
		15.50						BSF-C-1000/050-11.5	
		16.00						BSF-C-1000/050-10.5	BSF-M-C-1A-5.5
		16.50						BSF-C-1000/050-11.0	
		17.00						BSF-C-1000/050-11.5	
		17.50						BSF-C-1000/050-10.5	BSF-M-C-1A-7.0
		18.00						BSF-C-1000/050-11.0	
		18.50						BSF-C-1000/050-11.5	
		19.00						BSF-C-1000/050-10.5	BSF-M-C-1A-8.5
		19.50						BSF-C-1000/050-11.0	
		20.00						BSF-C-1000/050-11.5	
		20.50						BSF-C-1000/050-10.5	BSF-M-C-1A-10.0
		21.00						BSF-C-1000/050-11.0	
		21.50						BSF-C-1000/050-11.5	
		22.00						BSF-C-1000/050-10.5	BSF-M-C-1A-11.5
		22.50						BSF-C-1000/050-11.0	
		23.00						BSF-C-1000/050-11.5	

¹⁾A = Coating for steel alloys, titanium and Inconel / D = Coating for aluminium alloys (please see page 169)

ORDERING INFORMATION

- Standard shank for tool part number without any addition: Cylindrical shank.
- With addition: "-HB" = Weldon shank, "-HE" = Whistle Notch shank (please see page 169)
- For tools with air activation (please see page 170) add "A" to the article number (e.g. BSFA-C-0900/050-9.5)
- Attention: The blades for the tool need to be ordered separately.

BSF Tool for Bore-Ø 10.5 mm



Tool Table

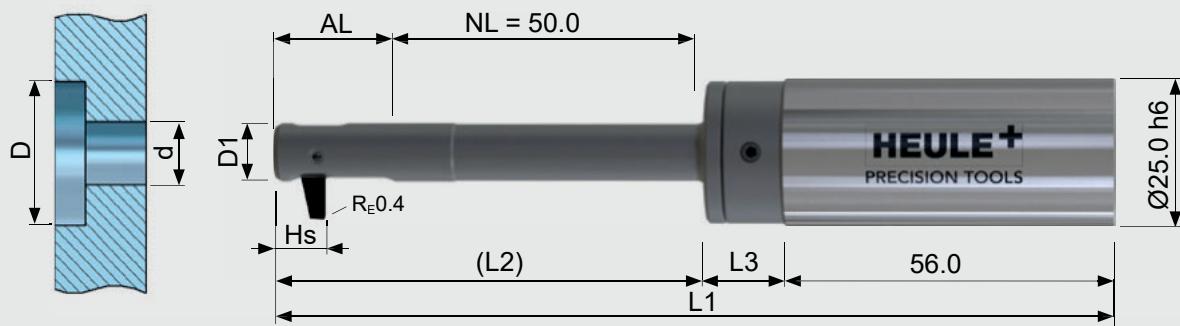
Bore-Ø d	Tool.-Ø D1	Counter-bore-Ø D	AL	HS	L1	L2	L3	Tool without Blade	Blade ¹
								Part No.	Part No.
10.50	10.40	15.50	22.50	9.63	146.00	76.50	13.50	BSF-D-1050/050-11.0	BSF-M-D-1A-4.5
		16.00						BSF-D-1050/050-11.5	
		16.50						BSF-D-1050/050-12.0	
		17.00						BSF-D-1050/050-12.5	
		17.50						BSF-D-1050/050-13.0	
		18.00						BSF-D-1050/050-11.0	BSF-M-D-1A-7.0
		18.50						BSF-D-1050/050-11.5	
		19.00						BSF-D-1050/050-12.0	
		19.50						BSF-D-1050/050-12.5	
		20.00						BSF-D-1050/050-13.0	
		20.50						BSF-D-1050/050-11.0	BSF-M-D-1A-9.5
		21.00						BSF-D-1050/050-11.5	
		21.50						BSF-D-1050/050-12.0	
		22.00						BSF-D-1050/050-12.5	
		22.50						BSF-D-1050/050-13.0	
		23.00						BSF-D-1050/050-11.0	BSF-M-D-1A-12.0
		23.50						BSF-D-1050/050-11.5	
		24.00						BSF-D-1050/050-12.0	
		24.50						BSF-D-1050/050-12.5	

¹⁾A = Coating for steel alloys, titanium and Inconel / D = Coating for aluminium alloys (please see page 169)

ORDERING INFORMATION

- Standard shank for tool part number without any addition: Cylindrical shank.
- With addition: "-HB" = Weldon shank, "-HE" = Whistle Notch shank (please see page 169)
- For tools with air activation (please see page 170) add "A" to the article number (e.g. BSFA-D-1050/050-11.0)
- Attention: The blades for the tool need to be ordered separately.

BSF Tool for Bore-Ø 11.0 mm



Tool Table

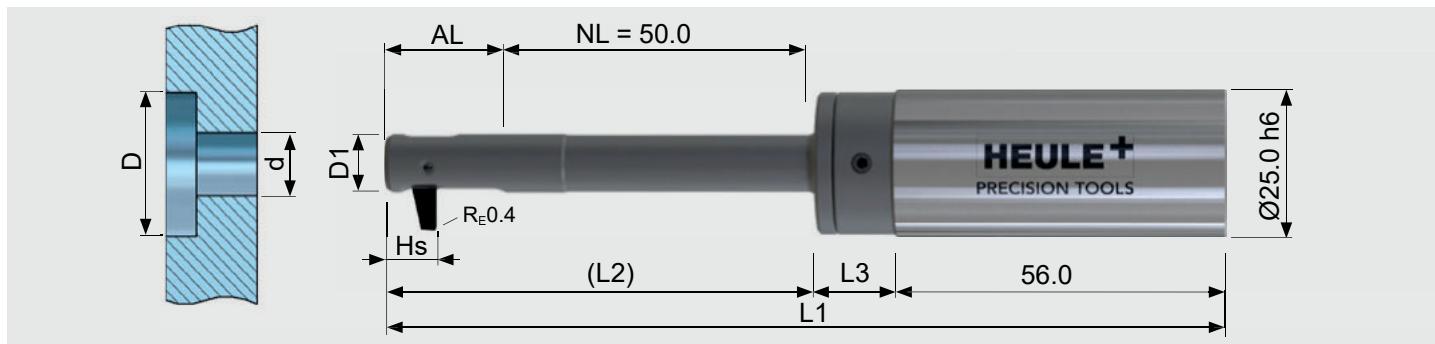
Bore-Ø d	Tool.-Ø D1	Counter-bore-Ø D	AL	HS	L1	L2	L3	Tool without Blade	Blade ¹
								Part No.	Part No.
11.00	10.90	16.00	22.50	9.63	146.00	76.50	13.50	BSF-D-1100/050-11.5	BSF-M-D-1A-4.5
			16.50					BSF-D-1100/050-12.0	
			17.00					BSF-D-1100/050-12.5	
			17.50					BSF-D-1100/050-13.0	
			18.00					BSF-D-1100/050-13.5	
		18.50	21.00					BSF-D-1100/050-11.5	BSF-M-D-1A-7.0
			21.50					BSF-D-1100/050-12.0	
			22.00					BSF-D-1100/050-12.5	
			22.50					BSF-D-1100/050-13.0	
			23.00					BSF-D-1100/050-13.5	
		23.50	21.00					BSF-D-1100/050-11.5	BSF-M-D-1A-9.5
			21.50					BSF-D-1100/050-12.0	
			22.00					BSF-D-1100/050-12.5	
			22.50					BSF-D-1100/050-13.0	
			23.00					BSF-D-1100/050-13.5	
		24.00	23.50					BSF-D-1100/050-11.5	BSF-M-D-1A-12.0
			24.00					BSF-D-1100/050-12.0	
			24.50					BSF-D-1100/050-12.5	
			25.00					BSF-D-1100/050-13.0	
			25.50					BSF-D-1100/050-13.5	

¹⁾A = Coating for steel alloys, titanium and Inconel / D = Coating for aluminium alloys (please see page 169)

ORDERING INFORMATION

- Standard shank for tool part number without any addition: Cylindrical shank.
- With addition: "-HB" = Weldon shank, "-HE" = Whistle Notch shank (please see page 169)
- For tools with air activation (please see page 170) add "A" to the article number (e.g. BSFA-D-1050/050-11.0)
- Attention: The blades for the tool need to be ordered separately.

BSF Tool for Bore-Ø 11.5 mm



Tool Table

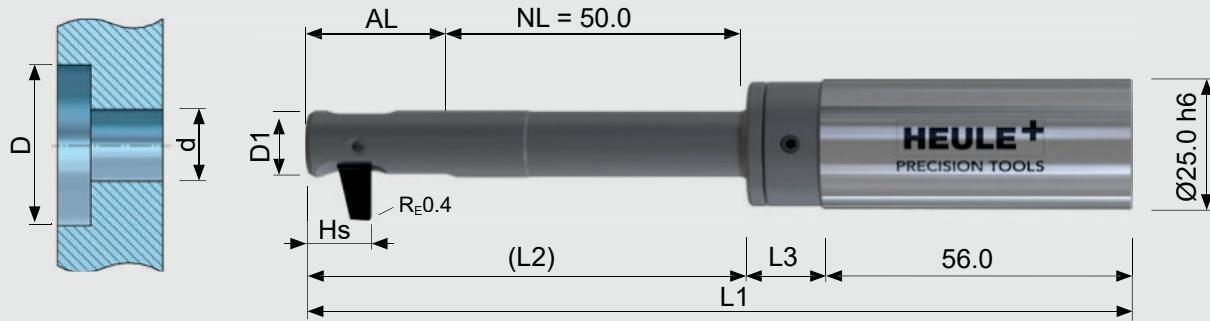
Bore-Ø d	Tool.-Ø D1	Counter- bore-Ø D	AL	HS	L1	L2	L3	Tool without Blade	Blade ¹
								Part No.	Part No.
11.50	11.40	16.50	23.75	9.63	147.25	77.75	13.50	BSF-D-1150/050-12.0	BSF-M-D-1A-4.5
		17.00						BSF-D-1150/050-12.5	
		17.50						BSF-D-1150/050-13.0	
		18.00						BSF-D-1150/050-13.5	
		18.50						BSF-D-1150/050-14.0	
		19.00						BSF-D-1150/050-12.0	BSF-M-D-1A-7.0
		19.50						BSF-D-1150/050-12.5	
		20.00						BSF-D-1150/050-13.0	
		20.50						BSF-D-1150/050-13.5	
		21.00						BSF-D-1150/050-14.0	
		21.50						BSF-D-1150/050-12.0	BSF-M-D-1A-9.5
		22.00						BSF-D-1150/050-12.5	
		22.50						BSF-D-1150/050-13.0	
		23.00						BSF-D-1150/050-13.5	
		23.50						BSF-D-1150/050-14.0	
		24.00						BSF-D-1150/050-12.0	BSF-M-D-1A-12.0
		24.50						BSF-D-1150/050-12.5	
		25.00						BSF-D-1150/050-13.0	
		25.50						BSF-D-1150/050-13.5	
		26.00						BSF-D-1150/050-14.0	
		26.50						BSF-D-1150/050-12.0	BSF-M-D-1A-14.5

¹⁾A = Coating for steel alloys, titanium and Inconel / D = Coating for aluminium alloys (please see page 169)

ORDERING INFORMATION

- Standard shank for tool part number without any addition: Cylindrical shank.
With addition: "-HB" = Weldon shank, "-HE" = Whistle Notch shank (please see page 169)
- For tools with air activation (please see page 170) add "A" to the article number (e.g. BSFA-D-1050/050-11.0)
- Attention: The blades for the tool need to be ordered separately.

BSF Tool for Bore-Ø 12.0 mm



Tool Table

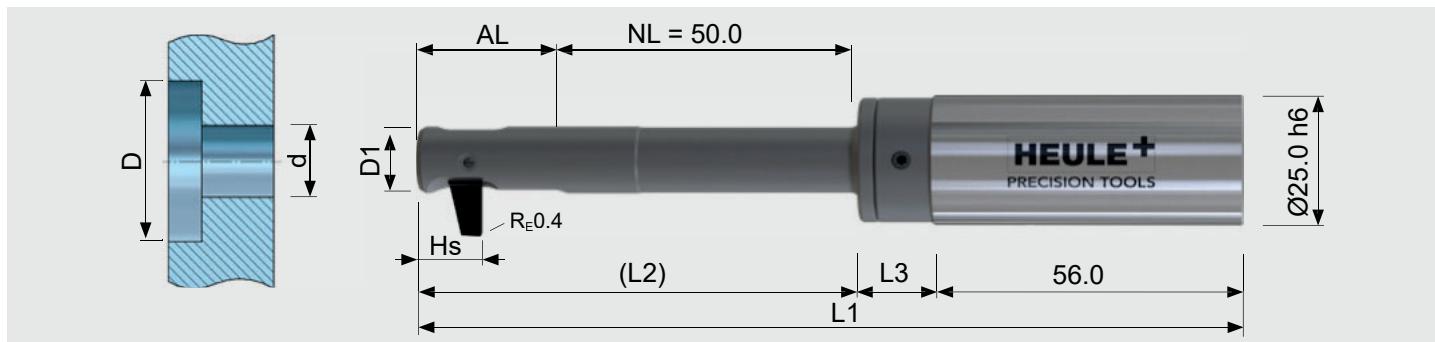
Bore-Ø d	Tool.-Ø D1	Counter- bore-Ø D	AL	HS	L1	L2	L3	Tool without Blade	Blade ¹
								Part No.	Part No.
12.00	11.90	18.00	26.75	11.40	150.25	80.75	13.50	BSF-E-1200/050-13.0	BSF-M-E-1A-5.0
		18.50						BSF-E-1200/050-13.5	
		19.00						BSF-E-1200/050-14.0	
		19.50						BSF-E-1200/050-14.5	
		20.00						BSF-E-1200/050-15.0	
	20.50	20.50						BSF-E-1200/050-13.0	BSF-M-E-1A-7.5
		21.00						BSF-E-1200/050-13.5	
		21.50						BSF-E-1200/050-14.0	
		22.00						BSF-E-1200/050-14.5	
		22.50						BSF-E-1200/050-15.0	
	23.00	23.00						BSF-E-1200/050-13.0	BSF-M-E-1A-10.0
		23.50						BSF-E-1200/050-13.5	
		24.00						BSF-E-1200/050-14.0	
		24.50						BSF-E-1200/050-14.5	
		25.00						BSF-E-1200/050-15.0	
	25.50	25.50						BSF-E-1200/050-13.0	BSF-M-E-1A-12.5
		26.00						BSF-E-1200/050-13.5	
		26.50						BSF-E-1200/050-14.0	
		27.00						BSF-E-1200/050-14.5	
		27.50						BSF-E-1200/050-15.0	
	28.00							BSF-E-1200/050-13.0	BSF-M-E-1A-15.0

¹⁾A = Coating for steel alloys, titanium and Inconel / D = Coating for aluminium alloys (please see page 169)

ORDERING INFORMATION

- Standard shank for tool part number without any addition: Cylindrical shank.
- With addition: "-HB" = Weldon shank, "-HE" = Whistle Notch shank (please see page 169)
- For tools with air activation (please see page 170) add "A" to the article number (e.g. BSF^A-D-1050/050-11.0)
- Attention: The blades for the tool need to be ordered separately.

BSF Tool for Bore-Ø 12.5 mm



Tool Table

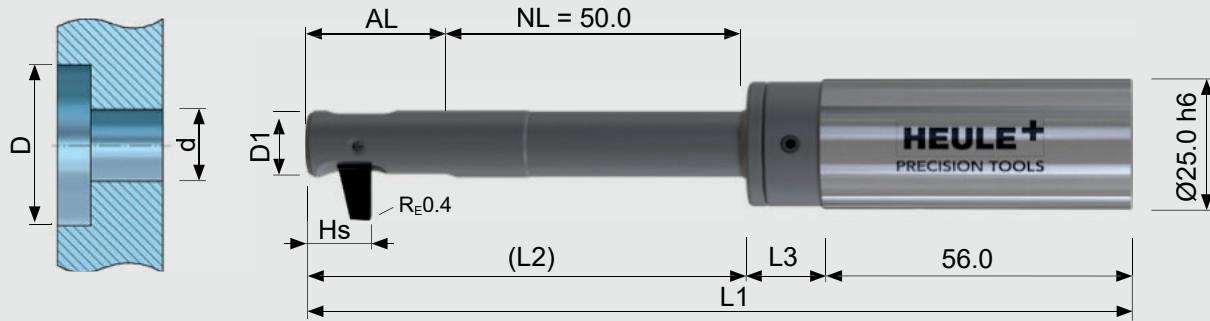
Bore-Ø d	Tool.-Ø D1	Counter- bore-Ø D	AL	HS	L1	L2	L3	Tool without Blade	Blade ¹
								Part No.	Part No.
12.50	12.40	18.50	26.75	11.40	150.25	80.75	13.50	BSF-E-1250/050-13.5	BSF-M-E-1A-5.0
		19.00						BSF-E-1250/050-14.0	
		19.50						BSF-E-1250/050-14.5	
		20.00						BSF-E-1250/050-15.0	
		20.50						BSF-E-1250/050-15.5	
	21.00	21.00						BSF-E-1250/050-13.5	BSF-M-E-1A-7.5
		21.50						BSF-E-1250/050-14.0	
		22.00						BSF-E-1250/050-14.5	
		22.50						BSF-E-1250/050-15.0	
		23.00						BSF-E-1250/050-15.5	
	23.50	23.50						BSF-E-1250/050-13.5	BSF-M-E-1A-10.0
		24.00						BSF-E-1250/050-14.0	
		24.50						BSF-E-1250/050-14.5	
		25.00						BSF-E-1250/050-15.0	
		25.50						BSF-E-1250/050-15.5	
	26.00	26.00						BSF-E-1250/050-13.5	BSF-M-E-1A-12.5
		26.50						BSF-E-1250/050-14.0	
		27.00						BSF-E-1250/050-14.5	
		27.50						BSF-E-1250/050-15.0	
		28.00						BSF-E-1250/050-15.5	
	28.50	28.50						BSF-E-1250/050-13.5	BSF-M-E-1A-15.0
		29.00						BSF-E-1250/050-14.0	

¹⁾A = Coating for steel alloys, titanium and Inconel / D = Coating for aluminium alloys (please see page 169)

ORDERING INFORMATION

- Standard shank for tool part number without any addition: Cylindrical shank.
With addition: "-HB" = Weldon shank, "-HE" = Whistle Notch shank (please see page 169)
- For tools with air activation (please see page 170) add "A" to the article number (e.g. BSFA-E-1200/050-13.0)
- Attention: The blades for the tool need to be ordered separately.

BSF Tool for Bore-Ø 13.0 mm



Tool Table

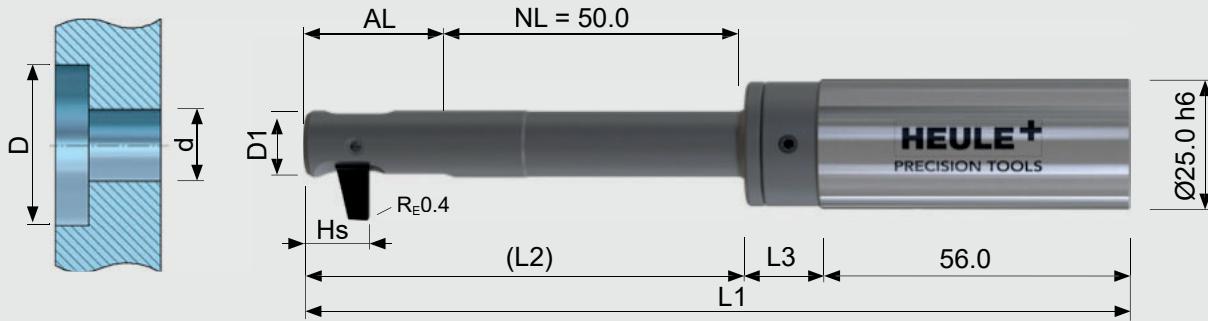
Bore-Ø d	Tool.-Ø D1	Counter- bore-Ø D	AL	HS	L1	L2	L3	Tool without Blade	Blade ¹
13.00	12.90	19.00	26.75	11.40	150.25	80.75	13.50	BSF-E-1300/050-14.0	BSF-M-E-1A-5.0
		19.50						BSF-E-1300/050-14.5	
		20.00						BSF-E-1300/050-15.0	
		20.50						BSF-E-1300/050-15.5	
		21.00						BSF-E-1300/050-16.0	
		21.50						BSF-E-1300/050-14.0	BSF-M-E-1A-7.5
		22.00						BSF-E-1300/050-14.5	
		22.50						BSF-E-1300/050-15.0	
		23.00						BSF-E-1300/050-15.5	
		23.50						BSF-E-1300/050-16.0	
		24.00						BSF-E-1300/050-14.0	BSF-M-E-1A-10.0
		24.50						BSF-E-1300/050-14.5	
		25.00						BSF-E-1300/050-15.0	
		25.50						BSF-E-1300/050-15.5	
		26.00						BSF-E-1300/050-16.0	
		26.50						BSF-E-1300/050-14.0	BSF-M-E-1A-12.5
		27.00						BSF-E-1300/050-14.5	
		27.50						BSF-E-1300/050-15.0	
		28.00						BSF-E-1300/050-15.5	
		28.50						BSF-E-1300/050-16.0	
		29.00						BSF-E-1300/050-14.0	BSF-M-E-1A-15.0
		29.50						BSF-E-1300/050-14.5	
		30.00						BSF-E-1300/050-15.0	

¹⁾A = Coating for steel alloys, titanium and Inconel / D = Coating for aluminium alloys (please see page 169)

ORDERING INFORMATION

- Standard shank for tool part number without any addition: Cylindrical shank.
- With addition: "-HB" = Weldon shank, "-HE" = Whistle Notch shank (please see page 169)
- For tools with air activation (please see page 170) add "A" to the article number (e.g. BSFA-E-1200/050-13.0)
- Attention: The blades for the tool need to be ordered separately.

BSF Tool for Bore-Ø 13.5 mm



Tool Table

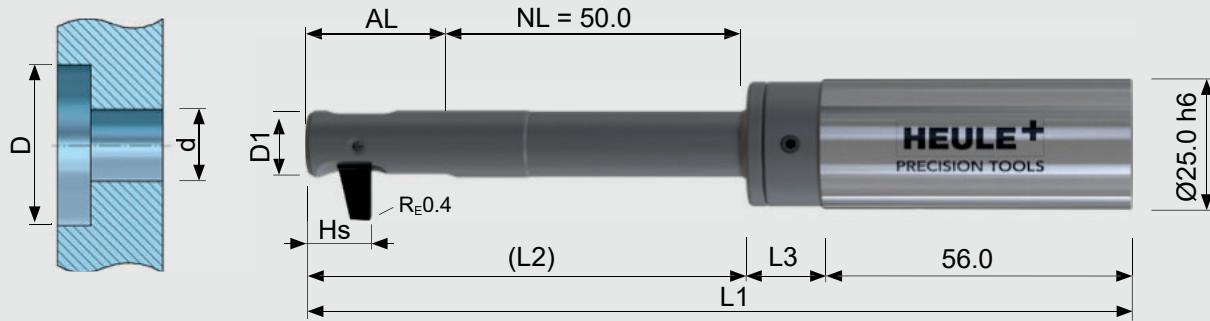
Bore-Ø d	Tool.-Ø D1	Counter- bore-Ø D	AL	HS	L1	L2	L3	Tool without Blade	Blade ¹
								Part No.	Part No.
13.50	13.40	19.50	26.75	11.40	150.25	80.75	13.50	BSF-E-1350/050-14.5	BSF-M-E-1A-5.0
		20.00						BSF-E-1350/050-15.0	
		20.50						BSF-E-1350/050-15.5	
		21.00						BSF-E-1350/050-16.0	
		21.50						BSF-E-1350/050-16.5	
	22.00	22.00						BSF-E-1350/050-14.5	BSF-M-E-1A-7.5
		22.50						BSF-E-1350/050-15.0	
		23.00						BSF-E-1350/050-15.5	
		23.50						BSF-E-1350/050-16.0	
		24.00						BSF-E-1350/050-16.5	
	24.50	24.50						BSF-E-1350/050-14.5	BSF-M-E-1A-10.0
		25.00						BSF-E-1350/050-15.0	
		25.50						BSF-E-1350/050-15.5	
		26.00						BSF-E-1350/050-16.0	
		26.50						BSF-E-1350/050-16.5	
	27.00	27.00						BSF-E-1350/050-14.5	BSF-M-E-1A-12.5
		27.50						BSF-E-1350/050-15.0	
		28.00						BSF-E-1350/050-15.5	
		28.50						BSF-E-1350/050-16.0	
		29.00						BSF-E-1350/050-16.5	
	29.50	29.50						BSF-E-1350/050-14.5	BSF-M-E-1A-15.0
		30.00						BSF-E-1350/050-15.0	
		30.50						BSF-E-1350/050-15.5	
	31.00	31.00						BSF-E-1350/050-16.0	
		31.50						BSF-E-1350/050-16.5	

¹⁾A = Coating for steel alloys, titanium and Inconel / D = Coating for aluminium alloys (please see page 169)

ORDERING INFORMATION

- Standard shank for tool part number without any addition: Cylindrical shank.
- With addition: "-HB" = Weldon shank, "-HE" = Whistle Notch shank (please see page 169)
- For tools with air activation (please see page 170) add "A" to the article number (e.g. BSFA-E-1200/050-13.0)
- Attention: The blades for the tool need to be ordered separately.

BSF Tool for Bore-Ø 14.0 mm



Tool Table

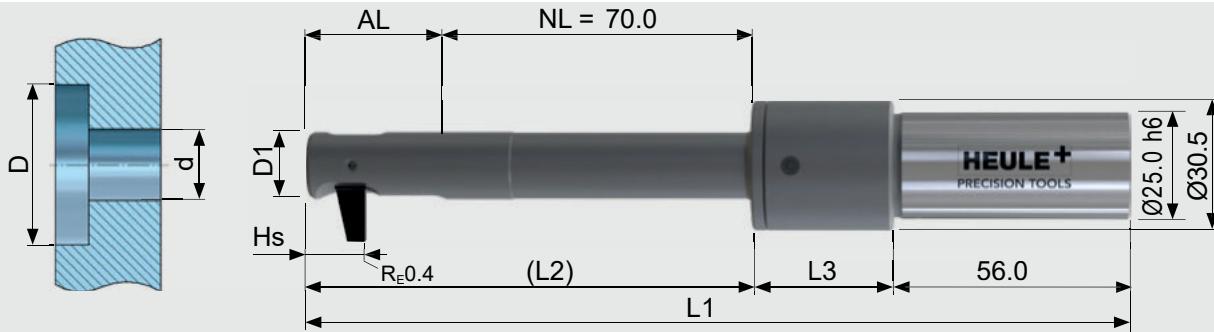
Bore-Ø d	Tool.-Ø D1	Counter- bore-Ø D	AL	HS	L1	L2	L3	Tool without Blade	Blade ¹
14.00	13.90	20.00	28.00	11.40	151.50	82.00	13.50	BSF-E-1400/050-15.0	BSF-M-E-1A-5.0
		20.50						BSF-E-1400/050-15.5	
		21.00						BSF-E-1400/050-16.0	
		21.50						BSF-E-1400/050-16.5	
		22.00						BSF-E-1400/050-17.0	
	22.50	22.50						BSF-E-1400/050-15.0	BSF-M-E-1A-7.5
		23.00						BSF-E-1400/050-15.5	
		23.50						BSF-E-1400/050-16.0	
		24.00						BSF-E-1400/050-16.5	
		24.50						BSF-E-1400/050-17.0	
	25.00	25.00						BSF-E-1400/050-15.0	BSF-M-E-1A-10.0
		25.50						BSF-E-1400/050-15.5	
		26.00						BSF-E-1400/050-16.0	
		26.50						BSF-E-1400/050-16.5	
		27.00						BSF-E-1400/050-17.0	
	27.50	27.50						BSF-E-1400/050-15.0	BSF-M-E-1A-12.5
		28.00						BSF-E-1400/050-15.5	
		28.50						BSF-E-1400/050-16.0	
		29.00						BSF-E-1400/050-16.5	
		29.50						BSF-E-1400/050-17.0	
	30.00	30.00						BSF-E-1400/050-15.0	BSF-M-E-1A-15.0
		30.50						BSF-E-1400/050-15.5	
		31.00						BSF-E-1400/050-16.0	
		31.50						BSF-E-1400/050-16.5	
		32.00						BSF-E-1400/050-17.0	
	32.50							BSF-E-1400/050-15.0	BSF-M-E-1A-17.5

¹⁾A = Coating for steel alloys, titanium and Inconel / D = Coating for aluminium alloys (please see page 169)

ORDERING INFORMATION

- Standard shank for tool part number without any addition: Cylindrical shank.
- With addition: "-HB" = Weldon shank, "-HE" = Whistle Notch shank (please see page 169)
- For tools with air activation (please see page 170) add "A" to the article number (e.g. BSFA-E-1200/050-13.0)
- Attention: The blades for the tool need to be ordered separately.

BSF Tool for Bore-Ø 14.5 mm



Tool Table

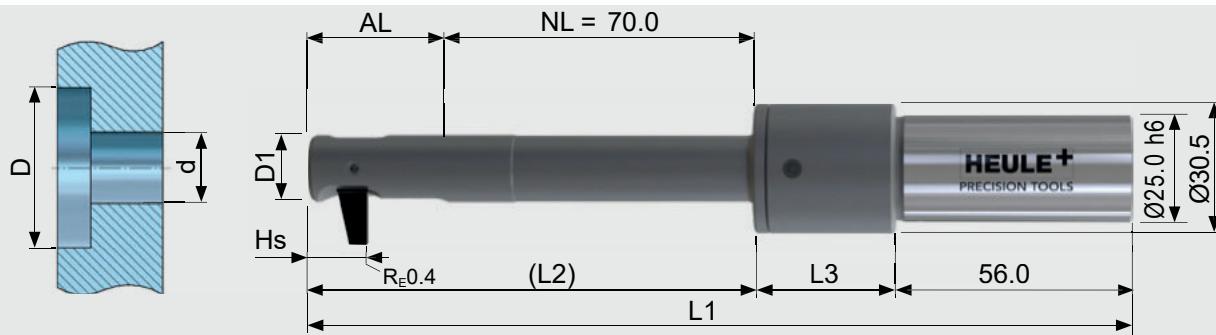
Bore-Ø d	Tool-Ø D1	Counter- bore-Ø D	AL	HS	L1	L2	L3	Tool without Blade	Blade ¹
								Part No.	Part No.
14.50	14.40	21.50	30.75	13.40	193.75	104.75	33.00	BSF-F-1450/070-16.0	BSF-M-F-1A-5.5
		22.00						BSF-F-1450/070-16.5	
		22.50						BSF-F-1450/070-17.0	
		23.00						BSF-F-1450/070-17.5	
		23.50						BSF-F-1450/070-18.0	
		24.00						BSF-F-1450/070-18.5	
		24.50						BSF-F-1450/070-19.0	
		25.00						BSF-F-1450/070-16.0	BSF-M-F-1A-9.0
		25.50						BSF-F-1450/070-16.5	
		26.00						BSF-F-1450/070-17.0	
		26.50						BSF-F-1450/070-17.5	
		27.00						BSF-F-1450/070-18.0	
		27.50						BSF-F-1450/070-18.5	
		28.00						BSF-F-1450/070-19.0	
		28.50						BSF-F-1450/070-16.0	BSF-M-F-1A-12.5
		29.00						BSF-F-1450/070-16.5	
		29.50						BSF-F-1450/070-17.0	
		30.00						BSF-F-1450/070-17.5	
		30.50						BSF-F-1450/070-18.0	
		31.00						BSF-F-1450/070-18.5	
		31.50						BSF-F-1450/070-19.0	
		32.00						BSF-F-1450/070-16.0	BSF-M-F-1A-16.0
		32.50						BSF-F-1450/070-16.5	
		33.00						BSF-F-1450/070-17.0	
		33.50						BSF-F-1450/070-17.5	

¹⁾A = Coating for steel alloys, titanium and Inconel / D = Coating for aluminium alloys (please see page 169)

ORDERING INFORMATION

- Standard shank for tool part number without any addition: Cylindrical shank.
- With addition: "-HB" = Weldon shank, "-HE" = Whistle Notch shank (please see page 169)
- For tools with air activation (please see page 170) add "A" to the article number (e.g. BSFA-F-1450/070-16.0)
- Attention: The blades for the tool need to be ordered separately.

BSF Tool for Bore-Ø 15.0mm



Tool Table

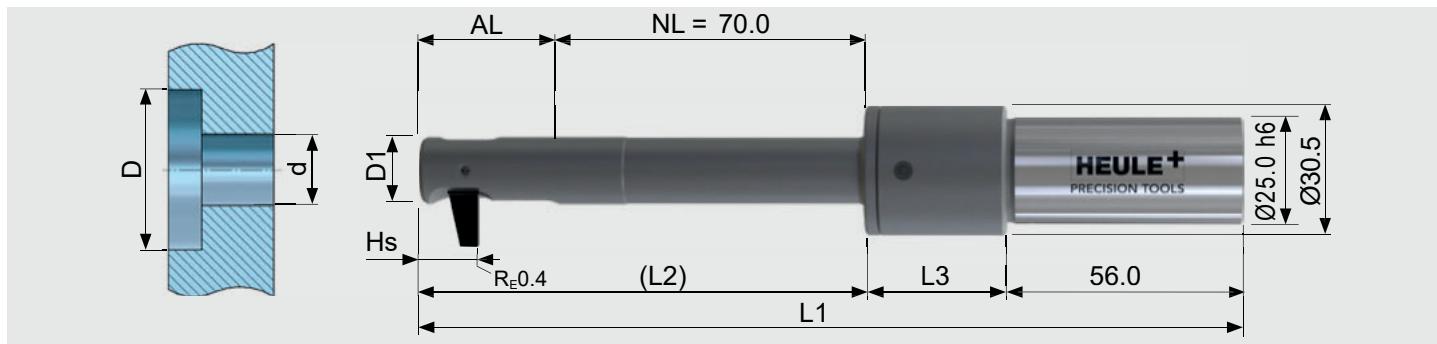
Bore-Ø d	Tool.-Ø D1	Counter- bore-Ø D	AL	HS	L1	L2	L3	Tool without Blade	Blade ¹
								Part No.	Part No.
15.00	14.90	22.00	30.75	13.40	193.75	104.75	33.00	BSF-F-1500/070-16.5	BSF-M-F-1A-5.5
		22.50						BSF-F-1500/070-17.0	
		23.00						BSF-F-1500/070-17.5	
		23.50						BSF-F-1500/070-18.0	
		24.00						BSF-F-1500/070-18.5	
		24.50						BSF-F-1500/070-19.0	
		25.00						BSF-F-1500/070-19.5	
		25.50						BSF-F-1500/070-16.5	BSF-M-F-1A-9.0
		26.00						BSF-F-1500/070-17.0	
		26.50						BSF-F-1500/070-17.5	
		27.00						BSF-F-1500/070-18.0	
		27.50						BSF-F-1500/070-18.5	
		28.00						BSF-F-1500/070-19.0	
		28.50						BSF-F-1500/070-19.5	
		29.00						BSF-F-1500/070-16.5	BSF-M-F-1A-12.5
		29.50						BSF-F-1500/070-17.0	
		30.00						BSF-F-1500/070-17.5	
		30.50						BSF-F-1500/070-18.0	
		31.00						BSF-F-1500/070-18.5	
		31.50						BSF-F-1500/070-19.0	
		32.00						BSF-F-1500/070-19.5	
		32.50						BSF-F-1500/070-16.5	BSF-M-F-1A-16.0
		33.00						BSF-F-1500/070-17.0	
		33.50						BSF-F-1500/070-17.5	
		34.00						BSF-F-1500/070-18.0	
		34.50						BSF-F-1500/070-18.5	

¹⁾A = Coating for steel alloys, titanium and Inconel / D = Coating for aluminium alloys (please see page 169)

ORDERING INFORMATION

- Standard shank for tool part number without any addition: Cylindrical shank.
With addition: "-HB" = Weldon shank, "-HE" = Whistle Notch shank (please see page 169)
- For tools with air activation (please see page 170) add "A" to the article number (e.g. BSFA-F-1450/070-16.0)
- Attention: The blades for the tool need to be ordered separately.

BSF Tool for Bore-Ø 15.5 mm



Tool Table

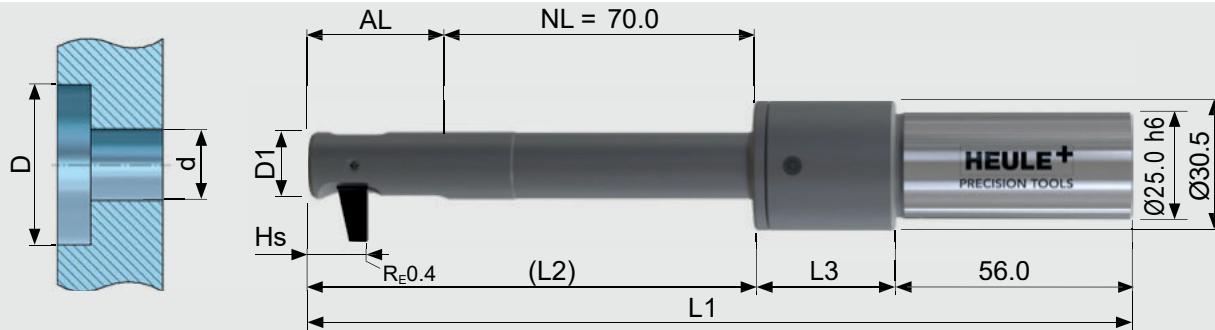
Bore-Ø d	Tool-Ø D1	Counter- bore-Ø D	AL	HS	L1	L2	L3	Tool without Blade	Blade ¹
								Part No.	Part No.
15.50	15.40	22.50	30.75	13.40	193.75	104.75	33.00	BSF-F-1550/070-17.0	BSF-M-F-1A-5.5
		23.00						BSF-F-1550/070-17.5	
		23.50						BSF-F-1550/070-18.0	
		24.00						BSF-F-1550/070-18.5	
		24.50						BSF-F-1550/070-19.0	
		25.00						BSF-F-1550/070-19.5	
		25.50						BSF-F-1550/070-20.0	
		26.00						BSF-F-1550/070-17.0	BSF-M-F-1A-9.0
		26.50						BSF-F-1550/070-17.5	
		27.00						BSF-F-1550/070-18.0	
		27.50						BSF-F-1550/070-18.5	
		28.00						BSF-F-1550/070-19.0	
		28.50						BSF-F-1550/070-19.5	
		29.00						BSF-F-1550/070-20.0	
		29.50						BSF-F-1550/070-17.0	BSF-M-F-1A-12.5
		30.00						BSF-F-1550/070-17.5	
		30.50						BSF-F-1550/070-18.0	
		31.00						BSF-F-1550/070-18.5	
		31.50						BSF-F-1550/070-19.0	
		32.00						BSF-F-1550/070-19.5	
		32.50						BSF-F-1550/070-20.0	
		33.00						BSF-F-1550/070-17.0	BSF-M-F-1A-16.0
		33.50						BSF-F-1550/070-17.5	
		34.00						BSF-F-1550/070-18.0	
		34.50						BSF-F-1550/070-18.5	
		35.00						BSF-F-1550/070-19.0	
		35.50						BSF-F-1550/070-19.5	
		36.00						BSF-F-1550/070-20.0	

¹⁾A = Coating for steel alloys, titanium and Inconel / D = Coating for aluminium alloys (please see page 169)

ORDERING INFORMATION

- Standard shank for tool part number without any addition: Cylindrical shank.
With addition: "-HB" = Weldon shank, "-HE" = Whistle Notch shank (please see page 169)
- For tools with air activation (please see page 170) add "A" to the article number (e.g. BSFA-F-1450/070-16.0)
- Attention: The blades for the tool need to be ordered separately.

BSF Tool for Bore-Ø 16.0 mm



Tool Table

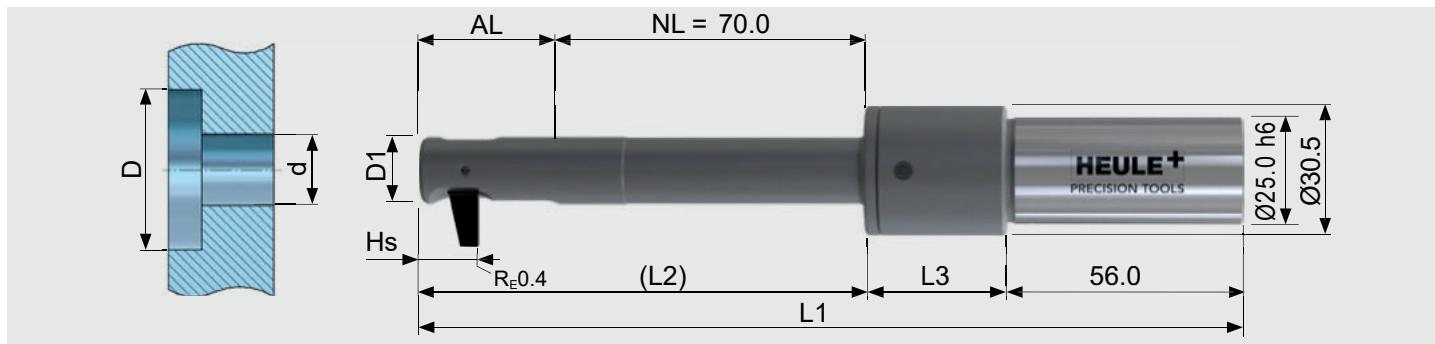
Bore-Ø d	Tool.-Ø D1	Counter- bore-Ø D	AL	HS	L1	L2	L3	Tool without Blade	Blade ¹
								Part No.	Part No.
16.00	15.90	23.00	32.50	13.40	195.50	106.50	33.00	BSF-F-1600/070-17.5	BSF-M-F-1A-5.5
		23.50						BSF-F-1600/070-18.0	
		24.00						BSF-F-1600/070-18.5	
		24.50						BSF-F-1600/070-19.0	
		25.00						BSF-F-1600/070-19.5	
		25.50						BSF-F-1600/070-20.0	
		26.00						BSF-F-1600/070-20.5	
		26.50						BSF-F-1600/070-17.5	BSF-M-F-1A-9.0
		27.00						BSF-F-1600/070-18.0	
		27.50						BSF-F-1600/070-18.5	
		28.00						BSF-F-1600/070-19.0	
		28.50						BSF-F-1600/070-19.5	
		29.00						BSF-F-1600/070-20.0	
		29.50						BSF-F-1600/070-20.5	
		30.00						BSF-F-1600/070-17.5	BSF-M-F-1A-12.5
		30.50						BSF-F-1600/070-18.0	
		31.00						BSF-F-1600/070-18.5	
		31.50						BSF-F-1600/070-19.0	
		32.00						BSF-F-1600/070-19.5	
		32.50						BSF-F-1600/070-20.0	
		33.00						BSF-F-1600/070-20.5	
		33.50						BSF-F-1600/070-17.5	BSF-M-F-1A-16.0
		34.00						BSF-F-1600/070-18.0	
		34.50						BSF-F-1600/070-18.5	
		35.00						BSF-F-1600/070-19.0	
		35.50						BSF-F-1600/070-19.5	
		36.00						BSF-F-1600/070-20.0	
		36.50						BSF-F-1600/070-20.5	
		37.00						BSF-F-1600/070-17.5	BSF-M-F-1A-19.5

¹⁾A = Coating for steel alloys, titanium and Inconel / D = Coating for aluminium alloys (please see page 169)

ORDERING INFORMATION

- Standard shank for tool part number without any addition: Cylindrical shank.
With addition: "-HB" = Weldon shank, "-HE" = Whistle Notch shank (please see page 169)
- For tools with air activation (please see page 170) add "A" to the article number (e.g. BSFA-F-1450/070-16.0)
- Attention: The blades for the tool need to be ordered separately.

BSF Tool for Bore-Ø 16.5 mm



Tool Table

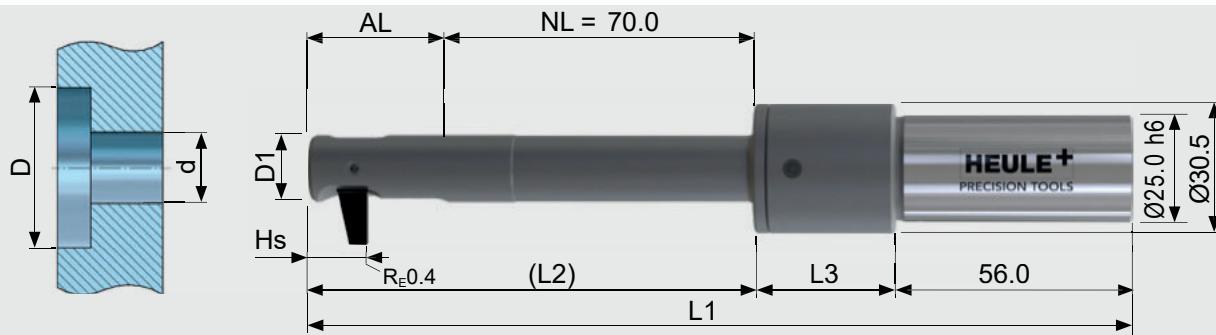
Bore-Ø d	Tool.-Ø D1	Counter- bore-Ø D	AL	HS	L1	L2	L3	Tool without Blade	Blade ¹
								Part No.	Part No.
16.50	16.40	23.50	32.50	13.40	195.50	106.50	33.00	BSF-F-1650/070-18.0	BSF-M-F-1A-5.5
		24.00						BSF-F-1650/070-18.5	
		24.50						BSF-F-1650/070-19.0	
		25.00						BSF-F-1650/070-19.5	
		25.50						BSF-F-1650/070-20.0	
		26.00						BSF-F-1650/070-20.5	
		26.50						BSF-F-1650/070-21.0	
		27.00						BSF-F-1650/070-18.0	BSF-M-F-1A-9.0
		27.50						BSF-F-1650/070-18.5	
		28.00						BSF-F-1650/070-19.0	
		28.50						BSF-F-1650/070-19.5	
		29.00						BSF-F-1650/070-20.0	
		29.50						BSF-F-1650/070-20.5	
		30.00						BSF-F-1650/070-21.0	
		30.50						BSF-F-1650/070-18.0	BSF-M-F-1A-12.5
		31.00						BSF-F-1650/070-18.5	
		31.50						BSF-F-1650/070-19.0	
		32.00						BSF-F-1650/070-19.5	
		32.50						BSF-F-1650/070-20.0	
		33.00						BSF-F-1650/070-20.5	
		33.50						BSF-F-1650/070-21.0	
		34.00						BSF-F-1650/070-18.0	BSF-M-F-1A-16.0
		34.50						BSF-F-1650/070-18.5	
		35.00						BSF-F-1650/070-19.0	
		35.50						BSF-F-1650/070-19.5	
		36.00						BSF-F-1650/070-20.0	
		36.50						BSF-F-1650/070-20.5	
		37.00						BSF-F-1650/070-21.0	
		37.50						BSF-F-1650/070-18.0	BSF-M-F-1A-19.5
		38.00						BSF-F-1650/070-18.5	

¹⁾A = Coating for steel alloys, titanium and Inconel / D = Coating for aluminium alloys (please see page 169)

ORDERING INFORMATION

- Standard shank for tool part number without any addition: Cylindrical shank.
- With addition: "-HB" = Weldon shank, "-HE" = Whistle Notch shank (please see page 169)
- For tools with air activation (please see page 170) add "A" to the article number (e.g. BSFA-F-1450/070-16.0)
- Attention: The blades for the tool need to be ordered separately.

BSF Tool for Bore-Ø 17.0 mm



Tool Table

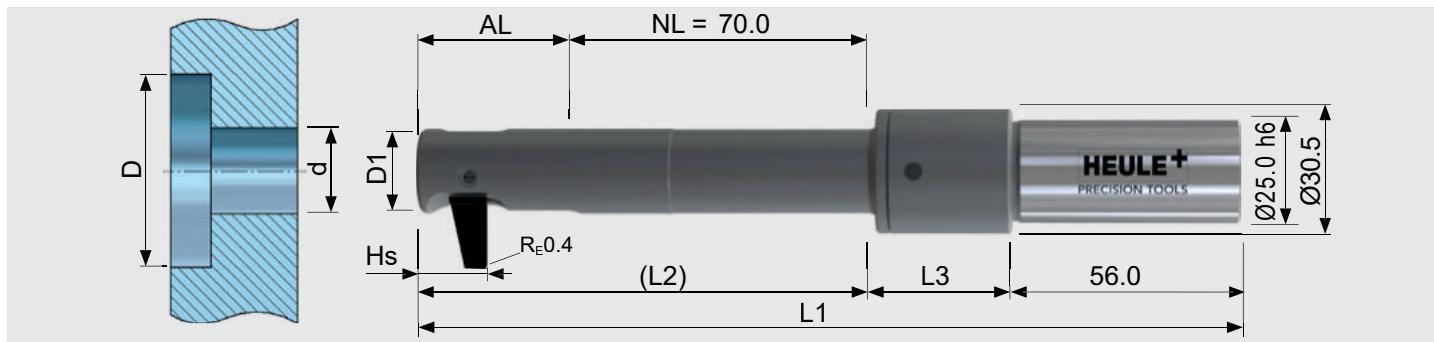
Bore-Ø d	Tool.-Ø D1	Counter- bore-Ø D	AL	HS	L1	L2	L3	Tool without Blade	Blade ¹
								Part No.	Part No.
17.00	16.90	24.00	32.50	13.40	195.50	106.50	33.00	BSF-F-1700/070-18.5	BSF-M-F-1A-5.5
		24.50						BSF-F-1700/070-19.0	
		25.00						BSF-F-1700/070-19.5	
		25.50						BSF-F-1700/070-20.0	
		26.00						BSF-F-1700/070-20.5	
		26.50						BSF-F-1700/070-21.0	
		27.00						BSF-F-1700/070-21.5	
		27.50						BSF-F-1700/070-18.5	BSF-M-F-1A-9.0
		28.00						BSF-F-1700/070-19.0	
		28.50						BSF-F-1700/070-19.5	
		29.00						BSF-F-1700/070-20.0	
		29.50						BSF-F-1700/070-20.5	
		30.00						BSF-F-1700/070-21.0	
		30.50						BSF-F-1700/070-21.5	
		31.00						BSF-F-1700/070-18.5	BSF-M-F-1A-12.5
		31.50						BSF-F-1700/070-19.0	
		32.00						BSF-F-1700/070-19.5	
		32.50						BSF-F-1700/070-20.0	
		33.00						BSF-F-1700/070-20.5	
		33.50						BSF-F-1700/070-21.0	
		34.00						BSF-F-1700/070-21.5	
		34.50						BSF-F-1700/070-18.5	BSF-M-F-1A-16.0
		35.00						BSF-F-1700/070-19.0	
		35.50						BSF-F-1700/070-19.5	
		36.00						BSF-F-1700/070-20.0	
		36.50						BSF-F-1700/070-20.5	
		37.00						BSF-F-1700/070-21.0	
		37.50						BSF-F-1700/070-21.5	
		38.00						BSF-F-1700/070-18.5	BSF-M-F-1A-19.5
		38.50						BSF-F-1700/070-19.0	
		39.00						BSF-F-1700/070-19.5	
		39.50						BSF-F-1700/070-20.0	

¹⁾A = Coating for steel alloys, titanium and Inconel / D = Coating for aluminium alloys (please see page 169)

ORDERING INFORMATION

- Standard shank for tool part number without any addition: Cylindrical shank.
- With addition: "-HB" = Weldon shank, "-HE" = Whistle Notch shank (please see page 169)
- For tools with air activation (please see page 170) add "A" to the article number (e.g. BSFA-F-1450/070-16.0)
- Attention: The blades for the tool need to be ordered separately.

BSF Tool for Bore-Ø 17.5 mm



Tool Table

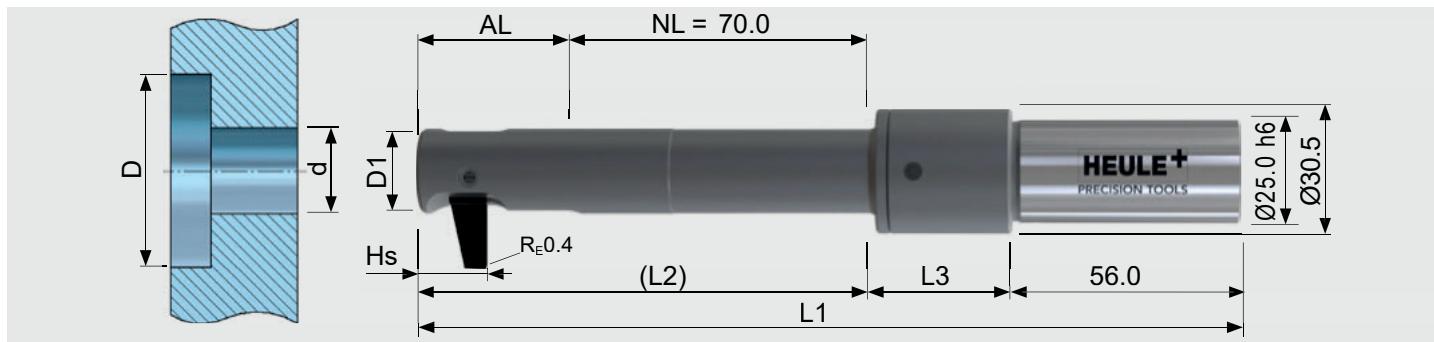
Bore-Ø d	Tool.-Ø D1	Counter- bore-Ø D	AL	HS	L1	L2	L3	Tool without Blade	Blade ¹
								Part No.	Part No.
17.50	17.40	26.00	37.25	16.30	200.25	111.25	33.00	BSF-G-1750/070-20.0	BSF-M-G-1A-6.0
		26.50						BSF-G-1750/070-20.5	
		27.00						BSF-G-1750/070-21.0	
		27.50						BSF-G-1750/070-21.5	
		28.00						BSF-G-1750/070-22.0	
		28.50						BSF-G-1750/070-22.5	
		29.00						BSF-G-1750/070-23.0	
		29.50						BSF-G-1750/070-23.5	
		30.00						BSF-G-1750/070-24.0	
		30.50						BSF-G-1750/070-20.0	BSF-M-G-1A-10.5
		31.00						BSF-G-1750/070-20.5	
		31.50						BSF-G-1750/070-21.0	
		32.00						BSF-G-1750/070-21.5	
		32.50						BSF-G-1750/070-22.0	
		33.00						BSF-G-1750/070-22.5	
		33.50						BSF-G-1750/070-23.0	
		34.00						BSF-G-1750/070-23.5	
		34.50						BSF-G-1750/070-24.0	
		35.00						BSF-G-1750/070-20.0	BSF-M-G-1A-15.0
		35.50						BSF-G-1750/070-20.5	
		36.00						BSF-G-1750/070-21.0	
		36.50						BSF-G-1750/070-21.5	
		37.00						BSF-G-1750/070-22.0	
		37.50						BSF-G-1750/070-22.5	
		38.00						BSF-G-1750/070-23.0	
		38.50						BSF-G-1750/070-23.5	
		39.00						BSF-G-1750/070-24.0	
		39.50						BSF-G-1750/070-20.0	BSF-M-G-1A-19.5
		40.00						BSF-G-1750/070-20.5	
		40.50						BSF-G-1750/070-21.0	

¹⁾A = Coating for steel alloys, titanium and Inconel / D = Coating for aluminium alloys (please see page 169)

ORDERING INFORMATION

- Standard shank for tool part number without any addition: Cylindrical shank.
- With addition: "-HB" = Weldon shank, "-HE" = Whistle Notch shank (please see page 169)
- For tools with air activation (please see page 170) add "A" to the article number (e.g. BSFA-G-1750/070-20.0)
- Attention: The blades for the tool need to be ordered separately.

BSF Tool for Bore-Ø 18.0 mm



Tool Table

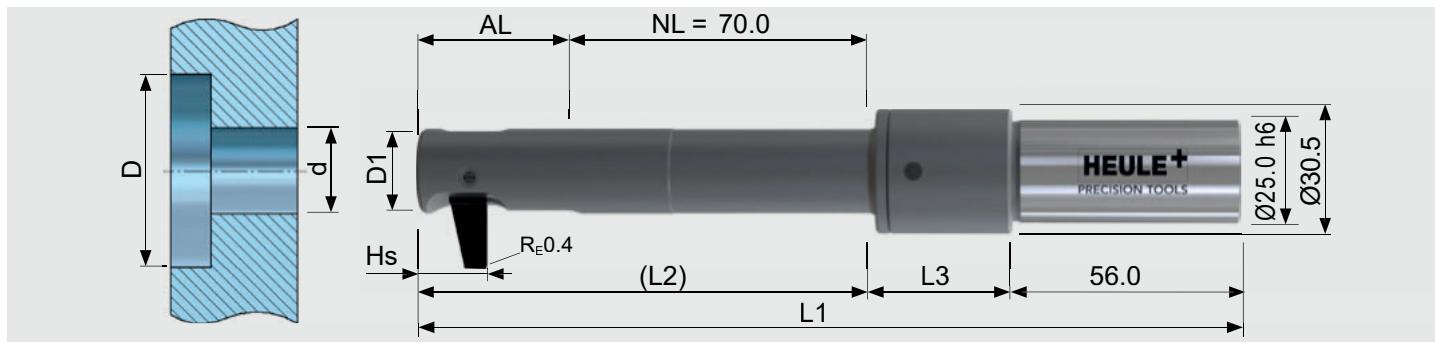
Bore-Ø d	Tool.-Ø D1	Counter- bore-Ø D	AL	HS	L1	L2	L3	Tool without Blade	Blade ¹
								Part No.	Part No.
18.00	17.90	26.50	37.25	16.30	200.25	111.25	33.00	BSF-G-1800/070-20.5	BSF-M-G-1A-6.0
		27.00						BSF-G-1800/070-21.0	
		27.50						BSF-G-1800/070-21.5	
		28.00						BSF-G-1800/070-22.0	
		28.50						BSF-G-1800/070-22.5	
		29.00						BSF-G-1800/070-23.0	
		29.50						BSF-G-1800/070-23.5	
		30.00						BSF-G-1800/070-24.0	
		30.50						BSF-G-1800/070-24.5	
		31.00						BSF-G-1800/070-20.5	BSF-M-G-1A-10.5
		31.50						BSF-G-1800/070-21.0	
		32.00						BSF-G-1800/070-21.5	
		32.50						BSF-G-1800/070-22.0	
		33.00						BSF-G-1800/070-22.5	
		33.50						BSF-G-1800/070-23.0	
		34.00						BSF-G-1800/070-23.5	
		34.50						BSF-G-1800/070-24.0	
		35.00						BSF-G-1800/070-24.5	
		35.50						BSF-G-1800/070-20.5	BSF-M-G-1A-15.0
		36.00						BSF-G-1800/070-21.0	
		36.50						BSF-G-1800/070-21.5	
		37.00						BSF-G-1800/070-22.0	
		37.50						BSF-G-1800/070-22.5	
		38.00						BSF-G-1800/070-23.0	
		38.50						BSF-G-1800/070-23.5	
		39.00						BSF-G-1800/070-24.0	
		39.50						BSF-G-1800/070-24.5	
		40.00						BSF-G-1800/070-20.5	BSF-M-G-1A-19.5
		40.50						BSF-G-1800/070-21.0	
		41.00						BSF-G-1800/070-21.5	
		41.50						BSF-G-1800/070-22.0	

¹A = Coating for steel alloys, titanium and Inconel / D = Coating for aluminium alloys (please see page 169)

ORDERING INFORMATION

- Standard shank for tool part number without any addition: Cylindrical shank.
- With addition: "-HB" = Weldon shank, "-HE" = Whistle Notch shank (please see page 169)
- For tools with air activation (please see page 170) add "A" to the article number (e.g. BSFA-G-1750/070-20.0)
- Attention: The blades for the tool need to be ordered separately.

BSF Tool for Bore-Ø 18.5 mm



Tool Table

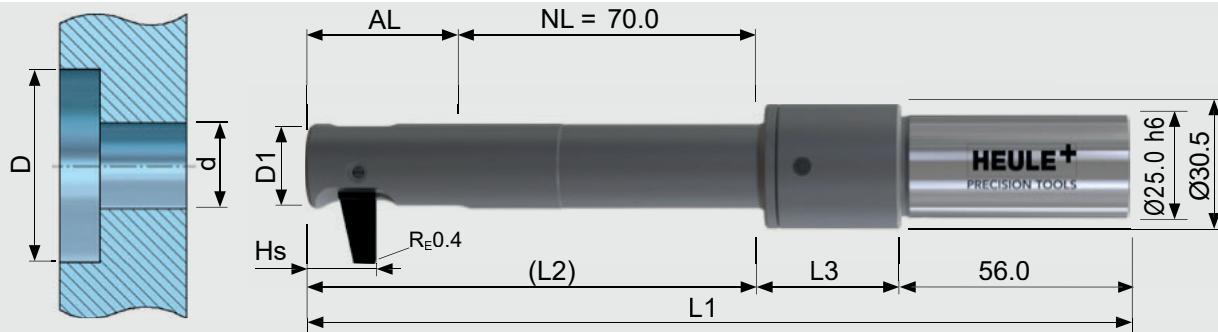
Bore-Ø d	Tool.-Ø D1	Counter- bore-Ø D	AL	HS	L1	L2	L3	Tool without Blade	Blade ¹
								Part No.	Part No.
18.50	18.40	27.00	37.25	16.30	200.25	111.25	33.00	BSF-G-1850/070-21.0	BSF-M-G-1A-6.0
		27.50						BSF-G-1850/070-21.5	
		28.00						BSF-G-1850/070-22.0	
		28.50						BSF-G-1850/070-22.5	
		29.00						BSF-G-1850/070-23.0	
		29.50						BSF-G-1850/070-23.5	
		30.00						BSF-G-1850/070-24.0	
		30.50						BSF-G-1850/070-24.5	
		31.00						BSF-G-1850/070-25.0	
		31.50						BSF-G-1850/070-21.0	BSF-M-G-1A-10.5
		32.00						BSF-G-1850/070-21.5	
		32.50						BSF-G-1850/070-22.0	
		33.00						BSF-G-1850/070-22.5	
		33.50						BSF-G-1850/070-23.0	
		34.00						BSF-G-1850/070-23.5	
		34.50						BSF-G-1850/070-24.0	
		35.00						BSF-G-1850/070-24.5	
		35.50						BSF-G-1850/070-25.0	
		36.00						BSF-G-1850/070-21.0	BSF-M-G-1A-15.0
		36.50						BSF-G-1850/070-21.5	
		37.00						BSF-G-1850/070-22.0	
		37.50						BSF-G-1850/070-22.5	
		38.00						BSF-G-1850/070-23.0	
		38.50						BSF-G-1850/070-23.5	
		39.00						BSF-G-1850/070-24.0	
		39.50						BSF-G-1850/070-24.5	
		40.00						BSF-G-1850/070-25.0	
		40.50						BSF-G-1850/070-21.0	BSF-M-G-1A-19.5
		41.00						BSF-G-1850/070-21.5	
		41.50						BSF-G-1850/070-22.0	
		42.00						BSF-G-1850/070-22.5	
		42.50						BSF-G-1850/070-23.0	
		43.00						BSF-G-1850/070-23.5	

¹⁾A = Coating for steel alloys, titanium and Inconel / D = Coating for aluminium alloys (please see page 169)

ORDERING INFORMATION

- Standard shank for tool part number without any addition: Cylindrical shank.
- With addition: "-HB" = Weldon shank, "-HE" = Whistle Notch shank (please see page 169)
- For tools with air activation (please see page 170) add "A" to the article number (e.g. BSFA-G-1750/070-20.0)
- Attention: The blades for the tool need to be ordered separately.

BSF Tool for Bore-Ø 19.0 mm



Tool Table

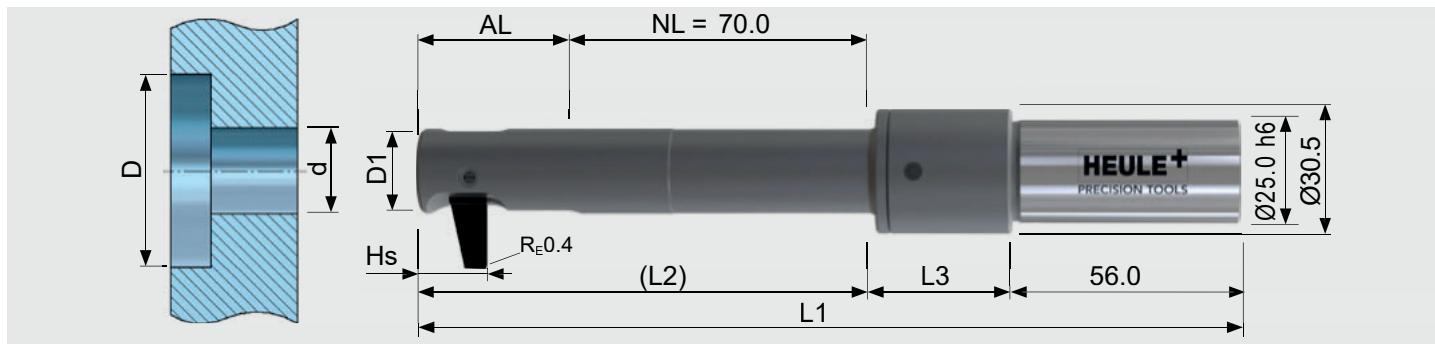
Bore-Ø d	Tool.-Ø D1	Counter- bore-Ø D	AL	HS	L1	L2	L3	Tool without Blade	Blade ¹
								Part No.	Part No.
19.00	18.90	27.50	37.25	16.30	200.25	111.25	33.00	BSF-G-1900/070-21.5	BSF-M-G-1A-6.0
		28.00						BSF-G-1900/070-22.0	
		28.50						BSF-G-1900/070-22.5	
		29.00						BSF-G-1900/070-23.0	
		29.50						BSF-G-1900/070-23.5	
		30.00						BSF-G-1900/070-24.0	
		30.50						BSF-G-1900/070-24.5	
		31.00						BSF-G-1900/070-25.0	
		31.50						BSF-G-1900/070-25.5	
		32.00						BSF-G-1900/070-21.5	BSF-M-G-1A-10.5
		32.50						BSF-G-1900/070-22.0	
		33.00						BSF-G-1900/070-22.5	
		33.50						BSF-G-1900/070-23.0	
		34.00						BSF-G-1900/070-23.5	
		34.50						BSF-G-1900/070-24.0	
		35.00						BSF-G-1900/070-24.5	
		35.50						BSF-G-1900/070-25.0	
		36.00						BSF-G-1900/070-25.5	
		36.50						BSF-G-1900/070-21.5	BSF-M-G-1A-15.0
		37.00						BSF-G-1900/070-22.0	
		37.50						BSF-G-1900/070-22.5	
		38.00						BSF-G-1900/070-23.0	
		38.50						BSF-G-1900/070-23.5	
		39.00						BSF-G-1900/070-24.0	
		39.50						BSF-G-1900/070-24.5	
		40.00						BSF-G-1900/070-25.0	
		40.50						BSF-G-1900/070-25.5	
		41.00						BSF-G-1900/070-21.5	BSF-M-G-1A-19.5
		41.50						BSF-G-1900/070-22.0	
		42.00						BSF-G-1900/070-22.5	
		42.50						BSF-G-1900/070-23.0	
		43.00						BSF-G-1900/070-23.5	
		43.50						BSF-G-1900/070-24.0	
		44.00						BSF-G-1900/070-24.5	

¹⁾A = Coating for steel alloys, titanium and Inconel / D = Coating for aluminium alloys (please see page 169)

ORDERING INFORMATION

- Standard shank for tool part number without any addition: Cylindrical shank.
- With addition: "-HB" = Weldon shank, "-HE" = Whistle Notch shank (please see page 169)
- For tools with air activation (please see page 170) add "A" to the article number (e.g. BSFA-G-1750/070-20.0)
- Attention: The blades for the tool need to be ordered separately.

BSF Tool for Bore-Ø 19.5 mm



Tool Table

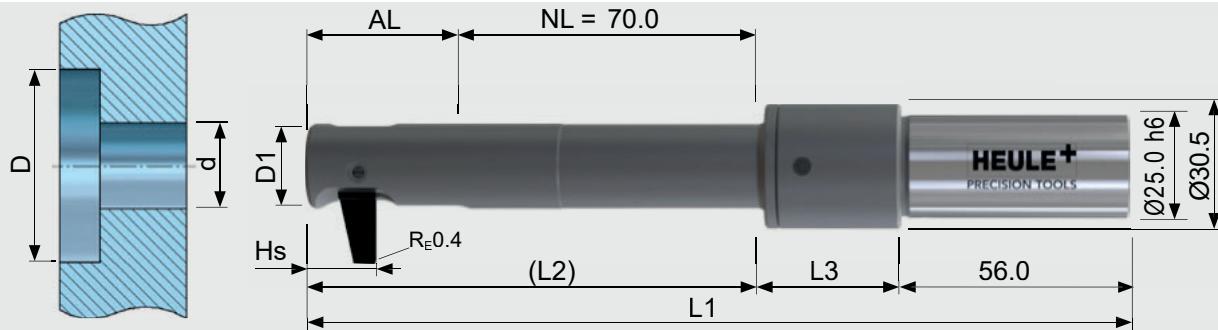
Bore-Ø d	Tool.-Ø D1	Counter- bore-Ø D	AL	HS	L1	L2	L3	Tool without Blade	Blade ¹
								Part No.	Part No.
19.50	19.40	28.00	37.25	16.30	200.25	111.25	33.00	BSF-G-1950/070-22.0	BSF-M-G-1A-6.0
		28.50						BSF-G-1950/070-22.5	
		29.00						BSF-G-1950/070-23.0	
		29.50						BSF-G-1950/070-23.5	
		30.00						BSF-G-1950/070-24.0	
		30.50						BSF-G-1950/070-24.5	
		31.00						BSF-G-1950/070-25.0	
		31.50						BSF-G-1950/070-25.5	
		32.00						BSF-G-1950/070-26.0	
		32.50						BSF-G-1950/070-22.0	BSF-M-G-1A-10.5
		33.00						BSF-G-1950/070-22.5	
		33.50						BSF-G-1950/070-23.0	
		34.00						BSF-G-1950/070-23.5	
		34.50						BSF-G-1950/070-24.0	
		35.00						BSF-G-1950/070-24.5	
		35.50						BSF-G-1950/070-25.0	
		36.00						BSF-G-1950/070-25.5	
		36.50						BSF-G-1950/070-26.0	
		37.00						BSF-G-1950/070-22.0	BSF-M-G-1A-15.0
		37.50						BSF-G-1950/070-22.5	
		38.00						BSF-G-1950/070-23.0	
		38.50						BSF-G-1950/070-23.5	
		39.00						BSF-G-1950/070-24.0	
		39.50						BSF-G-1950/070-24.5	
		40.00						BSF-G-1950/070-25.0	
		40.50						BSF-G-1950/070-25.5	
		41.00						BSF-G-1950/070-26.0	
		41.50						BSF-G-1950/070-22.0	BSF-M-G-1A-19.5
		42.00						BSF-G-1950/070-22.5	
		42.50						BSF-G-1950/070-23.0	
		43.00						BSF-G-1950/070-23.5	
		43.50						BSF-G-1950/070-24.0	
		44.00						BSF-G-1950/070-24.5	
		44.50						BSF-G-1950/070-25.0	
		45.00						BSF-G-1950/070-25.5	

¹⁾A = Coating for steel alloys, titanium and Inconel / D = Coating for aluminium alloys (please see page 169)

ORDERING INFORMATION:

- Standard shank for tool part number without any addition: Cylindrical shank. With addition: "-HB" = Weldon shank, "-HE" = Whistle Notch shank (please s. page 169) / - For tools with air activation (please see page 170) add "A" to the article number (e.g. BSFA-G-1750/070-20.0) / - Attention: The blades for the tool need to be ordered separately.

BSF Tool for Bore-Ø 20.0 mm



Tool Table

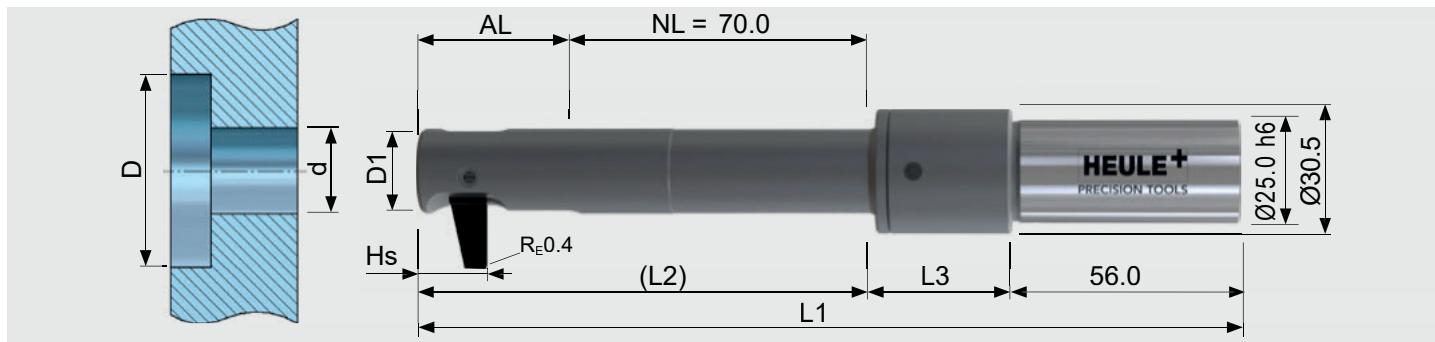
Bore-Ø d	Tool.-Ø D1	Counter- bore-Ø D	AL	HS	L1	L2	L3	Tool without Blade	Blade ¹
20.00	19.90	28.50	37.25	16.30	200.25	111.25	33.00	BSF-G-2000/070-22.5	BSF-M-G-1A-6.0
		29.00						BSF-G-2000/070-23.0	
		29.50						BSF-G-2000/070-23.5	
		30.00						BSF-G-2000/070-24.0	
		30.50						BSF-G-2000/070-24.5	
		31.00						BSF-G-2000/070-25.0	
		31.50						BSF-G-2000/070-25.5	
		32.00						BSF-G-2000/070-26.0	
		32.50						BSF-G-2000/070-26.5	
		33.00						BSF-G-2000/070-22.5	BSF-M-G-1A-10.5
		33.50						BSF-G-2000/070-23.0	
		34.00						BSF-G-2000/070-23.5	
		34.50						BSF-G-2000/070-24.0	
		35.00						BSF-G-2000/070-24.5	
		35.50						BSF-G-2000/070-25.0	
		36.00						BSF-G-2000/070-25.5	
		36.50						BSF-G-2000/070-26.0	
		37.00						BSF-G-2000/070-26.5	
		37.50						BSF-G-2000/070-22.5	BSF-M-G-1A-15.0
		38.00						BSF-G-2000/070-23.0	
		38.50						BSF-G-2000/070-23.5	
		39.00						BSF-G-2000/070-24.0	
		39.50						BSF-G-2000/070-24.5	
		40.00						BSF-G-2000/070-25.0	
		40.50						BSF-G-2000/070-25.5	
		41.00						BSF-G-2000/070-26.0	
		41.50						BSF-G-2000/070-26.5	
		42.00						BSF-G-2000/070-22.5	BSF-M-G-1A-19.5
		42.50						BSF-G-2000/070-23.0	
		43.00						BSF-G-2000/070-23.5	
		43.50						BSF-G-2000/070-24.0	
		44.00						BSF-G-2000/070-24.5	
		44.50						BSF-G-2000/070-25.0	
		45.00						BSF-G-2000/070-25.5	
		45.50						BSF-G-2000/070-26.0	
		46.00						BSF-G-2000/070-26.5	

¹⁾A = Coating for steel alloys, titanium and Inconel / D = Coating for aluminium alloys (please see page 169)

ORDERING INFORMATION:

- Standard shank for tool part number without any addition: Cylindrical shank. With addition: "-HB" = Weldon shank, "-HE" = Whistle Notch shank (please s. page 169) / - For tools with air activation (please see page 170) add "A" to the article number (e.g. BSFA-G-1750/070-20.0) / - Attention: The blades for the tool need to be ordered separately.

BSF Tool for Bore-Ø 20.5 mm



Tool Table

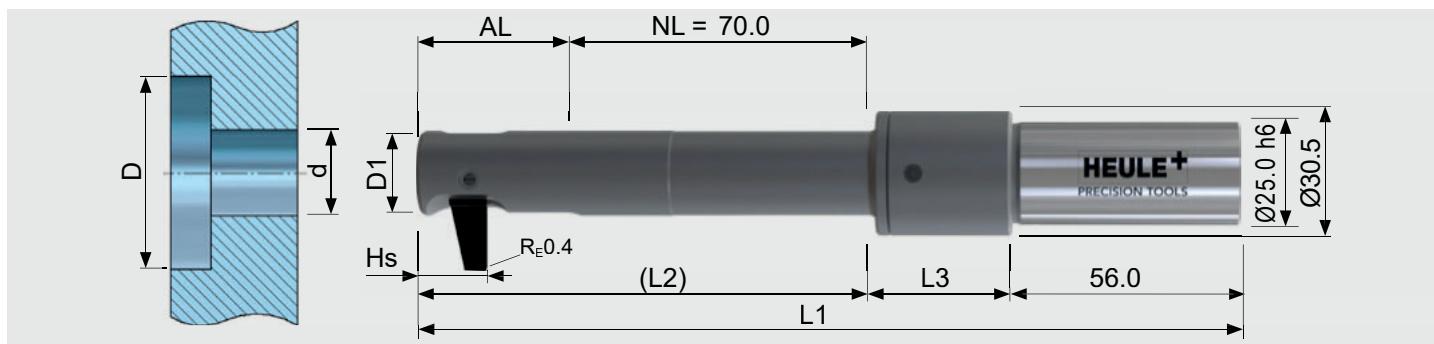
Bore-Ø d	Tool.-Ø D1	Counter- bore-Ø D	AL	HS	L1	L2	L3	Tool without Blade	Blade ¹
								Part No.	Part No.
20.50	20.40	29.00	39.50	16.30	202.50	113.50	33.00	BSF-G-2050/070-23.0	BSF-M-G-1A-6.0
		29.50						BSF-G-2050/070-23.5	
		30.00						BSF-G-2050/070-24.0	
		30.50						BSF-G-2050/070-24.5	
		31.00						BSF-G-2050/070-25.0	
		31.50						BSF-G-2050/070-25.5	
		32.00						BSF-G-2050/070-26.0	
		32.50						BSF-G-2050/070-26.5	
		33.00						BSF-G-2050/070-27.0	
		33.50						BSF-G-2050/070-23.0	BSF-M-G-1A-10.5
		34.00						BSF-G-2050/070-23.5	
		34.50						BSF-G-2050/070-24.0	
		35.00						BSF-G-2050/070-24.5	
		35.50						BSF-G-2050/070-25.0	
		36.00						BSF-G-2050/070-25.5	
		36.50						BSF-G-2050/070-26.0	
		37.00						BSF-G-2050/070-26.5	
		37.50						BSF-G-2050/070-27.0	
		38.00						BSF-G-2050/070-23.0	BSF-M-G-1A-15.0
		38.50						BSF-G-2050/070-23.5	
		39.00						BSF-G-2050/070-24.0	
		39.50						BSF-G-2050/070-24.5	
		40.00						BSF-G-2050/070-25.0	
		40.50						BSF-G-2050/070-25.5	
		41.00						BSF-G-2050/070-26.0	
		41.50						BSF-G-2050/070-26.5	
		42.00						BSF-G-2050/070-27.0	

¹⁾A = Coating for steel alloys, titanium and Inconel / D = Coating for aluminium alloys (please see page 169)

ORDERING INFORMATION

- Standard shank for tool part number without any addition: Cylindrical shank.
- With addition: "-HB" = Weldon shank, "-HE" = Whistle Notch shank (please see page 169)
- For tools with air activation (please see page 170) add "A" to the article number (e.g. BSFA-G-1750/070-20.0)
- Attention: The blades for the tool need to be ordered separately.

BSF Tool for Bore-Ø 20.5 mm



Tool Table

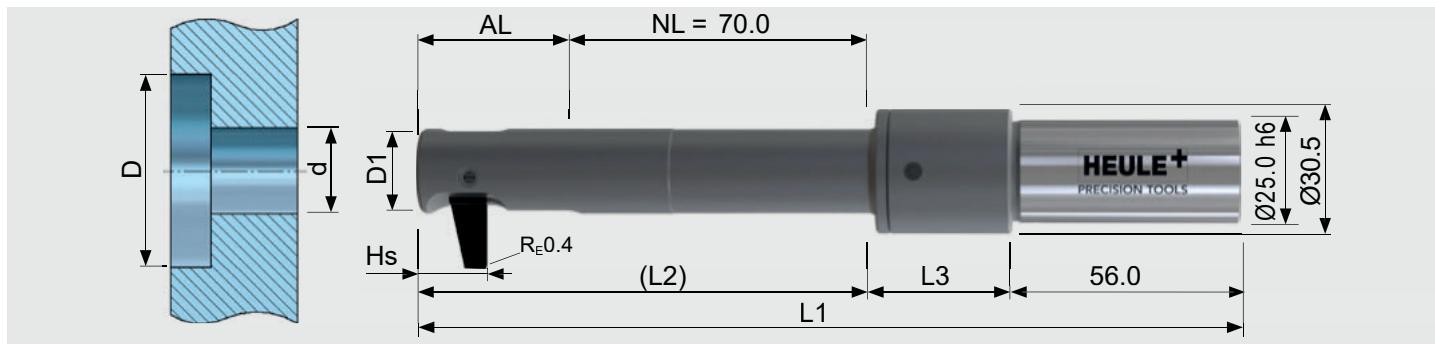
Bore-Ø d	Tool.-Ø D1	Counter- bore-Ø D	AL	HS	L1	L2	L3	Tool without Blade	Blade ¹
								Part No.	Part No.
20.50	20.40	42.50						BSF-G-2050/070-23.0	BSF-M-G-1A-19.5
		43.00						BSF-G-2050/070-23.5	
		43.50						BSF-G-2050/070-24.0	
		44.00						BSF-G-2050/070-24.5	
		44.50						BSF-G-2050/070-25.0	
		45.00						BSF-G-2050/070-25.5	
		45.50						BSF-G-2050/070-26.0	
		46.00						BSF-G-2050/070-26.5	
		46.50						BSF-G-2050/070-27.0	
		47.00	39.50	16.30	202.50	113.50	33.00	BSF-G-2050/070-23.0	BSF-M-G-1A-24.0
		47.50						BSF-G-2050/070-23.5	

¹⁾A = Coating for steel alloys, titanium and Inconel / D = Coating for aluminium alloys (please see page 169)

ORDERING INFORMATION

- Standard shank for tool part number without any addition: Cylindrical shank.
With addition: "-HB" = Weldon shank, "-HE" = Whistle Notch shank (please see page 169)
- For tools with air activation (please see page 170) add "A" to the article number (e.g. BSFA-G-1750/070-20.0)
- Attention: The blades for the tool need to be ordered separately.

BSF Tool for Bore-Ø 21.0 mm



Tool Table

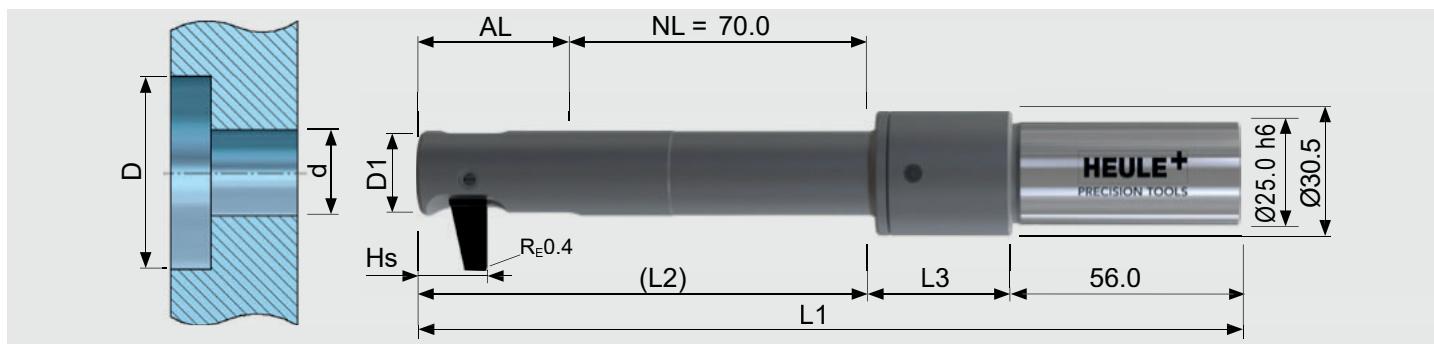
Bore-Ø d	Tool.-Ø D1	Counter- bore-Ø D	AL	HS	L1	L2	L3	Tool without Blade	Blade ¹
								Part No.	Part No.
21.00	20.90	29.50	29.50	39.50	16.30	202.50	113.50	33.00	BSF-G-2100/070-23.5
			30.00						BSF-M-G-1A-6.0
			30.50						BSF-G-2100/070-24.0
			31.00						BSF-G-2100/070-24.5
			31.50						BSF-G-2100/070-25.0
			32.00						BSF-G-2100/070-25.5
			32.50						BSF-G-2100/070-26.0
			33.00						BSF-G-2100/070-26.5
			33.50						BSF-G-2100/070-27.0
		34.00						BSF-G-2100/070-27.5	BSF-M-G-1A-10.5
								BSF-G-2100/070-23.5	
								BSF-G-2100/070-24.0	
								BSF-G-2100/070-24.5	
								BSF-G-2100/070-25.0	
								BSF-G-2100/070-25.5	
								BSF-G-2100/070-26.0	
								BSF-G-2100/070-26.5	
								BSF-G-2100/070-27.0	
								BSF-G-2100/070-27.5	
		38.50						BSF-G-2100/070-23.5	BSF-M-G-1A-15.0
								BSF-G-2100/070-24.0	
								BSF-G-2100/070-24.5	
								BSF-G-2100/070-25.0	
								BSF-G-2100/070-25.5	
								BSF-G-2100/070-26.0	
								BSF-G-2100/070-26.5	
								BSF-G-2100/070-27.0	
								BSF-G-2100/070-27.5	

¹⁾A = Coating for steel alloys, titanium and Inconel / D = Coating for aluminium alloys (please see page 169)

ORDERING INFORMATION

- Standard shank for tool part number without any addition: Cylindrical shank.
- With addition: "-HB" = Weldon shank, "-HE" = Whistle Notch shank (please see page 169)
- For tools with air activation (please see page 170) add "A" to the article number (e.g. BSFA-G-1750/070-20.0)
- Attention: The blades for the tool need to be ordered separately.

BSF Tool for Bore-Ø 21.0 mm



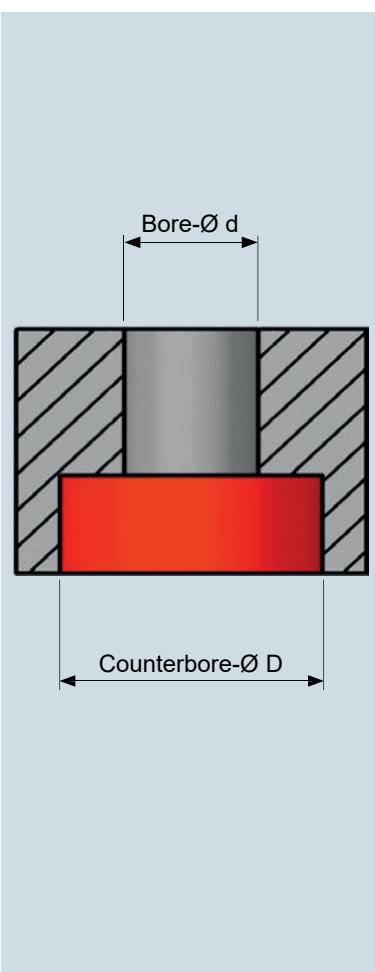
Tool Table

Bore-Ø d	Tool.-Ø D1	Counter- bore-Ø D	AL	HS	L1	L2	L3	Tool without Blade	Blade ¹
								Part No.	Part No.
21.00	20.90	43.00	39.50	16.30	202.50	113.50	33.00	BSF-G-2100/070-23.5	BSF-M-G-1A-19.5
		43.50						BSF-G-2100/070-24.0	
		44.00						BSF-G-2100/070-24.5	
		44.50						BSF-G-2100/070-25.0	
		45.00						BSF-G-2100/070-25.5	
		45.50						BSF-G-2100/070-26.0	
		46.00						BSF-G-2100/070-26.5	
		46.50						BSF-G-2100/070-27.0	
		47.00						BSF-G-2100/070-27.5	
		47.50						BSF-G-2100/070-23.5	BSF-M-G-1A-24.0
		48.00						BSF-G-2100/070-24.0	
		48.50						BSF-G-2100/070-24.5	
		49.00						BSF-G-2100/070-25.0	

¹⁾A = Coating for steel alloys, titanium and Inconel / D = Coating for aluminium alloys (please see page 169)

ORDERING INFORMATION

- Standard shank for tool part number without any addition: Cylindrical shank.
- With addition: "-HB" = Weldon shank, "-HE" = Whistle Notch shank (please see page 169)
- For tools with air activation (please see page 170) add "A" to the article number (e.g. BSFA-G-1750/070-20.0)
- Attention: The blades for the tool need to be ordered separately.



Bore-Ø d	Counterbore-Ø D		
6.5	11.0	13.0	15.0
	Tool BSF-A-0650/040-6.5	BSF-A-0650/040-7.0	BSF-A-0650/040-7.5
	Blade BSF-M-A-1A-4.5	BSF-M-A-1A-6.0	BSF-M-A-1A-7.5
8.5	15.0	16.0	18.0
	Tool BSF-B-0850/040-8.5	BSF-B-0850/040-9.5	BSF-B-0850/040-8.5
	Blade BSF-M-B-1A-6.5	BSF-M-B-1A-6.5	BSF-M-B-1A-9.5
10.5	18.0	20.0	24.0
	Tool BSF-D-1050/050-11.0	BSF-D-1050/050-13.0	BSF-D-1050/050-12.0
	Blade BSF-M-D-1A-7.0	BSF-M-D-1A-7.0	BSF-M-D-1A-12.0
13.0	20.0	24.0	26.0
	Tool BSF-E-1300/050-15.0	BSF-E-1300/050-14.0	BSF-E-1300/050-16.0
	Blade BSF-M-E-1A-5.0	BSF-M-E-1A-10.0	BSF-M-E-1A-10.0
17.0	26.0	30.0	33.0
	Tool BSF-F-1700/070-20.5	BSF-F-1700/070-21.0	BSF-F-1700/070-20.5
	Blade BSF-M-F-1A-5.5	BSF-M-F-1A-9.0	BSF-M-F-1A-12.5
21.0	33.0	36.0	40.0
	Tool BSF-G-2100/070-27.0	BSF-G-2100/070-25.5	BSF-G-2100/070-25.0
	Blade BSF-M-G-1A-6.0	BSF-M-G-1A-10.5	BSF-M-G-1A-15.0

Machine Parameters - Minimum Requirements

Machine	<p>Tool holder with internal cooling</p> <p>Clamping system Weldon without extra sealing option possible</p> <p>Activation speed to swing out the blade: up to 5000 rev./min.</p> <p>The activation speed depends on bore diameter and counterbore ratio. Please refer to page 202 for accurate indications.</p>
Coolant system	<p>Variant 1: Cooling lubricant emulsion</p> <p>Internal coolant through spindle, minimum 20 bar</p> <p>Activation pressure: 20-50 bar</p> <p>Attention: When machining soft materials, reduce internal coolant pressure! Coolant programmable (on/off).</p> <p>Coolant must be filtered (filter dimension $\leq 25 \mu\text{m}$)</p> <p>Variant 2: Compressed air</p> <p>Compressed air cooling through spindle, minimum 6 bar</p> <p>Activation pressure: 6-20 bar</p>
Clamping workpiece	The BSF tool is a pull operating tool. Make sure that there is enough space behind the workpiece for the chips. When machining long chipping materials, program the feed cycle so that you get short chips. The removal of the chips is supported by the coolant flushing.
Clamping system	When using tools with a cylindrical shank, a clamping collet seal is compulsory.

Technical Data and Settings

Cutting Data BSF

Material	Condition	Tensile strength (N/mm ²)	Cutting speed (m/min.)	Series and Bore diameter				
				A 6.50- 7.00	B 7.50- 8.50	C 9.00- 10.00	D 10.50- 11.50	E/F/G 12.00- 21.00
Feed F (mm/rev.)								
Unalloyed steel		<500	40-70	0.01-0.02	0.01-0.03	0.02-0.04	0.03-0.06	0.03-0.08
Cast steel		500-800	40-70	0.01-0.02	0.01-0.03	0.02-0.04	0.03-0.06	0.03-0.08
Grey cast iron		<500	50-90	0.01-0.02	0.01-0.03	0.02-0.04	0.03-0.06	0.03-0.08
Ductile cast iron		300-800	40-70	0.01-0.02	0.01-0.03	0.02-0.04	0.03-0.06	0.03-0.08
Low alloy steel	annealed	<850	40-70	0.01-0.02	0.01-0.03	0.02-0.04	0.03-0.06	0.03-0.08
	tempered	850-1000	30-50	0.01-0.02	0.01-0.03	0.02-0.04	0.03-0.06	0.03-0.08
	tempered	1000-1200	15-30	0.01-0.02	0.01-0.02	0.01-0.03	0.02-0.04	0.02-0.05
High alloy steel	annealed	<850	20-50	0.01-0.02	0.01-0.03	0.02-0.04	0.03-0.06	0.03-0.08
	tempered	850-1100	15-30	0.01-0.02	0.01-0.02	0.01-0.03	0.02-0.04	0.02-0.05
Stainless steel	ferritic	450-650	15-30	0.01-0.02	0.01-0.03	0.02-0.04	0.03-0.06	0.03-0.08
	austenitic	650-900	10-20	0.01-0.02	0.01-0.02	0.01-0.03	0.02-0.04	0.02-0.05
	martensitic	500-700	15-30	0.01-0.02	0.01-0.02	0.01-0.03	0.02-0.04	0.02-0.05
Special alloy	(Inconel, Titan)	<1200	10-20	0.01-0.02	0.01-0.02	0.01-0.03	0.02-0.04	0.02-0.05
Wrought / Cast aluminium alloys		60-120	60-120	0.02-0.03	0.02-0.04	0.02-0.05	0.02-0.08	0.05-0.10
Copper alloys	Brass		50-90	0.01-0.02	0.01-0.03	0.02-0.04	0.03-0.06	0.03-0.08
	Bronze short-chipping		30-50	0.01-0.02	0.01-0.03	0.02-0.04	0.03-0.06	0.03-0.08
	Bronze long-chipping		20-30	0.01-0.02	0.01-0.02	0.01-0.03	0.02-0.04	0.02-0.05

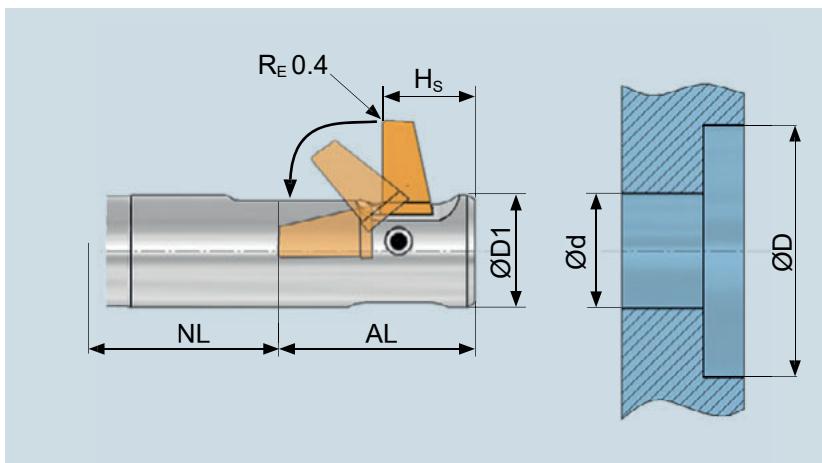
WARNING NOTICE

All listed cutting data are standard values only! The cutting values depend on the amount of slope of the uneven bore edge. (i.e. high slope ► low cutting value). The feed also depends on the sloping ratio. In case of hard to machine materials or uneven bore edges, we recommend to apply cutting speeds that are at the lower end of the range for uneven bore edges.

Activation Speed

The activation speed (rev./min.) to be set to swing out the blade depends on the bore diameter and the counterbore ratio (counterbore diameter : bore diameter).

Counterbore ratio	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3
Bore-Ø d										
Series A										
6.5	4500	4500	4500	3500	3500	3500	3000	3000	2500	2500
7.0	2500	2500	2500	2500	2500	2000	2000	2000	2000	2000
Series B										
7.5	4500	4500	4500	3500	3500	3000	3000	2500	2500	2500
8.0	2500	2500	2500	2500	2500	2000	2000	2000	2000	2000
8.5	2000	2000	2000	2000	2000	2000	2000	2000	1500	1500
Series C										
9.0	3500	3500	3500	3000	3000	2500	2500	2500	2500	2500
9.5	2500	2500	2500	2500	2000	2000	2000	2000	2000	2000
10.0	2000	2000	2000	2000	2000	2000	2000	2000	2000	1500
Series D										
10.5	5000	5000	5000	3500	3500	3500	3000	3000	2500	2500
11.0	3000	3000	3000	2500	2500	2500	2500	2500	2000	2000
11.5	2500	2500	2500	2000	2000	2000	2000	2000	2000	2000
Series E										
12.0	3500	3500	3500	2500	2500	2500	2500	2500	2000	2000
12.5 - 13.0	2500	2500	2500	2000	2000	2000	2000	1500	1500	1500
13.5 - 14.0	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
Series F										
14.5	3500	3500	3500	2500	2500	2500	2500	2500	2500	2000
15.0 - 15.5	3000	3000	3000	2500	2500	2500	2000	2000	2000	2000
16.0 - 17.0	2000	2000	2000	1500	1500	1500	1500	1500	1500	1500
Series G										
17.5 - 18.0	3500	3500	3500	2500	2500	2500	2000	2000	2000	1500
18.5 - 19.5	2000	2000	2000	1500	1500	1500	1500	1500	1500	1500
20.0 - 21.0	1500	1500	1500	1000	1000	1000	1000	1000	1000	1000



- $\varnothing d$ Bore diameter
- $\varnothing D$ Counterbore diameter
- $\varnothing D_1$ Tool diameter
- R_E Edge radius standard
- NL Working length
- AL Swing length
- H_s Blade height

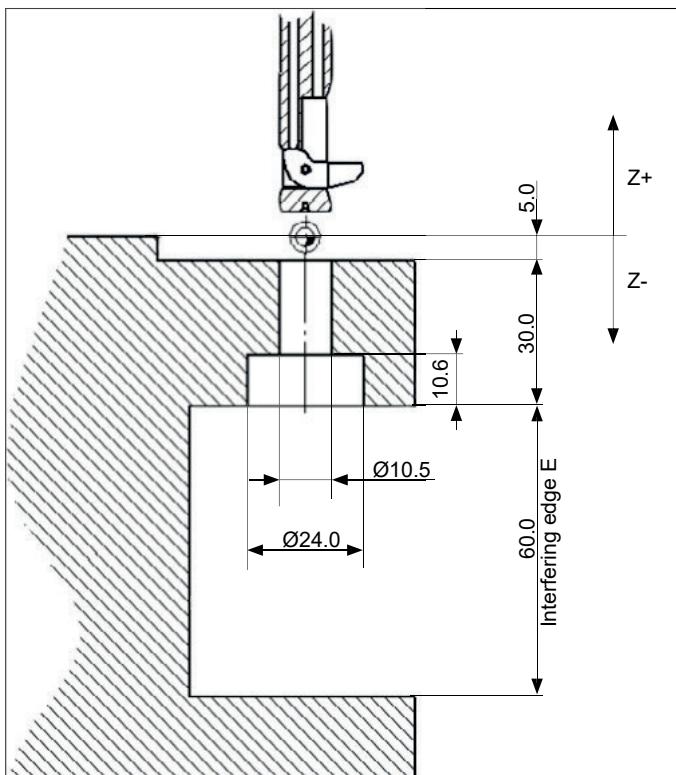
	Specification tolerance range bore diameter	Resulting machining tolerance counterbore diameter
BSF Standard, example A	$\varnothing d 0/+0.1 \text{ mm}$	$\varnothing D \pm 0.2 \text{ mm}$
BSF Standard, example B	$\varnothing d 0/+0.2 \text{ mm}$	$\varnothing D \pm 0.3 \text{ mm}$
BSF-P ¹ , Beispiel A	$\varnothing d 0/+0.1 \text{ mm}$	$\varnothing D \pm 0.1 \text{ mm}$

¹⁾ The tool design BSF-P operates in a smaller tolerance range, but is not part of the standard range (see explanation on page 166). Please contact HEULE for application-specific consultation.

NOTE

Please pay attention to the recommended bore hole tolerance. Bores with bigger tolerance can cause problems (tool is rubbing in the bore, reduced counterbore diameter).

If tool activation (coolant pressure/air pressure) is not switched on, a collision diameter (countersink $\varnothing D +2.0 \text{ mm}$) must be observed for the movement path. Reason: The blade can fold out of the blade housing by its own weight.



Application example

Counterbore M10 for Socket Head Cap Screw with internal hexagonal recess DIN 974-1.

Dimension according to drawing

Bore diameter d	10.5 mm
Counterbore diameter D	24.0 mm
Working length	approx. 30.0 mm
Counterbore depth	10.6 mm
Interfering edge E	60.0 mm
Material	Steel C45

1. Tool selection and series selection

Tool selection by bore diameter and counterbore diameter (see page 176)

Tool:
Bore diameter 10.5 mm
Counterbore diameter 24.0 mm
Result series D / 50 mm

Resulting part number: BSF-D-1050/050-12.0

2. Blade selection

Blade selection by series (see page 176)

Blade:
Series D (Bore diameter 10.5 mm)
Material steel C45: Carbide = 1
Coating A

Resulting part number: BSF-M-D-1A-12.0

Programming Example

FANUC control

Workpiece carbon steel C45

Cutting data (see page 201)

$V_c = 30 \text{ m/min.} \rightarrow S = 400 \text{ rev./min.}$

$F = 0.05 \text{ mm/rev.}$

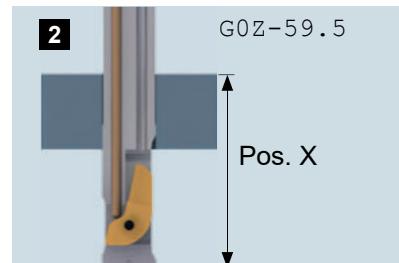
Activation speed (see page 202)

Counterbore ratio = $24.0 : 10.5 = 2.28$

→ Activation speed = 2500 rev./min.



Position the tool above the top material surface, spindle stop, internal coolant ON, 2-5 sec. dwell time for coolant pressure build-up (depending on the pump), the blade retracts.



Traverse in rapid feed to position X.
(Position X= 5.0 mm + 30.0 mm + swing length¹ 22.5 mm + safety distance 2.0 mm)



Switch OFF internal coolant, start activation speed², 1-2 sec. dwell time (attention to coolant pressure), blade swings out into the working position.

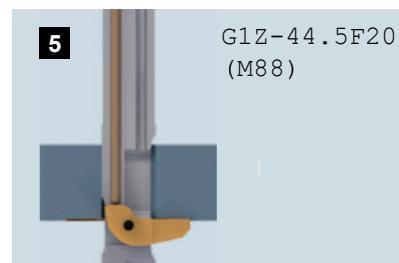
Recommended internal coolant pressure: 20-50 bar

¹⁾ Values for swing length (AL) see page 171 onwards

²⁾ Values for activation speed see page 202



Travel the tool in rapid feed with working speed³ until approx. 1.0 mm below the rear material surface (attention to burr size, part tolerances). External coolant on.

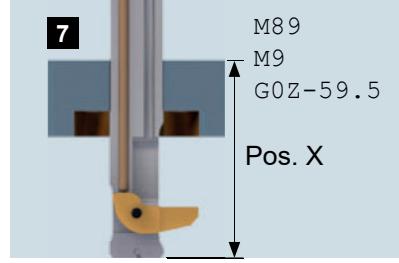


Start machining in working feed³. When full cut is reached (0.25 mm deep) internal coolant ON especially when working with deeper counterbores. Attention to internal coolant pressure particularly when machining soft materials!

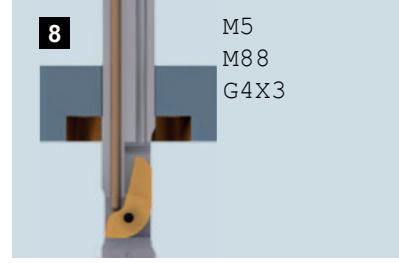


Continue machining to desired counterbore depth. Cutting free without internal coolant (recommendable!).

³⁾ Cutting data see page 201



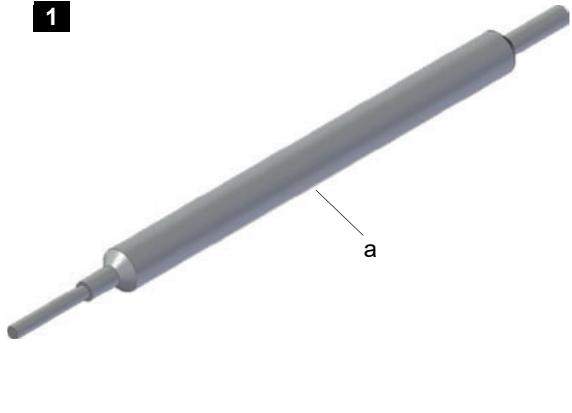
When the counterbore depth is reached, switch OFF internal coolant, in rapid feed back to position X.



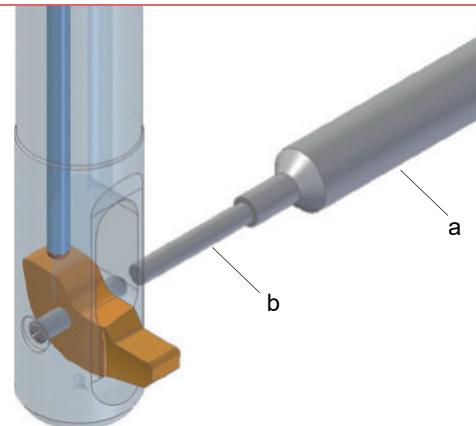
Spindle stop, internal coolant ON, 2-5 sec. dwell time (attention coolant pressure), blade retracts.



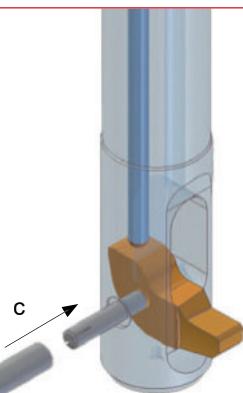
Now, move out of the workpiece in rapid speed.

1

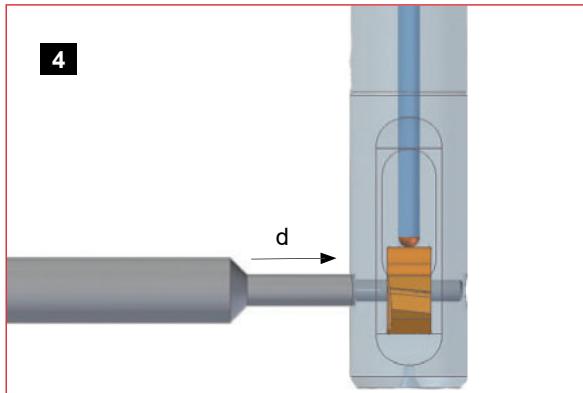
Dismantling - We supply an assembly pin (a) for the BSF blade change.

2

Use the stepped end (b) of the assembly pin and position the assembly pin with the slot free end onto the split pin. Press the assembly pin in until the split pin falls out and the blade is free to be removed.

3

Assembling - Insert the blade. Then insert the split pin with the flat end of the assembly pin first and position the blade (c).

4

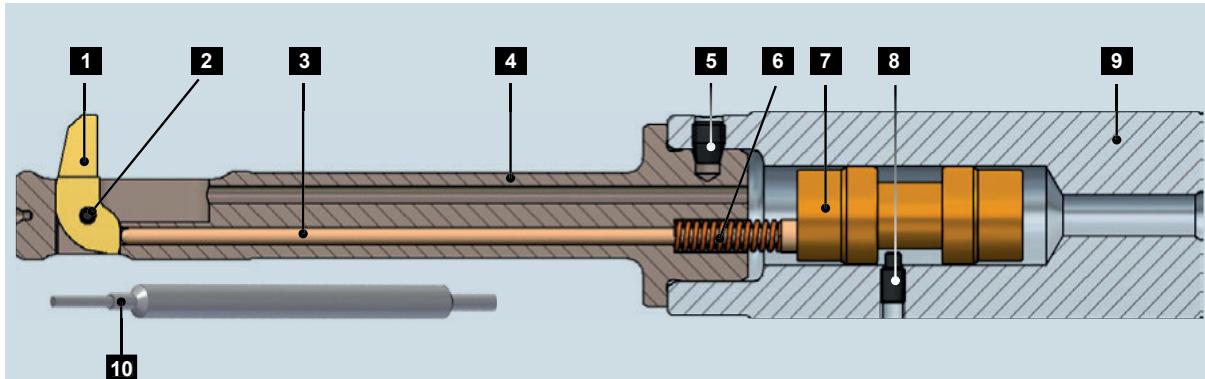
Push the split pin with the non-stepped end of the assembly pin until it is flush with the blade housing (d). Blade is fixed in place. Carry out function check.

NOTE

The blade must move freely by its own weight. If it is not, dismantle the blade and repeat the steps listed above. The blade and blade housing must be checked for soiling.

After an extended storage time it is recommended to check that the blade moves out freely. Dried oil, coolant or dust may cause the blade to stick.

Every time the blade is changed **the split pin must be replaced** (pin is included in blade shipment). Using a split pin several times may cause blade fixing problems.



¹⁾ Positions 1-6 and 10 are identical with the version for operation with compressed air (BSF-Air). The specific BSF-Air spare parts can be found on page 212.

- | | | | | | |
|----------|------------------------|----------|-----------------|-----------|----------------------------|
| 1 | Blade (see page 171ff) | 5 | Clamping screw | 9 | Shank |
| 2 | Split pin | 6 | Pressure spring | 10 | Assembly pin |
| 3 | Control bolt | 7 | Piston | 11 | Allen wrench
for Pos. 5 |
| 4 | Blade housing | 8 | Stop screw | | |

BSF-A-	Pos. 2	Pos. 3	Pos. 4	Pos. 5	Pos. 6	Pos. 7	Pos. 8	Pos. 9	Pos. 10	Pos. 11
	BSF-E-	BSF-B-	BSF-N-A-	GH-H-S-	GH-H-F-	BSF-E-	GH-H-S-	BSF-S-	BSF-V-	GH-H-S-
0650/040-6.5	0009	0001	0650/N025/040	0201	0052	0014	0302	0003	0009	2023
0650/040-7.0	0009	0001	0650/0000/040	0201	0052	0014	0302	0003	0009	2023
0650/040-7.5	0009	0001	0650/P025/040	0201	0052	0014	0302	0003	0009	2023
0700/040-7.0	0009	0002	0700/0000/040	0201	0052	0014	0302	0003	0009	2023
0700/040-7.5	0009	0002	0700/P025/040	0201	0052	0014	0302	0003	0009	2023
0700/040-8.0	0009	0002	0700/P050/040	0201	0052	0014	0302	0003	0009	2023

BSF-B-	Pos. 2	Pos. 3	Pos. 4	Pos. 5	Pos. 6	Pos. 7	Pos. 8	Pos. 9	Pos. 10	Pos. 11
	BSF-E-	BSF-B-	BSF-N-B-	GH-H-S-	GH-H-F-	BSF-E-	GH-H-S-	BSF-S-	BSF-V-	GH-H-S-
0750/040-7.5	0018	0003	0750/N025/040	0201	0052	0014	0302	0003	0009	2023
0750/040-8.0	0018	0003	0750/0000/040	0201	0052	0014	0302	0003	0009	2023
0750/040-8.5	0018	0003	0750/P025/040	0201	0052	0014	0302	0003	0009	2023
0800/040-8.0	0018	0003	0800/0000/040	0201	0052	0014	0302	0003	0009	2023
0800/040-8.5	0018	0003	0800/P025/040	0201	0052	0014	0302	0003	0009	2023
0800/040-9.0	0018	0003	0800/P050/040	0201	0052	0014	0302	0003	0009	2023
0850/040-8.5	0018	0004	0850/P025/040	0201	0052	0014	0302	0003	0009	2023
0850/040-9.0	0018	0004	0850/P050/040	0201	0052	0014	0302	0003	0009	2023
0850/040-9.5	0018	0004	0850/P075/040	0201	0052	0014	0302	0003	0009	2023

BSF-C-	Pos. 2	Pos. 3	Pos. 4	Pos. 5	Pos. 6	Pos. 7	Pos. 8	Pos. 9	Pos. 10	Pos. 11
	BSF-E-	BSF-B-	BSF-N-C-	GH-H-S-	GH-H-F-	BSF-E-	GH-H-S-	BSF-S-	BSF-V-	GH-H-S-
0900/050-9.5	0010	0005	0900/N025/050	0201	0053	0014	0302	0003	0006	2023
0900/050-10.0	0010	0005	0900/0000/050	0201	0053	0014	0302	0003	0006	2023
0900/050-10.5	0010	0005	0900/P025/050	0201	0053	0014	0302	0003	0006	2023
0950/050-10.0	0010	0005	0950/0000/050	0201	0053	0014	0302	0003	0006	2023
0950/050-10.5	0010	0005	0950/P025/050	0201	0053	0014	0302	0003	0006	2023
0950/050-11.0	0010	0005	0950/P050/050	0201	0053	0014	0302	0003	0006	2023
1000/050-10.5	0010	0005	1000/P025/050	0201	0053	0014	0302	0003	0006	2023
1000/050-11.0	0010	0005	1000/P050/050	0201	0053	0014	0302	0003	0006	2023
1000/050-11.5	0010	0005	1000/P075/050	0201	0053	0014	0302	0003	0006	2023

Spare Parts (continued)

BSF-D-	Pos. 2	Pos. 3	Pos. 4	Pos. 5	Pos. 6	Pos. 7	Pos. 8	Pos. 9	Pos. 10	Pos. 11
	BSF-E-	BSF-B-	BSF-N-D-	GH-H-S-	GH-H-F-	BSF-E-	GH-H-S-	BSF-S-	BSF-V-	GH-H-S-
1050/050-11.0	0019	0006	1050/N050/050	0201	0053	0014	0302	0003	0006	2023
1050/050-11.5	0019	0006	1050/N025/050	0201	0053	0014	0302	0003	0006	2023
1050/050-12.0	0019	0006	1050/0000/050	0201	0053	0014	0302	0003	0006	2023
1050/050-12.5	0019	0006	1050/P025/050	0201	0053	0014	0302	0003	0006	2023
1050/050-13.0	0019	0006	1050/P050/050	0201	0053	0014	0302	0003	0006	2023
1100/050-11.5	0019	0006	1100/N025/050	0201	0053	0014	0302	0003	0006	2023
1100/050-12.0	0019	0006	1100/0000/050	0201	0053	0014	0302	0003	0006	2023
1100/050-12.5	0019	0006	1100/P025/050	0201	0053	0014	0302	0003	0006	2023
1100/050-13.0	0019	0006	1100/P050/050	0201	0053	0014	0302	0003	0006	2023
1100/050-13.5	0019	0006	1100/P075/050	0201	0053	0014	0302	0003	0006	2023
1150/050-12.0	0019	0007	1150/0000/050	0201	0053	0014	0302	0003	0006	2023
1150/050-12.5	0019	0007	1150/P025/050	0201	0053	0014	0302	0003	0006	2023
1150/050-13.0	0019	0007	1150/P050/050	0201	0053	0014	0302	0003	0006	2023
1150/050-13.5	0019	0007	1150/P075/050	0201	0053	0014	0302	0003	0006	2023
1150/050-14.0	0019	0007	1150/P100/050	0201	0053	0014	0302	0003	0006	2023

BSF-E-	Pos. 2	Pos. 3	Pos. 4	Pos. 5	Pos. 6	Pos. 7	Pos. 8	Pos. 9	Pos. 10	Pos. 11
	BSF-E-	BSF-B-	BSF-N-E-	GH-H-S-	GH-H-F-	BSF-E-	GH-H-S-	BSF-S-	BSF-V-	GH-H-S-
1200/050-13.0	0011	0008	1200/N050/050	0201	0053	0014	0302	0003	0007	2023
1200/050-13.5	0011	0008	1200/N025/050	0201	0053	0014	0302	0003	0007	2023
1200/050-14.0	0011	0008	1200/0000/050	0201	0053	0014	0302	0003	0007	2023
1200/050-14.5	0011	0008	1200/P025/050	0201	0053	0014	0302	0003	0007	2023
1200/050-15.0	0011	0008	1200/P050/050	0201	0053	0014	0302	0003	0007	2023
1250/050-13.5	0011	0008	1250/N025/050	0201	0053	0014	0302	0003	0007	2023
1250/050-14.0	0011	0008	1250/0000/050	0201	0053	0014	0302	0003	0007	2023
1250/050-14.5	0011	0008	1250/P025/050	0201	0053	0014	0302	0003	0007	2023
1250/050-15.0	0011	0008	1250/P050/050	0201	0053	0014	0302	0003	0007	2023
1250/050-15.5	0011	0008	1250/P075/050	0201	0053	0014	0302	0003	0007	2023
1300/050-14.0	0011	0008	1300/0000/050	0201	0053	0014	0302	0003	0007	2023
1300/050-14.5	0011	0008	1300/P025/050	0201	0053	0014	0302	0003	0007	2023
1300/050-15.0	0011	0008	1300/P050/050	0201	0053	0014	0302	0003	0007	2023
1300/050-15.5	0011	0008	1300/P075/050	0201	0053	0014	0302	0003	0007	2023
1300/050-16.0	0011	0008	1300/P100/050	0201	0053	0014	0302	0003	0007	2023
1350/050-14.5	0011	0008	1350/P025/050	0201	0053	0014	0302	0003	0007	2023
1350/050-15.0	0011	0008	1350/P050/050	0201	0053	0014	0302	0003	0007	2023
1350/050-15.5	0011	0008	1350/P075/050	0201	0053	0014	0302	0003	0007	2023
1350/050-16.0	0011	0008	1350/P100/050	0201	0053	0014	0302	0003	0007	2023
1350/050-16.5	0011	0008	1350/P125/050	0201	0053	0014	0302	0003	0007	2023
1400/050-15.0	0011	0009	1400/P050/050	0201	0053	0014	0302	0003	0007	2023
1400/050-15.5	0011	0009	1400/P075/050	0201	0053	0014	0302	0003	0007	2023
1400/050-16.0	0011	0009	1400/P100/050	0201	0053	0014	0302	0003	0007	2023
1400/050-16.5	0011	0009	1400/P125/050	0201	0053	0014	0302	0003	0007	2023
1400/050-17.0	0011	0009	1400/P150/050	0201	0053	0014	0302	0003	0007	2023

Spare Parts (continued)

BSF-F-	Pos. 2	Pos. 3	Pos. 4	Pos. 5	Pos. 6	Pos. 7	Pos. 8	Pos. 9	Pos. 10	Pos. 11
	BSF-E-	BSF-B-	BSF-N-F-	GH-H-S-	GH-H-F-	BSF-E-	GH-H-S-	BSF-S-	BSF-V-	GH-H-S-
1450/070-16.0	0012	0010	1450/N075/070	0202	0051	0014	0302	0004	0007	2100
1450/070-16.5	0012	0010	1450/N050/070	0202	0051	0014	0302	0004	0007	2100
1450/070-17.0	0012	0010	1450/N025/070	0202	0051	0014	0302	0004	0007	2100
1450/070-17.5	0012	0010	1450/0000/070	0202	0051	0014	0302	0004	0007	2100
1450/070-18.0	0012	0010	1450/P025/070	0202	0051	0014	0302	0004	0007	2100
1450/070-18.5	0012	0010	1450/P050/070	0202	0051	0014	0302	0004	0007	2100
1450/070-19.0	0012	0010	1450/P075/070	0202	0051	0014	0302	0004	0007	2100
1500/070-16.5	0012	0010	1500/N050/070	0202	0051	0014	0302	0004	0007	2100
1500/070-17.0	0012	0010	1500/N025/070	0202	0051	0014	0302	0004	0007	2100
1500/070-17.5	0012	0010	1500/0000/070	0202	0051	0014	0302	0004	0007	2100
1500/070-18.0	0012	0010	1500/P025/070	0202	0051	0014	0302	0004	0007	2100
1500/070-18.5	0012	0010	1500/P050/070	0202	0051	0014	0302	0004	0007	2100
1500/070-19.0	0012	0010	1500/P075/070	0202	0051	0014	0302	0004	0007	2100
1500/070-19.5	0012	0010	1500/P100/070	0202	0051	0014	0302	0004	0007	2100
1550/070-17.0	0012	0010	1550/N025/070	0202	0051	0014	0302	0004	0007	2100
1550/070-17.5	0012	0010	1550/0000/070	0202	0051	0014	0302	0004	0007	2100
1550/070-18.0	0012	0010	1550/P025/070	0202	0051	0014	0302	0004	0007	2100
1550/070-18.5	0012	0010	1550/P050/070	0202	0051	0014	0302	0004	0007	2100
1550/070-19.0	0012	0010	1550/P075/070	0202	0051	0014	0302	0004	0007	2100
1550/070-19.5	0012	0010	1550/P100/070	0202	0051	0014	0302	0004	0007	2100
1550/070-20.0	0012	0010	1550/P125/070	0202	0051	0014	0302	0004	0007	2100
1600/070-17.5	0012	0011	1600/0000/070	0202	0051	0014	0302	0004	0007	2100
1600/070-18.0	0012	0011	1600/P025/070	0202	0051	0014	0302	0004	0007	2100
1600/070-18.5	0012	0011	1600/P050/070	0202	0051	0014	0302	0004	0007	2100
1600/070-19.0	0012	0011	1600/P075/070	0202	0051	0014	0302	0004	0007	2100
1600/070-19.5	0012	0011	1600/P100/070	0202	0051	0014	0302	0004	0007	2100
1600/070-20.0	0012	0011	1600/P125/070	0202	0051	0014	0302	0004	0007	2100
1600/070-20.5	0012	0011	1600/P150/070	0202	0051	0014	0302	0004	0007	2100
1650/070-18.0	0012	0011	1650/P025/070	0202	0051	0014	0302	0004	0007	2100
1650/070-18.5	0012	0011	1650/P050/070	0202	0051	0014	0302	0004	0007	2100
1650/070-19.0	0012	0011	1650/P075/070	0202	0051	0014	0302	0004	0007	2100
1650/070-19.5	0012	0011	1650/P100/070	0202	0051	0014	0302	0004	0007	2100
1650/070-20.0	0012	0011	1650/P125/070	0202	0051	0014	0302	0004	0007	2100
1650/070-20.5	0012	0011	1650/P150/070	0202	0051	0014	0302	0004	0007	2100
1650/070-21.0	0012	0011	1650/P175/070	0202	0051	0014	0302	0004	0007	2100
1700/070-18.5	0012	0011	1700/P050/070	0202	0051	0014	0302	0004	0007	2100
1700/070-19.0	0012	0011	1700/P075/070	0202	0051	0014	0302	0004	0007	2100
1700/070-19.5	0012	0011	1700/P100/070	0202	0051	0014	0302	0004	0007	2100
1700/070-20.0	0012	0011	1700/P125/070	0202	0051	0014	0302	0004	0007	2100
1700/070-20.5	0012	0011	1700/P150/070	0202	0051	0014	0302	0004	0007	2100
1700/070-21.0	0012	0011	1700/P175/070	0202	0051	0014	0302	0004	0007	2100
1700/070-21.5	0012	0011	1700/P200/070	0202	0051	0014	0302	0004	0007	2100

Spare Parts (continued)

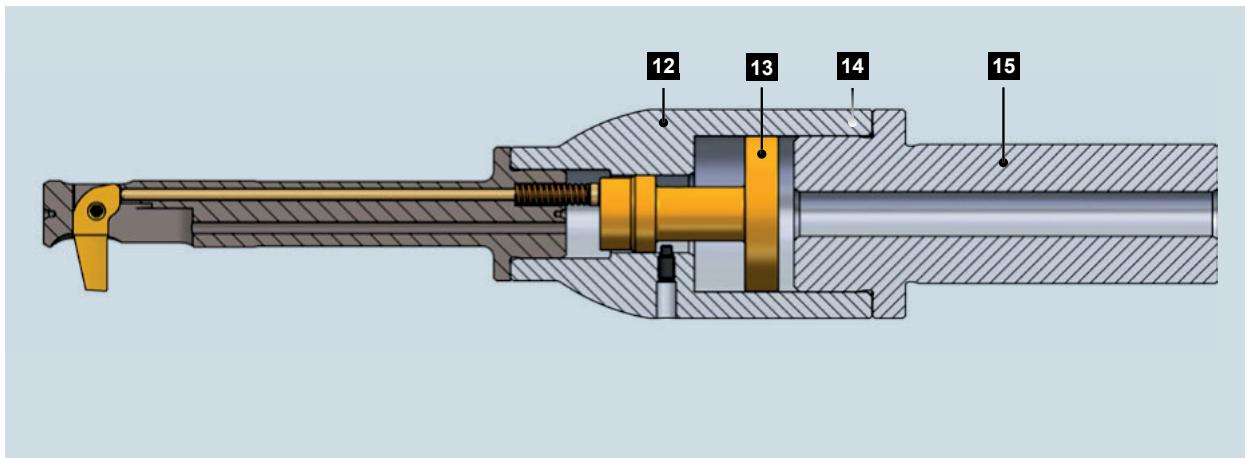
BSF-G-	Pos. 2	Pos. 3	Pos. 4	Pos. 5	Pos. 6	Pos. 7	Pos. 8	Pos. 9	Pos. 10	Pos. 11
	BSF-E-	BSF-B-	BSF-N-G-	GH-H-S-	GH-H-F-	BSF-E-	GH-H-S-	BSF-S-	BSF-V-	GH-H-S-
1750/070-20.0	0013	0012	1750/N100/070	0202	0051	0014	0302	0004	0008	2100
1750/070-20.5	0013	0012	1750/N075/070	0202	0051	0014	0302	0004	0008	2100
1750/070-21.0	0013	0012	1750/N050/070	0202	0051	0014	0302	0004	0008	2100
1750/070-21.5	0013	0012	1750/N025/070	0202	0051	0014	0302	0004	0008	2100
1750/070-22.0	0013	0012	1750/0000/070	0202	0051	0014	0302	0004	0008	2100
1750/070-22.5	0013	0012	1750/P025/070	0202	0051	0014	0302	0004	0008	2100
1750/070-23.0	0013	0012	1750/P050/070	0202	0051	0014	0302	0004	0008	2100
1750/070-23.5	0013	0012	1750/P075/070	0202	0051	0014	0302	0004	0008	2100
1750/070-24.0	0013	0012	1750/P100/070	0202	0051	0014	0302	0004	0008	2100
1800/070-20.5	0013	0012	1800/N075/070	0202	0051	0014	0302	0004	0008	2100
1800/070-21.0	0013	0012	1800/N050/070	0202	0051	0014	0302	0004	0008	2100
1800/070-21.5	0013	0012	1800/N025/070	0202	0051	0014	0302	0004	0008	2100
1800/070-22.0	0013	0012	1800/0000/070	0202	0051	0014	0302	0004	0008	2100
1800/070-22.5	0013	0012	1800/P025/070	0202	0051	0014	0302	0004	0008	2100
1800/070-23.0	0013	0012	1800/P050/070	0202	0051	0014	0302	0004	0008	2100
1800/070-23.5	0013	0012	1800/P075/070	0202	0051	0014	0302	0004	0008	2100
1800/070-24.0	0013	0012	1800/P100/070	0202	0051	0014	0302	0004	0008	2100
1800/070-24.5	0013	0012	1800/P125/070	0202	0051	0014	0302	0004	0008	2100
1850/070-21.0	0013	0012	1850/N050/070	0202	0051	0014	0302	0004	0008	2100
1850/070-21.5	0013	0012	1850/N025/070	0202	0051	0014	0302	0004	0008	2100
1850/070-22.0	0013	0012	1850/0000/070	0202	0051	0014	0302	0004	0008	2100
1850/070-22.5	0013	0012	1850/P025/070	0202	0051	0014	0302	0004	0008	2100
1850/070-23.0	0013	0012	1850/P050/070	0202	0051	0014	0302	0004	0008	2100
1850/070-23.5	0013	0012	1850/P075/070	0202	0051	0014	0302	0004	0008	2100
1850/070-24.0	0013	0012	1850/P100/070	0202	0051	0014	0302	0004	0008	2100
1850/070-24.5	0013	0012	1850/P125/070	0202	0051	0014	0302	0004	0008	2100
1850/070-25.0	0013	0012	1850/P150/070	0202	0051	0014	0302	0004	0008	2100
1900/070-21.5	0013	0012	1900/N025/070	0202	0051	0014	0302	0004	0008	2100
1900/070-22.0	0013	0012	1900/0000/070	0202	0051	0014	0302	0004	0008	2100
1900/070-22.5	0013	0012	1900/P025/070	0202	0051	0014	0302	0004	0008	2100
1900/070-23.0	0013	0012	1900/P050/070	0202	0051	0014	0302	0004	0008	2100
1900/070-23.5	0013	0012	1900/P075/070	0202	0051	0014	0302	0004	0008	2100
1900/070-24.0	0013	0012	1900/P100/070	0202	0051	0014	0302	0004	0008	2100
1900/070-24.5	0013	0012	1900/P125/070	0202	0051	0014	0302	0004	0008	2100
1900/070-25.0	0013	0012	1900/P150/070	0202	0051	0014	0302	0004	0008	2100
1900/070-25.5	0013	0012	1900/P175/070	0202	0051	0014	0302	0004	0008	2100
1950/070-22.0	0013	0012	1950/0000/070	0202	0051	0014	0302	0004	0008	2100
1950/070-22.5	0013	0012	1950/P025/070	0202	0051	0014	0302	0004	0008	2100
1950/070-23.0	0013	0012	1950/P050/070	0202	0051	0014	0302	0004	0008	2100
1950/070-23.5	0013	0012	1950/P075/070	0202	0051	0014	0302	0004	0008	2100
1950/070-24.0	0013	0012	1950/P100/070	0202	0051	0014	0302	0004	0008	2100
1950/070-24.5	0013	0012	1950/P125/070	0202	0051	0014	0302	0004	0008	2100
1950/070-25.0	0013	0012	1950/P150/070	0202	0051	0014	0302	0004	0008	2100
1950/070-25.5	0013	0012	1950/P175/070	0202	0051	0014	0302	0004	0008	2100
1950/070-26.0	0013	0012	1950/P200/070	0202	0051	0014	0302	0004	0008	2100

Spare Parts (continued)

BSF-G-	Pos. 2	Pos. 3	Pos. 4	Pos. 5	Pos. 6	Pos. 7	Pos. 8	Pos. 9	Pos. 10	Pos. 11
	BSF-E-	BSF-B-	BSF-N-G-	GH-H-S-	GH-H-F-	BSF-E-	GH-H-S-	BSF-S-	BSF-V-	GH-H-S-
2000/070-22.5	0013	0012	2000/P025/070	0202	0051	0014	0302	0004	0008	2100
2000/070-23.0	0013	0012	2000/P050/070	0202	0051	0014	0302	0004	0008	2100
2000/070-23.5	0013	0012	2000/P075/070	0202	0051	0014	0302	0004	0008	2100
2000/070-24.0	0013	0012	2000/P100/070	0202	0051	0014	0302	0004	0008	2100
2000/070-24.5	0013	0012	2000/P125/070	0202	0051	0014	0302	0004	0008	2100
2000/070-25.0	0013	0012	2000/P150/070	0202	0051	0014	0302	0004	0008	2100
2000/070-25.5	0013	0012	2000/P175/070	0202	0051	0014	0302	0004	0008	2100
2000/070-26.0	0013	0012	2000/P200/070	0202	0051	0014	0302	0004	0008	2100
2000/070-26.5	0013	0012	2000/P225/070	0202	0051	0014	0302	0004	0008	2100
2050/070-23.0	0013	0013	2050/P050/070	0202	0051	0014	0302	0004	0008	2100
2050/070-23.5	0013	0013	2050/P075/070	0202	0051	0014	0302	0004	0008	2100
2050/070-24.0	0013	0013	2050/P100/070	0202	0051	0014	0302	0004	0008	2100
2050/070-24.5	0013	0013	2050/P125/070	0202	0051	0014	0302	0004	0008	2100
2050/070-25.0	0013	0013	2050/P150/070	0202	0051	0014	0302	0004	0008	2100
2050/070-25.5	0013	0013	2050/P175/070	0202	0051	0014	0302	0004	0008	2100
2050/070-26.0	0013	0013	2050/P200/070	0202	0051	0014	0302	0004	0008	2100
2050/070-26.5	0013	0013	2050/P225/070	0202	0051	0014	0302	0004	0008	2100
2050/070-27.0	0013	0013	2050/P250/070	0202	0051	0014	0302	0004	0008	2100
2100/070-23.5	0013	0013	2100/P075/070	0202	0051	0014	0302	0004	0008	2100
2100/070-24.0	0013	0013	2100/P100/070	0202	0051	0014	0302	0004	0008	2100
2100/070-24.5	0013	0013	2100/P125/070	0202	0051	0014	0302	0004	0008	2100
2100/070-25.0	0013	0013	2100/P150/070	0202	0051	0014	0302	0004	0008	2100
2100/070-25.5	0013	0013	2100/P175/070	0202	0051	0014	0302	0004	0008	2100
2100/070-26.0	0013	0013	2100/P200/070	0202	0051	0014	0302	0004	0008	2100
2100/070-26.5	0013	0013	2100/P225/070	0202	0051	0014	0302	0004	0008	2100
2100/070-27.0	0013	0013	2100/P250/070	0202	0051	0014	0302	0004	0008	2100
2100/070-27.5	0013	0013	2100/P275/070	0202	0051	0014	0302	0004	0008	2100

Recommendation:

Selecting the right tool or component is easy using the **BSF TOOL SELECTOR** on www.heule.com.



12 Air cylinder

13 Air piston

14 Clamping screws
(M5x0.5x6.5)

15 Shaft

	Pos. 12	Pos. 13	Pos. 14	Pos. 15
Series A-E	BSFA-G-0001	BSFA-E-0001	GH-H-S-0202	BSFA-S-0001 ($\varnothing 20$)
Series F-G	BSFA-G-0002	BSFA-E-0002	GH-H-S-0202	BSFA-S-0002 ($\varnothing 25$)
Series F-G				BSFA-S-0003 ($\varnothing 32$)

ORDER NOTE

- Please note that for items 12, 13 and 15 the article number starts with BSFA-.

FAQ BSF

Question	Answer
The blade swings out on its own after the spindle stops (vertical position), is that normal?	Yes. The BSF is designed so the blade swings out automatically since it is not fixed when the internal coolant pressure is off. Nevertheless, it is compulsory to set the recommended activation speed for machining.
After running the machine, a counterbore is missing.	Has the correct correct activation speed been programmed? Please check if the blade is sticking in the blade housing. If it is, dismount the blade and clean the window of the blade housing and the blade itself.
Does it matter which side you mount the split pin in?	No.
There is a bore hole tolerance of H7. Does the BSF tool damage the bore?	Yes, it is a single blade tool. We recommend to counterbore on a smaller bore diameter (semi-finished bore) and to open the bore to the correct diameter after the counterbore operation.
Is it possible to hold the BSF tool in a shrink system?	No. Shank and other BSF items are manufactured out of tool steel. These parts have other shrinking parameters than carbide which is the common material (shank) for shrink systems!
The blade housing is fixed with 3 clamping screws. Is there a recommended fixing procedure?	No. The blade housing can be set in any position.
Is filtering of the coolant absolutely necessary?	Yes. The cooling agent has to be filtered by a 25my filter.
Does the tool work with a coolant pressure of under 20 bar?	It may be possible but every application has to be verified individually.
Is it possible to run the internal coolant while machining?	Yes, but only when the blade is full cutting mode.
What could be the cause if a tool with air activation does not work reliably?	Check the available air pressure in the machine spindle. HEULE can provide a measuring device for this purpose.