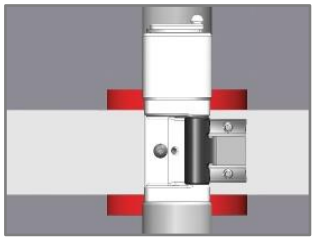
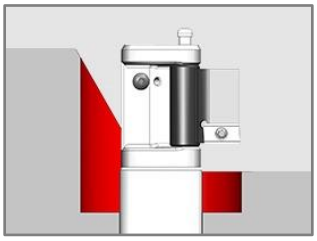
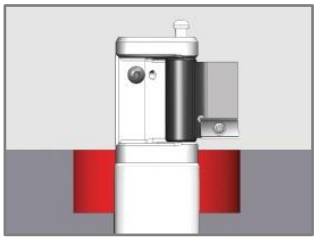
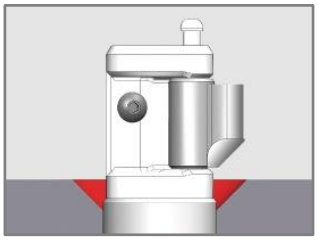
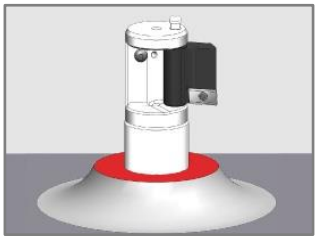
BACK COUNTERBORING

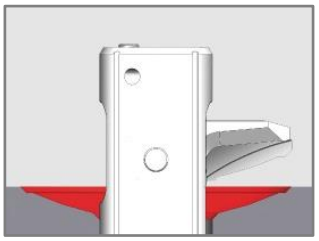


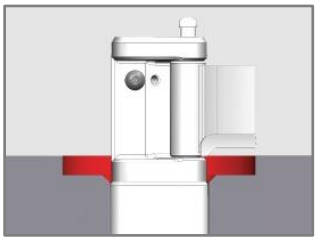


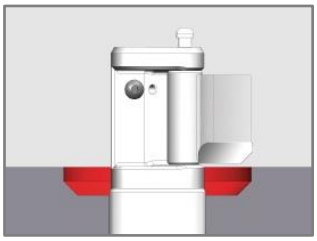


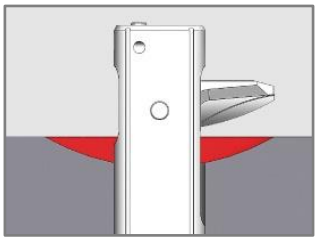












MADE IN USA

OEM of the Autofacer® since 1968

STEINER

INGENIOUS CUTTING TOOLS

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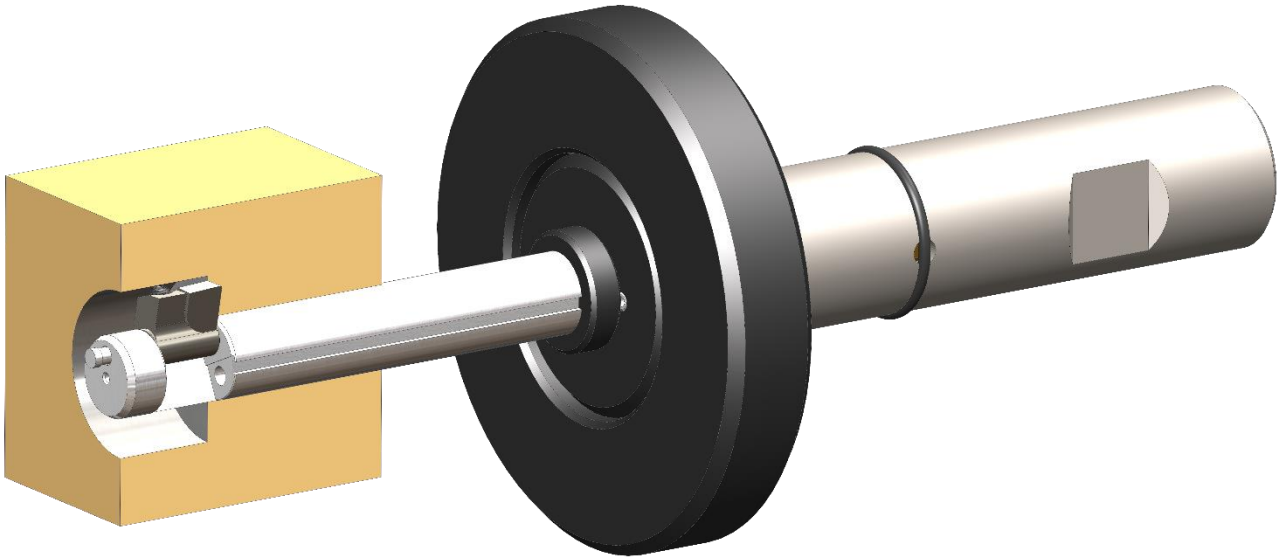
E-mail: info@stmech.pl - www.stmech.pl

Inertial Back counterboring tools

Standard models

High reliability – Reduced delivery time

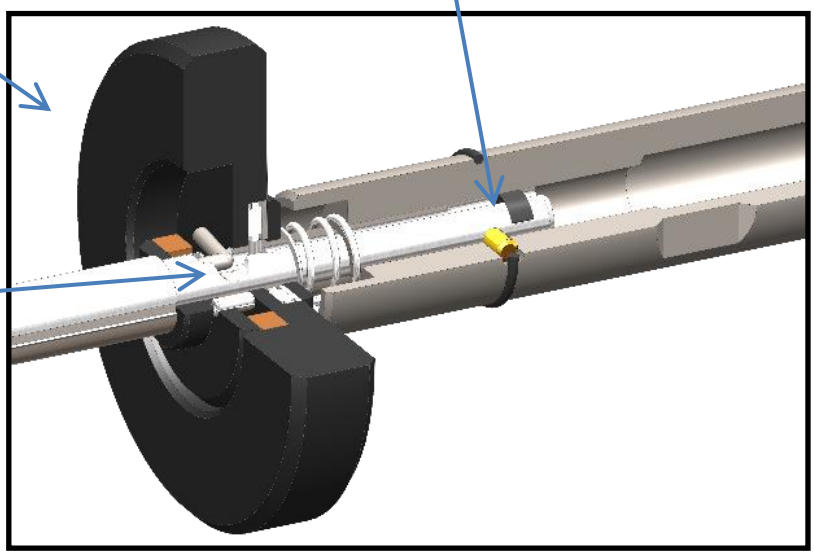


INERTIAL FLYWHEEL

The opening/closing of the blade is operated by a mechanism that holds it in position. This way, even interrupted cutting applications are not a problem

SAFETY PIN

Calibrated to break in case of excessive force. The shank detaches from the tool, preventing damage to the deburring tool, workpiece, and machine spindle. Easy and quick restoration for a prompt resumption of work



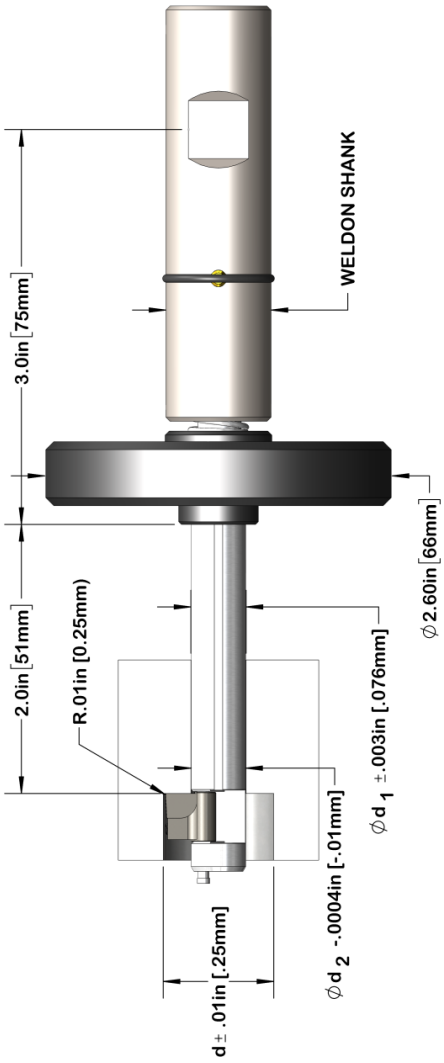
SPARE PARTS KIT

Available for restoration in case of breakage or wear, it includes: Safety pins, Control rod, Blade pin, etc.

Ø 9.5mm(.375”) – 15.5mm(.610”) counterbore

STEINER
INGENIOUS CUTTING TOOLS

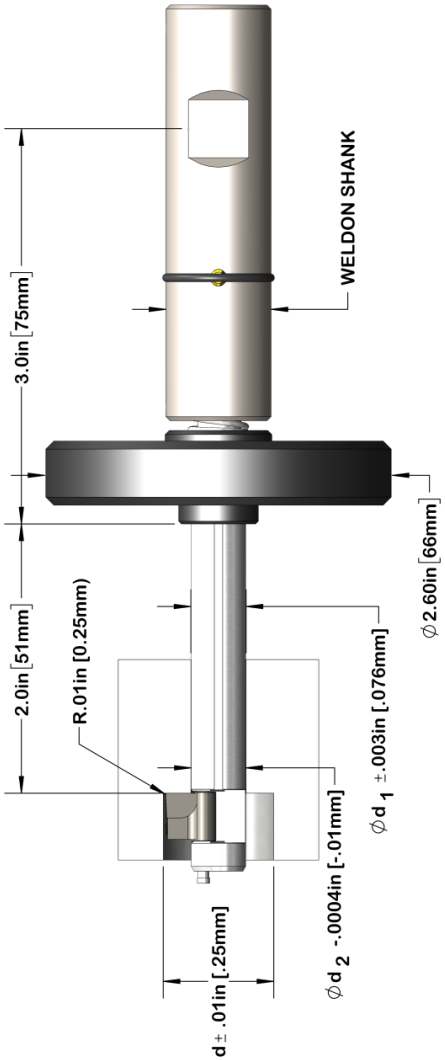
Counterbore		Hole		Shaft		Shank	Codes	
d		d1		d2		Weldon	Autofacer	Blade
mm	inch	mm	inch	mm	inch	mm	Code	Code
9.5	0.374	6.5	.256	6.4	.251	20	**AF25-6.50M**	**CB25-9.50M**
		7.0	.276	6.9	.270		**AF25-7.00M**	
10.0	0.394	6.5	.256	6.4	.251	20	**AF25-6.50M**	**CB25-10.00M**
		7.0	.276	6.9	.270		**AF25-7.00M**	
10.5	0.394	6.5	.256	6.4	.251	20	**AF25-6.50M**	**CB25-10.50M**
		7.0	.276	6.9	.270		**AF25-7.00M**	
11.0	0.433	6.5	.256	6.4	.251	20	**AF25-6.50M**	**CB25-11.00M**
		7.0	.276	6.9	.270		**AF25-7.00M**	
		7.5	.295	7.4	.290		**AF28-7.50M**	**CB28-11.00M**
11.5	0.453	6.5	.256	6.4	.251	20	**AF25-6.50M**	**CB25-11.50M**
		7.0	.276	6.9	.270		**AF25-7.00M**	
		7.5	.295	7.4	.290		**AF28-7.50M**	**CB28-11.50M**
		8.0	.315	7.9	.310		**AF31-8.00M**	**CB31-11.50M**
		8.5	.335	8.4	.330		**AF31-8.50M**	
12.0	0.472	6.5	.256	6.4	.251	20	**AF25-6.50M**	**CB25-12.00M**
		7.0	.276	6.9	.270		**AF25-7.00M**	
		7.5	.295	7.4	.290		**AF28-7.50M**	**CB28-12.00M**
		8.0	.315	7.9	.310		**AF31-8.00M**	**CB31-12.00M**
		8.5	.335	8.4	.330		**AF31-8.50M**	
12.5	0.492	6.5	.256	6.4	.251	20	**AF25-6.50M**	**CB25-12.50M**
		7.0	.276	6.9	.270		**AF25-7.00M**	
		7.5	.295	7.4	.290		**AF28-7.50M**	**CB28-12.50M**
		8.0	.315	7.9	.310		**AF31-8.00M**	**CB31-12.50M**
		8.5	.335	8.4	.330		**AF31-8.50M**	
13.0	0.512	6.5	.256	6.4	.251	20	**AF25-6.50M**	**CB25-13.00M**
		7.0	.276	6.9	.270		**AF25-7.00M**	
		7.5	.295	7.4	.290		**AF28-7.50M**	**CB28-13.00M**
		8.0	.315	7.9	.310		**AF31-8.00M**	**CB31-13.00M**
		8.5	.335	8.4	.330		**AF31-8.50M**	
13.5	0.531	7.5	.295	7.4	.290	20	**AF28-7.50M**	**CB28-13.50M**
		8.0	.315	7.9	.310		**AF31-8.00M**	**CB31-13.50M**
		8.5	.335	8.4	.330		**AF31-8.50M**	
		9.0	.354	8.9	.349		**AF34-9.00M**	**CB34-13.50M**
14.0	0.551	7.5	.295	7.4	.290	20	**AF28-7.50M**	**CB28-14.00M**
		8.0	.315	7.9	.310		**AF31-8.00M**	**CB31-14.00M**
		8.5	.335	8.4	.330		**AF31-8.50M**	
		9.0	.354	8.9	.349		**AF34-9.00M**	**CB34-14.00M**
		9.5	.374	9.4	.369		**AF38-9.50M**	**CB38-14.00M**
		10.0	.394	9.9	.389		**AF38-10.00M**	
14.5	0.571	8.0	.315	7.9	.310	20	**AF31-8.00M**	**CB31-14.50M**
		8.5	.335	8.4	.330		**AF31-8.50M**	
		9.0	.354	8.9	.349		**AF34-9.00M**	**CB34-14.50M**
		9.5	.374	9.4	.369		**AF38-9.50M**	**CB38-14.50M**
		10.0	.394	9.9	.389		**AF38-10.00M**	
15.0	0.591	8.0	.315	7.9	.310	20	**AF31-8.00M**	**CB31-15.00M**
		8.5	.335	8.4	.330		**AF31-8.50M**	
		9.0	.354	8.9	.349		**AF34-9.00M**	**CB34-15.00M**
		9.5	.374	9.4	.369		**AF38-9.50M**	**CB38-15.00M**
		10.0	.394	9.9	.389		**AF38-10.00M**	
15.5	0.610	8.0	.315	7.9	.310	20	**AF31-8.00M**	**CB31-15.50M**
		8.5	.335	8.4	.330		**AF31-8.50M**	
		9.0	.354	8.9	.349		**AF34-9.00M**	**CB34-15.50M**
		9.5	.374	9.4	.369		**AF38-9.50M**	**CB38-15.50M**
		10.0	.394	9.9	.389		**AF38-10.00M**	
		10.5	.413	10.4	.408		**AF40-10.50M**	**CB40-15.50M**
		11.0	.433	10.9	.428		**AF40-11.00M**	



Ø 16mm(.630”) – 20mm(.787”) counterbore

STEINER
INGENIOUS CUTTING TOOLS

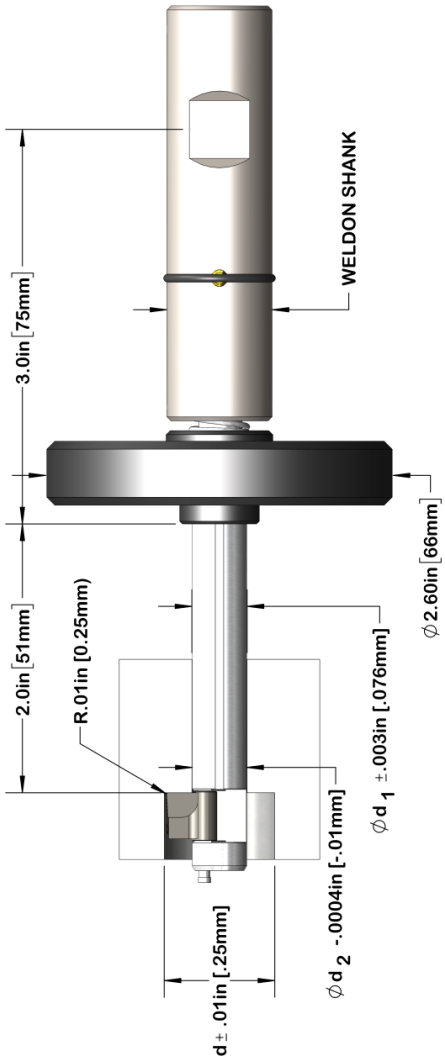
Counterbore		Hole		Shaft		Shank	Codes	
d		d1		d2		Weldon	Autofacer	Blade
mm	inch	mm	inch	mm	inch	mm	Code	Code
16.0	0.630	8.0	.315	7.9	.310	20	AF31-8.00M	CB31-16.00M
		8.5	.335	8.4	.330		AF31-8.50M	
		9.0	.354	8.9	.349		AF34-9.00M	CB34-16.00M
		9.5	.374	9.4	.369		AF38-9.50M	CB38-16.00M
		10.0	.394	9.9	.389		AF38-10.00M	
		10.5	.413	10.4	.408		AF40-10.50M	CB40-16.00M
		11.0	.433	10.9	.428		AF40-11.00M	
16.5	0.650	9.0	.354	8.9	.349	20	AF34-9.00M	CB34-16.50M
		9.5	.374	9.4	.369		AF38-9.50M	CB38-16.50M
		10.0	.394	9.9	.389		AF38-10.00M	
		10.5	.413	10.4	.408		AF40-10.50M	CB40-16.50M
		11.0	.433	10.9	.428		AF40-11.00M	
		11.5	.453	11.4	.448		AF44-11.50M	CB44-16.50M
17.0	0.669	9.0	.354	8.9	.349	20	AF34-9.00M	CB34-17.00M
		9.5	.374	9.4	.369		AF38-9.50M	CB38-17.00M
		10.0	.394	9.9	.389		AF38-10.00M	
		10.5	.413	10.4	.408		AF40-10.50M	CB40-17.00M
		11.0	.433	10.9	.428		AF40-11.00M	
		11.5	.453	11.4	.448		AF44-11.50M	CB44-17.00M
17.5	0.689	9.0	.354	8.9	.349	20	AF34-9.00M	CB34-17.50M
		9.5	.374	9.4	.369		AF38-9.50M	CB38-17.50M
		10.0	.394	9.9	.389		AF38-10.00M	
		10.5	.413	10.4	.408		AF40-10.50M	CB40-17.50M
		11.0	.433	10.9	.428		AF40-11.00M	
		11.5	.453	11.4	.448		AF44-11.50M	CB44-17.50M
18.0	.709	9.0	.354	8.9	.349	20	AF34-9.00M	CB34-18.00M
		9.5	.374	9.4	.369		AF38-9.50M	CB38-18.00M
		10.0	.394	9.9	.389		AF38-10.00M	
		10.5	.413	10.4	.408		AF40-10.50M	CB40-18.00M
		11.0	.433	10.9	.428		AF40-11.00M	
		11.5	.453	11.4	.448		AF44-11.50M	CB44-18.00M
		12.0	.472	11.9	.467		AF47-12.00M	CB47-18.00M
18.5	0.728	9.5	.374	9.4	.369	20	AF38-9.50M	CB38-18.50M
		10.0	.394	9.9	.389		AF38-10.00M	
		10.5	.413	10.4	.408		AF40-10.50M	CB40-18.50M
		11.0	.433	10.9	.428		AF40-11.00M	
		11.5	.453	11.4	.448		AF44-11.50M	CB44-18.50M
		12.0	.472	11.9	.467		AF47-12.00M	CB47-18.50M
		12.5	.492	12.4	.487		AF50-12.50M	CB50-18.50M
		13.0	.512	12.9	.507		AF50-13.00M	
19.0	0.748	10.5	.413	10.4	.408	20	AF40-10.50M	CB40-19.00M
		11.0	.433	10.9	.428		AF40-11.00M	
		11.5	.453	11.4	.448		AF44-11.50M	CB44-19.00M
		12.0	.472	11.9	.467		AF47-12.00M	CB47-19.00M
		12.5	.492	12.4	.487		AF50-12.50M	CB50-19.00M
		13.0	.512	12.9	.507		AF50-13.00M	
19.5	0.768	10.5	.413	10.4	.408	20	AF40-10.50M	CB40-19.50M
		11.0	.433	10.9	.428		AF40-11.00M	
		11.5	.453	11.4	.448		AF44-11.50M	CB44-19.50M
		12.0	.472	11.9	.467		AF47-12.00M	CB47-19.50M
		12.5	.492	12.4	.487		AF50-12.50M	CB50-19.50M
		13.0	.512	12.9	.507		AF50-13.00M	
		13.5	.531	13.4	.526		AF53-13.50M	CB53-19.50M
		14.0	.551	13.9	.546		AF53-14.00M	
20.0	0.787	10.5	.413	10.4	.408	20	AF40-10.50M	CB40-20.00M
		11.0	.433	10.9	.428		AF40-11.00M	
		11.5	.453	11.4	.448		AF44-11.50M	CB44-20.00M
		12.0	.472	11.9	.467		AF47-12.00M	CB47-20.00M
		12.5	.492	12.4	.487		AF50-12.50M	CB50-20.00M
		13.0	.512	12.9	.507		AF50-13.00M	
		13.5	.531	13.4	.526		AF53-13.50M	CB53-20.00M
		14.0	.551	13.9	.546		AF53-14.00M	



Ø 20.5mm(.807”) – 23.5mm(.925”) counterbore

STEINER
INGENIOUS CUTTING TOOLS

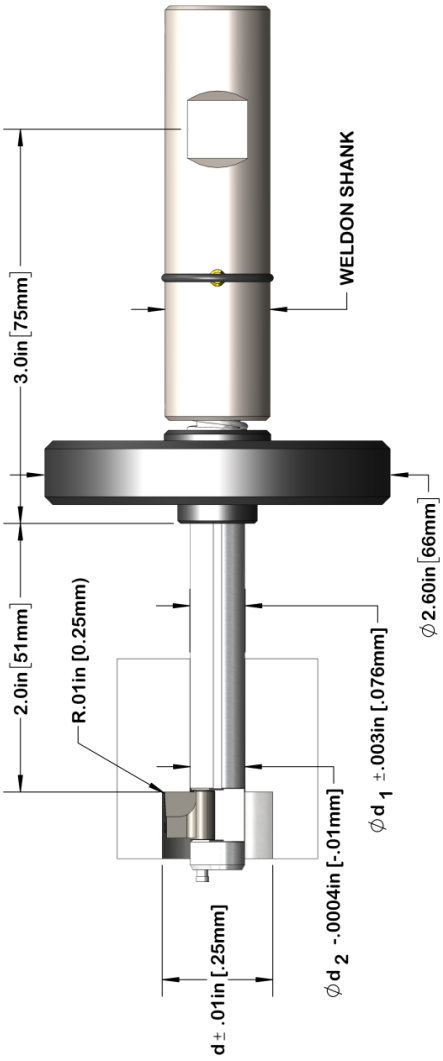
Counterbore		Hole		Shaft		Shank	Codes	
d		d1		d2		Weldon	Autofacer	Blade
mm	inch	mm	inch	mm	inch	mm	Code	Code
20.5	0.807	10.5	.413	10.4	.408	20	AF40-10.50M	CB40-20.50M
		11.0	.433	10.9	.428		AF40-11.00M	
		11.5	.453	11.4	.448		AF44-11.50M	CB44-20.50M
		12.0	.472	11.9	.467		AF47-12.00M	CB47-20.50M
		12.5	.492	12.4	.487		AF50-12.50M	CB50-20.50M
		13.0	.512	12.9	.507		AF50-13.00M	
		13.5	.531	13.4	.526		AF53-13.50M	CB53-20.50M
		14.0	.551	13.9	.546		AF53-14.00M	
21.0	0.827	10.5	.413	10.4	.408	20	AF40-10.50M	CB40-21.00M
		11.0	.433	10.9	.428		AF40-11.00M	
		11.5	.453	11.4	.448		AF44-11.50M	CB44-21.00M
		12.0	.472	11.9	.467		AF47-12.00M	CB47-21.00M
		12.5	.492	12.4	.487		AF50-12.50M	CB50-21.00M
		13.0	.512	12.9	.507		AF50-13.00M	
		13.5	.531	13.4	.526		AF53-13.50M	CB53-21.00M
		14.0	.551	13.9	.546		AF53-14.00M	
21.5	0.846	11.5	.453	11.4	.448	20	AF44-11.50M	CB44-21.50M
		12.0	.472	11.9	.467		AF47-12.00M	CB47-21.50M
		12.5	.492	12.4	.487		AF50-12.50M	CB50-21.50M
		13.0	.512	12.9	.507		AF50-13.00M	
		13.5	.531	13.4	.526		AF53-13.50M	CB53-21.50M
		14.0	.551	13.9	.546		AF53-14.00M	
		14.5	.571	14.4	.566		AF56-14.50M	CB56-21.50M
22.0	0.866	11.5	.453	11.4	.448	20	AF44-11.50M	CB44-22.00M
		12.0	.472	11.9	.467		AF47-12.00M	CB47-22.00M
		12.5	.492	12.4	.487		AF50-12.50M	CB50-22.00M
		13.0	.512	12.9	.507		AF50-13.00M	
		13.5	.531	13.4	.526		AF53-13.50M	CB53-22.00M
		14.0	.551	13.9	.546		AF53-14.00M	
		14.5	.571	14.4	.566		AF56-14.50M	CB56-22.00M
		15.0	.591	14.9	.585		AF59-15.00M	CB59-22.00M
		15.5	.610	15.4	.605		AF59-15.50M	
22.5	0.886	11.5	.453	11.4	.448	20	AF44-11.50M	CB44-22.50M
		12.0	.472	11.9	.467		AF47-12.00M	CB47-22.50M
		12.5	.492	12.4	.487		AF50-12.50M	CB50-22.50M
		13.0	.512	12.9	.507		AF50-13.00M	
		13.5	.531	13.4	.526		AF53-13.50M	CB53-22.50M
		14.0	.551	13.9	.546		AF53-14.00M	
		14.5	.571	14.4	.566		AF56-14.50M	CB56-22.50M
		15.0	.591	14.9	.585		AF59-15.00M	CB59-22.50M
		15.5	.610	15.4	.605		AF59-15.50M	
23.0	0.906	11.5	.453	11.4	.448	20	AF44-11.50M	CB44-23.00M
		12.0	.472	11.9	.467		AF47-12.00M	CB47-23.00M
		12.5	.492	12.4	.487		AF50-12.50M	CB50-23.00M
		13.0	.512	12.9	.507		AF50-13.00M	
		13.5	.531	13.4	.526		AF53-13.50M	CB53-23.00M
		14.0	.551	13.9	.546		AF53-14.00M	
		14.5	.571	14.4	.566		AF56-14.50M	CB56-23.00M
		15.0	.591	14.9	.585		AF59-15.00M	CB59-23.00M
		15.5	.610	15.4	.605		AF59-15.50M	
23.5	0.925	11.5	.453	11.4	.448	20	AF44-11.50M	CB44-23.50M
		12.0	.472	11.9	.467		AF47-12.00M	CB47-23.50M
		12.5	.492	12.4	.487		AF50-12.50M	CB50-23.50M
		13.0	.512	12.9	.507		AF50-13.00M	
		13.5	.531	13.4	.526		AF53-13.50M	CB53-23.50M
		14.0	.551	13.9	.546		AF53-14.00M	
		14.5	.571	14.4	.566		AF56-14.50M	CB56-23.50M
		15.0	.591	14.9	.585		AF59-15.00M	CB59-23.50M
		15.5	.610	15.4	.605		AF59-15.50M	



Ø 24.0mm(.945”) – 27.5mm(.1.083”) counterbore

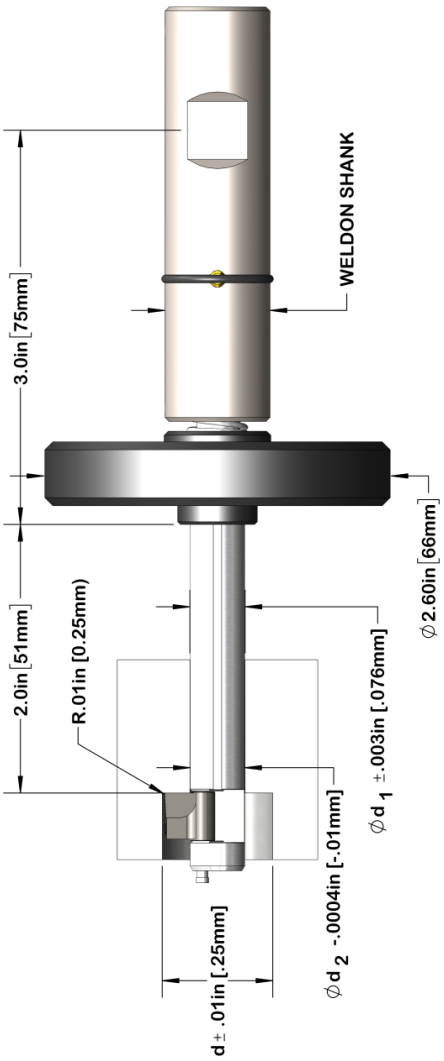
STEINER
INGENIOUS CUTTING TOOLS

Counterbore		Hole		Shaft		Shank	Codes	
d		d1		d2		Weldon	Autofacer	Blade
mm	inch	mm	inch	mm	inch	mm	Code	Code
24.0	0.945	12.0	.472	11.9	.467	20	AF47-12.00M	CB47-23.50M
		12.5	.492	12.4	.487		AF50-12.50M	CB50-23.50M
		13.0	.512	12.9	.507		AF50-13.00M	
		13.5	.531	13.4	.526		AF53-13.50M	CB53-23.50M
		14.0	.551	13.9	.546		AF53-14.00M	
		14.5	.571	14.4	.566		AF56-14.50M	CB56-23.50M
		15.0	.591	14.9	.585		AF59-15.00M	CB59-23.50M
		15.5	.610	15.4	.605		AF59-15.50M	
24.5	0.965	12.0	.472	11.9	.467	20	AF47-12.00M	CB47-24.00M
		12.5	.492	12.4	.487		AF50-12.50M	CB50-24.00M
		13.0	.512	12.9	.507		AF50-13.00M	
		13.5	.531	13.4	.526		AF53-13.50M	CB53-24.00M
		14.0	.551	13.9	.546		AF53-14.00M	
		14.5	.571	14.4	.566		AF56-14.50M	CB56-24.00M
		15.0	.591	14.9	.585		AF59-15.00M	CB59-24.00M
		15.5	.610	15.4	.605		AF59-15.50M	
25.0	.984	12.0	.472	11.9	.467	20	AF47-12.00M	CB47-25.00M
		12.5	.492	12.4	.487		AF50-12.50M	CB50-25.00M
		13.0	.512	12.9	.507		AF50-13.00M	
		13.5	.531	13.4	.526		AF53-13.50M	CB53-25.00M
		14.0	.551	13.9	.546		AF53-14.00M	
		14.5	.571	14.4	.566		AF56-14.50M	CB56-25.00M
		15.0	.591	14.9	.585		AF59-15.00M	CB59-25.00M
		15.5	.610	15.4	.605		AF59-15.50M	
25.5	1.004	12.0	.472	11.9	.467	20	AF47-12.00M	CB47-25.50M
		12.5	.492	12.4	.487		AF50-12.50M	CB50-25.50M
		13.0	.512	12.9	.507		AF50-13.00M	
		13.5	.531	13.4	.526		AF53-13.50M	CB53-25.50M
		14.0	.551	13.9	.546		AF53-14.00M	
		14.5	.571	14.4	.566		AF56-14.50M	CB56-25.50M
		15.0	.591	14.9	.585		AF59-15.00M	CB59-25.50M
		15.5	.610	15.4	.605		AF59-15.50M	
26.0	1.024	12.5	.492	12.4	.487	20	AF50-12.50M	CB50-26.00M
		13.0	.512	12.9	.507		AF50-13.00M	
		13.5	.531	13.4	.526		AF53-13.50M	CB53-26.00M
		14.0	.551	13.9	.546		AF53-14.00M	
		14.5	.571	14.4	.566		AF56-14.50M	CB56-26.00M
		15.0	.591	14.9	.585		AF59-15.00M	CB59-26.00M
		15.5	.610	15.4	.605		AF59-15.50M	
26.5	1.043	12.5	.492	12.4	.487	20	AF50-12.50M	CB50-26.50M
		13.0	.512	12.9	.507		AF50-13.00M	
		13.5	.531	13.4	.526		AF53-13.50M	CB53-26.50M
		14.0	.551	13.9	.546		AF53-14.00M	
		14.5	.571	14.4	.566		AF56-14.50M	CB56-26.50M
		15.0	.591	14.9	.585		AF59-15.00M	CB59-26.50M
		15.5	.610	15.4	.605		AF59-15.50M	
27.0	1.043	12.5	.492	12.4	.487	20	AF50-12.50M	CB50-27.00M
		13.0	.512	12.9	.507		AF50-13.00M	
		13.5	.531	13.4	.526		AF53-13.50M	CB53-27.00M
		14.0	.551	13.9	.546		AF53-14.00M	
		14.5	.571	14.4	.566		AF56-14.50M	CB56-27.00M
		15.0	.591	14.9	.585		AF59-15.00M	CB59-27.00M
		15.5	.610	15.4	.605		AF59-15.50M	
27.5	1.083	12.5	.492	12.4	.487	20	AF50-12.50M	CB50-27.50M
		13.0	.512	12.9	.507		AF50-13.00M	
		13.5	.531	13.4	.526		AF53-13.50M	CB53-27.50M
		14.0	.551	13.9	.546		AF53-14.00M	
		14.5	.571	14.4	.566		AF56-14.50M	CB56-27.50M
		15.0	.591	14.9	.585		AF59-15.00M	CB59-27.50M
		15.5	.610	15.4	.605		AF59-15.50M	



Ø 28mm(1.102”) – 33mm(1.299”) counterbore

Counterbore		Hole		Shaft		Shank	Codes	
d		d1		d2		Weldon	Autofacer	Blade
mm	inch	mm	inch	mm	inch	mm	Code	Code
28.0	1.102	12.5	.492	12.4	.487	20	AF50-12.50M	CB50-28.00M
		13.0	.512	12.9	.507		AF50-13.00M	
		13.5	.531	13.4	.526		AF53-13.50M	CB53-28.00M
		14.0	.551	13.9	.546		AF53-14.00M	
		14.5	.571	14.4	.566		AF56-14.50M	CB56-28.00M
		15.0	.591	14.9	.585		AF59-15.00M	CB59-28.00M
		15.5	.610	15.4	.605		AF59-15.50M	
28.5	1.122	13.5	.531	13.4	.526	20	AF53-13.50M	CB53-28.50M
		14.0	.551	13.9	.546		AF53-14.00M	
		14.5	.571	14.4	.566		AF56-14.50M	CB56-28.50M
		15.0	.591	14.9	.585		AF59-15.00M	CB59-28.50M
		15.5	.610	15.4	.605		AF59-15.50M	
29.0	1.142	13.5	.531	13.4	.526	20	AF53-13.50M	CB53-29.00M
		14.0	.551	13.9	.546		AF53-14.00M	
		14.5	.571	14.4	.566		AF56-14.50M	CB56-29.00M
		15.0	.591	14.9	.585		AF59-15.00M	CB59-29.00M
		15.5	.610	15.4	.605		AF59-15.50M	
29.5	1.161	14.5	.571	14.4	.566	20	AF56-14.50M	CB56-29.50M
		15.0	.591	14.9	.585		AF59-15.00M	CB59-29.50M
		15.5	.610	15.4	.605		AF59-15.50M	
30.0	1.181	14.5	.571	14.4	.566	20	AF56-14.50M	CB56-30.00M
		15.0	.591	14.9	.585		AF59-15.00M	CB59-30.00M
		15.5	.610	15.4	.605		AF59-15.50M	
30.5	1.201	14.5	.571	14.4	.566	20	AF56-14.50M	CB56-30.50M
		15.0	.591	14.9	.585		AF59-15.00M	CB59-30.50M
		15.5	.610	15.4	.605		AF59-15.50M	
31.0	1.220	14.5	.571	14.4	.566	20	AF56-14.50M	CB56-31.00M
		15.0	.591	14.9	.585		AF59-15.00M	CB59-31.00M
		15.5	.610	15.4	.605		AF59-15.50M	
31.5	1.240	14.5	.571	14.4	.566	20	AF56-14.50M	CB56-31.50M
		15.0	.591	14.9	.585		AF59-15.00M	CB59-31.50M
		15.5	.610	15.4	.605		AF59-15.50M	
32.0	1.260	14.5	.571	14.4	.566	20	AF56-14.50M	CB56-32.00M
		15.0	.591	14.9	.585		AF59-15.00M	CB59-32.00M
		15.5	.610	15.4	.605		AF59-15.50M	
32.5	1.280	15.0	.591	14.9	.585	20	AF59-15.00M	CB59-32.50M
		15.5	.610	15.4	.605		AF59-15.50M	
33.0	1.299	15.0	.591	14.9	.585	20	AF59-15.00M	CB59-33.00M
		15.5	.610	15.4	.605		AF59-15.50M	



Spare parts kits

Include:
Activation pin, control rod,
retention Seeger, safety pins (3pz),
O-Ring, Blade pin.

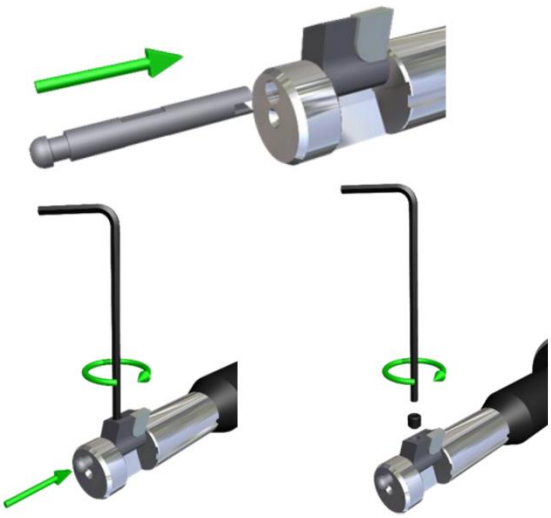
Kit code	Tool size	Safety pin code
SPK-AF25	25	203020-02
SPK-AF28	28	203020-02
SPK-AF31-34	31, 34	203020-02
SPK-AF38-40	38, 40	204020-02
SPK-AF44-47	44, 47	204020-02
SPK-AF50-53	50, 53	205020-02
SPK-AF56-59	56, 59	205620-02

Cutting speed

Speed	Fe	Steel	Stainless steel	Cast iron	Aluminum
m/min	91	67	46	107	183
mm/rev	0.028-0.038	0.028-0.038	0.028-0.038	0.038-0.050	0.050-0.063
SFM	300	220	150	350	600
IPR	.001-.002	.001-.002	.001-.002	.0015-.0025	.002-.003

Blade installation

1. Insert the blade pin through the passage hole in the body and the blade. Rotate it until it engages with the tang of the control rod.
2. With the blade in the open position, rotate the tool's clutch until the alignment mark on the blade pin is parallel to the allen key and the set screw seat. This will align the set screw with the flat on the pin.
3. Apply a drop of Loctite threadlocker (provided). Tighten the set screw to 0.7-1.1Nm, being careful not to exceed this value, and ensure that the set screw is aligned with the flat on the pin. In the case of blades with a double set screw, install the second one in series, tightening to 0.7Nm.



Verification: To check that the set screw is positioned on the flat reference, slightly loosen the set screw and try to pull out the pin. If positioned correctly, the pin should not come out but should slide slightly and then lock in place.

Working cycle

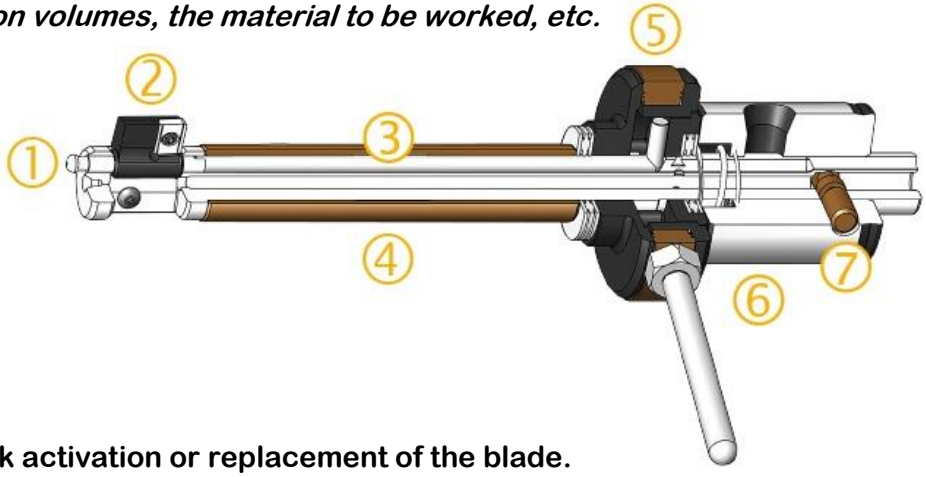
1. Coolant through the spindle OFF, external coolant ON, enter the hole with clockwise rotation at 500-800rpm
2. Advance until reaching a position that allows the blade to open safely.
3. Reverse the spindle rotation counterclockwise at 500-800g/min. Note: Do not stop the spindle while switching from clockwise to counterclockwise rotation (non-stop reversal). The blade opens. After 1-3 turns, increase the speed to the cutting speed. Coolant through the spindle ON
4. Retract, performing the back counterboring to the desired depth. Pause for 1-3 turns at the end of chamfering to clean the cut.
5. Advance until reaching a level that allows the blade to close safely. Coolant through the spindle OFF, leave the external coolant ON.
6. Set the rotation to 500-800g/min and reverse it by switching to clockwise rotation.

We can provide special tools for your specific application

SPECIAL TOOLS

***Autofacer** is a tool that allows for fully automatic circular machining from the other side of a through hole. Circular machining includes counterboring, facetting, enlarging, flaring, deburring, creating a spherical radius, or a combination of these operations. This is achieved thanks to a blade folded inside the tool body, allowing it to pass through the entry hole. Once the tool has entered the workpiece, the blade is mechanically opened, performing the cutting operation. The distinguishing features of the Autofacer are:*

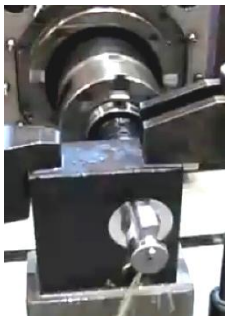
- *A clutch that mechanically opens and closes the blade, ensuring high reliability of the entire process*
- *The blade is mechanically held open during the machining process, allowing for the execution of challenging and interrupted cutting operations without issues*
- *The Autofacer body uses the through hole as support during the cutting action, enabling high cutting speeds even with substantial passage lengths or large-diameter counterbores.*
- *Braze-bonded or mechanically secured insert blades are produced in the geometry and configuration required by the customer's application. This allows for combining multiple operations into a single blade, maximizing time savings (e.g., counterboring and deburring or internal and/or external radiusing)*
- *There are different methods for opening/closing the blade, and the most suitable system for the customer's application is proposed, taking into consideration factors such as the machine tool used, production volumes, the material to be worked, etc.*



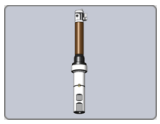
1. **Blade pin: Quick activation or replacement of the blade.**
2. **Blade: With insert or brazed, different grades and coatings depending on the application (including PCD)**
3. **Coolant through spindle: available for tools with shaft diameter ≥16mm**
4. **Shaft: Guides and supports the tool during the cutting action, preventing sticking in the hole**
5. **Clutch: Reliably opens and closes the blade, allowing interrupted cutting operations by holding the blade in the open position**
6. **Shank: Available in many configurations, including Weldon metric or inches, integral CV, BT, NMYB, or HSK, for transfer, high precision AF6, etc.**
7. **Safety pin: prevents damage caused by axial overload**

MAXIMUM COUNTERBORE DIAMETER IN RELATION TO ENTRY HOLE DIAMETER

Entry hole diameter	Maximum counterbore diameter
6.35 – 12.7 mm	Entry hole Ø x 1.9
12.8 – 19 mm	Entry hole Ø x 2.1
> 19 mm	Entry hole Ø x 2.2




BLADE OPENING SYSTEMS



THRUST/REVERSAL CONE ACTIVATION

By applying pressure, the cone grips the surface of the workpiece
By reversing the rotation, the blade either opens or closes
Very reliable, suitable for all machines, both CNC and manual
Equipped with a safety pin in the shank to safeguard the tool

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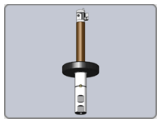

INERTIAL ACTIVATION

Blade opening/closing through rapid rotation reversal
Ideal for modern CNC machines capable of rapid spindle accelerations
Equipped with a safety pin in the shank to safeguard the tool

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PAD ACTIVATION

To open/close the blade, the pad grips the internal diameter of the pilot hole.
Ideal for large passage diameters, over 50mm.
The tool is very sensitive to the precision of the passage hole.
Equipped with a safety pin in the shank to safeguard the tool

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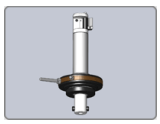

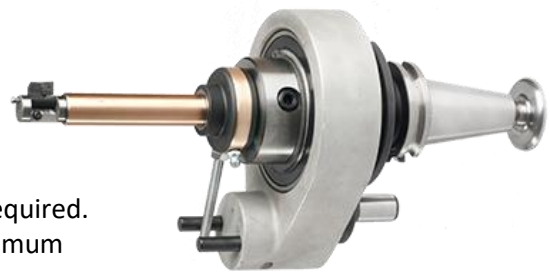

TORQUE BAR ACTIVATION

For the opening/closing, an anti-rotation system for the actuation rod is required.
A highly reliable system used for high-volume productions where the maximum level of reliability is required.
Equipped with a safety pin in the shank to safeguard the tool

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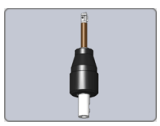
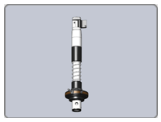


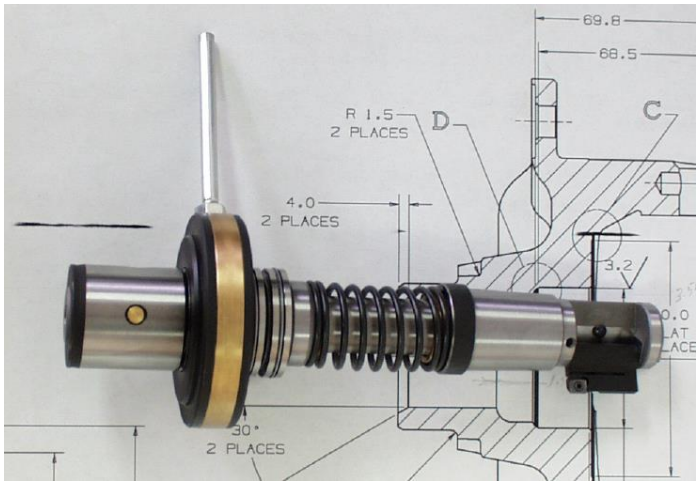
AIR/COOLANT ACTIVATION

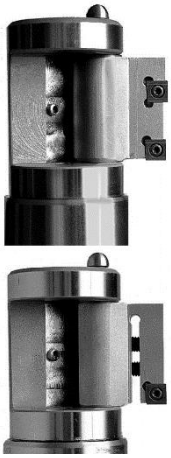
The pressure of the coolant or air opens the blade.
The blade closure is entrusted to a spring system.
Very easy to program.
Requires filtration of at least 10 microns.
Note: It does not have a safety pin.

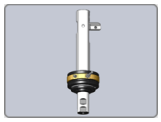


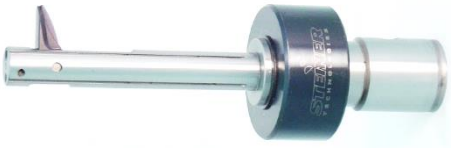
GUIDE BEARING

Finishing tool available for a torque bar activation system. A tapered bushing ensures precise support inside the hole. Adjustable insert cartridge.









EXTENDED WORKING RANGE

The different blade activation system allows counterboring diameters over 2.2 times the inlet diameter. Model available starting from entry hole diameter of 16mm. Activation with torque bar or coolant.

APPLICATION SECTORS

AUTOMOTIVE
Differential boxes and supports, planetary gears, axles, etc.
Transmissions: gearboxes, housings, supports, etc.
Steering joints and columns
Connecting rods, engine blocks, 4WD steering hubs

AEROSPACE
Engine compartment
Landing gear components
Turbine shafts, bearing housings
Helicopter rotors
Torque meter housings

HEAVY EQUIPMENT
Engine blocks, Cantilever supports
Attachment forks, Swing arms
Attachment brackets, Structures
Flywheel cover boxes

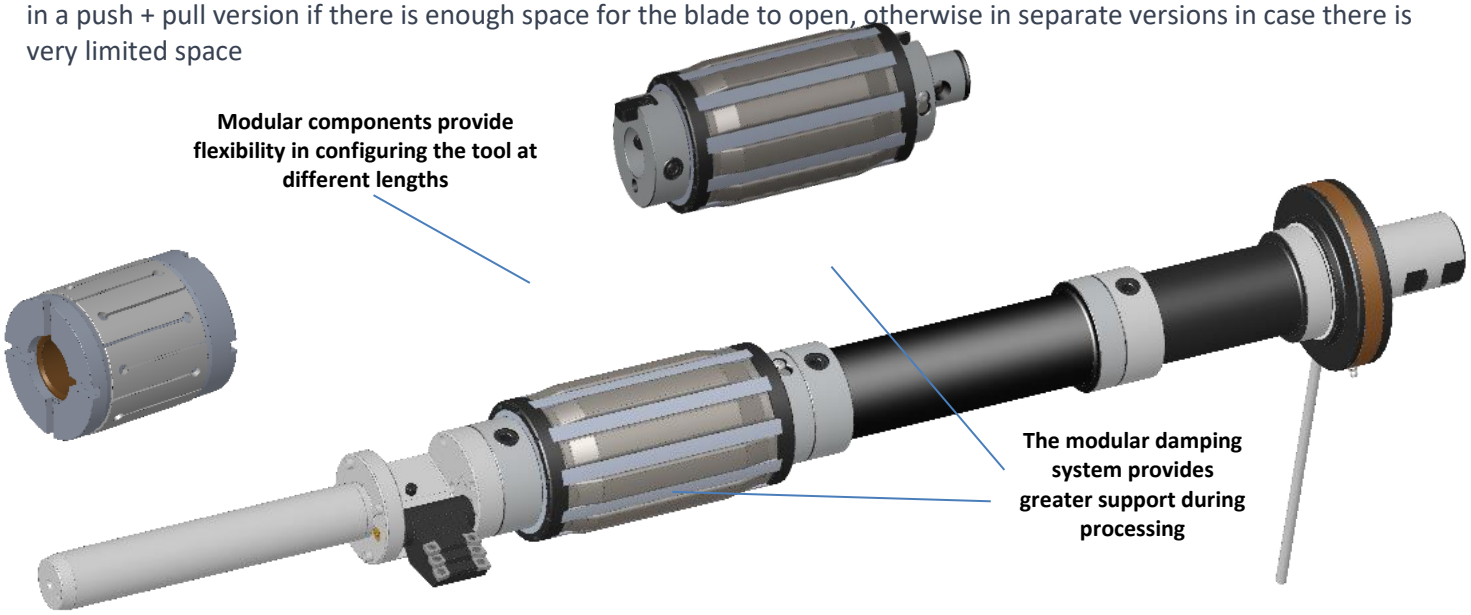
POWER GENERATORS
Housings and supports for steam turbines and gas turbines, Turbine shafts
Compressor components

MARINE
Gearboxes
Submarine components
Engine blocks, Ballasts, Manifolds
PUMPS AND VALVES
Pump housings
Valve seats, Valve bodies
Impellers and rotors

DEFENSE
Components for tanks and armored vehicles
Various components

KA MODEL – OIL & GAS VALVES

To significantly reduce processing times and optimize operations within the production processes of gate valves.
The expandable bushing provides support to the tools during the cutting action. We can design custom expandable bushings or use the ones already owned by the customer. The insert holder blades for working pockets can be provided in a push + pull version if there is enough space for the blade to open, otherwise in separate versions in case there is very limited space

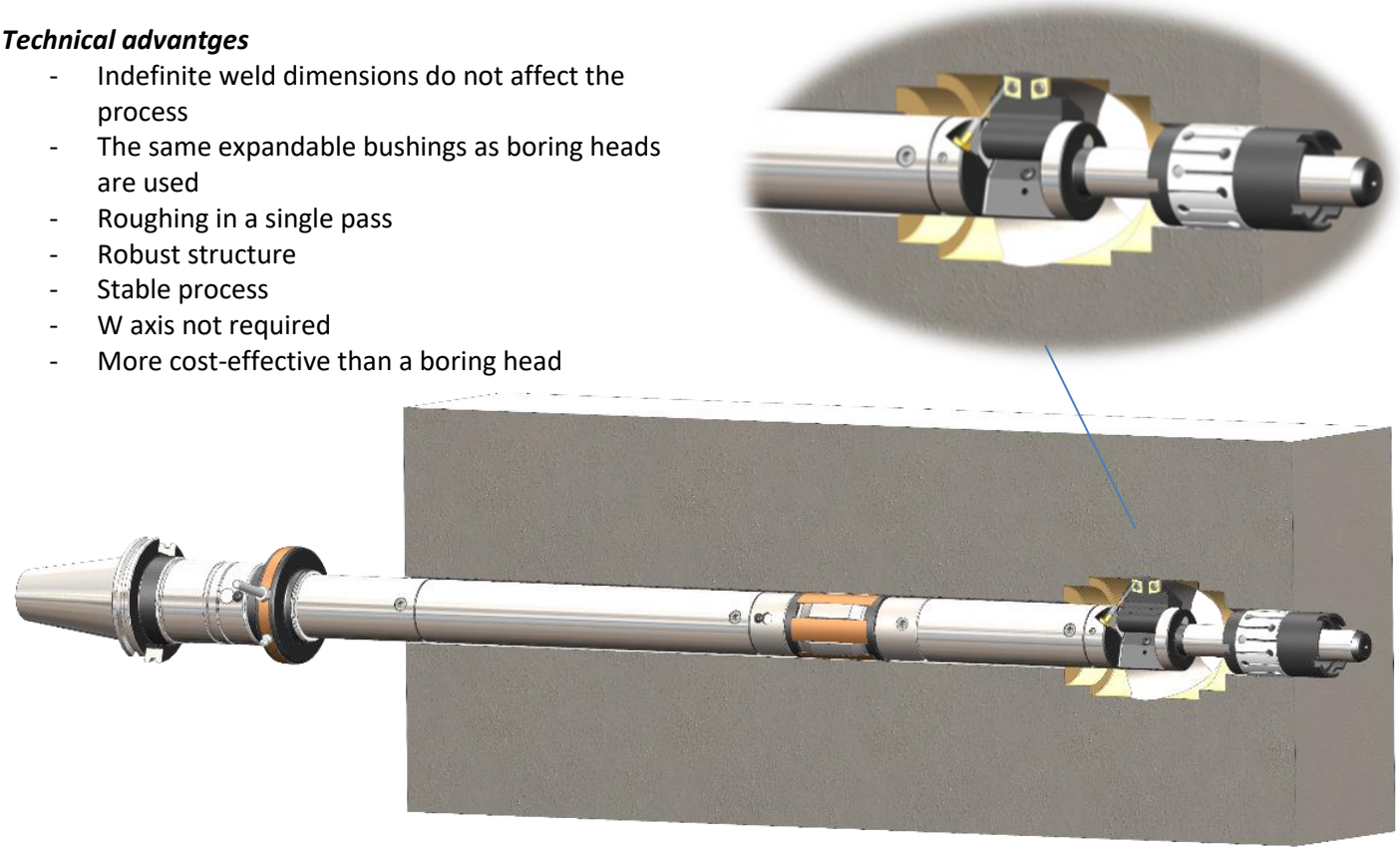


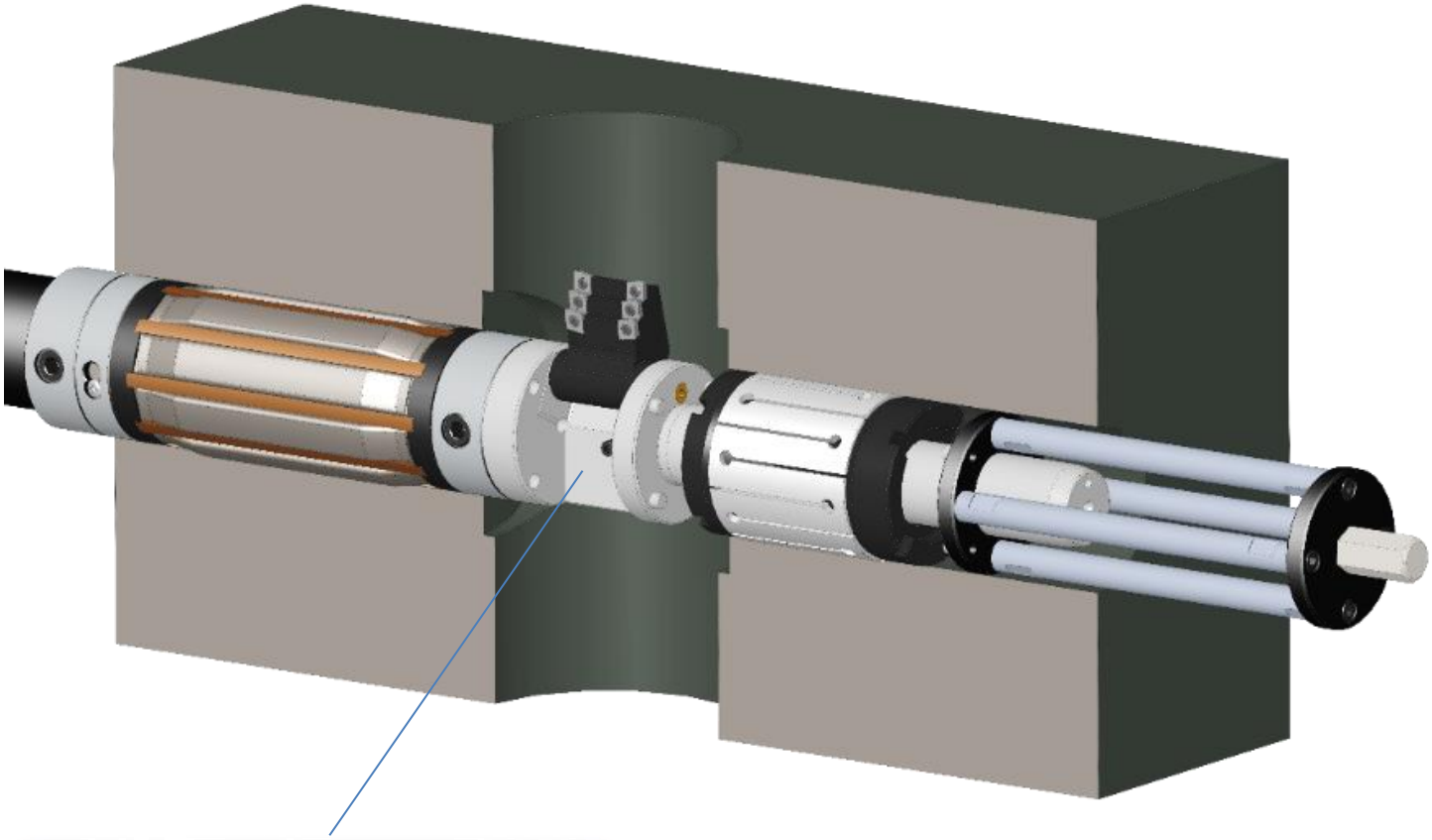
In case it is necessary to use boring heads for precision finishing, the previous processing with Autofacer greatly reduces processing times as there will be a known roughing diameter, and it will no longer be necessary to perform numerous empty passes. Having a preparation diameter instead of a weld, we will also reduce the risks of collisions and damages.

Modular
High-precision extensions are used to assemble the tool to the necessary length for processing.
Modular components are standard.
There are semi-standard models for valves from 2” to 7” (50-178mm).
Dampers reduce vibrations during cutting action

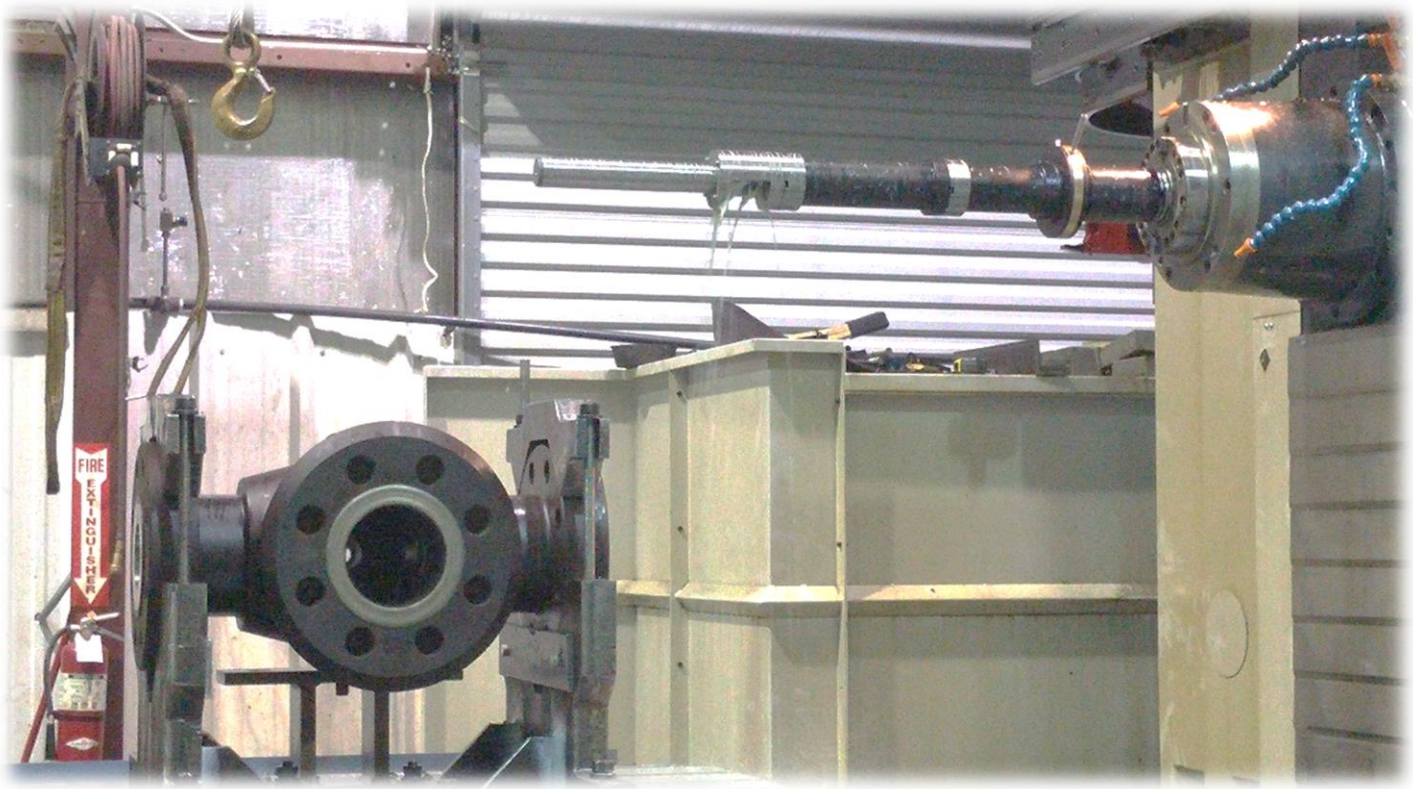
Technical advantges

- Indefinite weld dimensions do not affect the process
- The same expandable bushings as boring heads are used
- Roughing in a single pass
- Robust structure
- Stable process
- W axis not required
- More cost-effective than a boring head





The KA Autofacer can be used without problems in the presence of seats or pockets with Inconel overlay



ENTRY HOLE DIAMETER CLEARANCE – PILOT HOLE DIAMETER

A. For entry holes with a diameter up to 19mm, the pilot shaft has a diameter 0.05mm smaller than the minimum diameter of the entry hole.
B. For entry holes from 19.1mm to 50.8mm inclusive, the pilot shaft has a diameter 0.08mm smaller than the minimum diameter of the entry hole.
C. For entry holes from 50.9mm to 76.2mm inclusive, the pilot shaft has a diameter 0.1-0.13mm smaller than the minimum diameter of the entry hole.
D. For entry holes beyond 76.3mm, the pilot shaft has a diameter 0.13-0.15mm smaller than the minimum diameter of the entry hole.

Hole diameter	Clearance between diameters
6.35 – 19.00mm	0.05mm
19.10-50.8mm	0.08mm
50.9-76.2mm	0.1-0.13mm
76.3+ mm	0.13-0.15mm

MAXIMUM COUNTERBORE DIAMETER IN RELATION TO THE ENTRY HOLE DIAMETER

For an entry hole up to 12.7mm, the maximum working diameter has a ratio of 1.9
For an entry hole from 12.8 to 19mm, the maximum working diameter has a ratio of 2.1
For an entry hole above 19.1mm, the maximum working diameter has a ratio of 2.2

Entry hole diameter	Maximum working diameter ratio
6.35 – 12.7 mm	1.9
12.8 – 19 mm	2.1
19 + mm	2.2

SPEED AND FEED

The back counterbore tools must work with very slow feeds at high rotational speeds. The table shows the maximum values for rotational speed and feed for a given working diameter.
To obtain the appropriate spindle speed in revolutions per minute, use the following formula.

$$\text{Rotational speed (rpm)} = \frac{1000 \times \text{Cutting speed (m/min)}}{3.1416 \times \text{working diameter (mm)}}$$

Data based on a maximum ratio of 1.5 between the entry hole and the working diameter **Reduce the values for a higher ratio between the two diameters**						
Tool size	**Feed Speed**	**Brass**	**Aluminum**	**Cast iron**	**Steel**	**Stainless**
25-50	Feed (mm/rev) Cutting speed (m/min)	0.076 244	0.076 244	0.038 91	0.038 91	0.025 60
53-75	Feed (mm/rev) Cutting speed (m/min)	0.127 244	0.127 244	0.050 91	0.050 91	0.038 60
81-94	Feed (mm/rev) Cutting speed (m/min)	0.152 244	0.152 244	0.076 91	0.076 91	0.050 60
10-11	Feed (mm/rev) Cutting speed (m/min)	0.203 244	0.203 244	0.100 91	0.100 91	0.063 60
12-15	Feed (mm/rev) Cutting speed (m/min)	0.254 244	0.254 244	0.152 91	0.127 91	0.076 60
16-21	Feed (mm/rev) Cutting speed (m/min)	0.381 244	0.381 244	0.203 91	0.152 91	0.089 60
≥ 22	Feed (mm/rev) Cutting speed (m/min)	0.508 244	0.508 244	0.304 91	0.254 91	0.100 60

THE REPORTED VALUES SHOULD BE CONSIDERED AS MAXIMUM AND PURELY INDICATIVE, THERE MAY BE SIGNIFICANT VARIATIONS DEPENDING ON THE FOLLOWING VARIABLES. ALWAYS START WITH LOW VALUES AND INCREASE GRADUALLY.

- DIFFERENT TYPES OF MATERIAL
- INTERRUPTED CUT
- NON-PLANAR COUNTERBORING
- ETC.

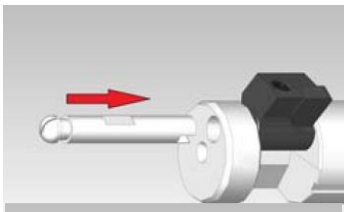
What to check before using Autofacer

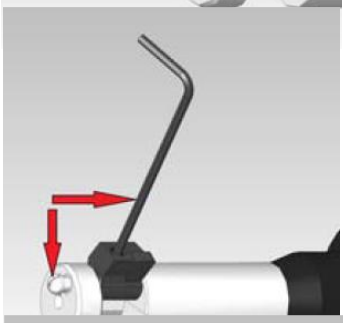
- Manually open and close the blade. Verify that the movement is smooth and without snags
- Check that the blade is correctly and safely mounted on the pin with the locking screw tightened against the flat of the pin (see “Instructions for the blade installation” below)
- Check the tightness of the blade’s locking screw, wether a secondary locking screw is present and wether thread-locking compound is applied to them. In the “open” position, the blade must be firmly resting against the guiding shaft’s head.
- In the “closed” position the blade mustt not be protruding from the outside diameter of the guiding shaft and must be firmly held closed with no excessive movement.
- If excessive movement is still present in the “open” position, check the whole blade-pin-screws assembly again
- Check wether the blade is clear of obstacles that could damage it in the “open” position

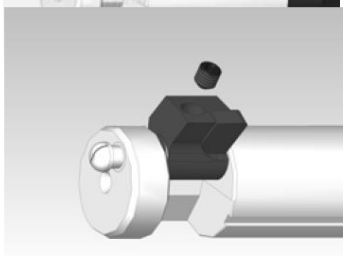
Suggestions for programming and usage

- Check the recommended speeds and feeds
- Check the work cycle for your specific tool
- Check that the blade is installed correctly (see “Instructions for the blade installation” below)
- Read the troubleshooting and blade re-sharpening instructions
- DO NOT activate the through spindle coolant before the blade is fully open and ready to work
- Stop the through spindle coolant flow BEFORE reversing the rotation to close the blade
- TOOL WITH A SAFETY PIN MUST BE LIFTED AT LEAST 72mm ABOVE THE WORKPIECE BEFORE MOVING LATERALLY. This is needed to allow the shank to fully separate from the rest of the tool without causing damage if the safety pin broke.
- The blade must be clear of any obstacle before opening

Instructions for the blade installation







NOTE: THE AUTOFACER RELIABILITY DEPENDS ON THE CORRECT TIGHTENING OF THE BLADE ON THE PIN’S FLAT

- Remove the protective wax, if present
- Some blades come with two locking screws
- Remove the external locking screw (if two are present), then the internal one
- NOTE: short blades and non-brazed blades come with only one locking screw
- Make sure that the inner-most screw doesn’t interfere with the blade pin entry
- If the blade comes with only one locking screw, completely unscrew it and apply a drop of the supplied thread locking compound onto it, to avoid it loosening because of vibrations. Reinsert the screw and bring it right up to the blade pin hole. Only use flat-pointed screws.
- Remove the blade pin from the tool
- While holding the tool’s shank, rotate the clutch clockwise as far as it goes
- Place the blade in the “open” position and slide the pin in, rotating it until it engages the tang on the control rod
- Bring the locking screw perpendicularly in contact with flat on the blade pin. To ensure the retention of the blade, slightly move the pin while tightening the locking screw. Lightly lossen and tighten it back again to ensure perfect coupling. DO NOT tighten with excessive torque (0.7-1.1Nm).
- Test the mechanism by rotating the clutch by hand to the left and to the right until both the fully open and fully closed positions are reached. When fully closed the blade must be firmly held against the tool’s head
- If present, insert and tighten the second locking screw (only use flat-pointed screws)

Maintenance

Every model must be disassembled, checked and cleaned periodically.

Lubrication

- If through spindle coolant is used, additional lubrication is not needed
- If through spindle coolant is NOT used, the clutch must be disassembled and greased every 10 hours of working time.
  Suggested lubricants:
  M1 grease (lubriplate No.930-AA) for generic use
  M2 grease (MO-LITH No.2) l ithium molybdenum grease
- If the Autofacer hasn't been used for a long time, lubrificate it before use
- If the Autofacer will not be used for a long time, lubricate it generously and apply rust protection before storing it

Inspection

The Autofacer should be inspected monthly to check for wear of the various components
It is advised to periodically check the opening and closing of the blade by hand to ensure that the movement is smooth and without snags

DISASSEMBLY

- Remove the safety pin retention ring with a small screwdriver
- Remove the safety pin with a hammer and a small punch.
- Remove the shank, and all the body and clutch components referring to the drawing provided with the tool.
- Remove the blade and the control rod.
- Thoroughly wash every component from dirt and grease using solvant.

INSPECTION OF THE COMPONENTS

- Inspect the wear of every component.
- With the tool body held between centers, check its concentricity to be under 0.05mm
- Inspect the control rod.
- Inspect the activation pin.
- INspetc the thrust washers, the clutch, and the flywheel.

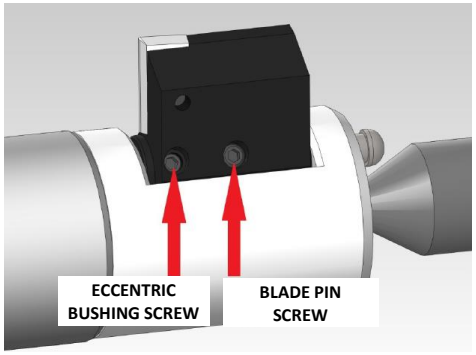
RE-ASSEMBY

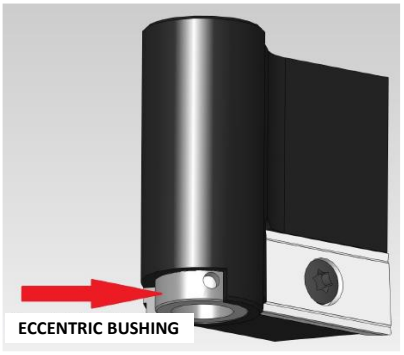
- Assemble all the components referring to the drawing provided with the tool. Using M1 grease, lubricateevery commponent during assembly, especially every moving component and the clutch body.
- Replace the control rod.
- Check the functionality by repeatedly operating the blade manually, ensuring that the clutch offers slight resistance but the movement is not freely rotating.
- Install the blade following the instructions and verify its operation by manually actuating it.

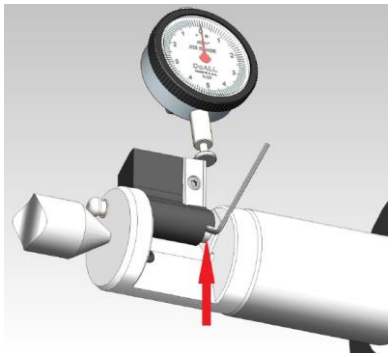
Instructions for adjustable blade

The blade is equipped with an eccentric bushing.
By rotating the bushing, the blade's protrusion can be adjusted, thus varying the counterbore's diameter
Once the counterbore's diameter is set, a locking screw holds the bushing in place.

To adjust it, mount the AUTOFACER between centers, ensure that the blade is correctly installed and locked against the pin's flat (see "Instructions for the blade installation" above).
Lightly loosen all the locking screws.
Calculate the counterbore diameter from the radius measured with the blade in the "open" position.
Use a small allen key or similar tool to rotate the eccentric bushing until the desired radius/counterbore diameter is reached.
Tighten the screw closest to the AUTOFACER's body to lock the eccentric bushing, then tighten the blade pin's locking screw.







TROUBLESHOOTING

SAFETY PIN BREAKING

Generally, the breakage of the safety pin is caused by too high working pressure, which is due to the wear of the cutting edge of the blade. Check the blade, replace, or sharpen if necessary.
The breakage can be caused by hard spots in the material or too fast feed. Replace the pin, check the feed and speed, and repeat the work cycle. If the pin breaks again, increase the speed by 25% and reduce the feed by 25%.
The breakage can also be caused by high working pressure due to a large blade radius. If the blade radius is greater than 0.4mm, reduce by 50% or more, the recommended value as the maximum feed.
High working pressure is also present in the case of angled chamfers to be deburred (large working surface in relation to the diameter). In this case, reduce by 50% or more, the recommended value as the maximum feed and, if necessary, also the rotation speed.
Excessive working pressure can also be caused by the upper strip of the brazed insert with a value below the center due to incorrect sharpening operation. DO NOT re-sharpen the upper strip of the blades.

CHIPS NOT BREAKING

If the chip does not break, it may be due to too slow feed, and there is a risk that it wraps around the tool and prevents the blade from closing. Increase the feed by 0.03-0.08mm/rev and occasionally stop the feed during cutting to break the chip and evacuate it from the work area.

THE BLADE IS NOT LOCKED ON THE PIN

Some blade models have two locking crews mounted in series, one for gripping the pin and the second for safety locking, while others have only one. Replace the screws, ensure correct tightening on the flat of the pin, and apply Loctite. Follow the instructions above for the correct blade assembly.

THE BLADE DOES NOT COMPLETELY OPEN OR CLOSE

Check the alignment of the locking screw with the flat on the pin, ensure the correct installation of the blade, disassemble and reassemble the Autofacer, ensuring that there are no chips stuck anywhere and/or any damage to the tool.

PIN BREAKING

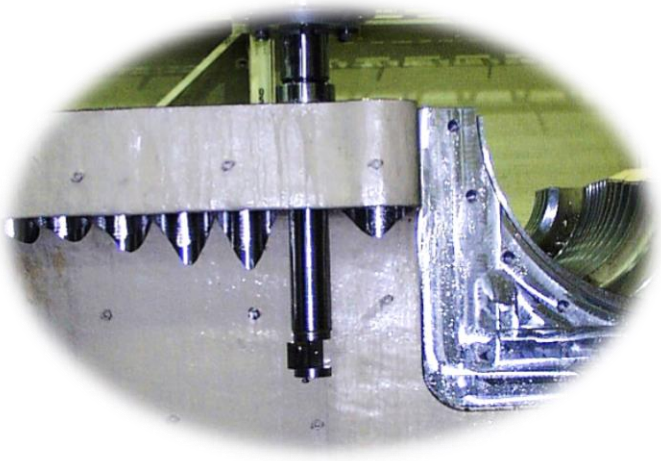
The blade was not installed correctly

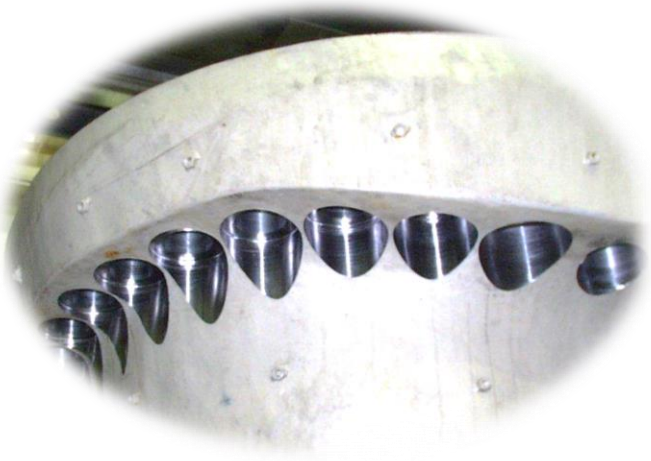
BLADE SKIPPING

Check the condition and play of the outer bushing on the stem with guide bushing.
Ensure that the play between the diameter of the guide bushing and the entry hole is not too large, it should be no more than 0.25mm and not less than 0.05mm.
Increase the feed by 0.03-0.08mm/rev.

FREE MOVEMENT OF THE CLUTCH

If the clutch moves freely and, consequently, the blade opens freely, inspect the condition of the clutch assembly by disassembling it.

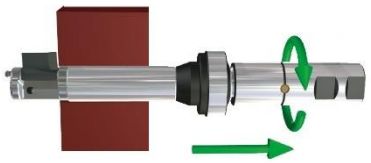




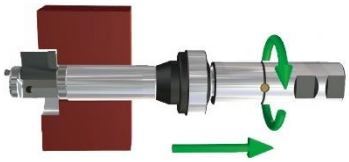
THRUST ACTIVATION

External coolant ON, coolant through the spindle OFF. Feed into the right-hand rotating hole (100 rpm) until the thrust cone contacts the surface.

Compress the cone by 1.5mm. Reverse the rotation to open the blade. Note: Ensure clearance from obstacles. After 1-3 turns, bring it up to working speed. Activate the coolant through the spindle.

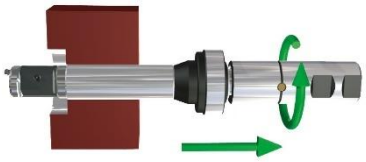


Approach the work surface rapidly. The tool is designed to operate at high rotational speeds with low feed.



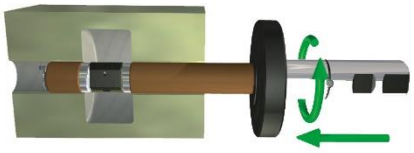
Perform the machining at the recommended cutting speed. A brief pause in the final position is advisable to clear the cut (1-3 turns).

Lower the speed to 100 rpm, fast feed until the cone makes contact with the surface.

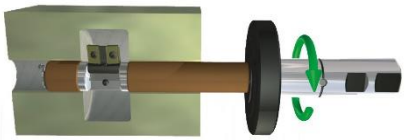


External coolant ON, coolant through the spindle OFF. Compress the cone by 1.5mm. Reverse the rotation to close the blade. Quickly retract from the hole to complete the work cycle.

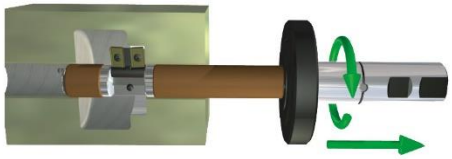
INERTIAL ACTIVATION



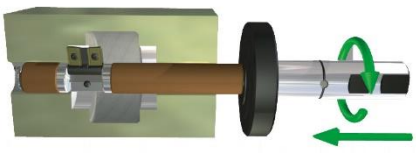
External coolant ON, coolant through the spindle OFF. Enter the hole in a clockwise rotation (rotational speed 300-800 rpm) until it passes through and position in an obstacle-free area for blade opening.



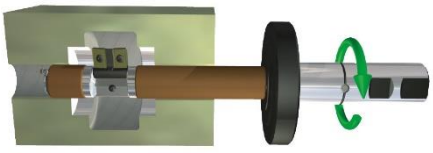
Reverse the rotation quickly at 300-800 rpm (do not program spindle stop between directions). The blade opens in the cutting position. After 1-3 turns, bring it up to working speed. Activate the coolant through the spindle.



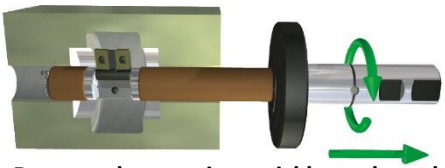
Approach the work surface rapidly. Perform the machining at the recommended cutting speed. A brief pause in the final position is advisable to clean the cut (1-3 turns).



If the model includes the front milling option, rapid feed for approaching the front surface, machining at the recommended speed, and a brief pause to clean the cut (1-3 turns).

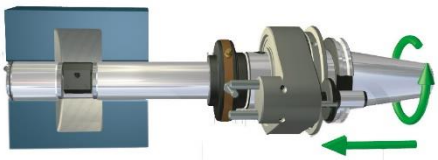


Position the blade in an obstacle-free area. External coolant ON, coolant through the spindle OFF.

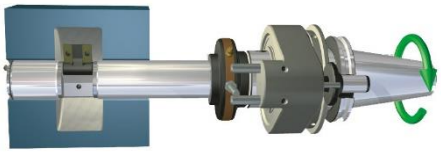


Reverse the rotation quickly to close the blade at 300-800 rpm (do not program spindle stop between directions). Rapid exit to disengage from the hole.

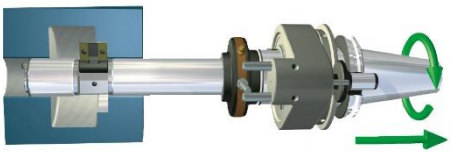
TORQUE BAR ACTIVATION



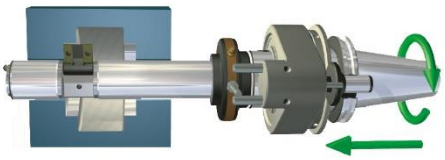
External coolant ON, coolant through the spindle OFF. Enter the hole with right-hand rotation (100 rpm).



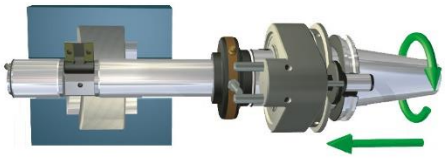
Reverse the rotation at 100 rpm. The blade opens in the cutting position. After 1-3 turns, bring it up to working speed. Activate the coolant through the spindle.



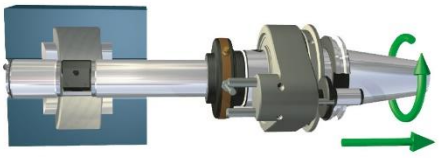
Approach the work surface rapidly. Perform the machining at the recommended cutting speed. A brief pause in the final position is advisable to clean the cut (1-3 turns).



If equipped with the front milling option, use rapid feed for approaching the front surface, perform the machining at the recommended speed, and make a brief pause to clean the cut (1-3 turns)



Position the blade in an obstacle-free area. External coolant ON, coolant through the spindle OFF.



Set the rotation at 100 rpm, reverse the rotation to close the blade. Rapid exit to disengage from the hole.