



Passion for Tools



**APPLICATION SOLUTIONS  
CUTTING TECHNOLOGY**

# THE HISTORY ABOUT THE COVER PICTURE

ALFRA is expert for holes. This may initially sound a bit strange, but also very simple.

In fact, we deal with various techniques and tools for more than 40 years to realize cut-outs into different materials in a preferably precise and simple way.

The product pictured on the cover page is one of our classics: the carbide-tipped Hole Saw.

You may claim, without exaggeration, that they were often copied, but never achieved.

Basis for our tools are optimized base materials for the blanks as well as best and balanced qualities for the carbide teeth. Tapered center drills for effort-saving spot drilling without drifting as well as ejector springs for an autonomous compulsion of the drilled-out part are additional specialties.

The use of our TCT Hole Saws in steel, stainless steel, aluminum, plastic and many other materials results in circular, precise holes within tolerances. Over a long period we have developed this product further and made it to a product which, nowadays, users appreciate around the world.

For just making any hole there are alternatives.

However, for making exact, process-reliable, ergonomic and safe cut-outs with repeated accuracy, there is no way to come around TCT Hole Saws "Made in Germany", "Made by ALFRA".

In this catalogue you will find many articles of the same quality standards which will ease your everyday work and help you to deliver a clean work result. For professionals achieve the best results only with professional tools.

Have a good time and we wish you lots of pleasure when using our products!

Yours, Alfra GmbH from Hockenheim/Germany.



# ENERGY AWARENESS BY ALFRA



**Over the last 4 years we have reduced our CO<sub>2</sub> emissions by almost 400 tonnes!  
We have produced 600 megawatt-hours of power for our own use!**

Only if you manufacture in-house, can you control and shape the entire manufacturing process.

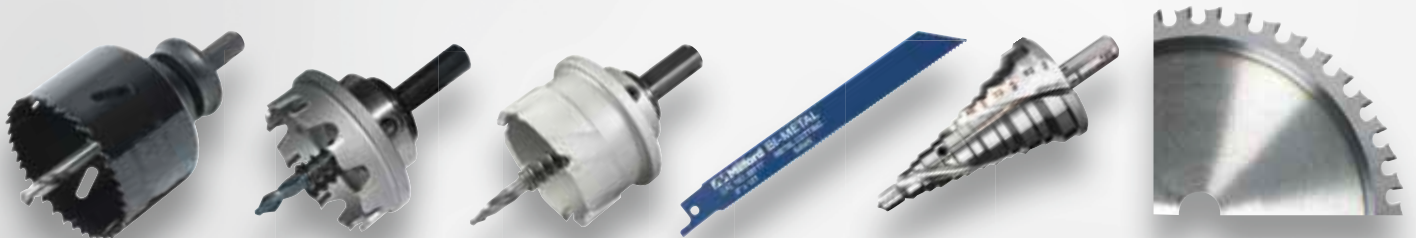
We have consistently implemented a resource-saving approach to our environment into daily practice in recent years and developed a heightened awareness of "what comes from where" and how to effectively make use of these valuable resources.

With the use of alternative energy, i.e. photovoltaics, we have achieved almost climate-neutral production process in recent years.

And lest we forget: we are, of course, certified according to ISO Standards since 1997!

This means that you can feel good about our tools – not just because they are so technically advanced and are so durable.

But also because the entire production cycle has been carefully designed to ensure that our tools won't leave any traces which could pollute the environment or leave problems for the generations that will follow us.



 **MADE IN GERMANY**



# CONTENTS

## CUTTING TOOLS



**Hole Saws  
HSS-Bi-Metal/Sets**

**Page 6 - 10**



**TCT-Hole Saws  
Short Type**

**Page 11- 15**



**TCT-Hole Saws  
Long Type**

**Page 16 - 17**



**TCT-Hole Saws  
MBS-Light**

**Page 18 - 19**



**TCT-Hole Saws  
MBS-Pro**

**Page 20 - 21**



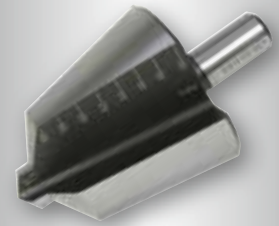
**TCT-Hole Saws  
FRP Type**

**Page 22 - 23**



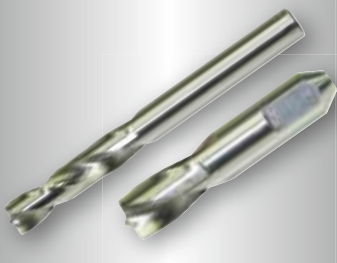
**Precision  
Multi-Step Drills**

**Page 24 - 27**



**Precision Conical  
One-Lip Bits**

**Page 28**



**Welding Point Drills**

**Page 29**



**Countersink Tools**

**Page 30 - 31**



**Sabre Saw Blades**

**Page 32 - 34**



**Special-Jigsaw Blades**

**Page 35**



**Circular Saw Blades  
HSS-Metal**

**Page 36**



**Circular Saw Blades  
RotaDry®**

**Page 37**



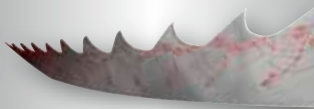
**Circular Saw Blades  
Rotaspeed®**

**Page 38**



**Metal Hand Saw Blades**

**Page 39**



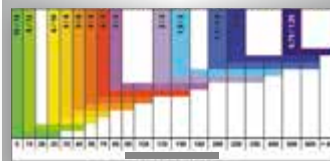
**Saw Blades Astroflex®**

**Page 40**



**Coolant**

**Page 41**



**Technical  
Information**

**Page 42 - 51**

# ALFRA HSS-BI-METAL HOLE SAWS

## Features:

- High concentricity
- With solid base plate, thus more threads and higher stability as well as concentric running exactness.
- For material from 2 mm – with positive chipping and cutting angles as well as combi-toothing 4/6 tpi. This variable spacing provides a more even cut, for a minor generation of vibrations and heat. Lower expenditure of energy when cutting.
- Cutting Depth: 38 mm (1-1/2").
- Lateral slots help to remove the core.
- Suitable for unalloyed steel (up to 700 N/mm<sup>2</sup>), nonferrous metals, light metals, plastics, gypsum, pulp wood- and plywood boards, lightweight building boards and general wood processing.
- Drill bit exchangeable with other commercially available arbors.





**Also steel/stainless steel up to approx. 3 mm, can be worked easily (for frequent use, we recommend our TCT Hole Saws).**



**... designed to work on softwoods.**

# ALFRA – HSS-BI-METAL HOLE SAWS

ALFRA HSS-Bi-Metal Hole Saws are applicable in portable and pillar drilling machines. When using pillar drilling machines, use manual feed only.

## Features:

- High concentricity.
- With solid base plate, thus more threads and higher stability as well as concentric running exactness.
- With positive chipping and cutting angles as well as combi-toothing 4/6 tpi. This variable spacing provides a more even cut, for a minor generation of vibrations and heat. Lower expenditure of energy when cutting.
- Cutting Depth: 38 mm (1-1/2").
- Lateral slots help to remove the core.
- Suitable for unalloyed steel (up to 700 N/mm<sup>2</sup>), nonferrous metals, light metals, plastics, gypsum, pulp wood- and plywood boards, lightweight building boards and general wood processing.
- Drill bit exchangeable with other commercially available arbors.

## Tip:

Start drilling operation with light pressure. Continue with light and steady pressure, avoid pendulum motion, follow the speed chart, use coolant. When cutting wood or wood substitutes, remove drill dust in time.



Combi toothing 4/6 tpi



from Ø 14.0 to 210 mm available

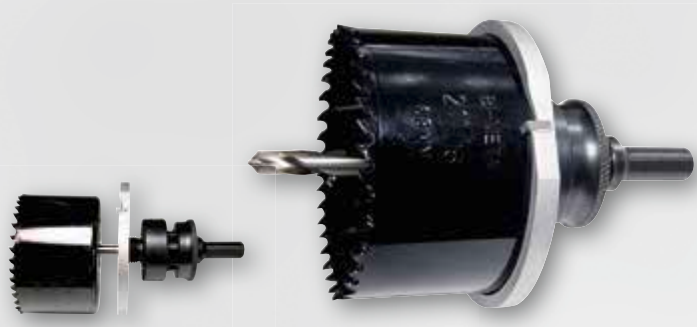


Saw-Ø mm	Inches	Prod.-No.
14.0	9/16"	0500014
16.0	5/8"	0500016
17.0	11/16"	0500017
19.0	3/4"	0500019
20.0	15/19"	0500020
21.0	13/16"	0500021
22.0	7/8"	0500022
24.0	15/16"	0500024
25.0	1"	0500025
27.0	11/16"	0500027
29.0	1-1/8"	0500029
30.0	1-3/16"	0500030
32.0	1-1/4"	0500032
33.0	1-5/16"	0500033
35.0	1-3/8"	0500035
37.0	1-7/16"	0500037
38.0	1-1/2"	0500038
40.0	1-9/16"	0500040
41.0	1-5/8"	0500041
43.0	1-11/16"	0500043
44.0	1-3/4"	0500044
46.0	1-13/16"	0500046
48.0	1-7/8"	0500048
51.0	2"	0500051
52.0	2-1/16"	0500052
54.0	2-1/8"	0500054
57.0	2-1/4"	0500057
59.0	2-5/16"	0500059
60.0	2-3/8"	0500060
64.0	2-1/2"	0500064
65.0	2-9/16"	0500065
67.0	2-5/8"	0500067
68.0	2-11/16"	0500068
70.0	2-3/4"	0500070
73.0	2-7/8"	0500073



# ALFRA – HSS BI-METAL HOLE SAWS

Saw Ø mm	Inches	Prod.-No.
74.0	2-11/12"	0500074
76.0	3"	0500076
79.0	3-1/8"	0500079
83.0	3-1/4"	0500083
86.0	3-3/8"	0500086
89.0	3-1/2"	0500089
92.0	3-5/8"	0500092
95.0	3-3/4"	0500095
98.0	3-7/8"	0500098
102.0	4"	0500102
105.0	4-1/8"	0500105
108.0	4-1/4"	0500108
111.0	4-3/8"	0500111
114.0	4-1/2"	0500114
121.0	4-3/4"	0500121
127.0	5"	0500127
140.0	5-1/2"	0500140
152.0	6"	0500152
From Ø 160.0 mm only suitable for wood and wood substitutes.		
160.0	6-5/16"	0500160
168.0	6-10/16"	0500168
177.0	7"	0500177
210.0	8-5/16"	0500210



Prod.-No. 0501013 with bi-metal hole saw Ø 68 mm + A2-SS

## Arbors

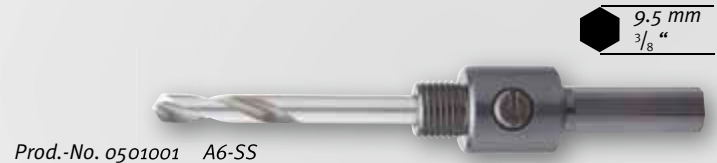
with pilot drill

Saw-Ø mm	Saw-Ø inch	Type	Shank-Ø	Prod.-No.
14 - 30	9/16" - 1-3/16"	A 6-SS	9.5 hexago	0501001
14 - 30	9/16" - 1-3/16"	A 6-SDS	SDS	0501002
32 - 152	1-1/4" - 6"	A 2-SS	9.5 hexago	0501003
32 - 152	1-1/4" - 6"	A 2-SDS	SDS	0501005
32 - 210	1-1/4" - 8-5/16"	A 3-SS	11.11 hexago	0501006
32 - 210	1-1/4" - 8-5/16"	A 5-SS	16.0 hexago	0501008

## Accessories:

Rim countersink for Ø 68 mm (with TCT-teeth)	0501013
Extension shaft 300 mm x 9.5 mm for A 6-SS + A 2-SS, A3-SS	0501010
Spare Center Drill HSS Ø 6.35 mm x 80 mm for A 6-SS + A 6-SDS + A 2-SS + A 2-SDS + A 3-SS + A 5-SS	0502001
Ejector Spring	0502004

**Important: Disable impact drill position when using SDS-shanks!**



Prod.-No. 0501001 A6-SS



Prod.-No. 0501002 A6-SDS



Prod.-No. 0501003 A2-SS



Prod.-No. 0501005 A2-SDS



Prod.-No. 0501006 A3-SS



Prod.-No. 0501013

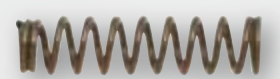


Diverse applications

Prod.-No. 0501010



Prod.-No. 0502001



Prod.-No. 0502004

# ALFRA – HSS BI-METAL HOLE SAW SETS

## HSS Bi-Metal Hole Saw Sets



■ The following HSS-Bi-Metal Hole Saw Sets enlarge our range. These sets were especially compiled for electricians, mechanics, plumbers and for general, universal applications.

■ All sets are delivered in a robust and practical plastic case

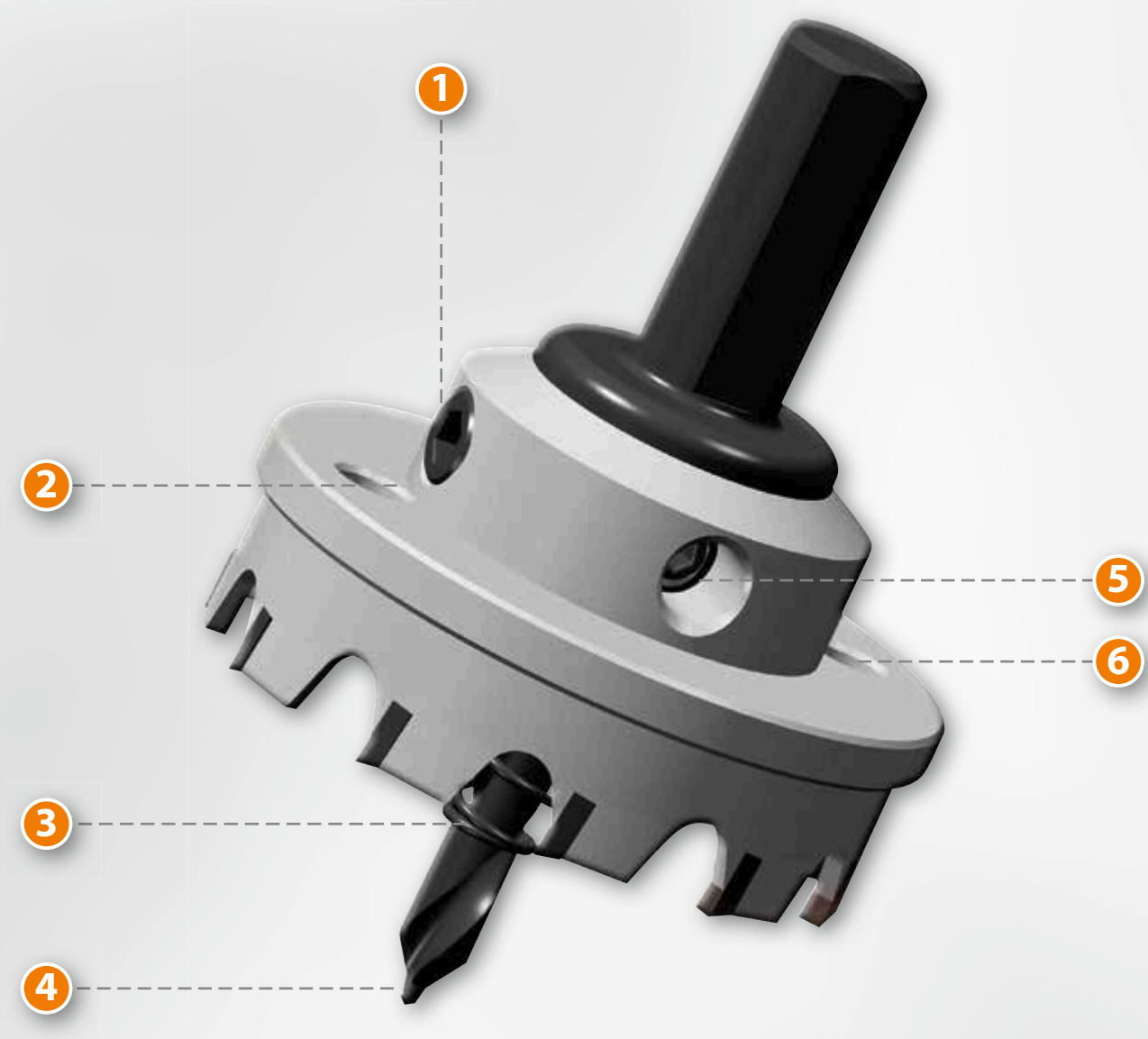
■ Incl. Arbor A6-SS, Arbor A2-SS, Spare Twist Drill

■ These sets improve the presentation. Storage in solid tool cases.

Ø mm	16.0	19.0	22.0	24.0	25.0	29.0	32.0	35.0	38.0	44.0	51.0	52.0	57.0	64.0	67.0	68.0	76.0	
Ø Inch	5/8"	3/4"	7/8"	15/16"	1"	1-1/8"	1-1/4"	1-3/8"	1-1/2"	1-3/4"	2"	2-1/16"	2-1/4"	2-1/2"	2-5/8"	2-11/16"	3"	
Prod.-No.																		
0503006	Hole Saw Set Standard																	
	●	●	●			●		●		●		●	●			●		
0503007	Hole Saw Set Professional																	
	●	●	●		●	●	●	●	●	●	●			●				●
0503008	Hole Saw Set Electro																	
			●			●		●		●	●			●			●	
0503009	Hole Saw Set Sanitary																	
	●	●		●		●			●	●			●			●		

# ALFRA HOLE SAWS

- 1 With Arbor-shank
- 2 Ejector holes
- 3 The ejector spring ejects the waste and protects the TCT-teeth when center drilling
- 4 Tapered center drill, centering without running off (center punching not necessary)
- 5 Fixing screw for center drill
- 6 Ejector holes



# TCT-HOLE SAWS IN USE



*TCT-Hole Saws – short-/long type*



*Plastic*



*Stainless steel*



*Poroton brick stone*



*TCT-Hole Saws – FRP type*



*TCT-Hole Saws – MBS type*



*Sanitary pipes – type SML*



**MBS Pro**  
Use on Rotabest Magnetic Drilling Machine  
with MT3 – Arbor Prod.-No.: 0734003

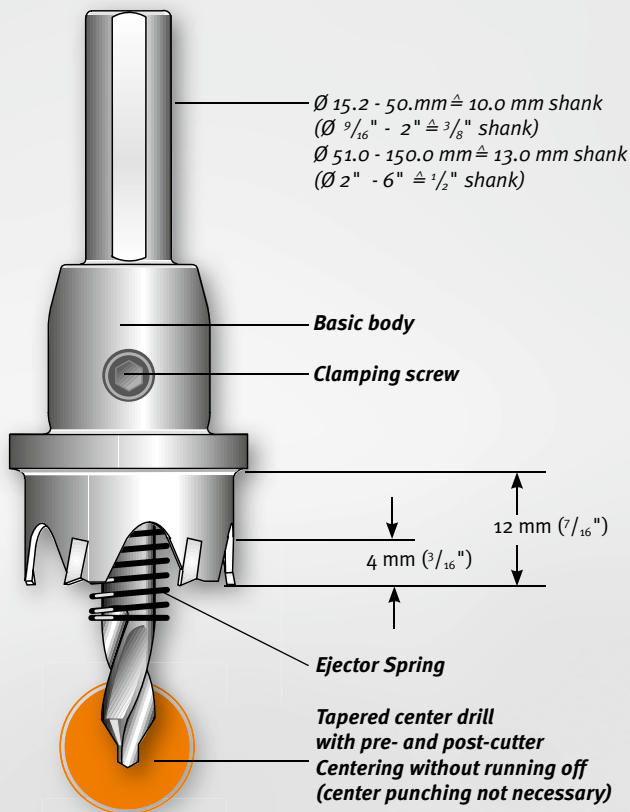


*Checker plate (stainless steel)*



*Sanitary pipes – type SML*

# ALFRA TCT-HOLE SAWS – SHORT TYPE



**EDELSTAHL**  
**STAINLESS STEEL**



The application area of TCT Hole Saws differs from HSS-Bi-Metal Hole Saws. With ALFRA TCT Hole Saws, suitable to economically process stainless steel up to 2 mm (1/16"), unalloyed steels up to 4 mm (3/16"), plastics, PVC, aluminium, zinc, gypsum plaster boards and lightweight building boards, as well as asbestos. Do not use automatic feed, when working with pillar drilling machines. For the use on portable- and pillar drilling machines. Do not use automatic feed, when working with pillar drilling machines.

## Features:

- High concentric running exactness through solid construction.
- CAD-optimized cutting angles with specially ground section ensures high cutting capacity and long tool life.
- Quick removal of drilled core through ejector spring for all hole saws up to 150 mm (5-29/32") Ø.
- Carbide tipping enables repeated re-grinding.
- ALFRA hole saws are repairable. In the event of a tooth breaking, it can easily be replaced and resharpened.
- Exchangeable center pin.
- Use of MT tool holders from Ø 31 mm (1-7/32").
- For use on hand drilling machines (recommended up to max. Ø 40 mm; 1-9/16") or stationary machines.

## Tips:

- At thicker materials: cut 2-3 mm (1/16" - 7/64") per cutting process, remove chips afterwards.
- When cutting metals, a high- grade cutting oil should be used. Exception: Do not use cutting oil when using cast iron, use paraffin instead of oil when cutting aluminium.
- **Keep in mind: Always wear safety goggles.**

## Another special technical feature:

From Ø 15.2 mm (3/16") to 30.0 mm (1-1/8"), the hole saw is made of one piece.

From Ø 31.0 mm (1-3/16") we use specially hardened tool holders to compensate for the torsional power in case of heavy operation, which avoids early shearing off of the tool holder shank.

In terms of construction not comparable with any other make.



# ALFRA TCT-HOLE SAWS – SHORT TYPE

Ø mm	Ø Inches	No. of teeth	Prod.-No.	Ø mm	Ø Inches	No. of teeth	Prod.-No.
Ø 15.2		4	0600152	Ø 77.0		13	0600770
Ø 16.0	5/8"	4	0600160	Ø 78.0	3-1/16"	14	0600780
Ø 17.0		4	0600170	Ø 79.0	3-1/8"	14	0600790
Ø 18.0	11/16"	4	0600180	Ø 80.0		14	0600800
Ø 18.6		4	0600186	Ø 81.0	3-3/16"	14	0600810
Ø 19.0	3/4"	4	0600190	Ø 82.0		14	0600820
Ø 20.0		5	0600200	Ø 83.0	3-1/4"	14	0600830
Ø 20.4		5	0600204	Ø 84.0	3-5/16"	15	0600840
Ø 21.0	13/16"	5	0600210	Ø 85.0		15	0600850
Ø 22.0		5	0600220	Ø 86.0	3-3/8"	15	0600860
Ø 22.5		5	0600225	Ø 87.0	3-7/16"	15	0600870
Ø 23.0	7/8"	5	0600230	Ø 88.0		15	0600880
Ø 24.0	15/16"	5	0600240	Ø 89.0	3-1/2"	16	0600890
Ø 25.0		5	0600250	Ø 90.0	3-9/16"	16	0600900
Ø 26.0	1"	5	0600260	Ø 91.0		16	0600910
Ø 27.0	1-1/16"	5	0600270	Ø 92.0	3-5/8"	16	0600920
Ø 28.0		5	0600280	Ø 93.0		16	0600930
Ø 28.3		5	0600283	Ø 94.0	3-11/16"	16	0600940
Ø 29.0	1-1/8"	5	0600290	Ø 95.0	3-3/4"	17	0600950
Ø 30.0	1-3/16"	5	0600300	Ø 96.0		17	0600960
Ø 31.0		6	0600310	Ø 97.0	3-13/16"	17	0600970
Ø 32.0	1-1/4"	6	0600320	Ø 98.0	3-7/8"	17	0600980
Ø 33.0		6	0600330	Ø 99.0		17	0600990
Ø 34.0	1-5/16"	6	0600340	Ø 100.0	3-15/16"	17	0601000
Ø 35.0	1-3/8"	6	0600350	Ø 105.0	4"	18	0601050
Ø 36.0		6	0600360	Ø 110.0		18	0601100
Ø 37.0	1-7/16"	7	0600370	Ø 115.0	4-1/2"	20	0601150
Ø 38.0		7	0600380	Ø 120.0		20	0601200
Ø 39.0	1-1/2"	7	0600390	Ø 125.0		20	0601250
Ø 40.0	1-9/16"	7	0600400	Ø 130.0	5"	20	0601300
Ø 41.0		8	0600410	Ø 135.0		24	0601350
Ø 42.0	1-5/8"	8	0600420	Ø 140.0	5-1/2"	24	0601400
Ø 43.0	1-11/16"	8	0600430	Ø 145.0		24	0601450
Ø 44.0		8	0600440	Ø 150.0		24	0601500
Ø 45.0	1-3/4"	8	0600450				
Ø 46.0		8	0600460				
Ø 47.0	1-13/16"	9	0600470				
Ø 48.0	1-7/8"	9	0600480				
Ø 49.0		9	0600490				
Ø 50.0	1-15/16"	9	0600500				
Ø 51.0	2"	9	0600510				
Ø 52.0		10	0600520				
Ø 53.0	2-1/16"	10	0600530				
Ø 54.0	2-1/8"	10	0600540				
Ø 55.0		10	0600550				
Ø 56.0	2-3/16"	10	0600560				
Ø 57.0	2-1/4"	10	0600570				
Ø 58.0		10	0600580				
Ø 59.0	2-5/16"	10	0600590				
Ø 60.0	2-3/8"	10	0600600				
Ø 61.0		11	0600610				
Ø 62.0	2-7/16"	11	0600620				
Ø 63.0		11	0600630				
Ø 64.0	2-1/2"	11	0600640				
Ø 65.0		11	0600650				
Ø 66.0	2-9/16"	12	0600660				
Ø 67.0	2-5/8"	12	0600670				
Ø 68.0		12	0600680				
Ø 69.0	2-11/16"	12	0600690				
Ø 70.0	2-3/4"	12	0600700				
Ø 71.0		12	0600710				
Ø 72.0	2-13/16"	13	0600720				
Ø 73.0	2-7/8"	13	0600730				
Ø 74.0	2-15/16"	13	0600740				
Ø 75.0		13	0600750				
Ø 76.0	3"	13	0600760				



Prod.-No. 0600001

## Set Metric

Set Metric	Prod.-No.
Set Metric	0600001

Contents:  
1 each of Ø 16 / 20 / 25 / 32 / 40 mm  
2 Allen Keys

## HSS-Spare Drill with tapered center tip

from Ø 15.2 - 100.0	Ø 6x50 mm	0602650
from Ø 101.0 - 150.0	Ø 8x50 mm	0602850

## MT Arbors

MT-2 (Ø 31.0 - 100.0 mm)	0734002
MT-3 (Ø 31.0 - 150.0 mm)	0734003

## SDS Arbor

SDS arbor shank (for use with Ø 31.0 - 100.0 mm)	060sds6
---	---------

## Spare Ejector

from Ø 15.2 - 150.0	Ø 6 mm	0602006
---------------------	--------	---------

## Coolant ALFRA

<b>ALFRA 2000</b> For mild steel DIN S233, 250 ml	21010
--	-------

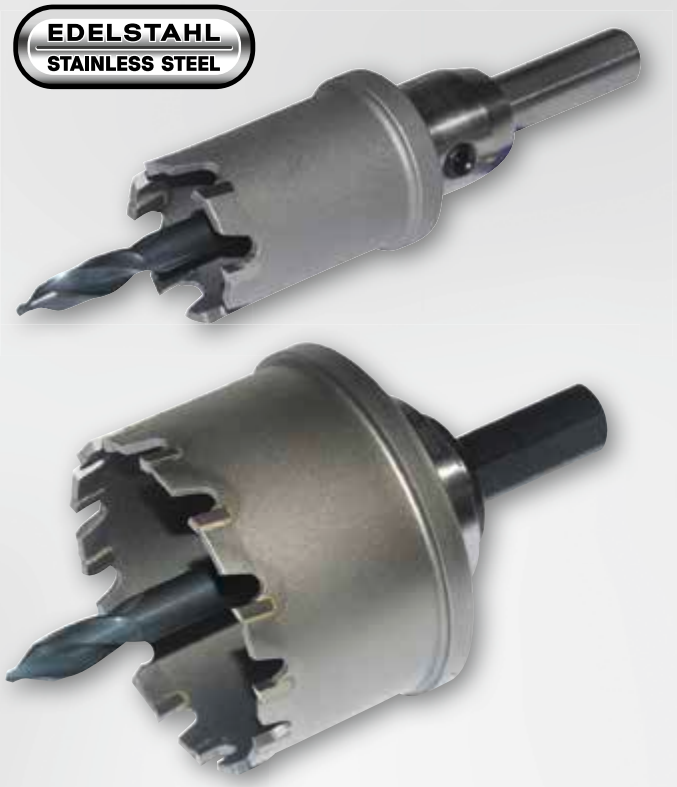
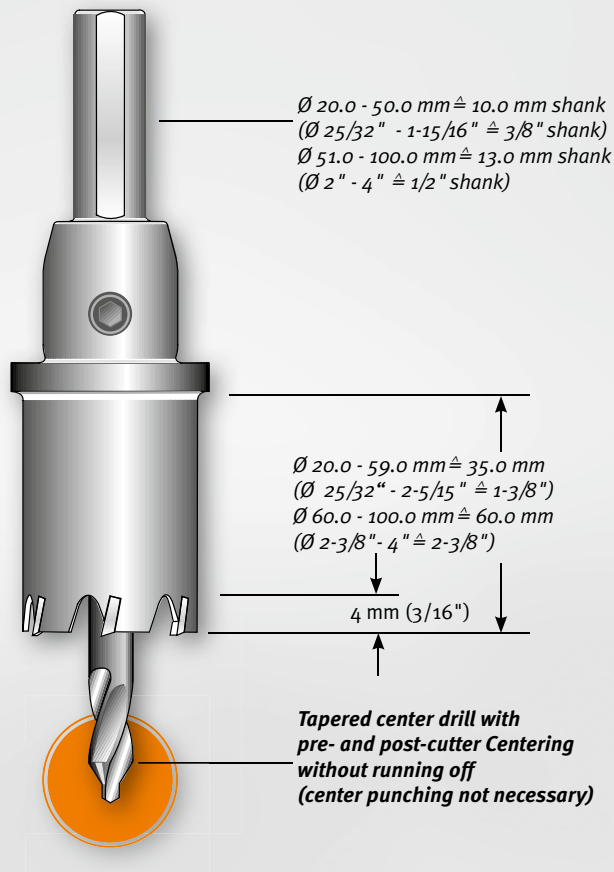
<b>ALFRA 4000</b> For titanium and manganese-carbon steels 300 ml	21040
---	-------



Prod.-No. 21040

Prod.-No. 21010

# ALFRA TCT-HOLE SAWS – LONG TYPE

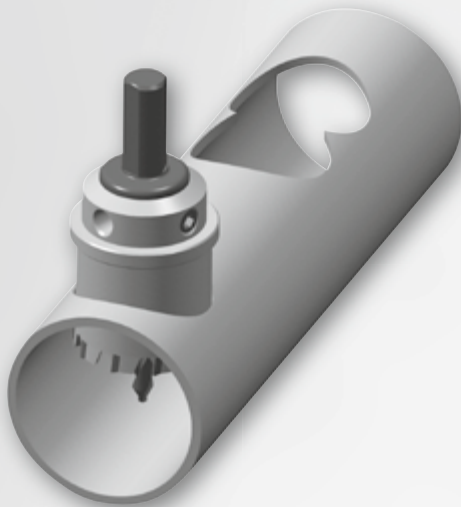


## Features:

- Especially developed for the use on pipes, vaulted materials, for unalloyed and alloyed steels, nonferrous metals, plastics as well as glass fibre reinforced plastic.
- For material thickness up to 4 mm (3/16"), 2 mm (1/16") stainless steel.
- For use on hand drilling machines, recommended up to max.  $\varnothing 40 \text{ mm}$  (1-9/16") or stationary machines.

## Tips:

- Start drilling operation with light pressure, when drilling pipes. Avoid pendulum motions.
- **Keep in mind: Always wear safety goggles.**



**Special tools for special applications on request!**



# ALFRA TCT-HOLE SAWS – LONG TYPE

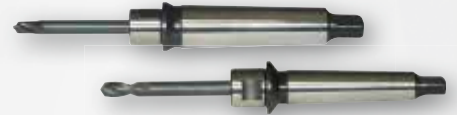
Ø mm	Ø Inches	No. of teeth	Prod.-No.	Ø mm	Ø Inches	No. of teeth	Prod.-No.	Ø mm	Ø Inches	No. of teeth	Prod.-No.
Ø 16.0	5/8"	4	0700160	Ø 54.0	2-1/8"	12	0700540	Ø 92.0	3-5/8"	20	0700920
Ø 17.0		4	0700170	Ø 55.0		12	0700550	Ø 93.0		20	0700930
Ø 18.0	11/16"	4	0700180	Ø 56.0	2-3/16"	12	0700560	Ø 94.0	3-11/16"	22	0700940
Ø 19.0	3/4"	4	0700190	Ø 57.0	2-1/4"	12	0700570	Ø 95.0	3-3/4"	22	0700950
Ø 20.0		5	0700200	Ø 58.0		12	0700580	Ø 96.0		22	0700960
Ø 21.0	13/16"	5	0700210	Ø 59.0	2-5/16"	12	0700590	Ø 97.0	3-13/16"	22	0700970
Ø 22.0		5	0700220	Ø 60.0	2-3/8"	14	0700600	Ø 98.0	3-7/8"	22	0700980
Ø 23.0	7/8"	5	0700230	Ø 61.0		14	0700610	Ø 99.0		22	0700990
Ø 24.0	15/16"	6	0700240	Ø 62.0	2-7/16"	14	0700620	Ø 100.0	3-15/16"	22	0701000
Ø 25.0		6	0700250	Ø 63.0		14	0700630				
Ø 26.0	1"	6	0700260	Ø 64.0	2-1/2"	14	0700640				
Ø 27.0	1-1/16"	6	0700270	Ø 65.0		14	0700650				
Ø 28.0		6	0700280	Ø 66.0	2-9/16"	14	0700660				
Ø 29.0	1-1/8"	6	0700290	Ø 67.0	2-5/8"	16	0700670				
Ø 30.0	1-3/16"	6	0700300	Ø 68.0		16	0700680				
Ø 31.0		8	0700310	Ø 69.0	2-11/16"	16	0700690				
Ø 32.0	1-1/4"	8	0700320	Ø 70.0	2-3/4"	16	0700700				
Ø 33.0		8	0700330	Ø 71.0		16	0700710				
Ø 34.0	1-5/16"	8	0700340	Ø 72.0	2-13/16"	16	0700720				
Ø 35.0	1-3/8"	8	0700350	Ø 73.0	2-7/8"	16	0700730				
Ø 36.0		8	0700360	Ø 74.0	2-15/16"	16	0700740				
Ø 37.0	1-7/16"	8	0700370	Ø 75.0		16	0700750				
Ø 38.0		8	0700380	Ø 76.0	3"	18	0700760				
Ø 39.0	1-1/2"	8	0700390	Ø 77.0		18	0700770				
Ø 40.0	1-9/16"	10	0700400	Ø 78.0	3-1/16"	18	0700780				
Ø 41.0		10	0700410	Ø 79.0	3-1/8"	18	0700790				
Ø 42.0	1-5/8"	10	0700420	Ø 80.0		18	0700800				
Ø 43.0	1-11/16"	10	0700430	Ø 81.0	3-3/16"	18	0700810				
Ø 44.0		10	0700440	Ø 82.0		18	0700820				
Ø 45.0	1-3/4"	10	0700450	Ø 83.0	3-1/4"	18	0700830				
Ø 46.0		10	0700460	Ø 84.0	3-5/16"	20	0700840				
Ø 47.0	1-13/16"	10	0700470	Ø 85.0		20	0700850				
Ø 48.0	1-7/8"	10	0700480	Ø 86.0	3-3/8"	20	0700860				
Ø 49.0		10	0700490	Ø 87.0	3-7/16"	20	0700870				
Ø 50.0	1-15/16"	12	0700500	Ø 88.0		20	0700880				
Ø 51.0	2"	12	0700510	Ø 89.0	3-1/2"	20	0700890				
Ø 52.0		12	0700520	Ø 90.0	3-9/16"	20	0700900				
Ø 53.0	2-1/16"	12	0700530	Ø 91.0		20	0700910				

## HSS-Spare Drill with tapered center tip



from Ø 20.0 - 59.0	Ø 6x80 mm	0702680
from Ø 60.0 - 100.0	Ø 8x100 mm	0702800

## MT Arbors



MT-2 (from Ø 31.0)	0734002
MT-3 (from Ø 31.0)	0734003

## SDS Arbor



SDS arbor shank (for use with Ø 31 - 59 mm)	060sds6
--	---------

# HIGHLY RECOMMENDED ACCESSORIES – COOLANT AND LUBRICANT!

## ALFRA 2000

ALFRA 2000 is a fully synthetic cutting oil, developed for high-quality cutting, threading and drilling of metals of any degree of hardness, ferrous metal, steel alloys, stainless steel, copper, aluminium and their alloys.

ALFRA 2000 is free of hydrocarbon, sulphur and chlorine.



## ALFRA 4000

Suitable for core drilling applications with ALFRA cutters. Also ideal for twist drilling, thread tapping, reaming, countersinking, and difficult cutting applications. It meets the requirements of work hygiene and safety.

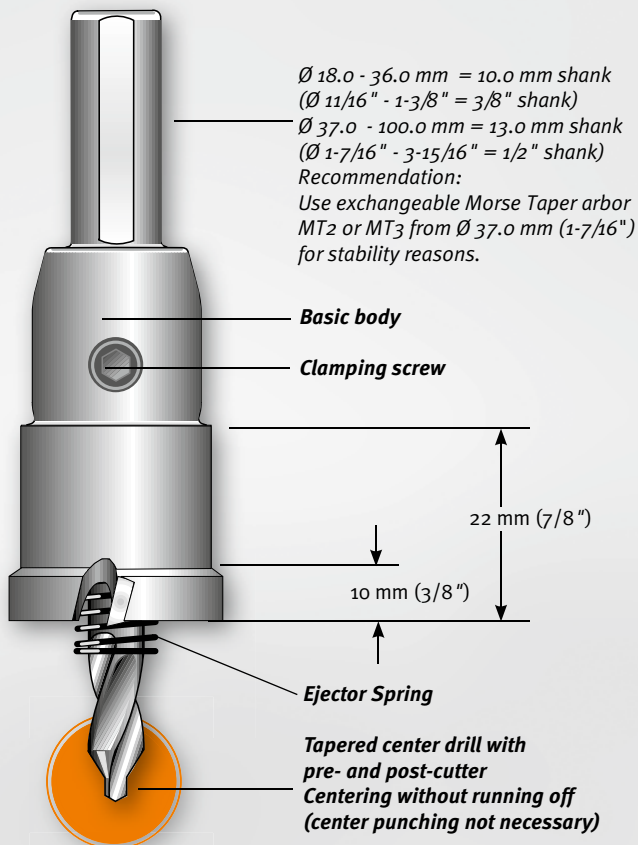
ALFRA 4000 is a pump spray, free from propellant gas ideal for drilling and tapping of high-alloy, stainless steels; chromium nickel steels; titanium and manganese-carbon steels



Aerosol can 250 ml	21010
5 ltr. Plastic container	21012
60 ltr. Barrel	21021

Aerosol can 300 ml	21040
--------------------	-------

# ALFRA TCT-HOLE SAWS – MBS-LIGHT



**EDELSTAHL**  
**STAINLESS STEEL**



This TCT Hole Saw is a multi-range Hole Saw for the universal use up to a material thickness of max. 10 mm (3/8") (without ejector spring). Through its solid construction and an enhanced cutting geometry (Registered Utility Model No. 202 03 232 9), an improved cutting behaviour combined with a high cutting capacity and tool life, is achieved.

For the use on flat steel, as well as on pipes and vaulted materials. Cutting of overlapping holes is possible.

For use on stationary and hand drilling machines (recommended up to max.  $\varnothing 40 \text{ mm}$ ; 1-9/16").

- **Portable drilling Machines:** up to 4 mm (1/8") material thickness
- **Stationary drilling Machines:** up to 10 mm (3/8") material thickness (for material thickness over 6 mm (15/64"), it is necessary to settle and empty the chips several times).

In case of heavy operation, we recommend Morse Taper Tool Holders, which are suitable from  $\varnothing 37 \text{ mm}$  (1-7/16").

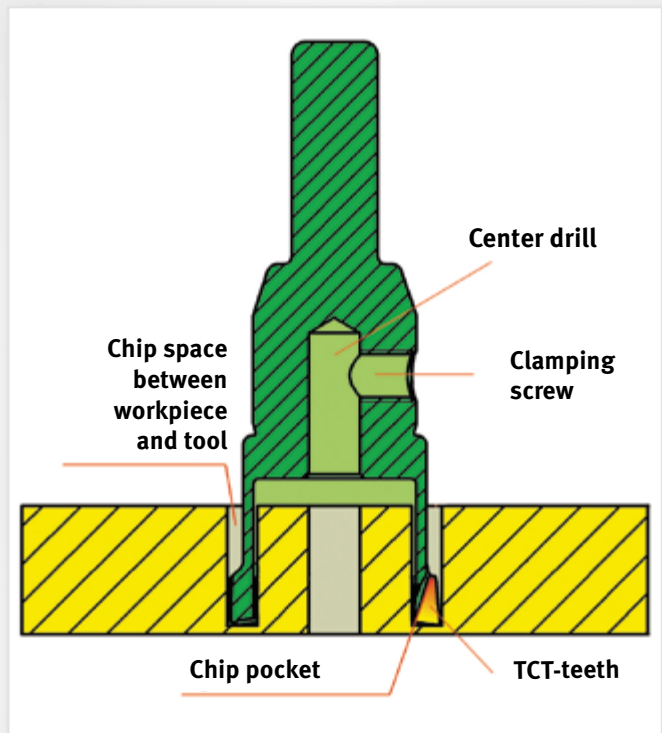
**Advantage:** All MBS-Light type TCT Hole Saws are equipped with an ejector spring. The cut material is self-ejecting.

**Another special technical feature:**

From  $\varnothing 37 \text{ mm}$  (1-7/16"), specially hardened tool holders are used to compensate for the torsional power in case of heavy operation which avoids early shearing off of the tool holder shank.

In terms of construction not comparable with any other make.

## MBS – for almost limitless use



# ALFRA TCT-HOLE SAWS – MBS-LIGHT

Ø mm	Ø Inches	No. of teeth	Prod.-No.
Ø 18.0	11/16"	4	0730018
Ø 18.6		4	07300186
Ø 19.0	3/4"	4	0730019
Ø 20.0		4	0730020
Ø 20.4		4	07300204
Ø 21.0	13/16"	4	0730021
Ø 22.0		4	0730022
Ø 22.5		4	07300225
Ø 23.0	7/8"	4	0730023
Ø 24.0	15/16"	4	0730024
Ø 25.0		4	0730025
Ø 26.0	1"	6	0730026
Ø 27.0	1-1/16"	6	0730027
Ø 28.0		6	0730028
Ø 29.0	1-1/8"	6	0730029
Ø 30.0	1-3/16"	6	0730030
Ø 31.0		6	0730031
Ø 32.0	1-1/4"	6	0730032
Ø 33.0		6	0730033
Ø 34.0	1-5/16"	6	0730034
Ø 35.0	1-3/8"	6	0730035
Ø 36.0		6	0730036

From Ø 37.0 mm (1-7/16") we recommend the use of MT arbors

Ø 37.0	1-7/16"	6	0730037
Ø 38.0		6	0730038
Ø 39.0	1-1/2"	6	0730039
Ø 40.0	1-9/16"	6	0730040
Ø 41.0		6	0730041
Ø 42.0	1-5/8"	6	0730042
Ø 43.0	1-11/16"	6	0730043
Ø 44.0		6	0730044
Ø 45.0	1-3/4"	6	0730045
Ø 46.0		6	0730046
Ø 47.0	1-13/16"	6	0730047
Ø 48.0	1-7/8"	6	0730048
Ø 49.0		6	0730049
Ø 50.0	1-15/16"	6	0730050
Ø 51.0	2"	6	0730051
Ø 52.0		6	0730052
Ø 53.0	2-1/16"	6	0730053
Ø 54.0	2-1/8"	6	0730054
Ø 55.0		6	0730055
Ø 56.0	2-3/16"	6	0730056
Ø 57.0	2-1/4"	6	0730057
Ø 58.0		6	0730058
Ø 59.0	2-5/16"	6	0730059
Ø 60.0	2-3/8"	8	0730060
Ø 61.0		8	0730061
Ø 62.0	2-7/16"	8	0730062
Ø 63.0		8	0730063
Ø 64.0	2-1/2"	8	0730064
Ø 65.0		8	0730065
Ø 66.0	2-9/16"	8	0730066
Ø 67.0	2-5/8"	8	0730067
Ø 68.0		8	0730068
Ø 69.0	2-11/16"	8	0730069
Ø 70.0	2-3/4"	8	0730070
Ø 71.0		10	0730071
Ø 72.0	2-13/16"	10	0730072
Ø 73.0	2-7/8"	10	0730073
Ø 74.0	2-15/16"	10	0730074
Ø 75.0		10	0730075
Ø 76.0	3"	10	0730076
Ø 77.0		12	0730077
Ø 78.0	3-1/16"	12	0730078

Ø mm	Ø Inches	No. of teeth	Prod.-No.
Ø 79.0	3-1/8"	12	0730079
Ø 80.0		12	0730080
Ø 81.0	3-3/16"	12	0730081
Ø 82.0		12	0730082
Ø 83.0	3-1/4"	12	0730083
Ø 84.0	3-5/16"	12	0730084
Ø 85.0		12	0730085
Ø 86.0	3-3/8"	14	0730086
Ø 87.0	3-7/16"	14	0730087
Ø 88.0		14	0730088
Ø 89.0	3-1/2"	14	0730089
Ø 90.0	3-9/16"	14	0730090
Ø 91.0		14	0730091
Ø 92.0	3-5/8"	14	0730092
Ø 93.0		14	0730093
Ø 94.0	3-11/16"	14	0730094
Ø 95.0	3-3/4"	14	0730095
Ø 96.0		14	0730096
Ø 97.0	3-13/16"	14	0730097
Ø 98.0	3-7/8"	14	0730098
Ø 99.0		14	0730099
Ø 100.0	3-15/16"	14	0730100



Drilling in checker sheet



Drilling in square profiles



Drilling in flat steel



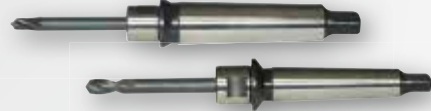
Drilling in pipes

## HSS-Spare Drill with tapered center tip



from Ø 18.0 - 60.0 Ø 6x50 mm 0602650  
 from Ø 61.0 - 100.0 Ø 8x50 mm 0602850  
 (old design)

## MT Arbors



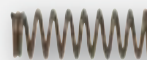
MT-2 (from Ø 37.0 mm) 0734002  
 MT-3 (from Ø 37.0 mm) 0734003

## Weldon adaptor



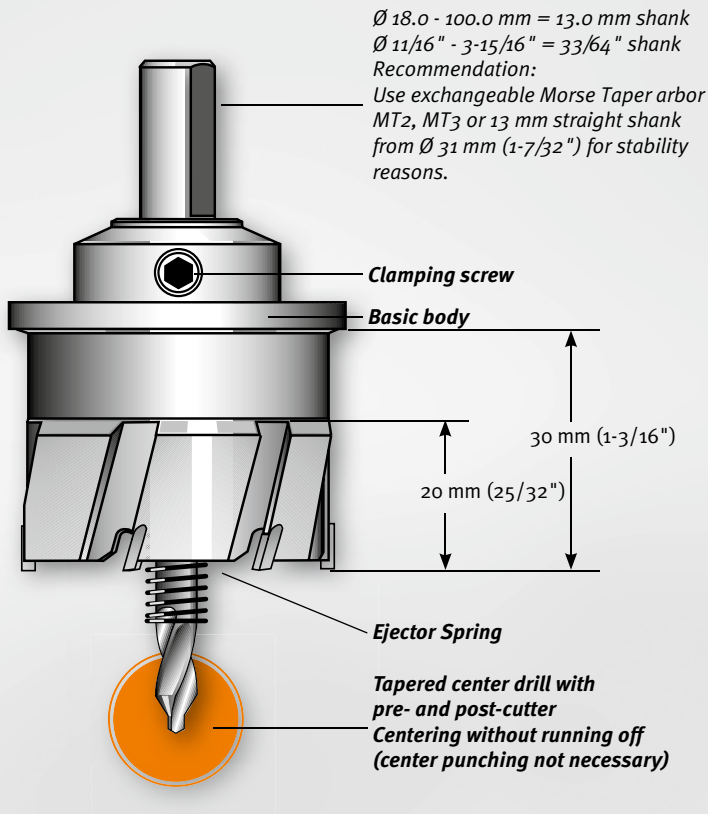
from Ø 37.0 mm 060WD  
 (incl. ejector pin Prod. No. 1950500)

## Spare Ejector



For tapered center drill  
 from Ø 18.0 - 60.0 mm Ø 6 mm 0732006  
 from Ø 61.0 - 100.0 mm Ø 8 mm 0732008

# ALFRA TCT-HOLE SAWS – MBS-PRO



**EDELSTAHL**  
**STAINLESS STEEL**



**Cutting geometries**  
Variable teeth, less Vibration,  
longer tool life, smoother cutting.

MBS-Multirange Hole Saws for universal use. **Max. cutting depth 20 mm (25/32")**

Suitable for flat materials but also for pipes and curved surfaces. Cutting of overlapping holes is possible. CAD optimized precision tools with high cutting performance and durability.

For use on stationary and portable drilling machines (recommended up to max. Ø 40 mm; 1-9/16")

- **Portable drilling Machines:** up to 6 mm (15/64") material thickness
- **Stationary drilling Machines:** up to 20 mm (25/32") material thickness at cutting depths from 6 mm (15/64") we recommend clearing the chips.

MBS hole saws can be resharpened, and it is possible to replace broken out teeth depending on the condition of the hole saw.

**Advantages:** All Alfra TCT Hole Saws MBS-Pro type are equipped with an ejector spring. The cut material is self-ejecting.

**Another special technical feature:**  
From Ø 31 mm (1-7/32"), we use specially hardened tool holders to compensate for the torsional power in case of heavy operation, which avoids early shearing off of the tool holder shank.  
In terms of construction not comparable with any other make.

## MBS – for almost limitless use

e.g., on Rotabest Magnetic Drilling Machine (with MT2 or MT3 – arbors) and Weldon adaptor Prod.-No. 060WD on Machines with Weldon Shank.



# ALFRA TCT-HOLE SAWS – MBS-PRO

Ø mm	Ø Inches	No. of teeth	Prod.-No.
Ø 18.0	11/16"	6	0760018
Ø 18.6		6	07600186
Ø 19.0	3/4"	6	0760019
Ø 20.0		6	0760020
Ø 20.4		6	07600204
Ø 21.0	13/16"	6	0760021
Ø 22.0		6	0760022
Ø 22.5		6	07600225
Ø 23.0	7/8"	6	0760023
Ø 24.0	15/16"	6	0760024
Ø 25.0		6	0760025
Ø 26.0	1"	6	0760026
Ø 27.0	1-1/16"	6	0760027
Ø 28.0		6	0760028
Ø 28.3		6	07600283
Ø 29.0	1-1/8"	6	0760029
Ø 30.0	1-3/16"	6	0760030
<b>As from Ø 31.0 mm (1-7/32") we recommend the use of MT arbors</b>			
Ø 31.0		6	0760031
Ø 32.0	1-1/4"	6	0760032
Ø 33.0		6	0760033
Ø 34.0	1-5/16"	6	0760034
Ø 35.0	1-3/8"	6	0760035
Ø 36.0		6	0760036
Ø 37.0	1-7/16"	6	0760037
Ø 38.0		6	0760038
Ø 39.0	1-1/2"	6	0760039
Ø 40.0	1-9/16"	6	0760040
Ø 41.0		6	0760041
Ø 42.0	1-5/8"	6	0760042
Ø 43.0	1-11/16"	6	0760043
Ø 44.0		6	0760044
Ø 45.0	1-3/4"	6	0760045
Ø 46.0		6	0760046
Ø 47.0	1-13/16"	6	0760047
Ø 48.0	1-7/8"	6	0760048
Ø 49.0		6	0760049
Ø 50.0	1-15/16"	6	0760050
Ø 51.0	2"	6	0760051
Ø 52.0		6	0760052
Ø 53.0	2-1/16"	6	0760053
Ø 54.0	2-1/8"	6	0760054
Ø 55.0		6	0760055
Ø 56.0	2-3/16"	6	0760056
Ø 57.0	2-1/4"	6	0760057
Ø 58.0		6	0760058
Ø 59.0	2-5/16"	6	0760059
Ø 60.0	2-3/8"	8	0760060
Ø 61.0		8	0760061
Ø 62.0	2-7/16"	8	0760062
Ø 63.0		8	0760063
Ø 64.0	2-1/2"	8	0760064
Ø 65.0		8	0760065
Ø 66.0	2-9/16"	8	0760066
Ø 67.0	2-5/8"	8	0760067
Ø 68.0		8	0760068
Ø 69.0	2-11/16"	8	0760069
Ø 70.0	2-3/4"	8	0760070
Ø 71.0		10	0760071
Ø 72.0	2-13/16"	10	0760072
Ø 73.0	2-7/8"	10	0760076
Ø 74.0	2-15/16"	10	0760074
Ø 75.0		10	0760075

Ø mm	Ø Inches	No. of teeth	Prod.-No.
<b>For drilling stainless steel from Ø 76.0 mm we recommend using Rotabest AL cutters (Prod.-No. 200207...)</b>			
Ø 76.0	3"	10	0760076
Ø 77.0		12	0760077
Ø 78.0	3-1/16"	12	0760078
Ø 79.0	3-1/8"	12	0760079
Ø 80.0		12	0760080
Ø 81.0	3-3/16"	12	0760081
Ø 82.0		12	0760082
Ø 83.0	3-1/4"	12	0760083
Ø 84.0	3-5/16"	12	0760084
Ø 85.0		12	0760085
Ø 86.0	3-3/8"	14	0760086
Ø 87.0	3-7/16"	14	0760087
Ø 88.0		14	0760088
Ø 89.0	3-1/2"	14	0760089
Ø 90.0	3-9/16"	14	0760090
Ø 91.0		14	0760091
Ø 92.0	3-5/8"	14	0760092
Ø 93.0		14	0760093
Ø 94.0	3-11/16"	14	0760094
Ø 95.0	3-3/4"	14	0760095
Ø 96.0		14	0760096
Ø 97.0	3-13/16"	14	0760097
Ø 98.0	3-7/8"	14	0760098
Ø 99.0		14	0760099
Ø 100.0	3-15/16"	14	0760100

## HSS-Spare Drill with tapered center tip



from Ø 18.0 - 60.0 Ø 6x80 mm 0732680  
 from Ø 61.0 - 100.0 Ø 8x80 mm 0732880  
 (old design)

## MT Arbors



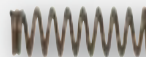
MT-2 (Ø 31.0 - 100.0 mm) 0734002  
 MT-3 (Ø 31.0 - 100.0 mm) 0734003

## Weldon adapter



from Ø 31.0 mm 060WD  
 (incl. ejector pin Prod. No. 1950500)

## Spare Ejector



**For tapered center drill**  
 from Ø 15.2 - 100.0 Ø 6 mm 0762006  
 suitable for spare drill Ø 6 mm



Drilling structured sheet metals



Drilling tubes

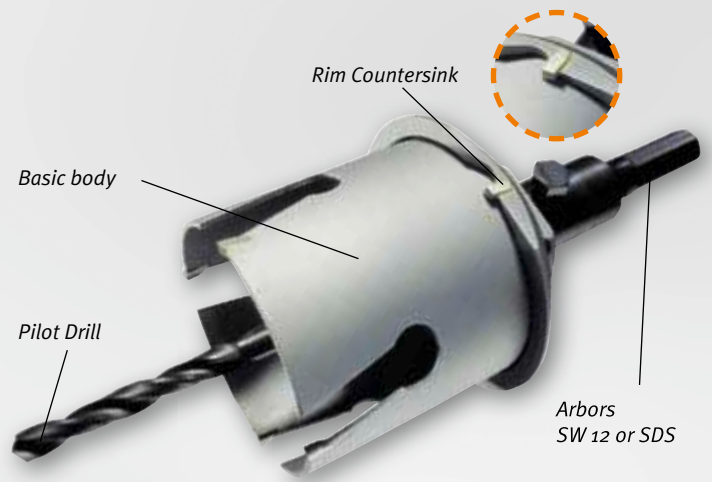
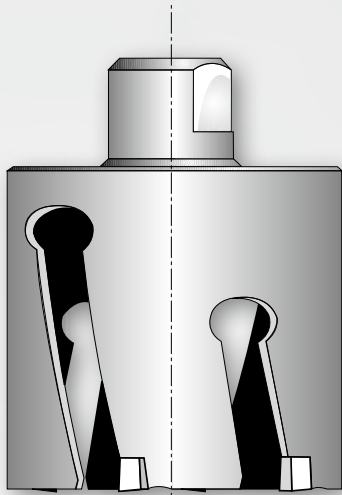


Drilling flat steels



Free-hand drilling up to Ø 30 mm

# ALFRA TCT-HOLE SAWS – FRP TYPE



Prod.-No. 0740068060 – FRP Ø 68 mm with tool holder and rim countersink

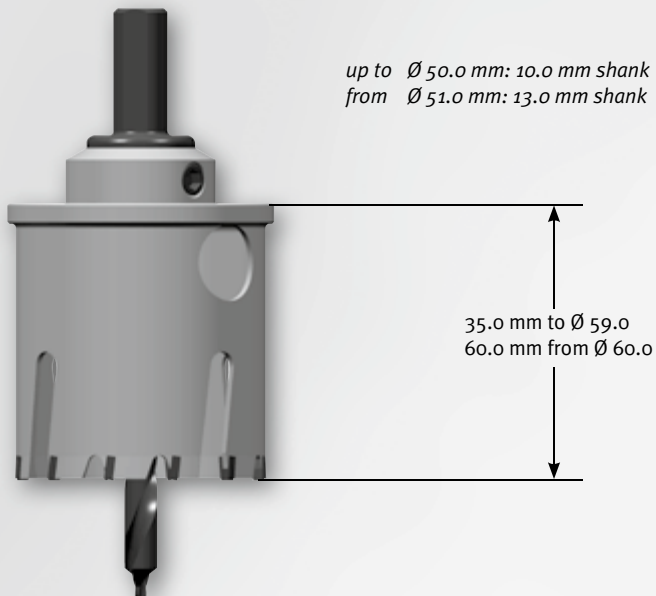
## Cutting depth 60 mm (2-3/8")

- Specially designed for wood, plain, laminated and coated chip board, plywood, paper-base laminate, PVC, glass fibre reinforced plastic, gas concrete, Ytong stone, plasterboard, hollow gauged brick/stones.
- No blocking due to optimal cutting geometry.
- Simple drill core removal based on new chip space design.
- In the event of a tooth breaking, it can easily be replaced and re-sharpened.
- Only use when rotating, switch off hammer action.
- Ideal for electricians, plumbers and heating engineers, carpenters and cabinet makers, stair construction and kitchen furniture fitters.



Perfect assembly of sockets in e.g. wood, gypsum plaster board,...

# ALFRA TCT-HOLE SAWS – FRP MULTI-TOOTH



## with arbor shank

- Cutting depth 35.0 / 60.0 for sandwich-composite material, wood and chipboard coated with insulation and sheet metal (also stainless), e.g., counters and refrigerators.



**When ordering, please indicate material and thickness!**

# ALFRA TCT-HOLE SAWS – FRP TYPE

Ø mm	TCT-Hole Saws FRP inch single drill bit, cutting depth 60 mm	Prod.-No.	Ø mm	TCT-Hole Saws FRP Multi-tooth No series production. Delivery on request. with arbor, cutting depth 35/60 mm.	Prod.-No.
25.0	Sanitary and heating pipes	0740025060	40.0	Sanitary drain pipes	0750040040
30.0	Sanitary and heating pipes	0740030060	45.0	Water and heating pipes	0750045040
35.0	Sanitary and heating pipes Cavity wall branch box, halogen reflector lamp	0740035060	50.0	with insulation 0750050040	
40.0	Sanitary drain pipes	0740040060	55.0		0750055040
45.0	Water and heating pipes	0740045060	60.0		0750060060
50.0	with insulation 0740050060		63.0	Switch boxes, diameter 60 mm	0750063060
55.0	Recessed lights Ø 55 mm	0740055060	65.0		0750065060
58.0	Recessed lights Ø 58 mm	0740058060	68.0	socket drill	0750068060
60.0	Recessed lights Ø 60 mm	0740060060	70.0		0750070060
63.0	Switch box Ø 60 mm	0740063060	74.0	Junction boxes, diameter 70 + 74 mm	0750074060
65.0	Cavity wall box Ø 65 mm	0740065060	75.0		0750075060
68.0	Cavity wall box Ø 68 mm	0740068060	80.0	Junction boxes	0750080060
70.0	Cavity wall branch boxes Ø 70 mm	0740070060	85.0		0750085060
74.0	Cavity wall branch boxes Ø 74 mm	0740074060	90.0		0750090060
80.0	Junction boxes, cable gland covers, Recessed lights Ø 80 mm	0740080060	95.0		0750095060
85.0	Recessed lights Ø 85 mm	0740085060	100.0		0750100060
90.0	Recessed lights Ø 90 mm	0740090060	105.0	Discharge air pipes	0750105060
105.0	Discharge air pipes	0740105060		Intermediate sizes and other cutting depths on request	0759 ... ..

## HSS spare drill for FRP Multi-tooth

Ø 30.0 - 59.0 mm = 8 x 80	0752880
Ø 61.0 - 105.0 mm = 8 x 100	0752800



Rim countersink for Ø 68 mm 0741068000



Tool Holder wrench size 12 0742000001



Arbor SDS 0742000002



Spare center drill HSS 7.2 mm 0742000003

## FRP Hole Saw Set Electrician

Content: 0743000001  
 1 each of Ø 35 / 68 / 74 mm  
 1 Tool Holder wrench size 12  
 1 HSS drill

## FRP Hole Saw Set Lighting

Content: 0743000002  
 1 each of Ø 35 / 60 / 68 / 80 / 85 mm  
 1 Tool Holder wrench size 12  
 1 HSS drill



Prod.-No. 0743000001



Prod.-No. 0743000002

# ALFRA - PRECISION MULTI-STEP DRILLS

- SPIRAL GROOVED, EACH STEP WITH AXIAL AND RADIAL RELIEF GRINDING ACCORDING TO ITS DIAMETER
- LASER-ETCHED SCALE IN THE CHIP SPACE
- SPECIAL DRILL TIP ENABLES CENTERING AND DRILLING EVEN THROUGH THIN-WALLED MATERIALS
- BURR-FREE DRILLING WITH NO DEFORMATION OF THE SHEET
- REGRINDABLE
- AVAILABLE IN HSS AND HSS WITH TiAlN COATING





# MULTI-STEP DRILLS – HSS DM 05

## Application area:

The ideal tool for sheet metal forming, for the electrical industry, HVAC or the common engineering or the switchboard industry.

Suitable for all materials such as nonferrous metals, stainless steel sheets, thermoplastic and thermosetting plastics, as well as for steel sheets up to a max. material thickness of 6 mm.

With the Multi-Step Drills, sheet metals can be centered, drilled and subsequently deburred in one work step.

- A break of the drill tip mostly occurs through high feed forces at the start of the drilling operation. Multi-step drills with fixed drill tips are worthless then. A broken center drill in an ALFRA multi-step drill can be easily replaced. This more than compensates for the higher price.
- Each stage is equipped with a radially adjusted relief grinding corresponding to its diameter.
- Each stage is provided with an axial relief grinding and a relief angle on its cutting edge.
- All step diameters are laser marked on the tool.

## Benefits of multi-step drills with keyway and 3 cutting edges:

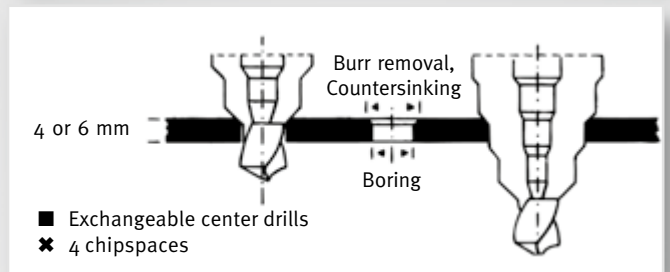
- The keyway allows the drill to make a chipping cut during drilling for better chip removal.
- The special keyway geometry, arranged around the drill, makes for a longer cutting edge compared to the usual straight groove and noticeably easier cutting.
- Spiral cut chip spaces guarantee an absolute running smoothness and a high cutting capacity.

## Tip:

The tool life can be considerably prolonged by using of ALFRA Cutting Spray or ALFRA Coolant Stick.

## Advantages of TiAlN hard coating:

- Suitable for use on very hard materials (VA).
- Offers optimal tool life with the same use at the highest cutting speeds.
- Very high microhardness HV 0.05 of 3200 – so that the blue-black hard coating is more than 20% harder than conventional gold-yellow TiN coating.
- Maximum working temperature: 800°C.



DescriptioShank Ø		Prod.-No.
AMS	10.0	08080

For general machine construction, drills circular holes in metals up to 4 mm thick, through application with hand drills, indispensable on the work-site.  
3 chip spaces, spiral grooved, replaceable center drill  
Steps Ø 9 - 12 - 15 - 18 - 21 - 24 - 27 - 30 - 33 - 36 mm  
(Step „40“ is for deburring)



Prod.-No. 08080 ■



Prod.-No. 08081 ■

AMS – TiAlN coated	10.0	08081
--------------------	------	-------

3 chip spaces, spiral grooved, replaceable center drill TiAlN coated  
Steps Ø 9 - 12 - 15 - 18 - 21 - 24 - 27 - 30 - 33 - 36 mm  
(Step „40“ is for deburring)

AM 1	12.0	08002
------	------	-------

Steps Ø 25 - 28 - 31 - 34 - 37 - 40 - 43 - 46 - 49 - 52 - 55 - 58 mm



Prod.-No. 08002 ■ ✕



Prod.-No. 08003 ■ ✕

PVD	10.0	08003
-----	------	-------

For the electrical industry, matched to holes for armoured conduit thread clearance holes, saves considerable time when producing borings for PG

Steps Ø PG 7 - PG 9 - PG 11 - PG 13 - PG 16 - PG 21 - 33 mm - PG 29 - 40 mm

# MULTI-STEP DRILLS – HSS DM 05

DescriptioShank Ø	Prod.-No.
<b>PVD-TiN-coated</b> 10.0	<b>08004</b>
<b>Steps Ø PG 7 – PG 9 – PG 11 – PG 13 – PG 16 – PG 21 – 33 mm – PG 29 – 40 mm</b>	

<b>SVB</b> 10.0	<b>08016</b>
Pre-drill specifically for punches & dies <b>Steps Ø 8.5 - 11.5 - 12.5 - 16.5 - 21.0</b>	

<b>DKS 40</b> 10.0	<b>08084</b>
3 chip spaces, spiral grooved, replaceable center drill, for metric borings acc. to EN, <b>Core - and clearance holes M 10 - M 40</b> <b>Steps Ø 10.5 - 12.5 - 14.5 - 16.5 - 18.5 - 20.5 - 23.5 - 25.5 - 32.5 - 38.5 - 40.5</b>	

<b>DKI 40-VA</b> 10.0	<b>08032</b>
4 chip spaces, replaceable center drill of HSS-Co 5 steel. For stainless steel to 3 mm thick <b>Core - and clearance holes M 10 - M 40</b> <b>Steps Ø 10.5 - 12.5 - 14.5 - 16.5 - 18.5 - 20.5 - 23.5 - 25.5 - 32.5 - 38.5 - 40.5</b>	

<b>Spare center drill TiN-beschichtet</b>	<b>08006</b>
suitable for AMS – PVD – PVK – DKI – DKS	

<b>Spare center drill</b>	<b>08007</b>
suitable for AMS – PVD – PVK – DKI – DKS	

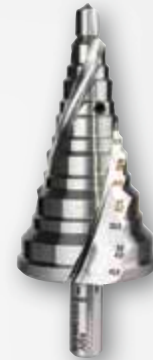
<b>Spare center drill TiAlN coated</b>	<b>08008</b>
suitable for AMS – PVD – PVK – DKI – DKS	



Prod.-No. 08004 ■ ✖



Prod.-No. 08016



Prod.-No. 08084 ■

*Pre-drill specifically  
for punches & dies*



Prod.-No. 08032 ■ ✖



Prod.-No. 08007



Prod.-No. 08008

- Replaceable center drill
- ✖ With 4 chip spaces

# MULTI-STEP DRILLS – HSS DM 05

## Standard execution with 2 chip spaces, spiral grooved.

- More precise hole diameter through cylindrical steps.
- Immediate deburring through the next step.
- Drilling of sheet metals as thin as 4 mm possible.
- Use coolant stick!
- The keyway allows the drill to make a chipping cut during drilling for better chip removal.
- Longer cutting edge compared to the usual straight groove and noticeably easier cutting.
- Laser-etched scale in the chip space to indicate the bore diameter achieved.

Description	Bore range	Shank Ø	Length	Prod.-No.
AM-12	4 - 12 mm x 1 mm	6.0	70 mm	08070
AM-20	4 - 20 mm x 2 mm	9.0	77 mm	08071
AM-30	6 - 30 mm x 2 mm	10.0	98 mm	08072

Set in plastic case 08073

Content:

1 of each Type AM-12/AM-20/AM-30

High-performance coolant stick 09012



Prod.-No. 08072



Prod.-No. 09012

## Standard values for the use of ALFRA Multi-step drills

This drill was developed to bore perfectly round and deburred holes in sheet metal from 4 - 6 mm thick. The transition forms a radius which serves to deburr or bevel the hole at the same time. While conical one-lip bits drill a slightly tapered hole, our ALFRA multi-step drill achieves a cylindrical hole. The tools have axial-radial relief grindings and can be lightly reground on the breast of the cutting tooth.

We recommend the use of pillar drilling machines, however, the small ALFRA Multi-step drills can be used on adjustable hand drilling machines. Sufficient cooling using **ALFRA coolant stick** or a bore emulsion is imperative.

## R.P.M. Guiding Values

Type		sheet steel S235	V2A sheets	non-ferrous metals	plastics (soft)
AM	drill	800	360	1000	1000
	countersink	500 - 180	50 - 70	800 - 400	1000 - 400
AM-1	drill	800	360	1000	1000
	countersink	200 - 100	100 - 50	500 - 200	600 - 250
PVD+PVK+DKI DKS + SVB	drill	800	360	1000	1000
	countersink	400 - 200	200 - 100	800 - 500	1000 - 600



Prod.-No. 08073

# PRECISION CONICAL ONE-LIP BITS – HSS DM 05

ALFRA Precision Conical One-Lip Bits are the ideal tools for general sheet metal working. Fields of applications include HVAC, electronic industries, engineering and panel building.

To be used on non-ferrous metals, stainless steels, thermo- and duro-plastic plastics, as well as on all common sheet steels up to a material thickness of max. 4 mm. With ALFRA Conical One-Lip Bits, you can center, spot drill and bore up in one work step.

If treated carefully, can be reground many times.

The tool life can considerably be prolonged by using ALFRA Cutting Oil or Coolant Stick.

**Packing:** separately in plastic box with operation manual.

Size	Bore Range mm	Shank-Ø	Prod.-No.
1	3.0 - 14.0	6.0	09001
2	6.0 - 20.0	8.0	09002
3	16.0 - 30.5	10.0	09003
4	26.0 - 40.0	12.0	09004
5	35.0 - 50.0	12.0	09005
6	46.0 - 60.0	13.0	09006
7 L	4.0 - 30.5	10.0	09007
8*	6.0 - 22.5	8.0	09008
Set 1	Size 1 + 2 + 3 + Stick		09009

Coolant stick, separately 09012

## \*Special Antenna-Bit

- Conical one-lip bit with cylindrical end section to drill holes for car antennas.
- Burr-free, no deformation, no countersinking, dimensional accuracy
- Size 6.0 - 22.5 mm.

## Precision Conical One-Lip Bit Set

Tin box

Prod.-No. 09009

Content:

- 1 x Size 1
- 1 x Size 2
- 1 x Size 3



Prod.-No. 09001



Prod.-No. 09002



Prod.-No. 09003



Prod.-No. 09004



Prod.-No. 09005



Prod.-No. 09006



Prod.-No. 09007



Prod.-No. 09008\*



Prod.-No. 09009

## WELDING POINT DRILLS – SHORT TYPE

For pneumatic machines, for breaking welding points.  
Made of special steel with chamfered shaft and center tip,  
CNC-polished.

Ø mm	Steel quality	length	Machine	Prod.-No.
8.0	HSS-Co	44.0	Variodrill	10016
8.0	HSS-Co	39.5	Spotle	10007
8.0	HSS-CoTi39.5	Spotle		10014
8.0	HSS-CoTi44.0	Variodrill		10015

P.U. 5 pieces



Prod.-No. 10016



Prod.-No. 10007



Prod.-No. 10014



Prod.-No. 10015

## WELDING POINT DRILLS – LONG TYPE

- Absolutely clean and burr-free counterboring of weld points due to ALFRA cross polished section with center-point.
- Guaranteed chatter-free work.
- Center punch of weld points is unnecessary. The drill centers itself.
- Use in all hand drills.
- No subsequent regrinding of the weld point.
- Can be regrinded.
- For low-speed drilling machines (max. 1000 U/min.).

Ø mm	quality of steel	length	P.U.	Prod.-No.
6.0	HSS	66	10	10017
8.0	HSS	79	10	10008
10.0	HSS	89	10	10018



Prod.-No. 10008

# COUNTERSINK TOOLS

- ALFRA HSS precision countersink tools are the perfect tools for all deburring works.
- ALFRA HSS precision countersink tools guarantee an excellent of grooves as well as the best center-pointing features.
- Applicable on steel, cast, light and non-ferrous metal.
- NEW: innovative relief-grinding for better cutting quality.

## ALFRA HSS Precision Countersink Tools

(α) 90° DIN 335 C with cylinder shank

Nom. Ø	Smallest Ø	shank Ø h 8	Total-length	Prod.-No.
6.3	1.5	5	45	1101063
8.3	2.0	6	50	1101083
10.4	2.5	6	50	1101104
12.4	2.8	8	56	1101124
15.0	3.2	10	60	1101150
16.5	3.2	10	60	1101165
19.0	3.5	10	63	1101190
20.5	3.5	10	63	1101205
25.0	3.8	10	67	1101250
31.0	4.2	12	71	1101310

### with wear-resistant TiAlN-Coating

6.3	1.5	5	45	1102063
8.3	2.0	6	50	1102083
10.4	2.5	6	50	1102104
12.4	2.8	8	56	1102124
16.5	3.2	10	60	1102165
20.5	3.5	10	63	1102205
25.0	3.8	10	67	1102250
31.0	4.2	12	71	1102310



Prod.-No. 1101...



Prod.-No. 1102...



Prod.-No. 1104...

## Countersink tools with cylinder shank

with oblique drilling 90° of HSS-E

These tools have an improved relief-grinding for even more quiet and chatter-free working. The chip-flow through the hole avoids chips being seized with the work piece

Ø mm	for sagging	shank Ø h 8	length Ø h 8	Prod.-No.
10	2 - 5	6	45	1104100
14	5 - 10	8	48	1104140
21	10 - 15	10	65	1104210
28	15 - 20	12	85	1104280
35	20 - 25	15	95	1104350

# COUNTERSINK TOOLS – SETS

Countersink Set  $\varnothing$  6.3 - 20.5 **Prod.-No.** 1105003  
**Content: (Nom- $\varnothing$ )**  
 6.3 - 8.3 - 10.4 - 12.4 - 16.5 - 20.5

Countersink Set  $\varnothing$  6,3 - 25,0 **Prod.-No.** 1105004  
**Content: (Nom- $\varnothing$ )**  
 6.3 - 8.3 - 10.4 - 12.4 - 16.5 - 20.5 - 25.0

Countersink Set TiAlN-coated **Prod.-No.** 1105009  
**Content: (Nom- $\varnothing$ )**  
 6.3 - 8.3 - 10.4 - 12.4 - 16.5 - 20.5 - 25.0

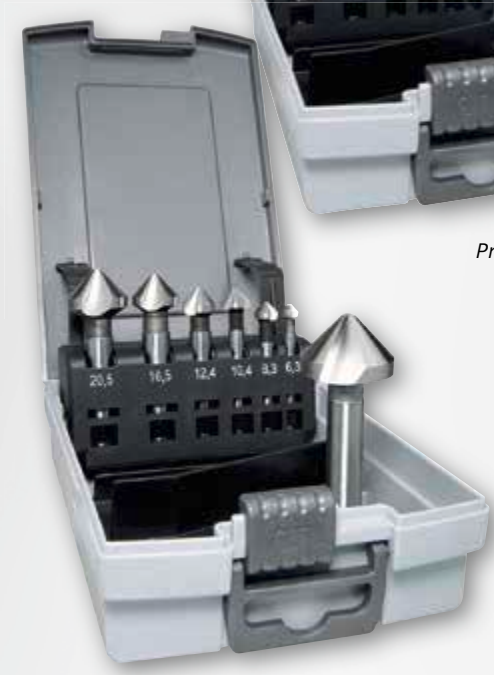
Countersink Set Special **Prod.-No.** 1105006  
 Countersink tools with oblique bore  $90^\circ$  made of HSS-E

**Content:**

- 1 countersink 10 mm  $\varnothing$  for drilling 2 - 5 mm
- 1 countersink 14 mm  $\varnothing$  for drilling 5 - 10 mm
- 1 countersink 21 mm  $\varnothing$  for drilling 10 - 15 mm
- 1 countersink 28 mm  $\varnothing$  for drilling 15 - 20 mm



Prod.-No. 1105003



Prod.-No. 1105004



Prod.-No. 1105009



Prod.-No. 1105006

# ALFRA SABRE SAW BLADES FOR PROFESSIONAL USE



















# ORIGINAL MILFORD SABRE SAW BLADES – EXKLUSIVE BY ALFRA

## for Metal flexible version



Application Range Metal processing	Material thickness mm	Steel- Quality	Length	Width	Thickness	Teeth Inch	Milford Prod.-No.	Alfa Prod.-No.
Metal processing; soft metals, Copper-, aluminium-, brass-cables, wires and pipes	 > 3 mm	HSS-Bi-Metal	100 mm	16 mm	0.9 mm	14	88161	30055
Metal processing; soft metals, Plastic, laminate and wood with nails	 > 3 mm	HSS-Bi-Metal	150 mm	16 mm	0.9 mm	8/12	88215	30040
All kind of metals, stainless steel, Steel pipes, cast iron, alloys, etc.	 > 6 mm	HSS-Bi-Metal	150 mm	16 mm	0.9 mm	10	88176	30058
All kind of metals, stainless steel, Steel pipes, cast iron, alloys, etc.	 > 3 mm	HSS-Bi-Metal	150 mm	16 mm	0.9 mm	14	88177	30059
All kind of metals, stainless steel, Steel pipes, cast iron, alloys, etc.	 > 1,15 mm	HSS-Bi-Metal	150 mm	16 mm	0.9 mm	18	88178	30060
All kind of metals, stainless steel, Steel pipes, cast iron, alloys, etc. With universal tothing	 3-6 mm	HSS-Bi-Metal	150 mm	16 mm	0.9 mm	10/14	88216	30062
Metal processing; soft metals, Plastic, laminate and wood with nails	 > 3 mm	HSS-Bi-Metal	225 mm	16 mm	0.9 mm	8/12	88219	30041
All kind of metals, stainless steel, Steel pipes, cast iron, alloys, etc.	 > 6 mm	HSS-Bi-Metal	225 mm	16 mm	0.9 mm	10	88174	30063
All kind of metals, stainless steel, Steel pipes, cast iron, alloys, etc.	 > 3 mm	HSS-Bi-Metal	225 mm	16 mm	0.9 mm	14	88186	30064
All kind of metals, stainless steel, Steel pipes, cast iron, alloys, etc.	 > 1,15 mm	HSS-Bi-Metal	225 mm	16 mm	0.9 mm	18	88187	30065
All kind of metals, stainless steel, Steel pipes, cast iron, alloys, etc. With universal tothing	 3-6 mm	HSS-Bi-Metal	225 mm	16 mm	0.9 mm	10/14	88217	30066
All kind of metals, stainless steel, Steel pipes, cast iron, alloys, etc. With universal tothing	 > 6 mm	HSS-Bi-Metal	290 mm	16 mm	0.9 mm	10/14	88218	30072







Metal processing; soft metals, plastic, laminate an wood with nails – particular for pallets	 > 3 mm		HSS-Bi-Metal	228 mm	19 mm	0.9 mm	10/14	88226	30045
--	---	---	--------------	--------	-------	--------	-------	-------	-------

# ORIGINAL MILFORD SABRE SAW BLADES – EXKLUSIVE BY ALFRA

## For Wood



Application Range Meta processing	Material	Steel-	Length	Width	Thickness	Teeth	Milford	Alfra
Special sabre saw for wood with nails; plasterboard In particular for the refurbishing		HSS-Bi-Metal	150 mm	19 mm	0.9 mm	5/8	88142	30085
Special sabre saw for wood Plastics or Laminates -curve sections-		HSS-Bi-Metal	150 mm		0.9 mm	4/6	88143	30086
Special sabre saw for wood, plasterboard In particular for the refurbishing		HSS-Bi-Metal	210 mm	19 mm	0.9 mm	6	88144	30087
Special sabre saw for wood, plasterboard In particular for the refurbishing		HSS-Bi-Metal	290 mm	19 mm	0.9 mm	6	88145	30088

## For wood (coated)



Special sabre saw for wood With a special lamination for minimum frictio		HSS-Bi-Metal	228 mm	19 mm	1.0 mm	7	87960	30031
---	--	--------------	--------	-------	--------	---	-------	-------

# ORIGINAL ASTROFLEX® – HSS-BI-METAL SABRE SAW BLADES

## For Rems- and Roller Sabre Sawing Machines

**ALFRA-Special-Sabre-Saw Blades** can be used problem-free on these machines. Made of HSS-Bi-Metal, heat treated to the point.

- Made of high alloy HSS-Bi-Metal.
- Heat treated to the point.
- Highest heat hardness and wear resistance.
- Tothing in crossed version.

## For free-hand and flush cutting



Application range	Steel quality	Length	Width	Thickness	Teeth per Inch	Blade No.	Alfra Prod.No.
For free-hand and flush cutting	HSS-Bi-Metal	150 mm	25 mm	1.1 mm	14		30105
	HSS-Bi-Metal	200 mm	25 mm	1.1 mm	14		30103
e. g. refurbishing, on walls and overhead	HSS-Bi-Metal	300 mm	25 mm	1.1 mm	14		30104

Packaging unit: 5 pieces

## ALFRA – SPECIAL JIGSAW BLADES

Made of HSS Bi-Metal for burr- and distortion-free cutting of thin sheet metals and plates, as well as for pipes in ventilation and air condition constructions. Precise crossing, highest endurance.



Prod.-No. 31014 - 31017



Prod.-No. 31018 - 31021

Application range	Length mm	Thickness mm	Width mm	Teeth	Prod.-No.
For sheet metals as from 1.1 mm thickness, plastic up to 3 mm, wood up to 5 mm	96	0.6	12.5	14	} 31014
	96	0.6	12.5	18	
For sheet metals 0.7 - 1.1 mm thickness	96	0.6	12.5	24	31016
For sheet metals up to 0.7 mm thickness	96	0.6	12.5	32	31017
For sheet metals as from 1.1 mm thickness, plastic up to 3 mm, wood up to 5 mm	97	0.6	12.5	14	} 31018
	97	0.6	12.5	18	
For sheet metals 0.7 - 1.1 mm thickness	97	0.6	12.5	24	31020
For sheet metals up to 0.7 mm thickness	97	0.6	12.5	32	31021

Attention: do not use any pressure, feed only with dead weight of machine.

# HSS-METAL CIRCULAR SAW BLADES – Ø 275 X 2,5 X 40 MM

- For Eisele and Trennjäger machines, also suitable for Häberle and Wegoma machines.
- Made of HSS DMO5 steel, steam surface coated.

		Prod.-No.
Dimension: 275 x 2.5 x 40		32060
Side holes: 2/8/55 + 4/11/63 mm		
Pitch:	4 t = 220 BW	32061
	6 t = 140 HZ	32062
	7 t = 120 HZ	32063
	8 t = 110 HZ	32064



# HSS-METAL CIRCULAR SAW BLADES – DM 05

Tooth form BW = Curved tooth with alternating chamfer  
 Tooth form C = Curved tooth with taper tap and regroover (HZ)  
 t = Pitch

When ordering, please indicate pitch, number of teeth and tooth form

Ø mm	Cutting Width mm	Bore, Side Holes (mm) Make	Pitch, Numer of Teeth, Tooth Form	Prod.-No.
225	2.0	32 2/8/45 + 2/11/63	3t = 220 BW, 4t = 180 BW,	32015
225	2.0	40 2/8/55 + 4/12/64	6t = 120 HZ, 8t = 90 HZ	32015
250	2.0	40 2/8/55 + 4/12/64	4t = 200 BW,	32012
250	2.0	32 2/8/45 + 2/12/64 + 4/9/50	6t = 128 HZ, 8t = 100 HZ,	32021
250	2.5	40 2/8/55 + 4/12/64	4t = 200 BW, 6t = 128 HZ, 8t = 100 HZ,	32022
275	2.0	40 2/8/55 + 4/12/64	3t = 280 BW, 4t = 220 BW,	32023
275	2.5	32 2/8/45 + 2/12/64 + 4/9/50	6t = 140 HZ, 7t = 120 HZ, 8t = 110 HZ	32028
300	2.5	40 2/8/55 + 4/12/64	4t = 220 BW, 6t = 160 HZ,	32030
300	2.5	32 2/8/45 + 2/12/64 + 4/9/50	8t = 120 HZ	32035
315	2.5	40 2/8/55 + 4/12/64	4t = 220 BW, 6t = 160 HZ,	32037
315	2.5	32 2/8/45 + 2/12/64 + 4/9/50	8t = 120 HZ	32041
315	3.0	40 2/8/55 + 4/12/64		32044
350	3.0	40 2/8/55 + 4/12/64	4t = 280 BW, 6t = 180 HZ, 8t = 140 HZ	32050
350	3.0	50 4/15/80 + 4/14/85	10t = 110 HZ	32053
370	3.0	50 4/15/80 + 4/14/85	5t = 220 BW, 7t = 160 HZ, 9t = 120 HZ, 11t = 100 HZ	32055
400	3.0	40 2/15/80 + 4/12/65 + 2/15/100	6t = 200 HZ, 8t = 160 HZ,	32057
400	3.5	50 4/15/80 + 4/14/85	10t = 128 HZ, 12t = 100 HZ	32058

# ALFRA-CIRCULAR SAW BLADES – ROTADRY®

Also suitable for cutters such as:

**Jepson/Global/Ridgid/Ryobi**

and other brands with arbor revolution = 1500 r.p.m.

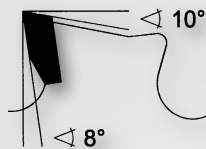
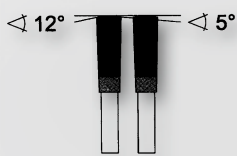
The universal TCT Saw blade for rapid cutting in:

**Steel – Copper – Aluminium – Profiles – Cables – Sheeting – Solid materials**

- without coolant.
- regrindable.
- low noise thanks to laser ornaments.

Dimensions		Steel	Stainless steel	Prod.-No.
305 x 2.2 x 25.4 mm	60 Z	•		32100
305 x 2.2 x 25.4 mm	80 Z	•		32101
355 x 2.4/2.0 x 25.4 mm	72 Z	•		32108
355 x 2.4 x 25.4 mm	90 Z	•		32102
355 x 2.6 x 25.4	90 Z	coated	•	32105

Other tooth counts upon request.



See also machine description in catalogue part B



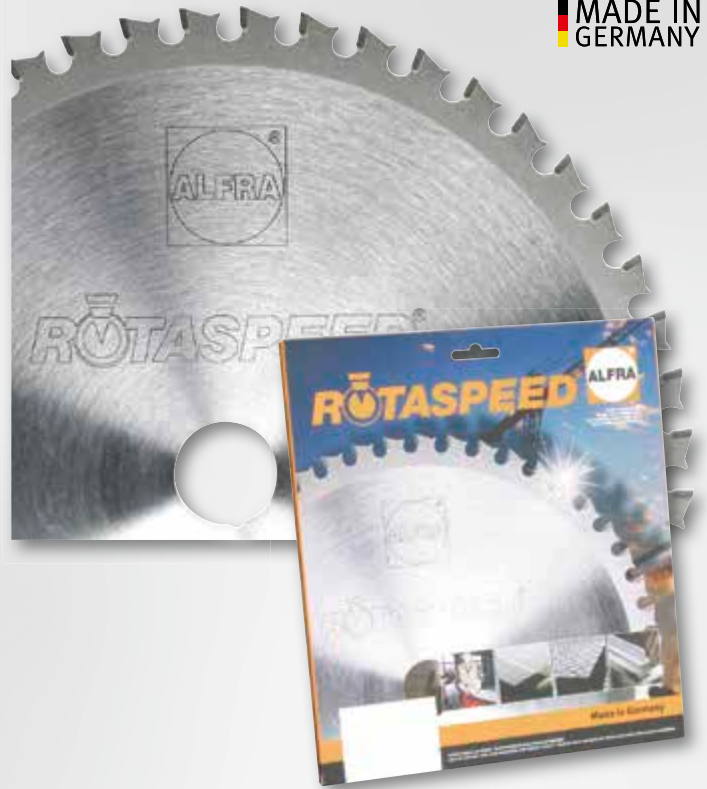
355 x 2.6 x 25.4 • 90 Z • coated



# ALFRA-CIRCULAR SAW BLADES – ROTASPEED®

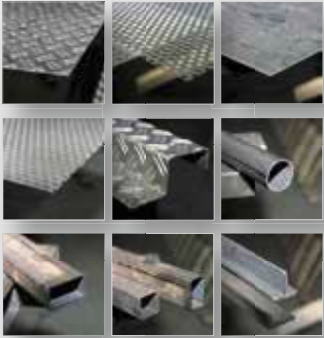
- Tungsten carbide tipped, suitable for metal cutting saws from: ALFRA, Flex, Euroboor, Evolution, Hitech, Jepson, Metallkraft, Ridgid, etc.
- These special TCT circular saws ensure fast and clean cuts in pipes, threaded rods, profiles, corrugated and trapezoidal sheets, wire ducts, sandwich panels, dry mortarless construction profiles, fastening profiles (DIN rails), grates using dry cutting method.
- For use on metals, CrNi steel\*, aluminium.
- High cutting performance and tool life. The excellent price/performance ratio makes these saws highly economical.
- **The corresponding manufacturer's machine guidelines and notes on use must be observed when using these saw blades.**

 **MADE IN GERMANY**



## Premium quality

Cutting- Ø mm	Applicationmm	Dimensions	No. of teeth	Prod.-No.
180/7"	Steel	180 x 30	34	22205
200/8"	Steel	200 x 30	40	22255
230/9"	Steel	230 x 25,4	44	22305
230/9"	Aluminium	230 x 25,4	62	22306
230/9"	For trapezoid sheeting	230 x 25,4	80	22307



# MAGNETIC CHIP REMOVER

In a stainless steel round rod, you can move a magnet back and forth. The strong magnet picks up metal chips - pull a knob and the chips fall off. For more cleanliness in the work place.

ALFRA magnetic chip remover, length 400 mm **Prod.-No. 18654**



Prod.-No. 18654



# ASTROFLEX® – METAL HAND SAW BLADES

## Typenauswahl

### FLEX: High-Carbon Steel Blade

Economical blade, especially designed for aluminium profiles or wood.

### BI-METAL: High-Speed Steel with Bi-Metal Strip

Blade with high durability and heat resistance for flexible and robust applications, such as for steel pipes and stainless steel sheets.

Type	No. of teeth/Inches		Prod.-No.
FLEX	18 Z	Wavy Set	3300F18
FLEX	24 Z	Wavy Set	3300F24
FLEX	32 Z	Wavy Set	3300F32

Type	No. of teeth/Inches		Prod.-No.
BI-METAL	18 Z	Wavy Set	3300BiM18
BI-METAL	24 Z	Wavy Set	3300BiM24
BI-METAL	32 Z	Wavy Set	3300BiM32

- Customer brand execution in colour, imprint and packaging from 5.000 pieces possible.
- Packaging unit: 100 pieces.



# ALFRA MACHINE SAW BLADES – HSS DM 05

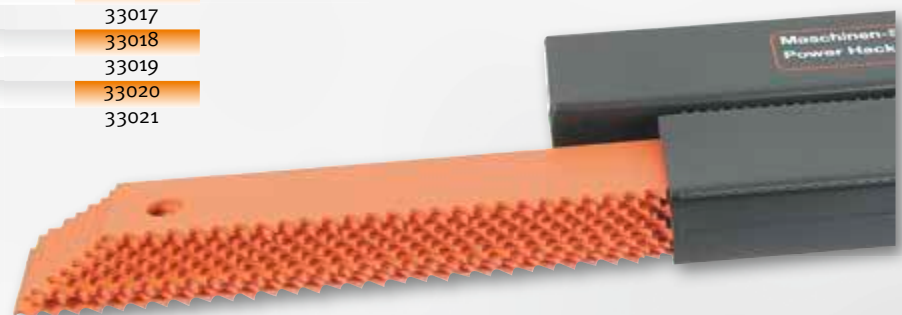
## For Hacksawing machines

- You can use the efficiency of the whole machine with these machine saw blades.
- For sawing solid material, pipes and profiles of all strengths.
- Also for high-strength steels.
- With parabolic tooth against early break.
- Sharp-edged and wear-resistant, with fine carbide repartition in micro structure.
- Straightened by master hand.
- For all types of machines.



Dimension mm	available toothing tpt				Prod.-No.
300 x 25 x 1.5	8	10	14		33010
350 x 30 x 1.5	6	8	10	14	33011
350 x 30 x 2.0	4	6	8	10	33012
400 x 30 x 1.5	6	8	10	14	33013
400 x 30 x 2.0	4	6	8	10	33014
450 x 30 x 2.0	4	6	8	10	33015
450 x 35 x 2.0	4	6	8	10	33016
450 x 40 x 2.0K	4	6	8	10	33017
500 x 40 x 2.0	4	6	8	10	33018
575 x 50 x 2.5K	3	4	6		33019
650 x 55 x 2.5K	3	4	6		33020
700 x 55 x 2.5K	3	4	6		33021

K = Kasto with displaced side holes  
 Other dimensions and toothings on request.  
 Length measured from hole center to center.  
 Packaging unit: 10 pieces



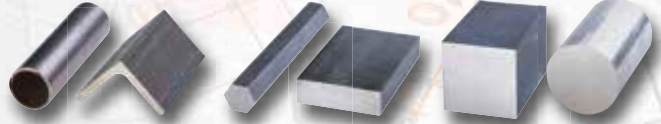
# RIX® ASTROFLEX® M42 SAW BLADES

## Rix® Astroflex® M42



Universal saw blade for cutting materials with tensile strength up to 1,300 N/mm<sup>2</sup>.

- ✓ Mild steel
- ✓ Case-hardened steel
- ✓ Free cutting steel
- ✓ Heat-treatable steel



Width x Thickness mm	Combi Tooth Pitch											
	0.75/1.25	1/2	1.5/2.0	2/3	3/4	4/5	4/6	5/6	5/8	6/10	8/12	10/14
6 x 0.90												●
10 x 0.90										●	●	●
13 x 0.65										●	●	●
13 x 0.90									●	●		●
20 x 0.90							●		●	●	●	●
27 x 0.90				●	●	●	●	●	●	●	●	●
34 x 1.10				●	●	●	●	●	●	●	●	
41 x 1.30			●	●	●	●	●	●	●			
54 x 1.30			●	●	●	●	●					
54 x 1.60	●	●	●	●	●	●	●					
67 x 1.60	●	●	●	●	●							
80 x 1.60	●	●	●	●								



# COOLANT – CUTTING, DRILLING, BROACHING OILS

## RIXOL-2000

### Coolant concentrate

- Universal use for sawing and drilling of steel, stainless steel, cast iron, nonferrous metal and aluminium alloys.
- Water emulsive, contains mineral oil, rot-proof, stable solution.
- Provides good rust protection and lubrication.
- Causes no irritation of the skin.
- No smoke development and no coagulation.
- Factor I for hand refractometer.
- Mixture: Circular saws 5 - 12%, Band saws 6 - 20 %

20 ltr. Plastic container  
208 ltr. Barrel

**Prod.-No.**  
21001  
on request



*Excellently suited for Rotabest® magnetic drills, as it is water-mixable.*

## ALFRA 2000

### High performance cutting oil

- ALFRA 2000 is an entirely synthetic cutting oil, developed for the metal working industry for core drilling, turning, drilling, milling, reaming, countersink, rubbing, tapping.
- Ideally qualified for all steel and steel alloys, chrome-nickel steel, copper, aluminium alloys.
- With special high pressure and anti wear additives.
- With corrosion and rust protection.
- Increases tool life up to 200 % and shortens operating time, reduces the number of rejects.

Can 250 ml  
5 ltr. Plastic container  
60 ltr. Barrel

**Prod.-No.**  
21010  
21012  
21021



*Prod.-No. 21010*

High-performance coolant stick

**Prod.-No.**  
09012



*Prod.-No. 09012*

## ALFRA 4000

### High Performance Cutting Oil Spray

- Suitable for core drilling applications with ALFRA cutters. Also ideal for twist drilling, thread tapping, reaming, countersinking, and difficult cutting applications.
- For use on: common steels; high-alloy, stainless steels; chromium nickel steels; titanium and manganese-carbon steels.
- 100% pure active substance.
- Optimal cutting performance.
- For working on walls and ceilings.
- Free from propellant gas.
- Free from chlorine and solvent.
- Pump spray.
- Optimal dosing quantity.

Can 300 ml

**Prod.-No.**  
21040



*Prod.-No. 21040*

TECHNICAL INFORMATION



# TCT CUTTING TOOLS – TECHNICAL TERMS

## Clearance Angle

Is the angle between the TCT tooth and the material to be cut. ALFRA TCT Cutters are equipped with several clearance angles at a cutting edge.

## Cutting Depth

Is the maximum material thickness which might be cut with the particular tool (not to be mistaken with the constructive height of the tool).

## Chip Flute

Takes the generated chips and advances this out of the bore.

## Chip Forwarding Pitch

Forwards the chips from the TCT tooth to the chip flute.

## Chip Surface

On this surface the chip is formed.

## Chip Angle

Is the angle between tool axis and chip surface.

## Tooth Excess Length

Is the carbide excess to the basic body.

## Tooth Height Difference

Acts as a chip breaker.

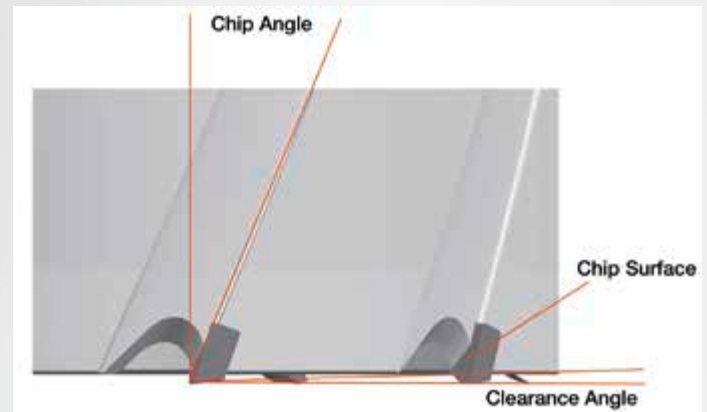
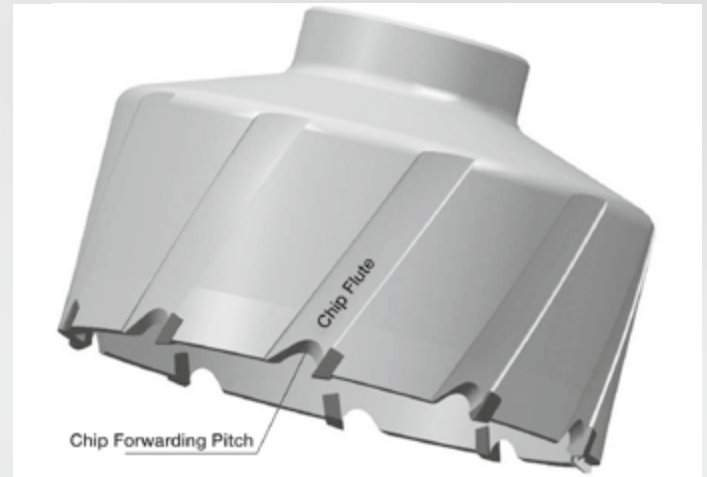
## RPM, cutting speed and feed (approximate value)

Rotabest®-TCT cutter

Not suitable for automatic feed

Material	m/min	mm/U
Constructional steel 50 kp/m <sup>2</sup>	40-60	0.08-0.12
Steel 50-70 kp/m <sup>2</sup>	30-50	0.08-0.12
Stainless steel	18-45	0.8-0.10
Cast iron	65-95	0.12-0.20
Non-ferrous metals, Aluminium	100-550	0.22-0.45
Exotic alloys	10-30	0.05-0.08

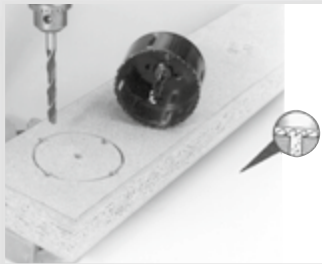
Exactness (approximate value)/input/+ 0.10 mm Output/± 0 mm



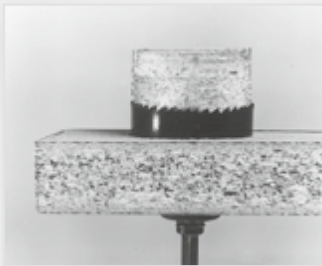
# HSS BI METAL HOLE SAWS – NOTES ON USE

1. Use the hole saws at the recommended cutting speed, see guide table on the packaging.
2. Do not apply excess pressure. Apply a little more pressure for a harder material and less pressure for a softer material.
3. In order to achieve good centring, the centre drill must project approximately 6 mm beyond the teeth. It is recommended that the hole is first predrilled with a twist drill and then the centre drill is used in the adapter as a centring pin.
4. Use a good cutting oil when drilling metal. This extends the hole saw's service life and prevents premature blunting of the tooth tips.
5. The arbor of the adapter must be firmly clamped with the flattened sides correctly seated in the chuck.
6. The hole saw must cut into the workpiece at a right angle. Avoid tilting. Risk of accident.
7. If large hole saw diameters are used in hand-held drills, the hand-held drill must be held particularly firmly. A drill stand should be used where possible.
8. The adapter must be firmly screwed into the hole saw with all its thread and the driver pins must be firmly seated in the driver holes.
9. Secure the driver pins with the rotating ring or lock in the case of a quick-change adapter.
10. Wear protective goggles when working with the bi-metal hole saws and keep hands away in case saw runs out. Never attempt to stop with your hands a saw that is running off.
11. Lift the saw clear frequently, especially when cutting timber, chipboard and wood substitutes and remove the sawdust and chips. If this is not done, the tooth tips can burn and the hole saw will jam in the cut.
12. We recommend the following procedure when drilling timber, chipboard and wood substitutes:

Drill a number of holes immediately inside the cut. This helps carry the chips away and avoids frequent interruptions in cutting to clean the tooth tips.



**If the workpiece is especially thick ...** it is also recommended that you cut from both sides, or drill a number of holes immediately inside the circular cut. This helps carry the chips away and avoids frequent interruptions in cutting to clean the tooth tips.



## Enlarging existing holes

Existing holes 32 mm (1-1/4") or more in diameter may be enlarged with a simple trick:

Take a 32 mm diameter hole saw and screw this inside the hole saw on the projecting thread of the A2 adapter. The inner hole saw then acts as a kind of guiding hole saw for extending existing holes, see photo.



## What you absolutely must avoid:

1. Drilling at too fast or too slow a cutting speed. The teeth will glide over the material and become prematurely blunt.
2. Avoid bringing the saw teeth abruptly down on the workpiece, the teeth will break off.
3. Never cut metallic materials dry. Always use a cutting oil.
4. Never bring the saw up to the workpiece on a slant. There is a risk of injury when hand drills are used. The saw can break up or the arbor could be damaged.
5. Ensure that the hole saw is running true. Check the chuck as necessary.
6. Never screw the adapter's guide pins only partially into the hole saw guide holes. The thread of the hole saw could be torn out.
7. Never regrind the hole saw freely by hand. Have hole saws reground by a specialist. Care must be taken to ensure sufficient residual setting and a uniform tooth height.
8. If the tool arbor is pushed into the chuck or if the arbor shears off, the advance pressure is too great.
9. If the hole saw is unevenly worn on the outside, then the saw is not running true or the material to be sawn was not correctly clamped.
10. If the tooth tips are blued, the saw has been used without cutting oil, or at too high a cutting speed.

# HSS BI-METAL HOLE SAWS – SPEED CHART

Diameter mm	Mild Steel	Cast Iron	Tool steel + stainless steels	Brass	Aluminium	Wood
14	580	400	300	790	900	3000
16	550	365	275	730	825	3000
17	500	330	250	665	750	3000
19	460	300	230	600	690	3000
20	440	290	220	580	660	3000
21	425	280	210	560	635	3000
22	390	260	195	520	585	3000
24	370	245	185	495	555	3000
25	350	235	175	470	525	2700
27	325	215	160	435	480	2700
29	300	200	150	400	450	2700
30	285	190	145	380	425	2400
32	275	180	140	380	410	2400
33	260	175	135	345	390	2400
35	250	165	125	330	375	2400
37	240	160	120	315	360	2400
38	230	150	115	300	345	2400
40	220	145	110	290	330	2100
41	210	140	105	280	315	2100
43	205	135	100	270	305	2100
44	195	130	95	260	295	2100
46	190	125	95	250	285	2100
48	180	120	90	240	270	2100
51	170	115	85	230	255	2000
52	165	110	80	220	245	2000
54	160	105	80	210	240	2000
57	150	100	75	200	225	2000
59	145	100	75	195	225	2000
60	140	95	70	190	220	2000
64	135	90	65	180	205	1800
65	130	85	65	175	200	1800
67	130	85	65	170	195	1800
70	125	80	60	160	185	1800
73	120	80	60	160	180	1800
76	115	75	55	150	170	1500
79	110	70	55	140	165	1500
83	105	70	50	140	155	1500
86	100	65	50	130	150	1200
89	95	65	45	130	145	1200
92	95	60	45	120	140	1200
95	90	60	45	120	135	1200
98	90	60	45	120	135	1200
102	85	55	40	110	130	1000
105	80	55	40	110	120	1000
108	80	55	40	110	120	900
111	80	50	40	100	120	900
114	75	50	35	100	105	900
121	75	50	35	95	95	900
127	65	45	30	90	90	800
133	60	40	25	86	85	800
140	60	40	25	85	85	800
146	55	35	25	75	75	800
152	55	35	25	75	75	800



These speeds are benchmarks. The speed can be higher or lower, this depends on the material type and the cutting behaviour.  
 Attention: Do not use cutting oil, if you are cutting cast iron. If you are cutting aluminium use paraffin wax or paraffin.

## Calculation of the Cutting Speed

$n$  = Speed (1/min)  
 $v_c$  = Cutting speed (m/min)  
 $d$  = Tool diameter (mm)

$$v_c = \frac{\pi \times d \times n}{1000}$$

# TCT-HOLE SAWS – SPEED CHART

## Speed calculation

n = Speed (1/min)

$v_c$  = Cutting Speed (m/min)

d = Tool diameter (mm)

$$n = \frac{v_c \times 1000}{d \cdot \pi}$$

## Worked sample:

d = 20 mm

$v_c$  = 50 m/min

$$n = \frac{50000}{20 \cdot \pi} = 795,77 \text{ 1/min}$$

Tool Ø	Cutting speed (m/min)													
	Stainless steel material							Mild steel - ST material						
	20	25	30	35	40	45	50	55	60	65	70	75	80	
16	398	498	597	697	796	896	995	1095	1194	1294	1393	1493	1592	
18	354	442	531	619	708	796	885	973	1062	1150	1238	1327	1415	
20	318	398	478	557	637	717	796	876	955	1035	1115	1194	1274	
22	290	362	434	507	579	651	724	796	869	941	1013	1086	1158	
24	265	332	398	464	531	597	663	730	796	863	929	995	1062	
26	245	306	367	429	490	551	612	674	735	796	857	919	980	
28	227	284	341	398	455	512	569	626	682	739	796	853	910	
30	212	265	318	372	425	478	531	584	637	690	743	796	849	
32	199	249	299	348	398	448	498	547	597	647	697	746	796	
34	187	234	281	328	375	422	468	515	562	609	656	703	749	
36	177	221	265	310	354	398	442	487	531	575	619	663	708	
38	168	210	251	293	335	377	419	461	503	545	587	629	670	
40	159	199	239	279	318	358	398	438	478	518	557	597	637	
42	152	190	227	265	303	341	379	417	455	493	531	569	607	
44	145	181	217	253	290	326	362	398	434	470	507	543	579	
46	138	173	208	242	277	312	346	381	415	450	485	519	554	
48	133	166	199	232	265	299	332	365	398	431	464	498	531	
50	127	159	191	223	255	287	318	350	382	414	446	478	510	
52	122	153	184	214	245	276	306	337	367	398	429	459	490	
54	118	147	177	206	236	265	295	324	354	383	413	442	472	
56	114	142	171	199	227	256	284	313	341	370	398	427	455	
58	110	137	165	192	220	247	275	302	329	357	384	412	439	
60	106	133	159	186	212	239	265	292	318	345	372	398	425	
62	103	128	154	180	205	231	257	283	308	334	360	385	411	
64	100	124	149	174	199	224	249	274	299	323	348	373	398	
66	97	121	145	169	193	217	241	265	290	314	338	362	386	
68	94	117	141	164	187	211	234	258	281	304	328	351	375	
70	91	114	136	159	182	205	227	250	273	296	318	341	364	
72	88	111	133	155	177	199	221	243	265	288	310	332	354	
74	86	108	129	151	172	194	215	237	258	280	301	323	344	
76	84	105	126	147	168	189	210	230	251	272	293	314	335	
78	82	102	122	143	163	184	204	225	245	265	286	306	327	
80	80	100	119	139	159	179	199	219	239	259	279	299	318	
82	78	97	117	136	155	175	194	214	233	252	272	291	311	
84	76	95	114	133	152	171	190	209	227	246	265	284	303	
86	74	93	111	130	148	167	185	204	222	241	259	278	296	
88	72	90	109	127	145	163	181	199	217	235	253	271	290	
90	71	88	106	124	142	159	177	195	212	230	248	265	283	
92	69	87	104	121	138	156	173	190	208	225	242	260	277	
94	68	85	102	119	136	152	169	186	203	220	237	254	271	
96	66	83	100	116	133	149	166	182	199	216	232	249	265	
98	65	81	97	114	130	146	162	179	195	211	227	244	260	
100	64	80	96	111	127	143	159	175	191	207	223	239	255	



## FRP Hole Saws

Ø mm	Timber Chipboard	Plastics	Masonry	Wall tiles*
25/30/35	1000	800	800	500
40/45/50	800	600	700	400
58 bis 74	600	400	600	400
80/105	400	300	300	300

\* Drilling in tiles only up to a scratch hardness of 6, mark centre, set the centre drill and drill through the glaze with at a low speed, allow the saw teeth to penetrate the glazing uniformly, running as smoothly and level as possible, so that the edge of the hole is made without chipping. Continue drilling at a normal drilling speed. Tiles with a scratch hardness greater than 6 may only be cut with diamond or carbide hole saws.

### Notes on use

- Use rotation only. Switch off impact or hammer drill.
- Impact and shock on the sharp, ground carbide cutters can lead to small carbide splinters and thus to a severe loss of performance.
- Do not tilt the hole saw in the hole.
- Remove the drill core after each operation. Remove the sawdust when drilling timber and timber products.

### Notes on use

For multipurpose hole saw with rim countersink

- The rim countersink is placed between hole saw and adapter and the carbide cutter is used to make a countersink in timber and timber substitutes. This makes it possible to fit sockets flush.

### Important notes on use

- The hole saw with rim countersink may not be stopped before it is removed.
- Advance with care, to prevent the cut edges tearing.

# SPEED CHART – MULTI-STEP DRILLS/CONICAL ONE-LIP BITS

## ALFRA-Multi-step drills

These drills were especially to drill perfectly round and simultaneously deburred holes in sheet metals of 3 - 6 mm. The radius transition simultaneously deburrs or bezeles the holes. While conical one-lip bits drill slightly conical holes, cylindrical holes can be drilled with ALFRA Multi-step drills. The tools are axial-radially relief ground and can be resharpened at the breast of the cutting tooth.

We recommend the use of pillar drilling machines, however, the small ALFRA Multi-step drills can be used on adjustable hand drilling machines. Imperatively use sufficient cooling (**ALFRA coolant stick or bore emulsion**).

Type		Stahl-blech S235	V2A-Bleche	NE-Metalle	Kunst-stoff weich
AM	anbohren	800	360	1000	1000
	aufsenken	500 - 180	50 - 70	800 - 400	1000 - 400
AM-1	anbohren	800	360	1000	1000
	aufsenken	200 - 100	100 - 50	500 - 200	600 - 250
PVD, PVK, DKI	anbohren	800	360	1000	1000
PVD-VA + SVB	aufsenken	400 - 200	200 - 100	800 - 500	1000 - 600

## ALFRA HSS DM 05 Precision Multi-step drills

- Take notice of the cutting speed
- Grease the cutting lips in case of application

The holes are deburred on both sides by the multistep drills. The multistep drill drills holes in thin materials, enlarges existing holes, makes inclined holes, drills pipes, makes holes penetrating each other. Suitable for any hand drill. For steel — PVC — polystrol — polyester — Plexiglas — card — plywood and similar materials. Can be reground many times, if treated carefully.

Material	unalloyed Mild steel 700 N/mm <sup>2</sup>	Mild steel 1000 N/mm <sup>2</sup>	Alloy steel > 250 N/mm <sup>2</sup>	Stainless steel < 1000 N/mm <sup>2</sup>	Al. alloy up to 11% Si	Thermo-plastic	Duro-plastic	Wood
Material gauge	4.0 mm	4.0 mm	4.0 mm	3.0 mm	4.0 mm	4.0 mm	4.0 mm	25.0 mm
Drilling paste	X	X	X	X	X	H <sub>2</sub> O	Air	
m/min	20 - 25	10 - 16	8 - 12	5 - 12	10 - 16	12 - 25	8 - 12	40 - 100
Ø mm	U/min	U/min	U/min	U/min	U/min	U/min	U/min	U/min
3.0 - 14.0	2600 - 600	2100 - 450	1060 - 230	500 - 300	2600 - 550	2100 - 450	1500 - 340	3000 - 1000
6.0 - 20.0	1500 - 400	1200 - 320	640 - 160	400 - 250	1590 - 400	1270 - 320	950 - 240	2800 - 1000
6.0 - 22.5	1500 - 250	1200 - 280	640 - 140	400 - 250	1500 - 350	1270 - 280	950 - 210	2000 - 800
16.0 - 30.0	300 - 200	400 - 210	200 - 100	150 - 80	500 - 260	400 - 210	300 - 160	1500 - 800
26.0 - 40.0	330 - 200	270 - 160	130 - 80	100 - 60	330 - 200	270 - 160	200 - 120	1000 - 400
36.0 - 50.0	220 - 160	180 - 130	90 - 60	80 - 40	220 - 160	180 - 130	130 - 100	600 - 200
46.0 - 60.0	200 - 130	160 - 100	80 - 50	40 - 20	200 - 130	160 - 100	120 - 80	500 - 100

# TAPER AND DEBURRING COUNTERBORES

Material	unalloyed Steel 700 N/mm <sup>2</sup>	unalloyed Steel 700 N/mm <sup>2</sup>	alloyed Steel 1000 N/mm <sup>2</sup>	Cast Iron < 250 N/mm <sup>2</sup>	Cast Iron > 250 N/mm <sup>2</sup>	Stainless Steel < 1000 N/mm <sup>2</sup>	CuZn alloyed brittle	CuZn alloyed tough	Alum. alloyed bis 11% Si	Thermo-plastic	Duro-plastic
Cutting Spray	X	X	X	X	X	X	X	X	X	H <sub>2</sub> O	Air
m/min	15	10	6	12	8	6	20	15	25	20	15
Ø mm	U/min	U/min	U/min	U/min	U/min	U/min	U/min	U/min	U/min	U/min	U/min
4.3	1100	740	440	890	590	400	1480	1110	1850	1480	1110
5.0	950	640	380	760	510	340	1270	950	1590	1270	950
5.3	900	600	360	720	480	320	1200	900	1500	1200	900
5.8	820	550	330	660	440	290	1100	820	1370	1100	820
6.0	800	530	320	640	420	280	1060	800	1330	1060	800
6.3	760	510	300	610	400	260	1010	760	1260	1010	760
7.0	680	450	270	550	360	230	910	680	1140	910	680
7.3	650	440	260	520	350	220	870	650	1090	870	650
8.0	600	400	240	480	320	200	800	600	990	800	600
8.3	580	380	230	460	310	190	770	580	960	770	580
9.4	510	340	200	410	270	160	680	510	850	680	510
10.0	480	320	190	380	250	150	640	480	800	640	480
10.4	460	310	180	370	240	140	610	460	770	610	460
11.5	420	280	170	330	220	130	550	420	690	550	420
12.4	390	260	150	310	210	110	510	390	640	510	390
13.4	360	240	140	290	190	100	480	360	590	480	360
14.4	340	220	130	270	170	90	450	320	550	450	320
15.0	320	210	130	250	170	90	420	320	530	420	320
16.5	290	190	120	230	150	80	390	290	480	390	290
19.0	250	170	100	200	130	60	340	250	420	340	250
20.5	230	160	90	190	120	50	310	230	390	310	230
23.0	210	140	80	170	110	50	280	210	350	280	210
25.0	190	130	80	150	100	50	250	190	320	250	190
26.0	180	120	70	150	100	40	240	180	310	240	180
28.0	170	110	70	140	90	40	230	170	280	230	170
30.0	160	110	60	130	80	40	210	160	270	210	160
31.0	150	100	60	120	80	30	210	150	260	210	150
32.0	150	100	60	120	80	30	210	150	260	210	150
34.0	140	90	60	110	70	30	190	140	230	190	140
37.0	130	90	50	100	70	30	170	130	220	170	130
40.0	120	80	50	100	60	30	160	120	200	160	120
50.0	100	60	40	80	50	20	130	100	160	130	100
63.0	80	50	30	60	40	20	100	80	130	100	80
80.0	60	40	20	50	30	20	80	60	100	80	60

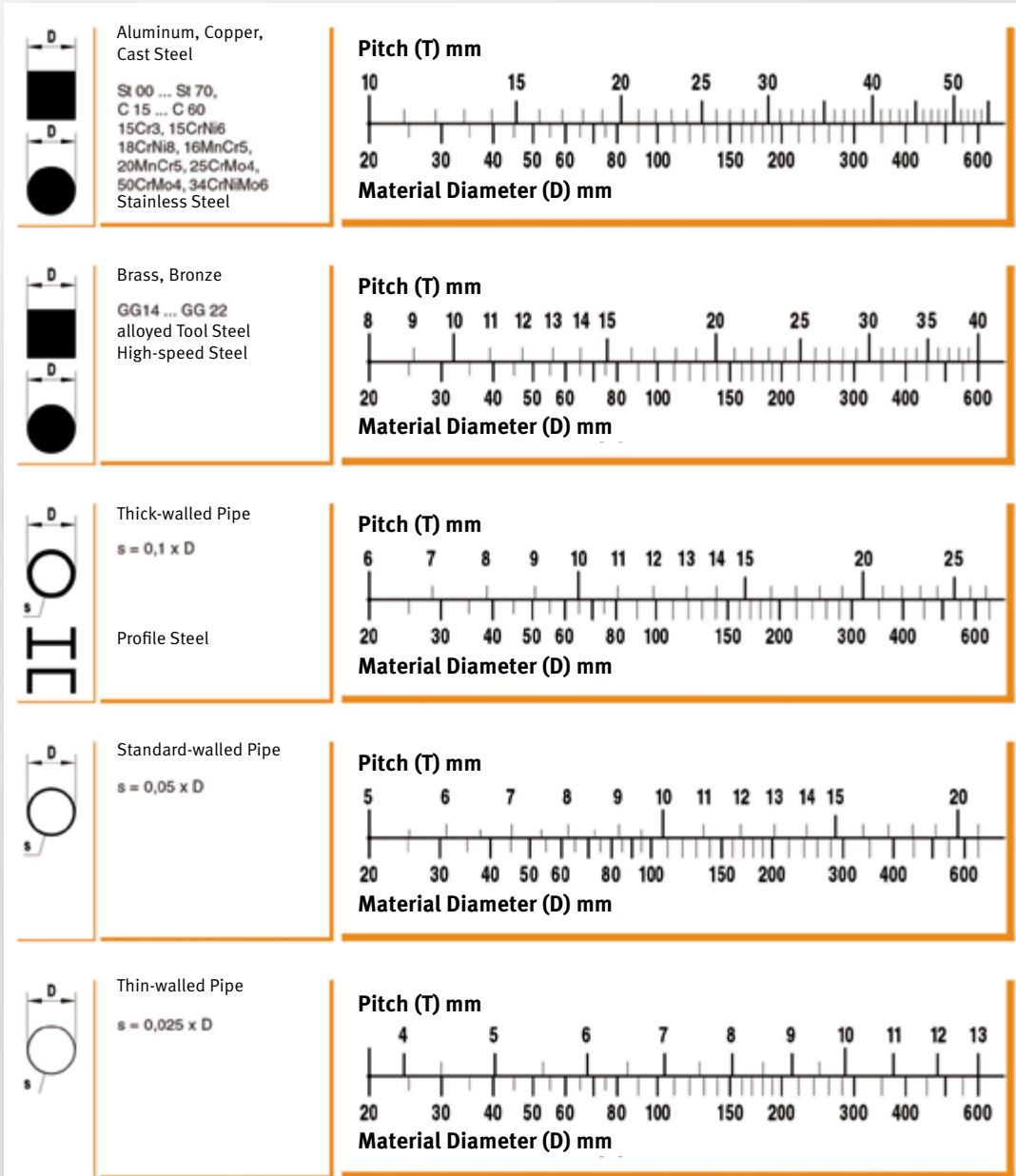
# SABRE SAW BLADES – COMPARISON CHART

Milford	Bahco	Bosch	MPS	Milwaukee	Metabo	Lenox	WILPU
	3840-100-6-ST	-	-	-	-	456RP	-
	3840-100-10-ST	-	4433	48 00 5090	-	-	-
<b>88161</b>	3840-100-14-ST	S522BF	4410	48 00 5181	-	414R	-
<b>88162</b>	3840-100-18-ST	S522EF	4400	48 00 5183	-	418R	3014/100
<b>88163</b>	3840-100-24-ST	S522AF	4403	48 00 5185	-	424R	3015/100
	3840-100-10-SC	-	-	48 00 5161	-	-	-
<b>88151</b>	3840-100-14-SC	S422BF	-	48 00 5162	6 31990	314RC	3017/90
<b>88152</b>	3840-100-18-SC	-	-	48 00 5163	-	318RC	-
<b>88166</b>	3840-150-6-ST	-	4035	-	-	-	-
<b>88125</b>	3840-150-8/12-ST	S123XF S922VF	4430 VP 4440 VP	48 00 5091	31914 6 6 31492 6 31911	650R	1014C/150
<b>88176</b>	3840-150-10-ST	S922HF	4430 4041	48 00 5092 48 00 5712	-	610R 6110R	3018/150
<b>88177</b>	3840-150-14-ST	S922BF	4411	48 00 5182 48 00 5782	6 31491	614R 6114R 6514R	3013/150
<b>88178</b>	3840-150-18-ST	S922EF	4401	48 00 5184 48 00 5784	6 31454	618R 6118R 9518R	3014/150
<b>88179</b>	3840-150-24-ST	S922AF	4405	48 00 5186	-	624R	3015/150
<b>88142</b>	3840-150-5/8-SL	-	4016	-	6 31984	-	-
<b>88143</b>	3840-150-4/6-SC	S711DF	-	48 00 5041	6 31985	676RC	-
<b>88219</b>	3840-228-8/12-ST	S1122VF	4434 VP 4431 VP 4441 VP	48 00 5093	6 31495	-	1014C/225
<b>88174</b>	3840-228-10-ST	S1122HF	4434 4431	48 00 5713	-	810R 9110R	3018/200
<b>88186</b>	3840-228-14-ST	S1122BF	4416	48 00 5787 48 00 5187	6 31494	9514R 9114R	3013/200
<b>88187</b>	3840-228-18-ST	S1122EF	4429 4402	48 00 5188 48 00 5788	6 31493	818R 9118R	3014/200
<b>88144</b>	3840-228-6-SL	S1111DF	4444	-	-	-	3021/225
	3840-300-14-ST	-	4422 4061	-	-	12114R	-
	3840-300-18-ST	-	-	48 00 5189 48 00 5789	-	118R 12118R	-
<b>88145</b>	3840-300-6-SL	S1411DF	4015 4017	48 00 5037	-	-	3021/300
<b>88230</b>	3840-300-8/12-SL	S1222VF	4432 VP	48 00 5094 48 00 5194	6 31407	110R	1014C/280
<b>88220</b>	3840-150-5/8-DSL	S611DF S610DF	-	48 00 5031 48 00 5021	6 31925	-	3021/150 3055/150
<b>88221</b>	3840-228-5/8-DSL	S3456XF S1110DF	4464 VP 4474 VP	48 00 5026	6 31926 6 31915	966R	-
<b>88222</b>	3840-300-5/8-DSL	-	-	48 00 5027	-	106R	-
<b>87950</b>	3842-150-7-SL	S644D	4011 4012 4013	48 00 5015	6 31470	656R 606R	3021/150 3019/150
<b>87960</b>	3842-228-7-SL	-	-	48 00 5016 48 00 5036	-	956R	3030/225
<b>87970</b>	3842-300-7-SL	-	4010	48 00 5017	6 31489 6 31472	156R	3030/300
	3846-150-6-SL	S641HM	4073 4014	48 00 5052	6 31137	6565RCT 636RP	3040/150HM
	3846-228-3-ST	S1141HM	4075	-	-	8535RCT	3041/225HM
	3846-228-6-ST	-	-	-	-	-	-
	3846-300-3-ST	S1241HM	4080	-	-	6 31146	-
	3846-300-6-ST	-	4060	-	-	-	-
	3846-100-G-ST	-	-	-	48 02 1400	-	-
	3846-150-G-ST	S1130Riff	4084	48 02 1420	6 31818	600RG	D12/230
<b>88228</b>	3840-228-10/14-PR13	-	4426 4436 4437 4438	48 00 5193	-	-	-
	3840-150-8-UST-5P	-	-	48 00 5500	-	608ER	-
	3840-200-8-UST-5P	-	-	48 00 5510	-	708ER	-
	3840-300-8-UST-5P	-	-	48 00 5515	-	-	-



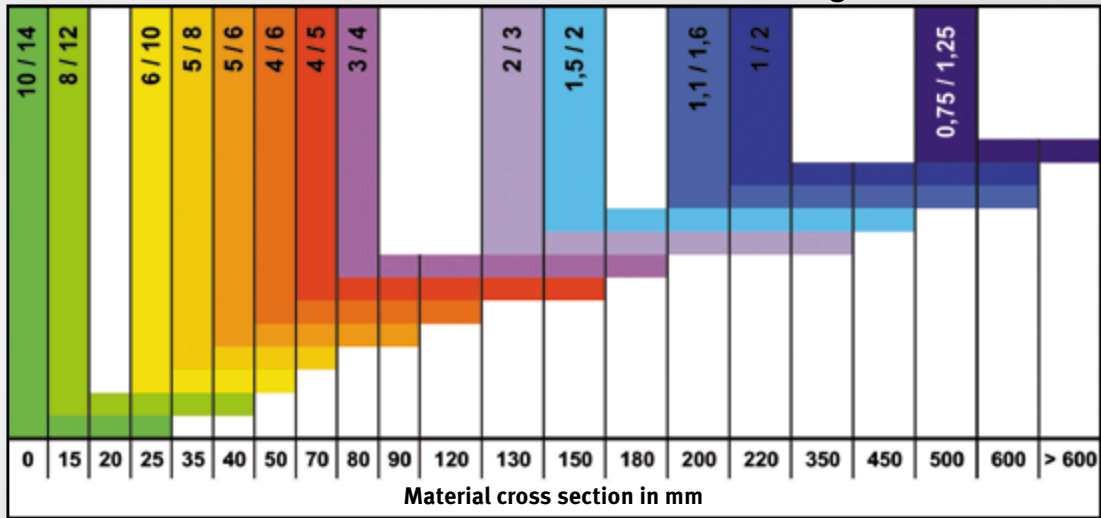
# METAL CIRCULAR SAWS – PITCH SELECTION

At first select material and form.  
Then look for material diameter (D) on the related scale  
and read off the pitch value (T).



# METAL BAND SAWS – PITCH RECOMMENDATIONS

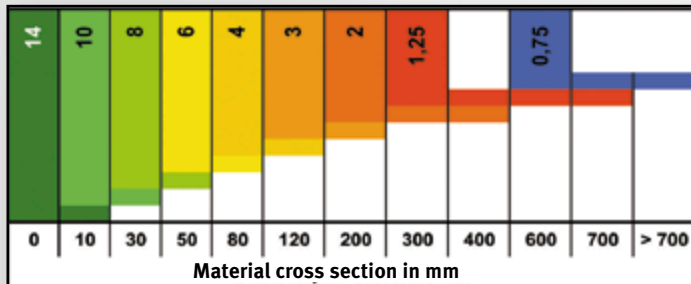
## Pitch recommendation for solid material and combi-toothing



## Pitch recommendation for pipes

Wall thickness	Pipe outside diameter									
	20	40	60	80	100	120	150	200	300	500
2	14	10 / 14	10 / 14	10 / 14	10 / 14	8 / 12	8 / 12	8 / 12	8 / 12	5 / 8
3	14	10 / 14	10 / 14	8 / 12	8 / 12	8 / 12	8 / 12	6 / 10	6 / 10	5 / 8
4	10 / 14	10 / 14	8 / 12	8 / 12	8 / 12	6 / 10	6 / 10	5 / 8	5 / 8	4 / 6
5	10 / 14	10 / 14	8 / 12	8 / 12	6 / 10	6 / 10	5 / 8	4 / 6	4 / 6	4 / 6
6	10 / 14	8 / 12	8 / 12	6 / 10	6 / 10	5 / 8	5 / 8	4 / 6	4 / 6	4 / 6
8	10 / 14	8 / 12	8 / 12	6 / 10	5 / 8	5 / 8	4 / 6	4 / 6	4 / 6	4 / 6
10		8 / 12	6 / 10	5 / 8	4 / 6	4 / 6	4 / 6	4 / 6	4 / 6	4 / 5
12		8 / 12	6 / 10	4 / 6	4 / 6	4 / 6	4 / 6	4 / 6	4 / 6	4 / 5
15		8 / 12	6 / 10	4 / 6	4 / 6	4 / 6	4 / 6	4 / 5	4 / 5	4 / 5
20			4 / 6	4 / 6	4 / 6	4 / 6	4 / 5	4 / 5	4 / 5	3 / 4
30				4 / 6	4 / 6	4 / 5	4 / 5	4 / 5	4 / 5	2 / 3
50						4 / 5	3 / 4	2 / 3	2 / 3	2 / 3
80							3 / 4	2 / 3	1,5 / 2	1,5 / 2
> 100									1,5 / 2	1 / 2

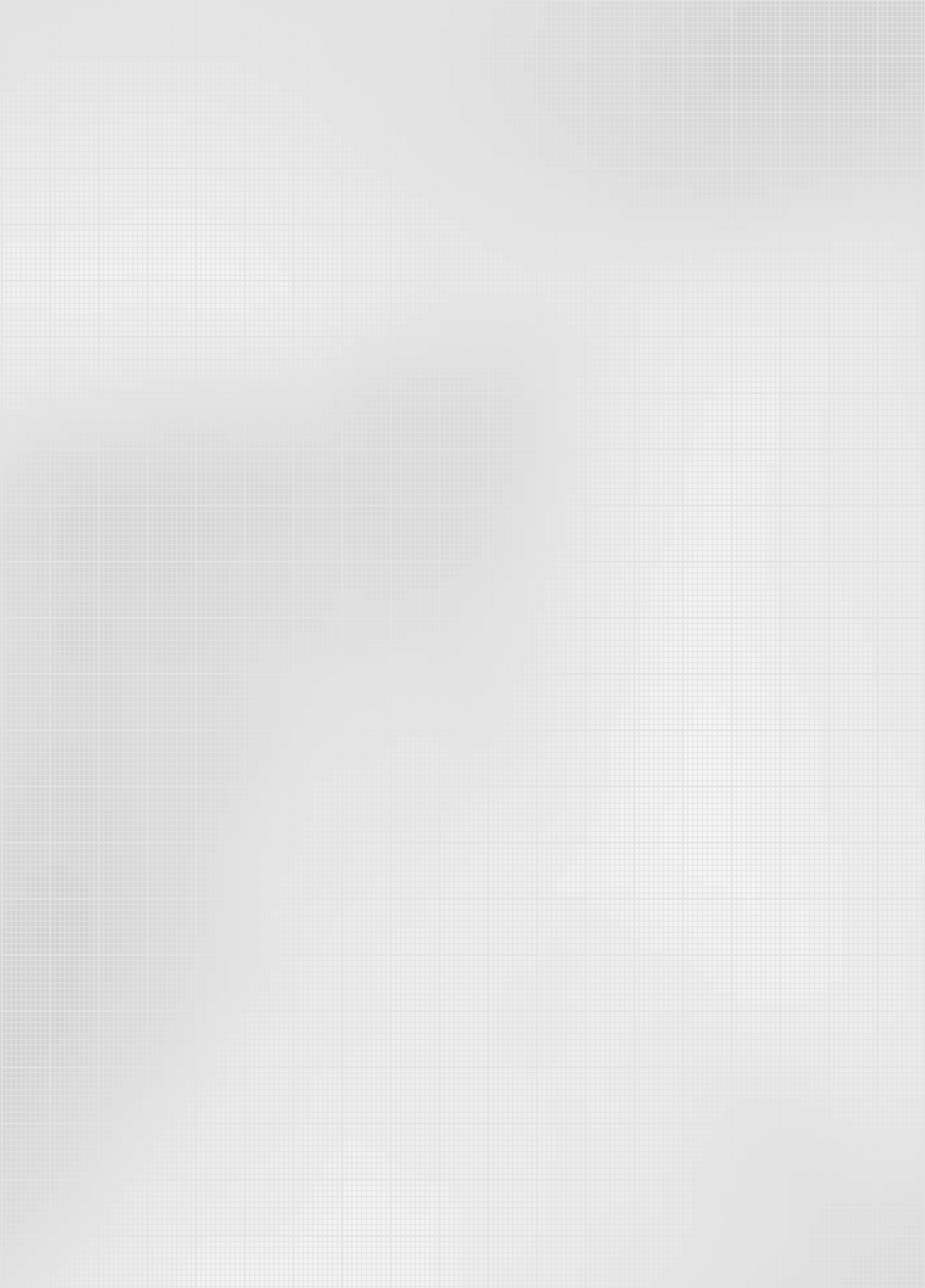
## Pitch recommendation for solid material and standard pitches (tpi)



# METAL BAND SAWS – R.P.M. RECOMMENDATIONS

Material	DIN	m/min Rapid	m/min M 42	cm <sup>2</sup> / min (bei M 42)	Cutting Oil	Emulsion
Construction Steel	St 37 / St 42	40 - 60 35 - 50	70 - 90 50 - 70	70	-	1 : 8
Case-hardened Steel	C10/C15 14 NiCr 14 21 NiCrMo 2 16 MnCr 5	50 - 70 30 - 35 30 - 35 35 - 40	40 - 70	40		1 : 8
Nitriding Steel	34 CrAl6	30 - 35	35 - 45	40	-	1 : 8
Machining Steel	9 S20	50 - 70	50 - 70	100	-	1 : 8
Free-cutting Steel	C35 / C45 / Ck 45 40 Mn 4 36 NiCr 6 34 CrNiMo 6 42 CrMo 4	40 - 60 40 - 50 35 - 45 35 - 45 35 - 45	55 - 75	80 40 40 40 40	-	1 : 8
Ball-bearing Steel	100 Cr 6	25 - 35	30 - 50	40	-	1 : 8
Spring Steel	65 Si 7 50 CrV 4	30 - 40 30 - 40	30 - 50	40	-	1 : 8
Unalloyed Tool Steel	C 125 W 1 C80W 1	30 - 40 30 - 40	30 - 50	25	-	1 : 8
Alloyed Tool Steel	125 Cr 1 X210 Cr12 X 42 Cr 13 58 SiCr 8 X 165 CrV 12 100 CrMo 5 56 NiCrMoV 7 45 wCrV 7 X 32 CrMoV 3 3	30 - 40 20 - 30 25 - 35 30 - 40 20 - 30 25 - 35 30 - 40 30 - 40 35 - 40	30 - 50	20	ja	1 : 8
High-speed Steel	S 6-5-2-5 S 6-5-2 S 3-3-2 S-18-0-1 S 18-1-2-10		25 - 45	25	ja	1 : 5
Valve Steel	X 45 CrSi 9 3 X 45 CrNi W 18 9		25 - 35	20	ja	1 : 5
Hochwärmefeste Stähle	W.Nr.4922 W.Nr.4980		15 - 30	15	ja	1 : 5
Highly Heat Resisting Steel	W.Nr.4713 W.Nr.4742 W.Nr.4841		15 - 30	15	ja	1 : 5
Stainless and Acid-proof Steel	X 5 CrNi 18 9 X 10 CrNiMoTi 18 10		25 - 35	20	ja	1 : 5
Cast Iron	GG 15 GG 30 GTW40 GTS65 GGG50	30 - 40 30 - 40 30 - 40 30 - 40 30 - 40	40 40 40 40 40	40		
Titan			10 - 25	6,5 - 7	ja	1 : 5
Copper		100 - 300	100			1 : 5
Brass	CuZn 10 CuZn 40 Pb 2 CuZn 31 Si	100 - 400 100 - 400 100 - 400	100 100 100			1 : 5
Bronze	CuSn 6 G-CuSn 8 G-CuSn 5 Zn Pb G-CuSn 10 Zn CuAl8 CuAl8 Fe G-CuAl10 Fe	80 - 120 80 - 120 80 - 120 80 - 120 35 - 45 25 - 35 25 - 35	80 80 80 80 50 35 35			1 : 5

# YOUR NOTES



Copyright by Alfra GmbH  
2018

All technical data, descriptions and illustrations in this catalogue are non-binding. We reserve to make changes as part of the further development of our products.

We assume no liability for typographical errors.

The publication of this catalogue renders all previous catalogues invalid.

Issued: July 2018

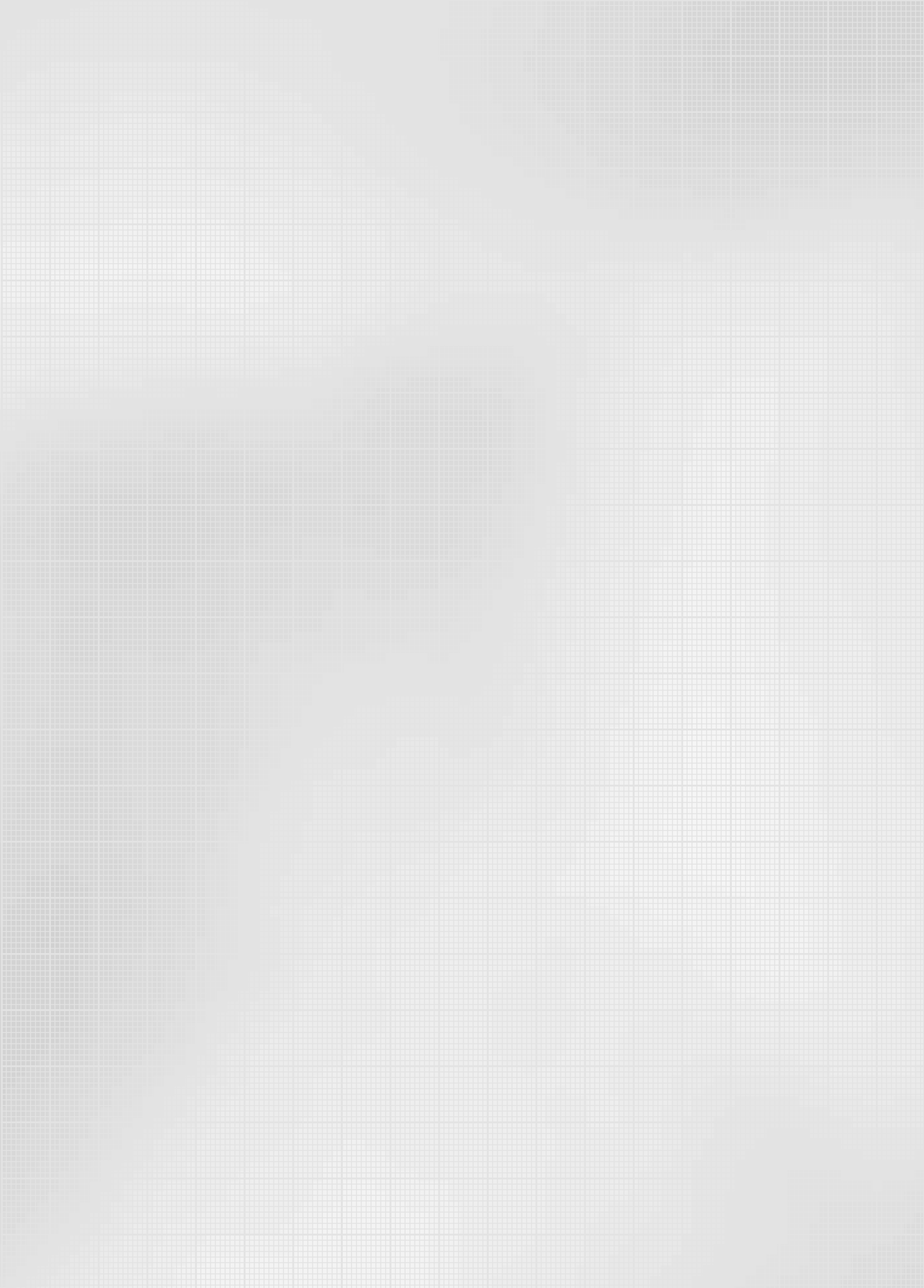
All rights reserved.

This catalogue has been prepared with the utmost care. All technical data and information has been verified before going to press. Due to the continuous improvement and development of the ALFRA production range, we reserve the right to modify products in this catalogue, or remove them if necessary from our range. Technical data and products contained in this catalogue may for this reason change without prior notice.

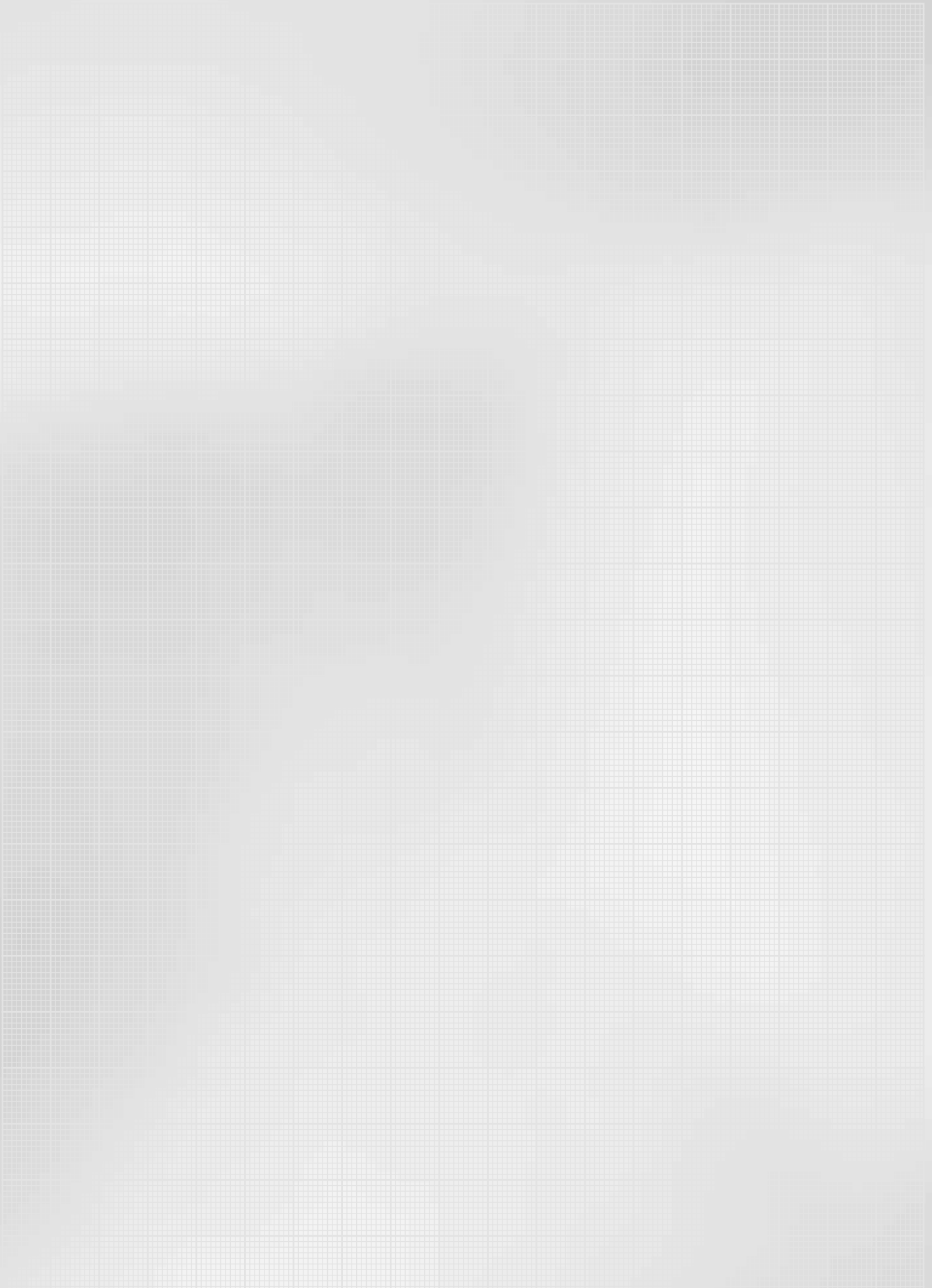
The full or partial use or reproduction of this catalogue (drawings, images, text, logos) is prohibited without prior written approval.

Picture credits:  
Döring Holding GmbH & Co. KG, [www.fotolia.com](http://www.fotolia.com), [www.123rf.com](http://www.123rf.com)

# YOUR NOTES

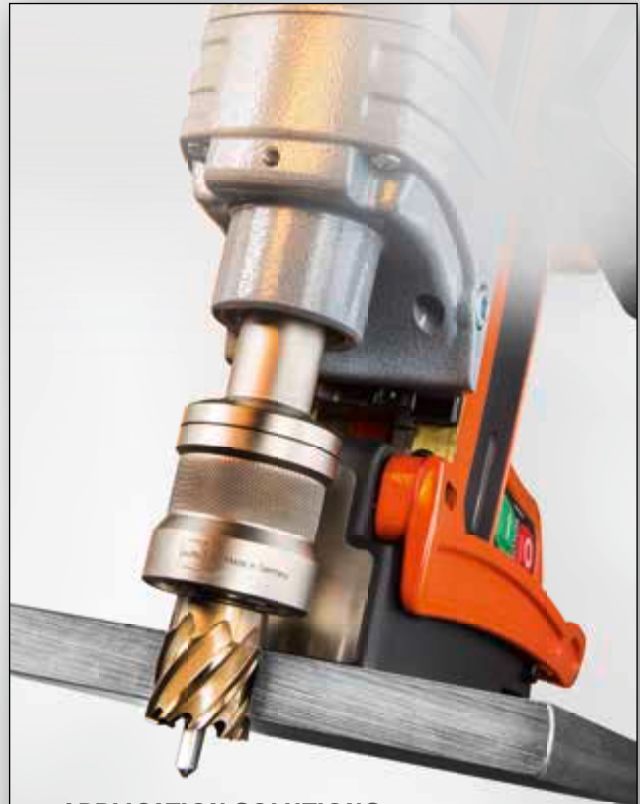


# YOUR NOTES





**APPLICATION SOLUTIONS  
CONTROL CABINET AND CONTROL ENGINEERING**



**APPLICATION SOLUTIONS  
STEEL AND METAL CONSTRUCTION**



**APPLICATION SOLUTIONS  
MAGNETICS AND LIFTING TECHNOLOGY**



**APPLICATION SOLUTIONS  
DEBURRING TECHNOLOGY**

07/2018

