edition 11/2014

toolholders with indexable inserts

milling, turning, grooving

ALESA
...us de Schwiiz

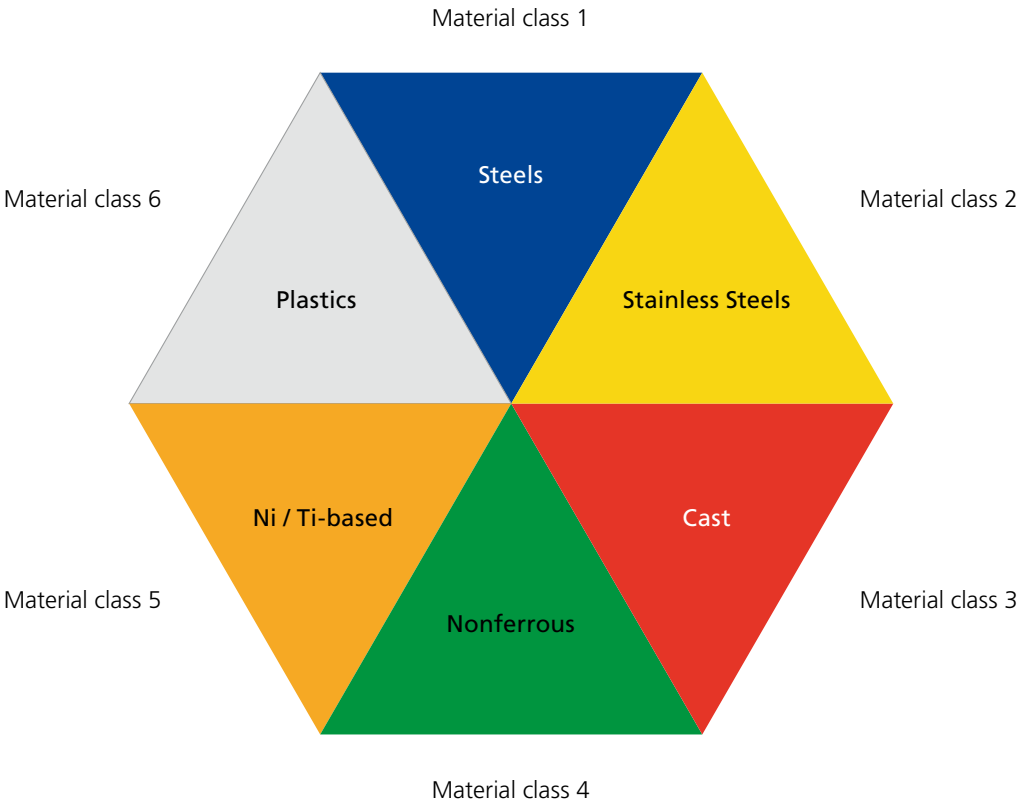
Symbols in this catalog

To facilitate the use of the ALESA catalog we have created the following overview of symbols.

Wet Processing	Dry machining	Internal coolant supply
Number of teeth	Rotation	Cutting direction
Recommended use	Conditionally recommended application	Cutting insert matching type

Color mapping for classes of materials

Individual classes of materials as referred to with different colors in this catalog.
The allocation of individual materials in the classes of materials can be found throughout the catalog.



Overview

Grüezi and welcome!

An innovative family company since 80 years

Within the manufacturing unit in Switzerland, ALESA employs highly motivated, well trained staff, sharing a wealth of experience and knowledge gained within the cutting tool industry. We are proud that we are one of the few remaining family owned businesses within our sector.

At all times we supply market leading products, offer the highest possible technical support, deliver on time at competitive prices. This is achieved via a network of some 60 global distributors ensuring continuity of supply of both products and services.

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info@alesa.ch, www.alesa.ch

Production plant and administration building of ALESA Ltd

Precision tool factory

Precision.

We specialise in the manufacture of highly positive, sharply ground, precision cutting tools produced from HSS and carbide.
These offer the highest possible performance figures particularly on difficult materials and extraordinary applications.

We can offer engineering solutions to the most demanding machining problems reducing cycle times, vibration and tooling costs whilst improving surface finishes and chip formation.

Call us now and realise the potential of ALESA!

Metal cutting with creativity.

Milling: The ALESA TWIST helical indexable insert which was developed and patented by us in 1996 is distinguished by a high-tech cutting geometry and is being used to great success all over the world.
The extensive range of ISO standard indexable inserts is of course also equipped with our highly positive, extremely sharp ground cutting edge.
ALESA indexable inserts are available in HSS-E and finest grain metal carbide.
Various hard material coatings ensure a long tool life.
It goes without saying that almost all our toolholders are prepared for internal coolant supply.

Turning/parting: In this area, too, we have an extensive range of toolholders for external and internal turning with the matching indexable inserts in HSS-E to ISO standard.
Our ALESA GOLD high-precision ISO toolbits and cutting tools are also world-renowned. Similarly, the Minicut and Duocut parting inserts and cutting-off tools in HSS-E are a byword in the trade.

Sawing: The ALESA metal-cutting circular saws in HSS and carbide give top performance all around. Our circular saws with steam-tempered surface or hard-material coating achieve even better life expectancy.

Nutex: The extraordinary combination of circular saw blade and holder in one tool indicates the system Nutex, Nutex Mini and Nutex Plus. With this tool it is possible to machine on CNC centres without fixings protruding out of the tool face.

Custom-made products: If you have any processing problems, we consider it our duty to be able to offer a solution. Our development department welcomes the challenge of producing special tools to individual requirements or customer drawings.

With you as partner we aim to develop visions and pursue new methods.

Our general delivery and sales conditions apply, see www.alesa.ch

Guide-line for ALESA Catalog

How do I get the best cutting value for my application?

1. **Allocation of the materials and material strength** - page 139

   Based on the materials table on pages 139f, the assigned class of the material may be obtained by material number, material grade DIN, Euro standard EN, AFNOR (French Standards), B.S. (British Standard), AISI SAE (USA). This class of materials is for HSS and carbide tools.
   In addition, the ultimate tensile strength of the material needs to be retained.

2. **Machining method** - page 4 (milling)

   Choose the appropriate tool from the ALESA catalog according to your machining method, such as plan, profile, or high-feed cutting.
   An overview, arranged by application, or machining method respectively, can be found on page 4.
   If you need assistance, please do not hesitate to contact us.

3. **Dimensions of the tool and type of indexable inserts** - page 127

   Based on consideration of machine performance, part size, and required cutting depth, select the tool diameter and the size of the inserts.
   For the selection of cutting insert quality (cutting geometry and coating), you will find help in the overview (layer selection for inserts) on page 127 in the catalog.

4. **Cutting speed v_c** - page 136

   Based on the material class, the meshing conditions, and the coating the recommended speed can be obtained from the corresponding data table (pages 136 - 138). The resulting tool speed can be calculated with the selected tool diameter (page 131).
   Please note the kappa angle.

5. **Calculation through average chip thickness «hm» and feed per tooth «fz»** - page 134/135

   With the permissible «hm» value for the average chip thickness (page 134) and the involvement of «ae in % of the tool diameter,» the feed per tooth can be obtained through the hm-fz table (90°, 45° or 15°) on page 135.
   With the available data, the feed rate (Vf) can now be calculated (page 131f).

6. **Calculation of the chip removal rate «Q»** - page 131

   The chip removal rate is a reliable factor to be able to compare the effectiveness of the processing.
   The chip removal rate is calculated with:
   Q = cutting depth «ap» x width of cut ae x feed «Vf» / 1000
   This formula also can again be found on page 131.

7. **Inspection and process corrections** - page 129

   After the working process has been started, conclusions about the processing time and tool life can be made. This way the processing cost and tool cost per part can be calculated.
   Corrective action according to page 129 can be made with the assessment of wear of the cutting tool.

Basic processing recommendations:

- Tool overhang as long as necessary but as briefly as possible
- Provide stable expansion operations, avoid vibrations
- Radial and axial run-out of the tools according to the manufacturer's instructions
- Large depth of cut, small cutting width (cutting insert length advantage, ae <35%)
- hm values and Vc conditions according to manufacturer
- climb milling cutting only

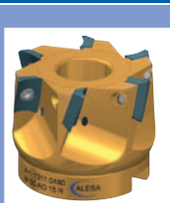
Milling tools

Profile milling

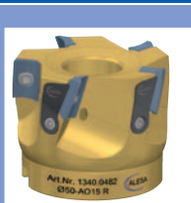
AO 10 Twist
Ø 16 – 32
No 1347, 1348
p. 8

AO 10 Twist
Ø 32 – 50
No 1311
p. 10

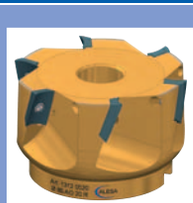
AO 15 Twist
Ø 25 – 40
No 1347, 1348
p. 12



AO 15 Twist
Ø 40 – 80
No 1311
p. 14



AO 15 Coolex
Ø 40 – 63
No 1340
p. 16



AO 20 Twist
Ø 50 – 100
No 1312
p. 18

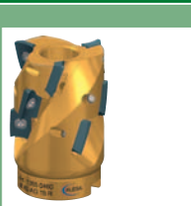
AP 16
Ø 25 – 40
No 1345
p. 20

AP 16
Ø 40 – 160
No 1310
p. 22

Hobbing

AO 10 Twist
Ø 25
No 1355
p. 26

AO 15 Twist
Ø 32
No 1355
p. 28



AO 15 Twist
Ø 40 – 53
No 1355
p. 30

AO 20 Twist
Ø 50 – 83
No 1355
p. 32

Fine finish milling

AO 15 e Twist
Ø 40 – 125
No 1311
p. 36

Nutex Plan
Ø 50 – 63
No 6365
p. 38

Nutex Faset
Ø 16
No 6343
p. 40

Face milling 45°

SD 09
Ø 16 – 40
No 1349
p. 44

SD 09
Ø 40 – 100
No 1316
p. 46

SD 12
Ø 50 – 160
No 1319
p. 48

High feed milling

SD 09 SPEED 15°
Ø 12 – 25
No 1352, 1353
p. 52

SD 09 SPEED 15°
Ø 32 – 50
No 1318
p. 54

SD 12 SPEED 15°
Ø 50 – 83
No 1322
p. 56

TWIST 481/581
Ø 16 – 40
No 1347, 1348
p. 58

TWIST 481/581
Ø 32 – 100
No 1311, 1312
p. 60

Milling with button inserts

RP 06 / 08 / 10
Ø 16 – 32
No 1326, 1327
p. 64

RP 12
Ø 40 – 160
No 1301
p. 66

Profile milling 90°

ALESA TWIST

The characteristics

- THE original of the high-positive, sharp-ground indexable inserts milling cutters
- SWISS Precision Tool. The milling head and cutting inserts are completely manufactured in Switzerland.
- Unique with 20° helix angle
- The peeling cutting process is very spindle and machine-friendly
- The sharp edges require less spindle power and the cutting forces are much lower
- The ALESA TWIST tools are optimized for modern 5-axis milling cutters
- All tools are provided with cooling holes. The cooling medium is exactly there where it is needed
- The best PVD coatings are available
- There are HSS and carbide inserts available from the warehouse with different radii

The benefits and options for you

- Fast delivery from the Seengen warehouse
- There are 3 sizes HSS and carbide inserts available
- From Ø 16 mm to Ø 40 mm Weldon
- From Ø 16 mm to Ø 32 mm screw-in tools
- Arbor milling cutters Ø 40 mm to Ø 100 mm
- With 3 different marked cutting geometries a very large range of material can be processed
- Carbide grades are available for dry and wet machining
- HSS is more reliable and powerful for many applications

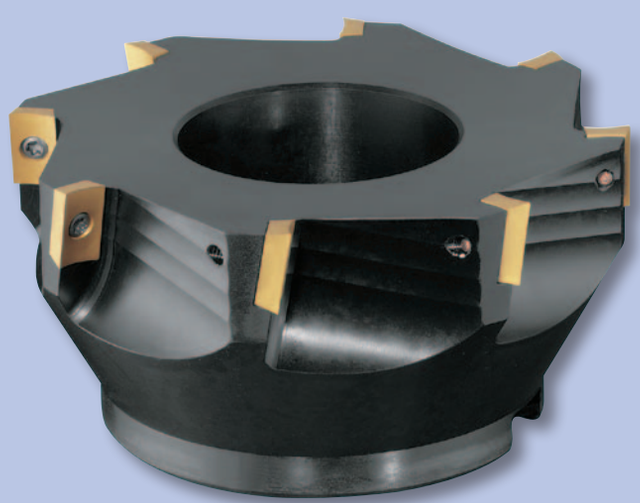
- High removal rate (Q) with a relatively small machine load
- Good tool life with high productivity
- With the high feed cutting insert type 481/581 it can also be used for 6xD - 10xD tool extensions
- Outstanding machining characteristics, also with the most difficult Ni-, Ti- and Co- alloys
- Manufactured according to ISO certified processes
- For special tools, our construction with great experience is available

Profile milling 90°

ALESA AP 16

The characteristics

- THE classic of the screw-in 90° corner cutting insert tools
- From ALESA with high positive, sharp-ground inserts
- SWISS Precision Tool. The milling head and cutting inserts are completely manufactured in Switzerland
- Robust solution with 5° helix angle
- The sharp edges require less spindle performance than sintered cutting inserts
- The sharp-cutting inserts are optimized for modern 5-axis centers
- AP16 tools are provided with cooling holes to Ø 100 mm. The cooling medium is exactly there where it is needed
  There is a coolant distribution ring for the larger diameters
- The best PVD coatings are available
- HSS and carbide cutting inserts are available from the warehouse



The benefits and options for you

- Fast delivery from the Seengen warehouse
- Weldon type from Ø 25 mm to Ø 40 mm
- Arbor type from Ø 40 mm to Ø 160 mm
- With 2 cutting geometries a very large range of materials can be processed
- Carbide qualities are present for dry and wet milling processes
- HSS cutting inserts with TiN and TiAlN coatings are safe and efficient for the processing of many applications
- High removal rate (Q) with a relatively small machine load
- Good tool life and high productivity
- Excellent cutting processes also with the most difficult Ni-, Ti- and Co- alloys
- Manufactured according to ISO certified processes
- For special tools, our construction with great experience is available

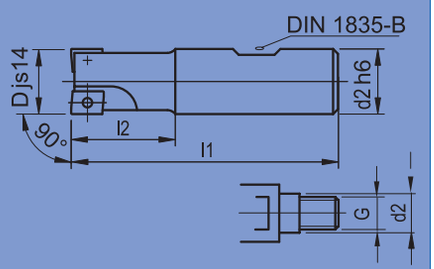
ALESA TWIST end mill and threaded type cutter
AO 10 R 90° / Ø 16 – 32

1347 – 10 / 1348 – 10

Pat. no. 686 235

1347.0340

1348.0382



Part No	Type	D mm	l2 mm	d2 mm	G	l1 mm				Accessories kit No	WSP
1347.0300	16-AO 10 R	16	25	16.0		75	✓	2	r	1494.0550	AOFT 10 03
1348.0300	16-AO 10 R	16	25	8.5	M8	41	✓	2	r	1494.0550	AOFT 10 03
1347.0338	20-AO 10 R Z2	20	30	20.0		82	✓	2	r	1494.0560	AOFT 10 03
1347.0340	20-AO 10 R Z3	20	30	20.0		82	✓	3	r	1494.0561	AOFT 10 03
1348.0340	20-AO 10 R	20	30	10.5	M10	48	✓	3	r	1494.0561	AOFT 10 03
1347.0382	25-AO 10 R	25	38	25.0		96	✓	4	r	1494.0562	AOFT 10 03
1348.0382	25-AO 10 R	25	35	12.5	M12	55	✓	4	r	1494.0562	AOFT 10 03
1348.0422	32-AO 10 R	32	42	17.0	M16	64	✓	5	r	1494.0563	AOFT 10 03

Tool will be delivered with holder, all screws and screw-driver, but without indexable inserts.

Accessories / spare parts

Part No	Torx screw				Screw-driver	
	Qty	Article	Type	Torque	Article	Type
1494.0550	2	1491.0210	M2.5x4	0.95 Nm	1493.0300	TP7 IP
1494.0560	2	1491.0220	M2.5x5	0.95 Nm	1493.0300	TP7 IP
1494.0561	3	1491.0220	M2.5x5	0.95 Nm	1493.0300	TP7 IP
1494.0562	4	1491.0220	M2.5x5	0.95 Nm	1493.0300	TP7 IP
1494.0563	5	1491.0220	M2.5x5	0.95 Nm	1493.0300	TP7 IP

ALESA TWIST: the patented spiral ground indexable insert for a smooth and vibration-free chip removal for any metals. The full cutting edge is useable (ap).

The high performance tool with 2 cutting edges allows slot milling in one process step.

Slot milling: for slot depths > 40% ap, use only tools with 2 cutting edges.

Info

Stainless steels (V2A) can be machined dry with AlCrN coated inserts.

Profile milling

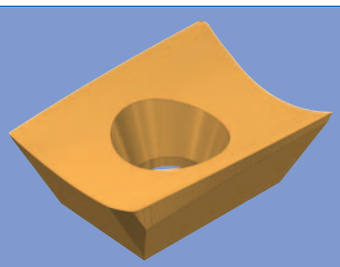
Slot milling

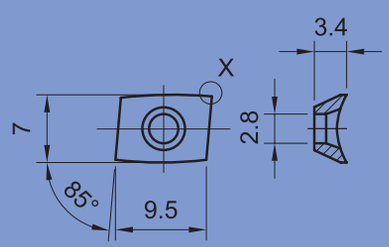
Face milling

Circular interpolation

ALESA TWIST end mill and threaded type cutter
AO 10 R 90° / Ø 16 – 32

ap = 8 mm

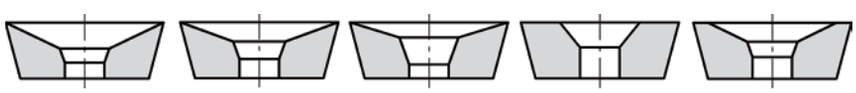

AOFT 10



Cutting material	Coating	Part No	ISO Code	Detail X				Mat. classification 1	2	3	4	5	6
HSS-E	**TiN**	1087.0170	AOFT 10 03 PF FR	0.2x45°	r	●		○	○		●		●
		1087.0180	AOFT 10 03 04 FR	R 0.4	r	●		○	○		●		●
	TiAlN	1162.0170	AOFT 10 03 PF FR	0.2x45°	r	●		○	●		●	○	●
		1162.0180	AOFT 10 03 04 FR	R 0.4	r	●		○	●		●	○	●
Carbide HM	**TiN**	1287.0200	AOFT 10 03 PF FR-411	0.2x45°	r	●	○	○	○	●	●		●
		1287.0205	AOFT 10 03 04 FR-411	R 0.4	r	●	○	○	○	●	●		●
	TiAlN	1287.0300	AOFT 10 03 PF FR-411	0.2x45°	r	●	○	○	○	●	●	○	●
		1287.0305	AOFT 10 03 04 FR-411	R 0.4	r	●	○	○	○	●	●	○	●
	AlCrN	1287.0651	AOFT 10 03 PF FR-421	0.2x45°	r	●	○	●	●	●	●	●	●
		1287.0656	AOFT 10 03 04 FR-421	R 0.4	r	●	○	●	●	●	●	●	●
		1287.0657	AOFT 10 03 04 FR-431	R 0.4	r	●	○	●	●	●	○	●	○
	AlCrN-VA	1287.0757	AOFT 10 03 04 FR-431	R 0.4	r	●	○		●	○		●	
Carbide HM-F	**TiAlN**	1287.0500	AOFT 10 03 PF FR-511	0.2x45°	r		●	○	○	●			●
		1287.0505	AOFT 10 03 04 FR-511	R 0.4	r		●	○	○	●			●
	AlCrN	1287.0701	AOFT 10 03 PF FR-521	0.2x45°	r		●	●	●	●	●		●
		1287.0706	AOFT 10 03 04 FR-521	R 0.4	r		●	●	●	●	●		●
		1287.0707	AOFT 10 03 04 FR-531	R 0.4	r		●	●	●	●	○		○
	AlCrN-VA	1287.0807	AOFT 10 03 04 FR-531	R 0.4	r		●		●	○			
Carbide HA	**AlCrN-VA**	1289.0202	AOFT 10 03 04 FR-631	R 0.4	r	●	○	○	●	○		●	

Fitting instructions for inserts see page 126

Zusatznummer Wendeschneidplatten ISO-Code (Schneidengeometrie)
Additional number indexable inserts ISO-code (cutting geometry)
Numéro supplémentaire plaquettes amovibles code ISO (géométrie de coupe)

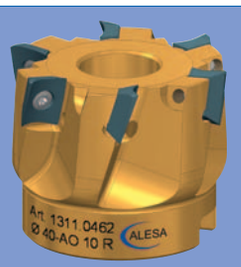


Overview of all indexable inserts see page 107 and following.

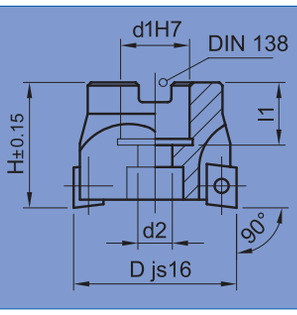
ALESA TWIST milling cutter
AO 10 R 90° / Ø 32 – 50

1311 – 10

Pat. no. 686 235



1311.0462



Part No	Type	D mm	H mm	d1 mm	d2 mm	l1 mm				Accessories kit No	WSP
1311.0422	32-AO 10 R	32	28	13.0	6.5	15	✓	5	r	1494.0564	AOFT 10 03
1311.0462	40-AO 10 R	40	32	16.0	8.5	18	✓	6	r	1494.0565	AOFT 10 03
1311.0482	50-AO 10 R	50	40	22.0	11	20	✓	8	r	1494.0566	AOFT 10 03

Tool will be delivered with holder, all screws and screw-driver, but without indexable inserts.

Accessories / spare parts

Part No	Torx screw				Screw-driver		Hex socket head screw		
	Qty	Article	Type	Torque	Article	Type	Article	Type	Torque
1494.0564	5	1491.0220	M2.5x5	0.95 Nm	1493.0300	TP7 IP	1490.0750	M 6 x 20	10 Nm
1494.0565	6	1491.0220	M2.5x5	0.95 Nm	1493.0300	TP7 IP	1490.0759	M 8 x 20	30 Nm
1494.0566	8	1491.0220	M2.5x5	0.95 Nm	1493.0300	TP7 IP	1490.0770	M 10 x 25	50 Nm

ALESA TWIST: the patented spiral ground indexable insert for a smooth and vibration-free chip removal for any metals. The full cutting edge is useable (ap).

Highly positive, extremely sharp cutting edge of HSS-E and carbide.

Info

Stainless steels (V2A) can be machined dry with AlCrN coated inserts.


Profile milling

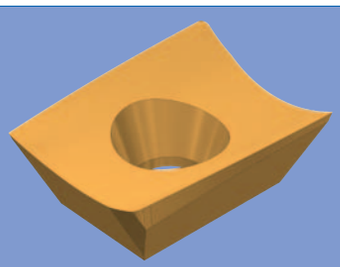

Slot milling

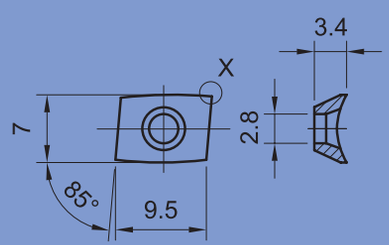

Face milling


Circular interpolation

ALESA TWIST milling cutter
AO 10 R 90° / Ø 32 – 50

ap = 8 mm

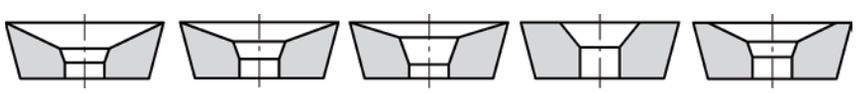

AOFT 10



Cutting material	Coating	Part No	ISO Code	Detail X				Mat. classification 1	2	3	4	5	6
HSS-E	**TiN**	1087.0170	AOFT 10 03 PF FR	0.2x45°	r	●		○	○		●		●
		1087.0180	AOFT 10 03 04 FR	R 0.4	r	●		○	○		●		●
	TiAlN	1162.0170	AOFT 10 03 PF FR	0.2x45°	r	●		○	●		●	○	●
		1162.0180	AOFT 10 03 04 FR	R 0.4	r	●		○	●		●	○	●
Carbide HM	**TiN**	1287.0200	AOFT 10 03 PF FR-411	0.2x45°	r	●	○	○	○	●	●		●
		1287.0205	AOFT 10 03 04 FR-411	R 0.4	r	●	○	○	○	●	●		●
	TiAlN	1287.0300	AOFT 10 03 PF FR-411	0.2x45°	r	●	○	○	○	●	●	○	●
		1287.0305	AOFT 10 03 04 FR-411	R 0.4	r	●	○	○	○	●	●	○	●
	AlCrN	1287.0651	AOFT 10 03 PF FR-421	0.2x45°	r	●	○	●	●	●	●	●	●
		1287.0656	AOFT 10 03 04 FR-421	R 0.4	r	●	○	●	●	●	●	●	●
		1287.0657	AOFT 10 03 04 FR-431	R 0.4	r	●	○	●	●	●	○	●	○
	AlCrN-VA	1287.0757	AOFT 10 03 04 FR-431	R 0.4	r	●	○		●	○		●	
Carbide HM-F	**TiAlN**	1287.0500	AOFT 10 03 PF FR-511	0.2x45°	r		●	○	○	●			●
		1287.0505	AOFT 10 03 04 FR-511	R 0.4	r		●	○	○	●			●
	AlCrN	1287.0701	AOFT 10 03 PF FR-521	0.2x45°	r		●	●	●	●	●		●
		1287.0706	AOFT 10 03 04 FR-521	R 0.4	r		●	●	●	●	●		●
		1287.0707	AOFT 10 03 04 FR-531	R 0.4	r		●	●	●	●	○		○
	AlCrN-VA	1287.0807	AOFT 10 03 04 FR-531	R 0.4	r		●		●	○			
Carbide HA	**AlCrN-VA**	1289.0202	AOFT 10 03 04 FR-631	R 0.4	r	●	○	○	●	○		●	

Fitting instructions for inserts see page 126

Zusatznummer Wendeschneidplatten ISO-Code (Schneidengeometrie)
Additional number indexable inserts ISO-code (cutting geometry)
Numéro supplémentaire plaquettes amovibles code ISO (géométrie de coupe)



Overview of all indexable inserts see page 107 and following.

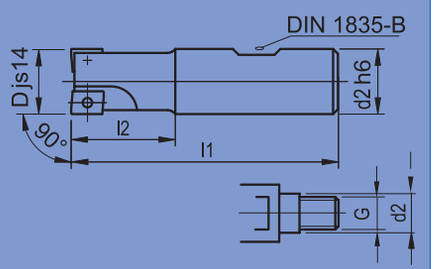
ALESA TWIST end mill and threaded type cutter
AO 15 R 90° / Ø 25 – 40

1347 – 15 / 1348 – 15

Pat. no. 686 235

1347.0420

1348.0420



Part No	Type	D mm	l2 mm	d2 mm	G	l1 mm				Accessories kit No	WSP
1347.0378	25-AO 15 R	25	38	20.0		90	✓	2	r	1494.0650	AOFT 15 T3
1347.0380	25-AO 15 R	25	38	25.0		96	✓	2	r	1494.0650	AOFT 15 T3
1348.0380	25-AO 15 R	25	40	12.5	M12	60	✓	2	r	1494.0650	AOFT 15 T3
1347.0408*	32-AO 15 R Z2	32	38	25.0		96	✓	2	r	1494.0650	AOFT 15 T3
1347.0410	32-AO 15 R Z3	32	38	25.0		96	✓	3	r	1494.0651	AOFT 15 T3
1347.0418*	32-AO 15 R Z2	32	38	32.0		100	✓	2	r	1494.0650	AOFT 15 T3
1347.0420	32-AO 15 R Z3	32	38	32.0		100	✓	3	r	1494.0651	AOFT 15 T3
1348.0418	32-AO 15 R Z2	32	44	17.0	M16	66	✓	2	r	1494.0650	AOFT 15 T3
1348.0420	32-AO 15 R Z3	32	44	17.0	M16	66	✓	3	r	1494.0651	AOFT 15 T3
1347.0458*	40-AO 15 R Z2	40	48	32.0		110	✓	2	r	1494.0650	AOFT 15 T3
1347.0460	40-AO 15 R Z4	40	48	32.0		110	✓	4	r	1494.0652	AOFT 15 T3

*while stocks last

Tool will be delivered with holder, all screws and screw-driver, but without indexable inserts.

Accessories / spare parts

Part No	Torx screw				Screw-driver	
	Qty	Article	Type	Torque	Article	Type
1494.0650	2	1490.0280	M3.5x7	2.55 Nm	1492.0500	T 15
1494.0651	3	1490.0280	M3.5x7	2.55 Nm	1492.0500	T 15
1494.0652	4	1490.0280	M3.5x7	2.55 Nm	1492.0500	T 15

ALESA TWIST: the patented spiral ground indexable insert for a smooth and vibration-free chip removal for any metals. The full cutting edge is useable (ap).

The high performance tool with 2 cutting edges allows slot milling in one process step.

Slot milling: for slot depths > 40% ap, use only tools with 2 cutting edges.

Info

Stainless steels (V2A) can be machined dry with AlCrN coated inserts.

Profile milling

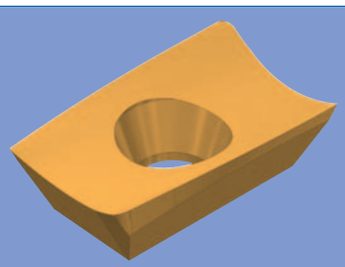
Slot milling

Face milling

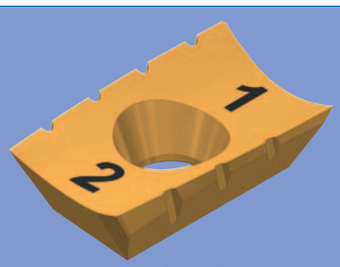
Circular interpolation

ALESA TWIST end mill and threaded type cutter
AO 15 R 90° / Ø 25 – 40

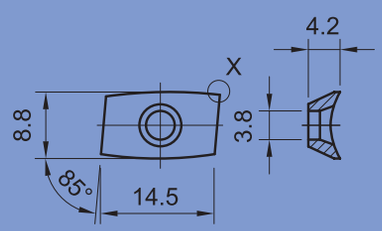
ap = 13 mm



AOFT 15



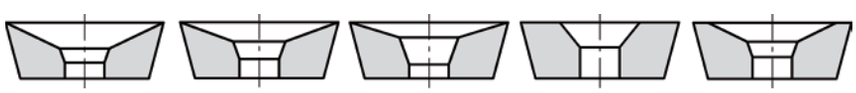
AOFT 15 chip splitting



Cutting material	Coating	Part No	ISO Code	Detail X				Mat. classification 1	2	3	4	5	6
HSS-E	**TiN**	1087.0190	AOFT 15 T3 PF FR	0.2x45°	r	●		○	○		●		●
		1087.0210	AOFT 15 T3 08 FR	R 0.8	r	●		○	○		●		●
	TiAlN	1162.0190	AOFT 15 T3 PF FR	0.2x45°	r	●		○	●		●	○	●
		1162.0210	AOFT 15 T3 08 FR	R 0.8	r	●		○	●		●	○	●
HSS-E chip splitting *	**TiN**	1087.0505	AOFT 15 T3 PF FR (No 1/2)	0.2x45°	r	●		○	○		●		●
		1087.0508	AOFT 15 T3 PF FR (No 3)	0.2x45°	r	●		○	○		●		●
Alesa X2	**TiAlN**	1164.0213	AOFT 15 T3 08 FR-721	R 0.8	r	●		○	●		●	○	●
Carbide HM	**TiN**	1287.0210	AOFT 15 T3 PF FR-411	0.2x45°	r	●	○	○	○	●	●		●
		1287.0215	AOFT 15 T3 08 FR-411	R 0.8	r	●	○	○	○	●	●		●
	TiAlN	1287.0310	AOFT 15 T3 PF FR-411	0.2x45°	r	●	○	○	○	●	●	○	●
		1287.0315	AOFT 15 T3 08 FR-411	R 0.8	r	●	○	○	○	●	●	○	●
	AlCrN	1287.0661	AOFT 15 T3 PF FR-421	0.2x45°	r	●	○	●	●	●	●	●	●
		1287.0666	AOFT 15 T3 08 FR-421	R 0.8	r	●	○	●	●	●	●	●	●
		1287.0667	AOFT 15 T3 08 FR-431	R 0.8	r	●	○	●	●	●	○	●	○
		1287.0669	AOFT 15 T3 12 FR-421	R 1.2	r	●	○	●	●	●	●	●	●
		1287.0671	AOFT 15 T3 16 FR-421	R 1.6	r	●	○	●	●	●	●	●	●
		1287.0673	AOFT 15 T3 20 FR-421	R 2.0	r	●	○	●	●	●	●	●	●
	AlCrN-VA	1287.0767	AOFT 15 T3 08 FR-431	R 0.8	r	●	○		●	○		●	
	DLC-H	1287.0916	AOFT 15 T3 08 FR-421	R 0.8	r	●	○			○	●		●
Carbide HM-F	**TiAlN**	1287.0510	AOFT 15 T3 PF FR-511	0.2x45°	r		●	○	○	●			●
		1287.0515	AOFT 15 T3 08 FR-511	R 0.8	r		●	○	○	●			●
	AlCrN	1287.0711	AOFT 15 T3 PF FR-521	0.2x45°	r		●	●	●	●	○		●
		1287.0716	AOFT 15 T3 08 FR-521	R 0.8	r		●	●	●	●	●		●
		1287.0717	AOFT 15 T3 08 FR-531	R 0.8	r		●	●	●	●	○		○
	AlCrN-VA	1287.0817	AOFT 15 T3 08 FR-531	R 0.8	r		●		●	○			
	DLC-H	1287.0967	AOFT 15 T3 08 FR-531	R 0.8	r		●			○	●		●
Carbide HA	**AlCrN-VA**	1289.0232	AOFT 15 T3 08 FR-631	R 0.8	r	●	○	○	●	○		●	

* Order of inserts with chip splitting see page 126
Fitting instructions for inserts see page 126

Zusatznummer Wendeschneidplatten ISO-Code (Schneidengeometrie)
Additional number indexable inserts ISO-code (cutting geometry)
Numéro supplémentaire plaquettes amovibles code ISO (géométrie de coupe)



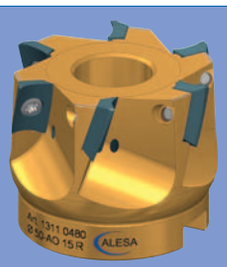
-111 -411 -511 | -121 -222 -421 -521 -721 | -131 -231 -431 -531 -631 | -851 | -223

Overview of all indexable inserts see page 107 and following.

ALESA TWIST milling cutter
AO 15 R 90° / Ø 40 – 80

1311 – 15

Pat. no. 686 235



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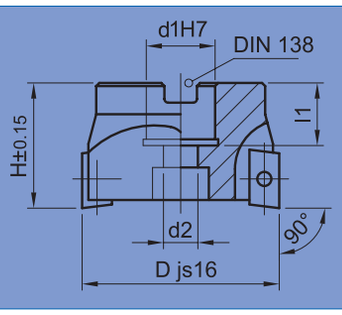


Part No	Type	D mm	H mm	d1 mm	d2 mm	l1 mm				Accessories kit No	WSP
1311.0460	40-AO 15 R	40	32	16.0	8.5	18	✓	4	r	1494.0653	AOFT 15 T3
1311.0480	50-AO 15 R	50	40	22.0	11	20	✓	6	r	1494.0655	AOFT 15 T3
1311.0500	63-AO 15 R	63	40	22.0	11	20	✓	7	r	1494.0657	AOFT 15 T3
1311.0520	80-AO 15 R	80	50	27.0	14	22	✓	9	r	1494.0660	AOFT 15 T3

Tool will be delivered with holder, all screws and screw-driver, but without indexable inserts.

Accessories / spare parts

Part No	Torx screw				Screw-driver		Hex socket head screw		
	Qty	Article	Type	Torque	Article	Type	Article	Type	Torque
1494.0653	4	1490.0280	M3.5x7	2.55 Nm	1492.0500	T 15	1490.0759	M 8 x 20	30 Nm
1494.0655	6	1490.0280	M3.5x7	2.55 Nm	1492.0500	T 15	1490.0770	M 10 x 25	50 Nm
1494.0657	7	1490.0280	M3.5x7	2.55 Nm	1492.0500	T 15	1490.0770	M 10 x 25	50 Nm
1494.0660	9	1490.0280	M3.5x7	2.55 Nm	1492.0500	T 15	1490.0780	M 12 x 30	90 Nm

ALESA TWIST: the patented spiral ground indexable insert for a smooth and vibration-free chip removal for any metals. The full cutting edge is useable (ap).

Highly positive, extremely sharp cutting edge of HSS-E and carbide.

When milling slots with an internal cooling system set operating pressure above 20 bar. Ensure clear chip removal.

Info

Stainless steels (V2A) can be machined dry with AlCrN coated inserts.


Profile milling

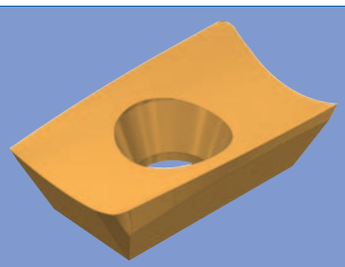

Slot milling

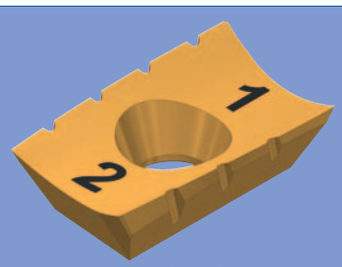

Face milling


Circular interpolation

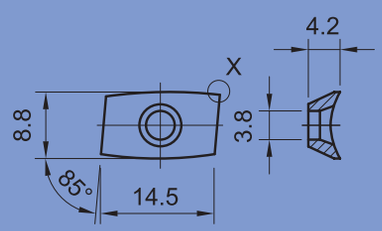
ALESA TWIST milling cutter
AO 15 R 90° / Ø 40 – 80

ap = 13 mm


AOFT 15



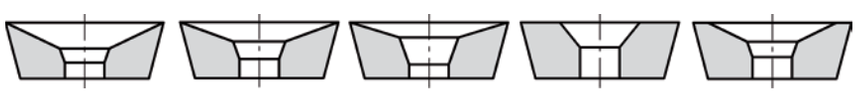
AOFT 15 chip splitting



Cutting material	Coating	Part No	ISO Code	Detail X				Mat. classification 1	2	3	4	5	6
HSS-E	**TiN**	1087.0190	AOFT 15 T3 PF FR	0.2x45°	r	●		○	○		●		●
		1087.0210	AOFT 15 T3 08 FR	R 0.8	r	●		○	○		●		●
	TiAlN	1162.0190	AOFT 15 T3 PF FR	0.2x45°	r	●		○	●		●	○	●
		1162.0210	AOFT 15 T3 08 FR	R 0.8	r	●		○	●		●	○	●
HSS-E chip splitting *	**TiN**	1087.0505	AOFT 15 T3 PF FR (No 1/2)	0.2x45°	r	●		○	○		●		●
		1087.0508	AOFT 15 T3 PF FR (No 3)	0.2x45°	r	●		○	○		●		●
Alesa X2	**TiAlN**	1164.0213	AOFT 15 T3 08 FR-721	R 0.8	r	●		○	●		●	○	●
Carbide HM	**TiN**	1287.0210	AOFT 15 T3 PF FR-411	0.2x45°	r	●	○	○	○	●	●		●
		1287.0215	AOFT 15 T3 08 FR-411	R 0.8	r	●	○	○	○	●	●		●
	TiAlN	1287.0310	AOFT 15 T3 PF FR-411	0.2x45°	r	●	○	○	○	●	●	○	●
		1287.0315	AOFT 15 T3 08 FR-411	R 0.8	r	●	○	○	○	●	●	○	●
	AlCrN	1287.0661	AOFT 15 T3 PF FR-421	0.2x45°	r	●	○	●	●	●	●	●	●
		1287.0666	AOFT 15 T3 08 FR-421	R 0.8	r	●	○	●	●	●	●	●	●
		1287.0667	AOFT 15 T3 08 FR-431	R 0.8	r	●	○	●	●	●	○	●	○
		1287.0669	AOFT 15 T3 12 FR-421	R 1.2	r	●	○	●	●	●	●	●	●
		1287.0671	AOFT 15 T3 16 FR-421	R 1.6	r	●	○	●	●	●	●	●	●
		1287.0673	AOFT 15 T3 20 FR-421	R 2.0	r	●	○	●	●	●	●	●	●
	AlCrN-VA	1287.0767	AOFT 15 T3 08 FR-431	R 0.8	r	●	○		●	○		●	
	DLC-H	1287.0916	AOFT 15 T3 08 FR-421	R 0.8	r	●	○			○	●		●
Carbide HM-F	**TiAlN**	1287.0510	AOFT 15 T3 PF FR-511	0.2x45°	r		●	○	○	●			●
		1287.0515	AOFT 15 T3 08 FR-511	R 0.8	r		●	○	○	●			●
	AlCrN	1287.0711	AOFT 15 T3 PF FR-521	0.2x45°	r		●	●	●	●	○		●
		1287.0716	AOFT 15 T3 08 FR-521	R 0.8	r		●	●	●	●	●		●
		1287.0717	AOFT 15 T3 08 FR-531	R 0.8	r		●	●	●	●	○		○
	AlCrN-VA	1287.0817	AOFT 15 T3 08 FR-531	R 0.8	r		●		●	○			
	DLC-H	1287.0967	AOFT 15 T3 08 FR-531	R 0.8	r		●			○	●		●
Carbide HA	**AlCrN-VA**	1289.0232	AOFT 15 T3 08 FR-631	R 0.8	r	●	○	○	●	○		●	

* Order of inserts with chip splitting see page 126
Fitting instructions for inserts see page 126

Zusatznummer Wendeschneidplatten ISO-Code (Schneidengeometrie)
Additional number indexable inserts ISO-code (cutting geometry)
Numéro supplémentaire plaquettes amovibles code ISO (géométrie de coupe)

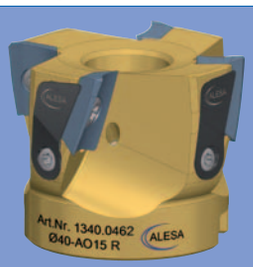

-111 -411 -511 | -121 -222 -421 -521 -721 | -131 -231 -431 -531 -631 | -851 | -223

Overview of all indexable inserts see page 107 and following.

ALESA TWIST Coolex milling cutter
AO 15 R 90° / Ø 40 – 63

1340 – 15

Pat. no. 686 235



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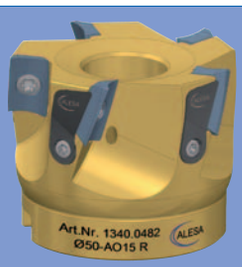
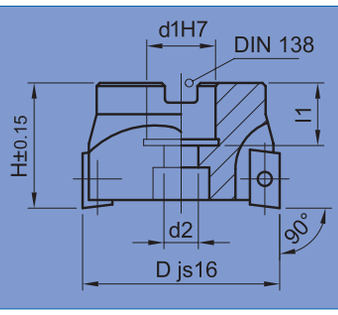


1340.0482

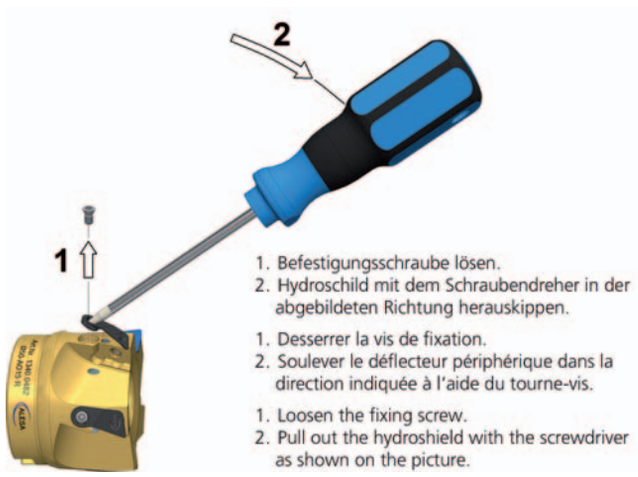


Part No	Type	D mm	H mm	d1 mm	d2 mm	l1 mm				Accessories kit No	WSP
1340.0462	40-AO 15 Coolex	40	32	16.0	8.5	18	✓	4	r	1494.0653	AOFT 15 T3
1340.0482	50-AO 15 Coolex	50	40	22.0	11	20	✓	5	r	1494.0655	AOFT 15 T3
1340.0502	63-AO 15 Coolex	63	40	22.0	11	20	✓	6	r	1494.0655	AOFT 15 T3

Tool will be delivered with holder, all screws and screw-driver, but without indexable inserts.

Special spare parts for ALESA TWIST Coolex AO15:
No 1489.0462 Hydroshield
No 1491.0220 Screw M2.5x5 for hydroshield
No 1493.0300 Screw-driver TP 7 IP

How to remove the hydroshield



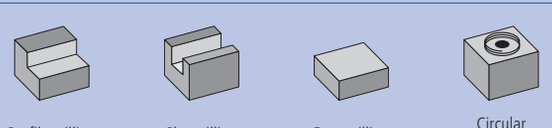
Accessories / spare parts

Part No	Torx screw				Screw-driver		Hex socket head screw		
	Qty	Article	Type	Torque	Article	Type	Article	Type	Torque
1494.0653	4	1490.0280	M3.5x7	2.55 Nm	1492.0500	T 15	1490.0759	M 8 x 20	30 Nm
1494.0655	6	1490.0280	M3.5x7	2.55 Nm	1492.0500	T 15	1490.0770	M 10 x 25	50 Nm

Info — Innovative cooling / lubricating solution over the relive face. ALESA recommendation for material classification 5 together with "631" inserts. Internal coolant pressure up to 70 bar.

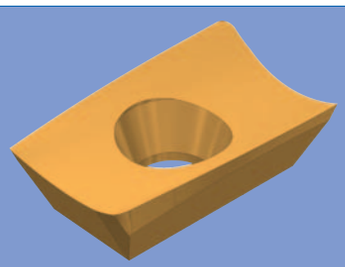
ALESA TWIST: the patented spiral ground indexable insert for a smooth and vibration-free chip removal for any metals. The full cutting edge is useable (ap).

When milling slots with an internal cooling system set operating pressure above 20 bar. Ensure clear chip removal.

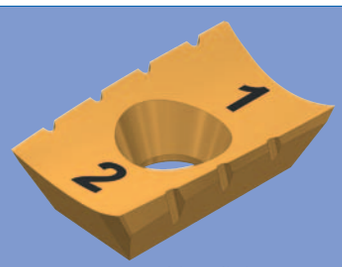


ALESA TWIST Coolex milling cutter
AO 15 R 90° / Ø 40 – 63

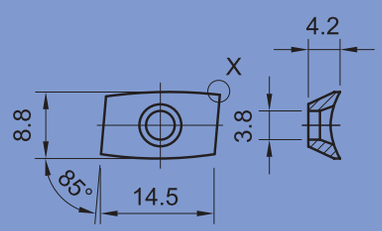
ap = 13 mm



AOFT 15



AOFT 15 chip splitting

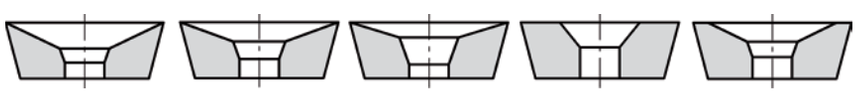


Cutting material	Coating	Part No	ISO Code	Detail X				Mat. classification 1	2	3	4	5	6
HSS-E	**TiN**	1087.0190	AOFT 15 T3 PF FR	0.2x45°	r	●		○	○		●		●
		1087.0210	AOFT 15 T3 08 FR	R 0.8	r	●		○	○		●		●
	TiAlN	1162.0190	AOFT 15 T3 PF FR	0.2x45°	r	●		○	●		●	○	●
		1162.0210	AOFT 15 T3 08 FR	R 0.8	r	●		○	●		●	○	●
HSS-E chip splitting *	**TiN**	1087.0505	AOFT 15 T3 PF FR (No 1/2)	0.2x45°	r	●		○	○		●		●
		1087.0508	AOFT 15 T3 PF FR (No 3)	0.2x45°	r	●		○	○		●		●
Alesa X2	**TiAlN**	1164.0213	AOFT 15 T3 08 FR-721	R 0.8	r	●		○	●		●	○	●
Carbide HM	**TiN**	1287.0210	AOFT 15 T3 PF FR-411	0.2x45°	r	●	○	○	○	●	●		●
		1287.0215	AOFT 15 T3 08 FR-411	R 0.8	r	●	○	○	○	●	●		●
	TiAlN	1287.0310	AOFT 15 T3 PF FR-411	0.2x45°	r	●	○	○	○	●	●	○	●
		1287.0315	AOFT 15 T3 08 FR-411	R 0.8	r	●	○	○	○	●	●	○	●
	AlCrN	1287.0661	AOFT 15 T3 PF FR-421	0.2x45°	r	●	○	●	●	●	●	●	●
		1287.0666	AOFT 15 T3 08 FR-421	R 0.8	r	●	○	●	●	●	●	●	●
		1287.0667	AOFT 15 T3 08 FR-431	R 0.8	r	●	○	●	●	●	○	●	○
		1287.0669	AOFT 15 T3 12 FR-421	R 1.2	r	●	○	●	●	●	●	●	●
		1287.0671	AOFT 15 T3 16 FR-421	R 1.6	r	●	○	●	●	●	●	●	●
		1287.0673	AOFT 15 T3 20 FR-421	R 2.0	r	●	○	●	●	●	●	●	●
	AlCrN-VA	1287.0767	AOFT 15 T3 08 FR-431	R 0.8	r	●	○		●	○		●	
	DLC-H	1287.0916	AOFT 15 T3 08 FR-421	R 0.8	r	●	○			○	●		●
Carbide HA	**AlCrN-VA**	1289.0232	AOFT 15 T3 08 FR-631	R 0.8	r	●	○	○	●	○		●	

* Order of inserts with chip splitting see page 126

Fitting instructions for inserts and 'how to remove the hydroshield' see page 126

Zusatznummer Wendeschneidplatten ISO-Code (Schneidengeometrie)
Additional number indexable inserts ISO-code (cutting geometry)
Numéro supplémentaire plaquettes amovibles code ISO (géométrie de coupe)



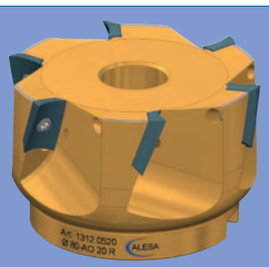
-111 -411 -511 | -121 -222 -421 -521 -721 | -131 -231 -431 -531 -631 | -851 | -223

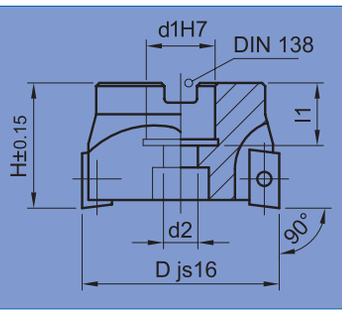
Overview of all indexable inserts see page 107 and following.

ALESA TWIST milling cutter
AO 20 R 90° / Ø 50 – 100

1312

Pat. no. 686 235





Part No	Type	D mm	H mm	d1 mm	d2 mm	l1 mm				Accessories kit No	WSP
1312.0480	50-AO 20 R	50	40	22.0	11	20	✓	4	r	1494.0713	AOFT 20 04
1312.0500	63-AO 20 R	63	40	22.0	11	20	✓	5	r	1494.0714	AOFT 20 04
1312.0520	80-AO 20 R	80	50	27.0	14	22	✓	6	r	1494.0715	AOFT 20 04
1312.0540	100-AO 20 R	100	50	32.0	18	25	✓	7	r	1494.0716	AOFT 20 04

Tool will be delivered with holder, all screws and screw-driver, but without indexable inserts.

The diameters 63 mm (18'000 rpm) and 100 mm (12'000 rpm) are available as HPC (High Performance Cutting) certified tools.
Standard balance grade: G 6.3. Please call for details.

Accessories / spare parts

Part No	Torx screw				Screw-driver		Hex socket head screw		
	Qty	Article	Type	Torque	Article	Type	Article	Type	Torque
1494.0713	4	1490.0360	M4x10	3.85 Nm	1492.0500	T 15	1490.0770	M 10 x 25	50 Nm
1494.0714	5	1490.0360	M4x10	3.85 Nm	1492.0500	T 15	1490.0770	M 10 x 25	50 Nm
1494.0715	6	1490.0360	M4x10	3.85 Nm	1492.0500	T 15	1490.0780	M 12 x 30	90 Nm
1494.0716	7	1490.0360	M4x10	3.85 Nm	1492.0500	T 15	1490.0789	M 16 x 30	160 Nm

ALESA TWIST: the patented spiral ground indexable insert for a smooth and vibration-free chip removal for any metals. The full cutting edge is useable (ap).

Highly positive, extremely sharp cutting edge of HSS-E and carbide.

When milling slots with an internal cooling system set operating pressure above 20 bar. Ensure clear chip removal.

Info

Stainless steels (V2A) can be machined dry with AlCrN coated inserts.


Profile milling

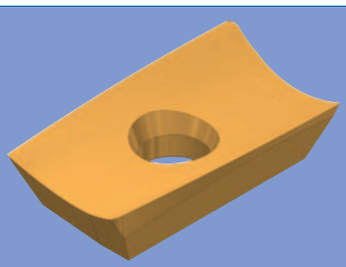

Slot milling


Face milling

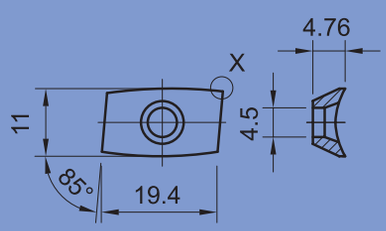

Circular interpolation

ALESA TWIST milling cutter
AO 20 R 90° / Ø 50 – 100

ap = 17.5 mm


AOFT 20

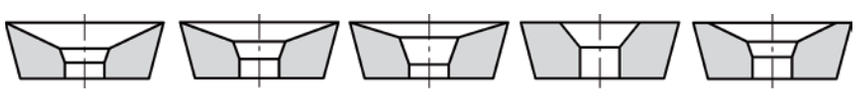
AOFT 20 chip splitting



Cutting material	Coating	Part No	ISO Code	Detail X				Mat. classification 1	2	3	4	5	6
HSS-E	**TiN**	1087.0215	AOFT 20 04 PF FR	0.2x45°	r	●		○	○		●		●
		1087.0315	AOFT 20 04 08 FR	R 0.8	r	●		○	○		●		●
	TiAlN	1162.0215	AOFT 20 04 PF FR	0.2x45°	r	●		○	●		●	○	●
		1162.0315	AOFT 20 04 08 FR	R 0.8	r	●		○	●		●	○	●
HSS-E chip splitting *	**TiN**	1087.0515	AOFT 20 04 PF FR (No 1/2)	0.2x45°	r	●		○	○		●		●
		1087.0518	AOFT 20 04 PF FR (No 3)	0.2x45°	r	●		○	○		●		●
Alesa X2	**TiAlN**	1164.0318	AOFT 20 04 08 FR-721	R 0.8	r	●		○	●		●	○	●
Carbide HM	**TiN**	1287.0225	AOFT 20 04 PF FR-411	0.2x45°	r	●	○	○	○	●	●		●
		1287.0230	AOFT 20 04 08 FR-411	R 0.8	r	●	○	○	○	●	●		●
	TiAlN	1287.0325	AOFT 20 04 PF FR-411	0.2x45°	r	●	○	○	○	●	●	○	●
		1287.0330	AOFT 20 04 08 FR-411	R 0.8	r	●	○	○	○	●	●	○	●
	AlCrN	1287.0676	AOFT 20 04 PF FR-421	0.2x45°	r	●	○	●	●	●	●	●	●
		1287.0681	AOFT 20 04 08 FR-421	R 0.8	r	●	○	●	●	●	●	●	●
		1287.0682	AOFT 20 04 08 FR-431	R 0.8	r	●	○	●	●	●	○	●	○
		1287.0691	AOFT 20 04 24 FR-421	R 2.4	r	●	○	●	●	●	●	●	●
		1287.0693	AOFT 20 04 32 FR-421	R 3.2	r	●	○	●	●	●	●	●	●
	AlCrN-VA	1287.0782	AOFT 20 04 08 FR-431	R 0.8	r	●	○		●	○		●	
Carbide HM-F	**TiAlN**	1287.0525	AOFT 20 04 PF FR-511	0.2x45°	r		●	○	○	●			●
		1287.0530	AOFT 20 04 08 FR-511	R 0.8	r		●	○	○	●			●
	AlCrN	1287.0726	AOFT 20 04 PF FR-521	0.2x45°	r		●	●	●	●	●		●
		1287.0731	AOFT 20 04 08 FR-521	R 0.8	r		●	●	●	●	●		●
		1287.0735	AOFT 20 04 08 FR-531	R 0.8	r		●	●	●	●	○		○
	AlCrN-VA	1287.0835	AOFT 20 04 08 FR-531	R 0.8	r		●		●	○			
Carbide HA	**AlCrN-VA**	1289.0262	AOFT 20 04 08 FR-631	R 0.8	r	●	○	○	●	○		●	

* Order of inserts with chip splitting see page 126
Fitting instructions for inserts see page 126

Zusatznummer Wendeschneidplatten ISO-Code (Schneidengeometrie)
Additional number indexable inserts ISO-code (cutting geometry)
Numéro supplémentaire plaquettes amovibles code ISO (géométrie de coupe)



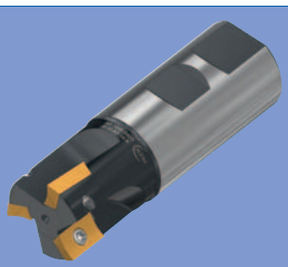
-111 -411 -511 | -121 -222 -421 -521 -721 | -131 -231 -431 -531 -631 | -851 | -223

Overview of all indexable inserts see page 107 and following.

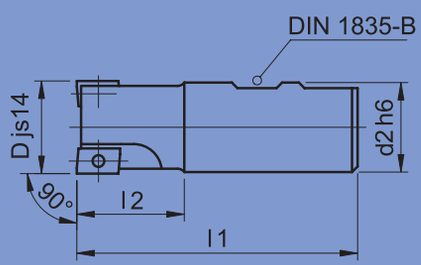
ALESA end mill AP

AP 16 R 90° / Ø 25 – 40

1345



1345.0420



Part No	Type	D mm	l2 mm	d2 mm	l1 mm				Accessories kit No	WSP
1345.0380	25-AP 16 R	25	38	25.0	96	✓	2	r	1494.0700	AP.T 16 04
1345.0420	32-AP 16 R	32	38	32.0	100	✓	3	r	1494.0710	AP.T 16 04
1345.0460	40-AP 16 R	40	48	32.0	110	✓	4	r	1494.0712	AP.T 16 04

Tool will be delivered with holder, all screws and screw-driver, but without indexable inserts.

Accessories / spare parts

Part No	Torx screw				Screw-driver	
	Qty	Article	Type	Torque	Article	Type
1494.0700	2	1490.0320	M4x6	3.85 Nm	1492.0500	T 15
1494.0710	3	1490.0360	M4x10	3.85 Nm	1492.0500	T 15
1494.0712	4	1490.0360	M4x10	3.85 Nm	1492.0500	T 15

Highly positive, extremely sharp cutting edge of HSS-E and carbide.

Holes for internal coolant supply guarantee ideal cooling.

Info

Stainless steels (V2A) can be machined dry with AlCrN coated inserts.

Profile milling

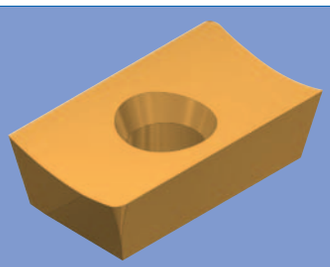
Slot milling

Face milling

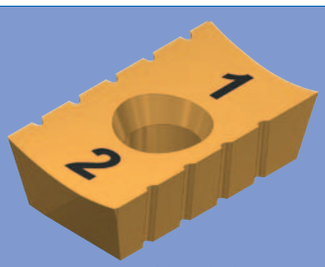
Circular interpolation

ALESA end mill AP
AP 16 R 90° / Ø 25 – 40

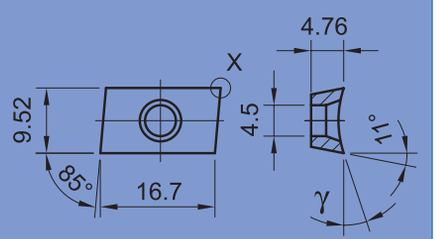
ap = 16 mm



APFT 16



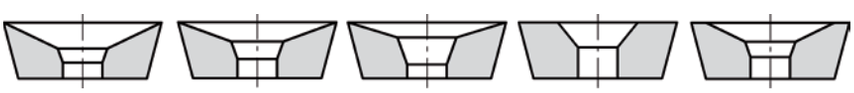
APFT 16 chip splitting



Cutting material	Coating	Part No	ISO Code	γ	Detail X					Mat. classification					
										1	2	3	4	5	6
HSS-E	**TiN**	1085.0200	APFT 16 04 PD FR	18°	0.2x45°		r	●		○	○		●		●
		1085.0230	APFT 16 04 PD FR	25°	0.2x45°		r	●		○	○		●		●
		1085.0250	APFT 16 04 04 FR	18°	R 0.4		r	●		○	○		●		●
		1085.0300	APFT 16 04 08 FR	18°	R 0.8		r	●		○	○		●		●
		1085.0350	APFT 16 04 12 FR	18°	R 1.2		r	●		○	○		●		●
	TiAlN	1160.0200	APFT 16 04 PD FR	18°	0.2x45°		r	●		○	●		●	○	●
		1160.0230	APFT 16 04 PD FR	25°	0.2x45°		r	●		○	●		●	○	●
		1160.0250	APFT 16 04 04 FR	18°	R 0.4		r	●		○	●		●	○	●
		1160.0300	APFT 16 04 08 FR	18°	R 0.8		r	●		○	●		●	○	●
		1160.0350	APFT 16 04 12 FR	18°	R 1.2		r	●		○	●		●	○	●
HSS-E chip splitting *	**TiN**	1086.0200	APFT 16 04 PD FR	18°	0.2x45°	1/2	r	●		○	○		●		●
		1086.0205	APFT 16 04 PD FR	18°	0.2x45°	3	r	●		○	○		●		●
		1086.0230	APFT 16 04 PD FR	25°	0.2x45°	1/2	r	●		○	○		●		●
		1086.0235	APFT 16 04 PD FR	25°	0.2x45°	3	r	●		○	○		●		●
Carbide MG20	**TiN**	1285.0200	APFT 16 04 PD FR-111	18°	0.2x45°		r	○	●	●	○	●	●		●
		1285.0250	APFT 16 04 04 FR-111	18°	R 0.4		r	○	●	●	○	●	●		●
		1285.0300	APFT 16 04 08 FR-111	18°	R 0.8		r	○	●	●	○	●	●		●
	TiAlN	1285.0205	APFT 16 04 PD FR-111	18°	0.2x45°		r	○	●	●	○	●	●	○	●
		1285.0255	APFT 16 04 04 FR-111	18°	R 0.4		r	○	●	●	○	●	●	○	●
		1285.0305	APFT 16 04 08 FR-111	18°	R 0.8		r	○	●	●	○	●	●	○	●
	AlCrN	1285.0215	APFT 16 04 PD FR-111	18°	0.2x45°		r	○	●	●	●	●	●	●	●
		1285.0265	APFT 16 04 04 FR-111	18°	R 0.4		r	○	●	●	●	●	●	●	●
		1285.0315	APFT 16 04 08 FR-111	18°	R 0.8		r	○	●	●	●	●	●	●	●
		1285.0515	APFT 16 04 PD FR-121	10°	0.2x45°		r	○	●	●	●	●	●	●	●
		1285.0615	APFT 16 04 08 FR-121	10°	R 0.8		r	○	●	●	●	●	●	●	●
	AlCrN-VA	1285.0520	APFT 16 04 PD FR-121	10°	0.2x45°		r	○	●		●	○		●	
		1285.0620	APFT 16 04 08 FR-121	10°	R 0.8		r	○	●		●	○		●	
Carbide 12CR	**TiAlN**	1285.0400	APHT 16 04 PD FR-222	16°			r	●	●	●	○	●	●	○	●
	AlCrN	1285.0410	APHT 16 04 PD FR-222	16°			r	●	●	●	●	●	○	●	○

* Order of inserts with chip splitting see page 126
Fitting instructions for inserts see page 126

Zusatznummer Wendeschneidplatten ISO-Code (Schneidengeometrie)
Additional number indexable inserts ISO-code (cutting geometry)
Numéro supplémentaire plaquettes amovibles code ISO (géométrie de coupe)



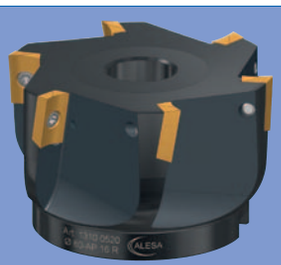
-111 -411 -511 | -121 -222 -421 -521 -721 | -131 -231 -431 -531 -631 | -851 | -223

Overview of all indexable inserts see page 107 and following.

ALESA milling cutter AP

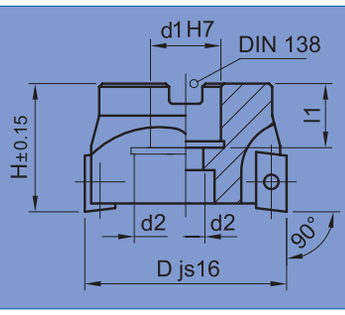
AP 16 R 90° / Ø 40 – 160

1310



1310.0520

KSSV



Part No	Type	D mm	H mm	d1 mm	d2 mm	l1 mm				Accessories kit No	Ring No	WSP
1310.0460	40-AP 16 R	40	32	16.0	8.5	18	✓	3	r	1494.0711		AP.T 16 04
1310.0480	50-AP 16 R	50	40	22.0	11	20	✓	4	r	1494.0713		AP.T 16 04
1310.0500	63-AP 16 R	63	40	22.0	11	20	✓	5	r	1494.0714		AP.T 16 04
1310.0520	80-AP 16 R	80	50	27.0	14	22	✓	6	r	1494.0715		AP.T 16 04
1310.0540	100-AP 16 R	100	50	32.0	18	25	✓	7	r	1494.0716		AP.T 16 04
1310.0560	125-AP 16 R	125	63	40.0	56	28	✓	8	r	1494.0717	1320.0135	AP.T 16 04
1310.0580	160-AP 16 R	160	63	40.0	56	28	✓	10	r	1494.0719	1320.0145	AP.T 16 04

Tool will be delivered with holder, all screws and screw-driver, but without indexable inserts.

Ring for the lubricant distribution on the tool face (KSSV)

Nr. / No. / No	Dimension			
1320.0135	Ø 56 x 31.5 x 28	1320.0215	M20x60	230 Nm
1320.0145	Ø 56 x 31.5 x 28	1320.0215	M20x60	230 Nm

Accessories / spare parts

Part No	Torx screw				Screw-driver		Hex socket head screw		
	Qty	Article	Type	Torque	Article	Type	Article	Type	Torque
1494.0711	3	1490.0360	M4x10	3.85 Nm	1492.0500	T 15	1490.0759	M 8 x 20	30 Nm
1494.0713	4	1490.0360	M4x10	3.85 Nm	1492.0500	T 15	1490.0770	M 10 x 25	50 Nm
1494.0714	5	1490.0360	M4x10	3.85 Nm	1492.0500	T 15	1490.0770	M 10 x 25	50 Nm
1494.0715	6	1490.0360	M4x10	3.85 Nm	1492.0500	T 15	1490.0780	M 12 x 30	90 Nm
1494.0716	7	1490.0360	M4x10	3.85 Nm	1492.0500	T 15	1490.0789	M 16 x 30	160 Nm
1494.0717	8	1490.0360	M4x10	3.85 Nm	1492.0500	T 15			
1494.0719	10	1490.0360	M4x10	3.85 Nm	1492.0500	T 15			

Holes for internal coolant supply guarantee ideal cooling.

All ALESA indexable inserts are ground in the high ISO standard tolerance classification F.

Info — Stainless steels (V2A) can be machined dry with AlCrN coated inserts.

Highly positive, extremely sharp cutting edge of HSS-E and carbide.

Profile milling

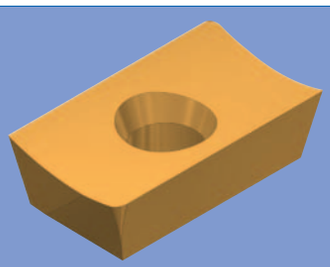
Slot milling

Face milling

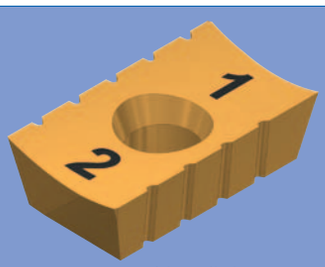
Circular interpolation

ALESA milling cutter AP
AP 16 R 90° / Ø 40 – 160

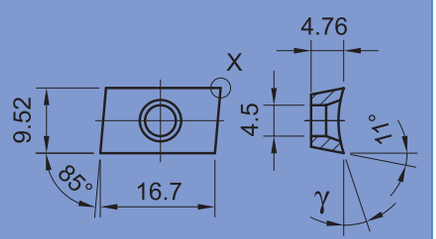
ap = 16 mm



APFT 16



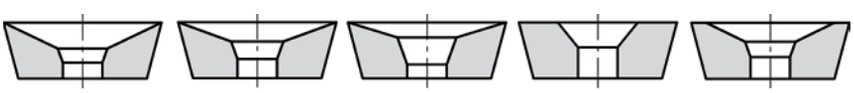
APFT 16 chip splitting



Cutting material	Coating	Part No	ISO Code	γ	Detail X					Mat. classification					
										1	2	3	4	5	6
HSS-E	**TiN**	1085.0200	APFT 16 04 PD FR	18°	0.2x45°		r	●		○	○		●		●
		1085.0230	APFT 16 04 PD FR	25°	0.2x45°		r	●		○	○		●		●
		1085.0250	APFT 16 04 04 FR	18°	R 0.4		r	●		○	○		●		●
		1085.0300	APFT 16 04 08 FR	18°	R 0.8		r	●		○	○		●		●
		1085.0350	APFT 16 04 12 FR	18°	R 1.2		r	●		○	○		●		●
	TiAlN	1160.0200	APFT 16 04 PD FR	18°	0.2x45°		r	●		○	●		●	○	●
		1160.0230	APFT 16 04 PD FR	25°	0.2x45°		r	●		○	●		●	○	●
		1160.0250	APFT 16 04 04 FR	18°	R 0.4		r	●		○	●		●	○	●
		1160.0300	APFT 16 04 08 FR	18°	R 0.8		r	●		○	●		●	○	●
		1160.0350	APFT 16 04 12 FR	18°	R 1.2		r	●		○	●		●	○	●
HSS-E chip splitting *	**TiN**	1086.0200	APFT 16 04 PD FR	18°	0.2x45°	1/2	r	●		○	○		●		●
		1086.0205	APFT 16 04 PD FR	18°	0.2x45°	3	r	●		○	○		●		●
		1086.0230	APFT 16 04 PD FR	25°	0.2x45°	1/2	r	●		○	○		●		●
		1086.0235	APFT 16 04 PD FR	25°	0.2x45°	3	r	●		○	○		●		●
Carbide MG20	**TiN**	1285.0200	APFT 16 04 PD FR-111	18°	0.2x45°		r	○	●	●	○	●	●		●
		1285.0250	APFT 16 04 04 FR-111	18°	R 0.4		r	○	●	●	○	●	●		●
		1285.0300	APFT 16 04 08 FR-111	18°	R 0.8		r	○	●	●	○	●	●		●
	TiAlN	1285.0205	APFT 16 04 PD FR-111	18°	0.2x45°		r	○	●	●	○	●	●	○	●
		1285.0255	APFT 16 04 04 FR-111	18°	R 0.4		r	○	●	●	○	●	●	○	●
		1285.0305	APFT 16 04 08 FR-111	18°	R 0.8		r	○	●	●	○	●	●	○	●
	AlCrN	1285.0215	APFT 16 04 PD FR-111	18°	0.2x45°		r	○	●	●	●	●	●	●	●
		1285.0265	APFT 16 04 04 FR-111	18°	R 0.4		r	○	●	●	●	●	●	●	●
		1285.0315	APFT 16 04 08 FR-111	18°	R 0.8		r	○	●	●	●	●	●	●	●
		1285.0515	APFT 16 04 PD FR-121	10°	0.2x45°		r	○	●	●	●	●	●	●	●
		1285.0615	APFT 16 04 08 FR-121	10°	R 0.8		r	○	●	●	●	●	●	●	●
	AlCrN-VA	1285.0520	APFT 16 04 PD FR-121	10°	0.2x45°		r	○	●		●	○		●	
		1285.0620	APFT 16 04 08 FR-121	10°	R 0.8		r	○	●		●	○		●	
Carbide 12CR	**TiAlN**	1285.0400	APHT 16 04 PD FR-222	16°			r	●	●	●	○	●	●	○	●
	AlCrN	1285.0410	APHT 16 04 PD FR-222	16°			r	●	●	●	●	●	○	●	○

* Order of inserts with chip splitting see page 126
Fitting instructions for inserts see page 126

Zusatznummer Wendeschneidplatten ISO-Code (Schneidengeometrie)
Additional number indexable inserts ISO-code (cutting geometry)
Numéro supplémentaire plaquettes amovibles code ISO (géométrie de coupe)



-111 -411 -511 | -121 -222 -421 -521 -721 | -131 -231 -431 -531 -631 | -851 | -223

Overview of all indexable inserts see page 107 and following.

Hobbing

ALESA TWIST

The characteristics

- THE original of the high-positive, sharp-ground shell end-indexable insert cutters
- SWISS Precision Tool. The milling head and cutting inserts are manufactured in Switzerland
- Unique with 20° helix angle
- The peeling of the cutting process is very spindle and machine-friendly
- The sharp blades require less spindle power and the cutting forces are much smaller
- The ALESA TWIST tools are optimized for modern 5-axis milling centers
- All tools are provided with cooling holes. Optimum cooling, optimal evacuation of chips
- HSS and carbide cutting inserts have the best available PVD coatings

The benefits and options for you

- Fast delivery from the Seengen warehouse
- There are 6 different Ø ranges available
- Ø 25 mm and Ø 32 mm Weldon, Ø 32 mm also with M16 screw head
- Ø 40 mm to Ø 83 mm as arbor milling cutter
- With 3 cutting-geometries a very large range of materials can be processed
- There are carbide qualities for the dry and wet machining
- HSS is very reliable and powerful for many applications
- High removal rate (Q) and large depth of cut with a relatively small machine load
- Good tool life and high productivity
- Excellent machining properties with the most difficult Ni-, Ti- and Co- alloys
- Manufactured according to ISO certified processes
- For special tools, our construction with great experience is available

Hobbing

ALESA TWIST

Comments on the application of shell-end mills

- Shell-end mills put heavy demands on spindle performance as well as on the stability of the tool holder and the clamping condition of parts
- Processing with vibration should be avoided
- The unequal division and the special ALESA TWIST spiral position of the cutting edges have a large influence on the cutting forces that occur
- Machine-friendly processes without oscillations and vibrations are the rule
- Choose tool holder to be as long as necessary and as short as possible
- In case of extensions, preferably select the tools with Ø 43 mm, Ø 53 mm, Ø 66 mm or Ø 83 mm, so that a potentially larger extension diameter can be used
- Preferably, use accurate holders! Circular and axial run-out errors have a much larger effect with shell end mills than with normal cutting tools
- Shell-end mills produce the best performance if ae <20% of the tool diameter is used
- Watch out for adequate and stable pressure coolant supply when using cooling
  The cooling demand is much higher than with normal cutting tools
- To tighten the center screw use torque wrenches
  Excessive torque can result in a deformation of the tool

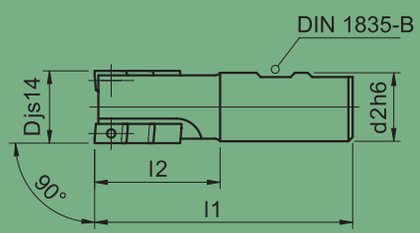
Cutting and process data for shell-end mills

- Cutting speed and average chip thickness hm can be found in the ALESA catalog
- For shell-end mills, the Vc_{max} in the slotting / face milling field «ae = 50% - 100%» has to match the class of materials
- Calculate N_{max} and Vf_{max} in advance
- IMPORTANT:
  If vibrations did occur, check the cutting insert bolts and if necessary tighten them again with the proper torque
- If cutting insert rows are not required, the cutting insert screws must be removed also
- For outer or inner circular processing the correct track speed «Vf» at the center of the milling machine must be calculated
- With outer and inner circular milling, several factors influence the actual cutting width "ae"
  The large depth of cut with the shell-end mills causes large radial forces, which can also go up excessively in case of strong increase of the width of the cut:
  The actual «ae» must therefore be calculated

ALESA TWIST shell end mill
AO 10 R 90° / Ø 25

1355 – 10

1355.0382



Part No	Type	D mm	l2 mm	d2 mm	l1 mm	ap mm				Accessories kit No	WSP
1355.0382	25-AO 10 R Z3x3	25	40	25.0	96	25	✓	3 x 3	r	1494.0567	AOFT 10 03

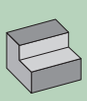
Tool will be delivered with holder, screws and screw-driver, but without indexable inserts.

Accessories / spare parts

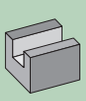
Part No	Torx screw				Screw-driver	
	Qty	Article	Type	Torque	Article	Type
1494.0567	9	1491.0220	M2.5x5	0.95 Nm	1493.0300	TP7 IP

ALESA TWIST: the patented spiral ground indexable insert for a smooth and vibration-free chip removal for any metals. The full cutting edge is useable (ap).

Best results at ae > 10-15% of the diameter.



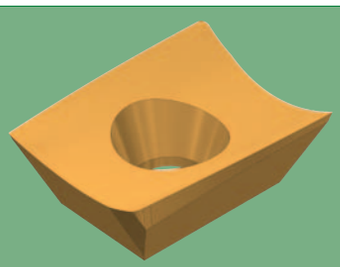
Profile milling

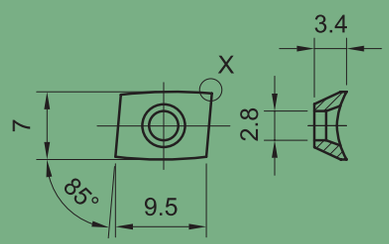


Slot milling

ALESA TWIST shell end mill
AO 10 R 90° / Ø 25

ap = 8 mm

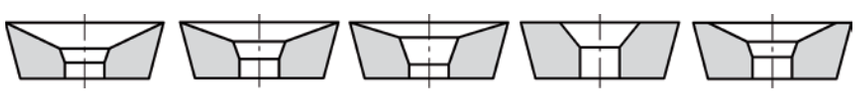

AOFT 10



Cutting material	Coating	Part No	ISO Code	Detail X				Mat. classification 1	2	3	4	5	6
HSS-E	**TiN**	1087.0170	AOFT 10 03 PF FR	0.2x45°	r	●		○	○		●		●
		1087.0180	AOFT 10 03 04 FR	R 0.4	r	●		○	○		●		●
	TiAlN	1162.0170	AOFT 10 03 PF FR	0.2x45°	r	●		○	●		●	○	●
		1162.0180	AOFT 10 03 04 FR	R 0.4	r	●		○	●		●	○	●
Carbide HM	**TiN**	1287.0200	AOFT 10 03 PF FR-411	0.2x45°	r	●	○	○	○	●	●		●
		1287.0205	AOFT 10 03 04 FR-411	R 0.4	r	●	○	○	○	●	●		●
	TiAlN	1287.0300	AOFT 10 03 PF FR-411	0.2x45°	r	●	○	○	○	●	●	○	●
		1287.0305	AOFT 10 03 04 FR-411	R 0.4	r	●	○	○	○	●	●	○	●
	AlCrN	1287.0651	AOFT 10 03 PF FR-421	0.2x45°	r	●	○	●	●	●	●	●	●
		1287.0656	AOFT 10 03 04 FR-421	R 0.4	r	●	○	●	●	●	●	●	●
		1287.0657	AOFT 10 03 04 FR-431	R 0.4	r	●	○	●	●	●	○	●	○
	AlCrN-VA	1287.0757	AOFT 10 03 04 FR-431	R 0.4	r	●	○		●	○		●	
Carbide HM-F	**TiAlN**	1287.0500	AOFT 10 03 PF FR-511	0.2x45°	r		●	○	○	●			●
		1287.0505	AOFT 10 03 04 FR-511	R 0.4	r		●	○	○	●			●
	AlCrN	1287.0701	AOFT 10 03 PF FR-521	0.2x45°	r		●	●	●	●	●		●
		1287.0706	AOFT 10 03 04 FR-521	R 0.4	r		●	●	●	●	●		●
		1287.0707	AOFT 10 03 04 FR-531	R 0.4	r		●	●	●	●	○		○
	AlCrN-VA	1287.0807	AOFT 10 03 04 FR-531	R 0.4	r		●		●	○			
Carbide HA	**AlCrN-VA**	1289.0202	AOFT 10 03 04 FR-631	R 0.4	r	●	○	○	●	○		●	

Fitting instructions for inserts see page 126

Zusatznummer Wendeschneidplatten ISO-Code (Schneidengeometrie)
Additional number indexable inserts ISO-code (cutting geometry)
Numéro supplémentaire plaquettes amovibles code ISO (géométrie de coupe)


-111 -411 -511

-121 -222 -421 -521 -721

-131 -231 -431 -531 -631

-851

-223

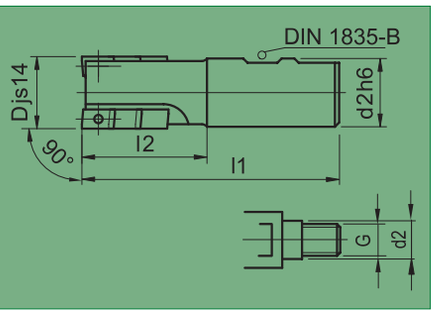
Overview of all indexable inserts see page 107 and following.

ALESA TWIST shell end mill and threaded type cutter
AO 15 R 90° / Ø 32

1355 – 15

1355.0418

1355.0420



Part No	Type	D mm	l2 mm	d2 mm	G	l1 mm	ap mm				Accessories kit No	WSP
1355.0418	32-AO 15 R Z2x3	32	60	32.0		120	38	✓	2 x 3	r	1494.0655	AOFT 15 T3
1355.0420	32-AO 15 R Z2x3	32	64	17.0	M16	86	38	✓	2 x 3	r	1494.0655	AOFT 15 T3

Tool will be delivered with holder, screws and screw-driver, but without indexable inserts.

Accessories / spare parts

Part No	Torx screw				Screw-driver	
	Qty	Article	Type	Torque	Article	Type
1494.0655	6	1490.0280	M3.5x7	2.55 Nm	1492.0500	T 15

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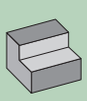
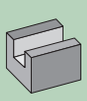
Best results at ae > 10-15% of the diameter.

The inserts with radius R > 0.8 mm must only be mounted in the first row.



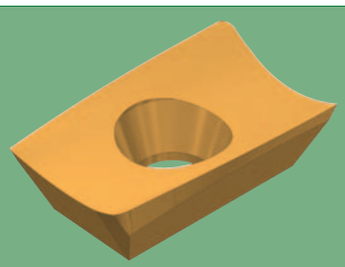
Profile milling



Slot milling

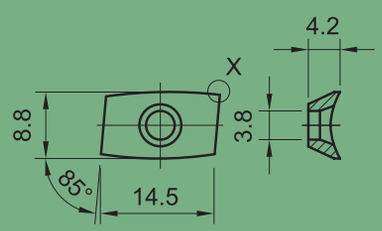
ALESA TWIST shell end mill and threaded type cutter
AO 15 R 90° / Ø 32

ap = 13 mm



AOFT 15

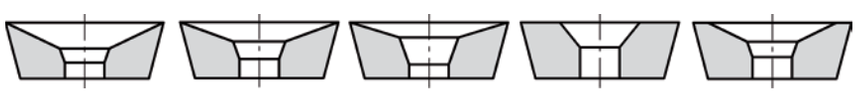
AOFT 15 chip splitting



Cutting material	Coating	Part No	ISO Code	Detail X				Mat. classification 1	2	3	4	5	6
HSS-E	**TiN**	1087.0190	AOFT 15 T3 PF FR	0.2x45°	r	●		○	○		●		●
		1087.0210	AOFT 15 T3 08 FR	R 0.8	r	●		○	○		●		●
	TiAlN	1162.0190	AOFT 15 T3 PF FR	0.2x45°	r	●		○	●		●	○	●
		1162.0210	AOFT 15 T3 08 FR	R 0.8	r	●		○	●		●	○	●
HSS-E chip splitting *	**TiN**	1087.0505	AOFT 15 T3 PF FR (No 1/2)	0.2x45°	r	●		○	○		●		●
		1087.0508	AOFT 15 T3 PF FR (No 3)	0.2x45°	r	●		○	○		●		●
Alesa X2	**TiAlN**	1164.0213	AOFT 15 T3 08 FR-721	R 0.8	r	●		○	●		●	○	●
Carbide HM	**TiN**	1287.0210	AOFT 15 T3 PF FR-411	0.2x45°	r	●	○	○	○	●	●		●
		1287.0215	AOFT 15 T3 08 FR-411	R 0.8	r	●	○	○	○	●	●		●
	TiAlN	1287.0310	AOFT 15 T3 PF FR-411	0.2x45°	r	●	○	○	○	●	●	○	●
		1287.0315	AOFT 15 T3 08 FR-411	R 0.8	r	●	○	○	○	●	●	○	●
	AlCrN	1287.0661	AOFT 15 T3 PF FR-421	0.2x45°	r	●	○	●	●	●	●	●	●
		1287.0666	AOFT 15 T3 08 FR-421	R 0.8	r	●	○	●	●	●	●	●	●
		1287.0667	AOFT 15 T3 08 FR-431	R 0.8	r	●	○	●	●	●	○	●	○
		1287.0669	AOFT 15 T3 12 FR-421	R 1.2	r	●	○	●	●	●	●	●	●
		1287.0671	AOFT 15 T3 16 FR-421	R 1.6	r	●	○	●	●	●	●	●	●
		1287.0673	AOFT 15 T3 20 FR-421	R 2.0	r	●	○	●	●	●	●	●	●
	AlCrN-VA	1287.0767	AOFT 15 T3 08 FR-431	R 0.8	r	●	○		●	○		●	
	DLC-H	1287.0916	AOFT 15 T3 08 FR-421	R 0.8	r	●	○			○	●		●
Carbide HM-F	**TiAlN**	1287.0510	AOFT 15 T3 PF FR-511	0.2x45°	r		●	○	○	●			●
		1287.0515	AOFT 15 T3 08 FR-511	R 0.8	r		●	○	○	●			●
	AlCrN	1287.0711	AOFT 15 T3 PF FR-521	0.2x45°	r		●	●	●	●	○		●
		1287.0716	AOFT 15 T3 08 FR-521	R 0.8	r		●	●	●	●	●		●
		1287.0717	AOFT 15 T3 08 FR-531	R 0.8	r		●	●	●	●	○		○
	AlCrN-VA	1287.0817	AOFT 15 T3 08 FR-531	R 0.8	r		●		●	○			
	DLC-H	1287.0967	AOFT 15 T3 08 FR-531	R 0.8	r		●			○	●		●
Carbide HA	**AlCrN-VA**	1289.0232	AOFT 15 T3 08 FR-631	R 0.8	r	●	○	○	●	○		●	

* Order of inserts with chip splitting see page 126
Fitting instructions for inserts see page 126

Zusatznummer Wendeschneidplatten ISO-Code (Schneidengeometrie)
Additional number indexable inserts ISO-code (cutting geometry)
Numéro supplémentaire plaquettes amovibles code ISO (géométrie de coupe)



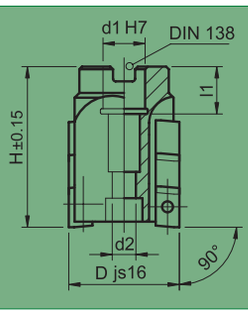
-111 -411 -511 | -121 -222 -421 -521 -721 | -131 -231 -431 -531 -631 | -851 | -223

Overview of all indexable inserts see page 107 and following.

ALESA TWIST shell end mill
AO 15 R 90° / Ø 40 – 53

1355 – 15

1355.0463



Part No	Type	D mm	H mm	d1 mm	d2 mm	l1 mm	ap mm				Accessories kit No	WSP
1355.0460*	40-AO 15 R Z3x3	40	60	16.0	8.5	18	38	✓	3 x 3	r	1494.0659	AOFT 15 T3
1355.0463	43-AO 15 R Z4x3	43	60	16.0	8.5	18	38	✓	4 x 3	r	1494.0665	AOFT 15 T3
1355.0473	53-AO 15 R Z4x4	53	75	22.0	11	20	50	✓	4 x 4	r	1494.0663	AOFT 15 T3

*while stocks last

Tool will be delivered with holder, screws and screw-driver, but without indexable inserts.

Accessories / spare parts

Part No	Torx screw				Screw-driver		Hex socket head screw		
	Qty	Article	Type	Torque	Article	Type	Article	Type	Torque
1494.0659	9	1490.0280	M3.5x7	2.55 Nm	1492.0500	T 15	1490.0700	M 8 x 50	30 Nm
1494.0663	16	1490.0280	M3.5x7	2.55 Nm	1492.0500	T 15	1490.0710	M 10 x 60	50 Nm
1494.0665	12	1490.0280	M3.5x7	2.55 Nm	1492.0500	T 15	1490.0700	M 8 x 50	30 Nm

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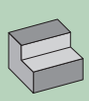
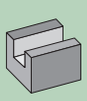
The inserts with radius R > 0.8 mm must only be mounted in the first row.

Best results at ae > 10-15% of the diameter.

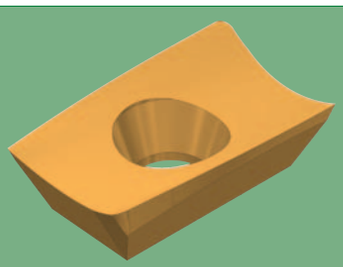

Profile milling


Slot milling

ALESA TWIST shell end mill

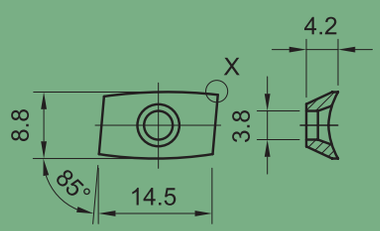
AO 15 R 90° / Ø 40 – 53

ap = 13 mm



AOFT 15

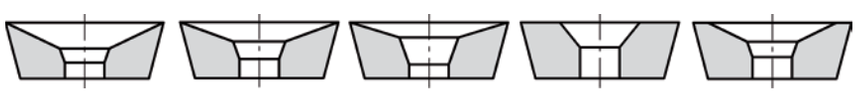
AOFT 15 chip splitting



Cutting material	Coating	Part No	ISO Code	Detail X				Mat. classification					
								1	2	3	4	5	6
HSS-E	**TiN**	1087.0190	AOFT 15 T3 PF FR	0.2x45°	r	●		○	○		●		●
		1087.0210	AOFT 15 T3 08 FR	R 0.8	r	●		○	○		●		●
	TiAlN	1162.0190	AOFT 15 T3 PF FR	0.2x45°	r	●		○	●		●	○	●
		1162.0210	AOFT 15 T3 08 FR	R 0.8	r	●		○	●		●	○	●
HSS-E chip splitting *	**TiN**	1087.0505	AOFT 15 T3 PF FR (No 1/2)	0.2x45°	r	●		○	○		●		●
		1087.0508	AOFT 15 T3 PF FR (No 3)	0.2x45°	r	●		○	○		●		●
Alesa X2	**TiAlN**	1164.0213	AOFT 15 T3 08 FR-721	R 0.8	r	●		○	●		●	○	●
Carbide HM	**TiN**	1287.0210	AOFT 15 T3 PF FR-411	0.2x45°	r	●	○	○	○	●	●		●
		1287.0215	AOFT 15 T3 08 FR-411	R 0.8	r	●	○	○	○	●	●		●
	TiAlN	1287.0310	AOFT 15 T3 PF FR-411	0.2x45°	r	●	○	○	○	●	●	○	●
		1287.0315	AOFT 15 T3 08 FR-411	R 0.8	r	●	○	○	○	●	●	○	●
	AlCrN	1287.0661	AOFT 15 T3 PF FR-421	0.2x45°	r	●	○	●	●	●	●	●	●
		1287.0666	AOFT 15 T3 08 FR-421	R 0.8	r	●	○	●	●	●	●	●	●
		1287.0667	AOFT 15 T3 08 FR-431	R 0.8	r	●	○	●	●	●	○	●	○
		1287.0669	AOFT 15 T3 12 FR-421	R 1.2	r	●	○	●	●	●	●	●	●
		1287.0671	AOFT 15 T3 16 FR-421	R 1.6	r	●	○	●	●	●	●	●	●
		1287.0673	AOFT 15 T3 20 FR-421	R 2.0	r	●	○	●	●	●	●	●	●
	AlCrN-VA	1287.0767	AOFT 15 T3 08 FR-431	R 0.8	r	●	○		●	○		●	
	DLC-H	1287.0916	AOFT 15 T3 08 FR-421	R 0.8	r	●	○			○	●		●
Carbide HM-F	**TiAlN**	1287.0510	AOFT 15 T3 PF FR-511	0.2x45°	r		●	○	○	●			●
		1287.0515	AOFT 15 T3 08 FR-511	R 0.8	r		●	○	○	●			●
	AlCrN	1287.0711	AOFT 15 T3 PF FR-521	0.2x45°	r		●	●	●	●	○		●
		1287.0716	AOFT 15 T3 08 FR-521	R 0.8	r		●	●	●	●	●		●
		1287.0717	AOFT 15 T3 08 FR-531	R 0.8	r		●	●	●	●	○		○
	AlCrN-VA	1287.0817	AOFT 15 T3 08 FR-531	R 0.8	r		●		●	○			
	DLC-H	1287.0967	AOFT 15 T3 08 FR-531	R 0.8	r		●			○	●		●
Carbide HA	**AlCrN-VA**	1289.0232	AOFT 15 T3 08 FR-631	R 0.8	r	●	○	○	●	○		●	

* Order of inserts with chip splitting see page 126
Fitting instructions for inserts see page 126

Zusatznummer Wendeschneidplatten ISO-Code (Schneidengeometrie)
Additional number indexable inserts ISO-code (cutting geometry)
Numéro supplémentaire plaquettes amovibles code ISO (géométrie de coupe)



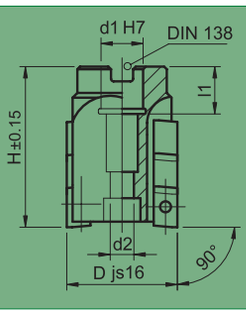
-111 -411 -511 | -121 -222 -421 -521 -721 | -131 -231 -431 -531 -631 | -851 | -223

Overview of all indexable inserts see page 107 and following.

ALESA TWIST shell end mill
AO 20 R 90° / Ø 50 – 83

1355 – 20

1355.0513



Part No	Type	D mm	H mm	d1 mm	d2 mm	l1 mm	ap mm				Accessories kit No	WSP
1355.0480*	50-AO 20 R Z3x3	50	72	22.0	11	20	50	✓	3 x 3	r	1494.0718	AOFT 20 04
1355.0483	53-AO 20 R Z3x3	53	72	22.0	11	20	50	✓	3 x 3	r	1494.0718	AOFT 20 04
1355.0500*	63-AO 20 R Z4x3	63	72	27.0	14	22	50	✓	4 x 3	r	1494.0720	AOFT 20 04
1355.0503	66-AO 20 R Z4x3	66	72	27.0	14	22	50	✓	4 x 3	r	1494.0720	AOFT 20 04
1355.0513	66-AO 20 R Z4x4	66	90	27.0	14	22	68	✓	4 x 4	r	1494.0721	AOFT 20 04
1355.0523	83-AO 20 R Z5x5	83	108	32.0	18	25	85	✓	5 x 5	r	1494.0722	AOFT 20 04

*while stocks last

Tool will be delivered with holder, screws and screw-driver, but without indexable inserts.

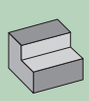
Accessories / spare parts

Part No	Torx screw				Screw-driver		Hex socket head screw		
	Qty	Article	Type	Torque	Article	Type	Article	Type	Torque
1494.0718	9	1490.0360	M4x10	3.85 Nm	1492.0500	T 15	1490.0710	M 10 x 60	50 Nm
1494.0720	12	1490.0360	M4x10	3.85 Nm	1492.0500	T 15	1490.0720	M 12 x 60	90 Nm
1494.0721	16	1490.0360	M4x10	3.85 Nm	1492.0500	T 15	1490.0729	M 12 x 75	90 Nm
1494.0722	25	1490.0360	M4x10	3.85 Nm	1492.0500	T 15	1490.0740	M 16 x 90	160 Nm

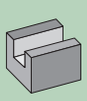
ALESA TWIST: the patented spiral ground indexable insert for a smooth and vibration-free chip removal for any metals. The full cutting edge is useable (ap).

The inserts with radius R > 0.8 mm must only be mounted in the first row.

Best results at ae > 10-15% of the diameter.



Profile milling

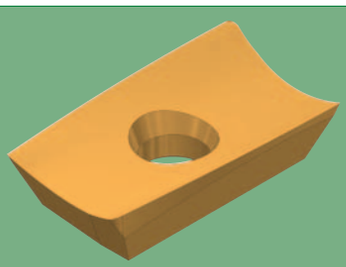


Slot milling

ALESA TWIST shell end mill

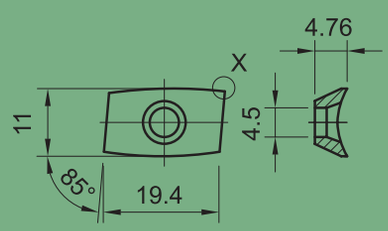
AO 20 R 90° / Ø 50 – 83

ap = 17.5 mm



AOFT 20

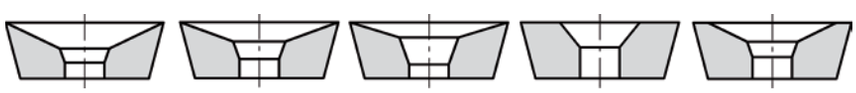
AOFT 20 chip splitting



Cutting material	Coating	Part No	ISO Code	Detail X				Mat. classification 1	2	3	4	5	6
HSS-E	**TiN**	1087.0215	AOFT 20 04 PF FR	0.2x45°	r	●		○	○		●		●
		1087.0315	AOFT 20 04 08 FR	R 0.8	r	●		○	○		●		●
	TiAlN	1162.0215	AOFT 20 04 PF FR	0.2x45°	r	●		○	●		●	○	●
		1162.0315	AOFT 20 04 08 FR	R 0.8	r	●		○	●		●	○	●
HSS-E chip splitting *	**TiN**	1087.0515	AOFT 20 04 PF FR (No 1/2)	0.2x45°	r	●		○	○		●		●
		1087.0518	AOFT 20 04 PF FR (No 3)	0.2x45°	r	●		○	○		●		●
Alesa X2	**TiAlN**	1164.0318	AOFT 20 04 08 FR-721	R 0.8	r	●		○	●		●	○	●
Carbide HM	**TiN**	1287.0225	AOFT 20 04 PF FR-411	0.2x45°	r	●	○	○	○	●	●		●
		1287.0230	AOFT 20 04 08 FR-411	R 0.8	r	●	○	○	○	●	●		●
	TiAlN	1287.0325	AOFT 20 04 PF FR-411	0.2x45°	r	●	○	○	○	●	●	○	●
		1287.0330	AOFT 20 04 08 FR-411	R 0.8	r	●	○	○	○	●	●	○	●
	AlCrN	1287.0676	AOFT 20 04 PF FR-421	0.2x45°	r	●	○	●	●	●	●	●	●
		1287.0681	AOFT 20 04 08 FR-421	R 0.8	r	●	○	●	●	●	●	●	●
		1287.0682	AOFT 20 04 08 FR-431	R 0.8	r	●	○	●	●	●	○	●	○
		1287.0691	AOFT 20 04 24 FR-421	R 2.4	r	●	○	●	●	●	●	●	●
		1287.0693	AOFT 20 04 32 FR-421	R 3.2	r	●	○	●	●	●	●	●	●
	AlCrN-VA	1287.0782	AOFT 20 04 08 FR-431	R 0.8	r	●	○		●	○		●	
Carbide HM-F	**TiAlN**	1287.0525	AOFT 20 04 PF FR-511	0.2x45°	r		●	○	○	●			●
		1287.0530	AOFT 20 04 08 FR-511	R 0.8	r		●	○	○	●			●
	AlCrN	1287.0726	AOFT 20 04 PF FR-521	0.2x45°	r		●	●	●	●	●		●
		1287.0731	AOFT 20 04 08 FR-521	R 0.8	r		●	●	●	●	●		●
		1287.0735	AOFT 20 04 08 FR-531	R 0.8	r		●	●	●	●	○		○
	AlCrN-VA	1287.0835	AOFT 20 04 08 FR-531	R 0.8	r		●		●	○			
Carbide HA	**AlCrN-VA**	1289.0262	AOFT 20 04 08 FR-631	R 0.8	r	●	○	○	●	○		●	

* Order of inserts with chip splitting see page 126
Fitting instructions for inserts see page 126

Zusatznummer Wendeschneidplatten ISO-Code (Schneidengeometrie)
Additional number indexable inserts ISO-code (cutting geometry)
Numéro supplémentaire plaquettes amovibles code ISO (géométrie de coupe)



-111 -411 -511 | -121 -222 -421 -521 -721 | -131 -231 -431 -531 -631 | -851 | -223

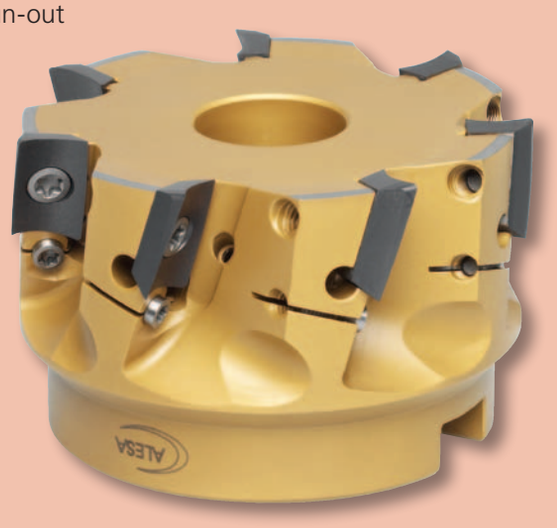
Overview of all indexable inserts see page 107 and following.

Fine finish milling

ALESA TWIST adjustable

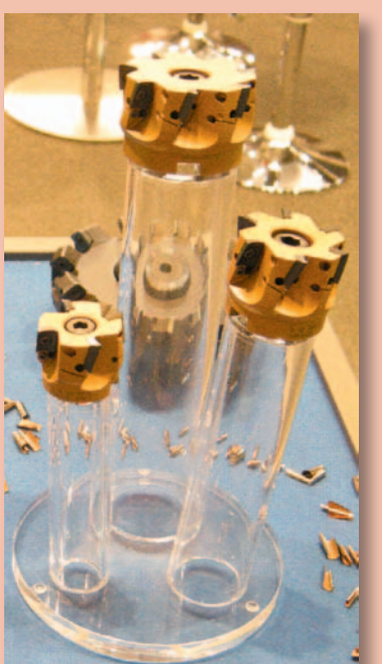
The characteristics

- Fine finishing tool based on the ALESA TWIST AOFT 15
- SWISS Precision Tool. The milling head and cutting inserts are manufactured in Switzerland
- Brilliantly simple setting system for adjusting the axial run-out
- Each insert can be set to 0.002 mm axially
- The fine finishing cutting inserts have a finishing edge
- The spiral angle of 20° means that the tools have a positive axial rake angle
- The sharp cutting produces a very small cutting force Prerequisite for accuracy
- The unequal division is minimizing vibrations
- All tools are provided with cooling holes. During finishing, the cooling affects the surface quality significantly
- The best PVD coatings are available



The benefits and options for you

- Fast delivery from the Seengen warehouse
- Arbor milling cutter Ø 40 mm to Ø 125 mm
- The optimized cutting geometries with fine finishing edge produce surfaces with Ra 0.3 - 0.4 (N5)
- High surface accuracy even when interrupted cutting
- Good tool life and high productivity
- Adjustability of the cutting inserts is also helpful to correct deviations for extensions
- Highest accuracy for guide and support surfaces
- Manufactured according to ISO certified processes
- For special tools, our construction with large experience is available



Fine finish milling

ALESA NUTEX PLAN

The characteristics

- Fine finishing tool based on the carbide Nutex Plus tool system
- All the teeth are ground in one setting, resulting in high accuracy
- Sharp ground cutting edges, with small cutting forces and good chip formation
- Positive cutting geometry in the axial direction also
- AlCrN PVD coating of the latest technology
- Very stable holders, based on the Nutex Plus System
- Internal coolant supply from both sides

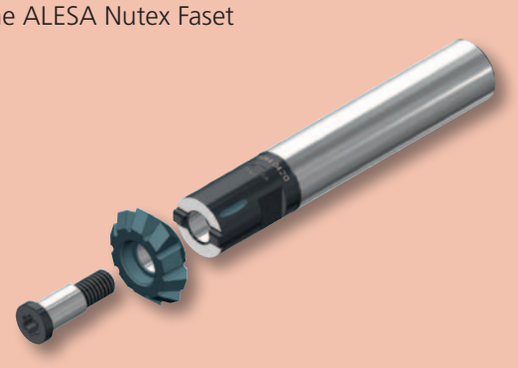
The benefits and options for you

- Fast delivery from the Seengen warehouse
- Level finishing tools are available in the Ø 50 mm
  Ø 63 mm with a width of 6 mm
- Large numbers of teeth Z=16 and Z=18, relatively high feed rates, short finish times
- Nutex finishing tools can be re-sharpened

ALESA NUTEX FASET

The characteristics

- 45° deburring tool based on the carbide Nutex Mini tool system
- The work of deburring can be improved significantly with the ALESA Nutex Faset



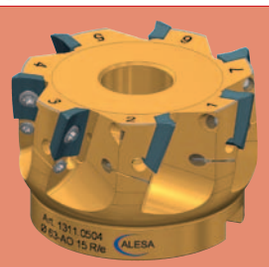
The benefits and options for you

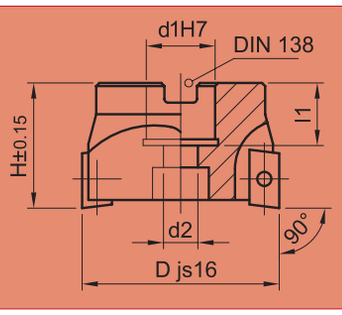
- Fast delivery from the Seengen warehouse
- Two holders are available (M6 and shaft)
- The small prism tool fits the Nutex mini holders
- Available Ø 16 x 4.5 with Z = 10, coating AlCrN
- It can be manufactured up to 2 x 45° chamfering

ALESA TWIST milling cutter adjustable
AO 15 R/e 90° / Ø 40 – 125

1311e

Pat. no. 686 235





Part No	Type	D mm	H mm	d1 mm	d2 mm	l1 mm				Accessories kit No	WSP
1311.0464	40-AO 15 R/e	40	32	16.0	8.5	18	✓	4	r	1494.0654	1287.0718
1311.0484	50-AO 15 R/e	50	40	22.0	11	20	✓	6	r	1494.0656	1287.0719
1311.0504	63-AO 15 R/e	63	40	22.0	11	20	✓	7	r	1494.0658	1287.0719
1311.0524	80-AO 15 R/e	80	50	27.0	14	22	✓	9	r	1494.0661	1287.0720
1311.0544	100-AO 15 R/e	100	50	32.0	18	25	✓	10	r	1494.0662	1287.0720
1311.0564	125-AO 15 R/e	125	63	40	22	29	✓	12	r	1494.0664	1287.0720

Tool will be delivered with holder, all screws and screw-driver, but without indexable inserts.

Accessories
No 1490.0270 Adjusting screw
No 1492.0400 Screw-driver

Accessories / spare parts

Part No	Torx screw				Screw-driver		Hex socket head screw		
	Qty	Article	Type	Torque	Article	Type	Article	Type	Torque
1494.0654	4	1490.0280	M3.5x7	2.55 Nm	1492.0500	T 15	1490.0759	M 8 x 20	30 Nm
1494.0656	6	1490.0280	M3.5x7	2.55 Nm	1492.0500	T 15	1490.0770	M 10 x 25	50 Nm
1494.0658	7	1490.0280	M3.5x7	2.55 Nm	1492.0500	T 15	1490.0770	M 10 x 25	50 Nm
1494.0661	9	1490.0280	M3.5x7	2.55 Nm	1492.0500	T 15	1490.0780	M 12 x 30	90 Nm
1494.0662	10	1490.0280	M3.5x7	2.55 Nm	1492.0500	T 15	1490.0789	M 16 x 30	160 Nm
1494.0664	12	1490.0280	M3.5x7	2.55 Nm	1492.0500	T 15	1490.0800	M 20 x 40	230 Nm

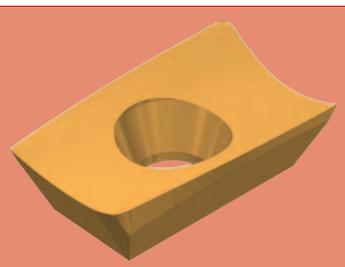
For a surface quality of N5 (Ra < 0.4 µm) when finishing.

Highly positive, extremely sharp ground cutting tool with level finishing edge.

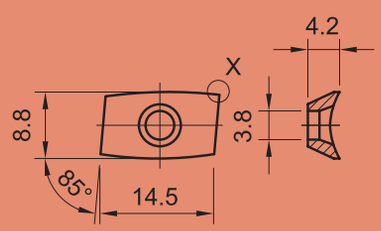
Face milling

ALESA TWIST milling cutter adjustable
AO 15 R/e 90° / Ø 40 – 125

ap = 0.02 - 0.5 mm



AOFT 15



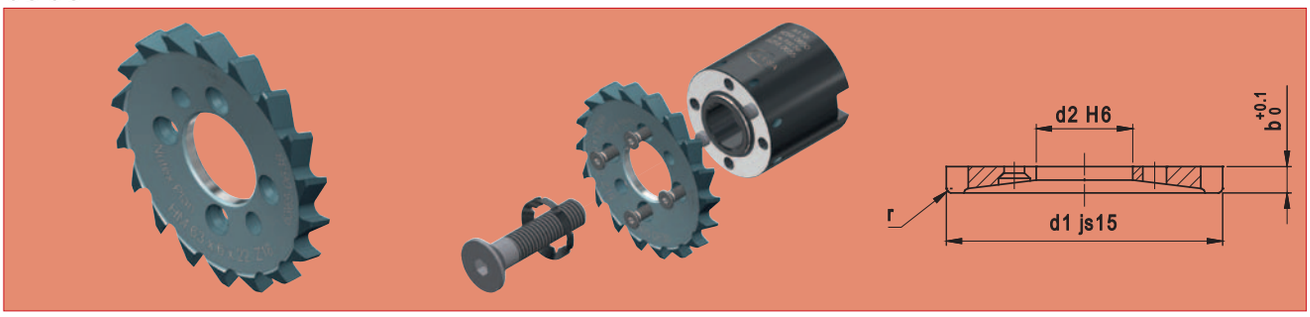
Cutting material	Coating	Part No	ISO Code	Detail X				Mat. classification					
								1	2	3	4	5	6
Carbide HM-F	**AlCrN**	1287.0718	AOFT 15 T3 08 FR-521/40	R 0.8	r	○	●	●	●	●	●		○
		1287.0719	AOFT 15 T3 08 FR-521/50/63	R 0.8	r	○	●	●	●	●	●		○
		1287.0720	AOFT 15 T3 08 FR-521/80-125	R 0.8	r	○	●	●	●	●	●		○

Fitting instructions for inserts see page 126

Overview of all indexable inserts see page 107 and following.

Nutex Plan carbide
AlCrN-coated

6365



Part No	d1 mm	b mm		r mm	d2 mm	Holder 6058. _ _ _ _
6365.0548	50	6.00	16	0.4	16	.0440, .0540, .0640
6365.0638	63	6.00	18	0.8	22	.0650

Tool will be delivered with: Nutex Plan and coolant spreading ring

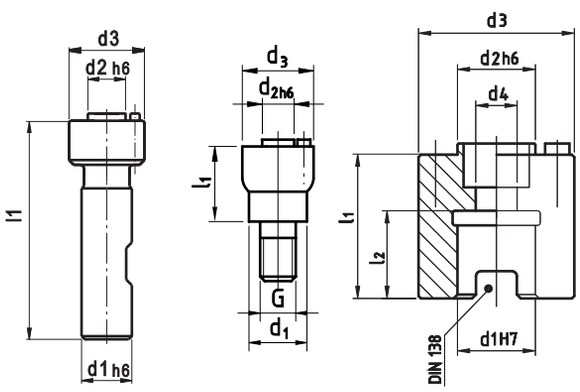
Holder for Nutex Plan
and accessories / spare parts

6058

6058.0440 – Type A4 | 6058.0540 – Type B3 | 6058.0650 – Type C2

Part No	Type	for Nutex Plan	d1 mm	d2 mm	d3 mm	d4 mm	G	l1 mm	l2 mm	
6058.0440	A4	Ø 50 mm	16	16	32			73.6		✓
6058.0540	B3	Ø 50 mm	29	16	32		M16	39.8		✓
6058.0640	C2	Ø 50 mm	16	16	32	9		29.7	18	✓
6058.0650	C2	Ø 63 mm	22	22	40	11		37.7	20	✓

Tool will be delivered with:
holder with Torx screws, screw-driver (Torx), coolant spreading ring (Nutex Plus), countersunk screw and fitting screw-driver.



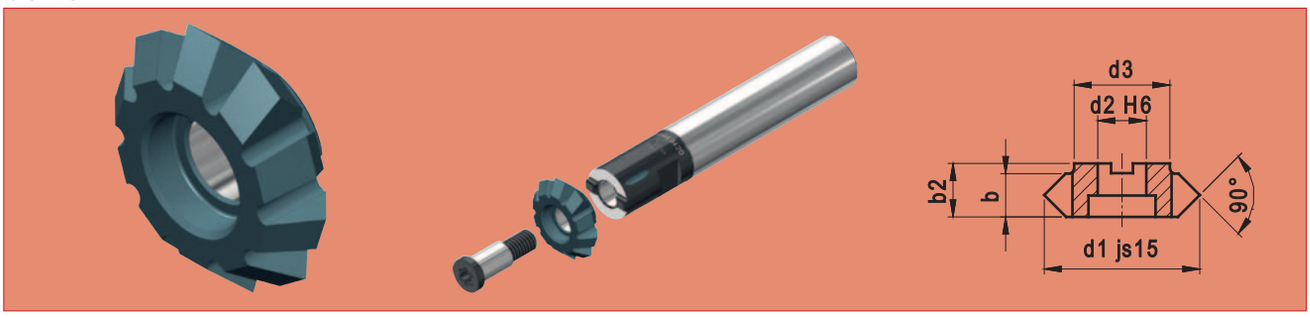
Typ / Type A4 Typ / Type B3 Typ / Type C2

Accessories / spare parts

Part No	Q	Torx screw	Torx Screw-driver	Q	Straight pin	Coolant spreading ring	Counter-sunk-screw	Hex wrench	Spare holder
6058.0440	3	1490.0600 M4x10 3.85Nm	1492.0500 T 15	1	6058.0950 Ø 5 x 20	6058.0845 Ø15.8x2.6x10.3	6058.0910 M8x20 30Nm	6058.0980 sw 5	6058.0445
6058.0540	3	1490.0600 M4x10 3.85Nm	1492.0500 T 15	1	6058.0950 Ø 5 x 20	6058.0845 Ø15.8x2.6x10.3	6058.0910 M8x20 30Nm	6058.0980 sw 5	6058.0545
6058.0640	3	1490.0600 M4x10 3.85Nm	1492.0500 T 15	1	6058.0955 Ø 5 x 31.6	6058.0845 Ø15.8x2.6x10.3	6058.0915 M8x35 30Nm	6058.0980 sw 5	6058.0645
6058.0650	4	1490.0600 M4x10 3.85Nm	1492.0500 T 15	2	6058.0960 Ø 5 x 39.6	6058.0855 Ø21.8x3x15.5	6058.0920 M10x45 50Nm	6058.0985 sw 6	6058.0655

Nutex Faset carbide
AlCrN-coated

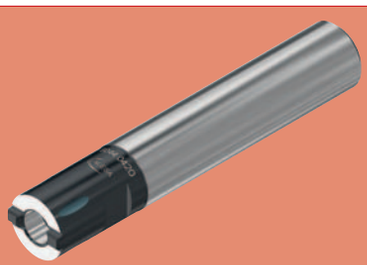
6343



Part No	d1 mm	b2 mm	b mm	d2 mm	d3 mm		chamfer max.	Holder 6044. _ _ _ _
6343.0156	16	5.5	4.5	5	9.85	10	2 x 45°	.0410, .0420, .0500

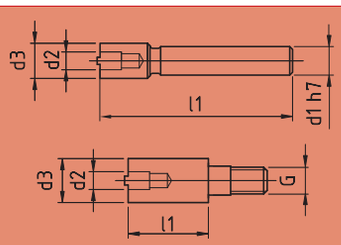
Holder for Nutex Faset
and accessories / spare parts

6044



6044.0420 – Type A1

6044.0500 – Type B1



Part No	Type	d1 mm	d2 mm	d3 mm	G	l1 mm		Torx screw	Type	Torx Screw-driv-er	Type
6044.0410	A1	8	5	9.85		53.2	✓	6044.0800	M4 / Ø6.5x16 / 4.5Nm	1492.0500	T 15
6044.0420	A1	10	5	9.85		57.2	✓	6044.0800	M4 / Ø6.5x16 / 4.5Nm	1492.0500	T 15
6044.0500	B1		5	9.85	M6	18	✓	6044.0800	M4 / Ø6.5x16 / 4.5Nm	1492.0500	T 15

Tool will be delivered with: holder with screw and screw-driver

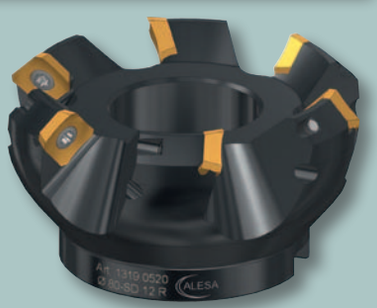
Torx screw 6044.0800

Face milling 45°

ALESA SD 12

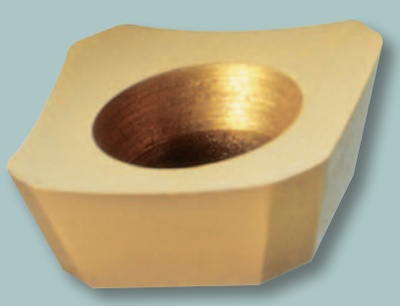
The characteristics

- THE classic of the 45° face cutting insert tools with SD 12 screw-in cutting inserts
- High positive ALESA sharp-ground inserts
- SWISS Precision Tool. The milling head and cutting inserts are manufactured in Switzerland
- Robust and proven solution according to DIN
- The sharp edges require less spindle power than pure sintered cutting inserts
- The sharp-ground cutting inserts are optimized for modern 5-axis milling centers
- There are face cutters with wide pitch (larger chip spaces) or with narrower pitch from Ø 50 mm to Ø 160 mm available
- The SD 12 tools Ø 50 mm to Ø 160 mm can be provided with a distribution ring, which enables an inner coolant supply
- The best PVD coatings are available
- HSS and several carbide cutting inserts are available from the warehouse



The benefits and options for you

- Fast delivery from the Seengen warehouse
- Arbor types Ø 50 mm to Ø 160 mm
- With 3 cutting geometries a very large range of materials can be processed
- HSS cutting inserts with TiN and TiAlN coatings are safe and efficient for the processing of many applications
- High removal rate (Q) with a relatively small machine load
- Good tool life and high productivity
- The same cutting inserts can also be used on the ALESA SPEED
- The latest developments show excellent cutting processes also with the most difficult Ni-, Ti- and Co- alloys
- Manufactured according to ISO certified processes
- For special tools, our construction with great experience is available



Face milling 45°

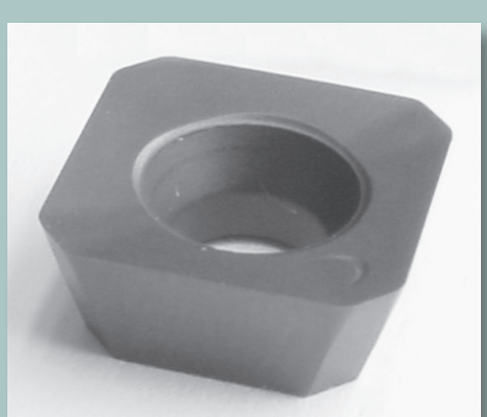
ALESA SD 09

The characteristics

- THE classic of the 45° face cutting insert tools with SD 09 screw-in cutting inserts
- From ALESA with high positive, sharp-ground inserts
- SWISS Precision Tool. The milling head and cutting inserts are manufactured in Switzerland
- Robust and proven solution according to DIN
- The sharp blades require less spindle power than pure sintered cutting inserts
- The sharp-ground cutting inserts are optimized for modern 5-axis milling centers
- SD 09 tools Ø 16 mm to Ø 100 mm are provided with coolant holes, which enable an inner coolant supply
- The best PVD coatings are available
- HSS and several carbide cutting inserts are available from the warehouse

The benefits and options for you

- Fast delivery from the Seengen warehouse
- Weldon type Ø 16 mm to Ø 40 mm
- Arbor type Ø 40 mm to Ø 160 mm
- With 3 cutting geometries a very large range of materials can be processed
- HSS cutting insert with TiN and TiAlN coatings are safe and efficient for the processing of many applications
- High removal rate (Q) with a relatively small machine load
- Good tool life and high productivity
- The same cutting inserts can also be used on the ALESA SPEED
- The latest developments show excellent cutting processes also with the most difficult Ni-, Ti- and Co- alloys
- Manufactured according to ISO certified processes
- For special tools, our construction with great experience is available

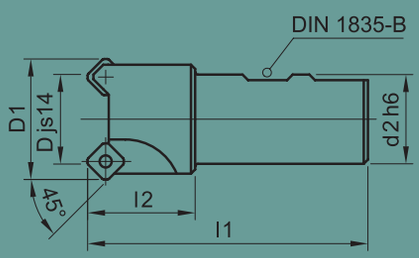


ALESA end mill SD 09

SD 09 R 45° / Ø 16 – 40

1349

1349.0380



Part No	Type	D mm	D1 mm	l2 mm	d2 mm	l1 mm				Accessories kit No	WSP
1349.0300	16-SD 09 R	16	26	22	16.0	75	✓	2	r	1494.0650	SD.T 09 T3
1349.0340	20-SD 09 R	20	30	28	20.0	82	✓	2	r	1494.0675	SD.T 09 T3
1349.0380	25-SD 09 R	25	35	35	25.0	96	✓	3	r	1494.0676	SD.T 09 T3
1349.0420	32-SD 09 R	32	42	35	32.0	100	✓	4	r	1494.0677	SD.T 09 T3

Tool will be delivered with holder, all screws and screw-driver, but without indexable inserts.

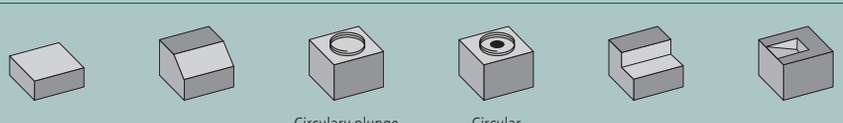
Accessories / spare parts

Part No	Torx screw				Screw-driver	
	Qty	Article	Type	Torque	Article	Type
1494.0650	2	1490.0280	M3.5x7	2.55 Nm	1492.0500	T 15
1494.0675	2	1490.0290	M3.5x8	2.55 Nm	1492.0500	T 15
1494.0676	3	1490.0290	M3.5x8	2.55 Nm	1492.0500	T 15
1494.0677	4	1490.0290	M3.5x8	2.55 Nm	1492.0500	T 15
1494.0679	5	1490.0290	M3.5x8	2.55 Nm	1492.0500	T 15

When operating circular motion full slot and dip milling ap is max = 3 mm.

Highly positive, extremely sharp cutting edge of HSS-E and carbide.

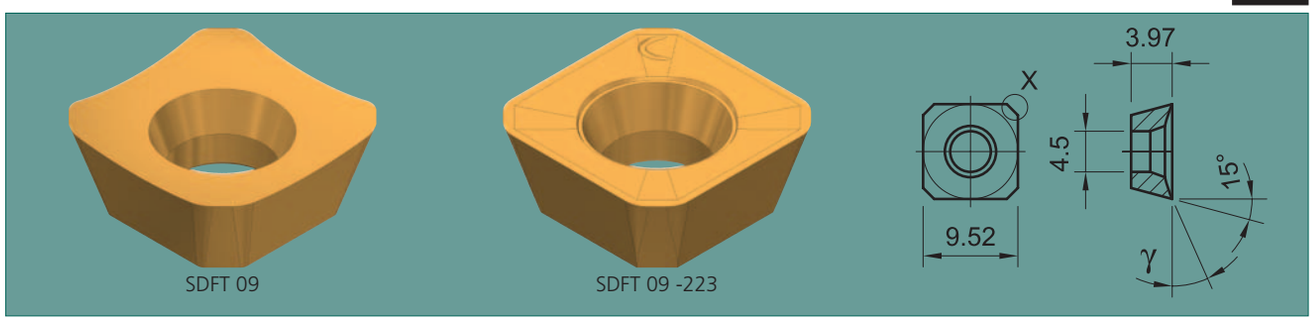
ALESA tools are distinguished by their very precise concentricity.



ALESA end mill SD 09

SD 09 R 45° / Ø 16 – 40

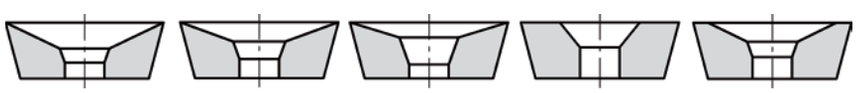
ap = 4.7 mm



Cutting material	Coating	Part No	ISO Code	γ	Detail X				Mat. classification					
									1	2	3	4	5	6
HSS-E	**TiN**	1091.0400	SDFT 09 T3 AE FN	17°	1.2x45° R1.2	r/l	●		○	○		●		●
	TiAlN	1166.0400	SDFT 09 T3 AE FN	17°	1.2x45° R1.2	r/l	●		○	●		●	○	●
Carbide MG20	**TiN**	1291.0400	SDFT 09 T3 AE FN-111	17°	1.2x45° R1.2	r/l	○	●	●	○	●	●		●
	TiAlN	1291.0405	SDFT 09 T3 AE FN-111	17°	1.2x45° R1.2	r/l	○	●	●	○	●	●	○	●
	AlCrN	1291.0415	SDFT 09 T3 AE FN-111	17°	1.2x45° R1.2	r/l	○	●	●	●	●	●	●	●
Carbide 12CR	**TiAlN**	1291.0420	SDHT 09 T3 AE FN-222	11°	1.2x45° R1.2	r/l	○	●	●	○	●	●	○	●
	AlCrN	1291.0430	SDHT 09 T3 AE FN-222	11°	1.2x45° R1.2	r/l	○	●	●	●	●	○	●	○
		1291.0630	SDFT 09 T3 AE FN-223	5°	1.2x45° R1.2	r/l	○	●	●	●	●	○	●	○
	AlCrN-VA	1291.0635	SDFT 09 T3 AE FN-223	5°	1.2x45° R1.2	r/l	○	●		●	○		●	
	DLC-H	1291.0640	SDFT 09 T3 AE FN-223	5°	1.2x45° R1.2	r/l	○	●			○	●		●
Ceramic KG14	**AlCrN-K**	1292.0200	SDFT 09 T3 AE FN-851	0°	1.2x45° R1.2	r/l		●			●			

Fitting instructions for inserts see page 126

Zusatznummer Wendeschneidplatten ISO-Code (Schneidengeometrie)
Additional number indexable inserts ISO-code (cutting geometry)
Numéro supplémentaire plaquettes amovibles code ISO (géométrie de coupe)



-111 -411 -511 | -121 -222 -421 -521 -721 | -131 -231 -431 -531 -631 | -851 | -223

Overview of all indexable inserts see page 107 and following.

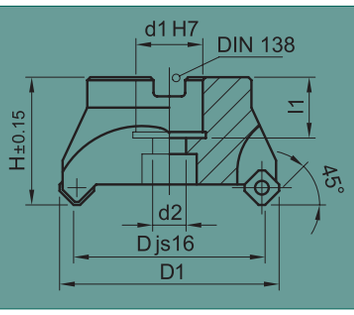
ALESA milling cutter SD 09

SD 09 R/L 45° / Ø 40 – 100

1316

1316.0520 right

1316.0481 left



Part No	Type	D mm	D1 mm	H mm	d1 mm	d2 mm	l1 mm				Accessories kit No	WSP
1316.0460	40-SD 09 R	40	50	40	16.0	8.5	18	✓	5	r	1494.0680	SD.T 09 T3
1316.0461	40-SD 09 L	40	50	40	16.0	8.5	18	✓	5	l	1494.0680	SD.T 09 T3
1316.0480	50-SD 09 R	50	60	42	22.0	11	20	✓	6	r	1494.0681	SD.T 09 T3
1316.0481	50-SD 09 L	50	60	42	22.0	11	20	✓	6	l	1494.0681	SD.T 09 T3
1316.0500	63-SD 09 R	63	73	42	22.0	11	20	✓	7	r	1494.0682	SD.T 09 T3
1316.0520	80-SD 09 R	80	90	50	27.0	14	22	✓	9	r	1494.0683	SD.T 09 T3
1316.0540	100-SD 09 R	100	110	54	32.0	18	25	✓	11	r	1494.0684	SD.T 09 T3

Tool will be delivered with holder, all screws and screw-driver, but without indexable inserts.

Accessories / spare parts

Part No	Torx screw				Screw-driver		Hex socket head screw		
	Qty	Article	Type	Torque	Article	Type	Article	Type	Torque
1494.0680	5	1490.0290	M3.5x8	2.55 Nm	1492.0500	T 15	1490.0759	M 8 x 20	30 Nm
1494.0681	6	1490.0290	M3.5x8	2.55 Nm	1492.0500	T 15	1490.0770	M 10 x 25	50 Nm
1494.0682	7	1490.0290	M3.5x8	2.55 Nm	1492.0500	T 15	1490.0770	M 10 x 25	50 Nm
1494.0683	9	1490.0290	M3.5x8	2.55 Nm	1492.0500	T 15	1490.0780	M 12 x 30	90 Nm
1494.0684	11	1490.0290	M3.5x8	2.55 Nm	1492.0500	T 15	1490.0789	M 16 x 30	160 Nm

Info Excellent tool for face milling.

Highly positive, extremely sharp cutting edge of HSS-E and carbide.

ALESA tools are distinguished by their very precise concentricity.

When operating circular motion full slot and dip milling ap is max = 3 mm.


Face milling


Chamfering


Circulary plunge milling


Circular interpolation

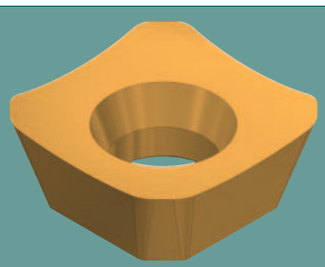

Profile milling


Ramping

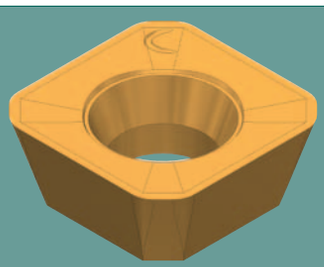
ALESA milling cutter SD 09

SD 09 R/L 45° / Ø 40 – 100

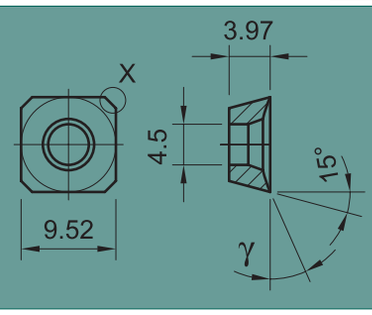
ap = 4.7 mm



SDFT 09



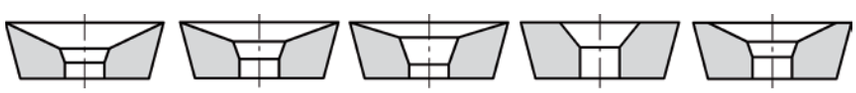
SDFT 09 -223



Cutting material	Coating	Part No	ISO Code	γ	Detail X				Mat. classification 1	2	3	4	5	6
HSS-E	**TiN**	1091.0400	SDFT 09 T3 AE FN	17°	1.2x45° R1.2	r/l	●		○	○		●		●
	TiAlN	1166.0400	SDFT 09 T3 AE FN	17°	1.2x45° R1.2	r/l	●		○	●		●	○	●
Carbide MG20	**TiN**	1291.0400	SDFT 09 T3 AE FN-111	17°	1.2x45° R1.2	r/l	○	●	●	○	●	●		●
	TiAlN	1291.0405	SDFT 09 T3 AE FN-111	17°	1.2x45° R1.2	r/l	○	●	●	○	●	●	○	●
	AlCrN	1291.0415	SDFT 09 T3 AE FN-111	17°	1.2x45° R1.2	r/l	○	●	●	●	●	●	●	●
Carbide 12CR	**TiAlN**	1291.0420	SDHT 09 T3 AE FN-222	11°	1.2x45° R1.2	r/l	○	●	●	○	●	●	○	●
	AlCrN	1291.0430	SDHT 09 T3 AE FN-222	11°	1.2x45° R1.2	r/l	○	●	●	●	●	○	●	○
		1291.0630	SDFT 09 T3 AE FN-223	5°	1.2x45° R1.2	r/l	○	●	●	●	●	○	●	○
	AlCrN-VA	1291.0635	SDFT 09 T3 AE FN-223	5°	1.2x45° R1.2	r/l	○	●		●	○		●	
	DLC-H	1291.0640	SDFT 09 T3 AE FN-223	5°	1.2x45° R1.2	r/l	○	●			○	●		●
Ceramic KG14	**AlCrN-K**	1292.0200	SDFT 09 T3 AE FN-851	0°	1.2x45° R1.2	r/l		●			●			

Fitting instructions for inserts see page 126

Zusatznummer Wendeschneidplatten ISO-Code (Schneidengeometrie)
Additional number indexable inserts ISO-code (cutting geometry)
Numéro supplémentaire plaquettes amovibles code ISO (géométrie de coupe)



-111 -411 -511 | -121 -222 -421 -521 -721 | -131 -231 -431 -531 -631 | -851 | -223

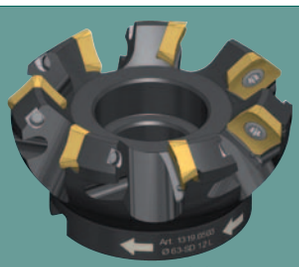
Overview of all indexable inserts see page 107 and following.

ALESA milling cutter SD 12

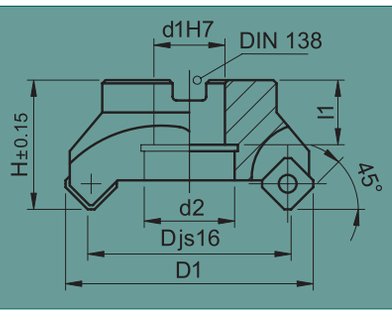
SD 12 R/L 45° / Ø 50 – 160

1319

1319.0520 right



1319.0503 left



Part No	Type	D mm	D1 mm	H mm	d1 mm	d2 mm	l1 mm				Accessories kit No	Ring No	WSP
1319.0480	50-SD 12 R Z4	50	64	40	22.0	30	20	✓	4	r	1494.0744	1320.0100	SD.T 12 04
1319.0482	50-SD 12 R Z5	50	64	40	22.0	30	20	✓	5	r	1494.0745	1320.0105	SD.T 12 04
1319.0483	50-SD 12 L Z5	50	64	40	22.0	30	20	✓	5	l	1494.0745	1320.0106	SD.T 12 04
1319.0500	63-SD 12 R Z5	63	77	40	22.0	30	20	✓	5	r	1494.0745	1320.0105	SD.T 12 04
1319.0502	63-SD 12 R Z7	63	77	40	22.0	30	20	✓	7	r	1494.0735	1320.0110	SD.T 12 04
1319.0503	63-SD 12 L Z7	63	77	40	22.0	30	20	✓	7	l	1494.0735	1320.0111	SD.T 12 04
1319.0520	80-SD 12 R Z6	80	94	50	27.0	38	22	✓	6	r	1494.0746	1320.0115	SD.T 12 04
1319.0522	80-SD 12 R Z8	80	94	50	27.0	38	22	✓	8	r	1494.0738	1320.0120	SD.T 12 04
1319.0523	80-SD 12 L Z8	80	94	50	27.0	38	22	✓	8	l	1494.0738	1320.0121	SD.T 12 04
1319.0540	100-SD 12 R Z7	100	114	50	32.0	45	25	✓	7	r	1494.0735	1320.0125	SD.T 12 04
1319.0542	100-SD 12 R Z10	100	114	50	32.0	45	25	✓	10	r	1494.0740	1320.0130	SD.T 12 04
1319.0543	100-SD 12 L Z10	100	114	50	32.0	45	25	✓	10	l	1494.0740	1320.0131	SD.T 12 04
1319.0560	125-SD 12 R Z8	125	139	63	40.0	56	28	✓	8	r	1494.0738	1320.0135	SD.T 12 04
1319.0562	125-SD 12 R Z11	125	139	63	40.0	56	28	✓	11	r	1494.0742	1320.0140	SD.T 12 04
1319.0580	160-SD 12 R Z10	160	174	63	40.0	56	28	✓	10	r	1494.0740	1320.0145	SD.T 12 04
1319.0582	160-SD 12 R Z14	160	174	63	40.0	56	28	✓	14	r	1494.0743	1320.0150	SD.T 12 04

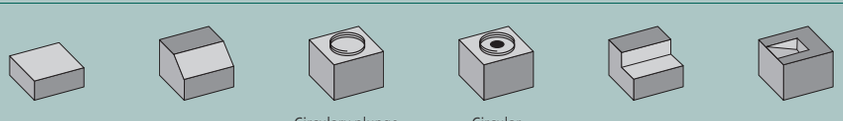
Tool will be delivered with holder, all screws and screw-driver, but without indexable inserts.

Accessories / spare parts

Part No	Torx screw				Screw-driver		Hex socket head screw		
	Qty	Article	Type	Torque	Article	Type	Article	Type	Torque
1494.0735	7	1490.0380	M4x11	3.85 Nm	1492.0600	T 20			
1494.0738	8	1490.0380	M4x11	3.85 Nm	1492.0600	T 20			
1494.0740	10	1490.0380	M4x11	3.85 Nm	1492.0600	T 20			
1494.0742	11	1490.0380	M4x11	3.85 Nm	1492.0600	T 20			
1494.0743	14	1490.0380	M4x11	3.85 Nm	1492.0600	T 20			
1494.0744	4	1490.0380	M4x11	3.85 Nm	1492.0600	T 20			
1494.0745	5	1490.0380	M4x11	3.85 Nm	1492.0600	T 20			
1494.0746	6	1490.0380	M4x11	3.85 Nm	1492.0600	T 20			

Info Excellent tool for face milling.

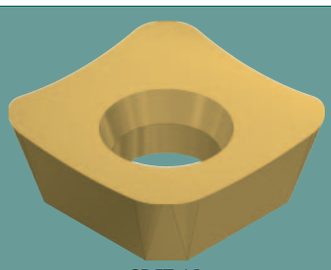
When operating circular motion full slot and dip milling ap is max = 4 mm.



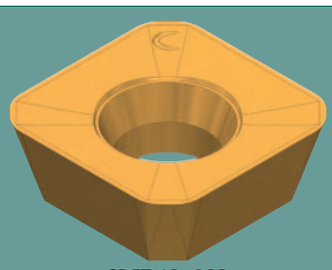
ALESA milling cutter SD 12

SD 12 R/L 45° / Ø 50 – 160

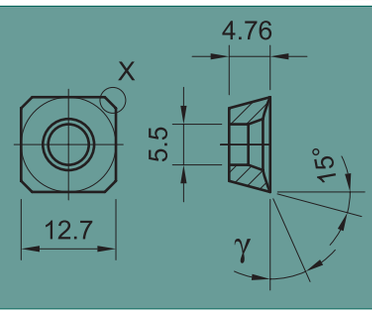
ap = 6.5 mm



SDFT 12



SDFT 12 -223



Cutting material	Coating	Part No	ISO Code	γ	Detail X				Mat. classification 1	2	3	4	5	6
HSS-E	**TiN**	1091.0450	SDFT 12 04 AE FN	17°	1.5x45° R2	r/l	●		○	○		●		●
	TiAlN	1166.0450	SDFT 12 04 AE FN	17°	1.5x45° R2	r/l	●		○	●		●	○	●
Carbide MG20	**TiN**	1291.0450	SDFT 12 04 AE FN-111	17°	1.5x45° R2	r/l	○	●	●	○	●	●		●
	TiAlN	1291.0455	SDFT 12 04 AE FN-111	17°	1.5x45° R2	r/l	○	●	●	○	●	●	○	●
	AlCrN	1291.0465	SDFT 12 04 AE FN-111	17°	1.5x45° R2	r/l	○	●	●	●	●	●	●	●
Carbide 12CR	**TiAlN**	1291.0470	SDHT 12 04 AE FN-222	11°	1.5x45° R2	r/l	○	●	●	○	●	●	○	●
	AlCrN	1291.0480	SDHT 12 04 AE FN-222	11°	1.5x45° R2	r/l	○	●	●	●	●	○	●	○
		1291.0680	SDFT 12 04 AE FN-223	5°	1.5x45° R2	r/l	○	●	●	●	●	○	●	○
	AlCrN-VA	1291.0685	SDFT 12 04 AE FN-223	5°	1.5x45° R2	r/l	○	●		●	○		●	
	DLC-H	1291.0690	SDFT 12 04 AE FN-223	5°	1.5x45° R2	r/l	○	●			○	●		●
Ceramic KG14	**AlCrN-K**	1292.0225	SDFT 12 04 AE FN-851	0°	1.5x45° R2	r/l		●			●			

Fitting instructions for inserts see page 126

Kühl-Schmierstoff-Verteilring (KSSV)
Ring for the lubricant distribution on the tool face (KSSV)
Bague de serrage qui distribue également le lubrifiant (KSSV)

Nr. / No. / No	Dimension	
1320.0100 - 1320.0111	Ø 30 x 17 x 14	1320.0200 M10x35 50 Nm
1320.0115 - 1320.0120	Ø 38 x 25 x 16	1320.0205 M12x45 90 Nm
1320.0125 - 1320.0130	Ø 44 x 22 x 20	1320.0210 M16x50 160 Nm
1320.0135 - 1320.0150	Ø 56 x 31.5 x 28	1320.0215 M20x60 230 Nm

Overview of all indexable inserts see page 107 and following.

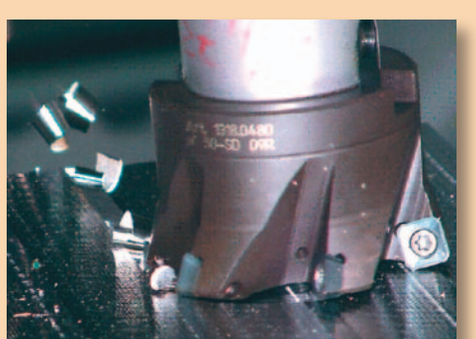
High feed milling

ALESA SPEED

The characteristics

- High Performance Cutting for modern 5-axis machines
- SWISS Precision Tool. The milling head and cutting inserts are manufactured in Switzerland
- Kappa angle 15°, high rough performance
- The peeling cutting process is very spindle and machine-friendly
- The sharp edges and the arrangement of the cutting inserts generate spindle-friendly cutting forces, which work mainly axially
- All tools are provided with cooling holes
  With center cooling in addition
- The best PVD coatings are available
- HSS and carbide cutting inserts with various cutting geometries available from the warehouse

The benefits and options for you



- Fast delivery from the Seengen warehouse
- The proved and tested SD 09 or SD 12 cutting insert can be used. 4 cutting edges per cutting insert are very effective
- Ø 12 mm to Ø 25 mm are available as Weldon and a screw-in toolholder
- Arbor milling cutters in the range Ø 32 mm to Ø 83 mm
- For the large range of materials, the economical cutting inserts with 3 available cutting geometries can be chosen
- Carbide grades are available for dry and wet processing
  Unique to ALESA Ltd., the HSS cutting inserts are also available
- HSS is reliable and efficient with many applications
- Process-safe and high removal rate (Q) with a relatively small machine load
- Good tool life and high productivity
- The high-feed tools are used in applications with large 6xD - 10xD tool extensions
- Suitable for circular plunging into solid material for holes from Ø 27 mm (SD 09) to Ø 206 mm (SD 12)
- Excellent for pockets and free-form shapes
- Excellent machining properties also with the most difficult Duplex, Ni-, and Ti- alloys
- Manufactured according to ISO certified processes
- For special tools, our construction with great experience is available

High feed milling

ALESA TWIST with inserts type 481/581

The characteristics

- Additional benefits of the ALESA TWIST tool holder family
- SWISS Precision Tool. The milling head and cutting inserts are manufactured in Switzerland
- In addition to the profile cutting inserts, high feed cutting inserts type 481/581 are also available
- New milling strategy: small cutting depth (ap) and high-tooth feed
- The sharpened cutting edges require less power than pure sintered high-feed cutting inserts
- The small cutting forces cause less vibrations and are spindle-friendly
- The sharp-ground cutting inserts are optimized for modern 5-axis milling centers
- All ALESA TWIST tools are provided with cooling holes The cooling medium is exactly there where it is needed
- The best PVD coatings are available

The benefits and options for you

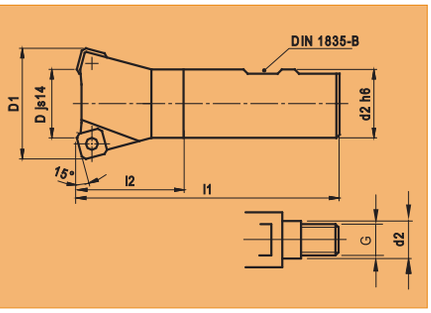
- Fast delivery from the Seengen warehouse
- Ø 16 mm to Ø 40 mm as Weldon
- Ø 16 mm to Ø 32 mm screw-in tools
- Arbor milling cutter Ø 40 mm to Ø 100 mm
- Carbide qualities are present for dry and wet machining processes
- High removal rate (Q) with a relatively small machine load and very good process safety
- The high-feed tools are used in applications with large 6xD - 10xD tool extensions
- Suitable for circular plunging into solid material for holes from Ø 19 mm (AO10) to Ø 200 mm (AO20)
- Excellent for pockets and free-form shapes
- Good tool life and high productivity
- Excellent metal cutting properties with the most difficult Ni-, Ti- and Co- alloys
- Manufactured according to ISO certified processes
- For special tools, our construction with great experience is available

ALESA SPEED end mill and threaded type cutter
SD 09 R 15° / Ø 12 – 25

1352 / 1353

1352.0300

1353.0380



Part No	Type	D mm	D1 mm	l2 mm	G	d2 mm	l1 mm				Accessories kit No	WSP
1352.0240	12-SD 09 SPEED	12	27	26		16.0	75	✓	2	r	1494.0675	SD.T 09 T3
1353.0240	12-SD 09 SPEED	12	27	32	M10	10.5	50	✓	2	r	1494.0675	SD.T 09 T3
1352.0300	16-SD 09 SPEED Z2	16	31	31		20.0	82	✓	2	r	1494.0675	SD.T 09 T3
1352.0305	16-SD 09 SPEED Z3	16	31	33		25.0	90	✓	3	r	1494.0676	SD.T 09 T3
1353.0300	16-SD 09 SPEED Z2	16	31	32	M12	12.5	52	✓	2	r	1494.0675	SD.T 09 T3
1353.0305	16-SD 09 SPEED Z3	16	31	32	M12	12.5	52	✓	3	r	1494.0676	SD.T 09 T3
1352.0380	25-SD 09 SPEED	25	40	39		25.0	96	✓	3	r	1494.0676	SD.T 09 T3
1353.0380	25-SD 09 SPEED	25	40	40	M16	17.0	62	✓	3	r	1494.0676	SD.T 09 T3

Tool will be delivered with holder, all screws and screw-driver, but without indexable inserts.

Accessories / spare parts

Part No	Torx screw				Screw-driver	
	Qty	Article	Type	Torque	Article	Type
1494.0675	2	1490.0290	M3.5x8	2.55 Nm	1492.0500	T 15
1494.0676	3	1490.0290	M3.5x8	2.55 Nm	1492.0500	T 15

Info The flat Kappa angle of around 15° allows a very high feed per tooth.

Info This tool mainly generates forces in axial direction, which allows big protrudings and preserves the spindle.

Info Due to the wide range of SD indexable inserts, the entire material range can also be machined with the SPEED milling cutter.


Face milling


Profile milling

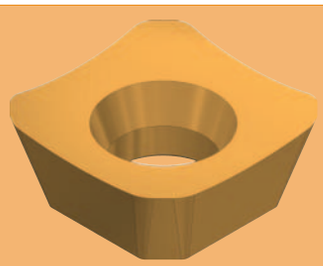

Circulary plunge milling

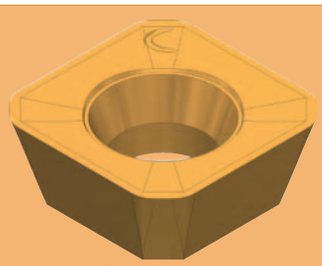

Circular interpolation

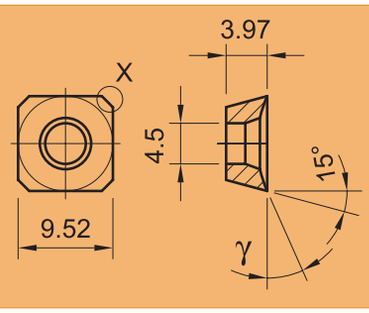

Ramping

ALESA SPEED end mill and threaded type cutter
SD 09 R 15° / Ø 12 – 25

ap = 1.75 mm


SDFT 09

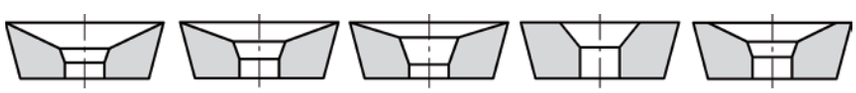

SDFT 09 -223



Cutting material	Coating	Part No	ISO Code	γ	Detail X				Mat. classification 1	2	3	4	5	6
HSS-E	**TiN**	1091.0400	SDFT 09 T3 AE FN	17°	1.2x45° R1.2	r/l	●		○	○		●		●
	TiAlN	1166.0400	SDFT 09 T3 AE FN	17°	1.2x45° R1.2	r/l	●		○	●		●	○	●
Carbide MG20	**TiN**	1291.0400	SDFT 09 T3 AE FN-111	17°	1.2x45° R1.2	r/l	○	●	●	○	●	●		●
	TiAlN	1291.0405	SDFT 09 T3 AE FN-111	17°	1.2x45° R1.2	r/l	○	●	●	○	●	●	○	●
	AlCrN	1291.0415	SDFT 09 T3 AE FN-111	17°	1.2x45° R1.2	r/l	○	●	●	●	●	●	●	●
Carbide 12CR	**TiAlN**	1291.0420	SDHT 09 T3 AE FN-222	11°	1.2x45° R1.2	r/l	○	●	●	○	●	●	○	●
	AlCrN	1291.0430	SDHT 09 T3 AE FN-222	11°	1.2x45° R1.2	r/l	○	●	●	●	●	○	●	○
		1291.0630	SDFT 09 T3 AE FN-223	5°	1.2x45° R1.2	r/l	○	●	●	●	●	○	●	○
	AlCrN-VA	1291.0635	SDFT 09 T3 AE FN-223	5°	1.2x45° R1.2	r/l	○	●		●	○		●	
		1291.0720	SDFT 09 T3 AE FR-223-S	5°	1.2x45° R1.2	r	○	●	●	●	●	○	●	○
	DLC-H	1291.0640	SDFT 09 T3 AE FN-223	5°	1.2x45° R1.2	r/l	○	●			○	●		●
Ceramic KG14	**AlCrN-K**	1292.0200	SDFT 09 T3 AE FN-851	0°	1.2x45° R1.2	r/l		●			●			

Fitting instructions for inserts see page 126.
The additional specification -S of the inserts ISO-code means "finishing insert".

Zusatznummer Wendeschneidplatten ISO-Code (Schneidengeometrie)
Additional number indexable inserts ISO-code (cutting geometry)
Numéro supplémentaire plaquettes amovibles code ISO (géométrie de coupe)


-111 -411 -511

-121 -222 -421 -521 -721

-131 -231 -431 -531 -631

-851

-223

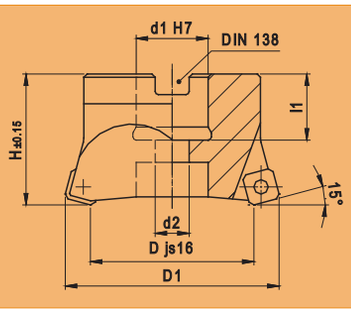
Overview of all indexable inserts see page 107 and following.

ALESA SPEED milling cutter SD 09

SD 09 R 15° / Ø 32 – 50

1318

1318.0460



Part No	Type	D mm	D1 mm	H mm	d1 mm	d2 mm	l1 mm				Accessories kit No	WSP
1318.0420	32-SD 09 SPEED	32	47	32	16.0	8.5	18	✓	4	r	1494.0678	SD.T 09 T3
1318.0460	40-SD 09 SPEED	40	55	40	22.0	11	20	✓	5	r	1494.0685	SD.T 09 T3
1318.0480	50-SD 09 SPEED	50	65	40	22.0	11	20	✓	6	r	1494.0681	SD.T 09 T3

Tool will be delivered with holder, all screws and screw-driver, but without indexable inserts.

Accessories / spare parts

Part No	Torx screw				Screw-driver		Hex socket head screw		
	Qty	Article	Type	Torque	Article	Type	Article	Type	Torque
1494.0678	4	1490.0290	M3.5x8	2.55 Nm	1492.0500	T 15	1490.0759	8 x 20	30 Nm
1494.0681	6	1490.0290	M3.5x8	2.55 Nm	1492.0500	T 15	1490.0770	M 10 x 25	50 Nm
1494.0685	5	1490.0290	M3.5x8	2.55 Nm	1492.0500	T 15	1490.0770	M 10 x 25	50 Nm

Info The flat Kappa angle of around 15° allows a very high feed per tooth.

Info This tool mainly generates forces in axial direction, which allows big protrudings and preserves the spindle.

Info Due to the wide range of SD indexable inserts, the entire material range can also be machined with the SPEED milling cutter.


Face milling


Profile milling


Circulary plunge milling

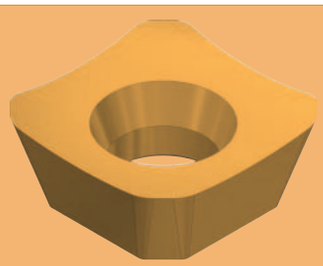

Circular interpolation


Ramping

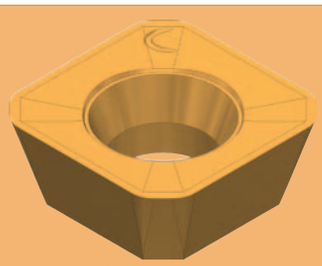
ALESA SPEED milling cutter SD 09

SD 09 R 15° / Ø 32 – 50

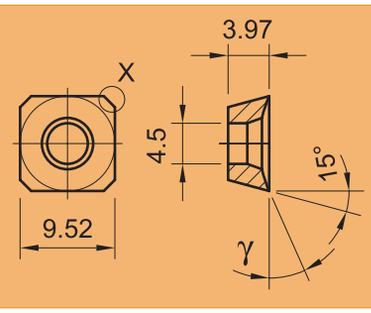
ap = 1.75 mm



SDFT 09



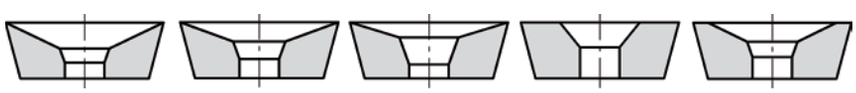
SDFT 09 -223



Cutting material	Coating	Part No	ISO Code	γ	Detail X				Mat. classification 1	2	3	4	5	6
HSS-E	**TiN**	1091.0400	SDFT 09 T3 AE FN	17°	1.2x45° R1.2	r/l	●		○	○		●		●
	TiAlN	1166.0400	SDFT 09 T3 AE FN	17°	1.2x45° R1.2	r/l	●		○	●		●	○	●
Carbide MG20	**TiN**	1291.0400	SDFT 09 T3 AE FN-111	17°	1.2x45° R1.2	r/l	○	●	●	○	●	●		●
	TiAlN	1291.0405	SDFT 09 T3 AE FN-111	17°	1.2x45° R1.2	r/l	○	●	●	○	●	●	○	●
	AlCrN	1291.0415	SDFT 09 T3 AE FN-111	17°	1.2x45° R1.2	r/l	○	●	●	●	●	●	●	●
Carbide 12CR	**TiAlN**	1291.0420	SDHT 09 T3 AE FN-222	11°	1.2x45° R1.2	r/l	○	●	●	○	●	●	○	●
	AlCrN	1291.0430	SDHT 09 T3 AE FN-222	11°	1.2x45° R1.2	r/l	○	●	●	●	●	○	●	○
		1291.0630	SDFT 09 T3 AE FN-223	5°	1.2x45° R1.2	r/l	○	●	●	●	●	○	●	○
	AlCrN-VA	1291.0635	SDFT 09 T3 AE FN-223	5°	1.2x45° R1.2	r/l	○	●		●	○		●	
		1291.0720	SDFT 09 T3 AE FR-223-S	5°	1.2x45° R1.2	r	○	●	●	●	●	○	●	○
	DLC-H	1291.0640	SDFT 09 T3 AE FN-223	5°	1.2x45° R1.2	r/l	○	●			○	●		●
Ceramic KG14	**AlCrN-K**	1292.0200	SDFT 09 T3 AE FN-851	0°	1.2x45° R1.2	r/l		●			●			

Fitting instructions for inserts see page 126.
The additional specification -S of the inserts ISO-code means "finishing insert".

Zusatznummer Wendeschneidplatten ISO-Code (Schneidengeometrie)
Additional number indexable inserts ISO-code (cutting geometry)
Numéro supplémentaire plaquettes amovibles code ISO (géométrie de coupe)



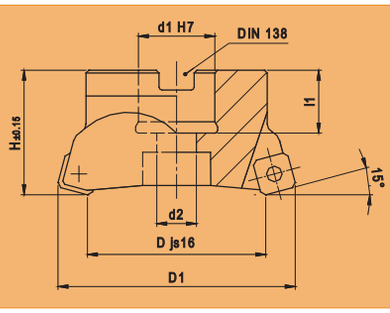
-111 -411 -511 | -121 -222 -421 -521 -721 | -131 -231 -431 -531 -631 | -851 | -223

Overview of all indexable inserts see page 107 and following.

ALESA SPEED milling cutter SD 12
SD 12 R 15° / Ø 50 – 83

1322

1322.0480



Part No	Type	D mm	D1 mm	H mm	d1 mm	d2 mm	l1 mm				Accessories kit No	WSP
1322.0480	D50-SD 12 SPEED	50	70	40	22.0	11	20	✓	5	r	1494.0732	SD.T 12 04
1322.0500	D63-SD 12 SPEED	63	83	45	27.0	14	22	✓	6	r	1494.0734	SD.T 12 04
1322.0530	D83-SD 12 SPEED	83	103	50	32.0	18	25	✓	7	r	1494.0737	SD.T 12 04

Tool will be delivered with holder, all screws and screw-driver, but without indexable inserts.

Accessories / spare parts

Part No	Torx screw				Screw-driver		Hex socket head screw		
	Qty	Article	Type	Torque	Article	Type	Article	Type	Torque
1494.0732	5	1490.0380	M4x11	3.85 Nm	1492.0600	T 20	1490.0770	M 10 x 25	50 Nm
1494.0734	6	1490.0380	M4x11	3.85 Nm	1492.0600	T 20	1490.0780	M 12 x 30	90 Nm
1494.0737	7	1490.0380	M4x11	3.85 Nm	1492.0600	T 20	1490.0789	M 16 x 30	160 Nm

Info The flat Kappa angle of around 15° allows a very high feed per tooth.

Info This tool mainly generates forces in axial direction, which allows big protrudings and preserves the spindle.

Info Due to the wide range of SD indexable inserts, the entire material range can also be machined with the SPEED milling cutter.


Face milling


Profile milling

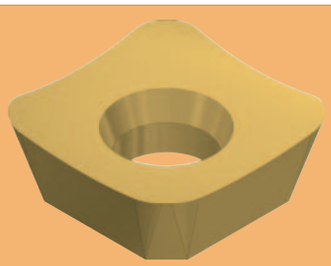

Circulary plunge milling

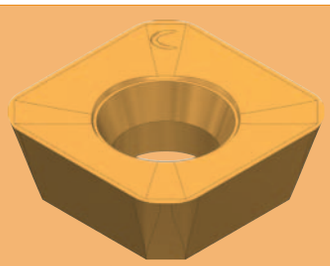

Circular interpolation

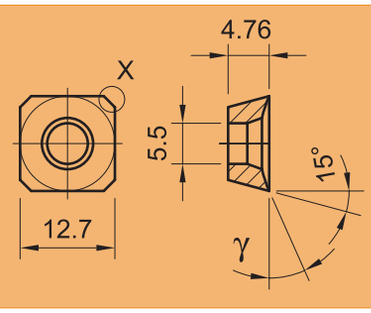

Ramping

ALESA SPEED milling cutter SD 12
SD 12 R 15° / Ø 50 – 83

ap = 2.5 mm


SDFT 12

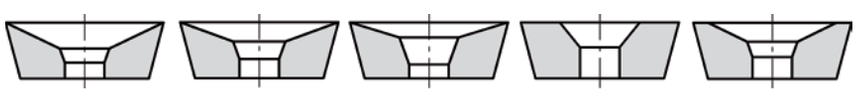

SDFT 12 -223



Cutting material	Coating	Part No	ISO Code	γ	Detail X				Mat. classification 1	2	3	4	5	6
HSS-E	**TiN**	1091.0450	SDFT 12 04 AE FN	17°	1.5x45° R2	r/l	●		○	○		●		●
	TiAlN	1166.0450	SDFT 12 04 AE FN	17°	1.5x45° R2	r/l	●		○	●		●	○	●
Carbide MG20	**TiN**	1291.0450	SDFT 12 04 AE FN-111	17°	1.5x45° R2	r/l	○	●	●	○	●	●		●
	TiAlN	1291.0455	SDFT 12 04 AE FN-111	17°	1.5x45° R2	r/l	○	●	●	○	●	●	○	●
	AlCrN	1291.0465	SDFT 12 04 AE FN-111	17°	1.5x45° R2	r/l	○	●	●	●	●	●	●	●
Carbide 12CR	**TiAlN**	1291.0470	SDHT 12 04 AE FN-222	11°	1.5x45° R2	r/l	○	●	●	○	●	●	○	●
	AlCrN	1291.0480	SDHT 12 04 AE FN-222	11°	1.5x45° R2	r/l	○	●	●	●	●	○	●	○
		1291.0680	SDFT 12 04 AE FN-223	5°	1.5x45° R2	r/l	○	●	●	●	●	○	●	○
	AlCrN-VA	1291.0685	SDFT 12 04 AE FN-223	5°	1.5x45° R2	r/l	○	●		●	○		●	
		1291.0770	SDFT 12 04 AE FR-223-S	5°	1.5x45° R2	r	○	●	●	●	●	○	●	○
	DLC-H	1291.0690	SDFT 12 04 AE FN-223	5°	1.5x45° R2	r/l	○	●			○	●		●
Ceramic KG14	**AlCrN-K**	1292.0225	SDFT 12 04 AE FN-851	0°	1.5x45° R2	r/l		●			●			

Fitting instructions for inserts see page 126.
The additional specification -S of the inserts ISO-code means "finishing insert".

Zusatznummer Wendeschneidplatten ISO-Code (Schneidengeometrie)
Additional number indexable inserts ISO-code (cutting geometry)
Numéro supplémentaire plaquettes amovibles code ISO (géométrie de coupe)


-111 -411 -511

-121 -222 -421 -521 -721

-131 -231 -431 -531 -631

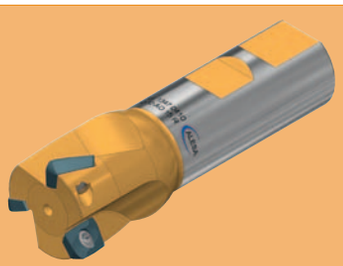
-851

-223

Overview of all indexable inserts see page 107 and following.

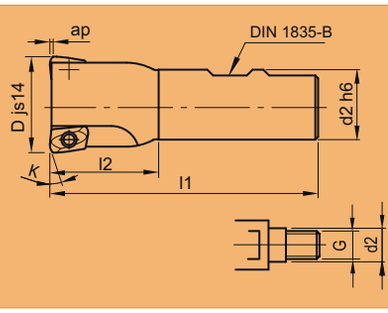
ALESA TWIST high feed cutter
AO 10 / 15 / Ø 16 – 40

1347 / 1348



1347.0410

1348.0418



Part No	Type	D mm	l2 mm	d2 mm	G	l1 mm				Accessories kit No	WSP
1347.0300	16-AO 10 R	16	25	16.0		75	✓	2	r	1494.0550	AOFT 10 03
1348.0300	16-AO 10 R	16	25	8.5	M8	41	✓	2	r	1494.0550	AOFT 10 03
1347.0338	20-AO 10 R Z2	20	30	20.0		82	✓	2	r	1494.0560	AOFT 10 03
1347.0340	20-AO 10 R Z3	20	30	20.0		82	✓	3	r	1494.0561	AOFT 10 03
1348.0340	20-AO 10 R	20	30	10.5	M10	48	✓	3	r	1494.0561	AOFT 10 03
1347.0382	25-AO 10 R	25	38	25.0		96	✓	4	r	1494.0562	AOFT 10 03
1348.0382	25-AO 10 R	25	35	12.5	M12	55	✓	4	r	1494.0562	AOFT 10 03
1347.0378	25-AO 15 R	25	38	20.0		90	✓	2	r	1494.0650	AOFT 15 T3
1347.0380	25-AO 15 R	25	38	25.0		96	✓	2	r	1494.0650	AOFT 15 T3
1348.0380	25-AO 15 R	25	40	12.5	M12	60	✓	2	r	1494.0650	AOFT 15 T3
1348.0422	32-AO 10 R	32	42	17.0	M16	64	✓	5	r	1494.0563	AOFT 10 03
1347.0410	32-AO 15 R Z3	32	38	25.0		96	✓	3	r	1494.0651	AOFT 15 T3
1347.0420	32-AO 15 R Z3	32	38	32.0		100	✓	3	r	1494.0651	AOFT 15 T3
1348.0418	32-AO 15 R Z2	32	44	17.0	M16	66	✓	2	r	1494.0650	AOFT 15 T3
1348.0420	32-AO 15 R Z3	32	44	17.0	M16	66	✓	3	r	1494.0651	AOFT 15 T3
1347.0460	40-AO 15 R Z4	40	48	32.0		110	✓	4	r	1494.0652	AOFT 15 T3

Tool will be delivered with holder, all screws and screw-driver, but without indexable inserts.

Accessories / spare parts

Part No	Torx screw				Screw-driver	
	Qty	Article	Type	Torque	Article	Type
1494.0550	2	1491.0210	M2.5x4	0.95 Nm	1493.0300	TP7 IP
1494.0560	2	1491.0220	M2.5x5	0.95 Nm	1493.0300	TP7 IP
1494.0561	3	1491.0220	M2.5x5	0.95 Nm	1493.0300	TP7 IP
1494.0562	4	1491.0220	M2.5x5	0.95 Nm	1493.0300	TP7 IP
1494.0563	5	1491.0220	M2.5x5	0.95 Nm	1493.0300	TP7 IP
1494.0650	2	1490.0280	M3.5x7	2.55 Nm	1492.0500	T 15
1494.0651	3	1490.0280	M3.5x7	2.55 Nm	1492.0500	T 15
1494.0652	4	1490.0280	M3.5x7	2.55 Nm	1492.0500	T 15

Info The flat Kappa angle of around 15° allows a very high feed per tooth.

Info By exchanging the indexable inserts, this milling tool can also be used as a step milling cutter.

Info This tool mainly generates forces in axial direction, which allows big protrudings and preserves the spindle.

Info The same TWIST milling bodies as for profile milling 90° can be used with 481/581 inserts.


Face milling

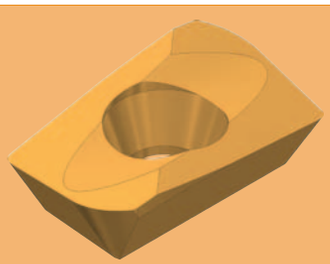

Profile milling


Circulary plunge milling

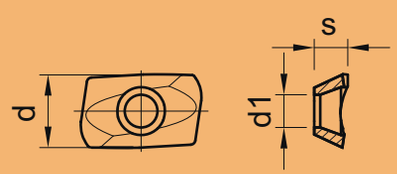

Circular interpolation


Ramping

ALESA TWIST high feed cutter
AO 10 / 15 / Ø 16 – 40



AOFT 481/581



Cutting material	Coating	Part No	ISO Code	d mm	s mm	d1 mm			Mat. classification 1	2	3	4	5	6
Carbide HM	**AlCrN**	1288.0300	AOFT 10 03 ZZ FR-481	7.00	3.35	2.8	●	○	●	●	●	●	●	●
		1288.0310	AOFT 15 T3 ZZ FR-481	9.07	4.00	3.8	●	○	●	●	●	●	●	●
Carbide HM-F	**AlCrN**	1288.0500	AOFT 10 03 ZZ FR-581	7.00	3.35	2.8		●	●	○	●	○		
		1288.0510	AOFT 15 T3 ZZ FR-581	9.07	4.00	3.8		●	●	○	●	○		

Fitting instructions for inserts see page 126

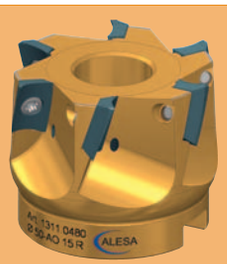
Winkel KAPPA für Wendeschneidplatten Typ 481 und 581
Angle KAPPA for indexable inserts type 481 and 581
Angle KAPPA pour plaquettes amovibles type 481 et 581

ap	AOFT 10	AOFT 15	AOFT 20
0.1 mm	7.50°	-	-
0.2 mm	10.50°	9.10°	-
0.3 mm	**13.00°**	11.20°	9.50°
0.4 mm	**15.00°**	**13.00°**	11.00°
0.5 mm	**16.80°**	**14.50°**	**12.40°**
0.6 mm	**18.50°**	**15.90°**	**13.50°**
0.7 mm	20.00°	**17.20°**	**14.60°**
0.8 mm	-	**18.50°**	**15.70°**
0.9 mm	-	19.60°	**16.70°**
1.0 mm	-	-	17.60°
1.1 mm	-	-	18.50°
Programmierhinweis Recommandation for programming Recommandation de programmation	R 2.5	R 3.5	R 4.5

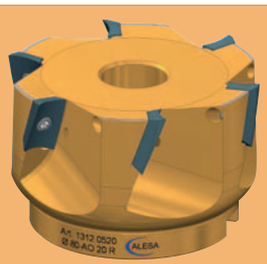
Overview of all indexable inserts see page 107 and following.

ALESA TWIST high feed cutter
AO 10 / 15 / 20 / Ø 32 – 100

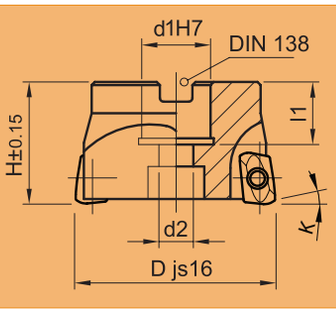
1311 / 1312



1311.0480



1312.0520



Part No	Type	D mm	H mm	d1 mm	d2 mm	l1 mm				Accessories kit No	WSP
1311.0422	32-AO 10 R	32	28	13.0	6.5	15	✓	5	r	1494.0564	AOFT 10 03
1311.0462	40-AO 10 R	40	32	16.0	8.5	18	✓	6	r	1494.0565	AOFT 10 03
1311.0460	40-AO 15 R	40	32	16.0	8.5	18	✓	4	r	1494.0653	AOFT 15 T3
1311.0482	50-AO 10 R	50	40	22.0	11	20	✓	8	r	1494.0566	AOFT 10 03
1311.0480	50-AO 15 R	50	40	22.0	11	20	✓	6	r	1494.0655	AOFT 15 T3
1312.0480	50-AO 20 R	50	40	22.0	11	20	✓	4	r	1494.0713	AOFT 20 04
1311.0500	63-AO 15 R	63	40	22.0	11	20	✓	7	r	1494.0657	AOFT 15 T3
1312.0500	63-AO 20 R	63	40	22.0	11	20	✓	5	r	1494.0714	AOFT 20 04
1311.0520	80-AO 15 R	80	50	27.0	14	22	✓	9	r	1494.0660	AOFT 15 T3
1312.0520	80-AO 20 R	80	50	27.0	14	22	✓	6	r	1494.0715	AOFT 20 04
1312.0540	100-AO 20 R	100	50	32.0	18	25	✓	7	r	1494.0716	AOFT 20 04

Tool will be delivered with holder, all screws and screw-driver, but without indexable inserts.

Accessories / spare parts

Part No	Torx screw				Screw-driver		Hex socket head screw		
	Qty	Article	Type	Torque	Article	Type	Article	Type	Torque
1494.0564	5	1491.0220	M2.5x5	0.95 Nm	1493.0300	TP7 IP	1490.0750	M 6 x 20	10 Nm
1494.0565	6	1491.0220	M2.5x5	0.95 Nm	1493.0300	TP7 IP	1490.0759	M 8 x 20	30 Nm
1494.0566	8	1491.0220	M2.5x5	0.95 Nm	1493.0300	TP7 IP	1490.0770	M 10 x 25	50 Nm
1494.0653	4	1490.0280	M3.5x7	2.55 Nm	1492.0500	T 15	1490.0759	M 8 x 20	30 Nm
1494.0655	6	1490.0280	M3.5x7	2.55 Nm	1492.0500	T 15	1490.0770	M 10 x 25	50 Nm
1494.0657	7	1490.0280	M3.5x7	2.55 Nm	1492.0500	T 15	1490.0770	M 10 x 25	50 Nm
1494.0660	9	1490.0280	M3.5x7	2.55 Nm	1492.0500	T 15	1490.0780	M 12 x 30	90 Nm
1494.0713	4	1490.0360	M4x10	3.85 Nm	1492.0500	T 15	1490.0770	M 10 x 25	50 Nm
1494.0714	5	1490.0360	M4x10	3.85 Nm	1492.0500	T 15	1490.0770	M 10 x 25	50 Nm
1494.0715	6	1490.0360	M4x10	3.85 Nm	1492.0500	T 15	1490.0780	M 12 x 30	90 Nm
1494.0716	7	1490.0360	M4x10	3.85 Nm	1492.0500	T 15	1490.0789	M 16 x 30	160 Nm

Info The flat Kappa angle of around 15° allows a very high feed per tooth.

Info This tool mainly generates forces in axial direction, which allows big protrudings and preserves the spindle.

Info By exchanging the indexable inserts, this milling tool can also be used as a step milling cutter.

Info The same TWIST milling bodies as for profile milling 90° can be used with 481/581 inserts.


Face milling

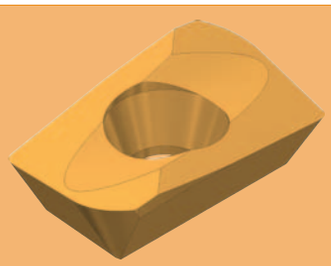

Profile milling


Circulary plunge milling

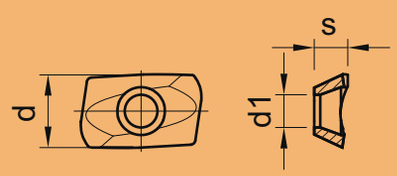

Circular interpolation


Ramping

ALESA TWIST high feed cutter
AO 10 / 15 / 20 / Ø 32 – 100



AOFT 481/581



Cutting material	Coating	Part No	ISO Code	d mm	s mm	d1 mm			Mat. classification 1	2	3	4	5	6
Carbide HM	**AlCrN**	1288.0300	AOFT 10 03 ZZ FR-481	7.00	3.35	2.8	●	○	●	●	●	●	●	●
		1288.0310	AOFT 15 T3 ZZ FR-481	9.07	4.00	3.8	●	○	●	●	●	●	●	●
		1288.0325	AOFT 20 04 ZZ FR-481	11.10	4.50	4.5	●	○	●	●	●	●	●	●
Carbide HM-F	**AlCrN**	1288.0500	AOFT 10 03 ZZ FR-581	7.00	3.35	2.8		●	●	○	●	○		
		1288.0510	AOFT 15 T3 ZZ FR-581	9.07	4.00	3.8		●	●	○	●	○		
		1288.0525	AOFT 20 04 ZZ FR-581	11.10	4.50	4.5		●	●	○	●	○		

Fitting instructions for inserts see page 126

Winkel KAPPA für Wendeschneidplatten Typ 481 und 581
Angle KAPPA for indexable inserts type 481 and 581
Angle KAPPA pour plaquettes amovibles type 481 et 581

ap	AOFT 10	AOFT 15	AOFT 20
0.1 mm	7.50°	-	-
0.2 mm	10.50°	9.10°	-
0.3 mm	**13.00°**	11.20°	9.50°
0.4 mm	**15.00°**	**13.00°**	11.00°
0.5 mm	**16.80°**	**14.50°**	**12.40°**
0.6 mm	**18.50°**	**15.90°**	**13.50°**
0.7 mm	20.00°	**17.20°**	**14.60°**
0.8 mm	-	**18.50°**	**15.70°**
0.9 mm	-	19.60°	**16.70°**
1.0 mm	-	-	17.60°
1.1 mm	-	-	18.50°
Programmierhinweis Recommandation for programming Recommandation de programmation	R 2.5	R 3.5	R 4.5

Overview of all indexable inserts see page 107 and following.

Milling with button inserts

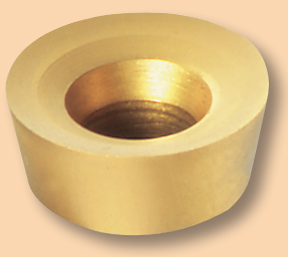
ALESA RP 12

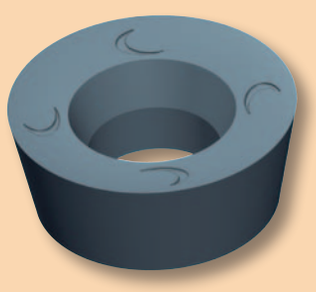
The characteristics

- THE classic of bolted button insert tools with RP 12 cutting inserts
- High positive ALESA sharp-ground inserts
- SWISS Precision Tool. The milling head and cutting inserts are manufactured in Switzerland
- Robust and proven solution according to DIN
- The sharp edges require less spindle power than pure sintered cutting insert
- The sharp-ground cutting inserts are optimized for modern 5-axis milling centers
- The RP 12 tools Ø 40 mm to Ø100 mm are equipped with cooling holes for internal coolant supply
- The RP 12 tools with Ø 125 mm and Ø 160 mm can be provided with coolant distribution rings, which contain an internal coolant supply
- The best PVD coatings are available
- HSS and carbide cutting inserts are available from the warehouse

The benefits and options for you

- Fast delivery from the Seengen warehouse
- Arbor type from Ø 40 mm to Ø 160 mm
- With 3 cutting geometries a very large range of materials can be processed
- HSS cutting inserts with TiN and TiAlN coatings are safe and efficient for the processing of many applications
- High chip removal rate (Q) with a relatively small machine load
- Good tool life and high productivity
- RP 12 cutting inserts are very efficient for face milling at cutting depths (ap) up to 2 mm
- The latest developments show excellent cutting processes with the most difficult Ni-, Ti- and Co- alloys
- Manufactured according to ISO certified processes
- For special tools, our construction with large experience is available





Milling with button inserts

ALESA RP 06/08/10

ALESA threaded type cutter RP 06/08/10

- Like the RP round insert cutter, the threaded type cutters are also available for inserts 06 / 08 and 10
- All ALESA's cutting inserts are high positive and sharp ground
- SWISS Precision Tool. The heads and cutting inserts are manufactured in Switzerland
- The sharp edges create less cutting forces and require less spindle performance than pure sintered cutting inserts
- The sharp ground cutting inserts are optimized for modern 5-axis milling centers
- The RD threaded type cutters are available from the warehouse in Ø 12 mm with RD 06, in Ø 16 mm with RD 08 and in Ø 20 mm with RD 10
- For the carbide RD cutting inserts, different powerful PVD coatings are available
- Fast delivery from the Seengen warehouse
- Manufactured according to ISO certified processes
- For special tools, our construction with great experience is available

ALESA RP 06/08/10

- Based on the classic button inserts, ALESA also delivers RP cutting inserts in sizes 06 / 08 and 10
- All ALESA's cutting inserts are high positive and sharp ground
- SWISS Precision Tool. The milling heads and cutting inserts are manufactured in Switzerland
- The sharp edges create less cutting forces and require less spindle power than pure sintered milling inserts
- The sharp ground cutting inserts are optimized for modern 5-axis milling centers
- The RP Weldon end mills are available from the warehouse in the Ø 16 mm and Ø 20 mm with RP 06, in Ø 25 mm with RP 08 and in Ø 32 mm with RP 10
- All RP tools are provided with coolant holes for internal coolant supply
- The best PVD coatings are available
- The RP cutting inserts are available in HSS and carbide

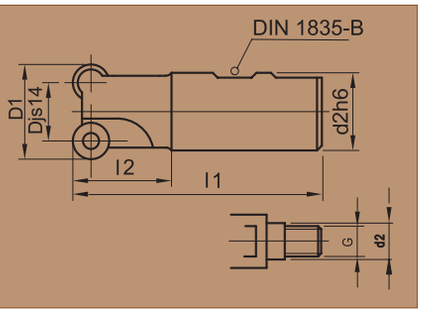
ALESA end mill and threaded type cutter RP

RP 06 / 08 / 10 R / Ø 16 – 32

1326 / 1327

1327.0380

1326.0300



Part No	Type	D mm	D1 mm	l2 mm	G	d2 mm	l1 mm				Accessories kit No	WSP
1326.0240	12-RP 06 R	6	12	20	M6	6.5	33	✓	2	r	1494.0550	RPFT 06 02
1327.0300	16-RP 06 R	10	16	58		16.0	108	✓	2	r	1494.0560	RPFT 06 02
1326.0300	16-RP 08 R	8	16	25	M8	8.5	41	✓	2	r	1494.0620	RPFT 08 03
1327.0340	20-RP 06 R	14	20	58		20.0	110	✓	3	r	1494.0561	RPFT 06 02
1326.0340	20-RP 10 R	10	20	30	M10	10.5	48	✓	2	r	1494.0700	RPFT 10 T3
1327.0380	25-RP 08 R	17	25	68		25.0	126	✓	3	r	1494.0620	RPFT 08 03
1327.0420	32-RP 10 R	22	32	68		32.0	130	✓	3	r	1494.0705	RPFT 10 T3

Tool will be delivered with holder, all screws and screw-driver, but without indexable inserts.

Accessories / spare parts

Part No	Torx screw				Screw-driver	
	Qty	Article	Type	Torque	Article	Type
1494.0550	2	1491.0210	M2.5x4	0.95 Nm	1493.0300	TP7 IP
1494.0560	2	1491.0220	M2.5x5	0.95 Nm	1493.0300	TP7 IP
1494.0561	3	1491.0220	M2.5x5	0.95 Nm	1493.0300	TP7 IP
1494.0620	3	1490.0240	M3x6	1.65 Mm	1492.0400	T 9
1494.0700	2	1490.0320	M4x6	3.85 Nm	1492.0500	T 15
1494.0705	3	1490.0340	M4x8	3.85 Nm	1492.0500	T 15

WSP All ALESA indexable inserts are ground in the high ISO standard tolerance classification F.

Holes for internal coolant supply guarantee ideal cooling.

Highly positive, extremely sharp cutting edge of HSS-E and carbide.

Face milling

Circulary plunge milling

Circular interpolation

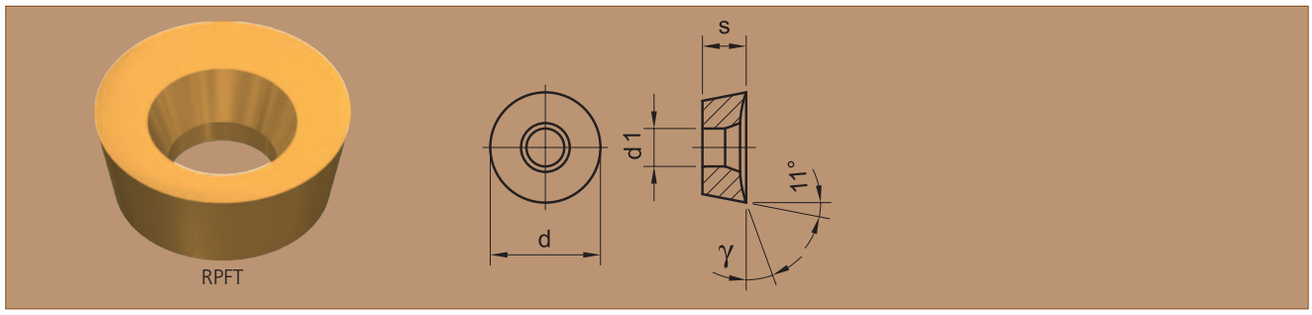
Ramping

Profiling

ALESA end mill and threaded type cutter RP

RP 06 / 08 / 10 R / Ø 16 – 32

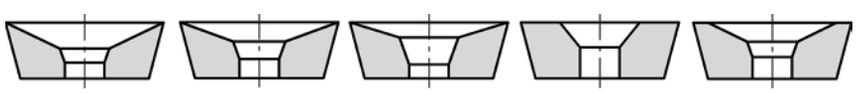
ap = 3/4/5 mm



Cutting material	Coating	Part No	ISO Code	d mm	s mm	d1 mm	γ				Mat. classification 1	2	3	4	5	6
HSS-E	**TiN**	1076.0200	RPFT 06 02 M0	6.00	2.38	3.0	20°	r/l	●		○	○		●		●
		1076.0240	RPFT 08 03 M0	8.00	3.18	3.6	20°	r/l	●		○	○		●		●
		1076.0300	RPFT 10 T3 M0	10.00	3.97	4.5	20°	r/l	●		○	○		●		●
	TiAlN	1151.0200	RPFT 06 02 M0	6.00	2.38	3.0	20°	r/l	●		○	●		●	○	●
		1151.0240	RPFT 08 03 M0	8.00	3.18	3.6	20°	r/l	●		○	●		●	○	●
		1151.0300	RPFT 10 T3 M0	10.00	3.97	4.5	20°	r/l	●		○	●		●	○	●
Carbide MG20	**TiN**	1276.0200	RPFT 06 02 M0-111	6.00	2.38	3.0	20°	r/l	○	●	●	○	●	●		●
		1276.0240	RPFT 08 03 M0-111	8.00	3.18	3.6	20°	r/l	○	●	●	○	●	●		●
		1276.0300	RPFT 10 T3 M0-111	10.00	3.97	4.5	20°	r/l	○	●	●	○	●	●		●
	TiAlN	1276.0205	RPFT 06 02 M0-111	6.00	2.38	3.0	20°	r/l	○	●	●	○	●	●	○	●
		1276.0245	RPFT 08 03 M0-111	8.00	3.18	3.6	20°	r/l	○	●	●	○	●	●	○	●
		1276.0305	RPFT 10 T3 M0-111	10.00	3.97	4.5	20°	r/l	○	●	●	○	●	●	○	●
	AlCrN	1276.0215	RPFT 06 02 M0-111	6.00	2.38	3.0	20°	r/l	○	●	●	●	●	○	●	●
		1276.0217	RPFT 06 02 M0-131	6.00	2.38	3.0	8°	r/l	○	●	●	●	●	○	●	○
		1276.0255	RPFT 08 03 M0-111	8.00	3.18	3.6	20°	r/l	○	●	●	●	●	○	●	●
		1276.0257	RPFT 08 03 M0-131	8.00	3.18	3.6	8°	r/l	○	●	●	●	●	○	●	○
		1276.0315	RPFT 10 T3 M0-111	10.00	3.97	4.5	20°	r/l	○	●	●	●	●	○	●	●
		1276.0317	RPFT 10 T3 M0-131	10.00	3.97	4.5	8°	r/l	○	●	●	●	●	○	●	○
	AlCrN-VA	1276.0222	RPFT 06 02 M0-131	6.00	2.38	3.0	8°	r/l	○	●		●	○		●	
		1276.0262	RPFT 08 03 M0-131	8.00	3.18	3.6	8°	r/l	○	●		●	○		●	
		1276.0322	RPFT 10 T3 M0-131	10.00	3.97	4.5	8°	r/l	○	●		●	○		●	

Fitting instructions for inserts see page 126

Zusatznummer Wendeschneidplatten ISO-Code (Schneidengeometrie)
Additional number indexable inserts ISO-code (cutting geometry)
Numéro supplémentaire plaquettes amovibles code ISO (géométrie de coupe)



-111 -411 -511 | -121 -222 -421 -521 -721 | -131 -231 -431 -531 -631 | -851 | -223

Overview of all indexable inserts see page 107 and following.

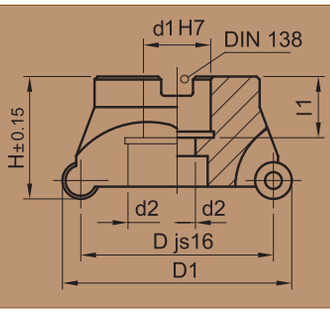
ALESA milling cutter RP

RP 12 R / Ø 40 – 160

1301

1301.0520

KSSV



Part No	Type	D mm	D1 mm	H mm	d1 mm	d2 mm	l1 mm				Accessories kit No	Ring No	WSP
1301.0460	40-RP 12 R	40	52	32	16.0	8.5	18	✓	4	r	1494.0730		RP.T 12 04
1301.0480	50-RP 12 R	50	62	40	22.0	11	20	✓	4	r	1494.0731		RP.T 12 04
1301.0500	63-RP 12 R	63	75	40	22.0	11	20	✓	5	r	1494.0732		RP.T 12 04
1301.0520	80-RP 12 R	80	92	50	27.0	14	22	✓	6	r	1494.0734		RP.T 12 04
1301.0540	100-RP 12 R	100	112	50	32.0	18	25	✓	7	r	1494.0737		RP.T 12 04
1301.0560	125-RP 12 R	125	137	63	40.0	56	28	✓	8	r	1494.0738	1320.0135	RP.T 12 04
1301.0580	160-RP 12 R	160	172	63	40.0	56	28	✓	10	r	1494.0740	1320.0145	RP.T 12 04

Tool will be delivered with holder, all screws and screw-driver, but without indexable inserts.

Ring for the lubricant distribution on the tool face (KSSV)

Nr. / No. / No	Dimension			
1320.0135	Ø 56 x 31.5 x 28	1320.0215	M20x60	230 Nm
1320.0145	Ø 56 x 31.5 x 28	1320.0215	M20x60	230 Nm

Accessories / spare parts

Part No	Torx screw				Screw-driver		Hex socket head screw		
	Qty	Article	Type	Torque	Article	Type	Article	Type	Torque
1494.0730	4	1490.0380	M4x11	3.85 Nm	1492.0600	T 20	1490.0759	M 8 x 20	30 Nm
1494.0731	4	1490.0380	M4x11	3.85 Nm	1492.0600	T 20	1490.0770	M 10 x 25	50 Nm
1494.0732	5	1490.0380	M4x11	3.85 Nm	1492.0600	T 20	1490.0770	M 10 x 25	50 Nm
1494.0734	6	1490.0380	M4x11	3.85 Nm	1492.0600	T 20	1490.0780	M 12 x 30	90 Nm
1494.0737	7	1490.0380	M4x11	3.85 Nm	1492.0600	T 20	1490.0789	M 16 x 30	160 Nm
1494.0738	8	1490.0380	M4x11	3.85 Nm	1492.0600	T 20			
1494.0740	10	1490.0380	M4x11	3.85 Nm	1492.0600	T 20			

WSP All ALESA indexable inserts are ground in the high ISO standard tolerance classification F.

Holes for internal coolant supply guarantee ideal cooling.


Face milling


Circulary plunge milling

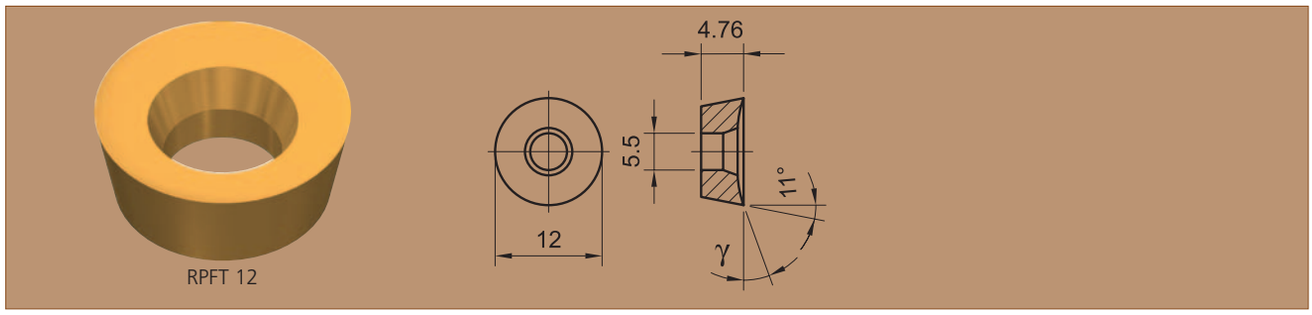

Circular interpolation


Ramping


Profiling

ALESA milling cutter RP
RP 12 R / Ø 40 – 160

ap = 6 mm

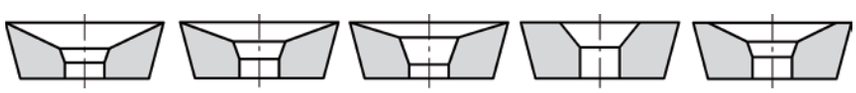


RPFT 12

Cutting material	Coating	Part No	ISO Code	γ				Mat. classification 1	2	3	4	5	6
HSS-E	**TiN**	1076.0400	RPFT 12 04 M0	20°	r/l	●		○	○		●		●
		1076.0410	RPFT 12 04 M0	30°	r/l	●		○	○		●		●
	TiAlN	1151.0400	RPFT 12 04 M0	20°	r/l	●		○	●		●	○	●
		1151.0410	RPFT 12 04 M0	30°	r/l	●		○	●		●	○	●
Carbide MG20	**TiN**	1276.0400	RPFT 12 04 M0-111	20°	r/l	○	●	●	○	●	●		●
	TiAlN	1276.0405	RPFT 12 04 M0-111	20°	r/l	○	●	●	○	●	●	○	●
	AlCrN	1276.0415	RPFT 12 04 M0-111	20°	r/l	○	●	●	●	●	●	●	●
Carbide 12CR	**TiAlN**	1276.0420	RPHT 12 04 M0-222	16°	r/l	○	●	●	○	●	●	○	●
	AlCrN	1276.0430	RPHT 12 04 M0-222	16°	r/l	○	●	●	●	●	○	●	○
		1276.0530	RPFT 12 04 M0-231	6°	r/l	○	●	●	●	●	○	●	○
	AlCrN-VA	1276.0535	RPFT 12 04 M0-231	6°	r/l	○	●		●	○		●	

Fitting instructions for inserts see page 126

Zusatznummer Wendeschneidplatten ISO-Code (Schneidengeometrie)
Additional number indexable inserts ISO-code (cutting geometry)
Numéro supplémentaire plaquettes amovibles code ISO (géométrie de coupe)


-111 -411 -511 | -121 -222 -421 -521 -721 | -131 -231 -431 -531 -631 | -851 | -223

Overview of all indexable inserts see page 107 and following.

Notes

Turning tools

Turning

SR
16 – 32
No 1905
p. 70

SC 06
8 – 10
No 1910
p. 72

SC 09
12 – 16
No 1910
p. 74

SD
10 – 20
No 1920
p. 76

SV 16
25
No 1935
p. 78

SA
12 – 25
No 1940
p. 80

SS
12 – 25
No 1945
p. 82

Turning inside

SC 06 / 09
Ø 8 – 20
No 1917
p. 84

SM
Ø 6 – 8
No 1918
p. 86

SD
Ø 12 – 20
No 1927
p. 88

Toolbits

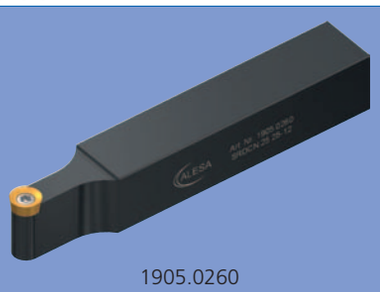
round
Ø 2 – 30
No 4120
p. 90

square
4x4 – 32x32
No 4140
p. 91

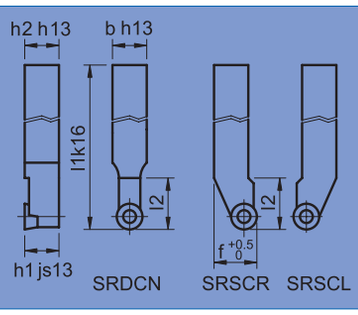
rectangular
6x4 – 32x20
No 4160
p. 92

ALESA toolholder SR for turning
RCFT / 16 – 32

1905



1905.0260



Part No	Type	h2 mm	b mm	l1 mm	h1 mm	f mm	l2 mm	↻	Article	Type	Article	Type	WSP
1905.0200	SRDCN 16 16 06	16	16	100	16		12	n	1491.0220	M2.5x5	1493.0300	TP7 IP	RCFT 06 02
1905.0300	SRSCR 16 16 06	16	16	100	16	20	16	r	1491.0220	M2.5x5	1493.0300	TP7 IP	RCFT 06 02
1905.0305	SRSCL 16 16 06	16	16	100	16	20	16	l	1491.0220	M2.5x5	1493.0300	TP7 IP	RCFT 06 02
1905.0220	SRDCN 20 20 08	20	20	125	20		16	n	1490.0240	M3x6	1492.0400	T 9	RCFT 08 03
1905.0320	SRSCR 20 20 08	20	20	125	20	25	20	r	1490.0240	M3x6	1492.0400	T 9	RCFT 08 03
1905.0325	SRSCL 20 20 08	20	20	125	20	25	20	l	1490.0240	M3x6	1492.0400	T 9	RCFT 08 03
1905.0240	SRDCN 20 20 10	20	20	125	20		22	n	1490.0360	M4x10	1492.0500	T 15	RCFT 10 T3
1905.0340	SRSCR 20 20 10	20	20	125	20	25	20	r	1490.0360	M4x10	1492.0500	T 15	RCFT 10 T3
1905.0345	SRSCL 20 20 10	20	20	125	20	25	20	l	1490.0360	M4x10	1492.0500	T 15	RCFT 10 T3
1905.0260	SRDCN 25 25 12	25	25	150	25		24	n	1490.0400	M5x16	1492.0600	T 20	RCFT 12 04
1905.0360	SRSCR 25 25 12	25	25	150	25	32	25	r	1490.0400	M5x16	1492.0600	T 20	RCFT 12 04
1905.0365	SRSCL 25 25 12	25	25	150	25	32	25	l	1490.0400	M5x16	1492.0600	T 20	RCFT 12 04
1905.0280	SRDCN 32 25 16	32	25	170	32		28	n	1490.0400	M5x16	1492.0600	T 20	RCFT 16 06
1905.0290	SRDCN 32 32 20	32	32	170	32		32	n	1490.0420	M6x18	4390.0540	SW 4	RCFT 20 06
1905.0400*	SRSCR 32 32 20	32	32	170	32	40	32	r	1490.0420	M6x18	4390.0540	SW 4	RCFT 20 06
1905.0405*	SRSCL 32 32 20	32	32	170	32	40	32	l	1490.0420	M6x18	4390.0540	SW 4	RCFT 20 06

*while stocks last

Tool will be delivered with holder, all screws and screw-driver, but without indexable inserts.

Rigid roughing tool with a strong insert for turning.

Good cooling increases tool life.

WSP All ALESA indexable inserts are ground in the high ISO standard tolerance classification F.


Turning

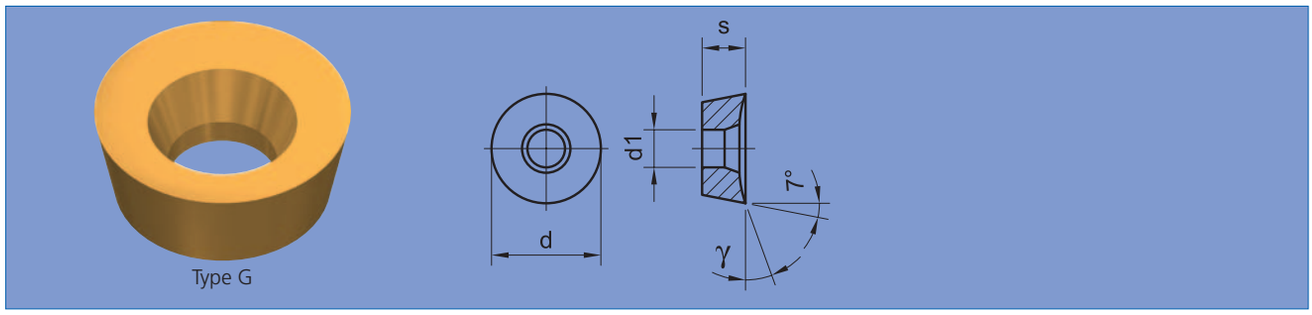

Face turning


Turning a shoulder


Profile turning


Relieving

ALESA toolholder SR for turning
RCFT / 16 – 32



Cutting material	Coating	Part No	ISO Code	Type G/K	d mm	s mm	d1 mm	γ				Mat. classification 1	2	3	4	5	6
HSS-E	**TiN**	1576.0200	RCFT 06 02 M0	G	6.00	2.38	3.0	25°	r/l	●		○	○		●		●
		1576.0240	RCFT 08 03 M0	G	8.00	3.18	3.6	25°	r/l	●		○	○		●		●
		1576.0300	RCFT 10 T3 M0	G	10.00	3.97	4.5	25°	r/l	●		○	○		●		●
		1576.0400	RCFT 12 04 M0	G	12.00	4.76	5.5	25°	r/l	●		○	○		●		●
		1576.0500	RCFT 16 06 M0	G	16.00	6.35	5.5	25°	r/l	●		○	○		●		●
		1576.0600	RCFT 20 06 M0	G	20.00	6.35	6.5	25°	r/l	●		○	○		●		●
	TiAlN	1651.0200	RCFT 06 02 M0	G	6.00	2.38	3.0	25°	r/l	●		○	●		●	○	●
		1651.0240	RCFT 08 03 M0	G	8.00	3.18	3.6	25°	r/l	●		○	●		●	○	●
		1651.0250	RCFT 08 03 M0	G	8.00	3.18	4.5	25°	r/l	●		○	●		●	○	●
		1651.0300	RCFT 10 T3 M0	G	10.00	3.97	4.5	25°	r/l	●		○	●		●	○	●
		1651.0400	RCFT 12 04 M0	G	12.00	4.76	5.5	25°	r/l	●		○	●		●	○	●
		1651.0500	RCFT 16 06 M0	G	16.00	6.35	5.5	25°	r/l	●		○	●		●	○	●
		1651.0600	RCFT 20 06 M0	G	20.00	6.35	6.5	25°	r/l	●		○	●		●	○	●

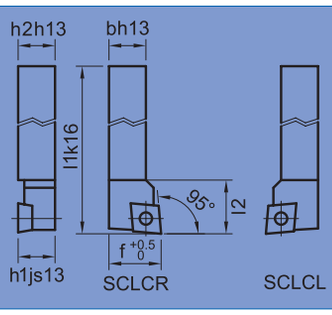
Overview of all indexable inserts see page 107 and following.

ALESA toolholder SC 06 for turning

CCFT 06 / 08 – 10

1910 – 06

1910.0220



Part No	Type	h2 mm	b mm	l1 mm	h1 mm	f mm	l2 mm	↻	Article	Type	Article	Type	WSP
1910.0200	SCLCR 08 08 06	8	8	60	8	10	9	r	1491.0220	M2.5x5	1493.0300	TP7 IP	CCFT 06 02
1910.0205	SCLCL 08 08 06	8	8	60	8	10	9	l	1491.0220	M2.5x5	1493.0300	TP7 IP	CCFT 06 02
1910.0220	SCLCR 10 10 06	10	10	70	10	12	9	r	1491.0220	M2.5x5	1493.0300	TP7 IP	CCFT 06 02
1910.0225	SCLCL 10 10 06	10	10	70	10	12	9	l	1491.0220	M2.5x5	1493.0300	TP7 IP	CCFT 06 02

Tool will be delivered with holder, all screws and screw-driver, but without indexable inserts.

Info The all purpose turning tool

Info The highly positive cutting geometries reduce the cutting forces considerably.

WSP Indexable insert type K for a controlled chip or as chip-breaker.

Info On a holder right: for longitudinal turning use inserts right, for face turning use inserts left. Holder left vice versa.

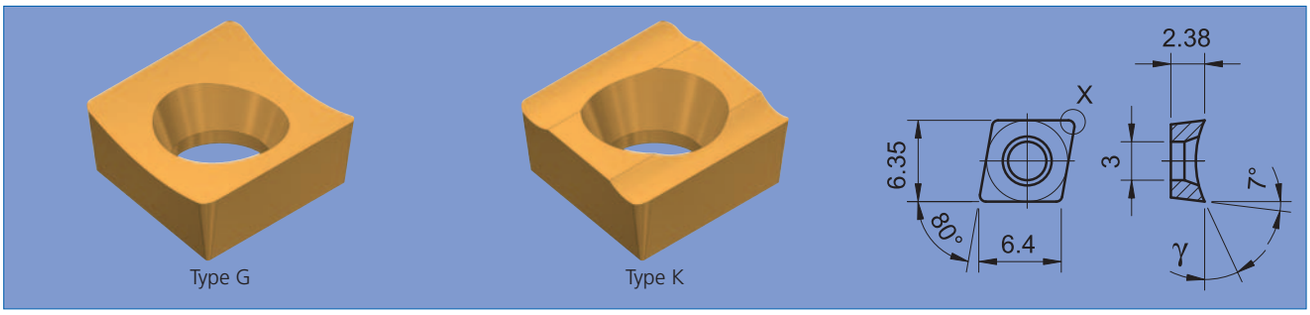

Turning


Face turning


Turning a shoulder

ALESA toolholder SC 06 for turning

CCFT 06 / 08 – 10

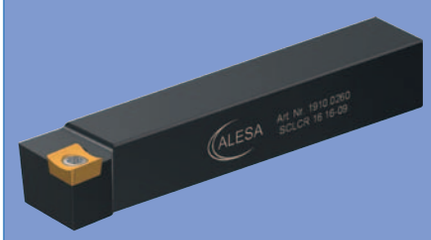


Cutting material	Coating	Part No	ISO Code	Type G/K	γ	Detail X				Mat. classification 1	2	3	4	5	6
HSS-E	**TiN**	1578.0245	CCFT 06 02 01 FR	G	20°	R 0.1	r	●		○	○		●		●
		1578.0247	CCFT 06 02 01 FL	G	20°	R 0.1	l	●		○	○		●		●
		1578.0250	CCFT 06 02 02 FR	G	20°	R 0.2	r	●		○	○		●		●
		1578.0252	CCFT 06 02 02 FL	G	20°	R 0.2	l	●		○	○		●		●
		1578.0255	CCFT 06 02 04 FR	G	20°	R 0.4	r	●		○	○		●		●
		1578.0257	CCFT 06 02 04 FL	G	20°	R 0.4	l	●		○	○		●		●
		1578.0750	CCFT 06 02 02 FR	K	30°	R 0.2	r	●		○	○		●		●
		1578.0752	CCFT 06 02 02 FL	K	30°	R 0.2	l	●		○	○		●		●
		1578.0755	CCFT 06 02 04 FR	K	30°	R 0.4	r	●		○	○		●		●
		1578.0757	CCFT 06 02 04 FL	K	30°	R 0.4	l	●		○	○		●		●
	TiAlN	1653.0245	CCFT 06 02 01 FR	G	20°	R 0.1	r	●		○	●		●	○	●
		1653.0247	CCFT 06 02 01 FL	G	20°	R 0.1	l	●		○	●		●	○	●
		1653.0250	CCFT 06 02 02 FR	G	20°	R 0.2	r	●		○	●		●	○	●
		1653.0252	CCFT 06 02 02 FL	G	20°	R 0.2	l	●		○	●		●	○	●
		1653.0255	CCFT 06 02 04 FR	G	20°	R 0.4	r	●		○	●		●	○	●
		1653.0257	CCFT 06 02 04 FL	G	20°	R 0.4	l	●		○	●		●	○	●
		1653.0750	CCFT 06 02 02 FR	K	30°	R 0.2	r	●		○	●		●	○	●
		1653.0752	CCFT 06 02 02 FL	K	30°	R 0.2	l	●		○	●		●	○	●
		1653.0755	CCFT 06 02 04 FR	K	30°	R 0.4	r	●		○	●		●	○	●
		1653.0757	CCFT 06 02 04 FL	K	30°	R 0.4	l	●		○	●		●	○	●

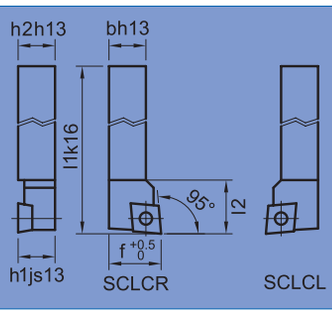
Overview of all indexable inserts see page 107 and following.

ALESA toolholder SC 09 for turning
CCFT 09 / 12 -16

1910 – 09



1910.0260



Part No	Type	h2 mm	b mm	l1 mm	h1 mm	f mm	l2 mm	↻	Article	Type	Article	Type	WSP
1910.0240	SCLCR 12 12 09	12	12	80	12	16	15	r	1490.0340	M4x8	1492.0500	T 15	CCFT 09 T3
1910.0245	SCLCL 12 12 09	12	12	80	12	16	15	l	1490.0340	M4x8	1492.0500	T 15	CCFT 09 T3
1910.0260	SCLCR 16 16 09	16	16	100	16	20	15	r	1490.0340	M4x8	1492.0500	T 15	CCFT 09 T3
1910.0265	SCLCL 16 16 09	16	16	100	16	20	15	l	1490.0340	M4x8	1492.0500	T 15	CCFT 09 T3

Tool will be delivered with holder, all screws and screw-driver, but without indexable inserts.

Info The all purpose turning tool

Info The highly positive cutting geometries reduce the cutting forces considerably.

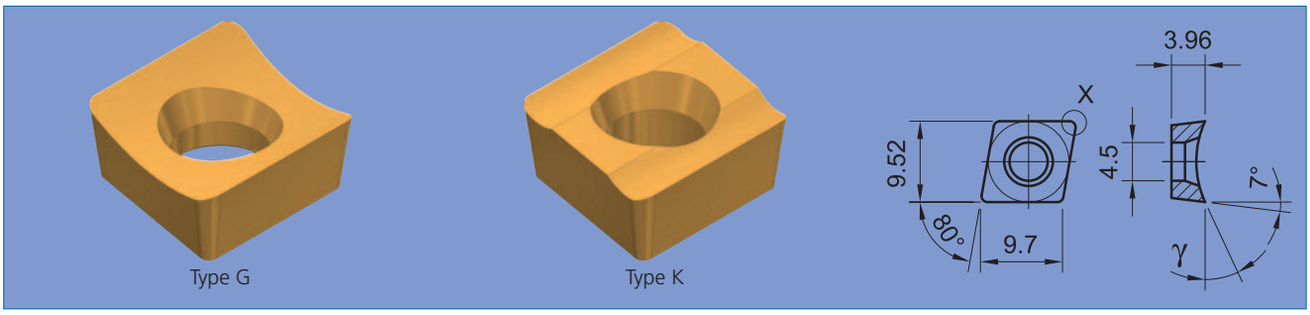
WSP Indexable insert type K for a controlled chip or as chip-breaker.

Info On a holder right: for longitudinal turning use inserts right, for face turning use inserts left. Holder left vice versa.

Turning

Turning a shoulder

ALESA toolholder SC 09 for turning
CCFT 09 / 12 -16

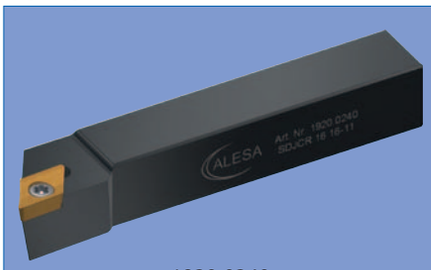


Cutting material	Coating	Part No	ISO Code	Type G/K	γ	Detail X				Mat. classification					
										1	2	3	4	5	6
HSS-E	**TiN**	1578.0350	CCFT 09 T3 02 FR	G	25°	R 0.2	r	●		○	○		●		●
		1578.0352	CCFT 09 T3 02 FL	G	25°	R 0.2	l	●		○	○		●		●
		1578.0355	CCFT 09 T3 04 FR	G	25°	R 0.4	r	●		○	○		●		●
		1578.0357	CCFT 09 T3 04 FL	G	25°	R 0.4	l	●		○	○		●		●
		1578.0360	CCFT 09 T3 08 FR	G	25°	R 0.8	r	●		○	○		●		●
		1578.0362	CCFT 09 T3 08 FL	G	25°	R 0.8	l	●		○	○		●		●
		1578.0855	CCFT 09 T3 04 FR	K	30°	R 0.4	r	●		○	○		●		●
		1578.0857	CCFT 09 T3 04 FL	K	30°	R 0.4	l	●		○	○		●		●
		1578.0860	CCFT 09 T3 08 FR	K	30°	R 0.8	r	●		○	○		●		●
		1578.0862	CCFT 09 T3 08 FL	K	30°	R 0.8	l	●		○	○		●		●
	TiAlN	1653.0350	CCFT 09 T3 02 FR	G	25°	R 0.2	r	●		○	●		●	○	●
		1653.0352	CCFT 09 T3 02 FL	G	25°	R 0.2	l	●		○	●		●	○	●
		1653.0355	CCFT 09 T3 04 FR	G	25°	R 0.4	r	●		○	●		●	○	●
		1653.0357	CCFT 09 T3 04 FL	G	25°	R 0.4	l	●		○	●		●	○	●
		1653.0360	CCFT 09 T3 08 FR	G	25°	R 0.8	r	●		○	●		●	○	●
		1653.0362	CCFT 09 T3 08 FL	G	25°	R 0.8	l	●		○	●		●	○	●
		1653.0855	CCFT 09 T3 04 FR	K	30°	R 0.4	r	●		○	●		●	○	●
		1653.0857	CCFT 09 T3 04 FL	K	30°	R 0.4	l	●		○	●		●	○	●
		1653.0860	CCFT 09 T3 08 FR	K	30°	R 0.8	r	●		○	●		●	○	●
		1653.0862	CCFT 09 T3 08 FL	K	30°	R 0.8	l	●		○	●		●	○	●

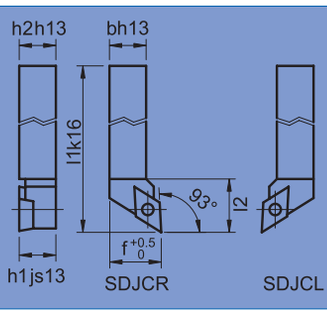
Overview of all indexable inserts see page 107 and following.

ALESA toolholder SD for turning
DCFT / 10 – 20

1920



1920.0240



Part No	Type	h2 mm	b mm	l1 mm	h1 mm	f mm	l2 mm	↻	Article	Type	Article	Type	WSP
1920.0200	SDJCR 10 10 07	10	10	70	10	12	13	r	1491.0220	M2.5x5	1493.0300	TP7 IP	DCFT 07 02
1920.0205	SDJCL 10 10 07	10	10	70	10	12	13	l	1491.0220	M2.5x5	1493.0300	TP7 IP	DCFT 07 02
1920.0220	SDJCR 12 12 11	12	12	80	12	16	22	r	1490.0360	M4x10	1492.0500	T 15	DCFT 11 T3
1920.0225	SDJCL 12 12 11	12	12	80	12	16	22	l	1490.0360	M4x10	1492.0500	T 15	DCFT 11 T3
1920.0240	SDJCR 16 16 11	16	16	100	16	20	25	r	1490.0360	M4x10	1492.0500	T 15	DCFT 11 T3
1920.0245	SDJCL 16 16 11	16	16	100	16	20	25	l	1490.0360	M4x10	1492.0500	T 15	DCFT 11 T3
1920.0260	SDJCR 20 20 11	20	20	125	20	25	25	r	1490.0360	M4x10	1492.0500	T 15	DCFT 11 T3
1920.0265	SDJCL 20 20 11	20	20	125	20	25	25	l	1490.0360	M4x10	1492.0500	T 15	DCFT 11 T3

Tool will be delivered with holder, all screws and screw-driver, but without indexable inserts.

Info Ideal cutting geometries and coating for stainless and acidproof steels with a high nickel and chrome content.

Info The perfect tool for profile turning and finishing.

Good cooling increases tool life.

WSP Indexable insert type K for a controlled chip or as chip-breaker.

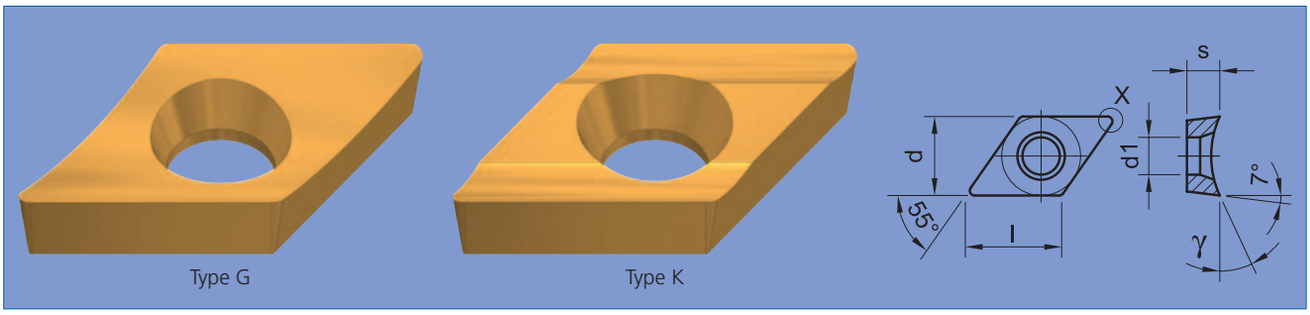

Turning


Turning a shoulder


Profile turning


Relieving

ALESA toolholder SD for turning
DCFT / 10 – 20

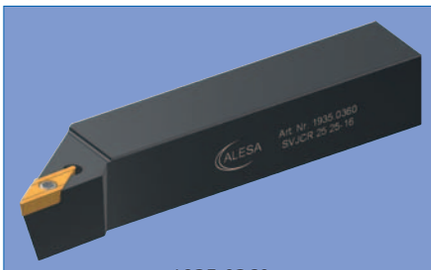


Cutting material	Coating	Part No	ISO Code	Type G/K	d mm	s mm	l mm	d1 mm	γ	Detail X		Mat. classification 1	2	3	4	5	6
HSS-E	**TiN**	1579.0245	DCFT 07 02 01 FR	G	6.35	2.38	7.75	3.0	20°	R 0.1	r	○	○		●		●
		1579.0247	DCFT 07 02 01 FL	G	6.35	2.38	7.75	3.0	20°	R 0.1	l	○	○		●		●
		1579.0250	DCFT 07 02 02 FR	G	6.35	2.38	7.75	3.0	20°	R 0.2	r	○	○		●		●
		1579.0252	DCFT 07 02 02 FL	G	6.35	2.38	7.75	3.0	20°	R 0.2	l	○	○		●		●
		1579.0255	DCFT 07 02 04 FR	G	6.35	2.38	7.75	3.0	20°	R 0.4	r	○	○		●		●
		1579.0257	DCFT 07 02 04 FL	G	6.35	2.38	7.75	3.0	20°	R 0.4	l	○	○		●		●
		1579.0355	DCFT 11 T3 04 FR	G	9.52	3.96	11.60	4.5	25°	R 0.4	r	○	○		●		●
		1579.0357	DCFT 11 T3 04 FL	G	9.52	3.96	11.60	4.5	25°	R 0.4	l	○	○		●		●
		1579.0360	DCFT 11 T3 08 FR	G	9.52	3.96	11.60	4.5	25°	R 0.8	r	○	○		●		●
		1579.0362	DCFT 11 T3 08 FL	G	9.52	3.96	11.60	4.5	25°	R 0.8	l	○	○		●		●
		1579.0750	DCFT 07 02 02 FR	K	6.35	2.38	7.75	3.0	30°	R 0.2	r	○	○		●		●
		1579.0752	DCFT 07 02 02 FL	K	6.35	2.38	7.75	3.0	30°	R 0.2	l	○	○		●		●
		1579.0755	DCFT 07 02 04 FR	K	6.35	2.38	7.75	3.0	30°	R 0.4	r	○	○		●		●
		1579.0757	DCFT 07 02 04 FL	K	6.35	2.38	7.75	3.0	30°	R 0.4	l	○	○		●		●
		1579.0855	DCFT 11 T3 04 FR	K	9.52	3.96	11.60	4.5	30°	R 0.4	r	○	○		●		●
		1579.0857	DCFT 11 T3 04 FL	K	9.52	3.96	11.60	4.5	30°	R 0.4	l	○	○		●		●
		1579.0860	DCFT 11 T3 08 FR	K	9.52	3.96	11.60	4.5	30°	R 0.8	r	○	○		●		●
		1579.0862	DCFT 11 T3 08 FL	K	9.52	3.96	11.60	4.5	30°	R 0.8	l	○	○		●		●
	TiAlN	1654.0245	DCFT 07 02 01 FR	G	6.35	2.38	7.75	3.0	20°	R 0.1	r	○	●		●	○	●
		1654.0247	DCFT 07 02 01 FL	G	6.35	2.38	7.75	3.0	20°	R 0.1	l	○	●		●	○	●
		1654.0250	DCFT 07 02 02 FR	G	6.35	2.38	7.75	3.0	20°	R 0.2	r	○	●		●	○	●
		1654.0252	DCFT 07 02 02 FL	G	6.35	2.38	7.75	3.0	20°	R 0.2	l	○	●		●	○	●
		1654.0255	DCFT 07 02 04 FR	G	6.35	2.38	7.75	3.0	20°	R 0.4	r	○	●		●	○	●
		1654.0257	DCFT 07 02 04 FL	G	6.35	2.38	7.75	3.0	20°	R 0.4	l	○	●		●	○	●
		1654.0355	DCFT 11 T3 04 FR	G	9.52	3.96	11.60	4.5	25°	R 0.4	r	○	●		●	○	●
		1654.0357	DCFT 11 T3 04 FL	G	9.52	3.96	11.60	4.5	25°	R 0.4	l	○	●		●	○	●
		1654.0360	DCFT 11 T3 08 FR	G	9.52	3.96	11.60	4.5	25°	R 0.8	r	○	●		●	○	●
		1654.0362	DCFT 11 T3 08 FL	G	9.52	3.96	11.60	4.5	25°	R 0.8	l	○	●		●	○	●
		1654.0750	DCFT 07 02 02 FR	K	6.35	2.38	7.75	3.0	30°	R 0.2	r	○	●		●	○	●
		1654.0752	DCFT 07 02 02 FL	K	6.35	2.38	7.75	3.0	30°	R 0.2	l	○	●		●	○	●
		1654.0755	DCFT 07 02 04 FR	K	6.35	2.38	7.75	3.0	30°	R 0.4	r	○	●		●	○	●
		1654.0757	DCFT 07 02 04 FL	K	6.35	2.38	7.75	3.0	30°	R 0.4	l	○	●		●	○	●
		1654.0855	DCFT 11 T3 04 FR	K	9.52	3.96	11.60	4.5	30°	R 0.4	r	○	●		●	○	●
		1654.0857	DCFT 11 T3 04 FL	K	9.52	3.96	11.60	4.5	30°	R 0.4	l	○	●		●	○	●
		1654.0860	DCFT 11 T3 08 FR	K	9.52	3.96	11.60	4.5	30°	R 0.8	r	○	●		●	○	●
		1654.0862	DCFT 11 T3 08 FL	K	9.52	3.96	11.60	4.5	30°	R 0.8	l	○	●		●	○	●

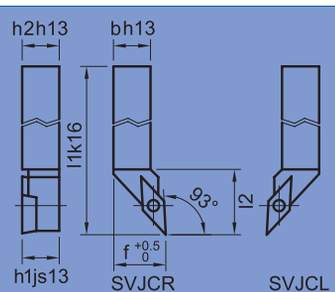
Overview of all indexable inserts see page 107 and following.

ALESA toolholder SV 16 for turning
VCFT 16 / 25

1935



1935.0360



Part No	Type	h2 mm	b mm	l1 mm	h1 mm	f mm	l2 mm		Article	Type	Article	Type	WSP
1935.0360	SVJCR 25 25 16	25	25	150	25	32	36	r	1490.0360	M4x10	1492.0500	T 15	VCFT 16 04
1935.0365	SVJCL 25 25 16	25	25	150	25	32	36	l	1490.0360	M4x10	1492.0500	T 15	VCFT 16 04

Tool will be delivered with holder, all screws and screw-driver, but without indexable inserts.

Info The classical finishing tool.

Good cooling increases tool life.

WSP Indexable insert type K for a controlled chip or as chip-breaker.

Info The highly positive cutting geometries reduce the cutting forces considerably.

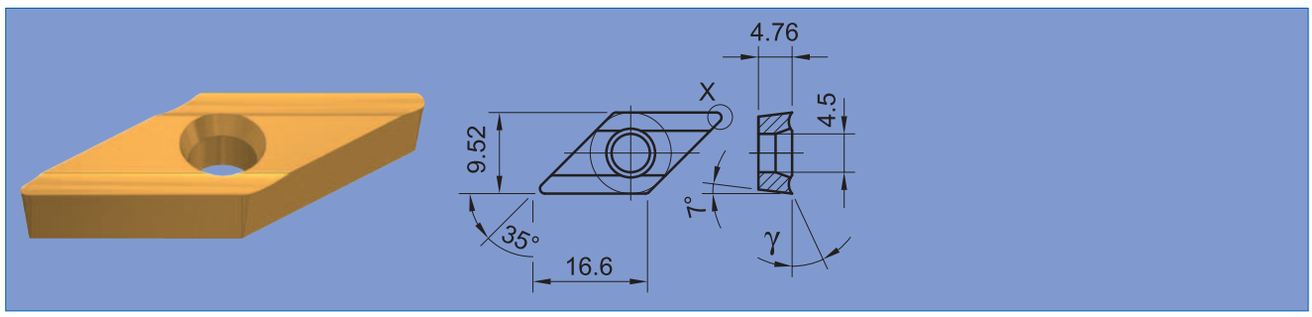

Turning


Turning a shoulder


Profile turning


Relieving

ALESA toolholder SV 16 for turning
VCFT 16 / 25

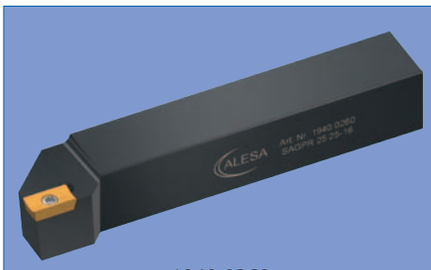


Cutting material	Coating	Part No	ISO Code	Type G/K	γ	Detail X				Mat. classification 1	2	3	4	5	6
HSS-E	**TiN**	1582.0855	VCFT 16 04 04 FR	K	30°	R 0.4	r	●		○	○		●		●
		1582.0857	VCFT 16 04 04 FL	K	30°	R 0.4	l	●		○	○		●		●
		1582.0860	VCFT 16 04 08 FR	K	30°	R 0.8	r	●		○	○		●		●
		1582.0862	VCFT 16 04 08 FL	K	30°	R 0.8	l	●		○	○		●		●
	TiAlN	1657.0855	VCFT 16 04 04 FR	K	30°	R 0.4	r	●		○	●		●	○	●
		1657.0857	VCFT 16 04 04 FL	K	30°	R 0.4	l	●		○	●		●	○	●
		1657.0860	VCFT 16 04 08 FR	K	30°	R 0.8	r	●		○	●		●	○	●
		1657.0862	VCFT 16 04 08 FL	K	30°	R 0.8	l	●		○	●		●	○	●

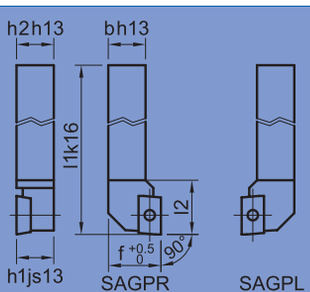
Overview of all indexable inserts see page 107 and following.

ALESA toolholder SA 16 for turning
APFT 16 / 12 – 25

1940



1940.0260



Part No	Type	h2 mm	b mm	l1 mm	h1 mm	f mm	l2 mm		Article	Type	Article	Type	WSP
1940.0200	SAGPR 12 12 16	12	12	100	12	15	23	r	1490.0340	M4x8	1492.0500	T 15	AP.T 16 04
1940.0205	SAGPL 12 12 16	12	12	100	12	15	23	l	1490.0340	M4x8	1492.0500	T 15	AP.T 16 04
1940.0220	SAGPR 16 16 16	16	16	110	16	20	24	r	1490.0340	M4x8	1492.0500	T 15	AP.T 16 04
1940.0225	SAGPL 16 16 16	16	16	110	16	20	24	l	1490.0340	M4x8	1492.0500	T 15	AP.T 16 04
1940.0240	SAGPR 20 20 16	20	20	125	20	25	26	r	1490.0340	M4x8	1492.0500	T 15	AP.T 16 04
1940.0245	SAGPL 20 20 16	20	20	125	20	25	26	l	1490.0340	M4x8	1492.0500	T 15	AP.T 16 04
1940.0260	SAGPR 25 25 16	25	25	150	25	32	29	r	1490.0340	M4x8	1492.0500	T 15	AP.T 16 04
1940.0265	SAGPL 25 25 16	25	25	150	25	32	29	l	1490.0340	M4x8	1492.0500	T 15	AP.T 16 04

Tool will be delivered with holder, all screws and screw-driver, but without indexable inserts.

Rigid roughing tool with a strong insert for turning.

WSP Indexable insert type K for a controlled chip or as chip-breaker.

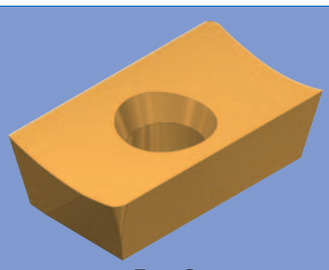
Info The tool for an excellent metal removal rate (cutting depth 16 mm).

90° Rectangular shoulder (90°) through the full length of cutting edge.

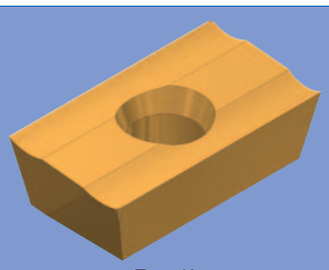
Turning

Turning a shoulder

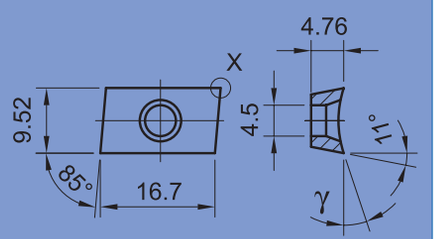
ALESA toolholder SA 16 for turning
APFT 16 / 12 – 25



Type G



Type K



Turning

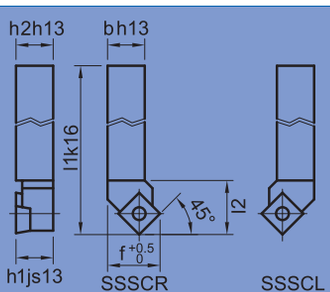
Cutting material	Coating	Part No	ISO Code	Type G/K	γ	Detail X				Mat. classification 1	2	3	4	5	6
HSS-E	**TiN**	1585.0200	APFT 16 04 PD FR	G	18°	0.2x45°	r	●		○	○		●		●
		1585.0210	APFT 16 04 PD FL	G	18°	0.2x45°	l	●		○	○		●		●
		1585.0230	APFT 16 04 PD FR	G	25°	0.2x45°	r	●		○	○		●		●
		1585.0250	APFT 16 04 04 FR	G	18°	R 0.4	r	●		○	○		●		●
		1585.0260	APFT 16 04 04 FL	G	18°	R 0.4	l	●		○	○		●		●
		1585.0300	APFT 16 04 08 FR	G	18°	R 0.8	r	●		○	○		●		●
		1585.0310	APFT 16 04 08 FL	G	18°	R 0.8	l	●		○	○		●		●
		1585.0350	APFT 16 04 12 FR	G	18°	R 1.2	r	●		○	○		●		●
		1585.0360	APFT 16 04 12 FL	G	18°	R 1.2	l	●		○	○		●		●
		1585.0700	APFT 16 04 PD FR	K	26°	0.2x45°	r	●		○	○		●		●
		1585.0710	APFT 16 04 PD FL	K	26°	0.2x45°	l	●		○	○		●		●
		1585.0750	APFT 16 04 04 FR	K	26°	R 0.4	r	●		○	○		●		●
		1585.0760	APFT 16 04 04 FL	K	26°	R 0.4	l	●		○	○		●		●
	TiAlN	1660.0200	APFT 16 04 PD FR	G	18°	0.2x45°	r	●		○	●		●	○	●
		1660.0210	APFT 16 04 PD FL	G	18°	0.2x45°	l	●		○	●		●	○	●
		1660.0230	APFT 16 04 PD FR	G	25°	0.2x45°	r	●		○	●		●	○	●
		1660.0250	APFT 16 04 04 FR	G	18°	R 0.4	r	●		○	●		●	○	●
		1660.0260	APFT 16 04 04 FL	G	18°	R 0.4	l	●		○	●		●	○	●
		1660.0300	APFT 16 04 08 FR	G	18°	R 0.8	r	●		○	●		●	○	●
		1660.0310	APFT 16 04 08 FL	G	18°	R 0.8	l	●		○	●		●	○	●
		1660.0350	APFT 16 04 12 FR	G	18°	R 1.2	r	●		○	●		●	○	●
		1660.0360	APFT 16 04 12 FL	G	18°	R 1.2	l	●		○	●		●	○	●
		1660.0700	APFT 16 04 PD FR	K	26°	0.2x45°	r	●		○	●		●	○	●
		1660.0710	APFT 16 04 PD FL	K	26°	0.2x45°	l	●		○	●		●	○	●
		1660.0750	APFT 16 04 04 FR	K	26°	R 0.4	r	●		○	●		●	○	●
		1660.0760	APFT 16 04 04 FL	K	26°	R 0.4	l	●		○	●		●	○	●
Carbide MG20	**TiAlN**	1785.0205	APFT 16 04 PD FR-111	G	18°	0.2x45°	r	○	●	●	○	●	●	○	●
		1785.0230	APFT 16 04 PD FL-111	G	18°	0.2x45°	l	○	●	●	○	●	●	○	●
		1785.0305	APFT 16 04 08 FR-111	G	18°	R 0.8	r	○	●	●	○	●	●	○	●
		1785.0330	APFT 16 04 08 FL-111	G	18°	R 0.8	l	○	●	●	○	●	●	○	●
	AlCrN	1785.0215	APFT 16 04 PD FR-111	G	18°	0.2x45°	r	○	●	●	●	●	○	●	●
		1785.0238	APFT 16 04 PD FL-111	G	18°	0.2x45°	l	○	●	●	●	●	○	●	●
		1785.0315	APFT 16 04 08 FR-111	G	18°	R 0.8	r	○	●	●	●	●	○	●	●
		1785.0338	APFT 16 04 08 FL-111	G	18°	R 0.8	l	○	●	●	●	●	○	●	●
		1785.0515	APFT 16 04 PD FR-121	G	10°	0.2x45°	r	○	●	●	●	●	○	●	○
		1785.0540	APFT 16 04 PD FL-121	G	10°	0.2x45°	l	○	●	●	●	●	○	●	○
		1785.0615	APFT 16 04 08 FR-121	G	10°	R 0.8	r	○	●	●	●	●	○	●	○
		1785.0640	APFT 16 04 08 FL-121	G	10°	R 0.8	l	○	●	●	●	●	○	●	○
Carbide 12CR	**TiAlN**	1785.0400	APHT 16 04 PD FR-222	G	16°		r	●	●	●	○	●	●	○	●

Overview of all indexable inserts see page 107 and following.

ALESA toolholder SS for turning
SCFT / 12 – 25

1945

1945.0360



Part No	Type	h2 mm	b mm	l1 mm	h1 mm	f mm	l2 mm	↻	Article	Type	Article	Type	WSP
1945.0300	SSSCR 12 12 09	12	12	80	12	16	18	r	1490.0300	M3.5x10	1492.0500	T 15	SCFT 09 04
1945.0305	SSSCL 12 12 09	12	12	80	12	16	18	l	1490.0300	M3.5x10	1492.0500	T 15	SCFT 09 04
1945.0320	SSSCR 16 16 09	16	16	100	16	20	18	r	1490.0300	M3.5x10	1492.0500	T 15	SCFT 09 04
1945.0325	SSSCL 16 16 09	16	16	100	16	20	18	l	1490.0300	M3.5x10	1492.0500	T 15	SCFT 09 04
1945.0340	SSSCR 20 20 12	20	20	125	20	25	25	r	1490.0400	M5x16	1492.0600	T 20	SCFT 12 05
1945.0345	SSSCL 20 20 12	20	20	125	20	25	25	l	1490.0400	M5x16	1492.0600	T 20	SCFT 12 05
1945.0360	SSSCR 25 25 12	25	25	150	25	32	25	r	1490.0400	M5x16	1492.0600	T 20	SCFT 12 05
1945.0365	SSSCL 25 25 12	25	25	150	25	32	25	l	1490.0400	M5x16	1492.0600	T 20	SCFT 12 05

Tool will be delivered with holder, all screws and screw-driver, but without indexable inserts.

Rigid roughing tool with a strong insert for turning.

WSP Indexable insert type K for a controlled chip or as chip-breaker.

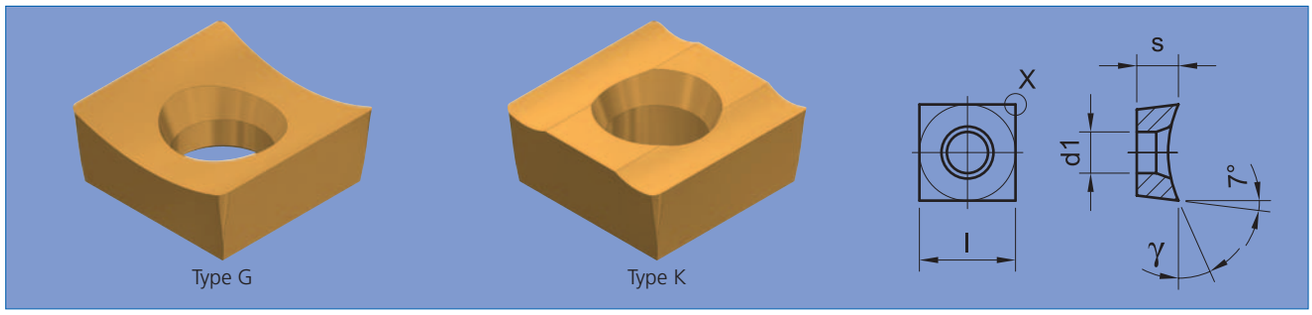
Info The all purpose turning tool

Good cooling increases tool life.

Turning

Turning a shoulder

ALESA toolholder SS for turning
SCFT / 12 – 25



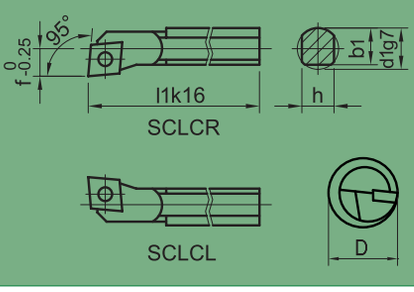
Cutting material	Coating	Part No	ISO Code	Type G/K	l mm	s mm	d1 mm	γ	Detail X		Mat. classification 1	2	3	4	5	6
HSS-E	**TiN**	1591.0200	SCFT 09 04 04 FN	G	9.52	4.00	4.5	25°	R 0.4	r/l	○	○		●		●
		1591.0220	SCFT 09 04 08 FN	G	9.52	4.00	4.5	25°	R 0.8	r/l	○	○		●		●
		1591.0250	SCFT 12 05 AC FN	G	12.83	5.56	5.5	24°	0.2x45°	r/l	○	○		●		●
		1591.0270	SCFT 12 05 04 FN	G	12.83	5.56	5.5	24°	R 0.4	r/l	○	○		●		●
		1591.0290	SCFT 12 05 08 FN	G	12.83	5.56	5.5	24°	R 0.8	r/l	○	○		●		●
		1591.0310	SCFT 12 05 12 FN	G	12.83	5.56	5.5	24°	R 1.2	r/l	○	○		●		●
		1591.0700	SCFT 09 04 04 FN	K	9.52	4.00	4.5	30°	R 0.4	r/l	○	○		●		●
		1591.0720	SCFT 09 04 08 FN	K	9.52	4.00	4.5	30°	R 0.8	r/l	○	○		●		●
		1591.0770	SCFT 12 05 04 FN	K	12.83	5.56	5.5	30°	R 0.4	r/l	○	○		●		●
		1591.0790	SCFT 12 05 08 FN	K	12.83	5.56	5.5	30°	R 0.8	r/l	○	○		●		●
		1591.0810	SCFT 12 05 12 FN	K	12.83	5.56	5.5	30°	R 1.2	r/l	○	○		●		●
	TiAlN	1666.0200	SCFT 09 04 04 FN	G	9.52	4.00	4.5	25°	R 0.4	r/l	○	●		●	○	●
		1666.0220	SCFT 09 04 08 FN	G	9.52	4.00	4.5	25°	R 0.8	r/l	○	●		●	○	●
		1666.0250	SCFT 12 05 AC FN	G	12.83	5.56	5.5	24°	0.2x45°	r/l	○	●		●	○	●
		1666.0270	SCFT 12 05 04 FN	G	12.83	5.56	5.5	24°	R 0.4	r/l	○	●		●	○	●
		1666.0290	SCFT 12 05 08 FN	G	12.83	5.56	5.5	24°	R 0.8	r/l	○	●		●	○	●
		1666.0310	SCFT 12 05 12 FN	G	12.83	5.56	5.5	24°	R 1.2	r/l	○	●		●	○	●
		1666.0700	SCFT 09 04 04 FN	K	9.52	4.00	4.5	30°	R 0.4	r/l	○	●		●	○	●
		1666.0720	SCFT 09 04 08 FN	K	9.52	4.00	4.5	30°	R 0.8	r/l	○	●		●	○	●
		1666.0770	SCFT 12 05 04 FN	K	12.83	5.56	5.5	30°	R 0.4	r/l	○	●		●	○	●
		1666.0790	SCFT 12 05 08 FN	K	12.83	5.56	5.5	30°	R 0.8	r/l	○	●		●	○	●
		1666.0810	SCFT 12 05 12 FN	K	12.83	5.56	5.5	30°	R 1.2	r/l	○	●		●	○	●
Carbide MG20	**TiAlN**	1791.0255	SCFT 12 05 AC FN-111	G	12.83	5.56	5.5	24°	0.2x45°	r/l	●	○	●	●	○	●
		1791.0295	SCFT 12 05 08 FN-111	G	12.83	5.56	5.5	24°	R 0.8	r/l	●	○	●	●	○	●
	AlCrN	1791.0265	SCFT 12 05 AC FN-111	G	12.83	5.56	5.5	24°	0.2x45°	r/l	●	●	●	○	●	●
		1791.0305	SCFT 12 05 08 FN-111	G	12.83	5.56	5.5	24°	R 0.8	r/l	●	●	●	○	●	●
		1791.0325	SCFT 12 05 08 FN-121	G	12.83	5.56	5.5	14°	R 0.8	r/l	●	●	●	○	●	○

Overview of all indexable inserts see page 107 and following.

ALESA toolholder SC for turning inside
CCFT / 06 – 09

1917

1917.0280



Part No	Type	d1 mm	b1 mm	h mm	l1 mm	f mm	D min			Article	Type	Article	Type	WSP
1917.0190	A08H SCLCR 06	8.0	7.6	7.2	100	5	10	✓	r	1491.0210	M2.5x4	1493.0300	TP7 IP	CCFT 06 02
1917.0195	A08H SCLCL 06	8.0	7.6	7.2	100	5	10	✓	l	1491.0210	M2.5x4	1493.0300	TP7 IP	CCFT 06 02
1917.0200	A08H SCLCR 06	8.0	7.6	7.2	100	6	12	✓	r	1491.0210	M2.5x4	1493.0300	TP7 IP	CCFT 06 02
1917.0205	A08H SCLCL 06	8.0	7.6	7.2	100	6	12	✓	l	1491.0210	M2.5x4	1493.0300	TP7 IP	CCFT 06 02
1917.0220	A10K SCLCR 06	10.0	9.5	9.0	125	7	14	✓	r	1491.0220	M2.5x5	1493.0300	TP7 IP	CCFT 06 02
1917.0225	A10K SCLCL 06	10.0	9.5	9.0	125	7	14	✓	l	1491.0220	M2.5x5	1493.0300	TP7 IP	CCFT 06 02
1917.0240	A12L SCLCR 06	12.0	11.5	11.0	140	9	18	✓	r	1491.0220	M2.5x5	1493.0300	TP7 IP	CCFT 06 02
1917.0245	A12L SCLCL 06	12.0	11.5	11.0	140	9	18	✓	l	1491.0220	M2.5x5	1493.0300	TP7 IP	CCFT 06 02
1917.0260	A16Q SCLCR 09	16.0	15.0	14.5	180	11	22	✓	r	1490.0320	M4x6	1492.0500	T 15	CCFT 09 T3
1917.0265	A16Q SCLCL 09	16.0	15.0	14.5	180	11	22	✓	l	1490.0320	M4x6	1492.0500	T 15	CCFT 09 T3
1917.0280	A20R SCLCR 09	20.0	18.5	18.0	200	13	26	✓	r	1490.0340	M4x8	1492.0500	T 15	CCFT 09 T3
1917.0285	A20R SCLCL 09	20.0	18.5	18.0	200	13	26	✓	l	1490.0340	M4x8	1492.0500	T 15	CCFT 09 T3

Tool will be delivered with holder, all screws and screw-driver, but without indexable inserts.

The right execution of toolholders for boring need a left hand insert, and vice versa.

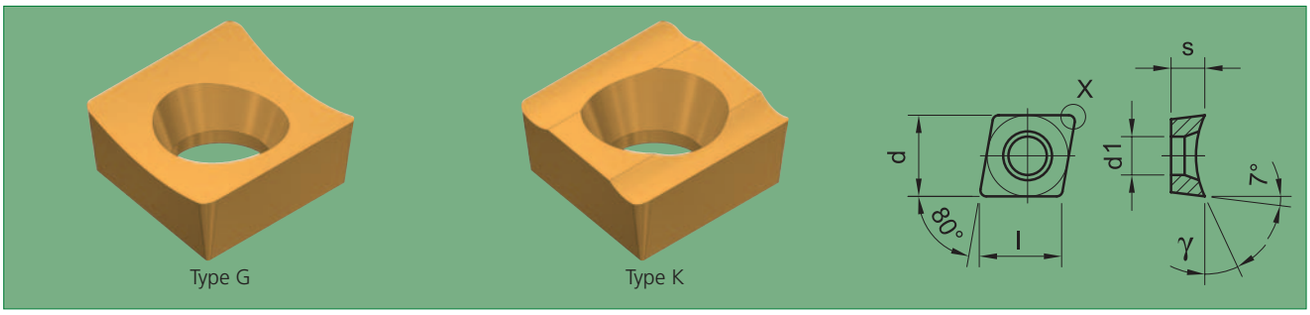
Holes for internal coolant supply guarantee ideal cooling.

WSP Indexable insert type K for a controlled chip or as chip-breaker.

Good cooling increases tool life.

Boring

ALESA toolholder SC for turning inside
CCFT / 06 – 09

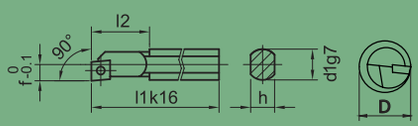


Cutting material	Coating	Part No	ISO Code	Type G/K	d mm	s mm	l mm	d1 mm	γ	Detail X		Mat. classification 1	2	3	4	5	6
HSS-E	**TiN**	1578.0245	CCFT 06 02 01 FR	G	6.35	2.38	6.40	3.0	20°	R 0.1	r	○	○		●		●
		1578.0247	CCFT 06 02 01 FL	G	6.35	2.38	6.40	3.0	20°	R 0.1	l	○	○		●		●
		1578.0250	CCFT 06 02 02 FR	G	6.35	2.38	6.40	3.0	20°	R 0.2	r	○	○		●		●
		1578.0252	CCFT 06 02 02 FL	G	6.35	2.38	6.40	3.0	20°	R 0.2	l	○	○		●		●
		1578.0255	CCFT 06 02 04 FR	G	6.35	2.38	6.40	3.0	20°	R 0.4	r	○	○		●		●
		1578.0257	CCFT 06 02 04 FL	G	6.35	2.38	6.40	3.0	20°	R 0.4	l	○	○		●		●
		1578.0350	CCFT 09 T3 02 FR	G	9.52	3.96	9.70	4.5	25°	R 0.2	r	○	○		●		●
		1578.0352	CCFT 09 T3 02 FL	G	9.52	3.96	9.70	4.5	25°	R 0.2	l	○	○		●		●
		1578.0355	CCFT 09 T3 04 FR	G	9.52	3.96	9.70	4.5	25°	R 0.4	r	○	○		●		●
		1578.0357	CCFT 09 T3 04 FL	G	9.52	3.96	9.70	4.5	25°	R 0.4	l	○	○		●		●
		1578.0360	CCFT 09 T3 08 FR	G	9.52	3.96	9.70	4.5	25°	R 0.8	r	○	○		●		●
		1578.0362	CCFT 09 T3 08 FL	G	9.52	3.96	9.70	4.5	25°	R 0.8	l	○	○		●		●
		1578.0750	CCFT 06 02 02 FR	K	6.35	2.38	6.40	3.0	30°	R 0.2	r	○	○		●		●
		1578.0752	CCFT 06 02 02 FL	K	6.35	2.38	6.40	3.0	30°	R 0.2	l	○	○		●		●
		1578.0755	CCFT 06 02 04 FR	K	6.35	2.38	6.40	3.0	30°	R 0.4	r	○	○		●		●
		1578.0757	CCFT 06 02 04 FL	K	6.35	2.38	6.40	3.0	30°	R 0.4	l	○	○		●		●
		1578.0855	CCFT 09 T3 04 FR	K	9.52	3.96	9.70	4.5	30°	R 0.4	r	○	○		●		●
		1578.0857	CCFT 09 T3 04 FL	K	9.52	3.96	9.70	4.5	30°	R 0.4	l	○	○		●		●
		1578.0860	CCFT 09 T3 08 FR	K	9.52	3.96	9.70	4.5	30°	R 0.8	r	○	○		●		●
		1578.0862	CCFT 09 T3 08 FL	K	9.52	3.96	9.70	4.5	30°	R 0.8	l	○	○		●		●
	TiAlN	1653.0245	CCFT 06 02 01 FR	G	6.35	2.38	6.40	3.0	20°	R 0.1	r	○	●		●	○	●
		1653.0247	CCFT 06 02 01 FL	G	6.35	2.38	6.40	3.0	20°	R 0.1	l	○	●		●	○	●
		1653.0250	CCFT 06 02 02 FR	G	6.35	2.38	6.40	3.0	20°	R 0.2	r	○	●		●	○	●
		1653.0252	CCFT 06 02 02 FL	G	6.35	2.38	6.40	3.0	20°	R 0.2	l	○	●		●	○	●
		1653.0255	CCFT 06 02 04 FR	G	6.35	2.38	6.40	3.0	20°	R 0.4	r	○	●		●	○	●
		1653.0257	CCFT 06 02 04 FL	G	6.35	2.38	6.40	3.0	20°	R 0.4	l	○	●		●	○	●
		1653.0350	CCFT 09 T3 02 FR	G	9.52	3.96	9.70	4.5	25°	R 0.2	r	○	●		●	○	●
		1653.0352	CCFT 09 T3 02 FL	G	9.52	3.96	9.70	4.5	25°	R 0.2	l	○	●		●	○	●
		1653.0355	CCFT 09 T3 04 FR	G	9.52	3.96	9.70	4.5	25°	R 0.4	r	○	●		●	○	●
		1653.0357	CCFT 09 T3 04 FL	G	9.52	3.96	9.70	4.5	25°	R 0.4	l	○	●		●	○	●
		1653.0360	CCFT 09 T3 08 FR	G	9.52	3.96	9.70	4.5	25°	R 0.8	r	○	●		●	○	●
		1653.0362	CCFT 09 T3 08 FL	G	9.52	3.96	9.70	4.5	25°	R 0.8	l	○	●		●	○	●
		1653.0750	CCFT 06 02 02 FR	K	6.35	2.38	6.40	3.0	30°	R 0.2	r	○	●		●	○	●
		1653.0752	CCFT 06 02 02 FL	K	6.35	2.38	6.40	3.0	30°	R 0.2	l	○	●		●	○	●
		1653.0755	CCFT 06 02 04 FR	K	6.35	2.38	6.40	3.0	30°	R 0.4	r	○	●		●	○	●
		1653.0757	CCFT 06 02 04 FL	K	6.35	2.38	6.40	3.0	30°	R 0.4	l	○	●		●	○	●
		1653.0855	CCFT 09 T3 04 FR	K	9.52	3.96	9.70	4.5	30°	R 0.4	r	○	●		●	○	●
		1653.0857	CCFT 09 T3 04 FL	K	9.52	3.96	9.70	4.5	30°	R 0.4	l	○	●		●	○	●
		1653.0860	CCFT 09 T3 08 FR	K	9.52	3.96	9.70	4.5	30°	R 0.8	r	○	●		●	○	●
		1653.0862	CCFT 09 T3 08 FL	K	9.52	3.96	9.70	4.5	30°	R 0.8	l	○	●		●	○	●

Overview of all indexable inserts see page 107 and following.

ALESA toolholder SM for turning inside
MPFT 04 / 06 – 08

1918



1918.0200

Part No	Type	d1 mm	h mm	l1 mm	l2 mm	f mm	D min		Article	Type	Article	Type	WSP
1918.0180	S06J SMFPR 04	6.0	5.5	90	15	3	6	r	1490.0190	M2x3.5	1492.0200	T 6	MPFT 04 02
1918.0200	S08J SMFPR 04	8.0	7.2	100	20	4	8	r	1490.0190	M2x4	1492.0200	T 6	MPFT 04 02

Tool will be delivered with holder, all screws and screw-driver, but without indexable inserts.

The right execution of toolholders for boring need a left hand insert, and vice versa.

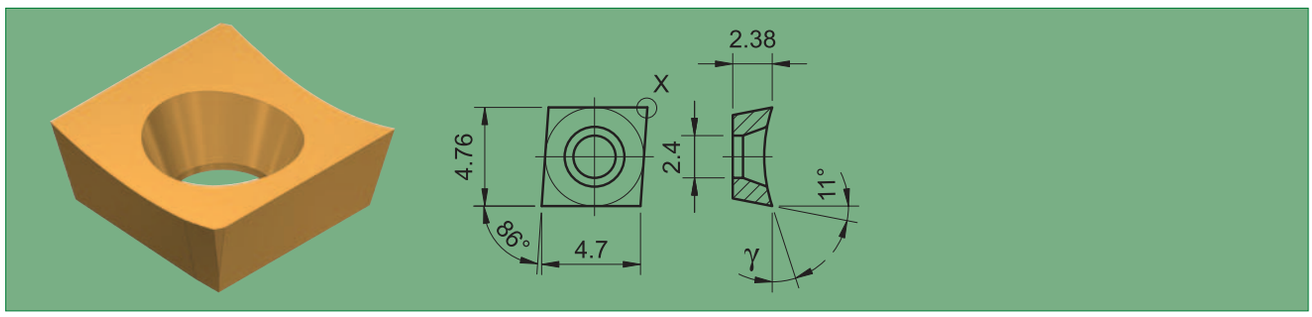
All ALESA indexable inserts are ground in the high ISO standard tolerance classification F.

The highly positive cutting geometries reduce the cutting forces considerably.

Good cooling increases tool life.

Boring

ALESA toolholder SM for turning inside
MPFT 04 / 06 – 08



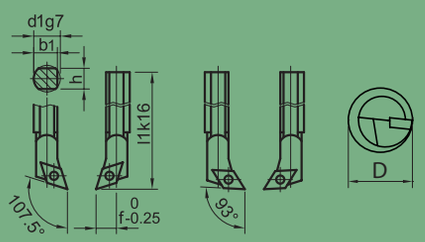
Cutting material	Coating	Part No	ISO Code	Type G/K	γ	Detail X				Mat. classification 1	2	3	4	5	6
HSS-E	**TiN**	1581.0210	MPFT 04 02 PP FL	G	18°	0.2x45°	l	●		○	○		●		●
	TiAlN	1656.0210	MPFT 04 02 PP FL	G	18°	0.2x45°	l	●		○	●		●	○	●

Overview of all indexable inserts see page 107 and following.

ALESA toolholder SD for turning inside

DCFT / 12 – 20

1927



Part No	Type	d1 mm	b1 mm	h mm	l1 mm	f mm	D min			Article	Type	Article	Type	WSP
1927.0200	A12L SDQCR 07	12.0	11.5	11.0	140	9	18	✓	r	1491.0220	M2.5x5	1493.0300	TP7 IP	DCFT 07 02
1927.0205	A12L SDQCL 07	12.0	11.5	11.0	140	9	18	✓	l	1491.0220	M2.5x5	1493.0300	TP7 IP	DCFT 07 02
1927.0220	A16Q SDQCR 07	16.0	15.0	14.5	180	11	22	✓	r	1491.0220	M2.5x5	1493.0300	TP7 IP	DCFT 07 02
1927.0225	A16Q SDQCL 07	16.0	15.0	14.5	180	11	22	✓	l	1491.0220	M2.5x5	1493.0300	TP7 IP	DCFT 07 02
1927.0240	A20R SDQCR 11	20.0	18.5	18.0	200	13	26	✓	r	1490.0340	M4x8	1492.0500	T 15	DCFT 11 T3
1927.0245	A20R SDQCL 11	20.0	18.5	18.0	200	13	26	✓	l	1490.0340	M4x8	1492.0500	T 15	DCFT 11 T3
1927.0300	A12L SDUCR 07	12.0	11.5	11.0	140	9	18	✓	r	1491.0220	M2.5x5	1493.0300	TP7 IP	DCFT 07 02
1927.0305	A12L SDUCL 07	12.0	11.5	11.0	140	9	18	✓	l	1491.0220	M2.5x5	1493.0300	TP7 IP	DCFT 07 02
1927.0320	A16Q SDUCR 07	16.0	15.0	14.5	180	11	22	✓	r	1491.0220	M2.5x5	1493.0300	TP7 IP	DCFT 07 02
1927.0325	A16Q SDUCL 07	16.0	15.0	14.5	180	11	22	✓	l	1491.0220	M2.5x5	1493.0300	TP7 IP	DCFT 07 02
1927.0340	A20R SDUCR 11	20.0	18.5	18.0	200	13	26	✓	r	1490.0340	M4x8	1492.0500	T 15	DCFT 11 T3
1927.0345	A20R SDUCL 11	20.0	18.5	18.0	200	13	26	✓	l	1490.0340	M4x8	1492.0500	T 15	DCFT 11 T3

Tool will be delivered with holder, all screws and screw-driver, but without indexable inserts.

The right execution of toolholders for boring need a left hand insert, and vice versa.

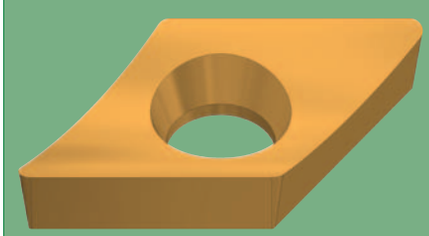
Holes for internal coolant supply guarantee ideal cooling.

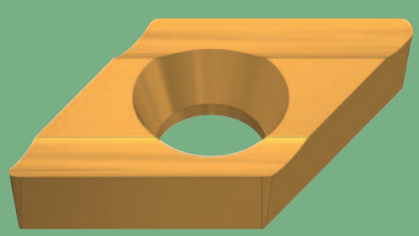
WSP Indexable insert type K for a controlled chip or as chip-breaker.

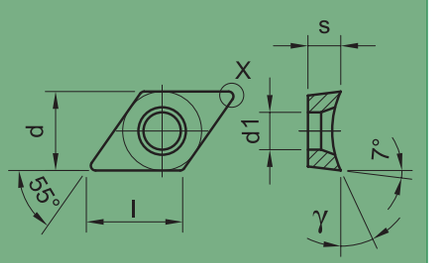
Good cooling increases tool life.

Boring

ALESA toolholder SD for turning inside
DCFT / 12 – 20


Type G


Type K



Cutting material	Coating	Part No	ISO Code	Type G/K	d mm	s mm	l mm	d1 mm	γ	Detail X		Mat. classification 1	2	3	4	5	6
HSS-E	**TiN**	1579.0245	DCFT 07 02 01 FR	G	6.35	2.38	7.75	3.0	20°	R 0.1	r	○	○		●		●
		1579.0247	DCFT 07 02 01 FL	G	6.35	2.38	7.75	3.0	20°	R 0.1	l	○	○		●		●
		1579.0250	DCFT 07 02 02 FR	G	6.35	2.38	7.75	3.0	20°	R 0.2	r	○	○		●		●
		1579.0252	DCFT 07 02 02 FL	G	6.35	2.38	7.75	3.0	20°	R 0.2	l	○	○		●		●
		1579.0255	DCFT 07 02 04 FR	G	6.35	2.38	7.75	3.0	20°	R 0.4	r	○	○		●		●
		1579.0257	DCFT 07 02 04 FL	G	6.35	2.38	7.75	3.0	20°	R 0.4	l	○	○		●		●
		1579.0355	DCFT 11 T3 04 FR	G	9.52	3.96	11.60	4.5	25°	R 0.4	r	○	○		●		●
		1579.0357	DCFT 11 T3 04 FL	G	9.52	3.96	11.60	4.5	25°	R 0.4	l	○	○		●		●
		1579.0360	DCFT 11 T3 08 FR	G	9.52	3.96	11.60	4.5	25°	R 0.8	r	○	○		●		●
		1579.0362	DCFT 11 T3 08 FL	G	9.52	3.96	11.60	4.5	25°	R 0.8	l	○	○		●		●
		1579.0750	DCFT 07 02 02 FR	K	6.35	2.38	7.75	3.0	30°	R 0.2	r	○	○		●		●
		1579.0752	DCFT 07 02 02 FL	K	6.35	2.38	7.75	3.0	30°	R 0.2	l	○	○		●		●
		1579.0755	DCFT 07 02 04 FR	K	6.35	2.38	7.75	3.0	30°	R 0.4	r	○	○		●		●
		1579.0757	DCFT 07 02 04 FL	K	6.35	2.38	7.75	3.0	30°	R 0.4	l	○	○		●		●
		1579.0855	DCFT 11 T3 04 FR	K	9.52	3.96	11.60	4.5	30°	R 0.4	r	○	○		●		●
		1579.0857	DCFT 11 T3 04 FL	K	9.52	3.96	11.60	4.5	30°	R 0.4	l	○	○		●		●
		1579.0860	DCFT 11 T3 08 FR	K	9.52	3.96	11.60	4.5	30°	R 0.8	r	○	○		●		●
		1579.0862	DCFT 11 T3 08 FL	K	9.52	3.96	11.60	4.5	30°	R 0.8	l	○	○		●		●
	TiAlN	1654.0245	DCFT 07 02 01 FR	G	6.35	2.38	7.75	3.0	20°	R 0.1	r	○	●		●	○	●
		1654.0247	DCFT 07 02 01 FL	G	6.35	2.38	7.75	3.0	20°	R 0.1	l	○	●		●	○	●
		1654.0250	DCFT 07 02 02 FR	G	6.35	2.38	7.75	3.0	20°	R 0.2	r	○	●		●	○	●
		1654.0252	DCFT 07 02 02 FL	G	6.35	2.38	7.75	3.0	20°	R 0.2	l	○	●		●	○	●
		1654.0255	DCFT 07 02 04 FR	G	6.35	2.38	7.75	3.0	20°	R 0.4	r	○	●		●	○	●
		1654.0257	DCFT 07 02 04 FL	G	6.35	2.38	7.75	3.0	20°	R 0.4	l	○	●		●	○	●
		1654.0355	DCFT 11 T3 04 FR	G	9.52	3.96	11.60	4.5	25°	R 0.4	r	○	●		●	○	●
		1654.0357	DCFT 11 T3 04 FL	G	9.52	3.96	11.60	4.5	25°	R 0.4	l	○	●		●	○	●
		1654.0360	DCFT 11 T3 08 FR	G	9.52	3.96	11.60	4.5	25°	R 0.8	r	○	●		●	○	●
		1654.0362	DCFT 11 T3 08 FL	G	9.52	3.96	11.60	4.5	25°	R 0.8	l	○	●		●	○	●
		1654.0750	DCFT 07 02 02 FR	K	6.35	2.38	7.75	3.0	30°	R 0.2	r	○	●		●	○	●
		1654.0752	DCFT 07 02 02 FL	K	6.35	2.38	7.75	3.0	30°	R 0.2	l	○	●		●	○	●
		1654.0755	DCFT 07 02 04 FR	K	6.35	2.38	7.75	3.0	30°	R 0.4	r	○	●		●	○	●
		1654.0757	DCFT 07 02 04 FL	K	6.35	2.38	7.75	3.0	30°	R 0.4	l	○	●		●	○	●
		1654.0855	DCFT 11 T3 04 FR	K	9.52	3.96	11.60	4.5	30°	R 0.4	r	○	●		●	○	●
		1654.0857	DCFT 11 T3 04 FL	K	9.52	3.96	11.60	4.5	30°	R 0.4	l	○	●		●	○	●
		1654.0860	DCFT 11 T3 08 FR	K	9.52	3.96	11.60	4.5	30°	R 0.8	r	○	●		●	○	●
		1654.0862	DCFT 11 T3 08 FL	K	9.52	3.96	11.60	4.5	30°	R 0.8	l	○	●		●	○	●

Overview of all indexable inserts see page 107 and following.

ALESA GOLD EXTRA toolbits round
hardened and ground – ISO 5421 / 77

4120

Part No	d mm	L mm	
4120.0357	2.00	50	
4120.0361	2.00	100	
4120.0387	2.50	50	
4120.0391	2.50	100	
4120.0406	3.00	100	
4120.0421	3.50	100	
4120.0433	4.00	63	
4120.0436	4.00	100	
4120.0646	5.00	100	
4120.0676	6.00	100	
4120.0680	6.00	160	
4120.0695	7.00	160	
4120.0706	8.00	100	
4120.0710	8.00	160	
4120.0711	8.00	200	
4120.0736	10.00	100	
4120.0740	10.00	160	
4120.0741	10.00	200	
4120.0766	12.00	100	
4120.0771	12.00	200	
4120.0801	14.00	200	
4120.0831	16.00	200	
4120.0846	18.00	200	
4120.0861	20.00	200	
4120.0876	22.00	200	
4120.0891	25.00	200	
4120.0906	30.00	200	

Tolerance (d): h9 / h6 possible
Hardness: 66 – 68 HRc

ALESA GOLD EXTRA toolbits square
hardened and ground – ISO 5421 / 77

4140

Part No	b mm	b1 mm	L mm	
4140.0102	4.00	4.00	63	
4140.0122	5.00	5.00	63	
4140.0142	6.00	6.00	63	
4140.0145	6.00	6.00	100	
4140.0148	6.00	6.00	160	
4140.0149	6.00	6.00	200	
4140.0169	7.00	7.00	200	
4140.0182	8.00	8.00	63	
4140.0185	8.00	8.00	100	
4140.0188	8.00	8.00	160	
4140.0189	8.00	8.00	200	
4140.0222	10.00	10.00	63	
4140.0225	10.00	10.00	100	
4140.0228	10.00	10.00	160	
4140.0229	10.00	10.00	200	
4140.0265	12.00	12.00	100	
4140.0268	12.00	12.00	160	
4140.0269	12.00	12.00	200	
4140.0309	14.00	14.00	200	
4140.0349	16.00	16.00	200	
4140.0369	18.00	18.00	200	
4140.0389	20.00	20.00	200	
4140.0449	25.00	25.00	200	
4140.0529	32.00	32.00	200	

Tolerance (d): h13
Hardness: 66 – 68 HRc

ALESA GOLD EXTRA toolbits rectangular

hardened and ground – ISO 5421 / 77

4160

Part No	h mm	b mm	L mm	
4160.0135	6.00	4.00	100	
4160.0165	8.00	2.00	100	
4160.0180	8.00	4.00	100	
4160.0210	10.00	3.00	100	
4160.0233	10.00	4.00	100	
4160.0240	10.00	5.00	100	
4160.0258	10.00	6.00	160	
4160.0259	10.00	6.00	200	
4160.0274	10.00	8.00	200	
4160.0285	12.00	3.00	100	
4160.0300	12.00	5.00	100	
4160.0318	12.00	6.00	160	
4160.0319	12.00	6.00	200	
4160.0334	12.00	8.00	200	
4160.0349	12.00	10.00	200	
4160.0364	14.00	6.00	200	
4160.0379	14.00	8.00	200	
4160.0454	15.00	10.00	200	
4160.0469	16.00	8.00	200	
4160.0484	16.00	10.00	200	
4160.0649	20.00	6.00	200	
4160.0679	20.00	10.00	200	
4160.0694	20.00	12.00	200	
4160.0709	20.00	15.00	200	
4160.0784	25.00	10.00	200	
4160.0799	25.00	12.00	200	
4160.0814	25.00	20.00	200	
4160.0889	32.00	20.00	200	

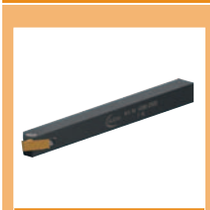
Tolerance (d): h13
Hardness: 66 – 68 HRc

Grooving and parting-off tools

Duocut

Duocut
12 – 25
No 4390
p. 94

Minicut



Minicut
10 – 20
No 4395
p. 96

Grooving and parting-off

KLH
20 – 25
No 1982
p. 98

KLS
20 – 25
No 1986
p. 100

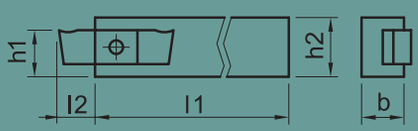
Toolholder
10 – 100
No 1988
p. 102

Toolholder
25 – 60
No 4370
p. 104

ALESA toolholder Duocut
and parting-off blades

4390

4390.0500

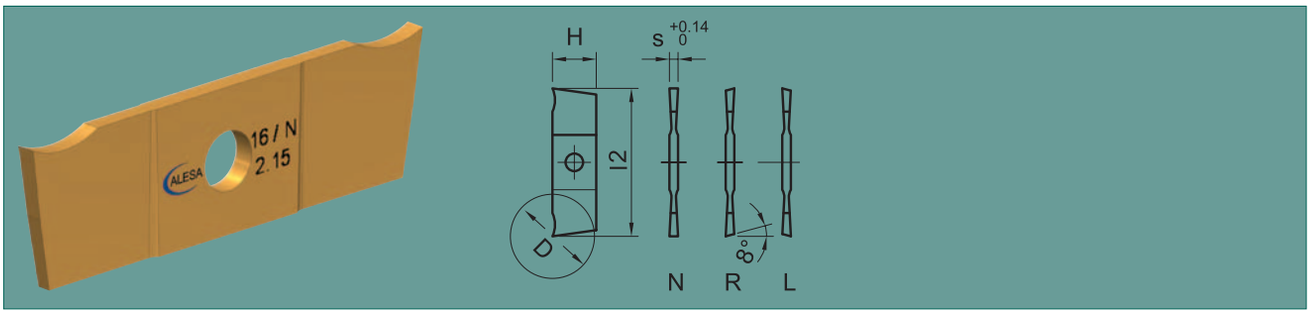


Part No	h2 mm	b mm	h1 mm	l1 mm	l2 mm	Plate	Article	Type	Article	Type	WSP
4390.0200	12	10	9.8	80	10	4390.0220	4390.0230	M4x10	4390.0240	SW 2.5	4350 8 x 40
4390.0300	16	10	12.8	90	12	4390.0320	4390.0330	M4x12	4390.0240	SW 2.5	4350 10 x 44
4390.0400	20	12	15.8	110	14	4390.0420	4390.0430	M5x14	4390.0440	SW 3	4350 12 x 48
4390.0500	25	16	20.3	120	17	4390.0520	4390.0530	M6x16	4390.0540	SW 4	4350 16 x 54

Tool will be delivered with holder, screws and screw-driver, but without parting-off blades.

Parting-off right | Parting-off left | Grooving

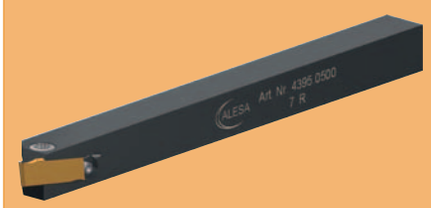
ALESA toolholder Duocut
and parting-off blades

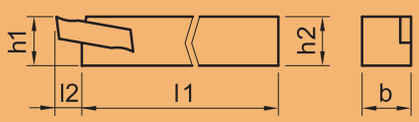


Cutting material	Coating	Part No	H mm	l2 mm	s mm	D max mm			
HSS-E	**TiN**	4350.0210	8.00	40	0.50	18	N	●	
		4350.0220	8.00	40	0.70	18	N	●	
		4350.0230	8.00	40	0.80	18	N	●	
		4350.0240	8.00	40	0.90	18	N	●	
		4350.0250	8.00	40	1.10	18	N	●	
		4350.0260	8.00	40	1.30	18	N	●	
		4350.0270	8.00	40	1.60	18	N	●	
		4350.0272	8.00	40	1.60	18	r	●	
		4350.0274	8.00	40	1.60	18	l	●	
		4350.0280	8.00	40	1.85	18	N	●	
		4350.0310	10.00	44	0.50	22	N	●	
		4350.0320	10.00	44	0.70	22	N	●	
		4350.0330	10.00	44	0.80	22	N	●	
		4350.0340	10.00	44	0.90	22	N	●	
		4350.0350	10.00	44	1.10	22	N	●	
		4350.0360	10.00	44	1.30	22	N	●	
		4350.0370	10.00	44	1.60	22	N	●	
		4350.0372	10.00	44	1.60	22	r	●	
		4350.0374	10.00	44	1.60	22	l	●	
		4350.0380	10.00	44	1.85	22	N	●	
		4350.0420	12.00	48	1.10	26	N	●	
		4350.0430	12.00	48	1.30	26	N	●	
		4350.0440	12.00	48	1.60	26	N	●	
		4350.0442	12.00	48	1.60	26	r	●	
		4350.0444	12.00	48	1.60	26	l	●	
		4350.0450	12.00	48	1.85	26	N	●	
		4350.0460	12.00	48	2.15	26	N	●	
		4350.0462	12.00	48	2.15	26	r	●	
		4350.0464	12.00	48	2.15	26	l	●	
		4350.0470	12.00	48	2.65	26	N	●	
		4350.0520	16.00	54	1.60	32	N	●	
		4350.0522	16.00	54	1.60	32	r	●	
		4350.0524	16.00	54	1.60	32	l	●	
		4350.0530	16.00	54	1.85	32	N	●	
		4350.0540	16.00	54	2.15	32	N	●	
		4350.0550	16.00	54	3.15	32	N	●	
		4350.0552	16.00	54	3.15	32	r	●	
		4350.0554	16.00	54	3.15	32	l	●	
		4350.0560	16.00	54	4.15	32	N	●	

ALESA toolholder Minicut
and parting-off blades

4395





4395.0500

Part No	Type	h2 mm	b mm	h1 mm	l1 mm	l2 mm	Rollpin	Article	Type	Article	Type	WSP
4395.0400	Typ R	10	10	10	140	5	4395.0420	1490.0370	M4x9	4395.0440	T 20	4360 6 x 20
4395.0405	Typ L	10	10	10	140	5	4395.0420	1490.0370	M4x9	4395.0440	T 20	4360 6 x 20
4395.0500	Typ R	12	12	12	140	8	4395.0520	1490.0380	M4x11	4395.0440	T 20	4360 7 x 25
4395.0505	Typ L	12	12	12	140	8	4395.0520	1490.0380	M4x11	4395.0440	T 20	4360 7 x 25
4395.0530	Typ R	16	16	16	140	8	4395.0550	1490.0380	M4x11	4395.0440	T 20	4360 7 x 25
4395.0535	Typ L	16	16	16	140	8	4395.0550	1490.0380	M4x11	4395.0440	T 20	4360 7 x 25
4395.0560	Typ R	20	20	20	140	8	4395.0580	1490.0380	M4x11	4395.0440	T 20	4360 7 x 25
4395.0565	Typ L	20	20	20	140	8	4395.0580	1490.0380	M4x11	4395.0440	T 20	4360 7 x 25

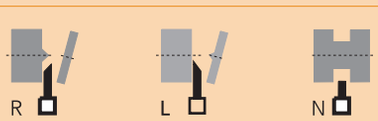
Tool will be delivered with holder, screws and screw-driver, but without parting-off blades.

RN **RR** **RL** **LN** **LR** **LL**

Info Exact positioning due to a perfect clamping device.

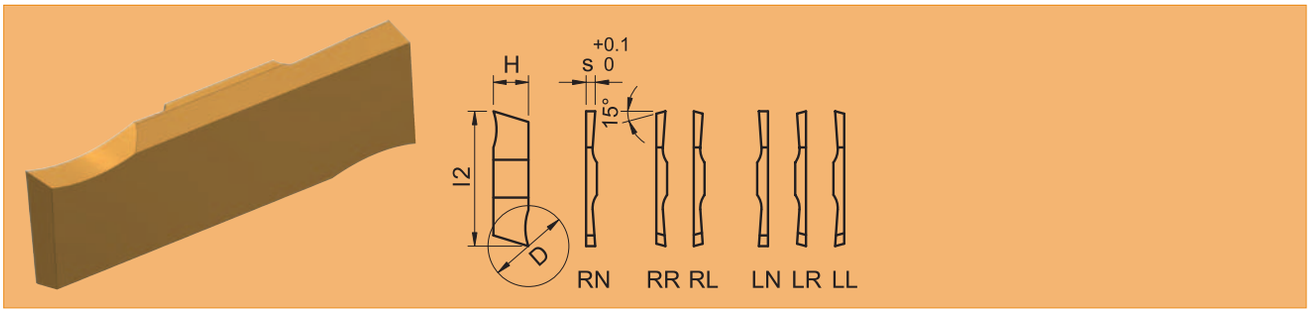
Info Correct center height and constant cutting speed for cutting off.

Info HSS-E is a shock-resistant cutting material ideal for interrupted cuts.



Parting-off right | Parting-off left | Grooving

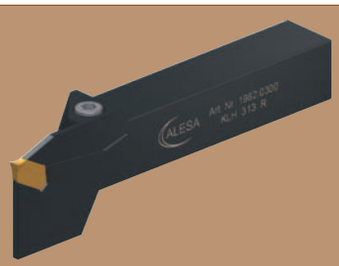
ALESA toolholder Minicut
and parting-off blades



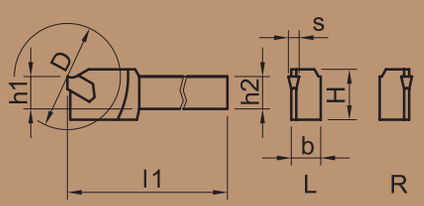
Cutting material	Coating	Part No	H mm	l2 mm	s mm	D max mm			
HSS-E	**TiN**	4360.0410	6.00	20	0.50	10	RN	●	
		4360.0415	6.00	20	0.50	10	LN	●	
		4360.0430	6.00	20	0.80	10	RN	●	
		4360.0435	6.00	20	0.80	10	LN	●	
		4360.0450	6.00	20	1.10	10	RN	●	
		4360.0455	6.00	20	1.10	10	LN	●	
		4360.0550	7.00	25	1.10	16	RN	●	
		4360.0555	7.00	25	1.10	16	LN	●	
		4360.0560	7.00	25	1.30	16	RN	●	
		4360.0565	7.00	25	1.30	16	LN	●	
		4360.0570	7.00	25	1.60	16	RN	●	
		4360.0572	7.00	25	1.60	16	RR	●	
		4360.0574	7.00	25	1.60	16	RL	●	
		4360.0575	7.00	25	1.60	16	LN	●	
		4360.0577	7.00	25	1.60	16	LR	●	
		4360.0579	7.00	25	1.60	16	LL	●	

ALESA grooving tools KLH
and grooving inserts

1982



1982.0300



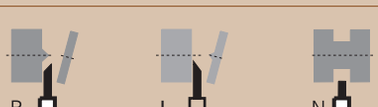
Part No	Type	h1 mm	h2 mm	b mm	s mm	l1 mm	H mm	D max mm	WSP
1982.0300	KLH 313 R	20	20	20	3.1	130	36	55	KLN/R/L 3
1982.0305	KLH 313 L	20	20	20	3.1	130	36	55	KLN/R/L 3
1982.0320	KLH 317 R	25	25	25	3.1	170	36	72	KLN/R/L 3
1982.0325	KLH 317 L	25	25	25	3.1	170	36	72	KLN/R/L 3

Tool will be delivered with holder, screws and screw-driver, but without grooving inserts.

Info Exact positioning due to a perfect clamping device.

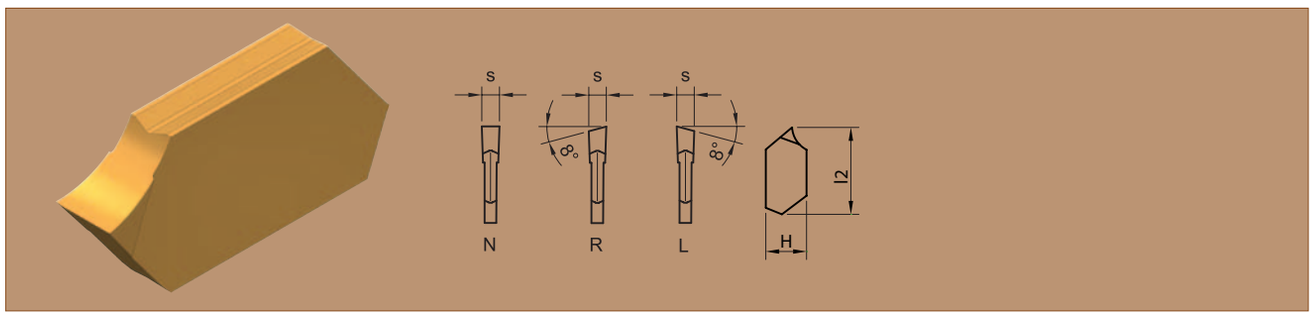
Info Correct center height and constant cutting speed for cutting off.

Info HSS-E is a shock-resistant cutting material ideal for interrupted cuts.



Parting-off right | Parting-off left | Grooving

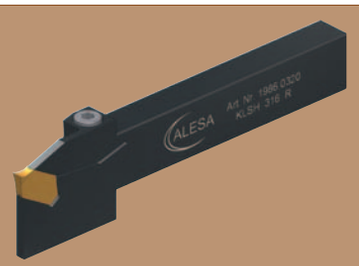
ALESA grooving tools KLH
and grooving inserts



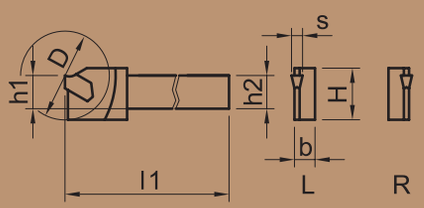
Cutting material	Coating	Part No	Type	s mm	H mm	l2 mm			
HSS-E	**TiN**	1598.0120	KLN 2	2.20	6.35	12	N	●	
		1598.0122	KLR 2	2.20	6.35	12	R	●	
		1598.0124	KLL 2	2.20	6.35	12	L	●	
		1598.0130	KLN 3	3.10	7.60	16	N	●	
		1598.0132	KLR 3	3.10	7.60	16	R	●	
		1598.0134	KLL 3	3.10	7.60	16	L	●	

ALESA grooving tools KLS
and grooving inserts

1986



1986.0320



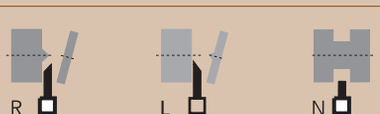
Part No	Type	h1 mm	h2 mm	b mm	s mm	l1 mm	H mm	D max mm	WSP
1986.0200	KLSH 210 R	10	10	10	2.2	110	24	30	KLN/R/L 2
1986.0205	KLSH 210 L	10	10	10	2.2	110	24	30	KLN/R/L 2
1986.0220	KLSH 212 R	12	12	10	2.2	110	24	44	KLN/R/L 2
1986.0225	KLSH 212 L	12	12	10	2.2	110	24	44	KLN/R/L 2
1986.0240	KLSH 216 R	16	16	10	2.2	110	24	44	KLN/R/L 2
1986.0245	KLSH 216 L	16	16	10	2.2	110	24	44	KLN/R/L 2
1986.0260	KLSH 220 R	20	20	10	2.2	110	24	44	KLN/R/L 2
1986.0265	KLSH 220 L	20	20	10	2.2	110	24	44	KLN/R/L 2
1986.0300	KLSH 312 R	12	12	10	3.1	110	28	44	KLN/R/L 3
1986.0305	KLSH 312 L	12	12	10	3.1	110	28	44	KLN/R/L 3
1986.0320	KLSH 316 R	16	16	10	3.1	110	28	44	KLN/R/L 3
1986.0325	KLSH 316 L	16	16	10	3.1	110	28	44	KLN/R/L 3
1986.0340	KLSH 320 R	20	20	10	3.1	110	28	44	KLN/R/L 3
1986.0345	KLSH 320 L	20	20	10	3.1	110	28	44	KLN/R/L 3

Tool will be delivered with holder, screws and screw-driver, but without grooving inserts.

Info Exact positioning due to a perfect clamping device.

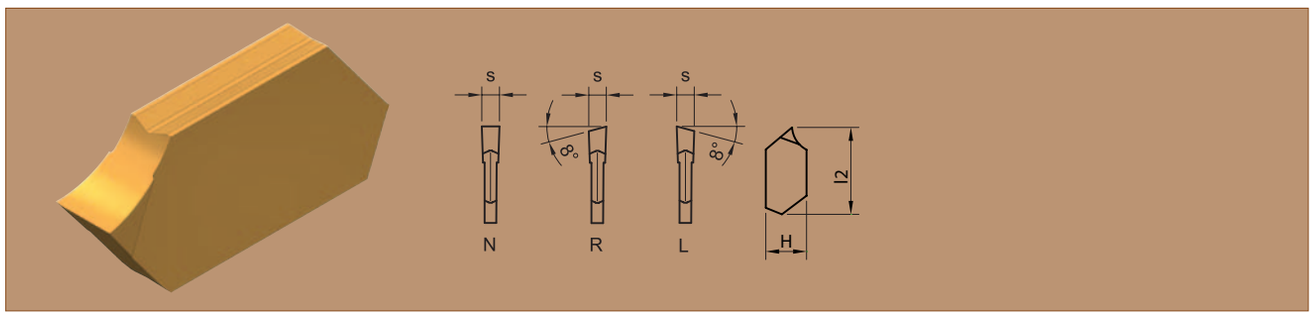
Info Correct center height and constant cutting speed for cutting off.

Info HSS-E is a shock-resistant cutting material ideal for interrupted cuts.



Parting-off right | Parting-off left | Grooving

ALESA grooving tools KLS
and grooving inserts

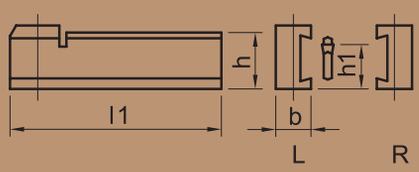


Cutting material	Coating	Part No	Type	s mm	H mm	l2 mm			
HSS-E	**TiN**	1598.0120	KLN 2	2.20	6.35	12	N	●	
		1598.0122	KLR 2	2.20	6.35	12	R	●	
		1598.0124	KLL 2	2.20	6.35	12	L	●	
		1598.0130	KLN 3	3.10	7.60	16	N	●	
		1598.0132	KLR 3	3.10	7.60	16	R	●	
		1598.0134	KLL 3	3.10	7.60	16	L	●	

ALESA toolholder for blades
and grooving inserts

1988

1988.0200



Part No	Type	h1 mm	b mm	l1 mm	h mm	WSP
1988.0200	KLKH 25.26 R	25	20	120	32	KLK 311
1988.0205	KLKH 25.26 L	25	20	120	32	KLK 311

Info Exact positioning due to a perfect clamping device.

Info Correct center height and constant cutting speed for cutting off.

Info HSS-E is a shock-resistant cutting material ideal for interrupted cuts.

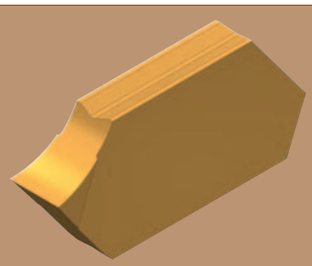
Parting-off right

Parting-off left

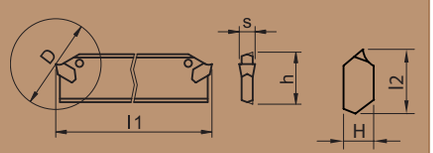
Grooving

ALESA toolholder for blades
and grooving inserts

1980.0300



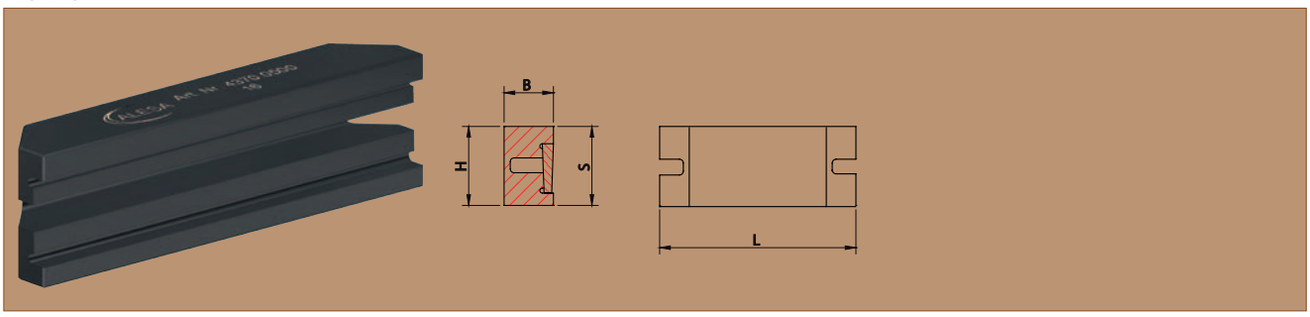
1598.0130



Part No	Type	s mm	h mm	H mm	l1 mm	l2 mm	D max mm			
1598.0130	KLN 3	3.10		7.60		16		N	●	
1598.0132	KLR 3	3.10		7.60		16		R	●	
1598.0134	KLL 3	3.10		7.60		16		L	●	
1980.0300	KLK 311	3.10	26.0		110		80			
1980.0320	KLK 315	3.10	32.0		150		100			

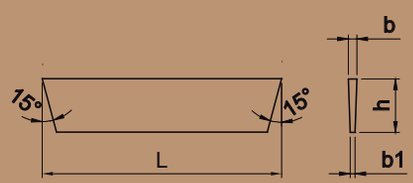
ALESA toolholder
and trapezoidal blades

4370



Part No	L mm	S mm	H mm	B mm	WSP
4370.0300	70	13	16	10	10 x 2.5 x 1.9 mm
4370.0400	70	16	20	12	12 x 2.5 x 1.8 mm
4370.0500	90	20	25	16	16 x 3.0 x 2.0 mm
4370.0700	120	25	32	20	20 x 4.0 x 2.8 mm
4370.0800	150	32	40	25	25 x 4.8 x 3.3 mm

ALESA toolholder
and trapezoidal blades



Part No	b mm	b1 mm	h mm	L mm	
4310.0310	2.50	1.90	10.00	150	
4310.0410	2.50	1.80	12.00	150	
4310.0510	3.00	2.00	16.00	150	
4310.0710	4.00	2.80	20.00	150	
4310.0810	4.80	3.30	25.00	150	
4310.0820	4.80	3.30	25.00	200	

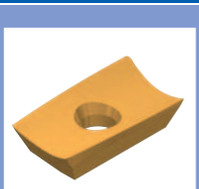
Notes

Indexable inserts

Indexable inserts

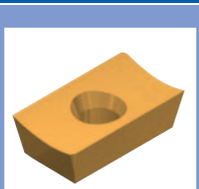
TWIST AOFT 10
HSS & Carbide
p. 108

TWIST AOFT 15
HSS & Carbide
p. 109

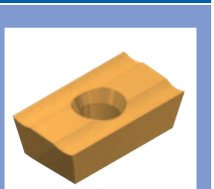


TWIST AOFT 20
HSS & Carbide
p. 110

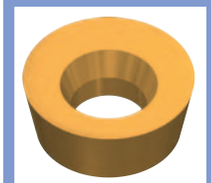
SDFT / SDHT
HSS & Carbide
p. 111



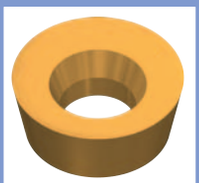
APFT / APHT
HSS & Carbide
Milling
p. 112



APFT / APHT
HSS & Carbide
Turning
p. 113



RPFT / RCFT
HSS
p. 114

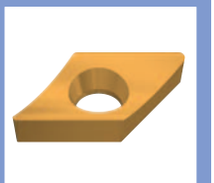


RPFT / RPHT
Carbide
p. 115

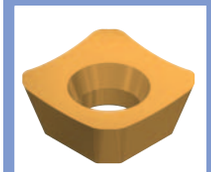
SCFT
HSS & Carbide
p. 116

MPFT
HSS & Carbide
p. 117

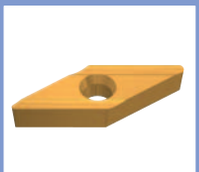
CCFT
HSS
p. 118



DCFT
HSS
p. 119



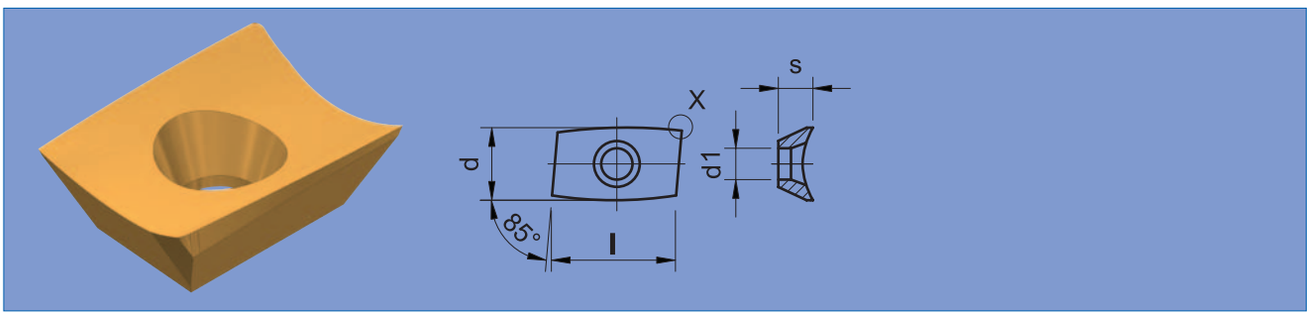
SEFT
HSS & Carbide
p. 120



VCFT
HSS
p. 121

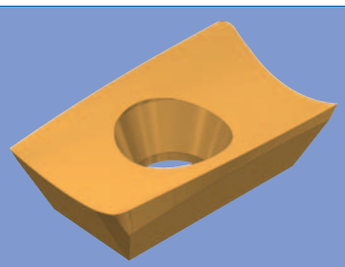
Indexable inserts TWIST AOFT 10

HSS and carbide

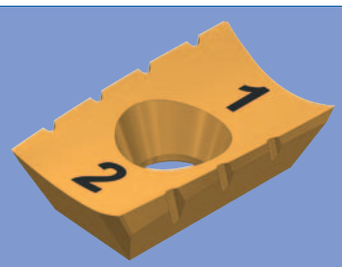


Cutting material	Coating	Part No	ISO Code	d mm	s mm	l mm	d1 mm	Detail X			
HSS-E	**TiN**	1087.0170	AOFT 10 03 PF FR	7.00	3.40	9.50	2.8	0.2x45°	r	●	
		1087.0180	AOFT 10 03 04 FR	7.00	3.40	9.50	2.8	R 0.4	r	●	
	TiAlN	1162.0170	AOFT 10 03 PF FR	7.00	3.40	9.50	2.8	0.2x45°	r	●	
		1162.0180	AOFT 10 03 04 FR	7.00	3.40	9.50	2.8	R 0.4	r	●	
Carbide HM	**TiN**	1287.0200	AOFT 10 03 PF FR-411	7.00	3.40	9.50	2.8	0.2x45°	r	●	○
		1287.0205	AOFT 10 03 04 FR-411	7.00	3.40	9.50	2.8	R 0.4	r	●	○
	TiAlN	1287.0300	AOFT 10 03 PF FR-411	7.00	3.40	9.50	2.8	0.2x45°	r	●	○
		1287.0305	AOFT 10 03 04 FR-411	7.00	3.40	9.50	2.8	R 0.4	r	●	○
	AlCrN	1287.0651	AOFT 10 03 PF FR-421	7.00	3.40	9.50	2.8	0.2x45°	r	●	○
		1287.0656	AOFT 10 03 04 FR-421	7.00	3.40	9.50	2.8	R 0.4	r	●	○
		1287.0657	AOFT 10 03 04 FR-431	7.00	3.40	9.50	2.8	R 0.4	r	●	○
		1288.0300	AOFT 10 03 ZZ FR-481	7.00	3.35		2.8		r	●	○
	AlCrN-VA	1287.0757	AOFT 10 03 04 FR-431	7.00	3.40	9.50	2.8	R 0.4	r	●	○
Carbide HM-F	**TiAlN**	1287.0500	AOFT 10 03 PF FR-511	7.00	3.40	9.50	2.8	0.2x45°	r		●
		1287.0505	AOFT 10 03 04 FR-511	7.00	3.40	9.50	2.8	R 0.4	r		●
	AlCrN	1287.0701	AOFT 10 03 PF FR-521	7.00	3.40	9.50	2.8	0.2x45°	r		●
		1287.0706	AOFT 10 03 04 FR-521	7.00	3.40	9.50	2.8	R 0.4	r		●
		1287.0707	AOFT 10 03 04 FR-531	7.00	3.40	9.50	2.8	R 0.4	r		●
		1288.0500	AOFT 10 03 ZZ FR-581	7.00	3.35		2.8		r		●
	AlCrN-VA	1287.0807	AOFT 10 03 04 FR-531	7.00	3.40	9.50	2.8	R 0.4	r		●
Carbide HA	**AlCrN-VA**	1289.0202	AOFT 10 03 04 FR-631	7.00	3.40	9.50	2.8	R 0.4	r	●	○

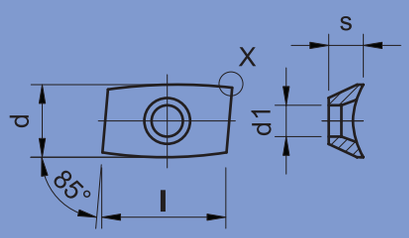
Indexable inserts TWIST AOFT 15
HSS and carbide



AOFT 15

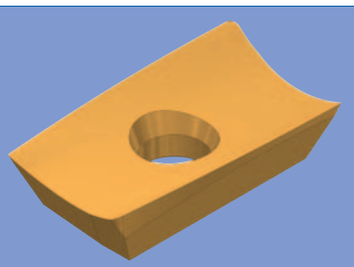


AOFT 15 chip splitting



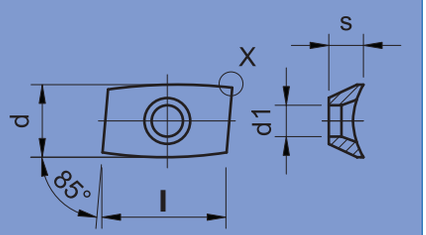
Cutting material	Coating	Part No	ISO Code	d mm	s mm	l mm	d1 mm	Detail X			
HSS-E	**TiN**	1087.0190	AOFT 15 T3 PF FR	8.80	4.20	14.50	3.8	0.2x45°	r	●	
		1087.0210	AOFT 15 T3 08 FR	8.80	4.20	14.50	3.8	R 0.8	r	●	
	TiAlN	1162.0190	AOFT 15 T3 PF FR	8.80	4.20	14.50	3.8	0.2x45°	r	●	
		1162.0210	AOFT 15 T3 08 FR	8.80	4.20	14.50	3.8	R 0.8	r	●	
HSS-E chip splitting *	**TiN**	1087.0505	AOFT 15 T3 PF FR (No 1/2)	8.80	4.20	14.50	3.8	0.2x45°	r	●	
		1087.0508	AOFT 15 T3 PF FR (No 3)	8.80	4.20	14.50	3.8	0.2x45°	r	●	
Alesa X2	**TiAlN**	1164.0213	AOFT 15 T3 08 FR-721	8.80	4.20	14.50	3.8	R 0.8	r	●	
Carbide HM	**TiN**	1287.0210	AOFT 15 T3 PF FR-411	8.80	4.20	14.50	3.8	0.2x45°	r	●	○
		1287.0215	AOFT 15 T3 08 FR-411	8.80	4.20	14.50	3.8	R 0.8	r	●	○
	TiAlN	1287.0310	AOFT 15 T3 PF FR-411	8.80	4.20	14.50	3.8	0.2x45°	r	●	○
		1287.0315	AOFT 15 T3 08 FR-411	8.80	4.20	14.50	3.8	R 0.8	r	●	○
	AlCrN	1287.0661	AOFT 15 T3 PF FR-421	8.80	4.20	14.50	3.8	0.2x45°	r	●	○
		1287.0666	AOFT 15 T3 08 FR-421	8.80	4.20	14.50	3.8	R 0.8	r	●	○
		1287.0667	AOFT 15 T3 08 FR-431	8.80	4.20	14.50	3.8	R 0.8	r	●	○
		1287.0669	AOFT 15 T3 12 FR-421	8.80	4.20	14.50	3.8	R 1.2	r	●	○
		1287.0671	AOFT 15 T3 16 FR-421	8.80	4.20	14.50	3.8	R 1.6	r	●	○
		1287.0673	AOFT 15 T3 20 FR-421	8.80	4.20	14.50	3.8	R 2.0	r	●	○
		1288.0310	AOFT 15 T3 ZZ FR-481	9.07	4.00		3.8		r	●	○
	AlCrN-VA	1287.0767	AOFT 15 T3 08 FR-431	8.80	4.20	14.50	3.8	R 0.8	r	●	○
	DLC-H	1287.0916	AOFT 15 T3 08 FR-421	8.80	4.20	14.50	3.8	R 0.8	r	●	○
Carbide HM-F	**TiAlN**	1287.0510	AOFT 15 T3 PF FR-511	8.80	4.20	14.50	3.8	0.2x45°	r		●
		1287.0515	AOFT 15 T3 08 FR-511	8.80	4.20	14.50	3.8	R 0.8	r		●
	AlCrN	1287.0711	AOFT 15 T3 PF FR-521	8.80	4.20	14.50	3.8	0.2x45°	r		●
		1287.0716	AOFT 15 T3 08 FR-521	8.80	4.20	14.50	3.8	R 0.8	r		●
		1287.0717	AOFT 15 T3 08 FR-531	8.80	4.20	14.50	3.8	R 0.8	r		●
		1287.0718	AOFT 15 T3 08 FR-521/40	8.80	4.20	14.50	3.8	R 0.8	r	○	●
		1287.0719	AOFT 15 T3 08 FR-521/50/63	8.80	4.20	14.50	3.8	R 0.8	r	○	●
		1287.0720	AOFT 15 T3 08 FR-521/80-125	8.80	4.20	14.50	3.8	R 0.8	r	○	●
		1288.0510	AOFT 15 T3 ZZ FR-581	9.07	4.00		3.8		r		●
	AlCrN-VA	1287.0817	AOFT 15 T3 08 FR-531	8.80	4.20	14.50	3.8	R 0.8	r		●
	DLC-H	1287.0967	AOFT 15 T3 08 FR-531	8.80	4.20	14.50	3.8	R 0.8	r		●
Carbide HA	**AlCrN-VA**	1289.0232	AOFT 15 T3 08 FR-631	8.80	4.20	14.50	3.8	R 0.8	r	●	○

Indexable inserts TWIST AOFT 20
HSS and carbide



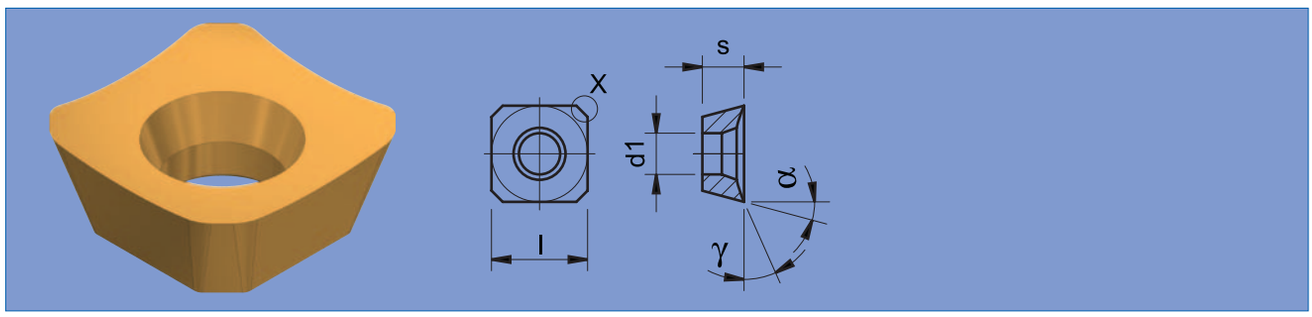
AOFT 20

AOFT 20 chip splitting



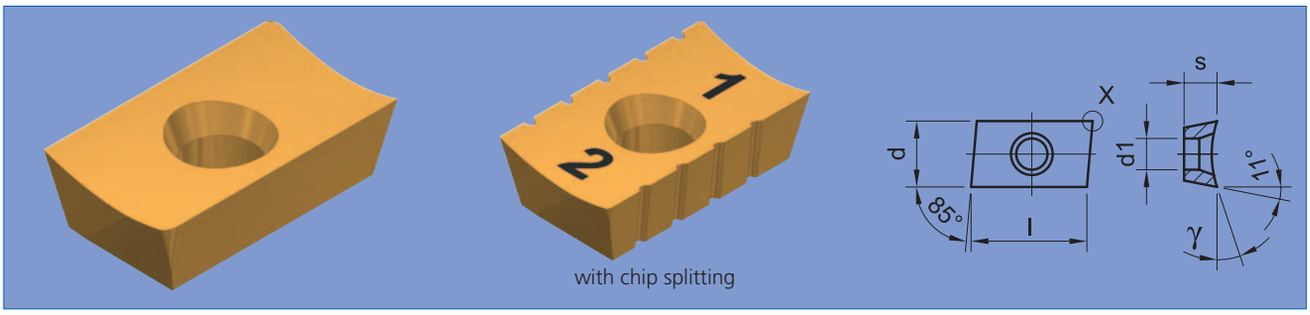
Cutting material	Coating	Part No	ISO Code	d mm	s mm	l mm	d1 mm	Detail X			
HSS-E	**TiN**	1087.0215	AOFT 20 04 PF FR	11.00	4.76	19.40	4.5	0.2x45°	r	●	
		1087.0315	AOFT 20 04 08 FR	11.00	4.76	19.40	4.5	R 0.8	r	●	
	TiAlN	1162.0215	AOFT 20 04 PF FR	11.00	4.76	19.40	4.5	0.2x45°	r	●	
		1162.0315	AOFT 20 04 08 FR	11.00	4.76	19.40	4.5	R 0.8	r	●	
HSS-E chip splitting *	**TiN**	1087.0515	AOFT 20 04 PF FR (No 1/2)	11.00	4.76	19.40	4.5	0.2x45°	r	●	
		1087.0518	AOFT 20 04 PF FR (No 3)	11.00	4.76	19.40	4.5	0.2x45°	r	●	
Alesa X2	**TiAlN**	1164.0318	AOFT 20 04 08 FR-721	11.00	4.76	19.40	4.5	R 0.8	r	●	
Carbide HM	**TiN**	1287.0225	AOFT 20 04 PF FR-411	11.00	4.76	19.40	4.5	0.2x45°	r	●	○
		1287.0230	AOFT 20 04 08 FR-411	11.00	4.76	19.40	4.5	R 0.8	r	●	○
	TiAlN	1287.0325	AOFT 20 04 PF FR-411	11.00	4.76	19.40	4.5	0.2x45°	r	●	○
		1287.0330	AOFT 20 04 08 FR-411	11.00	4.76	19.40	4.5	R 0.8	r	●	○
	AlCrN	1287.0676	AOFT 20 04 PF FR-421	11.00	4.76	19.40	4.5	0.2x45°	r	●	○
		1287.0681	AOFT 20 04 08 FR-421	11.00	4.76	19.40	4.5	R 0.8	r	●	○
		1287.0682	AOFT 20 04 08 FR-431	11.00	4.76	19.40	4.5	R 0.8	r	●	○
		1287.0691	AOFT 20 04 24 FR-421	11.00	4.76	19.40	4.5	R 2.4	r	●	○
		1287.0693	AOFT 20 04 32 FR-421	11.00	4.76	19.40	4.5	R 3.2	r	●	○
		1288.0325	AOFT 20 04 ZZ FR-481	11.10	4.50		4.5		r	●	○
	AlCrN-VA	1287.0782	AOFT 20 04 08 FR-431	11.00	4.76	19.40	4.5	R 0.8	r	●	○
Carbide HM-F	**TiAlN**	1287.0525	AOFT 20 04 PF FR-511	11.00	4.76	19.40	4.5	0.2x45°	r		●
		1287.0530	AOFT 20 04 08 FR-511	11.00	4.76	19.40	4.5	R 0.8	r		●
	AlCrN	1287.0726	AOFT 20 04 PF FR-521	11.00	4.76	19.40	4.5	0.2x45°	r		●
		1287.0731	AOFT 20 04 08 FR-521	11.00	4.76	19.40	4.5	R 0.8	r		●
		1287.0735	AOFT 20 04 08 FR-531	11.00	4.76	19.40	4.5	R 0.8	r		●
		1288.0525	AOFT 20 04 ZZ FR-581	11.10	4.50		4.5		r		●
	AlCrN-VA	1287.0835	AOFT 20 04 08 FR-531	11.00	4.76	19.40	4.5	R 0.8	r		●
Carbide HA	**AlCrN-VA**	1289.0262	AOFT 20 04 08 FR-631	11.00	4.76	19.40	4.5	R 0.8	r	●	○

Indexable inserts SDFT / SDHT
HSS and carbide



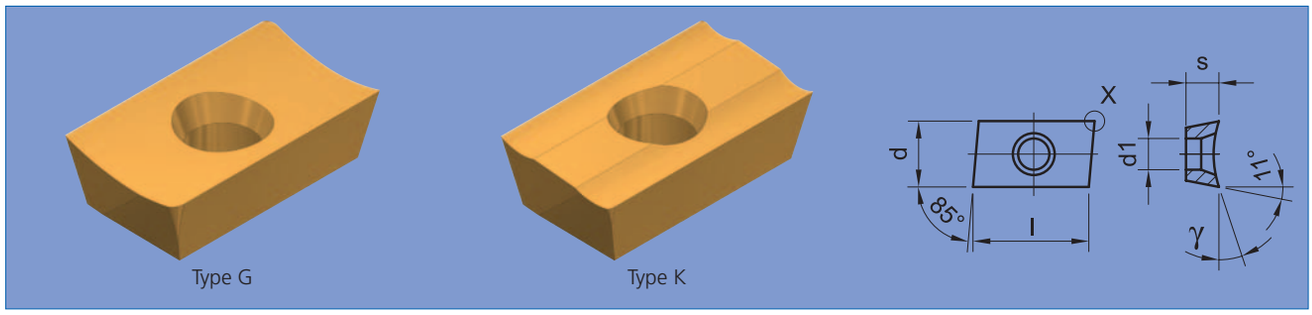
Cutting material	Coating	Part No	ISO Code	l mm	s mm	d1 mm	α	γ	Detail X			
HSS-E	**TiN**	1091.0400	SDFT 09 T3 AE FN	9.52	3.97	4.5	15°	17°	1.2x45° R1.2	r/l	●	
		1091.0450	SDFT 12 04 AE FN	12.70	4.76	5.5	15°	17°	1.5x45° R2	r/l	●	
	TiAlN	1166.0400	SDFT 09 T3 AE FN	9.52	3.97	4.5	15°	17°	1.2x45° R1.2	r/l	●	
		1166.0450	SDFT 12 04 AE FN	12.70	4.76	5.5	15°	17°	1.5x45° R2	r/l	●	
Carbide MG20	**TiN**	1291.0400	SDFT 09 T3 AE FN-111	9.52	3.97	4.5	15°	17°	1.2x45° R1.2	r/l	○	●
		1291.0450	SDFT 12 04 AE FN-111	12.70	4.76	5.5	15°	17°	1.5x45° R2	r/l	○	●
	TiAlN	1291.0405	SDFT 09 T3 AE FN-111	9.52	3.97	4.5	15°	17°	1.2x45° R1.2	r/l	○	●
		1291.0455	SDFT 12 04 AE FN-111	12.70	4.76	5.5	15°	17°	1.5x45° R2	r/l	○	●
	AlCrN	1291.0415	SDFT 09 T3 AE FN-111	9.52	3.97	4.5	15°	17°	1.2x45° R1.2	r/l	○	●
		1291.0465	SDFT 12 04 AE FN-111	12.70	4.76	5.5	15°	17°	1.5x45° R2	r/l	○	●
Carbide 12CR	**TiAlN**	1291.0420	SDHT 09 T3 AE FN-222	9.52	3.97	4.5	15°	11°	1.2x45° R1.2	r/l	○	●
		1291.0470	SDHT 12 04 AE FN-222	12.70	4.76	5.5	15°	11°	1.5x45° R2	r/l	○	●
	AlCrN	1291.0430	SDHT 09 T3 AE FN-222	9.52	3.97	4.5	15°	11°	1.2x45° R1.2	r/l	○	●
		1291.0480	SDHT 12 04 AE FN-222	12.70	4.76	5.5	15°	11°	1.5x45° R2	r/l	○	●
		1291.0630	SDFT 09 T3 AE FN-223	9.52	3.97	4.5	15°	5°	1.2x45° R1.2	r/l	○	●
		1291.0680	SDFT 12 04 AE FN-223	12.70	4.76	5.5	15°	5°	1.5x45° R2	r/l	○	●
	AlCrN-VA	1291.0635	SDFT 09 T3 AE FN-223	9.52	3.97	4.5	15°	5°	1.2x45° R1.2	r/l	○	●
		1291.0685	SDFT 12 04 AE FN-223	12.70	4.76	5.5	15°	5°	1.5x45° R2	r/l	○	●
		1291.0720	SDFT 09 T3 AE FR-223-S	9.52	3.97	4.5	15°	5°	1.2x45° R1.2	r	○	●
		1291.0770	SDFT 12 04 AE FR-223-S	12.70	4.76	5.5	15°	5°	1.5x45° R2	r	○	●
	DLC-H	1291.0640	SDFT 09 T3 AE FN-223	9.52	3.97	4.5	15°	5°	1.2x45° R1.2	r/l	○	●
		1291.0690	SDFT 12 04 AE FN-223	12.70	4.76	5.5	15°	5°	1.5x45° R2	r/l	○	●
Ceramic KG14	**AlCrN-K**	1292.0200	SDFT 09 T3 AE FN-851	9.52	3.97	4.4	15°	0°	1.2x45° R1.2	r/l		●
		1292.0225	SDFT 12 04 AE FN-851	12.70	4.76	5.5	15°	0°	1.5x45° R2	r/l		●

Indexable inserts APFT / APHT – milling
HSS and carbide



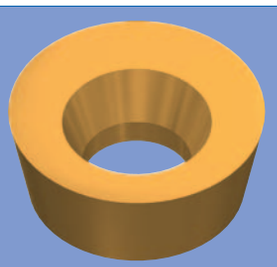
Cutting material	Coating	Part No	ISO Code	d mm	s mm	l mm	d1 mm	γ	Detail X				
HSS-E	**TiN**	1085.0200	APFT 16 04 PD FR	9.52	4.76	16.70	4.5	18°	0.2x45°		r	●	
		1085.0210	APFT 16 04 PD FL	9.52	4.76	16.70	4.5	18°	0.2x45°		l	●	
		1085.0230	APFT 16 04 PD FR	9.52	4.76	16.70	4.5	25°	0.2x45°		r	●	
		1085.0250	APFT 16 04 04 FR	9.52	4.76	16.70	4.5	18°	R 0.4		r	●	
		1085.0260	APFT 16 04 04 FL	9.52	4.76	16.70	4.5	18°	R 0.4		l	●	
		1085.0300	APFT 16 04 08 FR	9.52	4.76	16.70	4.5	18°	R 0.8		r	●	
		1085.0310	APFT 16 04 08 FL	9.52	4.76	16.70	4.5	18°	R 0.8		l	●	
		1085.0350	APFT 16 04 12 FR	9.52	4.76	16.70	4.5	18°	R 1.2		r	●	
		1085.0360	APFT 16 04 12 FL	9.52	4.76	16.70	4.5	18°	R 1.2		l	●	
	TiAlN	1160.0200	APFT 16 04 PD FR	9.52	4.76	16.70	4.5	18°	0.2x45°		r	●	
		1160.0230	APFT 16 04 PD FR	9.52	4.76	16.70	4.5	25°	0.2x45°		r	●	
		1160.0250	APFT 16 04 04 FR	9.52	4.76	16.70	4.5	18°	R 0.4		r	●	
		1160.0300	APFT 16 04 08 FR	9.52	4.76	16.70	4.5	18°	R 0.8		r	●	
		1160.0350	APFT 16 04 12 FR	9.52	4.76	16.70	4.5	18°	R 1.2		r	●	
HSS-E chip splitting *	**TiN**	1086.0200	APFT 16 04 PD FR	9.52	4.76	16.70	4.5	18°	0.2x45°	1/2	r	●	
		1086.0205	APFT 16 04 PD FR	9.52	4.76	16.70	4.5	18°	0.2x45°	3	r	●	
		1086.0210	APFT 16 04 PD FL	9.52	4.76	16.70	4.5	18°	0.2x45°	1/2	l	●	
		1086.0215	APFT 16 04 PD FL	9.52	4.76	16.70	4.5	18°	0.2x45°	3	l	●	
		1086.0230	APFT 16 04 PD FR	9.52	4.76	16.70	4.5	25°	0.2x45°	1/2	r	●	
		1086.0235	APFT 16 04 PD FR	9.52	4.76	16.70	4.5	25°	0.2x45°	3	r	●	
Carbide MG20	**TiN**	1285.0200	APFT 16 04 PD FR-111	9.52	4.76	16.70	4.5	18°	0.2x45°		r	○	●
		1285.0225	APFT 16 04 PD FL-111	9.52	4.76	16.70	4.5	18°	0.2x45°		l	○	●
		1285.0250	APFT 16 04 04 FR-111	9.52	4.76	16.70	4.5	18°	R 0.4		r	○	●
		1285.0275	APFT 16 04 04 FL-111	9.52	4.76	16.70	4.5	18°	R 0.4		l	○	●
		1285.0300	APFT 16 04 08 FR-111	9.52	4.76	16.70	4.5	18°	R 0.8		r	○	●
		1285.0325	APFT 16 04 08 FL-111	9.52	4.76	16.70	4.5	18°	R 0.8		l	○	●
	TiAlN	1285.0205	APFT 16 04 PD FR-111	9.52	4.76	16.70	4.5	18°	0.2x45°		r	○	●
		1285.0230	APFT 16 04 PD FL-111	9.52	4.76	16.70	4.5	18°	0.2x45°		l	○	●
		1285.0255	APFT 16 04 04 FR-111	9.52	4.76	16.70	4.5	18°	R 0.4		r	○	●
		1285.0280	APFT 16 04 04 FL-111	9.52	4.76	16.70	4.5	18°	R 0.4		l	○	●
		1285.0305	APFT 16 04 08 FR-111	9.52	4.76	16.70	4.5	18°	R 0.8		r	○	●
		1285.0330	APFT 16 04 08 FL-111	9.52	4.76	16.70	4.5	18°	R 0.8		l	○	●
	AlCrN	1285.0215	APFT 16 04 PD FR-111	9.52	4.76	16.70	4.5	18°	0.2x45°		r	○	●
		1285.0238	APFT 16 04 PD FL-111	9.52	4.76	16.70	4.5	18°	0.2x45°		l	○	●
		1285.0265	APFT 16 04 04 FR-111	9.52	4.76	16.70	4.5	18°	R 0.4		r	○	●
		1285.0290	APFT 16 04 04 FL-111	9.52	4.76	16.70	4.5	18°	R 0.4		l	○	●
		1285.0315	APFT 16 04 08 FR-111	9.52	4.76	16.70	4.5	18°	R 0.8		r	○	●
		1285.0338	APFT 16 04 08 FL-111	9.52	4.76	16.70	4.5	18°	R 0.8		l	○	●
		1285.0515	APFT 16 04 PD FR-121	9.52	4.76	16.70	4.5	10°	0.2x45°		r	○	●
		1285.0540	APFT 16 04 PD FL-121	9.52	4.76	16.70	4.5	10°	0.2x45°		l	○	●
		1285.0615	APFT 16 04 08 FR-121	9.52	4.76	16.70	4.5	10°	R 0.8		r	○	●
		1285.0640	APFT 16 04 08 FL-121	9.52	4.76	16.70	4.5	10°	R 0.8		l	○	●
	AlCrN-VA	1285.0520	APFT 16 04 PD FR-121	9.52	4.76	16.70	4.5	10°	0.2x45°		r	○	●
		1285.0545	APFT 16 04 PD FL-121	9.52	4.76	16.70	4.5	10°	0.2x45°		l	○	●
		1285.0620	APFT 16 04 08 FR-121	9.52	4.76	16.70	4.5	10°	R 0.8		r	○	●
		1285.0645	APFT 16 04 08 FL-121	9.52	4.76	16.70	4.5	10°	R 0.8		l	○	●
Carbide 12CR	**AlCrN**	1285.0410	APHT 16 04 PD FR-222	9.52	4.76	16.70	4.5	16°			r	●	●
	TiAlN	1285.0400	APHT 16 04 PD FR-222	9.52	4.76	16.70	4.5	16°			r	●	●

Indexable inserts APFT – turning
HSS and carbide

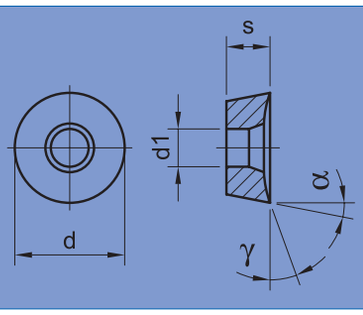


Cutting material	Coating	Part No	ISO Code	Type G/K	d mm	s mm	l mm	d1 mm	γ	Detail X			
HSS-E	**TiN**	1585.0200	APFT 16 04 PD FR	G	9.52	4.76	16.70	4.5	18°	0.2x45°	r	●	
		1585.0210	APFT 16 04 PD FL	G	9.52	4.76	16.70	4.5	18°	0.2x45°	l	●	
		1585.0230	APFT 16 04 PD FR	G	9.52	4.76	16.70	4.5	25°	0.2x45°	r	●	
		1585.0250	APFT 16 04 04 FR	G	9.52	4.76	16.70	4.5	18°	R 0.4	r	●	
		1585.0260	APFT 16 04 04 FL	G	9.52	4.76	16.70	4.5	18°	R 0.4	l	●	
		1585.0300	APFT 16 04 08 FR	G	9.52	4.76	16.70	4.5	18°	R 0.8	r	●	
		1585.0310	APFT 16 04 08 FL	G	9.52	4.76	16.70	4.5	18°	R 0.8	l	●	
		1585.0350	APFT 16 04 12 FR	G	9.52	4.76	16.70	4.5	18°	R 1.2	r	●	
		1585.0360	APFT 16 04 12 FL	G	9.52	4.76	16.70	4.5	18°	R 1.2	l	●	
		1585.0700	APFT 16 04 PD FR	K	9.52	4.76	16.70	4.5	26°	0.2x45°	r	●	
		1585.0710	APFT 16 04 PD FL	K	9.52	4.76	16.70	4.5	26°	0.2x45°	l	●	
		1585.0750	APFT 16 04 04 FR	K	9.52	4.76	16.70	4.5	26°	R 0.4	r	●	
		1585.0760	APFT 16 04 04 FL	K	9.52	4.76	16.70	4.5	26°	R 0.4	l	●	
	TiAlN	1660.0200	APFT 16 04 PD FR	G	9.52	4.76	16.70	4.5	18°	0.2x45°	r	●	
		1660.0210	APFT 16 04 PD FL	G	9.52	4.76	16.70	4.5	18°	0.2x45°	l	●	
		1660.0230	APFT 16 04 PD FR	G	9.52	4.76	16.70	4.5	25°	0.2x45°	r	●	
		1660.0250	APFT 16 04 04 FR	G	9.52	4.76	16.70	4.5	18°	R 0.4	r	●	
		1660.0260	APFT 16 04 04 FL	G	9.52	4.76	16.70	4.5	18°	R 0.4	l	●	
		1660.0300	APFT 16 04 08 FR	G	9.52	4.76	16.70	4.5	18°	R 0.8	r	●	
		1660.0310	APFT 16 04 08 FL	G	9.52	4.76	16.70	4.5	18°	R 0.8	l	●	
		1660.0350	APFT 16 04 12 FR	G	9.52	4.76	16.70	4.5	18°	R 1.2	r	●	
		1660.0360	APFT 16 04 12 FL	G	9.52	4.76	16.70	4.5	18°	R 1.2	l	●	
		1660.0700	APFT 16 04 PD FR	K	9.52	4.76	16.70	4.5	26°	0.2x45°	r	●	
		1660.0710	APFT 16 04 PD FL	K	9.52	4.76	16.70	4.5	26°	0.2x45°	l	●	
		1660.0750	APFT 16 04 04 FR	K	9.52	4.76	16.70	4.5	26°	R 0.4	r	●	
		1660.0760	APFT 16 04 04 FL	K	9.52	4.76	16.70	4.5	26°	R 0.4	l	●	
Carbide MG20	**TiAlN**	1785.0205	APFT 16 04 PD FR-111	G	9.52	4.76	16.70	4.5	18°	0.2x45°	r	○	●
		1785.0230	APFT 16 04 PD FL-111	G	9.52	4.76	16.70	4.5	18°	0.2x45°	l	○	●
		1785.0305	APFT 16 04 08 FR-111	G	9.52	4.76	16.70	4.5	18°	R 0.8	r	○	●
		1785.0330	APFT 16 04 08 FL-111	G	9.52	4.76	16.70	4.5	18°	R 0.8	l	○	●
	AlCrN	1785.0215	APFT 16 04 PD FR-111	G	9.52	4.76	16.70	4.5	18°	0.2x45°	r	○	●
		1785.0238	APFT 16 04 PD FL-111	G	9.52	4.76	16.70	4.5	18°	0.2x45°	l	○	●
		1785.0315	APFT 16 04 08 FR-111	G	9.52	4.76	16.70	4.5	18°	R 0.8	r	○	●
		1785.0338	APFT 16 04 08 FL-111	G	9.52	4.76	16.70	4.5	18°	R 0.8	l	○	●
		1785.0515	APFT 16 04 PD FR-121	G	9.52	4.76	16.70	4.5	10°	0.2x45°	r	○	●
		1785.0540	APFT 16 04 PD FL-121	G	9.52	4.76	16.70	4.5	10°	0.2x45°	l	○	●
		1785.0615	APFT 16 04 08 FR-121	G	9.52	4.76	16.70	4.5	10°	R 0.8	r	○	●
		1785.0640	APFT 16 04 08 FL-121	G	9.52	4.76	16.70	4.5	10°	R 0.8	l	○	●
Carbide 12CR	**TiAlN**	1785.0400	APHT 16 04 PD FR-222	G	9.52	4.76	16.70	4.5	16°		r	●	●

Indexable inserts RPFT / RCFT
HSS

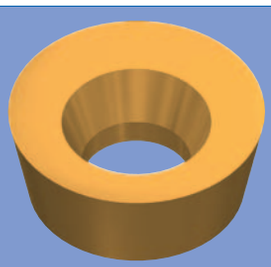


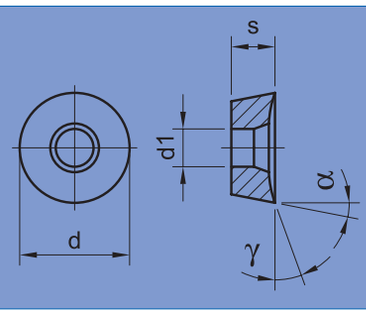
RPFT 08



Cutting material	Coating	Part No	ISO Code	d mm	s mm	d1 mm	α	γ			
HSS-E	**TiN**	1076.0200	RPFT 06 02 M0	6.00	2.38	3.0	11°	20°	r/l	●	
		1076.0240	RPFT 08 03 M0	8.00	3.18	3.6	11°	20°	r/l	●	
		1076.0300	RPFT 10 T3 M0	10.00	3.97	4.5	11°	20°	r/l	●	
		1076.0400	RPFT 12 04 M0	12.00	4.76	5.5	11°	20°	r/l	●	
		1076.0410	RPFT 12 04 M0	12.00	4.76	5.5	11°	30°	r/l	●	
		1076.0450	RPFT 12 04 00	12.70	4.76	5.5	11°	20°	r/l	●	
		1076.0500	RPFT 16 06 M0	16.00	6.35	5.5	11°	20°	r/l	●	
		1576.0200	RCFT 06 02 M0	6.00	2.38	3.0	7°	25°	r/l	●	
		1576.0240	RCFT 08 03 M0	8.00	3.18	3.6	7°	25°	r/l	●	
		1576.0250	RCFT 08 03 M0	8.00	3.18	4.5	7°	25°	r/l	●	
		1576.0300	RCFT 10 T3 M0	10.00	3.97	4.5	7°	25°	r/l	●	
		1576.0400	RCFT 12 04 M0	12.00	4.76	5.5	7°	25°	r/l	●	
		1576.0500	RCFT 16 06 M0	16.00	6.35	5.5	7°	25°	r/l	●	
		1576.0600	RCFT 20 06 M0	20.00	6.35	6.5	7°	25°	r/l	●	
	TiAlN	1151.0200	RPFT 06 02 M0	6.00	2.38	3.0	11°	20°	r/l	●	
		1151.0240	RPFT 08 03 M0	8.00	3.18	3.6	11°	20°	r/l	●	
		1151.0300	RPFT 10 T3 M0	10.00	3.97	4.5	11°	20°	r/l	●	
		1151.0400	RPFT 12 04 M0	12.00	4.76	5.5	11°	20°	r/l	●	
		1151.0410	RPFT 12 04 M0	12.00	4.76	5.5	11°	30°	r/l	●	
		1151.0450	RPFT 12 04 00	12.70	4.76	5.5	11°	20°	r/l	●	
		1151.0500	RPFT 16 06 M0	16.00	6.35	5.5	11°	20°	r/l	●	
		1651.0200	RCFT 06 02 M0	6.00	2.38	3.0	7°	25°	r/l	●	
		1651.0240	RCFT 08 03 M0	8.00	3.18	3.6	7°	25°	r/l	●	
		1651.0250	RCFT 08 03 M0	8.00	3.18	4.5	7°	25°	r/l	●	
		1651.0300	RCFT 10 T3 M0	10.00	3.97	4.5	7°	25°	r/l	●	
		1651.0400	RCFT 12 04 M0	12.00	4.76	5.5	7°	25°	r/l	●	
		1651.0500	RCFT 16 06 M0	16.00	6.35	5.5	7°	25°	r/l	●	
		1651.0600	RCFT 20 06 M0	20.00	6.35	6.5	7°	25°	r/l	●	

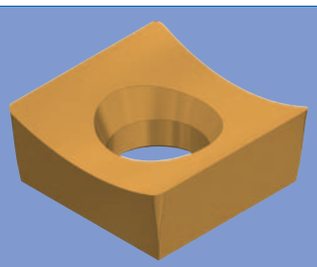
Indexable inserts RPFT / RPHT
Carbide


RPFT 08

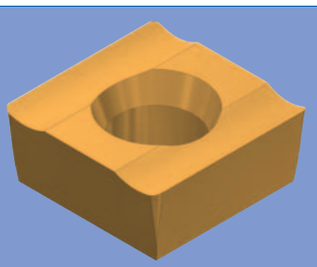


Cutting material	Coating	Part No	ISO Code	d mm	s mm	d1 mm	α	γ			
Carbide MG20	**TiN**	1276.0200	RPFT 06 02 M0-111	6.00	2.38	3.0	11°	20°	r/l	○	●
		1276.0240	RPFT 08 03 M0-111	8.00	3.18	3.6	11°	20°	r/l	○	●
		1276.0300	RPFT 10 T3 M0-111	10.00	3.97	4.5	11°	20°	r/l	○	●
		1276.0400	RPFT 12 04 M0-111	12.00	4.76	5.5	11°	20°	r/l	○	●
	TiAlN	1276.0205	RPFT 06 02 M0-111	6.00	2.38	3.0	11°	20°	r/l	○	●
		1276.0245	RPFT 08 03 M0-111	8.00	3.18	3.6	11°	20°	r/l	○	●
		1276.0305	RPFT 10 T3 M0-111	10.00	3.97	4.5	11°	20°	r/l	○	●
		1276.0405	RPFT 12 04 M0-111	12.00	4.76	5.5	11°	20°	r/l	○	●
	AlCrN	1276.0215	RPFT 06 02 M0-111	6.00	2.38	3.0	11°	20°	r/l	○	●
		1276.0217	RPFT 06 02 M0-131	6.00	2.38	3.0	11°	8°	r/l	○	●
		1276.0255	RPFT 08 03 M0-111	8.00	3.18	3.6	11°	20°	r/l	○	●
		1276.0257	RPFT 08 03 M0-131	8.00	3.18	3.6	11°	8°	r/l	○	●
		1276.0315	RPFT 10 T3 M0-111	10.00	3.97	4.5	11°	20°	r/l	○	●
		1276.0317	RPFT 10 T3 M0-131	10.00	3.97	4.5	11°	8°	r/l	○	●
		1276.0415	RPFT 12 04 M0-111	12.00	4.76	5.5	11°	20°	r/l	○	●
	AlCrN-VA	1276.0222	RPFT 06 02 M0-131	6.00	2.38	3.0	11°	8°	r/l	○	●
		1276.0262	RPFT 08 03 M0-131	8.00	3.18	3.6	11°	8°	r/l	○	●
		1276.0322	RPFT 10 T3 M0-131	10.00	3.97	4.5	11°	8°	r/l	○	●
Carbide 12CR	**TiAlN**	1276.0420	RPHT 12 04 M0-222	12.00	4.76	5.5	11°	16°	r/l	○	●
	AlCrN	1276.0430	RPHT 12 04 M0-222	12.00	4.76	5.5	11°	16°	r/l	○	●
		1276.0530	RPFT 12 04 M0-231	11.94	4.60	5.5	11°	6°	r/l	○	●
	AlCrN-VA	1276.0535	RPFT 12 04 M0-231	11.94	4.60	5.5	11°	6°	r/l	○	●

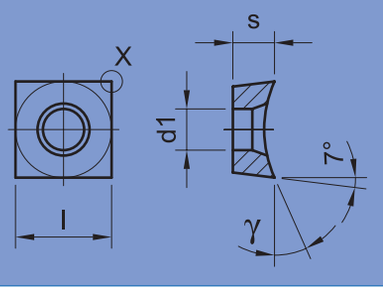
Indexable inserts SCFT
HSS and carbide



SCFT 09 Type G

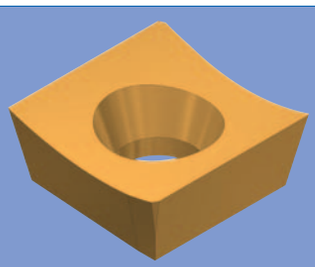


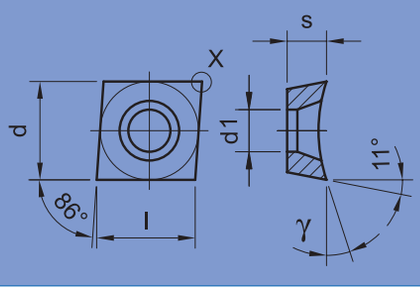
SCFT 09 Type K



Cutting material	Coating	Part No	ISO Code	Type G/K	l mm	s mm	d1 mm	γ	Detail X			
HSS-E	**TiN**	1591.0200	SCFT 09 04 04 FN	G	9.52	4.00	4.5	25°	R 0.4	r/l	●	
		1591.0220	SCFT 09 04 08 FN	G	9.52	4.00	4.5	25°	R 0.8	r/l	●	
		1591.0250	SCFT 12 05 AC FN	G	12.83	5.56	5.5	24°	0.2x45°	r/l	●	
		1591.0270	SCFT 12 05 04 FN	G	12.83	5.56	5.5	24°	R 0.4	r/l	●	
		1591.0290	SCFT 12 05 08 FN	G	12.83	5.56	5.5	24°	R 0.8	r/l	●	
		1591.0310	SCFT 12 05 12 FN	G	12.83	5.56	5.5	24°	R 1.2	r/l	●	
		1591.0700	SCFT 09 04 04 FN	K	9.52	4.00	4.5	30°	R 0.4	r/l	●	
		1591.0720	SCFT 09 04 08 FN	K	9.52	4.00	4.5	30°	R 0.8	r/l	●	
		1591.0770	SCFT 12 05 04 FN	K	12.83	5.56	5.5	30°	R 0.4	r/l	●	
		1591.0790	SCFT 12 05 08 FN	K	12.83	5.56	5.5	30°	R 0.8	r/l	●	
		1591.0810	SCFT 12 05 12 FN	K	12.83	5.56	5.5	30°	R 1.2	r/l	●	
	TiAlN	1666.0200	SCFT 09 04 04 FN	G	9.52	4.00	4.5	25°	R 0.4	r/l	●	
		1666.0220	SCFT 09 04 08 FN	G	9.52	4.00	4.5	25°	R 0.8	r/l	●	
		1666.0250	SCFT 12 05 AC FN	G	12.83	5.56	5.5	24°	0.2x45°	r/l	●	
		1666.0270	SCFT 12 05 04 FN	G	12.83	5.56	5.5	24°	R 0.4	r/l	●	
		1666.0290	SCFT 12 05 08 FN	G	12.83	5.56	5.5	24°	R 0.8	r/l	●	
		1666.0310	SCFT 12 05 12 FN	G	12.83	5.56	5.5	24°	R 1.2	r/l	●	
		1666.0700	SCFT 09 04 04 FN	K	9.52	4.00	4.5	30°	R 0.4	r/l	●	
		1666.0720	SCFT 09 04 08 FN	K	9.52	4.00	4.5	30°	R 0.8	r/l	●	
		1666.0770	SCFT 12 05 04 FN	K	12.83	5.56	5.5	30°	R 0.4	r/l	●	
		1666.0790	SCFT 12 05 08 FN	K	12.83	5.56	5.5	30°	R 0.8	r/l	●	
		1666.0810	SCFT 12 05 12 FN	K	12.83	5.56	5.5	30°	R 1.2	r/l	●	
Carbide MG20	**TiAlN**	1791.0255	SCFT 12 05 AC FN-111	G	12.83	5.56	5.5	24°	0.2x45°	r/l	○	●
		1791.0295	SCFT 12 05 08 FN-111	G	12.83	5.56	5.5	24°	R 0.8	r/l	○	●
	AlCrN	1791.0265	SCFT 12 05 AC FN-111	G	12.83	5.56	5.5	24°	0.2x45°	r/l	○	●
		1791.0305	SCFT 12 05 08 FN-111	G	12.83	5.56	5.5	24°	R 0.8	r/l	○	●
		1791.0325	SCFT 12 05 08 FN-121	G	12.83	5.56	5.5	14°	R 0.8	r/l	○	●

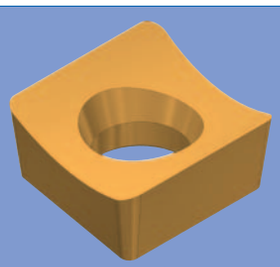
Indexable inserts MPFT
HSS and carbide

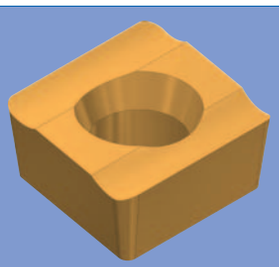

MPFT 08

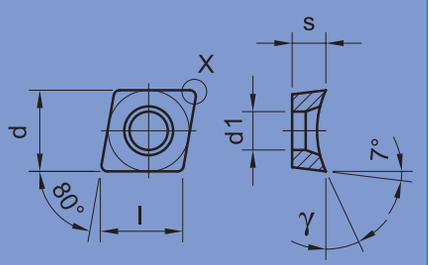


Cutting material	Coating	Part No	ISO Code	d mm	s mm	l mm	d1 mm	γ	Detail X			
HSS-E	**TiN**	1081.0360	MPFT 11 04 PP FL	11.11	4.76	11.15	4.5	18°	0.2x45°	l	●	
		1081.0200	MPFT 04 02 PP FR	4.76	2.38	4.70	2.4	18°	0.2x45°	r	●	
		1081.0210	MPFT 04 02 PP FL	4.76	2.38	4.70	2.4	18°	0.2x45°	l	●	
		1081.0250	MPFT 06 02 PP FR	6.35	2.38	6.30	3.0	18°	0.2x45°	r	●	
		1081.0260	MPFT 06 02 PP FL	6.35	2.38	6.30	3.0	18°	0.2x45°	l	●	
		1081.0300	MPFT 08 03 PP FR	7.94	3.18	8.00	3.4	18°	0.2x45°	r	●	
		1081.0310	MPFT 08 03 PP FL	7.94	3.18	8.00	3.4	18°	0.2x45°	l	●	
		1081.0330	MPFT 08 03 08 FR	7.94	3.18	8.00	3.4	18°	R 0.8	r	●	
		1081.0335	MPFT 08 03 08 FL	7.94	3.18	8.00	3.4	18°	R 0.8	l	●	
		1081.0350	MPFT 11 04 PP FR	11.11	4.76	11.15	4.5	18°	0.2x45°	r	●	
		1581.0210	MPFT 04 02 PP FL	4.76	2.38	4.70	2.4	18°	0.2x45°	l	●	
	TiAlN	1156.0200	MPFT 04 02 PP FR	4.76	2.38	4.70	2.4	18°	0.2x45°	r	●	
		1156.0250	MPFT 06 02 PP FR	6.35	2.38	6.30	3.0	18°	0.2x45°	r	●	
		1156.0300	MPFT 08 03 PP FR	7.94	3.18	8.00	3.4	18°	0.2x45°	r	●	
		1156.0330	MPFT 08 03 08 FR	7.94	3.18	8.00	3.4	18°	R 0.8	r	●	
		1156.0350	MPFT 11 04 PP FR	11.11	4.76	11.15	4.5	18°	0.2x45°	r	●	
		1656.0210	MPFT 04 02 PP FL	4.76	2.38	4.70	2.4	18°	0.2x45°	l	●	
Carbide MG20	**TiN**	1281.0425	MPFT 06 02 PP FL-111	6.35	2.38	6.30	3.0	18°	0.2x45°	l	○	●
		1281.0400	MPFT 06 02 PP FR-111	6.35	2.38	6.30	3.0	18°	0.2x45°	r	○	●
		1281.0600	MPFT 08 03 PP FR-111	7.94	3.18	8.00	3.4	18°	0.2x45°	r	○	●
		1281.0625	MPFT 08 03 PP FL-111	7.94	3.18	8.00	3.4	18°	0.2x45°	l	○	●
		1281.0800	MPFT 11 04 PP FR-111	11.11	4.76	11.15	4.5	18°	0.2x45°	r	○	●
		1281.0825	MPFT 11 04 PP FL-111	11.11	4.76	11.15	4.5	18°	0.2x45°	l	○	●
	TiAlN	1281.0405	MPFT 06 02 PP FR-111	6.35	2.38	6.30	3.0	18°	0.2x45°	r	○	●
		1281.0430	MPFT 06 02 PP FL-111	6.35	2.38	6.30	3.0	18°	0.2x45°	l	○	●
		1281.0605	MPFT 08 03 PP FR-111	7.94	3.18	8.00	3.4	18°	0.2x45°	r	○	●
		1281.0630	MPFT 08 03 PP FL-111	7.94	3.18	8.00	3.4	18°	0.2x45°	l	○	●
		1281.0805	MPFT 11 04 PP FR-111	11.11	4.76	11.15	4.5	18°	0.2x45°	r	○	●
		1281.0830	MPFT 11 04 PP FL-111	11.11	4.76	11.15	4.5	18°	0.2x45°	l	○	●
	AlCrN	1281.0415	MPFT 06 02 PP FR-111	6.35	2.38	6.30	3.0	18°	0.2x45°	r	○	●
		1281.0440	MPFT 06 02 PP FL-111	6.35	2.38	6.30	3.0	18°	0.2x45°	l	○	●
		1281.0615	MPFT 08 03 PP FR-111	7.94	3.18	8.00	3.4	18°	0.2x45°	r	○	●
		1281.0640	MPFT 08 03 PP FL-111	7.94	3.18	8.00	3.4	18°	0.2x45°	l	○	●
		1281.0815	MPFT 11 04 PP FR-111	11.11	4.76	11.15	4.5	18°	0.2x45°	r	○	●
		1281.0840	MPFT 11 04 PP FL-111	11.11	4.76	11.15	4.5	18°	0.2x45°	l	○	●

Indexable inserts CCFT
HSS

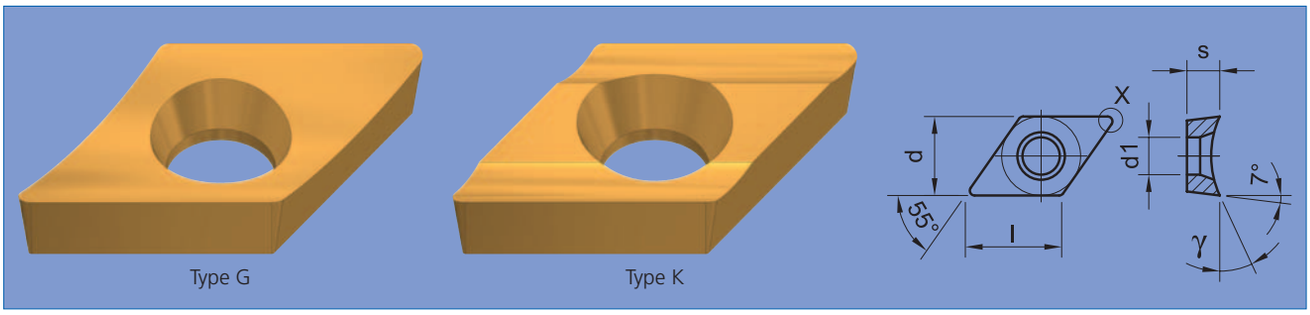

Type G


Type K



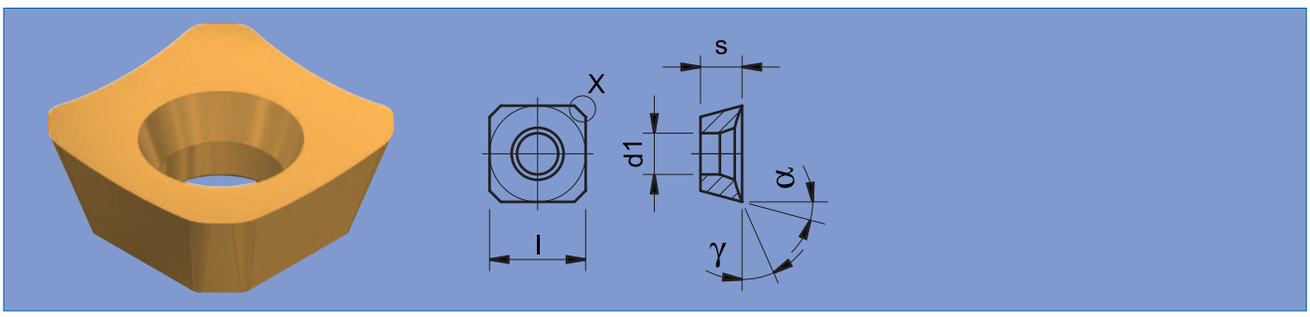
Cutting material	Coating	Part No	ISO Code	Type G/K	d mm	s mm	l mm	d1 mm	γ	Detail X			
HSS-E	**TiN**	1578.0245	CCFT 06 02 01 FR	G	6.35	2.38	6.40	3.0	20°	R 0.1	r	●	
		1578.0247	CCFT 06 02 01 FL	G	6.35	2.38	6.40	3.0	20°	R 0.1	l	●	
		1578.0250	CCFT 06 02 02 FR	G	6.35	2.38	6.40	3.0	20°	R 0.2	r	●	
		1578.0252	CCFT 06 02 02 FL	G	6.35	2.38	6.40	3.0	20°	R 0.2	l	●	
		1578.0255	CCFT 06 02 04 FR	G	6.35	2.38	6.40	3.0	20°	R 0.4	r	●	
		1578.0257	CCFT 06 02 04 FL	G	6.35	2.38	6.40	3.0	20°	R 0.4	l	●	
		1578.0350	CCFT 09 T3 02 FR	G	9.52	3.96	9.70	4.5	25°	R 0.2	r	●	
		1578.0352	CCFT 09 T3 02 FL	G	9.52	3.96	9.70	4.5	25°	R 0.2	l	●	
		1578.0355	CCFT 09 T3 04 FR	G	9.52	3.96	9.70	4.5	25°	R 0.4	r	●	
		1578.0357	CCFT 09 T3 04 FL	G	9.52	3.96	9.70	4.5	25°	R 0.4	l	●	
		1578.0360	CCFT 09 T3 08 FR	G	9.52	3.96	9.70	4.5	25°	R 0.8	r	●	
		1578.0362	CCFT 09 T3 08 FL	G	9.52	3.96	9.70	4.5	25°	R 0.8	l	●	
		1578.0750	CCFT 06 02 02 FR	K	6.35	2.38	6.40	3.0	30°	R 0.2	r	●	
		1578.0752	CCFT 06 02 02 FL	K	6.35	2.38	6.40	3.0	30°	R 0.2	l	●	
		1578.0755	CCFT 06 02 04 FR	K	6.35	2.38	6.40	3.0	30°	R 0.4	r	●	
		1578.0757	CCFT 06 02 04 FL	K	6.35	2.38	6.40	3.0	30°	R 0.4	l	●	
		1578.0855	CCFT 09 T3 04 FR	K	9.52	3.96	9.70	4.5	30°	R 0.4	r	●	
		1578.0857	CCFT 09 T3 04 FL	K	9.52	3.96	9.70	4.5	30°	R 0.4	l	●	
		1578.0860	CCFT 09 T3 08 FR	K	9.52	3.96	9.70	4.5	30°	R 0.8	r	●	
		1578.0862	CCFT 09 T3 08 FL	K	9.52	3.96	9.70	4.5	30°	R 0.8	l	●	
	TiAlN	1653.0245	CCFT 06 02 01 FR	G	6.35	2.38	6.40	3.0	20°	R 0.1	r	●	
		1653.0247	CCFT 06 02 01 FL	G	6.35	2.38	6.40	3.0	20°	R 0.1	l	●	
		1653.0250	CCFT 06 02 02 FR	G	6.35	2.38	6.40	3.0	20°	R 0.2	r	●	
		1653.0252	CCFT 06 02 02 FL	G	6.35	2.38	6.40	3.0	20°	R 0.2	l	●	
		1653.0255	CCFT 06 02 04 FR	G	6.35	2.38	6.40	3.0	20°	R 0.4	r	●	
		1653.0257	CCFT 06 02 04 FL	G	6.35	2.38	6.40	3.0	20°	R 0.4	l	●	
		1653.0350	CCFT 09 T3 02 FR	G	9.52	3.96	9.70	4.5	25°	R 0.2	r	●	
		1653.0352	CCFT 09 T3 02 FL	G	9.52	3.96	9.70	4.5	25°	R 0.2	l	●	
		1653.0355	CCFT 09 T3 04 FR	G	9.52	3.96	9.70	4.5	25°	R 0.4	r	●	
		1653.0357	CCFT 09 T3 04 FL	G	9.52	3.96	9.70	4.5	25°	R 0.4	l	●	
		1653.0360	CCFT 09 T3 08 FR	G	9.52	3.96	9.70	4.5	25°	R 0.8	r	●	
		1653.0362	CCFT 09 T3 08 FL	G	9.52	3.96	9.70	4.5	25°	R 0.8	l	●	
		1653.0750	CCFT 06 02 02 FR	K	6.35	2.38	6.40	3.0	30°	R 0.2	r	●	
		1653.0752	CCFT 06 02 02 FL	K	6.35	2.38	6.40	3.0	30°	R 0.2	l	●	
		1653.0755	CCFT 06 02 04 FR	K	6.35	2.38	6.40	3.0	30°	R 0.4	r	●	
		1653.0757	CCFT 06 02 04 FL	K	6.35	2.38	6.40	3.0	30°	R 0.4	l	●	
		1653.0855	CCFT 09 T3 04 FR	K	9.52	3.96	9.70	4.5	30°	R 0.4	r	●	
		1653.0857	CCFT 09 T3 04 FL	K	9.52	3.96	9.70	4.5	30°	R 0.4	l	●	
		1653.0860	CCFT 09 T3 08 FR	K	9.52	3.96	9.70	4.5	30°	R 0.8	r	●	
		1653.0862	CCFT 09 T3 08 FL	K	9.52	3.96	9.70	4.5	30°	R 0.8	l	●	

Indexable inserts DCFT
HSS



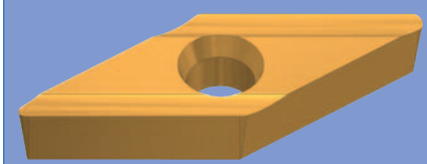
Cutting material	Coating	Part No	ISO Code	Type G/K	d mm	s mm	l mm	d1 mm	γ	Detail X			
HSS-E	**TiN**	1579.0245	DCFT 07 02 01 FR	G	6.35	2.38	7.75	3.0	20°	R 0.1	r	●	
		1579.0247	DCFT 07 02 01 FL	G	6.35	2.38	7.75	3.0	20°	R 0.1	l	●	
		1579.0250	DCFT 07 02 02 FR	G	6.35	2.38	7.75	3.0	20°	R 0.2	r	●	
		1579.0252	DCFT 07 02 02 FL	G	6.35	2.38	7.75	3.0	20°	R 0.2	l	●	
		1579.0255	DCFT 07 02 04 FR	G	6.35	2.38	7.75	3.0	20°	R 0.4	r	●	
		1579.0257	DCFT 07 02 04 FL	G	6.35	2.38	7.75	3.0	20°	R 0.4	l	●	
		1579.0355	DCFT 11 T3 04 FR	G	9.52	3.96	11.60	4.5	25°	R 0.4	r	●	
		1579.0357	DCFT 11 T3 04 FL	G	9.52	3.96	11.60	4.5	25°	R 0.4	l	●	
		1579.0360	DCFT 11 T3 08 FR	G	9.52	3.96	11.60	4.5	25°	R 0.8	r	●	
		1579.0362	DCFT 11 T3 08 FL	G	9.52	3.96	11.60	4.5	25°	R 0.8	l	●	
		1579.0750	DCFT 07 02 02 FR	K	6.35	2.38	7.75	3.0	30°	R 0.2	r	●	
		1579.0752	DCFT 07 02 02 FL	K	6.35	2.38	7.75	3.0	30°	R 0.2	l	●	
		1579.0755	DCFT 07 02 04 FR	K	6.35	2.38	7.75	3.0	30°	R 0.4	r	●	
		1579.0757	DCFT 07 02 04 FL	K	6.35	2.38	7.75	3.0	30°	R 0.4	l	●	
		1579.0855	DCFT 11 T3 04 FR	K	9.52	3.96	11.60	4.5	30°	R 0.4	r	●	
		1579.0857	DCFT 11 T3 04 FL	K	9.52	3.96	11.60	4.5	30°	R 0.4	l	●	
		1579.0860	DCFT 11 T3 08 FR	K	9.52	3.96	11.60	4.5	30°	R 0.8	r	●	
		1579.0862	DCFT 11 T3 08 FL	K	9.52	3.96	11.60	4.5	30°	R 0.8	l	●	
	TiAlN	1654.0245	DCFT 07 02 01 FR	G	6.35	2.38	7.75	3.0	20°	R 0.1	r	●	
		1654.0247	DCFT 07 02 01 FL	G	6.35	2.38	7.75	3.0	20°	R 0.1	l	●	
		1654.0250	DCFT 07 02 02 FR	G	6.35	2.38	7.75	3.0	20°	R 0.2	r	●	
		1654.0252	DCFT 07 02 02 FL	G	6.35	2.38	7.75	3.0	20°	R 0.2	l	●	
		1654.0255	DCFT 07 02 04 FR	G	6.35	2.38	7.75	3.0	20°	R 0.4	r	●	
		1654.0257	DCFT 07 02 04 FL	G	6.35	2.38	7.75	3.0	20°	R 0.4	l	●	
		1654.0355	DCFT 11 T3 04 FR	G	9.52	3.96	11.60	4.5	25°	R 0.4	r	●	
		1654.0357	DCFT 11 T3 04 FL	G	9.52	3.96	11.60	4.5	25°	R 0.4	l	●	
		1654.0360	DCFT 11 T3 08 FR	G	9.52	3.96	11.60	4.5	25°	R 0.8	r	●	
		1654.0362	DCFT 11 T3 08 FL	G	9.52	3.96	11.60	4.5	25°	R 0.8	l	●	
		1654.0750	DCFT 07 02 02 FR	K	6.35	2.38	7.75	3.0	30°	R 0.2	r	●	
		1654.0752	DCFT 07 02 02 FL	K	6.35	2.38	7.75	3.0	30°	R 0.2	l	●	
		1654.0755	DCFT 07 02 04 FR	K	6.35	2.38	7.75	3.0	30°	R 0.4	r	●	
		1654.0757	DCFT 07 02 04 FL	K	6.35	2.38	7.75	3.0	30°	R 0.4	l	●	
		1654.0855	DCFT 11 T3 04 FR	K	9.52	3.96	11.60	4.5	30°	R 0.4	r	●	
		1654.0857	DCFT 11 T3 04 FL	K	9.52	3.96	11.60	4.5	30°	R 0.4	l	●	
		1654.0860	DCFT 11 T3 08 FR	K	9.52	3.96	11.60	4.5	30°	R 0.8	r	●	
		1654.0862	DCFT 11 T3 08 FL	K	9.52	3.96	11.60	4.5	30°	R 0.8	l	●	

Indexable inserts SEFT
HSS and carbide

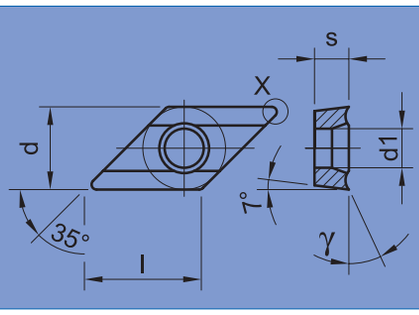


Cutting material	Coating	Part No	ISO Code	l mm	s mm	d1 mm	α	γ	Detail X			
HSS-E	**TiN**	1091.0500	SEFT 12 04 AF FN	12.70	4.76	5.5	20°	12°	1.5x45° R0.8	r/l	●	
	TiAlN	1166.0500	SEFT 12 04 AF FN	12.70	4.76	5.5	20°	12°	1.5x45° R0.8	r/l	●	
Carbide MG20	**TiN**	1291.0500	SEFT 12 04 AF FN-111	12.70	4.76	5.5	20°	12°	1.5x45° R0.8	r/l	○	●
	TiAlN	1291.0505	SEFT 12 04 AF FN-111	12.70	4.76	5.5	20°	12°	1.5x45° R0.8	r/l	○	●
	AlCrN	1291.0515	SEFT 12 04 AF FN-111	12.70	4.76	5.5	20°	12°	1.5x45° R0.8	r/l	○	●

Indexable inserts VCFT
HSS



VCFT 16 Type K



Cutting material	Coating	Part No	ISO Code	Type G/K	d mm	s mm	l mm	d1 mm	γ	Detail X			
HSS-E	**TiN**	1582.0855	VCFT 16 04 04 FR	K	9.52	4.76	16.60	4.5	30°	R 0.4	r	●	
		1582.0857	VCFT 16 04 04 FL	K	9.52	4.76	16.60	4.5	30°	R 0.4	l	●	
		1582.0860	VCFT 16 04 08 FR	K	9.52	4.76	16.60	4.5	30°	R 0.8	r	●	
		1582.0862	VCFT 16 04 08 FL	K	9.52	4.76	16.60	4.5	30°	R 0.8	l	●	
	TiAlN	1657.0855	VCFT 16 04 04 FR	K	9.52	4.76	16.60	4.5	30°	R 0.4	r	●	
		1657.0857	VCFT 16 04 04 FL	K	9.52	4.76	16.60	4.5	30°	R 0.4	l	●	
		1657.0860	VCFT 16 04 08 FR	K	9.52	4.76	16.60	4.5	30°	R 0.8	r	●	
		1657.0862	VCFT 16 04 08 FL	K	9.52	4.76	16.60	4.5	30°	R 0.8	l	●	

Special tools

Your partner for customized system solutions!

You know ALESA Ltd. as the specialists for highly positive and extremely sharply ground cutting inserts of HSS-E and carbide, and for special tools.
The competence of ALESA Ltd. covers the entire process from design, engineering, selecting the right cutting materials and coatings, including the application technology.

That is why worldwide ALESA Ltd. is a highly competent partner.
The product range includes, in addition to standardized tools, also complete customized system solutions.

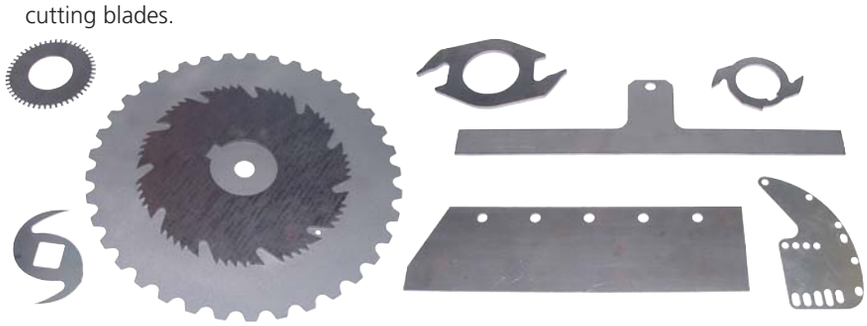
Special dimensions

Each standard tool can also be adapted to your individual needs.

HSS tool blanks

According to your drawings and specifications:
Blanks from our main HSS sheet metal camp in Switzerland
- Thickness 0.8 - 6.0 mm
- HSS quality (No. 1.3343) and HSS-E (No. 1.3243 and 1.3247)
- Contour-cut by laser beam
- Raw or flat ground
- Case-hardened and tempered
- Finished ground to thickness
- Suitable, for example, for the manufacturing of flat or circular cutting blades.

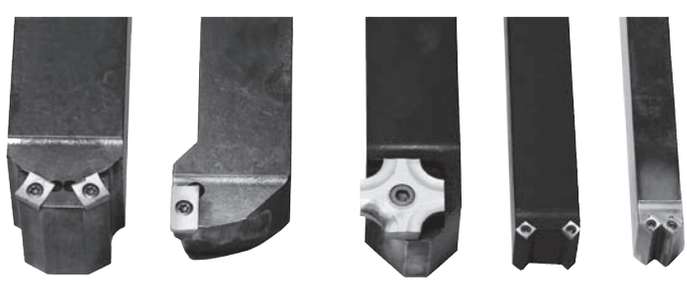
We also take over the hardening and tempering of the blanks you have processed.
Sheets in other qualities can also be delivered to us for laser cutting and for possible additional operations .
The blanks that are processed by us are best suited for further processing through wire cutting.
Ask for our non-binding offer.



Special plane tools

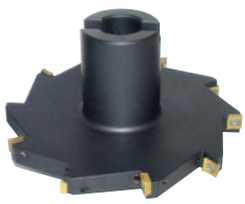
Because of the hardiness of HSS-E, the cutting inserts sustain the movements during entry and exit as well as uninterrupted cutting.

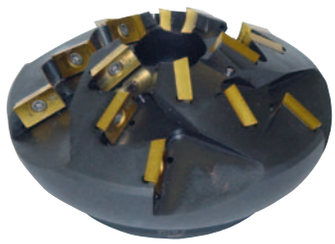
Through cutting insert technology always the same cutting edge geometry and repeat accuracy of measuring.
No regrinding.

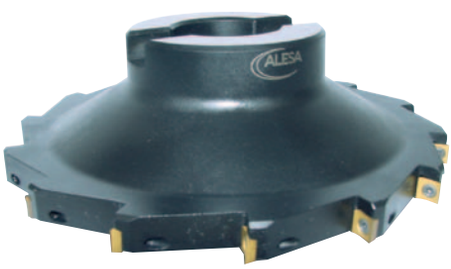


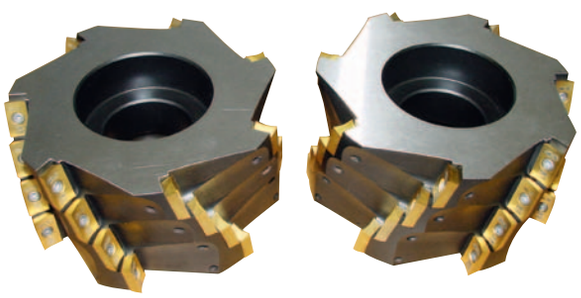
Special tools – examples

Special tools with indexable inserts

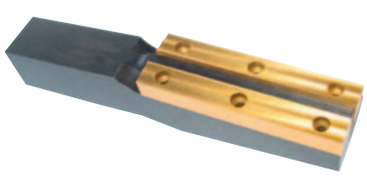





Special tools for turning and grooving

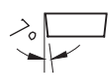
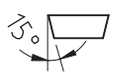
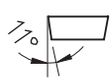
ISO – Designation system for indexable inserts

A	O	F	T		15	T3	08	F	R	-	521
1	2	3	4		5	6	7	8	9		13

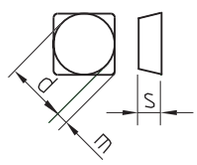
1 Basic shape

S		90°
C		80°
D		55°
M		86°
V		35°
A		85°
R		

2 Clearance angle

C	
D	
E	
P	
O	Symbol for other clearance angles which need more detail.

3 Tolerances

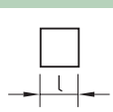
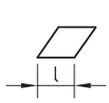
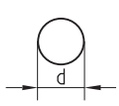


	F	H	E
d	± 0.013	± 0.013	± 0.025
m	± 0.005	± 0.013	± 0.025
s	± 0.025	± 0.025	± 0.025

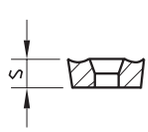
4 Type of inserts

T	 for countersunk screws 40–60° one-side groove for chips
X	special tools which need more detail

5 Edge length

S	
C, D, M, V	
L	
A, B	
R	

6 Thickness of inserts



Index	s
02	2.38
03	3.18
T3	3.97
04	4.76
05	5.56
06	6.35

7 Corner edge

Rounded cutting edges

Index	Radius
01	0.1 mm
02	0.2 mm
04	0.4 mm
08	0.8 mm
12	1.2 mm
16	1.6 mm
20	2.0 mm
24	2.4 mm
32	3.2 mm

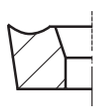
Minor cutting edge

K		α	
A	45°	**C**	7°
P	90°	**D**	15°
Z	n. def.	**E**	20°
		F	25°
		P	11°
		Z	n. def.

Round indexable inserts

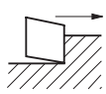
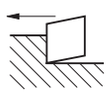
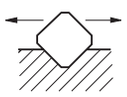
00	For diameter with imperial dimensions in mm
M0	For diameter in metric dimensions

8 Edge condition



F sharp-edged

9 Cutting direction

R	L	N
		

13 Additional number

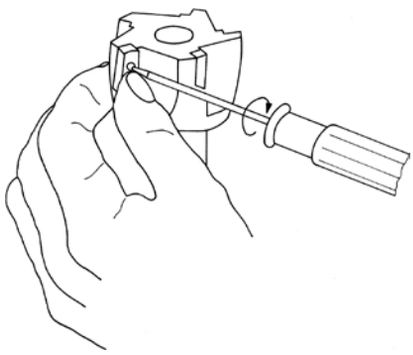
Substrate		Tool geometry		Features	
0		**0**	enlarged wedge	**0**	
1	MG20	**1**		**1**	Completely ground
2	12 CR	**2**		**2**	Peripherical ground
3		**3**		**3**	Reinforced edge
4	HM	**4**		**4**	
5	HM-F	**5**		**5**	Special coatings
6	HA	**6**		**6**	
7	ALESA X2	**7**		**7**	
8	KG14	**8**	fz plus	**8**	
9	Misc.	**9**	Misc.	**9**	

Indexable Inserts

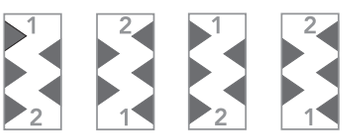
Informationen and instructions

Fitting instructions for inserts

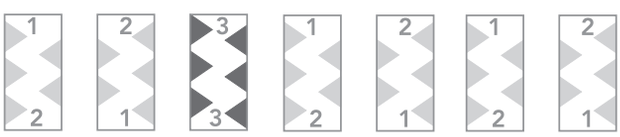
1. Tool rest and positioning surface of inserts and milling head must be cleaned carefully.
2. Inserts must lie absolutely flat.
3. Before tightening the screw, the insert has to be pressed onto the positioning surface of the milling head.
4. Then, the screw has to be fully tightened.
5. Screws must be tightened again according to our torque table after initial milling operation. To be observed particularly when using screws ≤ M 2,5 (settling)!



Order of inserts with chip splitting



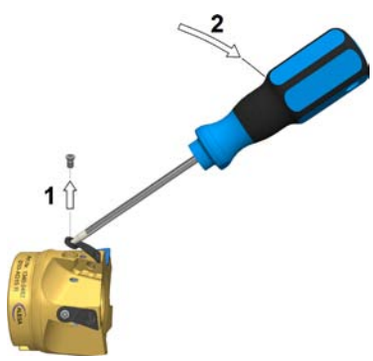
Order of even number of teeth



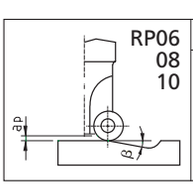
In case of odd number of teeth use indexable insert No 3 once

How to remove the hydroshield on milling head Coolex, No 1340

1. Loosen the fixing screw
2. Pull out the hydroshield with the screwdriver as shown on the picture.

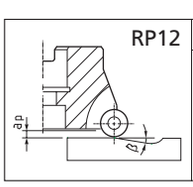


Plunging and ramping



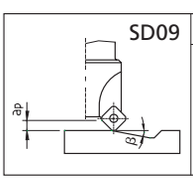
RP06 08 10

D	ap	β
Ø 12	0.2	2.0°
Ø 16	0.5	5.0°
Ø 20	0.7	4.0°
Ø 25	1.5	5.0°
Ø 32	2.0	5.0°



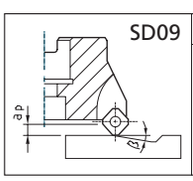
RP12

D	ap	β
Ø 40	2.0	2.8°
Ø 50	2.0	2.2°
Ø 63	2.0	1.8°
Ø 80	2.0	1.4°
Ø 100	2.0	1.1°
Ø 125	2.0	0.9°



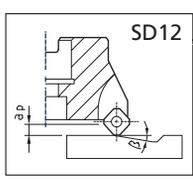
SD09

D	ap	β
Ø 16	4.0	14°
Ø 20	4.0	11°
Ø 25	4.0	9°
Ø 32	4.0	7°
Ø 40	4.0	5.5°



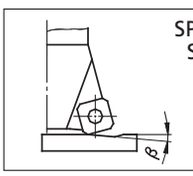
SD09

D	ap	β
Ø 40	4.0	5.7°
Ø 50	4.0	4.5°
Ø 63	4.0	3.6°
Ø 80	4.0	2.8°
Ø 100	4.0	2.2°



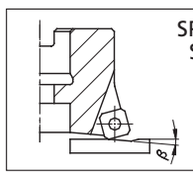
SD12

D	ap	β
Ø 50	6.0	6.8°
Ø 63	6.0	5.4°
Ø 80	6.0	4.2°
Ø 100	6.0	3.4°
Ø 125	6.0	2.7°
Ø 160	6.0	2.1°



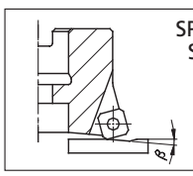
SPEED SD09

D	β
Ø 12	8.8°
Ø 16	6.2°
Ø 25	4.2°



SPEED SD09

D	β
Ø 32	2.7°
Ø 40	2.2°
Ø 50	1.6°



SPEED SD12

D	β
Ø 50	2.2°
Ø 63	1.4°
Ø 80	1.0°

Range of coatings for indexable inserts

	Material classification	HSS		Carbide					
		TiN	TiAlN	TiAlN	AlCrN	AlCrN-VA	DLC-H		special coating
1a	**Steels < 650 N/mm²** - Construction steels - Fine grain steels - Case hardening steels - Steel castings	●	●	●	●				
1b	**Steels < 800 N/mm²** - Construction steels - Fine grain steels - Case hardening steels - Free-cutting steels - Heat-treatable steels - High-temperature constructional steels - Tough at subzero steels - Nitriding steels - Tool steels	●	●	●	●				
1c	**Steels 800 - 1200 Nmm²** - Heat-treatable steels - High-temperature constructional steels - Tough at subzero steels - Nitriding steels - Tool steels - High speed steels - Heat-resisting steels		○	●	●				
1d	**Steels > 1200 N/mm²** - Heat-treatable steels - Nitriding steels - Tool steels - High speed steels			○	●				
2a	**Stainless steels < 800 N/mm²**	●	●	○	●	●			
2b	**Stainless steels > 800 N/mm²**		●	○	●	●			
3a	**Castings 1** - Grey cast iron < 150 HB - Cast iron with spheroidal graphite < 200 HB - Malleable cast iron < 200 HB - Magnesium cast alloy			●	●				
3b	**Castings 2** - Grey cast iron tempered > 150 HB - Cast iron with spheroidal graphite temp. > 200 HB - Malleable cast iron tempered > 200 HB			●	●				
3c	**Castings 3**: Steel castings < 800 N/mm²		○	●	●				
3d	**Castings 4:** Steel castings 800 - 1200 N/mm²		○	○	●	●			
3e	**Aluminium cast material > 6% Si**			●	●		●		○
4a	**Non-ferrous metal:** Copper and copper-tin alloys	●	○	●	○		●		
4b	**Non-ferrous metal** - Copper-forging alloys - Copper-tin alloys (bronze)	●	●	●	●		●		
4c	**Non-ferrous metal** - Pure aluminium - Non hardened aluminium	●	●	●	●		●		
4d	**Non-ferrous metal:** Hardened aluminium	●	●	●	●		●		
4e	**Aluminium cast material < 6% Si**	●	●	●	●		●		
5a	**Non-alloyed Ni / Ti < 650 N/mm²**		●	○	●	●			●
5b	**Ni-/Ti-based alloys < 900 N/mm², Duplex**		●	○	●	●			●
5c	**Ni-/Ti-based alloys 900 - 1200 N/mm²**			○	●	●			●
6a	**Synthetic material - Thermoplast**	●	●	●	●		●		
6b	**Synthetic material - Duroplast** - Duroplast non laminated - Duroplast laminated	●	●	●	●		●		

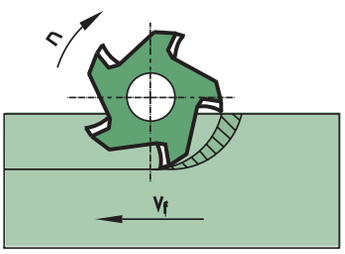
References and hints for problem solving

Positioning of the milling tool

favourable

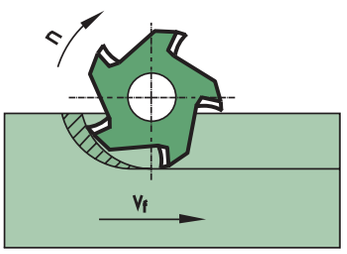
reduced eruption tendency
improved surface finish
longer tool life

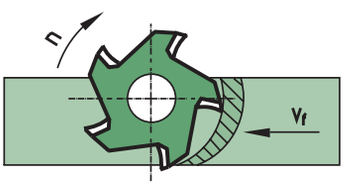
unfavourable



Climb milling vs. conventional milling

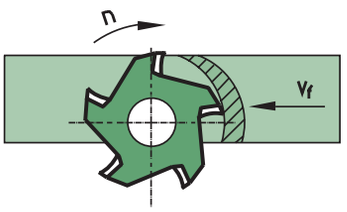
Climb milling should always be used unless the machine, clamping system or workpiece is not rigid enough.

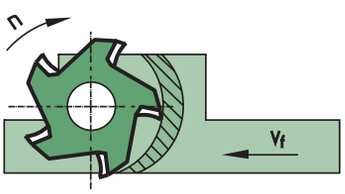




Positioning of milling tool

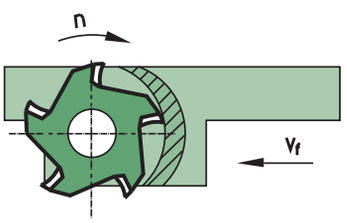
Where possible the milling cutter should machine tangentially to the workpiece.

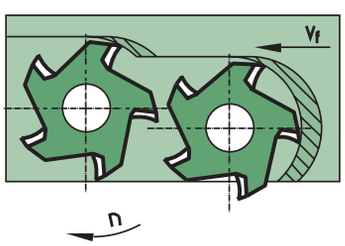




Positioning of workpiece

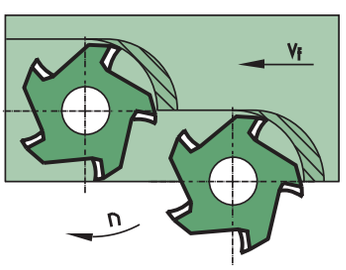
Where possible to reduce cutting forces the milling cutter should machine tangentially over the complete length of the workpiece.

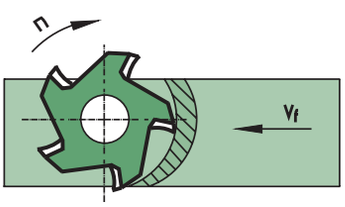




Overlapping

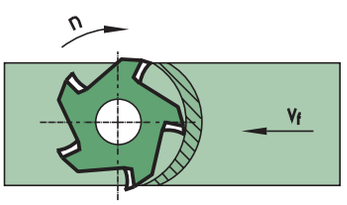
When overlapping extreme caution should be exercised when exiting with the milling cutter (as shown in the left hand sketch).



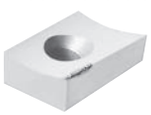
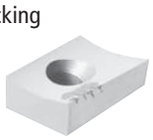


Size of the milling tool

When face milling the diameter of the milling tool should be 20–30% larger than the width of the workpiece.



Suggested solutions

Problem	Reason	Cutting speed	Feed	Cutting depth	With coolant	Without coolant	Climb milling	Conventional milling	Coating	Improve chip removal	Change positioning of the cutter	Reduce tool overlapping	Improve stability	Cutting edge angle
Excessive flank wear 	• Excessive cutting speed • Depth of cut too small • Feed too low • Incorrect milling method	↓	↑				■		■					
Excessive wear by indentation 	• Rough surface finish • Surface hardening	↓	↑	↑			■		■		■			■
Excessive crater wear 	• Increased cutting speed • Depth of cut too large • Increased cutting temperature	↓	↓						■					
Deformation of the cutting edge 	• Increased cutting temperature • Too high loading on the face	↓	↓	↓					■	■	■			■
Built-up edge 	• Incorrect cutting temperature • Feed rate too low • Incorrect positioning of the milling cutter • Incorrect milling method	↑	↑			■	■		■		■			
Cracking 	• Increased feed per tooth • Chip compression • Chip welding	↑	↓					■	■	■	■	■	■	
Thermal cracking 	• Unstable cutting temperature • Interrupted cut • Poor coolant pressure	↓	↓			■			■		■			
Insert breakage 	• Excessive strain on the cutting edge • Insert too small • Insufficient machine power	↓	↓	↓							■	■	■	■
Poor surface finish	• Excessive feed • Spindle run out • Poor rigidity	↑	↓	↓	■					■	■	■	■	
Vibration	• Incorrect cutting data • Poor rigidity	↓	↑	↓				■			■	■	■	
Eruptions at the workpiece edge		↓	↓	↓			■				■			■

↑ = Increase ↓ = Reduce ■ = Remedy

Hardness scale

Tensile strength	Vickers	Brinell	Rock-well	Shore
N/mm2	HV	HB	HRC	C
700	200	200	–	28
740	210	210	–	29
770	220	220	–	30
810	230	230	19.2	31
840	240	240	21.2	33
880	250	250	23	34
910	260	260	24.7	35
950	270	270	26.1	36
980	280	280	27.6	37
1020	290	290	29	39
1050	300	300	30.3	40
1090	310	310	31.5	41
1120	320	320	32.9	42
1150	330	330	33.8	43
1190	340	340	34.9	44
1230	350	350	36	45
1260	360	359	37	46
1300	370	368	38	47
1330	380	373	38.9	48
1370	390	385	39.8	49
1400	400	393	40.7	50
1440	410	400	41.5	51
1470	420	407	42.3	52
1510	430	416	43.2	53
1540	440	423	44	54
1580	450	429	44.8	55
1610	460	435	45.5	56
1650	470	441	46.3	57
1680	480	450	47	58
1720	490	457	47.7	59
1750	500	465	48.3	60
1790	510	474	49	61
1820	520	482	49.6	62
1860	530	489	50.3	63
1890	540	469	50.9	64
1930	550	503	51.5	65
1960	560	511	52.1	66
2000	570	520	52.7	67

Strength	Vickers	Brinell	Rock-well	Shore
N/mm2	HV	HB	HRC	C
2030	580	527	53.3	68
2070	590	533	53.8	69
2100	600	533	54.4	70
2140	610	543	54.9	71
2170	620	549	55.4	72
2210	630	555	55.9	73
2240	640	561	56.4	74
2280	650	568	56.9	75
2310	660	574	57.4	75
2350	670	581	57.9	76
2380	680	588	58.7	77
2410	690	595	58.9	78
2450	700	602	59.3	79
2480	710	609	59.8	80
2520	720	616	60.2	81
2550	730	622	60.7	82
2590	740	627	61.1	83
2630	750	633	61.5	83
2660	760	639	61.9	84
2700	770	644	62.3	85
2730	780	650	62.7	86
2770	790	656	63.1	86
2800	800	661	63.5	87
2840	810	666	63.9	87
2870	820	670	64.3	88
2910	830	677	64.6	89
2940	840	682	65	89
2980	850	–	65.3	90
3010	860	–	65.7	90
3050	870	–	66	91
3080	880	–	66.3	91
3120	890	–	66.6	92
3150	900	–	66.9	92
3190	910	–	67.2	–
3220	920	–	67.5	–
3260	930	–	67.7	–
3290	940	–	68	–
–	–	–	–	–

Formulas and calculations

Symbols and variables

for all ALESA-formula pages

a_e	Cutting width	[mm]
a_p	Cutting depth	[mm]
D	Diameter of milling cutter	[mm]
R	Radius of milling cutter	[mm]
m	Free diameter of cutter	[mm]
f_z	Feed per tooth	[mm]
hm	Average chip thickness	[mm]
n	Revolution	[rpm]
Q	Metal removal rate	[cm³/min]
v_c	Cutting speed	[m/min]
v_f	Feed rate	[mm/min]
Z	No. of teeth	
K	Angle ‹Kappa›	[°]
Φ	Angle ‹Phi›	[rad]

General formulas

Cutting speed [m/min]

$$v_c = \frac{D \cdot \pi \cdot n}{1000}$$

Revolution [rpm]

$$n = \frac{v_c \cdot 1000}{D \cdot \pi}$$

Feed rate [mm/min]

$$v_f = f_z \cdot n \cdot Z$$

Feed per tooth [mm]

$$f_z = \frac{v_f}{n \cdot Z}$$

Metal removal rate [cm³/min]

$$Q = \frac{a_p \cdot a_e \cdot v_f}{1000}$$

Circular interpolation (external and internal)

Circular interpolation (external)

Feed rate
(path speed to centre of milling tool)

$$v_f = \left(1 + \frac{D}{D_w}\right) \cdot n \cdot f_Z \cdot Z$$

Real cutting depth

$$a_e = \frac{D_a^2 - D_w^2}{4 \cdot (D_w + D)}$$

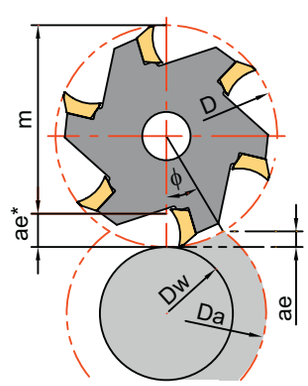
Circular interpolation (internal)

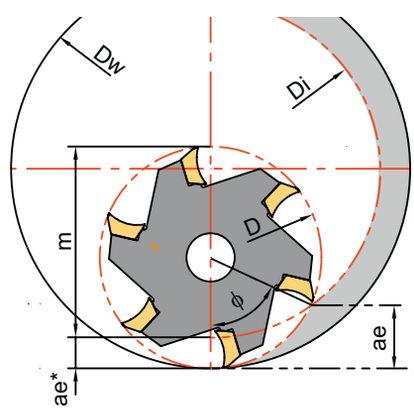
Feed rate
(path speed to centre of milling tool)

$$v_f = \left(1 - \frac{D}{D_w}\right) \cdot n \cdot f_Z \cdot Z$$

Real cutting depth

$$a_e = \frac{D_w^2 - D_i^2}{4 \cdot (D_w - D)}$$





The average chip thickness hm and the feed per tooth fz can be calculated by means of the formulas on the following page. Please note that the calculated real cutting depth ae and not the value ae* must be introduced in the formula.

Formulas and calculations

Minimum feed rate

valid for $a_e \leq 30\%$ of the tool diameter

To remain above an average chip thickness of **hm = 0.01 mm**, the feed rate should remain above the following values:

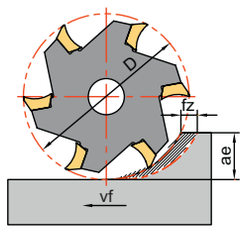
a_e/D:	0.01	0.02	0.04	0.06	0.10	0.30
Min.-f_z:	0.10	0.07	0.05	0.04	0.03	0.02

Milling cutters and full-side cutters

simplified formula to use up to $a_e/D \leq 30\%$

$$h_m \approx f_z \cdot \sqrt{\frac{a_e}{D}}$$

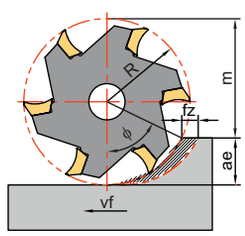
$$f_z \approx h_m \cdot \sqrt{\frac{D}{a_e}}$$

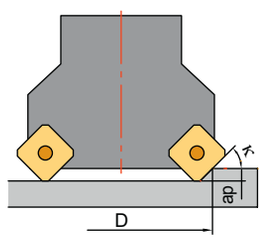


General formula for hm and fz

with angle of engaged cutting Φ

$$\Phi = \arcsin\left(1-\frac{m}{R}\right) + \arcsin\left(\frac{a_e+m}{R}-1\right)$$



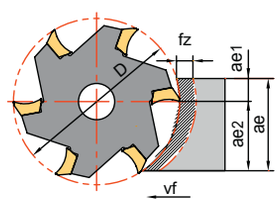


Average chip thickness

$$h_m = \frac{f_z \cdot a_e}{\Phi \cdot R} \cdot \sin(\mathrm{K})$$

Feed per tooth

$$f_z = \frac{h_m \cdot \Phi \cdot R}{a_e} \cdot \frac{1}{\sin(\mathrm{K})}$$



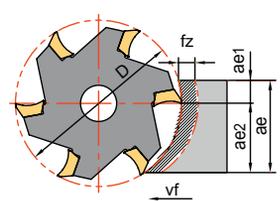
without angle of engaged cutting Φ

Average chip thickness

$$h_m = \frac{f_z \cdot a_e \cdot 360° \cdot \sin(\mathrm{K})}{\pi \cdot D \cdot \left(\arcsin\left(\frac{2 \cdot a_{e1}}{D}\right) + \arcsin\left(\frac{2 \cdot a_{e2}}{D}\right)\right)}$$

Feed per tooth

$$f_z = \frac{h_m \cdot \pi \cdot D \cdot \left(\arcsin\left(\frac{2 \cdot a_{e1}}{D}\right) + \arcsin\left(\frac{2 \cdot a_{e2}}{D}\right)\right)}{\sin(\mathrm{K}) \cdot 360° \cdot a_e}$$



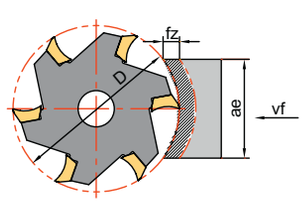
Face milling – above center of workpiece

Average chip thickness

$$h_m = \frac{f_z \cdot a_e \cdot 180° \cdot \sin(\mathrm{K})}{\pi \cdot D \cdot \arcsin\left(\frac{a_e}{D}\right)}$$

Feed per tooth

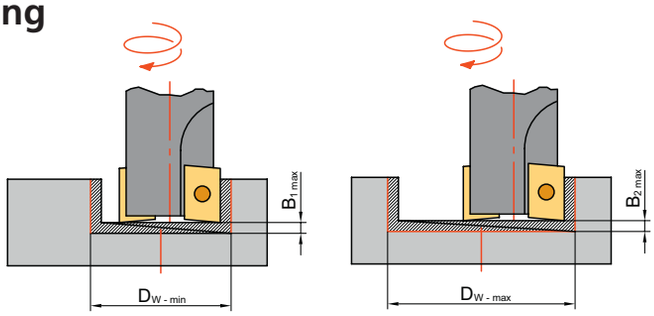
$$f_z = \frac{h_m \cdot \pi \cdot D \cdot \arcsin\left(\frac{a_e}{D}\right)}{\sin(\mathrm{K}) \cdot 360° \cdot a_e}$$



Formulas and calculations

Circularly interpolation whilst plunging

β	Ramp angle
B	Calculated ramp angle up to B_{max} $D_w > D_{w\text{-}min}$ and $D_w < D_{w\text{-}max}$
$B_{1\ max}$	maximum ramp angle within the minimum bore
$B_{2\ max}$	maximum ramp angle within the maximum bore
D	Tool diameter
D_w	Bore diameter
$D_{w\text{-}max}$	maximum bore diameter
$D_{w\text{-}min}$	minimum bore diameter



$$B = (D_w - D) \cdot \pi \cdot \tan \beta$$

Plunge milling - recommended bore diameter

ALESA SPEED SD09

No 1318, 1352, 1353

B_{max} = 1 mm

Ø D mm	Ø D1 mm	min Ø	max Ø	Ramp angle
12	27	39	54	8° 30'
16	31	47	62	6° 10'
25	40	65	80	4° 10'
32	47	79	94	2° 40'
40	55	98	110	2° 10'
50	65	115	130	1° 30'

ALESA SPEED SD12

No 1322

B_{max} = 1.5 mm

Ø D mm	Ø D1 mm	min Ø	max Ø	Ramp angle
50	70	120	140	2° 10'
63	83	146	166	1° 20'
83	103	186	206	1° 00'

ALESA TWIST AO10

No 1311, 1347, 1348

B_{max} = 0.4 mm

Ø D mm	min Ø	max Ø	Ramp angle
16	19	32	2° 30'
20	27	40	2° 15'
25	37	50	1° 45'
32	51	64	1° 15'
40	67	80	1° 00'
50	87	100	0° 50'

ALESA TWIST AO15

No 1311, 1347, 1348

B_{max} = 0.45 mm

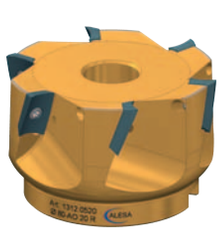
Ø D mm	min Ø	max Ø	Ramp angle
25	34	50	1° 50'
32	48	64	1° 20'
40	64	80	1° 00'
50	84	100	0° 50'
63	110	126	0° 40'
80	144	160	0° 30'

ALESA TWIST AO20

No 1312

B_{max} = 0.5 mm

Ø D mm	min Ø	max Ø	Ramp angle
50	80	100	1° 00'
63	106	126	0° 50'
80	140	160	0° 40'
100	180	200	0° 30'



hm [mm] table

Average chip thickness hm for milling with ALESA indexable inserts

Material classification		Face milling				Profile milling					
	indexable insert	SDFT RPFT	SDHT RPHT	SDFT09 SDFT12	AOFT	AOFT10	AOFT 15/20	AOFT	AOFT	APFT16	APHT16
	cutting material / inserts geometry	111	222	223	481/581	HSS	HSS	421/521	431/531	111	222
1a	**Steels < 650 N/mm²** - Construction steels - Fine grain steels - Case hardening steels - Steel castings	0.05 - 0.15	0.05 - 0.175	0.08 - 0.19	0.05 - 0.175	0.02 - 0.07	0.03 - 0.09	0.03 - 0.08	0.04 - 0.10	0.03 - 0.08	
1b	**Steels < 800 N/mm²** - Construction steels - Fine grain steels - Case hardening steels - Free-cutting steels - Heat-treatable steels - High-temperature constructional steels - Tough at subzero steels - Nitriding steels - Tool steels	0.04 - 0.10	0.05 - 0.135	0.05 - 0.15	0.05 - 0.135	0.02 - 0.06	0.03 - 0.08	0.03 - 0.065	0.04 - 0.08	0.03 - 0.065	0.04 - 0.075
1c	**Steels 800 - 1200 Nmm²** - Heat-treatable steels - High-temperature constructional steels - Tough at subzero steels - Nitriding steels - Tool steels - High speed steels - Heat-resisting steels		0.04 - 0.10	0.05 - 0.12	0.04 - 0.10	0.015 - 0.045	0.03 - 0.06	0.025 - 0.05	0.03 - 0.065	0.025 - 0.05	0.03 - 0.065
1d	**Steels > 1200 N/mm²** - Heat-treatable steels - Nitriding steels - Tool steels - High speed steels			0.05 - 0.07					0.03 - 0.055	0.02 - 0.045	
2a	**Stainless steels < 800 N/mm²**	0.04-0.10	0.05-0.13	0.05-0.15	0.05-0.13	0.02-0.06	0.03-0.08	0.03-0.06	0.04-0.07	0.03-0.06	0.04-0.07
2b	**Stainless steels > 800 N/mm²**		0.04-0.10	0.05-0.12	0.04-0.10	0.01-0.04	0.03-0.06	0.02-0.05	0.03-0.06	0.02-0.05	0.03-0.06
3a	**Castings 1** - Grey cast iron < 150 HB - Cast iron with spheroidal graphite < 200 HB - Malleable cast iron < 200 HB - Magnesium cast alloy	0.05 - 0.15	0.05 - 0.175	0.08 - 0.20	0.05 - 0.175			0.03 - 0.08	0.05 - 0.12	0.04 - 0.08	0.05 - 0.18
3b	**Castings 2** - Grey cast iron tempered > 150 HB - Cast iron with spheroidal graphite temp. > 200 HB - Malleable cast iron tempered > 200 HB	0.05 - 0.12	0.05 - 0.135	0.05 - 0.15	0.05 - 0.135			0.03 - 0.065	0.04 - 0.09	0.04 - 0.065	0.04- 0.09
3c	**Castings 3**: Steel castings < 800 N/mm²	0.04-0.10	0.05-0.13	0.05-0.15	0.05-0.13	0.02-0.06	0.03-0.08	0.03-0.06	0.04-0.08	0.03-0.06	0.04-0.08
3d	**Castings 4:** Steel castings 800 - 1200 N/mm²		0.05-0.10	0.05-0.12	0.05-0.10	0.01-0.04	0.03-0.06	0.03-0.05	0.03-0.06	0.03-0.05	0.03-0.06
3e	**Aluminium cast material > 6% Si**	0.04-0.10	0.05-0.13	0.05-0.15	0.05-0.13	0.02-0.06	0.02-0.08	0.03-0.06	0.04-0.08	0.03-0.07	0.04-0.08
4a	**Non-ferrous metal:** Copper and copper-tin alloys	0.05-0.15	0.05-0.17		0.05-0.17	0.02-0.07	0.03-0.09	0.03-0.08	0.04-0.10	0.04-0.08	
4b	**Non-ferrous metal** - Copper-forging alloys - Copper-tin alloys (bronze)	0.04 - 0.10	0.05 - 0.135	0.05 - 0.15	0.05 - 0.135	0.02 - 0.06	0.03 - 0.08	0.03 - 0.065	0.03 - 0.08	0.03 - 0.065	
4c	**Non-ferrous metal** - Pure aluminium - Non hardened aluminium	0.05 - 0.20	0.05 - 0.20		0.05 - 0.20	0.04 - 0.10	0.04 - 0.12	0.04 - 0.12		0.05 - 0.15	
4d	**Non-ferrous metal:** Hardened aluminium	0.05 -0.15	0.05-0.17		0.05-0.17	0.02-0.07	0.03-0.09	0.03-0.08		0.03-0.08	
4e	**Aluminium cast material < 6% Si**		0.05-0.13	0.05-0.15	0.05-0.13			0.03-0.06	0.04-0.08	0.03-0.06	0.04-0.08
5a	**Non-alloyed Ni / Ti < 650 N/mm²**	0.04-0.10	0.05-0.13	0.05-0.15	0.05-0.13	0.01-0.04	0.03-0.06	0.03-0.06	0.03-0.06	0.03-0.05	0.03-0.06
5b	**Ni-/Ti-based alloys < 900 N/mm², Duplex**		0.04-0.10	0.05-0.12	0.04-0.10		0.03-0.05		0.03-0.05	0.03-0.04	
5c	**Ni-/Ti-based alloys 900 - 1200 N/mm²**		0.03-0.07	0.04-0.10	0.03-0.07				0.03-0.05	0.02-0.04	
6a	**Synthetic material - Thermoplast**	0.05-0.20	0.05-0.20		0.05-0.20	0.04-0.10	0.04-0.12	0.04-0.12		0.04-0.12	
6b	**Synthetic material - Duroplast** - Duroplast non laminated - Duroplast laminated	0.05 - 0.20	0.05 - 0.20		0.05 - 0.20	0.02 - 0.07	0.03 - 0.09	0.03 - 0.08		0.03 - 0.08	

hm → fz table

Determine the feed per tooth fz by means of the average chip thickness hm

The table shows the feed per tooth fz [mm] to choose for obtaining the required average chip thickness hm.

Table valid for angle Kappa κ = 90° (e.g. Profile milling)

		ae in % of the tool diameter														
		5%	10%	15%	20%	25%	30%	35%	40%	45%	50%	60%	70%	80%	90%	100%
average chip thickness hm	0.150 mm	0.677	0.483	0.398	0.348	0.314	0.290	0.271	0.257	0.245	0.236	0.222	0.212	0.208	0.208	0.236
	0.125 mm	0.564	0.402	0.331	0.290	0.262	0.242	0.226	0.214	0.204	0.196	0.185	0.177	0.173	0.173	0.196
	0.100 mm	0.451	0.322	0.265	0.232	0.209	0.193	0.181	0.171	0.163	0.157	0.148	0.142	0.138	0.139	0.157
	0.090 mm	0.406	0.290	0.239	0.209	0.188	0.174	0.163	0.154	0.147	0.141	0.133	0.127	0.125	0.125	0.141
	0.085 mm	0.383	0.273	0.225	0.197	0.178	0.164	0.154	0.146	0.139	0.134	0.126	0.120	0.118	0.118	0.134
	0.080 mm	0.361	0.257	0.212	0.185	0.168	0.155	0.145	0.137	0.131	0.126	0.118	0.113	0.111	0.111	0.126
	0.075 mm	0.338	0.241	0.199	0.174	0.157	0.145	0.136	0.128	0.123	0.118	0.111	0.106	0.104	0.104	0.118
	0.070 mm	0.316	0.225	0.186	0.162	0.147	0.135	0.127	0.120	0.114	0.110	0.103	0.099	0.097	0.097	0.110
	0.065 mm	0.293	0.209	0.172	0.151	0.136	0.126	0.118	0.111	0.106	0.102	0.096	0.092	0.090	0.090	0.102
	0.060 mm	0.271	0.193	0.159	0.139	0.126	0.116	0.109	0.103	0.098	0.094	0.089	0.085	0.083	0.083	0.094
	0.055 mm	0.248	0.177	0.146	0.128	0.115	0.106	0.099	0.094	0.090	0.086	0.081	0.078	0.076	0.076	0.086
	0.050 mm	0.226	0.161	0.133	0.116	0.105	0.097	0.090	0.086	0.082	0.079	0.074	0.071	0.069	0.069	0.079
	0.045 mm	0.203	0.145	0.119	0.104	0.094	0.087	0.081	0.077	0.074	0.071	0.066	0.064	0.062	0.062	0.071
	0.040 mm	0.180	0.129	0.106	0.093	0.084	0.077	0.072	0.068	0.065	0.063	0.059	0.057	0.055	0.056	0.063
	0.035 mm	0.158	0.113	0.093	0.081	0.073	0.068	0.063	0.060	0.057	0.055	0.052	0.050	0.048	0.049	0.055
	0.030 mm	0.135	0.097	0.080	0.070	0.063	0.058	0.054	0.051	0.049	0.047	0.044	0.042	0.042	0.042	0.047
	0.020 mm	0.090	0.064	0.053	0.046	0.042	0.039	0.036	0.034	0.033	0.031	0.030	0.028	0.028	0.028	0.031

Table valid for angle Kappa κ = 45° (e.g. Face milling)

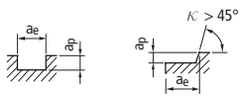
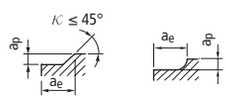
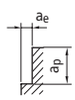
		ae in % of the tool diameter														
		5%	10%	15%	20%	25%	30%	35%	40%	45%	50%	60%	70%	80%	90%	100%
average chip thickness hm	0.250 mm	1.595	1.138	0.937	0.820	0.740	0.683	0.639	0.605	0.578	0.555	0.522	0.501	0.489	0.491	0.555
	0.225 mm	1.435	1.024	0.844	0.738	0.666	0.615	0.576	0.545	0.520	0.500	0.470	0.451	0.440	0.442	0.500
	0.200 mm	1.276	0.910	0.750	0.656	0.592	0.546	0.512	0.484	0.462	0.444	0.418	0.400	0.391	0.393	0.444
	0.175 mm	1.116	0.796	0.656	0.574	0.518	0.478	0.448	0.424	0.404	0.389	0.365	0.350	0.343	0.343	0.389
	0.160 mm	1.021	0.728	0.600	0.525	0.474	0.437	0.409	0.387	0.370	0.355	0.334	0.320	0.313	0.314	0.355
	0.150 mm	0.957	0.683	0.562	0.492	0.444	0.410	0.384	0.363	0.347	0.333	0.313	0.300	0.294	0.294	0.333
	0.140 mm	0.893	0.637	0.525	0.459	0.415	0.383	0.358	0.339	0.324	0.311	0.292	0.280	0.274	0.275	0.311
	0.130 mm	0.829	0.592	0.487	0.426	0.385	0.355	0.333	0.315	0.300	0.289	0.272	0.260	0.254	0.255	0.289
	0.120 mm	0.765	0.546	0.450	0.393	0.355	0.328	0.307	0.291	0.277	0.267	0.251	0.240	0.235	0.236	0.267
	0.110 mm	0.702	0.501	0.412	0.361	0.326	0.301	0.281	0.266	0.254	0.244	0.230	0.220	0.215	0.216	0.244
	0.100 mm	0.638	0.455	0.375	0.328	0.296	0.273	0.256	0.242	0.231	0.222	0.209	0.200	0.196	0.196	0.222
	0.090 mm	0.574	0.410	0.337	0.295	0.267	0.246	0.230	0.218	0.208	0.200	0.188	0.180	0.176	0.177	0.200
	0.080 mm	0.510	0.364	0.300	0.262	0.237	0.219	0.205	0.194	0.185	0.178	0.167	0.160	0.157	0.157	0.178
	0.070 mm	0.446	0.319	0.262	0.229	0.207	0.191	0.179	0.169	0.162	0.156	0.146	0.140	0.137	0.137	0.156
	0.060 mm	0.383	0.273	0.225	0.197	0.178	0.164	0.153	0.145	0.139	0.133	0.125	0.120	0.117	0.118	0.133
	0.050 mm	0.319	0.228	0.187	0.164	0.148	0.137	0.128	0.121	0.116	0.111	0.104	0.100	0.098	0.098	0.111
	0.040 mm	0.255	0.182	0.150	0.131	0.118	0.109	0.102	0.097	0.092	0.089	0.084	0.080	0.078	0.079	0.089

Table valid for angle Kappa κ = 15° (e.g. High feed milling)

		ae in % of the tool diameter														
		5%	10%	15%	20%	25%	30%	35%	40%	45%	50%	60%	70%	80%	90%	100%
average chip thickness hm	0.250 mm	4.357	3.108	2.561	2.239	2.023	1.866	1.747	1.653	1.578	1.517	1.426	1.368	1.337	1.341	1.517
	0.225 mm	3.921	2.797	2.305	2.015	1.821	1.680	1.572	1.488	1.421	1.366	1.284	1.231	1.203	1.206	1.366
	0.200 mm	3.485	2.486	2.049	1.791	1.618	1.493	1.398	1.323	1.263	1.214	1.141	1.094	1.069	1.072	1.214
	0.175 mm	3.050	2.176	1.793	1.567	1.416	1.306	1.223	1.157	1.105	1.062	0.999	0.957	0.936	0.938	1.062
	0.160 mm	2.788	1.989	1.639	1.433	1.295	1.194	1.118	1.058	1.010	0.971	0.913	0.875	0.856	0.858	0.971
	0.150 mm	2.614	1.865	1.537	1.344	1.214	1.120	1.048	0.992	0.947	0.910	0.856	0.821	0.802	0.804	0.910
	0.140 mm	2.440	1.740	1.434	1.254	1.133	1.045	0.978	0.926	0.884	0.850	0.799	0.766	0.749	0.751	0.850
	0.130 mm	2.265	1.616	1.332	1.164	1.052	0.970	0.908	0.860	0.821	0.789	0.742	0.711	0.695	0.697	0.789
	0.120 mm	2.091	1.492	1.229	1.075	0.971	0.896	0.839	0.794	0.758	0.728	0.685	0.656	0.642	0.643	0.728
	0.110 mm	1.917	1.367	1.127	0.985	0.890	0.821	0.769	0.728	0.694	0.668	0.628	0.602	0.588	0.590	0.668
	0.100 mm	1.743	1.243	1.024	0.896	0.809	0.747	0.699	0.661	0.631	0.607	0.571	0.547	0.535	0.536	0.607
	0.090 mm	1.568	1.119	0.922	0.806	0.728	0.672	0.629	0.595	0.568	0.546	0.514	0.492	0.481	0.483	0.546
	0.080 mm	1.394	0.995	0.820	0.717	0.647	0.597	0.559	0.529	0.505	0.486	0.456	0.438	0.428	0.429	0.486
	0.070 mm	1.220	0.870	0.717	0.627	0.566	0.523	0.489	0.463	0.442	0.425	0.399	0.383	0.374	0.375	0.425
	0.060 mm	1.046	0.746	0.615	0.537	0.486	0.448	0.419	0.397	0.379	0.364	0.342	0.328	0.321	0.322	0.364
	0.050 mm	0.871	0.622	0.512	0.448	0.405	0.373	0.349	0.331	0.316	0.303	0.285	0.274	0.267	0.268	0.303
	0.040 mm	0.697	0.497	0.410	0.358	0.324	0.299	0.280	0.265	0.253	0.243	0.228	0.219	0.214	0.214	0.243

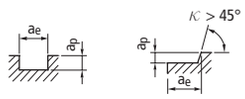
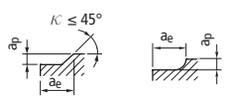
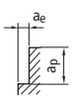
Cutting speed v_c [m/min] - Carbide

Milling with ALESA indexable inserts (carbide)

Material classification		ae = 50% up to 100%			ae = 20% up to 50%			ae = less 20%		
		Slot milling / Face milling 			Face milling 			Profile milling 		
	Coating	TiN / TiAlN	AlCrN	AlCrN-VA	TiN / TiAlN	AlCrN	AlCrN-VA	TiN / TiAlN	AlCrN	AlCrN-VA
1a	**Steels < 650 N/mm²** - Construction steels - Fine grain steels - Case hardening steels - Steel castings	100 - 240	200 - 300		180 - 280	250 - 350		220 - 320	300 - 400	
1b	**Steels < 800 N/mm²** - Construction steels - Fine grain steels - Case hardening steels - Free-cutting steels - Heat-treatable steels - High-temperature constructional steels - Tough at subzero steels - Nitriding steels - Tool steels	80 - 200	150 - 280		150 - 250	200 - 320		180 - 280	250 - 350	
1c	**Steels 800 - 1200 Nmm²** - Heat-treatable steels - High-temperature constructional steels - Tough at subzero steels - Nitriding steels - Tool steels - High speed steels - Heat-resisting steels	80 - 160	100 - 180		100 - 220	100 - 230		150 - 240	150 - 280	
1d	**Steels > 1200 N/mm²** - Heat-treatable steels - Nitriding steels - Tool steels - High speed steels	80 - 125	80 - 125	80 - 125	100 - 150	100 - 150	100 - 150	100 - 200	100 - 200	100 - 200
2a	**Stainless steels < 800 N/mm²**	80 - 160	100 - 180	100 - 180	100 - 220	100 - 230	100 - 230	150 - 240	150 - 280	150 - 280
2b	**Stainless steels > 800 N/mm²**	80 - 125	80 - 125	80 - 125	100 - 150	100 - 150	100 - 150	100 - 200	100 - 200	100 - 200
3a	**Castings 1** - Grey cast iron < 150 HB - Cast iron with spheroidal graphite < 200 HB - Malleable cast iron < 200 HB - Magnesium cast alloy	80 - 200	150 - 280		150 - 250	200 - 320		180 - 280	250 - 350	
3b	**Castings 2** - Grey cast iron tempered > 150 HB - Cast iron with spheroidal graphite temp. > 200 HB - Malleable cast iron tempered > 200 HB	80 - 160	100 - 180		100 - 220	100 - 230		150 - 240	150 - 280	
3c	**Castings 3**: Steel castings < 800 N/mm²	80 - 200	150 - 280		150 - 250	200 - 320		180 - 280	250 - 350	
3d	**Castings 4:** Steel castings 800 - 1200 N/mm²	80 - 160	100 - 180	100 - 180	100 - 220	100 - 230	100 - 230	150 - 240	150 - 280	150 - 280
3e	**Aluminium cast material > 6% Si**	100 - 270	100 - 270		100 - 270	120 - 280		180 - 340	200 - 400	
4a	**Non-ferrous metal:** Copper and copper-tin alloys	160 - 300	200 - 400		700-1400	300-1500		800-1500	1000-2000	
4b	**Non-ferrous metal** - Copper-forging alloys - Copper-tin alloys (bronze)	100 - 220	800-1200		110 - 230	800-1500		150 - 275	1000-2000	
4c	**Non-ferrous metal** - Pure aluminium - Non hardened aluminium	600-1200	800-1500		700-1500	1000-2000		1000-2000	1500-2500	
4d	**Non-ferrous metal:** Hardened aluminium	400-1000	600-1200		600-1200	1000-1500		1000-1500	1500-2000	
4e	**Aluminium cast material < 6% Si**	200 - 400	500-1000		300 - 500	700-1200		400 - 800	1000-1500	
5a	**Non-alloyed Ni / Ti < 650 N/mm²**	80 - 125	80 - 125	80 - 125	100 - 150	100 - 150	100 - 150	100 - 200	100 - 200	100 - 200
5b	**Ni-/Ti-based alloys < 900 N/mm², Duplex**	25 - 60	25 - 60	25 - 60	40 - 80	40 - 80	40 - 80	80 - 100	80 - 100	80 - 100
5c	**Ni-/Ti-based alloys 900 - 1200 N/mm²**	20 - 40	20 - 40	20 - 40	30 - 60	30 - 60	30 - 60	40 - 80	40 - 80	40 - 80
6a	**Synthetic material - Thermoplast**	800-1200	800-1200		800-1500	800-1500		1000-2000	1000-2000	
6b	**Synthetic material - Duroplast** - Duroplast non laminated - Duroplast laminated	80 - 240	100 - 280		100 - 250	200 - 300		140 - 300	250 - 350	

Cutting speed v_c [m/min] - HSS

Milling with ALESA indexable inserts (HSS - High Speed Steel)

Material classification		ae = 50% up to 100%		ae = 20% up to 50%		ae = less 20%	
		Slot milling / Face milling 		Face milling 		Profile milling 	
	Coating	TiN	TiAlN	TiN	TiAlN	TiN	TiAlN
1a	**Steels < 650 N/mm²** - Construction steels - Fine grain steels - Case hardening steels - Steel castings	60 - 80	65 - 90	60 - 90	65 - 100	65 - 100	70 - 110
1b	**Steels < 800 N/mm²** - Construction steels - Fine grain steels - Case hardening steels - Free-cutting steels - Heat-treatable steels - High-temperature constructional steels - Tough at subzero steels - Nitriding steels - Tool steels	40 - 60	50 - 70	50 - 70	55 - 75	55 - 75	60 - 80
1c	**Steels 800 - 1200 Nmm²** - Heat-treatable steels - High-temperature constructional steels - Tough at subzero steels - Nitriding steels - Tool steels - High speed steels - Heat-resisting steels		35 - 55		40 - 60		40 - 70
1d	**Steels > 1200 N/mm²** - Heat-treatable steels - Nitriding steels - Tool steels - High speed steels		15 - 35		20 - 40		25 - 45
2a	**Stainless steels < 800 N/mm²**	40 - 60	50 - 70	50 - 70	55 - 75	55 - 75	60 - 80
2b	**Stainless steels > 800 N/mm²**		35 - 55		40 - 60		40 - 70
3a	**Castings 1** - Grey cast iron < 150 HB - Cast iron with spheroidal graphite < 200 HB - Malleable cast iron < 200 HB - Magnesium cast alloy						
3b	**Castings 2** - Grey cast iron tempered > 150 HB - Cast iron with spheroidal graphite temp. > 200 HB - Malleable cast iron tempered > 200 HB						
3c	**Castings 3**: Steel castings < 800 N/mm²		35 - 55		40 - 60		40 - 70
3d	**Castings 4:** Steel castings 800 - 1200 N/mm²		15 - 35		20 - 40		25 - 45
3e	**Aluminium cast material > 6% Si**		60 - 130		60 - 150		150 - 300
4a	**Non-ferrous metal:** Copper and copper-tin alloys	150 - 300	160 - 400	700 - 1300	700 - 1500	800 - 1400	800 - 1600
4b	**Non-ferrous metal** - Copper-forging alloys - Copper-tin alloys (bronze)	80 - 100	90 - 110	90 - 110	90 - 120	100 - 200	100 - 200
4c	**Non-ferrous metal** - Pure aluminium - Non hardened aluminium	700 - 1500	700 - 1500	800 - 1600	800 - 1600	1000 - 2000	1000 - 2000
4d	**Non-ferrous metal:** Hardened aluminium	500 - 1000	500 - 1000	600 - 1200	600 - 1200	800 - 1500	800 - 1500
4e	**Aluminium cast material < 6% Si**	300 - 500	400 - 600	400 - 600	500 - 700	600 - 800	600 - 1000
5a	**Non-alloyed Ni / Ti < 650 N/mm²**		50 - 70		55 - 75		60 - 80
5b	**Ni-/Ti-based alloys < 900 N/mm², Duplex**		15 - 40		20 - 40		25 - 45
5c	**Ni-/Ti-based alloys 900 - 1200 N/mm²**						
6a	**Synthetic material - Thermoplast**	250 - 500	250 - 500	400 - 800	400 - 800	800 - 1400	800 - 1400
6b	**Synthetic material - Duroplast** - Duroplast non laminated - Duroplast laminated	70 - 100	70 - 100	80 - 120	80 - 120	100 - 160	100 - 160

Cutting speed v_c [m/min] - HSS

Turning, Grooving, Planing and Shaping (guide lines)

Material classification		Turning			Grooving		Planing / Shaping	
		v_c	f (45°)	f	v_c	f	v_c	f
1a	**Steels < 650 N/mm²** - Construction steels - Fine grain steels - Case hardening steels - Steel castings	65 - 90	0.15 - 0.40	0.10 - 0.25	65 - 90	0.02 - 0.15	20 - 30	0.05 - 0.30
1b	**Steels < 800 N/mm²** - Construction steels - Fine grain steels - Case hardening steels - Free-cutting steels - Heat-treatable steels - High-temperature constructional steels - Tough at subzero steels - Nitriding steels - Tool steels	50 - 70	0.10 - 0.30	0.10 - 0.20	50 - 70	0.02 - 0.15	20 - 30	0.05 - 0.50
1c	**Steels 800 - 1200 Nmm²** - Heat-treatable steels - High-temperature constructional steels - Tough at subzero steels - Nitriding steels - Tool steels - High speed steels - Heat-resisting steels	35 - 55	0.10 - 0.25	0.08 - 0.15	35 - 55	0.02 - 0.12	10 - 30	0.05 - 0.50
1d	**Steels > 1200 N/mm²** - Heat-treatable steels - Nitriding steels - Tool steels - High speed steels	20 - 40	0.10 - 0.20	0.05 - 0.12	20 - 40	0.02 - 0.10	10 - 20	0.05 - 0.30
2a	**Stainless steels < 800 N/mm²**	35 - 55	0.10 - 0.25	0.08 - 0.15	35 - 55	0.02 - 0.12	10 - 20	0.05 - 0.30
2b	**Stainless steels > 800 N/mm²**	20 - 40	0.10 - 0.20	0.05 - 0.12	20 - 40	0.02 - 0.10	10 - 20	0.05 - 0.30
3a	**Castings 1** - Grey cast iron < 150 HB - Cast iron with spheroidal graphite < 200 HB - Malleable cast iron < 200 HB - Magnesium cast alloy	50 - 70	0.10 - 0.50	0.10 - 0.25	50 - 70	0.02 - 0.15	20 - 30	0.05 - 0.50
3b	**Castings 2** - Grey cast iron tempered > 150 HB - Cast iron with spheroidal graphite temp. > 200 HB - Malleable cast iron tempered > 200 HB	20 - 40	0.10 - 0.30	0.08 - 0.18	20 - 40	0.02 - 0.10	10 - 20	0.05 - 0.30
3c	**Castings 3**: Steel castings < 800 N/mm²	35 - 55	0.10 - 0.30	0.10 - 0.20	35 - 55	0.02 - 0.12	10 - 20	0.05 - 0.30
3d	**Castings 4:** Steel castings 800 - 1200 N/mm²	20 - 40	0.10 - 0.25	0.08 - 0.15	20 - 40	0.02 - 0.10	10 - 20	0.05 - 0.30
3e	**Aluminium cast material > 6% Si**	60 - 130	0.10 - 0.30	0.10 - 0.20	60 - 130	0.02 - 0.15	40 - 80	0.05 - 1.20
4a	**Non-ferrous metal:** Copper and copper-tin alloys	110 - 180	0.50 - 1.00	0.10 - 0.30	110 - 180	0.02 - 0.15	30 - 45	0.05 - 0.50
4b	**Non-ferrous metal** - Copper-forging alloys - Copper-tin alloys (bronze)	90 - 110	0.10 - 0.25	0.08 - 0.15	90 - 110	0.02 - 0.15	30 - 45	0.05 -0.50
4c	**Non-ferrous metal** - Pure aluminium - Non hardened aluminium	400 - 900	0.50 - 1.50	0.10 - 0.50	400 - 900	0.02 - 0.18	40 - 80	0.05 - 1.20
4d	**Non-ferrous metal:** Hardened aluminium	140 - 240	0.10 - 0.40	0.10 - 0.25	140 - 240	0.02 - 0.15	40 - 80	0.05 - 1.20
4e	**Aluminium cast material < 6% Si**	140 - 240	0.10 - 0.30	0.10 - 0.20	140 - 240	0.02 - 0.15	40 - 80	0.05 - 1.20
5a	**Non-alloyed Ni / Ti < 650 N/mm²**	50 - 70	0.10 - 0.30	0.10 - 0.20	50 - 70	0.02 - 0.15	20 - 30	0.05 - 0.30
5b	**Ni-/Ti-based alloys < 900 N/mm², Duplex**	20 - 30	0.10 - 0.25	0.08 - 0.15	20 - 30	0.02 - 0.10	8 - 15	0.05 - 0.30
5c	**Ni-/Ti-based alloys 900 - 1200 N/mm²**	10 - 20	0.10 - 0.20	0.05 - 0.12	10 - 20	0.02 - 0.10	6 - 9	0.05 - 0.30
6a	**Synthetic material - Thermoplast**	250 - 900	0.10 - 0.50	0.10 - 0.25	250 - 900	0.02 - 0.18	40 - 80	0.05 - 1.50
6b	**Synthetic material - Duroplast** - Duroplast non laminated - Duroplast laminated	70 - 160	0.10 - 0.25	0.08 - 0.15	70 - 160	0.02 - 0.15	40 - 80	0.05 - 1.50

Allocation of the materials

Material	Tensile strength	DIN-No.	DIN-Code	Euronorm EN	AFNOR	B.S.	AISI SAE	Material classification
Construction steels	< 650 N/mm²	1.0032	St34-2	S25GT				1a
		1.0035	St33	S185	A 33	Fe 310-0	A283 Gr.A	
		1.0037	St37-2	S 235 JR	E 24-2	Fe 360 B	A283 Gr.C, 1015	
		1.0044	St44-2	S 275 JR	E 28-2	Fe 430 B FN	A570 Gr.40, 1020	
		1.0570	St52-3	S 355 J2 G3				
	< 800 N/mm²	1.0050	St50-2	E 295	A 50-2	Fe 490-2, 50C	A570 Gr.50	1b
		1.0060	St60-2	E 335	A 60-2	Fe 590-2 FN	A572 Gr.65	
Fine grain steels	< 650 N/mm²	1.0970	QStE 260 N	S 260 MC				1a
		1.0974	QStE 340 TM	S 340 MC				
		1.0978	QStE 380 TM	S 380 MC				
		1.0980	QStE 420 TM	S 420 MC				
	< 800 N/mm²	1.0982	QStE 460 TM	S 460 MC				1b
		1.0984	QStE 500 TM	S 500 MC				
		1.0986	QStE 550 TM	S 550 MC				
Free-cutting steels	< 800 N/mm²	1.0711	9S20	10S20		220M07	1112	1b
		1.0715	9SMn28	9SMn28	S 250	230M07	1213	
		1.0718	9SMnPb28	11SMnPb30	S 250 Pb		12L13	
		1.0722	10SPb20	10SPb20	10 PbF 2		11L08	
		1.0726	35S20	35S20	35 MF 6	212M36	1140	
		1.0737	9SMnPb36	11SMnPb37	S 300 Pb		12L14	
Case hardening steels	< 650 N/mm²	1.0301	C10	C10	C 10; XC 10	045M10	1010	1a
		1.0302	C10Pb	C10	AF34C10	045M10	1010	
		1.0401	C15	S15R	XC18, AF37C12	080M15	1015	
		1.1121	Ck10	2C10 E	XC10	040A10	1010	
		1.1141	Ck15	C15E , 32C	XC12	080M15	1015	
		1.7131	16MnCr5	EN 10084:2008-06	16MC4; 16MnCr5	527M20	5115	
	< 800 N/mm²	1.5752	14NiCr14	ECN 35, 36A	12NC15; 14NC12	655M13,655A12	3415; 3310	1b
		1.5919	15CrNi6	15CrNi6	16NC6		3115	
		1.5920	18CrNi8	18CrNi8	20NC6			
		1.6587	17CrNiMo6	18CrNiMo7-6	18NCD6	820A16		
Heat-treatable steels	< 800 N/mm²	1.1151	Ck22	C22E	XC25	055M15	1023	1b
		1.1181	Ck35	C35E	XC38H2	080A35	C1034	
		1.1191	Ck45	C45E	XC42H1, XC45	080M46	1045	
		1.1221	Ck60	C60E, 43D	C60; XC60	060A62	1060	
		1.7218	25CrMo4	25CrMo4	25CD4	708A25	4130	
		1.7220	34CrMo4	19B, 34CrMo4	35CD4	708A37	4137; 4135	
		1.7225	42CrMo4	19A, 42CrMo4	42CD4	709M40	4140, 4142	
		1.7228	50CrMo4	50CrMo4	50CrMo4	708A47	4150	
	800-1200 N/mm²	1.0601	C 60	C60	CC55	080A62	1060	1c
		1.0966	QStE 690 TM	S 700 MC				
		1.7218	25CrMo4	25CrMo4	25CD4	708A25	4130	
		1.7220	34CrMo4	19B, 34CrMo4	35CD4	708A37	4137; 4135	
		1.7225	42CrMo4	19A, 42CrMo4	42CD4	709M40	4140, 4142	
		1.7228	50CrMo4	50CrMo4	50CrMo4	708A47	4150	
		1.5864	35NiCr8	35NiCr18	40NC17			
		1.6580	30CrNiMo8	30CrNiMo8	30CND8	823M30		
		1.6582	34CrNiMo6	EN24T, 34CrNiMo6	35NCD6	816M40; 817M40	4340, 4337	
		1.7361	32CrMo12	40B	30CD12	722M24		
		1.7707	30CrMoV9	30CrMoV9				
		1.8161	58CrV4	58CrV4		526M60		
	> 1200 N/mm²	1.7218	25CrMo4	25CrMo4	25CD4	708A25	4130	1d
		1.7220	34CrMo4	19B, 34CrMo4	35CD4	708A37	4135; 4137	
		1.7225	42CrMo4	19A, 42CrMo4	42CD4	709M40	4140; 4142	
		1.7228	50CrMo4	50CrMo4	50 CrMo 4	708A47	4150	
		1.5864	35NiCr8	35NiCr18	40NC17			
		1.6580	30CrNiMo8	30CrNiMo8	30CND8	823M30		
		1.6582	34CrNiMo6	EN24T, 34CrNiMo6	35NCD6	816M40; 817M40	4340, 4337	
		1.7361	32CrMo12	40B	30CD12	722M24		
		1.7707	30CrMoV9	30CrMoV9				
		1.8161	58CrV4	58CrV4		526M60		
High-temperature constructional steels	< 800 N/mm²	1.0482	19Mn5	P 310 GH				1b
		1.4922	X20CrMoV12-1	SEW310		762	416C	
		1.5406	17MoV8 4	17MoV8-4				
		1.6513	28NiCrMo4	110	40NCD3	816M40	9840	
		1.8070	21CrMoV5 11	21CrMoV5-11				
	> 800 N/mm²	1.0482	19Mn5	P 310 GH				1c
		1.4922	X20CrMoV12-1	SEW310		762	416C	
		1.5406	17MoV8 4	17MoV8-4				
		1.6513	28NiCrMo4	110	40NCD3	816M40	9840	
		1.8070	21CrMoV5 11	21CrMoV5-11				
Tough at subzero steels	< 800 N/mm²	1.6900	X12CrNi189					1b
		1.7219	26CrMo4	26CrMo4			4130, 4130H	
	> 800 N/mm²	1.6900	X12CrNi189					1c
		1.7219	26CrMo4	26CrMo4			4130, 4130H	
Nitriding steels	< 800 N/mm²	1.8504	34CrAl6					1b
		1.8506	31CrAlS5					
	800-1200 N/mm²	1.8507	34CrAlMo5	34CrAlMo5-10	30CAD6-12		A355Cl-D	1c
		1.8515	31CrMo12	31CrMo12	30CD12	722M24		
		1.8519	31CrMoV9	31CrMoV9				
		1.8523	39CrMoV13-9	39CrMoV13-9	40CDV12	897M39, 3S132		
		1.8550	34CrAlNi7	34CrAlNi7				
	> 1200 N/mm²	1.8523	39CrMoV139	39CrMoV13-9	40CDV12	897M39, 3S132		1d
		1.8550	34CrAlNi7	34CrAlNi7				
Tool steels	< 800 N/mm²	1.2056	90Cr3	90Cr3				1b
		1.2162	21MnCr5	21MnCr5				
		1.2363	X100CrMoV5-1	X100CrMoV5-1	Z100CDV5	BA2	A2	
		1.2519	110WCrV5	110WCrV5				
		1.2823	70Si7	70Si7				
	800-1200 N/mm²	1.2080	X210Cr12	X210Cr12	Z200C12	BD3	D3	1c
		1.2311	40CrMnMo7	40CrMnNiMo8-6	40CMD8			
		1.2312	40CrMnMoS86	40CrMnNiMoS8-6-4	40CMD8S			
		1.2344	X40CrMoV5-1	X40CrMoV5-1	Z40CDV5	BH13	H13	

Allocation of the materials

Material	Tensile strength	DIN-No.	DIN-Code	Euronorm EN	AFNOR	B.S.	AISI SAE	Material classification
		1.2379	X155CrVMo12-1	X155CrVMo12-1	32CDV12-28	BD2	D2	1c
		1.2436	X210CrW12	X210CrW12	X210CW12-01		D6	
		1.2567	X30WCrV5 3	X30WCrV5-3	X32WCRV5			
		1.2678	X45CoCrWV555	X45CoCrWV5-5-5				
		1.2713	55NiCrMoV6	55NiCrMoV6	55NCD7	BH224/5	L6	
		1.2714	56NiCrMoV7	55NiCrMoV7			6F3	
		1.2743	60NiCrMo124	60NiCrMoV12-4				
		1.2766	35NiCrMo16	35NiCrMo16	35NCD16	BP30		
	> 1200 N/mm²	1.2080	X210Cr12	X210Cr12	Z200C12	BD3	D3	1d
		1.2311	40CrMnMo7	40CrMnNiMo8-6	40CMD8			
		1.2312	40CrMnMoS86	40CrMnNiMoS8-6-4	40CMD8S			
		1.2344	X40CrMoV5-1	X40CrMoV5-1	Z40CDV5	BH13	H13	
		1.2379	X155CrVMo12-1	X155CrVMo12-1	32CDV12-28	BD2	D2	
		1.2436	X210CrW12	X210CrW12	Z210CW12-01		D6	
		1.2567	X30WCrV5 3	X30WCrV5-3	X32WCRV5			
		1.2678	X45CoCrWV555	X45CoCrWV5-5-5				
		1.2713	55NiCrMoV6	55NiCrMoV6	55NCDV7;	BH224/5	L6	
		1.2714	56NiCrMoV7	55NiCrMoV7			6F3	
		1.2743	60NiCrMo124	60NiCrMoV12-4				
		1.2766	35NiCrMo16	35NiCrMo16	35NCD16	BP30		
High speed steels	800-1200 N/mm²	1.3207	S10-4-3-10	HS 10-4-3-10	Z130WKCDV	BT42		1c
		1.3243	S6-5-2-5	HS 6-5-2-5	Z85WDKCV	BM35		
		1.3247	S2-10-1-8	HS 2-10-1-8	Z110DKCWV	BM42	M42	
		1.3343	S6-5-2	HS 6-5-2	Z85WDCV	BM2	M2 CLASS 1	
	> 1200 N/mm²	1.3207	S10-4-3-10	HS 10-4-3-10	Z130WKCDV	BT42		1d
		1.3243	S6-5-2-5	HS 6-5-2-5	Z85WDKCV	BM35		
		1.3247	S2-10-1-8	HS 2-10-1-8	Z110DKCWV	BM42	M42	
		1.3343	S6-5-2	HS 6-5-2	Z85WDCV	BM2	M2 CLASS 1	
Steel castings	< 700 N/mm²	1.0416	GS-38	EN 10016-2:1995-04	230-400 M			1a
		1.0446	GS-45	GE 240	E23-45 M	A1		
		1.0552	GS-52	S355 JRC		A2		
	< 800 N/mm²	1.5919	GS-15CrNi6	15CrNi6	16NC6		3115	3c
		1.7218	GS-25CrMo4	25CrMo4	25CD4	708A25	4130	
		1.7220	GC-34CrMo4	19B, 34CrMo4	35CD4	708A37	4137; 4135	
		1.7379	GS-18CrMo910	G17CrMo9-10		622		
	800-1200 N/mm²	1.0416	GS-38	EN 10016-2:1995-04	230-400 M			3d
		1.0446	GS-45	GE 240	E23-45M	A1		
		1.0552	GS-52	S355 JRC		A2		
		1.5919	GS-15CrNi6	15CrNi6	16NC6		3115	
		1.7218	GS-25CrMo4	25CrMo4	25CD4	708A25	4130	
		1.7220	GS-34CrMo4	19B, 34CrMo4	35CD4	708A37	4137; 4135	
		1.7379	GS-18CrMo910	G17CrMo9-10		622		
Grey cast iron	< 150 HB	0.6015	GG-15	EN-GJL-150	Ft 15 D	Grade 150	No 25B	3a
		0.6020	GG-20	EN-GJL-200	Ft 20 D	Grade 220	No 30B	
		0.6025	GG-25	EN-GJL-250	Ft 25 D	Grade 260	No 35B	
		0.6030	GG-30	EN-GJL-300	Ft 30 D	Grade 300	No 45B	
Grey cast iron tempered	> 150 HB	0.6015	GG-15	EN-GJL-150	Ft 15 D	Grade 150	No 25B	3b
		0.6020	GG-20	EN-GJL-200	Ft 20 D	Grade 220	No 30B	
		0.6025	GG-25	EN-GJL-250	Ft 25 D	Grade 260	No 35B	
		0.6030	GG-30	EN-GJL-300	Ft 30 D	Grade 300	No 45B	
Cast iron with spheroidal graphite	< 200 HB	0.7040	GGG-40	EN-GJS-400-15	FCS 400-12	SNG 420/12	60-40-18	3a
		0.7050	GGG-50	EN-GJS-500-7	FGS 500-7	SNG 500/7	65-54-12	
		0.7060	GGG-60	EN-GJS-600-3	FGS 600-3	SNG 600/3	80-55-06	
Malleable cast iron	< 200 HB	0.8035	GTW-35-04	EN-GJS-800-2				3a
		0.8040	GTW-40-05	EN-GJS-800-2				
		0.8045	GTW-45-07	EN-GJS-800-2				
		0.8135	GTS-35-10	EN-JM1010	MN 35-10	B 340/12	32510	
		0.8145	GTS-45-06	EN-JM1040	MN 450	P 440/7	40010	
		0.8155	GTS-55-04	EN-JM1050	MP 50-5	P 510/4	50005	
		0.8165	GTS-65-02	GJMB 650-2	MP 60-3	P 570/3	70003	
Cast iron with spheroidal graphite tempered	> 200 HB	0.7040	GGG-40	EN-GJS-400-15	FCS 400-12	SNG 420/12	60-40-18	3b
		0.7050	GGG-50	EN-GJS-500-7	FGS 500-7	SNG 500/7	65-54-12	
		0.7060	GGG-60	EN-GJS-600-3	FGS 600-3	SNG 600/3	80-55-06	
		0.7070	GGG-70	EN-GJS-700-2	FGS 700-2	SNG 700/2	100-70-03	
		0.7080	GGG-80	EN-GJS-800-2				
Malleable cast iron tempered	> 200 HB	0.8035	GTW-35-04	EN-GJS-800-2				3b
		0.8040	GTW-40-05	EN-GJS-800-2				
		0.8045	GTW-45-07	EN-GJS-800-2				
		0.8135	GTS-35-10	EN-JM1010	MN 35-10	B 340/12	32510	
		0.8145	GTS-45-06	EN-JM1040	MN 450	P 440/7	40010	
		0.8155	GTS-55-04	EN-JM1050	MP 50-5	P 510/4	50005	
		0.8165	GTS-65-02	GJMB 650-2	MP 60-3	P 570/3	70003	
Stainless steels	< 850 N/mm²	1.4104	14CrMoS17	X14CrMoS17-2	Z 3CF17	441S29	430F	2a
		1.4113	X 6 CrMo 17	X6CrMo17-1	Z8CD17.01	434S17	434	
		1.4301	X5CrNi1810	58E, X5CrNi18-10	Z4CN18-10FF	304S15	304	
		1.4305	X8CrNiS18-9	58M; X10CrNiS18-9	Z8CNF18-09	303S21	303	
		1.4306	X2CrNi19-11	X2CrNi19-11	Z2CN18-10	304S12	304L	
		1.4401	X5CrNiMo17 12 2	G-X6CrNiMo17-12-2	Z6CND17-17-11	316S16	316	
		1.4404	X2CrNiMo17-12-2	X3CrNiMo17122	Z3CND18-12-02	316S12	316L	
		1.4406	X2CrNiMoN17-11-2	X2CrNiMoN17-12-2	Z2CND17-12-Az	316S16	316LN	
		1.4435	X2CrNiMo18-14-3	X2CrNiMo18-14-3	Z2CND18-14-03	316S11	316L	
		1.4436	X3CrNiMo17-13-3	X3CrNiMo17-13-3	Z7CND18-12-03;	316S33	316	
		1.4539	X1NiCrMoCuN25-20-5	X1NiCrMoCu25-20-5	Z2NCDU25-20-5	904S13	904L, N08904	
		1.4541	X6CrNiTi18-10	58B; X6CrNiTi18-10	Z6CNT18-10	321S31	321	
		1.4573	X10CrNiMoTi18-12	X6CrNiMoTi18-12		320S33	316Ti	
	< 1000 N/mm²	1.4002	X6CrAl13	X6CrAl13	Z6CA13	405S17	405	2b
		1.4006	X10Cr13	56A; X12Cr13	Z10C14	410S21	410, AMS 5613	
		1.4016	X6Cr17	60; X6Cr17	Z8C17	430S17	430/1	
		1.4021	X20Cr13	X20Cr13	Z20C13	420S37	420	
		1.4028	X30Cr13	X30Cr13	Z30C13	420S45	420F	
		1.4034	X46Cr13	56D; X46Cr13	Z38C13M	420S45	420C/4	
		1.4057	X17CrNi16-2	57; X17CrNi16-2	Z15CN16-02	431S29	431	

Allocation of the materials

Material	Tensile strength	DIN-No.	DIN-Code	Euronorm EN	AFNOR	B.S.	AISI SAE	Material classification
		1.4112	X90CrMoV18	X90CrMoV18			440B	2b
		1.4116	X45CrMoV15	X50CrMoV15	A35-572		UNE 36016-1	
		1.4125	X105CrMo17	X105CrMo17	Z100CD17	X105CrMo17	440C	
		1.4460	X3CrNiMon27-5-2	X3CrNiMoN27-5-2	Z3CND27-07 AZ	X3CrNiMoN27-5-2	329	
		1.4510	X3CrTi17	X6CrTi17	Z4CT17, X3CrTi17	X3CrTi17	430Ti	
		1.4512	X6CrTi12	X5CrTi12	Z3CT12, Z6CT12	409S19	409	
		1.4582	X4CrNiMoNb257	X4CrNiMoNb25-7				
Stainless steel castings	< 850 N/mm²	1.4308	GX6CrNi18 9	G-X6CrNi18-9	Z6CN18-10M	304C15	304H,CF-8	2a
		1.4340	G-X40CrNi274	GX40CrNi27-4			J92615, A781-05	
	< 1000 N/mm²	1.4086	G-X120Cr29	57; X17CrNi16-2	15CN16-02	431S29	431	2b
		1.4106	G-X10CrMo13	X2CrMoSiS18-2-1	X2CrMoSiS18-2-1			
		1.4138	G-X120CrMo292					
Heat-resisting steels	< 1000 N/mm²	1.4722	X10CrSi13					1c
		1.4724	X10CrAl13; X10CrAlSi13	X10CrAl11-3	Z13C13	403S17	405	
		1.4741	X10CrSi18					
		1.4742	X10CrAl18	60; X10CrAl(Si)18	Z10CAS18	430S15	430	
		1.4762	X10CrAl24	X10CrAlSi25	Z210CAS24	X10CrAlSi25	446	
		1.4821	X20CrNiSi254		Z20CNS25-4			
Duplex steels	< 900 N/mm²	1.3964	X 2 CrNiMnMoNNb 21 16 5 3		NF 05-159		XM-19	5b
		1.4429	X 2 CrNiMoN 17 13 3	X2CrNiMoN17-13-3	Z2CND17-13-Az	316S63	316LN	
		1.4462	X 2 CrNiMoN 22 5 3	X2CrNiMoN22-5-3	Z2CNDU21-08-Az	318S13	329A, UNS31803	
		1.4529	X 1 NiCrMoCuN 25 20 7	10088-3	X1CrNiMoCuN25-20-7	X1CrNiMoCuN25-20-7	B649, N08926	
		1.4547	X 1 CrNiMoCuN 20 18 7	10088-3	X1CrNiMoCuN20-18-7	X1CrNiMoCuN20-18-7	S31254	
Non-alloyed titanium	< 650 N/mm²	3.7024	Ti 99.5					5a
		3.7034	Ti 99.7					
		3.7055	Ti 99.4					
		3.7064	Ti 99.2					
Titanium alloys soft-annealed	< 900 N/mm²	3.7164	TiAl6V4					5b
		3.7114	TiAl5Sn2					
		3.7124	TiCu2					
		3.7174	TiAl6V6Sn2					
Titanium alloys hardened	900-1250 N/mm²	3.7164	TiAl6V4					5c
		3.7124	TiCu2					
		3.7144	TiAl6Sn2Zr4Mo2					
		3.7154	TiAl6Zr5					
		3.7174	TiAl6V6Sn2					
		3.7184	TiAl4Mo4Sn2					
Pure nickel	< 500 N/mm²	2.4060	Nickel 200					5a
High temperature nickel-based alloys	< 900 N/mm²	2.4360	Monel 400					5b
		2.4375	Monel K 500	Alloy K500		3072 3076 (NA18)	N05500	
		2.4812	Hastelloy C		Ni-Mo28	ANC15		
		2.4816	Inconel 600			HR208		
		2.4617	Hastelloy B-2				N10665	
		2.4665	Hastelloy X			HR204		
		2.4983	Udimet 500					
		1.4876	Incoloy 800		Z8NC32-21	3076NA15H	B163, N08800	
	900-1200 N/mm²	2.4631	Nimonic 80A			2HR201	NC20TA, HEV5	5c
		2.4632	Nimonic 90			2HR2	HEV6	
		2.4634	Nimonic 105					
		2.4662	Nimonic 901		Z8NCDT42	HR 53	5660, 5661	
		2.4668	Inconel 718		NC19FeNb	HR 8	N07718, 5662, 5663	
		2.4670	Nimocast 713					
		2.4674	Nimocast PK24					
		2.4856	Inconel 625	499		NA21	B564/446, 5599, 5666	
		2.6554	Waspaloy					
Pure copper	< 350 N/mm²	2.0060	E-Cu57					4a
		2.0070	SE-Cu					
		2.0090	SF-Cu					
		2.1356	CuMn3	CW107C			C19400	
Copper-zinc alloys (brass)	< 700 N/mm²	2.0250	CuZn20					4a
		2.0265	CuZn30					
		2.0321	CuZn37					
		2.0360	CuZn40					
		2.0380	CuZn39Pb2					
		2.0410	CuZn44Pb2					
		2.0561	CuZn40Al1	CW713R		CZ135, CZ114	C67400	
		2.0580	CuZn40Mn1Pb	CW713R		CZ135, CZ114	C67400	
		2.0771	CuNi7Zn39Mn5Pb3					
Copper-forging alloys hardenable	< 800 N/mm²	2.1245	CuBe1.7					4b
		2.1247	CuBe2					
		2.1293	CuCrZr					
		2.1525	CuSi3Mn	CW107C			C19400	
Copper-forging alloys non hardenable	< 600 N/mm²	2.1201	CuAgo.03	CC491K	CuSn5Pb5Zn5	LG2	C83600	4b
		2.1366	CuMn5	CW107C			C19400	
		2.1522	CuSi2Mn	CW107C			C19400	
		2.1525	CuSi3Mn	CW107C			C19400	
Copper-tin alloys (bronze)	< 700 N/mm²	2.1016	CuSn4	CW450K	CuSn4P	PB101	C51100	4b
		2.1020	CuSn6	CW452K	CuSn6P	PB103	C51900	
		2.1030	CuSn8	CW453K	CuSn8P, CuSn9	PB104	C52100	
		2.1050	G-CuSn10-C	CC480K	CuSn10P	CT1/PB4	C90700	
		2.1052	G-CuSn12-C	CC483K	CuSn12P / UE12P	PB2	C90800	
		2.1060	G-CuSn12Ni2-C	CC484K	CuSn12Ni2	CT2	C91700	
		2.1061	G-CuSn11Pb2-C	CC482K	CuSn12Pb	PB4	C92500	
		2.1076	CuSn4Pb4Zn4	CW456K	CuSn4Pb4Zn4		C54400	
		2.1080	CuSn6Zn6	CW456K	CuSn4Pb4Zn4		C54400	
		2.1086	G-CuSn10Zn	CW456K	CuSn4Pb4Zn4		C54400	
		2.1090	G-CuSn7Zn4Pb7-C	CC493K	CuSn7Pb6Zn4		C93200	
		2.1093	G-CuSn6ZnNi	CC492K	CuSn7Zn2Pb3	LG4	C91410	
		2.1096	G-CuSn5ZnPb	CC491K	CuSn5Pb5Zn5	LG2	C83600	

Allocation of the materials

Material	Tensile strength	DIN-No.	DIN-Code	Euronorm EN	AFNOR	B.S.	AISI SAE	Material classification
Pure aluminium	< 150 N/mm²	3.0255	Al99.5	EN AW-1050A	A-5	1B	1050A	4c
Non hardened aluminium	< 400 N/mm²	3.0515	AlMn1	EN AW-3003/3103	A-M1/-	N3		4c
		3.2315	AlMgSi1	EN AW-6082	A-SGM0.7	H30	6082	
		3.3315	AlMg1	EN AW-5005A	A-G0,6	N41	5005A	
		3.3535	AlMg3	EN AW-5754	A-G3M		5754	
		3.3547	AlMg4.5Mn	EN AW-5083	A-G4,5MC	N8	5083	
		3.4365	AlZnMgCu1.5	EN AW-7075	A-Z5GU	2L95/96	7075	
Hardened aluminium	< 650 N/mm²	3.0615	AlMgSiPb	EN AW-6012	A-SGPb		6012	4d
		3.1325	AlCuMg1	EN AW-2017A	A-U4G	H14	2017A	
		3.1355	AlCuMg2	EN AW-2024	A-U4G1	2L97/98	2024	
		3.1655	AlCuBiPb	EN AW-2011	A-U5PbBi	FC1	2011	
		3.4335	AlZn4.5Mg1	EN AW-7020	A-Z5G	H17	7020	
		3.4345	AlZnMgCu5.0	EN AW-7022	A-Z4GU		7022	
		3.4365	AlZnMgCu1.5	EN AW-7075	A-Z5GU	2L95/96	7075	
Aluminium cast material < 6% Si	< 400 N/mm²	3.1841	G-AlCu4Ti	EN AC-AlCu4Ti				4e
		3.2134	G-AlSi5Cu1Mg	EN AC-AlCu4Ti				
		3.3241	G-AlMg3Si	EN AW-6061	A-GSUC	H20	6061	
		3.3292	GD-AlMg9					
Aluminium cast material > 6% Si	< 400 N/mm²	3.2152	GD-AlSi6Cu4	EN AC-AlSi6Cu4				3e
		3.2162	GD-AlSi8Cu3	EN AC-AlSi6Cu4				
		3.2373	G-AlSi9Mg	EN AC-AlSi9Mg				
		3.2381	G-AlSi10Mg	EN AC-AlSi10Mg				
		3.2383	G-AlSi10Mg (Cu)					
		3.2581	G-AlSi12	EN AC-AlSi12(a)				
		3.2583	G-AlSi12 (12)	EN AC-AlSi12(Cu)				
		3.2982	GD-AlSi12 (Cu)	EN AC-AlSi12Cu1(Fe)				
Magnesium cast alloy	< 400 N/mm2	3.5106	G-MgAg3SE2Zr1					3e
		3.5662	G-MgAl6					
		3.5812	G-MgAl8Zn1					
		3.5912	G-MgAl9Zn1					
Thermoplast		PTFE	Teflon, Hostaflon, Lubriflon					6a
		PVDF	Kynar, Solef					
		PA	Ertalon, Ultramid, Nylon					
		POM	Delrin, Hostaform					
		PETP	Arnite, Ertalyte					
		PVC-hart	Hostalit, Vinoflex, Trovidur					
		PETP	Hostalen, Ertalene, Lupolen					
		PP	Hostalen, Ertalen					
		PC	Makralon, Lexan					
Duroplast non laminated		PF	Bakelit, Resalit, Luphen					6b
		MF	Albamit, Keramin, Resopal					
		UF	Resopal, Basapor					
Duroplast laminated		PF	Ferrozell, Resofil, Canevasit					6b
		MF	Resopal, Resamin, Textolit					
		UF	Resamin, Basapor					

Please contact us, if the DIN standard no. you're searching for, is not mentioned above.

Substitutes for obsolete articles

Invalid articles	Substitute	1)
Toolholders (Part-no. in ascending order)		
1315.0XYZ ABC-SC 12 R	1319.0XYZ ABC-SD 12 R	W
1328.0240 12-RD 06 R	1326.0240 12-RP 06 R	W
1328.0300 16-RD 08 R	1326.0300 16-RP 08 R	W
1328.0340 20-RD 10 R	1326.0340 20-RP 10 R	W
Indexable insers (Part-no. in ascending order)		
1085.0450 APFT 16 05 PD FR TiN	1085.1503-01 APFT 16 05 PD FR TiN	N
1088.0200 LDFT 15 03 PD FR TiN	can still be ordered as special tool	X
1088.0250 LDFT 15 03 PD FR TiN	can still be ordered as special tool	X
1088.0300 LDFT 15 T3 PD FR TiN	can still be ordered as special tool	X
1088.0400 BPFT 16 04 PD FR TiN	can still be ordered as special tool	X
1091.0200 SCFT 09 04 04 FN TiN	1591.0200 SCFT 09 04 04 FN TiN	N
1091.0220 SCFT 09 04 08 FN TiN	1591.0220 SCFT 09 04 08 FN TiN	N
1091.0250 SCFT 12 05 AC FN TiN	1591.0250 SCFT 12 05 AC FN TiN	N
1091.0270 SCFT 12 05 04 FN TiN	1591.0270 SCFT 12 05 04 FN TiN	N
1091.0290 SCFT 12 05 08 FN TiN	1591.0290 SCFT 12 05 08 FN TiN	N
1091.0310 SCFT 12 05 12 FN TiN	1591.0310 SCFT 12 05 12 FN TiN	N
1091.0550 SEFX 12 T3 AF FN TiN	can still be ordered as special tool	X
1096.0200 S 110 23 - TiN	can still be ordered as special tool	X
1096.0210 S 110 27 - TiN	can still be ordered as special tool	X
1096.0250 S 127 54 - TiN	can still be ordered as special tool	X
1160.0450 APFT 16 05 PD FR TIALN	can still be ordered as special tool	X
1161.0200 APFT 16 04 PD FR NO 1/2 TIALN	1086.0200 APFT 16 04 PD FR NO 1/2 TiN	B
1161.0205 APFT 16 04 PD FR NO 3 TIALN	1086.0205 APFT 16 04 PD FR NO 3 TiN	B
1161.0230 APFT 16 04 PD FR NO 1/2 TIALN	1086.0230 APFT 16 04 PD FR NO 1/2 TiN	B
1161.0235 APFT 16 04 PD FR NO 3 TIALN	1086.0235 APFT 16 04 PD FR NO 3 TiN	B
1162.0505 AOFT 15 T3 PF FR NO 1/2 TiAlN	1087.0505 AOFT 15 T3 PF FR NO 1/2 TiN	B
1162.0508 AOFT 15 T3 PF FR NO 3 TiAlN	1087.0508 AOFT 15 T3 PF FR NO 3 TiN	B
1162.0515 AOFT 20 04 PF FR NO 1/2 TiAlN	1087.0515 AOFT 20 04 PF FR NO 1/2 TiN	B
1162.0518 AOFT 20 04 PF FR NO 3 TiAlN	1087.0518 AOFT 20 04 PF FR NO 3 TiN	B
1163.0200 LDFT 15 03 PD FR TIALN	can still be ordered as special tool	X
1163.0250 LDFT 15 03 PD FR TIALN	can still be ordered as special tool	X
1163.0300 LDFT 15 T3 PD FR TIALN	can still be ordered as special tool	X
1163.0400 BPFT 16 04 PD FR TIALN	can still be ordered as special tool	X
1166.0200 SCFT 09 04 04 FN TIALN	1666.0200 SCFT 09 04 04 FN TIALN	N
1166.0220 SCFT 09 04 08 FN TIALN	1666.0220 SCFT 09 04 08 FN TIALN	N
1166.0250 SCFT 12 05 AC FN TIALN	1666.0250 SCFT 12 05 AC FN TIALN	N
1166.0270 SCFT 12 05 04 FN TIALN	1666.0270 SCFT 12 05 04 FN TIALN	N
1166.0290 SCFT 12 05 08 FN TIALN	1666.0290 SCFT 12 05 08 FN TIALN	N
1166.0310 SCFT 12 05 12 FN TIALN	1666.0310 SCFT 12 05 12 FN TIALN	N
1166.0550 SEFX 12 T3 AF FN TIALN	can still be ordered as special tool	X
1276.0210 RPFT 06 02 M0-111 TIALN-X	1276.0215 RPFT 06 02 M0-111 AlCrN	B
1276.0250 RPFT 08 03 M0-111 TIALN-X	1276.0255 RPFT 08 03 M0-111 AlCrN	B
1276.0310 RPFT 10 T3 M0-111 TIALN-X	1276.0315 RPFT 10 T3 M0-111 AlCrN	B
1276.0410 RPFT 12 04 M0-111 TIALN-X	1276.0415 RPFT 12 04 M0-111 AlCrN	B
1276.0425 RPHT 12 04 M0-222 TIALN-X	1276.0430 RPHT 12 04 M0-222 AlCrN	B
1276.0440 RPFT 12 04 M0-925 SPICA	can still be ordered as special tool	X
1276.0XXX RDFT 06 / 08 / 10	please use RPFT-tools	X
1281.0410 MPFT 06 02 PP FR-111 TIALN-X	1281.0415 MPFT 06 02 PP FR-111 AlCrN	B
1281.0435 MPFT 06 02 PP FL-111 TIALN-X	1281.0440 MPFT 06 02 PP FL-111 AlCrN	B
1281.0610 MPFT 08 03 PP FR-111 TIALN-X	1281.0615 MPFT 08 03 PP FR-111 AlCrN	B
1281.0635 MPFT 08 03 PP FL-111 TIALN-X	1281.0640 MPFT 08 03 PP FL-111 AlCrN	B
1281.0810 MPFT 11 04 PP FR-111 TIALN-X	1281.0815 MPFT 11 04 PP FR-111 AlCrN	B
1281.0835 MPFT 11 04 PP FL-111 TIALN-X	1281.0840 MPFT 11 04 PP FL-111 AlCrN	B
1285.0210 APFT 16 04 PD FR-111 TIALN-X	1285.0215 APFT 16 04 PD FR-111 AlCrN	B
1285.0235 APFT 16 04 PD FL-111 TIALN-X	1285.0238 APFT 16 04 PD FL-111 AlCrN	B
1285.0240 APFT 16 04 PD FR-915 SPICA	can still be ordered as special tool	X
1285.0260 APFT 16 04 04 FR-111 TIALN-X	1285.0265 APFT 16 04 04 FR-111 AlCrN	B
1285.0285 APFT 16 04 04 FL-111 TIALN-X	1285.0290 APFT 16 04 04 FL-111 AlCrN	B
1285.0310 APFT 16 04 08 FR-111 TIALN-X	1285.0315 APFT 16 04 08 FR-111 AlCrN	B
1285.0335 APFT 16 04 08 FL-111 TIALN-X	1285.0338 APFT 16 04 08 FL-111 AlCrN	B

Invalid articles	Substitute	1)
1285.0340 APFT 16 04 08 FR-915 SPICA	can still be ordered as special tool	X
1285.0405 APHT 16 04 PD FR-222 TIALN-X	1285.0410 APHT 16 04 PD FR-222 AlCrN	B
1287.0350 AOFT 10 03 PF FR-411 TIALN-X	1287.0651 AOFT 10 03 PF FR-421 AlCrN	B, G
1287.0351 AOFT 10 03 PF FR-421 TIALN-X	1287.0651 AOFT 10 03 PF FR-421 AlCrN	B
1287.0355 AOFT 10 03 04 FR-411 TIALN-X	1287.0656 AOFT 10 03 04 FR-421 AlCrN	B, G
1287.0356 AOFT 10 03 04 FR-421 TIALN-X	1287.0656 AOFT 10 03 04 FR-421 AlCrN	B
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1) Changes: B = Coating, G = Geometry, W = other type of insert, N = new part-no., X = no substitute available from stock

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.0330	APFT 16 04 08 FL-111 TiAlN	81, 113
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.0220	SRDCN 20 20 08	70
.0240	SRDCN 20 20 10	70
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.0290	SRDCN 32 32 20	70
.0300	SRSCR 16 16 06	70
.0305	SRSCL 16 16 06	70
.0320	SRSCR 20 20 08	70
.0325	SRSCL 20 20 08	70
.0340	SRSCR 20 20 10	70
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.0360	SRSCR 25 25 12	70
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.0400	SRSCR 32 32 20	70
.0405	SRSCL 32 32 20	70
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.0205	SCLCL 08 08 06	72
.0220	SCLCR 10 10 06	72
.0225	SCLCL 10 10 06	72
.0240	SCLCR 12 12 09	74
.0245	SCLCL 12 12 09	74
.0260	SCLCR 16 16 09	74
.0265	SCLCL 16 16 09	74
1917		
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.0200	A08H SCLCR 06	84
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.0225	A10K SCLCL 06	84
.0240	A12L SCLCR 06	84
.0245	A12L SCLCL 06	84
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.0265	A16Q SCLCL 09	84
.0280	A20R SCLCR 09	84
.0285	A20R SCLCL 09	84
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.0200	S08J SMFPR 04	86
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.0225	SDJCL 12 12 11	76
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.0225	A16Q SDQCL 07	88
.0240	A20R SDQCR 11	88
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.0300	A12L SDUCR 07	88
.0305	A12L SDUCL 07	88
.0320	A16Q SDUCR 07	88
.0325	A16Q SDUCL 07	88
.0340	A20R SDUCR 11	88
.0345	A20R SDUCL 11	88
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.0360	SVJCR 25 25 16	78
.0365	SVJCL 25 25 16	78
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.0200	SAGPR 12 12 16	80
.0205	SAGPL 12 12 16	80
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.0300	SSSCR 12 12 09	82
.0305	SSSCL 12 12 09	82
.0320	SSSCR 16 16 09	82
.0325	SSSCL 16 16 09	82
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.0225	KLSH 212 L	100
.0240	KLSH 216 R	100
.0245	KLSH 216 L	100
.0260	KLSH 220 R	100
.0265	KLSH 220 L	100
.0300	KLSH 312 R	100
.0305	KLSH 312 L	100
.0320	KLSH 316 R	100
.0325	KLSH 316 L	100
.0340	KLSH 320 R	100
.0345	KLSH 320 L	100
1988		
.0200	KLKH 25.26 R	102
.0205	KLKH 25.26 L	102
4310		
.0310	10x2.5 / 1.9x150 mm	105
.0410	12x2.5 / 1.8x150 mm	105
.0510	16x3.0 / 2.0x150 mm	105
.0710	20x4.0 / 2.8x150 mm	105
.0810	25x4.8 / 3.3x150 mm	105
.0820	25x4.8 / 3.3x200 mm	105
4350		
.0210	8 x 40 x 0.50 mm N TiN	95
.0220	8 x 40 x 0.70 mm N TiN	95
.0230	8 x 40 x 0.80 mm N TiN	95
.0240	8 x 40 x 0.90 mm N TiN	95
.0250	8 x 40 x 1.10 mm N TiN	95
.0260	8 x 40 x 1.30 mm N TiN	95
.0270	8 x 40 x 1.60 mm N TiN	95
.0272	8 x 40 x 1.60 mm R TiN	95
.0274	8 x 40 x 1.60 mm L TiN	95
.0280	8 x 40 x 1.85 mm N TiN	95
.0310	10 x 44 x 0.50 mm N TiN	95
.0320	10 x 44 x 0.70 mm N TiN	95
.0330	10 x 44 x 0.80 mm N TiN	95
.0340	10 x 44 x 0.90 mm N TiN	95
.0350	10 x 44 x 1.10 mm N TiN	95
.0360	10 x 44 x 1.30 mm N TiN	95
.0370	10 x 44 x 1.60 mm N TiN	95
.0372	10 x 44 x 1.60 mm R TiN	95
.0374	10 x 44 x 1.60 mm L TiN	95
.0380	10 x 44 x 1.85 mm N TiN	95
.0420	12 x 48 x 1.10 mm N TiN	95
.0430	12 x 48 x 1.30 mm N TiN	95
.0440	12 x 48 x 1.60 mm N TiN	95
.0442	12 x 48 x 1.60 mm R TiN	95
.0444	12 x 48 x 1.60 mm L TiN	95
.0450	12 x 48 x 1.85 mm N TiN	95
.0460	12 x 48 x 2.15 mm N TiN	95
.0462	12 x 48 x 2.15 mm R TiN	95
.0464	12 x 48 x 2.15 mm L TiN	95
.0470	12 x 48 x 2.65 mm N TiN	95
.0520	16 x 54 x 1.60 mm N TiN	95
.0522	16 x 54 x 1.60 mm R TiN	95
.0524	16 x 54 x 1.60 mm L TiN	95
.0530	16 x 54 x 1.85 mm N TiN	95

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.0540	16 x 54 x 2.15 mm N TiN	95
.0550	16 x 54 x 3.15 mm N TiN	95
.0552	16 x 54 x 3.15 mm R TiN	95
.0554	16 x 54 x 3.15 mm L TiN	95
.0560	16 x 54 x 4.15 mm N TiN	95
4360		
.0410	6 x 20 x 0.5 mm RN TiN	97
.0415	6 x 20 x 0.5 mm LN TiN	97
.0430	6 x 20 x 0.8 mm RN TiN	97
.0435	6 x 20 x 0.8 mm LN TiN	97
.0450	6 x 20 x 1.1 mm RN TiN	97
.0455	6 x 20 x 1.1 mm LN TiN	97
.0550	7 x 25 x 1.1 mm RN TiN	97
.0555	7 x 25 x 1.1 mm LN TiN	97
.0560	7 x 25 x 1.3 mm RN TiN	97
.0565	7 x 25 x 1.3 mm LN TiN	97
.0570	7 x 25 x 1.6 mm RN TiN	97
.0572	7 x 25 x 1.6 mm RR TiN	97
.0574	7 x 25 x 1.6 mm RL TiN	97
.0575	7 x 25 x 1.6 mm LN TiN	97
.0577	7 x 25 x 1.6 mm LR TiN	97
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4370		
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.0400	20 x 12 mm	104
.0500	25 x 16 mm	104
.0700	32 x 20 mm	104
.0800	40 x 25 mm	104
4390		
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.0300	Klemmhalter (10 mm)	94
.0400	Klemmhalter (12 mm)	94
.0500	Klemmhalter (16 mm)	94
4395		
.0400	10 x 10 x 140 mm R	96
.0405	10 x 10 x 140 mm L	96
.0500	12 x 12 x 140 mm R	96
.0505	12 x 12 x 140 mm L	96
.0530	16 x 16 x 140 mm R	96
.0535	16 x 16 x 140 mm L	96
.0560	20 x 20 x 140 mm R	96
.0565	20 x 20 x 140 mm L	96