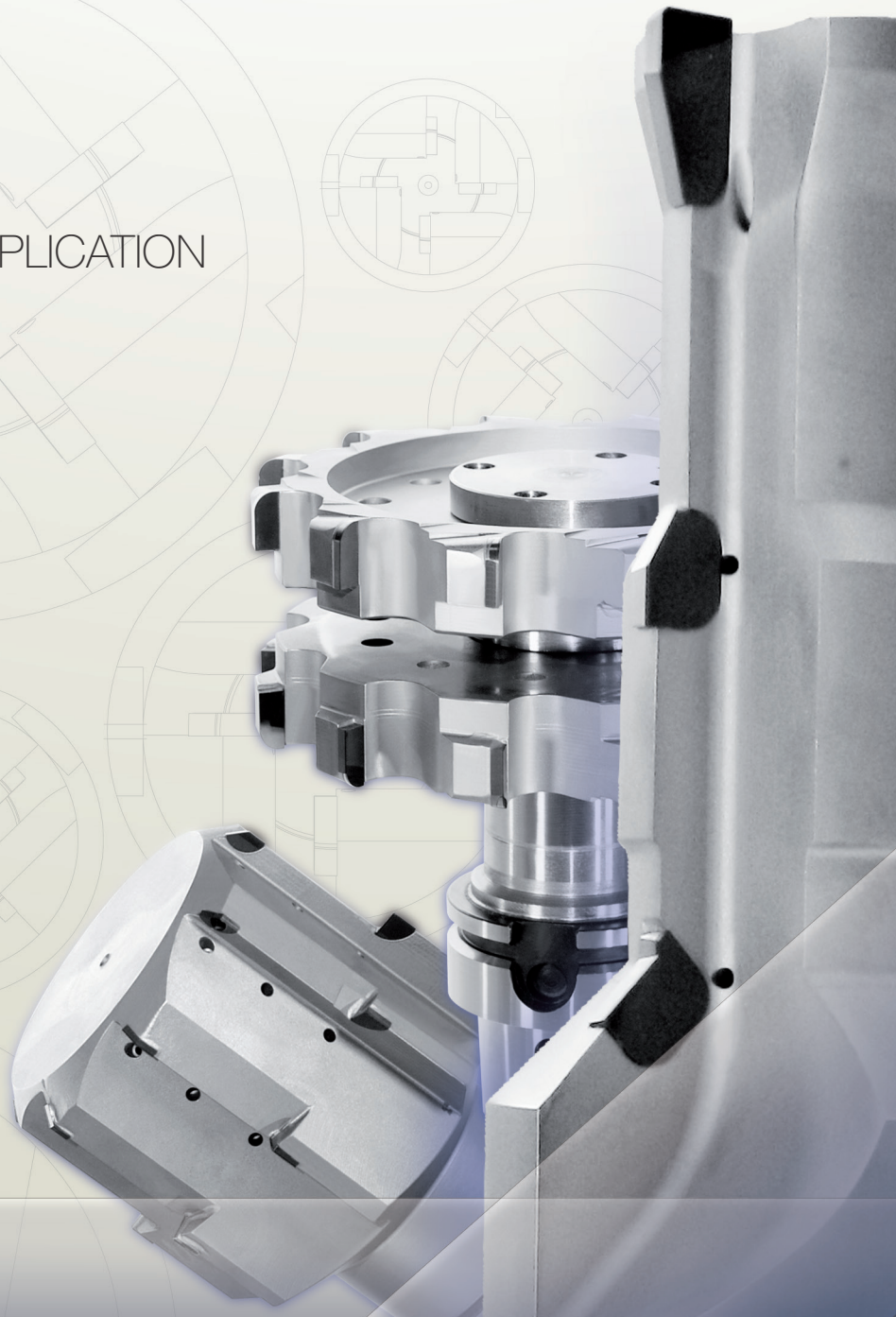
SAINT JEAN TOOLING

A TOOL FOR EACH APPLICATION

High precision cutting tools



ISO 9001

INNOVATIVE SOLUTIONS

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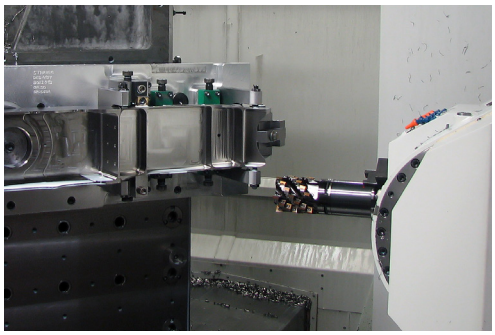

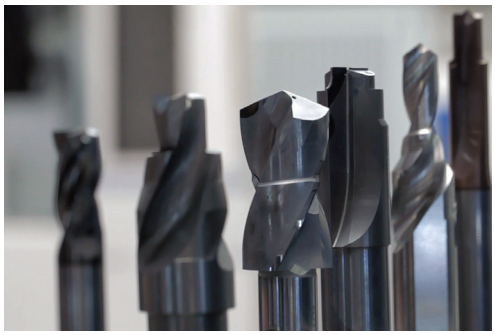

General presentation

«Artisan know-how developed into industrial production!»

Cutting tool design and manufacturing activity began in 1958 with the ROC Company. It then became part of the Saint Jean Industries Group in 1985 and thus became the eponymous cutting tool brand of the group.

In the years to follow, we became specialized in carbide tools thanks to internal engineering and technical developments.

The end of the 1990s marked a turning point for the cutting tool activity with a broadening of its product range to include **PCD** (Polycrystalline Diamond) tools. This technical revolution enabled the activity to reach the level of excellence it knows today.

The creation in early 2010 of the Saint Jean Tooling subsidiary was due to the increasing development of the tooling activity of the Saint Jean Industries Group.

Saint Jean Tooling is specialized in the design and manufacturing of 3 types of tools, enabling its customers to access a global offer:

- casting molds and forge dies,
- machining and control assemblies,
- cutting tools.

Advanced technology, draconian control standards, high-end equipment, all this would be nothing without the know-how and skills developed by our technicians over 20 years.

Current business

We currently work for all types of industrial markets and are a preferred partner of **automotive** and **aeronautic** manufacturers and equipment.

Location

Saint Jean Tooling supplies its customers **all over the world**: Germany, United States, France, Croatia, China, etc...

Our mission & our values

Our mission is to support our customers, through our know-how, to meet the daily production challenges they face. Satisfying our customers is our satisfaction.

The values we share with our partners and which define the identity of our company are:

- **Listening** attentively on a daily basis,
- Sincerity, essential for a **trusting relationship**,
- Continuous improvement through **innovation**,
- The complete **satisfaction** of our customers.

Made in France

La FRENCH FAB

Saint Jean Tooling is a **French** company whose activity is carried out exclusively in France and more precisely in its home town: Saint Jean d'Ardières.

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Quality commitment

Our team :

Our team is a pillar for the **quality** of our products. All staff, from design to manufacturing through shipping, are involved in a rigorous process enabling total quality. One person is assigned to each client.

Our experience :

Our experience has enabled us to continuously improve the quality of our products, in particular using feedback from internal testing which is capitalized on in our machining workshops. An experience that allows us to provide products with **high precision** and **repeatability from quality** to infinity.

Our equipment :

The high-tech production equipment we use enables us to ensure **reliability** and **accuracy** which are essential in satisfying our customers' requirements.

Our control equipment :

An essential element in order to check the quality of the finished product, Saint Jean Tooling has control machines **at the cutting edge of technology.**

Dedicated test center :

Our know-how has reached its current level of excellence thanks to our site for the large scale production of parts which is used as a test center.

Our certifications :

With **ISO 9001**, Saint Jean Tooling dedicates a lot of energy to constantly improving its products.

Our partners :

We work in close collaboration with our suppliers in order to obtain the **best performing** raw materials, essential in reaching an optimum level of quality for products.

6-axis diamond sharpening/grinding machine

Electro wire erosion & sinking

5-axis robot-operated sharpening machine

Electro wire erosion 6 axis

5-axis sharpening machine

Products

We manufacture cutting tools with brazed PCD/CW, solid carbide, brazed carbide and HSS as well as tools with indexable plates (PCD/CW) and carbide plates according to the needs of our customers.

Our range of tools is composed of drills, cutters and reamers and we are particularly specialized in specific machining applications, whether for small or large-scale production.

We manufacture your tool with the type of attachment you require: HSK, BT, ISO etc.

The internal liquid cooling enables lubrication and cooling of your tools for optimum use in line with minimal quantity lubrication (MQL).

We offer tool coatings that prevent deformation of cutting edges and increase the life of the tool.

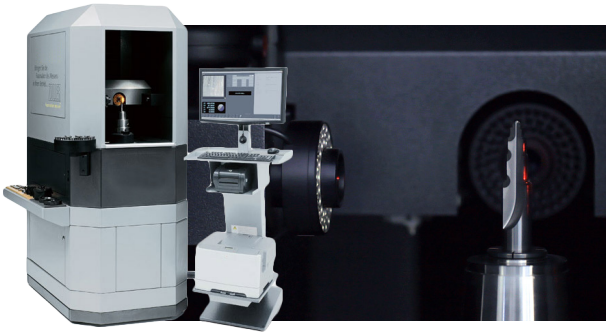
Services

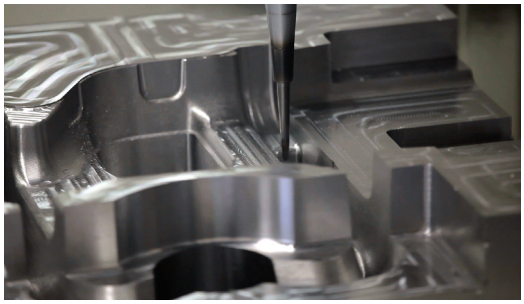
Design:

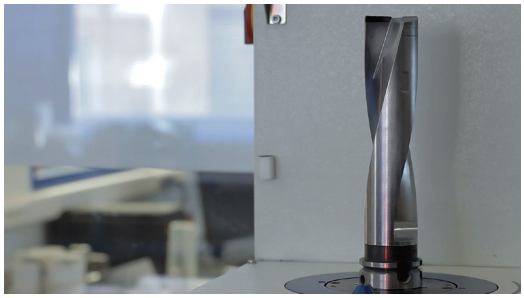
- Study of range/process - testing for existing applications,
- Combination of operations to optimize the cycle time.

Reconditioning & maintenance:

- Sharpening,
- Complete repair.







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Specialist in automotive and aeronautic applications

SJT offers complete machining solutions adapted to small, medium and large-scale production according to the specific requirements of your automotive and aeronautic applications.

Reliable and economical solutions for the machining of numerous materials such as:

- Aluminum casting: cylinder head and cylinder block, turbo, casing (motor, gearbox, clutch etc.), hydraulic actuator, ABS case, brake calipers, chassis & support parts, as well as all other non-ferrous metals: bronze, copper etc.
- Grey cast iron and steel (all grades, treatment/hardness),
- Hard and composite metals: aeronautic aluminum & CMM, titanium, magnesium, inconel, carbon and other layered materials.

Our range of cutting tools covers:

- CW/PCD drills, mills and reamers (standard or specific),
- Specific CW/PCD combination tools (range optimization on part plan).

NB: we also provide machining assemblies and other clamps/grippers, if you would like a complete solution.

In relation to special brazed tools, we offer ranges corresponding to rough cutting or finishing applications such as:

- End mills (pocketing, counterboring, embossing, deburring) ball nose end mills (hemispherical and torus) roughing or finishing,
- Face milling cutters and gang mills with 3 cutting edges (grooving),
- Chamfering mills (orbital) and other form tools (interpolation),
- Combined tools such as step drills-reamers, with push or pull chamfering, cutting guide and chip breaker if required,
- PCD sandwich point or diamond monolith drills (in particular for aeronautic applications in titanium, magnesium, inconel or composite carbons).

If you would like to find out more about the technical innovations we can provide for you, do not hesitate to request a detailed presentation, and compare our positioning (for new/reconditioning/sharpening) before benefiting from testing on your problematic applications or optimization plans (cycle time, quality, repeatability and cutting life).

We put all our experience in your service to provide quality tools: make the most of our 30-year experience !

Examples of Automotive applications

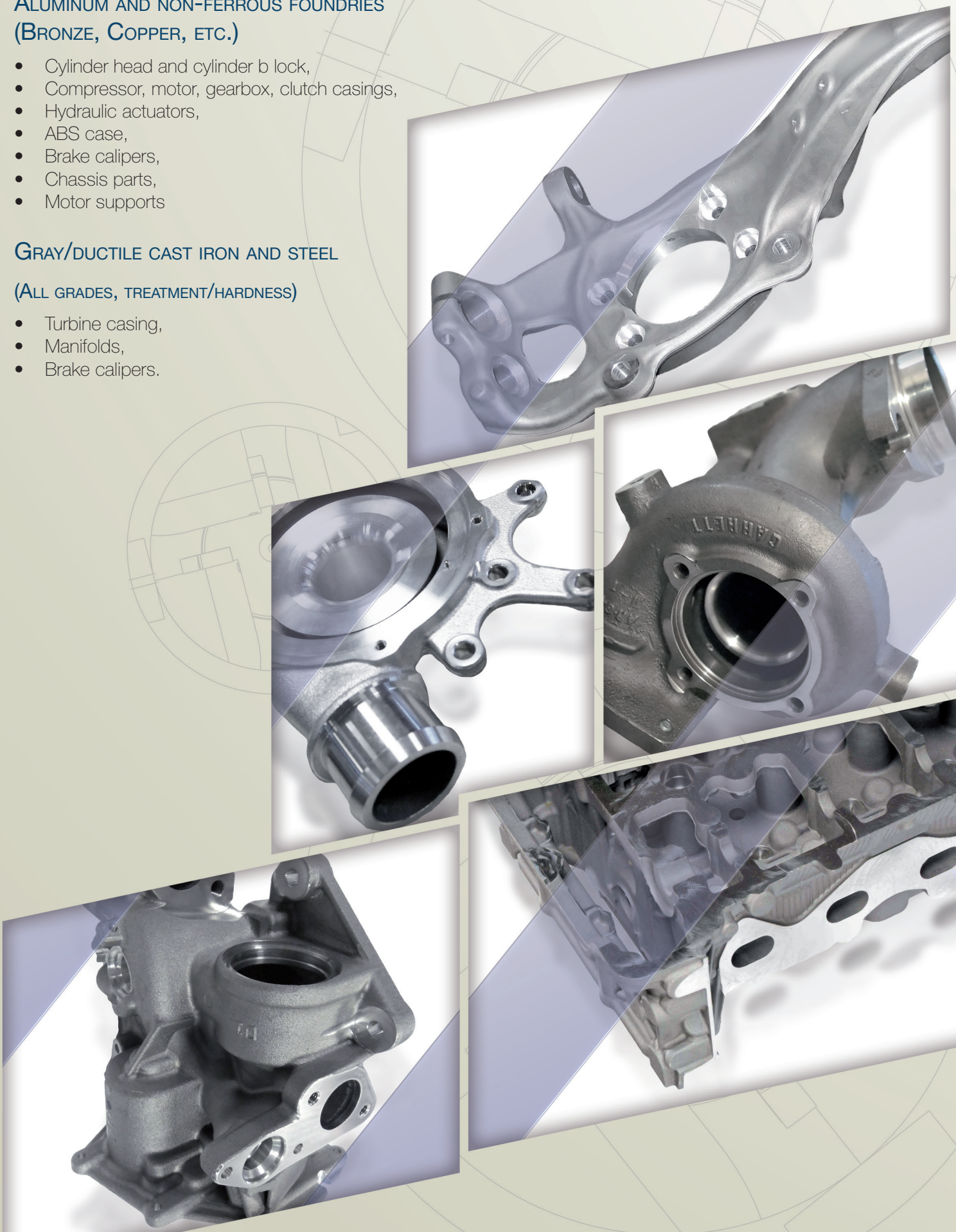
Aluminum and non-ferrous foundries (Bronze, Copper, etc.)

- Cylinder head and cylinder b lock,
- Compressor, motor, gearbox, clutch casings,
- Hydraulic actuators,
- ABS case,
- Brake calipers,
- Chassis parts,
- Motor supports

Gray/ductile cast iron and steel

(All grades, treatment/hardness)

- Turbine casing,
- Manifolds,
- Brake calipers.



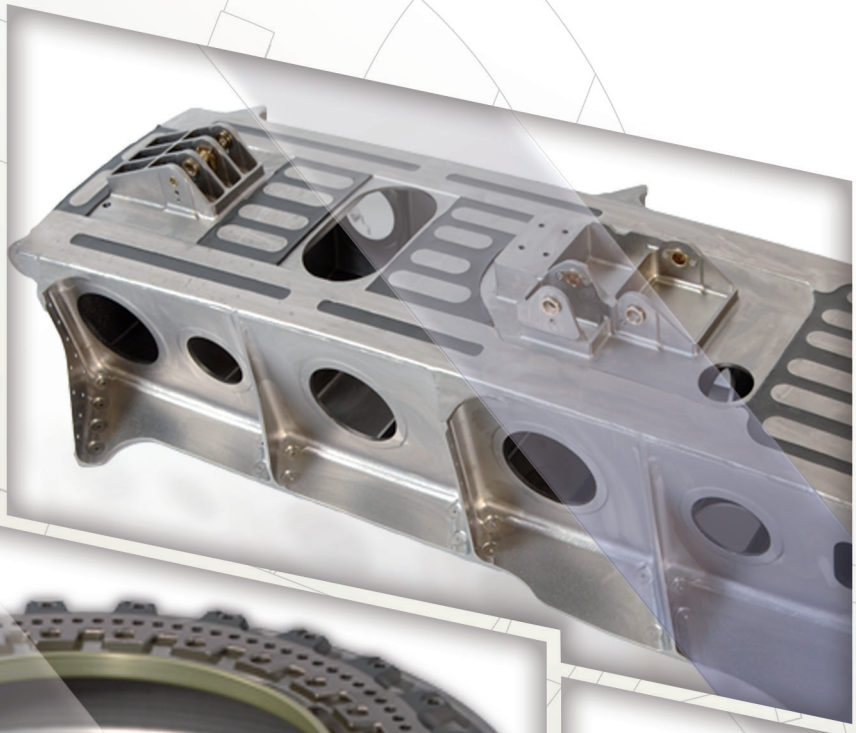
Examples of aeronautic applications

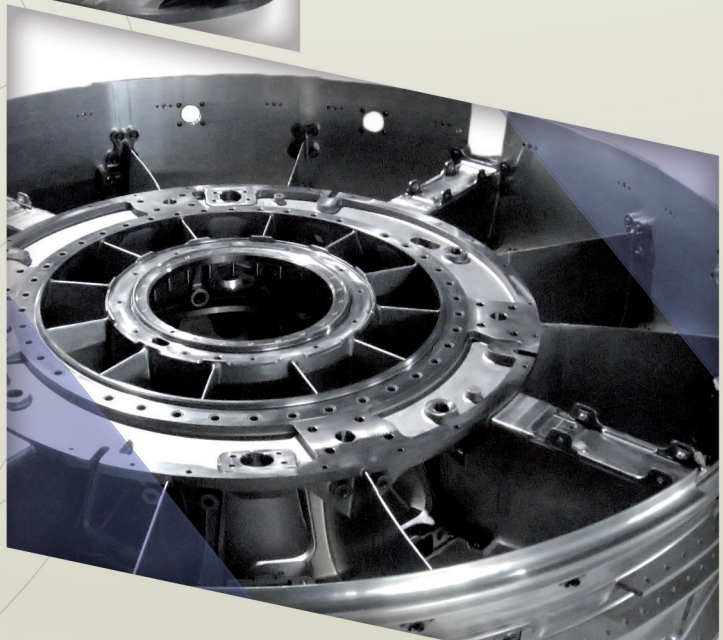
Hard and composite metals :

Aeronautic aluminum & CMM, titanium, magnesium, inconel, Carbon and other layered materials.

Structural parts for civil and military aviation:

- Engine blades,
- Propeller sleeves,
- Empennage casing.

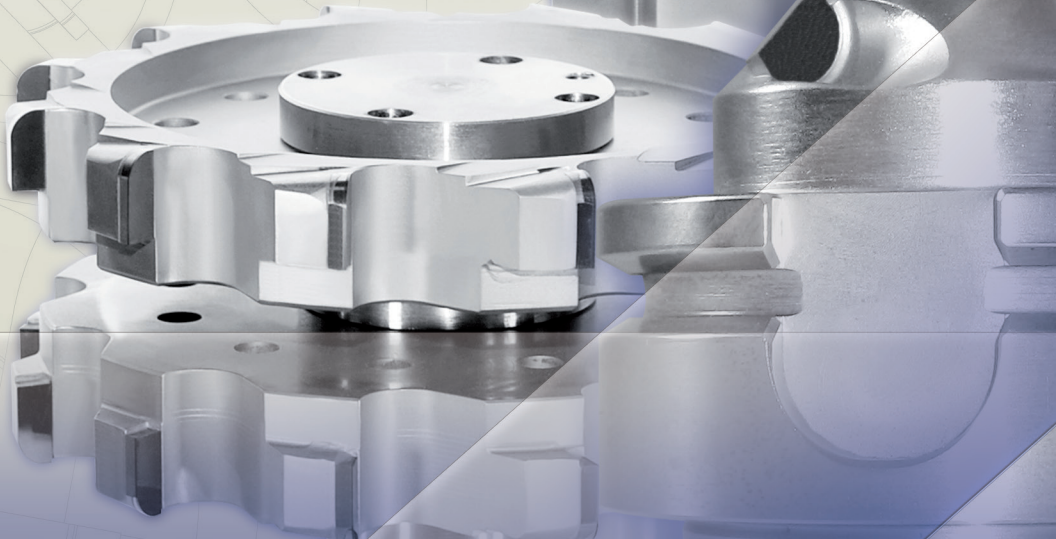




CUTTING PRECISION

PCD / CW TOOLS CATALOG

High precision cutting tools



ISO 9001

INNOVATIVE SOLUTIONS

PCD drilling

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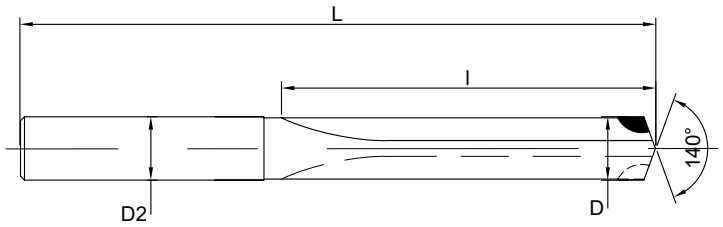
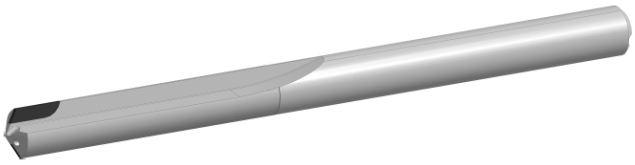
PCD Drills

Cylindrical shank H6
Carbide body
With lubrication
Tolerance ± 0,02





Aluminum and non-ferrous applications

References	ØD	ØD2	L	Z	l
PCD-FO-04.0	4	6	90	2	44
PCD-FO-04.2	4,2	6	90	2	44
PCD-FO-04.5	4,5	6	90	2	44
PCD-FO-05.0	5	6	90	2	44
PCD-FO-05.2	5,2	6	90	2	44
PCD-FO-05.5	5,5	6	90	2	44
PCD-FO-06.0	6	6	90	2	44
PCD-FO-06.2	6,2	8	90	2	53
PCD-FO-06.5	6,5	8	90	2	53
PCD-FO-06.8	6,8	8	90	2	53
PCD-FO-07.0	7	8	90	2	53
PCD-FO-07.2	7,2	8	90	2	53
PCD-FO-07.2	7,5	8	90	2	53
PCD-FO-08.0	8	8	90	2	53
PCD-FO-08.5	8,5	10	110	2	61
PCD-FO-08.8	8,8	10	110	2	61
PCD-FO-09.0	9	10	110	2	61
PCD-FO-09.2	9,2	10	110	2	61
PCD-FO-09.5	9,5	10	110	2	61
PCD-FO-10.0	10	10	110	2	61
PCD-FO-10.2	10,2	12	120	2	71
PCD-FO-10.5	10,5	12	120	2	71
PCD-FO-10.8	10,8	12	120	2	71
PCD-FO-11.0	11	12	120	2	71
PCD-FO-11.5	11,5	12	120	2	71
PCD-FO-12.0	12	12	120	2	71
PCD-FO-12.5	12,5	14	120	2	77
PCD-FO-13.0	13	14	120	2	77
PCD-FO-13.5	13,5	14	120	2	77
PCD-FO-14.0	14	14	120	2	77
PCD-FO-14.5	14,5	16	130	2	83
PCD-FO-15.0	15	16	130	2	83
PCD-FO-15.5	15,5	16	130	2	83
PCD-FO-16.0	16	16	130	2	83
PCD-FO-17.0	17	18	150	2	93
PCD-FO-18.0	18	18	150	2	93
PCD-FO-19.0	19	20	150	2	100
PCD-FO-20.0	20	20	150	2	100

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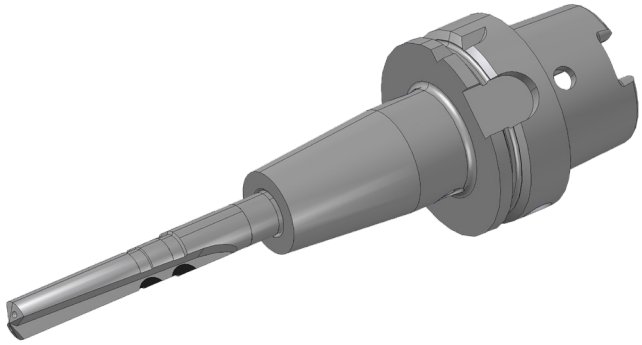
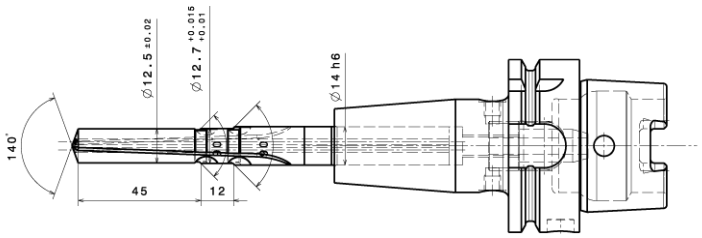
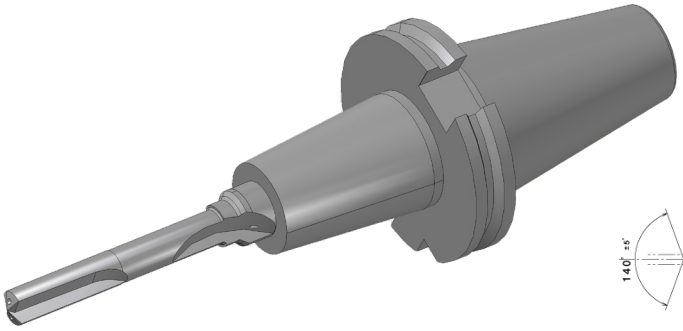
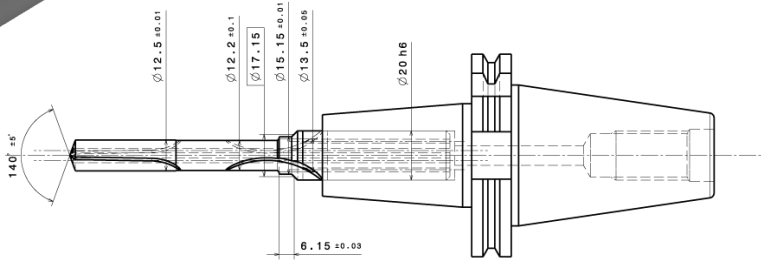
Step drills



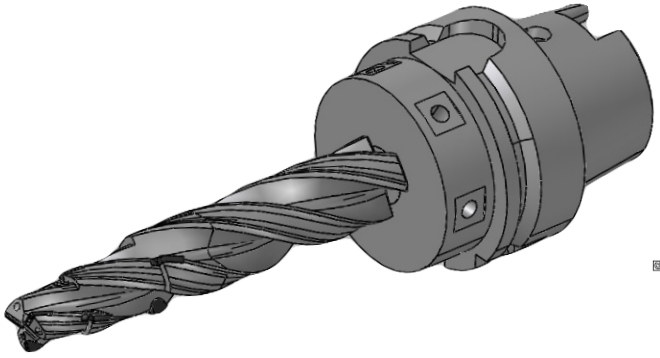


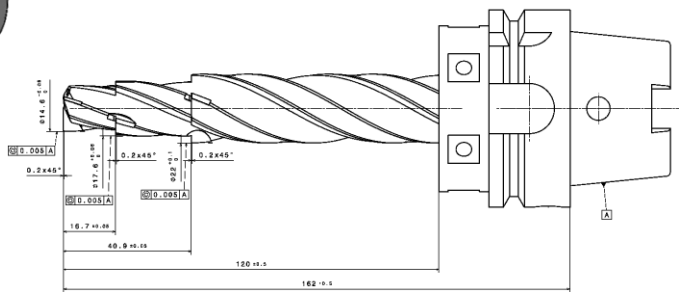
Step drills with counterbore



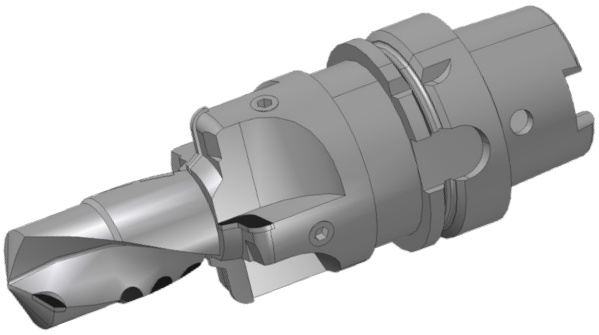


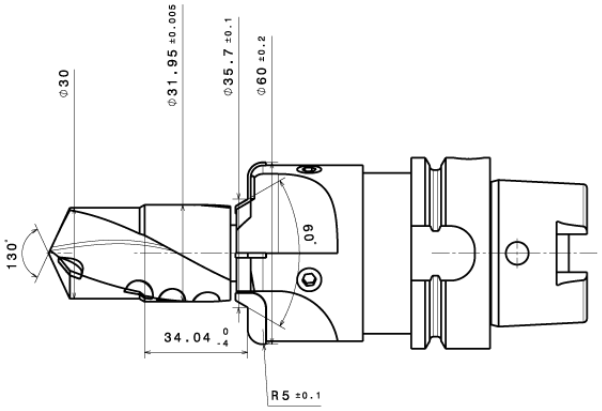
Helical step drills



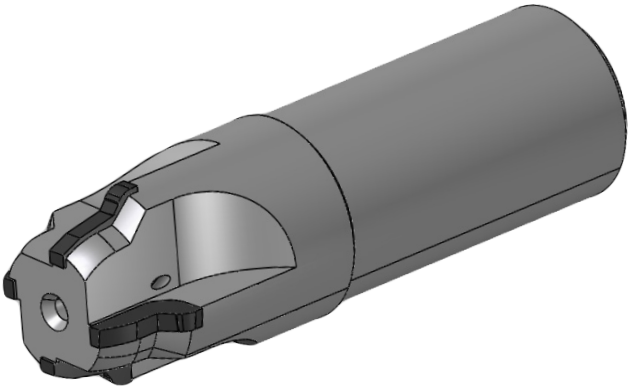


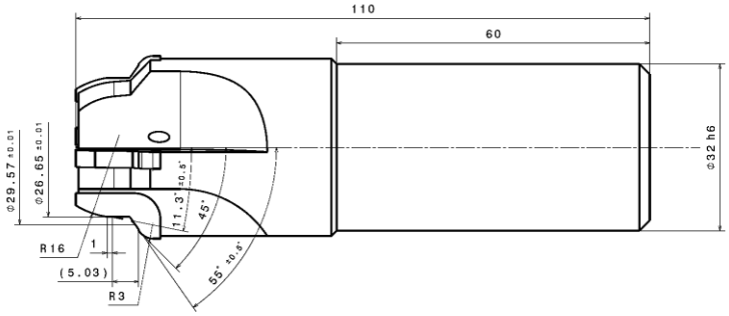
Helical drills with counterbore



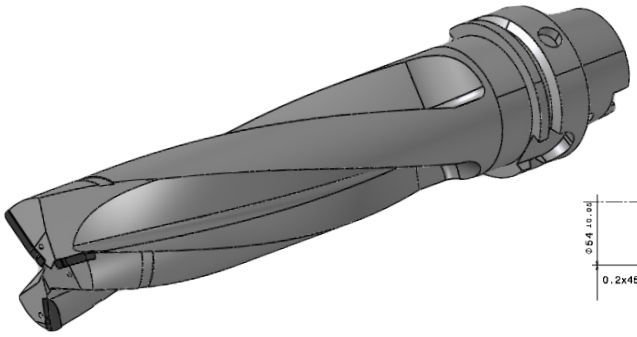


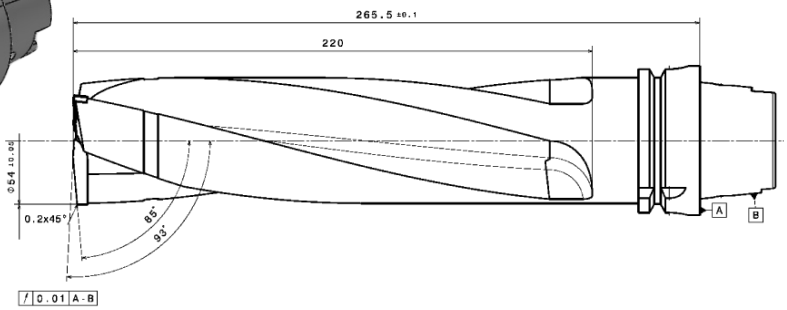
Specific drills





Long drills





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PCD milling

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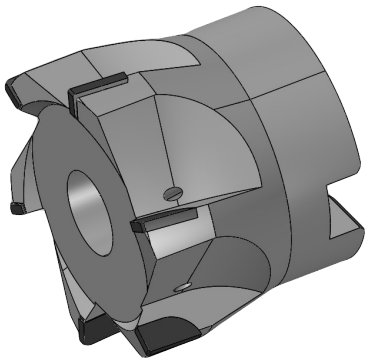
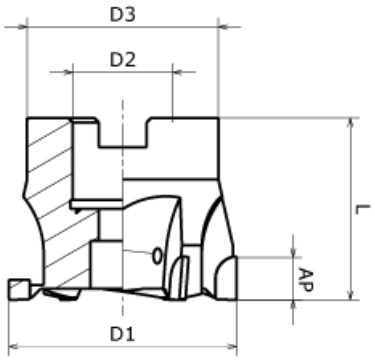
Face mills with interchangeable head

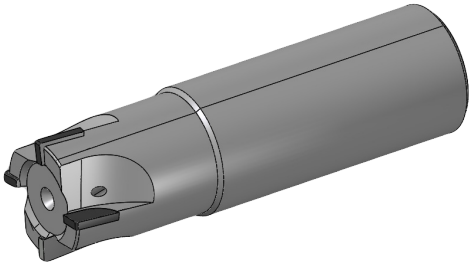
References	ØD1	ØD2	ØD3	L	Z	AP
STD PCD T036-05	36	16	32	40	5	10
STD PCD T040-05	40	16	32	40	5	10
STD PCD T050-06	50	22	42	40	6	10
STD PCD T063-07	63	22	42	40	7	10
STD PCD T080-08	80	27	51	50	8	10
STD PCD T100-10	100	32	61	50	10	10
STD PCD T125-11	125	40	73	63	11	10
STD PCD T160-13	160	40	116	63	13	10

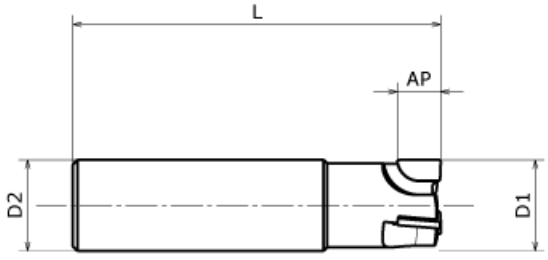




Face mills with cylindrical shank

References	ØD1	ØD2	L	Z	AP
STD PCD Q008-02	08	08	60	2	10
STD PCD Q010-02	10	10	60	2	10
STD PCD Q012-03	12	12	75	3	10
STD PCD Q014-03	14	14	75	3	10
STD PCD Q016-03	16	16	75	3	10
STD PCD Q020-03	20	20	81	3	10
STD PCD Q025-04	25	25	88	4	10
STD PCD Q032-05	32	32	100	5	10
STD PCD Q040-06	40	40	100	6	10





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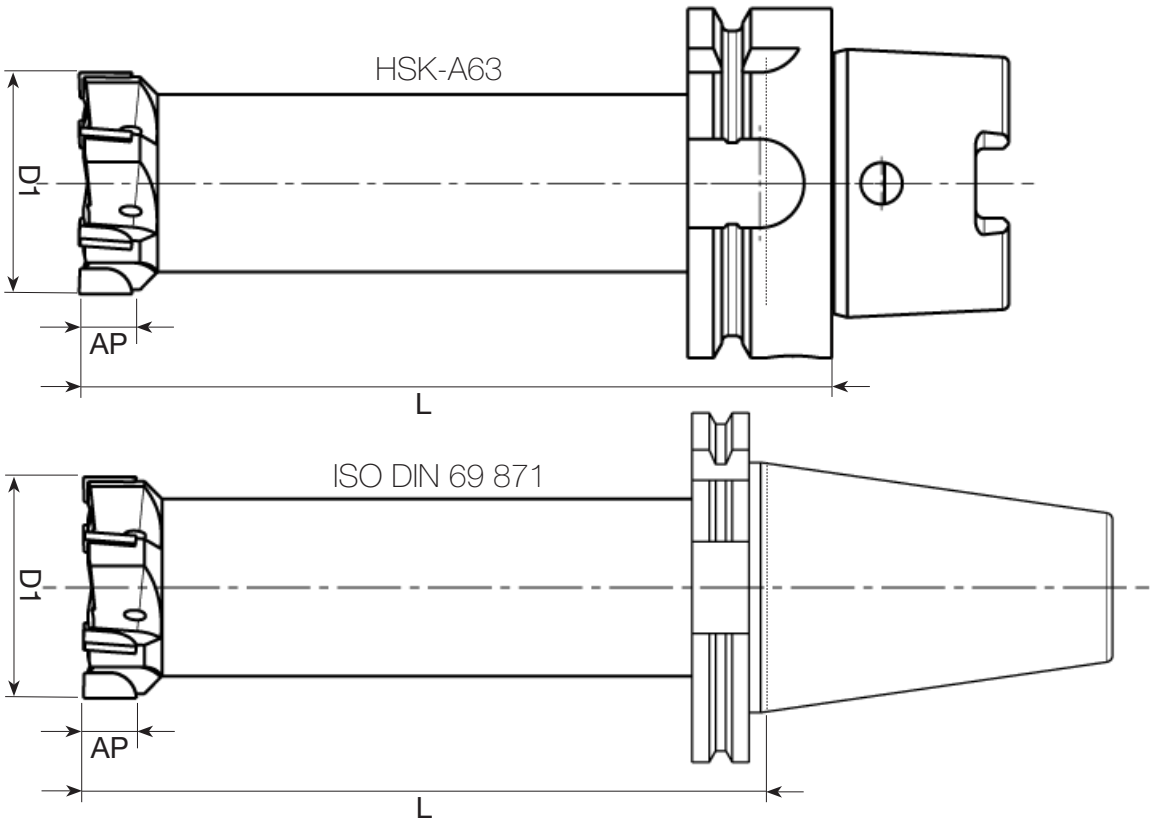
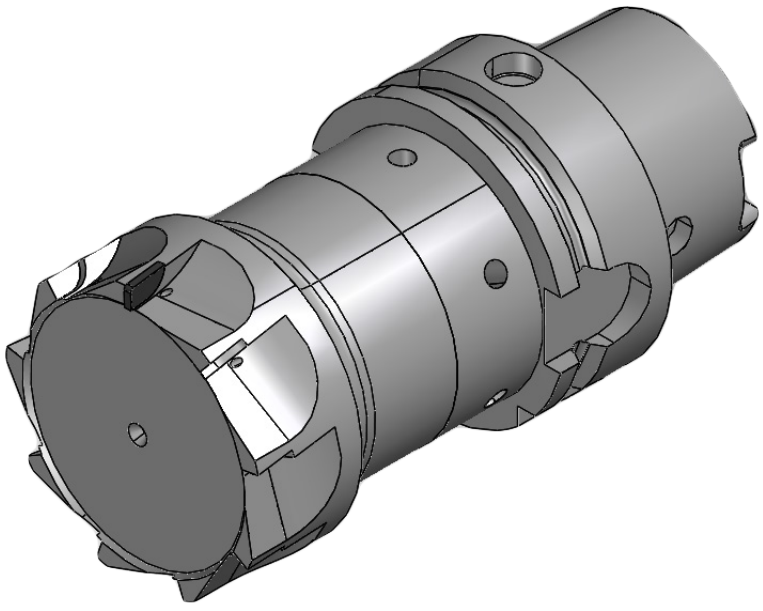
Solid face mills

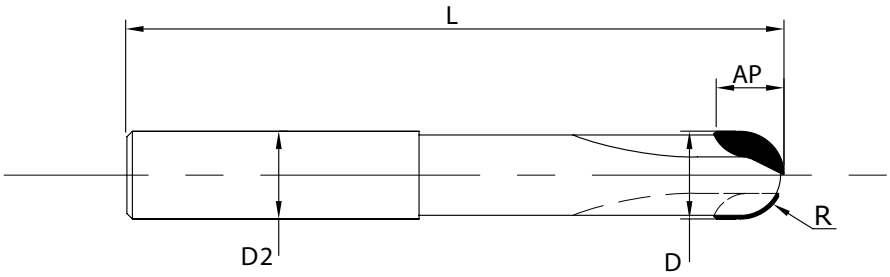


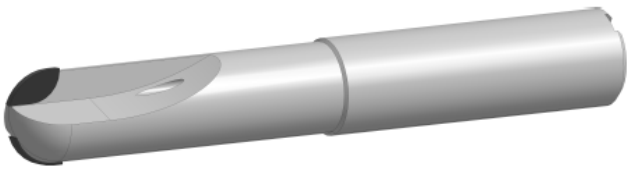
References HSK-A63	References ISO DIN 69 871	ØD1	L	Z	AP	AP
STD PCD HSK032-05	STD PCD DIN032-05	32	100	5	10	10
STD PCD HSK036-05	STD PCD DIN036-05	36	100	5	10	10
STD PCD HSK040-05	STD PCD DIN040-05	40	100	5	10	10
STD PCD HSK050-06	STD PCD DIN050-06	50	100	6	10	10
STD PCD HSK063-07	STD PCD DIN063-07	63	100	7	10	10
STD PCD HSK080-08	STD PCD DIN080-08	80	100	8	10	10



H mills

Hemispherical mill
Center cutting
Cylindrical shank h6
Carbide body
With lubrification





Aluminum and non-ferrous applications

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PCD-HES06	6	6	3	58	10	2
PCD-HES08	8	8	4	64	10	2
PCD-HES10	10	10	5	73	10	2
PCD-HES12	12	12	6	84	10	2
PCD-HES14	14	14	7	84	10	2
PCD-HES16	16	16	8	93	10	2
PCD-HES20	20	20	10	105	13	2

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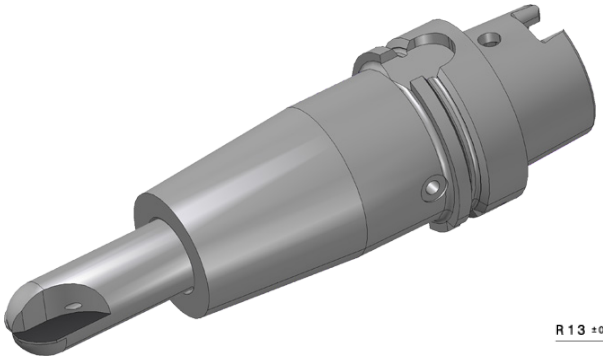
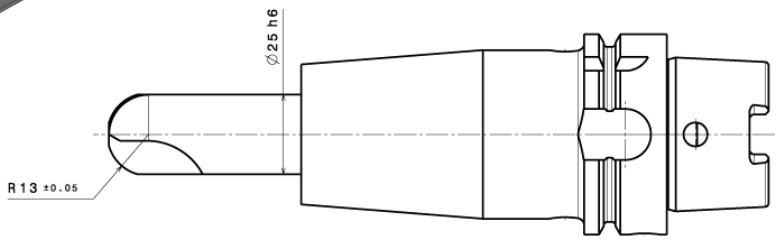
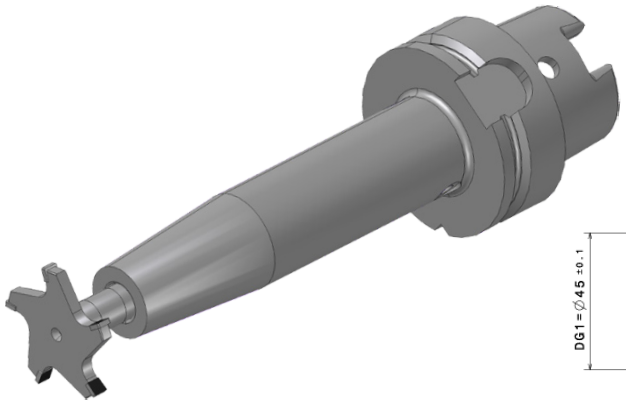
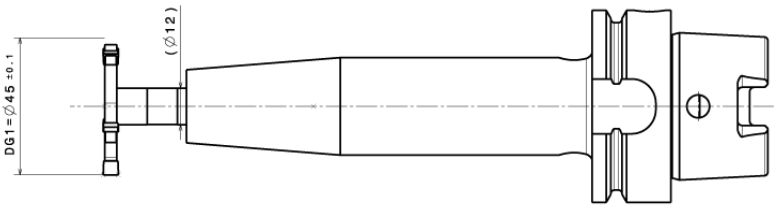
Ball nose end mills (hemispherical & torus)

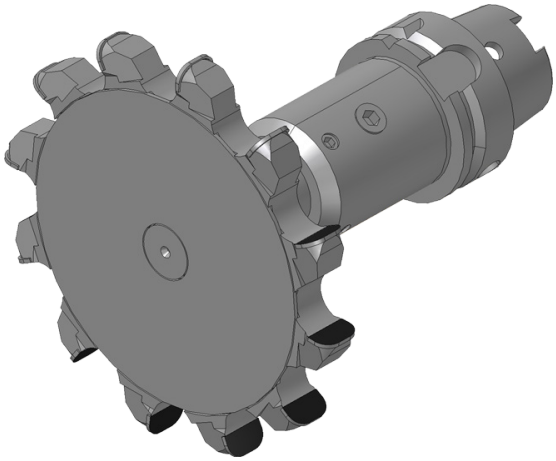


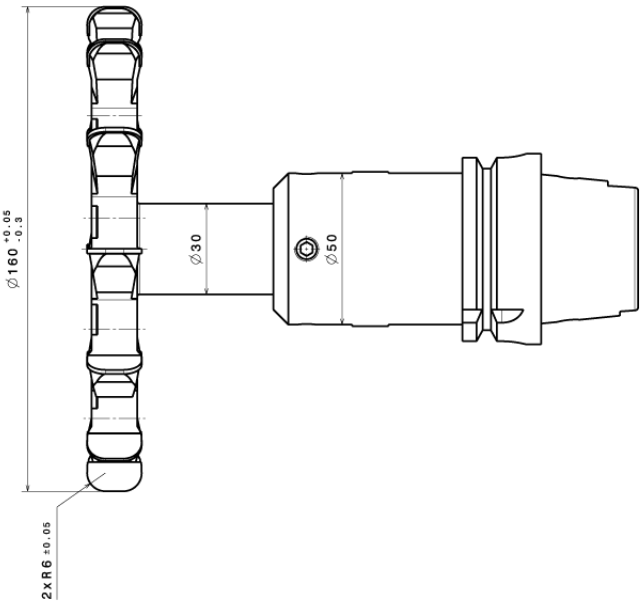


Radius mills

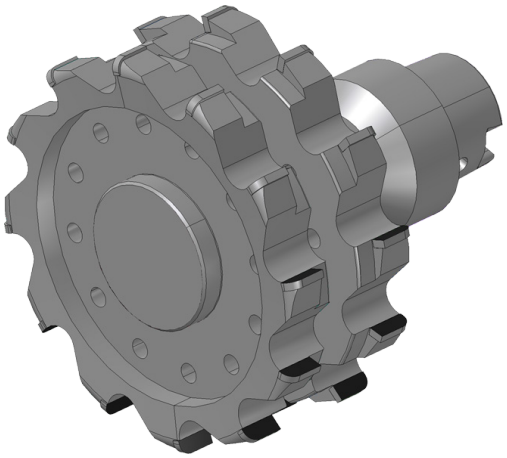


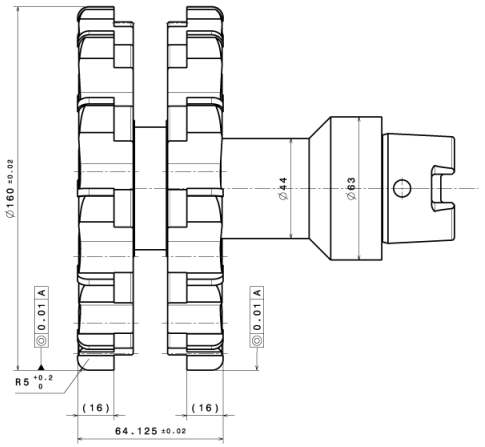


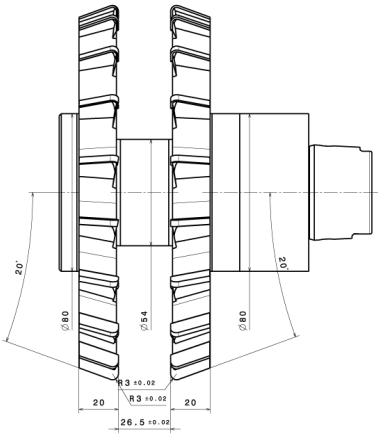




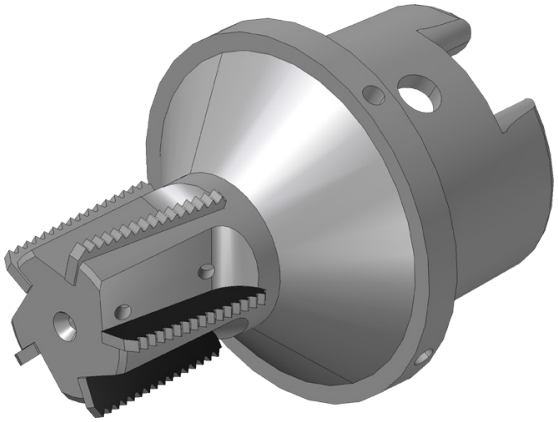
Gang mills

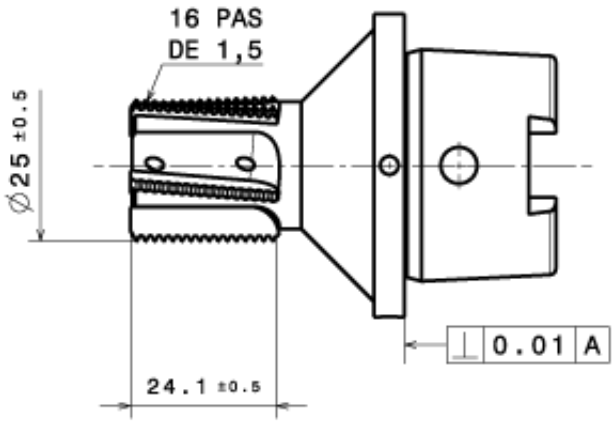






Thread milling





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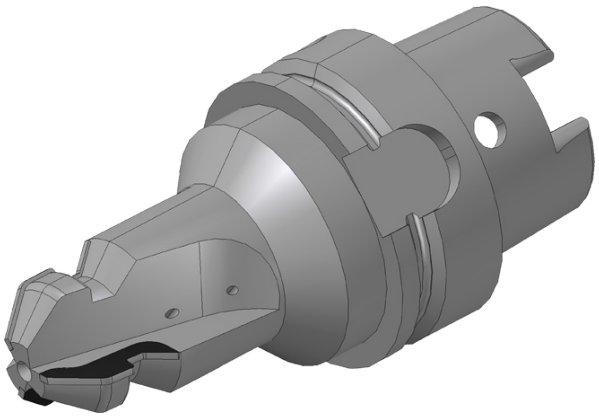
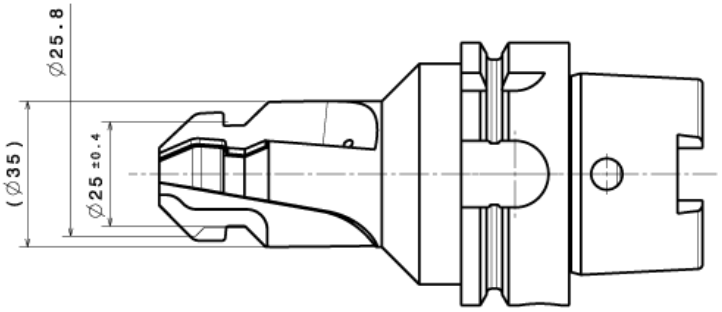
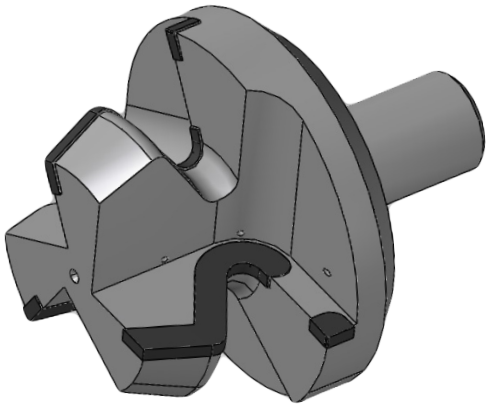
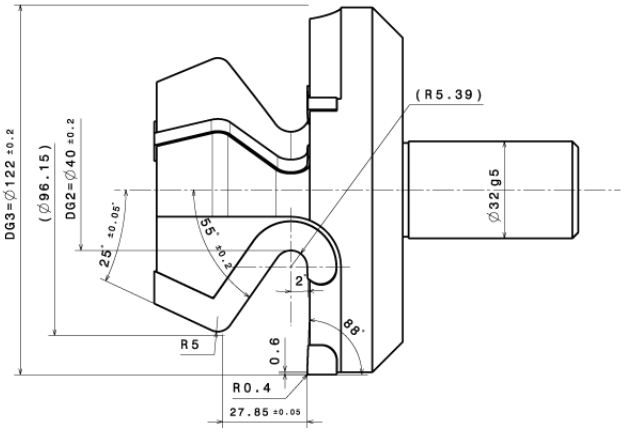
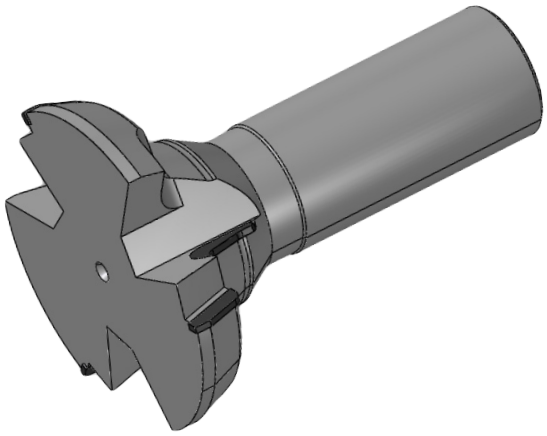
Form mills

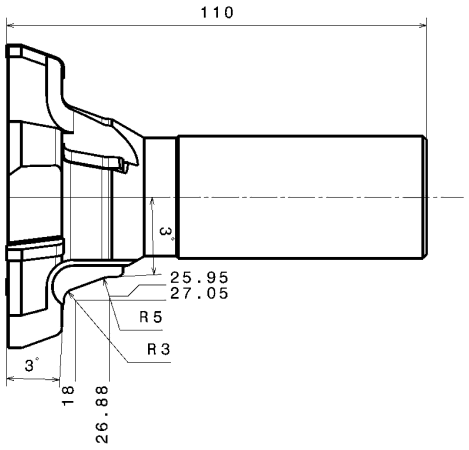



Ø25.8
(Ø35)
Ø25 ±0.4

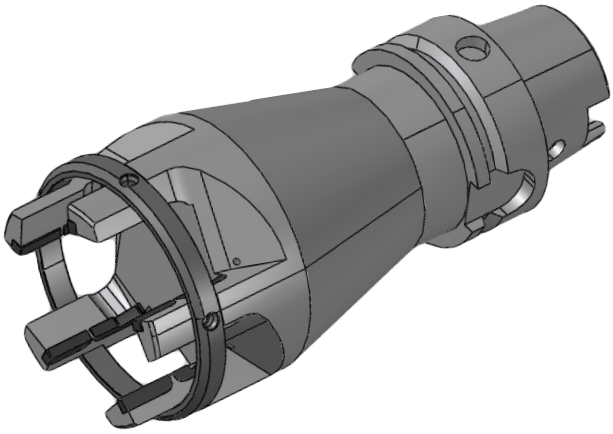


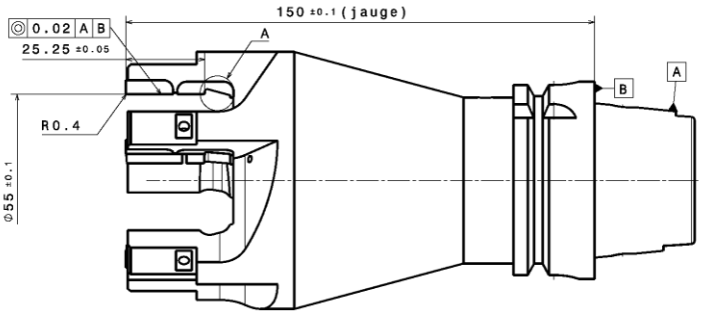

(R5.39)
DG3=Ø122 ±0.2
(Ø96.15)
DG2=Ø40 ±0.2
Ø32g5
25° ±0.05°
55° ±0.5°
2
68°
R5
0.6
R0.4
27.85 ±0.05

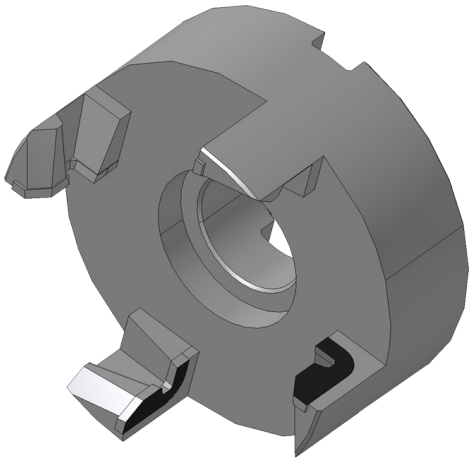


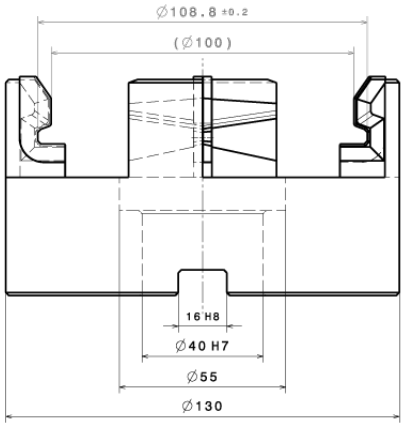

110
3
25.95
27.05
R5
R3
3°
18
26.88

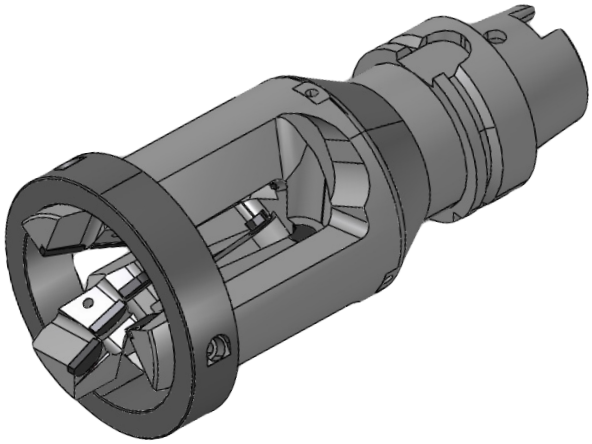
Chamfering mills

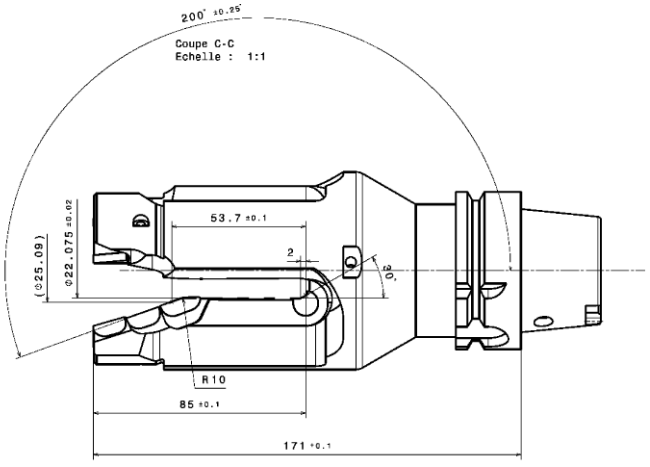












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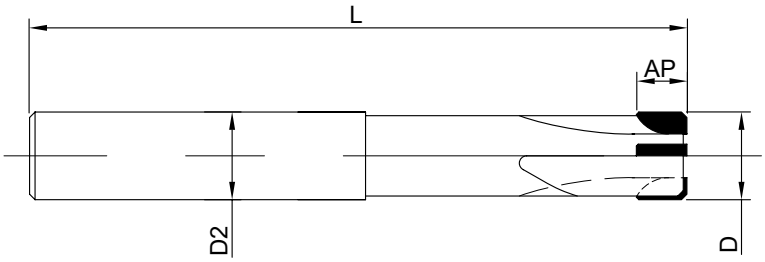
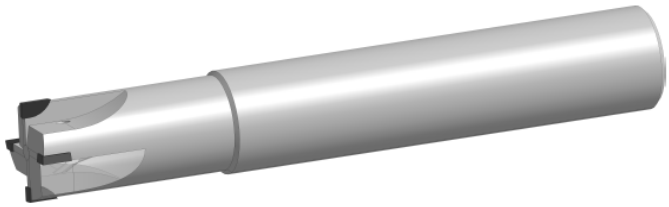
PCD reamers & PCD combined tools

Reamers, mills... (push/pull chamfering and counterboring)

PCD reamers

Cylindrical shank H6
Carbide body
With lubrication
Tolerance ± 0,02





Aluminum and non-ferrous applications

References	ØD	ØD2	L	AP	l
PCD-AL*	4,000 à 6,000	6	65	2	7
PCD-AL*	6,001 à 8,000	8	65	2	7
PCD-AL*	8,001 à 10,000	10	90	2	7
PCD-AL*	10,001 à 12,000	12	90	4	7
PCD-AL*	12,001 à 14,000	14	90	4	7
PCD-AL*	14,001 à 16,000	16	90	4	7
PCD-AL*	16,001 à 18,000	18	110	4	7
PCD-AL*	18,001 à 20,100	20	110	4	7

** Indicates the diameter requested*

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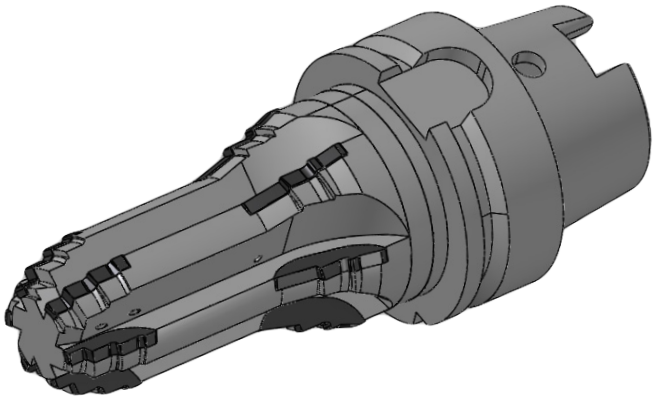
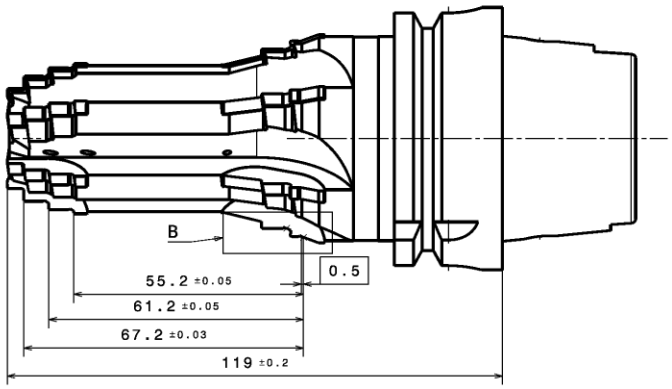
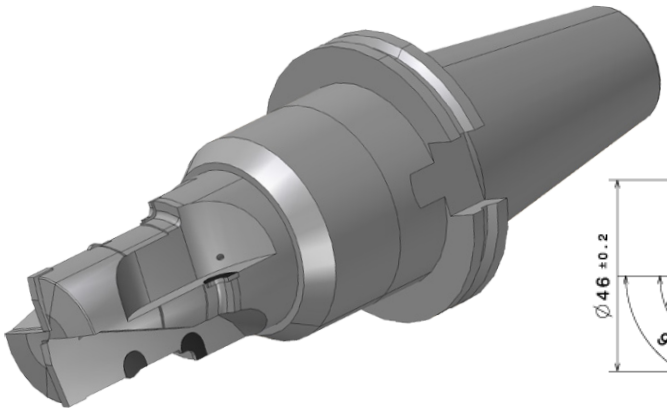
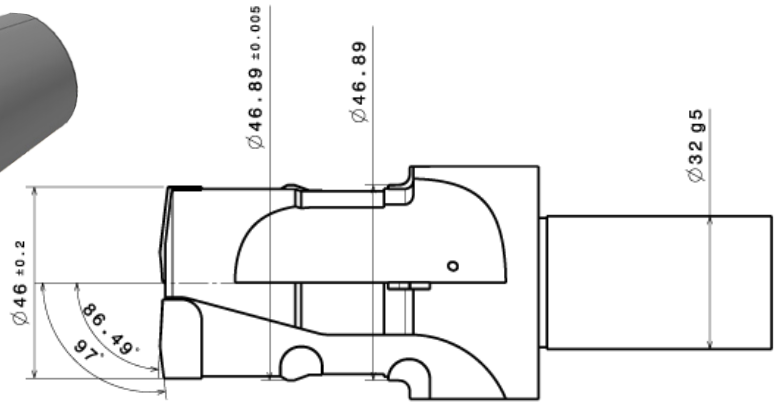
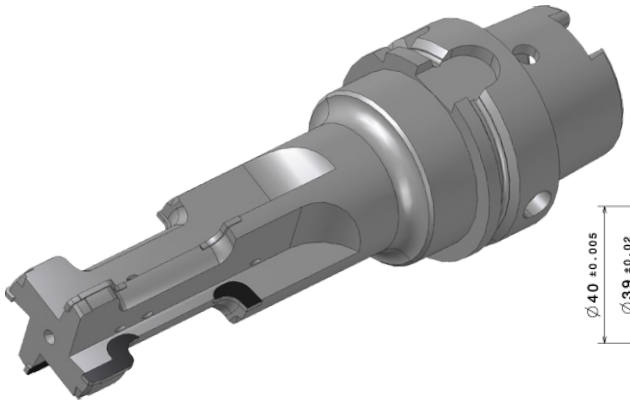
Reamers, mills etc. (push/pull chamfering and counterboring)

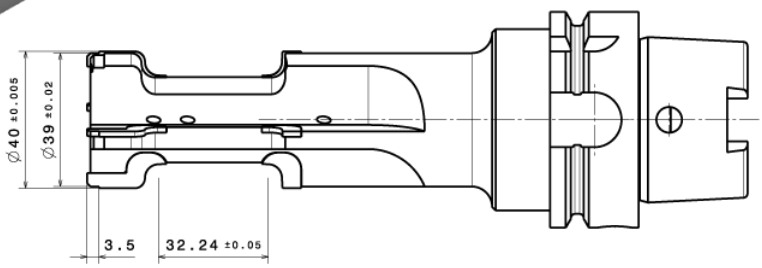




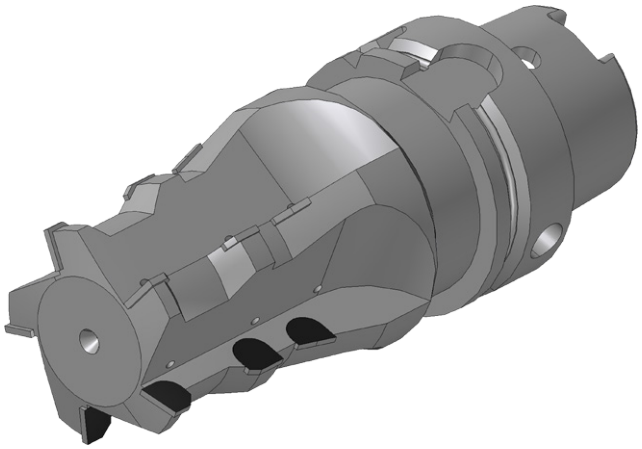


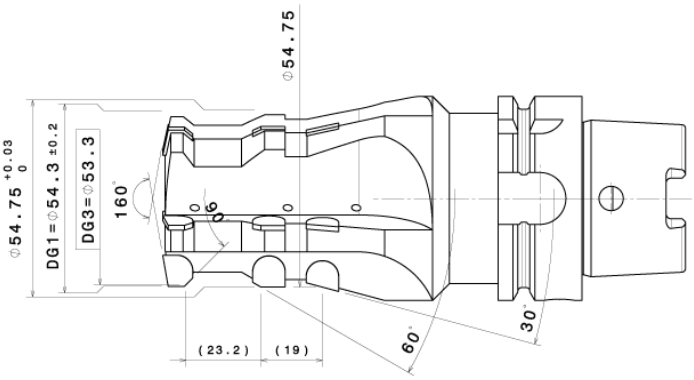


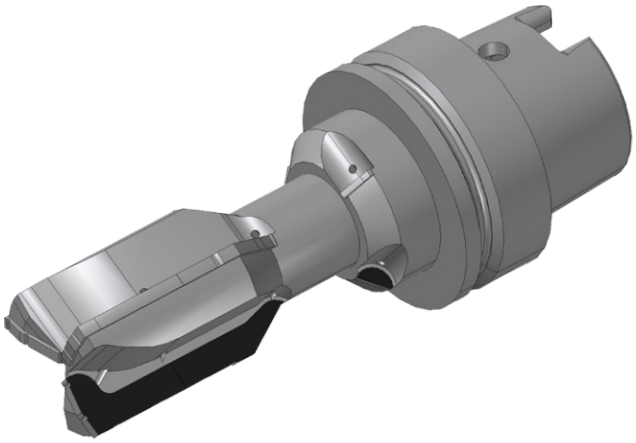


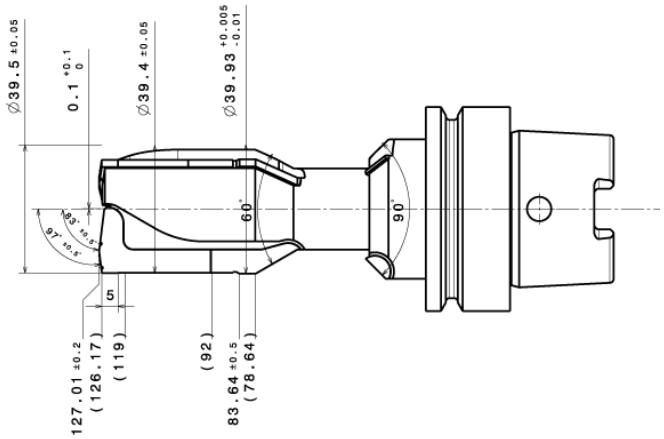


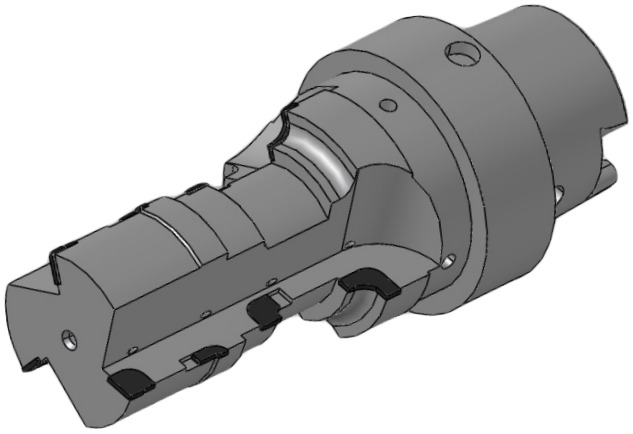
Reamers, mills etc. (push/pull chamfering and counterboring)

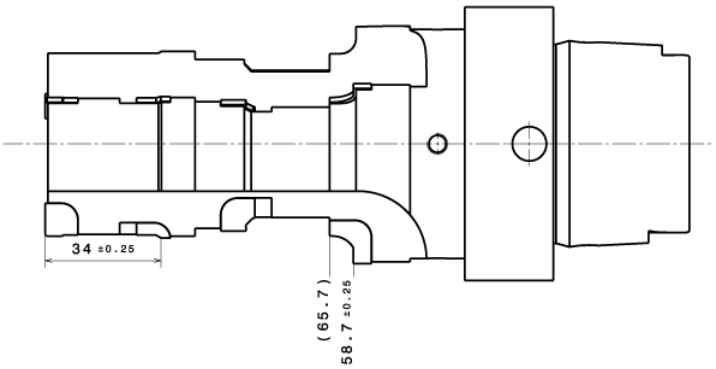












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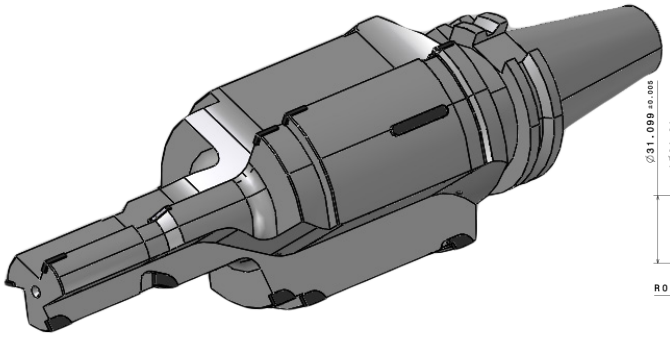
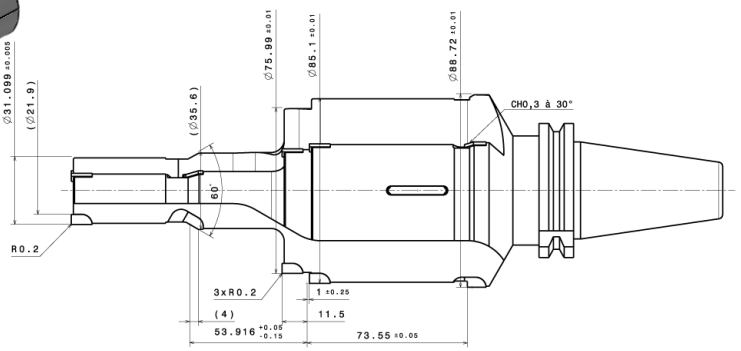
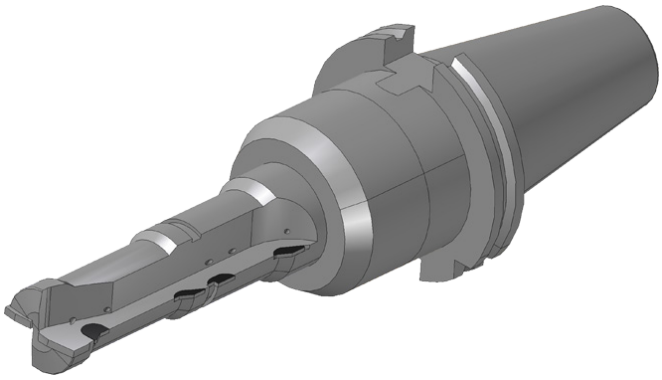
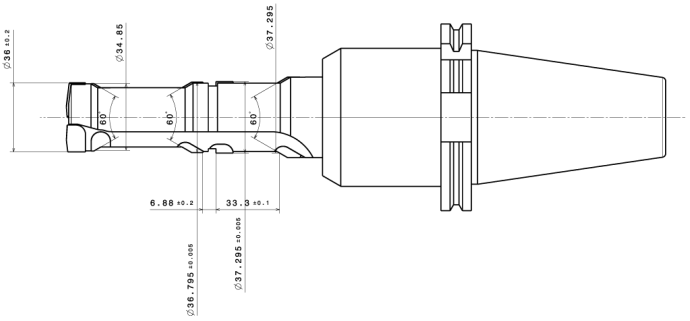
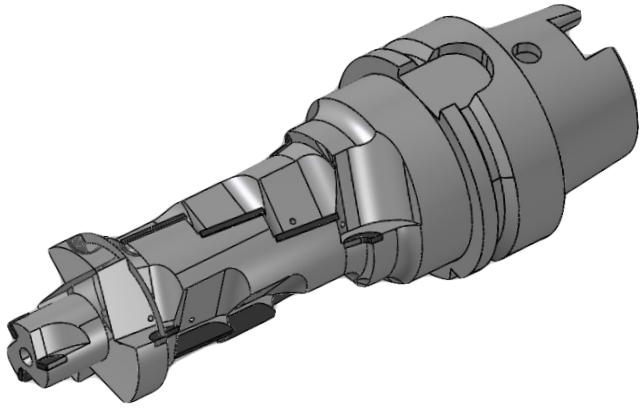
Reamers, mills etc. (push/pull chamfering and counterboring)

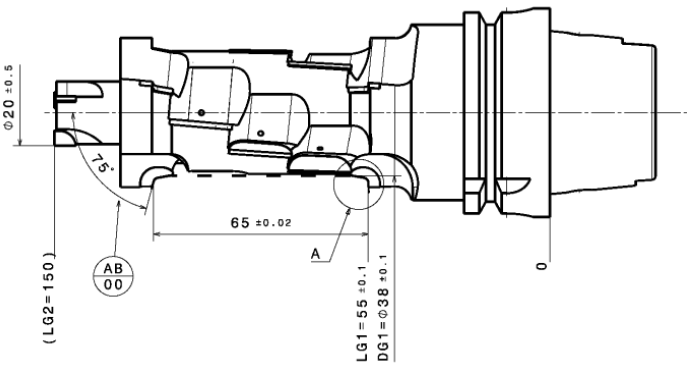






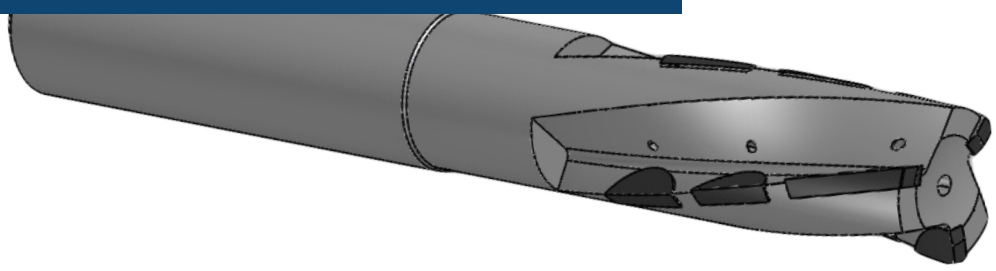




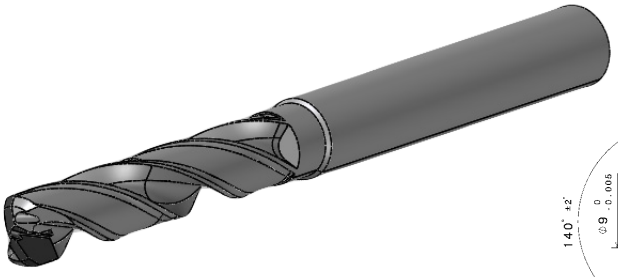


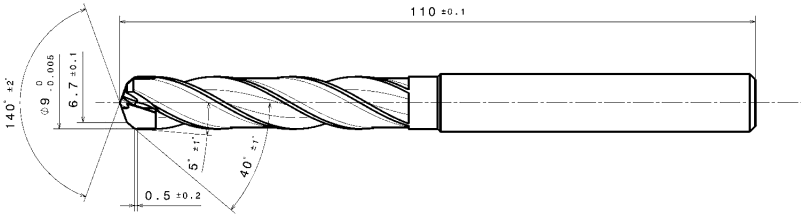
Aeronautics tools

Pages >

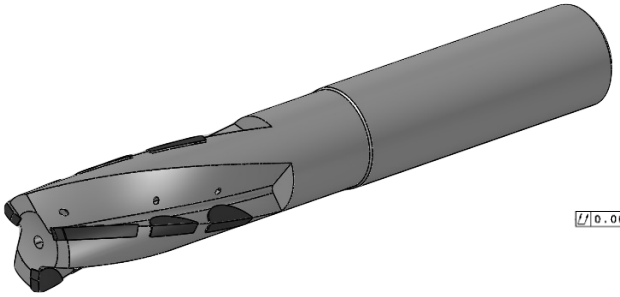


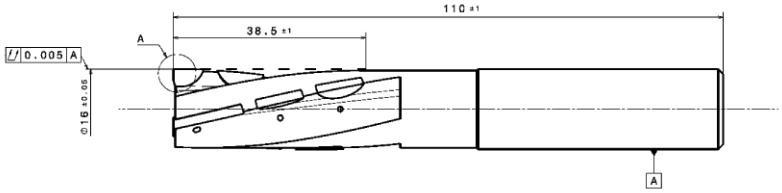
«Sandwich» point drill



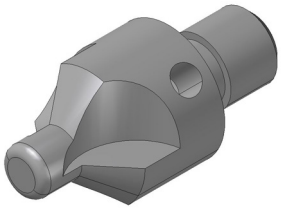


Helical end mills (roughing or finishing, milling and/or pocketing)





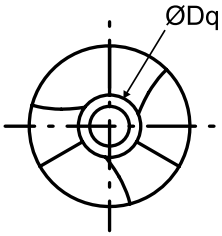
HSS and CW countersinking tool with solid pilot

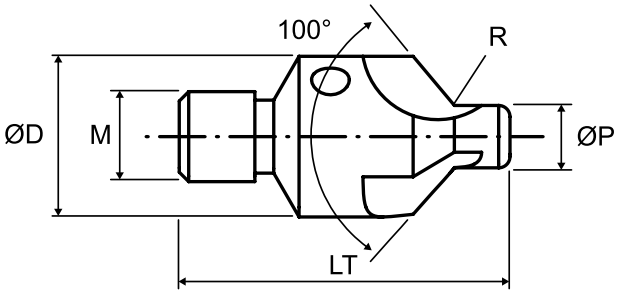


Aluminum and non-ferrous applications

Other countersinking angles
or dimensions available on request

FRPM HSS: M42 FRPM CW
Speed steel: CKI 10 Carbide





ØD	M	LT	ØP	Z	R	Item code
10	M6 x 100	34	2,38	3	0,2 à 0,4	FRPM HSS - 0238
						FRPM CW - 0238
		35	3,17			FRPM HSS - 0317
						FRPM CW - 0317
			3,5			FRPM HSS - 0350
						FRPM CW - 0350
			3,60			FRPM HSS - 0360
						FRPM CW - 0360
			3,97			FRPM HSS - 0397
						FRPM CW - 0397
			4,00			FRPM HSS - 0400
						FRPM CW - 0400
			4,15			FRPM HSS - 0415
						FRPM CW - 0415
			4,76		0,4 à 0,75	FRPM HSS - 0476
						FRPM CW - 0476
			4,80			FRPM HSS - 0480
						FRPM CW - 0480
		36	5,60			FRPM HSS - 0560
						FRPM CW - 0560
14	M8 x 100	35	4,76			FRPM HSS - 0476
						FRPM CW - 0476
		36	5,00			FRPM HSS - 0500
						FRPM CW - 0500
			5,60		0,75 à 1,25	FRPM HSS - 0560
						FRPM CW - 0560
			6,00			FRPM HSS - 0600
						FRPM CW - 0600
			6,35			FRPM HSS - 0635
						FRPM CW - 0635
17		37	8,00			FRPM HSS - 0800
						FRPM CW - 0800
21		38	10,00			FRPM HSS - 1000
						FRPM CW - 1000

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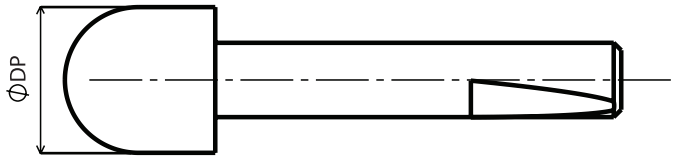
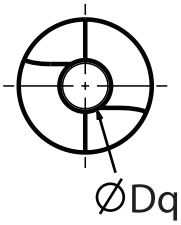
HSS and CW countersinking tool with removable pilot

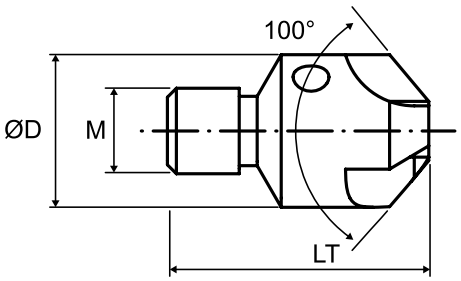
Aluminum and non-ferrous applications

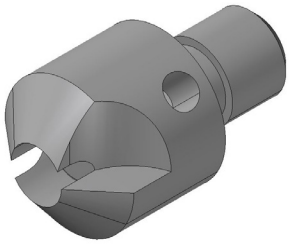
Other countersinking angles
or dimensions available on request

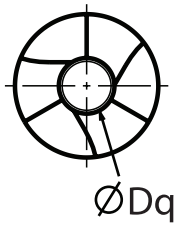
FRPA HSS: M42 FRPA CW
Speed steel: CKI 10 Carbide

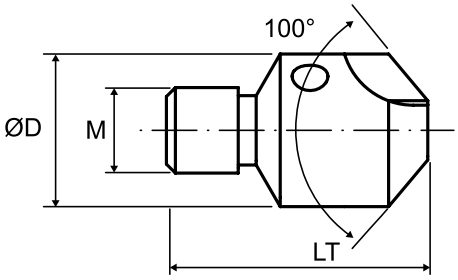


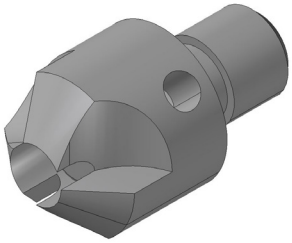










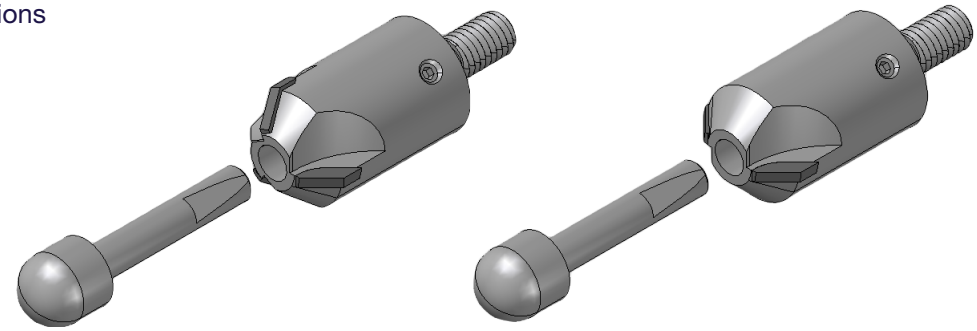


ØD	M	ØDq	ØDp	Z	Particularity	LT	R	Item code
10	M6 x 100	2,00	See page 27	2	Carbide tip	28mm	Radius on request	FRPA HSS - 1001
10				3		28mm		FRPA CW - 1001
10		2,50		2		28mm		FRPA HSS - 1002
10				3		28mm		FRPA CW - 1002
10		3,00		2		28mm		FRPA HSS - 1003
10				3		28mm		FRPA CW - 1003
10		3,50		2		28mm		FRPA HSS - 1004
10				3		28mm		FRPA CW - 1004
14	M8 x 100	4,00		2	Brazed plates	28mm		FRPA HSS - 1405
14				3		28mm		FRPA CW - 1405
17		5		2		28mm		FRPA HSS - 1706
17				3		28mm		FRPA CW - 1706
21				3		28mm		FRPA HSS - 2107
21				3		28mm		FRPA CW - 2107

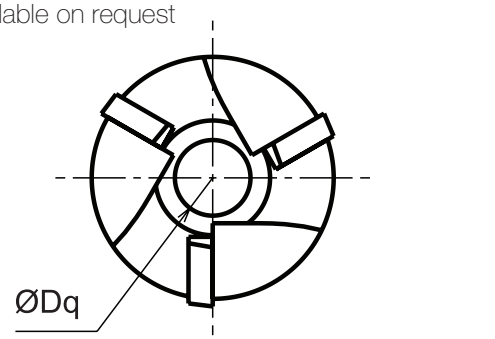
Countersinking tool with diamond plates

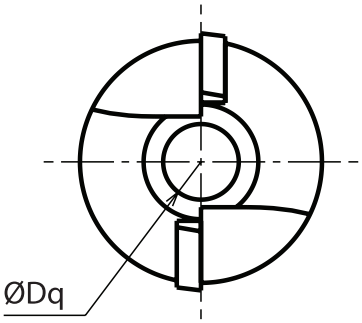
Aluminum and non-ferrous applications

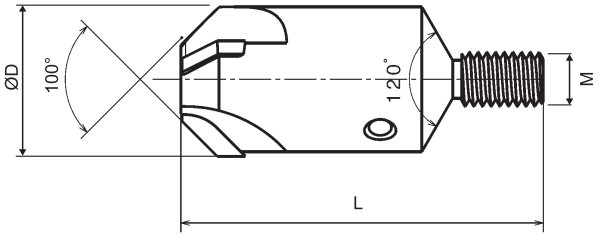
Characteristics :
Right-hand cutting
Right cutting edge: 0°
Material: PCD and body of mill
35 CD4
Coaxiality: 0.01 max
Tool provided with or without pilot
Pilot clamping screws: M3

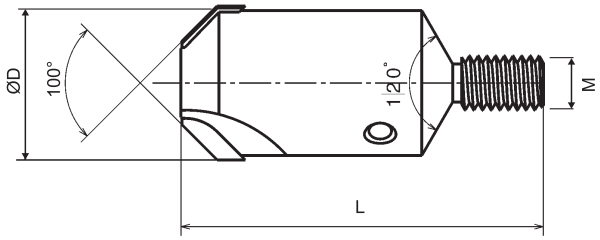


Other countersinking angles or
dimensions available on request









ØD	ØDq	ØDp	M	Z	LT	Item code
10	2	See page 27	M6 x 100	2	28 mm	FRPA PCD - 1001
	2,5					FRPA PCD - 1002
12,4	2					FRPA PCD - 1240
14	3		M8 x 100			FRPA PCD - 1401
	4					FRPA PCD - 1402
15,5	5			3	29,5	FRPA PCD - 1550
17	5				29,5	FRPA PCD - 1700
20	5				29,5	FRPA PCD - 2000
21	5				29,5	FRPA PCD - 2100
25	6				32	FRPA PCD - 2500
27,5	6				32	FRPA PCD - 2750

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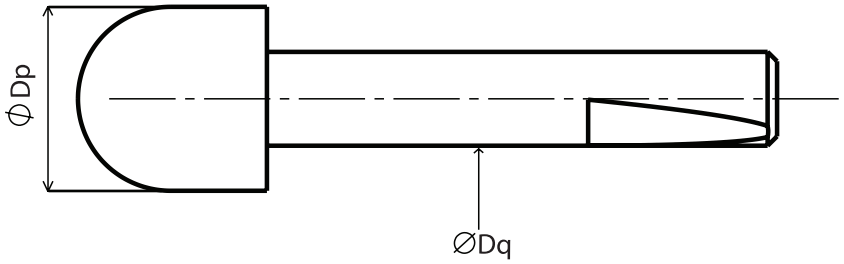
Smooth pilot

We provide non-standard dimensions on request.



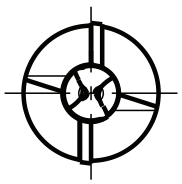
ØDp	ØDq	L	Item code
2,00	2	17	PIL - 0200
2,38			PIL - 0238
2,50			PIL - 0250
2,80	2,5		PIL - 0280
3,00			PIL - 0300
3,17			PIL - 0317
3,50	3		PIL - 0350
4,00	3,5		PIL - 0400
4,15			PIL - 0415
4,76	4		PIL - 0476
4,80			PIL - 0480
5,00			PIL - 0500
5,60			PIL - 0560
6,00			PIL - 0600
6,35			PIL - 0635
7,94	5		PIL - 0794
8,00			PIL - 0800
9,52			PIL - 0952
10,00			PIL - 1000
11,11	6	27	PIL - 1111
12,70			PIL - 1270
14,29			PIL - 1429
15,87			PIL - 1587

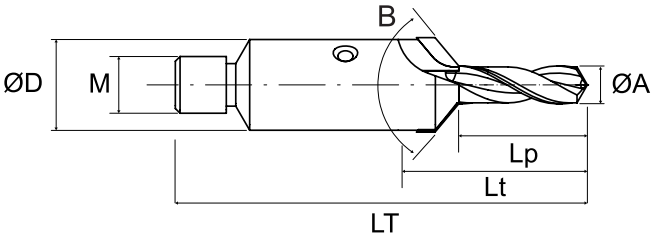
PCD countersinking tool with removable carbide drill

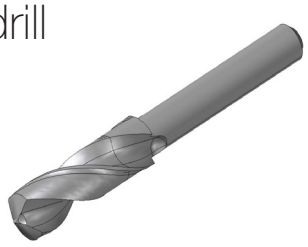
Characteristics :
Right-hand cutting
Right cutting edge: 0°
Material: PCD

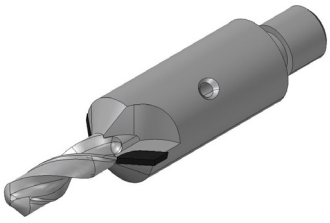
Body of mill:
35CD4 steel, 2 teeth

Drill: FOCW
Right-handed cutting
Right-hand helix: 30°
2 flutes
Material: CK 10 carbide









Other countersinking angles or dimensions available on request

ASSEMBLED TOOL

ØA	ØD	M	LT	Lp	Lt	B	Item code
3,20	12	M6 x 100	42	9,5	21,5	100° 130°	FRPCD FOCW - 3212
4,17	12		45	12,5	24,5		FRPCD FOCW - 4112
4,82	12		48	14,5	26,5		FRPCD FOCW - 4812
5,56	14	M8 x 100	55	17	31		FRPCD FOCW - 5514
6,35	14		60	19	33		FRPCD FOCW - 6314
7,92	17		70	23,5	40,5		FRPCD FOCW - 7917
9,52	17		80	28,5	45,5		FRPCD FOCW - 9517

BODY

ØA	Ø BORE	M	B	Item code
12	2,6	M6 x 100	100°	FRPCD - 1226
12	2,9			FRPCD - 1229
12	3,5			FRPCD - 1235
14	4,3	M8 x 100		FRPCD - 1443
14	5			FRPCD - 1450
17	6,5			FRPCD - 1765
17	8			FRPCD - 1780

DRILL

ØA	Lp	L (total)	Item code
3,2	9,2	28	FOCW - 0320
4,17	12,5	32	FOCW - 0417
4,82	14,5	35	FOCW - 0482
5,56	17	42	FOCW - 0556
6,35	19	46	FOCW - 0635
7,92	23,5	57	FOCW - 0792
9,52	28,5	66	FOCW - 0952

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CUTTING PRECISION

CW TOOLS CATALOG

High precision cutting tools

ISO 9001

INNOVATIVE SOLUTIONS

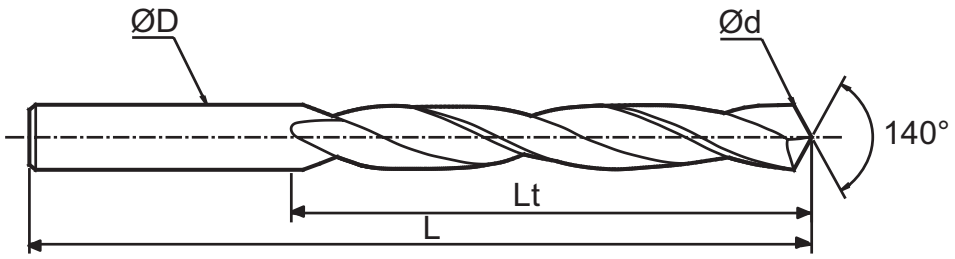
Solid drills

Pages >

Carbide drills

2 flutes
Right-hand cutting
Grade k 10

Coating on request

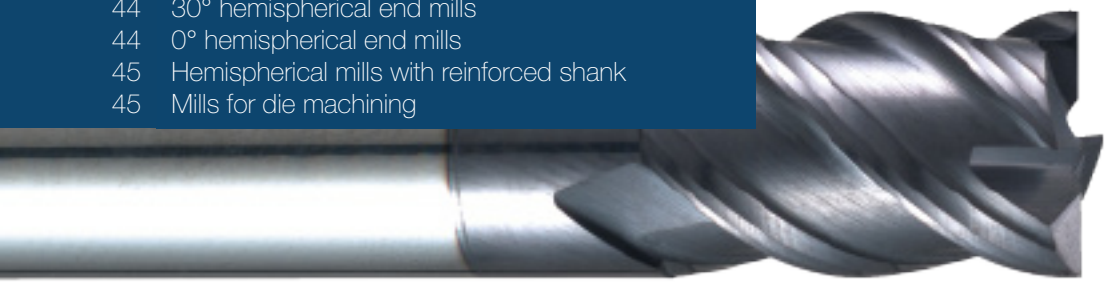


Diameter in mm	ØD	L x Lt
4,0	6x36	66x24
4,1 - 4,2 - 4,25	6x36	66x24
4,3 - 4,4 - 4,5	6x36	66x24
4,6 - 4,7 - 4,75	6x36	66x24
4,8 - 4,9	6x36	66x24
5,0	6x36	66x24
5,1 - 5,2 - 5,3	6x36	66x24
5,4 - 5,5 - 5,6	6x36	66x24
5,7 - 5,8 - 5,9	6x36	66x24
6,0	6x36	66x24
6,1 - 6,2 - 6,3	8x36	79x34
6,4 - 6,5 - 6,6	8x36	79x34
6,7 - 6,8 - 6,9	8x36	79x34
7,0	8x36	79x34
7,1 - 7,2 - 7,3	8x36	79x34
7,4 - 7,5 - 7,6	8x36	79x34
7,7 - 7,8 - 7,9	8x36	79x34
8,0	8x36	79x34
8,1 - 8,2 - 8,3	10x40	89x47

Diameter in mm	ØD	L x Lt
8,4 - 8,5 - 8,6	10x40	89x47
8,7 - 8,8 - 8,9	10x40	89x47
9,0	10x40	89x47
9,1 - 9,2 - 9,3	10x40	89x47
9,4 - 9,5 - 9,6	10x40	89x47
9,7 - 9,8 - 9,9	10x40	89x47
10,0	10x40	89x47
10,25 - 10,5	12x45	102x55
11,0 - 11,5	12x45	102x55
12,0	12x45	102x55
12,5 - 13,0 - 13,5	14x45	110x60
14,0	14x45	110x60
14,5 - 15 - 15,5	16x48	110x60
16,0	16x48	110x60
16,5 - 17 - 17,5	18x48	123x73
18,0	18x48	123x73
18,5 - 19 - 19,5	20x50	131x79
20,0	20x50	131x79

Milling cutters

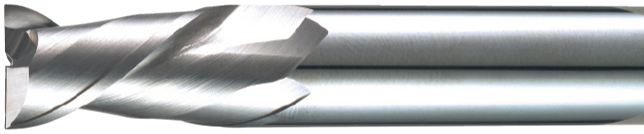
Pages >



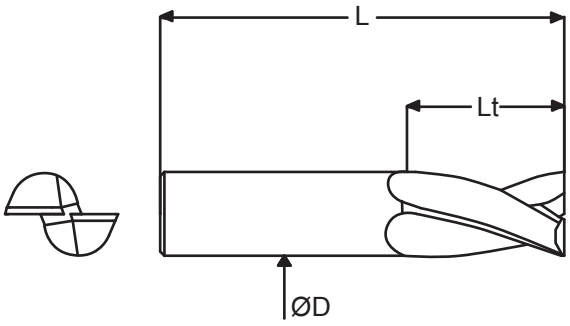
End mills 2 cutting edges

Helix 45°
2 teeth
Right-hand cutting
2 cutting edges with 1 centered

Coating on request



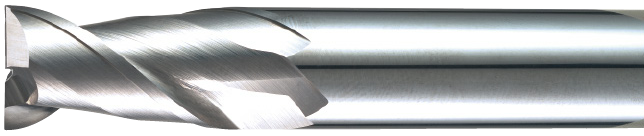
Ø D	L	Lt	Ød	Z
6	57	13		2
8	63	19		2
10	72	22		2
12	76	22	NOMINAL	2
14	83	26		2
16	89	32		2
18	92	32		2
20	101	38		2



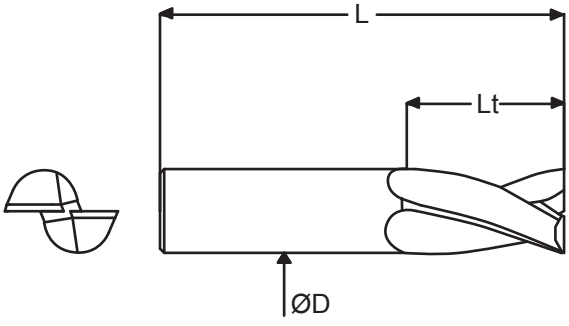
End mill 2 cutting edges long series

Helix 45°
2 teeth
Right-hand cutting
2 cutting edges with 1 centered

Coating on request



Ø D	L	Lt	Ød	Z
6	75	30		2
8	88	35		2
10	100	35		2
12	110	40	NOMINAL	2
14	110	40		2
16	150	55		2
18	150	55		2
20	150	60		2

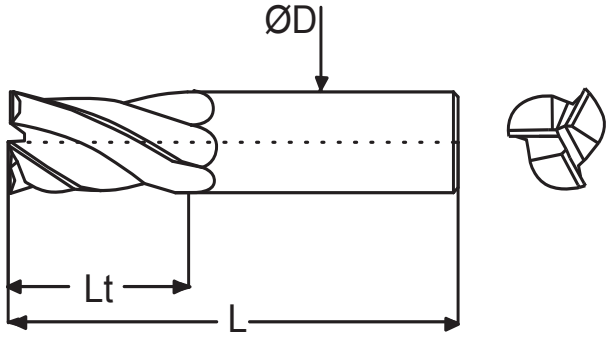


End mills 3 cutting edges

Helix 45°
3 teeth
Right-hand cutting
3 cutting edges with 1 centered

Coating on request

Ø D	L	Lt	Ød	Z
6	57	13		3
8	63	19		3
10	72	22		3
12	76	22	NOMINAL	3
14	83	26		3
16	89	32		3
18	92	32		3
20	104	38		3

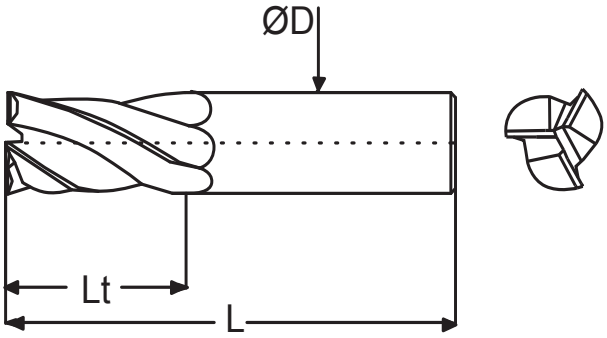


End mills 3 cutting edges long series

Helix 45°
3 teeth
Right-hand cutting
3 cutting edges with 1 centered

Coating on request

Ø D	L	Lt	Ød	Z
6	75	30		3
8	88	35		3
10	100	35		3
12	110	40	NOMINAL	3
14	110	40		3
16	150	55		3
18	150	55		3
20	150	60		3



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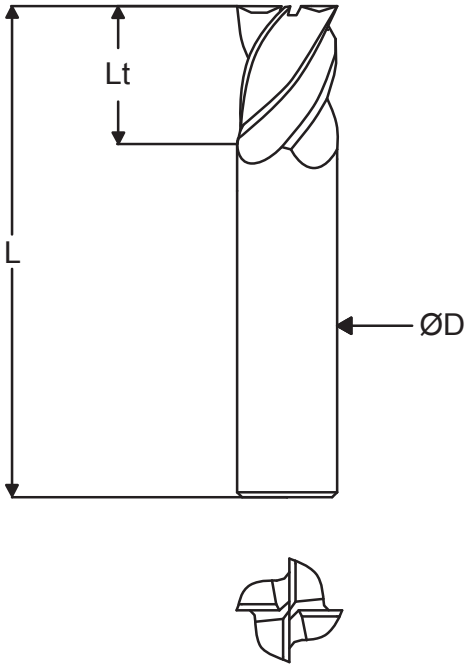
End mills 4 cutting edges

Helix 45°
Right-hand cutting
4 cutting edges with 2 centered

Coating on request

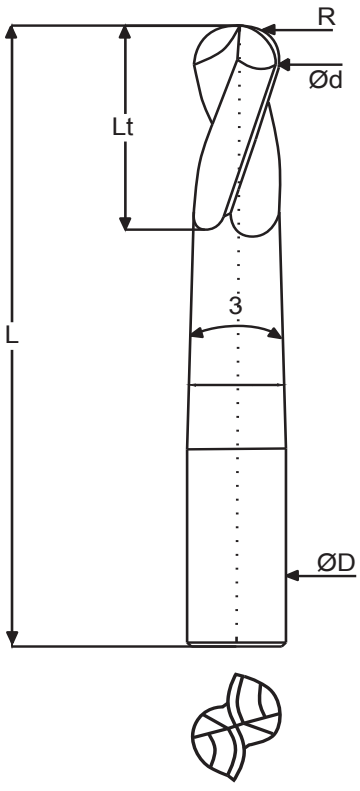


Ø D	Ød	L	Lt	Z
6	NOMINAL	57	13	4
8		63	19	4
10		72	22	4
12		76	22	4
14		83	26	4
16		89	32	4
18		92	32	4
20		101	38	4

Hemispherical end mills with reinforced shank

Helix 30°
Reinforced shank 1.5° gradient
Right-hand cutting 2 teeth
Centre cutting edge-to-edge

Coating on request

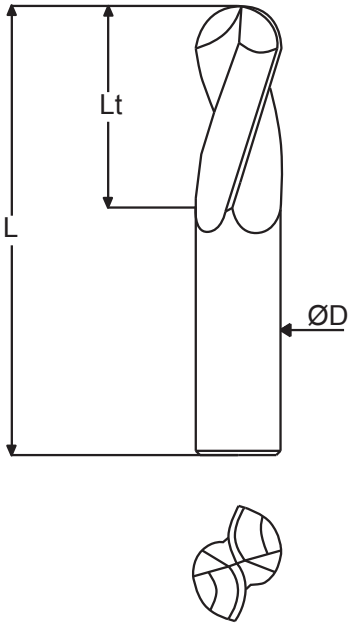


ØD	Ød	L	Lt	R
6	3	110	15	1,5
8	4	110	18	2
10	6	110	18	3
12	8	130	20	4
14	10	130	25	5
16	12	150	25	6
18	14	165	30	7
20	16	165	30	8

30° hemispherical end mills

Helix 30°
Right-hand cutting 2 cutting edges

Coating on request

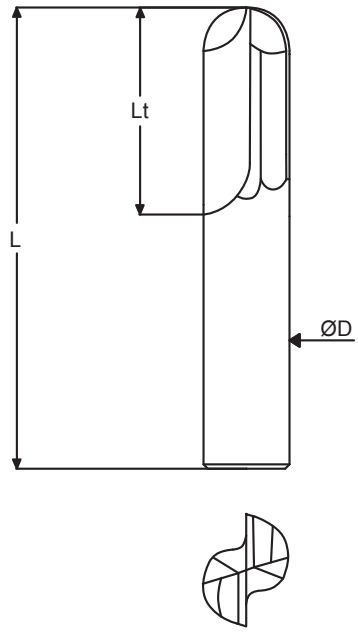


ØD	L	Lt	R	Z
6	110	15	3	2
8	110	18	4	2
10	110	18	5	2
12	130	20	6	2
14	130	25	7	2
16	150	25	8	2
18	165	30	9	2
20	165	30	10	2

0° hemispherical end mills

Helix 0°
Right-hand cutting 2 teeth
Centered cutting edge-to-edge

Coating on request



ØD	L	Lt	R	Z
6	110	15	3	2
8	110	18	4	2
10	110	18	5	2
12	130	20	6	2
14	130	25	7	2
16	150	25	8	2
18	165	30	9	2
20	165	30	10	2

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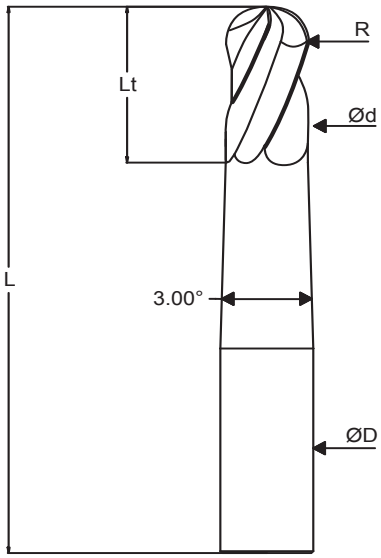
Hemispherical mills with reinforced shank

Helix 30°
Reinforced shank 1.5° gradient
Right-hand cutting
4 teeth
2 cutting edges centered edge-to-edge

Coating on request

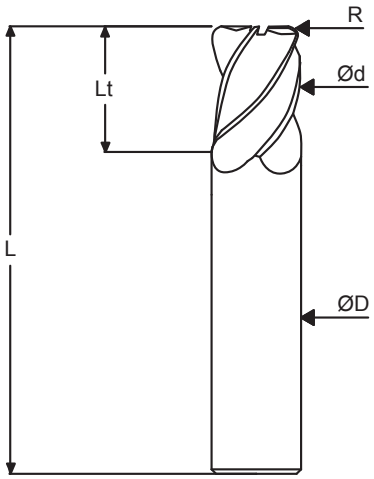


ØD	Ød	L	Lt	R
6	3	110	15	1,5
8	4	110	18	2
10	6	110	18	3
12	8	130	20	4
14	10	130	25	5
16	12	150	25	6
18	14	165	30	7
20	16	165	30	8

Mills for die machining

Helix 30°
4 cutting edges with 2 centered

Coating on request



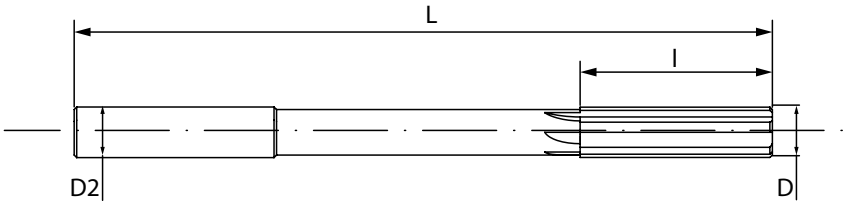
ØD	Ød	L	Lt	R	Z
6	3	65	8	0,5	2
6	4	65	8	0,5	2
6	6	80	10	1,0	2
8	8	80	12	1,0	4
10	10	100	18	1,0	4
12	12	110	25	1,5	4
16	16	110	32	2,0	4
20	20	110	35	2,5	4

Solid reamers

Pages >

Straight reamers

Cylindrical shank h6
Carbide body
With lubrication

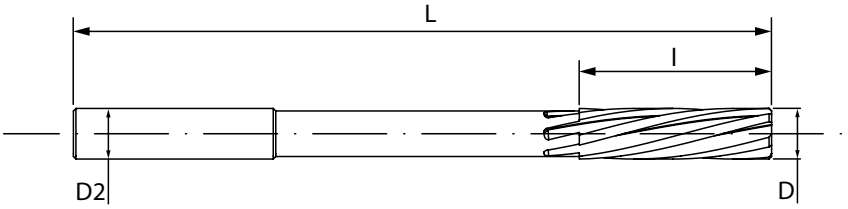


References	ØD	ØD2	L	Z	l
CWM-ALD*	4,000 à 6,000	6	80	4	20
CWM-ALD*	6,001 à 8,000	8	110	6	30
CWM-ALD*	8,001 à 10,000	10	130	6	35
CWM-ALD*	10,001 à 12,000	12	150	6	40
CWM-ALD*	12,001 à 14,000	14	160	6	45
CWM-ALD*	14,001 à 16,000	16	170	6	50
CWM-ALD*	16,001 à 18,000	18	180	6	55
CWM-ALD*	18,001 à 20,100	20	190	6	60

** Indicates the diameter requested*

Helical reamers

Cylindrical shank h6 l
Carbide body
With lubrication



References	ØD	ØD2	L	Z	l
CWM-ALH*	4,000 à 6,000	6	80	4	20
CWM-ALH*	6,001 à 8,000	8	110	6	30
CWM-ALH*	8,001 à 10,000	10	130	6	35
CWM-ALH*	10,001 à 12,000	12	150	6	40
CWM-ALH*	12,001 à 14,000	14	160	6	45
CWM-ALH*	14,001 à 16,000	16	170	6	50
CWM-ALH*	16,001 à 18,000	18	180	6	55
CWM-ALH*	18,001 à 20,100	20	190	6	60

** Indicates the requested diameter and the helix direction*

Conditions of use

Formulas

SC= π D x N/1000
N= 1000 x Sc/ π D
Sf= Fz x Z x N

Abbreviations used

D : Tool diameter
N : Number of turns/minute
Z : Number of teeth
Sc : Speed of cutting
Sf : Forward speed

Milling tools

Materials			Fz (teeth feed in mm)					Sc m/ min
Reference	Example	Hardness	Ø4	Ø5 à Ø6	Ø8 à Ø10	Ø12 à Ø16	Ø18 à Ø20	
Non-alloy steel	XC18 - XC42	400-800N/mm2	0,020	0,030	0,050	0,075	0,100	100
Alloy steel	35CD4	800-1000N/mm2	0,020	0,035	0,045	0,700	0,090	120
Tool steel	40CMD8	1700N/mm2	0,010	0,020	0,040	0,060	0,070	75
Stainless steel	Z12CD18	450-800N/mm2	0,015	0,030	0,040	0,070	0,080	100
Flake graphite cast iron	FT18/MP35 GS4N00	220HB	0,020	0,035	0,045	0,060	0,100	150
Lightened alloys	AS5U3 AU4G	40DaN/mm2	0,025	0,045	0,060	0,150	0,250	200
Lightened alloys Aluminum <10% silicon	A-S2G	22DaN/mm2	0,030	0,045	0,080	0,120	0,160	285
Aluminum >10% silicon	A-S13G	26DaN/mm2	0,015	0,035	0,050	0,085	0,120	250
Copper - Brass	Cu							
Bronze	CuZa35Pb	<200HB	0,015	0,025	0,050	0,070	0,080	250

Drilling tools

Materials			Fz (teeth feed in mm)					Sc m/ min
Reference	Example	Hardness	Ø4	Ø5 à Ø6	Ø8 à Ø10	Ø12 à Ø16	Ø18 à Ø20	
Non-alloy steel	XC18 - XC42	400-800N/mm2	0,030	0,040	0,050	0,070	0,100	90-110
Alloy steel	35CD4	800-1000N/mm2	0,025	0,030	0,040	0,055	0,075	50-70
Tool steel	40CMD8	1700N/mm2	0,020	0,025	0,045	0,050	0,065	15-30
Stainless steel	Z12CD18	450-800N/mm2	0,028	0,050	0,065	0,075	0,100	50-70
Flake graphite cast iron	FT18/MP35 GS400	220HB	0,060	0,090	0,150	0,200	0,250	60-80
Lightened alloys	AS5U3 AU4G	40DaN/mm2	0,090	0,140	0,210	0,280	0,300	150-220
Lightened alloys Aluminum <10% silicon	A-S2G	22DaN/mm2	0,060	0,090	0,140	0,200	0,280	140-170
Aluminum >10% silicon	A-S13G	26DaN/mm2	0,080	0,110	0,130	0,200	0,250	110-150
Copper - Brass	Cu							
Bronze	CuZa35Pb	<200HB	0,090	0,150	0,210	0,350	0,400	85-120

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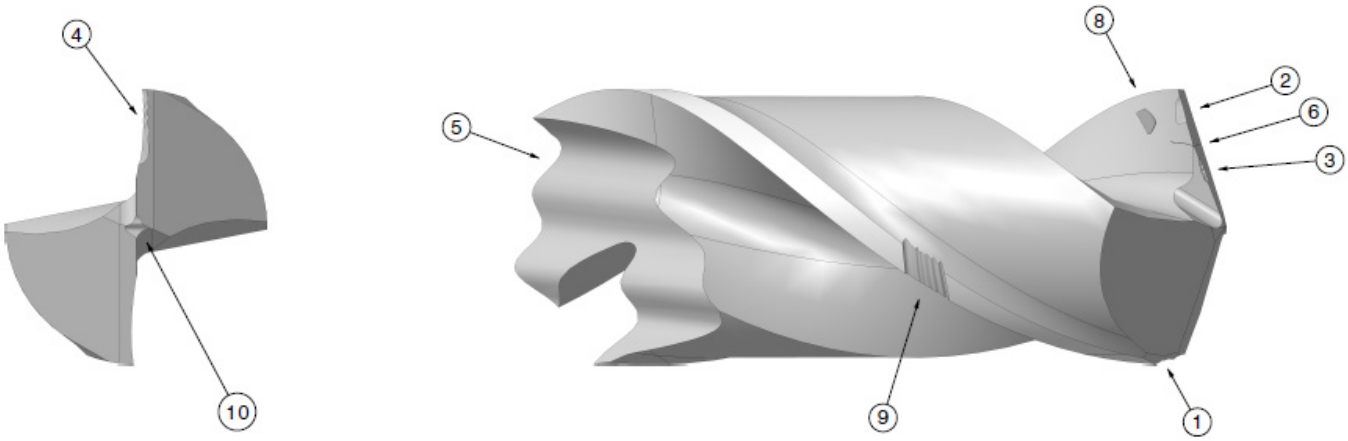

1. Splintering on external nose
2. Cratering
3. Lip splintering
4. Excessive flank wear
5. Tools breakage
6. Wear of cutting edge
7. Splintering on center
8. Stick of material
9. Wear of guide lands
10. Non-compliant chip
11. Hole beyond tolerance
12. Rough surface

Problems encountered	Causes and Remedies
1 - 3 - 5 - 7 - 9 - 11 - 12	Lack of rigidity of the machine during assembly
4 - 10	Increase feed rate
1 - 2 - 3 - 5 - 6 - 8 - 10 - 11 - 12	Reduce feed rate
1 - 3 - 5 - 7 - 9 - 10 - 12	Fix the piece to avoid deformation during drilling
1 - 3 - 5 - 7 - 9 - 11 - 12	Reduce drilling lenght
1 - 3 - 4 - 5 - 7 - 9 - 11	Out-of-round ≥ à 0,03
1 - 3 - 4 - 5 - 7 - 9 - 11	The space between the drilling holder and the drilling must be ≤ 0,02
1 - 3 - 5 - 6 - 7 - 8 - 10	Check coulant supply
1 - 3 - 5 - 7 - 9 - 11 - 12	Reduce entering feed
1 - 3 - 4 - 5 - 6 - 7 - 9 - 10 - 11 - 12	Reduce cutting spees

ISO 9001

Innovative Solutions

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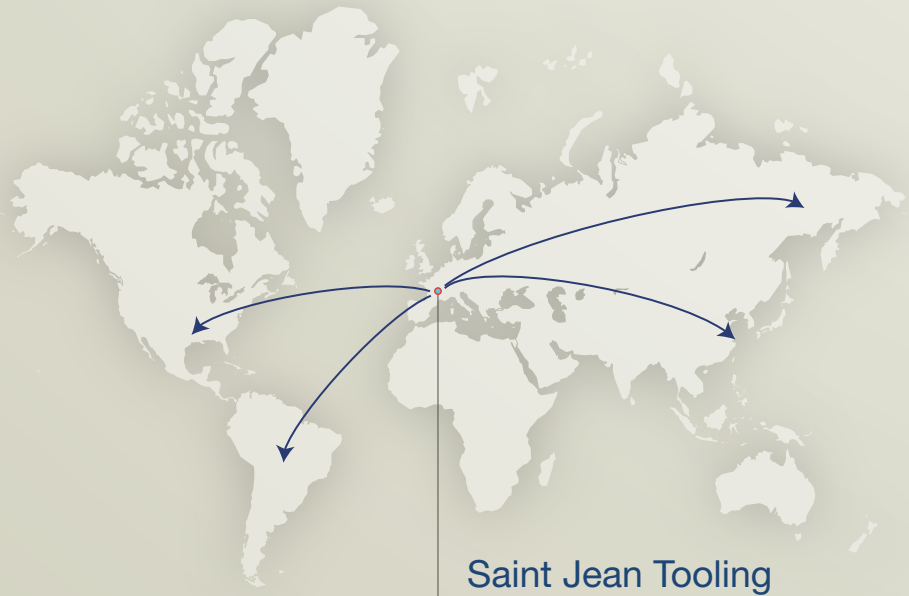

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