

**LIEFERPROGRAMM**  
**DELIVERY PROGRAM**  
*PROGRAMME DE VENTE*

## Hartmetallsorten - Zusammensetzung und Eigenschaften

Carbide grades - Composition and Properties

Nuances de Carbure - Composition et Propriétés

	Feinstkorn submicron grain micrograin			Feinkorn fine grain grain fin	
	EMT100	EMT210	EMT212	EMT409	EMT412
<b>WC</b>	93 %	89 %	87 %	90 %	87 %
<b>Co</b>	6 %	10 %	12 %	9 %	12 %
<b>Ni</b>	—	—	—	—	—
<b>Zusatzkarbide</b> Other carbides <i>Autres carbures</i>	1 %	1 %	1 %	1 %	1 %
<b>Korngrösse</b> Average grain size <i>Dimension des grains</i> $\mu\text{m}$	~0.8	~0.8	~0.8	~1.2	~1.2
<b>Dichte ISO 3369</b> Density <i>Densité</i> $\text{g/cm}^3$	14.80 $\pm$ 0.1	14.45 $\pm$ 0.1	14.20 $\pm$ 0.1	14.50 $\pm$ 0.1	14.25 $\pm$ 0.1
<b>Härte ISO3878</b> Hardness <i>Dureté</i> <b>HV 30</b>	1'800 $\pm$ 60	1'600 $\pm$ 60	1'550 $\pm$ 60	1'550 $\pm$ 60	1'440 $\pm$ 60
<b>Biegefestigkeit</b> Transverse rupture strength <i>Résistance à la flexion</i> <b>N/mm<sup>2</sup></b>	> 3'800	> 4'300	> 4'300	> 3'500	> 4'000
<b>Bruchzähigkeit K<sub>IC</sub></b> Fracture toughness <i>Résistance à la rupture</i> <b>MPa*m<sup>1/2</sup></b>	9.4	10.0	11.5	10.5	12.3

	Ultrafeinkorn ultrafine grain grain ultrafin		Mittelkorn medium grain grain moyen		Feinstkorn submicron grain micrograin
	EMT609	EMT612	EMT812	EMT815	EMT909
<b>WC</b>	89.5 %	86.5 %	86.8 %	85 %	90.5 %
<b>Co</b>	9 %	12 %	12 %	15 %	—
<b>Ni</b>	—	—	—	—	8.5 %
<b>Zusatzkarbide</b> Other carbides <i>Autres carbures</i>	1.5 %	1.5 %	1.2 %	0 %	1 %
<b>Korngrösse</b> Average grain size <i>Dimension des grains</i> $\mu\text{m}$	~0.5	~0.5	~2.5	~2.5	< 1.0
<b>Dichte ISO 3369</b> Density <i>Densité</i> $\text{g/cm}^3$	14.40 $\pm$ 0.1	14.10 $\pm$ 0.1	14.15 $\pm$ 0.1	14.10 $\pm$ 0.1	14.50 $\pm$ 0.1
<b>Härte ISO3878</b> Hardness <i>Dureté</i> <b>HV 30</b>	1'930 $\pm$ 60	1'720 $\pm$ 60	1'320 $\pm$ 60	1'120 $\pm$ 60	1'600 $\pm$ 60
<b>Biegefestigkeit</b> Transverse rupture strength <i>Résistance à la flexion</i> <b>N/mm<sup>2</sup></b>	> 4'000	> 4'200	> 3'200	> 3'200	> 3'600
<b>Bruchzähigkeit K<sub>IC</sub></b> Fracture toughness <i>Résistance à la rupture</i> <b>MPa*m<sup>1/2</sup></b>	7.7	7.8	12.5	14.0	9.5

K<sub>IC</sub>\* nach Palmquist

Die Daten in dieser Tabelle sind typische Materialkennwerte. Änderungen der Daten im Rahmen des technischen Fortschritts oder durch betrieblich bedingte Weiterentwicklung behalten wir uns vor. \*K<sub>IC</sub>: Die gemessenen kritischen Spannungsintensitätsfaktoren (K<sub>IC</sub>) sind in hohem Masse von der Probengeometrie und Probenpräparation abhängig. Ein direkter Vergleich mit Werten, die mit einer anderen Verfahrensweise ermittelt wurden, ist daher nicht zulässig.

The data in this table are typical material parameters. We reserve the right to modify the data due to technical progress or due to further development within our company. \*K<sub>IC</sub>: The measured critical tension intensity factors (K<sub>IC</sub>) depend to a high degree on the sample geometry and sample preparation. A direct comparison with parameters which have been determined by means of a different method is therefore not admissible.

Les données figurant dans ce tableau représentent les paramètres spécifiques matière. Nous nous réservons le droit de modifier ces données en fonction des progrès technologiques ou de nos futurs développements. \*K<sub>IC</sub>: Les facteurs critiques d'intensité de contraintes (K<sub>IC</sub>) dépendent fortement de la géométrie et de la préparation de l'échantillon. Une comparaison directe avec des valeurs obtenues par une autre méthode n'est donc pas possible.

## Standardprogramm

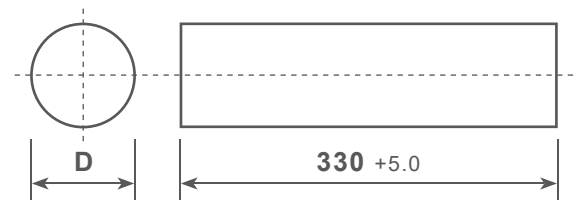
Product portfolio

Article standard

- 4 **Rundstäbe | voll | sinterroh**  
Round bars | solid | sintered  
*Barreaux ronds | pleins | bruts*
- 6 **Rundstäbe | voll | geschliffen**  
Round bars | solid | ground  
*Barreaux ronds | pleins | rectifiés*
- 7 **Rundstäbe | voll | geschliffen und gefast**  
Round bars | solid | ground and chamfered  
*Barreaux ronds | pleins | rectifiés et chanfreinés*
- 8 **Rundstäbe | 1 Kühlkanal zentral | sinterroh**  
Round bars | 1 coolant hole central | sintered  
*Barreaux ronds | 1 trou central | bruts*
- 9 **Rundstäbe | 2 Kühlkanäle parallel | sinterroh**  
Round bars | 2 coolant holes linear | sintered  
*Barreaux ronds | 2 trous parallèles | bruts*
- 11 **Rundstäbe für die Luftfahrtindustrie | 2 Kühlkanäle gedraht | sinterroh**  
Round bars for the aerospace industry | 2 coolant holes twisted | sintered  
*Barreaux ronds pour l'industrie aéronautique | 2 trous hélicoïdaux | bruts*
- 11 **Rundstäbe | 2 Kühlkanäle 30° - 40° gedraht | sinterroh**  
Round bars | 2 coolant holes 30° - 40° twisted | sintered  
*Barreaux ronds | 2 trous hélicoïdaux 30° - 40° | bruts*
- 12 **Rundstäbe | 2 Kühlkanäle 15° gedraht | sinterroh**  
Round bars | 2 coolant holes 15° twisted | sintered  
*Barreaux ronds | 2 trous hélicoïdaux 15° | bruts*
- 13 **Rundstäbe | 2 Kühlkanäle gedraht | geschliffen und gefast**  
Round bars | 2 coolant holes twisted | ground and chamfered  
*Barreaux ronds | 2 trous hélicoïdaux | rectifiés et chanfreinés*
- 14 **Rundstäbe | 3 Kühlkanäle gedraht | sinterroh**  
Round bars | 3 coolant holes twisted | sintered  
*Barreaux ronds | 3 trous hélicoïdaux | bruts*
- 15 **Quadrat - und Rechteckstäbe | sinterroh**  
Square and Rectangular bars | sintered  
*Barreaux carrés et méplats | bruts*



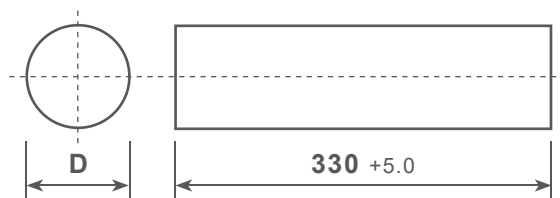
Rundstäbe | voll | sinterroh  
 Round bars | solid | sintered  
 Barreaux ronds | pleins | bruts



Abmessungen in mm | Dimensions in mm | Dimensions en mm

D	Tol.	EMT							Artikel Nr.
		100	210	212	409	412	609	612	Item No   Nr. Réf.
1.25	-0.05 / +0.15	●	●				○	●	010020xxx
1.60	-0.05 / +0.15	○	●						010035xxx
1.80	-0.05 / +0.15	●	●					●	010040xxx
2.25	-0.05 / +0.15	●	●					●	010050xxx
2.75	-0.05 / +0.15	●	●						010060xxx
3.25	-0.05 / +0.15	●	●		●	●	●	●	010080xxx
3.45	-0.05 / +0.15	●	●		●	●	●	●	010085xxx
3.75	-0.05 / +0.15	●	●						010090xxx
4.25	-0.05 / +0.15	●	●		●	●	●	●	010100xxx
4.75	-0.05 / +0.15	●	●						010110xxx
5.25	-0.05 / +0.15	●	●		○	●	●	●	010125xxx
5.80	-0.05 / +0.15	●	●						010140xxx
6.30	-0.05 / +0.20	●	●	●	●	●	●	●	010150xxx
6.70	-0.05 / +0.20	●	●		○	●	●	●	010160xxx
7.30	-0.05 / +0.20	●	●						010180xxx
8.30	-0.05 / +0.20	●	●	●	●	●	●	●	010200xxx
8.80	-0.05 / +0.20	●	●						010210xxx
9.30	-0.05 / +0.20	●	●						010230xxx
9.80	-0.05 / +0.20	●	●		○	●	○	●	010240xxx
10.30	-0.05 / +0.20	●	●	●	●	●	●	●	010250xxx
10.80	-0.05 / +0.25	●	●						010260xxx
11.35	-0.05 / +0.25	●	●						010280xxx
12.30	-0.05 / +0.25	●	●	●	●	●	●	●	010300xxx
13.00	-0.05 / +0.25	●	●		○	●	●	●	010315xxx
13.30	-0.05 / +0.25	●	●						010320xxx
14.30	-0.05 / +0.25	●	●		○	●	●	●	010350xxx
14.80	-0.05 / +0.25	●	●						010360xxx
15.30	-0.05 / +0.30	●	●						010380xxx
16.30	-0.05 / +0.30	●	●	●	○	●	●	●	010400xxx
16.80	-0.05 / +0.30	○	○						010410xxx
17.30	-0.05 / +0.30	○	○						010430xxx
18.30	-0.05 / +0.30	●	●		○	●	●	●	010450xxx
19.30	-0.05 / +0.30	○	●			○		○	010480xxx
20.30	-0.05 / +0.30	●	●	●	○	●	●	●	010500xxx
21.30	-0.05 / +0.40	○	●						010520xxx
22.30	-0.05 / +0.40	○	●						010550xxx
23.30	-0.05 / +0.40	●	●						010570xxx
24.30	-0.05 / +0.40	○	●						010600xxx
25.30	-0.05 / +0.40	●	●		○	○	●	●	010630xxx
25.80	-0.05 / +0.40	○	●						010640xxx

Rundstäbe | voll | sinterroh  
 Round bars | solid | sintered  
 Barreaux ronds | pleins | bruts



Abmessungen in mm | Dimensions in mm | Dimensions en mm

D	Tol.	EMT							Artikel Nr.
		100	210	212	409	412	609	612	Item No   Nr. Réf.
26.30	-0.05 / +0.40	●	●						010650xxx
28.30	-0.05 / +0.50	●	●						010680xxx
30.30	-0.05 / +0.50	●	●						010700xxx
32.60	-0.10 / +0.60	●	●				○	●	0109326xxx
34.60	-0.10 / +0.60	○	○						0109346xxx
36.60	-0.10 / +0.60	○	○						0109366xxx
38.60	-0.10 / +0.60	○	○						0109386xxx
40.60	-0.10 / +0.60	○	●						0109406xxx
50.60	-0.10 / +0.60	○	○						0109506xxx
60.60	-0.10 / +0.60	○	○						0109606xxx

Ihre Sortenauswahl - unsere Artikelreferenz

Ersetzen Sie die Ziffern « xxx » am Ende der Artikelnummer mit der gewünschten HM-Sorte  
 z.B. 010100**100**, 010100**210** oder 010100**409** ...

Your selected grade - our item number

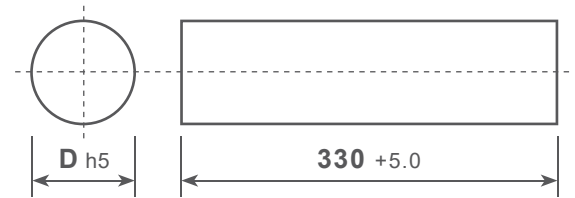
Please replace the « xxx » at the end of the item no. with the grade of your choice  
 e.g. 010100**100**, 010100**210** or 010100**409** ...

Votre choix- notre nr. référence

Veillez remplacer les codes « xxx » à la fin de la référence avec la nuance de votre choix  
 par ex. 010100**100**, 010100**210** ou 010100**409** ...

- Standard | standard | standard
- auf Kundenwunsch | upon customer request | sur demande du client
- andere Abmessungen auf Anfrage | other dimensions on demand | autres dimensions sur demande

Rundstäbe | voll | geschliffen  
 Round bars | solid | ground  
 Barreaux ronds | pleins | rectifiés

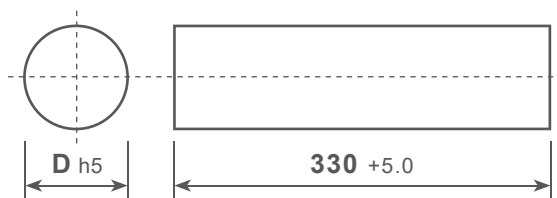


Abmessungen in mm | Dimensions in mm | Dimensions en mm

D	EMT							Artikel Nr.
	100	210	212	409	412	609	612	Item No   Nr. Réf.
1.00	●	●						2100100xxx
1.50	●	●						2100150xxx
2.00	●	●					●	2100200xxx
2.50	●	●						2100250xxx
3.00	●	●		○	○	●	●	2100300Axxx
3.50	●	●						2100350Axxx
4.00	●	●		●	○	●	●	2100400Axxx
4.50	○	○						2100450Axxx
5.00	●	●		●	○	●	●	2100500Axxx
5.50	○	○						2100550Axxx
6.00	●	●	●	●	●	●	●	2100600Axxx
6.50	○	○						2100650Axxx
7.00	●	●						2100700Axxx
8.00	●	●	●	●	●	●	●	2100800Axxx
8.50	○	○						2100850Axxx
9.00	●	●						2100900Axxx
10.00	●	●	●	●	●	●	●	2101000Axxx
11.00	○	○						2101100Axxx
12.00	●	●	●	●	●	●	●	2101200Axxx
13.00	○	●						2101300Axxx
14.00	●	●		●	●	●	●	2101400Axxx
15.00	○	●						2101500Axxx
16.00	●	●	●	●	●	●	●	2101600Axxx
18.00	●	●						2101800Axxx
20.00	●	●	●	●	●	●	●	2102000Axxx
22.00	●	●						2102200Axxx
24.00	○	●						2102400Axxx
25.00	●	●		○	○	●	●	2102500Axxx
28.00	●	●						2102800Axxx
30.00	●	●						2103000Axxx
32.00	○	○						2103200Axxx
40.00		○						2104000Axxx

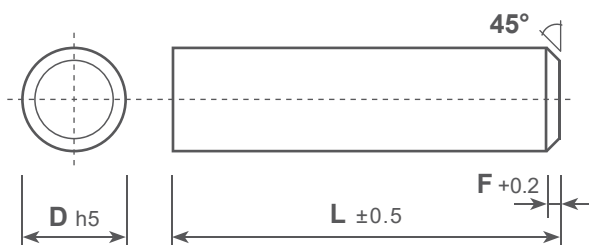
D		EMT						Artikel Nr.
inch	mm	100	210	409	412	609	612	Item No   Nr. Ref.
1/8	3.175	●	●			●	●	21703175Axxx
3/16	4.763		●			●	●	21704763Axxx
1/4	6.350	●	●		●	●	●	21706350Axxx
5/16	7.938		●		○	●	●	21707938Axxx
3/8	9.525	○	●		●	●	●	21709525Axxx
7/16	11.113		●		●	●	●	21711113Axxx

**Rundstäbe | voll | geschliffen**  
 Round bars | solid | ground  
 Barreaux ronds | pleins | rectifiés



D		EMT						Artikel Nr.
inch	mm	100	210	409	412	609	612	Item No   Nr. Ref.
1/2	12.700	○	●		●	●	●	21712700Axxx
9/16	14.288		●		●	●	●	21714288Axxx
5/8	15.875		●		●	○	○	21715875Axxx
11/16	17.463		●		●	○	○	21717463Axxx
3/4	19.050		●		●	○	○	21719050Axxx
7/8	22.225		●		●	○	○	21722225Axxx
1	25.400		●		●	○	○	21725400Axxx

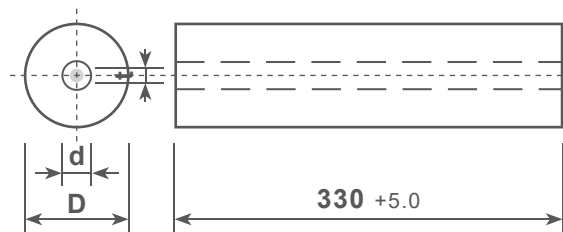
**Rundstäbe | voll | geschliffen und gefast**  
 Round bars | solid | ground and chamfered  
 Barreaux ronds | pleins | rectifiés et chanfreinés



Abmessungen in mm | Dimensions in mm | Dimensions en mm

D		L		EMT		Artikel Nr.
D	L	F	210	612	Item No   Nr. Réf.	
3.00	39	0.20	●	●	2160300039xxx	
3.00	58	0.20	●	●	2160300058xxx	
4.00	51	0.30	●	●	2160400051xxx	
4.00	55	0.30	●	○	2160400055xxx	
4.00	58	0.30	●	○	2160400058xxx	
5.00	51	0.30	●	●	2160500051xxx	
5.00	55	0.30	●	○	2160500055xxx	
5.00	58	0.30	●	○	2160500058xxx	
6.00	51	0.40	●	●	2160600051xxx	
6.00	55	0.40	●	●	2160600055xxx	
6.00	58	0.40	●	●	2160600058xxx	
8.00	59	0.40	●	○	2160800059xxx	
8.00	64	0.40	●	●	2160800064xxx	
10.00	67	0.40	●	●	2161000067xxx	
10.00	73	0.40	●	●	2161000073xxx	
12.00	74	0.70	●	●	2161200074xxx	
12.00	84	0.70	●	●	2161200084xxx	
14.00	76	0.70	●	○	2161400076xxx	
14.00	84	0.70	●	●	2161400084xxx	
16.00	83	0.70	●	●	2161600083xxx	
16.00	93	0.70	●	●	2161600093xxx	
18.00	85	0.90	●	○	2161800085xxx	
18.00	93	0.90	●	●	2161800093xxx	
20.00	93	0.90	●	○	2162000093xxx	
20.00	105	0.90	●	●	2162000105xxx	

**Rundstäbe | 1 Kühlkanal zentral | sinterroh**  
 Round bars | 1 coolant hole central | sintered  
 Barreaux ronds | 1 trou central | bruts

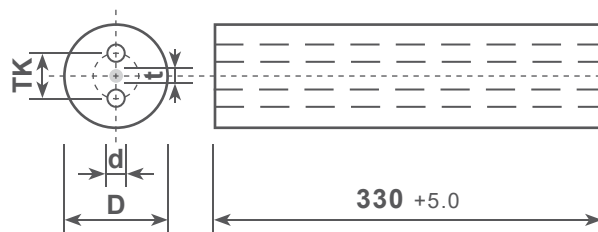


Abmessungen in mm | Dimensions in mm | Dimensions en mm

D	Tol.	d	Tol.	t	EMT			Artikel Nr.
					100	210	412	Item No   Nr. Réf.
4.25	-0.05 / +0.15	0.40	-0.05	0.15	○			03010004xxx
4.25	-0.05 / +0.15	0.60	-0.05	0.15	●	●		03010006xxx
4.25	-0.05 / +0.15	1.00	-0.10	0.15	●	○		030100010xxx
5.25	-0.05 / +0.15	0.50	-0.05	0.15			●	030125005xxx
5.25	-0.05 / +0.15	1.00	-0.10	0.15	●			030125010xxx
5.25	-0.05 / +0.15	2.00	-0.10	0.15		○		030125020xxx
6.30	-0.05 / +0.20	0.50	-0.05	0.15			●	030150005xxx
6.30	-0.05 / +0.20	0.60	-0.05	0.15		●		030150006xxx
6.30	-0.05 / +0.20	1.00	-0.10	0.15	●	●	●	030150010xxx
6.30	-0.05 / +0.20	1.50	-0.10	0.15	●	●		030150015xxx
6.30	-0.05 / +0.20	2.00	-0.10	0.15		●		030150020xxx
8.30	-0.05 / +0.20	0.50	-0.05	0.15			●	030200005xxx
8.30	-0.05 / +0.20	0.80	-0.05	0.15		●		030200008xxx
8.30	-0.05 / +0.20	1.00	-0.10	0.15	○			030200010xxx
8.30	-0.05 / +0.20	1.30	-0.10	0.15	○	○	●	030200013xxx
8.30	-0.05 / +0.20	1.50	-0.10	0.15	●	●		030200015xxx
8.30	-0.05 / +0.20	2.00	-0.10	0.15	●			030200020xxx
10.30	-0.05 / +0.20	0.50	-0.05	0.20			●	030250005xxx
10.30	-0.05 / +0.20	1.00	-0.10	0.20	●	●	○	030250010xxx
10.30	-0.05 / +0.20	1.50	-0.10	0.20	●	●	●	030250015xxx
10.30	-0.05 / +0.20	2.00	-0.10	0.20	●	●		030250020xxx
10.80	-0.05 / +0.25	1.50	-0.10	0.20	○			030260015xxx
12.30	-0.05 / +0.25	1.50	-0.10	0.20	●	●		030300015xxx
12.30	-0.05 / +0.25	2.00	-0.10	0.20	●	●	●	030300020xxx
12.30	-0.05 / +0.25	2.50	-0.10	0.20	●	○		030300025xxx
12.30	-0.05 / +0.25	3.00	-0.10	0.20	○			030300030xxx
13.30	-0.05 / +0.25	2.50	-0.10	0.25	●			030320025xxx
14.30	-0.05 / +0.25	2.00	-0.10	0.25	●	●	●	030350020xxx
14.30	-0.05 / +0.25	2.50	-0.10	0.25	●	●		030350025xxx
16.30	-0.05 / +0.30	2.00	-0.10	0.25	○	●		030400020xxx
16.30	-0.05 / +0.30	2.50	-0.10	0.25			●	030400025xxx
16.30	-0.05 / +0.30	3.00	-0.10	0.25	●	●		030400030xxx
18.30	-0.05 / +0.30	2.00	-0.10	0.30		●		030450020xxx
18.30	-0.05 / +0.30	3.00	-0.10	0.30	●			030450030xxx
20.30	-0.05 / +0.30	2.00	-0.10	0.30	●	●	●	030500020xxx
20.30	-0.05 / +0.30	3.50	-0.15	0.30	●	●		030500035xxx
22.30	-0.05 / +0.40	3.50	-0.15	0.30	●	●		030550035xxx
25.30	-0.05 / +0.40	3.00	-0.10	0.30		○	●	030630030xxx
25.30	-0.05 / +0.40	5.00	-0.15	0.30	●	●		030630050xxx
30.30	-0.05 / +0.50	3.00	-0.10	0.30			●	030700030xxx
30.30	-0.05 / +0.50	5.00	-0.15	0.30	○	○		030700050xxx
32.60	-0.10 / +0.60	5.00	-0.15	0.30		●		0309326050xxx



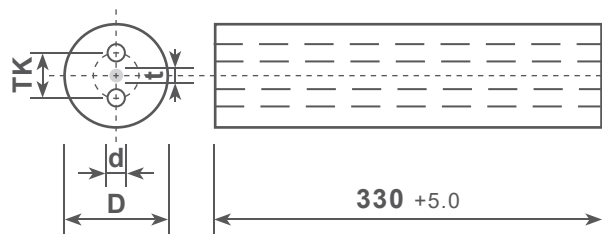
**Rundstäbe | 2 Kühlkanäle parallel | sinterroh**  
 Round bars | 2 coolant holes linear | sintered  
 Barreaux ronds | 2 trous parallèles | bruts



Abmessungen in mm | Dimensions in mm | Dimensions en mm

D	Tol.	TK	Tol.	t	d	Tol.	EMT 100	Artikel Nr. Item No   Nr. Réf.
5.25	-0.05 / +0.15	2.00	-0.15	0.13	0.90	-0.05	●	02012502009100
6.30	-0.05 / +0.20	1.10	-0.20	0.15	0.50	-0.05	●	02015001105100
6.30	-0.05 / +0.20	1.70	-0.20	0.15	0.80	-0.05	●	02015001708100
6.30	-0.05 / +0.20	2.00	-0.20	0.15	0.90	-0.05	●	02015002009100
6.30	-0.05 / +0.20	2.30	-0.20	0.15	0.90	-0.05	●	02015002309100
6.30	-0.05 / +0.20	3.00	-0.20	0.15	0.90	-0.05	●	02015003009100
6.30	-0.05 / +0.20	3.00	-0.20	0.15	1.20	-0.10	●	02015003012100
7.30	-0.05 / +0.20	2.00	-0.20	0.15	0.90	-0.05	●	02018002009100
8.30	-0.05 / +0.20	1.70	-0.30	0.15	0.80	-0.05	●	02020001708100
8.30	-0.05 / +0.20	2.00	-0.30	0.15	0.90	-0.05	●	02020002009100
8.30	-0.05 / +0.20	2.60	-0.30	0.15	1.20	-0.10	●	02020002612100
8.30	-0.05 / +0.20	3.00	-0.30	0.15	1.20	-0.10	●	02020003012100
8.30	-0.05 / +0.20	3.30	-0.30	0.15	0.90	-0.05	●	02020003309100
8.30	-0.05 / +0.20	3.50	-0.30	0.15	1.50	-0.10	●	02020003515100
8.30	-0.05 / +0.20	4.00	-0.30	0.15	0.90	-0.05	●	02020004009100
8.30	-0.05 / +0.20	4.00	-0.30	0.15	1.20	-0.10	●	02020004012100
10.30	-0.05 / +0.20	1.70	-0.30	0.20	0.80	-0.05	●	02025001708100
10.30	-0.05 / +0.20	2.60	-0.30	0.20	1.20	-0.10	●	02025002612100
10.30	-0.05 / +0.20	3.50	-0.30	0.20	1.50	-0.10	●	02025003515100
10.30	-0.05 / +0.20	4.00	-0.30	0.20	1.50	-0.10	●	02025004015100
10.30	-0.05 / +0.20	5.00	-0.30	0.20	1.20	-0.10	●	02025005012100
10.30	-0.05 / +0.20	5.00	-0.30	0.20	2.00	-0.10	●	02025005020100
11.35	-0.05 / +0.25	3.50	-0.30	0.28	1.50	-0.10	●	02028003515100
12.30	-0.05 / +0.25	3.50	-0.30	0.30	0.90	-0.05	●	02030003509100
12.30	-0.05 / +0.25	3.50	-0.30	0.30	1.50	-0.10	●	02030003515100
12.30	-0.05 / +0.25	4.00	-0.30	0.30	1.50	-0.10	●	02030004015100
12.30	-0.05 / +0.25	5.00	-0.30	0.30	2.00	-0.10	●	02030005020100
12.30	-0.05 / +0.25	6.20	-0.30	0.30	1.50	-0.10	●	02030006215100
12.30	-0.05 / +0.25	6.20	-0.30	0.30	2.00	-0.10	●	02030006220100
14.30	-0.05 / +0.25	2.60	-0.30	0.37	0.90	-0.05	●	02035002609100
14.30	-0.05 / +0.25	3.50	-0.30	0.37	1.50	-0.10	●	02035003515100
14.30	-0.05 / +0.25	5.00	-0.30	0.37	2.00	-0.10	●	02035005020100
14.30	-0.05 / +0.25	7.00	-0.30	0.37	1.50	-0.10	●	02035007015100
14.30	-0.05 / +0.25	7.00	-0.30	0.37	2.00	-0.10	●	02035007020100
16.30	-0.05 / +0.30	3.50	-0.30	0.40	1.50	-0.10	●	02040003515100
16.30	-0.05 / +0.30	5.00	-0.30	0.40	2.00	-0.10	●	02040005020100
16.30	-0.05 / +0.30	6.20	-0.30	0.40	2.00	-0.10	●	02040006220100
16.30	-0.05 / +0.30	8.00	-0.30	0.40	2.00	-0.10	●	02040008020100
18.30	-0.05 / +0.30	5.00	-0.30	0.50	2.00	-0.10	●	02045005020100
18.30	-0.05 / +0.30	6.20	-0.30	0.50	2.00	-0.10	●	02045006220100
18.30	-0.05 / +0.30	7.00	-0.30	0.50	2.50	-0.10	●	02045007025100
18.30	-0.05 / +0.30	9.00	-0.30	0.50	2.00	-0.10	●	02045009020100

**Rundstäbe | 2 Kühlkanäle parallel | sinterroh**  
 Round bars | 2 coolant holes linear | sintered  
 Barreaux ronds | 2 trous parallèles | bruts



Abmessungen in mm | Dimensions in mm | Dimensions en mm

D	Tol.	TK	Tol.	t	d	Tol.	EMT	Artikel Nr.
							100	Item No   Nr. Réf.
20.30	-0.05 / +0.30	3.50	-0.40	0.50	1.50	-0.10	●	02050003515100
20.30	-0.05 / +0.30	6.20	-0.40	0.50	2.00	-0.10	●	02050006220100
20.30	-0.05 / +0.30	7.00	-0.40	0.50	2.50	-0.10	●	02050007025100
20.30	-0.05 / +0.30	10.00	-0.40	0.50	2.50	-0.10	●	02050010025100
21.30	-0.05 / +0.40	6.20	-0.40	0.50	2.00	-0.10	●	02052006220100
21.30	-0.05 / +0.40	10.00	-0.40	0.50	2.50	-0.10	●	02052010025100
22.30	-0.05 / +0.40	7.00	-0.40	0.50	2.00	-0.10	●	02055007020100
22.30	-0.05 / +0.40	7.00	-0.40	0.50	2.50	-0.10	●	02055007025100
22.30	-0.05 / +0.40	11.00	-0.40	0.50	2.50	-0.10	●	02055011025100
23.30	-0.05 / +0.40	7.00	-0.40	0.50	2.50	-0.10	●	02057007025100
23.30	-0.05 / +0.40	11.00	-0.40	0.50	2.50	-0.10	●	02057011025100
24.30	-0.05 / +0.40	6.20	-0.50	0.50	2.00	-0.10	●	02060006220100
24.30	-0.05 / +0.40	7.00	-0.50	0.50	2.50	-0.10	●	02060007025100
24.30	-0.05 / +0.40	12.00	-0.50	0.50	3.00	-0.10	●	02060012030100
25.30	-0.05 / +0.40	8.00	-0.50	0.50	2.50	-0.10	●	02063008025100
25.30	-0.05 / +0.40	12.00	-0.50	0.50	3.00	-0.10	●	02063012030100
26.30	-0.05 / +0.40	12.00	-0.50	0.50	3.00	-0.10	●	02065012030100
28.30	-0.05 / +0.50	10.00	-0.50	0.50	2.00	-0.10	●	02068010020100
28.30	-0.05 / +0.50	13.00	-0.50	0.50	3.00	-0.10	●	02068013030100
30.30	-0.05 / +0.50	13.00	-0.50	0.50	3.00	-0.10	●	02070013030100
32.60	-0.10 / +0.60	13.00	-0.50	0.50	3.00	-0.10	●	020932313030100

**t = Mittenversatz: Das Zentrum vom TK muss im Ø t liegen und mit der Basisachse fluchten.**

t = Concentricity: The centre of TK has to be in Ø t and has to align with the base axle.

t = Concentricité: Le centre de TK doit être dans le Ø t et doit s'aligner avec l'axe de base.

**Ihre Sortenauswahl - unsere Artikelreferenz**

Ersetzen Sie die Ziffern « xxx » am Ende der Artikelnummer mit der gewünschten HM-Sorte

z.B. 010100**100**, 010100**210** oder 010100**409** ...

Your selected grade - our item number

Please replace the « xxx » at the end of the item no. with the grade of your choice

e.g. 010100**100**, 010100**210** or 010100**409** ...

Votre choix- notre nr. référence

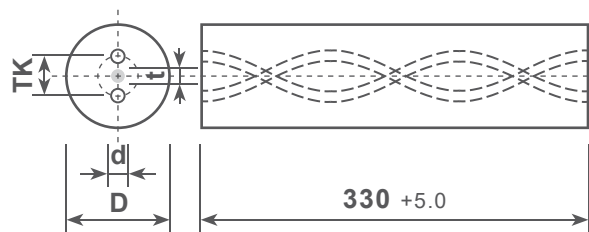
Veillez remplacer les codes « xxx » à la fin de la référence avec la nuance de votre choix  
 par ex. 010100**100**, 010100**210** ou 010100**409** ...

- Standard | standard | standard
- auf Kundenwunsch | upon customer request | sur demande du client
- andere Abmessungen auf Anfrage | other dimensions on demand | autres dimensions sur demande

## Rundstäbe für die Luftfahrtindustrie 2 Kühlkanäle gedreht | sinterroh

Round bars for the aerospace industry  
2 coolant holes twisted | sintered

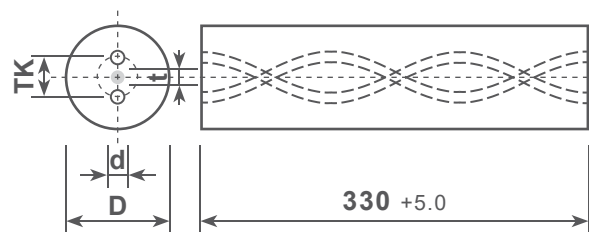
Barreaux ronds pour l'industrie aéronautique  
2 trous hélicoïdaux | bruts



Abmessungen in mm | Dimensions in mm | Dimensions en mm

D	Tol.	TK	Tol.	t	d	Tol.	Steigung Pitch   Pas	EMT 100	Artikel Nr. Item No   Nr. Réf.
10.30	+0.65 / +0.90	2.70	-0.50	0.20	0.80	±0.15	37.44	●	180250037401100
13.30	+0.65 / +0.95	2.80	-0.50	0.20	0.80	±0.15	48.67	●	180320048701100
20.30	+0.65 / +1.00	4.60	-0.60	0.25	1.20	±0.15	74.88	●	180500074902100

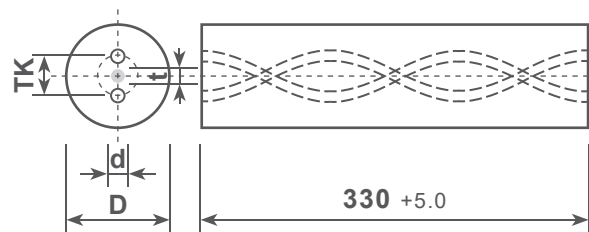
## Rundstäbe | 2 Kühlkanäle 30° - 40° gedreht | sinterroh Round bars | 2 coolant holes 30° - 40° twisted | sintered Barreaux ronds | 2 trous hélicoïdaux 30° - 40° | bruts



Abmessungen in mm | Dimensions in mm | Dimensions en mm

D	Tol.	TK	Tol.	t	d	Tol.	Steigung Pitch   Pas	EMT 210	Artikel Nr. Item No   Nr. Réf.
3.30	+0.45 / +0.65	1.50	-0.30	0.10	0.40	±0.05	16.32	●	160080016301210
4.30	+0.45 / +0.65	2.10	-0.40	0.15	0.50	±0.10	21.77	●	160100021801210
5.30	+0.45 / +0.65	2.60	-0.40	0.15	0.70	±0.10	27.21	●	160125027201210
6.30	+0.45 / +0.70	1.60	-0.30	0.10	0.50	±0.10	18.00	●	180150018001210
6.30	+0.45 / +0.70	1.60	-0.30	0.10	0.50	±0.10	22.46	●	180150022501210
6.30	+0.45 / +0.70	1.90	-0.40	0.15	0.60	±0.10	32.65	●	160150032601210
6.30	+0.45 / +0.70	2.00	-0.40	0.15	0.50	±0.10	22.46	●	180150022502210
6.30	+0.45 / +0.70	2.10	-0.40	0.15	0.60	±0.10	22.46	●	180150022503210
6.30	+0.45 / +0.70	2.20	-0.40	0.15	0.80	±0.10	32.65	●	160150032603210
6.30	+0.45 / +0.70	2.60	-0.40	0.15	0.70	±0.10	32.65	●	160150032602210
6.80	+0.45 / +0.70	2.20	-0.40	0.15	0.50	±0.10	24.34	●	180160024301210
6.80	+0.45 / +0.70	3.50	-0.50	0.20	1.00	±0.10	35.37	●	160160035401210
7.30	+0.45 / +0.70	2.40	-0.40	0.15	0.65	±0.10	26.21	●	180180026201210
8.30	+0.55 / +0.80	2.70	-0.50	0.20	0.65	±0.10	29.95	●	180200030001210
8.30	+0.55 / +0.80	3.50	-0.50	0.20	0.90	±0.10	35.00	●	180200035001210
8.30	+0.55 / +0.80	4.00	-0.50	0.20	1.00	±0.15	43.53	●	160200043501210
9.30	+0.65 / +0.90	3.20	-0.50	0.20	0.75	±0.10	33.70	●	180230033701210
10.30	+0.65 / +0.90	2.70	-0.50	0.20	0.80	±0.15	37.44	●	180250037402210
10.30	+0.65 / +0.90	3.50	-0.50	0.20	0.80	±0.15	37.44	●	180250037401210
10.30	+0.65 / +0.90	4.50	-0.50	0.25	1.10	±0.15	46.00	●	180250046001210
10.30	+0.65 / +0.90	4.80	-0.50	0.25	1.40	±0.15	54.41	●	160250054401210
12.30	+0.65 / +0.95	4.20	-0.60	0.25	0.90	±0.15	44.93	●	180300044901210
12.30	+0.65 / +0.95	5.40	-0.60	0.25	1.50	±0.15	65.30	●	160300065301210
12.30	+0.65 / +0.95	5.70	-0.60	0.25	1.40	±0.15	57.00	●	180300057001210
12.30	+0.65 / +0.95	5.90	-0.60	0.25	1.70	±0.15	65.30	●	160300065302210
13.30	+0.65 / +0.95	4.40	-0.60	0.25	0.90	±0.15	48.67	●	180320048701210
13.30	+0.65 / +0.95	6.50	-0.60	0.30	1.75	±0.15	70.74	●	160320070701210

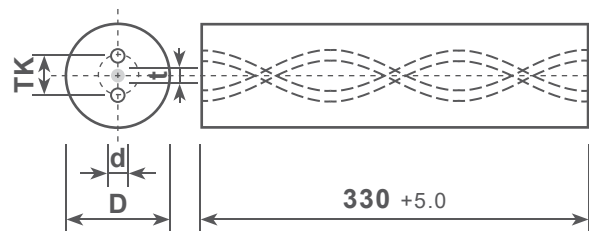
**Rundstäbe | 2 Kühlkanäle 30° - 40° gedraht | sinterroh**  
 Round bars | 2 coolant holes 30° - 40° twisted | sintered  
 Barreaux ronds | 2 trous hélicoïdaux 30° - 40° | bruts



Abmessungen in mm | Dimensions in mm | Dimensions en mm

D	Tol.	TK	Tol.	t	d	Tol.	Steigung Pitch   Pas	EMT 210	Artikel Nr. Item No   Nr. Réf.
14.30	+0.65 / +0.95	4.70	-0.60	0.25	1.00	±0.15	52.42	●	180350052401210
14.30	+0.65 / +0.95	7.10	-0.60	0.30	1.75	±0.15	76.18	●	160350076101210
14.30	+0.65 / +0.95	7.10	-0.60	0.30	2.00	±0.15	76.18	●	160350076102210
15.30	+0.65 / +1.00	5.10	-0.60	0.25	1.10	±0.15	56.16	●	180380056201210
15.30	+0.65 / +1.00	7.70	-0.60	0.35	1.75	±0.15	81.62	●	160380081601210
16.30	+0.65 / +1.00	5.50	-0.60	0.25	1.20	±0.15	59.90	●	180400059901210
16.30	+0.65 / +1.00	8.30	-0.60	0.35	1.75	±0.15	87.06	●	160400087001210
16.30	+0.65 / +1.00	8.60	-0.60	0.35	2.50	±0.15	87.06	●	160400087002210
18.30	+0.65 / +1.00	6.30	-0.60	0.30	1.50	±0.15	67.39	●	180450067401210
18.30	+0.65 / +1.00	9.50	-0.60	0.40	2.00	±0.15	97.95	●	160450097901210
18.30	+0.65 / +1.00	9.70	-0.60	0.40	2.80	±0.15	97.95	●	160450097902210
19.30	+0.65 / +1.00	10.10	-0.60	0.40	2.50	±0.15	103.39	●	160480103401210
20.30	+0.65 / +1.00	7.10	-0.60	0.30	1.50	±0.15	74.88	●	180500074901210
20.30	+0.65 / +1.00	10.40	-0.60	0.40	2.80	±0.15	108.83	●	160500108801210
20.30	+0.65 / +1.00	10.70	-0.60	0.40	3.20	±0.15	108.83	●	160500108802210
22.30	+0.65 / +1.10	9.00	-0.90	0.60	2.20	±0.20	119.70	●	160550119701210
25.30	+0.65 / +1.10	13.00	-1.00	0.60	2.50	±0.25	136.03	●	160630136001210
25.80	+0.65 / +1.10	10.70	-1.00	0.55	1.50	±0.25	138.21	●	160640138201210

**Rundstäbe | 2 Kühlkanäle 15° gedraht | sinterroh**  
 Round bars | 2 coolant holes 15° twisted | sintered  
 Barreaux ronds | 2 trous hélicoïdaux 15° | bruts

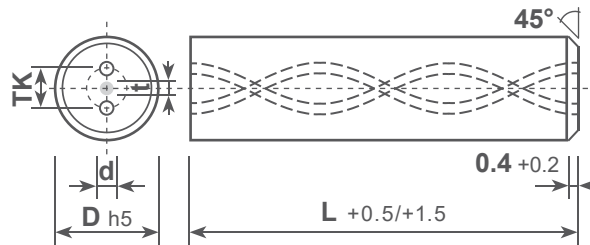


Abmessungen in mm | Dimensions in mm | Dimensions en mm

D	Tol.	TK	Tol.	t	d	Tol.	Steigung Pitch   Pas	EMT 210	Artikel Nr. Item No   Nr. Réf.
6.30	+0.45 / +0.70	2.50	-0.40	0.15	0.70	±0.10	70.35	●	150150070301210
8.30	+0.55 / +0.80	3.50	-0.50	0.20	1.30	±0.15	93.80	●	150200093801210
10.30	+0.65 / +0.90	5.00	-0.70	0.25	1.50	±0.15	117.25	●	150250117201210
12.30	+0.65 / +0.95	6.20	-0.80	0.30	1.60	±0.15	140.70	●	150300140701210
14.30	+0.65 / +0.95	7.00	-0.80	0.40	2.00	±0.20	164.14	●	150350164101210
16.30	+0.65 / +1.00	8.00	-0.90	0.45	2.00	±0.20	187.59	●	150400187501210
18.30	+0.65 / +1.00	9.00	-0.90	0.50	2.20	±0.20	211.04	●	150450211101210
20.30	+0.65 / +1.00	10.00	-1.00	0.55	2.50	±0.20	234.49	●	150500234401210

- Standard
- auf Kundenwunsch
- andere Abmessungen auf Anfrage
- standard
- upon customer request
- other dimensions on demand
- standard
- sur demande du client
- autres dimensions sur demande

**Rundstäbe | 2 Kühlkanäle gedreht | geschliffen und gefast**  
 Round bars | 2 coolant holes twisted | ground and chamfered  
 Barreaux ronds | 2 trous hélicoïdaux | rectifiés et chanfreinés



Abmessungen in mm | Dimensions in mm | Dimensions en mm

D	L	TK	Tol.	t	d	Tol.	Steigung		EMT 210	Artikel Nr.	
							Pitch	Pas		Item No	Nr. Réf.
6.00	63	1.60	-0.3	0.10	0.50	±0.05	18.00		●	386060018006301210	
6.00	67	1.60	-0.3	0.10	0.50	±0.05	18.00		●	386060018006701210	
6.00	73	1.60	-0.3	0.10	0.50	±0.05	18.00		●	386060018007301210	
6.00	93	1.60	-0.3	0.10	0.50	±0.05	18.00		●	386060018009301210	
6.00	67	2.10	-0.4	0.15	0.60	±0.10	22.46		●	386060022506702210	
6.00	75	2.10	-0.4	0.15	0.60	±0.10	22.46		●	386060022507502210	
6.00	82	2.10	-0.4	0.15	0.60	±0.10	22.46		●	386060022508202210	
6.00	103	2.10	-0.4	0.15	0.60	±0.10	22.46		●	386060022510302210	
6.00	67	2.20	-0.4	0.15	0.80	±0.10	32.65		●	366060032606701210	
6.00	82	2.20	-0.4	0.15	0.80	±0.10	32.65		●	366060032608201210	
6.00	96	2.20	-0.4	0.15	0.80	±0.10	32.65		●	366060032609601210	
6.00	117	2.20	-0.4	0.15	0.80	±0.10	32.65		●	366060032611701210	
8.00	80	3.50	-0.5	0.20	0.90	±0.15	35.00		●	386080035008001210	
8.00	92	3.50	-0.5	0.20	0.90	±0.15	35.00		●	386080035009201210	
8.00	115	3.50	-0.5	0.20	0.90	±0.15	35.00		●	386080035011501210	
8.00	80	4.00	-0.5	0.20	1.00	±0.15	43.53		●	366080043508001210	
8.00	92	4.00	-0.5	0.20	1.00	±0.15	43.53		●	366080043509201210	
8.00	115	4.00	-0.5	0.20	1.00	±0.15	43.53		●	366080043511501210	
10.00	90	4.50	-0.5	0.20	1.10	±0.15	46.00		●	386100046009001210	
10.00	104	4.50	-0.5	0.20	1.10	±0.15	46.00		●	386100046010401210	
10.00	90	4.80	-0.5	0.20	1.40	±0.15	54.41		●	366100054409001210	
10.00	104	4.80	-0.5	0.20	1.40	±0.15	54.41		●	366100054410401210	

**t = Mittenversatz: Das Zentrum vom TK muss im Ø t liegen und mit der Basisachse fluchten.**

t = Concentricity: The centre of TK has to be in Ø t and has to align with the base axle.

t = Concentricité: Le centre de TK doit être dans le Ø t et doit s'aligner avec l'axe de base.

#### Ihre Sortenauswahl - unsere Artikelreferenz

Ersetzen Sie die Ziffern « xxx » am Ende der Artikelnummer mit der gewünschten HM-Sorte  
 z.B. 010100**100**, 010100**210** oder 010100**409** ...

Your selected grade - our item number

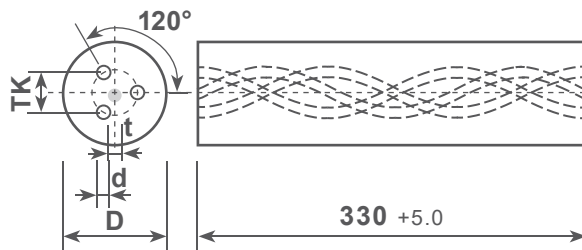
Please replace the « xxx » at the end of the item no. with the grade of your choice

e.g. 010100**100**, 010100**210** or 010100**409** ...

Votre choix- notre nr. référence

Veillez remplacer les codes « xxx » à la fin de la référence avec la nuance de votre choix  
 par ex. 010100**100**, 010100**210** ou 010100**409** ...

**Rundstäbe | 3 Kühlkanäle gedraht | sinterroh**  
 Round bars | 3 coolant holes twisted | sintered  
 Barreaux ronds | 3 trous hélicoïdaux | bruts



Abmessungen in mm | Dimensions in mm | Dimensions en mm

D	Tol.	TK	Tol.	t	d	Tol.	Steigung Pitch   Pas	EMT 210	Artikel Nr. Item No   Nr. Réf.
6.30	+0.45 / +0.70	2.20	-0.40	0.15	0.50	±0.10	22.46	●	190150022501210
6.30	+0.45 / +0.70	2.90	-0.40	0.20	0.50	±0.10	32.65	●	170150032601210
8.30	+0.55 / +0.80	2.70	-0.40	0.15	0.65	±0.10	29.95	●	190200030001210
8.30	+0.55 / +0.80	3.90	-0.50	0.25	0.70	±0.10	43.50	●	170200043501210
10.30	+0.65 / +0.90	3.50	-0.50	0.20	0.80	±0.10	37.44	●	190250037401210
10.30	+0.65 / +0.90	5.10	-0.70	0.30	0.90	±0.10	54.41	●	170250054401210
12.30	+0.65 / +0.95	4.20	-0.60	0.25	0.90	±0.10	44.93	●	190300044901210
12.30	+0.65 / +0.95	6.30	-0.80	0.35	1.10	±0.15	65.30	●	170300065302210
14.30	+0.65 / +0.95	7.30	-0.80	0.40	1.40	±0.15	76.18	●	170350076101210
16.30	+0.65 / +1.00	5.50	-0.70	0.30	1.20	±0.15	59.90	●	190400059901210
16.30	+0.65 / +1.00	8.30	-0.90	0.45	1.60	±0.15	87.06	●	170400087001210
18.30	+0.65 / +1.00	9.50	-0.90	0.50	1.70	±0.15	97.95	●	170450097901210
20.30	+0.65 / +1.00	7.10	-0.80	0.40	1.50	±0.15	74.88	●	190500074901210
20.30	+0.65 / +1.00	10.20	-1.00	0.55	1.90	±0.15	108.83	●	170500108801210
25.30	+0.65 / +1.10	12.50	-1.00	0.60	2.00	±0.20	136.03	●	170630136001210

**t = Mittenversatz: Das Zentrum vom TK muss im Ø t liegen und mit der Basisachse fluchten.**

t = Concentricity: The centre of TK has to be in Ø t and has to align with the base axle.

t = Concentricité: Le centre de TK doit être dans le Ø t et doit s'aligner avec l'axe de base.

**Ihre Sortenauswahl - unsere Artikelreferenz**

Ersetzen Sie die Ziffern « xxx » am Ende der Artikelnummer mit der gewünschten HM-Sorte  
 z.B. 010100**100**, 010100**210** oder 010100**409** ...

Your selected grade - our item number

Please replace the « xxx » at the end of the item no. with the grade of your choice

e.g. 010100**100**, 010100**210** or 010100**409** ...

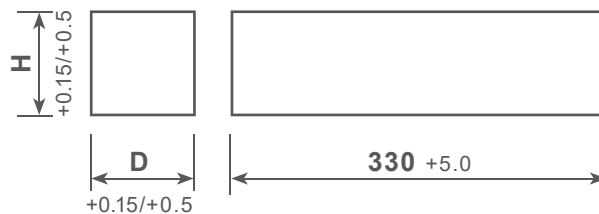
Votre choix- notre nr. référence

Veuillez remplacer les codes « xxx » à la fin de la référence avec la nuance de votre choix  
 par ex. 010100**100**, 010100**210** ou 010100**409** ...

- **Standard** | standard | standard
- **auf Kundenwunsch** | upon customer request | sur demande du client
- **andere Abmessungen auf Anfrage** | other dimensions on demand | autres dimensions sur demande



**Quadrat - und Rechteckstäbe | sinterroh**  
 Square and Rectangular bars | sintered  
 Barreaux carrés et méplats | bruts

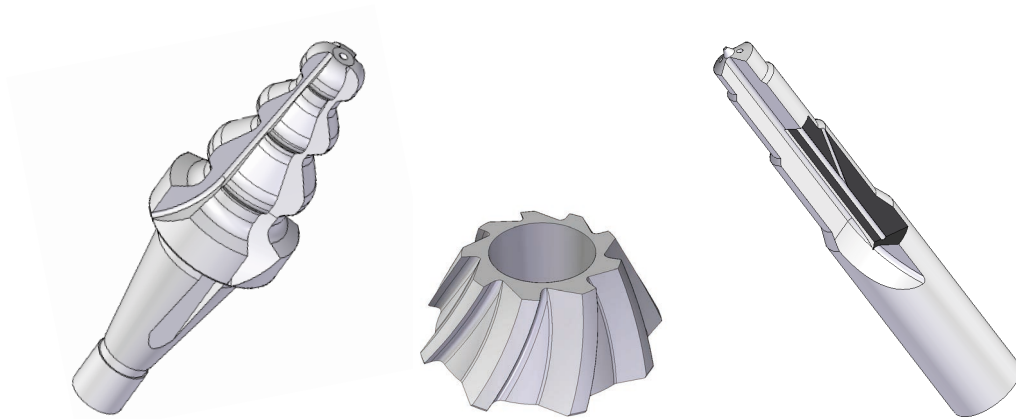


Abmessungen in mm | Dimensions in mm | Dimensions en mm

H	D	EMT		Artikel Nr.
		100	210	Item No   Nr. Réf.
2.00	3.00	●	○	080023033xxx
2.00	4.00	●	○	080023043xxx
2.00	5.00	●	●	080023053xxx
2.00	6.00	●	○	080023063xxx
2.00	8.00	●	●	080023083xxx
2.00	10.00	●	●	080023103xxx
3.00	3.00		○	090033033xxx
3.00	4.00	●	●	080033043xxx
3.00	6.00	●	●	080033063xxx
3.00	8.00	●	●	080033083xxx
3.00	10.00	●	●	080033103xxx
3.00	12.00	●	●	080033123xxx
3.00	14.00	○	○	080033143xxx
3.00	16.00	●	●	080033163xxx
3.00	18.00	○	●	080033183xxx
3.00	25.00	○	●	080033253xxx
3.00	30.00		○	080033303xxx
4.00	4.00		○	090043043xxx
4.00	6.00	●	●	080043063xxx
4.00	8.00	●	○	080043083xxx
4.00	10.00	●	○	080043103xxx
4.00	12.00	●	○	080043123xxx
4.00	13.00	●	○	080043133xxx
4.00	16.00	○	○	080043163xxx
4.00	20.00	○	●	080043203xxx
4.00	25.00		○	080043253xxx
5.00	8.00	○	○	080053083xxx
5.00	10.00	○	○	080053103xxx
5.00	13.00	●	●	080053133xxx
5.00	16.00	○	○	080053163xxx
5.00	20.00	○	○	080053203xxx
5.00	25.00	○	○	080053253xxx
5.00	30.00	○	○	080053303xxx
5.00	35.00	○	○	080053353xxx
6.00	6.00	○	●	090063063xxx
6.00	20.00	●	●	080063203xxx
6.00	30.00	○	●	080063303xxx
8.00	8.00		○	090083083xxx
10.00	10.00	○	●	090103103xxx

# Kundenlösungen | Customer Solutions | Solutions Spécifiques

auf Anfrage | on demand | sur demande



Printed in Switzerland - 8/2018 (AL 4.12.04)