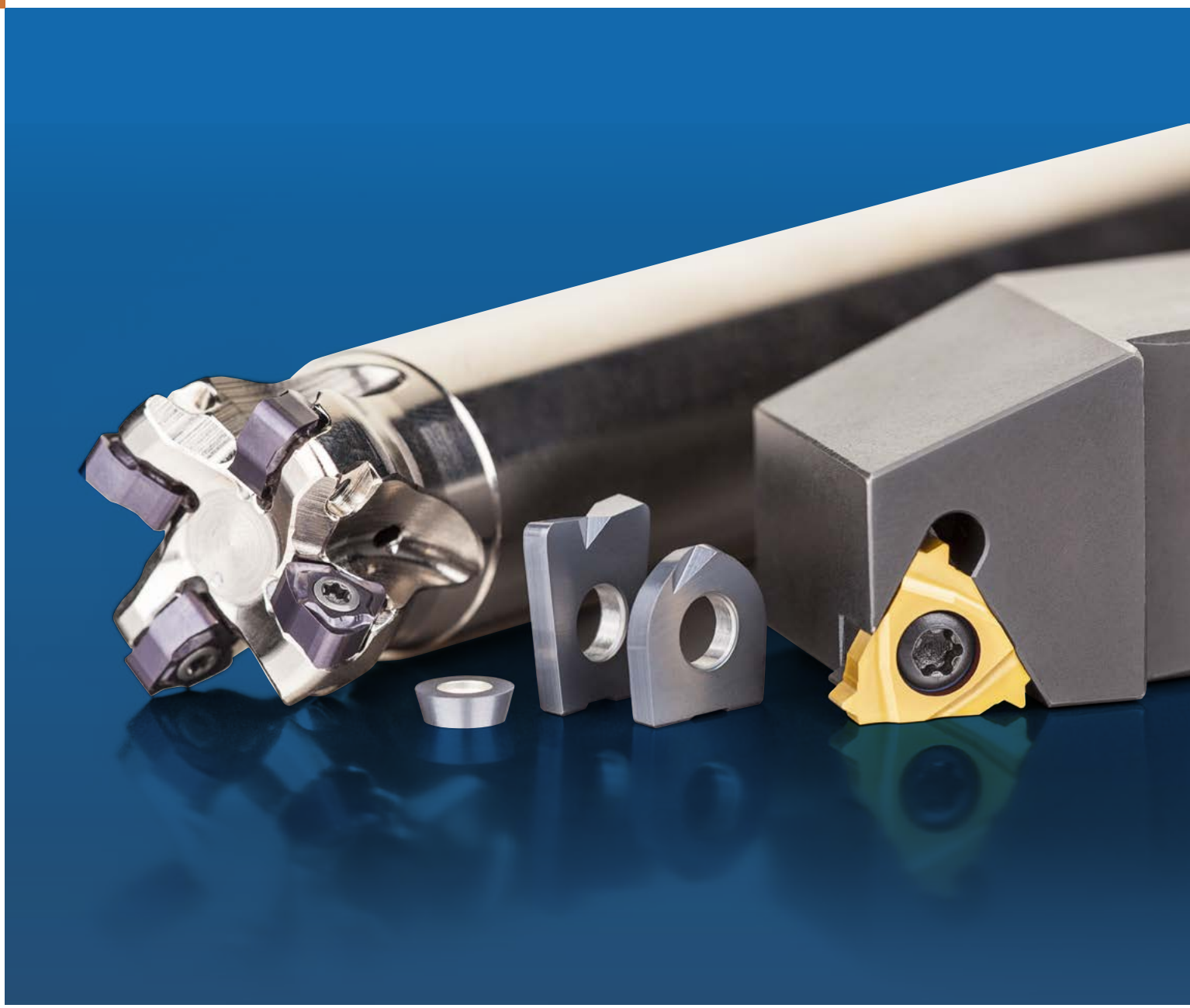
PRAMET

New products 2017–18



PRAMET

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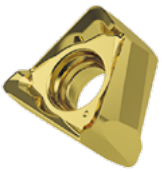
MILLING INSERTS



TURNING INSERTS

NEGATIVE INSERTS FOR ROUGHING OF STAINLESS STEEL

New negative inserts have been developed for roughing and semi-roughing of stainless steel and soft steel.
The chipbreaker is available for both double-sided and large single-sided inserts.

FEATURES & BENEFITS

- Broad range of depth of cut
- Wide chip-groove
- Double-sided inserts can be used for roughing and semi-roughing operations
- Single-sided inserts can also be used for lower feeds and depths of cut
- Roughing of stainless steel without risk of work hardening
- Designed for **serial production** - high performance and higher feeds
- **Excellent chip-breaking** in stainless steel even at lower feeds
- **Good chip evacuation** in wide application area

NRM

CHIP BREAKER NRM

Roughing and semi-roughing

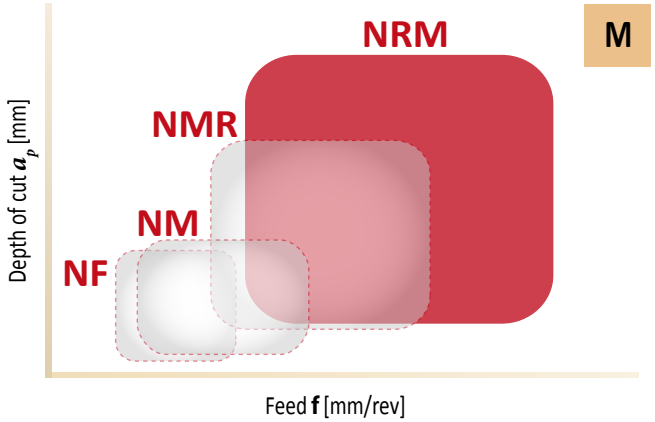
- Positive geometry with wide T-land
- For stainless steel and soft steel
- Double-sided and single-sided inserts

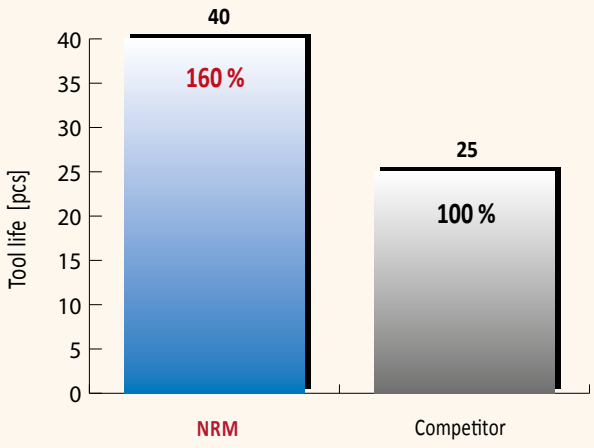
MACHINING EXAMPLE

Material:	DIN 1.4301
Material group:	M
Insert:	CNMG 120408-NRM: T7335

Cutting speed	v_c	150	m/min
Feed	f	0,27	mm/rev
Depth of cut	a_p	4	mm

AREA OF APPLICATION

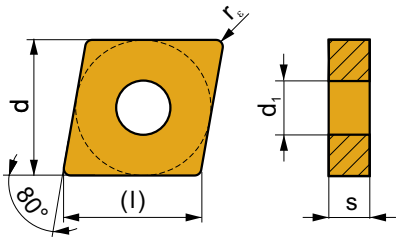




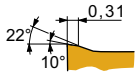
PRAMET

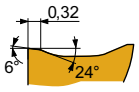
CNMG

	d	d_1	l	s
1204	12,700	5,16	12,9	4,76
1606	15,875	6,35	16,1	6,35
1906	19,050	7,94	19,3	6,35
2509	25,400	9,12	25,8	9,525



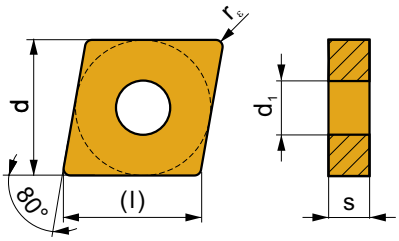
ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
CNMG 120404E-NMR	**T6310**	◪	■			◪		●	+	0,4	0,20	0,30	0,4	4,0
CNMG 120408E-NMR	**T6310**	◪	■			◪		⬣	+ +	0,8	0,20	0,55	0,8	5,0
CNMG 120412E-NMR	**T6310**	◪	■			◪		⬣	+ +	1,2	0,22	0,60	1,2	5,5
CNMG 190608E-NMR	**T6310**	◪	■			◪		⬣	+ +	0,8	0,20	0,60	0,8	7,5
CNMG 190612E-NMR	**T6310**	◪	■			◪		⬣	+ +	1,2	0,22	0,65	1,2	8,0
CNMG 120408-NRM	**T7325**	◪	■			□		⬣	+ +	0,8	0,23	0,55	0,8	7,0
	T7335	◪	■			□		⬣	+ +	0,8	0,23	0,55	0,8	7,0
	T9315	■						⬣	+ +	0,8	0,23	0,55	0,8	7,0
CNMG 120412-NRM	**T7325**	◪	■			□		⬣	+ +	1,2	0,25	0,70	1,2	7,0
	T7335	◪	■			□		⬣	+++	1,2	0,25	0,70	1,2	7,0
	T9315	■						⬣	+ +	1,2	0,25	0,70	1,2	7,0
CNMG 120416-NRM	**T7325**	◪	■			□		⬣	+ +	1,6	0,30	0,75	1,6	7,0
	T7335	◪	■			□		⬣	+++	1,6	0,30	0,75	1,6	7,0
	T9315	■						⬣	+ +	1,6	0,30	0,75	1,6	7,0
CNMG 160608-NRM	**T7325**	◪	■			□		⬣	+ +	0,8	0,27	0,60	0,8	8,0
	T7335	◪	■			□		⬣	+++	0,8	0,27	0,60	0,8	8,0
	T9315	■						⬣	+ +	0,8	0,27	0,60	0,8	8,0
CNMG 160612-NRM	**T7325**	◪	■			□		⬣	+ +	1,2	0,28	0,70	1,2	8,0
	T7335	◪	■			□		⬣	+++	1,2	0,28	0,70	1,2	8,0
	T9315	■						⬣	+ +	1,2	0,28	0,70	1,2	8,0
CNMG 160616-NRM	**T7325**	◪	■			□		⬣	+ +	1,6	0,30	0,80	1,6	8,0
	T7335	◪	■			□		⬣	+++	1,6	0,30	0,80	1,6	8,0
	T9315	■						⬣	+ +	1,6	0,30	0,80	1,6	8,0
CNMG 190608-NRM	**T7325**	◪	■			□		⬣	+ +	0,8	0,28	0,60	0,8	10,0
	T7335	◪	■			□		⬣	+++	0,8	0,28	0,60	0,8	10,0
	T9315	■						⬣	+ +	0,8	0,28	0,60	0,8	10,0
CNMG 190612-NRM	**T7325**	◪	■			□		⬣	+ +	1,2	0,32	0,70	1,2	10,0
	T7335	◪	■			□		⬣	+++	1,2	0,32	0,70	1,2	10,0
	T9315	■						⬣	+ +	1,2	0,32	0,70	1,2	10,0
CNMG 190616-NRM	**T7325**	◪	■			□		⬣	+++	1,6	0,32	0,80	1,6	10,0
	T7335	◪	■			□		⬣	+++	1,6	0,32	0,80	1,6	10,0
	T9315	■						⬣	+ +	1,6	0,32	0,80	1,6	10,0
CNMG 250924-NRM	**T7325**	◪	■			□		✖	+++	2,4	0,35	1,00	2,0	15,0
	T7335	◪	■			□		✖	+++	2,4	0,35	1,00	2,0	15,0
	T9315	■						⬣	+++	2,4	0,35	1,00	2,0	15,0





CNMM

	d	d_1	l	s
2509	25,400	9,12	25,8	9,525



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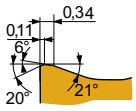
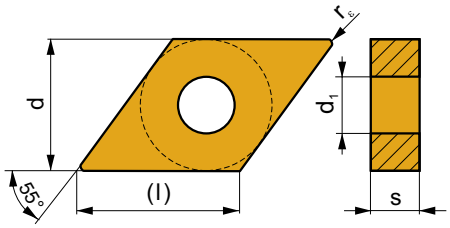
CNMM 250924-NRM	**T7325**	◪	■			□		✖	+++	2,4	0,35	1,00	2,0	16,0
	T7335	◪	■			□		✖	+++	2,4	0,35	1,00	2,0	16,0
	T9315	■						●	+++	2,4	0,35	1,00	2,0	16,0

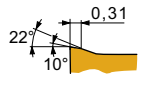


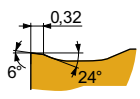
DNMG

	d	d_1	l	s
1504	12,700	5,16	15,5	4,76
1506	12,700	5,16	15,5	6,35



ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
DNMG 150608E-NMR	**T6310**	◪	■			◪		●	++	0,8	0,20	0,48	0,8	4,0
DNMG 150408-NRM	**T7325**	◪	■			□		●	++	0,8	0,23	0,45	0,8	4,0
	T7335	◪	■			□		●	+++	0,8	0,23	0,45	0,8	4,0
	T9315	■						●	++	0,8	0,23	0,45	0,8	4,0
DNMG 150604-NRM	**T7325**	◪	■			□		●	++	0,4	0,15	0,24	0,4	4,0
	T7335	◪	■			□		●	++	0,4	0,15	0,24	0,4	4,0
	T9315	■						●	++	0,4	0,15	0,24	0,4	4,0
DNMG 150608-NRM	**T7325**	◪	■			□		●	++	0,8	0,23	0,45	0,8	4,0
	T7335	◪	■			□		●	+++	0,8	0,23	0,45	0,8	4,0
	T9315	■						●	++	0,8	0,23	0,45	0,8	4,0
DNMG 150612-NRM	**T7325**	◪	■			□		●	+++	1,2	0,25	0,70	1,2	4,0
	T7335	◪	■			□		●	+++	1,2	0,25	0,70	1,2	4,0
	T9315	■						●	+++	1,2	0,25	0,70	1,2	4,0

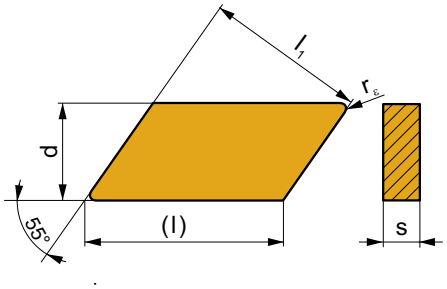


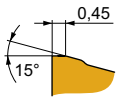
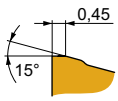
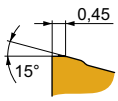
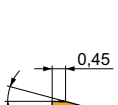
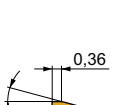
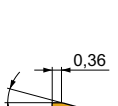
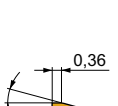


PRAMET

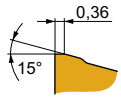
KNUX

	d	l	l_1	s
1604	9,525	19,5	16,2	4,76



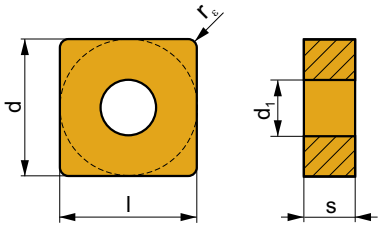
		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
		**KNUX 160405L-22**	**T5315**	◪	□	■				●	++	0,5	0,23	0,40	0,5	4,8
			T7325	◪	◪					●	++	0,5	0,23	0,40	0,5	4,8
			T7335	◪	◪					●	+++	0,5	0,23	0,40	0,5	4,8
			T9325	■	◪	◪				●	++	0,5	0,23	0,40	0,5	4,8
			T9335	■	◪					●	+++	0,5	0,23	0,40	0,5	4,8
		**KNUX 160405R-22**	**T5315**	◪	□	■				●	++	0,5	0,23	0,40	0,5	4,8
			T7325	◪	◪					●	++	0,5	0,23	0,40	0,5	4,8
			T7335	◪	◪					●	+++	0,5	0,23	0,40	0,5	4,8
			T9325	■	◪	◪				●	++	0,5	0,23	0,40	0,5	4,8
			T9335	■	◪					●	+++	0,5	0,23	0,40	0,5	4,8
		**KNUX 160410L-22**	**T9335**	■	◪					●●	+++	1,0	0,23	0,55	1,0	4,8
		**KNUX 160410R-22**	**T9335**	■	◪					●●	+++	1,0	0,23	0,55	1,0	4,8
		**KNUX 160405L-32**	**T5315**	◪	□	■				●	++	0,5	0,25	0,40	0,5	4,8
			T7325	◪	◪					●	++	0,5	0,25	0,40	0,5	4,8
			T7335	◪	◪					●	+++	0,5	0,25	0,40	0,5	4,8
			T9325	■	◪	◪				●	++	0,5	0,25	0,40	0,5	4,8
			T9335	■	◪					●	+++	0,5	0,25	0,40	0,5	4,8
		**KNUX 160405R-32**	**T5315**	◪	□	■				●	++	0,5	0,25	0,40	0,5	4,8
			T7325	◪	◪					●	++	0,5	0,25	0,40	0,5	4,8
			T7335	◪	◪					●	+++	0,5	0,25	0,40	0,5	4,8
			T9325	■	◪	◪				●	++	0,5	0,25	0,40	0,5	4,8
			T9335	■	◪					●	+++	0,5	0,25	0,40	0,5	4,8
		**KNUX 160410L-32**	**T9325**	■	◪	◪				●●	++	1,0	0,25	0,60	1,0	4,8
			T9335	■	◪					●●	+++	1,0	0,25	0,60	1,0	4,8

ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
KNUX 160410R-32	**T9325**	■	◪	◪				●	++	1,0	0,25	0,60	1,0	4,8
	T9335	■	◪					●	+++	1,0	0,25	0,60	1,0	4,8

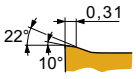


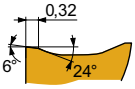
SNMG

	d	d_1	l	s
1204	12,700	5,16	12,700	4,76
1506	15,875	6,35	15,875	6,35
1906	19,050	7,94	19,050	6,35
2507	25,400	9,12	25,400	7,94
2509	25,400	9,12	25,400	9,525



ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
SNMG 120408E-NMR	**T6310**	◪	■			◪		●	+	0,8	0,20	0,55	0,8	5,0
SNMG 120412E-NMR	**T6310**	◪	■			◪		●	+	1,2	0,22	0,60	1,2	5,5
SNMG 150612E-NMR	**T6310**	◪	■			◪		✖	++	1,2	0,22	0,65	1,2	6,0
SNMG 190612E-NMR	**T6310**	◪	■			◪		✖	++	1,2	0,22	0,65	1,2	8,0
SNMG 190616E-NMR	**T6310**	◪	■			◪		✖	++	1,6	0,25	0,70	1,6	8,0
SNMG 120408-NRM	**T7325**	◪	■			□		●	++	0,8	0,23	0,55	0,8	7,0
	T7335	◪	■			□		●	++	0,8	0,23	0,55	0,8	7,0
	T9315	■						●	++	0,8	0,23	0,55	0,8	7,0
SNMG 120412-NRM	**T7325**	◪	■			□		●	++	1,2	0,25	0,70	1,2	7,0
	T7335	◪	■			□		●	++	1,2	0,25	0,70	1,2	7,0
	T9315	■						●	++	1,2	0,25	0,70	1,2	7,0
SNMG 150612-NRM	**T7325**	◪	■			□		●	++	1,2	0,28	0,70	1,2	8,0
	T7335	◪	■			□		●	+++	1,2	0,28	0,70	1,2	8,0
	T9315	■						●	++	1,2	0,28	0,70	1,2	8,0
SNMG 150616-NRM	**T7325**	◪	■			□		●	++	1,6	0,30	0,80	1,6	8,0
	T7335	◪	■			□		●	+++	1,6	0,30	0,80	1,6	8,0
	T9315	■						●	++	1,6	0,30	0,80	1,6	8,0
SNMG 190612-NRM	**T7325**	◪	■			□		●	++	1,2	0,32	0,70	1,2	10,0
	T7335	◪	■			□		●	+++	1,2	0,32	0,70	1,2	10,0
	T9315	■						●	++	1,2	0,32	0,70	1,2	10,0
SNMG 190616-NRM	**T7325**	◪	■			□		●	++	1,6	0,32	0,80	1,6	10,0
	T7335	◪	■			□		●	+++	1,6	0,32	0,80	1,6	10,0
	T9315	■						●	++	1,6	0,32	0,80	1,6	10,0
SNMG 250724-NRM	**T7325**	◪	■			□		✖	++	2,4	0,35	1,00	2,0	14,0
	T7335	◪	■			□		✖	+++	2,4	0,35	1,00	2,0	14,0
	T9315	■						●	++	2,4	0,35	1,00	2,0	14,0
SNMG 250924-NRM	**T7325**	◪	■			□		✖	++	2,4	0,35	1,00	2,0	15,0
	T7335	◪	■			□		✖	+++	2,4	0,35	1,00	2,0	15,0
	T9315	■						●	++	2,4	0,35	1,00	2,0	15,0

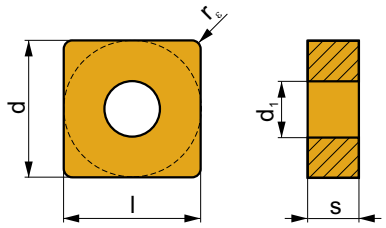


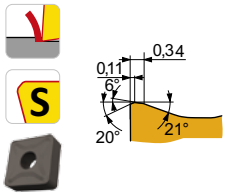


PRAMET

SNMM

	d	d_1	l	s
2507	25,400	9,12	25,400	7,94
2509	25,400	9,12	25,400	7,94

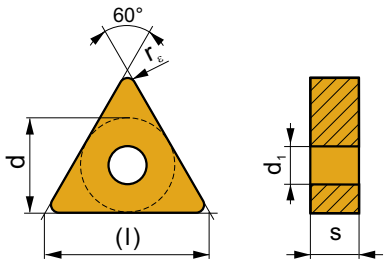


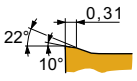


ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
SNMM 250716-NRM	**T7325**	◪	■			□		✖	+ +	1,6	0,32	0,90	1,6	14,0
	T7335	◪	■			□		✖	+++	1,6	0,32	0,90	1,6	14,0
	T9315	■						●	+ +	1,6	0,32	0,90	1,6	14,0
SNMM 250724-NRM	**T7325**	◪	■			□		✖	+ +	2,4	0,35	1,00	2,0	14,0
	T7335	◪	■			□		✖	+++	2,4	0,35	1,00	2,0	14,0
	T9315	■						●	+ +	2,4	0,35	1,00	2,0	14,0
SNMM 250924-NRM	**T7325**	◪	■			□		✖	+ +	2,4	0,35	1,00	2,0	16,0
	T7335	◪	■			□		✖	+++	2,4	0,35	1,00	2,0	16,0
	T9315	■						●	+ +	2,4	0,35	1,00	2,0	16,0

TNMG

	d	d_1	l	s
1604	9,525	3,81	16,5	4,76
2204	12,700	5,16	22,0	4,76

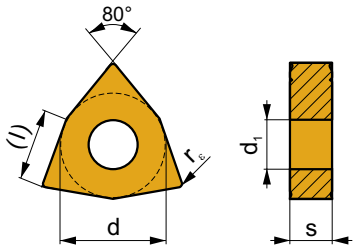




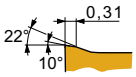
ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
TNMG 160404E-NMR	**T6310**	◪	■			◪		●	+	0,4	0,20	0,24	0,4	4,0
TNMG 160408E-NMR	**T6310**	◪	■			◪		●	+ +	0,8	0,20	0,48	0,8	4,0
TNMG 220408E-NMR	**T6310**	◪	■			◪		●	+ +	0,8	0,20	0,48	0,8	6,0
TNMG 220412E-NMR	**T6310**	◪	■			◪		●	+ +	1,2	0,22	0,70	1,2	6,0

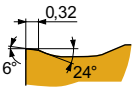
WNMG

	d	d_1	l	s
0604	9,525	3,81	6,5	4,76
0804	12,700	5,16	8,7	4,76



ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
WNMG 060404E-NMR	**T6310**	◪	■			◪		●	+	0,4	0,20	0,30	0,4	3,5
WNMG 060408E-NMR	**T6310**	◪	■			◪		⬣	+	0,8	0,20	0,45	0,8	3,5
WNMG 080404E-NMR	**T6310**	◪	■			◪		●	+	0,4	0,20	0,30	0,4	4,0
WNMG 080408E-NMR	**T6310**	◪	■			◪		⬣	+ +	0,8	0,20	0,55	0,8	5,0
WNMG 080412E-NMR	**T6310**	◪	■			◪		⬣	+ +	1,2	0,22	0,60	1,2	5,0
WNMG 080404-NRM	**T7325**	◪	■			□		●	+ +	0,4	0,15	0,30	0,4	4,0
	T7335	◪	■			□		●	+ +	0,4	0,15	0,30	0,4	4,0
	T9315	■						●	+ +	0,4	0,15	0,30	0,4	4,0
WNMG 080408-NRM	**T7325**	◪	■			□		⬣	+ +	0,8	0,23	0,55	0,8	5,0
	T7335	◪	■			□		⬣	+ +	0,8	0,23	0,55	0,8	5,0
	T9315	■						⬣	+ +	0,8	0,23	0,55	0,8	5,0
WNMG 080412-NRM	**T7325**	◪	■			□		⬣	+ +	1,2	0,25	0,70	1,2	5,0
	T7335	◪	■			□		⬣	+++	1,2	0,25	0,70	1,2	5,0
	T9315	■						⬣	+ +	1,2	0,25	0,70	1,2	5,0

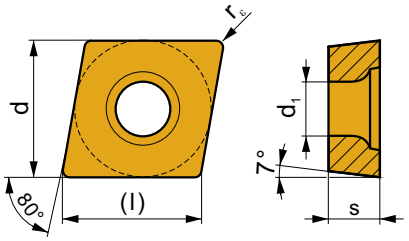




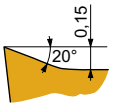
PRAMET

CCGT

	d	d_1	l	s
0602-SF3	6,350	2,80	6,4	2,58
09T3-SF3	9,525	4,40	9,7	4,22
1204-SF3	12,700	5,50	12,9	5,01

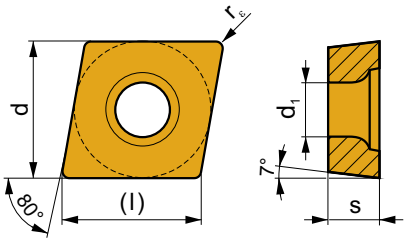


ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
CCGT 060201E-SF3	**T6310**		■		◪	■		●	+	0,1	0,02	0,08	0,1	1,6
CCGT 09T301E-SF3	**T6310**		■		◪	■		●	+	0,1	0,02	0,08	0,1	1,6
CCGT 120404E-SF3	**T6310**		■		◪	■		●	+	0,4	0,05	0,20	0,4	2,5

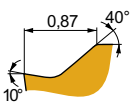


CCMT

	d	d_1	l	s
0602	6,350	2,80	6,4	2,38
09T3	9,525	4,40	9,7	3,97

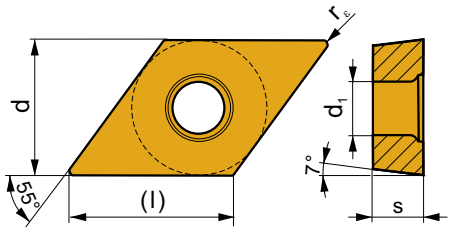


ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
CCMT 060202E-FF	**T9315**	■		◪				●	+	0,2	0,05	0,15	0,2	2,0
CCMT 060204E-FF	**T9315**	■		◪				●	+	0,4	0,05	0,23	0,2	2,0
CCMT 09T304E-FF	**T9315**	■		◪				●	+	0,4	0,05	0,23	0,2	2,0

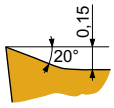


DCGT

	d	d_1	l	s
0702-SF3	6,350	2,80	7,8	2,58
11T3-SF3	9,525	4,40	11,6	4,22

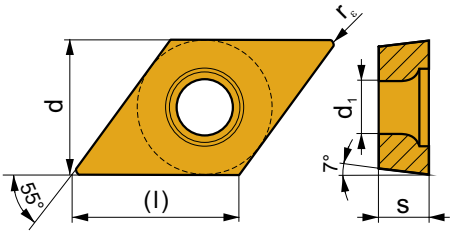


ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
DCGT 070201E-SF3	**T6310**		■		◪	■		●	+	0,1	0,02	0,06	0,1	1,6
DCGT 11T301E-SF3	**T6310**		■		◪	■		●	+	0,1	0,02	0,06	0,1	1,8

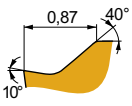


DCMT

	d	d_1	l	s
11T3	9,525	4,40	11,6	3,97



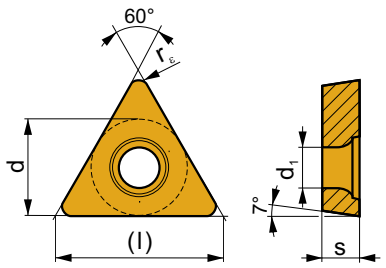
ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
DCMT 11T302E-FF	**T9315**	■		◪				●	+ +	0,2	0,05	0,12	0,2	2,0
DCMT 11T304E-FF	**T9315**	■		◪				●	+ +	0,4	0,05	0,23	0,2	2,0
DCMT 11T308E-FF	**T9315**	■		◪				●	+ +	0,8	0,05	0,23	0,2	2,0



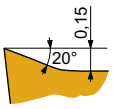
PRAMET

TCGT

	d	d_1	l	s
16T3-SF3	9,525	4,40	16,5	4,22

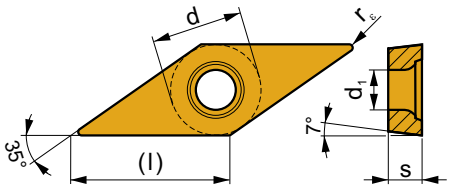


ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
TCGT 16T312E-SF3	**T6310**		■		◪	■		●	++	1,2	0,10	0,60	0,8	3,5

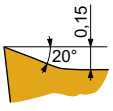


VCGT

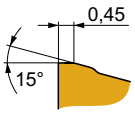
	d	d_1	l	s
1102-SF3	6,350	2,80	11,1	2,58
1103-SF3	6,350	2,80	11,1	3,43
1604-SF3	9,525	4,40	16,6	5,01

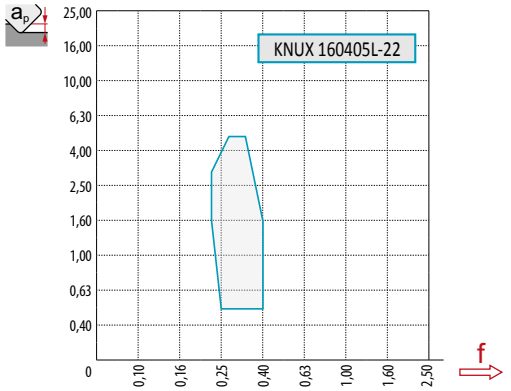


ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
VCGT 110201E-SF3	**T6310**		■		◪	■		●	+	0,1	0,02	0,05	0,1	1,6
VCGT 110301E-SF3	**T6310**		■		◪	■		●	+	0,1	0,02	0,05	0,1	1,6
VCGT 110302E-SF3	**T6310**		■		◪	■		●	+	0,2	0,02	0,10	0,2	1,6
VCGT 110304E-SF3	**T6310**		■		◪	■		●	+	0,4	0,04	0,20	0,4	2,0
VCGT 160402E-SF3	**T6310**		■		◪	■		●	+	0,2	0,02	0,10	0,2	2,0



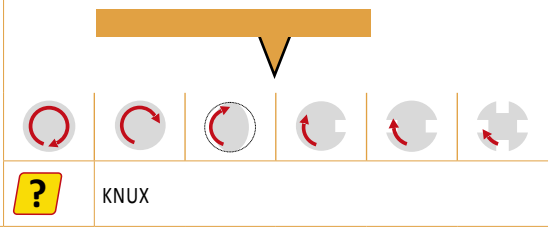
22





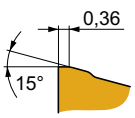
P	M	K	N	S	H
■	◪	■			

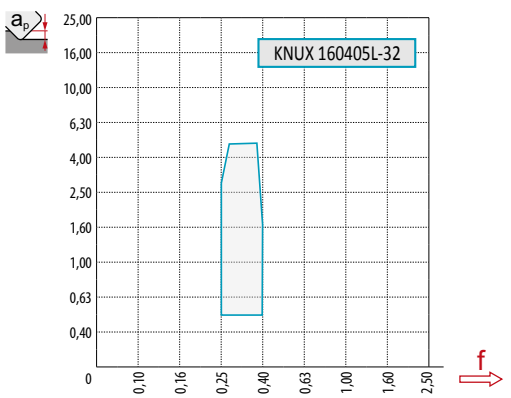
f	0,23 – 0,55
ap	0,50 – 4,80



KNUX

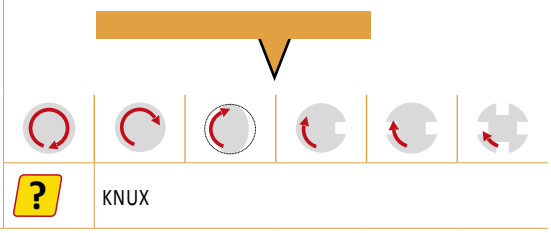
32





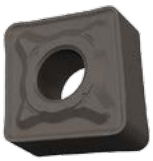
P	M	K	N	S	H
■	◪	■			

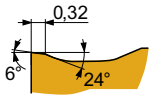
f	0,25 – 0,6
ap	0,50 – 4,80

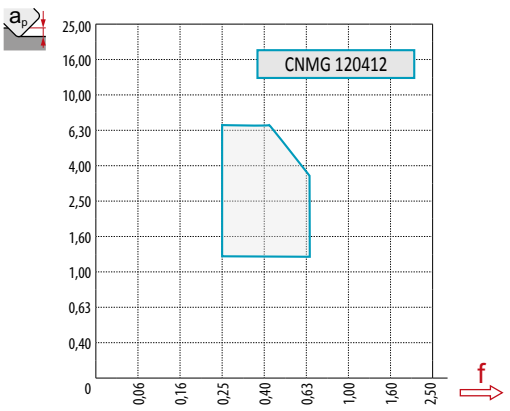


KNUX

NRM

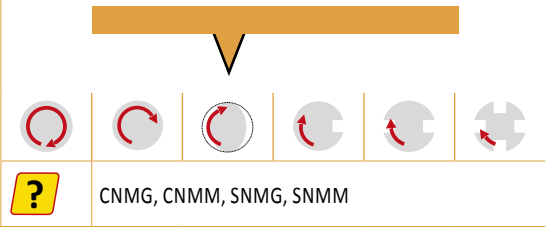






P	M	K	N	S	H
■	■			□	

f	0,23 – 1,0
ap	0,8 – 16,0



CNMG, CNMM, SNMG, SNMM

PRAMET

T8010

TURNING INSERTS

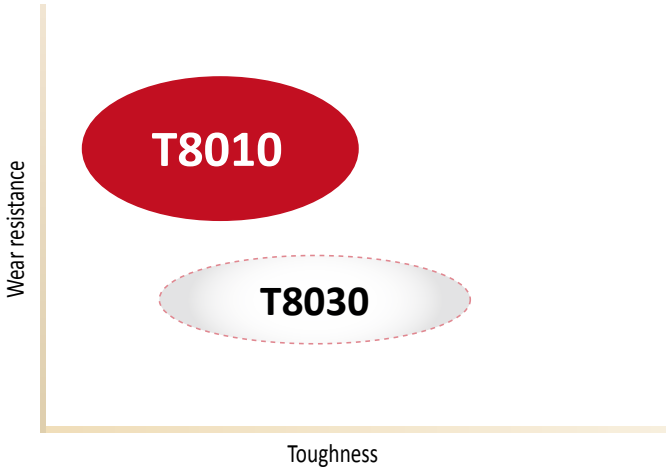
HIGH WEAR RESISTANT GRADE FOR RELIABLE AND PRECISE THREAD TURNING

The new grade is suitable for continuous high precision thread turning of steels, stainless steel, cast iron and super alloys. Offering excellent wear resistance while ensuring operational reliability, the T8010 extends the application area of the universal grade T8030.

FEATURES & BENEFITS

- **Accurate and reliable** - Stable cutting edge due to enhanced plastic deformation resistance
- **Longer tool life** – hard substrate and PVD coating with optimized interior residual stress
- **Easy wear indication** – gold finish of the inserts
- **Performance** – High wear resistance grade for increased cutting speeds

AREA OF APPLICATION



COMPONENT MATERIALS

- Steels, stainless steel and cast iron. Also suitable for super alloys

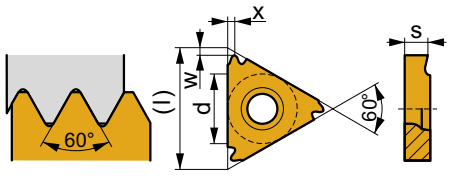
Where to use which grade?

T8010: Higher cutting speeds and accuracy are required. Also for super alloys

T8030: Universal choice for a wide range of materials

TN M EXT

	d	l	s
16	9,525	16,5	3,47
22	12,700	22,0	4,71

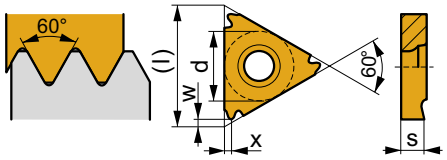


ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$		1 2 3 / 1"	x	w
TN 16ER050M	**T8010**	■	■	■		◪		●	+++	–	–	–	–	–	0,50	–	0,80	0,80
TN 16ER075M	**T8010**	■	■	■		◪		●	+++	–	–	–	–	–	0,75	–	0,80	0,80
TN 16ER080M	**T8010**	■	■	■		◪		●	+++	–	–	–	–	–	0,80	–	0,60	0,80
TN 16ER100M	**T8010**	■	■	■		◪		●	+++	–	–	–	–	–	1,00	–	0,80	0,80
TN 16ER125M	**T8010**	■	■	■		◪		●	+++	–	–	–	–	–	1,25	–	0,80	0,80
TN 16ER150M	**T8010**	■	■	■		◪		●	+++	–	–	–	–	–	1,50	–	0,80	0,80
TN 16ER175M	**T8010**	■	■	■		◪		●	+++	–	–	–	–	–	1,75	–	1,50	1,20
TN 16ER200M	**T8010**	■	■	■		◪		●	+++	–	–	–	–	–	2,00	–	1,50	1,20
TN 16ER250M	**T8010**	■	■	■		◪		●	+++	–	–	–	–	–	2,50	–	1,50	1,20
TN 16ER300M	**T8010**	■	■	■		◪		●	+++	–	–	–	–	–	3,00	–	1,50	1,20
TN 22ER350M	**T8010**	■	■	■		◪		●	+++	–	–	–	–	–	3,50	–	2,50	1,80
TN 22ER400M	**T8010**	■	■	■		◪		●	+++	–	–	–	–	–	4,00	–	2,50	1,80
TN 22ER450M	**T8010**	■	■	■		◪		●	+++	–	–	–	–	–	4,50	–	2,50	1,80
TN 22ER500M	**T8010**	■	■	■		◪		●	+++	–	–	–	–	–	5,00	–	2,50	1,80
TN 16EL100M	**T8010**	■	■	■		◪		●	+++	–	–	–	–	–	1,00	–	0,80	0,80
TN 16EL125M	**T8010**	■	■	■		◪		●	+++	–	–	–	–	–	1,25	–	0,80	0,80
TN 16EL150M	**T8010**	■	■	■		◪		●	+++	–	–	–	–	–	1,50	–	0,80	0,80
TN 16EL175M	**T8010**	■	■	■		◪		●	+++	–	–	–	–	–	1,75	–	1,50	1,20
TN 16EL200M	**T8010**	■	■	■		◪		●	+++	–	–	–	–	–	2,00	–	1,50	1,20
TN 16EL250M	**T8010**	■	■	■		◪		●	+++	–	–	–	–	–	2,50	–	1,50	1,20
TN 16EL300M	**T8010**	■	■	■		◪		●	+++	–	–	–	–	–	3,00	–	1,50	1,20

PRAMET

TN M INT

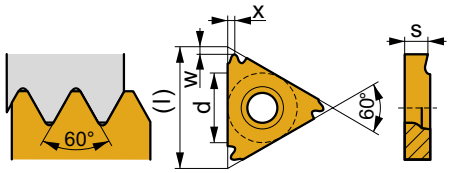
	d	l	s
11	6,350	11,0	3,00
16	9,525	16,5	3,47
22	12,700	22,0	4,71



		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$		1 2 3 / 1"	x	w
		TN 11NR050M	T8010	■	■	■		◪		●	+++	–	–	–	–	–	0,50	–	0,80	0,80
		TN 11NR075M	T8010	■	■	■		◪		●	+++	–	–	–	–	–	0,75	–	0,80	0,80
		TN 11NR100M	T8010	■	■	■		◪		●	+++	–	–	–	–	–	1,00	–	0,80	0,80
		TN 11NR125M	T8010	■	■	■		◪		●	+++	–	–	–	–	–	1,25	–	0,80	0,80
		TN 11NR150M	T8010	■	■	■		◪		●	+++	–	–	–	–	–	1,50	–	0,80	0,80
		TN 11NR200M	T8010	■	■	■		◪		●	+++	–	–	–	–	–	2,00	–	0,90	0,80
1		TN 16NR050M	T8010	■	■	■		◪		●	+++	–	–	–	–	–	0,50	–	0,80	0,80
U		TN 16NR075M	T8010	■	■	■		◪		●	+++	–	–	–	–	–	0,75	–	0,80	0,80
E	15°	TN 16NR100M	T8010	■	■	■		◪		●	+++	–	–	–	–	–	1,00	–	0,80	0,80
		TN 16NR125M	T8010	■	■	■		◪		●	+++	–	–	–	–	–	1,25	–	0,80	0,80
		TN 16NR150M	T8010	■	■	■		◪		●	+++	–	–	–	–	–	1,50	–	0,80	0,80
		TN 16NR175M	T8010	■	■	■		◪		●	+++	–	–	–	–	–	1,75	–	1,50	1,20
		TN 16NR200M	T8010	■	■	■		◪		●	+++	–	–	–	–	–	2,00	–	1,50	1,20
		TN 16NR250M	T8010	■	■	■		◪		●	+++	–	–	–	–	–	2,50	–	1,50	1,20
		TN 16NR300M	T8010	■	■	■		◪		●	+++	–	–	–	–	–	3,00	–	1,50	1,20
		TN 22NR350M	T8010	■	■	■		◪		●	+++	–	–	–	–	–	3,50	–	2,50	1,80
		TN 22NR400M	T8010	■	■	■		◪		●	+++	–	–	–	–	–	4,00	–	2,50	1,80
		TN 22NR450M	T8010	■	■	■		◪		●	+++	–	–	–	–	–	4,50	–	2,50	1,80
		TN 22NR500M	T8010	■	■	■		◪		●	+++	–	–	–	–	–	5,00	–	2,50	1,80
		TN 11NL150M	T8010	■	■	■		◪		●	+++	–	–	–	–	–	1,50	–	0,80	0,80
1		TN 11NL200M	T8010	■	■	■		◪		●	+++	–	–	–	–	–	2,00	–	0,90	0,80
U		TN 16NL100M	T8010	■	■	■		◪		●	+++	–	–	–	–	–	1,00	–	0,80	0,80
E	15°	TN 16NL125M	T8010	■	■	■		◪		●	+++	–	–	–	–	–	1,25	–	0,80	0,80
		TN 16NL150M	T8010	■	■	■		◪		●	+++	–	–	–	–	–	1,50	–	0,80	0,80
		TN 16NL175M	T8010	■	■	■		◪		●	+++	–	–	–	–	–	1,75	–	1,50	1,20
		TN 16NL200M	T8010	■	■	■		◪		●	+++	–	–	–	–	–	2,00	–	1,50	1,20
		TN 16NL250M	T8010	■	■	■		◪		●	+++	–	–	–	–	–	2,50	–	1,50	1,20
		TN 16NL300M	T8010	■	■	■		◪		●	+++	–	–	–	–	–	3,00	–	1,50	1,20

TN 60° PP EXT

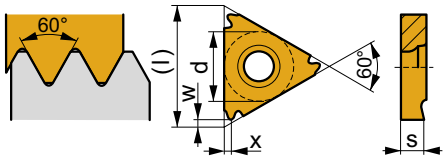
	d	l	s
16	9,525	16,5	3,47
22	12,700	22,0	4,71



		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$		1 2 3 / 1"	x	w
1 U E	10°	TN 16ERA60	T8010	■	■	■		◪		●	+++	–	–	–	–	–	0,50 - 1,50	48,0 - 16,0	0,80	0,60
		TN 16ERAG60	T8010	■	■	■		◪		●	+++	–	–	–	–	–	0,50 - 3,00	48,0 - 8,0	1,50	1,10
		TN 16ERG60	T8010	■	■	■		◪		●	+++	–	–	–	–	–	1,75 - 3,00	14,0 - 8,0	1,50	1,10
		TN 22ERN60	T8010	■	■	■		◪		●	+++	–	–	–	–	–	3,50 - 5,00	7,0 - 5,0	2,50	1,80
1 U E	10°	TN 16ELAG60	T8010	■	■	■		◪		●	+++	–	–	–	–	–	0,50 - 3,00	48,0 - 8,0	1,50	1,10

TN 60° PP INT

	d	l	s
11	6,350	11,0	3,00
16	9,525	16,5	3,47
22	12,700	22,0	4,71

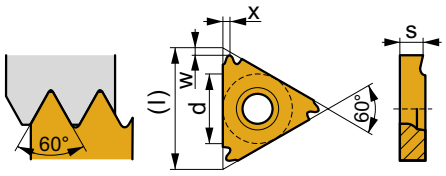


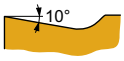
		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$		1 2 3 / 1"	x	w
1 U E	15°	TN 11NRA60	T8010	■	■	■		◪		●	+++	–	–	–	–	–	0,50 - 1,50	48,0 - 16,0	0,80	0,70
		TN 16NRA60	T8010	■	■	■		◪		●	+++	–	–	–	–	–	0,50 - 1,50	48,0 - 16,0	0,80	0,70
		TN 16NRAG60	T8010	■	■	■		◪		●	+++	–	–	–	–	–	0,50 - 3,00	48,0 - 8,0	1,50	1,10
		TN 16NRG60	T8010	■	■	■		◪		●	+++	–	–	–	–	–	1,75 - 3,00	14,0 - 8,0	1,50	1,10
		TN 22NRN60	T8010	■	■	■		◪		●	+++	–	–	–	–	–	3,50 - 5,00	7,0 - 5,0	2,50	1,80
1 U E	15°	TN 16NLAG60	T8010	■	■	■		◪		●	+++	–	–	–	–	–	0,50 - 3,00	48,0 - 8,0	1,50	1,10

PRAMET

TN UN EXT

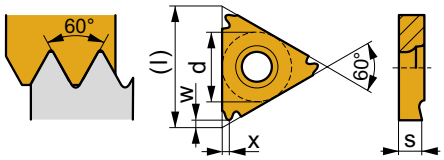
	d	l	s
16	9,525	16,5	3,47

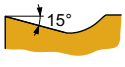


		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$		1 2 3 / 1"	x	w
1 U E		**TN 16ER200UN**	**T8010**	■	■	■		◪		●	+++	–	–	–	–	–	–	20,0	0,80	0,80

TN UN INT

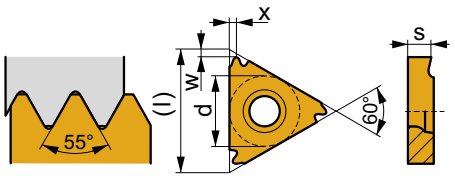
	d	l	s
16	9,525	16,5	3,47



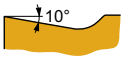
		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$		1 2 3 / 1"	x	w
1 U E		**TN 16NR200UN**	**T8010**	■	■	■		◪		●	+++	–	–	–	–	–	–	20,0	0,80	0,80
		TN 16NR120UN	**T8010**	■	■	■		◪		●	+++	–	–	–	–	–	–	12,0	1,50	1,20
		TN 16NR080UN	**T8010**	■	■	■		◪		●	+++	–	–	–	–	–	–	8,0	1,50	1,20

TN W EXT

	d	l	s
16	9,525	16,5	3,47

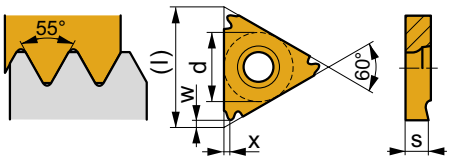


		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$		1 2 3 / 1"	x	w
		TN 16ER190W	**T8010**	■	■	■		◪		●	+++	–	–	–	–	–	–	19,0	0,80	0,80
		TN 16ER140W	**T8010**	■	■	■		◪		●	+++	–	–	–	–	–	–	14,0	1,50	1,20
		TN 16ER110W	**T8010**	■	■	■		◪		●	+++	–	–	–	–	–	–	11,0	1,50	1,20

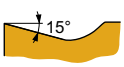


TN W INT

	d	l	s
11	6,350	11,0	3,00
16	9,525	16,5	3,47



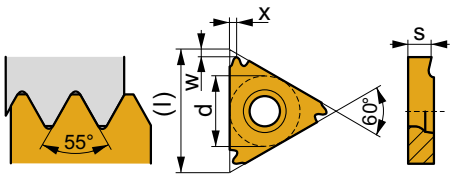
		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$		1 2 3 / 1"	x	w
		TN 11NR190W	**T8010**	■	■	■		◪		●	+++	–	–	–	–	–	–	19,0	0,80	0,80
		TN 11NR140W	**T8010**	■	■	■		◪		●	+++	–	–	–	–	–	–	14,0	0,90	0,70
		TN 16NR190W	**T8010**	■	■	■		◪		●	+++	–	–	–	–	–	–	19,0	0,80	0,80
		TN 16NR140W	**T8010**	■	■	■		◪		●	+++	–	–	–	–	–	–	14,0	1,50	1,20
		TN 16NR110W	**T8010**	■	■	■		◪		●	+++	–	–	–	–	–	–	11,0	1,50	1,20



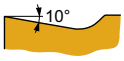
PRAMET

TN 55° PP EXT

	d	l	s
16	9,525	16,5	3,47
22	12,700	22,0	4,71

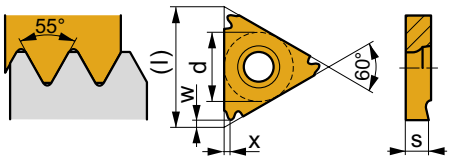


	ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$		1 2 3 / 1"	x	w
	TN 16ERAG55	**T8010**	■	■	■		◪		●	+++	–	–	–	–	–	0,50 - 3,00	48,0 - 8,0	1,50	1,10
	TN 22ERN55	**T8010**	■	■	■		◪		●	+++	–	–	–	–	–	3,50 - 5,00	7,0 - 5,0	2,50	1,80

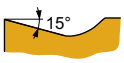


TN 55° PP INT

	d	l	s
16	9,525	16,5	3,47

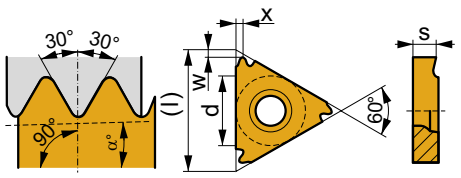


	ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$		1 2 3 / 1"	x	w
	TN 16NRAG55	**T8010**	■	■	■		◪		●	+++	–	–	–	–	–	0,50 - 3,00	48,0 - 8,0	1,50	1,10

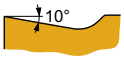


TN NPT EXT

	α°	d	l	s
16	1°47´	9,525	16,5	3,47

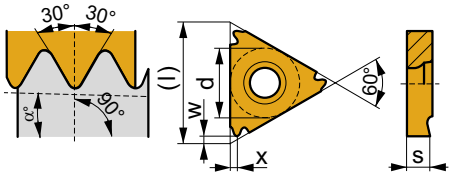


ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$		1 2 3 / 1"	x	w
TN 16ER140NPT	**T8010**	■	■	■		◪		●	+++	–	–	–	–	–	–	14,0	1,50	1,10
TN 16ER115NPT	**T8010**	■	■	■		◪		●	+++	–	–	–	–	–	–	11,5	1,50	1,10

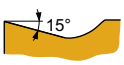


TN NPT INT

	α°	d	l	s
16	1°47´	9,525	16,5	3,47



ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$		1 2 3 / 1"	x	w
TN 16NR140NPT	**T8010**	■	■	■		◪		●	+++	–	–	–	–	–		14,0	1,50	1,10
TN 16NR115NPT	**T8010**	■	■	■		◪		●	+++	–	–	–	–	–		11,5	1,50	1,10



INSERTS FOR BAR PEELING OF STAINLESS STEEL

A new chip breaker developed especially for machining of stainless steel. Also suitable for steel and super alloys.

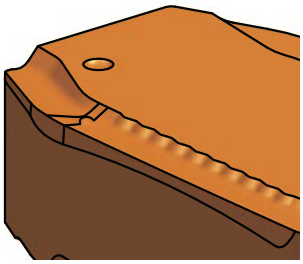
FEATURES & BENEFITS

- New chipbreaker designed for stainless steel
- Strong geometry
- Increased stability of cutting edge
- Cutting edge identification marks

Options of cutting edge:

- S01 for hard material
- S02 for medium hardness
- S03 for soft materials or low rigidity

- **Reliable** tool thanks to improved chip control
- Designed for **high feeds**
- Suitable for heavy conditions
- **Even spread of cutting forces** thanks to high insert accuracy
- Longer tool life
- Reduced vibrations thanks to stabilization facet on main cutting edge (S03)



CHIP BREAKER MM

MM

Roughing to finishing

- Wide, strong T-land
- For stainless steel and steel.
- Suitable for super alloys

LNGF inserts

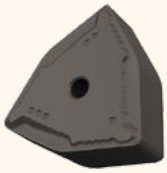
Roughing to finishing

RNGH inserts

Roughing

WNGF inserts

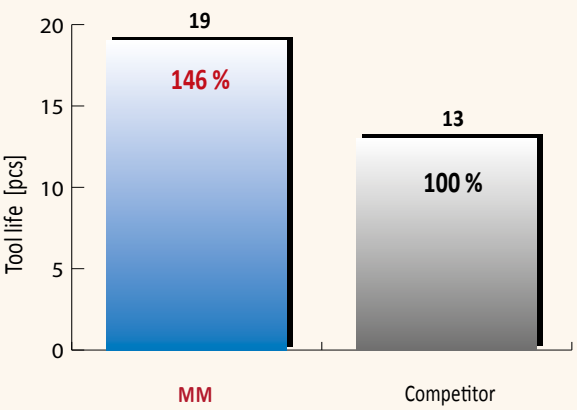
Roughing to finishing



MACHINING EXAMPLE

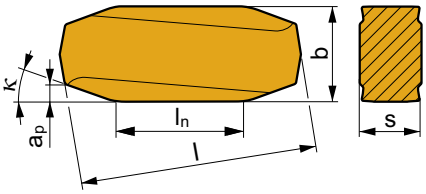
Material:	1.4028
Material group:	M
Insert:	RNGH 381200-MM: T9315

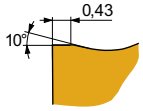
Cutting speed	v_c	70	m/min
Feed	f	5,5	mm/rev
Axial depth of cut	a_p	4	mm
Cutting length		5 000	mm



LNGF

	κ°	a_p	b	l	l_n	s
300715	20	1,5	12	30,12	13	7,54
361220	20	2,0	18	36,50	16	12,00

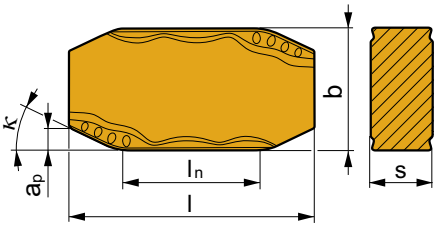


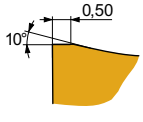


ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
LNGF 300715-MM-S01	**T7325**	◪	■			◪			+++	–	2,00	10,00	0,5	1,5
	T9315	■							+++	–	2,00	10,00	0,5	1,5
	T6310	◪	■			◪			+++	–	2,00	10,00	0,5	1,5
LNGF 300715-MM-S02	**T7325**	◪	■			◪			+++	–	2,00	10,00	0,5	1,5
LNGF 300715-MM-S03	**T7325**	◪	■			◪			+++	–	2,00	10,00	0,5	1,5
LNGF 361220-MM-S01	**T7325**	◪	■			◪			+++	–	2,50	13,00	0,6	2,0
	T9315	■							+++	–	2,50	13,00	0,6	2,0
	T6310	◪	■			◪			+++	–	2,50	13,00	0,6	2,0
LNGF 361220-MM-S02	**T7325**	◪	■			◪			+++	–	2,50	13,00	0,6	2,0
	T9315	■							+++	–	2,50	13,00	0,6	2,0
LNGF 361220-MM-S03	**T7325**	◪	■			◪			+++	–	2,50	13,00	0,6	2,0
	T9315	■							+++	–	2,50	13,00	0,6	2,0
LNGF 361220-MM-S04	**H07**		◪			◪			+++	–	2,50	13,00	0,6	2,0
LNGF 300715-PM	**T7325**	◪	■			◪			+++	–	1,20	10,00	0,3	1,5
	T9315	■							+++	–	1,20	10,00	0,3	1,5
	T9226	■							+++	–	1,20	10,00	0,3	1,5
	6630	■							+++	–	1,20	10,00	0,3	1,5
	T6310	◪							+++	–	1,20	10,00	0,3	1,5
LNGF 300715-PM-S02	**T7325**	◪	■			◪			+++	–	1,20	10,00	0,3	1,5
LNGF 300715-PM-S03	**T7325**	◪	■			◪			+++	–	1,20	10,00	0,3	1,5
LNGF 361220-PM-S01	**T7325**	◪	■			◪			+++	–	1,60	13,00	0,4	2,0
	T9315	■							+++	–	1,60	13,00	0,4	2,0
LNGF 361220-PM-S02	**T7325**	◪	■			◪			+++	–	1,60	13,00	0,4	2,0
LNGF 361220-PM-S03	**T7325**	◪	■			◪			+++	–	1,60	13,00	0,4	2,0

LNGF 40

	a_p	b	κ°	l	l_n	s
401035	3,5	20	25	40	20	10

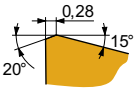




ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
LNGF 401035-MM-S01	**T7325**	◪	■			◪			+++	–	2,00	16,00	0,5	3,5
	T9315	■							+++	–	2,00	16,00	0,5	3,5
	T6310	◪	■			◪			+++	–	2,00	16,00	0,5	3,5
LNGF 401035-MM-S02	**T7325**	◪	■			◪			+++	–	2,00	16,00	0,5	3,5
LNGF 401035-MM-S03	**T7325**	◪	■			◪			+++	–	2,00	16,00	0,5	3,5

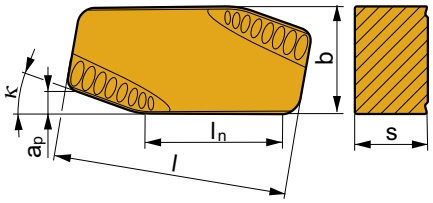
PRAMET

ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
LNGF 401035-PM-S01	**T7325**	◪	■			◪			+++	–	1,20	16,00	0,5	3,5
	T9315	■							+++	–	1,20	16,00	0,5	3,5
	T9226	■							+++	–	1,20	16,00	0,5	3,5
	6630	■							+++	–	1,20	16,00	0,5	3,5
	6610	■							+++	–	1,20	16,00	0,5	3,5
LNGF 401035-PM-S02	**T7325**	◪	■			◪			+++	–	1,20	16,00	0,5	3,5
LNGF 401035-PM-S03	**T7325**	◪	■			◪			+++	–	1,20	16,00	0,5	3,5

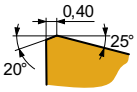


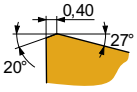
LNXR

	κ°	a_p	b	l	l_n	s
381240	20	4	17,5	38,25	21	12



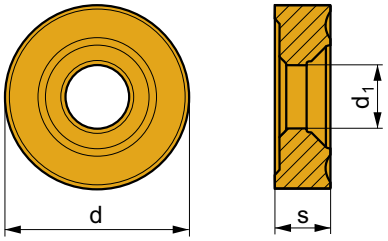
ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
LNXR 381240-PM	**T9315**	■							+++	–	1,60	16,00	0,5	4,0
	T9226	■							+++	–	1,60	16,00	0,5	4,0
	6610	■							+++	–	1,60	16,00	0,5	4,0
LNXR 381240-PR	**T9226**	■							+++	–	1,60	16,00	0,5	4,0
	6630	■							+++	–	1,60	16,00	0,5	4,0





RNGH

	a_p	d	d_1	s
381200	8	38,1	12,7	12,7
5018MO	12	50,0	12,7	18,0

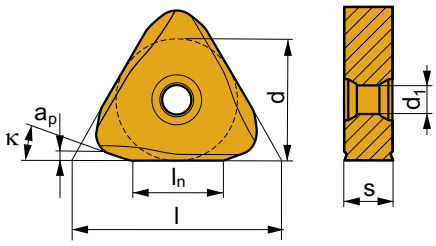


ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
RNGH 381200-MM	T7325	◪	■			◪		●	+++	–	2,50	13,00	1,5	8,0
	T9315	■						●	+++	–	2,50	13,00	1,5	8,0
	T6310	◪	■			◪		●	++	–	2,50	13,00	1,5	8,0
RNGH 5018MO-MM	M9340	◪	■			◪		⬣	++	–	3,00	16,00	1,5	12,0
	T7325	◪	■			◪		⬣	+++	–	3,00	16,00	1,5	12,0
	T9315	■						⬣	+++	–	3,00	16,00	1,5	12,0
	T6310	◪	■			◪		⬣	++	–	3,00	16,00	1,5	12,0
RNGH 381200-MR	T7325	◪	■			◪		⬣	+++	–	2,20	13,00	1,5	8,0
	T9315	■						⬣	+++	–	2,20	13,00	1,5	8,0
	T9226	■	■			□		⬣	+++	–	2,20	13,00	1,5	8,0
	6640	■	■			□		⬣	+++	–	2,20	13,00	1,5	8,0
RNGH 5018MO-MR	M9340	◪	■			◪		⬣	++	–	3,00	16,00	1,5	12,0
	T7325	◪	■			◪		⬣	+++	–	3,00	16,00	1,5	12,0
	T9335	■	■			◪		⬣	+++	–	3,00	16,00	1,5	12,0
RNGH 381200-PR	T9226	■						⬣	+++	–	4,80	13,00	1,5	8,0

PRAMET

TNGJ

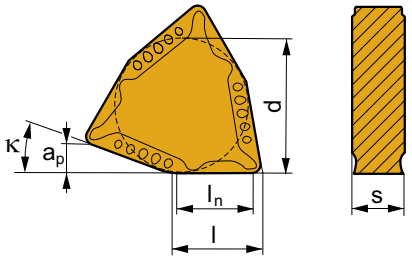
	κ°	a_p	d	d_1	l	l_n	s
220720	20	2,0	21,96	7	38,0	12	7,94
281025	20	2,5	28,60	7	49,5	18	10,00



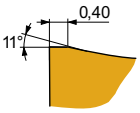
		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
HFC		TNGJ 220720-PF-S01	T9315	■						●	+++	–	1,20	12,00	0,4	2,0
		TNGJ 220720-PF-S02	T7325	◪	■			◪		●	+++	–	1,20	12,00	0,4	2,0
W		TNGJ 281025-PF-S01	T9315	■						●	+++	–	1,20	16,00	0,5	2,5
	6°		T9226	■	■			□		●	+++	–	1,20	16,00	0,5	2,5
E			6630	■	■			□		●	+++	–	1,20	16,00	0,5	2,5
			6610	■	□					●	+++	–	1,20	16,00	0,5	2,5
		TNGJ 281025-PF-S02	T7325	◪	■			◪		●	+++	–	1,20	16,00	0,5	2,5
		TNGJ 281025-PF-S03	T7325	◪	■			◪		●	+++	–	1,20	16,00	0,5	2,5
U		TNGJ 220720-PM-S01	T9315	■						●	+++	–	1,20	12,00	0,4	2,0
		TNGJ 220720-PM-S02	T7325	◪	■			◪		●	+++	–	1,20	12,00	0,4	2,0
HFC			T9315	■						●	+++	–	1,20	12,00	0,4	2,0
			T9226	■						●	+++	–	1,20	12,00	0,4	2,0
W	0,32 21° 14°															
S																

WNGF

	κ°	a_p	d	l	l_n	s
201380	25	8	31,75	20	15	13

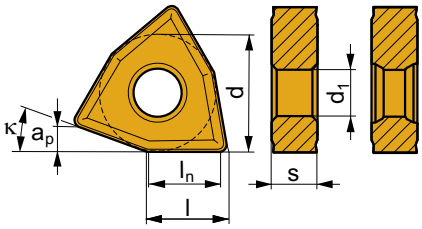


ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
WNGF 201380-MM-S01	**T7325**	■	■			■		●	+++	–	2,00	12,00	0,5	8,0
	T9315	■						●	+++	–	2,00	12,00	0,5	8,0
	T6310	■	■			■		●	+++	–	2,00	12,00	0,5	8,0
WNGF 201380-MM-S02	**T7325**	■	■			■		●	+++	–	2,00	12,00	0,5	8,0
WNGF 201380-MM-S03	**M9340**	■	■			■		●	+++	–	2,00	12,00	0,5	8,0

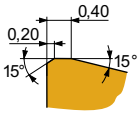


WNGU

	κ°	a_p	d	d_1	l	l_n	s
150935	15	3,5	22,225	7,94	15	13	9,52



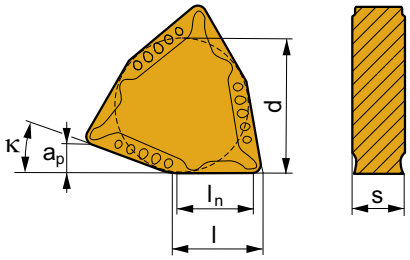
ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
WNGU 150935-PM-S02	**T9226**	■						●	+++	–	1,60	12,00	0,5	3,5
	6630	■						●	+++	–	1,60	12,00	0,5	3,5



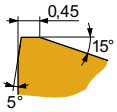
PRAMET

WNMF

	κ°	a_p	d	l	l_n	s
201380	25	8	31,75	20	15	13

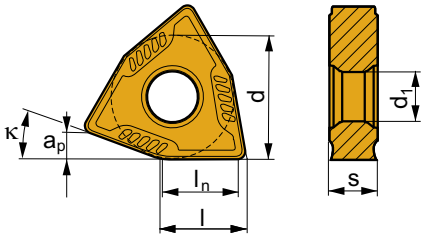


ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
WNMF 201380-PM-S01	**T9226**	■						●	+++	–	2,00	12,00	0,5	8,0
	6630	■						●	+++	–	2,00	12,00	0,5	8,0

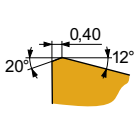


WNMJ

	κ°	a_p	d	d_1	l	l_n	s
201380	25	8	31,75	9,12	20	15	13
201480	25	8	31,75	9,12	20	15	14

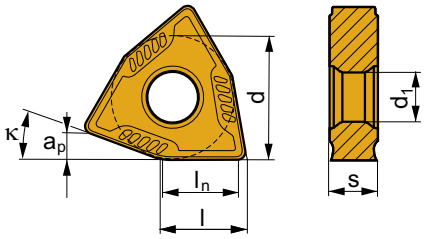


ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
WNMJ 201380-PR	**T9226**	■						●	+++	–	1,60	12,00	0,5	8,0
WNMJ 201480-PR	**6630**	■						●	+++	–	1,60	12,00	0,5	8,0

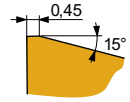


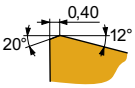
WNXJ

	κ°	a_p	d	d_1	l	l_n	s
150935	15	3,5	22,225	7,94	15	12	9,52
201380	25	8,0	31,750	9,12	20	15	13,00



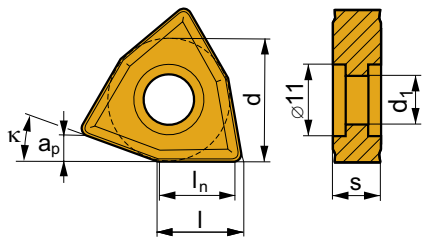
ISO		P	M	K	N	S	H		r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
WNXJ 150935-PM	**6630**	■							+++	–	1,60	12,00	0,5	3,5
WNXJ 201380-PR-S01	**T9226**	■							+++	–	1,60	12,00	0,5	8,0
	6630	■							+++	–	1,60	12,00	0,5	8,0



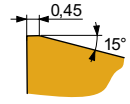


WNXX

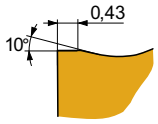
	κ°	a_p	d	d_1	l	l_n	s
150935	15	3,5	22,225	7,94	15	12	9,52

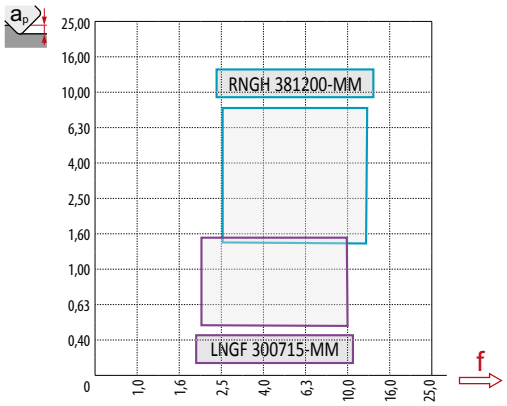


ISO		P	M	K	N	S	H		r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
WNXX 150935-PM	**6630**	■							+++	–	1,60	12,00	0,5	3,5



MM

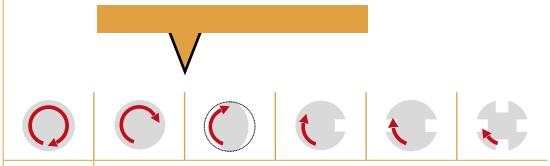




P	M	K	N	S	H
◪	◪			■	

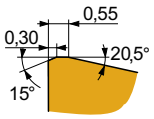
f 2,0 – 16,0

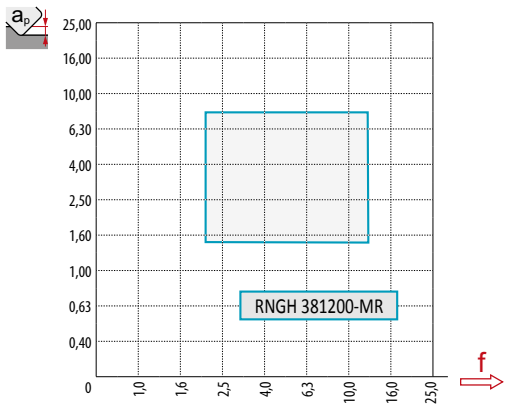
a_p 0,5 – 12,0



? LNGF, RNGH, WNGF

MR

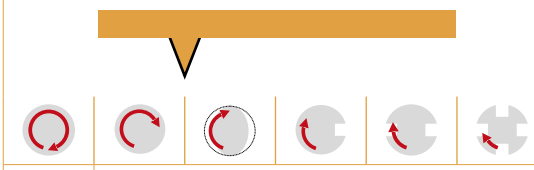




P	M	K	N	S	H
■	■			◪	

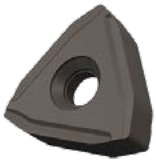
f 2,2 – 16,0

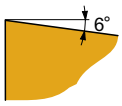
a_p 0,5 – 12,0

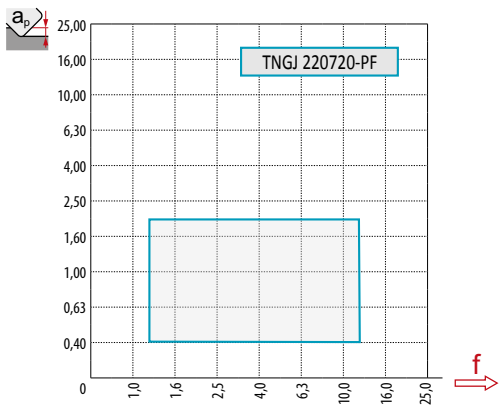


? RNGH

PF



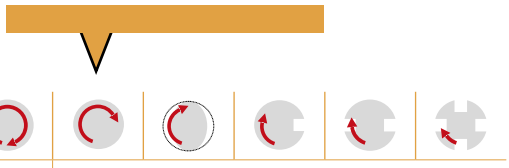




P	M	K	N	S	H
■	■			◪	

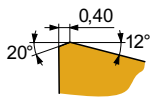
f 1,2 – 16,0

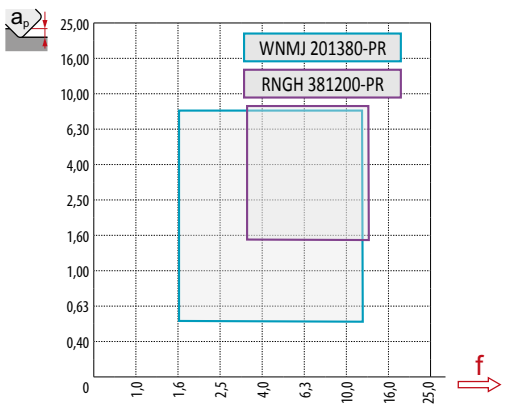
a_p 0,4 – 2,5



? TNGJ

PR

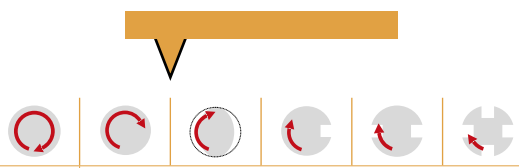


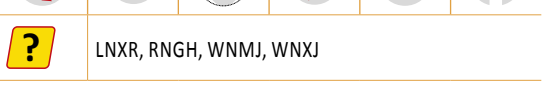


P	M	K	N	S	H
■					

f 1,6 – 16,0

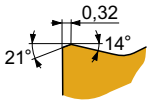
a_p 0,5 – 8,0

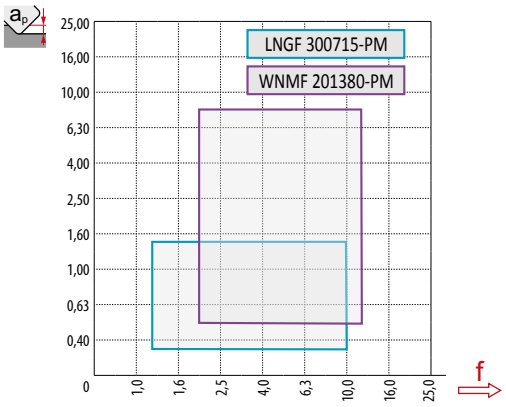




? LNXR, RNGH, WNMJ, WNXJ

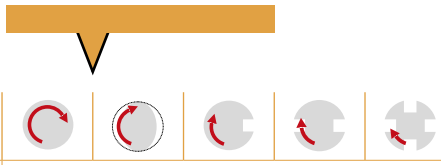
PM





P	M	K	N	S	H
■					

f	1,2 – 16,0
a_p	0,3 – 8,0



?

LNGF, LNXR, TNGJ, WNGU, WNMF, WNXJ, WNXX

MILLING CUTTERS AND INSERTS

VERSATILE TOOLS FOR FACE, SHOULDER AND COPY MILLING

Popular line of face milling cutters with OEHT inserts has been expanded with a new range of versatile cutters capable of carrying octagonal (OD), round (RD) and square (SD) shaped inserts.

FEATURES & BENEFITS

- Range of cutters and insert shapes and geometries for wide variety of applications:
  - Roughing to finishing.
  - Face milling, shoulder milling, slotting, plunging, ramping
  - Wide range of workpiece materials
- All types of inserts have the same radial and axial positions of edges - useful for CNC programming or manual operations
- **Versatile tool** – One cutter for broad range of operations
- **Easy to use for operators** – Same cutter for mixed production
- **Economical** – 8 cutting edges of ODxT insert
- **Productive** – higher depths of cut with SDxT inserts

INSERT TYPES

OD

OCTAGONAL

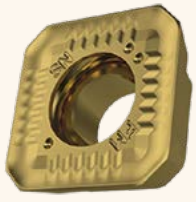
Face and shoulder milling

- 8 cutting edges

RD

ROUND

High feed roughing, shallow profiling, ramping



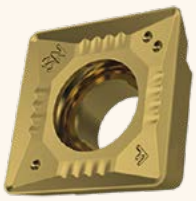
SD

SQUARE

Economical square shoulder milling with 4 cutting edges

SOD05 / ODMT 05

INSERT GEOMETRIES

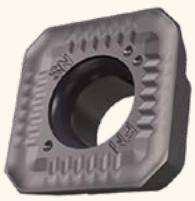


F

GEOMETRY F

Primary choice for low carbon steels, non-ferrous materials

- Positive geometry
- Finishing



FM

GEOMETRY FM

Steels, stainless steels

- Positive geometry with protective chamfer
- Universal – semi-finishing to medium machining

R

GEOMETRY R

Steels, cast iron

- Suitable for unstable cutting conditions

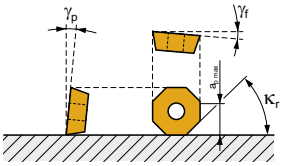
PRAMET

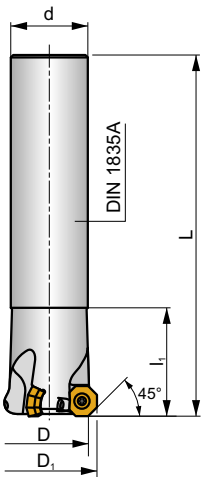
SOD05

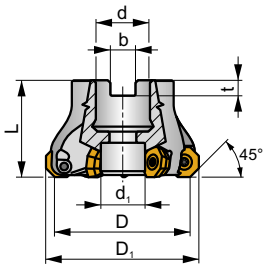
P M K N S

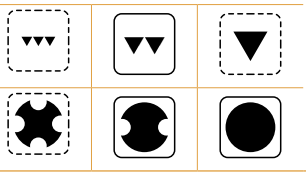
S

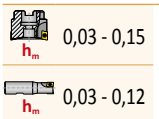
κ_r	45°
a_{pmax}	3,0 (10,0) mm



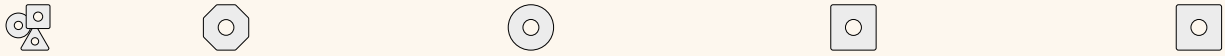




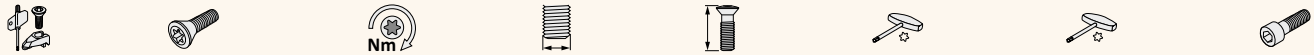




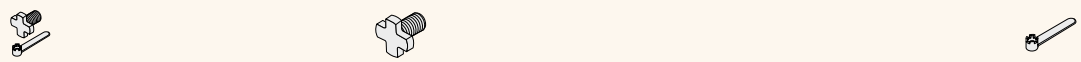
	ISO	D	D_1	L	d	d_1	l_1	k_r	b	t	γ_f°	γ_p°			max.		kg			
DIN 1835A	**32N3R045A25-SOD05-C**	24,7	32	130	25	–	45	45	–	–	-10	8	3	–	17700	#	0,41	GI326	FA049	–
	40N3R045A32-SOD05-C	32,6	40	150	32	–	45	45	–	–	-7	8	3	–	15800	#	0,83	GI326	FA040	–
ISO 6462 DIN 8030	**40A03R-S45OD05-C**	32,7	40	40	16	14	–	45	8,4	5,6	-10	8	3	–	15800	#	0,16	GI326	FA042	–
	50A04R-S45OD05-C	42,6	50	40	22	18	–	45	10,4	6,3	-7	8	4	–	14100	#	0,24	GI326	FA043	–
	50A05R-S45OD05-C	42,6	50	40	22	18	–	45	10,4	6,3	-7	8	5	–	14100	#	0,25	GI326	FA043	–
	63A05R-S45OD05-C	55,6	63	40	22	18	–	45	10,4	6,3	-7	8	5	#	12600	#	0,36	GI326	FA043	–
	63A06R-S45OD05-C	55,6	63	40	22	18	–	45	10,4	6,3	-7	8	6	#	12600	#	0,36	GI326	FA043	–
	80A06R-S45OD05-C	72,6	80	50	27	38	–	45	12,4	7	-7	8	6	#	11100	#	0,62	GI326	FA041	AC001
	80A08R-S45OD05-C	72,6	80	50	27	38	–	45	12,4	7	-7	8	8	#	11100	#	0,65	GI326	FA041	AC001
	100A07R-S45OD05-C	92,6	100	50	32	45	–	45	14,4	8	-7	8	7	#	10000	#	1,06	GI326	FA041	AC002
	125A08R-S45OD05-C	117,6	125	63	40	56	–	45	16,4	9	-7	8	8	#	8900	#	2,19	GI326	FA041	AC003



GI326	OD.. 0505..	RD.. 1205..	SDKT 1205..	SDMT 1205..SN



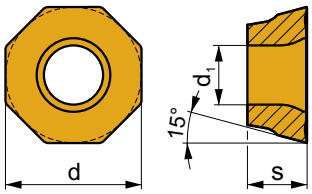
FA040	US 45014-T20P	5	M 5	13	Flag T20P	–	–
FA041	US 45014-T20P	5	M 5	13	–	SDR T20P-T	–
FA042	US 45014-T20P	5	M 5	13	–	SDR T20P-T	HS 90835
FA043	US 45014-T20P	5	M 5	13	–	SDR T20P-T	HS 1030C
FA049	US 45011-T20P	5	M 5	11	Flag T20P	–	–



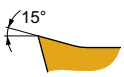
AC001	KS 1230	K.FMH27
AC002	KS 1635	K.FMH32
AC003	KS 2040	K.FMH40

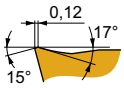
ODKT 05IM

	d	d_1	s
0505	12,700	5,5	5,56



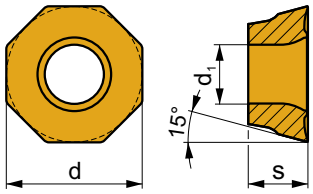
ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
ODKT 0505ADFR-F	**M8310**	■	◪			□		●	-	0,8	0,05	0,25	0,2	2,7
ODKT 0505ADSR-FM	**M9340**	◪	■			□		✱	- - -	0,8	0,17	0,26	0,3	2,7
	M6330	◪	■			□		✖	-	0,8	0,17	0,35	0,3	2,7
	M8310	■	◪	◪		□		✱	-	0,8	0,17	0,35	0,3	2,7
	M8330	■	◪	◪		□		✱	-	0,8	0,17	0,35	0,3	2,7
	M8345	■	◪			□		✖	+ / -	0,8	0,17	0,35	0,3	2,7



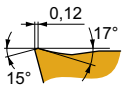


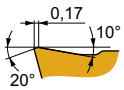
ODMT 05IM

	d	d_1	s
0505	12,700	5,5	5,56



ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
ODMT 0505ADSR-FM	**M9340**	◪	■			□		✱	- - -	0,8	0,17	0,26	0,3	3,0
	M8340	■	◪	◪		□		✖	+ / -	0,8	0,17	0,35	0,3	3,0
ODMT 050508SN-R	**M9340**	◪						✖	- - -	0,8	0,23	0,34	0,3	3,0
	M8330	■		■				✖	-	0,8	0,23	0,45	0,3	3,0

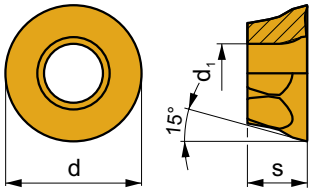


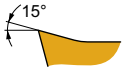
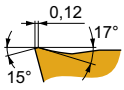


PRAMET

RDGT 12IM

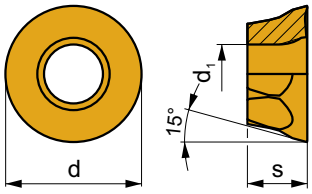
	d	d_1	s
1205	12,700	5,5	5,56

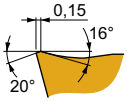


		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
HFC F		**RDGT 120500FN-F**	**M8310**	■	◪			□		●	-	–	0,05	0,25	0,2	6,0
U HFC S		**RDGT 120500SN-FM**	**M8345**	■	◪			□		●	+ / -	–	0,12	0,35	0,2	6,0
			M8330	■	◪	◪		□		●	-	–	0,12	0,35	0,2	6,0

RDMT 12IM

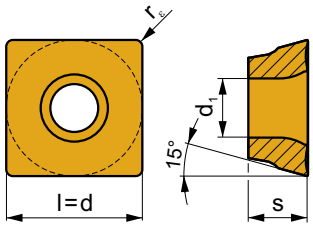
	d	d_1	s
1205	12,700	5,5	5,56

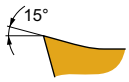
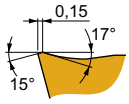


		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
HFC S		**RDMT 120500SN-R**	**M9340**	◪						⬢	- - -	–	0,17	0,34	0,3	6,0
			M8330	■		■				⬢	-	–	0,17	0,45	0,3	6,0
			M8340	■		◪				⬢	+ / -	–	0,17	0,45	0,3	6,0

SDKT 12IM

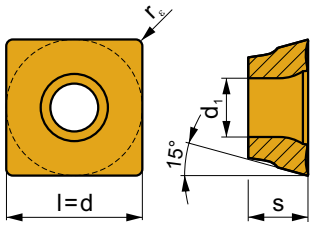
	d	d_1	l	s
1205	12,700	5,5	12,700	5,56

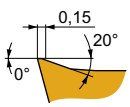
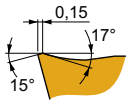
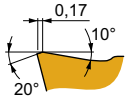


		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
F		**SDKT 1205PDFR-F**	**8215**	■	◪		◪	□		●	-	0,8	0,05	0,25	0,2	10,0
1 U S		**SDKT 1205PDSR-FM**	**M8330**	■	◪	◪		□		❦	-	0,8	0,15	0,35	0,2	10,0
			M8345	■	◪			□		❦	+ / -	0,8	0,15	0,35	0,2	10,0
		SDKT 1205AESN-FM	**M6330**	◪	◪			□		❦	-	–	0,15	0,35	0,2	10,0
			M8330	■	◪	◪		□		❦	-	–	0,15	0,35	0,2	10,0
			M8345	■	◪			□		✖	+ / -	–	0,15	0,35	0,2	10,0

SDMT 12IM

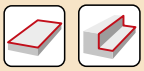
	d	d_1	l	s
1205	12,700	5,5	12,700	5,56



		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
S		**SDMT 120508SN-F**	**M8310**	■	◪			□		❦	-	0,8	0,15	0,30	0,3	10,0
			M8330	■	◪		□	□		❦	-	0,8	0,15	0,30	0,3	10,0
S		**SDMT 120508SN-FM**	**M8345**	■	◪			□		❦	+ / -	0,8	0,15	0,35	0,3	10,0
		SDMT 120508SN-R	**M9340**	◪						✖	- - -	0,8	0,17	0,34	0,3	10,0
			M8330	■		■				✖	-	0,8	0,17	0,45	0,3	10,0
S			**M8345**	■						✖	+ / -	0,8	0,17	0,45	0,3	10,0
		SDMT 1205AESN-R	**M8330**	■		■				✖	-	–	0,17	0,45	0,3	10,0
			M8340	■		◪				✖	+ / -	–	0,17	0,45	0,3	10,0

PRAMET

ISO		f_{min}	f_{max}	M9340	M6330	M8310	M8330	M8340	M8345	8215
P	●	0,07	0,30	320	287	329	314	293	212	315
	⧓	0,07	0,25	284	257	297	279	257	180	275
	✖	0,07	0,15	252	227	266	246	221	153	234
M	●	0,07	0,25	189	187	198	183	176	126	189
	⧓	0,07	0,20	171	167	176	163	153	108	162
	✖	0,07	0,15	149	146	158	142	131	90	140
K	●	0,07	0,30	-	-	311	303	275	-	297
	⧓	0,07	0,25	-	-	284	271	243	-	261
	✖	0,07	0,15	-	-	252	242	212	-	221
N	●	0,07	0,30	-	-	-	798	-	-	792
	⧓	0,07	0,25	-	-	-	703	-	-	689
	✖	0,07	0,15	-	-	-	604	-	-	590
S	●	0,07	0,25	95	94	99	89	86	63	95
	⧓	0,07	0,20	86	85	86	82	77	54	81
	✖	0,07	0,15	72	74	77	69	63	45	68

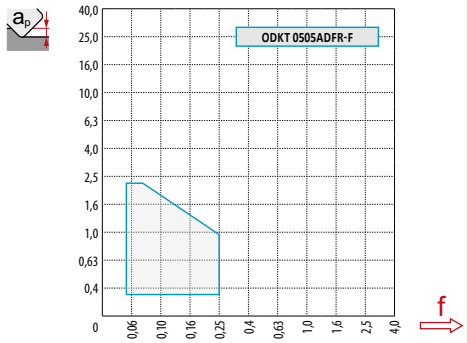


a_e/D	0,05	0,10	0,15	0,20	0,25	0,30	0,40	0,50	0,60	0,70	0,75	0,80	0,90	1,00
X.V	1,48	1,35	1,27	1,22	1,19	1,16	1,11	1,08	1,05	1,03	1,00	1,00	1,00	1,00
⇨X.f	2,87	2,05	1,69	1,48	1,33	1,23	1,09	0,75	0,94	0,90	0,89	0,88	0,88	1,00
⇨X.f	0,64	0,64	0,64	0,64	0,64	0,65	0,65	0,67	0,68	0,71	0,72	0,74	0,79	1,00

	ODKT 05-F	ODKT 05-FM	ODMT 05-FM	ODMT 05-R
r_ε	0,4	0,8	0,8	0,8
a	1,00	1,00	–	–

	RDGT 12-F	RDGT 12-FM	RDGT 12-R
r_ε	6,35	6,35	6,35
a	–	–	–

	SDKT 12-F	SDKT 12-FM	SDMT 12-F	SDMT 12-R
r_ε	0,8	0,8	0,8	0,8
a	2,30	2,30	–	–


ODKT 0505ADFR-F
ap
f
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6,3
4,0
2,5
1,6
1,0
0,63
0,4
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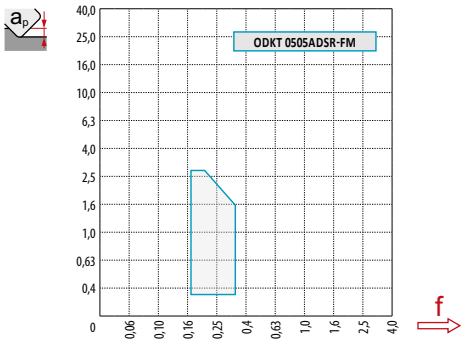
0,06
0,10
0,16
0,25
0,4
0,63
1,0
1,6
2,5
4,0


ODKT 0505ADSR-FM
ap
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6,3
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1,6
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0,4
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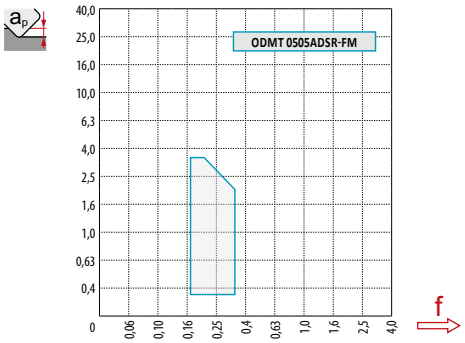
2,5
4,0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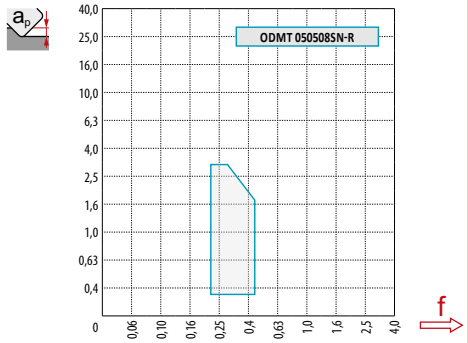
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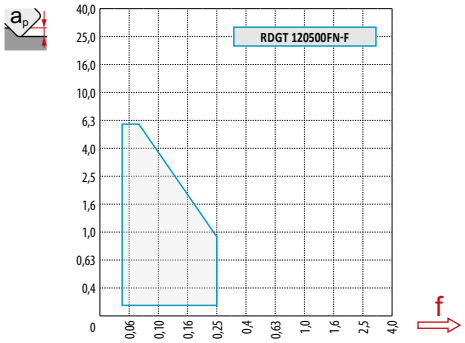
RDGT 120500FN-F
ap
f
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10,0
6,3
4,0
2,5
1,6
1,0
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0,25
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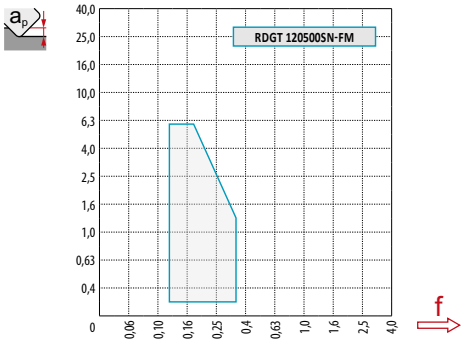
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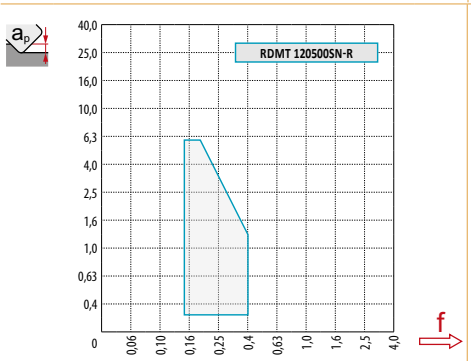
4,0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f
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10,0
6,3
4,0
2,5
1,6
1,0
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0,10
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0,4
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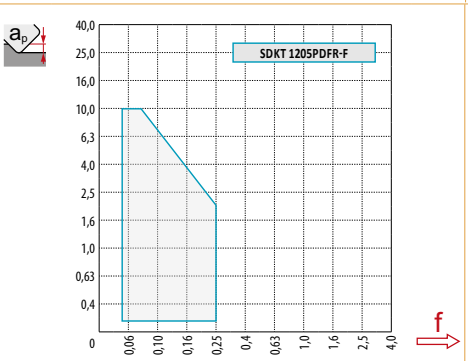
4,0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6,3
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0,4
0,63
1,0
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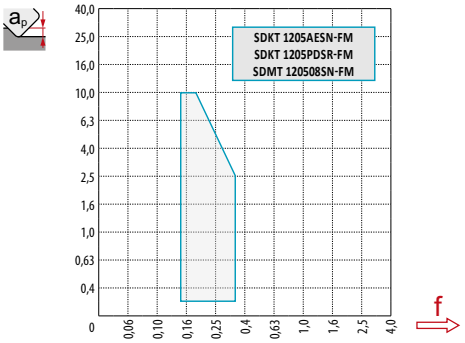
2,5
4,0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6,3
4,0
2,5
1,6
1,0
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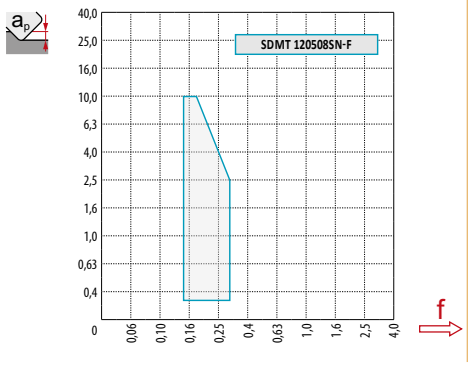
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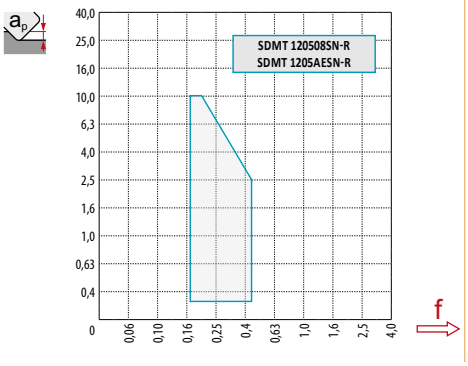
SDMT 120508SN-R
SDMT 1205AESN-R
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10,0
6,3
4,0
2,5
1,6
1,0
0,63
0,4
0
0,06
0,10
0,16
0,25
0,4
0,63
1,0
1,6
2,5
4,0

PRAMET

R

D	a_p 0,25	0,50	0,60	0,70	0,80	1,00	1,25	1,50	2,00	3,00	4,00	5,00	6,00
32	D_{ef} 23,43	24,80	25,23	25,62	25,99	26,63	27,33	27,94	28,94	30,39	31,31	31,83	32,00
40	31,43	32,80	33,23	33,62	33,99	34,63	35,33	35,94	36,94	38,39	39,31	39,83	40,00
50	41,43	42,80	43,23	43,62	43,99	44,63	45,33	45,94	46,94	48,39	49,31	49,83	50,00
63	54,43	55,80	56,23	56,62	56,99	57,63	58,33	58,94	59,94	61,39	62,31	62,83	63,00
80	71,43	72,80	73,23	73,62	73,99	74,63	75,33	75,94	76,94	78,39	79,31	79,83	80,00
100	91,43	92,80	93,23	93,62	93,99	94,63	95,33	95,94	96,94	98,39	99,31	99,83	100,00
125	116,43	117,80	118,23	118,62	118,99	119,63	120,33	120,94	121,94	123,39	124,31	124,83	125,00

D	X.V	f_{max}
32	1,36	0,28
40	1,40	0,31
50	1,43	0,33
63	1,47	0,37
80	1,52	0,42
100	1,57	0,47
125	1,62	0,52

S

a_{pmax}
10,0

S

a_p	1,0	5,0	10,0
f	0,35	0,21	0,15

D	O		R	
	α_{max} °	a_p/l	α_{max} °	a_p/l
50	4,1	7,05/100	3,8	6,2/95
63	2,7	4,6/100	2,5	4,25/100
80	1,8	3/100	1,7	2,85/100
100	1,7	2,85/100	1,6	2,65/100
125	0,7	1,1/100	0,3	0,4/100

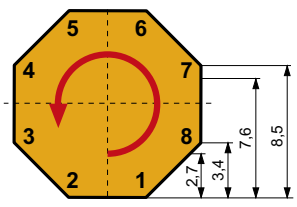
D	O				R			
	d_{min}	d_{max}	s_{max} D_{min}	s_{max} d_{max}	d_{min}	d_{max}	s_{max} D_{min}	s_{max} d_{max}
50	78,0	100,0	4,5	4,5	78,0	100,0	4,5	4,5
50	78,0	100,0	4,5	4,5	78,0	100,0	4,5	4,5
63	105,0	126,0	4,5	4,5	105,0	126,0	4,5	4,5
63	105,0	126,0	4,5	4,5	105,0	126,0	4,5	4,5
80	138,0	160,0	4,5	4,5	138,0	160,0	4,5	4,5
80	138,0	160,0	4,5	4,5	138,0	160,0	4,5	4,5
100	178,0	200,0	4,5	4,5	178,0	200,0	4,5	4,5
125	229,0	250,0	4,0	4,5	230,0	250,0	4,0	4,5

	O	R
a_p	2,4	2,3

R	R										
D	µm	3	5	10	15	20	30	40	50	60	80	100
32		0,620	0,800	1,131	1,386	1,600	1,960	2,263	2,530	2,771	3,200	3,578
40		0,693	0,894	1,265	1,549	1,789	2,191	2,530	2,828	3,098	3,578	4,000
50		0,775	1,000	1,414	1,732	2,000	2,449	2,828	3,162	3,464	4,000	4,472
63	f_e	0,869	1,122	1,587	1,944	2,245	2,750	3,175	3,550	3,888	4,490	5,020
80		0,980	1,265	1,789	2,191	2,530	3,098	3,578	4,000	4,382	5,060	5,657
100		1,095	1,414	2,000	2,449	2,828	3,464	4,000	4,472	4,899	5,657	6,325
125		1,225	1,581	2,236	2,739	3,162	3,873	4,472	5,000	5,477	6,325	7,071

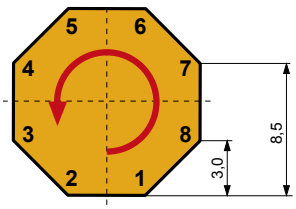
r_ε	µm	3	5	10	15	20	30	40	50	60	80	100
6,0	f_e	0,379	0,490	0,693	0,849	0,980	1,200	1,386	1,549	1,697	1,960	2,191

ODKT 05



a_p	
–> 2,7	8
–> 3,4	7
–> 7,6	4
–> 8,5	2

ODMT 05



a_p	
–> 3,0	8
–> 8,5	4

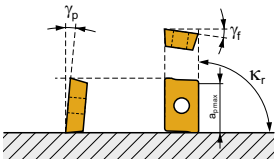
PRAMET

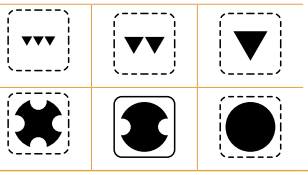
SAD07D

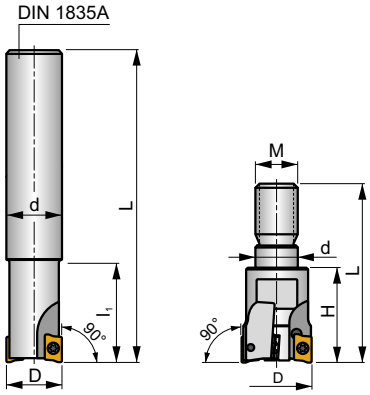
P M K N S

S

κ_r	90°
a_{pmax}	5,0 mm







h_m 0,03 - 0,08

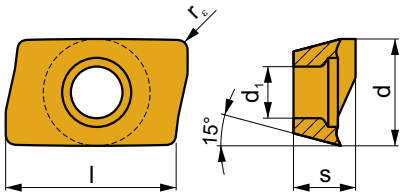
	ISO	D	L	d	l_1	H	M	γ_f°	γ_p°			max.		kg		
DIN 1835A	**10A2R018A08-SAD07D-CF**	10	100	8	18	–	–	-12	+8	2	–	61600	✓	0,03	GI276	SQ010
	10A2R018A10-SAD07D-CF	10	80	10	18	–	–	-12	+8	2	–	61600	✓	0,04	GI276	SQ010
	12A3R020A12-SAD07D-CF	12	90	12	20	–	–	-10	+8	3	–	56200	✓	0,07	GI276	SQ010
	14A3R020A12-SAD07D-CF	14	140	12	20	–	–	-9	+8	3	–	52100	✓	0,10	GI276	SQ010
	14A3R020A14-SAD07D-CF	14	90	14	20	–	–	-9	+8	3	–	52100	✓	0,09	GI276	SQ010
MODULAR	**14A3R023M08-SAD07D-CF**	14	41	8,5	–	23	M8	-9	+8	3	–	–	✓	0,02	GI276	SQ010

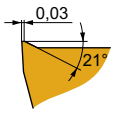
GI276	ADMX 0702..	ADEX 0702..

SQ010	US 62003A-T06P	0,6 Nm	M 2	3	Flag T06P

ADMX 07

	d	d_1	l	s
0702	4,482	2,20	6,95	2,48

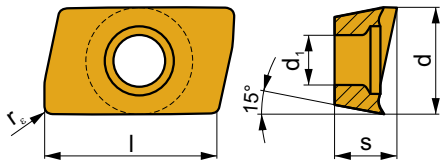


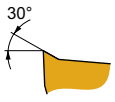


ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
ADMX 070202SR-M	**M8330**	■	◪	■		□		●	-	0,2	0,03	0,12	0,1	5,0
ADMX 070204SR-M	**M8330**	■	◪	■		□		●	-	0,4	0,03	0,12	0,1	5,0
ADMX 070208SR-M	**M6330**	◪	■			◪		●	-	0,8	0,03	0,12	0,1	5,0
	M8330	■	◪	■		□		●	-	0,8	0,03	0,12	0,1	5,0
ADMX 070220SR-M	**M8330**	■	◪	■		□		✖	-	2,0	0,03	0,12	0,1	5,0

ADEX 07-FA

	d	d_1	l	s
0702	4,497	2,20	6,95	2,48



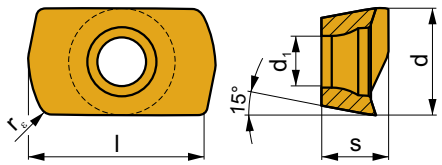


ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
ADEX 070204FR-FA	**M0315**				■			●	++	0,4	0,03	0,20	0,1	5,0
	HF7				■			●	+ / -	0,4	0,03	0,20	0,1	5,0
ADEX 070208FR-FA	**HF7**				■			●	+ / -	0,8	0,03	0,20	0,1	5,0

PRAMET

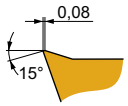
ADEX 07-HF

	d	d_1	l	s
0702	4,439	2,20	6,45	2,48



ISO		P	M	K	N	S	H		r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
ADEX 070206SR-HF	M6330	◪	■			◪		⬢	-	0,6	0,20	0,90	0,1	0,3
	M8330	■	◪	□		□	□	⬢	-	0,6	0,20	0,90	0,1	0,3
	M8340	■	■	□		◪		⬢	+ / -	0,6	0,20	0,90	0,1	0,3

HFC

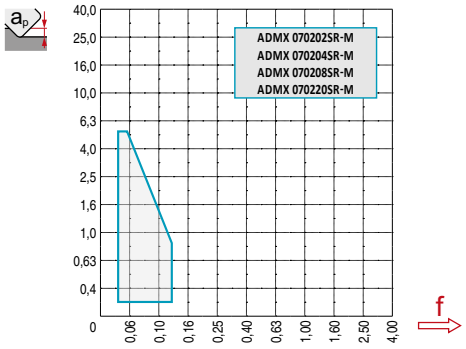


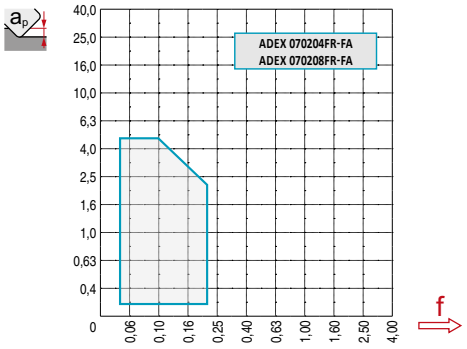
ISO		f_{min}	f_{max}	M6330	M8330	M8340	HF7	M0315
P	●	0,03	0,12	255	278	260	-	-
	⬢	0,03	0,08	225	244	225	-	-
	✖	0,03	0,05	200	216	195	-	-
M	●	0,03	0,12	165	162	155	-	-
	⬢	0,03	0,08	145	144	135	-	-
	✖	0,03	0,05	125	126	115	-	-
K	●	0,03	0,12	-	264	240	-	-
	⬢	0,03	0,08	-	238	215	-	-
	✖	0,03	0,05	-	210	185	-	-
N	●	0,03	0,20	-	-	-	306	684
	⬢	0,03	0,16	-	-	-	275	612
	✖	0,03	0,12	-	-	-	239	536
H	●	0,03	0,12	80	78	75	-	-
	⬢	0,03	0,08	70	70	65	-	-
	✖	0,03	0,05	60	62	55	-	-

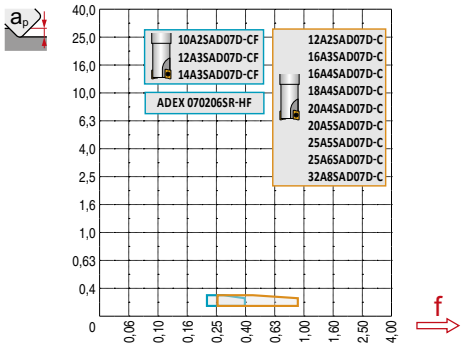
HFC		f_{min}	f_{max}	M8330	M8340	M6330
P	●	0,20	0,90	265	250	235
	⬢	0,20	0,70	235	220	210
	✖	0,20	0,50	205	190	180
M	●	0,20	0,90	160	150	165
	⬢	0,20	0,70	140	130	145
	✖	0,20	0,50	125	115	127
K	●	0,20	0,90	250	235	–
	⬢	0,20	0,70	220	205	–
	✖	0,20	0,50	190	180	–
S	●	0,20	0,70	70	65	73
	⬢	0,20	0,60	60	55	65
	✖	0,20	0,50	55	50	56
H	●	0,10	0,20	52	–	–
	⬢	0,10	0,20	42	–	–
	✖	0,10	0,20	40	–	–

a_e/D	0,05	0,10	0,15	0,20	0,25	0,30	0,40	0,50	0,60	0,70	0,75	0,80	0,90	1,00
X.V	1,48	1,35	1,27	1,22	1,19	1,16	1,11	1,08	1,05	1,03	1,00	1,00	1,00	1,00
⇨X.f	2,87	2,05	1,69	1,48	1,33	1,23	1,09	0,75	0,94	0,90	0,89	0,88	0,88	1,00
⇨X.f	0,64	0,64	0,64	0,64	0,64	0,65	0,65	0,67	0,68	0,71	0,72	0,74	0,79	1,00

	ADMX 07-M				ADEX 07-HF	ADEX 07-FA	
r_ε	0,2	0,4	0,8	2,0	0,6	0,4	0,8
a	1,38	0,89	0,54	0,33	–	0,94	0,55







	ADEX 07-HF			
D	a_p	0	0,1	0,2	0,3
10		5,6	7,8	8,7	9,4
12		7,6	9,8	10,7	11,4
14		9,6	11,8	12,7	13,4
16	D_{ef}	11,6	13,8	14,7	15,4
18		13,6	15,8	16,7	17,4
20		15,6	17,8	18,7	19,4
25		20,6	22,8	23,7	24,4
32		27,6	29,8	30,7	31,4

	HFC		
a_p	0,1	0,2	0,3
1 ⇨f	0,9	0,8	0,6

D	α_{max} °	a_p/l	HFC α_{max} °	HFC α_{max} °	HFC a_p/l
10	5,2	5,0/56	3,5	3,5	0,3/6
12	3,4	5,0/86	2,2	2,2	0,3/9
14	2,5	4,2/100	1,6	1,6	0,3/12
16	1,9	3,2/100	1,3	1,3	0,3/15
18	1,7	2,8/100	1,1	1,1	0,3/17
20	1,5	2,5/100	0,9	0,9	0,3/21
25	1,1	1,8/100	0,7	0,7	0,3/26
32	0,8	1,2/100	0,5	0,5	0,3/36

a_p	1,0	3,0	5,0
1 ⇨f	0,13	0,08	0,05

HFC a_p	0,1	0,2	0,3
1 ⇨f	0,7	0,6	0,4

PRAMET

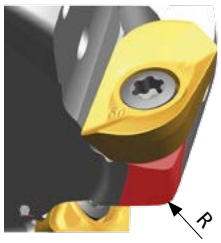
D	d_{min}	d_{max}	s_{max} d_{min}	s_{max} d_{max}
10	12,0	20,0	0,5	2,8
12	16,0	24,0	0,7	2,2
14	20,0	28,0	0,8	1,9
16	24,0	32,0	0,8	1,6
18	28,0	36,0	0,9	1,6
20	32,0	40,0	0,9	1,6
25	42,0	50,0	1,0	1,5
32	56,0	64,0	1,0	1,4

	HFC			
D	d_{min}	d_{max}	s_{max} d_{min}	s_{max} d_{max}
10	12	20	0,30	0,30
12	16	24	0,30	0,30
14	20	28	0,30	0,30
16	24	32	0,30	0,30
18	28	36	0,30	0,30
20	32	40	0,30	0,30
25	42	50	0,30	0,30
32	56	64	0,30	0,30

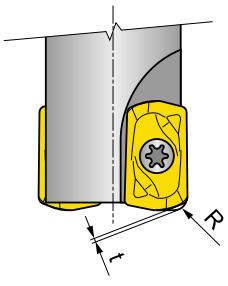
a_p	HFC
0,9	0,3

max
3,9

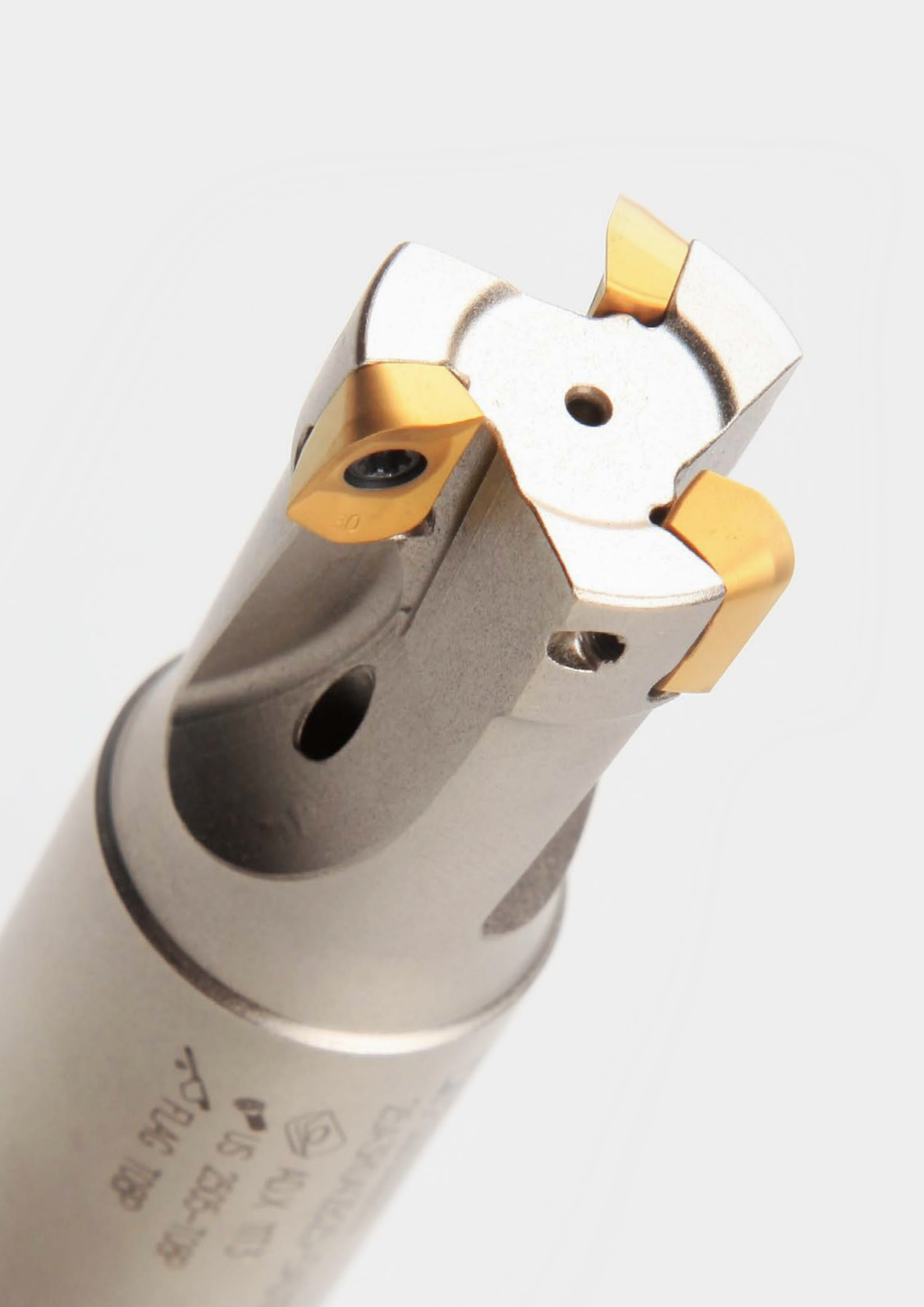
D	µm	3	5	10	15	20	30	40	50	60	80	100
10		0,346	0,447	0,632	0,775	0,894	1,095	1,265	1,414	1,549	1,789	2,000
12		0,379	0,490	0,693	0,849	0,980	1,200	1,386	1,549	1,697	1,960	2,191
14		0,410	0,529	0,748	0,917	1,058	1,296	1,497	1,673	1,833	2,117	2,366
16	f_e	0,438	0,566	0,800	0,980	1,131	1,386	1,600	1,789	1,960	2,263	2,530
18		0,465	0,600	0,849	1,039	1,200	1,470	1,697	1,897	2,078	2,400	2,683
20		0,490	0,632	0,894	1,095	1,265	1,549	1,789	2,000	2,191	2,530	2,828
25		0,548	0,707	1,000	1,225	1,414	1,732	2,000	2,236	2,449	2,828	3,162
32		0,620	0,800	1,131	1,386	1,600	1,960	2,263	2,530	2,771	3,200	3,578



ADMX 07	R
ADMX 070216SR-M	1
ADMX 070220SR-M	1,5



ADEX 07	R	t
	[mm]	[mm]
ADEX 070206SR-HF	0,8	0,18



ECONOMICAL TOOLS FOR SHOULDER MILLING

Our range of tools for economical milling has been expanded with small diameter cutters for low depth of cut.
New economical inserts SOMT 05 with 4 cutting edges for general machining.

FEATURES & BENEFITS

- Small diameter cutters – wide range 12-40 mm
- Single sided with 4 cutting edges
- Insert radii 0,4 and 0,8 mm
- Depth of cut up to 4,5 mm
- High performance grades for milling steels and stainless steels
- For shoulder milling, face milling, and shallow slot milling and plunging
- **Low costs** – price per cutting edge
- **Productivity** – high number of teeth
- Suitable for milling small parts on light duty machines
- Range of cutters ideally suited for turn-milling

INSERT GEOMETRIES

M

GEOMETRY M

Particularly suited to light and medium machining

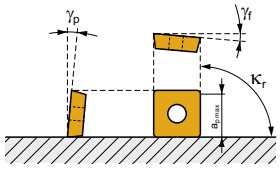
- Suitable mainly for steels, stainless steels and cast iron
- Sharp geometry with narrow positive T-land

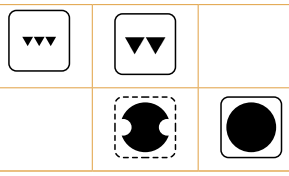
SSO05O

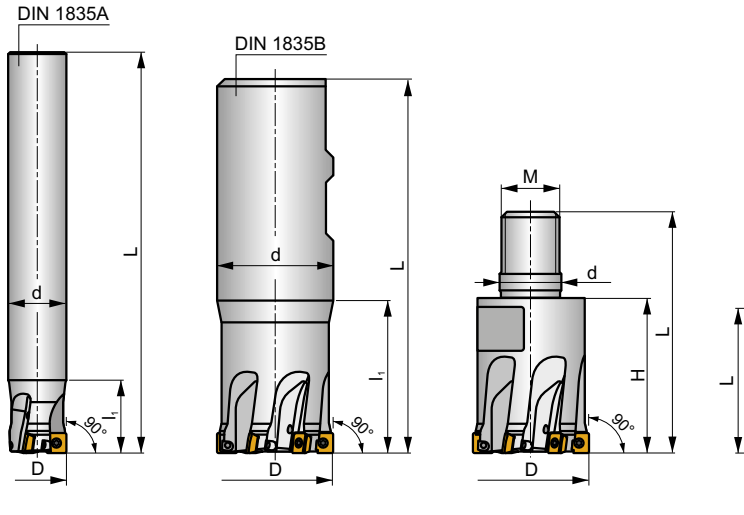
P M K N S

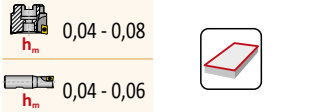
S

κ_r	90°
a_{pmax}	4,5 mm









	ISO	D	L	d	d_1	l_1	H	M	k_r	b	t	γ_f°	γ_p°			max.		kg			
DIN 1835A	**12A2R018A10-SSO05O-C**	12	90	10	–	18	–	–	90	–	–	-8	8	2	–	58000	#	0,04	GI327	SQ330	–
	12A2R018A12-SSO05O-C	12	90	12	–	18	–	–	90	–	–	-8	8	2	–	58000	#	0,06	GI327	SQ330	–
	16A3R020A14-SSO05O-C	16	110	14	–	20	–	–	90	–	–	-5	8	3	–	50300	#	0,11	GI327	SQ330	–
	16A3R020A16-SSO05O-C	16	110	16	–	20	–	–	90	–	–	-5	8	3	–	50300	#	0,15	GI327	SQ330	–
	20A4R020A18-SSO05O-C	20	125	18	–	20	–	–	90	–	–	-5	8	4	#	45000	#	0,21	GI327	SQ330	–
	20A4R020A20-SSO05O-C	20	125	20	–	20	–	–	90	–	–	-5	8	4	#	45000	#	0,26	GI327	SQ330	–
	25A5R024A25-SSO05O-C	25	140	25	–	24	–	–	90	–	–	-5	8	5	#	40200	#	0,48	GI327	SQ330	–
DIN 1835B	**20A4R032B20-SSO05O-C**	20	83	20	–	32	–	–	90	–	–	-5	8	4	#	45000	#	0,16	GI327	SQ330	–
	25A5R042B25-SSO05O-C	25	99	25	–	42	–	–	90	–	–	-5	8	5	#	40200	#	0,31	GI327	SQ330	–
	32A6R042B32-SSO05O-C	32	103	32	–	42	–	–	90	–	–	-4,5	8	6	#	35500	#	0,54	GI327	SQ330	–
	40A8R050B32-SSO05O-C	40	111	32	–	50	–	–	90	–	–	-4	8	8	#	31800	#	0,65	GI327	SQ330	–
MODULAR	**12A2R020M06-SSO05O-C**	12	35	6,5	–	–	20	M6	90	–	–	-8	8	2	–	–	#	0,01	GI327	SQ330	–
	16A3R023M08-SSO05O-C	16	41	8,5	–	–	23	M8	90	–	–	-5	8	3	–	–	#	0,03	GI327	SQ330	–
	20A4R030M10-SSO05O-C	20	49	10,5	–	–	30	M10	90	–	–	-5	8	4	#	–	#	0,05	GI327	SQ330	–
	25A5R035M12-SSO05O-C	25	57	12,5	–	–	35	M12	90	–	–	-5	8	5	#	–	#	0,09	GI327	SQ330	–
	32A6R043M16-SSO05O-C	32	66	17	–	–	43	M16	90	–	–	-4,5	8	6	#	–	#	0,21	GI327	SQ330	–
ISO 6462 DIN 8030	**32A06R-S90SO05O-C**	32	32	16	12,4	–	–	–	90	8,4	5,6	-4,5	8	6	#	35500	#	0,10	GI327	SQ332	–
	40A08R-S90SO05O-C	40	40	22	18,1	–	–	–	90	10,4	6,3	-4	8	8	#	31800	#	0,19	GI327	SQ333	–

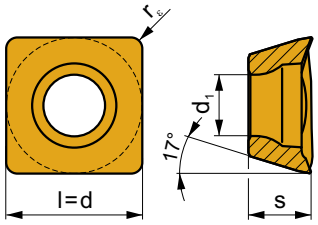
GI327	SOMT 0502..

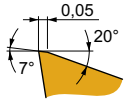
		Nm						
SQ330	US 62204-T07P	0,8	M 2,2	4,1	Flag T07P	–	–	–
SQ332	US 62204-T07P	0,8	M 2,2	4,1	–	D-T07P/T09P	FG-15	HS 90835
SQ333	US 62204-T07P	0,8	M 2,2	4,1	–	D-T07P/T09P	FG-15	HS 1030C

PRAMET

SOMT 05

	d	d_1	l	s
0502	5,570	2,5	5,570	2,63



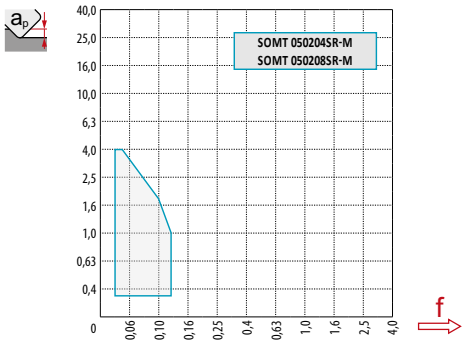


ISO		P	M	K	N	S	H		r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
SOMT 050204SR-M	M9340	◪	■			◪		●	- - -	0,4	0,03	0,09	0,4	4,5
	M6330	◪	■			◪		⬣	-	0,4	0,03	0,12	0,4	4,5
	M8310	■	◪	◪		◪		●	-	0,4	0,03	0,12	0,4	4,5
	M8330	■	◪	◪	□	□		●	-	0,4	0,03	0,12	0,4	4,5
	M8340	■	■	◪		◪		⬣	+ / -	0,4	0,03	0,12	0,4	4,5
	8215	■	◪	◪	□	◪		●	-	0,4	0,03	0,12	0,4	4,5
SOMT 050208SR-M	M6330	◪	■			◪		⬣	-	0,8	0,03	0,12	0,4	4,5
	M8330	■	◪	◪	□	□		⬣	-	0,8	0,03	0,12	0,4	4,5
	M8340	■	■	◪		◪		⬣	+ / -	0,8	0,03	0,12	0,4	4,5
	8215	■	◪	◪	□	◪		⬣	-	0,8	0,03	0,12	0,4	4,5

ISO		f_{min}	f_{max}	M9340	M6330	M8310	M8330	M8340	8215
P	●	0,03	0,12	280	255	290	278	260	280
	⬣	0,03	0,08	250	225	260	244	225	240
	✖	0,03	0,05	220	200	235	216	195	205
M	●	0,03	0,12	165	165	175	160	155	165
	⬣	0,03	0,08	150	145	155	140	135	140
	✖	0,03	0,05	130	125	140	120	115	120
K	●	0,03	0,12	-	-	275	264	240	260
	⬣	0,03	0,08	-	-	250	238	215	230
	✖	0,03	0,05	-	-	220	210	185	195
N	●	0,03	0,12	-	-	-	1017	-	1010
	⬣	0,03	0,08	-	-	-	898	-	880
	✖	0,03	0,05	-	-	-	461	-	450
S	●	0,03	0,12	80	80	85	78	75	80
	⬣	0,03	0,08	75	70	75	68	65	70
	✖	0,03	0,05	60	60	65	58	55	60

a_e/D	0,05	0,10	0,15	0,20	0,25	0,30	0,40	0,50	0,60	0,70	0,75	0,80	0,90	1,00
X.V	1,48	1,35	1,27	1,22	1,19	1,16	1,11	1,08	1,05	1,03	1,00	1,00	1,00	1,00
⇨X.f	2,87	2,05	1,69	1,48	1,33	1,23	1,09	0,75	0,94	0,90	0,89	0,88	0,88	1,00
⇨X.f	0,64	0,64	0,64	0,64	0,64	0,65	0,65	0,67	0,68	0,71	0,72	0,74	0,79	1,00

	SOMT 05-M	
r_ε	0,4	0,8
a	–	–



max
1,5

a_p	1,0	2,0	4,0
1 ⇨f	0,12	0,08	0,03

ECONOMICAL HIGH FEED MILLING TOOLS

New range of versatile cutters with HFC inserts featuring four edges for productive machining of a wide range of materials. Its unique pocket design can also carry inserts for shoulder milling, offering a complete package for mold and die applications, from roughing to finishing.

FEATURES & BENEFITS

- Cutters for copy milling, ramping, helical interpolation, slotting and plunging. Also, for face and shoulder milling
- BNGX10 inserts for high feed roughing
- ANHX10 for finishing operations
- Three geometries suitable for wide range of materials (see below for details)
- Unique design for smoother cut
- Wide range of cutter diameters (16 - 42 mm) and types (end mills, modular and shell mills)
- Special through coolant design directs lubrication nearer to cutting edges
- **Complete mold and die offer** - One cutter enables machining from roughing to finishing
- **Productivity** - High feed rates with axial depth of cut up to 1mm
- **Process security** - Higher ramping angle improves chip control
- **Adaptable** - Suitable for unstable set-ups and excessive overhang
- **Cost savings** - versatile cutters with BNGX10 inserts featuring four cutting edges

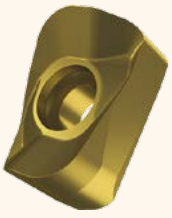
INSERT TYPES

BNGX

BNGX 10

High feed roughing

- Double sided insert with four cutting edges
- HFC design makes it suitable for high feed roughing even with long overhang
- Compatible with three geometries covering most machined materials



ANHX

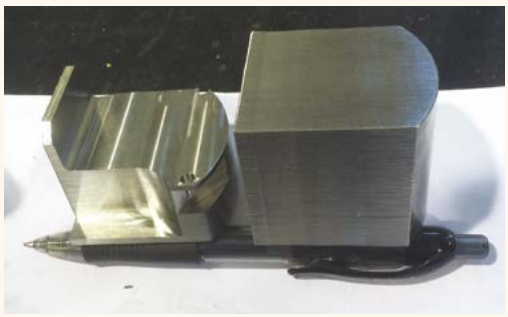
ANHX 10

Finishing, shoulder and face milling

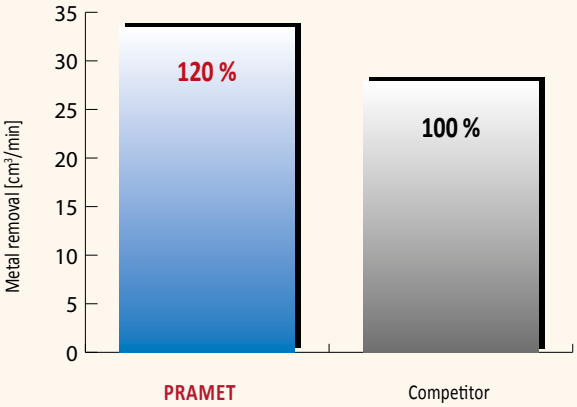
- Single sided insert with two cutting edges
- Positive geometry suitable for long overhang, decreased vibrations and lower noise during finishing

BNGX10 - MACHINING EXAMPLE

Material: DIN 1.4541 (900Mpa)
Material group: M
Workpiece: AIRCRAFT PARTS
Insert: **BNGX 10T308SR-MM:M8345**
Coolant: Yes



			PRAMET	Competitor
Operation			High feed copy milling	
Tool			32E6R040M16--SBN10-C	D=32 mm; 5 teeth
Cutting speed	v_c	m/min	80	80
Feed tooth	f_z	mm/tooth	0,5	0,5
Feed	f	mm/min	2389	1990
Axial depth of cut	a_p	mm	0,7	0,7
Radial depth of cut	a_e	mm	20	20
Metal removal	Q	cm³/min	33,4	27,9
Durability	T	min	44	19,5
		pcs	8	3



After 8 pieces | After 3 pieces

BNGX10 INSERT GEOMETRIES

M

GEOMETRY M

- Steels and cast irons

MM

GEOMETRY MM

- Low carbon steels, stainless steels and super alloys

HM

GEOMETRY HM

- Hardened steel

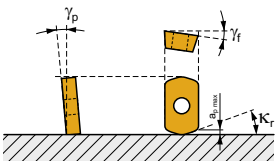
PRAMET

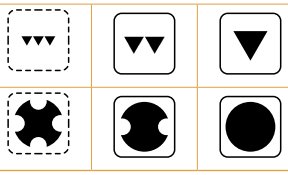
SBN10

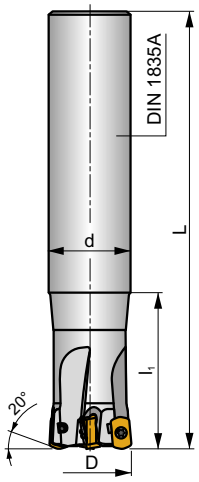
P M K S H

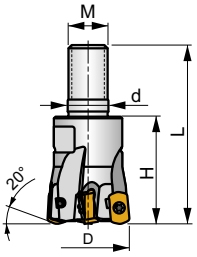
S

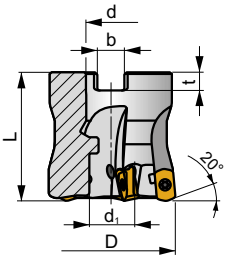
κ_r	20°
a_{pmax}	1,0 mm











h_m 0,17-0,41

h_m 0,17-0,41

	ISO	D	L	d	d_1	l_1	H	M	b	t	γ_p°	γ_f°			max.		kg		
	16E2R030A16-SBN10-C	16	100	16	–	30	–	–	–	–	-10	-12	2	–	31100	✓	0,12	GI329	CO310
	16E2R050A16-SBN10-C	16	150	16	–	50	–	–	–	–	-10	-12	2	–	31100	✓	0,18	GI329	CO310
	16E2R030A14-SBN10-C	16	150	14	–	30	–	–	–	–	-10	-12	2	–	31100	✓	0,15	GI329	CO310
	18E2R030A16-SBN10-C	18	150	16	–	30	–	–	–	–	-10	-11	2	–	29200	✓	0,20	GI329	CO310
	20E3R040A20-SBN10-C	20	130	20	–	40	–	–	–	–	-10	-10	3	–	27700	✓	0,25	GI329	CO310
	20E3R080A20-SBN10-C	20	160	20	–	80	–	–	–	–	-10	-10	3	–	27700	✓	0,29	GI329	CO310
	20E3R040A18-SBN10-C	20	180	18	–	40	–	–	–	–	-10	-10	3	–	27700	✓	0,30	GI329	CO310
	20E4R040A20-SBN10-C	20	130	20	–	40	–	–	–	–	-10	-10	4	–	27700	✓	0,26	GI329	CO310
DIN 1835A	**25E4R050A25-SBN10-C**	25	140	25	–	50	–	–	–	–	-10	-9	4	✓	24800	✓	0,42	GI329	CO310
	25E4R100A25-SBN10-C	25	180	25	–	100	–	–	–	–	-10	-9	4	✓	24800	✓	0,51	GI329	CO310
	25E4R050A22-SBN10-C	25	220	22	–	50	–	–	–	–	-10	-9	4	✓	24800	✓	0,54	GI329	CO310
	25E5R050A25-SBN10-C	25	140	25	–	50	–	–	–	–	-10	-9	5	–	24800	✓	0,50	GI329	CO310
	32E5R070A32-SBN10-C	32	150	32	–	70	–	–	–	–	-10	-8	5	✓	21900	✓	0,73	GI329	CO310
	32E6R070A32-SBN10-C	32	150	32	–	70	–	–	–	–	-10	-8	6	✓	21900	✓	0,73	GI329	CO310
	32E5R120A32-SBN10-C	32	200	32	–	120	–	–	–	–	-10	-8	5	✓	21900	✓	0,94	GI329	CO310
	35E5R050A32-SBN10-C	35	200	32	–	50	–	–	–	–	-10	-7,5	5	✓	21000	✓	1,08	GI329	CO310
	35E6R050A32-SBN10-C	35	200	32	–	50	–	–	–	–	-10	-7,5	6	✓	21000	✓	1,08	GI329	CO310
	16E2R025M08-SBN10-C	16	43	8,5	–	–	25	M8	–	–	-10	-12	2	–	31100	✓	0,03	GI329	CO310
	18E2R025M08-SBN10-C	18	43	8,5	–	–	25	M8	–	–	-10	-11	2	–	29200	✓	0,03	GI329	CO310
	20E3R030M10-SBN10-C	20	49	10,5	–	–	30	M10	–	–	-10	-10	3	–	27700	✓	0,05	GI329	CO310
	20E4R030M10-SBN10-C	20	49	10,5	–	–	30	M10	–	–	-10	-10	4	–	27700	✓	0,05	GI329	CO310
MODULAR	**25E4R033M12-SBN10-C**	25	55	12,5	–	–	33	M12	–	–	-10	-9	4	✓	24800	✓	0,08	GI329	CO310
	25E5R033M12-SBN10-C	25	55	12,5	–	–	33	M12	–	–	-10	-9	5	–	24800	✓	0,19	GI329	CO310
	28E5R035M12-SBN10-C	28	57	12,5	–	–	35	M12	–	–	-10	-8,5	5	✓	23400	✓	0,10	GI329	CO310
	32E5R040M16-SBN10-C	32	63	17	–	–	40	M16	–	–	-10	-8	5	✓	21900	✓	0,19	GI329	CO310
	32E6R040M16-SBN10-C	32	63	17	–	–	40	M16	–	–	-10	-8	6	✓	21900	✓	0,19	GI329	CO310
	35E6R043M16-SBN10-C	35	66	17	–	–	43	M16	–	–	-10	-7,5	6	✓	21000	✓	0,22	GI329	CO310

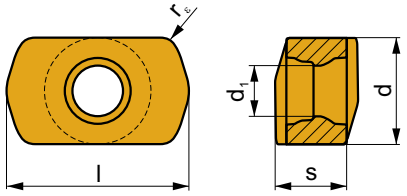
	ISO	D	L	d	d_1	l_1	H	M	b	t	γ_p°	γ_f°			max.		kg		
MODULAR	**40E6R043M16-SBN10-C**	40	66	17	–	–	43	M16	–	–	-10	-7	6	✓	19600	✓	0,26	GI329	CO310
	40E7R043M16-SBN10-C	40	66	17	–	–	43	M16	–	–	-10	-7	7	✓	19600	✓	0,26	GI329	CO310
ISO 6462 DIN 8030	**40A05R-SMOBN10-C**	40	40	16	14,1	–	–	–	8,4	5,6	-10	-7	5	✓	19600	✓	0,21	GI329	CO312
	40A07R-SMOBN10-C	40	40	16	14,1	–	–	–	8,4	5,6	-10	-7	7	✓	19600	✓	0,22	GI329	CO312
	42A05R-SMOBN10-C	42	40	16	14,1	–	–	–	8,4	5,6	-10	-7	5	✓	19100	✓	0,23	GI329	CO312
	42A07R-SMOBN10-C	42	40	16	14,1	–	–	–	8,4	5,6	-10	-7	7	✓	19100	✓	0,24	GI329	CO312

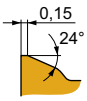
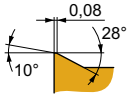
GI329	BNGX 10T3..	ANHX 10T3..

		Nm						
CO310	US42507-T07P	0,9	M 2,5	7	–	–	Flag T07P	–
CO312	US42507-T07P	0,9	M 2,5	7	D-T07P/T09P	FG-15	–	HS0830C

BNGX 10

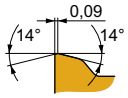
	d	d_1	l	s
10T3	5,800	2,76	9,92	3,90



		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
1 U S		**BNGX 10T308SR-M**	**M9325**	■	□					⬢	- - -	0,8	0,20	1,05	0,3	1,0
			M6330	◪	□					✖	-	0,8	0,20	1,40	0,3	1,0
			M8310	■	□	■			◪	⬢	-	0,8	0,20	1,40	0,3	1,0
			M8330	■	□	■			◪	⬢	-	0,8	0,20	1,40	0,3	1,0
			M8340	■	□	◪				✖	+ / -	0,8	0,20	1,40	0,3	1,0
			M8345	■	□					✖	+ / -	0,8	0,20	1,40	0,3	1,0
			8215	■	□	■			◪	⬢	-	0,8	0,20	1,40	0,3	1,0
HFC S		**BNGX 10T308SR-MM**	**M9325**	◪	◪			◪		⬢	- - -	0,8	0,20	0,83	0,3	1,0
			M9340	◪	■			■		⬢	- - -	0,8	0,20	0,83	0,3	1,0
			M6330	◪	■			■		⬢	-	0,8	0,25	1,10	0,3	1,0
			M8310	◪	◪	□		□		⬢	-	0,8	0,25	1,10	0,3	1,0
			M8330	◪	◪	□	□	□		⬢	-	0,8	0,25	1,10	0,3	1,0
			M8340	◪	■	□		■		⬢	+ / -	0,8	0,25	1,10	0,3	1,0
			M8345	◪	■			■		⬢	+ / -	0,8	0,25	1,10	0,3	1,0

PRAMET

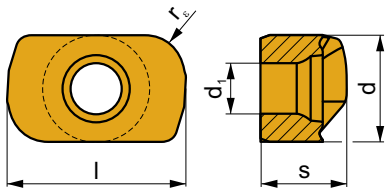
ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
BNGX 10T308SR-HM	M8310	□		■			■	✖	-	0,8	0,10	1,00	0,1	1,0
	M8330	□		■			◪	✖	-	0,8	0,10	1,00	0,1	1,0
	8215	□		■			■	✖	-	0,8	0,10	1,00	0,1	1,0



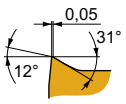
ISO		f_{min}	f_{max}	M9325	M9340	M6330	M8310	M8330	M8340	M8345	8215
P	●	0,20	1,40	296	264	212	267	244	222	177	257
	⧓	0,20	1,16	272	243	195	246	224	204	162	236
	✖	0,20	0,93	234	209	167	205	187	175	140	194
M	●	0,25	1,10	149	155	149	127	137	132	104	142
	⧓	0,25	0,88	137	143	137	117	126	121	95	130
	✖	0,25	0,66	117	123	117	100	108	104	82	112
K	●	0,20	1,50	–	–	–	253	230	208	–	242
	⧓	0,20	1,25	–	–	–	233	211	191	–	223
	✖	0,20	1,00	–	–	–	200	181	164	–	191
S	●	0,20	0,90	68	72	65	59	63	59	47	–
	⧓	0,20	0,77	62	66	60	54	58	54	43	–
	✖	0,10	0,66	53	57	52	46	50	46	37	–
H	●	0,05	0,70	–	–	–	53	48	–	–	51
	⧓	0,05	0,56	–	–	–	49	45	–	–	47
	✖	0,05	0,42	–	–	–	42	38	–	–	40

ANHX 10

	d	d_1	l	s
10T3	5,800	2,76	9,72	4,70



ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
ANHX 10T320SR-F	M8310	■	◪	□		□	◪	●	-	2,0	0,05	0,15	0,1	3,0
	M8330	■	◪	□	□	□	◪	✖	-	2,0	0,05	0,15	0,1	3,0
	M8340	■	◪	□		◪		✖	+ / -	2,0	0,05	0,15	0,1	3,0

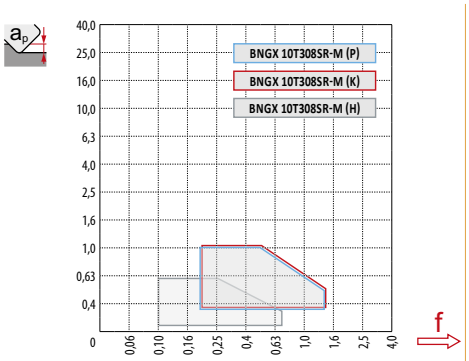


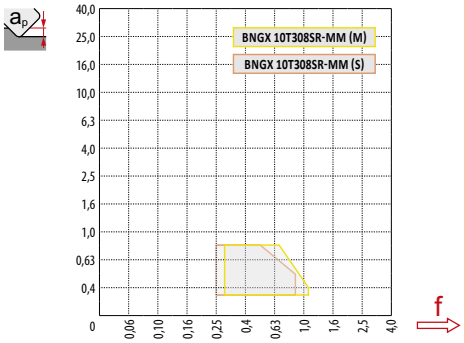
ISO		f_{min}	f_{max}	M8310	M8330	M8340
P	●	0,05	0,15	400	323	323
	●	0,05	0,12	368	297	297
	✖	0,05	0,10	316	255	255
M	●	0,05	0,15	203	190	213
	●	0,05	0,12	186	175	196
	✖	0,05	0,09	160	150	168
K	●	0,05	0,15	378	303	340
	●	0,05	0,12	347	278	313
	✖	0,05	0,10	298	239	269
S	●	0,05	0,15	90	85	95
	●	0,05	0,13	83	78	87
	✖	0,05	0,11	71	67	75
H	●	0,05	0,15	78	70	-
	●	0,05	0,12	71	64	-
	✖	0,05	0,09	61	55	-

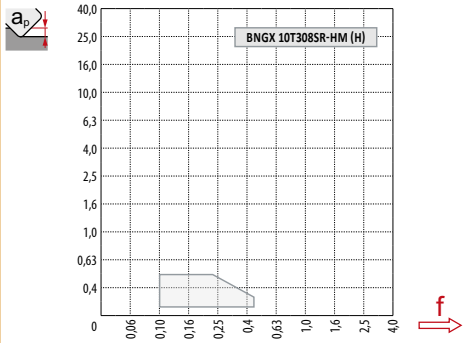
a_e / D	0,05	0,10	0,15	0,20	0,25	0,30	0,40	0,50	0,60	0,70	0,75	0,80	0,90	1,00
X.V	1,48	1,35	1,27	1,22	1,19	1,16	1,11	1,08	1,05	1,03	1,00	1,00	1,00	1,00
X.f	2,87	2,05	1,69	1,48	1,33	1,23	1,09	0,75	0,94	0,90	0,89	0,88	0,88	1,00
X.f	0,64	0,64	0,64	0,64	0,64	0,65	0,65	0,67	0,68	0,71	0,72	0,74	0,79	1,00

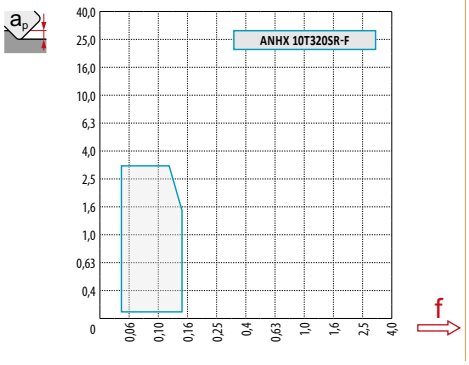
	BNGX 10-M	BNGX 10-MM	BNGX 10-HM
r_ε	0,8	0,8	0,8
a	–	–	–

	ANHX 10 - F
r_ε	2,0
a	0,92









BNGX 10 (HFC)

D	a_p	0,00	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00
16	D_{ef}	9,40	12,85	13,36	13,80	14,20	14,56	14,88	15,19	15,47
18		11,40	14,85	15,36	15,80	16,20	16,56	16,88	17,19	17,47
20		13,40	16,85	17,36	17,80	18,20	18,56	18,88	19,19	19,47
25		18,40	21,85	22,36	22,80	23,20	23,56	23,88	24,19	24,47
32		25,40	28,85	29,36	29,80	30,20	30,56	30,88	31,19	31,47
35		28,40	31,85	32,36	32,80	33,20	33,56	33,88	34,19	34,47
40		33,40	36,85	37,36	37,80	38,20	38,56	38,88	39,19	39,47
42		35,40	38,85	39,36	39,80	40,20	40,56	40,88	41,19	41,47

	a_p	0,00	0,30	0,40	0,50	0,60	0,70	0,80	0,90	1,00
	1 f	–	1,30	1,10	0,90	0,80	0,72	0,68	0,65	0,50

BNGX 10

D	max	f_{max}
16	3,5	0,12
18	3,5	0,12
20	4,0	0,15
25	4,0	0,15
28	4,0	0,17
32	4,0	0,17
35	4,0	0,17
40	4,0	0,17
42	4,0	0,17

BNGX 10 (HFC)

a_p	0,3	0,6	1,0
1 f	1,10	0,60	0,30

BNGX 10 (HFC)

D	α_{max} °	a_p/l
16	4,0	1/16
18	4,0	1/16
20	4,0	1/16
25	2,8	1/22
28	2,3	1/26
32	1,9	1/32
35	1,7	1/35
40	1,3	1/46
42	1,3	1/46

ANHX 10

D	α_{max} °	a_p/l
16	1,6	2,65/100
18	1,3	2,15/100
20	1,1	1,80/100
25	0,8	1,25/100
28	0,7	1,10/100
32	0,5	0,75/100
35	0,5	0,75/100
40	0,4	0,55/100
42	0,4	0,55/100

BNGX 10 (HFC)

D	a_p	f_{max}
16	0,4	0,15
18	0,7	0,15
20	0,7	0,15
25	0,7	0,15
32	0,7	0,2
35	0,7	0,2
40	0,7	0,2
42	0,7	0,2

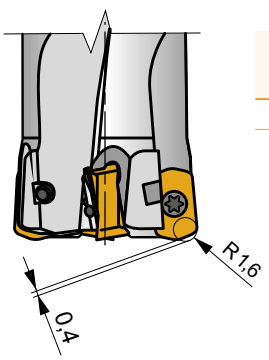
BNGX 10 (HFC)

D	d_{min}	d_{max}	s_{max} / d_{min}	s_{max} / d_{max}
16	22,4	31,8	0,5	0,5
18	25,4	35,8	0,5	0,5
20	29,4	39,8	0,5	0,5
25	39,4	49,8	0,5	0,5
28	45,4	55,8	0,5	0,5
32	53,4	63,8	0,5	0,5
35	59,4	69,8	0,5	0,5
40	69,4	79,8	0,5	0,5
42	73,4	83,8	0,5	0,5

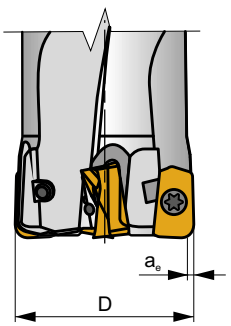
D	µm	3	5	10	15	20	30	40	50	60	80	100
16	f_e	0,438	0,566	0,800	0,980	1,131	1,386	1,600	1,789	1,960	2,263	2,530
18		0,465	0,600	0,849	1,039	1,200	1,470	1,697	1,897	2,078	2,400	2,683
20		0,490	0,632	0,894	1,095	1,265	1,549	1,789	2,000	2,191	2,530	2,828
25		0,548	0,707	1,000	1,225	1,414	1,732	2,000	2,236	2,449	2,828	3,162
32		0,620	0,800	1,131	1,386	1,600	1,960	2,263	2,530	2,771	3,200	3,578
35		0,648	0,837	1,183	1,449	1,673	2,049	2,366	2,646	2,898	3,347	3,742
40		0,693	0,894	1,265	1,549	1,789	2,191	2,530	2,828	3,098	3,578	4,000
42		0,710	0,917	1,296	1,587	1,833	2,245	2,592	2,898	3,175	3,666	4,099

ANHX 10

r_ε	µm	3	5	10	15	20	30	40	50	60	80	100
2,0	f_e	0,219	0,283	0,400	0,490	0,566	0,693	0,800	0,894	0,980	1,131	1,265



	R	t
BNGX 10T308	1,60	0,44



	max a_e/D
ANHX 10T320	0,05

PRODUCTIVE COPY MILLING CUTTERS

We have expanded our existing line of SRC copy milling tools with a new range of smaller diameter cutters. Also, we have added a range of RCMT10 inserts to support a variety of cutters which offer versatile and productive machining.

FEATURES & BENEFITS

- Suitable for face milling, helical interpolation, ramping, progressive plunging and high feed cutting
- RCMT10 inserts designed to allow high feed per tooth, bigger depth of cut up to 5 mm and high durability
- Compatible with three geometries suitable for a wide range of materials (see below for details)
- Double negative design for stable cutting action
- Comprehensive assortment of cutters (end mills, modular and shell mills) and diameters 25-66 mm.
- All cutters feature through coolant
- **Universal** - Designed for copy milling from roughing to finishing
- **Productive** - Copy milling cutters with higher number of teeth
- **High metal removal rate** - Roughing with up to 5 mm depth of cut
- **Reliability** - Pocket design to give maximal support to inserts with eight location facets

INSERT GEOMETRIES

GEOMETRY F

- Stainless steels, super alloys, low carbon steels

GEOMETRY M

- Steels, stainless steels

GEOMETRY R

- Cast iron, hardened materials

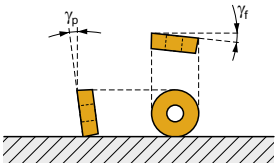
PRAMET

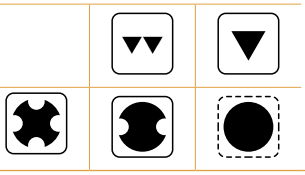
SRC10

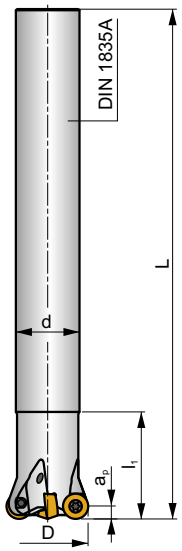
P M K N S H

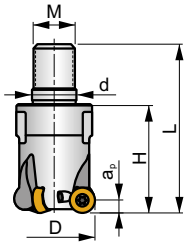
S

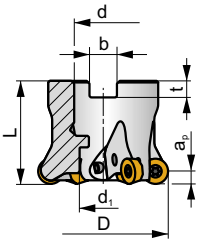
a_{pmax}	5,0 mm











hm 0,08-0,15

hm 0,05-0,12

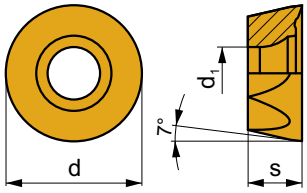
	ISO	D	D_1	L	d	d_1	l_1	H	M	b	t	γ_p°	γ_f°			max.		kg		
DIN 1835A	**25E2R034A20-SRC10-C**	25	–	170	20	–	34	–	–	–	–	-7	-3	2	–	20900	✓	0,37	GI328	CO010
	25E3R034A20-SRC10-C	25	–	170	20	–	34	–	–	–	–	-7	-3	3	–	20900	✓	0,36	GI328	CO010
	32E3R042A25-SRC10-C	32	–	200	25	–	42	–	–	–	–	-7	-2,6	4	–	18500	✓	0,67	GI328	CO010
	32E4R042A25-SRC10-C	32	–	200	25	–	42	–	–	–	–	-7	-2,6	3	–	18500	✓	0,67	GI328	CO010
MODULAR	**25E2R032M12-SRC10-C**	25	21	54	12,5	–	–	32	M12	–	–	-7	-3	2	–	20900	✓	0,08	GI328	CO010
	25E3R032M12-SRC10-C	25	21	54	12,5	–	–	32	M12	–	–	-7	-3	3	–	20900	✓	0,08	GI328	CO010
	32E3R042M16-SRC10-C	32	29	65	17	–	–	42	M16	–	–	-7	-2,6	3	–	18500	✓	0,18	GI328	CO010
	32E4R042M16-SRC10-C	32	29	65	17	–	–	42	M16	–	–	-7	-2,6	4	–	18500	✓	0,18	GI328	CO010
	35E4R042M16-SRC10-C	35	29	65	17	–	–	42	M16	–	–	-7	-2,4	4	–	17700	✓	0,20	GI328	CO010
	42E4R042M16-SRC10-C	42	29	65	17	–	–	42	M16	–	–	-7	-2,1	4	–	16100	✓	0,22	GI328	CO010
	42E5R042M16-SRC10-C	42	29	65	17	–	–	42	M16	–	–	-7	-2,1	5	–	16100	✓	0,22	GI328	CO010
ISO 6462 DIN 8030	**40A05R-SMORC10-C**	40	–	40	16	14	–	–	–	8,4	5,6	-7	-2,2	5	–	16500	✓	0,14	GI328	CO012
	50A05R-SMORC10-C	50	–	40	22	18	–	–	–	10,4	6,3	-7	-2	5	–	14800	✓	0,25	GI328	CO013
	50A06R-SMORC10-C	50	–	40	22	18	–	–	–	10,4	6,3	-7	-2	6	–	14800	✓	0,24	GI328	CO013
	52A05R-SMORC10-C	52	–	40	22	18	–	–	–	10,4	6,3	-7	-2	5	–	14500	✓	0,26	GI328	CO013
	52A06R-SMORC10-C	52	–	40	22	18	–	–	–	10,4	6,3	-7	-2	6	–	14500	✓	0,26	GI328	CO013
	63A06R-SMORC10-C	63	–	40	22	18	–	–	–	10,4	6,3	-7	-1,8	6	–	13200	✓	0,43	GI328	CO013
	63A07R-SMORC10-C	63	–	40	22	18	–	–	–	10,4	6,3	-7	-1,8	7	–	13200	✓	0,42	GI328	CO013
	66A06R-SMORC10-C	66	–	50	27	22	–	–	–	12,4	7	-7	-1,4	6	–	12800	✓	0,54	GI328	CO014
	66A07R-SMORC10-C	66	–	50	27	22	–	–	–	12,4	7	-7	-1,4	7	–	12800	✓	0,52	GI328	CO014

GI328	RCMT 10T3MO..

		Nm				
CO010	US 63509-T10P	3,0	M 3,5	9	Flag T10P	–
CO012	US 63509-T10P	3,0	M 3,5	9	Flag T10P	HS 8030C
CO013	US 63509-T10P	3,0	M 3,5	9	Flag T10P	HS 1030C
CO014	US 63509-T10P	3,0	M 3,5	9	Flag T10P	HS 1230C

RCMT 10

	d	d_1	s
10T3	10,000	3,90	3,97

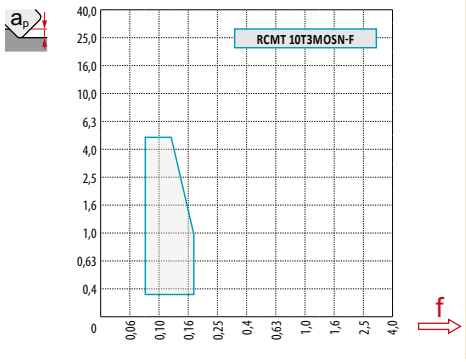


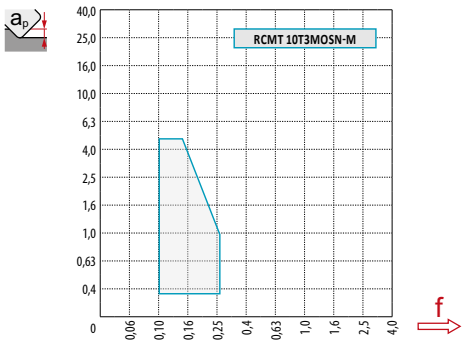
	ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
HFC, S	RCMT 10T3MOSN-F	M6330	◪	■			■		✖	-	–	0,08	0,18	0,3	5,0
		M8310	■	◪	□		□		●	-	–	0,08	0,18	0,3	5,0
		M8330	■	◪	□	□	□		●	-	–	0,08	0,18	0,3	5,0
		M8340	■	■	□		■		✖	+/-	–	0,08	0,18	0,3	5,0
1, U, HFC, S	RCMT 10T3MOSN-M	M9325	■	◪			◪		✖	---	–	0,10	0,24	0,3	5,0
		M9340	◪	■			■		✖	---	–	0,10	0,24	0,3	5,0
		M6330	◪	■			■		✖	-	–	0,10	0,27	0,3	5,0
		M8310	■	◪	■		□	□	✖	-	–	0,10	0,27	0,3	5,0
		M8330	■	◪	■	□	□	□	✖	-	–	0,10	0,27	0,3	5,0
		M8340	■	■	◪		■		✖	+/-	–	0,10	0,27	0,3	5,0
		M8345	■	■			■		✖	+/-	–	0,10	0,27	0,3	5,0
HFC, S	RCMT 10T3MOSN-R	M5315	◪		■			■	✖	---	–	0,15	0,38	0,5	5,0
		M9325	■	◪			◪		✖	---	–	0,15	0,38	0,5	5,0
		M8310	■	◪	■		□	■	✖	-	–	0,15	0,40	0,5	5,0
		M8330	■	◪	■		□	◪	✖	-	–	0,15	0,40	0,5	5,0
		M8340	■	◪	◪		◪		✖	+/-	–	0,15	0,40	0,5	5,0

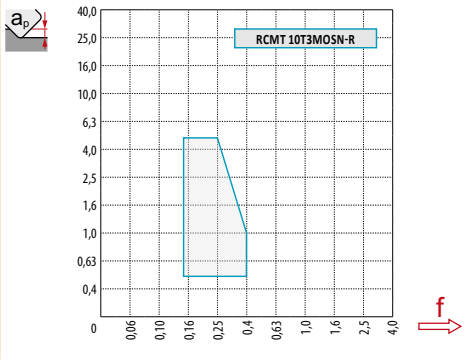
ISO		f_{min}	f_{max}	M5315	M9325	M9340	M6330	M8310	M8330	M8340	M8345
P	●	0,10	0,35	373	383	380	299	358	322	293	235
	●	0,10	0,25	335	344	342	269	322	290	257	212
	✖	0,10	0,15	298	306	304	239	286	257	221	188
M	●	0,10	0,25	-	193	225	211	179	192	176	138
	●	0,10	0,20	-	173	203	190	161	173	153	124
	✖	0,10	0,15	-	154	180	169	143	153	131	110
K	●	0,10	0,35	353	-	-	-	338	303	275	-
	●	0,10	0,25	317	-	-	-	304	272	243	-
	✖	0,10	0,15	282	-	-	-	270	242	212	-
S	●	0,10	0,25	-	84	100	91	78	83	86	60
	●	0,10	0,20	-	75	90	82	71	74	77	54
	✖	0,10	0,15	-	67	80	73	63	66	63	48
H	●	0,10	0,20	73	-	-	-	64	59	-	-
	●	0,10	0,15	65	-	-	-	57	53	-	-
	✖	0,10	0,12	58	-	-	-	51	47	-	-

a_e / D	0,05	0,10	0,15	0,20	0,25	0,30	0,40	0,50	0,60	0,70	0,75	0,80	0,90	1,00
X.V	1,48	1,35	1,27	1,22	1,19	1,16	1,11	1,08	1,05	1,03	1,00	1,00	1,00	1,00
X.f	2,87	2,05	1,69	1,48	1,33	1,23	1,09	0,75	0,94	0,90	0,89	0,88	0,88	1,00
X.f	0,64	0,64	0,64	0,64	0,64	0,65	0,65	0,67	0,68	0,71	0,72	0,74	0,79	1,00

	RCMT 10-F	RCMT 10-M	RCMT 10-R
r_ε	5,0	5,0	5,0
a	–	–	–







D	a_p	0,00	0,15	0,30	0,50	0,75	1,00	1,25	1,50	2,00	2,50	3,00	4,00	5,00
25		15,00	17,43	18,41	19,36	20,27	21,00	21,61	22,14	23,00	23,66	24,17	24,80	25,00
32		22,00	24,43	25,41	26,36	27,27	28,00	28,61	29,14	30,00	30,66	31,17	31,80	32,00
35		25,00	27,43	28,41	29,36	30,27	31,00	31,61	32,14	33,00	33,66	34,17	34,80	35,00
40		30,00	32,43	33,41	34,36	35,27	36,00	36,61	37,14	38,00	38,66	39,17	39,80	40,00
42	D_{ef}	32,00	34,43	35,41	36,36	37,27	38,00	38,61	39,14	40,00	40,66	41,17	41,80	42,00
50		40,00	42,43	43,41	44,36	45,27	46,00	46,61	47,14	48,00	48,66	49,17	49,80	50,00
52		42,00	44,43	45,41	46,36	47,27	48,00	48,61	49,14	50,00	50,66	51,17	51,80	52,00
63		53,00	55,43	56,41	57,36	58,27	59,00	59,61	60,14	61,00	61,66	62,17	62,80	63,00
66		56,00	58,43	59,41	60,36	61,27	62,00	62,61	63,14	64,00	64,66	65,17	65,80	66,00

	a_p	–	0,15	0,30	0,50	0,75	1,00	1,25	1,50	2,00	2,50	3,00	4,00	5,00
	1 f	–	0,90	0,64	0,50	0,41	0,35	0,32	0,29	0,25	0,23	0,21	0,19	0,17

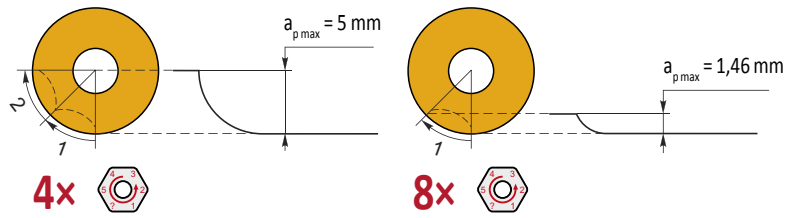
D	α_{max} °	a_p/l
25	13,2	5/23
32	12,6	5/24
35	12,3	5/24
40	9,5	5/31
42	6,5	5/45
50	6,4	5/46
52	6,1	5/48
63	4,7	5/62
66	4,4	5/66

D	d_{min}	d_{max}	s_{max} d_{min}	s_{max} d_{max}
25	32,0	50,0	3,0	3,0
32	45,0	64,0	3,0	3,0
35	51,0	70,0	3,0	3,0
40	61,0	80,0	3,0	3,0
42	65,0	84,0	3,0	3,0
50	81,0	100,0	3,0	3,0
52	85,0	104,0	3,0	3,0
63	107,0	126,0	3,0	3,0
66	113,0	132,0	3,0	3,0

a_p
2,24

D	µm	3	5	10	15	20	30	40	50	60	80	100
25	f_e	0,548	0,707	1,000	1,225	1,414	1,732	2,000	2,236	2,449	2,828	3,162
32		0,620	0,800	1,131	1,386	1,600	1,960	2,263	2,530	2,771	3,200	3,578
35		0,648	0,837	1,183	1,449	1,673	2,049	2,366	2,646	2,898	3,347	3,742
40		0,693	0,894	1,265	1,549	1,789	2,191	2,530	2,828	3,098	3,578	4,000
42		0,710	0,917	1,296	1,587	1,833	2,245	2,592	2,898	3,175	3,666	4,099
50		0,775	1,000	1,414	1,732	2,000	2,449	2,828	3,162	3,464	4,000	4,472
52		0,790	1,020	1,442	1,766	2,040	2,498	2,884	3,225	3,533	4,079	4,561
63		0,869	1,122	1,587	1,944	2,245	2,750	3,175	3,550	3,888	4,490	5,020
66		0,890	1,149	1,625	1,990	2,298	2,814	3,250	3,633	3,980	4,596	5,138

r_ε	µm	3	5	10	15	20	30	40	50	60	80	100
5,0	f_e	0,346	0,447	0,632	0,775	0,894	1,095	1,265	1,414	1,549	1,789	2,000



PRODUCTIVE COPY MILLING TOOLS FOR SEMI-FINISHING AND FINISHING

Our family of economical milling tools has been enhanced by a new range of productive tools (ø12-20mm) for die and mold applications. Designed for smooth cutting in operations with long overhang.
Featuring **more teeth for maximum productivity** and wiper geometry providing an improved surface finish, resulting in reduced machining time for finishing.

FEATURES & BENEFITS

- **Productivity** - Close pitch increases the number of teeth and enables at least 20% higher productivity than standard pitch cutters
- **Increased surface quality** - Patented wiper edges generate superior finish on component walls and face
- **Decreased vibration** - Optimized for deep cavity milling with particularly smooth cutting in corners and pockets
- **Cost saving** per cutting edge - Double-sided inserts with up to 4 cutting edges.
- Optimal **chip evacuation** - Internal coolant

APPLICATIONS

Materials:

- Steels, hardened steel and cast irons.

Process:

- Contouring, profiling, plunging and face milling.

INSERT TYPES

CNHX 05

CNHX 05

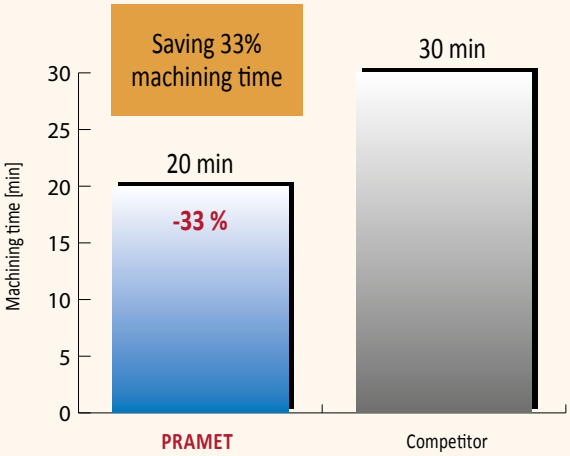
Wiper geometry for both shoulder and face milling

- 4 cutting edges
- Semi-finishing and finishing
- Double-sided insert
- Positive geometry
- Radius 0.5 and 1.0 mm

Also available with new grades developed for hardened materials (see page 22)

SCN05C / CNHX 05 MACHINING EXAMPLE

Material: AISI H13
Material group: H
Workpiece: Mold
Insert: CNHX 050210ER-WM: M4310
Coolant: YES - air

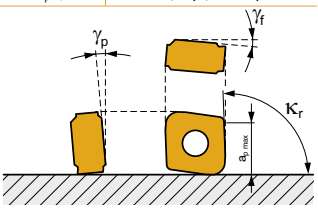


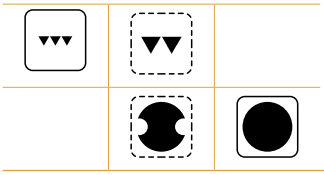
			PRAMET	Competitor
Operation			Contouring - finishing	
Tool			16A3R025M08--SCN05C-C	D16 mm, 2 teeth
Cutting speed	v_c	m/min	180	180
Feed per tooth	f_z	mm/tooth	0,1	0,1
Feed per minute	f	mm/min	1074	716
Axial depth of cut	a_p	mm	0,25	0,25
Radial depth of cut	a_e	mm	0,25	0,25
Machining time	t	min	20	30
Durability	T	min	45	30

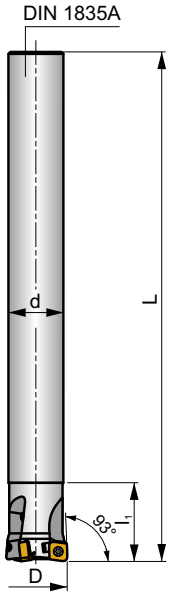
SCN05C

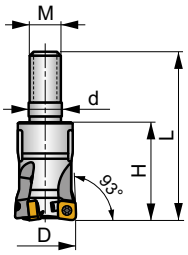
P K H S

κ_r	93
a_{pmax}	0,5 (1,0 mm)









h_m 0,02 - 0,07

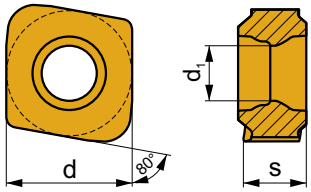
	ISO	D	L	d	l_1	H	M	γ_f°	γ_p°			max.		kg		
DIN 1835A	**12A2R020A10-SCN05C-C**	12	100	10	20	–	–	-15	-8	2	–	48700	✓	0,05	GI330	CO601
	16A3R020A14-SCN05C-C	16	130	14	20	–	–	-13,5	-7,8	3	–	42200	✓	0,13	GI330	CO601
	20A5R020A18-SCN05C-C	20	160	18	20	–	–	-12,7	-7,5	5	✓	37700	✓	0,28	GI330	CO601
MODULAR	**12A2R020M06-SCN05C-C**	12	35	–	–	20	M6	-15	-8	2	–	–	✓	0,01	GI330	CO601
	16A3R025M08-SCN05C-C	16	43	–	–	25	M8	-13,5	-7,8	3	–	–	✓	0,03	GI330	CO601
	20A5R030M10-SCN05C-C	20	49	–	–	30	M10	-12,7	-7,5	5	✓	–	✓	0,05	GI330	CO601

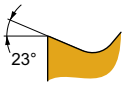
GI330	CNHX 0502..

		Nm			
CO601	US 62005-T06P	0,9	M 2	4,9	Flag T06P

CNHX 05

	d	d_1	s
0502	4,800	2,10	2,40





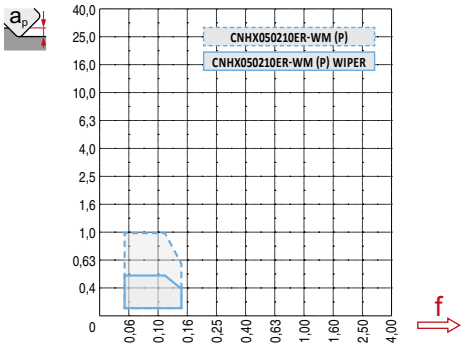
ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
CNHX 050205ER-WM	**M4310**	◪		■			■	●	-	0,5	0,05	0,15	0,1	1,0
	M8330	■		■			◪	⬣	-	0,5	0,05	0,15	0,1	1,0
CNHX 050210ER-WM	**M4310**	◪		■			■	⬣	-	1,0	0,05	0,15	0,1	1,0
	M8330	■		■			◪	⬣	-	1,0	0,05	0,15	0,1	1,0

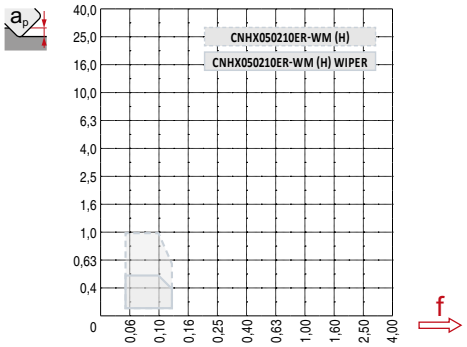
ISO		f_{min}	f_{max}	M4310	M8330
P	●	0,05	0,15	350	365
	⬣	0,05	0,12	315	329
	✖	0,05	0,10	280	292
K	●	0,05	0,15	330	345
	⬣	0,20	0,12	297	311
	✖	0,20	0,10	264	276
H	●	0,05	0,15	71	68
	⬣	0,05	0,12	64	61
	✖	0,05	0,10	57	54

a_e / D	0,05	0,10	0,15	0,20	0,25	0,30	0,40	0,50	0,60	0,70	0,75	0,80	0,90	1,00
X.V	1,48	1,35	1,27	1,22	1,19	1,16	1,11	1,08	1,05	1,03	1,00	1,00	1,00	1,00

a_e / D	0,005	0,01	0,02	0,03	0,04	0,05
X.V	2,04	1,85	1,68	1,59	1,53	1,48

	CNHX 05-WM	
r_ε	0,5	1,0
a	0,50	0,50





D	max.
12	0,4
16	0,4
20	0,5

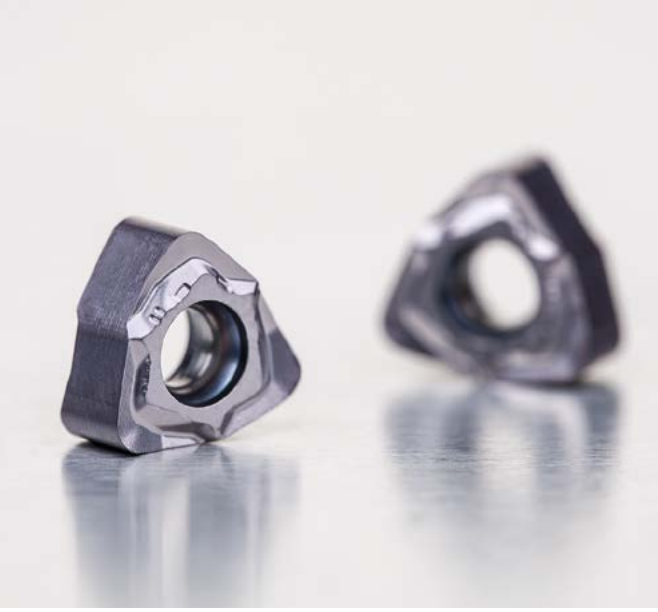
D	α_{max} °	a_p/l
12	2,4	1/25
14	1,5	1/40
16	1,1	1/54

ECONOMICAL AND PRODUCTIVE COPY MILLING TOOLS FOR SEMI-FINISHING AND FINISHING

Our family of economical milling tools has been further enhanced by a new range of productive tools (ø 20-35mm) for die and mold applications. Designed for smooth cutting in operations with long overhang.
Featuring **more cutting edges for extreme economical** use and wiper geometry providing an improved surface finish, resulting in reduced machining time for finishing.

FEATURES & BENEFITS

- **Economical** – 6-cutting edges providing a more cost-effective option
- **Increased surface quality** - patented wiper edges generate superior finish on component walls and face
- **Decreased vibration** - Optimized for deep cavity milling with particularly smooth cutting in corners and pockets
- **Productive** – higher feeds
- Optimal **chip evacuation** - Internal coolant



APPLICATIONS

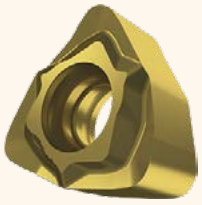
Materials:

- Steels, hardened steel and cast irons.

Process:

- Contouring, profiling, plunging and face milling.

INSERT TYPES



WNHX 04

WNHX 04

Wiper geometry for both shoulder and face milling

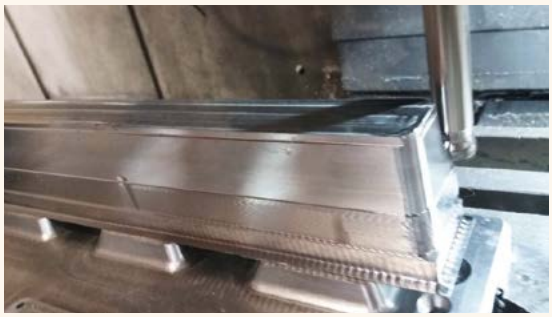
- 6 cutting edges
- Semi-finishing and finishing
- Double-sided insert
- Positive geometry
- Radius 0.5, 1.0 and 1.5 mm

Also available with new grades developed for hardened materials (see page 22)

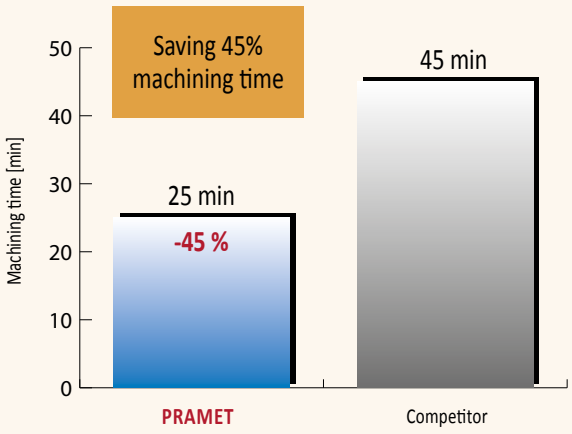
SWN04C / WNHX 04

SWN04C / WNHX 04 MACHINING EXAMPLE

Material: DIN 1.2738 (AISI P20)
Material group: P
Workpiece: Mold for plastic injection
Insert: WNHX 040310ER-WM: M4310
Coolant: YES - air



			PRAMET	Competitor
Operation			Contouring - finishing	
Tool			25A4R020A22--SWN04C-C	D25mm, 4 teeth
Cutting speed	v_c	m/min	196	196
Feed per tooth	f_z	mm/tooth	0,36	0,20
Feed per minute	f	mm/min	3600	2000
Axial depth of cut	a_p	mm	0,50	0,50
Radial depth of cut	a_e	mm	0,70	0,70
Machining time	t	min	25	45
Durability	T	min	45	45

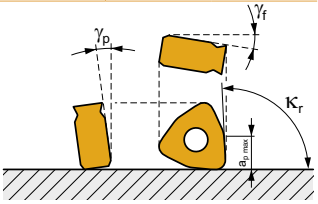


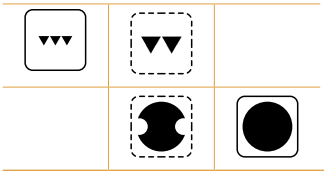
PRAMET

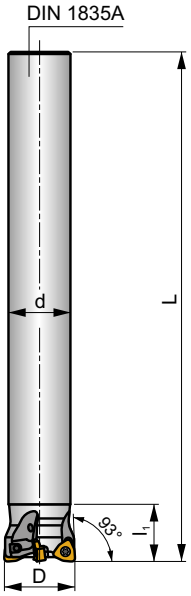
SWN04C

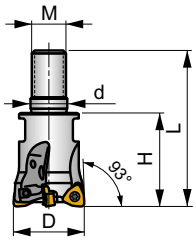
P K H S

κ_r	93
a_{pmax}	0,5 (2,0 mm)









h_m 0,02 - 0,07

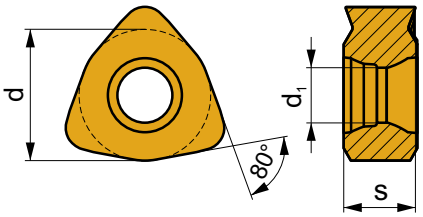
	ISO	D	L	d	l_1	H	M	γ_f°	γ_p°			max.		kg		
DIN 1835A	**20A3R020A18-SWN04C-C**	20	160	18	20	–	–	-12	-8	3	–	19700	✓	0,27	GI331	CO602
	25A4R020A22-SWN04C-C	25	180	22	20	–	–	-11,5	-8	4	✓	26600	✓	0,45	GI331	CO602
	32A6R020A25-SWN04C-C	32	200	25	20	–	–	-11,2	-8	6	✓	23500	✓	0,69	GI331	CO602
MODULAR	**20A3R030M10-SWN04C-C**	20	49	–	–	30	M10	-12	-8	3	–	–	✓	0,05	GI331	CO602
	25A4R033M12-SWN04C-C	25	55	–	–	33	M12	-11,5	-8	4	✓	–	✓	0,08	GI331	CO602
	32A6R040M16-SWN04C-C	32	63	–	–	40	M16	-11,2	-8	6	✓	–	✓	0,19	GI331	CO602
	35A6R043M16-SWN04C-C	35	66	–	–	43	M16	-11,1	-8	6	✓	–	✓	0,22	GI331	CO602

GI331	WNHX 0403..

		Nm			
CO602	US 42507-T07P	1,2	M 2,5	7	Flag T07P

WNHX 04

	d	d_1	s
0403	6,200	2,60	3,38



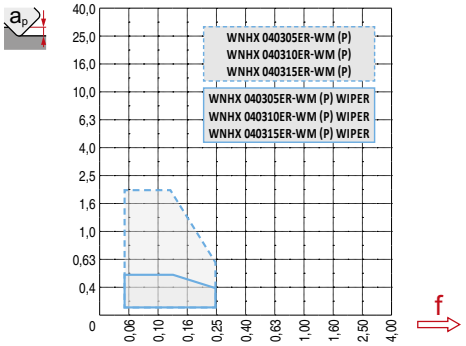
ISO		P	M	K	N	S	H		r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
WNHX 040305ER-WM	**M4310**	◪		■			■	●	-	0,5	0,05	0,25	0,1	2,0
	M8330	■		■			◪	⬣	-	0,5	0,05	0,25	0,1	2,0
WNHX 040310ER-WM	**M4310**	◪		■			■	⬣	-	1,0	0,05	0,25	0,1	2,0
	M8330	■		■			◪	⬣	-	1,0	0,05	0,25	0,1	2,0
WNHX 040315ER-WM	**M4310**	◪		■			■	⬣	-	1,5	0,05	0,25	0,1	2,0
	M8330	■		■			◪	⬣	-	1,5	0,05	0,25	0,1	2,0

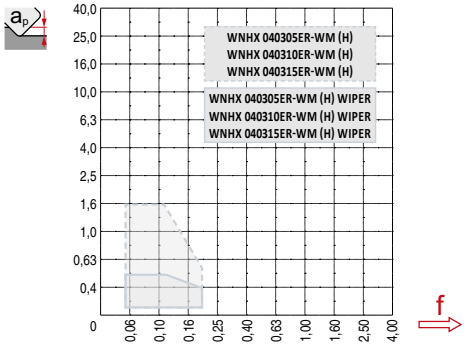
ISO		f_{min}	f_{max}	M4310	M8330
P	●	0,05	0,15	327	345
	⬣	0,05	0,12	294	311
	✖	0,05	0,10	261	276
K	●	0,05	0,15	308	326
	⬣	0,20	0,12	278	293
	✖	0,20	0,10	247	261
H	●	0,05	0,15	68	64
	⬣	0,05	0,12	61	58
	✖	0,05	0,10	54	51

a_e / D	0,05	0,10	0,15	0,20	0,25	0,30	0,40	0,50	0,60	0,70	0,75	0,80	0,90	1,00
X.V	1,48	1,35	1,27	1,22	1,19	1,16	1,11	1,08	1,05	1,03	1,00	1,00	1,00	1,00

a_e / D	0,005	0,01	0,02	0,03	0,04	0,05
X.V	2,04	1,85	1,68	1,59	1,53	1,48

	WNHX 04-WM		
r_ε	0,5	1,0	1,5
a	0,50	0,50	0,50





D	max
20	0,4
25	0,5
32	0,5
35	0,5

D	α_{max} °	a_p/l
20	0,7	1,1/100
25	0,5	0,75/100
32	03	0,4/100
35	0,3	0,4/100

MILLING INSERTS

HIGH PERFORMANCE GRADES FOR HARD MILLING

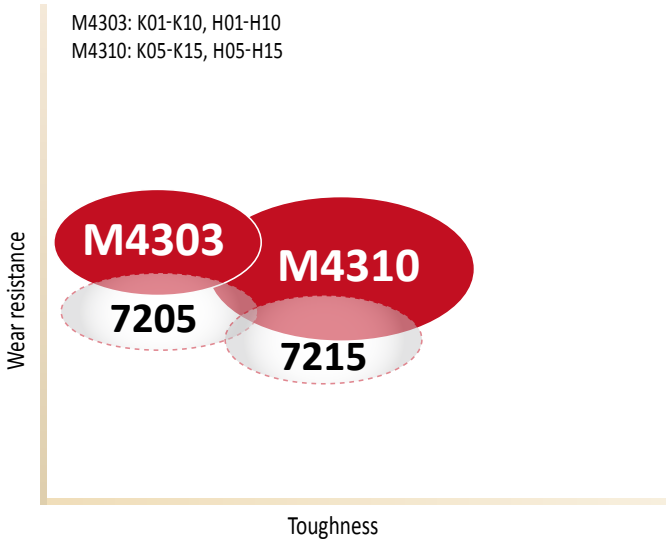
New PVD grades developed for increased performance and durability when semi-finishing and finishing in hardened steels and cast iron.

FEATURES & BENEFITS

- **High performance** - Delivering high speed hard milling solutions for die and mold applications
- **Reliability** - Predictable behaviour (consistent wear progression)
- **Longer tool life** - Increased wear resistance
- **Smooth cutting properties** - Ultra thin PVD coating increases cutting edge toughness
- **Prevents fracture by chipping** - Substrate with high hardness (M4303) and with balanced toughness and wear resistance (M4310)

M4303, M4310

AREA OF APPLICATION



M4303 GRADE

M4303

Superior wear resistance

First choice for hardened steel (above 55HRC) and cast iron

- Second choice for steels and non-ferrous metals
- Replacement of existing grade 7205

M4310 GRADE

M4310

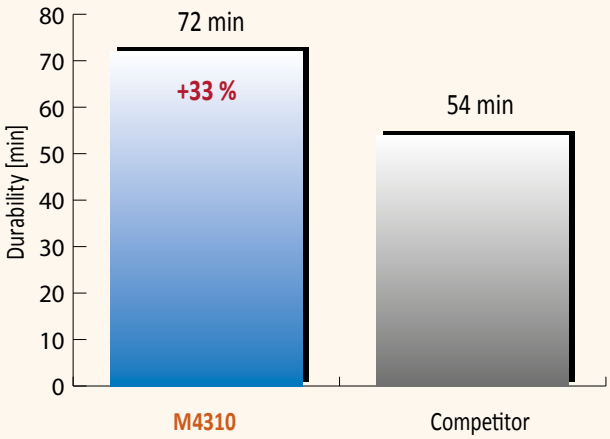
Balance of toughness and wear resistance

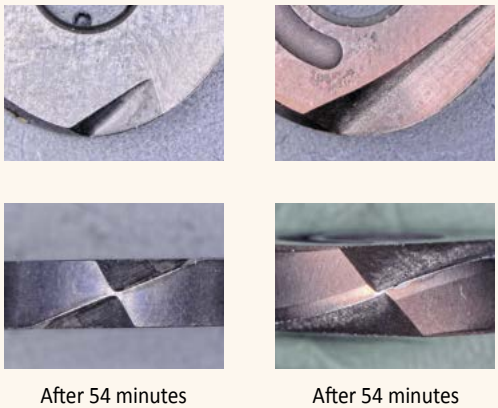
- First choice for hardened steel and cast iron
- Second choice for stainless steel, steels and non-ferrous metals
- Replacement of existing grade 7215

M4310 MACHINING EXAMPLE

Material: X15CrVMo121 (62 HRC)
Material group: H
Insert: RC 16
Coolant: No

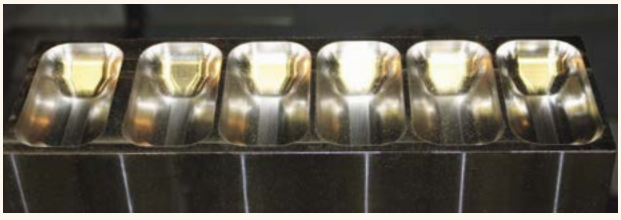
			PRAMET	Competitor
Grade			M4310	
Cutting speed	v_c	m/min	220	220
Feed tooth	f_z	mm/tooth	0,2	0,2
Axial depth of cut	a_p	mm	0,5	0,5
Durability	T	min	72	54





After 54 minutes

After 54 minutes



M8330

NEW VERSATILE MILLING GRADE FOR STEELS

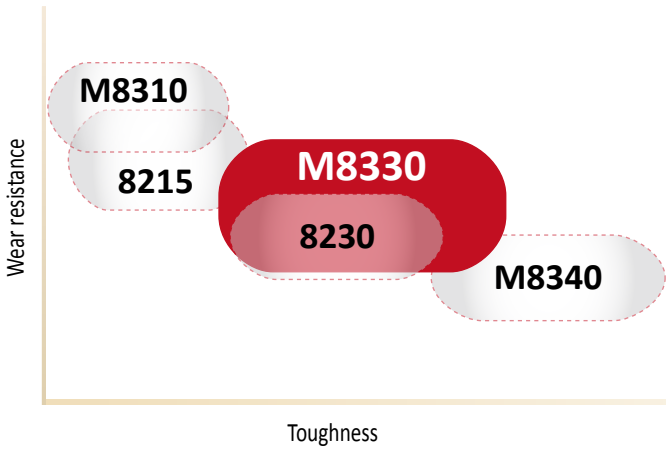
New grade for general machining, which replaces the existing 8230 grade. Developed mainly for steels, M8330 offers improved productivity and wear resistance.

FEATURES & BENEFITS

- Versatile choice for steels and cast irons
- Also suitable for stainless steels, super alloys and hardened steels
- New milling grade with nanolayered PVD coating
- Added to more than 90 different types of inserts
- Compared with 8230 it offers **GREATER**
  - Resistance to heat-related cracks
  - Wear resistance
  - Toughness and impact strength

- **Versatility** – suitable for finishing to roughing even in unfavorable conditions
- **Reliability and high performance** when machining with and without coolant
- **High durability** machining steels with medium-high cutting speeds
- **Easy to use** - gold surface finish to help visually monitor wear progression

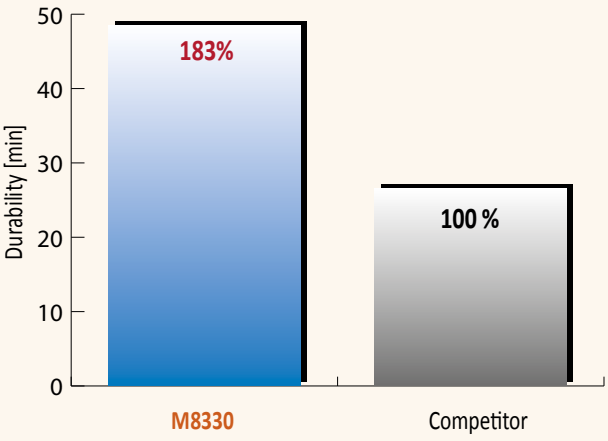
AREA OF APPLICATION

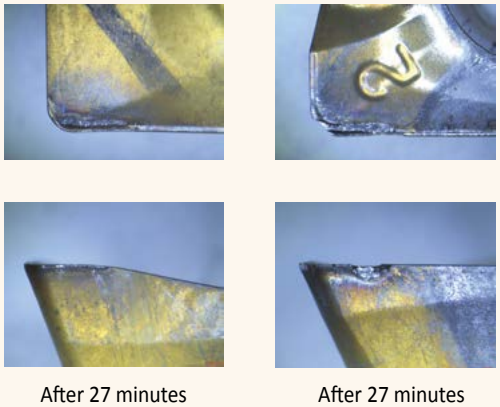


MACHINING EXAMPLE USING M8330 GRADE

Material: 12050.9
Material group: P
Insert: ADMX 160608SR-M
Coolant: No

			PRAMET	Competitor
Grade			M8330	
Cutting speed	v_c	m/min	280	280
Feed tooth	f_z	mm/tooth	0,2	0,2
Axial length of cut	a_p	mm	2,5	2,5
Durability	T	min	48,5	26,5

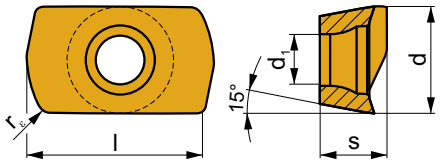


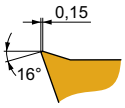
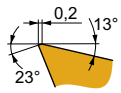


After 27 minutes | After 27 minutes

ADEX 11-HF

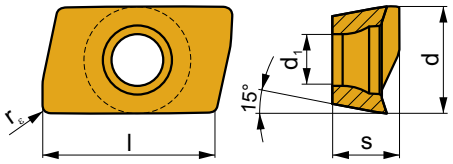
	d	d_1	l	s
11T3	6,450	2,90	10,67	3,82

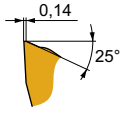


	ISO		P	M	K	N	S	H		r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
HFC S  	**ADEX 11T308SR-HF**	**M6330**	◪	■			◪			-	0,8	0,40	1,30	0,1	0,6
		M8330	■	◪	□		□	□		-	0,8	0,40	1,30	0,1	0,6
HFC S  	**ADEX 11T308SR-HF2**	**M8330**	■	◪	■		□	◪		-	0,8	0,40	1,30	0,2	0,6

ADEX 16

	d	d_1	l	s
1606	10,000	4,50	16,00	6,25

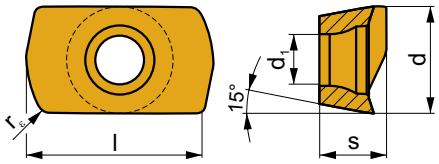


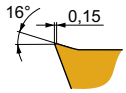
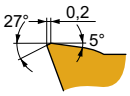
	ISO		P	M	K	N	S	H		r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
 	**ADEX 160608SR-FM**	**M8330**	■	◪	■		□			-	0,8	0,10	0,25	0,3	13,0

PRAMET

ADEX 16-HF

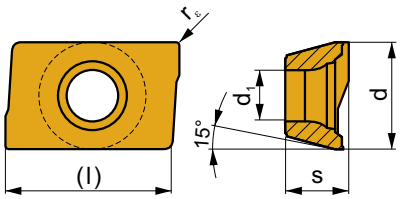
	d	d_1	l	s
1606	10,000	4,50	16,00	5,88

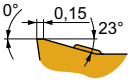


		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
HFC S		**ADEX 160612SR-HF**	**M8330**	■	◪	□		□	□		-	1,2	0,60	1,30	0,3	1,3
HFC S		**ADEX 160612SR-HF2**	**M8330**	■	◪	■		□	◪	✖	-	1,2	0,60	1,30	0,3	1,3

ADKT 15

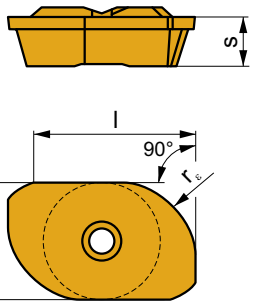
	d	d_1	l	s
1505	9,525	4,40	15,55	5,60

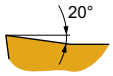


		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
1 U S		**ADKT 1505PDER-M**	**M8330**	■	◪	■		□			-	0,8	0,15	0,30	1,0	13,0

ADKX 15

	d	l	s
15T3	9,525	12,20	3,97

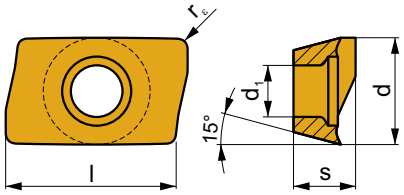


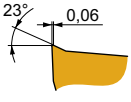


ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
ADKX 15T304ER-F	**M8330**	■	◪	□	□	□		●	-	0,4	0,05	0,09	0,3	10,0
ADKX 15T308ER-F	**M8330**	■	◪	□	□	□		⬣	-	0,8	0,05	0,12	0,3	10,0
ADKX 15T330ER-F	**M8330**	■	◪	□	□	□		⬣	-	3,0	0,05	0,15	0,3	10,0
ADKX 15T340ER-F	**M8330**	■	◪	□	□	□		⬣	-	4,0	0,05	0,19	0,3	10,0
ADKX 15T360ER-F	**M8330**	■	◪	□	□	□		⬣	-	6,0	0,05	0,26	0,3	10,0

ADMX 11

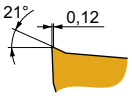
	d	d_1	l	s
11T3	6,530	2,90	11,00	3,97





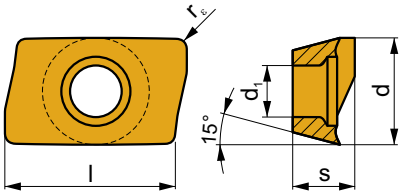
ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
ADMX 11T304SR-F	**M8330**	■	◪	◪	□	□		●	-	0,4	0,07	0,12	0,2	9,0
ADMX 11T308SR-F	**M8330**	■	◪	◪	□	□		⬣	-	0,8	0,07	0,12	0,2	9,0
ADMX 11T302SR-M	**M8330**	■	◪	■		□		●	-	0,2	0,10	0,14	0,2	9,0
ADMX 11T304SR-M	**M8330**	■	◪	■		□		⬣	-	0,4	0,10	0,18	0,2	9,0
ADMX 11T308SR-M	**M8330**	■	◪	■		□		⬣	-	0,8	0,10	0,18	0,2	9,0
ADMX 11T310SR-M	**M8330**	■	◪	■		□		✖	-	1,0	0,10	0,22	0,2	9,0
ADMX 11T312SR-M	**M8330**	■	◪	■		□		✖	-	1,2	0,10	0,22	0,2	9,0
ADMX 11T316SR-M	**M6330**	◪	■			◪		✖	-	1,6	0,10	0,22	0,2	9,0
	M8330	■	◪	■		□		✖	-	1,6	0,10	0,22	0,2	9,0
ADMX 11T320SR-M	**M6330**	◪	■			◪		✖	-	2,0	0,10	0,22	0,2	9,0
	M8330	■	◪	■		□		✖	-	2,0	0,10	0,22	0,2	9,0
ADMX 11T325SR-M	**M6330**	◪	■			◪		✖	-	2,5	0,10	0,22	0,2	9,0
	M8330	■	◪	■		□		✖	-	2,5	0,10	0,22	0,2	9,0
ADMX 11T330SR-M	**M6330**	◪	■			◪		✖	-	3,0	0,10	0,22	0,2	9,0
	M8330	■	◪	■		□		✖	-	3,0	0,10	0,22	0,2	9,0

ISO		P	M	K	N	S	H		r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
ADMX 11T308PR-R	**M8330**	■	◪	■		□	◪	✖	-	0,8	0,15	0,25	0,8	9,0
ADMX 11T316PR-R	**M8330**	■	◪	■		□	◪	✖	-	1,6	0,15	0,25	0,8	9,0

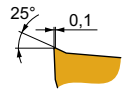


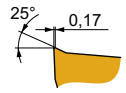
ADMX 16

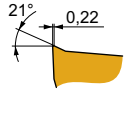
	d	d_1	l	s
1606	9,950	4,50	16,00	6,25



ISO		P	M	K	N	S	H		r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
ADMX 160608SR-F	**M8330**	■	◪	◪	□	□		✖	-	0,8	0,07	0,15	0,3	13,0
ADMX 160604SR-M	**M8330**	■	◪	■		□		✖	-	0,4	0,10	0,25	0,3	13,0
ADMX 160608SR-M	**M8330**	■	◪	■		□		✖	-	0,8	0,10	0,25	0,3	13,0
ADMX 160616SR-M	**M8330**	■	◪	■		□		✖	-	1,6	0,10	0,30	0,3	13,0
ADMX 160620SR-M	**M6330**	◪	■			◪		✖	-	2,0	0,10	0,30	0,3	13,0
	M8330	■	◪	■		□		✖	-	2,0	0,10	0,30	0,3	13,0
ADMX 160630SR-M	**M8330**	■	◪	■		□		✖	-	3,0	0,10	0,30	0,3	13,0
ADMX 160632SR-M	**M6330**	◪	■			◪		✖	-	3,2	0,10	0,30	0,3	13,0
	M8330	■	◪	■		□		✖	-	3,2	0,10	0,30	0,3	13,0
ADMX 160640SR-M	**M6330**	◪	■			◪		✖	-	4,0	0,10	0,30	0,3	13,0
	M8330	■	◪	■		□		✖	-	4,0	0,10	0,30	0,3	13,0
ADMX 160650SR-M	**M8330**	■	◪	■		□		✖	-	5,0	0,10	0,30	0,3	13,0
ADMX 160608PR-R	**M8330**	■	◪	■		□	◪	✖	-	0,8	0,17	0,35	1,0	13,0
ADMX 160616PR-R	**M8330**	■	◪	■		□	◪	✖	-	1,6	0,17	0,35	1,0	13,0

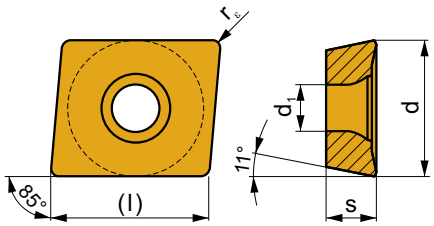






APET 15

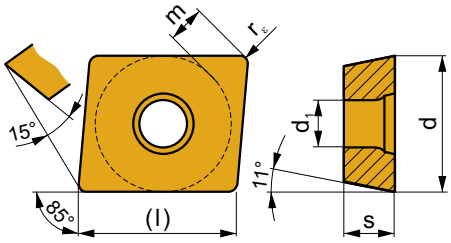
	d	d_1	l	s
1504	12,700	5,50	15,90	4,76



ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
APET 150412EN	**M8330**	■	◪	◪		□	□		-	1,2	0,10	0,35	1,5	12,0
APET 150412SN	**M8330**	■	◪	◪		□	□		-	1,2	0,20	0,35	1,5	12,0

APEW 15

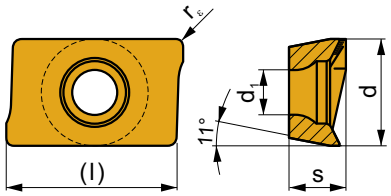
	d	d_1	l	m	s
1504	12,700	5,50	15,90	3,71	4,76



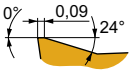
ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
APEW 150412ER	**M8330**	◪	□	■			◪		-	1,2	0,10	0,30	1,2	12,0
APEW 150412SR	**M8330**	◪	□	■			◪		-	1,2	0,20	0,40	1,2	12,0

APKT 10

	d	d_1	l	s
1003	6,700	2,88	11,00	3,50

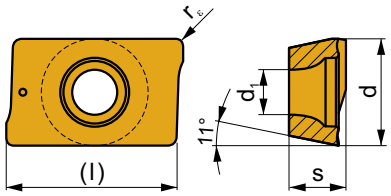


	ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	APKT 1003PDER-M	**M8330**	■	◪	■		□			-	0,5	0,10	0,25	1,0	9,0

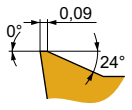


APKT 16

	d	d_1	l	s
1604	9,440	4,60	17,00	5,67

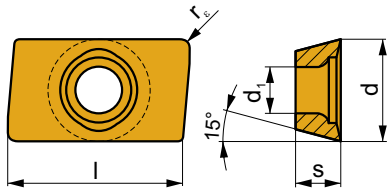


	ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	APKT 1604PDR-GM	**M8330**	■	◪	■		□			-	0,8	0,15	0,30	1,0	13,0
	APKT 1604PDR-HM	**M8330**	■	◪	■		□			-	0,8	0,20	0,35	1,0	13,0



APMT 16

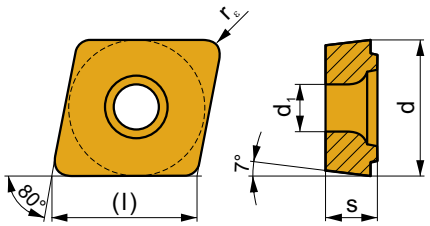
	d	d_1	l	s
1604	9,600	4,50	17,00	4,76



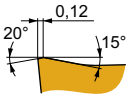
		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	0,15 20°	**APMT 1604PDER-F**	**M8330**	■	◪	◪	□	□			-	-	0,07	0,15	0,3	13,0
	0,15 23°	**APMT 1604PDER-FM**	**M8330**	■	◪	◪	□	□			-	-	0,12	0,25	0,6	13,0
	0,15 20°	**APMT 1604PDER-R**	**M8330**	■	□	■					-	-	0,15	0,30	0,8	13,0
	0,17 23°	**APMT 1604PDSR-R**	**M8330**	■	□	■				✖	-	-	0,17	0,40	0,8	13,0

CCMX

	d	d_1	l	s
0603	6,350	2,80	6,40	3,50
08T3	8,030	3,50	8,10	4,40
09T3	9,525	3,50	9,70	3,97

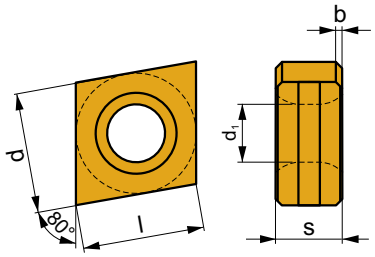


	ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	CCMX 060304S-TS1	**M8330**	■	◪	■	□	□	□		-	0,4	0,08	0,14	–	–
	CCMX 08T308S-TS1	**M8330**	■	◪	■	□	□	□		-	0,8	0,10	0,16	–	–
	CCMX 09T308S-TS1	**M8330**	■	◪	■	□	□	□		-	0,8	0,10	0,18	–	–

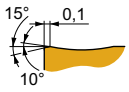


CNHQ

	b	d	d_1	l	s
1005	0,5 x 45°	10,000	4,70	10,00	5,40

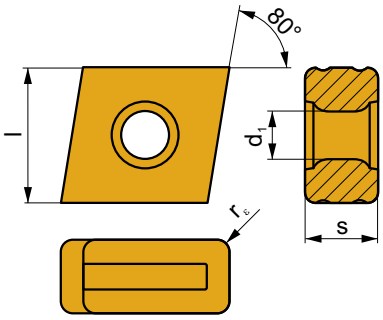


	ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	CNHQ 1005AZTN	**M8330**	■	◪	■	□	□	□		-	-	0,10	0,50	-	-

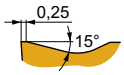


CNM

	d_1	l	s
63	5,50	15,00	8,00

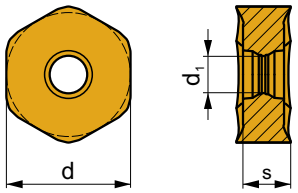


		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
		CNM 563	**M8330**	■		■				●	-	1,2	0,20	0,40	2,0	14,0

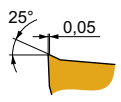


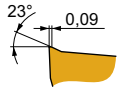
HNGX 06

	d	d_1	s
0604	10,500	3,70	4,76

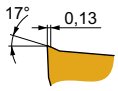


		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
		HNGX 0604ANSN-F	**M6330**	◪	■					✱	-	–	0,08	0,17	0,3	3,0
			M8330	■	◪	□	□			✱	-	-	0,08	0,17	0,3	3,0
		HNGX 0604ANSN-M	**M6330**	◪	◪					✖	-	–	0,13	0,25	0,6	3,0
			M8330	■	◪	■	□		□	✖	-	-	0,13	0,25	0,6	3,0



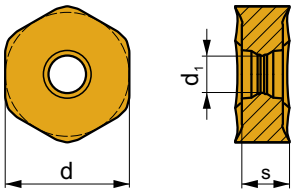


		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
		HNGX 0604ANSN-R	**M8330**	■	◪	■			◪	✖	-	-	0,18	0,30	1,0	3,0

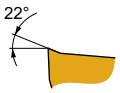


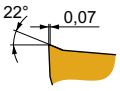
HNGX 09

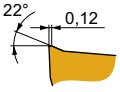
	d	d_1	s
0906	16,500	4,90	6,35

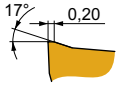


		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
		HNGX 0906ANEN-FF	**M8330**	■	◪	□	□			●	-	-	0,05	0,20	0,5	5,0
		HNGX 0906ANSN-F	**M6330**	◪	■					⬣	-	–	0,10	0,20	0,5	5,0
			M8330	■	◪	□	□			⬣	-	-	0,10	0,20	0,5	5,0
		HNGX 0906ANSN-M	**M8330**	■	◪	■	□		□	✖	-	-	0,17	0,35	0,8	5,0
		HNGX 0906ANSN-R	**M8330**	■	◪	■			◪	✖	-	-	0,30	0,50	1,0	5,0



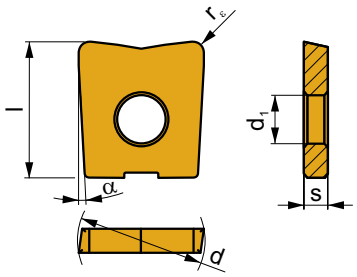






LC

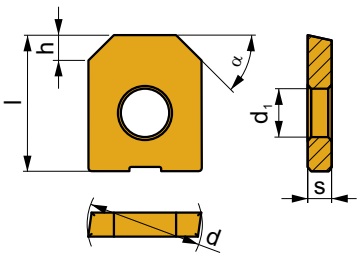
	α°	d	d_1	l	s
08	3°	8,000	3,00	9,50	2,00
10	3°	10,000	4,00	11,50	2,50
12	7°	12,000	5,00	14,00	2,50
16	7°	16,000	5,00	16,00	3,00
20	7°	20,000	5,00	18,00	3,00



ISO		P	M	K	N	S	H		r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
LC 0806-KP	M4310	◪		■			■	●	-	0,6	0,08	0,20	0,1	0,6
	M8330	■		■			◪	⬣	-	0,6	0,08	0,20	0,1	0,6
LC 0810-KP	M4310	◪		■			■	⬣	-	1,0	0,08	0,20	0,1	1,0
LC 1008-KP	M4310	◪		■			■	⬣	-	0,8	0,08	0,25	0,1	0,8
	M8330	■		■			◪	⬣	-	0,8	0,08	0,25	0,1	0,8
LC 1010-KP	M4310	◪		■			■	⬣	-	1,0	0,08	0,25	0,1	1,0
	M8330	■		■			◪	⬣	-	1,0	0,08	0,25	0,1	1,0
LC 1210-KP	M4310	◪		■			■	⬣	-	1,0	0,08	0,25	0,1	1,0
	M8330	■		■			◪	⬣	-	1,0	0,08	0,25	0,1	1,0
LC 1220-KP	M4310	◪		■			■	⬣	-	2,0	0,08	0,25	0,1	2,0
LC 1610-KP	M4310	◪		■			■	⬣	-	1,0	0,08	0,30	0,1	1,0
	M8330	■		■			◪	⬣	-	1,0	0,08	0,30	0,1	1,0
LC 1613-KP	M4310	◪		■			■	⬣	-	1,3	0,08	0,30	0,1	1,3
LC 1630-KP	M4310	◪		■			■	⬣	-	3,0	0,08	0,30	0,1	3,0
LC 2010-KP	M4310	◪		■			■	⬣	-	1,0	0,08	0,35	0,1	1,0
	M8330	■		■			◪	⬣	-	1,0	0,08	0,35	0,1	1,0
LC 2016-KP	M4310	◪		■			■	⬣	-	1,6	0,08	0,35	0,1	1,6
LC 2040-KP	M8330	■		■			◪	⬣	-	4,0	0,08	0,35	0,1	4,0
LC 0806-KPF	M4310	◪		■			■	●	-	0,6	0,05	0,15	0,1	0,6
LC 1008-KPF	M4310	◪		■			■	⬣	-	0,8	0,05	0,20	0,1	0,8
LC 1210-KPF	M4310	◪		■			■	⬣	-	1,0	0,05	0,15	0,1	1,0
	M8330	■		■			◪	⬣	-	1,0	0,05	0,15	0,1	1,0
LC 1613-KPF	M4310	◪		■			■	⬣	-	1,3	0,05	0,15	0,1	1,3
LC 2016-KPF	M4310	◪		■			■	⬣	-	1,6	0,05	0,15	0,1	1,6

LC 12-CH

	α°	d	d_1	h	l	s
1245	45°	12,000	5,00	3,0	14,00	2,50

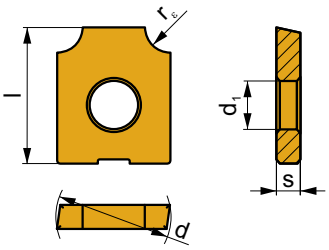


ISO		P	M	K	N	S	H		r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
LC 1245-CH	M4310	◪		■			■	⬣	-	–	0,08	0,25	0,1	2,0

PRAMET

LC 12-RE

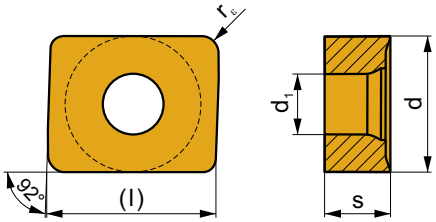
	d	d_1	l	s
12	12,000	5,00	14,00	2,50



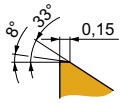
	ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	LC 1220-RE	**M4310**	◪		■			■	✱	-	2,0	0,08	0,25	0,1	2,0
	LC 1230-RE	**M4310**	◪		■			■	✱	-	3,0	0,08	0,25	0,1	3,0

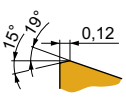
LNET 16

	d	d_1	l	s
1606	13,200	5,90	16,40	6,38



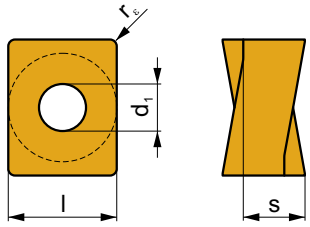
	ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	LNET 160616SR-M	**M8330**	■	□	■				✖	-	1,6	0,15	0,35	1,6	15,0
	LNET 160616SR-R	**M8330**	■	□	■				✖	-	1,6	0,15	0,40	1,6	15,0





LNGU 12

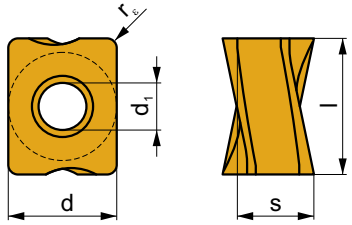
	d	d_1	l	s
1205	9,500	4,50	12,00	5,96



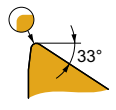
ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
LNGU 120525ER-M	**M8330**	■	□	■		□	□	✖	-	2,5	0,05	0,25	0,2	9,0
LNGU 120530ER-M	**M8330**	■	□	■		□	□	✖	-	3,0	0,05	0,25	0,2	9,0

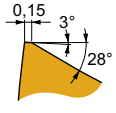
LNGX 12

	d	d_1	l	s
1205	9,500	4,50	12,00	5,96



ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
LNGX 120504ER-F	**M8330**	■	◪	◪		□		●	-	0,4	0,04	0,15	0,2	9,0
LNGX 120508ER-F	**M8330**	■	◪	◪		□		⧓	-	0,8	0,04	0,15	0,2	9,0
LNGX 120504ER-M	**M8330**	■	□	■		□	□	●	-	0,4	0,05	0,25	0,2	9,0
LNGX 120508ER-M	**M8330**	■	□	■		□	□	⧓	-	0,8	0,05	0,25	0,2	9,0
LNGX 120510ER-M	**M8330**	■	□	■		□	□	⧓	-	1,0	0,05	0,25	0,2	9,0
LNGX 120512ER-M	**M8330**	■	□	■		□	□	⧓	-	1,2	0,05	0,25	0,2	9,0
LNGX 120516ER-M	**M8330**	■	□	■		□	□	⧓	-	1,6	0,05	0,25	0,2	9,0
LNGX 120520ER-M	**M8330**	■	□	■		□	□	✖	-	2,0	0,05	0,25	0,2	9,0
LNGX 120508SR-R	**M8330**	■	□	■		□	□	⧓	-	0,8	0,15	0,35	1,0	9,0
LNGX 120516SR-R	**M8330**	■	□	■		□	□	✖	-	1,6	0,15	0,35	1,0	9,0

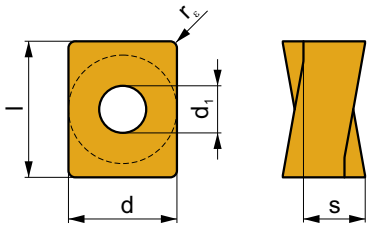




PRAMET

LNMU 16

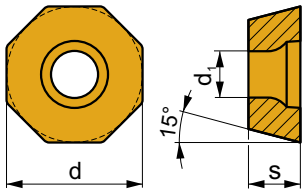
	d	d_1	l	s
1607	13,200	5,70	16,60	7,50



ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
LNMU 160708ER-F	**M8330**	■		◪				●	-	0,8	0,08	0,20	0,3	13,0
LNMU 160708SR-M	**M8330**	■		■			□	✖	-	0,8	0,10	0,30	0,3	13,0
LNMU 160720SR-M	**M8330**	■		■			□	✖	-	2,0	0,10	0,30	0,3	13,0
LNMU 160730SR-M	**M8330**	■		■			□	✖	-	3,0	0,10	0,30	0,3	13,0
LNMU 160740SR-M	**M8330**	■		■			□	✖	-	4,0	0,10	0,30	0,3	13,0
LNMU 160708SR-R	**M8330**	■		■			◪	✖	-	0,8	0,15	0,40	1,0	13,0
LNMU 160716SR-R	**M8330**	■		■			◪	✖	-	1,6	0,15	0,40	1,0	13,0

ODEW 06

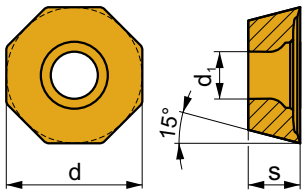
	d	d_1	s
0605	15,875	5,50	5,56

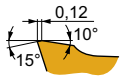


ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
ODEW 0605ZZN	**M8330**	◪	□	■			◪	✖	-	–	0,15	0,45	1,0	3,1

ODMT 06

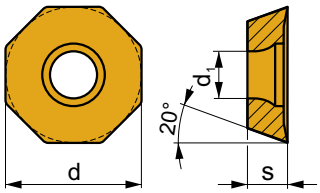
	d	d_1	s
0605	15,875	5,50	5,56

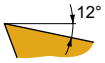
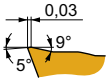


		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
1 S		**ODMT 0605ZZN**	**M8330**	■		■			□		-	–	0,15	0,45	1,0	3,1

OEHT 06

	d	d_1	s
0604	16,050	5,50	4,76

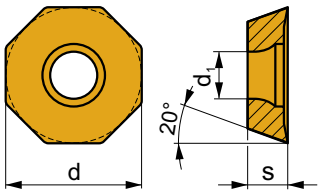


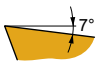
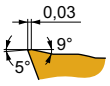
		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
E		**OEHT 0604AEER-MF**	**M8330**	◪	◪		□	□			-	–	0,08	0,20	0,5	3,3
1 E		**OEHT 0604AEER-MM**	**M8330**	◪	◪		□	□			-	–	0,08	0,25	0,5	3,3
S		**OEHT 0604AESR-M**	**M8330**	■	◪			□			-	–	0,08	0,35	0,5	3,3

PRAMET

OEHT 09

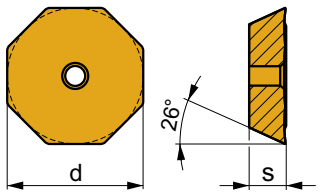
	d	d_1	s
0906	24,100	8,60	7,15

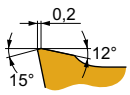


		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
1 E		**OEHT 0906AEER-MM**	**M8330**	■	◪		□	□			-	–	0,12	0,35	1,0	5,0
S		**OEHT 0906AESR-M**	**M8330**	■	◪			□			-	–	0,12	0,45	1,2	5,0

OFKR 07

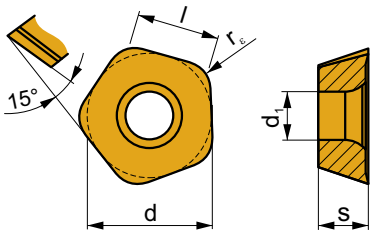
	d	d_1	s
0704	17,845	2,65	4,56



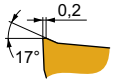
		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
S		**OFKR 0704SN-M**	**M8330**	■	◪	◪					-	–	0,10	0,30	0,5	12,0

PDKT 09

	d	d_1	l	s
0905	13,500	5,50	9,00	5,47

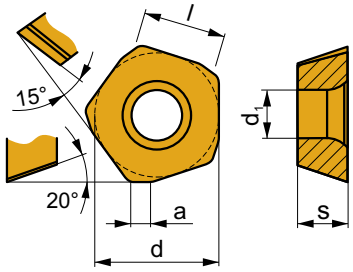


	ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	PDKT 090530ER-FM	**M8330**	■	◪	◪	□	□			-	3,0	0,50	2,50	0,3	2,0

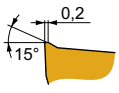


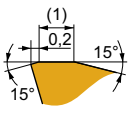
PDMX 09

	a	d	d_1	l	s
0905	2,00	13,500	5,50	9,00	5,47



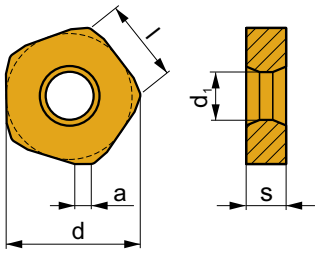
	ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	PDMX 0905ZEER-M	**M8330**	■	◪	◪	□	□			-	–	0,50	2,50	0,3	2,0
	PDMX 0905ZESR-R	**M8330**	◪	□	■			◪		-	–	0,50	2,50	0,3	2,0



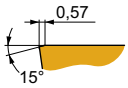


PNMQ 13

	a	d	d_1	l	s
1308	3,00	24,400	10,00	13,00	7,94

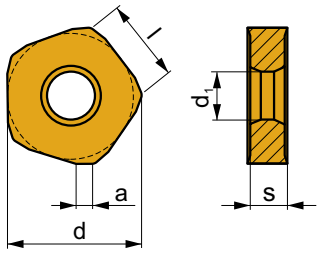


ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
PNMQ 1308DNSN	**M8330**	◪		■			◪	✖	-	–	0,30	0,70	0,5	10,0

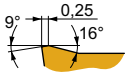


PNMU 13

	a	d	d_1	l	s
1308	3,00	24,400	10,00	13,00	7,94

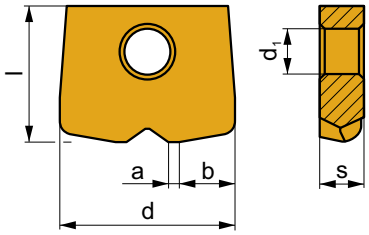


ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
PNMU 1308DNSR-M	**M8330**	■	◪	■		□	□	✖	-	–	0,25	0,70	0,5	10,0



PPHF

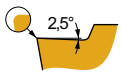
	a	b	d	d_1	l	s
0800	0,40	2,60	8,000	2,50	7,0	2,40
1000	0,50	3,20	10,000	3,00	8,5	2,60
1200	0,60	3,90	12,000	3,50	10,0	3,00
1600	0,80	5,20	16,000	4,00	12,0	4,00
2000	1,00	6,40	20,000	5,00	15,0	5,00
2500	1,20	7,90	25,000	6,00	18,5	6,00



ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
PPHF 080004-CE1	**M8330**	■	◪	■	□	□	◪	●	-	–	0,20	0,40	0,1	0,4
PPHF 100005-CE1	**M8330**	■	◪	■	□	□	◪	⬬	-	–	0,20	0,50	0,1	0,5
PPHF 120006-CE1	**M8330**	■	◪	■	□	□	◪	⬬	-	–	0,30	0,60	0,1	0,6
PPHF 160008-CE1	**M8330**	■	◪	■	□	□	◪	⬬	-	–	0,40	0,80	0,1	0,8
PPHF 200010-CE1	**M8330**	■	◪	■	□	□	◪	⬬	-	–	0,50	1,00	0,1	1,0
PPHF 250012-CE1	**M8330**	■	◪	■	□	□	◪	⬬	-	–	0,60	1,50	0,2	1,2

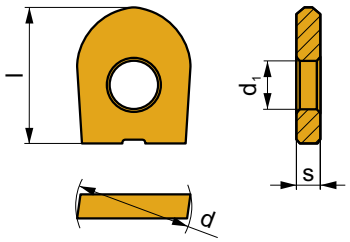
HFC

E



RC

	d	d_1	l	s
08	8,000	3,00	9,50	2,00
10	10,000	4,00	11,50	2,50
12	12,000	5,00	12,00	2,50
16	16,000	5,00	14,00	3,00
20	20,000	5,00	16,00	3,00
25	25,000	6,00	21,50	4,00
32	32,000	8,00	25,80	5,00



ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
RC 08	**M4310**	◪		■			■	⬬	-	–	0,10	0,30	0,3	0,8
	M8330	■		■			◪	⬬	-	–	0,10	0,30	0,3	0,8
RC 10	**M4310**	◪		■			■	⬬	-	–	0,10	0,33	0,3	1,0
	M8330	■		■			◪	⬬	-	–	0,10	0,33	0,3	1,0
RC 12	**M4310**	◪		■			■	⬬	-	–	0,10	0,35	0,4	1,2
	M8330	■		■			◪	⬬	-	–	0,10	0,35	0,4	1,2
RC 16	**M4310**	◪		■			■	⬬	-	–	0,10	0,40	0,5	1,6
	M8330	■		■			◪	⬬	-	–	0,10	0,40	0,5	1,6
RC 20	**M4310**	◪		■			■	⬬	-	–	0,10	0,50	0,6	2,0
	M8330	■		■			◪	⬬	-	–	0,10	0,50	0,6	2,0
RC 25	**M4310**	◪		■			■	⬬	-	–	0,10	0,55	0,6	2,5
	M8330	■		■			◪	⬬	-	–	0,10	0,55	0,6	2,5
RC 32	**M4310**	◪		■			■	⬬	-	–	0,10	0,60	0,6	3,2
	M8330	■		■			◪	⬬	-	–	0,10	0,60	0,6	3,2
RC 08-F	**M4310**	◪		■			■	⬬	-	–	0,05	0,30	0,3	0,8
RC 10-F	**M4310**	◪		■			■	⬬	-	–	0,05	0,33	0,3	1,0
RC 12-F	**M4310**	◪		■			■	⬬	-	–	0,05	0,35	0,4	1,2
RC 16-F	**M4310**	◪		■			■	⬬	-	–	0,05	0,40	0,5	1,6
	M8330	■		■			◪	⬬	-	–	0,05	0,40	0,5	1,6
RC 20-F	**M4310**	◪		■			■	⬬	-	–	0,05	0,50	0,5	2,0
	M8330	■		■			◪	⬬	-	–	0,05	0,50	0,5	2,0

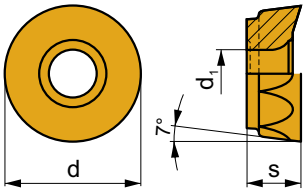
U

E

F

RCMT 12

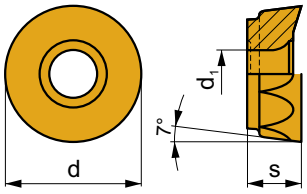
	d	d_1	s
1204	12,000	4,40	4,76



	ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	RCMT 1204MOEN-F	**M8330**	■	◪	□	□	□			-	–	0,05	0,20	0,3	6,0
	RCMT 1204MOSN-M	**M8330**	■	◪	■	□	□	□	✖	-	–	0,15	0,40	0,3	6,0
	RCMT 1204MOEN-R	**M8330**	■	◪	■		□	◪	✖	-	–	0,20	0,50	0,3	6,0

RCMT 16

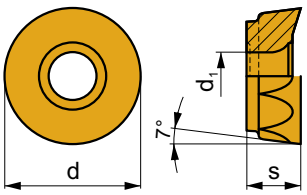
	d	d_1	s
1606	16,000	5,50	6,35



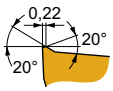
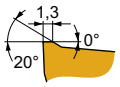
	ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
HFC E	**RCMT 1606MOEN-F**	**M8330**	■	◪	□	□	□			-	–	0,05	0,25	0,3	8,0
HFC S	**RCMT 1606MOSN-M**	**M8330**	■	◪	■	□	□	□		-	–	0,15	0,45	0,3	8,0
HFC P	**RCMT 1606MOSN-R**	**M8330**	■	◪	■		□	◪		-	–	0,20	0,60	0,3	8,0

RCMT 20

	d	d_1	s
2006	20,000	5,50	6,35

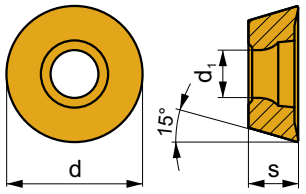


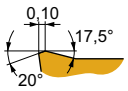
	ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
HFC S	**RCMT 2006MOSN-F**	**M8330**	■	◪	□	□	□			-	–	0,08	0,30	0,3	10,0

		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
U, HFC, S		**RCMT 2006MOSN-M**	**M6330**	◪	■			■		✖	-	–	0,15	0,45	0,3	10,0
			M8330	■	◪	■	□	□	□	✖	-	–	0,15	0,45	0,3	10,0
HFC, P		**RCMT 2006MOSN-R**	**M8330**	■	◪	■		□	◪	✖	-	–	0,20	0,60	0,3	10,0

RDGT 10

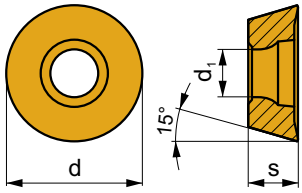
	d	d_1	s
1003	10,000	3,90	3,18



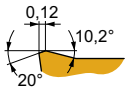
		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
U, HFC, T		**RDGT 1003MOT**	**M6330**	◪	■			◪		✖	-	–	0,10	0,30	0,5	2,5

RDGT 12

	d	d_1	s
12T3	12,000	3,90	3,97

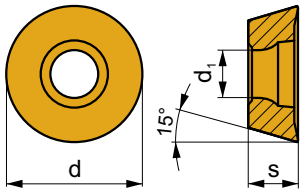


		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
		RDGT 12T3MOT	**M6330**	◪	■			◪		✖	-	–	0,10	0,35	1,0	3,0

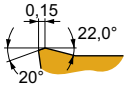


RDGT 16

	d	d_1	s
1604	16,000	5,20	4,76

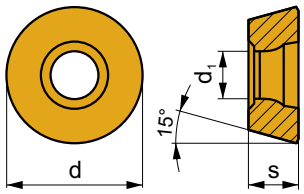


		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
		RDGT 1604MOT	**M6330**	◪	■			◪		✖	-	–	0,10	0,40	1,0	4,0

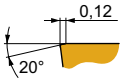


RDHX 07

	d	d_1	s
0702	7,000	2,80	2,38

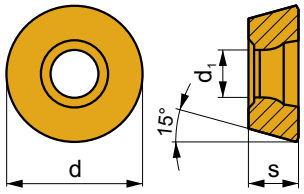


	ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	RDHX 0702MOT	**M4303**	■	□	■			■	✖	-	–	0,10	0,20	0,5	2,0

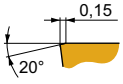


RDHX 10

	d	d_1	s
1003	10,000	3,90	3,18

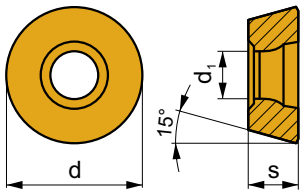


	ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	RDHX 1003MOT	**M4303**	■	□	■			■	✖	-	–	0,10	0,30	0,5	2,5

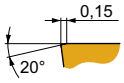


RDHX 12

	d	d_1	s
12T3	12,000	3,90	3,97

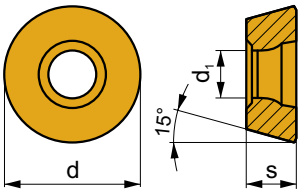


	ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	RDHX 12T3MOT	**M4303**	◪	□	■			■	✖	-	–	0,10	0,35	1,0	3,0

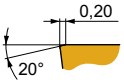


RDHX 16

	d	d_1	s
1604	16,000	5,20	4,76



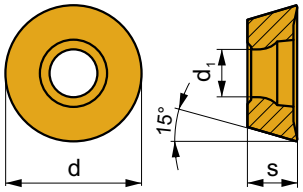
	ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	RDHX 1604MOT	**M9325**	◪	□					✖	- - -	–	0,20	0,40	1,0	4,0



PRAMET

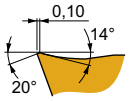
RDMT 07

	d	d_1	s
0702	7,000	2,8	2,38

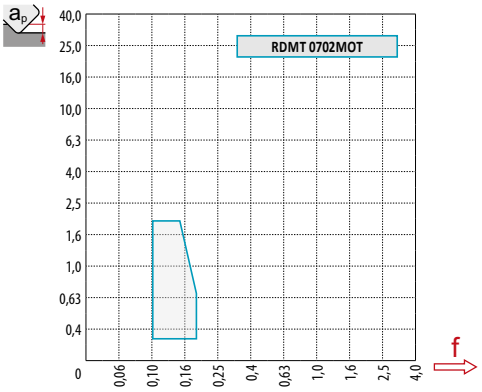


ISO		P	M	K	N	S	H		r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
RDMT 0702MOT	M8325	■	◪	□				-	–	0,10	0,20	0,3	2,0

HFC

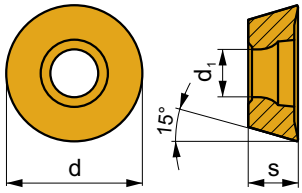


ISO		f_{min}	f_{max}	M8325
P	●	0,10	0,20	308
	⬣	0,10	0,17	275
	✖	0,10	0,15	242
M	●	0,10	0,20	182
	⬣	0,10	0,17	165
	✖	0,10	0,15	143
K	●	0,10	0,20	292
	⬣	0,10	0,17	259
	✖	0,10	0,15	231
N	●	0,10	0,20	-
	⬣	0,10	0,17	-
	✖	0,10	0,15	-
S	●	0,10	0,20	-
	⬣	0,10	0,15	-
	✖	0,10	0,10	-
H	●	0,10	0,20	-
	⬣	0,10	0,15	-
	✖	0,10	0,10	-



RDMT 10

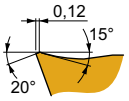
	d	d_1	s
1003	10,000	3,9	3,18



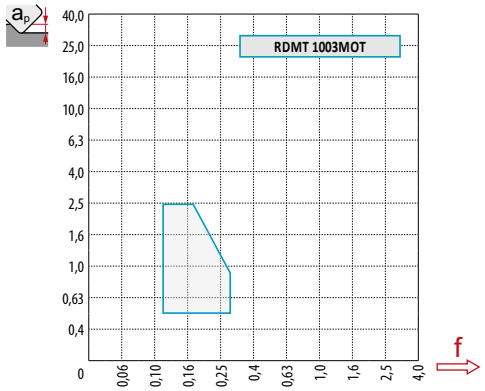
ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
RDMT 1003MOT	M8325	■	◪	□				●	-	–	0,12	0,30	0,5	2,5
	M8345	■	◪					✖	+/-	–	0,12	0,30	0,5	2,5

HFC

S



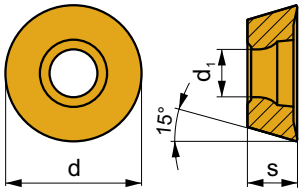
ISO		f_{min}	f_{max}	M8325	M8345
P	●	0,10	0,30	308	259
	●	0,10	0,25	275	220
	✖	0,10	0,15	242	187
M	●	0,10	0,30	182	154
	●	0,10	0,25	165	132
	✖	0,10	0,15	143	110
K	●	0,10	0,30	292	-
	●	0,10	0,25	259	-
	✖	0,10	0,15	231	-
N	●	0,10	0,30	-	-
	●	0,10	0,25	-	-
	✖	0,10	0,15	-	-
S	●	0,10	0,30	-	77
	●	0,10	0,25	-	66
	✖	0,10	0,15	-	55
H	●	0,10	0,30	-	-
	●	0,10	0,20	-	-
	✖	0,10	0,12	-	-



PRAMET

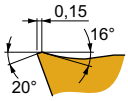
RDMT 12

	d	d_1	s
12T3	12,000	3,9	3,97

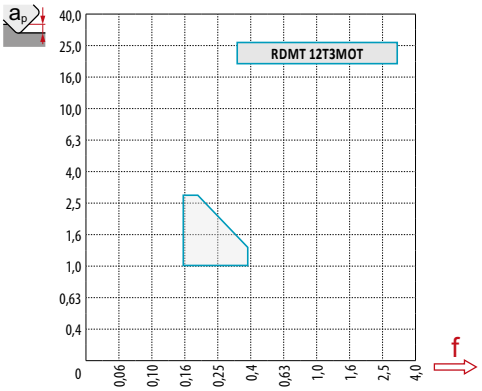


ISO		P	M	K	N	S	H		r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
RDMT 12T3MOT	M8325	■	◪	□				●	-	–	0,15	0,35	1,0	3,0
	M8345	■	◪					✖	+/-	–	0,15	0,35	1,0	3,0

HFC

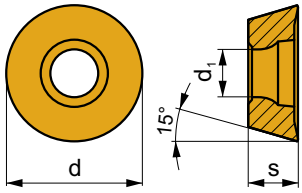


ISO		f_{min}	f_{max}	M8325	M8345
P	●	0,10	0,35	308	259
	●	0,10	0,30	275	220
	✖	0,10	0,20	242	187
M	●	0,10	0,35	182	154
	●	0,10	0,30	165	132
	✖	0,10	0,20	143	110
K	●	0,10	0,35	292	-
	●	0,10	0,30	259	-
	✖	0,10	0,20	231	-
N	●	0,10	0,35	-	-
	●	0,10	0,30	-	-
	✖	0,10	0,20	-	-
S	●	0,10	0,30	-	77
	●	0,10	0,25	-	66
	✖	0,10	0,15	-	55
H	●	0,10	0,30	-	-
	●	0,10	0,20	-	-
	✖	0,10	0,15	-	-



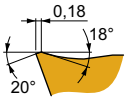
RDMT 16

	d	d_1	s
1604	16,000	5,2	4,76

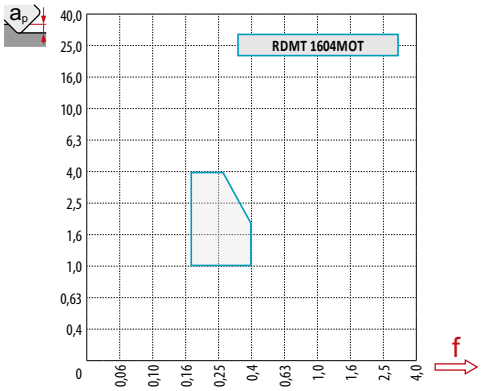


ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
RDMT 1604MOT	M8325	■	◪	□				●	-	–	0,18	0,40	1,0	4,0
	M8345	■	◪					✖	+/-	–	0,18	0,40	1,0	4,0

HFC

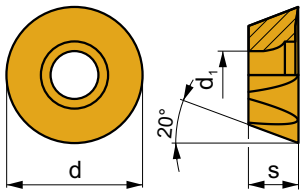


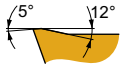
ISO		f_{min}	f_{max}	M8325	M8345
P	●	0,10	0,40	308	259
	●	0,10	0,30	275	220
	✖	0,10	0,18	242	187
M	●	0,10	0,30	182	154
	●	0,10	0,25	165	132
	✖	0,10	0,17	143	110
K	●	0,10	0,40	292	-
	●	0,10	0,30	259	-
	✖	0,10	0,18	231	-
N	●	0,10	0,40	-	-
	●	0,10	0,30	-	-
	✖	0,10	0,18	-	-
S	●	0,10	0,30	-	77
	●	0,10	0,25	-	66
	✖	0,10	0,17	-	55
H	●	0,10	0,25	-	-
	●	0,10	0,20	-	-
	✖	0,10	0,15	-	-



REHT 16

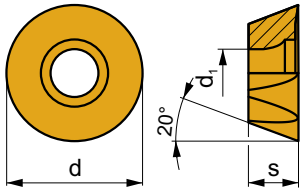
	d	d_1	s
1604	16,000	5,50	4,76

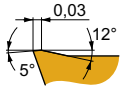


		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
E		**REHT 1604M0EN-MM**	**M8330**	◪	◪		□	□		✱	-	–	0,08	0,25	0,5	4,0
S		**REHT 1604M0SN-M**	**M8330**	■	◪			□		✖	-	–	0,08	0,35	0,5	4,0

REHT 24

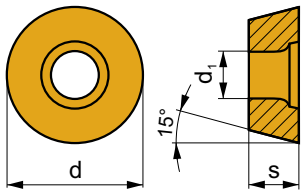
	d	d_1	s
2406	24,000	8,60	7,15



		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
E		**REHT 2406M0EN-MM**	**M8330**	◪	◪		□	□		✱	-	–	0,12	0,35	0,6	6,0
S		**REHT 2406M0SN-M**	**M8330**	■	◪			□		✖	-	–	0,12	0,45	0,5	6,0

RPET 12

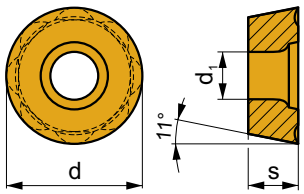
	d	d_1	s
1204	12,000	4,40	4,76



		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
HFC		**RPET 1204MOSN**	**M8330**	■	◪	◪		□	□	✖	-	–	0,12	0,40	0,5	3,0
S	0,15 / 15° / 10°															

RPET 15

	d	d_1	s
1505	15,785	5,50	5,56

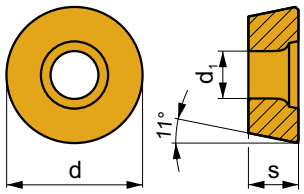


		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
HFC		**RPET 1505MOS-M**	**M8330**	■	◪	◪		□	□	✖	-	–	0,12	0,50	0,5	3,5
S	0,08 / 12°															

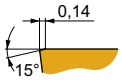
PRAMET

RPEW 12

	d	d_1	s
1204	12,000	4,40	4,76

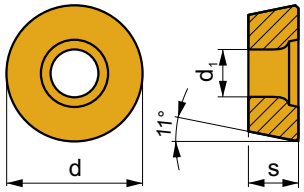


ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
RPEW 1204MOSN	**M8330**	◪	□	■			◪	✖	-	–	0,10	0,40	0,5	3,0

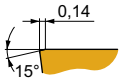


RPEW 15

	d	d_1	s
1505	15,785	5,50	5,56

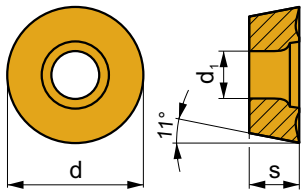


ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
RPEW 1505MOS	**M8330**	◪	□	■			◪	✖	-	–	0,15	0,50	0,5	3,5



RPEX

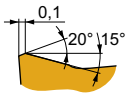
	d	d_1	s
1204	12,000	4,40	4,76



ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
RPEX 1204MOSN-12	**M8330**	■	◪	◪		□	□	✖	-	–	0,12	0,40	0,5	3,0

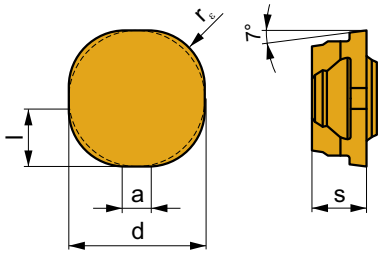
HFC

S



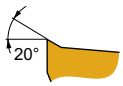
SCKR 09

	a	d	l	s
09T3	1,50	9,525	4,000	3,97



ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
SCKR 09T340EN-F	**M8330**	◪	◪	□	□	□			-	4,0	0,08	0,26	0,3	4,0

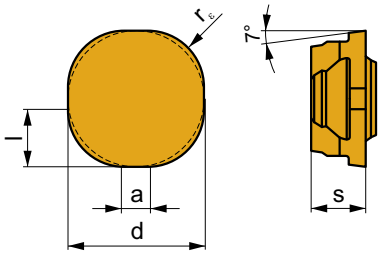
E



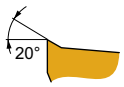
PRAMET

SCKR 12

	a	d	l	s
12T3	1,10	12,700	6,000	3,97

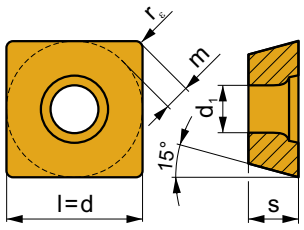


	ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SCKR 12T360EN-F	**M8330**	◪	◪	□	□	□			-	6,0	0,08	0,26	0,3	6,0

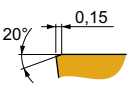


SDEW 09

	d	d_1	l	m	s
0903	9,525	4,40	9,525	1,64	3,18

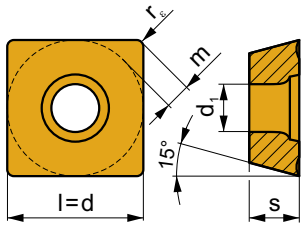


	ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SDEW 090308EN	**M8330**	◪	□	■			◪		-	0,8	0,10	0,30	1,0	4,5
	SDEW 090308SN	**M8330**	◪	□	■			◪		-	0,8	0,15	0,30	1,0	4,5

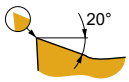


SDEX 09

	d	d_1	l	m	s
0903	9,525	4,40	9,525	1,64	3,18

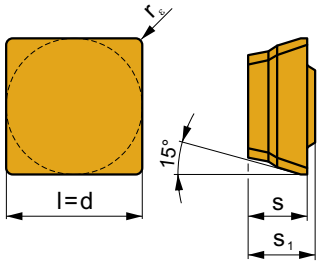


	ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SDEX 090308FN-74	M8330	■	◪	◪	□	□			-	0,8	0,10	0,30	0,5	4,5

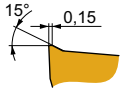


SDGX 12

	d	l	s	s_1
1205	12,700	12,700	5,56	6,35



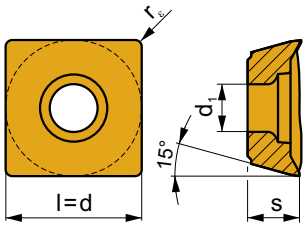
	ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SDGX 120508EN-FM	M8330	■	◪	■		□			-	0,8	0,07	0,15	1,0	12,0

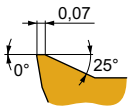
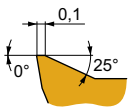
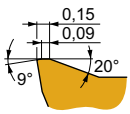
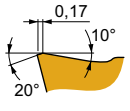


PRAMET

SDMT 12

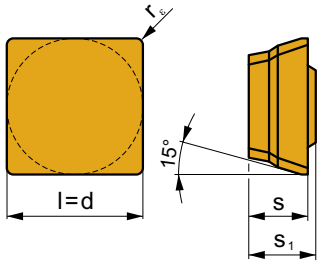
	d	d_1	l	s
1205	12,700	4,40	12,700	5,00



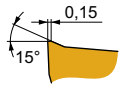
		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
S		**SDMT 120508SR-F**	**M8330**	■	◪	◪	□	□		●	-	0,8	0,07	0,25	1,0	5,0
1 U S		**SDMT 120508SR-M**	**M8330**	■	◪	◪	□	□		●	-	0,8	0,10	0,25	1,0	10,0
P		**SDMT 120508PR-R**	**M8330**	■	◪	◪		□		✖	-	0,8	0,20	0,45	1,0	10,0
		SDMT 120508SN-R	**M8330**	■		■				✖	-	0,8	0,17	0,45	0,3	10,0
S		**SDMT 1205AESN-R**	**M8330**	■		■				✖	-	–	0,17	0,45	0,3	10,0

SDMX 12

	d	l	s	s_1
1205	12,700	12,700	5,56	6,35

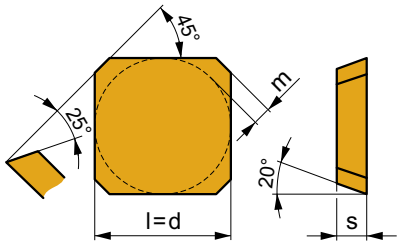


		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
		SDMX 120508EN-M	**M8330**	■	◪	□	□	□			-	0,8	0,07	0,15	1,0	12,0

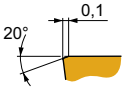


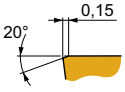
SEEN

	d	l	m	s
1203	12,700	12,700	1,60	3,18
1204	12,700	12,700	1,60	4,76
1504	15,875	15,875	2,00	4,76



		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
		SEEN 1203AFFN	**M8330**	■	◪	□	□				-	–	0,05	0,30	0,5	6,5
		SEEN 1204AFFN	**M8330**	■	◪	□	□				-	–	0,05	0,40	0,5	6,5
		SEEN 1203AFSN	**M8330**	■	◪	□	□				-	–	0,15	0,40	1,0	6,5
		SEEN 1204AFSN	**M8330**	■	◪	□	□				-	–	0,15	0,40	1,0	6,5
		SEEN 1504AFSN	**M8330**	■	◪	□	□				-	–	0,20	0,40	1,0	9,0

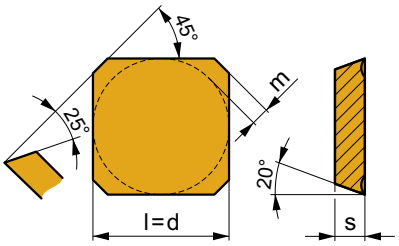




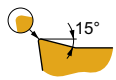
PRAMET

SEER

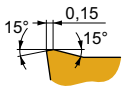
	d	l	m	s
1203	12,700	12,700	1,60	3,18
1204	12,700	12,700	1,60	4,76
1504	15,875	15,875	2,00	4,76



ISO		P	M	K	N	S	H		-	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
SEER 1203AFEN	**M8330**	■	◪	◪		□	□		-	–	0,20	0,30	0,5	6,5
SEER 1204AFEN	**M8330**	■	◪	◪		□	□		-	–	0,20	0,40	0,5	6,5
SEER 1504AFEN	**M8330**	■	◪	◪		□	□		-	–	0,20	0,40	0,5	9,0

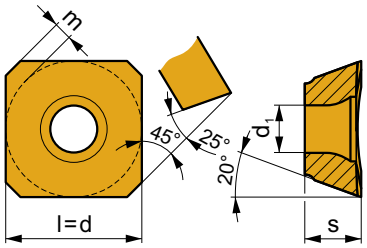


SEER 1203AFSN	**M8330**	■	◪	◪		□	□		-	–	0,20	0,40	1,0	6,5
SEER 1204AFSN	**M8330**	■	◪	◪		□	□		-	–	0,20	0,40	1,0	6,5
SEER 1504AFSN	**M8330**	■	◪	◪		□	□		-	–	0,20	0,40	0,5	9,0

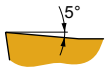


SEET 09

	d	d_1	l	m	s
09T3	9,525	3,50	9,525	1,21	3,97

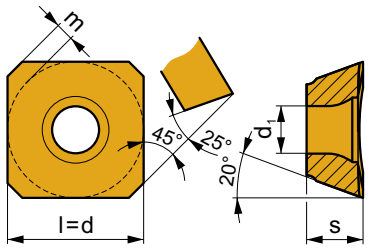


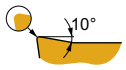
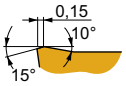
ISO		P	M	K	N	S	H		-	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
SEET 09T3AFEN	**M8330**	■	◪		□	□			-	–	0,08	0,30	0,3	4,5



SEET 12

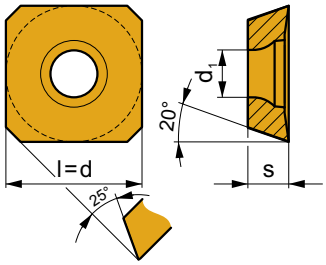
	d	d_1	l	m	s
1204	12,700	5,50	12,700	1,60	4,76

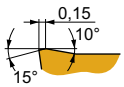


		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
E		**SEET 1204AFEN**	**M8330**	■	◪	◪		□	□		-	–	0,20	0,40	0,5	6,5
1 S		**SEET 1204AFSN**	**M8330**	■	◪	◪		□	□		-	–	0,20	0,40	1,0	6,5

SEET 12-PM

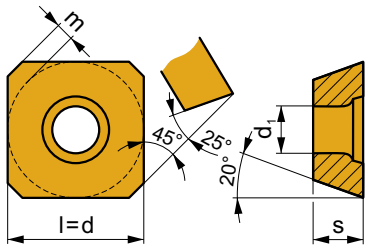
	d	d_1	l	s
12T3	13,400	4,20	13,400	3,97



		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
U S		**SEET 12T3M-PM**	**M6330**	◪	■			◪			-	–	0,20	0,35	1,0	6,5
			M8330	■	◪	◪		□	□		-	–	0,20	0,35	1,0	6,5

SEEW 12

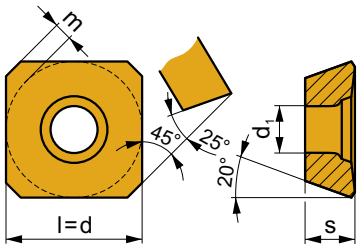
	d	d_1	l	m	s
1204	12,700	5,50	12,700	1,60	4,76



	ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SEEW 1204AFEN	**M8330**	◪	□	■			◪		-	–	0,10	0,40	0,5	6,5
	SEEW 1204AFSN	**M8330**	◪	□	■			◪		-	–	0,15	0,40	1,0	6,5

SEMT 09

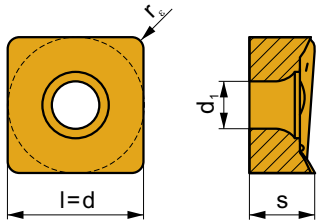
	d	d_1	l	m	s
09T3	9,525	3,50	9,525	1,21	3,97



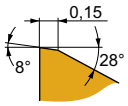
	ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SEMT 09T3AFSN	**M8330**	■	◪	■	□	□			-	–	0,12	0,35	0,5	4,5

SNET 13

	d	d_1	l	s
1305	13,200	5,90	13,200	6,33

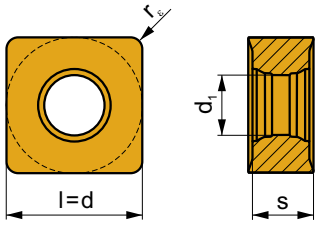


	ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SNET 130512SR-M	**M8330**	■	□	■				✖	-	1,2	0,15	0,35	1,2	12,0

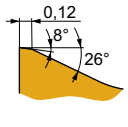


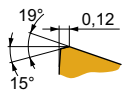
SNGX 13

	d	d_1	l	s
1305	13,200	5,90	13,200	5,96



	ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SNGX 130512SN-M	**M8330**	■	□	■				✖	-	1,2	0,15	0,35	1,2	12,0
	SNGX 130512PN-R	**M8330**	■	□	■				✖	-	1,2	0,15	0,40	1,2	12,0

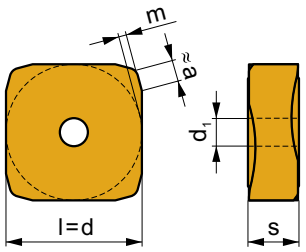




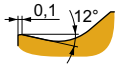
PRAMET

SNHF

	a	d	l	m	s
1204	2,00	12,700	12,700	0,50	4,76
1504	1,40	15,875	15,875	1,10	4,76

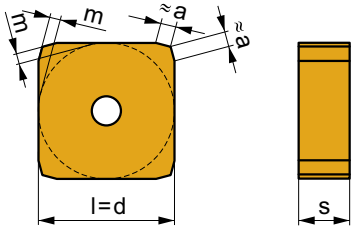


ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
SNHF 1204ENSR-M	**M8330**	■	◪	■		□		✖	-	–	0,15	0,40	1,0	6,0
SNHF 1504ENSR-M	**M8330**	■	◪	■		□		✖	-	–	0,15	0,40	1,0	9,0



SNHN

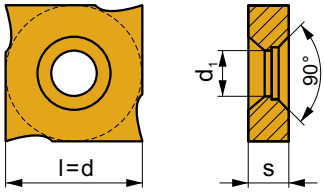
	a	d	l	m	s
1204	1,40	12,700	12,700	0,95	4,76
1504	1,40	15,875	15,875	1,30	4,76



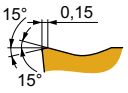
ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
SNHN 1204ENEN	**M8330**	◪	□	■			◪	⬢	-	–	0,10	0,40	0,5	9,0
SNHN 1504ENEN	**M8330**	◪	□	■			◪	⬢	-	–	0,10	0,40	0,5	13,5

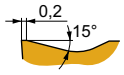
SNHQ AZ

	d	d_1	l	s
1102	11,000	4,30	11,000	2,30
1103	11,000	4,30	11,000	2,70
1203	12,700	5,00	12,700	3,20
1204	12,700	5,00	12,700	4,50
1205	12,700	5,00	12,700	5,40
1207	12,700	5,00	12,700	7,00



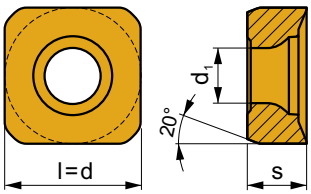
ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
SNHQ 1102AZTN	**M8330**	■	◪	■	□	□	□	⚙	-	–	0,10	0,40	–	–
SNHQ 1103AZTN	**M8330**	■	◪	■	□	□	□	⚙	-	–	0,10	0,40	–	–
SNHQ 1203AZTN	**M8330**	■	◪	■	□	□	□	⚙	-	–	0,10	0,40	–	–
SNHQ 1204AZTN	**M8330**	■	◪	■	□	□	□	⚙	-	–	0,20	0,50	–	–
SNHQ 1205AZTN	**M8330**	■	◪	■	□	□	□	⚙	-	–	0,20	0,50	–	–
SNHQ 1207AZTN	**M8330**	■	◪	■	□	□	□	⚙	-	–	0,20	0,50	–	–



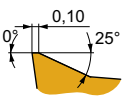


SNKT 12

	d	d_1	l	s
1205	12,700	5,20	12,700	5,56

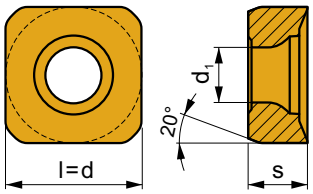


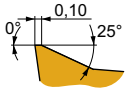
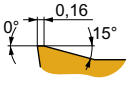
ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
SNKT 1205AZSR-M	**M8330**	■	◪	◪		□	□	✖	-	–	0,15	0,50	3,2	3,2



SNMT 12

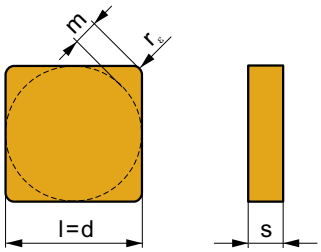
	d	d_1	l	s
1205	12,700	5,20	12,700	5,56

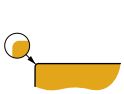


		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
		**SNMT 1205AZSR-M**	**M8330**	■	◪	◪		□	□	✖	-	–	0,15	0,50	1,0	6,5
		**SNMT 1205AZSR-R**	**M8330**	■	◪	◪		□	□	✖	-	–	0,18	0,50	1,0	6,5

SNUN

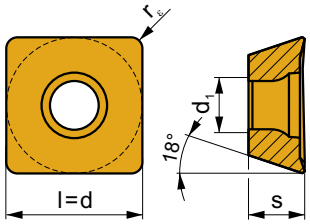
	d	l	m	s
1204	12,700	12,700	2,30	4,76
1504	15,875	15,875	2,80	4,76



		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
		**SNUN 120408**	**M8330**	◪	□	■			◪	✖	-	0,8	0,10	0,40	1,0	9,0
		SNUN 120412	**M8330**	◪	□	■			◪	✖	-	1,2	0,10	0,40	1,2	9,0
		SNUN 150412	**M8330**	◪	□	■			◪	✖	-	1,2	0,10	0,40	1,2	13,5

SOMT 09

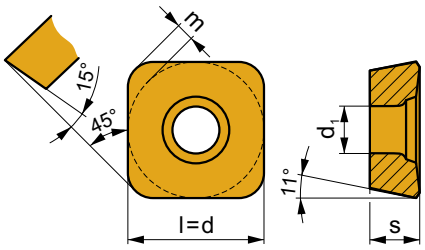
	d	d_1	l	s
09T3	9,550	3,50	9,550	3,97



	ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SOMT 09T308-M	**M8330**	■	◪	■	□	□		●	-	0,8	0,12	0,40	1,0	8,0
	SOMT 09T304-MI	**M8330**	■	◪	■	□	□		●	-	0,4	0,08	0,35	0,5	8,0
	SOMT 09T304-P	**M8330**	■	◪	◪	□	□		●	-	0,4	0,08	0,35	0,5	8,0

SPET 12

	d	d_1	l	m	s
1204	12,700	5,50	12,700	1,90	4,76

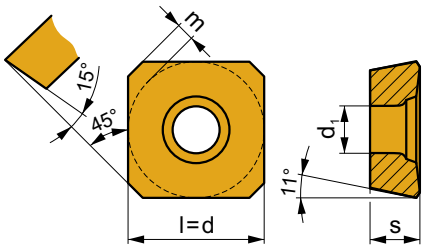


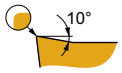
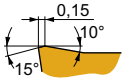
	ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SPET 120408S	**M8330**	■	◪	◪		□	□	●	-	0,8	0,17	0,40	1,0	12,0

PRAMET

SPET 12 AD

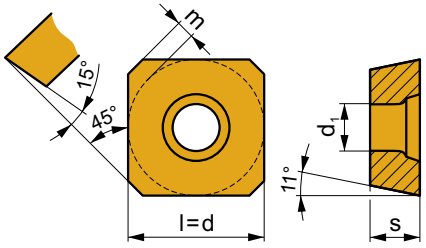
	d	d_1	l	m	s
1204	12,700	5,50	12,700	1,90	4,76

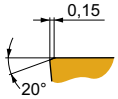


		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
E		**SPET 1204ADEN**	**M8330**	■	◪	◪		□	□		-	–	0,12	0,40	1,0	12,0
S		**SPET 1204ADSN**	**M8330**	■	◪	◪		□	□		-	–	0,12	0,40	1,0	12,0

SPEW 12 AD

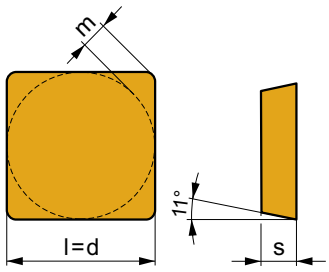
	d	d_1	l	m	s
1204	12,700	5,50	12,700	1,92	4,76



		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
E		**SPEW 1204ADEN**	**M8330**	◪	□	■			◪		-	–	0,10	0,35	1,0	12,0
S		**SPEW 1204ADSN**	**M8330**	◪	□	■			◪		-	–	0,15	0,40	1,0	12,0

SPGN

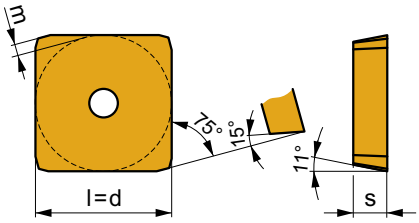
	d	l	m	s
1203	12,700	12,700	2,30	3,18
1504	15,875	15,875	2,80	4,76



		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
E		**SPGN 120304**	**M8330**	◪	□	■			◪		-	0,4	0,10	0,25	0,5	9,0
		SPGN 120308	**M8330**	◪	□	■			◪		-	0,8	0,10	0,25	1,0	9,0
		SPGN 150408	**M8330**	◪	□	■			◪		-	0,8	0,10	0,35	1,0	13,5
		SPGN 150412	**M8330**	◪	□	■			◪		-	1,2	0,10	0,35	1,2	13,5

SPKN

	d	l	m	s
1203	12,700	12,700	0,88	3,18
1504	15,875	15,875	1,26	4,76

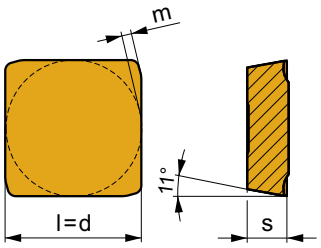


		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
E		**SPKN 1203EDER**	**M8330**	◪	□	■			◪		-	–	0,10	0,25	1,0	9,0
		SPKN 1504EDEL	**M8330**	◪	□	■			◪		-	–	0,10	0,35	1,0	13,0
		SPKN 1504EDER	**M8330**	◪	□	■			◪		-	–	0,10	0,35	1,0	13,0
U S	0,13 20°	**SPKN 1203EDSL**	**M8330**	◪	□	■			◪		-	–	0,15	0,30	1,0	9,0
		SPKN 1203EDSR	**M8330**	◪	□	■			◪		-	–	0,15	0,30	1,0	9,0
U S	0,16 20°	**SPKN 1504EDSR**	**M8330**	◪	□	■			◪		-	–	0,20	0,40	1,0	13,0

PRAMET

SPKR

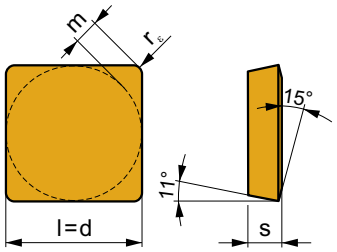
	d	l	m	s
1203	12,700	12,700	0,90	3,18
1504	15,875	15,875	1,22	4,76



ISO		P	M	K	N	S	H		-	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
SPKR 1203EDSR	**M8330**	■	◪	◪		□	□		-	–	0,15	0,30	1,0	9,0
SPKR 1504EDSR	**M8330**	■	◪	◪		□	□		-	–	0,25	0,45	1,0	12,0

SPUN

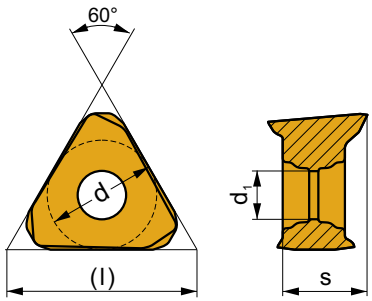
	d	l	m	s
1203	12,700	12,700	2,14	3,18
1504	15,875	15,875	2,80	4,76
1904	19,050	19,050	3,45	4,76



ISO		P	M	K	N	S	H		-	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
SPUN 120304	**M8330**	◪	□	■			◪		-	0,4	0,10	0,30	0,4	9,0
SPUN 120308	**M8330**	◪	□	■			◪		-	0,8	0,10	0,30	1,0	9,0
SPUN 120312	**M8330**	◪	□	■			◪		-	1,2	0,10	0,30	1,2	9,0
SPUN 150412	**M8330**	◪	□	■			◪	✖	-	1,2	0,10	0,40	1,2	13,0
SPUN 190408	**M8330**	◪	□	■			◪		-	0,8	0,10	0,40	1,0	16,0
SPUN 190412	**M8330**	◪	□	■			◪	✖	-	1,2	0,10	0,40	1,2	16,0

TNGX 10

	d	d_1	l	s
1004	6,000	2,8	10,39	4,69



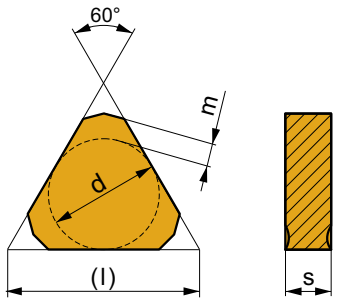
		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
		TNGX 100402SR-F	**M8330**	■	◪	◪		□		●	-	0,2	0,03	0,11	0,1	5,0
		TNGX 100404SR-F	**M6330**	◪	■			◪		●	-	0,4	0,03	0,11	0,1	5,0
			M8330	■	◪	◪		□		●	-	0,4	0,03	0,11	0,1	5,0
		TNGX 100408SR-F	**M6330**	◪	■			◪		●	-	0,8	0,03	0,11	0,1	5,0
			M8330	■	◪	◪		□		●	-	0,8	0,03	0,11	0,1	5,0
		TNGX 100404SR-M	**M6330**	◪	■			◪		●	-	0,4	0,05	0,15	0,3	5,0
			M8330	■	◪	◪		□		●	-	0,4	0,05	0,15	0,3	5,0
		TNGX 100408SR-M	**M6330**	◪	■			◪		⬣	-	0,8	0,05	0,15	0,3	5,0
			M8330	■	◪	◪		□		⬣	-	0,8	0,05	0,15	0,3	5,0

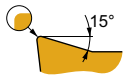
ISO		f_{min}	f_{max}	M6330	M8330
P	●	0,05	0,15	224	244
	⬣	0,05	0,11	200	217
	✖	0,05	0,08	175	189
M	●	0,05	0,12	147	143
	⬣	0,05	0,05	130	126
	✖	0,05	0,06	112	108
K	●	0,05	0,15	-	232
	⬣	0,05	0,10	-	212
	✖	0,05	0,08	-	184
N	●	0,05	0,20	-	-
	⬣	0,05	0,15	-	-
	✖	0,05	0,10	-	-
S	●	0,05	0,12	74	72
	⬣	0,05	0,08	63	61
	✖	0,05	0,06	56	54

PRAMET

TNJF

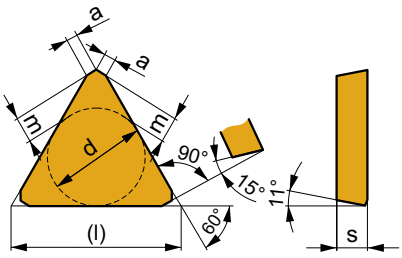
	a	d	l	m	s
1204	10,73	12,700	22,00	2,41	4,76

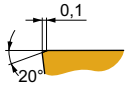


		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
E		**TNJF 1204ANEN**	**M8330**	■	◪	■	□	□	□		-	–	0,10	0,40	2,0	6,0

TPCN 16

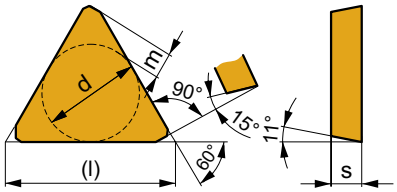
	a	d	l	m	s
1603	1,20	9,530	16,10	2,45	3,18

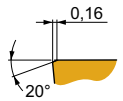


		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
U S		**TPCN 1603PDSN**	**M8330**	■	◪	■	□	□	□		-	–	0,12	0,25	–	–

TPKN

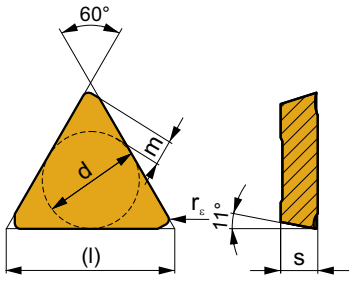
	d	l	m	s
1603	9,530	16,50	2,45	3,18
2204	12,700	22,00	3,55	4,76

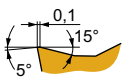


		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
E		**TPKN 1603PDER**	**M8330**	◪	□	■			□	●	-	–	0,10	0,20	1,0	12,0
		TPKN 2204PDER	**M8330**	◪	□	■			□	●	-	–	0,10	0,25	1,0	17,0
U S		**TPKN 1603PDSR**	**M8330**	◪	□	■			□	⧓	-	–	0,20	0,25	1,0	12,0
		TPKN 2204PDSR	**M8330**	◪	□	■			□	⧓	-	–	0,20	0,30	1,0	17,0

TPKR

	d	l	m	s
1603	9,530	16,50	2,45	3,18
2204	12,700	22,00	3,55	4,76

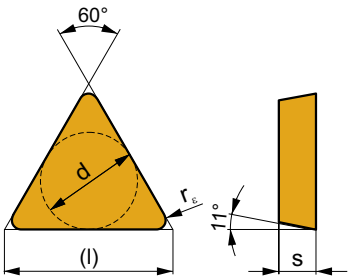


		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
1 S		**TPKR 1603PDSR**	**M8330**	■	◪	■				⧓	-	–	0,10	0,30	1,0	12,0
		TPKR 2204PDSR	**M8330**	■	◪	■				⧓	-	–	0,10	0,40	1,0	17,0

PRAMET

TPUN

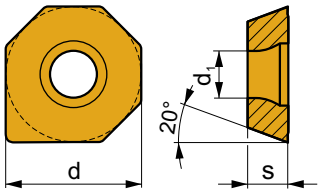
	d	l	s
1103	6,350	11,0	3,18
1603	9,525	16,5	3,18
2204	12,700	22,0	4,76



ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
TPUN 110304	**M8330**	■	□	■			■	●	-	0,4	0,10	0,15	0,5	8,0
TPUN 110308	**M8330**	■	□	■			■	⬣	-	0,8	0,10	0,15	0,8	8,0
TPUN 160304	**M8330**	■	□	■			□	●	-	0,4	0,10	0,20	0,5	12,0
TPUN 160308	**M8330**	■	□	■			■	⬣	-	0,8	0,10	0,20	1,0	12,0
TPUN 160312	**M8330**	■	□	■			■	⬣	-	1,2	0,10	0,20	1,2	12,0
TPUN 220408	**M8330**	■	□	■			□	●	-	0,8	0,10	0,25	1,0	17,0
TPUN 220412	**M8330**	■	□	■			■	⬣	-	1,2	0,10	0,25	1,2	17,0

XEHT 06

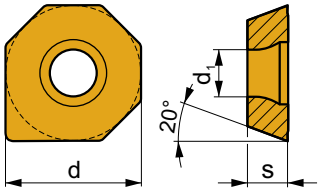
	d	d_1	s
0604	16,050	5,50	4,76

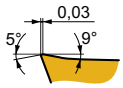


ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
XEHT 0604AESR	**M8330**	■	◪			□		✖	-	–	0,08	0,35	0,1	3,3

XEHT 09

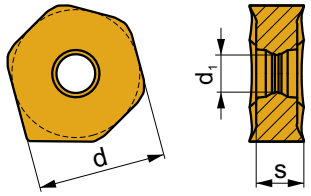
	d	d_1	s
0906	24,100	8,60	7,15

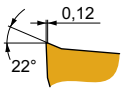


		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
W S		**XEHT 0906AESR**	**M8330**	■	◪			□		✖	-	–	0,12	0,45	0,5	5,0

XNGX 09

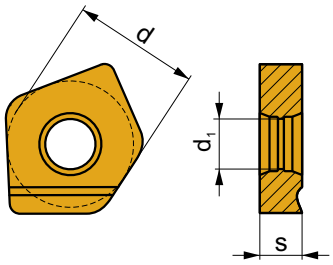
	d	d_1	s
0906	16,500	4,90	6,35



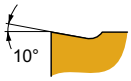
		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
W S		**XNGX 0906ANSN**	**M8330**	■	◪	■				✖	-	–	0,17	0,50	0,8	5,0

XNGX 13

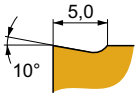
	d	d_1	s
1308	24,180	10,00	7,94

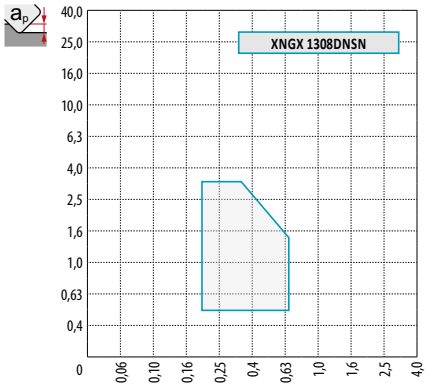


ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
XNGX 1308DNSN	**M8330**	■	□	■				✖	-	-	0,25	0,70	0,5	3,5



XNGX 13

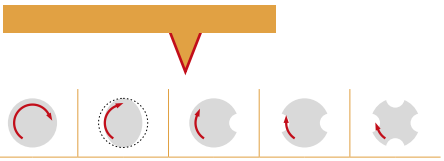




P	M	K	N	S	H
■	□	■			

f 0,25 – 0,7

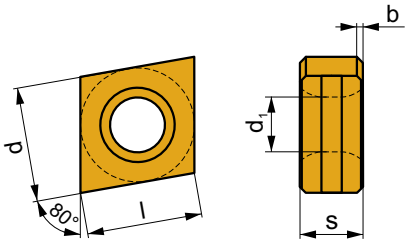
a_p 0,5 – 3,5



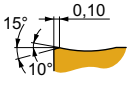
XNGX 1308DNSN

XNHQ

	b	d	d_1	l	s
1205	0,5 x 45°	10,000	4,70	12,70	5,40
1606	0,5 x 45°	12,000	5,90	16,00	6,40

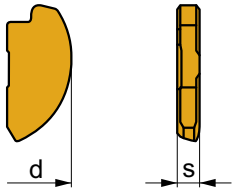


ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
XNHQ 1205AZTN	**M8330**	■	◪	■	□	□	□	⬌	-	–	0,10	0,50	–	–
XNHQ 1606AZTN	**M8330**	■	◪	■	□	□	□	⬌	-	–	0,10	0,60	–	–



XP

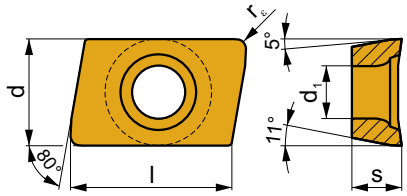
	d	s
16	16	2,00
20	20	2,50
25	25	3,17
32	32	4,00



ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
XP 16ER-FM	**M8330**	■	◪	■		□	◪		-	–	0,05	0,15	0,3	8,0
XP 20ER-FM	**M8330**	■	◪	■		□	◪		-	–	0,07	0,17	0,3	10,0
XP 25ER-FM	**M8330**	■	◪	■		□	◪		-	–	0,07	0,20	0,3	12,5
XP 32ER-FM	**M8330**	■	◪	■		□	◪		-	–	0,10	0,25	0,3	16,0

XPHT 16

	d	d_1	l	s
1604	9,525	4,40	15,88	4,76

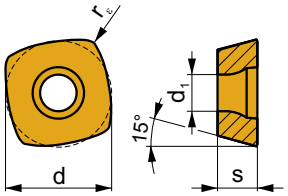


ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
XPHT 160412E	**M6330**	◪	■			□			-	1,2	0,05	0,30	1,2	15,0
	M8330	■	◪	◪		□			-	1,2	0,05	0,30	1,2	15,0
XPHT 160412S	**M8330**	■	◪	◪		□		✖	-	1,2	0,10	0,30	1,2	15,0

PRAMET

ZDEW 12

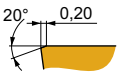
	d	d_1	l	s
1204	12,700	4,40	12,70	4,76



		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
		ZDEW 120408	**M4303**	■		■			■	●	-	0,8	0,50	3,00	0,3	1,6

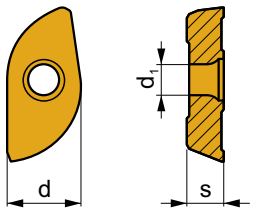
HFC

S



ZP

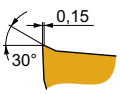
	d	d_1	s
12	12	2,90	2,38
16	16	2,90	3,18
20	20	4,00	3,97
25	25	4,70	4,76
32	32	5,90	6,35

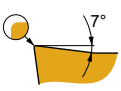


		ISO		P	M	K	N	S	H			r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
1		**ZP 12ER-M**	**M8330**	■	◪	◪		□	□	●	-	–	0,06	0,13	0,3	10,7
		ZP 16ER-M	**M8330**	■	◪	◪		□	□	●	-	–	0,07	0,16	0,3	15,0
		ZP 20ER-M	**M8330**	■	◪	◪		□	□	●	-	–	0,07	0,16	0,3	17,9
		ZP 25ER-M	**M8330**	■	◪	◪		□	□	●	-	–	0,08	0,20	0,3	22,3
		ZP 32ER-M	**M8330**	■	◪	◪		□	□	●	-	–	0,10	0,25	0,3	28,6
U		**ZP 32ER-R**	**M8330**	■	◪	◪	□	□	□	●	-	–	0,12	0,31	0,3	28,6

S

E





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