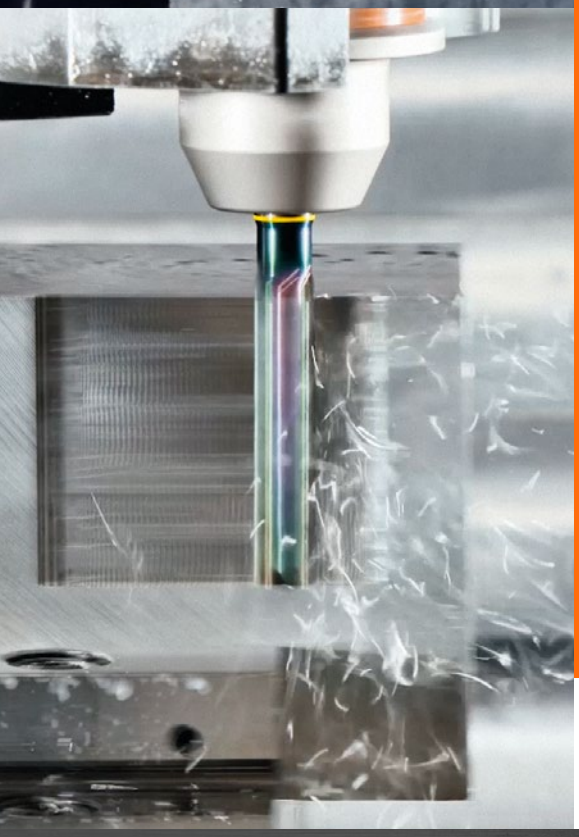
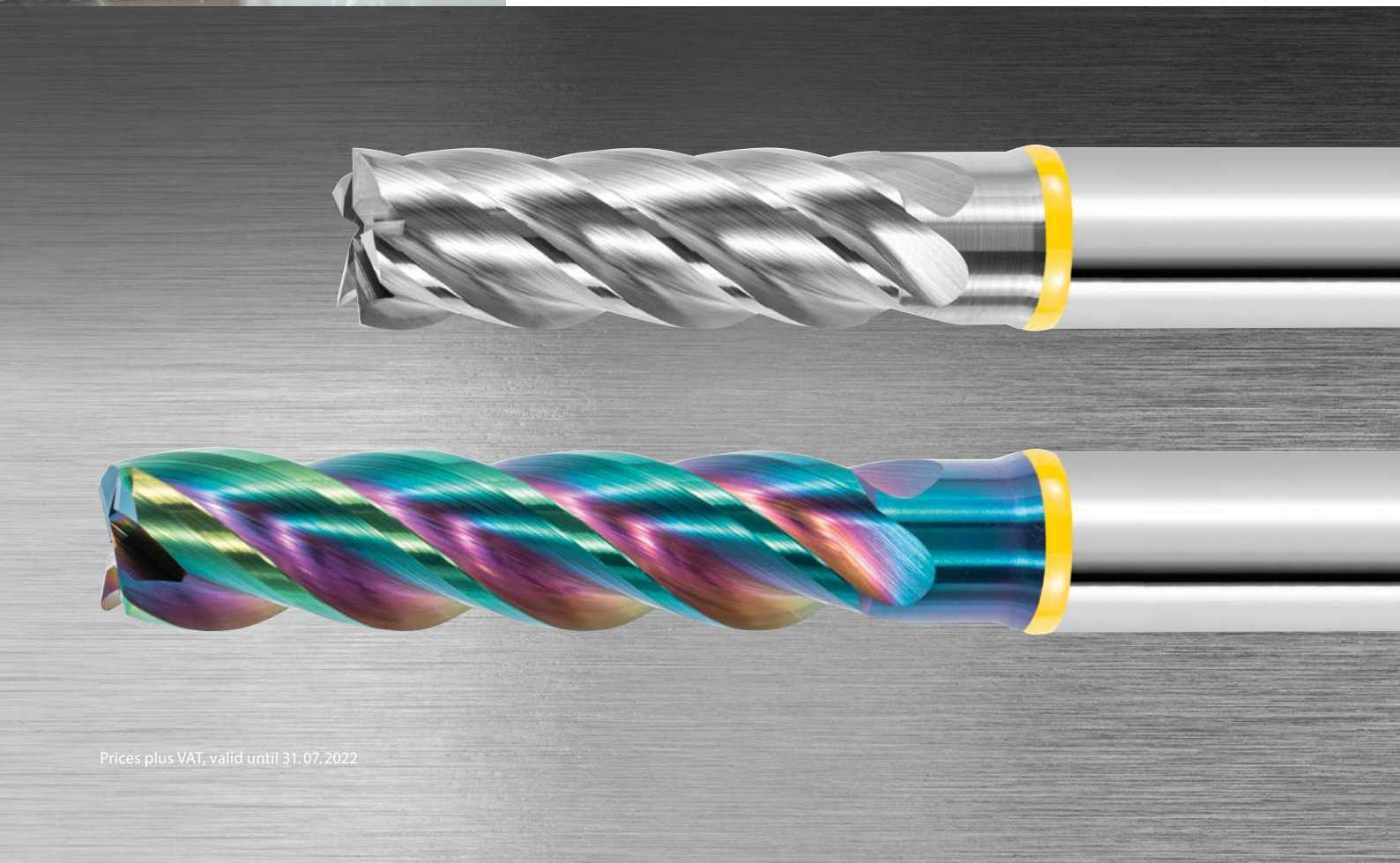


Hoffmann Group

THE NEW MASTERS FOR ALUMINIUM.

GARANT Master Alu – discover the extended range.

Garant



Prices plus VAT, valid until 31.07.2022

THE NEW GENERATION OF TOOLS – GARANT MASTER ALU.

202002 202004 202006 202008 202010 202012 202014 202015 202017 202019

Master Alu PickPocket

206255 206257 206261 206258 206264 201070 201075 201260

Master Alu PickPocket solid carbide torus cutter

Master Alu SlotMachine

Master Alu solid carbide torus cutter

Master Alu solid carbide milling cutter, precision balanced

Master Alu solid carbide milling cutter, z = 2, DLC-coated

Experience the GARANT Master Alu in the video: http://ho7.eu/master-alu

Garant

203203 203204 203205

Master Alu
solid carbide finishing cutter

202470 202512

Master Alu solid carbide milling cutter, z = 4, uncoated and DLC-coated

203113 203114 203115

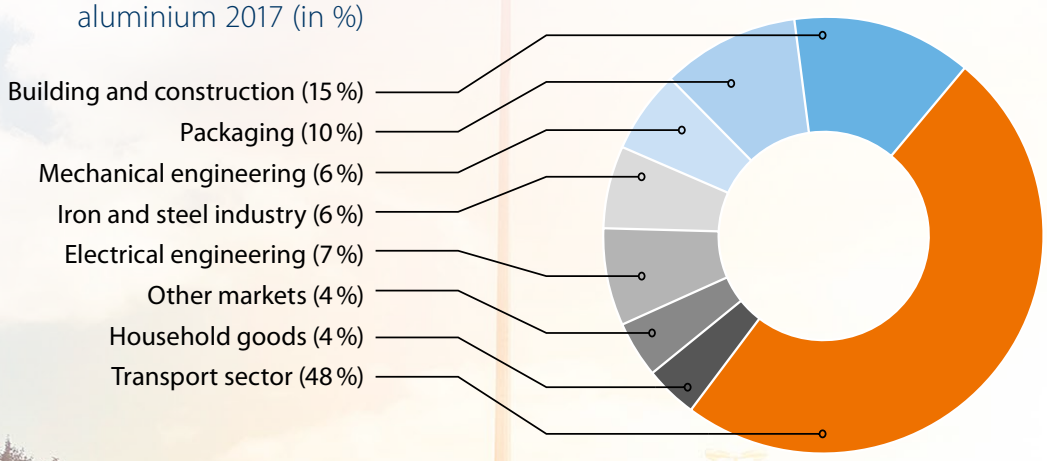
Master Alu
solid carbide milling cutter, TPC

205250 205255 205265 205267 205274 205275

Master Alu
SlotMachine

ALUMINIUM. LIGHTWEIGHT MATERIAL FOR HEAVY DUTIES.

Main markets for aluminium 2017 (in %)



MORE AND MORE ALUMINIUM IS BEING PROCESSED IN INDUSTRIAL PRODUCTION. ITS SPECIAL CHARACTERISTICS MAKE IT VERY VALUABLE.

Aluminium has a high specific strength. Compared to steel, aluminium components of a given strength are only half as heavy, but are larger in volumetric terms. Therefore they are attractive to use in lightweight structures where a low mass is desirable, for instance in transport applications where they contribute to reductions in fuel consumption, especially in aerospace.

This reason is applicable also to motor-vehicle construction; where previously the high material price, the difficulties of welding and the problematic fatigue strength and deformation characteristics in the event of collisions (low energy absorption in the crunch zones) were obstacles. The corrosion resistance of aluminium to seawater makes it attractive for building small and medium sized boats. In 2017, vehicle building (incl. planes, boats and railway cars) accounted for the largest proportion, approx. 48 %, of the world-wide consumption of aluminium (source GDA e.V.).

Aluminium alloys achieve strength values that are only a little less than those for steel. Aluminium and duraluminium are widely used in aircraft construction in particular. The majority of the structure of present-day commercial aircraft is made by riveting together various thicknesses and alloys of sheet aluminium.

In general, aluminium is regarded as easy to cut. Compared to steel of the same strength, the cutting forces that occur are considerably lower (approx. 30 % of those of steel). On account of the relatively large chip volume possible with aluminium, the chip shape is an important criterion. It depends on the material itself, the cutting conditions and on the tool geometry.

Advantages of aluminium

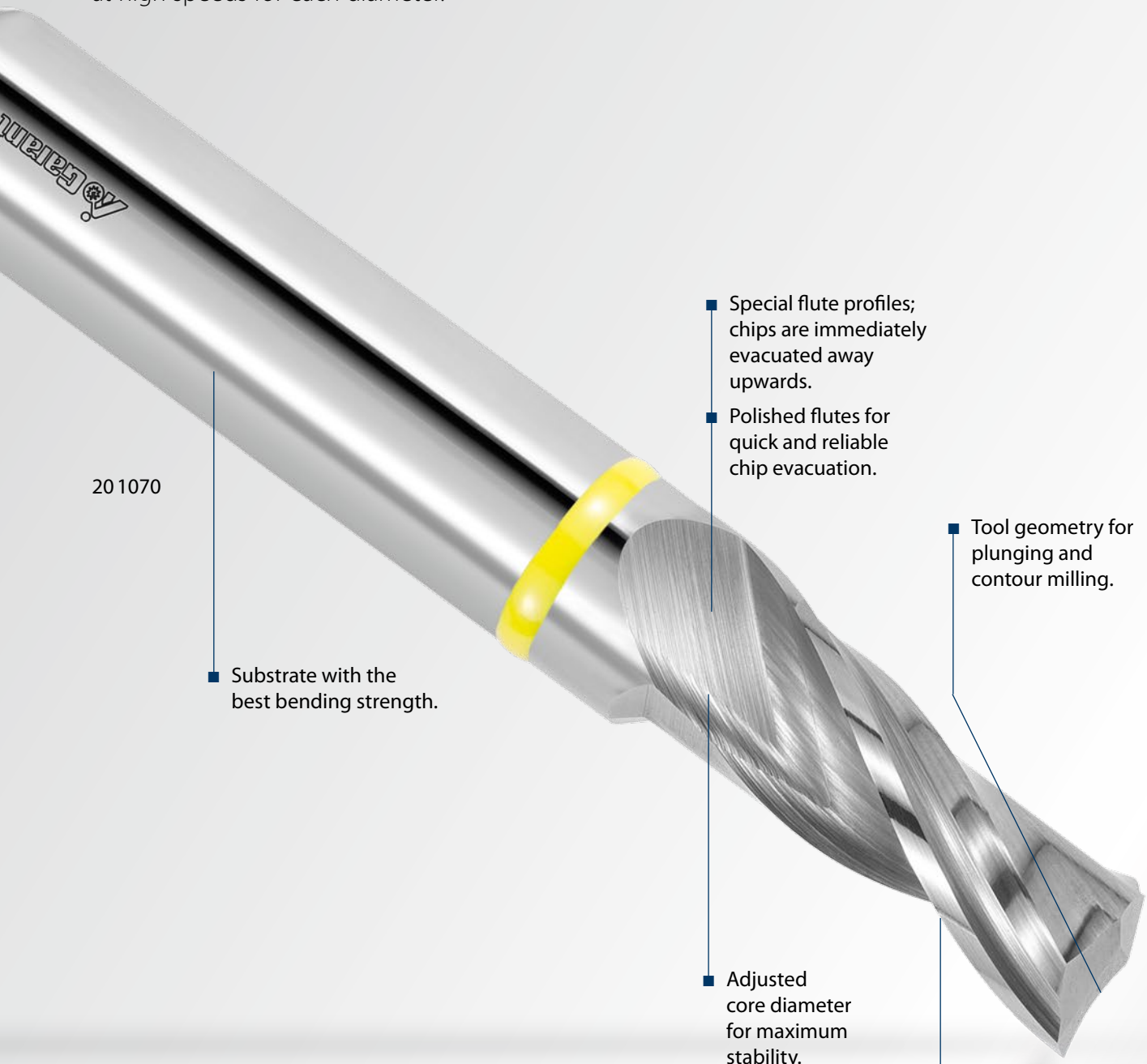
- Aluminium is light: Weight reduction is a critical advantage for reducing energy consumption, especially in the automotive and aerospace industries.
- Aluminium is stable: The use of alloys achieves strengths that are virtually the same as in steel.
- Aluminium is corrosion-resistant: A thin oxide layer quickly forms and protects the metal.
- Aluminium is easily processed: Complicated hollow sections and geometries are achievable by extrusion.
- Aluminium is a good conductor: The high thermal conductivity, in conjunction with the high specific heat capacity tend to favour the good machinability and permit high cutting speeds.
- Conservation of resources: Aluminium lends its itself very well to recycling.

Aluminium

Density	**2.7 g/cm³**
Melting point	933.47 K (660.32 °C)
Specific heat capacity	897[1] J/(kg • K)
Electrical conductivity	37.7 • 106 A/(V • m)
Thermal conductivity	**235 W/(m • K)**

PRECISION-BALANCED TOOLS. UNCOATED OR WITH DLC COATING.

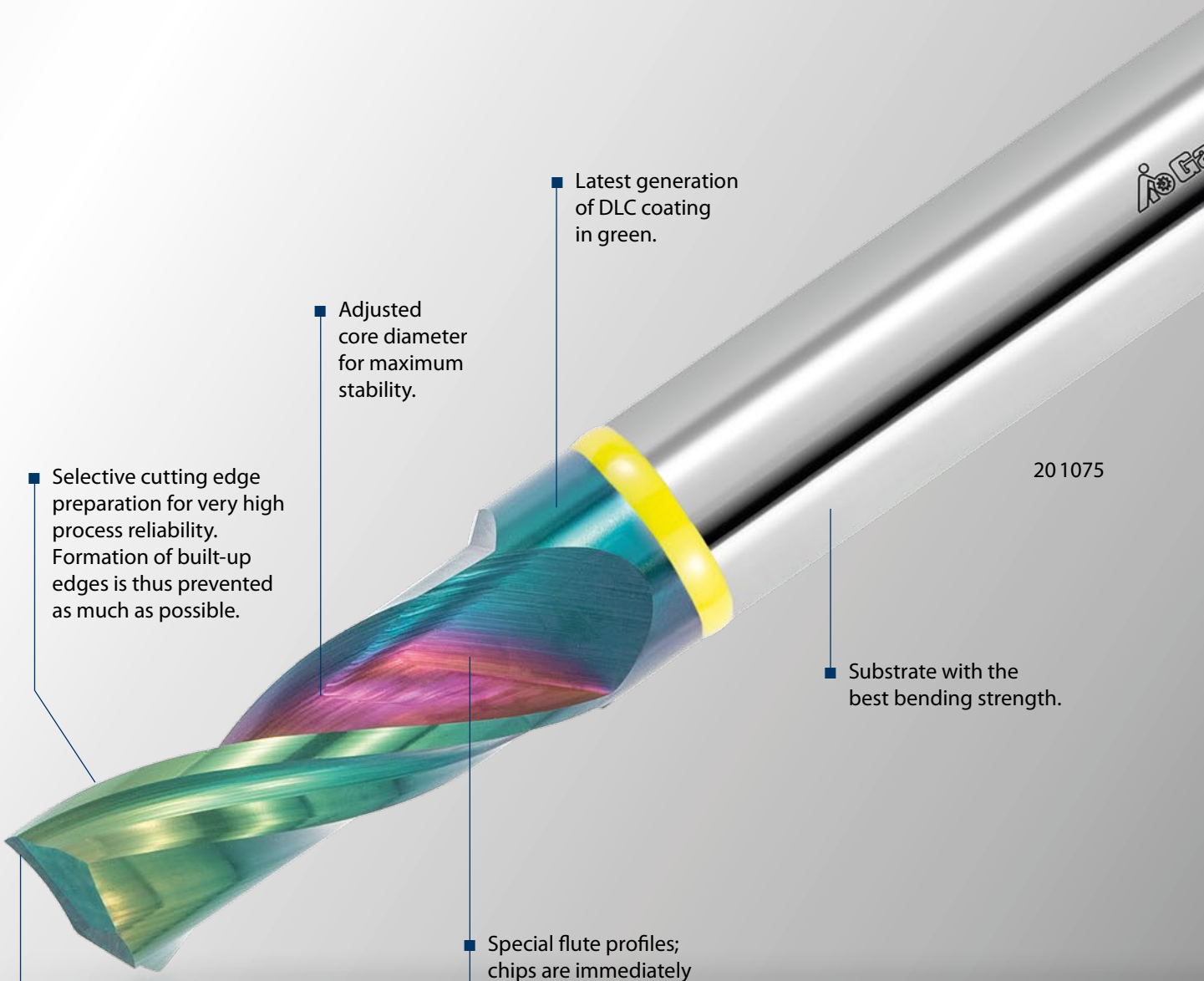
Special ground finish to optimise the out-of-balance and achieve the best possible out-of-balance at high speeds for each diameter.



INFORMATION:

Good to know – each diameter of tool receives a special ground finish to optimise the out-of-balance.
This ensures the best possible out-of-balance of G1.8.

Garant



Latest generation of DLC coating in green.

Adjusted core diameter for maximum stability.

Selective cutting edge preparation for very high process reliability. Formation of built-up edges is thus prevented as much as possible.

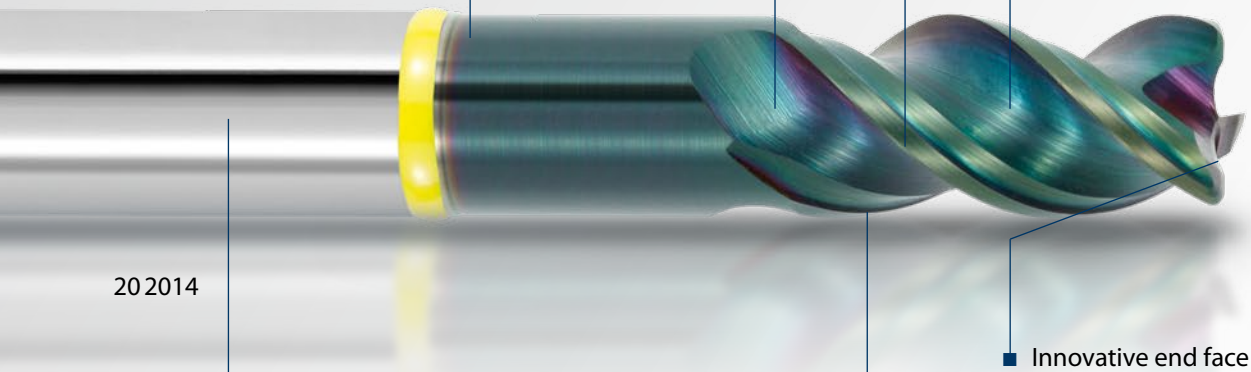
Substrate with the best bending strength.

Special flute profiles; chips are immediately evacuated away upwards.

Polished flutes for quick and reliable chip evacuation.

Tool geometry for plunging and contour milling.

GARANT MASTER ALU PICKPOCKET. PROVEN CONCEPT – NOW ALSO FOR MACHINING ALUMINIUM.



- Reinforced core diameter for very high stability when milling slots.
- Variable helical pitch for smooth running in all applications. For the best possible surface quality.
- Latest generation of DLC coating in green.
- Polished flutes for quick and reliable chip evacuation.
- Large chip flutes especially shaped for non-ferrous materials. For quick and reliable evacuation of high volumes of chips.

20 2014

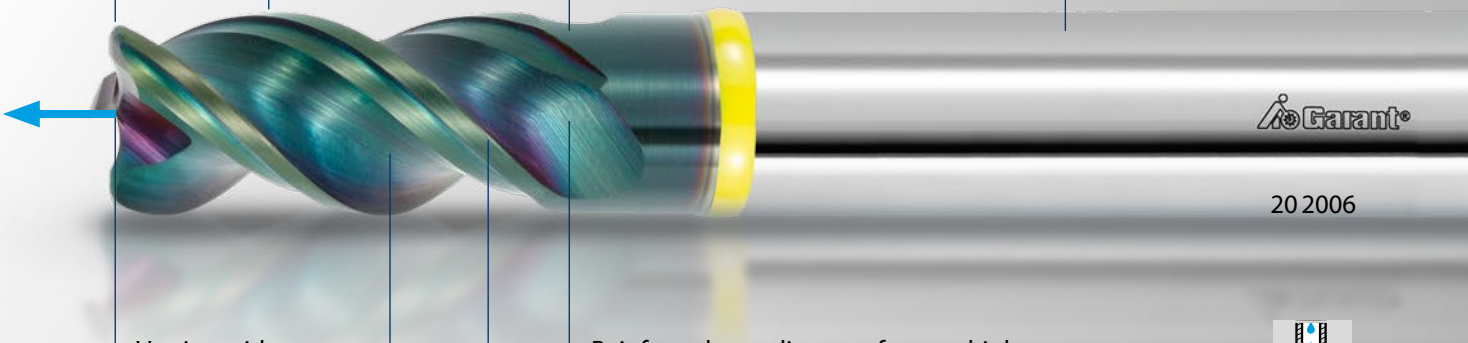
- Substrate with the best bending strength.
- Innovative end face geometry for plunging (drilling) and ramping at very high feed rates. Avoids build-up of chips when drilling.
- Selective cutting edge preparation for very high process reliability. Formation of built-up edges is thus prevented as much as possible.

APPLICATION RECOMMENDATION:

At maximum feed rates, wet machining is recommended in order to prevent material galling to the cut surface, which can cause generation of large amounts of heat!

Garant

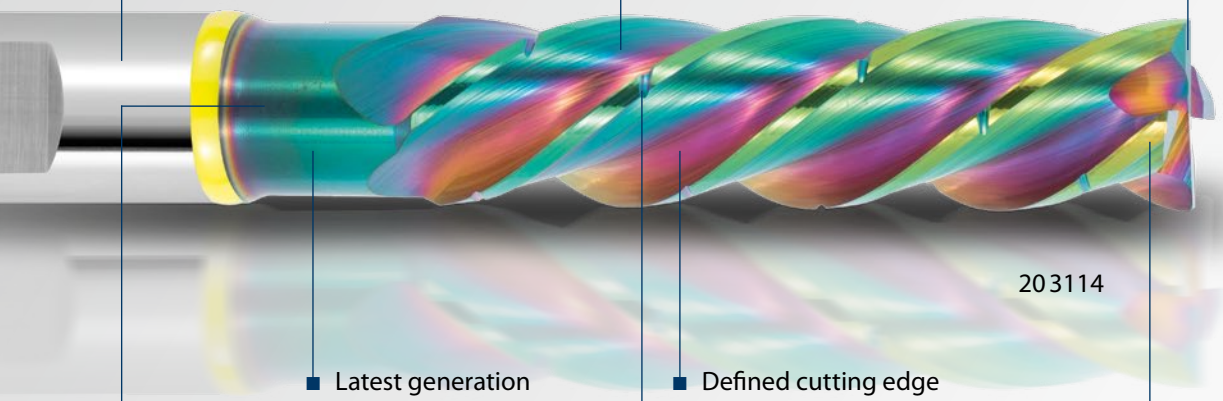
- Innovative end face geometry for plunging (drilling) and ramping at very high feed rates. Avoids build-up of chips when drilling.
- Selective cutting edge preparation for very high process reliability. Formation of built-up edges is thus prevented as much as possible.
- Substrate with the best bending strength.
- Latest generation of DLC coating in green.



- Version with through-coolant. Ideal for direct plunging (drilling) and ramping.
- Reinforced core diameter for very high stability when milling slots.
- Variable helical pitch for smooth running in all applications. For the best possible surface quality.
- Polished flutes for quick and reliable chip evacuation.
- Large chip flutes especially shaped for non-ferrous materials. For quick and reliable evacuation of high volumes of chips.

GARANT MASTER ALU MILLING CUTTER TPC. WITH CHIP SEPARATORS FOR CONTROLLED CHIP BREAKAGE.

- Solid carbide grade with outstanding bending strength, designed for machining non-ferrous materials.
- Optimised flutes specially for TPC machining of aluminium to prevent chip jams and for ideal chip evacuation.
- Face geometry recessed on the inside for reliable helix milling and plunging.



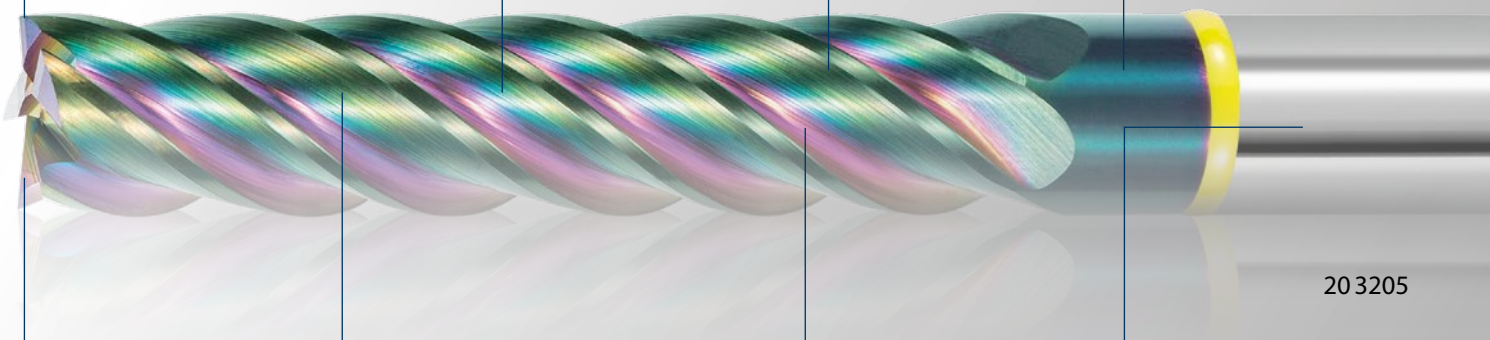
- Latest generation of DLC coating in green.
- Defined cutting edge preparation to ensure process reliability and very high surface qualities.
- Reinforced core diameter for stability and optimised force distribution during TPC milling operation.
- Chip separator design and arrangement for extra-short chips to avoid accumulation of chips.
- Variable helical pitch to prevent vibrations and to provide a homogenous cutting action.

RECOMMENDATION:

Due to the high heat generation during TPC milling in non-ferrous metals, the use of wet machining is preferable. The formation of built-up edges in particular is thus counteracted as much as possible. Conversely, the cutting data ae can be increased.

FINISHING CUTTER WITH 5 CUTTING EDGES AVAILABLE IN 3 LENGTHS. WITH THE LATEST GENERATION OF DLC COATING IN GREEN.

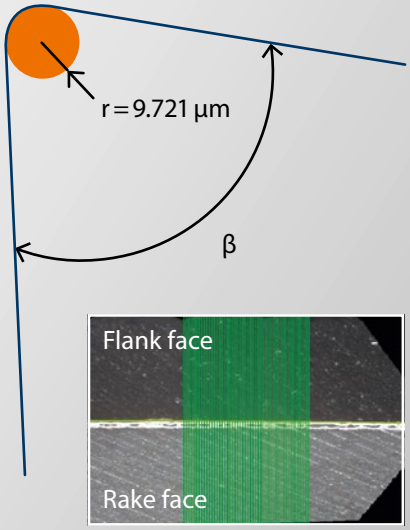
- Selective cutting edge preparation for very high process reliability. Reduction or prevention of vibration for very high surface qualities.
- Variable helical pitch for smooth running and avoidance of vibrations.
- Polished flutes for avoidance of material galling.
- Latest generation of DLC coating in green.



- Five cutting edges for effective finishing operations.
- Specially designed with deep flutes for non-ferrous materials. For quick and reliable evacuation of chips and for avoidance of chips jamming.
- Reinforced core diameter for very high stability.
- Substrate with the best bending strength.

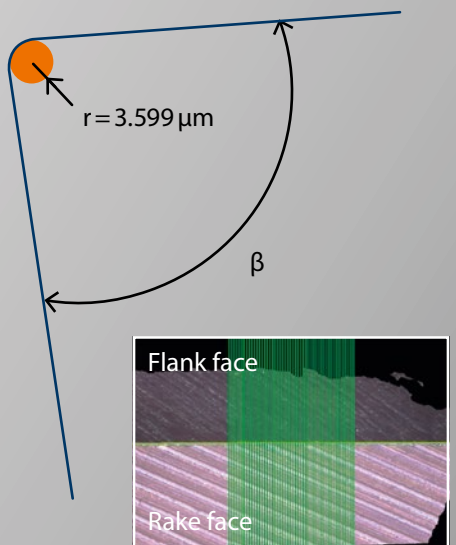
MASTER STEEL FINISHING CUTTER 20 4016_12

Edge preparation designed for machining steel.



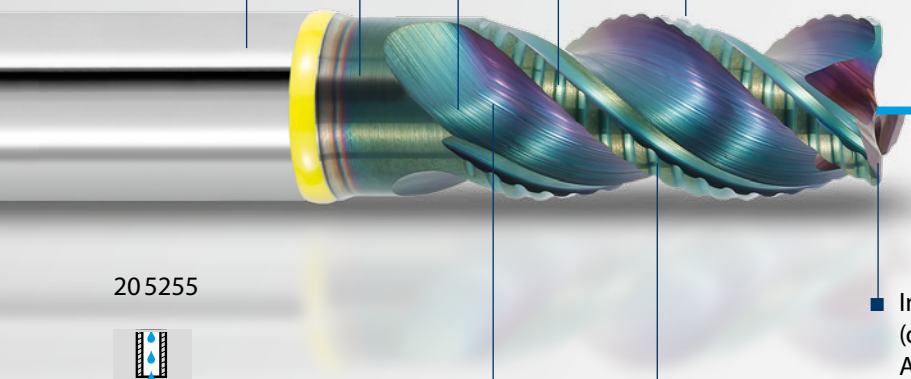
MASTER ALU FINISHING CUTTER 20 3204_12

Edge preparation designed for the main application of aluminium (sharper).



GARANT MASTER ALU SLOTMACHINE. WITH THE LATEST GENERATION OF DLC COATING IN GREEN, ALSO WITH THROUGH-COOLANT.

- Substrate with the best bending strength.
- Latest generation of DLC coating in green.
- Reinforced core diameter for very high stability when milling slots.
- Selective cutting edge preparation for very high process reliability. Formation of built-up edges is thus prevented as much as possible.
- Variable helical pitch for smooth running in all applications.



- Version with through-coolant is ideal for direct plunging (drilling) and ramping.

20 5255

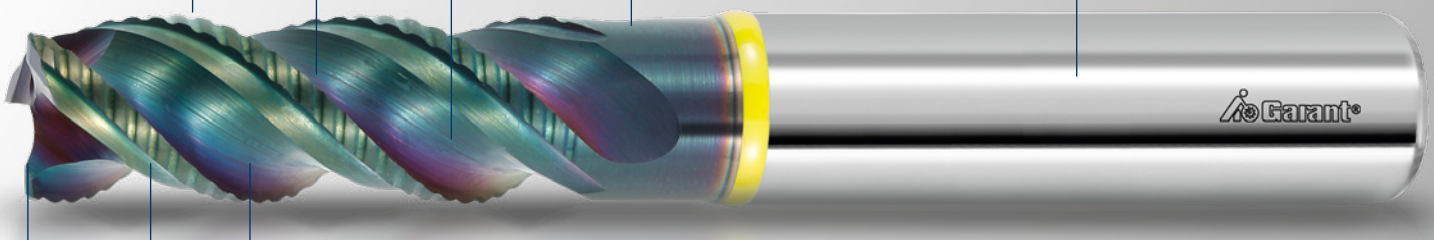
- Innovative end face geometry for plunging (drilling) and ramping at very high feed rates. Avoids build-up of chips when drilling.
- Knuckle form profile for small chips and soft cut. The depth of the knuckle profile is designed to produce chips that are as short as possible, even at extremely high feed rates.
- Polished flutes for quick and reliable chip evacuation.
- Large chip flutes especially shaped for non-ferrous materials. For quick and reliable evacuation of high volumes of chips.

APPLICATION RECOMMENDATION:

At maximum feed rates, wet machining is recommended in order to prevent material galling to the cut surface, which can cause generation of large amounts of heat!

Garant

- Selective cutting edge preparation for very high process reliability. Formation of built-up edges is thus prevented as much as possible.
- Variable helical pitch for smooth running in all applications.
- Reinforced core diameter for very high stability when milling slots.
- Latest generation of DLC coating in green.
- Substrate with the best bending strength.



20 5265

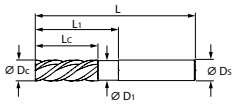
- Polished flutes for quick and reliable chip evacuation.
- Large chip flutes especially shaped for non-ferrous materials. For quick and reliable evacuation of high volumes of chips.
- Knuckle form profile for small chips and soft cut. The depth of the knuckle profile is designed to produce chips that are as short as possible, even at extremely high feed rates.
- Innovative end face geometry for plunging (drilling) and ramping at very high feed rates. Avoids build-up of chips when drilling.

Solid carbide | Standard | Type W | e8 | 1 | 30° | a_e 0.5×D | G 1,8 n_{max} | HPC

GARANT GARANT Master Alu HPC solid carbide slot drill

Precision balanced tools, ideally suited for use on **high-speed spindles.**
Special geometry for optimum chip evacuation thanks to
newly developed balancing process.
Very smooth cutting action for **outstanding surface quality.**

20 1070



20 1075

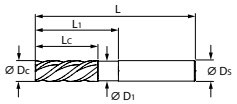
Suitable for/ v_c [m/min]	Alu plastics	Alu	Alu cast > 10 % Si	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	PEEK CF30	Honey-comb sandwich	Cu	CuZn
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
20 1070	180	140	105	180	130	150	130	110								180	140	180
20 1075	480	440	400	200	160	200	150	130		180	160	150	130	160		300	160	200

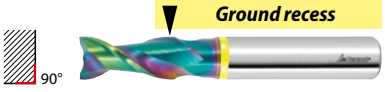
Ø e8 D_c	11Z 20 1070	11Z 20 1075	L_c	L_1	Ø D_1	L	Ø D_s	Alu f_z	Alu f_z
	GARANT Master Alu solid carbide slot drill HPC								
mm	uncoated	DLC	mm	mm	mm	mm	mm	mm	mm
2M	31.02	35.69	5	–	–	50	6	0.02	0.04
2L	37.84	43.52	11	–	–	50	6	0.02	0.04
3M	31.02	35.69	6	9	2.8	50	6	0.03	0.05
3L	37.84	43.52	12	16	2.8	50	6	0.03	0.05
4M	37.84	43.52	10	16	3.8	50	6	0.04	0.06
4L	45.46	52.27	16	21	3.8	55	6	0.04	0.06
5E	37.84	43.52	9	14	4.8	50	6	0.05	0.07
5M	45.46	52.27	16	21	4.8	55	6	0.05	0.07
6E	39.05	44.96	11	17	5.5	50	6	0.06	0.08
6L	41.09	47.30	16	24	5.5	50	6	0.06	0.08
6X	47.30	54.51	21	27	5.5	55	6	0.06	0.08
8K	43.23	49.63	8	13	7.4	50	8	0.08	0.1
8E	44.44	51.06	14	26	7.4	60	8	0.08	0.1
8D	48.31	55.73	14	43	7.4	70	8	0.07	0.09
8S	48.31	55.73	21	31	7.4	60	8	0.08	0.1
8T	59.60	68.54	26	34	7.4	70	8	0.07	0.09
8X	56.55	65.09	31	43	7.4	70	8	0.07	0.09
10D	54.51	62.85	10	16	9.2	55	10	0.1	0.12
10E	56.55	65.49	18	28	9.2	60	10	0.1	0.12
10S	65.90	75.66	18	52	9.2	80	10	0.08	0.1
10L	59.60	68.54	26	34	9.2	60	10	0.1	0.12
10M	78.10	89.90	26	34	9.2	85	10	0.08	0.1
10X	61.63	70.98	33	43	9.2	70	10	0.09	0.11
12K	91.53	105.26	12	19	11	60	12	0.12	0.14
12E	105.26	120.52	21	33	11	70	12	0.1	0.12
12L	113.40	130.18	32	42	11	70	12	0.1	0.12

Solid carbide | DIN 6527 | Type W | e6 | 2 | 38° | a_e 0.5×D | h6 DIN 6535 HA | G 2.5 n_{max}

GARANT GARANT Master ALU solid carbide slot drill / solid carbide slot drill

Stronger cutting edges.
Dimensions similar to DIN 6527.
With the latest generation of **DLC coating sp²**.
Advantage: Very smooth cutting action for **outstanding surface quality.**





20 1260

Suitable for/ v_c [m/min]	Alu	Alu	Alu cast > 10 % Si	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	PEEK CF30	Honey-comb sandwich	Cu	CuZn
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
20 1260	550	500	450	200	160	200	150	130		180	160	150	130	160		300	160	200

Ø D_c	11X 20 1260	L_c	L_1	Ø D_1	L	Ø D_s	Alu f_z	Alu f_z
	GARANT Master Alu solid carbide slot drill DIN 6535 HA							
mm	DLC	mm	mm	mm	mm	mm	mm	mm
1	40.99	5	10	0.9	57	6	0.03	0.04
2	40.99	8	16	1.9	57	6	0.03	0.04
3	40.99	8	18	2.9	57	6	0.04	0.05
4	40.99	11	18	3.9	57	6	0.05	0.06
5	40.99	13	20	4.9	57	6	0.06	0.08
6	40.99	13	20	5.9	57	6	0.06	0.08
8	46.63	19	26	7.7	63	8	0.08	0.1
10	64.55	22	29	9.7	72	10	0.09	0.12
12	99.50	26	36	11.7	83	12	0.1	0.15
16	157.41	32	42	15.5	92	16	0.14	0.18
20	227.70	38	52	19.5	104	20	0.18	0.22

Solid carbide | Type W | 3 | 42° | ≠ | ≠ | a_e 0.5×D | h6 DIN 6535 HA | G 2.5 n max | HPC

Garant

GARANT Master Alu PickPocket HPC solid carbide roughing end mill

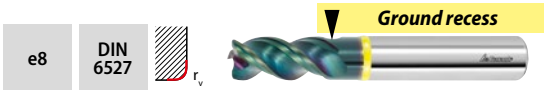
For roughing and finishing.
Up to 2 × D into solid material at very high feed rates and smooth cutting action.
Very high feed rates when plunging vertically.
Ramping capability up to 45°.

20 2006 – Improved chip evacuation due to central through-coolant. Due to the patented geometry also suitable for boring.

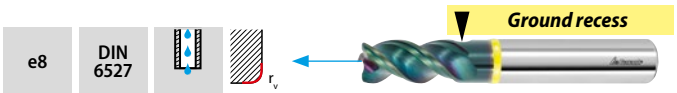
20 2004/2006/2010 – With the latest generation of DLC coating sp^2.

Advantage: **Optimised flute form, eccentric relief ground, generous chip spaces.**

20 2002



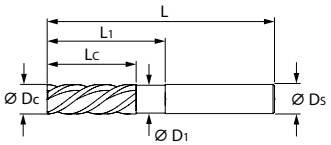
20 2004



20 2006

20 2008

20 2010



Suitable for/ v_c [m/min]	Alu	Alu	Alu cast > 10 % Si	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	PEEK CF30	Honey-comb sandwich	Cu	CuZn				
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N				
20 2002/2008	250	200	180	180	130	150	130	110								180	120	150	●	○	○	●
20 2004/2010	550	500	450	200	160	200	150	130		180	160	150	130	160		300	160	200	●	○	○	●
20 2006	550	500	450	200	160	200	150	130		180	160	150	130	160		300	160	200	●			●

Ø e8 D_C	11X 20 2002	11X 20 2004	11X 20 2006	L_c	L_1	Ø D_1	L	Ø D_s	Corner rounding r_v	Alu f_z	Alu f_z
	GARANT Master Alu PickPocket solid carbide roughing end mill		GARANT Master Alu PickPocket solid carbide roughing end mill with through-coolant						20 2004 20 2006		
		HPC									
mm		DLC	DLC	mm	mm	mm	mm	mm	mm	mm	mm
1,8	37.22	–	–	4	–	–	57	6	–	0.03	0.04
2	37.22	–	–	5	–	–	57	6	–	0.03	0.04
3	37.22	–	–	8	–	–	57	6	–	0.04	0.05
3,8	37.22	42.87	51.48	8	–	–	57	6	0.1	0.04	0.05
4	37.22	42.87	51.48	8	–	–	57	6	0.1	0.05	0.06
4M	39.01	44.95	–	11	17	3.7	57	6	0.1	0.05	0.06
4,8	37.22	42.87	51.48	9	–	–	57	6	0.2	0.05	0.06
5	37.22	42.87	51.48	9	–	–	57	6	0.2	0.06	0.08
5M	39.01	44.95	–	13	19	4.7	57	6	0.2	0.06	0.08
5,7	37.22	42.87	51.48	13	19	5.5	57	6	0.2	0.06	0.08
6	37.22	42.87	51.48	13	19	5.8	57	6	0.2	0.06	0.08
7	48.41	55.84	66.92	16	25	6.8	63	8	0.2	0.07	0.1
7,7	48.41	55.84	66.92	19	25	7.5	63	8	0.2	0.07	0.1
8	48.41	55.84	66.92	19	25	7.8	63	8	0.2	0.08	0.1
8M	50.89	58.61	–	21	25	7.8	63	8	0.2	0.08	0.1
9	68.11	78.21	94.05	22	30	8.8	72	10	0.32	0.08	0.12
9,7	68.11	78.21	94.05	22	30	9.5	72	10	0.32	0.09	0.12
10	68.11	78.21	94.05	22	30	9.8	72	10	0.32	0.09	0.12
11,7	86.53	99.50	119.79	26	36	11.5	83	12	0.32	0.1	0.15
12	86.53	99.50	119.79	26	36	11.8	83	12	0.32	0.1	0.15
14	114.35	131.18	157.41	26	36	13.8	83	14	0.32	0.12	0.17
15,5	160.38	191.57	–	31	42	15.3	92	16	0.32	0.14	0.18
16	160.38	191.57	230.67	31	42	15.8	92	16	0.32	0.14	0.18
16M	164.44	196.32	–	36	42	15.8	92	16	0.2	0.14	0.18
18	181.67	218.79	261.36	31	42	17.8	92	18	0.32	0.16	0.2
20	230.67	276.21	331.65	41	52	19.8	104	20	0.5	0.18	0.22

Ø e6 D_C	11X 20 2008	11X 20 2010	L_c	L_1	Ø D_1	L	Ø D_s	Corner rounding r_v	Alu f_z	Alu f_z
	GARANT Master Alu PickPocket solid carbide roughing end mill							20 2010		
	HPC									
mm		DLC	mm	mm	mm	mm	mm	mm	mm	mm
6	42.87	49.30	18	24	5.8	62	6	0.2	0.04	0.06
8	55.84	64.25	24	30	7.8	68	8	0.2	0.05	0.07
10	78.41	86.03	30	38	9.8	80	10	0.2	0.06	0.08
12	99.50	114.44	36	46	11.8	93	12	0.2	0.08	0.11
16	176.42	201.12	48	58	15.8	108	16	0.2	0.12	0.14
20	253.74	290.07	60	74	19.8	126	20	0.2	0.16	0.18

Solid carbide | Standard | Type W | 3 | 42° | ≠ | ≠ | h6 DIN 6535 HA | G 2.5 n_{max} | HPC

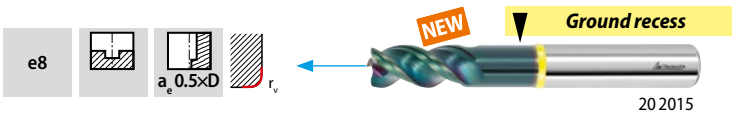
GARANT GARANT Master Alu PickPocket HPC solid carbide roughing end mill

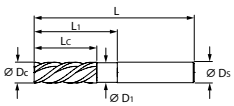
For roughing and finishing.
Up to 2×D into solid material at very high feed rates and smooth cutting action.
Very high feed rates when plunging vertically.
Ramping capability up to 45°.

20 2014–2019 – With the latest generation of DLC coating sp^2.
20 2015/2019 – Improved chip evacuation due to central through-coolant.
20 2017/2019 – Very long overhang for safe machining of deep cavities.

Advantage: **Optimised flute form, eccentric relief ground, generous chip spaces.**

Note: A minimum oversize of 0.1×D must be maintained for subsequent finishing operations.





Suitable for/ v_c [m/min]	Alu	Alu	Alu cast > 10 % Si	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	PEEK CF30	Honey-comb sandwich	Cu	CuZn				
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N				
20 2012	250	200	180	180	130	150	130	110								180	120	150	●	○	○	●
20 2014	550	500	450	200	160	200	150	130		180	160	150	130	160		300	160	200	●	○	○	●
20 2015	550	500	450	200	160	200	150	130		180	160	150	130	160		300	160	200	●			●
20 2017	380	300	270	180	130	150	130	110		160	150	140	120	150		220	140	160	●	○	○	●
20 2019	380	300	270	180	130	150	130	110		160	150	140	120	150		220	140	160	●			●

Ø e8 D_c	11X 20 2012	11X 20 2014	11X 20 2015	L_c	L_1	Ø D_1	L	Ø D_s	Corner rounding r_v	Alu f_z	Alu f_z
	GARANT Master Alu PickPocket solid carbide roughing end mill		GARANT Master Alu PickPocket solid carbide roughing end mill with through-coolant								
		HPC							20 2014 20 2015		
mm		DLC	DLC	mm	mm	mm	mm	mm	mm	mm	mm
6	44.75	51.48	59.20	13	24	5.8	62	6	0.2	0.04	0.06
7	58.21	66.92	–	16	30	6.8	68	8	0.2	0.05	0.07
8	58.21	66.92	77.02	19	30	7.8	68	8	0.2	0.05	0.07
9	81.97	94.05	–	22	38	8.8	80	10	0.32	0.06	0.08
10	81.97	94.05	108.21	22	38	9.8	80	10	0.32	0.06	0.08
12	104.45	119.79	137.81	26	46	11.8	93	12	0.32	0.08	0.1
14	136.62	157.41	–	26	52	13.8	99	14	0.32	0.1	0.12
16	191.57	230.67	242.25	31	58	15.8	108	16	0.32	0.12	0.14
18	218.79	261.36	–	31	67	17.8	117	18	0.32	0.14	0.16
20	276.21	331.65	348.28	41	74	19.8	126	20	0.5	0.2	0.22

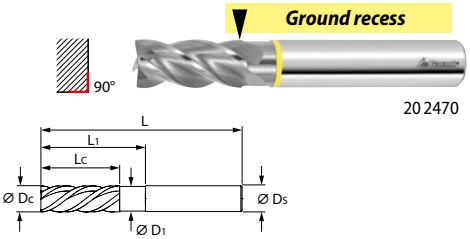
Ø e6 D_c	11X 20 2017	11X 20 2019	L_c	L_1	Ø D_1	L	Ø D_s	Corner rounding r_v	Alu f_z	Alu f_z
	GARANT Master Alu PickPocket solid carbide roughing end mill	GARANT Master Alu PickPocket solid carbide roughing end mill with through-coolant								
	HPC									
mm	DLC	DLC	mm	mm	mm	mm	mm	mm	mm	mm
4	60.29	–	6.5	24	3.7	80	6	0.1	0.03	0.04
5	60.29	–	8	30	4.7	80	6	0.1	0.04	0.06
6	60.29	69.10	10	42	5.7	80	6	0.2	0.04	0.06
8	78.11	89.89	13	62	7.4	100	8	0.2	0.05	0.07
10	109.79	120.58	16	58	9.2	100	10	0.2	0.05	0.07
12	130.19	143.15	19	73	11	120	12	0.2	0.06	0.08
16	239.09	262.94	25	100	15	150	16	0.2	0.08	0.1
20	344.12	–	32	98	19	150	20	0.2	0.12	0.15

Solid carbide | DIN 6527 | Type W | h6 | 4 | 38° | a_e 0.5×D | h6 DIN 6535 HA | HPC

Garant GARANT Master Alu solid carbide milling cutter, HPC

Extra sharp cutting edges.
Dimensions similar to DIN 6527.
Double relief ground side clearance angle.
For roughing and finishing.
Up to 2×D into solid material at very high feed rates and smooth cutting action.

Note:	**Successor product to No. 202480.**



Suitable for/ v_c [m/min]	Alu	Alu	Alu cast > 10 % Si	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	PEEK CF30	Honey-comb sandwich	Cu	CuZn					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
20 2470	**250**	**200**	**180**	**180**	**130**	**150**	**130**	**110**								180	**120**	**150**	●	○	○	○	

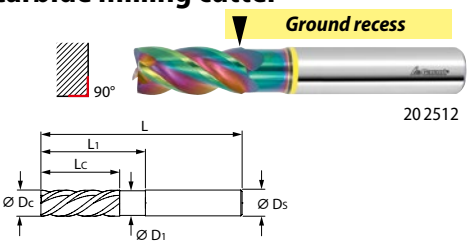
Ø D_c	11X	**20 2470**	L_c	L_1	Ø D_1	L	Ø D_s	Alu f_z	Alu f_z
		GARANT Master Alu solid carbide milling cutter **HPC**							
mm		**uncoated**	mm	mm	mm	mm	mm	mm	mm
3		37.32	10	15	2.8	57	6	0.04	0.05
4		37.32	13	18	3.7	57	6	0.05	0.06
5		37.32	15	20	4.7	57	6	0.06	0.08
6		37.32	16	21	5.5	57	6	0.06	0.08
8		39.80	22	27	7.4	63	8	0.08	0.1
10		49.30	25	30	9.2	72	10	0.09	0.12
12		70.79	28	33	11	83	12	0.1	0.15
14		93.85	30	35	13	83	14	0.12	0.17
16		158.99	36	41	15	92	16	0.14	0.18
20		241.96	41	51	19	104	20	0.18	0.22

Solid carbide | DIN 6527 | Type W | h6 | 4 | 38° | a_e 0.25×D | h6 DIN 6535 HA | HPC

Garant GARANT Master Alu solid carbide milling cutter HPC / solid carbide milling cutter

Extra sharp cutting edges.
Dimensions similar to DIN 6527.
For roughing and finishing.
Up to 2×D into solid material at very high feed rates and smooth cutting action.
With the latest generation of **DLC coating sp²**.

Note:	**Successor product to No. 202515.**



Suitable for/ v_c [m/min]	Alu	Alu	Alu cast > 10 % Si	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	PEEK CF30	Honey-comb sandwich	Cu	CuZn					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
20 2512	**550**	**500**	**450**	**200**	**160**	**200**	**150**	**130**		**180**	**160**	**150**	**130**	**160**		**300**	**160**	**200**	●	○	○	●	

Ø D_c	11X	**20 2512**	L_c	L_1	Ø D_1	L	Ø D_s	Alu f_z	Alu f_z
		GARANT Master Alu solid carbide milling cutter **HPC**							
mm		**DLC**	mm	mm	mm	mm	mm	mm	mm
2		46.33	6	13	1.8	57	6	0.03	0.04
3		46.33	10	15	2.8	57	6	0.04	0.05
4		46.33	13	18	3.7	57	6	0.05	0.06
4M		46.33	16	22	3.7	57	6	0.05	0.06
5		46.33	15	20	4.7	57	6	0.06	0.08
6		46.33	16	21	5.5	57	6	0.06	0.08
6M		53.66	20	24	5.5	65	6	0.06	0.08
8		60.98	22	27	7.4	63	8	0.08	0.1
8M		71.18	26	30	7.4	70	8	0.08	0.1
10		88.01	25	30	9.2	72	10	0.09	0.12
10M		101.28	30	38	9.2	80	10	0.09	0.12
12		117.02	28	33	11	83	12	0.1	0.15
12M		131.97	36	46	11	93	12	0.1	0.15
16		197.80	36	41	15	92	16	0.14	0.18
16M		223.54	48	58	15	110	16	0.14	0.18
20		301.55	41	51	19	104	20	0.18	0.22
20M		346.30	60	74	19	126	20	0.18	0.22

Solid carbide | Standard | Type W | h6 | 38° | TPC | 4 | 5 | h6 DIN 6535 HA | h6 DIN 6535 HB | G 2.5 n_{max} | G 2.5 n_{max}

Garant

GARANT Master Alu solid carbide TPC milling cutter with more chip separators

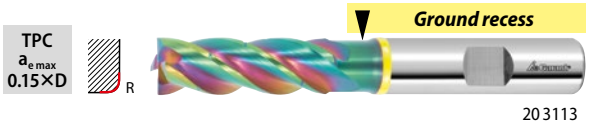
Specially designed for TPC high-performance milling. **Optimised bending strength** due to the use of ultra-fine grain substrates. **1×D** chip separator for controlled chip breaking.
Balanced for very high process reliability and protecting the machine at high speeds.
Application: Especially for milling **aluminium and non-ferrous metals.**

Note:

20 3113 – h_{max}: The values stated in the table are maximum values.
ae_{max} = 0.15×D for TPC machining.

20 3114 – h_{max}: The values stated in the table are maximum values.
ae_{max} = 0.12×D for TPC machining.
Successor product for No. 202281, 202282.

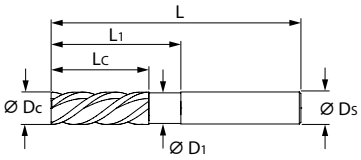
20 3115 – h_{max}: The values stated in the table are maximum values.
ae_{max} = 0.1×D for TPC machining.
Successor product for No. 202283, 202284.



20 3113

20 3114

20 3115



Suitable for/ v_c [m/min]	Alu	Alu	Alu cast > 10 % Si	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	PEEK CF30	Honey-comb sandwich	Cu	CuZn					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
20 3113	550	500	450	200	160	200	150	130		180	160	150	130	160		300	160	200		●	○	●	●
20 3114/3115	500	450	400	180	140	180	130	110		160	140	120	140	260		260	140	120		●	○	●	●

Ø h6 D_C	11X 20 3113 GARANT Master Alu solid carbide milling cutter with more chip separators TPC DLC	No. of teeth Z	L_c	L_1	Ø D_1	L	Ø D_s	Shank form	Corner rounding r_v	TPC Alu h_{max}
mm			mm	mm	mm	mm	mm		mm	mm
5	57.82	4	17	24	4.5	65	6	HA	0.05	0.036
6	57.82	4	18	25	5.5	65	6	HA	0.05	0.043
8	76.43	4	24	30	7.5	70	8	HA	0.1	0.057
10	96.43	4	30	35	9.5	80	10	HB	0.1	0.071
12	126.72	4	36	45	11	93	12	HB	0.1	0.086
16	227.60	5	48	55	15	110	16	HB	0.2	0.114
20	354.42	5	60	70	19	125	20	HB	0.2	0.143

Ø h6 D_C	11X 20 3114	11X 20 3115 GARANT Master Alu solid carbide milling cutter with more chip separators TPC	No. of teeth Z	L_c		L_1		Ø D_1	L		Ø D_s	Shank form	Corner rounding r_v	TPC Alu h_{max}	
				20 3114	20 3115	20 3114	20 3115		20 3114	20 3115				20 3114	20 3115
mm	DLC	DLC		mm	mm	mm	mm	mm	mm	mm	mm		mm	mm	mm
4	65.34	–	4	17	–	23	–	3.7	65	–	6	HA	0.05	0.026	–
5	65.34	75.24	4	21	26	30	36	4.5	70	75	6	HA	0.05	0.032	0.03
6	65.34	75.24	4	25	31	30	36	5.5	70	75	6	HA	0.05	0.039	0.036
8	82.57	93.06	4	33	41	40	48	7.5	80	90	8	HA	0.1	0.052	0.048
10	107.91	123.95	4	41	51	50	60	9.5	90	104	10	HB	0.1	0.065	0.06
12	139.59	154.44	4	49	61	60	72	11	110	120	12	HB	0.1	0.078	0.072
16	264.03	299.38	5	65	81	80	96	15	130	150	16	HB	0.2	0.104	0.096
20	403.92	467.78	5	82	102	100	120	19	150	175	20	HB	0.2	0.13	0.12

Solid carbide | Standard | Type W | e8 | 5 | 38° | ≠ | h6 DIN 6535 HA | G 2.5 | nmax | HPC

Garant GARANT Master Alu HPC solid carbide finishing cutter

For finishing operations.
Special geometry for optimum chip evacuation.
Unequal spacing gives high intrinsic stability and smooth cutting action.
For profile milling as a finishing operation.

Note:
20 3203 – Order the **uncoated version** using **No. 203207**.
20 3204 – Order the **uncoated version** using **No. 203208**.
20 3205 – Order the **uncoated version** using **No. 203209**.

20 3203

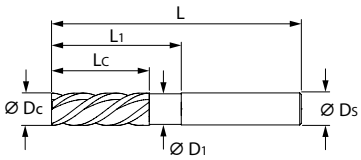
20 3207

20 3204

20 3208

20 3205

20 3209



Suitable for/ v_c [m/min]	Alu	Alu	Alu cast > 10 % Si	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	PEEK CF30	Honey-comb sandwich	Cu	CuZn					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
20 3203	550	500	450	200	160	200	150	130		180	160	150	130	160		300	160	200		●	○	●	●
20 3204/3205	500	450	400	180	140	180	130	110		160	140	140	120	140		260	140	120		●	○	●	●

Ø e8 D_c	11X 20 3203 GARANT Master Alu solid carbide milling cutter, HPC HPC DLC	L_c	L_1	Ø D_1	L	Ø D_s	Alu f_z
mm		mm	mm	mm	mm	mm	mm
4	58.41	16	23	3.8	65	6	0.05
6	58.41	18	25	5.8	65	6	0.05
8	77.22	24	30	7.8	70	8	0.06
10	97.42	30	35	9.5	80	10	0.065
12	128.21	36	45	11.5	93	12	0.07
16	219.78	48	55	15.5	110	16	0.08
20	341.55	60	70	19.5	125	20	0.09

Ø e8 D_c	11X 20 3204	11X 20 3205	L_c		L_1		Ø D_1	L		Ø D_s	Alu f_z	
	GARANT Master Alu solid carbide milling cutter, HPC HPC		20 3204	20 3205	20 3204	20 3205		20 3204	20 3205		20 3204	20 3205
mm	DLC	DLC	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
6	66.13	–	24	–	32	–	5.8	65	–	6	0.045	–
8	83.56	96.62	32	40	40	48	7.8	75	80	8	0.05	0.04
10	109.40	128.21	40	50	48	58	9.5	90	100	10	0.06	0.05
12	141.08	164.84	48	60	56	68	11.5	100	119	12	0.06	0.05
16	254.43	288.09	64	80	72	88	15.5	125	134	16	0.07	0.06
20	389.07	450.45	80	100	88	108	19.5	150	175	20	0.08	0.07

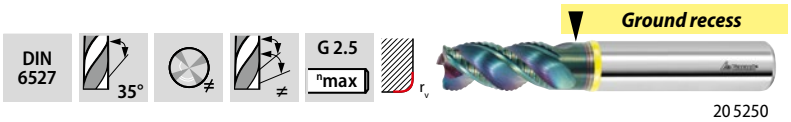
Solid carbide | WR | e8 | 35° | ≠ | ≠ | a_e 0.5×D | h6 DIN 6535 HA | G 2.5 n max | HPC | 3 | 4

GARANT Master Alu SlotMachine HPC solid carbide roughing end mill / HPC solid carbide roughing end mill

For roughing.
Special profile for machining non-ferrous metals.

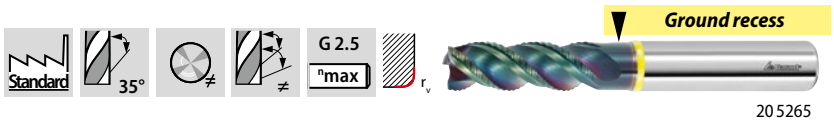
20 5255 – Improved chip evacuation due to central through-coolant. Due to the patented geometry also suitable for boring.

Advantage: **Optimised flute form, eccentric relief ground, generous chip spaces.**
Up to 2 × D into solid material at very high feed rates and smooth cutting action.
Ramping capability up to 45°.
Very high feed rates when plunging vertically, thanks to **special plunging geometry**.

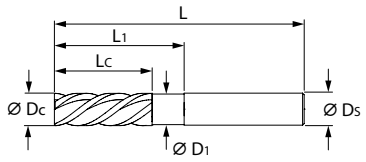


20 5250

20 5255



20 5265



Suitable for/ v_c [m/min]	Alu	Alu	Alu cast > 10 % Si	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	PEEK CF30	Hybrid	Cu	CuZn					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
20 5250/5265	450	400	380			120	100										160	200		●	○	○	●
20 5255	450	400	380			120	100										160	200		●			●

Ø e8 D_c	11X 20 5250 GARANT Master Alu SlotMachine solid carbide roughing end mill HPC DLC	11X 20 5255 GARANT Master Alu SlotMachine solid carbide roughing end mill with through-coolant HPC DLC	No. of teeth Z	L_c	L_1	Ø D_1	L	Ø D_s	Corner rounding r_v	Alu f_z	Alu f_z
mm				mm	mm	mm	mm	mm	mm	mm	mm
4	60.19	72.47	3	8	–	–	57	6	0.1	0.04	0.06
5	60.19	72.47	3	9	–	–	57	6	0.2	0.06	0.08
6	60.19	72.47	3	13	19	5.5	57	6	0.2	0.08	0.1
8	76.63	92.07	3	19	25	7.5	63	8	0.2	0.1	0.12
10	93.85	112.86	3	22	30	9.5	72	10	0.32	0.12	0.14
12	106.43	127.71	3	26	36	11	83	12	0.32	0.15	0.18
14	143.55	172.26	4	26	36	13	83	14	0.32	0.18	0.2
16	194.04	233.64	4	31	42	15	92	16	0.32	0.2	0.22
18	236.61	283.14	4	31	42	17	92	18	0.32	0.22	0.25
20	280.17	335.61	4	41	52	19	104	20	0.5	0.25	0.28

Ø e8 D_c	11X 20 5265 GARANT Master Alu SlotMachine solid carbide roughing end mill HPC DLC	No. of teeth Z	L_c	L_1	Ø D_1	L	Ø D_s	Corner rounding r_v	Alu f_z	Alu f_z
mm			mm	mm	mm	mm	mm	mm	mm	mm
6	83.36	3	18	24	5.5	62	6	0.2	0.08	0.1
8	106.43	3	24	30	7.5	68	8	0.2	0.1	0.12
10	129.69	3	30	38	9.5	80	10	0.32	0.12	0.14
12	146.52	3	36	46	11	93	12	0.32	0.15	0.18
14	198.00	4	42	52	13	99	14	0.32	0.18	0.2
16	268.29	4	48	58	15	108	16	0.32	0.2	0.22
18	325.71	4	54	67	17	117	18	0.32	0.22	0.25
20	386.10	4	60	74	19	126	20	0.5	0.25	0.28

Solid carbide | Standard | WR | e8 | 35° | ≠ | ≠ | h6 DIN 6535 HA | G 2.5 n_{max} | TPC | 3 | 4

Garant GARANT Master Alu SlotMachine solid carbide roughing end mill HPC/TPC, TPC

For roughing.
Special profile for machining non-ferrous metals.
Significant reduction in the chip volume due to targeted chip fragmentation using the **special cutter geometry.**

20 5267 – Improved chip evacuation due to central through-coolant.

20 5274/5275 – **Problem-solver** for **TPC machining.** Ideal for automated production as the risk of chip accumulations in the machine is largely prevented.

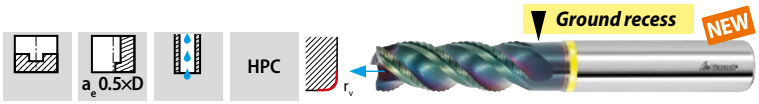
Note:

20 5274 – For **HB shanks** use order **no. 205276**.
h_{max}: The values stated in the table are maximum values.
ae_{max} is 0.12 × D for TPC machining.

20 5275 – For **HB shanks** use order **no. 205277**.
h_{max}: The values stated in the table are maximum values.
ae_{max} is 0.1 × D for TPC machining.

20 5274/5275 – Please use tools with HB drive flats for particularly demanding roughing machining tasks. Can be ordered in the Hoffmann Group's e-shop.

20 5274/5275 – HB shanks are available at the same price as HA.



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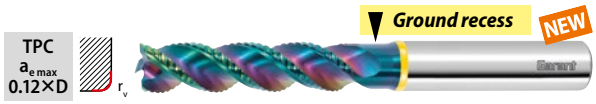

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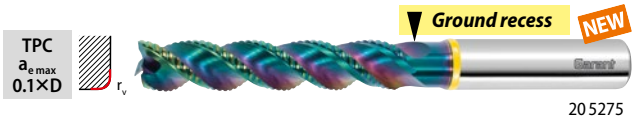

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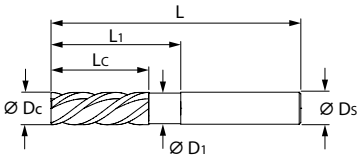


Suitable for/ v_c [m/min]	Alu	Alu	Alu cast > 10 % Si	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	PEEK CF30	Hybrid	Cu	CuZn					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
20 5267	**450**	**400**	**380**			120	100										**160**	**200**	●				●
20 5274	**400**	**360**	**340**			110	90										**140**	**180**	●	○	○		●
20 5275	**360**	**320**	**300**			100	80										**130**	**160**	●	○	○		●

Ø e8 D_c	11X 20 5267	No. of teeth Z	L_c	L_1	Ø D_1	L	Ø D_s	Corner rounding r_v	Alu f_z	Alu f_z
	GARANT Master Alu SlotMachine solid carbide roughing end mill with through-coolant HPC / TPC									
mm	DLC		mm	mm	mm	mm	mm	mm	mm	mm
6	87.52	3	18	24	5.5	62	6	0.2	0.08	0.1
8	111.67	3	24	30	7.5	68	8	0.2	0.1	0.12
10	136.03	3	30	38	9.5	80	10	0.32	0.12	0.14
12	153.85	3	36	46	11	93	12	0.32	0.15	0.18
16	281.75	4	48	58	15	108	16	0.32	0.2	0.22
20	404.91	4	60	74	19	126	20	0.5	0.25	0.28

Ø e8 D_c	11X 20 5274	11X 20 5275	No. of teeth Z	L_c		L_1		Ø D_1		L		Ø D_s	Corner rounding r_v	TPC Alu h_{max}	
	GARANT Master Alu SlotMachine solid carbide roughing end mill HPC			20 5274	20 5275	20 5274	20 5275	20 5274	20 5275	20 5274	20 5275			20 5274	20 5275
mm	DLC	DLC		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
6	88.90	95.63	3	25	31	30	36	5.7	5.7	70	75	6	0.2	0.039	0.036
8	114.35	128.90	3	33	41	40	48	7.5	7.5	80	90	8	0.2	0.052	0.048
10	140.58	161.67	3	41	51	50	60	9.5	9.5	90	104	10	0.32	0.065	0.06
12	163.85	181.37	3	49	61	60	72	11	11	110	120	12	0.32	0.078	0.072
16	297.00	336.60	4	65	81	80	96	19	15	130	150	16	0.32	0.104	0.096
20	425.70	–	4	82	–	100	–	19	–	150	–	20	0.5	0.13	–

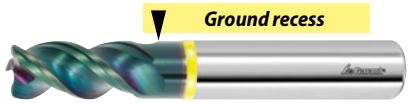
Solid carbide | Type W | e8 | 3 | 42° | ≠ | ≠ | a_e 0.5×D | a_e 0.05×D | h6 DIN 6535 HA | G 2.5 n_{max} | HPC

Garant GARANT Master Alu PickPocket HPC solid carbide torus cutter

Cutting edge length to DIN 6527.
Tolerance: Corner radius R_1 = ± 0.01 mm.
20 6255 – All dimensions to DIN.

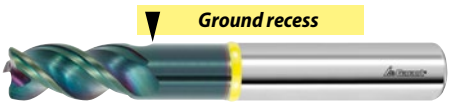
Application: Especially for **high speed machining** in **mould and tool making** for **copy milling.**

DIN 6527 R

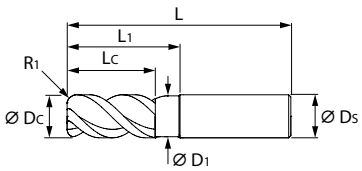


20 6255

Standard R



20 6257



Suitable for/ v_c [m/min]	Alu plastics	Alu	Alu cast > 10 % Si	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	PEEK CF30	Honey-comb sandwich	Cu	CuZn					
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N					
20 6255/6257	550	500	450	200	160	200	150	130		180	160	150	130	160		300	160	200	●	○	○	●	

Ø e8 D_c / R_1	11X	20 6255	L_c	R_1	L_1	Ø D_1	L	Ø D_s	Alu f_z	Alu f_z
		GARANT Master Alu PickPocket solid carbide torus cutter								
		HPC								
mm		DLC	mm	mm	mm	mm	mm	mm	mm	mm
5/0,5		42.37	9	0.5	–	–	57	6	0.08	0.09
5/1,0		42.37	9	1	–	–	57	6	0.08	0.09
6/0,5		42.37	13	0.5	19	5.8	57	6	0.08	0.09
6/1,0		42.37	13	1	19	5.8	57	6	0.08	0.09
8/0,5		55.24	19	0.5	25	7.8	63	8	0.1	0.12
8/1,0		55.24	19	1	25	7.8	63	8	0.1	0.12
10/0,5		77.42	22	0.5	30	9.8	72	10	0.12	0.14
10/1,0		77.42	22	1	30	9.8	72	10	0.12	0.14
12/0,5		98.41	26	0.5	36	11.8	83	12	0.15	0.16
12/1,0		98.41	26	1	36	11.8	83	12	0.15	0.16
16/1,0		189.59	31	1	42	15.8	92	16	0.18	0.2
16/2,0		189.59	31	2	42	15.8	92	16	0.18	0.2
16/4,0		189.59	31	4	42	15.8	92	16	0.18	0.2
16/5,0		189.59	31	5	42	15.8	92	16	0.18	0.2
20/4,0		273.24	41	4	52	19.8	104	20	0.22	0.25
20/5,0		273.24	41	5	52	19.8	104	20	0.22	0.25

Ø e8 D_c / R_1	11X	20 6257	L_c	R_1	L_1	Ø D_1	L	Ø D_s	Alu f_z	Alu f_z
		GARANT Master Alu PickPocket solid carbide torus cutter								
		HPC								
mm		DLC	mm	mm	mm	mm	mm	mm	mm	mm
6/0,5		50.89	13	0.5	24	5.8	62	6	0.06	0.08
6/1,0		50.89	13	1	24	5.8	62	6	0.06	0.08
8/0,5		66.13	19	0.5	30	7.8	68	8	0.07	0.1
8/1,0		66.13	19	1	30	7.8	68	8	0.07	0.1
10/0,5		93.06	22	0.5	38	9.8	80	10	0.08	0.11
10/1,0		93.06	22	1	38	9.8	80	10	0.08	0.11
12/0,5		118.31	26	0.5	46	11.8	93	12	0.1	0.12
12/1,0		118.31	26	1	46	11.8	93	12	0.1	0.12
16/1,0		227.70	31	1	58	15.8	108	16	0.14	0.16
16/2,0		227.70	31	2	58	15.8	108	16	0.14	0.16
16/4,0		227.70	31	4	58	15.8	108	16	0.14	0.16
16/5,0		227.70	31	5	58	15.8	108	16	0.14	0.16
20/4,0		327.69	41	4	74	19.8	126	20	0.18	0.2
20/5,0		327.69	41	5	74	19.8	126	20	0.18	0.2

Solid carbide | Standard | h6 DIN 6535 HA | G 2.5 n_{max} | HPC

GARANT Master Alu SlotMachine solid carbide torus cutter HPC/TPC, GARANT Master Alu PickPocket solid carbide torus cutter HPC, GARANT Master Alu solid carbide torus cutter HPC

Eccentric relief ground, additionally polish ground in the flutes for outstanding chip evacuation in long-chipping non-ferrous materials.

20 6258 – With a new knurled profile, optimised for higher feed rates. Tremendous bending strength due to the use of an innovative micrograin substrate.

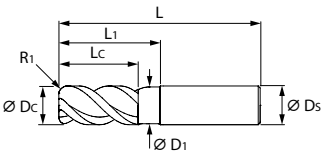
20 6261/6264 – Tolerances:

- Corner radius

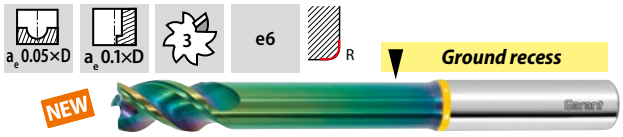
R_1 = 0.5 tolerance ±0.02 mm.
R_1 > 0.5 – 1.5 tolerance ±0.03 mm.
R_1 > 1.5 tolerance ±0.05 mm.

Application:

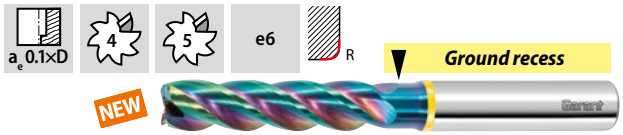
20 6264 – Particularly suitable for finishing work.



20 6258



20 6261



20 6264

Suitable for/ v_c [m/min]	Alu	Alu	Alu cast > 10 % Si	PMMA acrylic	PE-HD	PA 66	PEEK	PF 31	AFRP aramid	PVDF GF20	POM GF25	PA 66 GF30	PEEK GF30	PTFE CF25	PEEK CF30	Honey-comb sandwich	Cu	CuZn				
ISO code	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N				
20 6258	450	400	380			120	100										160	200	●	○	○	●
20 6261	340	320	290	150	120	150	110	100		130	120	110	100	110		220	120	150	●	○	○	●
20 6264	500	450	400	180	140	180	130	110		160	140	120	140	260		260	140	120	●	○	○	●

Ø e8 D_c / R_1	11X 20 6258 GARANT Master Alu SlotMachine solid carbide torus cutter HPC / TPC	No. of teeth Z	L_c	R_1	L_1	Ø D_1	L	Ø D_s	Alu f_z	Alu f_z
mm	DLC		mm	mm	mm	mm	mm	mm	mm	mm
6/0,5	88.90	3	25	0.5	30	5.5	65	6	0.07	0.08
6/1,0	88.90	3	25	1	30	5.5	65	6	0.07	0.08
8/0,5	114.35	3	33	0.5	40	7.5	75	8	0.09	0.1
8/1,0	114.35	3	33	1	40	7.5	75	8	0.09	0.1
8/2,0	114.35	3	33	2	40	7.5	75	8	0.09	0.1
10/0,5	140.58	3	41	0.5	50	9.5	90	10	0.1	0.12
10/2,0	140.58	3	41	2	50	9.5	90	10	0.1	0.12
12/1,0	163.85	3	49	1	60	11	100	12	0.13	0.15
12/3,0	163.85	3	49	3	60	11	100	12	0.13	0.15
16/2,0	297.00	4	65	2	80	15	125	16	0.17	0.2
20/2,0	425.70	4	82	2	100	19	150	20	0.2	0.25
20/3,0	425.70	4	82	3	100	19	150	20	0.2	0.25

Ø e6 D_c / R_1	11X 20 6261 GARANT Master Alu PickPocket solid carbide torus cutter	11X 20 6264 GARANT Master Alu solid carbide torus cutter	No. of teeth Z		L_c		R_1	L_1		Ø D_1	L		Ø D_s	Alu f_z		Alu f_z
	HPC		20 6261	20 6264	20 6261	20 6264		20 6261	20 6264		20 6261	20 6264		20 6261	20 6264	20 6261
mm	DLC	DLC			mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
4/1,0	60.29	–	3	–	6.5	–	1	24	–	3.7	80	–	6	0.03	–	0.035
5/0,5	60.29	–	3	–	8	–	0.5	30	–	4.7	80	–	6	0.035	–	0.04
5/1,0	60.29	–	3	–	8	–	1	30	–	4.7	80	–	6	0.035	–	0.04
6/0,5	60.29	66.13	3	4	10	25	0.5	42	30	5.7	80	65	6	0.04	0.045	0.045
6/1,0	60.29	66.13	3	4	10	25	1	42	30	5.7	80	65	6	0.04	0.045	0.045
8/0,5	78.11	83.56	3	4	13	33	0.5	62	40	7.4	100	75	8	0.045	0.05	0.05
8/1,0	78.11	83.56	3	4	13	33	1	62	40	7.4	100	75	8	0.045	0.05	0.05
8/2,0	78.11	83.56	3	4	13	33	2	62	40	7.4	100	75	8	0.045	0.05	0.05
10/0,5	109.79	109.40	3	4	16	41	0.5	68	50	9.2	110	90	10	0.05	0.06	0.06
10/1,0	109.79	–	3	–	16	–	1	68	–	9.2	110	–	10	0.05	–	0.06
10/2,0	109.79	109.40	3	4	16	41	2	68	50	9.2	110	90	10	0.05	0.06	0.06
10/3,0	109.79	–	3	–	16	–	3	68	–	9.2	110	–	10	0.05	–	0.06
12/0,5	130.19	–	3	–	19	–	0.5	73	–	11	120	–	12	0.05	–	0.06
12/1,0	130.19	141.08	3	4	19	49	1	73	60	11	120	100	12	0.05	0.06	0.06
12/2,0	130.19	–	3	–	19	–	2	73	–	11	120	–	12	0.05	–	0.06
12/3,0	130.19	141.08	3	4	19	49	3	73	60	11	120	100	12	0.05	0.06	0.06
16/1,0	239.09	–	3	–	25	–	1	100	–	15	150	–	16	0.06	–	0.07
16/2,0	239.09	254.43	3	5	25	65	2	100	80	15	150	125	16	0.06	0.07	0.07
16/5,0	239.09	–	3	–	25	–	5	100	–	15	150	–	16	0.06	–	0.07
20/2,0	–	389.07	–	5	–	82	2	–	100	19	–	150	20	–	0.08	–
20/3,0	–	389.07	–	5	–	82	3	–	100	19	–	150	20	–	0.08	–

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