Positive turning insert for Aluminum cutting (medium cutting)

AM Chip Breaker

Positive

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- Applying surface finish and toughness balanced cutting edge for general use (light interrupted cutting - continuous cutting).
- Stable machining and high productivity with good chip evacuation even in high feed speed cutting

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Positive turning insert for Aluminum cutting (medium cutting)

AM Chip Breaker Positive

Aluminum is a type of light metal with high machinability but it is necessary to machine it with care because the material is vulnerable to welding and scratches. The usage of it keeps increasing with rising demands on light weight parts and enhanced accessibility of recycling.

KORLOY launches **AM chip breaker** minimizing welding, better chip evacuation and enhanced surface finish in Aluminum light interrupted cutting to continuous cutting.

The **AM chip breaker** with 2 step rake angle for protecting cutting edge increases cutting edge strength and surface finish. Its bridge structure for preventing chip jam makes good chip evacuation and surface finish.

AM chip breaker with good chip evacuation and enhanced surface finish in medium cutting is the best solution increasing productivity and efficiency in Aluminum part machining and non-ferrous metal cutting.

Vast cutting range
- Wide cutting range from light interrupted cutting to continuous cutting.

Good surface finish
- Enhanced chip evacuation by bridge design to prevent chip jam.

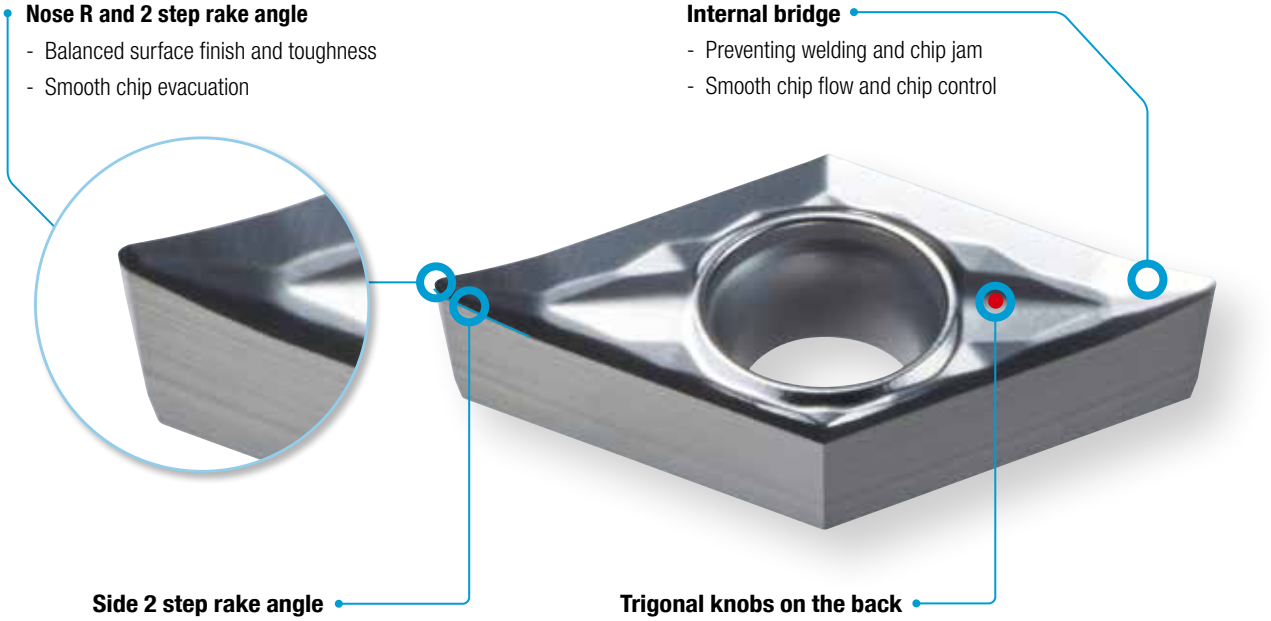
Better welding resistance
- Sharp cutting edge and mirror-like finishing.

Stable tool life
- Improved cutting edge strength and good surface finish with 2 step rake angle

Chip breaker features

AM chip breaker (for medium Aluminum cutting)

- Preventing welding and chip jam with internal bridge structure enhancing smooth chip flow
- Balanced surface finish and toughness from nose R and 2 step side rake angle
- Preventing minor cutting edge fracture with divided bridge structure on the top surface bottom part blocks chips over minor cutting edge



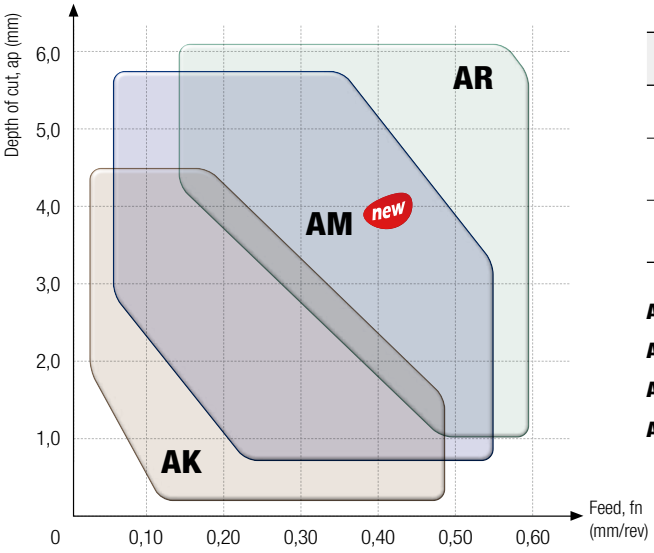
Nose R and 2 step rake angle
- Balanced surface finish and toughness
- Smooth chip evacuation

Internal bridge
- Preventing welding and chip jam
- Smooth chip flow and chip control

Side 2 step rake angle
- Longer effective cutting edge
- Minimized cutting resistance
- Good surface finish

Trigonal knobs on the back
- Effective chip breaking in medium cutting
- Less cutting resistance due to smooth chip flow
- Directing flow of long chip for stable chip evacuation
- Protecting cutting edge with a structure preventing chip jam

Application range



Cutting range	Chip breaker	ap (mm)	fn (mm/rev)
Roughing	**AR**	0.50 - 6.00	0.05 - 0.60
Medium to finishing - Medium to roughing	**AM** new	0.30 - 5.50	0.04 - 0.55
Finishing - medium cutting	**AK**	0.10 - 5.00	0.03 - 0.50

AK 1st recommended in Aluminum and non-ferrou metal cutting

AM recommended in medium cutting and light interrupted cutting

AM 1st recommended in Aluminum wheel machining

AR recommended when high toughness is required in heavily interrupted cutting

Recommended cutting conditions

Workpiece					Specific cutting force (N/mm2)	Brinell hardness (HB)	Wear resistance ↔ Tough-ness		Medium to finishing ↔ Medium to roughing		Finishing ↔ medium cutting	
ISO	Workpiece materials		ISO	AISI			High speed and continuous cutting	Low speed and heavy interrupted cutting	Light interrupted cutting		Continuous cutting	
							Grade		Chip breaker			
							H01	H05	AM		AK	
							vc (m/min)		fn (mm/rev)	ap (mm)	fn (mm/rev)	ap (mm)
N	Aluminum forged alloy	-	AlMg1SiCu	6061	400	60	240	225	0,55	0,3 - 5,5	0,50	0,1 - 5,0
							1980	**1800**	**0,25**		**0,20**	
							2470	2250	0,04		0,03	
		Aged	AlZn5.5MgCu	7075	500	70	240	225	0,55		0,50	
							1980	**1800**	**0,25**		**0,20**	
							2470	2250	0,04		0,03	
	Aluminum cast alloy	-	Al-8SiCu3Fe	A380.0	600	75	240	225	0,55		0,50	
							1980	**1800**	**0,25**		**0,20**	
							2470	2250	0,04		0,03	
		Aged	Al-Cu4Nl2Mg2	242.0	700	90	240	225	0,55		0,50	
							1980	**1800**	**0,25**		**0,20**	
							2470	2250	0,04		0,03	
	Copper alloy	Free cutting alloy 1% ≥ Pb	CuZn39Pb0.5	C36500	550	110	70	65	0,55		0,50	
							550	**500**	**0,25**		**0,20**	
							690	630	0,04		0,03	
		Brass	CuZn36Pb3	CDA360	550	90	70	65	0,55		0,50	
							550	**500**	**0,25**		**0,20**	
							690	630	0,04		0,03	
		Electrolytic copper	-	-	1350	100	45	40	0,55		0,50	
							330	**300**	**0,25**		**0,20**	
							400	370	0,04		0,03	
	Nonferrous	Duroplastic, reinforced carbon fiber	-	-	-	-	-	-	0,55		0,50	
							-	**-**	**0,25**		**0,20**	
							-	-	0,04		0,03	
		Hard rubber	-	-	-	-	-	-	0,55		0,50	
							-	**-**	**0,25**		**0,20**	
							-	-	0,04		0,03	

Please refer to the page 7 for detailed depth of cut of chip breakers

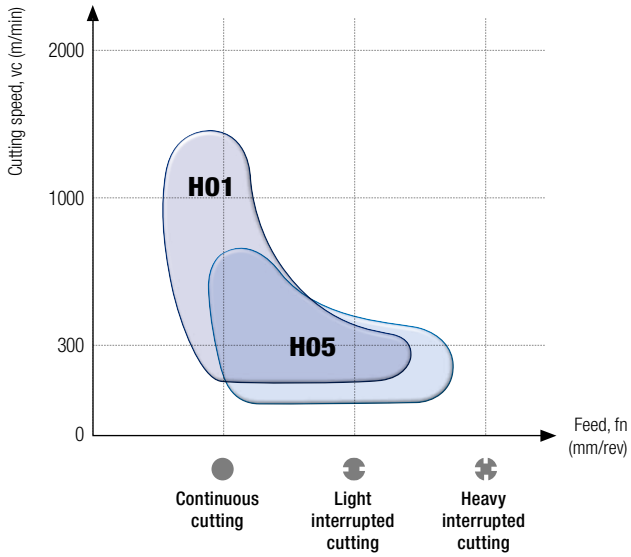
Grade features

H01

- Good wear resistance with ultra-fine substrate
- Enhanced welding resistance by special surface treatment technology

H05

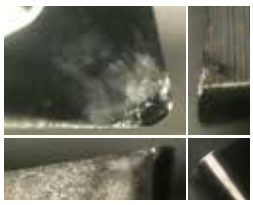
- 1st recommended grade in various cutting conditions including non-ferrous metal cutting
- Enhanced welding resistance by special surface treatment technology



Performance evaluation

Welding and wear resistance

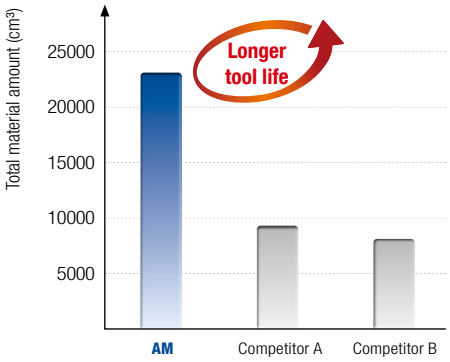
- **Workpiece** Aluminum (AlZn5.5MgCu)
- **Cutting conditions** vc = 500 m/min · fn 0.25 mm/rev · ap = 0.5 mm · wet
- **Tools** Insert CCGT09T304-AM (H05) Holder SCLCR2525-M09



AM

Competitor A

Competitor B



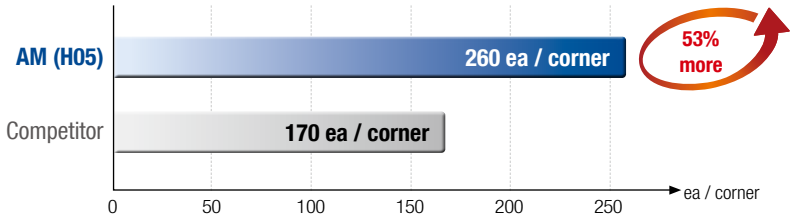
▶ Sharp cutting edge obtained good surface finish without any welding and chipping on the cutting edge.

▶ Preventing overflowing chips with divided bridge structure.

Application examples

Aluminum Al-Si7Mg (Fe)

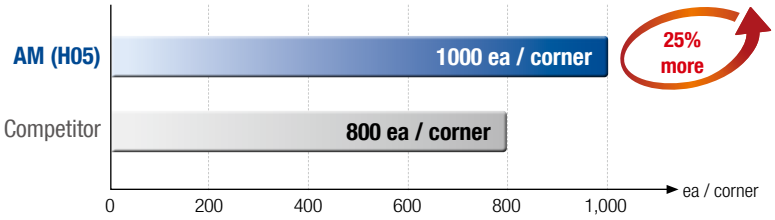
- **Workpiece** Aluminum wheel
- **Cutting conditions** vc = 1000 m/min · fn = 0.5 - 0.7 mm/rev · ap = 2.0 - 3.0 mm · wet
- **Tools** Insert VCGT220530-AM (H05) Holder S40V-SVQCR-22



▶ Finishing cutting with good surface finish by stable tool life and chip evacuation in Aluminum medium roughing and heavy interrupted cutting.

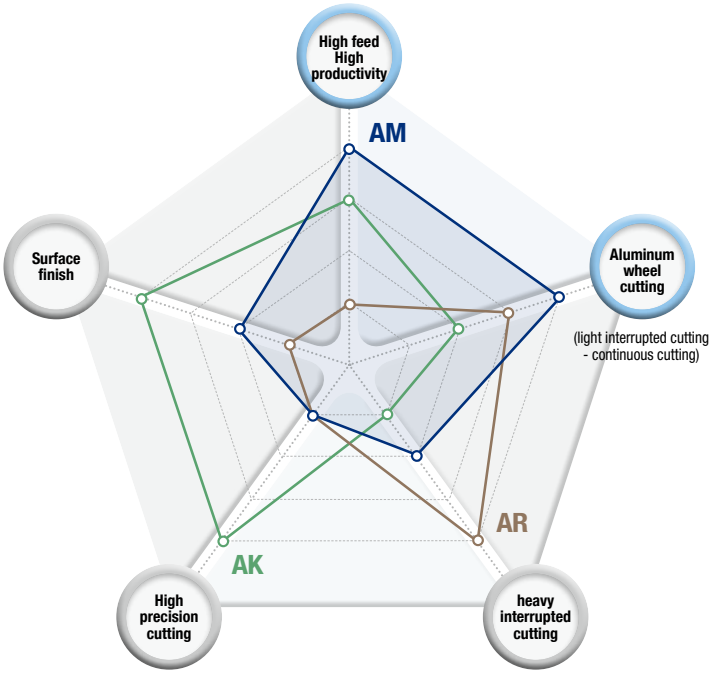
Aluminum Al-Si7Mg (Fe)

- **Workpiece** Aluminum wheel
- **Cutting conditions** vc = 560 m/min · fn = 0.3 mm/rev · ap = 0.5 mm · wet
- **Tools** Insert VCGT160408-AM (H05) Holder S25R-SVQCR-16



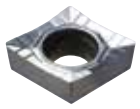
▶ Stable tool life and chip evacuation in Aluminum wheel journal part finishing

Tool selection guide



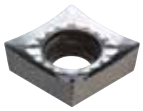
AR

- For heavy interrupted cutting
- High toughness designed applying flat corner cutting edge



AM new

- Wide cutting range (light interrupted cutting - continuous cutting)
- Good chip evacuation with internal bridge design (high feed cutting)
- Balanced toughness and surface finish from 2 step side rake angle

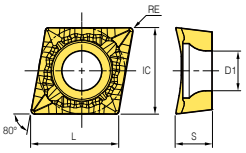
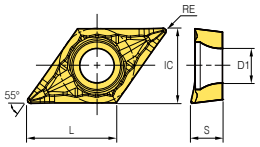
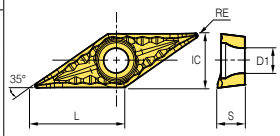
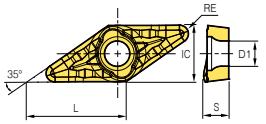


AK

- 1st recommended in Aluminum and non-ferrous metal cutting
- Good surface finish and minimized cutting resistance by applying high rake angle
- High precision cutting

Cutting range	Chip breaker	High feed (High productivity)	Aluminum wheel cutting (light interrupted cutting - continuous cutting)	heavy interrupted cutting	High precision cutting	Surface finish (Good surface roughness)
Roughing	AR	★	★★★	★★★★	★	★
Medium to finishing - Medium to roughing	AM new	★★★★	★★★★	★★	★	★★
Finishing - medium cutting	AK	★★★	★★	★	★★★★	★★★★

Stock items

Picture	Designation		Uncoated		Dimensions (mm)					Cutting conditions		Geometries
			H01	H05	L	IC	S	RE	D1	fn (mm/ rev)	ap (mm)	
	CCGT	09T302-AM		●	9.672	9.525	3.97	0.2	4.4	0.03-0.25	0.05-3.50	
		09T304-AM		●	9.672	9.525	3.97	0.4	4.4	0.03-0.35	0.10-5.20	
		09T308-AM		●	9.672	9.525	3.97	0.8	4.4	0.03-0.55	0.10-5.50	
	DCGT	11T302-AM		●	11.628	9.525	3.97	0.2	4.4	0.03-0.25	0.05-3.50	
		11T304-AM		●	11.628	9.525	3.97	0.4	4.4	0.03-0.35	0.10-5.20	
		11T308-AM		●	11.628	9.525	3.97	0.8	4.4	0.03-0.55	0.10-5.50	
	VCGT	160402-AM		●	16.606	9.525	4.76	0.2	4.4	0.03-0.25	0.05-3.50	
		160404-AM		●	16.606	9.525	4.76	0.4	4.4	0.03-0.35	0.10-5.20	
		160408-AM		●	16.606	9.525	4.76	0.8	4.4	0.03-0.55	0.10-5.50	
	VCGT	220520-AM		●	22.142	12.7	5.56	20	5.6	0.12-1.00	1.20-7.00	
		220530-AM		●	22.142	12.7	5.56	30	5.6	0.15-1.00	1.20-7.50	

▲: Stock item Europe ●: Stock item Korea ○: Production on demand

⚠ For the safe metalcutting

- Use safety supplies such as protective gloves to prevent possible injury while touching the edge of tools.
- Use safety glasess or safety cover to hedge possible dangers. Inappropriate usage or excessive cutting condition may lead tool's breakage or even the fragment's scattering.
- Clamp the workpiece tightly enough to prevent its movement while its machining.

Properly manage the tool change phase because the inordinately used tool can be easily broken under the excessive cutting load or severe wear, and it may threat the operator's safety.

- Use safety cover because chips evacuated during cutting are hot and sharp and may cause burns and cuts. To remove chips safely, stop machining, put on protective gloves, and use a hook or other tools.
- Prepare for fire prevention measures as the use of the non-water soluble cutting oil may cause fire.
- Use safety cover and other safety supplies because the spare parts or the inserts can be pulled out due to centrifugal force while high speed machining.

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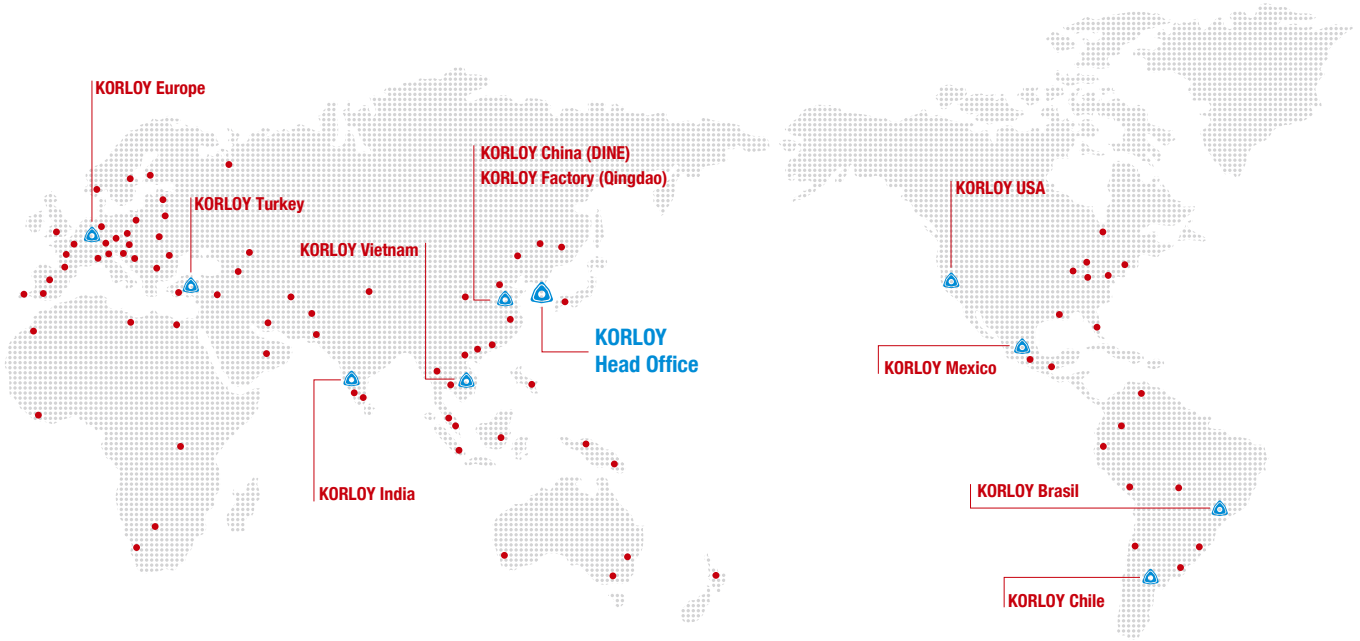

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