

NPA

New Product Announcement

MILLING

27-2022

SEPTEMBER 2022

METRIC



Expanding
Inserts Variety



Easy Chip
Evacuation



Cost Effective
Insert



HELI2000 HELIMILL HELIPLUS-07

**HELI2000 Revolutionary Age Integrates
HELIMILL and HELIPLUS Line
with 15, 10 and 07mm Edged Inserts**

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Highlights

Proved Improved HELI2000 New Geometries and Carbide Grades to Maximize Productivity

ISCAR expands its HELI2000 line of inserts with the new IC5600 carbide grade - intended for machining steel (ISO P main group of application, ISCAR Material Groups 1-13) with indexable insert milling cutters, specifically for high cutting speeds.

The new additions promise higher tool life, increased productivity, and higher process reliability.

The list of new inserts, made of IC5600 carbide grade, is shown in the table below:

	Item#	Description
1	3427973	HM90 ADKT 1505PDR IC5600
2	3427974	HM90 ADKT 150516PDR IC5600
3	3427975	HM90 ADKT 150520PDR IC5600
4	3427978	HM90 ADKT 150532PDR IC5600
5	3427979	HM90 ADKT 150540PDR IC5600
6	3427980	HM90 ADKT 150550PDR IC5600
7	3427976	HM90 ADKT 150564PDR IC5600
8	3424794	HM90 APKT 1003PDR IC5600
9	3427963	HM90 APKT 100304PDR IC5600
10	3427969	HM90 APKT 100312PDR IC5600
11	3427970	HM90 APKT 100316PDR IC5600
12	3427971	HM90 APKT 100325PDR IC5600
13	3427972	HM90 APKT 100330PDR IC5600

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In addition, HELIMILL-10 and HELIPLUS-07 lines are also expanded with new IC716 carbide grade and new geometries:

1. Innovative geometry with new high positive (HP) chip-former and the new IC716 carbide grade developed specifically for high-performance machining Titanium and titanium alloys (ISO S main group of application, ISCAR material groups 20-25) with indexable insert milling cutters.
2. Chip-splitting (CS) cutting edge geometry for general roughing applications.
3. Reinforced cutting-edge geometry (GT) for Fast Feed (FF) highly efficient rough milling intended for hardened materials of up to 60 HRC hardness for both APKT 1003 and HP ANKT 0702 insert families.

Item#	Description	
3392629	HP ANKT 0702R12GT-FF IC808	New geometry
3425077	HP ANKT 0702R12GT-FF IC5600	New geometry with new grade
3392632	APKT 1003R8GT-FF IC808	New geometry
3424927	APKT 1003R8GT-FF IC5600	New geometry with new grade
3321498	APKT 1003PDR-HM-CS IC830	New geometry
3413631	HM90 APKT 1003PDR IC716	Standard geometry with new grade
3405166	APKR 1003PDR-HP IC716	New geometry with new grade
3403367	APKR 1003PDR-HP IC840	New geometry
3361919	ADKR 1505PDR-HP IC716	New geometry with new grade
3352881	ADKR 1505PDR-HP IC840	New geometry
3361920	ADKR 150532PDR-HP IC716	New geometry with new grade
3361921	ADKR 150532PDR-HP IC840	New geometry

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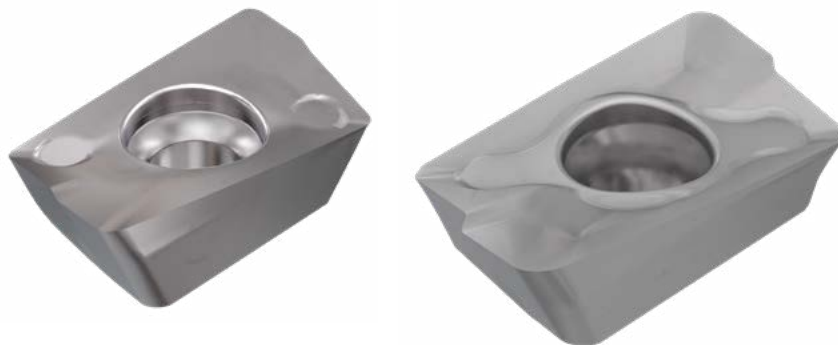
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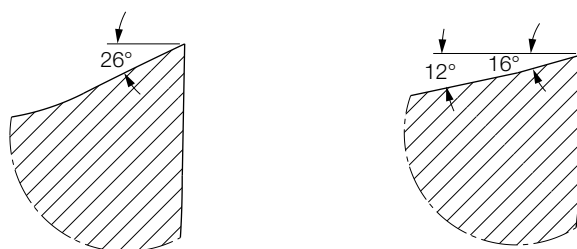
APKR/ADKR...PDR-HP



Product Features

- Specially designed for rough and finish milling applications related to ISO S materials of the main application group.
- Pressed-to-size durable insert structure.
- Reduces cutting load and enables high table feed due to high axial and rake angles.
- Wiper with improved edge preparation for high surface finish.

Insert APKR 1003...PDR-HP and ADKR 1505...PDR-HP



Applications

- Positive insert intended mainly for machining Titanium and High Temperature Alloys (HTSA machining) when milling square shoulders, faces-near-to-shoulder, slots, edges, pockets including ramping by helical interpolation.

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Expanding Inserts Variety



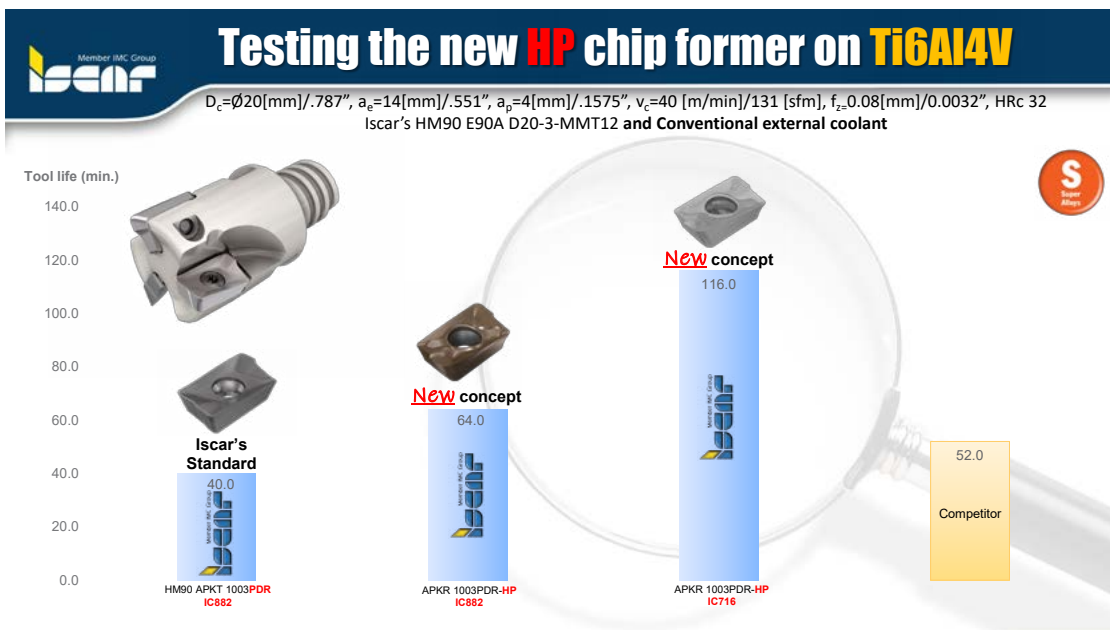
Easy Chip Evacuation



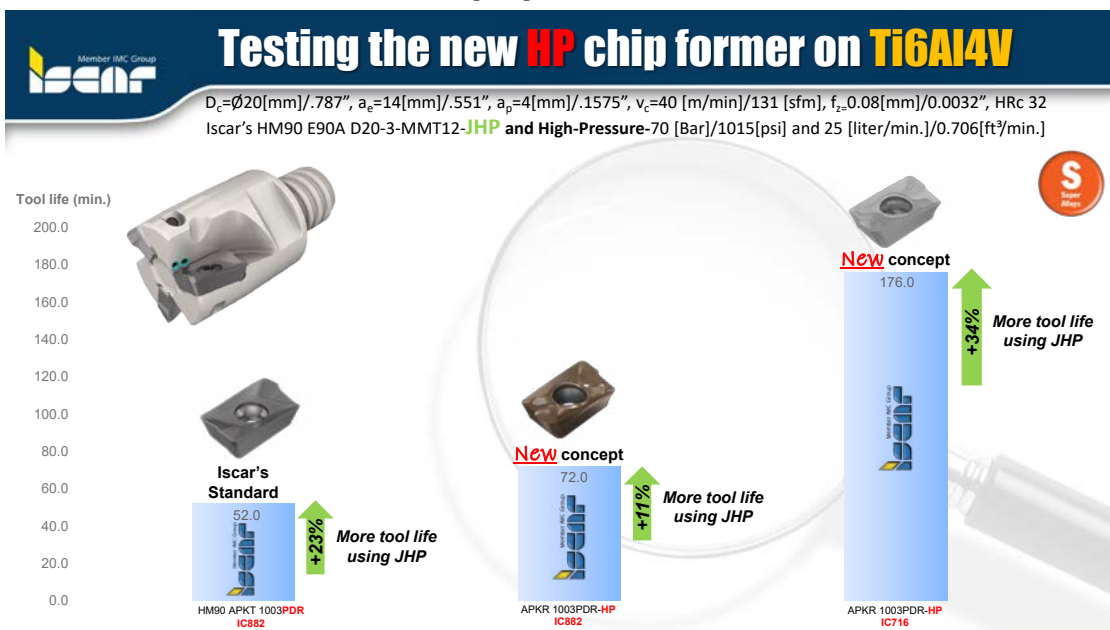
Cost Effective Insert

Benefits

- Milling 90° square shoulders with excellent surface finish.
- Suitable for HELI2000 tools with conventional coolant or high-pressure jet coolant supply (JHP) and pinpointed coolant outlets.
- High performance due to advantageous combination of all 3 recently developed elements:
 1. New HP chipformer geometry.
 2. IC716 carbide grade.
 3. Pinpointed outlets for efficient JHP cutters.



Same test with JHP tool and pinpointed coolant outlets:



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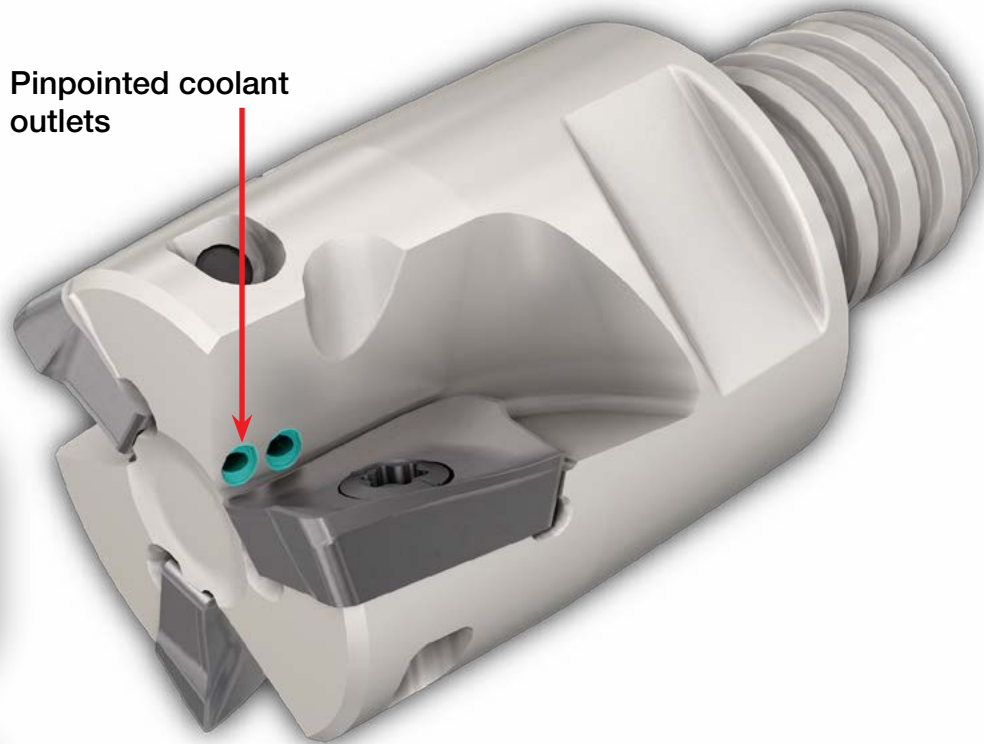
Cost Effective Insert

HELI2000 HELIMILL HELIPLUS-07

The new line of MILL2000 JHP tools utilize advanced production technology and design by use of Computational Fluid Dynamics (CFD), which optimize coolant outlets that enable coolant supply directed to the critical area of the insert.

- Increased tool life - achieved by reducing temperature on the cutting zone.
- Increased productivity - achieved by increasing the cutting parameters.
- Improved chip formation control - less chip entanglement and reduced risk of machine stops.
- Better surface finish.
- Higher process reliability.
- High Pressure Coolant (HPC) reduces built-up edge, especially when machining high-temperature Superalloys and Stainless Steel.

Pinpointed coolant
outlets



Designed by Computational Fluid Dynamics
Click for Short Video

Click for Short Video

Click for Short Video

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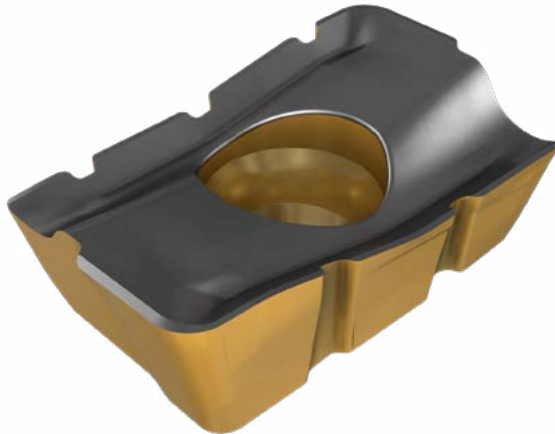
Cost Effective Insert

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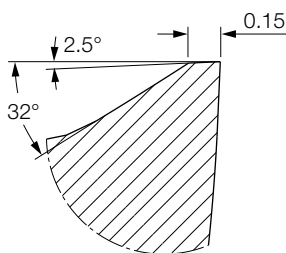
APKT 1003PDR-HM-CS



Product Features

- Intended for milling square shoulders.
- Designed for full slots with high depth of cut.
- Significantly improves chip evacuation.
- Reduces cutting load and enables high table feed.
- Reduces vibration.
- Reduces heat generation.
- The Insert's wide wiper improves surface quality.

Insert APKT 1003PDR-HM-CS



Applications

- Positive land intended for milling ISO P use caps for naming metals - carbon and alloy steel, ferritic and martensitic stainless-steel, and ISO M materials - such as austenitic stainless steel.
- Milling square shoulders, faces-near-to-shoulder, slots, edges, pockets including ramping by helical interpolation.
- Milling with high tool overhangs.

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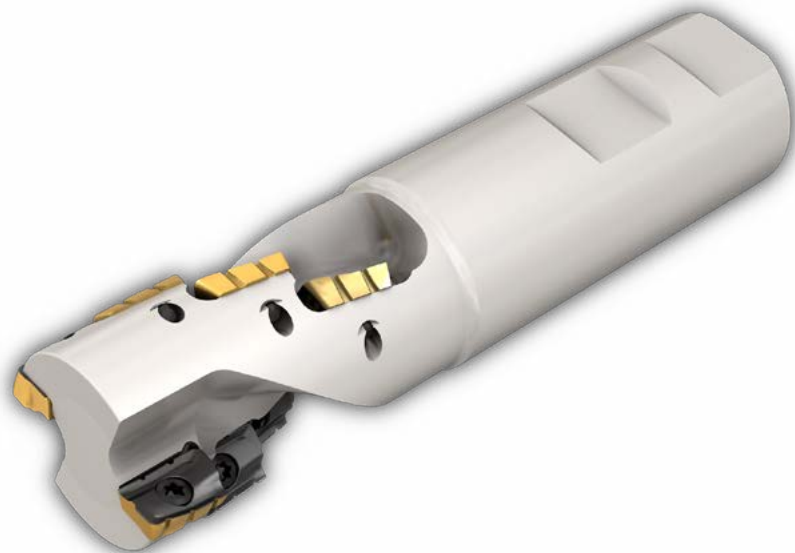
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Benefits

- Productivity by use of high metal removal rates (MRR).
- Milling square shoulders.
- High performance even when milling under unstable conditions.
- Lower power consumption which allows applying the cutters on machine tools with limited power, small capacity machining centers and turn-milling machines.
- Suitable for HELI2000 tools type HM90 F90AP-10, HM90 E90A-10 and APK...-FE extended flute cutters (Ø20-40mm).



[Click for Short Video](#)

Product Operation Guidelines

For optimal performance it is recommended to mount the inserts in an alternating edge configuration on adjacent cutter flutes to achieve effective chip splitting results.

The chip splitting inserts demonstrate maximum efficiency when mounted on milling cutters with an even-number of teeth (flute).

[Click for Short Video](#)

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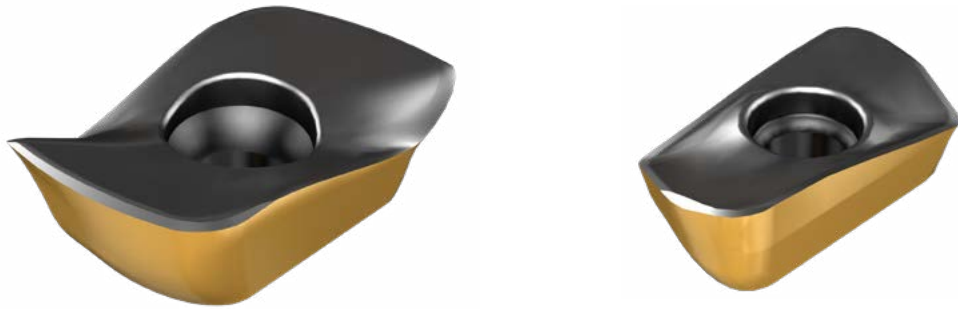
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APKT 1003R8GT-FF and HP ANKT 0702R12GT-FF



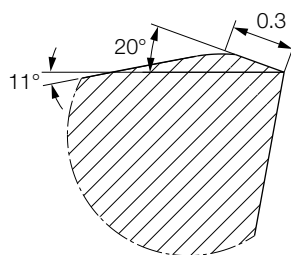
A new reinforced cutting-edge geometry for Fast Feed (FF) high efficiency rough milling for hardened materials-up to 60 Rockwell C hardness, which combats high stress and intensive wear.

The new inserts designed with a reinforced cutting edge specially for FF hard milling, feature a unique reinforced cutting edge with T-land chipformer to significantly improve tool life and boost productivity.

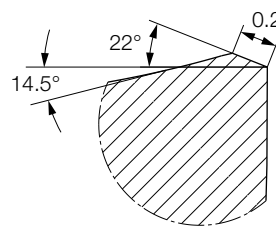
Product Features

- Negative robust T-land with optimal edge strength to reduce chipping.
- Highly durable insert coated with ISCAR's IC808 SUMO TEC and the latest IC5600 grade for machining steels, including materials with high hardness.

Insert APKT 1003R8GT-FF



HP ANKT 0702R12GTFF



Applications

- FF milling plane faces and 3D surfaces of steel and cast-iron components when workpiece hardness is 40-60 HRC.
- Ramping down capabilities.
- Industrial sectors: General engineering, Die and Mold manufacturing.

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Benefits

- Higher process durability and reliability combined with high feed rates.
- Increased tool life - achieved by the insert's cutting profile and chipformer cutting geometry.
- Great alternative to grinding, EDM or any other time-consuming production methods in rough machining.

Product Operation Guidelines

Controlling the temperature on the cutting edge is essential and assures longer tool life and higher material removal rate.

When machining hardened steel, ISCAR recommends:

1. Use high rigidity.
2. Use a toolholder with 4 or more teeth to reduce chip load.
3. Ensure using a tool holder with minimum runouts- Shrink fit or hydraulic clamping.
4. Maintain cutter engagement with the workpiece during machining to reduce vibration.
5. For cooling and chip evacuation use air blast.
6. Refer to ISCAR's cutting recommendations table in the next page or under "MORE INFO" in the E-Cat.

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Cutting Recommendations for New HELIMILL Inserts:

- The table below defines initial feed rates.
- For initial cutting speeds refer to **ISCAR**'s recommendations related to carbide grades.

Calculating Cutting Feed Rate:

$$fz = fz0 \times Kef \times Ks \text{ where}$$

$fz0$ - Basic feed (Table 1),

Kef - Engagement factor (Table 2),

Ks - Stability factor (Table 3)

Table 1 - Basic feed, $fz0$, mm/tooth

ISO	Material	Material No. ⁽¹⁾	"fz0 for Insert Size/Geometry"				
			APKR 1003 PDR-HM-CS	APKR 1003... PDR-HP	ADKR 1505... PDR-HP	APKT 1003 R8GT-FF	HP ANKT 0702R12GTFF
P	Non-alloy steel and cast steel, free cutting steel	< 0.25 %C	0.12	-	-	0.90	0.70
		>= 0.25 %C					
		< 0.55 %C					
		>= 0.55 %C					
	Low alloy steel and cast steel (less than 5% of alloying elements)		0.11	-	-	0.80	0.60
			0.10	-	-	0.70	0.50
			0.10	-	-	0.70	0.50
			0.10	-	-	0.70	0.50
			0.10	-	-	0.70	0.50
			0.10	-	-	0.70	0.50
			0.10	-	-	0.70	0.50
			0.10	-	-	0.70	0.50
M	Stainless steel and cast steel	14	0.10	0.10	0.12	-	-
K	Grey cast iron (GG)	15	-	-	-	-	-
		16	-	-	-	-	-
	Cast iron nodular (GGG)	17	-	-	-	-	-
		18	-	-	-	-	-
		19	-	-	-	-	-
Malleable cast iron	20	-	-	-	-	-	
S	High temp. alloys	Fe based	0.10	0.09	0.10	-	-
		Ni or Co based					
	Titanium alloys		0.10	0.09	0.10	-	-
H	Hardened steel	38	-	-	-	0.40	0.30
		39	-	-	-	0.30	0.20
	Chilled cast iron	40	-	-	-	0.40	0.30
	Cast iron	41	-	-	-	0.40	0.30

⁽¹⁾ in accordance with VDI3323 standard

Table 2 - Engagement Factor Kef

a_e/D	0.5...1	0.25 up to 0.5	less than 0.25
K_e	1	1.1	1.3

a_e - Width of cut
D - Cutting diameter

Table 3 - Stability Factor Ks

Stability	High	Moderate
K_s	1	0.9

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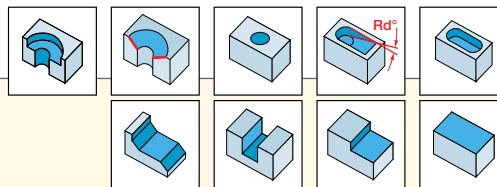
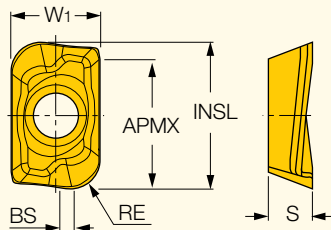
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HELI2000 HELIMILL HELIPLUS-07

HM90 ADKT 1505

Inserts with 2 Helical Cutting Edges for General Use

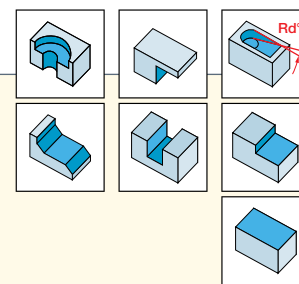
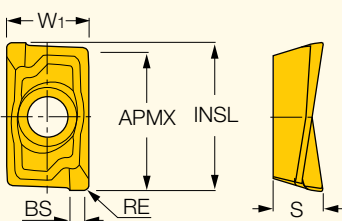


Designation	Dimensions						Tough ↔ Hard										Recommended Machining Data				
	W1	INSL	APMX	S	RE	BS	IC5600 NEW	IC882	IC330	IC328	IC830	IC928	IC5400	IC950	IC380	IC808	IC908	IC810	IC910	ap (mm)	fz (mm/t)
HM90 ADKT 1505PDR	9.65	16.18	12.00	5.85	0.80	2.16	•	•	•	•	•	•	•	•	•	•	•	•	•	1.20-12.00	0.08-0.15
HM90 ADKT 1505PDR-MM	9.60	16.00	12.00	5.80	0.80	2.70					•									1.20-12.00	0.08-0.15
HM90 ADKT 150516PDR	9.65	15.60	12.00	5.92	1.60	1.37	•										•			2.00-12.00	0.08-0.15
HM90 ADKT 150520PDR	9.65	15.60	12.00	5.90	2.00	0.79	•										•			2.40-12.00	0.08-0.15
HM90 ADKT 150524PDR	9.65	15.60	12.00	5.80	2.40	0.52											•			2.80-12.00	0.08-0.15
HM90 ADKT 150532PDR	9.65	15.20	12.00	5.85	3.20	-	•										•			3.60-12.00	0.08-0.15
HM90 ADKT 150540PDR	9.65	14.83	12.00	5.80	4.00	-	•										•			4.40-12.00	0.08-0.15
HM90 ADKT 150550PDR	9.65	14.85	12.00	5.75	5.00	-	•										•			5.40-12.00	0.08-0.15
HM90 ADKT 150564PDR	9.65	14.85	12.00	5.65	6.40	-	•										•			6.80-12.00	0.08-0.15

- For inserts with corner radii larger than 2.0 mm, the cutter body and seats should be modified
- Inserts with corner radii larger than 0.8 mm should be used on ADK & SM tools only on the face of the cutter.

ADKR 1505PDR/L

High Positive Inserts for Machining Steel, Stainless Steel and High Temperature Alloys



Designation	Dimensions						Tough ↔ Hard						Recommended Machining Data	
	INSL	W1	APMX	S	RE	BS	IC28	IC328	IC716 NEW	IC840	IC928	IC950	ap (mm)	fz (mm/t)
ADKR 150504PDR-HM	16.30	9.60	12.00	5.63	0.40	1.60	•	•				•	0.80-12.00	0.07-0.15
ADKR 1505PDL-HM (1)	15.95	9.60	12.00	6.00	0.80	1.60		•					1.20-12.00	0.07-0.15
ADKR 1505PDR-HM	15.95	9.60	12.00	6.00	0.80	1.60	•	•			•		1.20-12.00	0.07-0.15
ADKR 1505PDR-HP	16.18	9.60	14.00	6.48	0.80	2.50			•	•			1.20-14.00	0.07-0.15
ADKR 150532PDR-HP	15.40	9.60	12.00	6.20	3.20	1.60			•	•			3.60-12.00	0.07-0.15

(1) PDL - Left-hand inserts are used only for special tools

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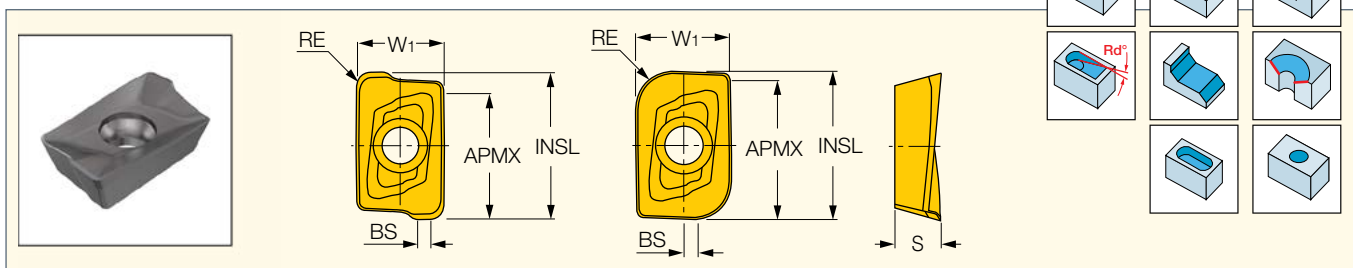
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HELI2000 HELIMILL HELIPLUS-07

HM90 APKT 1003

Inserts for General Use with 2 Helical Cutting Edges for High 90° Shoulder Accuracy

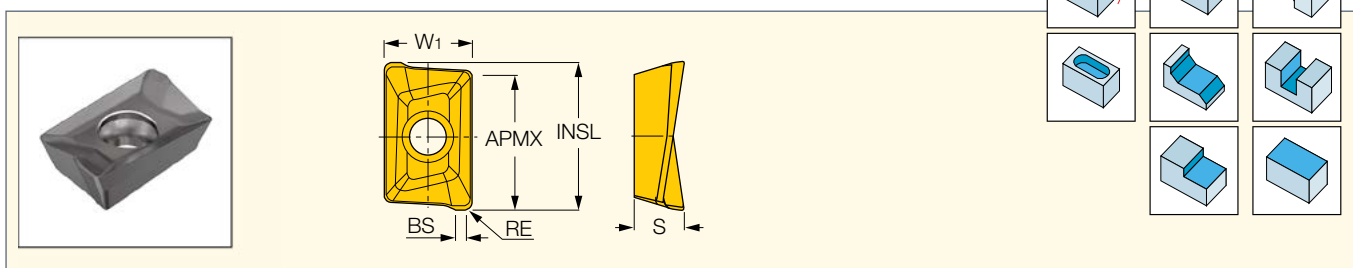


Designation	Dimensions						Tough ← Hard											Recommended Machining Data						
	W1	INSL	APMX	S	RE	BS	IC5600 NEW	IC882	IC28	IC330	IC328	IC716 NEW	IC830	IC928	IC5400	IC950	IC380	IC808	IC908	IC810	IC910	ap (mm)	fz (mm/t)	
HM90 APKT 1003PDR	6.76	11.45	8.00	3.53	0.80	1.40	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	1.20-8.00	0.08-0.15
HM90 APKT 1003PDR-SC	6.80	11.60	8.00	4.00	0.40	1.80							•	•									0.80-8.00	0.08-0.15
HM90 APKT 1003PDR-MM	6.70	11.50	8.00	3.50	0.80	1.60							•	•									1.20-8.00	0.08-0.15
HM90 APKT 1003PDTR-8M	6.76	11.45	8.00	3.53	0.80	1.40							•	•							•		1.20-8.00	0.08-0.20
HM90 APKT 100304PDR	6.76	11.45	8.00	3.53	0.40	1.78	•		•		•		•	•									0.80-8.00	0.08-0.15
HM90 APKT 100308R	6.76	11.45	8.00	3.53	0.80	1.00							•	•									1.20-8.00	0.08-0.15
HM90 APKT 100310PDR	6.76	11.45	8.00	3.53	1.00	1.00												•					1.40-8.00	0.08-0.15
HM90 APKT 100312PDR	6.76	11.45	8.00	3.53	1.20	1.00	•				•		•	•									1.60-8.00	0.08-0.15
HM90 APKT 100316PDR	6.76	11.45	8.00	3.53	1.60	0.58	•				•		•	•									2.00-8.00	0.08-0.15
HM90 APKT 100325PDR	6.76	10.40	8.00	3.53	2.50	-	•				•		•	•									2.90-8.00	0.08-0.15
HM90 APKT 100330PDR	6.76	10.40	8.00	3.53	3.00	-	•				•		•	•									3.40-8.00	0.08-0.15

• For inserts with corner radii larger than 1.5 mm, the cutter body should be modified

APKR 1003PDR

High Positive Inserts for Machining Stainless Steel and High Temperature Alloys



Designation	Dimensions						Tough ← Hard						Recommended Machining Data	
	W1	INSL	APMX	S	RE	BS	IC28	IC330	IC328	IC716 NEW	IC840	IC928	ap (mm)	fz (mm/t)
APKR 1003PDR-HM	6.70	11.20	8.00	3.76	0.50	1.20	•	•	•				0.90-8.00	0.07-0.15
APKR 1003PDR-HP	6.70	11.50	10.20	3.80	0.80	1.90				•	•		0.90-8.00	0.07-0.15

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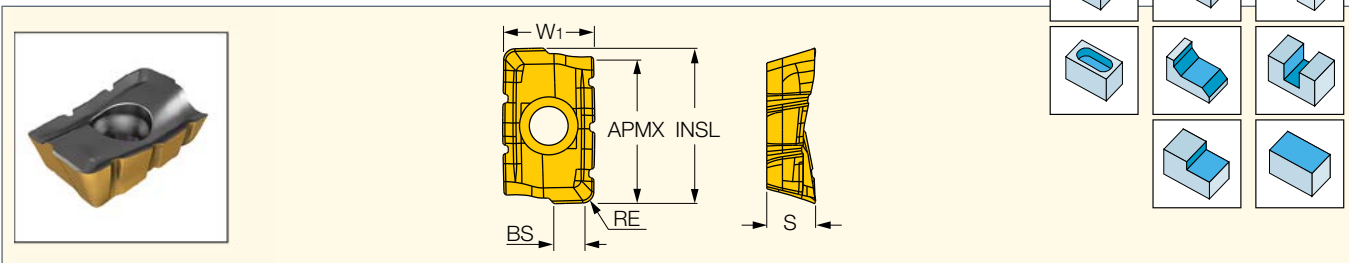
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APKT 1003PDR-HM-CS

Chip Splitting Insert for Rough Steel Milling,
Specially Made for Extended Flute Tools or Long Overhang Applications

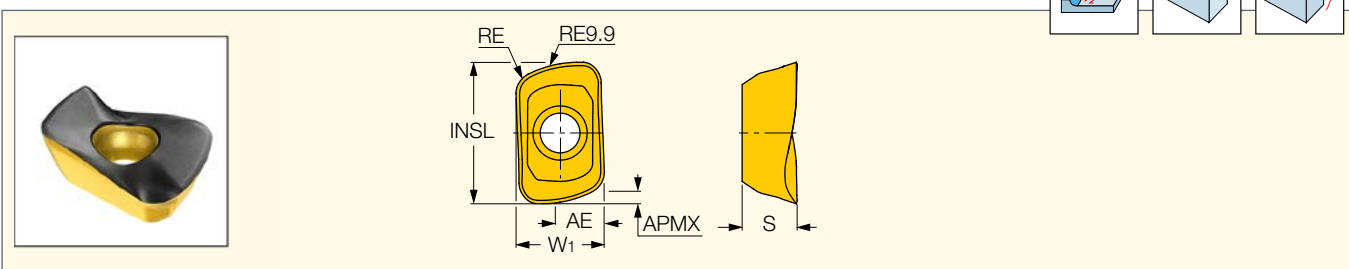


Designation	Dimensions						IC880	Recommended Machining Data	
	W1	INSL	S	APMX	RE	BS		a_p (mm)	f_z (mm/t)
APKT 1003PDR-HM-CS	6.70	10.95	3.55	8.00	0.80	1.20	●	8.00-8.00 ⁽¹⁾	0.08-0.15

⁽¹⁾ Machine with maximum depth of cut

APKT 1003-FF

Insert for Fast Feed Milling



Designation	Dimensions						Tough ↔ Hard			Recommended Machining Data	
	W1	INSL	APMX	AE	S	RE ⁽²⁾	IC5600 NEW	IC830	IC808	a_p (mm)	f_z (mm/t)
APKT 1003R8T-FF	6.60	10.80	1.00	4.5	3.50	1.90	●	●	●	0.50-1.00	0.50-1.50
APKT 1003R8GT-FF ⁽¹⁾	6.60	10.80	0.70	4.5	3.50	1.90	●	●	●	0.50-1.00	0.50-1.50

• The actual diameter of the tool is 0.1 mm larger than the nominal diameter when using this insert • Tool corner should be modified by rounding to 2.0 mm.

• Should be used on tools of 12 mm diameter and up • At D.O.C. larger than a_p max, regular insert feed should be applied

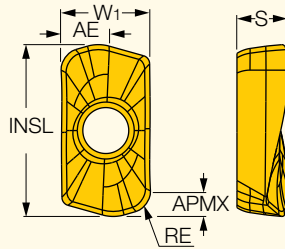
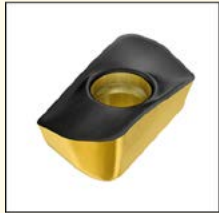
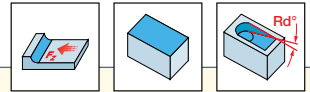
⁽¹⁾ Reinforced cutting-edge geometry for Fast Feed (FF) hardened materials up to 60 HRC

⁽²⁾ Radius for CNC programming is considered as 1.8 mm

HELI2000 HELIMILL HELIPLUS-07

HP ANKT 0702-FF

Inserts for Fast Feed Milling



Designation	Dimensions						Tough ↔ Hard			Recommended Machining Data f _z (mm/t)
	W1	RE	S	INSL	APMX	AE	IC5600 NEW	IC830	IC808	
HP ANKT 0702R12T-FF	4.40	1.20	2.60	8.55	0.70	1.9		•	•	0.30-1.00
HP ANKT 0702R12GT-FF ⁽¹⁾	4.40	1.20	2.60	8.55	0.70	1.9	•		•	0.30-1.00

• Can be used on 12 mm and larger tools

⁽¹⁾ Reinforced cutting-edge geometry for Fast Feed (FF) hardened materials up to 60 HRC

NEW