

**NEW
PRODUCT!**

Deep-hole Drilling Insert — AP301U(N)



Achteck is launching general-purpose deep-hole drilling inserts with a high productivity for many industries: energy, construction machinery, injection molding, aviation, shipbuilding, national defense, etc. Good hole straightness in long workpieces and high surface finish. Existing geometries and grades cover good machinability of steel, stainless steel and super-alloy, etc.

• Application and features

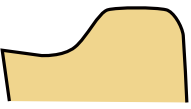
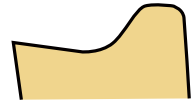
- The inserts can be mounted in the same type of drill body's for deep-hole drilling
- AP301U(N) is the first choice for drilling steel and stainless steel
- All geometries with good chip-breaking effect
- Increased efficiency due to high feed rate
- Resulting in low cost per hole

• Grade and application

Grade	Coating	Workpiece Material					
		P	M	K	S	N	H
AP301U(N)	PVD	●	◐		○		

- Marked : 1st Choice ◐ Marked : 2nd Choice ○ Marked : Supplementary application
- ISO P : (P15-P35) General-purpose PVD coating with excellent wear-resistance and toughness
- ISO M : (M15-M35) ISO-M General-purpose grade for ISO-M applications, PVD coating with excellent toughness and resistance to built-up edges
- ISO S : (S15-S35) PVD coating with excellent wear resistance and toughness, good resistance to built-up edges

• Chip breaker features

Chip breaker name	Edge Preparation	Application
DH		• General machining • With high cutting speed and feed; • Good cutting control in most materials;
DL		• For materials with long chips (such as low carbon alloy steel and duplex stainless steel); • Obtain a safe production process in cutting materials where chip jamming easily could occur
LH		• With open geometry; • Suitable for high cutting speed and feed;

Case stories

Work piece: non-magnetic drill collar

Material: P350 non-magnetic stainless steel

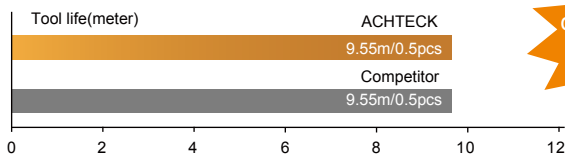
Hardness: HRC36

Insert: APHT 09T308P-DL AP301U(N)

Machining type: inner hole length 9550mm / branch

Cutting parameter: Spindle speed 50 rpm, rotating rod 320 rpm,
drill pipe feed 30mm / min

Cutting method: Emulsion M1012A



Work piece: Military product (confidential)

Material: 34CrNi3Mo1V

Hardness: HRC38

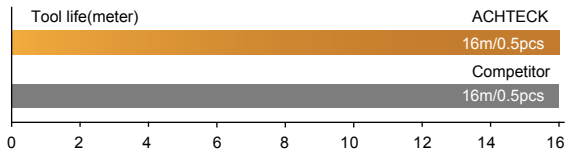
Insert: EPMT 050308I-DH AP301U(N)/EPMT 050308C-DH AP301U(N)

Machining type: Inner hole length 1600mm / branch

Cutting diameter: 26mm

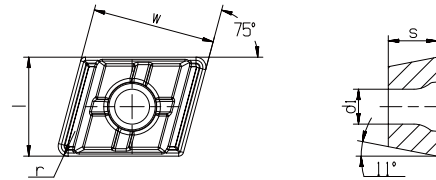
Cutting parameter: Rotating rod speed 900 rpm, Drill pipe box feed 100mm / min

Cutting method: Sulfurized oil

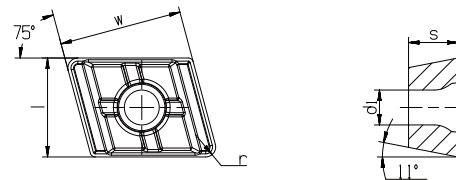


Insert stock item

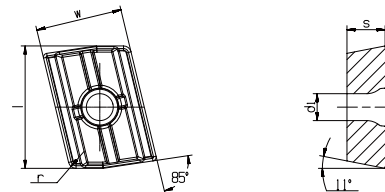
-DH geometry



Center insert	Designation	l	w	s	r	d1	Competitor's designation	Stock
	EPMT 050308C-DH AP301U(N)	5.56	8.00	3.18	0.8	0.8	800-050308M-C-G 1025	●
	EPMT 06T308C-DH AP301U(N)	6.35	9.87	3.97	0.8	0.8	800-06T308M-C-G 1025	●
	EPMT 08T308C-DH AP301U(N)	7.94	9.87	3.97	0.8	0.8	800-08T308M-C-G 1025	●
	EPMT 10T308C-DH AP301U(N)	9.53	9.87	3.97	0.8	0.8	800-10T308M-C-G 1025	●
	EPMT 12T308C-DH AP301U(N)	12.70	9.87	3.97	0.8	0.8	800-12T308M-C-G 1025	●

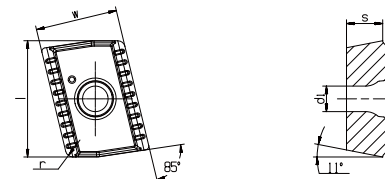


Intermediate insert	Designation	l	w	s	r	d1	Competitor's designation	Stock
	EPMT 050308I-DH AP301U(N)	5.56	8.00	3.18	0.8	2.5	800-050308M-I-G 1025	●
	EPMT 06T308I-DH AP301U(N)	6.35	9.87	3.97	0.8	2.8	800-06T308M-I-G 1025	●
	EPMT 08T308I-DH AP301U(N)	7.94	9.87	3.97	0.8	2.8	800-08T308M-I-G 1025	●
	EPMT 12T308I-DH AP301U(N)	12.70	9.87	3.97	0.8	2.8	800-12T308M-I-G 1025	●



Periphery insert	Designation	l	w	s	r	d1	Competitor's designation	Stock
	APHT 060308P-DH AP301U(N)	6.50	8.00	3.18	0.8	2.5	800-060308H-P-G 1025	●
	APHT 08T308P-DH AP301U(N)	8.50	9.00	3.97	0.8	2.8	800-08T308H-P-G 1025	●
	APHT 09T308P-DH AP301U(N)	9.66	9.00	3.97	0.8	2.8	800-09T308H-P-G 1025	●
	APHT 11T308P-DH AP301U(N)	12.75	9.00	3.97	0.8	2.8	800-11T308H-P-G 1025	●

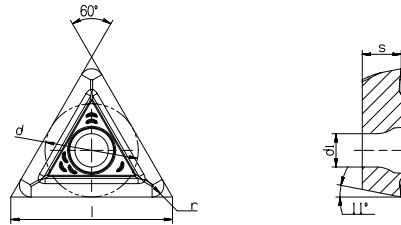
-DL geometry



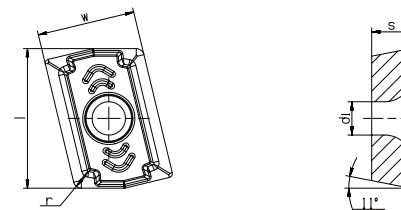
Periphery insert	Designation	l	w	s	r	d1	Competitor's designation	Stock
	APHT 060308P-DL AP301U(N)	6.50	8.00	3.18	0.8	2.5	800-060308H-P-L 1025	●
	APHT 08T308P-DL AP301U(N)	8.50	9.00	3.97	0.8	2.8	800-08T308H-P-L 1025	●
	APHT 09T308P-DL AP301U(N)	9.66	9.00	3.97	0.8	2.8	800-09T308H-P-L 1025	●
	APHT 11T308P-DL AP301U(N)	12.75	9.00	3.97	0.8	2.8	800-11T308H-P-L 1025	●

● Represent for standard stock

-DH geometry

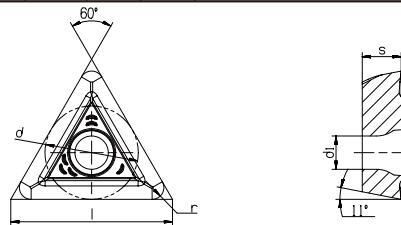


Center and intermediate insert	Designation	l	w	s	r	d1	Competitor's designation	Stock
	TPMT 16T312R-DH AP301U(N)	16.5	9.525	3.97	1.2	3.4	TPMT 16T308R-23 1025	●
	TPMT 220612R-DH AP301U(N)	22.0	12.7	6.35	1.2	3.4	TPMT 220612R-23 1025	●

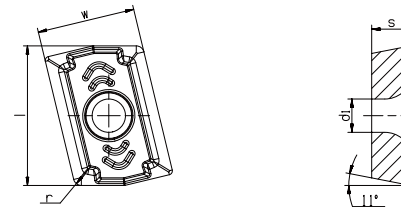


Periphery insert	Designation	l	w	s	r	d1	Competitor's designation	Stock
	APMT 13T308-DH AP301U(N)	14.6	10.0	3.97	0.8	3.4	R424.9-13T308-23 1025	●
	APMT 180608-DH AP301U(N)	20.6	11.5	6.35	0.8	4.4	R424.9-180608-23 1025	●

-LH geometry



Center and intermediate insert	Designation	l	w	s	r	d1	Competitor's designation	Stock
	TPMT 16T312R-LH AP301U(N)	16.5	9.525	3.97	1.2	4.4	TPMT 16T308R-22 1025	●
	TPMT 220612R-LH AP301U(N)	22.0	12.7	6.35	1.2	4.4	TPMT 220612R-22 1025	●



Periphery insert	Designation	l	w	s	r	d1	Competitor's designation	Stock
	APMT 13T308-LH AP301U(N)	14.6	10.0	3.97	0.8	3.4	R424.9-13T308-22 1025	●
	APMT 180608-LH AP301U(N)	20.6	11.5	6.35	0.8	4.4	R424.9-180608-22 1025	●

● Represent for standard stock

Recommended cutting speed by materials (Dia 25.00-65.00mm)

Workpiece material			Brinell hardness (HB)	Grade Insert*)			Cutting speed Vc m/min	Feed fn mm/r	
				P	I	C		Drilling Dia mm	
P	Non-alloyed steel	C=0.05-0.10%	125	AP301U(N)			70-130	0.11-0.41	0.14-0.45
		C=0.10-0.25%	125				70-130	0.11-0.41	0.14-0.45
		C=0.25-0.55%	150				70-130	0.11-0.41	0.14-0.45
		C=0.55-0.80%	170				70-130	0.11-0.41	0.14-0.45
	High carbon steel	Carbon tool steel	210	AP301U(N)			70-120	0.11-0.41	0.20-0.45
	Low-alloyed steel	Non-Hardened	180	AP301U(N)			55-110	0.11-0.41	0.20-0.45
		Tempered	275				70-120	0.11-0.41	0.20-0.45
		Tempered	350				70-120	0.11-0.41	0.20-0.45
	High-alloyed steel	Annealed	200	AP301U(N)			55-110	0.11-0.38	0.20-0.40
		Hardened tool steel	325				55-110	0.20-0.38	0.20-0.40
M	Stainless steel	Non-Hardened/Ferritic/martensitic	200	AP301U(N)			40-110	0.11-0.41	0.20-0.45
		Austenitic	200				40-110	0.11-0.41	0.20-0.45
		Austenitic, precipitation hardened (PH)	300				40-110	0.11-0.33	0.20-0.35
		Austenitic/ferritic, duplex	230				40-80	0.11-0.33	0.20-0.35
S	Heat-resistant alloys	Fe-based Annealed	200	AP301U(N)			10-55	0.09-0.30	0.20-0.33
		Fe-based Hardened	280				10-55	0.09-0.30	0.20-0.33
		Ni or Co-based Annealed	250				10-55	0.09-0.30	0.20-0.33
		Ni or Co-based Hardened	350				10-55	0.09-0.30	0.20-0.33
		Ni or Co-based cast	320				10-55	0.09-0.30	0.20-0.33
	Titanium alloys	Pure titanium	200	AP301U(N)			30-60	0.09-0.30	0.20-0.33
		α alloys	375				30-60	0.09-0.30	0.20-0.33
		α and β alloys	375				30-60	0.09-0.30	0.20-0.33
		β alloys	410				30-60	0.09-0.30	0.20-0.33
K	Malleable cast iron	Ferritic	200	AP301U(N)			80-120	0.11-0.38	0.24-0.41
		Pearlitic	260				80-120	0.11-0.38	0.24-0.41
	Grey cast iron	Low tensile strength	180	AP301U(N)			60-110	0.11-0.38	0.24-0.41
		High tensile strength	245				60-110	0.11-0.38	0.24-0.41
	Cast iron with spheroidal graphite	Ferritic	160	AP301U(N)			50-110	0.11-0.38	0.24-0.41
		Pearlitic	250				50-110	0.11-0.38	0.24-0.41
H	GGV (CGI)	GGV (CGI)	230						
N	Hardened steel	Hardened and tempered	43-47 HRC						
	Hardened cast iron		47- 60 HRC						
	Aluminium wrought alloys	Cannot be hardened	30	AP301U(N)			65-150	0.09-0.33	0.20-0.33
		Hardenable, hardened	100				65-150	0.09-0.33	0.20-0.33
	Cast aluminium alloys	≤ 12 % Si, cannot be hardened	75	AP301U(N)			65-150	0.09-0.33	0.20-0.33
		≤ 12 % Si hardened	90				65-150	0.09-0.33	0.20-0.33
		> 12 % Si, cannot be hardened	130				65-150	0.09-0.33	0.20-0.33
	Magnesium alloy		70						
O	Copper and copper alloys (Bronze/Brass)	Non-alloyed, electrolytic copper	100	AP301U(N)			65-150	0.09-0.33	0.20-0.33
		Brass, bronze, red brass	90	AP301U(N)			65-150	0.09-0.33	0.20-0.33
		Cu-alloys, short-chipping	110				65-150	0.09-0.33	0.20-0.33
		High-strength Ampco	300				65-150	0.09-0.33	0.20-0.33
O	Thermoplastics	Without abrasive fillers							
	Thermosetting plastics	Without abrasive fillers							
	Plastic, glass-fibre reinforced	GFRP							
	Plastic, carbon-fibre reinforced	CFRP							
	Plastic, aramid-fibre reinforced	AFRP							
	Graphite (technical)								

*) Insert position-P , I , C

P=peripheral insert , I=intermediate insert, C=center insert

Recommended cutting speed by materials (Dia ≥63.50mm)

Workpiece material			Brinell hardness (HB)	Grade			Cutting speed Vc m/min	Feed fn mm/r	
				Insert*)				Drilling Dia mm	
				P	I	C	≥63.50		
P	Non-alloyed steel	C=0.05-0.10%	125	AP301U(N)			80-100	0.18-0.35	
		C=0.10-0.25%	125				80-100	0.18-0.35	
		C=0.25-0.55%	150				80-100	0.18-0.35	
		C=0.55-0.80%	170				80-100	0.18-0.35	
	High carbon steel	Carbon tool steel	210	AP301U(N)			70-100	0.18-0.35	
	Low-alloyed steel	Non-Hardened	180	AP301U(N)			60-100	0.16-0.35	
		Tempered	275				70-100	0.18-0.30	
		Tempered	350				70-100	0.18-0.30	
	High-alloyed steel	Annealed	200	AP301U(N)			60-100	0.16-0.30	
		Hardened tool steel	325				60-100	0.16-0.30	
Cast steel	Non-alloyed steel	180	AP301U(N)			50-100	0.15-0.30		
	Low-alloy (alloy<5%)	200				50-100	0.15-0.30		
M	Stainless steel	Non-Hardened/Ferritic/martensitic	200	AP301U(N)			50-90	0.16-0.35	
		Austenitic	200				50-90	0.16-0.35	
		Austenitic, precipitation hardened (PH)	300						
		Austenitic/ferritic, duplex	230						
S	Heat-resistant alloys	Fe-based Annealed	200	AP301U(N)			20-65	0.15-0.30	
		Fe-based Hardened	280				20-65	0.15-0.30	
		Ni or Co-based Annealed	250				20-65	0.15-0.30	
		Ni or Co-based Hardened	350				20-65	0.15-0.30	
		Ni or Co-based cast	320						
	Titanium alloys	Pure titanium	200	AP301U(N)			30-100	0.15-0.30	
		α alloys	375				30-100	0.15-0.30	
		α and β alloys	375				30-100	0.15-0.30	
		β alloys	410				30-100	0.15-0.30	
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		Pearlitic	260						
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		High tensile strength	245						
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		Pearlitic	250						
	GGV (CGI)	GGV (CGI)	230						
H	Hardened steel	Hardened and tempered	43-47 HRC						
	Hardened cast iron		47- 60 HRC						
N	Aluminium wrought alloys	Cannot be hardened	30	AP301U(N)			65-130	0.10-0.30	
		Hardenable, hardened	100				65-130	0.10-0.30	
	Cast aluminium alloys	≤ 12 % Si, cannot be hardened	75	AP301U(N)			65-130	0.10-0.30	
		≤ 12 % Si hardened	90				65-130	0.10-0.30	
		> 12 % Si,cannot be hardened	130				65-130	0.10-0.30	
	Magnesium alloy		70						
	Copper and copper alloys (Bronze/Brass)	Non-alloyed, electrolytic copper	100	AP301U(N)			65-130	0.10-0.30	
		Brass, bronze, red brass	90	AP301U(N)			65-130	0.10-0.30	
		Cu-alloys, short-chipping	110			65-130	0.10-0.30		
High-strength Ampco		300			65-130	0.10-0.30			
O	Thermoplastics	Without abrasive fillers							
	Thermosetting plastics	Without abrasive fillers							
	Plastic, glass-fibre reinforced	GFRP							
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