

DrillLine

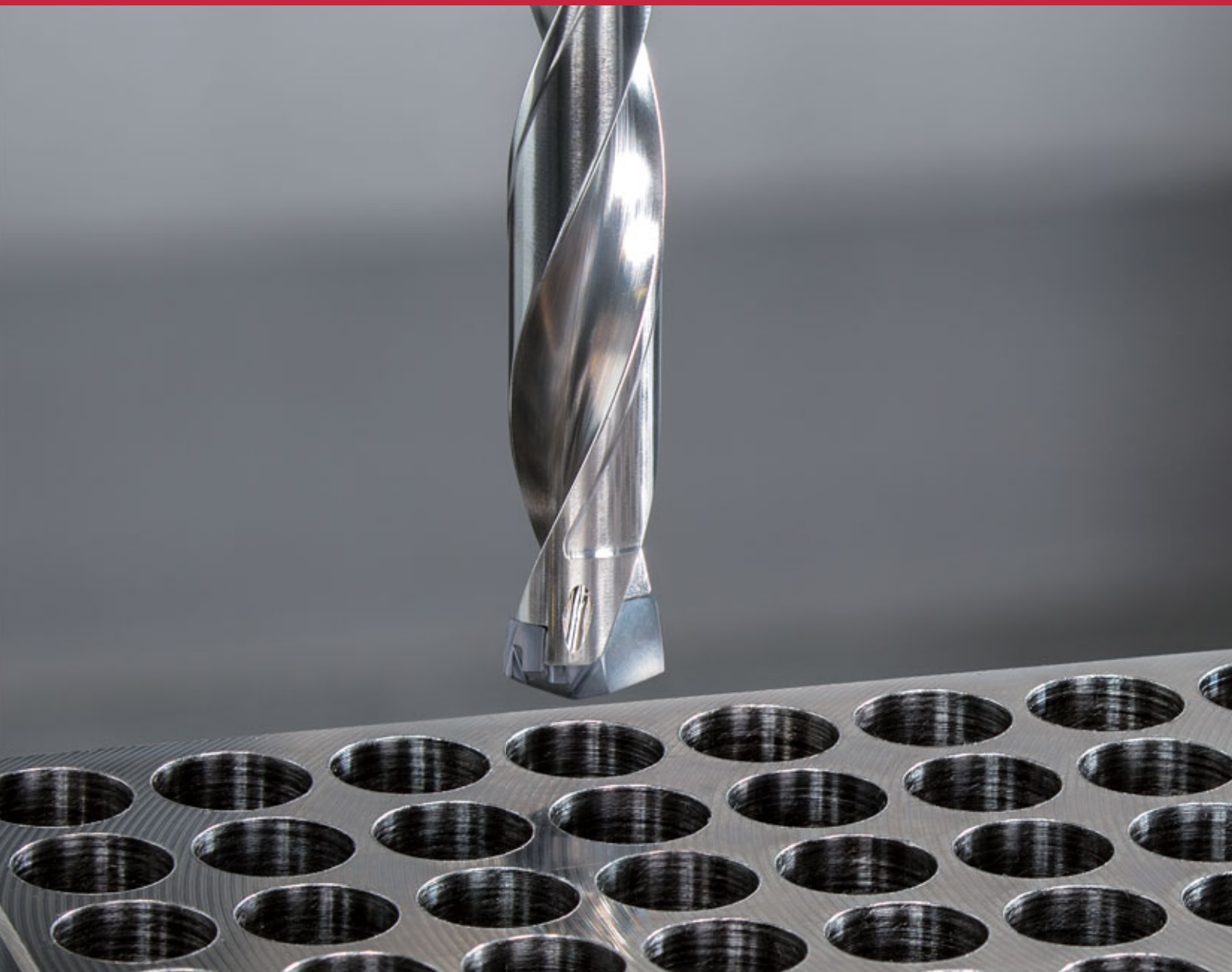


DRILLMEISTER

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Tungaloy Report No. 412S1-G

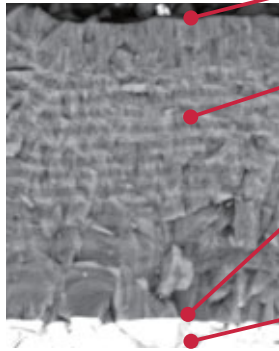
Expansion of AH9130 with DMP head in range $\varnothing 10 - 19.9$ mm



INDUSTRY 4.0
FEED the SPEED!

Excellent-balanced wear resistance by unique multi layered coating optimized for drilling application

New AH9130



Feature 1: Resistance to builtup-edge

Coating layer to resist builtup-edge

Feature 2: Resistance to wear, oxidation, and fracture

2 coating layers for wear and oxidation resistance
Layered alternatively to prevent crack from propagating to fracture

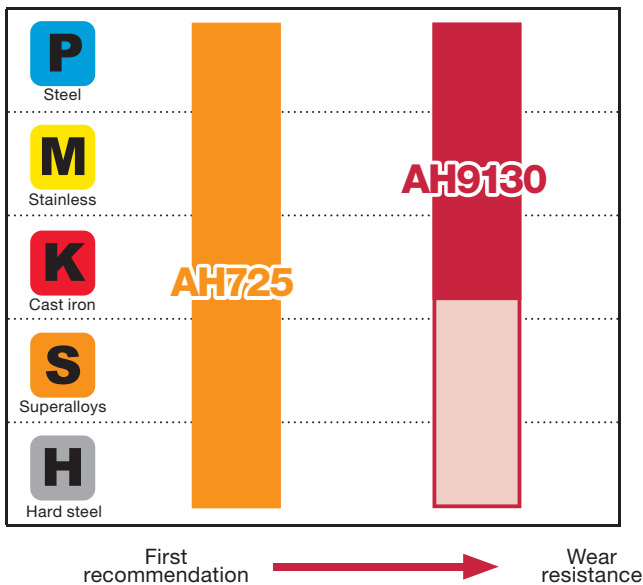
Feature 3: Strong coating-substrate adhesion

Coating is provided with strong adhesion between the coating layer and carbide substrate to prevent coating delamination

Substrate

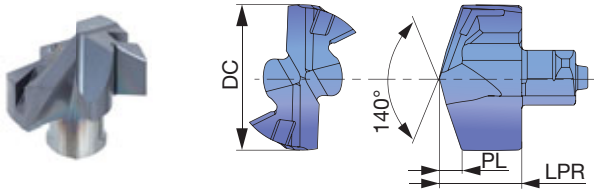
Carbide substrate features wear and fracture resistance

Application range



DRILL HEAD

DMP



Tool diameter	ø10 - ø17.9	ø18 - ø19.8
Head diameter tolerance	+0.018 / 0	+0.021 / 0

Designation	DC	Grade		LPR	PL	Pocket size	Body	Designation	DC	Grade		LPR	PL	Pocket size	Body
		AH725	AH9130							AH725	AH9130				
DMP100	10	●	●	6.1	1.47	10	TID*100*	DMP140	14	●	●	8	2.12	14	TID*140*
DMP101	10.1	●		6.1	1.49	10	TID*100*	DMP141	14.1	●		8	2.14	14	TID*140*
DMP102	10.2	●		6.1	1.51	10	TID*100*	DMP142	14.2	●	●	8	2.16	14	TID*140*
DMP103	10.3	●	●	6.1	1.52	10	TID*100*	DMP143	14.3	●	●	8	2.17	14	TID*140*
DMP104	10.4	●	●	6.1	1.54	10	TID*100*	DMP144	14.4	●		8	2.19	14	TID*140*
DMP105	10.5	●	●	6.1	1.56	10	TID*105*	DMP145	14.5	●	●	8	2.21	14	TID*145*
DMP106	10.6	●		6.1	1.58	10	TID*105*	DMP146	14.6	●		8	2.23	14	TID*145*
DMP107	10.7	●		6.1	1.6	10	TID*105*	DMP147	14.7	●		8	2.25	14	TID*145*
DMP108	10.8	●	●	6.1	1.62	10	TID*105*	DMP148	14.8	●		8	2.27	14	TID*145*
DMP109	10.9	●		6.1	1.63	10	TID*105*	DMP149	14.9	●		8	2.28	14	TID*145*
DMP110	11	●	●	6.5	1.67	11	TID*110*	DMP150	15	●	●	8.5	2.27	15	TID*150*
DMP111	11.1	●		6.5	1.69	11	TID*110*	DMP151	15.1	●		8.5	2.29	15	TID*150*
DMP112	11.2	●		6.5	1.71	11	TID*110*	DMP152	15.2	●	●	8.5	2.31	15	TID*150*
DMP113	11.3	●	●	6.5	1.72	11	TID*110*	DMP153	15.3	●	●	8.5	2.32	15	TID*150*
DMP114	11.4	●		6.5	1.74	11	TID*110*	DMP154	15.4	●		8.5	2.34	15	TID*150*
DMP115	11.5	●	●	6.5	1.76	11	TID*115*	DMP155	15.5	●	●	8.5	2.36	15	TID*150*
DMP116	11.6	●		6.5	1.78	11	TID*115*	DMP156	15.6	●		8.5	2.38	15	TID*150*
DMP117	11.7	●		6.5	1.8	11	TID*115*	DMP157	15.7	●		8.5	2.4	15	TID*150*
DMP118	11.8	●		6.5	1.82	11	TID*115*	DMP158	15.8	●	●	8.5	2.42	15	TID*150*
DMP119	11.9	●		6.5	1.83	11	TID*115*	DMP159	15.9	●		8.5	2.43	15	TID*150*
DMP120	12	●	●	6.8	1.82	12	TID*120*	DMP160	16	●	●	9.1	2.42	16	TID*160*
DMP121	12.1	●	●	6.8	1.84	12	TID*120*	DMP161	16.1	●	●	9.1	2.44	16	TID*160*
DMP122	12.2	●		6.8	1.86	12	TID*120*	DMP162	16.2	●		9.1	2.46	16	TID*160*
DMP123	12.3	●	●	6.8	1.87	12	TID*120*	DMP163	16.3	●	●	9.1	2.47	16	TID*160*
DMP124	12.4	●	●	6.8	1.89	12	TID*120*	DMP164	16.4	●		9.1	2.49	16	TID*160*
DMP125	12.5	●	●	6.8	1.91	12	TID*125*	DMP165	16.5	●	●	9.1	2.51	16	TID*160*
DMP126	12.6	●	●	6.8	1.93	12	TID*125*	DMP166	16.6	●	●	9.1	2.53	16	TID*160*
DMP127	12.7	●	●	6.8	1.95	12	TID*125*	DMP167	16.7	●	●	9.1	2.55	16	TID*160*
DMP128	12.8	●		6.8	1.97	12	TID*125*	DMP168	16.8	●		9.1	2.57	16	TID*160*
DMP129	12.9	●		6.8	1.98	12	TID*125*	DMP169	16.9	●		9.1	2.58	16	TID*160*
DMP130	13	●	●	7.4	1.96	13	TID*130*	DMP170	17	●	●	9.7	2.59	17	TID*170*
DMP131	13.1	●		7.4	1.98	13	TID*130*	DMP171	17.1	●		9.7	2.61	17	TID*170*
DMP132	13.2	●		7.4	2	13	TID*130*	DMP172	17.2	●		9.7	2.63	17	TID*170*
DMP133	13.3	●	●	7.4	2.01	13	TID*130*	DMP173	17.3	●		9.7	2.64	17	TID*170*
DMP134	13.4	●		7.4	2.03	13	TID*130*	DMP174	17.4	●		9.7	2.66	17	TID*170*
DMP135	13.5	●	●	7.4	2.05	13	TID*135*	DMP175	17.5	●	●	9.7	2.68	17	TID*170*
DMP136	13.6	●		7.4	2.07	13	TID*135*	DMP176	17.6	●		9.7	2.7	17	TID*170*
DMP137	13.7	●		7.4	2.09	13	TID*135*	DMP177	17.7	●		9.7	2.72	17	TID*170*
DMP138	13.8	●	●	7.4	2.11	13	TID*135*	DMP178	17.8	●		9.7	2.74	17	TID*170*
DMP139	13.9	●	●	7.4	2.12	13	TID*135*	DMP179	17.9	●	●	9.7	2.75	17	TID*170*

●: New ●: Line-up
 Package Quantity: ø10 - ø19.8 = 2 pcs.

Designation	DC	Grade		LPR	PL	Pocket size	Body
		AH725	AH9130				
DMP180	18	●	●	10.3	2.73	18	TID*180*
DMP181	18.1	●		10.3	2.75	18	TID*180*
DMP182	18.2	●		10.3	2.77	18	TID*180*
DMP183	18.3	●		10.3	2.78	18	TID*180*
DMP184	18.4	●		10.3	2.8	18	TID*180*
DMP185	18.5	●	●	10.3	2.82	18	TID*180*
DMP186	18.6	●		10.3	2.84	18	TID*180*
DMP187	18.7	●		10.3	2.86	18	TID*180*
DMP188	18.8	●		10.3	2.88	18	TID*180*
DMP189	18.9	●		10.3	2.89	18	TID*180*
DMP190	19	●	●	10.8	2.88	19	TID*190*
DMP191	19.1	●		10.8	2.9	19	TID*190*
DMP192	19.2	●		10.8	2.92	19	TID*190*
DMP1927	19.27	●		10.8	2.93	19	TID*190*
DMP193	19.3	●	●	10.8	2.93	19	TID*190*
DMP194	19.4	●	●	10.8	2.95	19	TID*190*
DMP195	19.5	●	●	10.8	2.97	19	TID*190*
DMP196	19.6	●		10.8	2.99	19	TID*190*
DMP197	19.7	●		10.8	3.01	19	TID*190*
DMP198	19.8	●	●	10.8	3.03	19	TID*190*

●: New ●: Line-up
 Package Quantity: ø10 - ø19.8 = 2 pcs.



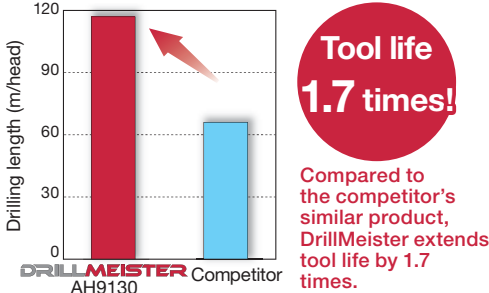
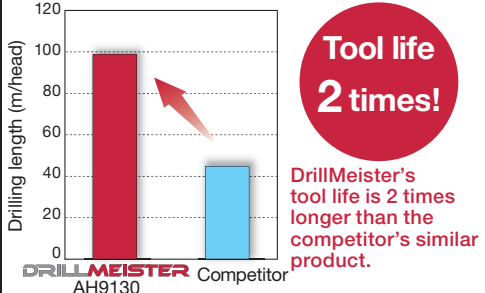

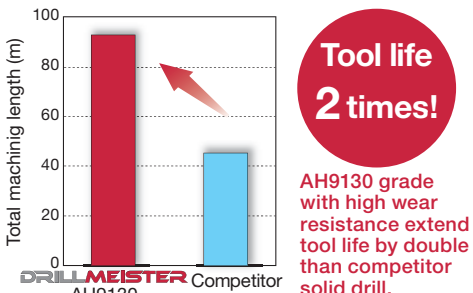
STANDARD CUTTING CONDITIONS

ISO	Workpiece materials	Priority	Grade	Cutting speed Vc (m/min)	Feed: f (mm/rev)						
					DC (mm)						
					ø6 - ø7.9	ø8 - ø9.9	ø10 - ø11.9	ø12 - ø13.9	ø14 - ø15.9	ø16 - ø19.9	ø20 - ø25.9
P	Low carbon steel (C < 0.3) (SS400 / St42-1, SM490 / St52-3, S25C / C25, etc.)	First choice	AH725	80 - 140	0.09 - 0.13	0.12 - 0.25	0.15 - 0.28	0.18 - 0.3	0.2 - 0.35	0.25 - 0.45	0.25 - 0.45
		Wear resistance	AH9130								
	High carbon steel (C > 0.3) (S45C / C45, S55C / C55, etc.)	First choice	AH725	70 - 120	0.09 - 0.13	0.12 - 0.25	0.15 - 0.28	0.18 - 0.3	0.2 - 0.35	0.25 - 0.45	0.25 - 0.45
		Wear resistance	AH9130								
	Low alloy steel (SCM415, etc.)	First choice	AH725	70 - 120	0.08 - 0.13	0.11 - 0.25	0.14 - 0.28	0.16 - 0.32	0.18 - 0.35	0.23 - 0.4	0.25 - 0.45
		Wear resistance	AH9130								
	Alloy steel (SCM440 / 42CrMo4, SCr420 / 20Cr4, etc.)	First choice	AH725	40 - 90	0.08 - 0.13	0.11 - 0.25	0.14 - 0.28	0.16 - 0.32	0.18 - 0.35	0.23 - 0.4	0.25 - 0.45
		Wear resistance	AH9130								
M	Stainless steel (SUS304 / X5CrNi18-9, SUS316 / X5CrNiMo17-12-2, etc.)	First choice	AH725	30 - 70	0.08 - 0.1	0.1 - 0.15	0.12 - 0.18	0.14 - 0.2	0.16 - 0.24	0.16 - 0.26	0.18 - 0.3
		Wear resistance	AH9130								
K	Grey cast iron (FC250 / GG25, etc.)	First choice	AH725	80 - 180	0.12 - 0.18	0.15 - 0.3	0.2 - 0.35	0.25 - 0.4	0.3 - 0.45	0.35 - 0.55	0.35 - 0.6
		Wear resistance	AH9130								
	Ductile cast iron (FCD700 / GGG70, etc.)	First choice	AH725	80 - 140	0.12 - 0.18	0.15 - 0.3	0.2 - 0.35	0.25 - 0.4	0.3 - 0.45	0.35 - 0.55	0.35 - 0.6
		Wear resistance	AH9130								
N	Aluminium alloys (ADC12, etc.)	First choice	AH725	80 - 220	0.1 - 0.2	0.2 - 0.35	0.25 - 0.4	0.3 - 0.45	0.35 - 0.5	0.4 - 0.6	0.5 - 0.75
		Wear resistance	AH9130								
S	Titanium alloys (Ti-6Al-4V, etc.)	First choice	AH725	20 - 50	0.05 - 0.07	0.06 - 0.12	0.08 - 0.15	0.1 - 0.18	0.12 - 0.2	0.14 - 0.22	0.18 - 0.27
		Wear resistance	AH9130								
	Nickel-based alloys	First choice	AH725	20 - 50	0.05 - 0.07	0.06 - 0.11	0.08 - 0.13	0.1 - 0.15	0.12 - 0.18	0.12 - 0.22	0.14 - 0.25
		Wear resistance	AH9130								
H	Hardened steel	First choice	AH725	20 - 50	0.05 - 0.07	0.06 - 0.12	0.08 - 0.15	0.1 - 0.18	0.12 - 0.2	0.14 - 0.22	0.16 - 0.25
		Wear resistance	AH9130								

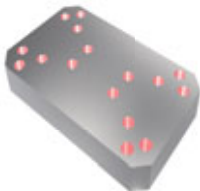

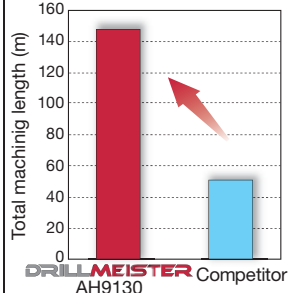
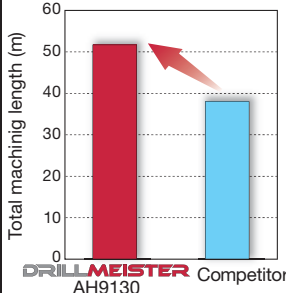
- Cutting conditions in the above table show standard cutting conditions.
 - Cutting conditions may change due to the rigidity and power of the machine and the workpiece material.

- Machined hole diameter may change depending upon the rigidity of the machine tool or cutting conditions.
 - In case of L/D = 8 & 12 drill, the recommended range of cutting speeds and feeds is between the minimum and median values listed above.

PRACTICAL EXAMPLES

Workpiece type		Out put shaft	Drive pinion shaft	
Drill body		TIDC160C16-5	TID160F20-5	
Head		DMP165 AH9130	DMP160 AH9130	
		SCr420 / 20Cr4	SCM415 / Low carbon alloy	
Workpiece material		 P	 P	
Cutting conditions	Cutting speed: V_c (m/min)	80	110	
	Feed : f (mm/rev)	0.18	0.25	
	Feed speed : V_f (mm/min)	277.9	547	
	Drill diameter : ϕD_c (mm)	16.5	16	
	Hole depth : H (mm)	30	72.2	
	Machine	Vertical M/C	NC lathe	
Coolant		Wet (Internal)	Wet (Internal)	
Results	 <p>Drilling length (m/head)</p> <p>Tool life 1.7 times!</p> <p>Compared to the competitor's similar product, DrillMeister extends tool life by 1.7 times.</p>		 <p>Drilling length (m/head)</p> <p>Tool life 2 times!</p> <p>DrillMeister's tool life is 2 times longer than the competitor's similar product.</p>	
Workpiece type		Hub		
Drill body		TID105F16-3		
Head		DMP108 AH9130		
		S35C		
Workpiece material		 P		
Cutting conditions	Cutting speed: V_c (m/min)	90		
	Feed : f (mm/rev)	0.18		
	Feed speed : V_f (mm/min)	477.7		
	Drill diameter : ϕD_c (mm)	10.8		
	Hole depth : H (mm)	13		
	Machine	Vertical M/C		
Coolant		Wet (External)		
Results	 <p>Total machining length (m)</p> <p>Tool life 2 times!</p> <p>AH9130 grade with high wear resistance extend tool life by double than competitor solid drill.</p>			

ACCELERATED MACHINING

Workpiece type	Plate	Pin
Drill body	TID190F25-3	TID150F20-8
Head	DMP9130 AH9130	DMP150 AH9130
	HT590	SS400 / E275A
Workpiece material	 P	 P
Cutting conditions	Cutting speed: V_c (m/min)	54
	Feed : f (mm/rev)	0.22
	Feed speed : V_f (mm/min)	199.1
	Drill diameter : ϕD_c (mm)	19
	Hole depth : H (mm)	30
	Machine	Vertical M/C
	Coolant	Wet (Internal)
Results	 <p>Tool life 3 times!</p> <p>DrillMeiser with AH9130 tool life is 3 times longer than the competitor's similar product.</p>	 <p>Tool life 1.4 times!</p> <p>AH9130 grade shown 1.4 times longer tool life. Compared to the competitor's similar product.</p>

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