

DrillLine

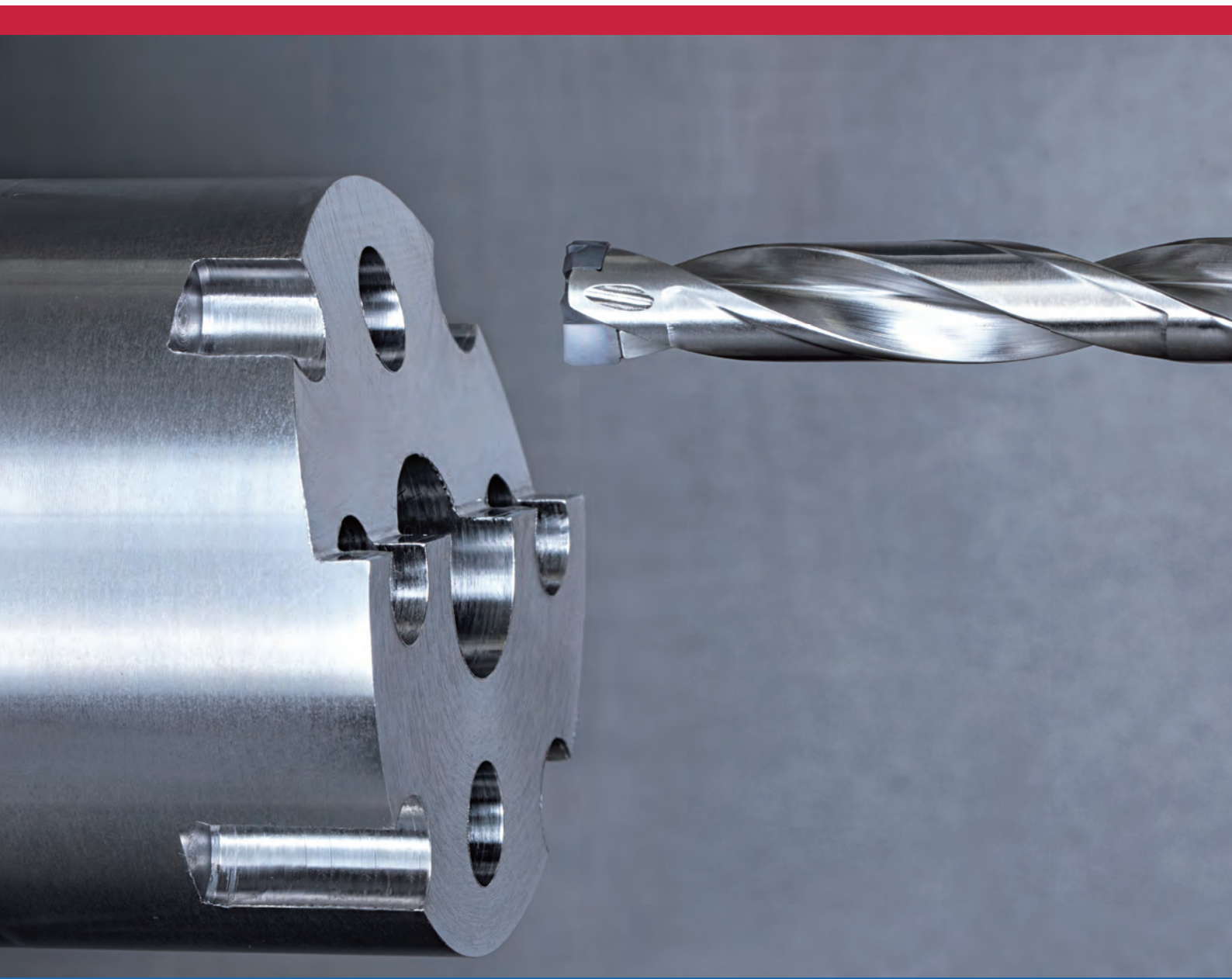
**DRILLMEISTER**

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Tungaloy Report No. 412S2-US



Irregular surface drilling made easy with **new flat-edged DMF drill head**  $\varnothing 0.394'' - \varnothing 0.780''$  ( $\varnothing 10$  mm - 19.8 mm)



**INDUSTRY 4.0**  
*FEED the SPEED!*



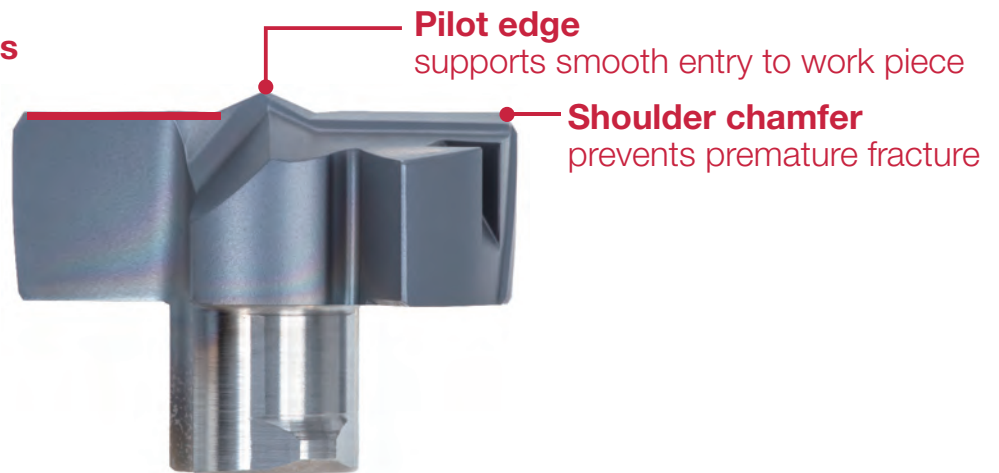
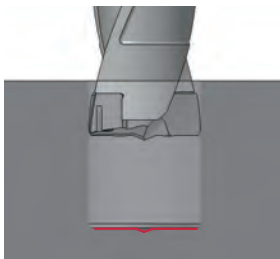
## Optimized edge design for efficient drilling of flat-bottom holes

**New**

### DMF DrillMeister flat head

- Flat edge design with pilot edge performs balanced drill entry
- Significantly reduced radial forces promise stable drilling for complex surfaces at drill entry and exit
- Stable drilling with long overhang up to L/D x 8 without pre-hole

**180° flat cutting edges** produces holes with flat bottom. Ideal for counterboring for bolt heads.

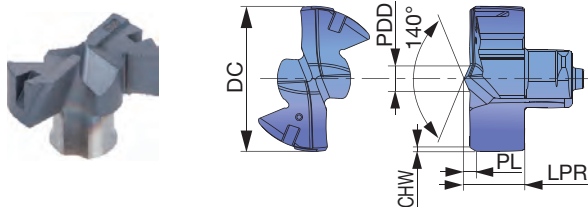


## Solution for a wide application range of complex surfaces:



## DRILL HEAD LINEUP

### DMF Flat geometry head



Tool diameter (Inch)	ø0.394" - ø0.705"	ø0.709" - ø0.780"
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Head diameter tolerance	+0.0007" / 0	+0.0008" / 0
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Tool diameter (mm)	ø10 - ø17.9	ø18 - ø19.8
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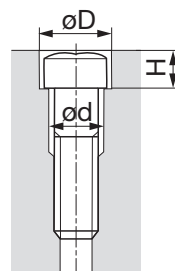
Head diameter tolerance	+0.018 / 0	+0.021 / 0
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Designation	DC (in)	DC (mm)	Grade AH9130	PDD (mm)	LPR (mm)	PL (mm)	CHW (mm)	Pocket size	Body
DMF100	0.394	10	●	2.89	4.72	1.17	0.4	10	TID*100*
DMF101	0.398	10.1	●	2.89	4.72	1.17	0.4	10	TID*100*
DMF103	0.406	10.3	●	2.89	4.72	1.17	0.4	10	TID*100*
DMF104	0.409	10.4	●	2.89	4.72	1.17	0.4	10	TID*100*
DMF105	0.413	10.5	●	2.89	4.72	1.17	0.4	10	TID*105*
DMF106	0.417	10.6	●	2.89	4.72	1.17	0.4	10	TID*105*
DMF107	0.421	10.7	●	2.89	4.72	1.17	0.4	10	TID*105*
DMF108	0.425	10.8	●	2.89	4.72	1.17	0.4	10	TID*105*
DMF110	0.433	11	●	2.98	4.90	1.25	0.4	11	TID*110*
DMF115	0.453	11.5	●	2.98	4.90	1.25	0.4	11	TID*115*
DMF117	0.461	11.7	●	2.98	4.90	1.25	0.4	11	TID*115*
DMF120	0.472	12	●	3.13	5.21	1.26	0.4	12	TID*120*
DMF121	0.476	12.1	●	3.13	5.21	1.26	0.4	12	TID*120*
DMF122	0.480	12.2	●	3.13	5.21	1.26	0.4	12	TID*120*
DMF123	0.484	12.3	●	3.13	5.21	1.26	0.4	12	TID*120*
DMF124	0.488	12.4	●	3.13	5.21	1.26	0.4	12	TID*120*
DMF126	0.496	12.6	●	3.13	5.21	1.26	0.4	12	TID*125*
DMF127	0.500	12.7	●	3.13	5.21	1.26	0.4	12	TID*125*
DMF130	0.512	13	●	3.52	5.53	1.28	0.4	13	TID*130*
DMF131	0.516	13.1	●	3.52	5.53	1.28	0.4	13	TID*130*
DMF133	0.524	13.3	●	3.52	5.53	1.28	0.4	13	TID*130*
DMF135	0.531	13.5	●	3.52	5.53	1.28	0.4	13	TID*135*
DMF137	0.539	13.7	●	3.52	5.53	1.28	0.4	13	TID*135*
DMF138	0.543	13.8	●	3.52	5.53	1.28	0.4	13	TID*135*
DMF139	0.547	13.9	●	3.52	5.53	1.28	0.4	13	TID*135*
DMF140	0.551	14	●	3.81	5.96	1.31	0.4	14	TID*140*
DMF141	0.555	14.1	●	3.81	5.96	1.31	0.4	14	TID*140*
DMF142	0.559	14.2	●	3.81	5.96	1.31	0.4	14	TID*140*
DMF143	0.563	14.3	●	3.81	5.96	1.31	0.4	14	TID*140*
DMF144	0.567	14.4	●	3.81	5.96	1.31	0.4	14	TID*140*
DMF145	0.571	14.5	●	3.81	5.96	1.31	0.4	14	TID*145*
DMF150	0.591	15	●	4.24	6.43	1.35	0.4	15	TID*150*
DMF152	0.598	15.2	●	4.24	6.43	1.35	0.4	15	TID*150*
DMF155	0.610	15.5	●	4.24	6.43	1.35	0.4	15	TID*150*
DMF157	0.618	15.7	●	4.24	6.43	1.35	0.4	15	TID*150*
DMF158	0.622	15.8	●	4.24	6.43	1.35	0.4	15	TID*150*
DMF160	0.630	16	●	4.06	6.84	1.39	0.4	16	TID*160*
DMF161	0.634	16.1	●	4.06	6.84	1.39	0.4	16	TID*160*
DMF165	0.650	16.5	●	4.06	6.84	1.39	0.4	16	TID*160*
DMF167	0.657	16.7	●	4.06	6.84	1.39	0.4	16	TID*160*

Designation	DC (in)	DC (mm)	Grade AH9130	PDD (mm)	LPR (mm)	PL (mm)	CHW (mm)	Pocket size	Body
DMF170	0.669	17	●	4.14	7.15	1.4	0.4	17	TID*170*
DMF175	0.689	17.5	●	4.14	7.15	1.4	0.4	17	TID*170*
DMF179	0.705	17.9	●	4.14	7.15	1.4	0.4	17	TID*170*
DMF180	0.709	18	●	4.16	7.45	1.42	0.4	18	TID*180*
DMF185	0.728	18.5	●	4.16	7.45	1.42	0.4	18	TID*180*
DMF190	0.748	19	●	4.25	7.79	1.44	0.4	19	TID*190*
DMF195	0.768	19.5	●	4.25	7.79	1.44	0.4	19	TID*190*
DMF198	0.780	19.8	●	4.25	7.79	1.44	0.4	19	TID*190*

●: Line up

### Recommended dimensions for metric bolt heads



Screw size	M6	M8	M10
øD (mm)	11	14	17.5
H (mm)	6.5	8.6	10.8
ød (mm)	6	9	11
Head	DMF110	DMF140	DMF175
Tool	TID*110...	TID*140...	TID*170...

## STANDARD CUTTING CONDITIONS



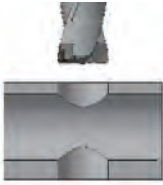




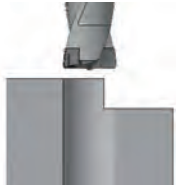
ISO	Workpiece materials	Cutting speed Vc (sfm)	Feed: f (ipr)			
			DC (in)			
			ø0.394 - ø0.469	ø0.472 - ø0.547	ø0.551 - ø0.626	ø0.630 - ø0.780
<b>P</b>	Low carbon steel (C < 0.3) 1018, 1020, 1026, etc.	262 - 459	0.006 - 0.011	0.007 - 0.012	0.008 - 0.014	0.010 - 0.018
	High carbon steel (C > 0.3) 1045, 1055, etc.	230 - 394	0.006 - 0.011	0.007 - 0.012	0.008 - 0.014	0.010 - 0.018
	Low alloy steel 5120, etc.	230 - 394	0.006 - 0.011	0.006 - 0.013	0.007 - 0.014	0.009 - 0.016
	Alloy steel 4140, 8620, etc.	131 - 295	0.006 - 0.011	0.006 - 0.013	0.007 - 0.014	0.009 - 0.016
<b>M</b>	Stainless steel 304SS, 316SS, 17-4PH, etc.	98 - 230	0.005 - 0.007	0.006 - 0.008	0.006 - 0.009	0.006 - 0.010
<b>K</b>	Gray cast iron Class 25, Class 30, etc.	262 - 591	0.008 - 0.014	0.010 - 0.016	0.012 - 0.018	0.014 - 0.022
	Ductile cast iron 60-40-18, 60-55-06, etc.	262 - 459	0.008 - 0.014	0.010 - 0.016	0.012 - 0.018	0.014 - 0.022
<b>N</b>	Aluminum alloys 6061, 7075, etc.	262 - 722	0.010 - 0.016	0.012 - 0.018	0.014 - 0.020	0.016 - 0.024
<b>S</b>	Titanium alloys Ti-6Al-4V, etc.	66 - 164	0.003 - 0.006	0.004 - 0.007	0.005 - 0.008	0.006 - 0.009
	Nickel-based alloys	66 - 164	0.003 - 0.005	0.004 - 0.006	0.005 - 0.007	0.005 - 0.009
<b>H</b>	Hardened steel	66 - 164	0.003 - 0.006	0.004 - 0.007	0.005 - 0.008	0.006 - 0.009

- 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.




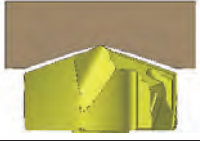





## Application range and recommended tool lengths

Please use the shortest possible tool

Recommended L/D	≤ 8			
Application	Plane surface	Complex exit	Cross hole	Rough / cast surface
				
Recommended L/D	≤ 3		≤ 1.5	
Application	Slant surface	Round surface	Hole expansion	Plunging
				

- Maximum slant angle 12 degrees
- Feed rate should be decreased when drilling uneven surfaces
- Overlap should be under 30% of head dia. at hole expansion
- Plunging width should be 70% of head dia.

## Head combinations of pre-hole to main hole

		Pre-hole		
		DMP	DMC	DMF
Hole	DMP	<b>Good</b> 	<b>Not good</b> 	<b>Not good</b> 
	DMC	<b>Good</b> 	<b>Good</b> 	<b>Good</b> 
	DMF	<b>Not good</b> 	<b>Not good</b> 	<b>Good</b> 

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