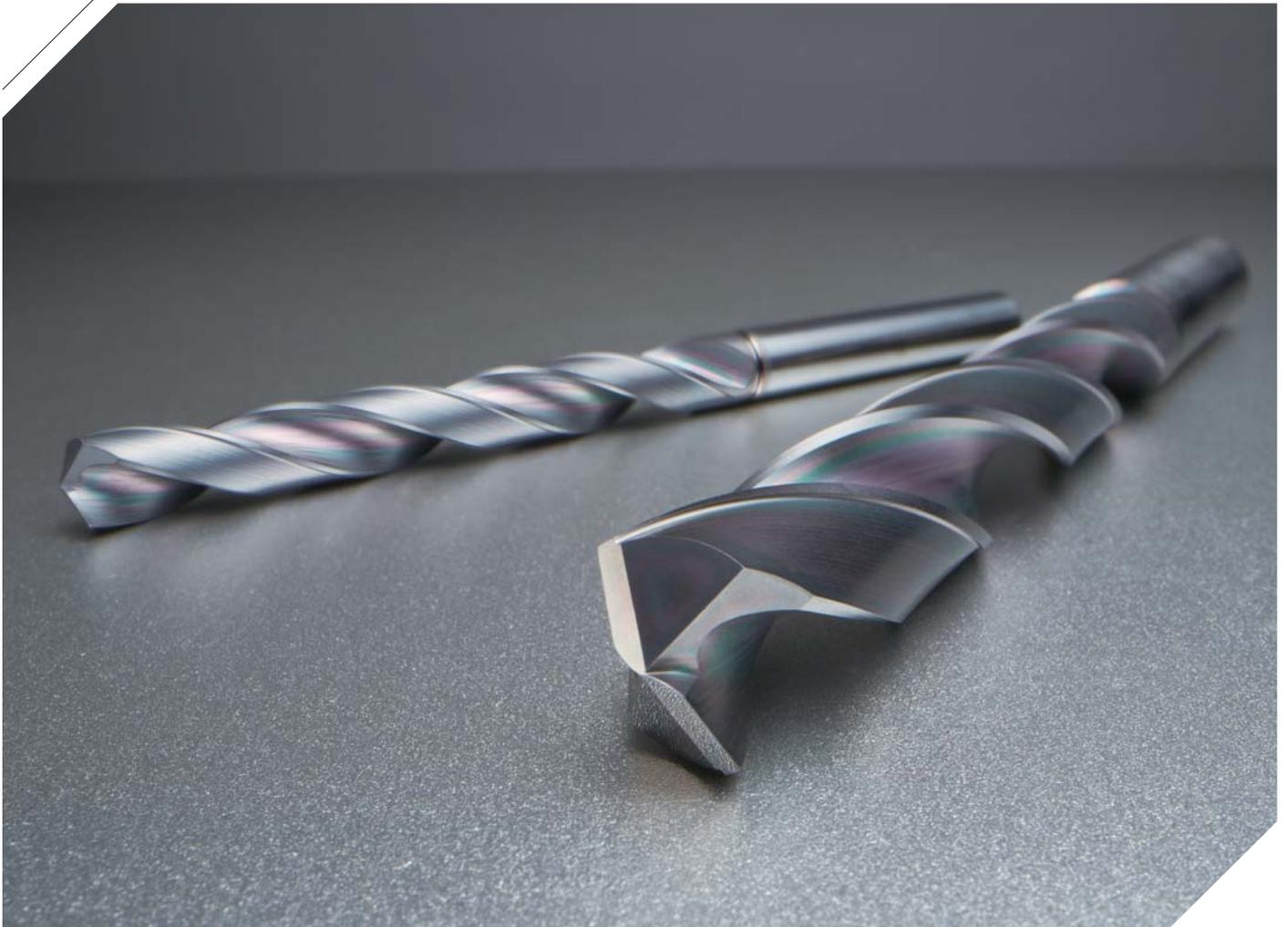


W-Star Drill

Economical carbide coated solid drill

- Better cutting performance with an improved thinning shape which lessens cutting load
- High rigidity and good chip evacuation from the optimal designed flute



Economical carbide coated solid drill

W-Star Drill

Drilling is applied to various industries in numerous ways. In addition, various workpieces including Carbon steel, Cast iron, Alloy steel, Stainless steel and etc. are applied in drilling. Higher cutting performance and reduced machining time are required for efficient cutting.

W-Star Drill is designed for general use with enhanced stability and efficiency, and it has been designed for good chip control with reduced flute radius. Also the Drill's improved surface finish shows better chip evacuation.

The exclusive coating based on AlCrN increases tool life by higher wear resistance and lubrication with higher welding resistance.

W-Star Drill is used for various types of cutting due to stable and excellent performance in wide cutting range, from low to high conditions.

.....

» **Stable tool life**

- For automotive line, enhanced productivity

» **Various standard line-up**

- Customized service provision

» **Increased cutting performance, stable chip evacuation**

- Reduced cutting load on the cutting edge and better surface finish

» **Applicable to various workpieces**

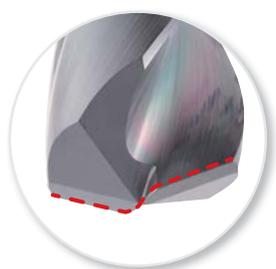
- P, M, K



Code system

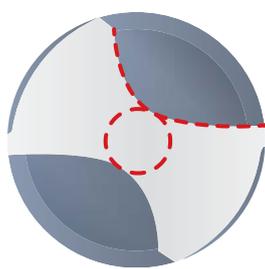
NDP	G	504	100
W-Star Drill	Appearance G: General	Aspect ratio (L/D) 503 : 3D 504 : 4D 507 : 7D	Drill dia. 010 : Ø1.0 mm 060 : Ø6.0 mm 065 : Ø6.5 mm 100 : Ø10.0 mm

Features



XR Thinning shape

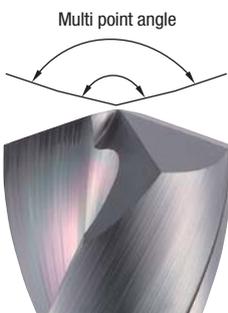
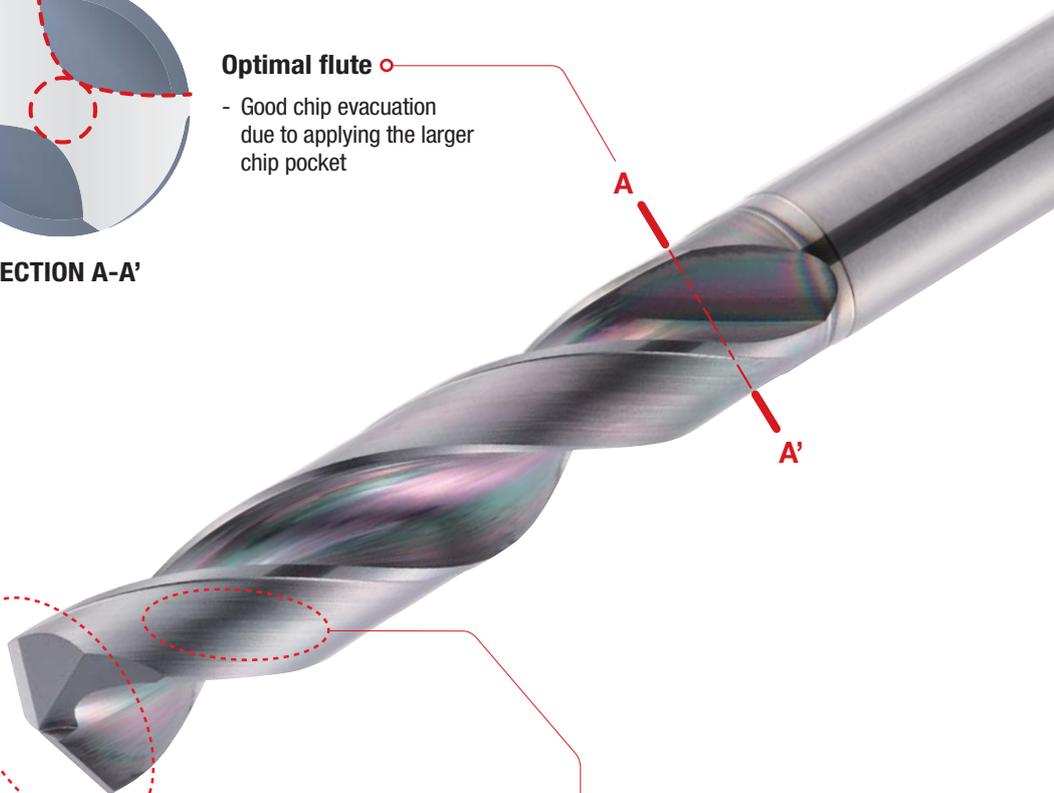
- Reduced cutting load on the cutting edge with a streamlined thinning
- Improved chip breaking



SECTION A-A'

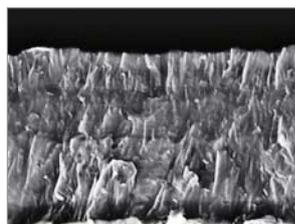
Optimal flute

- Good chip evacuation due to applying the larger chip pocket



Multi point angle

- Separated cutting load by optimal point angle
- Streamlined 1st point angle



New AlCrN coating

- Improved chip evacuation with enhanced flute lubrication
- Enhanced wear resistance and oxidation resistance by multi-layer coating

Application range

◎: 1st recommendation ○: 2nd recommendation

P					M	K
Carbon steel	Alloy steel	Pre-hardened steel	Heat-treated steel		Stainless steel	Cast iron
			STD61(~HRC55)	STD11(HRC55~63)		
◎	◎	○	-	-	◎	○

Line-up

Aspect ratio (L/D)	Designation	Picture	Product name	No. of flute	Size (Ø)	
					Min.	Max.
3D	NDPG503		General purpose Drill	2	1	13
4D	NDPG504		General purpose Drill	2	1	20
7D	NDPG507		General purpose Drill	2	3	20

Recommended cutting conditions

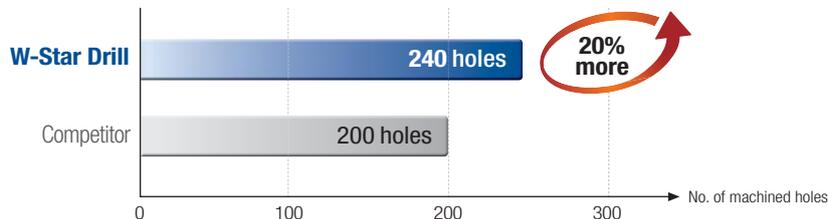
Workpiece	Carbon steel (C<0.3%), Alloy steel		Carbon steel (C<0.3%), Alloy steel		Gray cast iron				Stainless steel	
	SS400, SCM (~710 N/mm ²)		SM50C, SCM (~1,060 N/mm ²)		< HB240		< HB250			
Condition	80~120 m/min		80~120 m/min		120~200 m/min		80~130 m/min		40~45 m/min	
Diameter (Ø)	RPM n (min ⁻¹)	Feed vf (mm/min)	RPM n (min ⁻¹)	Feed vf (mm/min)	RPM n (min ⁻¹)	Feed vf (mm/min)	RPM n (min ⁻¹)	Feed vf (mm/min)	RPM n (min ⁻¹)	Feed vf (mm/min)
1	13,000	520	13,000	520	21,300	852	14,200	568	7,160	215
2	13,000	780	13,000	780	21,300	1,278	14,200	852	7,160	286
3	13,000	1,690	13,000	1,690	21,000	2,730	14,000	1,820	4,780	335
4	9,500	1,330	9,500	1,330	16,000	2,240	10,500	1,470	3,600	288
5	7,600	1,140	7,600	1,140	13,000	1,950	8,300	1,245	2,850	257
6	6,400	1,088	6,400	1,088	11,000	1,870	6,900	1,173	2,400	240
8	4,800	1,008	4,800	1,008	8,000	1,680	5,200	1,092	1,800	216
10	3,800	950	3,800	950	6,400	1,600	4,150	1,038	1,450	218
12	3,200	864	3,200	864	5,300	1,431	3,450	932	1,200	204
14	2,750	798	2,750	798	4,550	1,320	3,000	870	1,000	190
16	2,400	744	2,400	744	4,000	1,240	2,600	806	900	189
18	2,100	693	2,100	693	3,550	1,172	2,300	759	800	184
20	1,900	665	1,900	665	3,200	1,120	2,100	735	700	175

※ NDPG507 : Use 85% to the above condition

Application examples

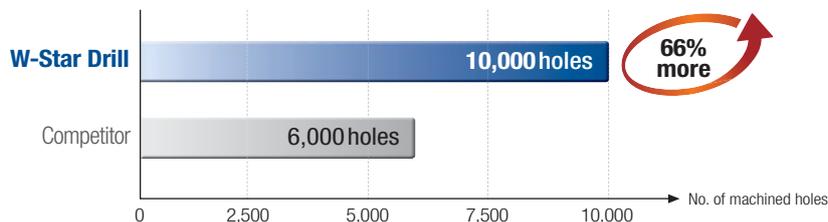
Heat-resisting Stainless steel [1.4848 (DIN)]

Workpiece	Automotive engine components
Cutting condition	vc (m/min) = 27.3, fn (mm/rev) = 0.13, ap (mm) = 15, wet
Tool	Insert NDPG504130



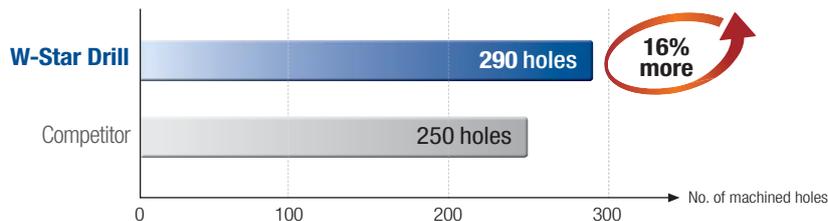
Ductile cast iron (400-18)

Workpiece	Bed plate
Cutting condition	vc (m/min) = 84, fn (mm/rev) = 0.15, ap (mm) = 26, wet
Tool	Insert NDPG504060



Ductile cast iron (HiSiMo)

Workpiece	Automotive engine components
Cutting condition	vc (m/min) = 57, fn (mm/rev) = 0.12, ap (mm) = 15, wet
Tool	Insert NDPG504114



⚠ For the safe metalcutting

- Use safety supplies such as protective gloves to prevent possible injury while touching the edge of tools.
- Use safety glasses 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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