

High Efficiency Solid Carbide Drills for Deep Hole Drilling

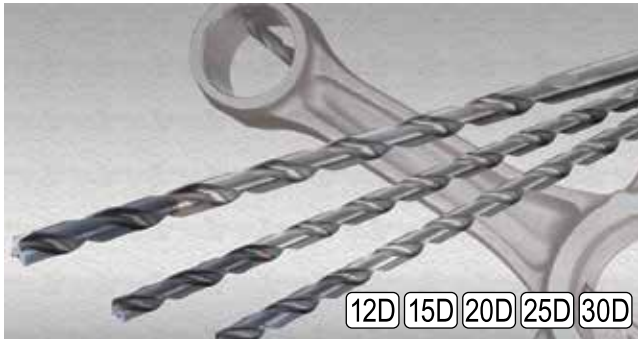
# Super MultiDrill XHGS Series



- Higher efficiency in deep hole drilling:  
12D, 15D, 20D, 25D, 30D
- Low cutting resistance by special „RX thinning“ shape
- Improved chip control by new groove shape „J flute“
- DEX coating provides long tool life
- Compatible with MQL system

# Super MultiDrill XHGS/PHT Series

Solid Carbide Drills for Deep Hole Drilling



## Series

Applications	Series	Diameter Range (mm)	Hole Depth (L/D)
Deep Hole Drilling	MDW0000XHGS12	Ø3,0 ~ 12,0	~12
	MDW0000XHGS15	Ø3,0 ~ 12,0	~15
	MDW0000XHGS20	Ø3,0 ~ 12,0	~20
	MDW0000XHGS25	Ø3,0 ~ 12,0	~25
	MDW0000XHGS30	Ø3,0 ~ 10,0	~30
Pilot Hole Drilling	MDW0000PHT	Ø3,0 ~ 12,0	~2

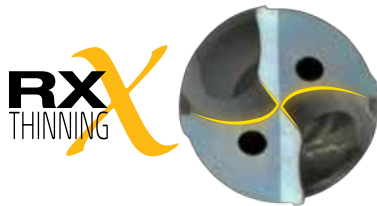
## General Features

Super MultiDrill XHGS series is a next-generation drill for deep hole drilling, features stable chip control and improved strength to further enhance efficiency of deep hole drilling.

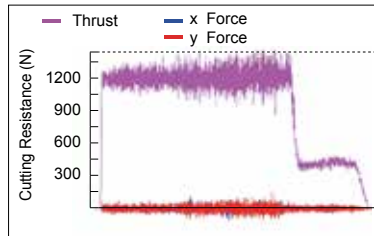
## Characteristics and Applications

### Low Cutting Resistance

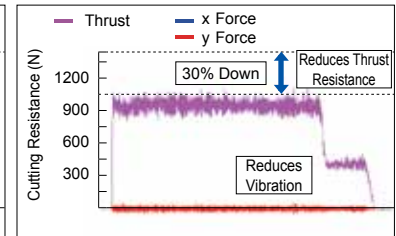
The application of a new special thinning shape „RX thinning“ reduces cutting resistance during high efficiency drilling.



### Conventional Drill



### XHGS Series



Work Material: C45  
 Tools: MDW050XHT20 (conventional), MDW0500XHGS20 (Ø5,0mm, 20D)  
 Cutting Cond.:  $v_c=80\text{m/min}$ ,  $f=0,35\text{mm/rev}$  ( $\Rightarrow$  at the time of entry penetration  $f=0,08\text{mm/rev}$ ),  $H=90\text{mm}$   
 Coolant: MQL

### Chip Control

New groove shape „J flute“ with improved chip control stability when drilling deep holes.



XHGS Series

Conv. Drill



$f = 0,35\text{mm/rev}$

$f = 0,40\text{mm/rev}$

$f = 0,45\text{mm/rev}$

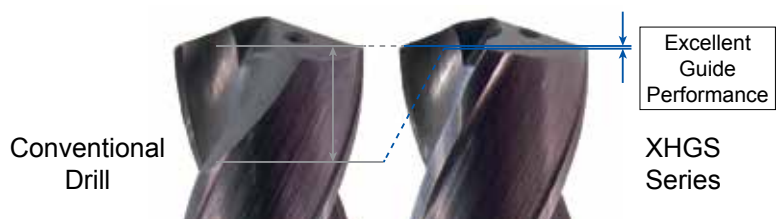
Consistent Chips

Improved chip evacuation makes it possible to reduce spindle load fluctuation, ensuring stable, long tool life.

Work Material: C45  
 Tools: MDW050XHT20 (conventional), MDW0500XHGS20 (Ø5,0mm, 20D)  
 Cutting Cond.:  $v_c=80\text{m/min}$ ,  $H=90\text{mm}$   
 Coolant: MQL

### High Precision & Stability

The XHGS series provides excellent guide performance due to the unique design when compared to the conventional drill.

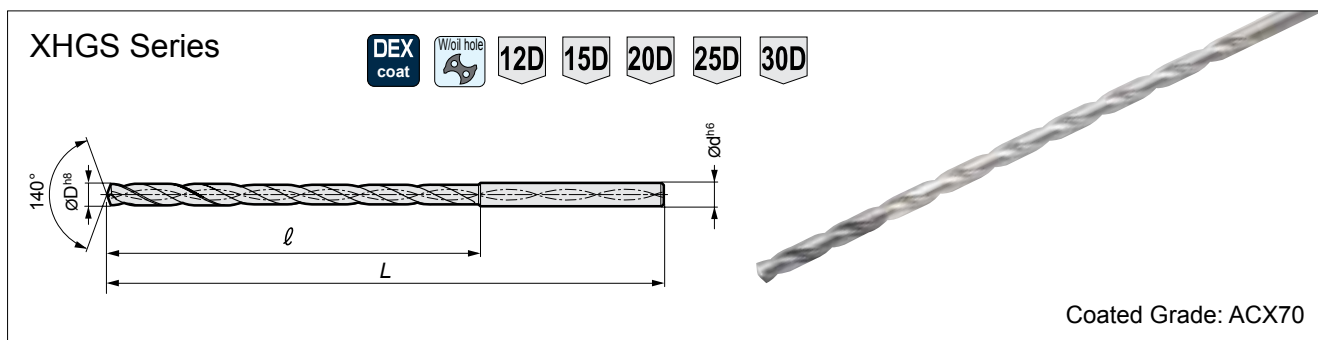


Conventional Drill

Excellent Guide Performance

XHGS Series

## ■ MDW...XHGS Type with Internal Coolant Supply



## ■ MDW...XHGS Type for Deep Hole Drilling, Diameter ØD: 3,0 ~ 12,0mm

High Efficiency Deep Hole Drill XHGS Series																	
ØD (mm)	Ød (mm)	Cat. No. 12, 15, 20, 25, 30 ↘	Hole Depth: 12 x D			Hole Depth: 15 x D			Hole Depth: 20 x D			Hole Depth: 25 x D			Hole Depth: 30 x D		
			Stock	Dimensions (mm)		Stock	Dimensions (mm)		Stock	Dimensions (mm)		Stock	Dimensions (mm)		Stock	Dimensions (mm)	
				L	ℓ		L	ℓ		L	ℓ		L	ℓ		L	ℓ
3,0	4,0	MDW 0300XHGS□□HAK	●	85	57	●	94	66	●	109	81	●	124	96	●	139	111
3,5		0350XHGS□□HAK	●	89	61	●	100	72	●	117	89	●	135	107	●	152	124
4,0		0400XHGS□□HAK	●	95	67	●	107	79	●	127	99	●	147	119	●	167	139
4,5	5,0	MDW 0450XHGS□□HAK	●	104	76	●	118	90	●	140	112	●	163	135	●	184	156
5,0		0500XHGS□□HAK <sup>5*</sup>	●	108	80	●	123	95	●	148	120	●	173	145	●	198	170
5,0	6,0	MDW 0500XHGS□□HAK	●	116	80	●	131	95	●	156	120	●	181	145	●	206	170
5,5		0550XHGS□□HAK	●	124	88	●	141	105	●	168	132	●	196	160	●	223	187
6,0		0600XHGS□□HAK	●	130	94	●	148	112	●	178	142	●	208	172	●	238	202
6,5	8,0	MDW 0650XHGS□□HAK	●	138	102	●	158	122	●	190	154	●	223	187	●	255	219
6,8		0680XHGS□□HAK	●	144	108	●	164	128	●	198	162	●	236	200	●	266	230
7,0		0700XHGS□□HAK	●	145	109	●	166	130	●	201	165	●	236	200	●	271	235
7,5		0750XHGS□□HAK	●	151	115	●	174	138	●	211	175	●	249	213	●	286	250
8,0		0800XHGS□□HAK	●	157	121	●	181	145	●	221	185	●	261	225	●	301	265
8,5	10,0	MDW 0850XHGS□□HAK	●	171	131	●	197	157	●	239	199	●	282	242	●	324	284
9,0		0900XHGS□□HAK	●	177	137	●	204	164	●	249	209	●	294	254	●	339	299
9,5		0950XHGS□□HAK	●	183	143	●	212	172	●	259	219	●	305	265	●	352	312
10,0		1000XHGS□□HAK	●	187	147	●	217	177	●	267	227	●	317	277	●	367	327
10,5	12,0	1050XHGS□□HAK	●	202	157	●	234	189	●	286	241	●	339	294	-	-	-
11,0		MDW 1100XHGS□□HAK	●	208	163	●	241	196	●	296	251	●	351	306	-	-	-
11,5		1150XHGS□□HAK	●	213	168	●	248	203	●	305	260	●	363	318	-	-	-
12,0		1200XHGS□□HAK	●	219	174	●	255	210	●	315	270	●	375	330	-	-	-

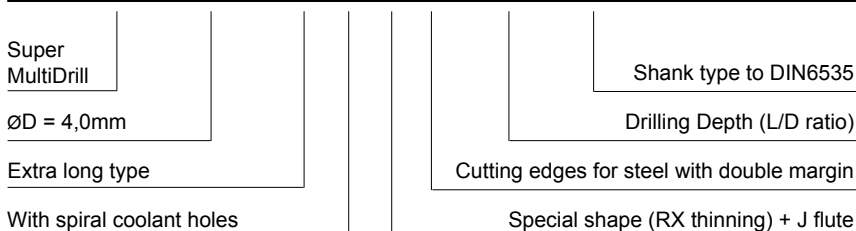
(\*) Cat. No. description: Drill-Ø = 5mm, shank-Ø = 5mm, (Eg. for 20xD: MDW050XHGS20HAK5)

● Euro stock

Non-standard diameters and lengths on request (Ø 2,5 ~ Ø16,0 possible)

## ■ Identification Details

**MDW 0400 XHGS 30 HAK ACX70** (Grade)



## ■ MDW...PHT Type with Internal Coolant Supply

PHT Series

Coated Grade: ACW70

## ■ MDW...PHT Type for Pilot Hole Drilling

For Pilot Hole Drilling							
ØD (mm)	Ød (mm)	Cat. No.	Stock	Dimensions (mm)			
				L	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>
3,03	4,0	MDW 0303 PHT	●	52	9	22	28
3,53		0353 PHT	●	52	9	22	28
4,03	5,0	MDW 0403 PHT	●	59	12	29	28
4,53		0453 PHT	●	59	12	29	28
5,03	6,0	MDW 0503 PHT	●	71	15	33	36
5,53		0553 PHT	●	71	15	33	36
6,03	8,0	MDW 0603 PHT	●	76	18	38	36
6,53		0653 PHT	●	76	18	38	36
6,83		0683 PHT	●	76	18	38	36
7,03		0703 PHT	●	82	21	43	36
7,53		0753 PHT	●	82	21	43	36
8,03	10,0	MDW 0803 PHT	●	88	24	46	40
8,53		0853 PHT	●	88	24	46	40
9,03		0903 PHT	●	88	24	46	40
9,53		0953 PHT	●	88	24	46	40
10,03	12,0	MDW 1003 PHT	●	104	30	55	45
10,53		1053 PHT	●	104	30	55	45
11,03		1103 PHT	●	104	30	55	45
11,53		1153 PHT	●	104	30	55	45
12,03	14,0	MDW 1203 PHT	●	117	42	68	45

Non-standard diameters and lengths on request.

● Euro stock

## ■ Identification Details

### MDW 0403 PHT ACW70

Super MultiDrill		Coated Grade
ØD = 4,03mm		Pilot drill with spiral coolant holes

## ■ Recommended Cutting Conditions

Min. - Optimum - Max.

Drill Diameter ØD (mm)	Cutting Conditions	Soft Steel (~200HB)	General Steel (~250HB)	Alloy Steel (~300HB)	Hardened Steel (~40HRC)	Cast Iron FC FCD
~Ø3,0	v <sub>c</sub>	50 - <b>60</b> - 80	60 - <b>80</b> - 100	40 - <b>55</b> - 70	30 - <b>40</b> - 50	40 - <b>55</b> - 70
	f	0,12 - <b>0,15</b> - 0,20	0,12 - <b>0,15</b> - 0,20	0,10 - <b>0,13</b> - 0,16	0,06 - <b>0,08</b> - 0,12	0,15 - <b>0,18</b> - 0,23
~Ø5,0	v <sub>c</sub>	50 - <b>60</b> - 80	60 - <b>80</b> - 100	50 - <b>60</b> - 70	30 - <b>45</b> - 55	50 - <b>60</b> - 70
	f	0,15 - <b>0,20</b> - 0,25	0,15 - <b>0,23</b> - 0,30	0,12 - <b>0,15</b> - 0,20	0,08 - <b>0,10</b> - 0,14	0,17 - <b>0,25</b> - 0,35
~Ø10,0	v <sub>c</sub>	50 - <b>70</b> - 90	60 - <b>80</b> - 110	50 - <b>65</b> - 80	30 - <b>50</b> - 60	50 - <b>65</b> - 80
	f	0,20 - <b>0,25</b> - 0,30	0,20 - <b>0,25</b> - 0,32	0,15 - <b>0,20</b> - 0,25	0,10 - <b>0,15</b> - 0,20	0,25 - <b>0,28</b> - 0,35
~Ø12,0	v <sub>c</sub>	60 - <b>80</b> - 100	60 - <b>90</b> - 120	50 - <b>65</b> - 80	40 - <b>55</b> - 70	50 - <b>65</b> - 80
	f	0,25 - <b>0,30</b> - 0,35	0,25 - <b>0,30</b> - 0,35	0,15 - <b>0,23</b> - 0,27	0,12 - <b>0,15</b> - 0,23	0,25 - <b>0,30</b> - 0,35

Note: Use lower speed when using MQL coolant and higher speed when using internal coolant.  
Reduce feed by 50% when using MDW...PHT type.

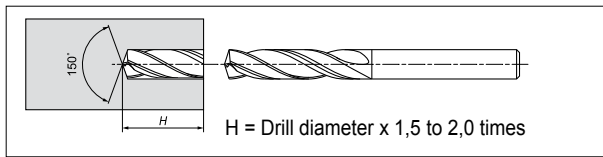
# Super MultiDrill XHGS/PHT Series

Solid Carbide Drills for Deep Hole Drilling

## ■ Recommended Drilling Method

### 1. Drill a pilot hole using the dedicated PHT

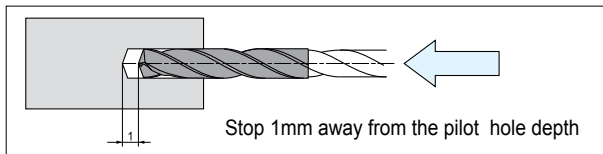
Select the same nominal diameter for the dedicated pilot hole drill PHT type as the deep hole drill XHGS type.  
(The pilot drill diameter is designed +0,02mm to +0,05mm larger than the long drill diameter)



### 2. Enter the pilot hole at reduced cutting data

Rotation speed: 500min<sup>-1</sup>

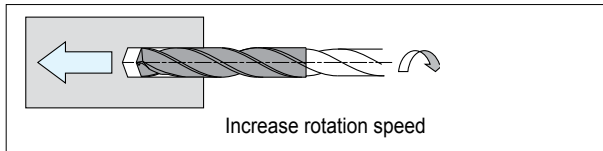
Feed rate: 1000 to 2000mm/min



Important:

DO NOT enter pilot hole at higher cutting data, this will cause damage to the drill.

### 3. Increase rotation speed until the set cutting speed is reached, and start normal drilling operation

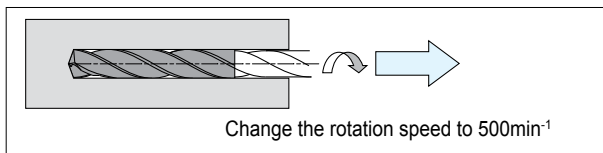


When using a NC machine, only begin drilling operation once full rotation speed is reached.

### 4. After drilling rotation speed is reduced and the drill is retracted from the work material

Rotation speed: 500min<sup>-1</sup>

Feed rate: 1.000 to 2.000mm/min



Retracting a drill from the work material at a high rotation speed is dangerous as doing so may result in breakage due to run-out.

### 5. Other Notes

A flat base should be prepared when the surface for the pilot tool is slanted. Spot face using:

MultiDrill MDF type or

a flat endmill.

When the deep hole drill exits through an angle surface, decrease the feed rate to  $f=0,05\text{mm/rev}$  just before drilling through.

## ■ Coolant

### 1. Internal coolant supply

Use suitable coolant / emulsion

Pump pressure: Steel: 1,5 to 2,0MPa (cooling effect increases at higher pressure, affecting chips/wear)  
Cast iron & aluminium alloy: 4,0 to 6,0MPa (priority on cooling)




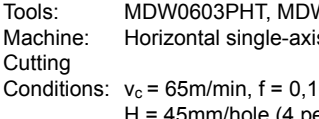

### 2. Internal MQL

Airpressure: 0,5MPa or higher

Discharge volume: It is recommended to set the maximum discharge volume possible on the machine.

\*Consult the manufacturer before using with aluminium alloy.

## Application Examples

Semiconductor Manufacturing Machine Component (X5CrNiS1810)	
Tools: MDW0403PHT, MDW0400XHGS25 (Ø4,0mm 25D)	 <p>Reduction in processing time achieved via continuous feed, eliminating the pecking cycle required by the competitor drill.</p>
Machine: Vertical machining center (BT40)	
Cutting	
Conditions: $v_c = 44\text{m/min}$ , $f = 0,08\text{mm/rev}$ , $H = 105\text{mm/hole}$ (5 per unit)	
Coolant: Internal coolant (emulsion, pump pressure 2MPa) Tool Life: 60 units (31,5m)	
Generator Component (Inconel)	
Tools: MDW1103PHT, MDW1100XHGS25 (Ø11,0mm)	 <p>Processing efficiency and tool life improvements achieved.</p>
Machine: Horizontal machining center	
Cutting	
Conditions: $v_c = 30\text{m/min}$ , $f = 0,10\text{mm/rev}$ , $H = 300\text{mm/hole}$	
Coolant: Internal coolant (emulsion, pump pressure 2MPa) Tool Life: 3 holes (0,9m)	
Automotive Component (FCA)	
Tools: MDW0803PHT, MDW0800XHGS30 (Ø8,0mm)	
Machine: Horizontal single-axis NC-machine	
Cutting	
Conditions: $v_c = 60\text{m/min}$ , $f = 0,32\text{mm/rev}$ , $H = 250\text{mm/hole}$	
Coolant: MQL (air pressure 0,5MPa, volume approx. 4cc/h) Tool Life: 600 units (150m)	
Automotive Component (C40)	
Tools: MDW0503PHT, MDW0500XHGS25 (Ø5,0mm)	
Machine: Horizontal single-axis NC-machine	
Cutting	
Conditions: $v_c = 80\text{m/min}$ , $f = 0,28\text{mm/rev}$ , $H = 85\text{mm/hole}$ (3 per unit)	
Coolant: MQL (air pressure 0,5MPa, volume approx. 4cc/h) Tool Life: 500 units (113m)	
Automotive Component (42CrMo4)	
Tools: MDW0603PHT, MDW0600XHGS25 (Ø6,0mm)	
Machine: Horizontal single-axis NC-machine	
Cutting	
Conditions: $v_c = 65\text{m/min}$ , $f = 0,16\text{mm/rev}$ , $H = 45\text{mm/hole}$ (4 per unit)	
Coolant: MQL (air pressure 0,5MPa, volume approx. 3cc/h) Tool Life: 500 units (90m)	



(Germany)  
SUMITOMO ELECTRIC Hardmetal GmbH  
Siemensring 84, D - 47877 Willich

Tel. +49(0)2154 4992-0, Fax +49(0)2154 41072  
Info@SumitomoTool.com  
www.SumitomoTool.com



(UK and Ireland)  
SUMITOMO ELECTRIC Hardmetal Ltd.  
Summerleys Road, Princes Risborough  
Buckinghamshire HP27 9PW, UK

Tel. +44(0)1844 342081, Fax: +44(0)1844 342415  
enquiries@sumitomo-hardmetal.co.uk  
www.SumitomoTool.com



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