SUMITOMO
CARBIDE - CBN - DIAMOND

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

Series

Applications	Series	Diameter Range (mm)	Hole Depth (L/D)
Deep Hole Drilling	MDW□□□□XHGS12	Ø3,0 ~ 12,0	~12
	MDW□□□□XHGS15	Ø3,0 ~ 12,0	~15
	MDW□□□□XHGS20	Ø3,0 ~ 12,0	~20
	MDW□□□□XHGS25	Ø3,0 ~ 12,0	~25
	MDW□□□□XHGS30	Ø3,0 ~ 10,0	~30
Pilot Hole Drilling	MDW□□□□PHT	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=80m/min, f=0,35mm/rev, (⇨ at the time of entry penetration f=0,08mm/rev), H=90mm
Coolant: MQL

Chip Control

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

Consistant Chips

f = 0,35mm/rev f = 0,40mm/rev f = 0,45mm/rev

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

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

High Precision & Stability

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

MDW...XHGS Type with Internal Coolant Supply

XHGS Series

DEX coat | W/oil hole | 12D | 15D | 20D | 25D | 30D

Coated Grade: ACX70

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.	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**		
		12, 15, 20, 25, 30	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(5*)	●	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)
Non-standard diameters and lengths on request (Ø 2,5 ~ Ø16,0 possible)

● Euro stock

Identification Details

MDW 0400 X H G S 30 HAK ACX70 (Grade)

- Super MultiDrill
- ØD = 4,0mm
- Extra long type
- With spiral coolant holes
- Special shape (RX thinning) + J flute
- Cutting edges for steel with double margin
- Drilling Depth (L/D ratio)
- Shank type to DIN6535

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	ℓ1	ℓ2	ℓ3
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

- MDW: Super MultiDrill
- 0403: ØD = 4,03mm
- PHT: Pilot drill with spiral coolant holes
- ACW70: Coated Grade

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_c	50 - **60** - 80	60 - **80** - 100	40 - **55** - 70	30 - **40** - 50	40 - **55** - 70
	f	0,12 - **0,15** - 0,20	0,12 - **0,15** - 0,20	0,10 - **0,13** - 0,16	0,06 - **0,08** - 0,12	0,15 - **0,18** - 0,23
~Ø5,0	v_c	50 - **60** - 80	60 - **80** - 100	50 - **60** - 70	30 - **45** - 55	50 - **60** - 70
	f	0,15 - **0,20** - 0,25	0,15 - **0,23** - 0,30	0,12 - **0,15** - 0,20	0,08 - **0,10** - 0,14	0,17 - **0,25** - 0,35
~Ø10,0	v_c	50 - **70** - 90	60 - **80** - 110	50 - **65** - 80	30 - **50** - 60	50 - **65** - 80
	f	0,20 - **0,25** - 0,30	0,20 - **0,25** - 0,32	0,15 - **0,20** - 0,25	0,10 - **0,15** - 0,20	0,25 - **0,28** - 0,35
~Ø12,0	v_c	60 - **80** - 100	60 - **90** - 120	50 - **65** - 80	40 - **55** - 70	50 - **65** - 80
	f	0,25 - **0,30** - 0,35	0,25 - **0,30** - 0,35	0,15 - **0,23** - 0,27	0,12 - **0,15** - 0,23	0,25 - **0,30** - 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.

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^{-1},
   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^{-1}
   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=0,05mm/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)
Machine: Vertical machining center (BT40)
Cutting Conditions: v_c = 44m/min, f= 0,08mm/rev, H = 105mm/hole (5 per unit)
Coolant: Internal coolant (emulsion, pump pressure 2MPa)
Tool Life: 60 units (31,5m)

Reduction in processing time achieved via continuous feed, eliminating the pecking cycle required by the competitor drill.

Generator Component (Inconel)

Tools: MDW1103PHT, MDW1100XHGS25 (Ø11,0mm)
Machine: Horizontal machining center
Cutting Conditions: v_c = 30m/min, f = 0,10mm/rev, H = 300mm/hole
Coolant: Internal coolant (emulsion, pump pressure 2MPa)
Tool Life: 3 holes (0,9m)

Processing efficiency and tool life improvements achieved.

Automotive Component (FCA)

Tools: MDW0803PHT, MDW0800XHGS30 (Ø8,0mm)
Machine: Horizontal single-axis NC-machine
Cutting Conditions: v_c = 60m/min, f = 0,32mm/rev, H = 250mm/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 = 80m/min, f = 0,28mm/rev, H = 85mm/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 = 65m/min, f = 0,16mm/rev, H = 45mm/hole (4 per unit)
Coolant: MQL (air pressure 0,5MPa, volume approx. 3cc/h)
Tool Life: 500 units (90m)

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