

High Efficiency Solid Carbide Drills for Deep Hole Drilling

Super MultiDrill XHGS Series

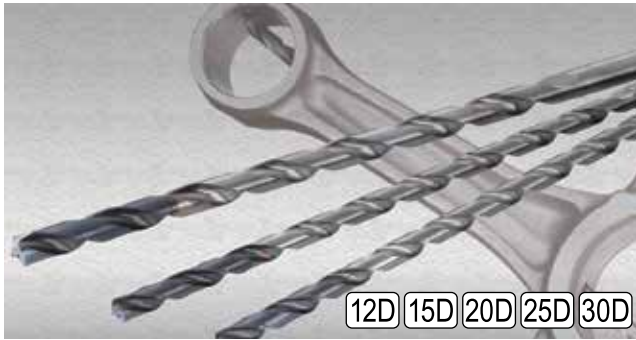


- Higher efficiency in deep hole drilling:
12D, 15D, 20D, 25D, 30D
- Low cutting resistance by special „RX thinning“ shape
- Improved chip control by new groove shape „J flute“
- DEX coating provides long tool life
- Compatible with MQL system

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 | MDW00000XHGS12 | Ø3,0 ~ 12,0 | ~12 |
| | MDW00000XHGS15 | Ø3,0 ~ 12,0 | ~15 |
| | MDW00000XHGS20 | Ø3,0 ~ 12,0 | ~20 |
| | MDW00000XHGS25 | Ø3,0 ~ 12,0 | ~25 |
| | MDW00000XHGS30 | Ø3,0 ~ 10,0 | ~30 |
| Pilot Hole Drilling | MDW00000PHT | Ø3,0 ~ 12,0 | ~2 |

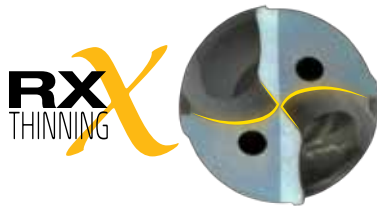
General Features

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.

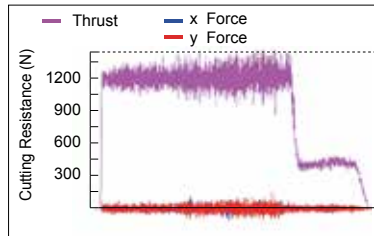
Characteristics and Applications

Low Cutting Resistance

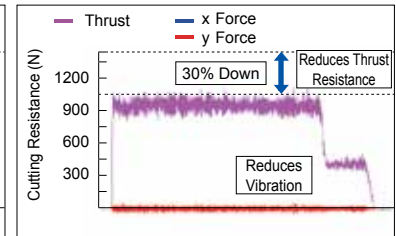
The application of a new special thinning shape „RX thinning“ reduces cutting resistance during high efficiency drilling.



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



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

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

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

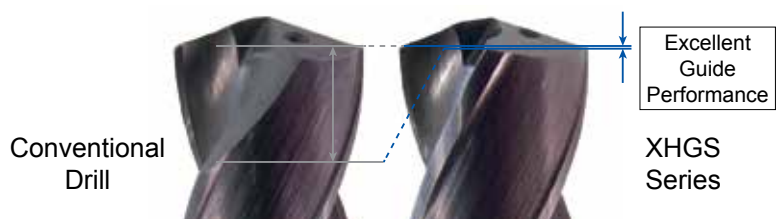
Consistant Chips

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

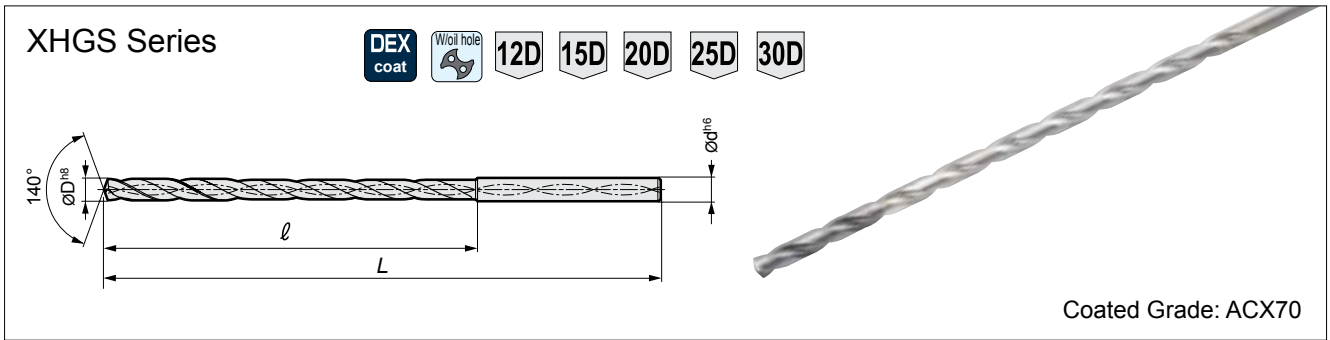
Work Material: C45
Tools: MDW050XHT20 (conventional), MDW0500XHGS20 (Ø5,0mm, 20D)
Cutting Cond.: $v_c=80\text{m/min}$, $H=90\text{mm}$
Coolant: MQL

High Precision & Stability

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



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) | | | | |
| | | | | 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)

● Euro stock

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

Identification Details

MDW 0400 XHGS 30 HAK ACX70 (Grade)

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

■ 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 ₁ | l ₂ | l ₃ |
| 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 _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 |

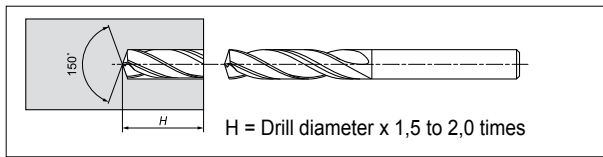
Note: Use lower speed when using MQL coolant and higher speed when using internal coolant.
Reduce feed by 50% when using MDW...PHT type.

Super MultiDrill XHGS/PHT Series

Solid Carbide Drills for Deep Hole Drilling

Recommended Drilling Method

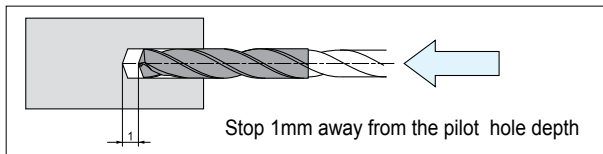
1. Drill a pilot hole using the dedicated PHT
Select the same nominal diameter for the dedicated pilot hole drill PHT type as the deep hole drill XHGS type.
(The pilot drill diameter is designed +0,02mm to +0,05mm larger than the long drill diameter)



2. Enter the pilot hole at reduced cutting data

Rotation speed: 500min⁻¹

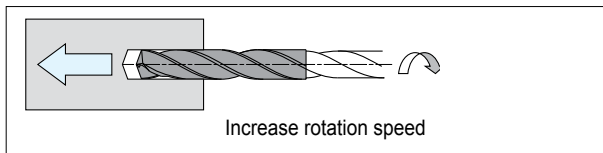
Feed rate: 1000 to 2000mm/min



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

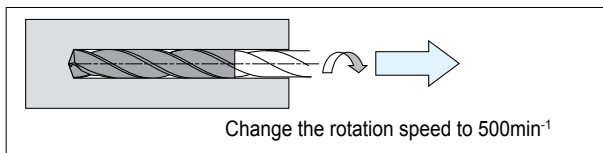


When using a NC machine, only begin drilling operation once full rotation speed is reached.

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 $f=0,05\text{mm/rev}$ 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)




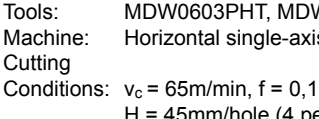

2. Internal MQL

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) | |



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