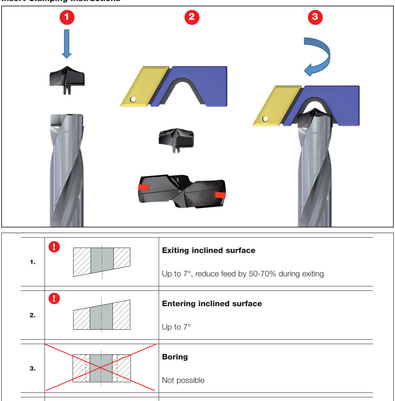
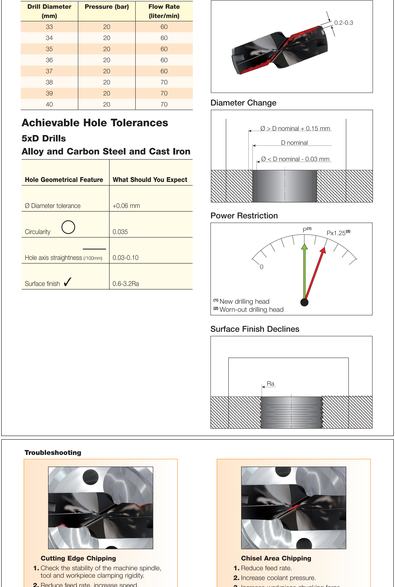
Insert Clamping Instructions



1.	!	**Exiting inclined surface** Up to 7°, reduce feed by 50-70% during exiting
2.	!	**Entering inclined surface** Up to 7°
3.		**Boring** Not possible
4.	!	**Cross hole** Maximum cross hole diameter must be ¼ of drill diameter
5.	!	**Stacked plates** Requires a rigid clamping
6.	!	**Chamber** Reduce feed by 50-70%, maximum depth 3XD
7.	!	**Convex** The radius of the penetration surface must be 4X the CHAMIQDRILL head ØD. Short pre-hole is needed
8.	!	**Concave** Spot facing operation is needed before drilling



- Prior to using 8xD and longer drills, it is recommended to drill a 0.5xD pre-hole using a short or centering drill. Enter the pre-hole at slow speed and feed until 2-5 mm from its bottom. Start the cooling system and increase rotation to recommended drilling speed. Hold for 2-3 seconds, then continue at the recommended drilling feed rate.

Flow Rate vs. Pressure and Drill Diameter

Drill Diameter (mm)	Pressure (bar)	Flow Rate (liter/min)
33	20	60
34	20	60
35	20	60
36	20	60
37	20	60
38	20	70
39	20	70
40	20	70

Achievable Hole Tolerances

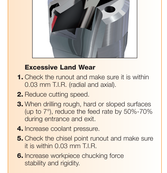
5xD Drills

Alloy and Carbon Steel and Cast Iron

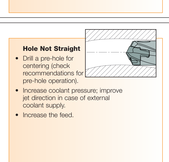
Hole Geometrical Feature	What Should You Expect
Ø Diameter tolerance	+0.06 mm
Circularity	0.035
Hole axis straightness (100mm)	0.03-0.10
Surface finish ✓	0.6-3.2Ra

Indication of Drill Head Wear

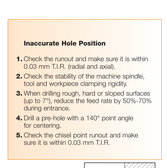
Wear Limit



Diameter Change

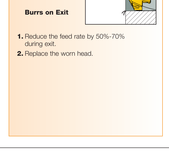


Power Restriction



(N) New drilling head
(W) Worn-out drilling head

Surface Finish Declines



Troubleshooting

Cutting Edge Chipping

1. Check the stability of the machine spindle, tool and workpiece clamping rigidity.
2. Reduce feed rate, increase speed.
3. If the drill vibrates, reduce cutting speed and increase feed rate.
4. When drilling rough, hard or sloped surfaces (up to 7°), reduce the feed rate by 50%-70% during entrance and exit.
5. Check cooling lubricant. Increase coolant pressure. In case of external coolant supply, improve jet direction and add cooling jets.

Chisel Area Chipping

1. Reduce feed rate.
2. Increase coolant pressure.
3. Increase workpiece chucking force.

Excessive Flank Wear

1. Reduce cutting speed.
2. Increase internal coolant pressure.

Excessive Land Wear

1. Check the runout and make sure it is within 0.03 mm T.I.R. (radial and axial).
2. Reduce cutting speed.
3. When drilling rough, hard or sloped surfaces (up to 7°), reduce the feed rate by 50%-70% during entrance and exit.
4. Increase coolant pressure.
5. Check the chisel point runout and make sure it is within 0.03 mm T.I.R.
6. Increase workpiece chucking force stability and rigidity.

Troubleshooting

Built-Up Edge

1. Increase cutting speed/feed.
2. Increase coolant pressure.

Hole Not Straight

- Drill a pre-hole for centering (check recommendations for pre-hole operation).
- Increase coolant pressure; improve jet direction in case of external coolant supply.
- Increase the feed.

Deviation of Hole Tolerance

1. Check the runout and make sure it is within 0.03 mm T.I.R. (radial and axial cutting points).
2. Reduce feed rate.
3. Check the chisel point runout and make sure it is within 0.03 mm T.I.R.
4. Worn cutting edge. Replace head.
5. Increase workpiece chucking force.
6. Increase internal coolant pressure.

Inaccurate Hole Position

1. Check the runout and make sure it is within 0.03 mm T.I.R. (radial and axial).
2. Check the stability of the machine spindle, tool and workpiece clamping rigidity.
3. When drilling rough, hard or sloped surfaces (up to 7°), reduce the feed rate by 50%-70% during entrance.
4. Drill a pre-hole with a 140° point angle for centering.
5. Check the chisel point runout and make sure it is within 0.03 mm T.I.R.

Surface Finish Too Rough

1. Check the runout and make sure it is within 0.03 mm T.I.R. (radial and axial).
2. Adjust the feed for improved chip formation.
3. In case of chip jamming - increase the coolant flow and/or reduce the cutting speed.
4. Increase the coolant pressure.
5. Check the chisel point runout and make sure it is within 0.03 mm T.I.R.
6. Use pecking cycle.
7. Replace the drilling head

Burrs on Exit

1. Reduce the feed rate by 50%-70% during exit.
2. Replace the worn head.