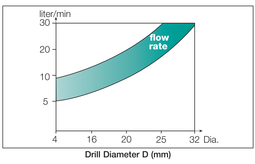
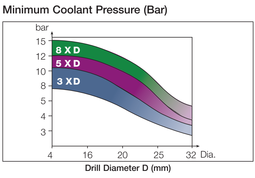
- When drilling stainless steel or high temperature alloys using the **ICM** drilling head, it is highly recommended to apply high-pressure oil or 7-10% mineral or vegetable based oil emulsion.
- Following is the recommended coolant flow rate and pressure.

Coolant Flow Rate (Liter/min)



Drill Diameter D (mm)

Minimum Coolant Pressure (Bar)

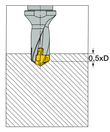


Drill Diameter D (mm)

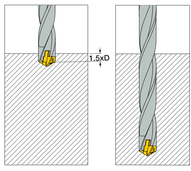
- For optimal performance, it is recommended to adjust runout of outer points or chisel with a maximum of 0.02mm. Large runout will influence drill performance tool life and hole quality.
- No setup time is needed after indexing the SUMO-CHAM drill head.
- SUMO-CHAM drills can be used either on milling centers or lathe machines.
- When using SUMO-CHAM drill in stationary (lathe) applications, we recommend using the ISCAR GYRO device or eccenter sleeve to reduce misalignment. Misalignment will cause poor performance of the SUMO-CHAM drill or even tool breakage.

- Prior to using 8D or 12D 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 2-5mm from its bottom. Start the cooling system and increase rotation to the recommended drilling speed. Hold for 2-3 seconds, then continue at the recommended drilling feed.

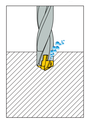
1 Pre-hole 0.5xD deep for centering



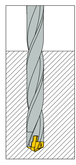
2 Slow rotation and feed while entering the pre-hole



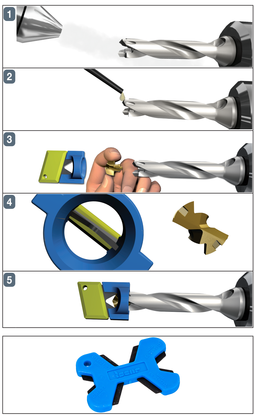
3 Maintain for 2-3 seconds and activate the cooling system



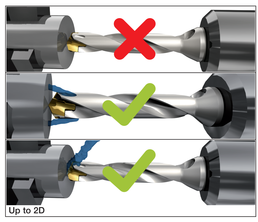
4 Continue drilling at recommended cutting conditions



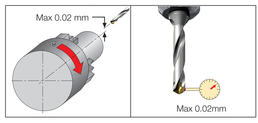
Drilling Head Mounting Procedure



Coolant Recommendations

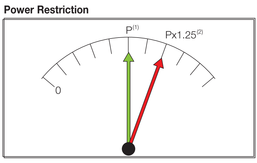


Maximum Runout, Misalignment

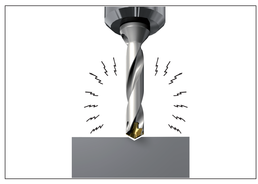


K DCN MULTI
The optional K DCN MULTI key enables clamping all **SUMO-CHAM** drilling heads geometry variety in 6-26.99 mm diameter range.

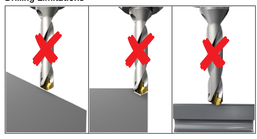
Power Restriction



[1] New drilling head
[2] Worn-out drilling head



Drilling Limitations



Diameter Change	Surface Finish Declines
Ø > D nominal + 0.15mm	
D nominal	
Ø < D nominal - 0.03mm	Ra

Vibration Noise Drastically Increases

	**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 30-50% when entering and exiting. 5 Check cooling lubricant and 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 Check the adaptation. Use hydraulic clamping chuck, MAXIN power chuck or side lock systems. 4 Increase workpiece chucking force.
	**Excessive Flank Wear** 1 Check that the correct geometry is used. 2 Reduce cutting speed. 3 Increase internal coolant pressure.
	**Excessive Flute Land Wear** 1 Check that the correct geometry is used. 2 Check the runout and make sure it is within 0.02mm T.I.R. (radial and axial). 3 Reduce cutting speed. 4 When drilling rough, hard or sloped surfaces (up to 7°), reduce the feed rate by 30-50% when entering and exiting. 5 Increase coolant pressure. 6 Check the chisel point runout and make sure it is within 0.02mm T.I.R. 7 Increase workpiece chucking force stability and rigidity. 8 If there is low pocket gripping force - replace drill body.
	**Built-Up Edge** 1 Increase cutting speed/feed. 2 Increase coolant pressure.
	**Deviation of Hole Tolerance** 1 Check the runout and make sure it is within 0.02mm T.I.R. (radial and axial cutting points). 2 Reduce feed rate. 3 Check the chisel point runout and make sure that it is within 0.02mm T.I.R. 4 Wrong cutting edge. Replace head. 5 Increase workpiece chucking force. 6 Check the adaptation. Use hydraulic clamping chuck, **MAXIN** power chuck or side clamping systems. 7 Increase internal coolant pressure.
	**Surface Finish Too Rough** 1 Check the runout and make sure it is within 0.02mm 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 0.02mm T.I.R. 6 Use pecking cycle. 7 Use double margin geometry.
	**Hole Not Straight:** 1 Use 2M geometry. 2 Drill a pre-hole for centering (check recommendations for pre-hole operation). 3 Increase coolant pressure, improve jet direction in case of external coolant supply. 4 Increase the feed.
	Inaccurate Hole Position 1 Check the runout and make sure it is within 0.02mm 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 30% -50% when entering. 4 Drill a pre-hole with a 140° point angle for centering. 5 Check the chisel point runout and make sure it is within 0.02mm T.I.R.
	Burrs on Exit 1 Reduce the feed rate by 30% -50% when exiting. 2 Replace the worn head. 3 Check the adaptation. Use hydraulic clamping chuck, **MAXIN** power chuck or side clamping systems.