



# DURA-HOG®

CARBIDE INSERT DRILLS

800-438-1538



MADE IN U.S.A.





***It's not just one feature that makes our drills stand out. It's the entire package of benefits that makes **DURA-HOG** the best value for your tooling dollars.***

 ***A Choice of Shank Diameters***

- Select from popular shank diameters to minimize unnecessary sleeving.
- Shank diameters from 1.000 to 1.750.

 ***A Choice of Coolant Styles***

- Simplify the method of connection to the coolant source. Select one of three coolant styles that is most compatible with your machine.
- Our "M" series (thru-the-holder coolant style designed for Mori Seiki turning centers) permits coolant to be supplied without external plumbing when used with the machine's standard I.D. holder.

 ***Selection of Length to Diameter Ratios***

- Our standard 3:1 length to diameter ratio provides our drills with ample rigidity to withstand higher feed rates without sacrificing drilling depth.
- Our 2:1 ratio drills are designed for CNC milling centers where extra rigidity is required.

 ***Secondary Coolant Ports***

- In addition to the primary coolant holes in the end of the drill, a second set of holes supply coolant across the top of the inserts when the drill contacts the workpiece.

 ***Balanced Cutting***

- The orientation of each insert pocket for every drill size has been carefully determined by computer aided design and on-the-machine testing to balance the cutting forces.
- A balanced cutting drill will produce a more predictable hole size while putting less strain on the machine.

 ***4 Insert Sizes Cover Entire Diameter Range***

- Minimize tooling inventory by stocking only 4 insert sizes for our complete range of 0.937 to 2.50 inch diameter drills.

 ***Toll-free Technical Support/Order Hotline 1-800-438-1538***

- Customer service is our specialty. Call us toll-free with your questions, comments and orders.
- Our friendly technical staff, with many years of machining experience, will be happy to assist you with specific applications.

 ***Competitive Price***

- Be assured that there is no compromising on quality to achieve our competitive prices.
- We concentrate on efficient manufacturing processes to help keep costs down.

 ***All Drills, Inserts & Components are in Stock, Ready for Immediate Shipment!***

 ***Drills are Hardened & the Shank is Precision Ground!***

 ***All American Made!***

***Satisfaction and drill performance **GUARANTEED !!*****



# Finding Your Drill

All DURA-HOG drills begin with the letter "D"

The second set of numbers refer to the drill diameter (in inches)  
FOR EXAMPLE :

- 094 = 0.937 dia.
- 131 = 1.312 dia.
- 225 = 2.250 dia.

**DR15-131**

The second letter indicates shank style

- R = Rear Entry (lower overhang)
- S = Side and Rear Entry
- M = 'Mori Seiki' Style Shank\*
- B = CNC Mills (only on 2:1 drills)

The first set of numbers represent the shank diameter (in inches)

- 10 = 1.000 dia. (DB series only)
- 12 = 1.250 dia.
- 15 = 1.500 dia.
- 17 = 1.750 dia.

Follow these **3 EASY STEPS** to find the order number for the drill you need.

**1**

### Select the Coolant Style

Turn to the page with the letter R, S, M or B for the coolant style needed.

**R**

Rear Entry With Low Overhang Coolant Style

**S**

Side & Rear Entry Coolant Style

**M**

Mori Seiki\* Coolant Style

**B**

Stub 2:1 Drills For CNC Vertical & Horizontal Machine Centers

**2**

### Select the Drill Diameter

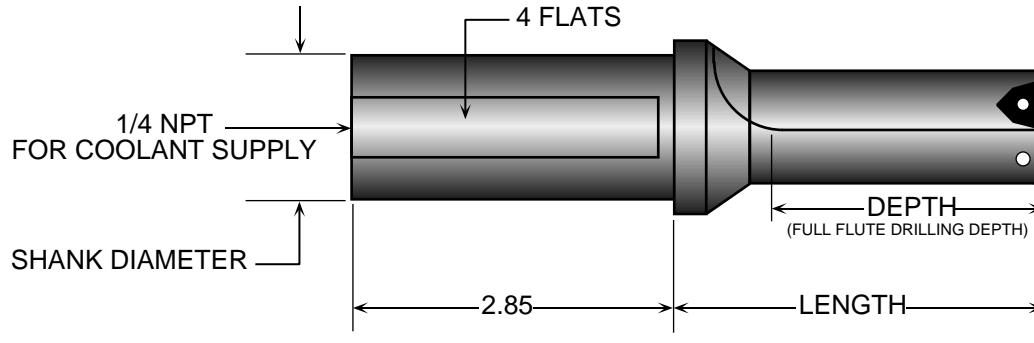
Find the desired drill diameter in the first column labeled DRILL DIAMETER.

**3**

### Select the Shank Diameter

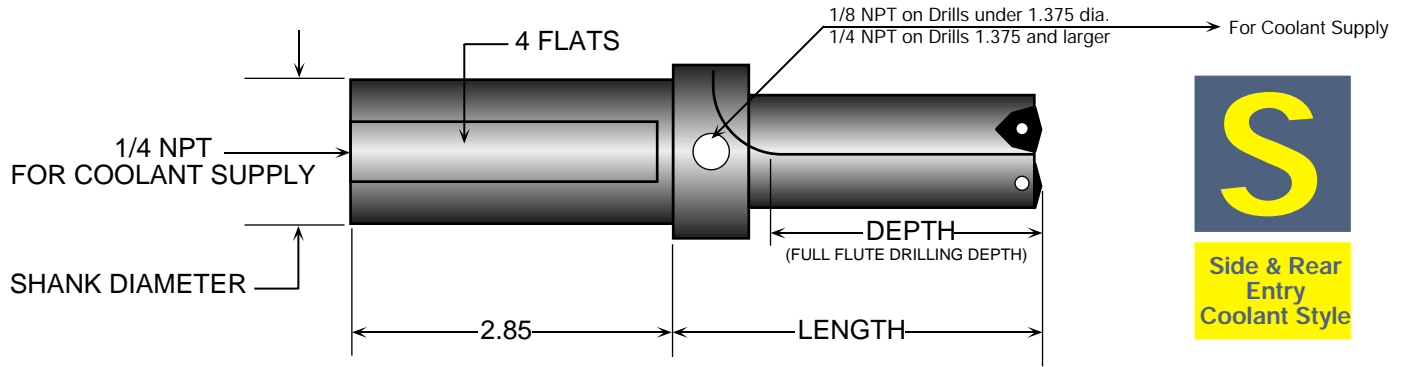
Move across to the right and locate the DURA-HOG order number in the column under the shank diameter preferred.

\*Mori Seiki is a registered name of Mori Seiki Co. Ltd.



DRILL DIAMETER	SHANK DIAMETER			LENGTH	DEPTH	CARBIDE INSERTS	INSERT SCREWS	TORX® WRENCH
	1.250	1.500	1.750					
0.937	DR12-094	DR15-094	DR17-094	2.81	2.24	(2) 8 mm I.C. Trigon Inserts	M2.5x0.45	T-7
0.984	DR12-098	DR15-098	DR17-098	2.94	2.37			
1.000	DR12-100	DR15-100	DR17-100	3.00	2.43			
1.031	DR12-103	DR15-103	DR17-103	3.09	2.52			
1.062	DR12-106	DR15-106	DR17-106	3.19	2.62			
1.125	DR12-112	DR15-112	DR17-112	3.38	2.81			
1.187	DR12-119	DR15-119	DR17-119	3.56	2.99	(2) 10 mm I.C. Trigon Inserts	M3.5x0.6	T-10
1.218	DR12-122	DR15-122	DR17-122	3.65	3.08			
1.250	DR12-125	DR15-125	DR17-125	3.75	3.18			
1.281	DR12-128	DR15-128	DR17-128	3.84	3.27			
1.312	DR12-131	DR15-131	DR17-131	3.94	3.37			
1.375	DR12-137	DR15-137	DR17-137	4.13	3.56			
1.437	DR12-144	DR15-144	DR17-144	4.31	3.74			
1.468	DR12-147	DR15-147	DR17-147	4.40	3.83			
1.500	DR12-150	DR15-150	DR17-150	4.50	3.93			
1.562	DR12-156	DR15-156	DR17-156	4.69	4.12			
1.625	DR12-162	DR15-162	DR17-162	4.88	4.31			
1.687	DR12-169	DR15-169	DR17-169	5.06	4.49			
1.750	DR12-175	DR15-175	DR17-175	5.25	4.68			
1.812		DR15-181	DR17-181	5.44	4.87	(2) 12 mm I.C. Trigon Inserts	M4.5x0.75	T-15
1.875		DR15-187	DR17-187	5.63	5.06			
1.937		DR15-194	DR17-194	5.81	5.24			
2.000		DR15-200	DR17-200	6.00	5.43			
2.125		DR15-212	DR17-212	6.00	5.43	(2) 15 mm I.C. Trigon Inserts	M4.5x0.75	T-15
2.250		DR15-225	DR17-225	6.00	5.43			
2.375		DR15-237	DR17-237	6.00	5.43			
2.500		DR15-250	DR17-250	6.00	5.43			

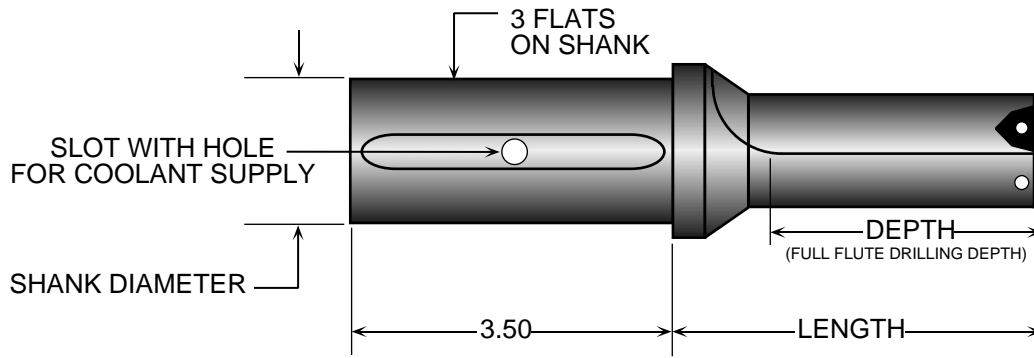
(1) TORX wrench and (4) insert screws included with drill. Inserts sold separately.



DRILL DIAMETER	SHANK DIAMETER			LENGTH	DEPTH	CARBIDE INSERTS	INSERT SCREWS	TORX® WRENCH
	1.250	1.500	1.750					
0.937	DS12-094	DS15-094	DS17-094	3.40	2.37	(2) 8 mm I.C. Trigon Inserts	M2.5x0.45	T-7
0.984	DS12-098	DS15-098	DS17-098	3.52	2.49			
1.000	DS12-100	DS15-100	DS17-100	3.58	2.55			
1.031	DS12-103	DS15-103	DS17-103	3.66	2.63			
1.062	DS12-106	DS15-106	DS17-106	3.75	2.72			
1.125	DS12-112	DS15-112	DS17-112	3.93	2.90			
1.187	DS12-119	DS15-119	DS17-119	4.10	3.07	(2) 10 mm I.C. Trigon Inserts	M3.5x0.6	T-10
1.218	DS12-122	DS15-122	DS17-122	4.19	3.16			
1.250	DS12-125	DS15-125	DS17-125	4.28	3.25			
1.281	DS12-128	DS15-128	DS17-128	4.36	3.33			
1.312	DS12-131	DS15-131	DS17-131	4.45	3.42			
1.375	DS12-137	DS15-137	DS17-137	4.77	3.60			
1.437	DS12-144	DS15-144	DS17-144	4.94	3.77			
1.468	DS12-147	DS15-147	DS17-147	5.03	3.86			
1.500	DS12-150	DS15-150	DS17-150	5.12	3.95			
1.562	DS12-156	DS15-156	DS17-156	5.29	4.12			
1.625	DS12-162	DS15-162	DS17-162	5.47	4.30			
1.687	DS12-169	DS15-169	DS17-169	5.64	4.47			
1.750	DS12-175	DS15-175	DS17-175	5.82	4.65			
1.812		DS15-181	DS17-181	5.99	4.82	(2) 12 mm I.C. Trigon Inserts	M4.5x0.75	T-15
1.875		DS15-187	DS17-187	6.17	5.00			
1.937		DS15-194	DS17-194	6.34	5.17			
2.000		DS15-200	DS17-200	6.52	5.35			
2.125		DS15-212	DS17-212	6.52	5.35	(2) 15 mm I.C. Trigon Inserts	M4.5x0.75	T-15
2.250		DS15-225	DS17-225	6.52	5.35			
2.375		DS15-237	DS17-237	6.52	5.35			
2.500		DS15-250	DS17-250	6.52	5.35			

(1) TORX wrench and (4) insert screws included with drill. Inserts sold separately.

\*TORX is a registered trademark of the Camcar Division of Textron, Inc.

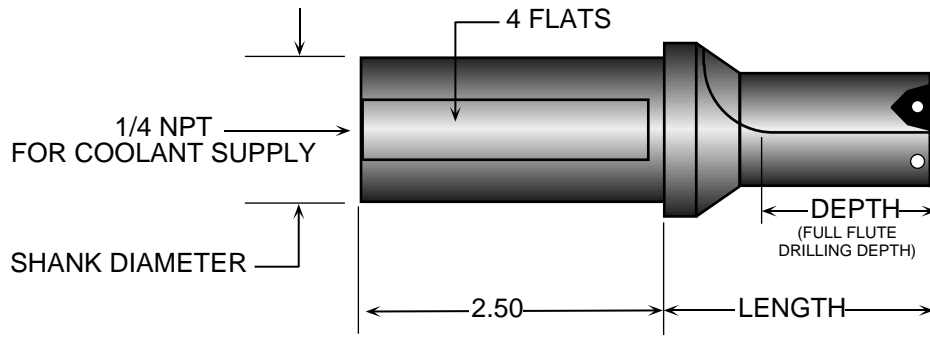


\* Mori Seiki Is A Registered Name Of Mori Seiki Co. Ltd.

DRILL DIAMETER	SHANK DIAMETER			LENGTH	DEPTH	CARBIDE INSERTS	INSERT SCREWS	TORX® WRENCH
	1.250	1.500	1.750					
0.937	DM12-094	DM15-094	DM17-094	2.81	2.24	(2) 8 mm I.C. Trigon Inserts	M2.5x0.45	T-7
0.984	DM12-098	DM15-098	DM17-098	2.94	2.37			
1.000	DM12-100	DM15-100	DM17-100	3.00	2.43			
1.031	DM12-103	DM15-103	DM17-103	3.09	2.52			
1.062	DM12-106	DM15-106	DM17-106	3.19	2.62			
1.125	DM12-112	DM15-112	DM17-112	3.38	2.81			
1.187	DM12-119	DM15-119	DM17-119	3.56	2.99	(2) 10 mm I.C. Trigon Inserts	M3.5x0.6	T-10
1.218	DM12-122	DM15-122	DM17-122	3.65	3.08			
1.250	DM12-125	DM15-125	DM17-125	3.75	3.18			
1.281	DM12-128	DM15-128	DM17-128	3.84	3.27			
1.312	DM12-131	DM15-131	DM17-131	3.94	3.37			
1.375	DM12-137	DM15-137	DM17-137	4.13	3.56			
1.437	DM12-144	DM15-144	DM17-144	4.31	3.74			
1.468	DM12-147	DM15-147	DM17-147	4.40	3.83			
1.500	DM12-150	DM15-150	DM17-150	4.50	3.93			
1.562	DM12-156	DM15-156	DM17-156	4.69	4.12			
1.625	DM12-162	DM15-162	DM17-162	4.88	4.31			
1.687	DM12-169	DM15-169	DM17-169	5.06	4.49			
1.750	DM12-175	DM15-175	DM17-175	5.25	4.68			
1.812		DM15-181	DM17-181	5.44	4.87	(2) 12 mm I.C. Trigon Inserts	M4.5x0.75	T-15
1.875		DM15-187	DM17-187	5.63	5.06			
1.937		DM15-194	DM17-194	5.81	5.24			
2.000		DM15-200	DM17-200	6.00	5.43			
2.125		DM15-212	DM17-212	6.00	5.43	(2) 15 mm I.C. Trigon Inserts	M4.5x0.75	T-15
2.250		DM15-225	DM17-225	6.00	5.43			
2.375		DM15-237	DM17-237	6.00	5.43			
2.500		DM15-250	DM17-250	6.00	5.43			

(1) TORX wrench and (4) insert screws included with drill. Inserts sold separately.

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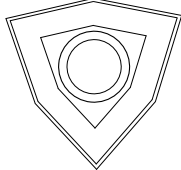


DRILL DIAMETER	SHANK DIAMETER		LENGTH	DEPTH	CARBIDE INSERTS	INSERT SCREWS	TORX® WRENCH
	1.000	1.250					
0.937	DB10-094	DB12-094	1.81	1.24	(2) 8 mm I.C. Trigon Inserts	M2.5x0.45	T-7
0.984	DB10-098	DB12-098	1.94	1.37			
1.000	DB10-100	DB12-100	2.00	1.43			
1.031	DB10-103	DB12-103	2.09	1.52			
1.062	DB10-106	DB12-106	2.19	1.62			
1.125	DB10-112	DB12-112	2.38	1.81			
1.187	DB10-119	DB12-119	2.56	1.99	(2) 10 mm I.C. Trigon Inserts	M3.5x0.6	T-10
1.218	DB10-122	DB12-122	2.65	2.08			
1.250	DB10-125	DB12-125	2.75	2.18			
1.281	DB10-128	DB12-128	2.84	2.27			
1.312	DB10-131	DB12-131	2.94	2.37			
1.375	DB10-137	DB12-137	3.13	2.56			
1.437	DB10-144	DB12-144	3.31	2.74			
1.468	DB10-147	DB12-147	3.40	2.83			
1.500	DB10-150	DB12-150	3.50	2.93			
1.562		DB12-156	3.69	3.12			
1.625		DB12-162	3.88	3.31			
1.687		DB12-169	4.06	3.49			
1.750		DB12-175	4.25	3.68			

(1) TORX wrench and (4) insert screws included with drill. Inserts sold separately.

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**INSERTS**

Drill Diameter Range		0.937 thru 1.125 Diameter Drills	1.187 thru 1.750 Diameter Drills	1.812 thru 2.000 Diameter Drills	2.125 thru 2.500 Diameter Drills
INSERT SIZE (I.C.)		 8 mm	 10 mm	 12 mm	 15 mm
INSERT ORDER NO.		WCMX-080304	WCMX-100304	WCMX-120404	WCMX-150504
GRADE	UNCOATED	P40	P40	P40	P40
	TITANIUM NITRIDE COATED	TiN	TiN	TiN	TiN

Inserts sold in packs of 10. When ordering inserts, specify order number and grade.

**COMPONENTS**

Drill Diameter Range		0.937 thru 1.125 Diameter Drills	1.187 thru 1.750 Diameter Drills	1.812 thru 2.000 Diameter Drills	2.125 thru 2.500 Diameter Drills
INSERT SCREWS		M2.5 x 0.45	M3.5 x 0.6	M4.5 x 0.75	M4.5 x 0.75
TORX® WRENCH		T-7	T-10	T-15	T-15

TORX is a registered trademark of the Camcar Division of Textron, Inc.

Insert screws sold in packs of 5. Wrenches are sold individually.

**Safety Notes**

Drilling with a carbide insert drill, like any machining operation, can be dangerous if care and the proper precautions are not used.

**CAUTION !** Drilling through a rotating part produces a dangerous slug that can be ejected through a rotating part produces a dangerous slug that can be ejected with tremendous force. Use proper machine guards to avoid injury.

**WARNING !** Carbide inserts may chip or fragment in use. Use machine guards, protective clothing, and safety glasses to prevent burns or other injury to body or eyes from flying particles or chips.



## **Common questions and answers**

### **Do I need thru-the-spindle coolant?**

We do recommend it, but it's not necessary. It's important though to flood the drill with external coolant if your machine does not have thru-the-spindle coolant. Your drilling depth might be limited without through the spindle coolant.

### **Do I have to peck the drill?**

No. You do not need to peck the drill unless you exceed the recommended drilling depth or large chips are packing in the flutes due to the material.

### **Do I use a Center drill?**

No, it is not necessary.

### **Why aren't the chips breaking up?**

The main factor in stringy chips is the material. If your machine has the additional horsepower, increase your feed rate. This will help in breaking up the chips.

### **Why am I stalling my spindle?**

Carbide insert drills can use tremendous amounts of horsepower. If you are using a large diameter DURA-HOG drill, you may be exceeding the limits of your machine. Try these solutions . . .

- 1) Place your machine in the lowest gear range if available.
- 2) Slow the feed rate.
- 3) Try a smaller diameter drill and bore diameter up to size.

### **How can I avoid chips from welding to the sides of my drill? (also called galling)**

Some materials (like 1018 and A36 material) are prone to creating stringy, coarse chips that are hard to evacuate. These chips wrap themselves around the drill and weld themselves to the part and drill causing loud pops and screeches. A solution is to grind or turn the O.D. of your drill behind the inserts to allow extra chip clearance.

### **Why is the drill chipping on the inside insert near the center?**

The relative surface feet per minute at the center of the workpiece is zero and the insert is pushing the material instead of cutting the material. This causes the inner insert to chip at the center on certain materials. The insert life is generally not reduced because of the chipping. If the insert life is reduced, here are some solutions that may help . . .

- 1) On turning centers, a possibility may be that your turret is not properly aligned. We suggest rotating the drill 180°.
- 2) If using coated inserts, switch the inner insert to an uncoated one. The uncoated insert is more tolerant of this problem.

### **Why is the drill cutting oversize on my turning center?**

Misalignment of the turret or the machine holder are some factors. Material is another. Here are some solutions . . .

- 1) Rotate the drill so the inserts are aligned with the X-axis, placing the outer insert in position like a boring bar. Then just use your offset to compensate.
- 2) If turret misalignment is the cause, rotating your drill 90° or 180° will help correct the problem.

If your problem is not listed here or you need additional information, please call us for assistance.

**Our toll free number is 1-800-438-1538.**



Legend      **IPR** = Inches Per Revolution      **RPM** = Revolutions Per Minute  
                  **IPM** = Inches Per Minute                      **SFM** = Surface Feet per Minute

<b>Formulas</b>	To calculate RPM $\text{RPM} = \frac{\text{SFM} \times 3.82}{\text{Diameter}}$	To calculate IPM $\text{IPM} = \text{RPM} \times \text{IPR}$
	To calculate SFM $\text{SFM} = \text{RPM} \times .262 \times \text{Diameter}$	To calculate IPR $\text{IPR} = \text{IPM} \div \text{RPM}$

Note: Feed rates given on this sheet assume a 20 horsepower spindle on a rigid CNC turning center. Feed rates may need to increase or decrease depending upon the machine capabilities.

MATERIALS	SFM	DRILLS .984-1.125 IPR	DRILLS 1.187-1.375 IPR	DRILLS 1.437-1.687 IPR	DRILLS 1.750-2.000 IPR	DRILLS 2.120-2.500 IPR	HELPFUL TIPS
1010, 1018, 1020	500	.003	.0045	.006	.007	.006	Stringy chips. May need to clear O.D. of tool for chip relief.
1040, 1045, 1144	450	.0025	.004	.005	.006	.006	
12L14, 1117L	600	.0035	.005	.007	.008	.007	
8620	450	.003	.0045	.006	.007	.006	
4140, 4142	400	.0025	.004	.005	.006	.006	
4150PHT, P20	325	.0025	.004	.005	.006	.006	
H13	350	.0025	.004	.005	.006	.006	Stringy chips. May need to clear O.D. of tool for chip relief.
O6, L6	400	.0025	.004	.005	.006	.006	
D2, M2	275	.0015	.0025	.0035	.0045	.0045	
CAST IRON	600	.005	.007	.010	.013	.013	If drilling through, slow feed last .100 depth to reduce material chipping.
ALUMINUM	1500	.005	.010	.012	.015	.015	Large amount of chips Use thru-tool-coolant to evacuate them.
AMPCO 18	900	.004	.008	.010	.012	.010	Start with fresh inserts.
303 ST. STEEL	450	.003	.0045	.006	.007	.006	
304 ST. STEEL	225	.002	.003	.003	.004	.003	
416 ST. STEEL	550	.003	.0045	.006	.007	.007	
S-1, S-7, W-1	350	.003	.0045	.006	.007	.006	
DELTRIN, PLASTIC	1500	.005	.01	.012	.015	.015	Must use coolant.
BRASS	1000	.004	.008	.010	.012	.012	
COPPER	800	.004	.008	.010	.012	.012	



## General Notes

Carbide insert drills work best in higher horsepower, rigid machines.

- The more rigid the machine, the more trouble free the drill will operate. A rigid machine reduces chatter, vibration and premature fracturing of inserts.
- Higher horsepower allows for higher feed rates. Higher feed rates yield faster cycle times and can reduce or eliminate stringy chips.

The slug produced by drilling through a workpiece can sometimes become jammed between the drill and workholding device. To minimize the likeliness of this happening, provide ample clearance in this area.

## Methods of Holding and Alignment.

- TURNING CENTERS - A standard I. D. holder is sufficient. If using a DM or DZ style drill, make sure that the drill slot or holes are aligned with the coolant hole of the holder. Align the drill's inserts along the X-axis plane to control the drill size with the machine's X-axis offset.
- MILLING CENTERS - Use a standard end mill holder. Some shanks may need to be cut off for the shoulder of the drill to sit against the face of the tool holder.

## Coolant

We strongly suggest thru-the-tool coolant on all our drills. This directs the coolant exactly where you need it. It also helps evacuate the large volume of chips created by the drill. A normal coolant pump should be sufficient to deliver enough coolant for the chip evacuation. Flood coolant is acceptable when the drilling depth does not exceed a 2:1 ratio to the diameter.

**Note:** On some CNC machines, the rapid rate of tool positioning does not allow enough time for coolant flow to begin prior to drill contact with the workpiece. If the drill begins cutting without coolant, even for a second or two, insert life can be shortened considerably. Adding a short dwell in the program, to assure coolant flow **before** workpiece contact, will greatly enhance insert life and drill performance.

## Programming Tips

We do not recommend pecking of the drill in short hole applications or when the drill is in the vertical position. Chips may fall to the bottom of the hole and pinch between the insert and hole bottom, possibly fracturing the insert. Use a pecking method only if you are using the drill to its maximum depth and/or you are experiencing stringy chips.

A simple method for reducing stringy chips is to create a small loop program which allows the drill to pause every .025-.050 depth. This method breaks up the stringy chip and allows the coolant to evacuate the chips.

It is possible to bore with the drill, but we do not recommend it. The drill is designed for cutting from solid. If the inserts are oriented correctly, you can slightly offset the drill to achieve a desired size. Call our technical support at 1-800-438-1538 and we would be happy to assist you.

**Save  
Time  
Save  
Money  
HOC  
Through It!**



**2:1 Ratio for  
Short Hole Drilling**  
Fits standard  
endmill holders



**Universal Rear & Side  
Entry Coolant**  
For machines without  
thru-holder coolant



**Rear Entry Coolant**  
Standard 3:1 ratio



**Custom Shanks for  
Mori Seiki & Mazak  
Turning Centers**  
No external plumbing  
necessary

**Carbide Insert Drills**



**DURA-HOC**

1954

33637 Sterling Ponds Blvd.  
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