BCT USA

BROOK CUTTING TOOLS USA

CHIPBREAKER DRILLS

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This outstanding development increases drill cutting efficiency by chip control. The chipbreaker rib is positioned along the length of the flutes thus the chipbreaker feature is maintained throughout the drill life. This drill is re-sharpened in the same manner as any standard twist drill on any reputable drill point grinder. The cutting action of the Chipbreaker Drill is the same as a standard drill, the cut being effected by the full length of the cutting edge with the chip side down the face of the flutes. Contact with the chipbreaker rib then curls and breaks the chip into short lengths.

Standard drill in action

Standard drill chips

CHIP CONTROL AND REMOVAL

There is no clogging of chips in the flutes, as they are broken into conveniently short lengths and suitably curled to ensure free flow along the flutes. Thus the Chipbreaker Drill cuts more freely than the standard drill.

FASTER DRILLING

The efficient manner in which the chips are broken ensures faster drilling times. This is particularly evident on deep hole horizontal drilling, which can be done with the minimum number of withdrawals due to the small controlled chips produced and the absence of pronounced clogging.
The small chips permit the coolant to flow more freely to the point of the drill, thus giving improved heat dissipation and drilling performance.

Chipbreaker drill in action

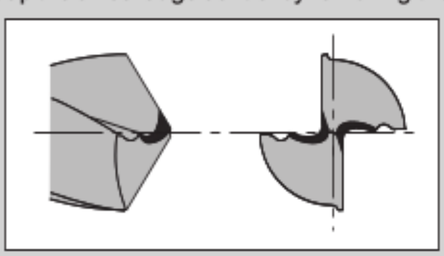
Chipbreaker drill chips

FEATURES

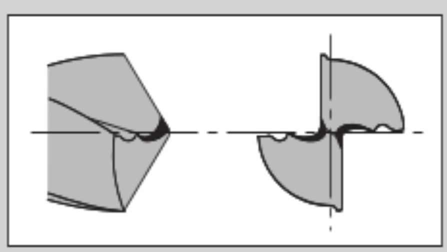
- **Control of the chip size eliminates long spiral swarf which is both inconvenient and dangerous to the operator.**
- **Small chips are easier to handle and transport.**
- **Chipbreaker drills can be re-sharpened with existing standard equipment and practice.**
- **The chipbreaker rib is constant throughout the life of the drill.**
- **The chipbreaker rib gives added rigidity, markedly increasing the number of holes per re-grind even where chip control is not considered important.**
- **This drill has a wide field of application, equally suited to precision drilling and the contrasting conditions of constructional work and ship-building.**
- **The Chipbreaker Drill dispenses with any other mechanical aid required to facilitate chip control, and in consequence can be used in the confined space in multi-spindle set-ups.**

RE-SHARPENING

Chipbreaker drills do not require any special re-sharpening. The lip clearance angle and the chisel edge angle are applied in the usual way on any commercial drill point grinder - or by hand if no machine is available.
Chipbreaker drills have a parallel web and constant flute section - eliminating the need for increased web thinning when the flutes are shortened.
The most suitable type of web thinning is shown below and is recommended for drill diameters 13mm (33/64") and larger. The thinning notch must be ground between the maximum and minimum limits shown to ensure the correct chip flow. Care must be taken to keep the chisel edge central by removing the same amount from each flute.



MAXIMUM
The thinning notch may break with Chipbreaker's rib for half the height of the back edge of the rib.



MINIMUM
The thinning notch must extend as far as the apex of Chipbreaker's rib.

CHIPBREAKER OIL FEED DRILLS

The technique of oil feed drilling has been known for many years. The benefits of providing coolant directly to the cutting edge of a drill include higher cutting speeds, higher feed rates, longer tool life and less frequent re-sharpening. The coolant also assists in clearing chips from the drill point and its pressure ejects the swarf along the flutes of the drill thus facilitating drilling to greater depths without repeated withdrawal to clear swarf.

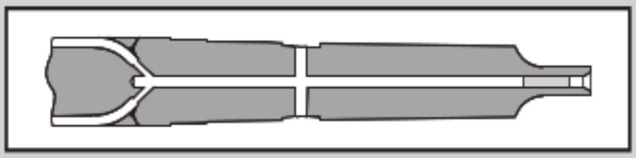
FEATURES

- **Coolant tubes are located away from the drill web thus not affecting web strength.**
- **Connects to all coolant systems.**
- **Allows for drilling at greater speeds and feeds.**
- **Faster drilling - particularly on deep holes (reducing times by up to 75%).**
- **Longer drill life and less maintenance (3-10 times longer life).**
- **Superior finish and hole size.**

SHANK TYPES

MTS - CROSS HOLE FEED

Standard shank sizes - 3 MTS, 4 MTS and 5 MTS.



MTS - INDUCER RING FEED

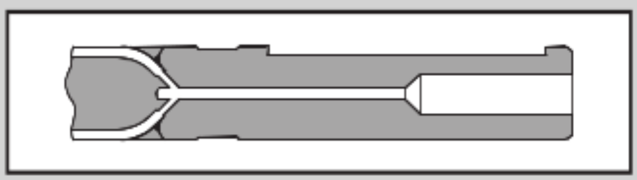
Standard shank sizes - 3 MTS and 4 MTS.

PARALLEL SHANK - END FEED

Shank diameter equivalent to drill diameter.

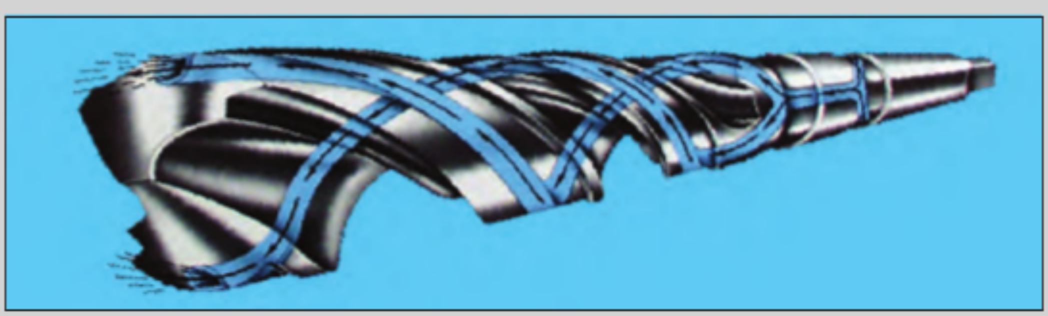
FLATTED SHANK - END FEED

Standard shank sizes - 16, 20 and 25mm.



COOLANT SYSTEM

Coolant can be provided by the normal coolant pump supplied with most machines using soluble oil. We do however recommend using a mist coolant at a pressure of 550 to 800 kPa (80 to 120 psi). This method is clean, efficient and economical and uses only a small quantity of coolant which eliminates the problem of collecting, filtering and re-using the coolant.



RECOMMENDED SPEED, COOLANT, LIP CLEARANCE ANGLE					
Material to be drilled	Speed		Coolant	Point Angle	Lip Clearance Angle
	Metres per Minute	Feet per Minute			
Aluminium and Aluminium Alloys	61 to 92	200 to 300	Soluble oil or Paraffin	118°	12°
Brass	46 to 76	150 to 250	Dry or Soluble oil	118°	15°
Brass - Leaded	61 to 92	200 to 300	Dry or Soluble oil	118°	15°
Bronze	30 to 61	100 to 200	Soluble oil.	118°	15°
Bronze - High Tensile	22 to 30	70 to 100	Soluble oil.	118°	15°
Cast Iron - Soft	30 to 46	100 to 150	Dry. Use air.	90°	12°- 15°
Cast Iron - Malleable	22 to 24	70 to 80	Soluble oil.	118°	10°- 12°
Cast Iron - Hard	15 to 22	50 to 70	Dry or use air.	118°	10°- 12°
Cast Iron - Chilled	8 to 11	25 to 35	Soluble oil.	118°	10°- 12°
Copper	30 to 61	100 to 200	Soluble oil..	100°	15°
Magnesium	Up to 122	Up to 400	Soluble oil or Paraffin.	118°	12°
Monel	12 to 15	40 to 50	Soluble oil or Sulphurised oil.	125°	10°- 12°
Steel - Plate, Bar, Cast, Forged Free-Cutting Mild	30 to 61	100 to 200	Soluble oil or Sulphurised oil.	118°	10°- 12°
Steel - Up to 620 N/mm≤ (175 HB)	24 to 33	80 to 110	Soluble oil or Sulphurised oil.	118°	10°- 12°
Steel - >620 N/mm≤ (175 HB) # 910 N/mm≤ (250 HB)	14 to 22	45 to 70	Soluble oil or Sulphurised oil.	118°	10°
Steel - >910 N/mm≤ (250 HB) # 1220 N/mm≤ (350 HB)	9 to 14	30 to 45	Soluble oil or Sulphurised oil.	125°	12°
Steel - >1220 N/mm≤ (350 HB)	5 to 8	15 to 25	Soluble oil or Sulphurised oil.	130°	10°
Steel - Manganese (Low)	5 to 6	15 to 20	Sulphurised oil.	130°	10°
Steels - Stainless - Free Cutting	15 to 18	50 to 60	Soluble oil or Sulphurised oil.	118°	10°- 12°
Steel - Tough Grades	6 to 15	20 to 50	Soluble oil or Sulphurised oil.	130° - 140°	6° - 12°

CHIPBREAKER DRILL RECOMMENDED FEED RATE			
METRIC SIZES		IMPERIAL SIZES	
Drill Diameter	Feed per rev.	Drill Diameter	Feed per rev.
6.0 up to & incl. 8.0	0.10 to 0.25	1/4" up to & incl. 5/16"	0.004" to 0.010"
> 8.0 up to & incl.11.0	0.15 to 0.30	>5/16" up to & incl.7/16"	0.006" to 0.012"
>11.0 up to & incl.14.0	0.20 to 0.35	>7/16" up to & incl.9/16"	0.008" to 0.014"
>14.0 up to & incl.17.5	0.25 to 0.40	>9/16" up to & incl.11/16"	0.010" to 0.015"
>17.5 up to & incl.20.5	0.30 to 0.45	>11/16" up to & incl.13/16"	0.012" to 0.018"
>20.5 up to & incl.28.5	0.30 to 0.50	>13/16" up to & incl.1-1/8"	0.012" to 0.020"
>28.5 up to & incl.38.0	0.35 to 0.75	>1-1/8" up to & incl.1-1/2"	0.014" to 0.030"
>38.0	0.40 to 0.90	>1-1/2"	0.016" to 0.035"

Feed is the important aspect in successful performance. When drilling a new material start at the lower end of the recommended feed and increase until optimum results are obtained. Optimum results are the lowest cost in producing the hole, tool life being just one factor. Emphasis should be placed on production rate, with tool life considered a partial cost of that production, rather than the end result.

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