Tips for Successful Drilling

- Ensure workpiece is firmly and securely fastened.
- Avoid excess lateral loads.
- Ensure collets and drill chucks are in good condition and will not allow drill slippage. Both drill and component damage can occur.
- When using taper shank drills ensure all taper sleeves are clean and in good condition. Never allow the drill to drive off the tang. This is an indication that either the drill, the sleeve, or both are damaged. Use only soft faced hammers to drive the taper shank into the sleeve. Use a proper drift key to remove the shank from the sleeve.
- Ensure drill is kept sharp, and sharpen before point of failure. If allowed to become blunt extra grinding will be needed to bring the drill back to optimum performance.
- Keep the flutes free from swarf. Clogged flutes will hamper drill performance.
- Use adequate coolant, particularly at the drill point, wherever possible.
- Avoid excessive speed and feed rates. Use the charts in this catalogue. If unsure of the correct speed or feed rate to use, it is generally better to start at low speeds and feeds, and build up as appropriate.
- When resharpening it is important that all wear is removed, and the correct point geometry is maintained. Do not overheat or burn the drill when grinding.
- If the hole is deeper than 3 times its diameter it is considered a deep hole. When drilling deep holes peck drilling is needed in order for the coolant to reach the point of the drill, and also to aid chip clearance.

Recommended SPEEDS for Deep Hole Drilling

3 x Diameter of Drill	10% speed reduction
4 x Diameter of Drill	20% speed reduction
5 x Diameter of Drill	30% speed reduction
>6 x Diameter of Drill	40% speed reduction

Recommended FEEDS for Deep Hole Drilling

3 x Diameter of Drill	10% feed reduction
4 x Diameter of Drill	10% feed reduction
5-8 x Diameter of Drill	20% feed reduction

Drill Bit Surface Treatment

Bright Finish
A bright finish tool has no surface treatment and is supplied in the as-ground condition. These tools are suitable for general purpose use, particularly for non-ferrous applications.

Black Finish (also called blue finish)
A black finish is achieved by steam tempering, a thermal process resulting in a porous tool coating. This surface helps to keep lubricant on the tool, particularly important on the cutting edges, thus reducing friction and cold welding. The result is increased tool life. Black finish tools are generally recommended for ferrous applications where the oxide layer aids chip flow and heat dissipation.

Bright / Black Finish
These drills are ground and then a black finish is achieved by steam tempering, a thermal process resulting in a porous tool coating. This surface aids chip flow and heat dissipation. The drill is then ground a second time to achieve a bright finish on the shank and cutting edges.

Bronze Finish (gold oxide)
This metallic brown coloured low temperature temper treatment is normally only used on cobalt tools for identification purposes Cobalt HSS drills are extremely hard and provide superior performance and increased tool life especially in stainless steel and high tensile steel.

Gold Finish (TiN) (Titanium Nitride)
A very hard gold coloured surface finish a few microns thick is achieved by Physical Vapour Deposition (PVD). As with all surface coated tools, performance will deteriorate after resharpening. The coating helps to dissipate heat and reduces friction and cold welding. Higher speed and feed rates can be achieved and tool life is greatly increased.

Violet / Grey - TiAlN (Titanium Aluminium Nitride – TiAlN)
A violet/grey finish with a higher hardness than both TiN and TiCN coating utilises aluminium in the coating which imparts greater oxidation stability. This stability is a result of a very thin film (of Aluminium Oxide) which is formed on the surface of the TiAlN. This film is self repairing which leads to increased tool service life. This high performance coating is able to withstand much higher temperatures which allows increased speeds and feeds and semi-dry machining operations. TiAlN coating is especially useful when machining cast iron and tough steels.