

Perfection

In

Thermal drilling

FORMDRILL: The drill system for screw-, solder-, glue- and welding assemblies in thin sheet metal work pieces.

In just a few seconds you will drill a perfect hole with a bushing on the back side. The Formdrill positioned onto the work piece will develop friction heat due to the rotational and axial forces. This causes the material to become plastic deformable.

Afterwards the thread is cold-formed with a TIN-coated Formtap.

What is Formdrill™ ?



The Formdrill™ allows the making of high-strength holes in sheet metal or light gauge tube, with a bush formed as the hole is created. This bush can then be tapped, the bushing can also be used as a through hole for welded, soldered or brazed connections as well as for a load-bearing surface. It is an excellent alternative to welded nuts or threaded inserts.



When you normally drill a hole, you remove material from the work piece. Wouldn't it be better if that metal was retained, giving the hole greater strength and providing enough metal to allow the formation of a bush which could be tapped or be used as a through hole for welded, soldered or brazed connections.



That's exactly what the Formdrill™ does - it makes holes without removing any material.

The Formdrill™ and How it Works

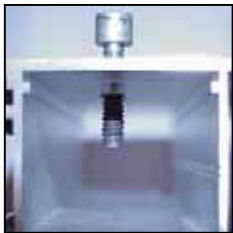
The Formdrill™ is a thermal drilling and bush-forming tool that attaches to the chuck of any high-powered drill-press. Rotating the Formdrill™ at high speed under high axial load (the drill-bit being strongly pushed towards the work piece) generates frictional heat. The temperature of the Formdrill™ rapidly climbs to around 650-750 degrees C, while the focal area of metal reaches around 600 degrees C. This heat softens a small section of the metal's structure and allows the Formdrill™ to penetrate the work piece. There is absolutely no cutting involved during the creation of the hole. Unlike a conventional drill, the strength of the work piece is not compromised by the removal of material. Instead, the heated material Forms away from its original position to form a 360° bush around the periphery of the hole. During initial stages of the Formdrill™ process, the heated material rises against the tool's leading taper but once the surface is completely penetrated, the bulk of the displaced material forms to the underside of the hole. This underside bush usually projects downwards by three times the thickness of the material, while the raised collar sits only slightly above the surface. Note that this collar can be left in place or milled flush to the surface



Formdrill™ Capacities



The Formdrill™ can be used on many commonly found materials. It is approved for use on ferrous and non-ferrous metals as mild steel (up to 1100N/mm strength), stainless steel, copper, brass and most aluminium alloys. Some Formdrills™ can penetrate through metals up to 12 millimetres thick. The Formdrill™ is available in various diameters, with different models forming holes from 2 to 25.4mm in diameter. Each drill has a typical working life of 10,000 operations.



**Examples in
Steel,
Stainless,
Copper,
Brass and
Alu.**

No special equipment is required – a standard drill press, milling machine or CNC machining center are suitable. It's important to ensure the machine is capable of the power, rpm and feed rate required to form a given hole.

Formdrill™ Types

There are several Formdrill™ shapes to choose from. The Short Formdrill™ has short parallel sides behind the leading taper. This serves to form a conical bushing with a rolled topside collar. The Long Formdrill™ has a longer parallel-sided body that extends behind the leading taper. This produces a long cylindrical bush and a rolled collar on top of the working surface. A Super Short Formdrill™ is also available. This has shorter than usual parallel side and leading taper lengths to allow clearance in situations where there is limited penetration distance (such as inside a small diameter tube). There is one option for each Formdrill™ shape: The Flat-style. The Flat Formdrill™ eliminates the raised top collar in favour of a flush surface finish. A milling cutter integrated into the tool shaft removes this volume of material.

Note that Formdrill™ also sells lubrication paste and fluid. A small amount added to the Formdrill™ while it's still running, directly after operation, helps to prevent material adhering to the carbide tip. Application of conventional lubricants or cooling fluids during the Formdrill™ operation only reduces frictional efficiency and must be avoided.



SHORT

SHORT/FLAT



LONG

LONG/FLAT

Formtapping a Thread



Once a bushed hole has been formed in a workpiece, it's quite likely that you'll want to tap a thread into it. This can be done using conventional cutting taps or - **preferably** - with a cold-form Formtap

Again, this process does not involve removal of material. Formtapping results in maximum thread wall strength. Other advantages include quick tapping speed, reduced chance of pitch errors and no straying material. A large range of thread sizes is available. These come in metric, BSP and US thread types.

The torque necessary to Formtap depends on many factors - the Formdrill™ diameter, thread pitch, workpiece material and lubrication. As a rule, however, cold forming requires 20% more torque than traditional cutting techniques.

Uses for the Formdrill™ and Formtap

Formdrill™ and Formtapping have many applications in different industries: Automotive, Heating&Airco, Furniture, Manufacturing....

This includes making threaded connections (with or without a raised collar on the top) and giving positive location to a tube for brazing or soldering. The Formdrill™ is also suitable for forming bearings for light-load shafts.

Formdrill™ is fast, maintains maximum material strength and the tools are very durable. (good for 10,000 operations in mild steel)

The Formtap method of creating a thread maintains maximum thread wall strength and eliminates loose material. It is also a very durable tool. (good for 20,000 operations in mild steel)



Indeed, the Formdrill™ is the non-cutting edge in hole and thread forming.

For more information on our product contact us and ask for our Multi-media CD-Rom

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