

Material	
1.1 Structural Steel	All HMT tooling in this category is suitable for the common grades of steel
1.2 Hardened Steel	Feasible for countersinking some grades of hardened steel in controlled situations. For best results, the HMT Ultra tooling range is recommended. Hardened or heat-affected materials may require higher torque, reduced RPM & feed rates and extra coolant
1.3 Stainless Steel	Suitable for harder materials such as Stainless Steel when used at reduced RPM
1.4 Non Ferrous	All HMT tooling in this category is suitable for Non Ferrous materials
1.5 Additional Notes	Heat Affected Zones (HAZ) are areas of metal that have been exposed to welding, flame cutting or other high temperatures and are often harder to countersink. In these situations it usually helps to reduce RPM speeds, increase feed pressure, and use a rotary drilling machine with a powerful motor
	Plasma or Flame Cut holes: Flame cut or profiled holes can often be tapered or have a poor finish. Specify drilled holes to avoid these problems.
	Punched holes: When reworking holes that have been created by punching, note that the edge will have been hardened by the shearing action of the punch which affects the structure of the material
Apparatus / Drilling Machines	
2.1 Impact Wrench	Versadrive Countersinks are suitable for light chamfering / deburring using an impact wrench. For full depth countersinking, use a rotary drilling machine.
	When using Impact Wrenches, this tooling will perform best on higher torque settings. Low torque can lead to the cutting tool stalling during the cut, which can lead to a breakage. Select the correct torque for Impact tools using the relevant Torque Table on P131 / P142.
2.2 Rotary Pistol Drill	All Versadrive Countersinks & Drillsinks can be used in Pistol drills with a suitably low RPM
2.3 Compact Magnet Drill	As compact magnet drills are normally single speed, they are usually only suitable for the smaller sizes of Countersink eg below 20mm diameter
2.4 Large Magnet/Pillar Drill	Optimum life and performance will generally be achieved from HMT countersinks when used with Magnet Drills or Pillar Drills. Use at low speed Gear setting (for maximum torque)
2.5 Additional Notes	When using a Magnet Drill regularly check that the slides, handles, arbors and movable parts have not vibrated loose over time. Ensure a debris-free surface of sufficient steel thickness for strong magnet hold when Magnet Drilling - (min 10mm)
	When using cordless power-tools, regularly check that sufficient battery charge is still available. Low battery charge results in torque drop, which can damage cutting tools
	If the drilling machine has a variable speed trigger switch (once the appropriate gear setting has been selected) it is recommended to use the full speed available by fully depressing the trigger switch. Feathering the trigger will give inconsistent spindle speed and torque
Thickness	
3.1 Sheet Metal up to 4mm	All HMT countersinks are suitable for this application
3.2 Standard Plate 5 - 12mm	All HMT countersinks are suitable for this application
3.3 Medium Plate 12 - 25mm	All HMT countersinks are suitable for this application
3.4 Heavy Plate - above 25mm	All HMT countersinks are suitable for this application
Lubricant	
4.1 SpeedLube	Recommended for all general purpose countersinking applications
4.2 BioCut Paste	Recommended for overhead drilling and other applications where liquid lubricant is not suitable
4.3 BioCut Blue	Not recommended for general purpose countersinking. Recommended for harder steels and stainless steels where heat reduction is critical. Best choice if the material is to be welded or galvanised
4.4 Additional Notes	Ensure regular application of quality cooling lubricant, especially when countersinking thick or harder materials, use flood coolant to keep tool & workpiece cool to prevent work hardening.
Accessories	
5.1 Impact Adapters	Versadrive Countersinks & Drillsinks up to 16.5mm diameter can be used on Impact Wrenches & Impact Drivers (See Torque Table)
5.2 Pistol Drill / Chuck	The Versadrive Hex shank fits into any standard drill chuck. 130mm and 300mm Versadrive Extension Arbors will fit into all drill chucks
5.3 Weldon Adapters	All HMT Countersinks are suitable for use in Magnet Drills
5.4 Morse Taper Adapters	Versadrive Countersinks & Drillsinks can be adapted for use in Morse Taper drills with 111045 Adapters



Best Practice	
6.1 Do I need a pilot hole or a centre punch?	Not applicable
6.2 What is the correct feed pressure?	Apply firm, steady feed pressure throughout the cut. Excess feed pressure will increase heat buildup and reduce tool life
6.3 How many holes can I expect the cutting tool to last?	There are many customer reports of HMT tooling lasting for hundreds of holes, however, due to the demanding nature of some portable drilling applications, this can vary widely depending on the application. HMT can take the MATLAS details of your application and provide an estimate of tool life
6.4 How can I prevent chipping or breakage	Avoid lateral movement or tilting which can cause damage to the tooling. Do not use excessive feed pressure. Steady feed pressure will mean the tool is better controlled and held at 90° to the cut. This helps prevent snagging, chipping or kick-back. Try to maintain a consistent flow of swarf
	Do not allow the countersink to vibrate over swarf while cutting as this will cause chatter, ultimately causing the cutting edge to chip & blunt
6.5 Additional Notes	For best results when countersinking, the countersink should be piloted where possible see MultiSink pilots on P101. Piloted Countersink Bits (like the MultiSink) will significantly increase countersinking performance preventing movement of the countersink whilst rotating
	Drilling operations take place in a wide variety of environments, each with different risks and requirements. For this reason, safe working practices and specific risk assessments or method statements must be determined by the user. Always select and use appropriate PPE, follow correct operating procedures for all equipment, and inspect tooling before use.

HSS Countersinks					
Diameter Range		Structural Steel (10 m/min)	Hardened Steel (N/A)	Stainless Steel (6 m/min)	Non-Ferrous (28 m/min)
6–8 mm	1/4"–5/16"	400–745	N/A	200–425	995–1855
9–12 mm	11/32"–1/2"	265–495	N/A	135–285	665–1240
13–17 mm	33/64"–11/16"	185–345	N/A	95–195	470–855
18–22 mm	11/16"–7/8"	145–250	N/A	70–140	360–620
23–30 mm	29/32"–1 3/16"	105–195	N/A	55–110	265–485
31–40 mm	1 1/4"–1 19/32"	80–145	N/A	40–80	200–360
41–55 mm	1 5/8"–2 5/32"	60–110	N/A	30–60	145–270
56–80 mm	2 7/32"–3 5/32"	40–80	N/A	20–45	100–200
TCT Countersinks					
Diameter Range		Structural Steel (12.5 m/min)	Hardened Steel (7 m/min)	Stainless Steel (8 m/min)	Non-Ferrous (35 m/min)
32–35 mm	1-1/4"–1-3/8"	115–125	65–70	75–80	320–345
36–40 mm	1-13/32"–1-9/16"	100–110	55–65	65–70	280–310
41–45 mm	1-5/8"–1-3/4"	90–100	50–55	55–60	250–270
46–55 mm	1-13/16"–2-5/32"	70–85	40–50	45–55	195–240
56–63 mm	2-3/16"–2-1/2"	60–70	35–40	40–45	170–200
64–72 mm	2-17/32"–2-27/32"	50–60	30–35	35–40	145–175
73–80 mm	2-7/8"–3-5/32"	45–50	25–30	30–35	130–150