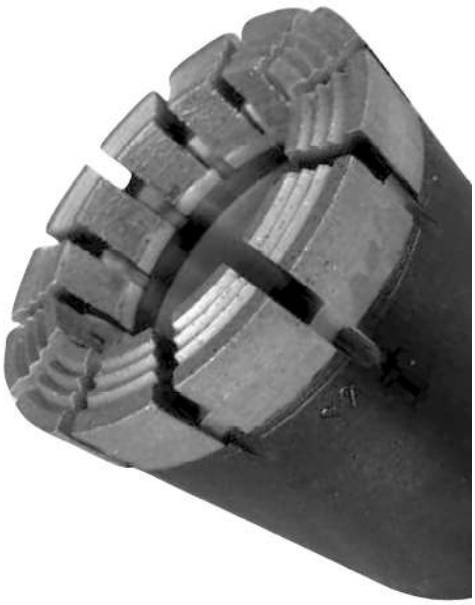
DIAMOND IMPREGNATED BIT OPTIONS

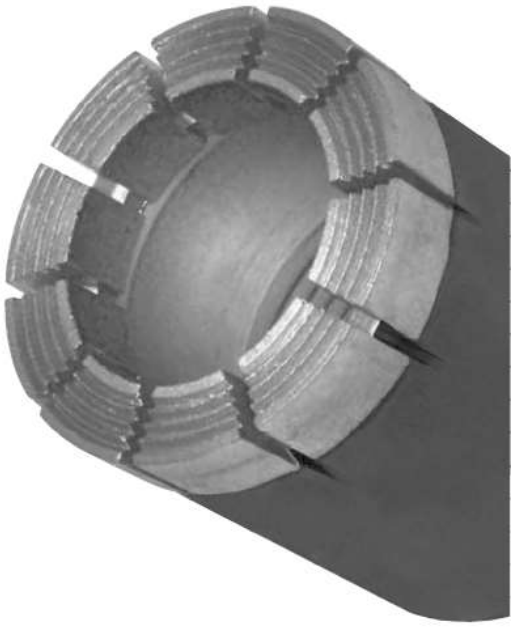
Diamond impregnated bits are the most widely used bits in the core drilling industry. By adjusting the combination of metal powders and diamonds in the crown (or matrix), diamond impregnated bits can be manufactured to maximize penetration rates and bit life in a variety of rock formations. These variations are commonly identified by a series rating.

As drilling progresses, the crown is slowly worn away, exposing new diamonds on the cutting surface. When the wear rate between the matrix material and the diamonds is balanced, optimum penetration rates and bit life will be achieved.



GT Diamond Impregnated Bits

Hole Products' GT bits are offered as a non-customizable design with a standard crown height and waterways. GT bits offer a great combination of quality and value.



Premium Diamond Impregnated Bits

Hole Products' premium diamond impregnated bits are designed to optimize performance in any rock formation. Premium bits are fully customizable with multiple waterway options and numerous crown heights.

DIAMOND IMPREGNATED BIT SERIES GUIDE

Diamond impregnated bits are typically designated by "Series". Each series is designed to work under specific conditions of ground hardness and abrasiveness. Please refer to the selection table to identify the appropriate series for your drilling conditions.

Series 2: For abrasive formations and/or most fractured formations. A general-purpose bit for use on all types of power drills.

Series 4: For abrasive and course grained competent formations. Recommended for low powered drills only. High loads (more than recommended) will seriously reduce bit life.

Series 6: For medium to hard, low abrasive, and partly fractured formations. This series bit is less susceptible to over-drilling at high loads than series 4.

Series 7: For hard, moderately abrasive, and fractured formations. A tough, relatively free cutting, fast penetrating bit.

Series 8: For hard, competent, and nonabrasive formations. This free cutting bit requires high rotational speeds and light bit loads for best performance.

Series 9: Very free cutting bit with good life in hard to very hard competent and nonabrasive formations. High rotational speeds and light bit loads.

Series 10*: Recommended for ultra-hard, nonabrasive formations. Needs high rotation speeds and low thrust. Not for use in abrasive formations.

* For ultra hard nonabrasive formations series 12 and 14 are available. Please contact your Hole Products representative for further assistance.

ROCK TYPE	APPROXIMATE HARDNESS	SERIES GUIDE						
		2	4	6	7	8	9	10+
Gypsum, Potash, Shale, Sandstone, Talc	Soft							
Limestone, Weathered Granite, Marl, Peridotite, Sandstone, Serpentine, Hard Shale, Siltstone	Medium							
Diabase, Dolomite, Pegmatite, Sandstone, Schist	Medium Hard							
Andesite, Basalt, Gabbro, Quartz	Hard							
Gneiss, Granite, Quartzite, Rhyolite, Diorite	Very Hard							
Chert, Ironstone, Jasperite, Glassy Quartzite, Tuff	Extremely Hard							

ROCSO

HOLE PRODUCTS' BIT SELECTION GUIDELINES			
ROCK TYPE	**CHARACTERISTICS**	**DIAMOND IMPREGNATED BIT SERIES GUIDE**	**DIAMOND SURFACE SET STONES PER CARAT (SPC)**
VERY SOFT Clay, Shale, Alluvium, Weathered Saprolite	Unconsolidated Very Abrasive Fine to Coarse Grained Highly Weathered	Not Recommended Use Surface Set Bits	10/15 SPC, 6/10 SPC
SOFT Gypsum, Potash, Shale, Sandstone, Talc	Abrasive Fine to Course Grained Fractured	2,4	15/25 SPC, 10/15 SPC, 6/10 SPC
MEDIUM Limestone, Weathered Granite, Marl, Peridotite, Sandstone, Serpentine, Hard Shale, Siltstone	Abrasive Medium to Coarse Grained Competent to Fractured	4	25/35 SPC, 15/25 SPC
MEDIUM HARD Diabase, Dolomite, Pegmatite, Sandstone, Schist	Moderately Abrasive Medium to Coarse Grained Competent to Fractured	6,7	45/55 SPC, 35/45 SPC
HARD Andesite, Basalt, Gabbro, Quartz	Slightly Abrasive Fine to Medium Grained Competent to Fractured	7,8	Not Recommended Use Impregnated Bit
VERY HARD Gneiss, Granite, Quartzite, Rhyolite, Diorite	Non-Abrasive Fine Grained Competent	8,9	Not Recommended Use Impregnated Bit
EXTREMELY HARD Chert, Ironstone, Jasperite, Glassy Quartzite, Tuff	Non-Abrasive Very Fine Grained Competent	10*	Not Recommended Use Impregnated Bit

** For ultra hard non-abrasive formations series 12 and 14 are available.*
Please contact your Hole Products representative for further assistance.