PRIMEHORIZONTAL

Drill Bits

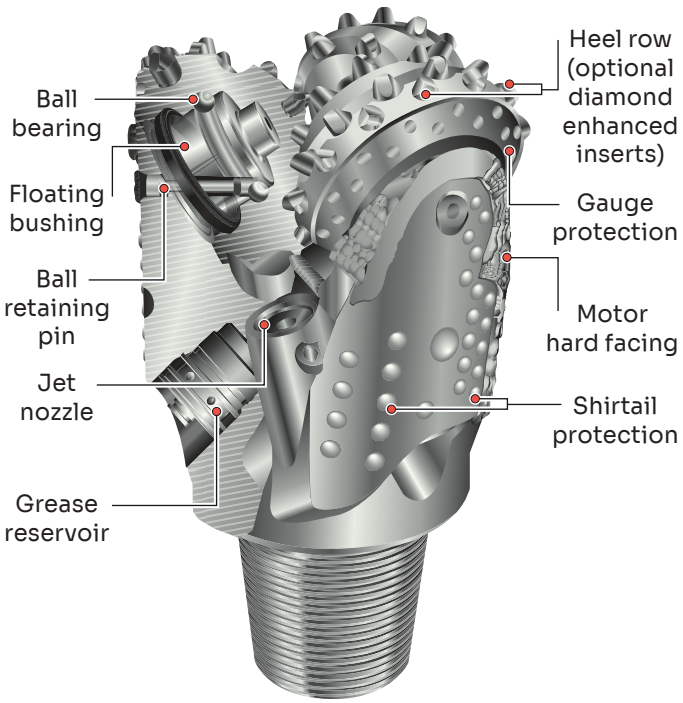
Since the early 1900's when the first roller cone tri-cone rock bits were patented, these tools have proven to provide the best all-around cutters for drilling rock, from soft formations all the way to extremely hard formations. While most cutting technologies have been attempted, their uses have proven too limited to specific rock formations, and the tri-cone roller cone rock bit remains the bit of choice for the wide range of applications encountered in HDD horizontal drilling projects.

All the major bit manufacturing companies have developed bits for specialized applications during the past 20 years, but these developments generally have focused on vertical drilling applications rather than horizontal drilling applications.

Prime Horizontal has chosen to work with a small group of bit suppliers who consistently provide bits tailored to the wear characteristics of horizontal drilling. Prime Horizontal sells bits with extra heavy gauge protection and the bit suppliers add these options to the bits they sell. In certain circumstances additional options are asked for, such as diamond impregnated coatings on the shirt-tails to extended jet nozzles for softer formation jet bits.

It is important to understand the type of formation intended to be drilled so an accurate recommendation can be made as to which type of bit would be best for a specific project. For example, there are 8 different grades of roller cones, denoting softer formations all the way to the hardest. Within each grade, there are another four different sub-grades of each. And finally, within each of the sub-grades, there are many additional options from changing up the type of bearing in use based on formation expectations.

Clients are asked to supply the compressive strengths of the formations and the type of formations to be drilled so Prime Horizontal can make appropriate recommendations on which drill bits to use.



IADC coding

First digit	1, 2 and 3 designate Steel tooth bits with 1 for soft, 2 for medium and 3 for hard formations.
	4, 5, 6, 7 and 8 designate Tungsten carbide insert bits for varying formation hardness with 4 the softest and 8 the hardest.
Second digit	1, 2, 3 and 4 are a further breakdown of formation with 1 the softest and 4 the hardest.
Third digit	This digit will classify the bit according to bearing/seal type and special gauge wear protection as follows:
	1. Standard open bearing roller bit
	2. Standard open bearing roller bit for air drilling only
	3. Standard open bearing roller bit with gauge protection which is defined as carbide inserts in the heel of the cone
	4. Ball & roller sealed bearing bit
	5. Roller sealed bearing bit with carbide inserts in the heel of the cone
	6. Journal sealed bearing bit.
	7. Journal sealed bearing bit with carbide inserts in the heel of the cone.

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