

The Basics of Boring Rock

Proper equipment and tool selection is critical to successfully bore rock. In general, a mud motor is the industry wide accepted method to effectively and efficiently bore rock. The key to effective mud motor use is obtaining sufficient volume from the mud pump. The mud pump size (pumping capacity in GPM) will determine the size of mud motor that can be used. The larger the mud pump the greater the capability to make larger bores in rock. Ideally torque and thrust capacities of a boring machine should meet or exceed the needs of a rock bore. The following equipment and tool packages are typically used on intermediate sized drill rigs in the HDD industry.

Mud Pump Size (GPM)	25-40	50-80	75-120	100-160	175-250
Tools					
Motor Size (inch OD)	2 7/8 Low Flow	2 7/8	3 3/4	3 3/4 Full	5
Motor Tq. (ft/lb)	143	190	435	764	1700
Motor speed (RPM)	185-300	250-400	210-350	74-180	140-210
Bit Size Range (inch OD)	4 1/2	4 1/2 - 4 3/4	4 3/4 - 5 7/8	4 3/4 - 5 7/8	5 7/8 - 7 7/8
Max Back ream (inch OD)	8 - 10 5/8	8 - 12 1/4	8 - 17 1/2	8 - 17 1/2	8 - 17 1/2
Min drill rod (inch OD)	2 1/8 - 2 3/8	2 3/8 - 2 7/8	2 7/8 - 3 1/2	2 7/8 - 3 3/4	3 1/2 - 4 1/2
Bore length (feet)	50/500	100/1,500	300/2,000	400/2,500	400/2,500
Rock Hardness (PSI)	8,000	10,500	All Formations	All Formations	All Formations
Recovery and Cleaning System {Mud Mizzer}					
System requirements (GPM)	60	100	150	250	250
Mud Mix System (Gallons) {Mud Maker}					
System requirements	300-750	750	1,500-2,000	2,000	2,000

- **Guidance:** On installations where normal walk over location methods are not suitable or where greater accuracy of bore direction is required, **INROCK®** offers a steering system with "TruTracker" along with engineering services to assist the contractor.
- **Training services:** Boring rock is a knowledge intensive operation. To assist an operator in learning to bore rock, **INROCK®** offers an onsite training program. **INROCK®** can assist an operator in bidding prospective jobs with a suggested time/cost estimate based on operator input such as length of bore, hardness and type of rock (very important) and equipment resources.

INROCK® offers a complete line of services, down hole tools and equipment (sales and rental) that will assist the contractor to successfully bore in rock.