

Wire Line Drilling

- Wire-line core drilling is a special type of core drilling, most commonly used for minerals exploration.
- While drilling in medium hard and soft formations as are usually encountered in coal areas (sand stone, shale and coal) it is seen that, in deeper holes, more time is spend in hoisting and lowering of drill string, for taking out core sample after every three meter run in comparison to the time spend in cutting the three meter depth.
- With the objective of cutting the down time spend in hoisting and lowering of the drill string, the wire line system of drilling was developed.
- In drilling with conventional equipment, the entire drill string with core barrel is required to be hoisted out of the borehole after every three-meter run to take the core sample out, and again lowered back with the drill string, to start the next run.

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- With wire-line drilling, a barrel of core can be removed from the bottom of the hole without removing the drill rod string assembly.
- When the driller wants to remove the core, an overshot is lowered on the end of a wire line.
- The overshot attaches to the back of the core barrel inner tube and the wire line is pulled back and the inner tube disengages itself from the barrel.
- For wire-line drilling, the rods are made of fine high-tensile steel. This makes them thin, so that the core can be as large as possible.

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- In this process most of time is available for drilling and so speedier progress can be made with the same time spent in actual drilling.
- Hoisting of the drill string is required to be done only when the bit has to be changed.
- Wire line core drilling equipment is specially suited for drilling in coal formations, where the drilling depth involved are over about 200 meters

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- It employs the drilling of boreholes with wire-line core-barrel drill-string equipment.
- Normally core barrels of 0.5 m to 3 m length are employed.
- Core size less than BX is not possible with wire line coring equipment which is there for used for drilling holes of NX and BX size only.
- The speed of drilling with this equipment is nearly 80 m per shift (8 hours) in the types of rock met within the coalfields.
- All the drill rods need to be withdrawn to the surface only when the bit has to be changes.

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- Wire line drilling is possible up to a depth of 1000m.
- As stated earlier, the rods used for wire line drilling have specifications as laid down in "Q" series decided by DCDMA.
- Ordinary drilling equipment can be adopted to wire line drilling and hoisting with suitable modifications.

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- **Wire-line cable:** A wire rope 3/16 in or 1/4 in (4.8 mm or 6.4 mm) in diameter; used to handle the inner tube of a wire-line core barrel.

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- **Wire-line core barrel:** Double-tube, swivel-type core barrel: available in various outside diameters corresponding to sizes of diamond- and rotary-drill boreholes; designed so that the inner-tube assembly is retractable.
- At the end of a core run, the drill string is broken at the top joint so that an overshot latching device can be lowered on a cable through the drill-rod string. When it reaches the core barrel, the overshot latches onto the retractable inner-tube assembly, which is locked in the core barrel during the core run.
- The upward pull of the overshot releases the inner tube and permits it to be hoisted to the surface through the drill rods; it is then emptied and serviced and dropped or pumped back into the hole, where it relocks itself in the core barrel at the bottom.

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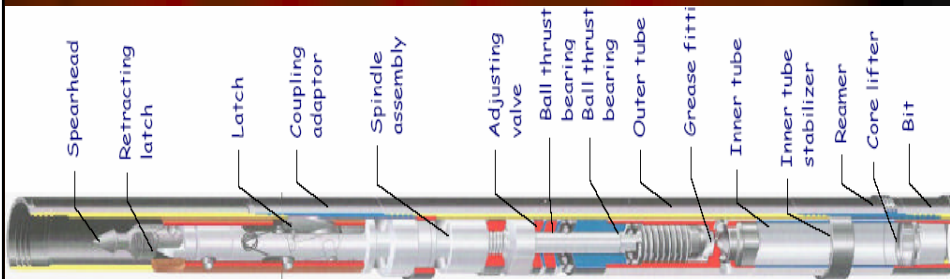
- **Wire-line coring** is the act or process of core drilling with a wire-line core barrel.

CORE BARRELS						
Series	AQ	BQ	NQ	HQ	PQ	SQ
Hole diameter (mm)	48	60	75,8	96	122,6	146
Core diameter (mm)	27	36,5	47,6	63,5	85	102
DRILL RODS						
Series	AQ	BQ	NQ	HQ	PQ	SQ
Ext diam (mm)	44,5	55,6	69,9	88,9	114,3	139,7
Int diam (mm)	34,9	46	60,3	77,8	103,2	125,4
Weight (kg/m)	4,7	6	7,8	11,5	17,4	24,3
CASINGS						
Series	AW	BW	NW	HW	PW	SW
Ext diam (mm)	57,1	73	88,9	114,3	139,7	168,3
Int diam (mm)	48,4	60,3	76,2	101,6	127	152,4
Weight (kg/m)	5,7	10,4	12,8	16,8	21,4	31

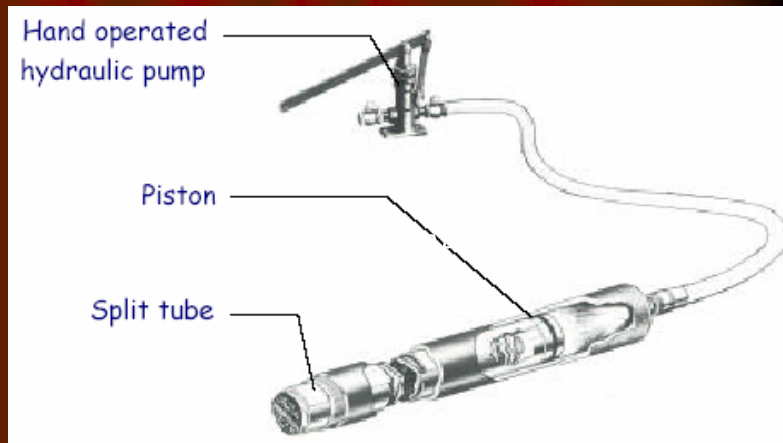
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- **Wire-line drill rod:** Drill rod having couplings that are nearly flush on the inside and designed so that the inner tube of a wire-line core barrel and overshoot assembly can be run inside the rod.

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Triple tube core barrel