

NOVIN COMPOSITE



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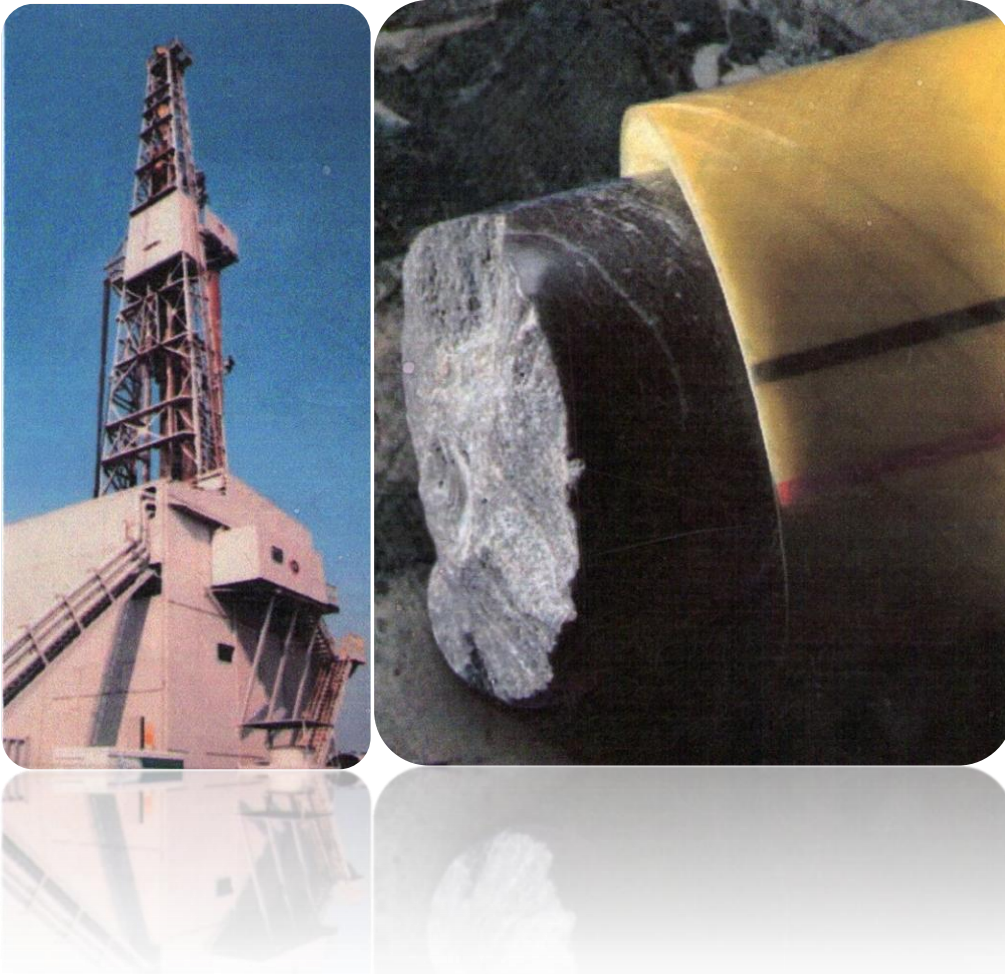
GRE PIPE FOR CORING WITH METALIC CONECTIONS (FIBERGLASS INNER TUBE)

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1. Scope

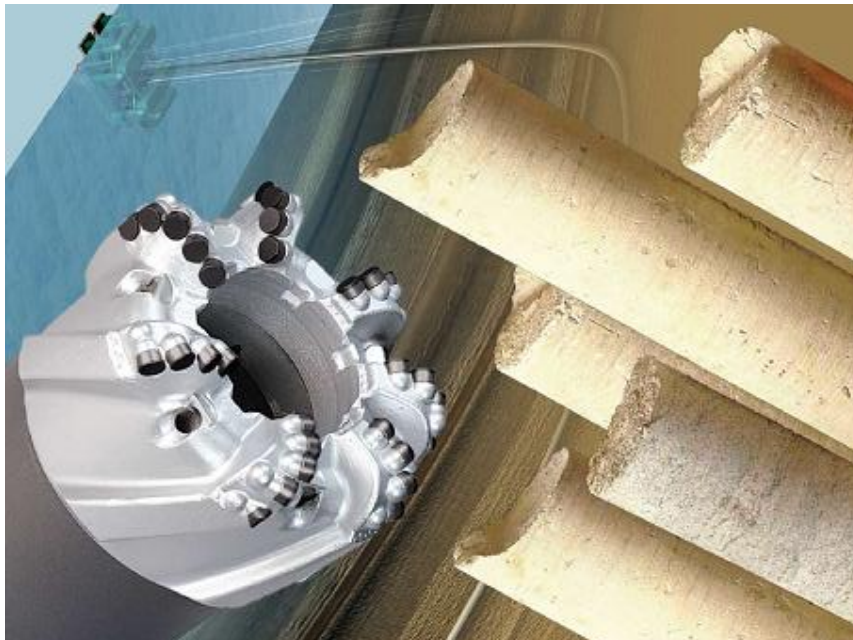
Many reasons, as well as demand of the petroleum geologists for undisturbed core samples and safe transportation from the rig site to the laboratory, leading coring service company wanted to use specific epoxy pipes as inner core barrel for this purpose.

This catalog contains the advantages of fiberglass inner core barrel, production method, Dimension and specification of these pipes manufactured by NOVIN COMPOSITE Co.



2. Advantages of fiberglass coring inner tubes

- Corrosion free material, so no special protection necessary, also not during storage.
- Chemical resistant to additives in the drilling fluids.
- Specific gravity only 1850 Kg/m³, so light in weight and easy to handle and transport.
- Fiber tubes are easy to cut with no risk of dangerous sparks.
- Fiber tubes are non-toxic, so they can be used for storage of the core and therefore saving wooden crates.
- They have low friction coefficient so:
 - Core penetration is easy and more core footage per run saving expensive rig-time
 - Less core jamming
 - Faster penetration rates
 - Disturbing of the core sample is avoided
- Fiber tube inner core barrels can be used for hard and unconsolidated cores, while the soft core can also be frozen inside the fiber tube.
- Possible recovery of the nipples, when steel coupling nipples are used.
- Preventing damage to steel nipples because of small Young modulus of composite compared to steel.



3. Method of production

The process is manufacturing of an inner tube element made of synthetic resin for a double tube coring apparatus provided for deep boring. The tube element is provided with coupling nipples (box & pin) for connecting it to other inner tube elements. Fibers coated with synthetic resin are wound helically onto a cylindrical mandrel so as to overlap each nipple.

This process gives the tube element a higher strength than that of glued nipples. According to a feature of the process, the fibers are wound in the form of twisted fiber webs crossing each other, so that the crossing angle is comprised between 40 to 60 degree in order to grip a multiplicity of ribs or corrugations of the nipple.

It has surprisingly been found that the inner tube elements according to this manufacturing method have a bursting, collapsing and tensile strength which is quite comparable to that of an inner tube made of steel, in spite of the high temperatures which prevail in the boring wells in which the coring apparatuses are used.

Due to the fact that they are anchored to the twisted glass fibers, the coupling nipples of usual size (4 inches) are capable of resisting enormous tractions of three to ten tons which may occur in deep borings, without danger of shearing or deformation, in spite of the high temperatures prevailing in the wells wherein these tubes are used. These temperatures may reach 80.degree. C. at a boring depth of about 2000 meters and even more than 100.degree. C. at a boring depth of about 3000 meters.



4. Raw materials

No.	Material	Type
1	Resin	Epoxy resin
2	Fiberglass	C glass veil/ C Glass Chop strand mat/EDR Glass Direct roving/ EDR Glass

5. Dimension and specification

Dimensions					
Core barrel size(barrel×core)		$4\frac{3}{4} \times 2\frac{5}{8}$ (in × in)		$6\frac{3}{4} \times 4$ (in × in)	
Parameter		Imperial	metric	Imperial	metric
Outer barrel	Outside	$4\frac{3}{4}$ in	120.7 mm	$6\frac{3}{4}$ in	171.5mm
	Inside	$3\frac{3}{4}$ in	95.3 mm	$5\frac{3}{8}$ in	136.5 mm
Fiberglass inner barrel	Outside	$3\frac{1}{4}$ in	82.6 mm	$4\frac{3}{4}$ in	120.7 mm
	Inside	$2\frac{7}{8}$ in	73 mm	$4\frac{1}{4}$ in	108 mm
Maximum OD (Fiberglass inner barrel)		–	89 mm	–	134 mm
Core size		$2\frac{5}{8}$ in	67 mm	4 in	101.6 mm
Length (ft.)		30 ft.	9.14 m	30 ft.	9.14 m
Nominal wall thickness (mm)		–	4.9 mm	–	6.2 mm
Weight per 30 ft.		–	29 Kg	–	49 Kg

Mechanical Properties		
property	unit	value
Axial tensile strength	Tons	8.7, 16.5
Axial tensile modulus	MPa	12500
Axial bending strength (beam)	MPa	100
Hoop tensile strength	MPa	480
Hoop tensile modulus	MPa	23250

Physical Properties		
property	unit	value
Thermal conductivity	W/mK	0.3
Thermal expansion coefficient	mm/mmC	2×10^{-5}
Flow coefficient	Hazen-williams	150
Density	Kg/m ³	1850
Passion's ratio	-	0.4
Barcol hardness	Barcol	50

6. Product feature

- Low temperature:
An advantage of these pipes is that it does not become brittle at extremely low temperature. Freezing of a soft core with liquid nitrogen at -196°C (-320°F) is possible.
- High temperature:
Fiberglass inner core barrels can withstand contact temperatures as high as 120°C (248°F).
- Color coding line:
All pipes have color coding lines over the full length of fiber tubes to understand the direction.
The red and blue lines are inerasable providing the following advantages:
 - Handmade color coding on site can be eliminated.
 - Mistakes in color coding cannot occur.
 - Disappearing of making is impossible.







Novin Composite Sadra

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