



DURAFIBER-X 3MM:

Strengthening Cement and Reducing Losses Through Powerful Chemical Bonds

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A MULTIFUNCTIONAL FIBER TECHNOLOGY

Durafiber-X is the next generation fiber technology transforming oilfield cementing operations. Thanks to a high fiber count, excellent suspension properties, and unique chemistry, Durafiber-X significantly increases the mechanical properties of cement and effectively seals formation fractures, dramatically improving top of cement, lost circulation control, and fluid loss. Based on Polyacrylonitrile (PAN) acrylic obtained from the reaction of acrylonitrile monomers, Durafiber is the precursor to carbon fiber and the only multifunctional fiber technology available in the market today.

THE CHEMISTRY OF STRONGER CEMENT

Durafiber-X 3mm has an extremely high fiber count: Upward of 1.3 billion fibers (3mm), which is approximately 10x the number of fibers per pound of polypropylene and even higher than glass fiber and basalt. With a specific gravity of 1.17, Durafiber-X also does not float, nor does it sink, suspending itself evenly throughout a mixture. When blended with cement, unlike inert fibers, Durafiber-X bonds actively with cement. The bonding mechanism is a combination of chemical and physical interactions:

- **CHEMICAL AND IONIC INTERACTION:** The fiber's PAN acrylic surface chemistry features a free-standing carbon ion. This allows it to chemically react and bond with the cement during the hydration process.
- **PHYSICAL INTERLOCKING:** As the cement hydrates, it forms a matrix (C-S-H) that physically interlocks with the vast number of fibers, creating an incredibly strong and durable composite material. As a result, a highly durable, crack/stress/strain resistant, and tensile/flexural modulus cement forms, helping to slow down losses.

Durafiber-X 3mm can be dosed in a bulk plant for consistent loadings, or hand dosed onsite in cement and spacers. This plus its strength make it the best possible fiber replacement for rebar downhole.

VERSATILITY AT ITS FINEST

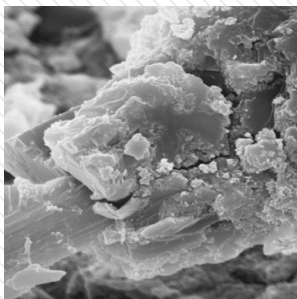
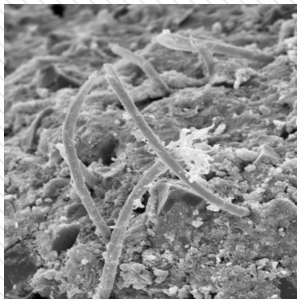
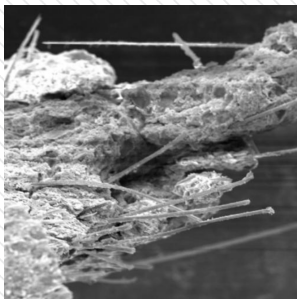
In addition to its ability to prevent lost circulation and create incredibly ductile cement, Durafiber-X also has a high thermal resistance (600°F+) and a high chemical resistance to acids and bases for CO₂/H₂/H₂S environments. It is viable in all forms of cementitious applications with its bonding/mechanical properties and offers particularly dramatic improvements for areas of lost circulation in porous formations. Durafiber-X is also highly compatible with additives like CrackAttack, which is often used in similar cementitious applications.



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ENHANCING THE MATRIX

Durafiber-X bonds and becomes a part of the cement matrix during the hydration process.



FIBER CHARACTERISTICS

Material	PAN Acrylic Fiber
Fiber Length	3mm
Acid & Alkali Resistance	Excellent
Specific Gravity	1.17 g/m ³
Decomposition Temperature	330°C / 626°F
Diameter	< 15 microns (1.5 denier)
Tenacity	> 600 MPa
Fiber Color	Natural
Very Large Surface Area to Volume Ratio	

FIBER COUNT COMPARISON

Specific Gravity	AC Products	1.17 g/m ³
	Polypropylene (PP) products	0.92 g/m ³
Thermal Stability / Decomposition Temperature	AC products	330°C / 626°F
	PP products	160°C / 320°F
Fiber Count (per 1lb of fiber)	3mm Acrylic	1.3B fibers per pound
	3mm PP	160M fibers per pound
	6mm Acrylic	650M fibers per pound
	6mm PP	80M fibers per pound