

3M Technologies for Flow Assurance



Keep Your Profits Flowing

3M

As the search for oil and gas moves farther offshore into deeper and more hostile environments, ensuring a reliable flow of product has become increasingly challenging.

High pressures, cold temperatures and corrosive chemicals combine to increase viscosity and deposition, restricting flow – all while placing enormous demands on lines, risers and equipment.

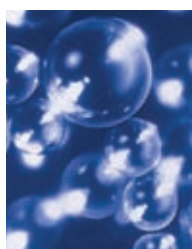
To help you address these issues, 3M offers a variety of proven technologies, all designed to help keep your product – and your profits – flowing.



Pipeline Insulation

3M™ Glass Bubbles for High Performance Syntactic Foams

3M™ Glass Bubbles are inert particles that are compatible with commonly used components of insulating and buoyancy systems. What's more, they are virtually insoluble in water – providing excellent utility in offshore applications.



At the low temperatures and high pressures encountered in deepwater environments, hydrates and asphaltenes can quickly form deposits that clog flowlines. Syntactic foam insulation made with 3M™ Glass Bubbles is a proven, cost-effective solution for maintaining temperature in pipelines and risers, to help prevent deposition and scaling.

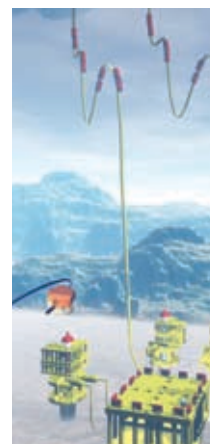
The high strength and low thermal conductivity ($0.06 - 0.2 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ at 0°C) of 3M glass bubbles make them ideal additives in pipeline and riser insulation. They are compatible with most resins, including polyurethane, epoxy and polypropylene – three commonly-used insulating materials. In addition, their low density allows them to help with both insulation and buoyancy in production risers.

Buoyancy Modules

3M™ Glass Bubbles for High Performance Syntactic Foams

Buoyancy modules prevent the steel casing from collapsing under its own weight at depth, and protect the drill string against ocean currents. When 3M™ Glass Bubbles are formulated with resin, the resultant syntactic foam has a high strength to density ratio to provide maximum net buoyancy for a given depth rating.

3M glass bubbles are available in pressure ratings ranging from 250 psi to 18,000 psi, and densities ranging from 0.125 g/cc to 0.6 g/cc. Incorporated into syntactic foams, this makes them excellent components in buoyancy modules, buoys, moorings, or buoyancy blocks for undersea vehicles.



Pipeline Coatings

Internal Flow Efficiency Coatings

3M™ Scotchkote™ Pipelinings (formerly Copon™ Pipelinings) have been used for over 50 years to create smooth, defect-free linings on the interiors of gas and oil pipelines – increasing the flow of product, while providing internal corrosion protection during storage and commissioning.



By reducing the energy required to move product through the pipeline, the use of Scotchkote pipelinings can quickly pay for itself through reduced pump energy costs. In many cases, it may also reduce the number of compression stations required.

External Corrosion Coatings

3M™ Scotchkote™ fusion-bonded epoxy coatings are designed for optimal corrosion protection in even the harshest environments, including saltwater, wastewater, petrochemicals and corrosive gases.

Scotchkote fusion bonded epoxy coatings protect against all the corrosive elements associated with underground or underwater use. The coatings excellent physical properties minimize damage during transit, installation and operation.



Fluid Control

CUNO Filter Systems for Waterflood, Well Completion, Lube Oil & Glycol Dehydration*

High performance liquid filter systems from CUNO, a 3M company, help protect against plugged formations caused by waterflood impurities, and also help keep downstream pumps and valves clear and free flowing.

Field-proven CUNO® PolyKLEAN™ filter cartridges deliver consistent filtration through the life of the filter, increased surface area for extended filter life, and low initial pressure drop for enhanced flow. The filter's extended service life results in fewer filter changeouts, while its enhanced flow characteristics can typically reduce the number of filters required to achieve a given flow rate – helping to significantly reduce total filtration cost.

* CUNO Filter Systems are made and manufactured by CUNO, a 3M company, and/or its subsidiaries and affiliates. Please contact CUNO for information about or to buy CUNO products.



Ideal for demanding offshore applications, the new CUNO High Flow Filtration System delivers outstanding high flow performance in a compact housing design. By providing flow rates up to 500 gpm per element, the space-saving CUNO High Flow filter system can accommodate your flow requirements with as few as 1/10 the number of elements needed by competitive pleated cartridges – saving space and reducing capital costs.

Improving productivity and dependability

Pipeline Integrity

Dyneon™ PVDF for Subsea Riser Liners*

Dyneon PVDF is a versatile, cost-effective fluoropolymer used in pumps, valves, pipes, tubes and fittings that require outstanding chemical, temperature and abrasion resistance. Various grades are available that can be processed by injection molding, compression molding, blow molding and extrusion.

In deepwater environments, risers take a lot of punishment – from wide temperature variations to the torsional stresses inherent in offshore wells. Dyneon PVDF is a high-performance fluoropolymer, used as a liner material in flexible flow lines. Although Dyneon PVDF is tough enough to resist abrasion from contact with steel spiral reinforcing bands, it is also flexible, to prevent cracking. In addition to its excellent mechanical strength, it also displays outstanding oil and chemical resistance, as well as temperature resistance to 150°C (302°F). All of these features make Dyneon PVDF ideal for ensuring pipeline integrity.

* Dyneon Fluoropolymers are made and manufactured by Dyneon LLC, a 3M company, and/or its subsidiaries and affiliates. Please contact Dyneon for information about or to buy Dyneon products.

Scotch® High Strength Filament Reinforced Tapes for Armored Flexible Piping

Scotch High Strength Filament Reinforced Tapes are used to contain the steel bands or wires used for armoring flexible flow lines, risers and umbilicals during the manufacturing process. Designed to be highly resistant to cuts and abrasion, these tapes also offer high adhesion and tensile strength with low elongation, so they stay in place. And they come in long length rolls that will increase your pipe production productivity, while minimizing your changeover time.



Committed to your Success



Every day, 3M products and materials are used by customers in over 30 oil and gas-producing regions around the world. 3M technologies serve a broad range of industry needs, from enhancing recovery and improving productivity to protecting worker comfort and safety.

To make it easier for our customers to access these technologies, 3M has established an Oil and Gas Customer Center in Houston, Texas.

Here, our experienced team of industry experts can help you quickly tap in to a wealth of proven 3M technologies and products for oil and gas applications.

What's more, we can work with you to develop new solutions to your toughest business challenges, through services that include: application development, technical service, training and much more.

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