

Compression PackTM

Aerogel Pipe-In-Pipe Insulation

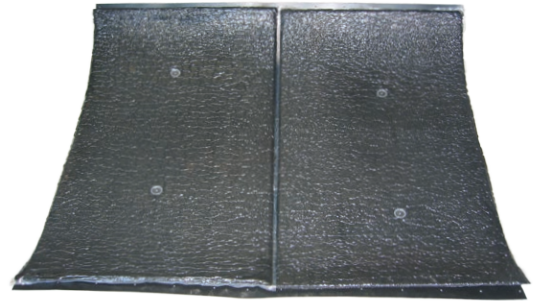


At Johns Manville Industrial Insulation Group, we are committed offering innovative industrial insulation solutions. That's why we have partnered with Cabot Corporation to bring you the Compression Pack™, a pipe-in-pipe insulation system designed specifically for the demanding rigors of subsea flow lines. We have incorporated Cabot's unique aerogel insulation technology into a ready-to-use package that is custom-designed to make installation faster and more reliable.

What is a Compression Pack?

The Compression Pack is an aerogel insulation system designed specifically to insulate subsea pipe-in-pipe flow lines that operate at temperatures ranging from -200°C to 200°C/-325°F to 390°F.

We manufacture the Compression Pack by vacuum-packaging pure, opacified aerogel granules into custom-sized sheets and adhering the sheets to a durable, polymer jacket with an integrated fastener system. The Compression Pack arrives on the fabrication site ready to install and requires no cutting, taping, or on-site fabrication. The unique mechanics of the Compression Pack system typically result in a faster installation that requires less rework than alternative products. The HDPE sheath ensures the system has a tight OD tolerance for trouble-free sleeving, and this is all coupled with high insulating value provided by Cabot's proprietary aerogel technology.

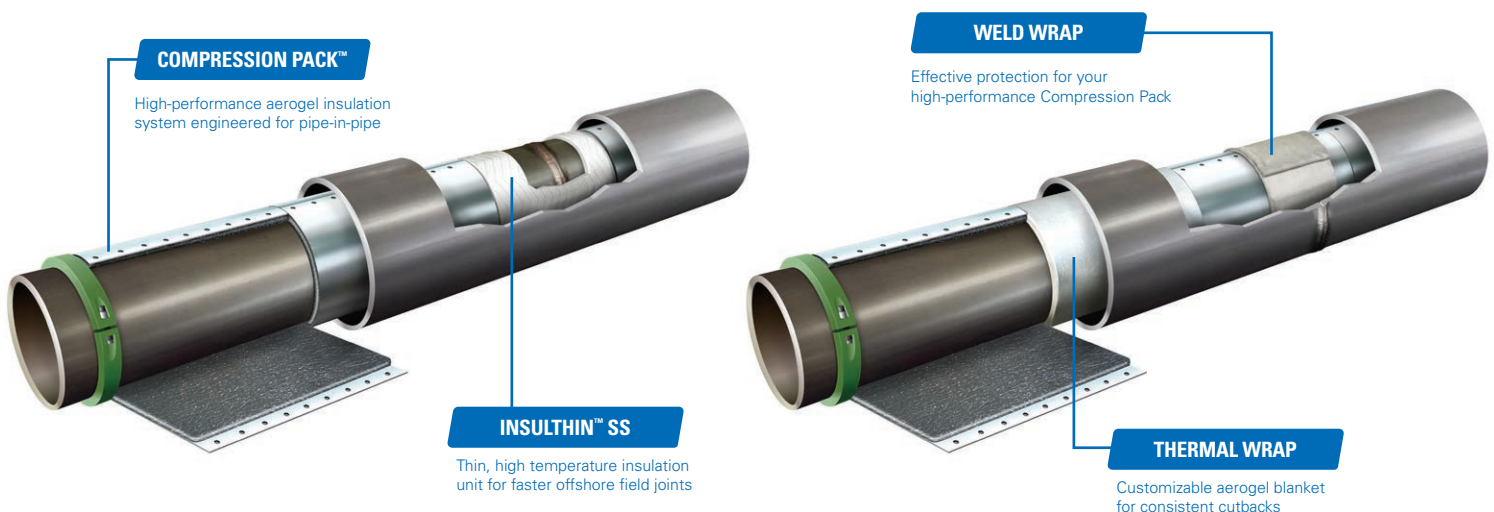


Each Compression Pack is designed to the specific thermal requirements of the project. The Compression Pack's thickness can be manufactured in 0.1mm increments, optimizing performance and saving money by providing only the insulation you need for the application. Furthermore, the width of the Compression Pack is designed to the centralizer spacing of your specific project.

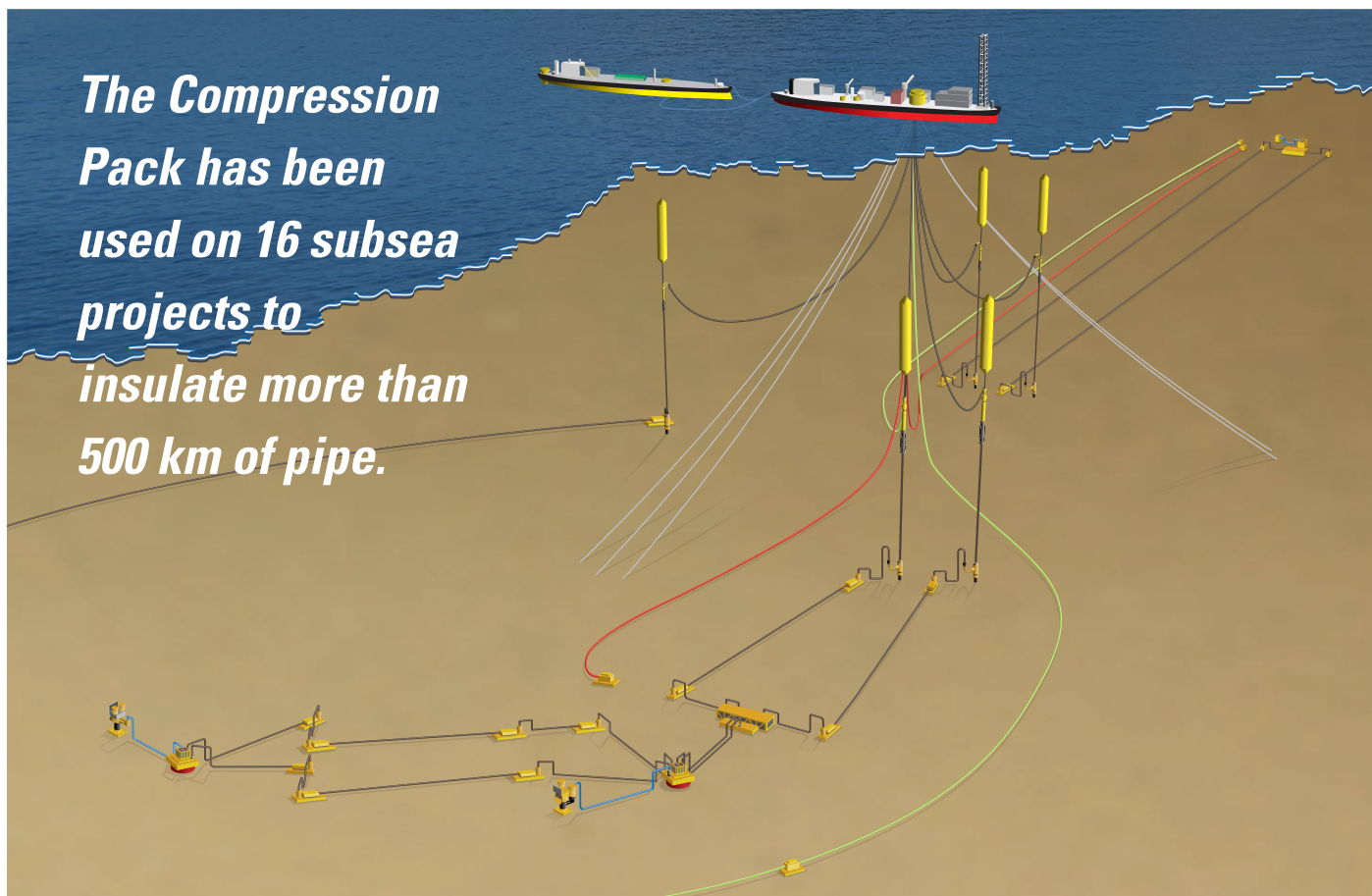
How do they work?

The Compression Pack is the keystone to a four-component insulation system that is designed to help expedite pipe-in-pipe insulation installation and sleeving. Simply wrap the Compression Pack around the pipe, engage the fasteners, and activate the Compression Pack by penetrating the vacuum seal. Once activated, the aerogel insulation will expand, filling any air space between the pipe and the sheath as well as any potential space between the butted joints of the Compression Packs. The HDPE sheath holds the assembly in 10% compression against the inner pipe throughout this process, reducing snagging and pullouts by protecting the insulation during sleeving.

The other three components to the Compression Pack system are designed to help facilitate a faster, more effective field joint installation. First is InsulThin™ SS; this microporous blanket insulation is intended to insulate the welds of the inner pipe. It can be installed immediately after the weld is complete, while the pipe is still hot, eliminating the need to wait for the pipe to cool before installation can continue. The second component is Thermal Wrap, an aerogel blanket engineered to insulate the inner pipe when the space is too small to accommodate the length of an entire Compression Pack. The third, and final, component to the system is Weld Wrap. This is a thin, high-temperature protective layer that wraps around the installed Compression Pack at the weld joints of the casing pipe. It is designed to protect the Compression Pack from the heat at the weld-joints during field jointing operations.

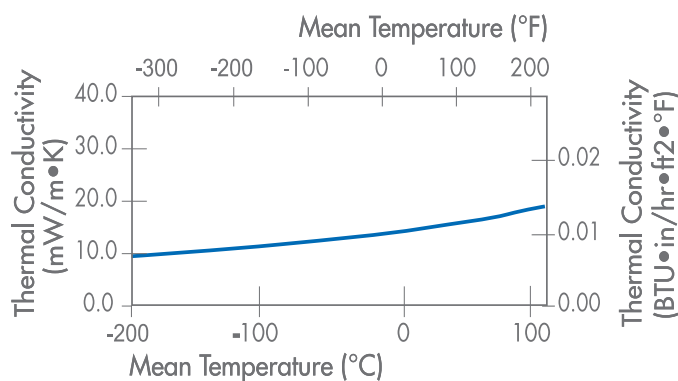


The Compression Pack has been used on 16 subsea projects to insulate more than 500 km of pipe.



The Benefits of the Compression Pack:

- Ultra-low conductivity for smaller casing pipes and longer flow lines
- Cleaner, faster installation
- Longer cool-down times
- Precise outer diameter after installation
- Validated project life of 25-years or more
- Proven installation in reel lay, J-lay, and S-lay



Thermal Conductivity

For mean temperatures outside ranges shown, please contact Johns Manville for more information, as performance varies based on material grade and specific application.

































Why Cabot Aerogel?

Cabot Corporation is a global supplier of performance chemicals with market leading positions in particles for reinforcement, rheology control, and insulation. Their proprietary process for continuous aerogel production under ambient conditions has been producing consistently high-quality material for 15 years. Cabot's unparalleled experience in particulate aerogel ensures that the Compression Pack meets your expectations for performance and reliability.

A Proven History of Performance:

The Compression Pack system has been used successfully in over 500 km of PIP applications since 2008. Our end-to-end project support team will ensure that the product is delivered on time and that your on-site fabrication staff will have the resources required to complete the job safely and efficiently. We've combined Cabot's aerogel insulation technology with the exceptional product quality and customer support that are key components of working with Johns Manville Industrial Insulation Group.



Delivery	EPIC/Contractor	Operator	Development Name	Pipe Size	Pipe Length	Solutions
2008			Danny	8"	60 km	Compression Pack
2009			Chinook	9"	37 km	Compression Pack
2009			Block 31 NE	10", 12"	56 km	Compression Pack Weld Wrap Field Joint System
2010			Galapagos	8"	31 km	Compression Pack Weld Wrap Field Joint System
2010			Kizomba Satellites Phase 1	8", 10"	35 km	Compression Pack
2010			Gladden	5"	34 km	Compression Pack Weld Wrap Field Joint System
2010			Smorbukk Extension	10"	6 km	Compression Pack Weld Wrap Field Joint System
2010			Jasmine Riser	16"	110 km	Compression Pack
2011			Devenick	8", 10"	37 km	Compression Pack Weld Wrap Field Joint System
2011			Gaupe	8"	14 km	Compression Pack Weld Wrap Field Joint System
2011			Islay	6"	6 km	EHT Compression Pack Weld Wrap Field Joint System
2012			Clipper	5"	25 km	Compression Pack Weld Wrap Field Joint System
2012			Brynild	6"	39 km	Compression Pack Weld Wrap Field Joint System
2013			Dalmatian	8"	34 km	Compression Pack Weld Wrap Field Joint System
2014			Kizomba Satellites Phase 2	8", 10"	37 km	Compression Pack Weld Wrap Field Joint System
2016			Culzean	6"	3.7 km	Compression Pack Weld Wrap Field Joint System



717 17th Street, Denver, Colorado 80202
www.jm.com/industrial