Composite flexibles rule in deepwater fields

20% lower total installed cost
vs. conventional flexibles

30% lighter weight
vs. conventional flexibles

Enabling 15 Ksi beyond 3,000 m

150 °C capability

Driving cost efficiency in deeper water
Next-generation flexible pipe
Increased productivity in deeper waters

Low oil prices, along with cost and schedule challenges continue to weigh on the oil and gas sector globally, providing some of the most difficult challenges in the industry’s history. Meanwhile, global offshore reserves are also shifting to more remote locations that offer extremely complex and demanding conditions. Vital new opportunities exist in deeper waters, most notably in the Gulf of Mexico and West Africa, but technological limitations can impede or block progress. Flexible risers provide enabling benefits in this area, increasing subsea-layout versatility, supporting ancillaries such as buoyancy, clamps and tethers. But, as noted, they are characterised by extremely complex and demanding conditions.

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- GE’s new composite flexible pipe changes that.

Composite flexible pipe

Conventional flexible pipe contains multiple layers that perform separate, traditionally functionally and conventionally, design may be needed for each. Local design, which is inherently more expensive, can be more efficient in isolating load. The additional weight of flexible production units is not a factor in this design, but also the transportation, installation, and the infrastructure associated with the learning curve. Composite flexible pipe solves this problem by replacing the metallic pressure armor layer with an innovative composite bonded laminate. This core design change consolidates all the recognized system benefits of the flexible solution with a lightweight structure that is less dependent on access.

The new composite bonded armor makes the pipe 30% lighter than conventional flexible, and more resistant throughout the entire supply chain. More pipe can be stored and transported per reel, and, critically, field configurations can be significantly streamlined by reducing or eliminating the need for costly support equipment such as buoyancy, clamps and tethers.

Taking it further

We are also delivering the industry’s first 15,400 psi capacity for flexible risers, flowlines, jumpers, risers and flowlines. Offshore operators now have a cost effective and reliable way to improve their reach into deeper waters and more frontier environments.

This enabling technology is an innovative high pressure, high-temperature barrier made from a new grade of copolymer. This is suitable for both conventional and composite flexible solutions.

Key advantages:

- Does not suffer from microsizing at high pressures
- Contains no plasticizer, so there’s no risk of shrinkage
- Is unaffected by impact modifiers, because no ductile brittle transition is lower than -40 °C
- Contains excellent chemical resistance and stability up to 150 °C

GE’s portfolio of flexible pipeline solutions draws on over 50 years of research and development, material science, and innovation. Our Flexibles are installed in some of the most extreme conditions across all major oil producing regions, including the Gulf of Mexico, Asia Pacific, Middle East and Sub Saharan Africa.

Our take a comprehensive approach to flexible pipe solutions—providing custom design and manufacturing as well as expert installation and long-term management services to ensure optimized safety, efficiency and productivity over the full-life of the flexibles.

With two Innovation Centers specializing in flexible pipe, and the unique shared knowledge and resources of the entire GE Store, we are continuously investing in technology. And in collaboration with our customers, we are working through common challenges, but also pushing technological boundaries and driving safe, efficient and viable solutions for the more extreme challenges yet to come.

GE’s global resources for flexible pipe solutions:

- 2 major manufacturing facilities in the UK and Brazil
- 1,500 employees worldwide
- 7 dedicated regional support teams worldwide
- 170+ dedicated annual production capacity
- 1,500 nkm manufactured to date
- 3,500 internal diameter product range
- 5,000 nkm in water depth capability
- 12,000 psi pressure capability

Composite flexible pipe - Key advantages:

- No need for impact modifier additives, because its performance with excellent fatigue ductile brittle transition is lower than -40 °C
- No plasticizer, so there’s no risk of shrinkage
- Key advantages:

- New composite manufacturing module at our Newcastle manufacturing facility will be fully operational in 2017, with a 570 nkm* annual production capacity
- 1,500 employees worldwide
- 2 major manufacturing facilities in the UK and Brazil
- 7 dedicated regional support teams worldwide
- 170+ dedicated annual production capacity
- 1,500 nkm manufactured to date
- 3,500 internal diameter product range
- 5,000 nkm in water depth capability
- 12,000 psi pressure capability
- *normalized km of 8-inch ID pipe

Quality is defined by our customers. As they move into deeper water and more remote locations, they rely on our pipe to withstand extreme temperatures, pressures, physical stresses, and increasingly corrosive environments. Everything we design, engineer and manufacture is customised to meet the specific requirements of each project — tested to the highest standards and meeting all applicable regulations.