



ICEFLEX™

**The marine energy cable which resists
ultra-cold Arctic temperatures**

Safe and secure Arctic development...

The Arctic is currently the source of 10% of the world's oil production and 25% of its gas production, with Russia alone producing 80% of its oil and 99% of its gas in high northern latitudes. Already, hundreds of oil and gas production sites are operating offshore and onshore in the North American and Eurasian Arctic regions.

The Far North contains 22% of the world's undiscovered recoverable resources.

Dozens of geographical sectors are now being prospected in the Mackenzie Delta–Beaufort Sea Basin, the Sverdrup Basin and the Barents Sea (e.g. the vast Shtokman field).

Once new resources are found, special technologies will be needed to adapt to Arctic conditions to assure safe and secure production, both off and onshore, and ensure environmental safety.

Also, with accessibility and northern shipping lanes opening up, a new generation of ships – including tankers, containerships, LNG carriers, deep-sea drilling and FPSO ships, supply, prospection and scientific vessels, and even cruise ships for tourism – will require advanced shipboard cables to survive in the harsh Arctic climate.



A cable for all seasons, conditions and applications

As a ship designer, engineer, shipyard, installer, or offshore/onshore refinery, you want high-performance marine cables that will:

- meet the challenge of severe cold, storms and iceberg threats
- operate reliably in icy, snowy conditions for a variety of technical applications
- survive in exposed conditions onboard, topside or in frozen ground or permafrost
- adapt to abrupt temperature variations during the Spring and Autumn period
- safeguard the Arctic environment from chemical and biological threats
- protect crew, platform workers and personnel from fire, smoke and dangerous gases
- assure higher productivity and competitiveness in tough conditions
- support all exploration, extraction, refining and transportation activities
- provide sustainable new technologies for the economic viability of Arctic projects



...requires **ICEFLEX™** ultra-cold cable

ICEFLEX™ ultra-cold cable meets the Arctic challenge. It is the first marine energy cable on the market qualified for extremely low temperatures. Normally, cables become stiff and brittle in intense cold. This rubber-based cable remains highly flexible and resistant, while ensuring advanced fire performance.

ICEFLEX™ for shipbuilding and offshore/onshore

Nexans new ultra-cold-resistant rubber cable was designed for all shipboard and offshore/onshore applications. Not only can it maintain its properties down to -50°C , it is also fire-retardant and resists oils and aggressive chemicals and fluids. The ability to withstand these environmental constraints is a major technical achievement which will make it easier to safely develop new oil and gas fields, shipping routes and refineries in the High Arctic.



ICEFLEX™ in two versions

Two products are available: Halogen-Free Flame & Fire-Retardant (HFFR) and halogenated versions, both of which are widely specified in shipbuilding and the oil and gas industry. These products are fully certified by Lloyd's Register, and are now commercially available to shipyards and refinery builders worldwide.

Benefits of Nexans ICEFLEX™ ultra-cold cable

- flexibility and high mobility is maintained down to -50°C and more for the life cycle of the cable
- EPR hydrocarbon rubber insulation combines unique electrical performance with mechanical toughness and resistance to atmospheric agents (ozone, UV, heat, etc.)
- EVA elastomer in the outer sheath resists the deteriorating influence of oils, chemicals, heat and extreme weather aggression
- fire-retardancy: the cables do not propagate smoke, fire, or generate toxic gases for personnel, and corrosive gases which can damage equipment
- fire-resistance: they maintain power supply for vital safety equipment (emergency lighting, alarm systems, fire pumps, communication circuits, etc.)
- high impact-resistance at ultra-cold conditions, meaning that they will neither crack nor break when subjected to sustained or violent physical shock (vibration, operational stress, iceberg impact)
- safety and security for all exploration, extraction, refining and transportation activities



ICEFLEX™, a very low temperature application



Construction details

1. **Conductor:** stranded tinned annealed copper as per IEC 60228, Class 2
2. **Insulation:** halogen-free ethylene propylene as per IEC 60092-351, HF-EPR
3. **Inner sheath:** flame-retardant thermosetting compound
PKCK: halogen-free thermosetting compound as per IEC 60092-359, SHF2
PHCH: low-halogen chlorosulphonated polyethylene as per IEC 60092-359, SH
4. **Aarmor:** metal wire braid as per IEC 60092-350
5. **Outer sheath:** flame-retardant thermosetting compound
PKCK: halogen-free thermosetting compound as per IEC 60092-359, SHF2
PHCH: low-halogen chlorosulphonated polyethylene as per IEC 60092-359, SH

Standard applied

Design guideline:

IEC 60092-354/353/376

Material properties:

IEC 60092-351, insulation, HF-EPR
IEC 60092-359, sheath, SHF or SH

Flame-retardant:

IEC 60332-3-22, Cat. 'A'

Fire-resistant (option):

IEC 60331-21/31

HCI emission:

IEC 60754-1, 0,5% for SHF2, 5% for SH

Smoke emission:

IEC 61034-1/2 for SHF2

Cold properties:

CSA C22,2 No. 03, -50°C cold bend,
-45°C cold impact

For more details about ICEFLEX™, please consult our e-catalogue on www.nexans.com



Global expert in cables and cabling systems

With energy as the basis of its development, Nexans, the worldwide leader in the cable industry, offers an extensive range of cables and cabling systems. The Group is a global player in the infrastructure, industry, building and Local Area Network markets. Nexans addresses a series of market segments from energy, transport and telecom networks to shipbuilding, oil and gas, nuclear power, automotive, electronics, aeronautics, handling and automation. With an industrial presence in 39 countries and commercial activities worldwide, Nexans employs 22,400 people and had sales in 2008 of 6.8 billion euros. Nexans is listed on NYSE Euronext Paris, compartment A.

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