

SUBMARINE TECHNOLOGY
COMPLETE CABLE SOLUTIONS
FOR SUBSEA APPLICATIONS





ABOUT NEXANS NORWAY

Nexans Norway was established in 1915 and is a leading supplier of submarine cables and cabling solutions.

We produce and install power cables and advanced umbilicals to transmit power and signals. Our product range also includes special-purpose cables for direct electrical heating of flow lines, seismic

surveys, controlling remotely operated vehicles (ROVs) and fiber optic cables.

Nexans Norway is part of the Nexans group, one of the world's leading cable manufacturers, with industrial facilities in 40 countries and commercial activities worldwide. Nexans is listed on the Paris stock exchange.



FOCUS ON QHSE

Nexans' focus on health and safety meets the most demanding requirements in the energy, and oil and gas industries.

Our customers' challenges and our participation in large, complex projects often demand innovative solutions from our R&D team. Through our quality management system, we strive to achieve and

maintain our quality standards by concentrating on verification and qualification testing, as well as conformance to recognized international standards.

Our testing services include mechanical, electrical and optical testing. We also provide additional third-party testing upon request.

Our quality standards cover all aspects of our activities, from raw materials to process controls to finished products and documentation. Nexans Norway is ISO 9001, ISO14001 and OHSAS18001 certified.



PRODUCTION FACILITIES

Nexans' expertise center for high voltage submarine power cables and umbilicals is the plant in Halden, in the south-east of Norway.

The plant produces paper insulated high voltage cables, cross-linked polyethylene (XLPE) insulated cables, direct electrical heating (DEH) solutions and umbilicals. The expertise center conducts extensive research and development for all our submarine products.

The plant in Halden was established in 1974 and has

been upgraded continuously to keep up with developments in the offshore industry and in close cooperation with our clients. The high voltage laboratory located in the Halden plant is one of the largest and most advanced in Europe, and features state-of-the-art test equipment for high voltage components according to international standards. The plant has both engineering and mechanical testing capabilities in-house.

Our plant for custom submarine fiber optic cables in Rognan, on the coast of Northern

Norway, has produced specialized telecommunication cables for more than four decades. The plant has deep water quay access and produces submarine communication cables, ROV umbilicals, tethers, and seismic and oceanographic cables.

Nippon High Voltage Cable Corporation in Japan was fully acquired by Nexans in 2017. The production facility, located in Futtsu, Japan, produces high voltage cables for submarine and land applications.



Production facility in Halden, Norway



Production facility in Futtsu, Japan



Production facility in Rognan, Norway

SUBMARINE POWER CABLES

Highly reliable cable solutions are required all over the world to cross fjords and connect countries, offshore wind farms and offshore oil and gas installations. Nexans has made the highest standards in engineering design, quality assurance, testing, and manufacturing the key criteria for our operations.

We have in-house capability to design and deliver turnkey solutions, from R&D to completely installed and commissioned cable systems, including engineering of all required cable laying operations and cable protection work.

Our factories specialize in manufacturing long lengths optimized to suit the load capacity of our dedicated cable-laying vessels and barges.

Nexans offers a full range of cable solutions for high voltage, direct current (HVDC) and high voltage, alternative current (HVAC) applications, and works together with customers to



push technology forward. Our production facilities have been developed to meet customers' needs with solutions for deeper waters, higher voltages and longer lengths.

Our product development is dedicated to creating long lasting subsea power cable systems, designed to withstand high mechanical stresses during laying and operating,

especially when the cable system is to be installed at deep waters.

Strict requirements for reliability demands solutions that are based on long operating experience and extensive testing in the form of mechanical and electrical tests. We deliver complete solutions combining fiber and power in one cable.



Skagerrak 4, the 130 km long subsea high voltage connection between Denmark and Norway, was handed over to Statnett and Energinet in 2014.

SUBMARINE SYSTEM INSTALLATION

As critical elements in any submarine transmission system, it is important that cables and umbilicals are installed properly. With references from more than 1,500 submarine installations, Nexans has the knowledge and equipment to ensure safe installation and protection services.



C/S Nexans Skagerrak

This includes specialized in-house engineering and operations personnel covering all required disciplines to design and execute submarine system installation worldwide including required shore transitions and land cable systems. The specialized installation equipment consists of large capacity, state-of-the art equipment.

C/S Nexans Skagerrak

The C/S Nexans Skagerrak, one of the world's most advanced laying vessels, is purpose-built to install large-sized cables and umbilicals, both in respect of total weight and length. With its large diameter (29 m outer diameter) turntable capable of loading

7,000 tons of cable and its unique cable capstan system, it offers an efficient tool for demanding projects.

Barges

Nexans has two, fully-equipped barges for worldwide transport, storage and laying of high voltage subsea cables, umbilicals and flowlines. The EB 32 has two permanent turntables with a total capacity of 4600 tonnes. The UR 141 has one permanent turntable system with a loading capacity of 7000 tonnes.

Increasing marine capabilities

To meet the increasing global demand for energy, Nexans has invested in a new,

state-of-the art cable-laying vessel. The new vessel encompasses almost 100 years of Nexans' experience in submarine cable installation and brings it to the next level with a high degree of redundancy in power and propulsion. The vessel will target the latest and future developments in HVDC and HVAC cable technology with a loading capacity of 10 000 tones. The vessel is expected to be delivered and start operations within 2020.

Nexans CAPJET trenching system

The Nexans CAPJET trenching system has buried more than 8,000 km of cables, umbilicals



Nexans has invested in a new cable-laying vessel with expected delivery in 2020.

and pipelines since it was first introduced. Originally developed by Nexans for power cable trenching in shallow water, the CAPJET system has been continuously developed to bury cables, steel and flexible flowlines and large diameter oil and gas transport pipelines at water depths down to 1,500 m. It is based on the principle of fluidizing seabed materials, and uses water jetting for both trenching and propulsion.

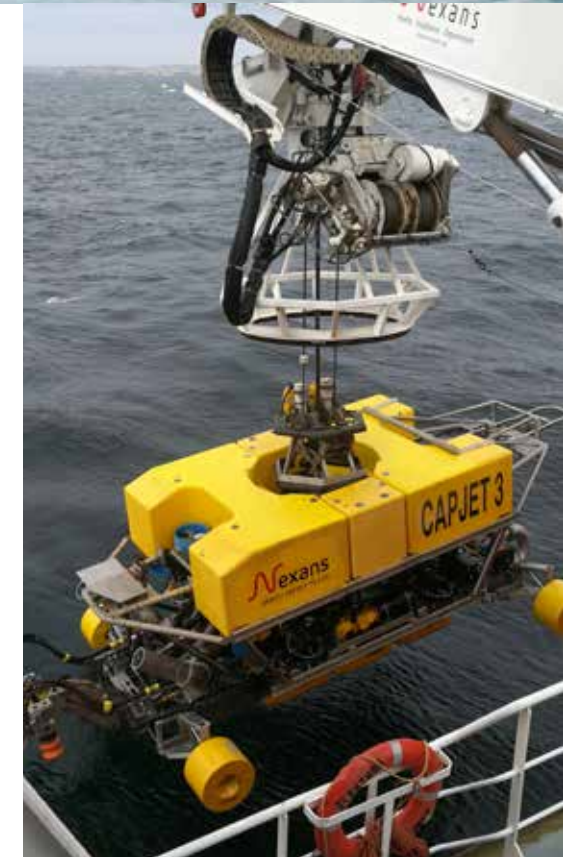
The CAPJET system has been subsequently enhanced with special features for handling hard soil conditions, cable de-burial and other specialized seabed operations.

Nexans mobile high voltage jointing systems

Nexans operates a number of modular jointing spreads for specialized and high quality jointing services. These units are easy to transport and mobilize worldwide covering both project and after-sales needs.

Inspection, maintenance and repair

Nexans provides specialized services for inspection, maintenance and repair of submarine transmission systems for the full lifecycle of the system. This is achieved by utilizing in-house product and installation competency and resources.



Nexans CAPJET trenching system

UMBILICALS

Nexans is a world-leading manufacturer of umbilical systems. We perform every step in supplying these systems from design, engineering and manufacturing to testing, installation and commissioning.

Nexans' umbilicals are used in many applications worldwide: interconnecting subsea installations, connecting subsea installations to fixed and floating platforms, and FPSOs, as well as connecting subsea systems to shore.

We introduced the first steel tube umbilical in 1993 and the first dynamic steel tube umbilical in 1995. Since then, we have supplied more than 3,000 km of umbilicals, including the 145-km long umbilical installed at Statoil's Snøhvit field. Nexans has thorough expertise in umbilical systems for advanced subsea applications, including fiber optic cables, low voltage signal cables, high voltage power cables, and steel tube technology.

A challenge for mature fields is often to maintain operations, as the integrity of the electrical systems deteriorates. In these circumstances, an all-electric umbilical can be installed to secure future operations.

Nexans' broad cable expertise supports the market for subsea power distribution with its need to operate subsea pumps and

processing equipment. Nexans has pushed the technology envelope to realize complex power umbilicals, which combine high voltage cables with the functions traditionally provided by electro/hydraulic umbilicals. This technology has been supplied to BP's King project, Statoil's Tyrihans project and Chevron's Jack & St.Malo project.



The Jack & St. Malo power umbilicals were installed in August 2014 on Chevron's oil and gas fields in the Gulf of Mexico. With a water depth of about 2,400 meters, it represents the deepest installation Nexans has ever developed and delivered power umbilicals for.

DIRECT ELECTRICAL HEATING

Direct electrical heating (DEH) is a flow assurance technology developed to safeguard the well stream through the pipeline to the platform.

Nexans developed this technology in cooperation with Statoil and SINTEF more than 20 years ago. Nexans is the world-leading supplier of DEH systems and has delivered approximately 90% of the DEH systems in operation today.

Our DEH system is designed to heat the pipeline to a temperature above the onset of hydrate and/or wax formation in order to keep the well stream floating through the pipe. DEH systems can be used for continuous heating or easily be switched on and off if needed.

The DEH system includes a riser cable, feeder cable and piggyback cable as well as mechanical and electrical accessories. A feature of the DEH system patented by Nexans is the break detection system (BDS) which is based on fiber optics. The fiber optics can also be used for Distributed Temperature Sensing (DTS).

Nexans' patented integrated protection system (IPS) and mechanical protection system (MPS) can further be used to protect the piggyback cable against trawling or dropped objects. Nexans' DEH systems have been installed and operated successfully in the Norwegian Sea since the first delivery to Åsgard in 2000.

A proven track record in DEH solutions
Nexans delivered the world's longest DEH

cable at 43 km, to Chevron's Lianzi project in 2014. The cable was prepared for the deepest installation to date at 1 070 m, installed offshore Congo and Angola in 2015.

The first phase of the Shah Deniz DEH cables for BP's field in Azerbaijan was delivered in 2014. When in operation the Shah Deniz field will be the world's largest and most complex DEH installation with 10 parallel heated pipelines (over 120 km in total) connected to the platform.



Installation of a subsea junction box

REMOTELY OPERATED VEHICLES

Nexans is an established supplier of underwater control cables to the international ROV market.

We focus on continuous improvement and innovation in materials and manufacturing processes. Our highly dynamic, torque-balanced and compact cables are known for their reliability and robustness. Nexans supplies umbilicals and tethers to most of the major ROV manufacturers and

operators. We have designs for most standard ROVs, and develop systems for new applications to customer specifications.

Our manufacturing capabilities include umbilicals for work and observation class ROVs and trenchers, as well as deepwater umbilicals designed for dynamic applications down to 7,000 meters. Nexans' ROV tether cables are lightweight, neutral, or buoyant for a variety

of underwater applications. Our tethers are designed to be both flexible and durable.

To ensure their longevity, we advise and train users in the handling and maintenance of dynamic cables. Our experienced technicians and engineers regularly conduct courses for ROV operators.



SEISMIC AND OCEANOGRAPHY/HYBRID

Nexans supplies robust and reliable seismic and oceanographic cables for both towed and permanent bottom-laid systems.

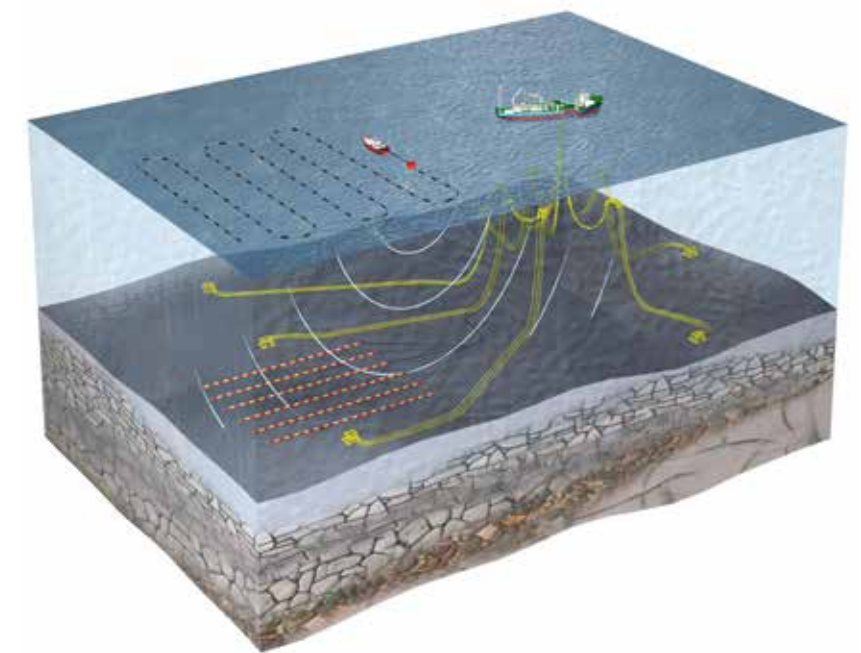
Our bottom-laid systems include fiber optic sensor array cables, backbone cables, and dynamic riser cables, and incorporate design elements from our standard fiber optic submarine applications. We deliver both complete systems and separate cables. The world's record fiber optic riser cable for a bottom-laid system, with 768 fibers, was delivered by Nexans.

Our towed systems include lead-in cables, which are part of our standard product line. For termination and fairing of lead-in cables, we deliver solutions developed both in-house and in cooperation with other specialists in the industry.

Nexans' design and manufacturing expertise in hybrid subsea cables responds to the oil and gas industry's increasing focus on cost-effective operation of installations and greater

utilization of reserves. Our composite platform cables are also used for inter-platform and shore-to-platform signal and power applications. We also deliver fire and mud-resistant fiber optic topside cables that meet the most stringent IEC requirements. Nexans designs

and delivers a complete system of components and accessories for these solutions, including personnel for offshore installation, assistance and training.



Nexans delivers bottom-laid cables and components

SUBMARINE FIBER SOLUTIONS

Nexans has supplied more than 35,000 km of cable in over two hundred projects worldwide gaining a solid technological foundation. Our customers include telecommunications providers, oil and gas companies, and the public sector.

Nexans' fiberoptic submarine cables are designed for both repeaterless and repeatered systems, and have almost unlimited capacity over long distances.

Nexans' steel tube technology is unique in the industry and delivers three main advantages: first, it provides a more robust cable system; second, it extends the design lifetime; and third, it simplifies sealing and termination.

Our number one unrepeatered cable, URC-1, is used for systems with lengths up to 500 km in which the optical signal can be a remotely optically pumped special fiber (ROPA). The second repeatered optical cable, ROC-2, is used for systems up to 10,000 km

long and down to 8,000 m water depth, typically for transatlantic and transpacific connections. The ROC-2 can also be equipped with power and signal feeding to subsea installations, scientific sensors, seismic arrays, etc.

For a total solution, Nexans provides any accessories to secure and fasten the cables, including hang-offs, cable

clamps, J-tube seals, elastomer protection sleeves, flexible steel hose, cable coiling frames, and more. For cable network and repair, we supply branching units, wet-mateable connectors, ROPA boxes, cable joints for submarine, topside and onshore use, and terminations for wet-mateable connectors and optical distribution frames (ODFs).



The ROC-2 is used for systems up to 10,000 km long and down to 8,000 m water depth



The URC-1 is used for systems with lengths up to 500 km





NEXANS BRINGS ENERGY TO LIFE

Nexans brings energy to life through an extensive range of cables and cabling solutions that deliver increased performance for our customers worldwide. Nexans' teams are committed to a partnership approach that supports customers in four main business areas: Power transmission and distribution (submarine and land), Energy resources (Oil & Gas, Mining and Renewables), Transportation (Road, Rail, Air, Sea) and Building (Commercial, Residential and Data Centers). Nexans' strategy is founded on continuous innovation in products, solutions and services, employee development, customer training and the introduction of safe, low-environmental-impact industrial processes. In 2013, Nexans became the first cable player to create a Foundation to introduce sustained initiatives for access to energy for disadvantaged communities worldwide.

Nexans is an active member of Europacable, the European Association of Wire & Cable Manufacturers, and a signatory of the Europacable Industry Charter. The Charter expresses its members' commitment to the principles and objectives of developing ethical, sustainable and high-quality cables.

Nexans, acting for the energy transition, has an industrial presence in 40 countries, commercial activities worldwide, is employing close to 26,000 people and generating sales in 2016 of 5.8 billion euros. Nexans is listed on Euronext Paris, compartment A.

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