



**Oil and gas special cables:
Reliability, Innovation and Safety
for tough environments**

Oil and gas complexes (petroleum refineries, offshore platforms, handling and storage infrastructures, etc.) are among the most strenuous environments on earth, combining high pressure, oil and gas permeation, harsh conditions, and the ever-present danger of fire. Cables are key elements in this complex infrastructure, since refineries and platforms often produce and internally distribute their own electricity for lighting, pumps, compressors and instrumentation. Because they are non-stop operations, cable safety, reliability and efficiency are vital to their success.

The special needs of oil & gas

Engineering companies, contractors, offshore platform operators and the refineries, themselves, have strict concerns when ordering cable. These companies and installers want a cable that meets all operational constraints, including manufacturing flexibility, so that they can modify type and quantity even during the implementation phase. They need a specialist who speaks their language and can adapt the product to specifications in terms of cable management and custom-tailored solutions. Refineries want to safeguard their investment and operational reliability. That means highly resistant cables that are not only suitable for tough conditions (hydrocarbons, corrosion, abrasion, desert conditions, rodent, humidity, mud projections, etc), but can protect equipment, manpower and the environment.



Refined oil and gas solutions through



Oil and gas refineries and offshore platforms combine a diverse range of operations from distillation, recovery and cracking facilities to gas/oil/olefin conversion, all of which are dependent on cables.

The fact that electricity is often generated on-site means that specific power-production and delivery cabling is essential. But in addition to this, various special cables are needed for lighting, electric motor-driven pumps, compressors and instrumentation systems.

Wherever cables are present, it is important that all electrical, control and telecommunications systems operate non-stop under normally harsh conditions. In the event of a fire, these vital systems must survive intense heat for a given period. Moreover gases, fumes and blinding smoke must be reduced to a minimum to protect personnel and infrastructure.

For the demanding petrochemical environment, Nexans has designed a full-range of cables from 24 V to 36 kV for the three critical functions of refineries and offshore platforms:

- **Instrumentation cables:** Precision cables make it possible to monitor sensors and activate control, safety and bleed valves so as to open, modify and cut off fluid and gas flows.
- **Compensation cables:** These alloyed cables allow for accurate temperature measurement and important control functions.
- **Control and power cables:** Delivering up to 36 kV, they either provide control delivery energy for pumps, motors and relays.

**Offshore:
the Norwegian connection**

Oil platforms, floating production units, and direct shore plant to sub-sea facilities all use the above array of cables, in addition to special topside cables (NEK 606 standard) and multifunction umbilical cables which carry electricity, various fluids (hydraulic or

methanol), the oil and gas itself, and even telecommunications (fiber). Drawing on over 50 years of experience in submarine cables, our Norwegian plant is an unrivalled master of factors like corrosion, force and weather, wave and seabed conditions. We have exclusive agreements for cable-laying vessels, and have our own remote operated trenching machines (Capjet) which have already trenched over 3,000 km of cable. And we have extensive in-house testing and R&D facilities.

For optimum safety and security, Nexans also offers many options for cable protection:

- **Mechanical protection by armoured cables** (steel-wire, steel-tape or braided solutions).
- **Petrochemical protection:**
e.g. **Hypron®:** aluminium - polyethylene complex; mud-resistant and halogen-free outer sheath.
e.g. **lead covering**
...can both be used to preserve the cable integrity from severe aggressions.
- **Electromagnetic interference protection** (various types of shields).



refinery cables: keep the energy flowing



Medium Voltage



Offshore Low Voltage



Instrumentation



Compensation



IEC 60332-3



IEC 60331



IEC 61034 Low smoke



Superior fire-performance with



Umbilical

Given the volatile nature of many hydrocarbons - and fire risks inherent in the distillation, cracking and conversation processes - fire security is extremely important for refineries, especially since even short shutdowns can have heavy economic consequences. Nexans halogen-free, fire-resistant (HFFR or BFOU) cables reduce risk to equipment and infrastructure. Since these cables do not contain halogen, very little corrosive gas is released which can damage electrical equipment and corrode metal building frameworks. Because these cables

produce less toxic gases (CO_2) and minimum opaque smoke, refinery workers are protected, and firemen can more easily locate and control the source of the fire. Finally, the fact that the cables keep on functioning, even as the protective sheath is reduced to compact ash, assures that vital alarm and power systems continue to operate, further safeguarding the system and assuring emergency measures.

Protect people and infrastructure

- IEC 60332-3 category A, B or C and IEC 60331 fire-resistance
- keeps essential energy and information flowing for at least 90 minutes
- offers low smoke, low or no halogen, and low toxicity
- enhanced protection for people, equipment and infrastructure
- avoids costly shutdowns



Operate safely and securely with



Whether a simple topping refinery, a complex conversion plant, or a drilling platform or floating production unit, the oil and gas processing environment demands an incredible variety of cables. In fact, refineries or platforms often look like small cities with their large tankage systems, processing units and complex utilities. With 30 years experience in the oil and gas industry, Nexans has been a precursor in petroleum refinery and offshore cables of all types, and a trusted supply partner. In any new project, we first conduct a technical analysis according to product, environment, processing constraints and country-specific norms. Then we adapt our own plant production to meet your special needs, in terms of deadlines, delivery and custom-tailored and preconditioned products.

Ultimate tests and standards

Because lives and infrastructure are at stake, Nexans oil and gas cables are subjected to rigorous testing at high temperatures and over extended periods. They are also exposed to intense water spray, mechanical stress and shocks. Even under scorching conditions, they continue to function, while smoke and destructive halogen gas emissions are vastly reduced. Nexans cables not only meet fire-resistant requirements of IEC standards, BS6387 standard CWZ categories or NEK 606, they also provide for environmental and human safety.

Cables for all conditions

- a complete range of cables provided by a single supplier
- product reliability in extremely tough operating conditions
- specific cables for special environments: heat, cold, humidity, abrasion, rodents, etc.
- a global presence and fast delivery wherever you are located
- manufacturing flexibility and custom-tailored solutions
- the ability to match cables to country-specific norms
- a quality assurance system according to ISO 9001, approved by BASEC and DNV
- proven fire-performance capability in emergency situations
- mud-resistant and halogen-free cables according to NEK 606



The future runs through Nexans



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