



## C-Lite Cables

For Offshore and Marine Applications

Weight-Saving, Space-Saving Cable Solutions

# TE: Leadership in Connectivity

With a 50-plus year history of leadership, TE Connectivity (TE) is a global company that designs and manufactures over 500,000 products that connect and protect the flow of power and data inside the products that touch every aspect of people's lives.

Our nearly 100,000 employees, including 8000 engineers, partner with customers in virtually every industry—from consumer electronics, energy and healthcare, to automotive, aerospace and communication networks—enabling smarter, faster, better technologies to connect products to possibilities. More information on TE can be found at: <http://www.te.com/adm>.



## Advanced Materials for Advanced Products

Our Raychem brand holds a reputation for leadership in material science technologies. Raychem wires and cables are recognized worldwide and are backed by a history of proven performance, reliability, innovation and quality.

Developed from our expertise in materials, C-Lite wires and cables have been engineered to meet the requirements of DNV type approval program number 6-827.11.1 and, as such, is the light weight cabling solution for challenging marine applications.

## C-Lite Wires and Cables Save Space and Weight

TE's expertise in materials and related processing allows the use of unique thin-wall insulation systems. The use of halogen-free cable jackets completes the product offering. This means that C-Lite cable products can offer significant size and weight reductions when compared to conventional insulation systems, while at the same time meeting key criteria such as low-fire hazard performance and mechanical robustness.

### TE Components . . . TE Technology . . . TE Know-how . . .

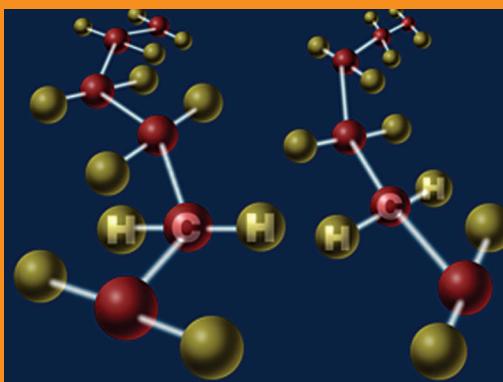
AMP | AGASTAT | CII | HARTMAN | KILOVAC | MICRODOT | NANONICS | POLAMCO | Raychem | Rochester | DEUTSCH  
SEACON Phoenix | LL ROWE | Phoenix Optix | AFP | SEACON

Get your product to market faster with a smarter, better solution.

# Reduce the Wall Thickness, Not the Performance

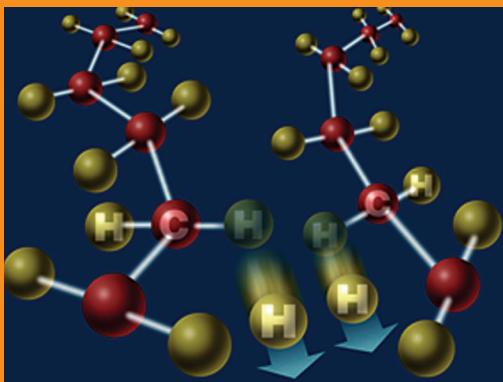
C-Lite cables use TE's advanced materials technology to deliver a thin-wall insulation that dramatically reduces the size and weight of cables – without reducing the electrical or mechanical properties

## ① Modular Chain



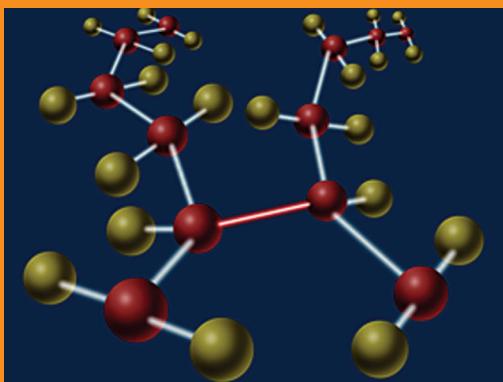
Expertise in polymer chemistry allows TE to create thin-wall insulations. Our unique formulations go beyond off-the-shelf polymers to ensure performance equivalent to or exceeding comparable thick-wall cables.

## ② Crosslinking



Radiation cross-linking allows thinwall insulation and jacket materials that offer the additional rugged features found in our C-Lite CL105 and CL105FR cables. Cross-linked materials are known for being physically rugged even at elevated temperatures, remaining thermally stable, and offering excellent resistance to fluids and chemicals.

## ③ Crosslinked Molecular Chain



TE pioneered cross-linked insulation for wire and cable, initially for the aerospace industry. To achieve cross-linking, a polymer product is exposed to high-energy radiation. This is generally done by exposure to high-energy electron beta radiation using an electron beam.

# C-Lite Cables for Every Need

From general power and lighting to communication, control, and instrumentation applications, the C-Lite cable family is designed for use in a variety of marine applications.



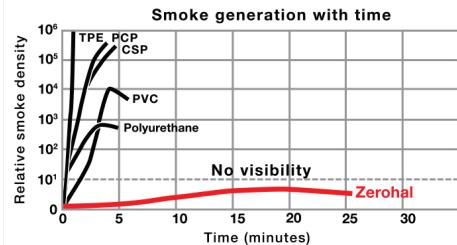
## Approvals

C-Lite cables are approved internationally for maritime use.

- |                                |         |
|--------------------------------|---------|
| • American Bureau of Shipping  | USA     |
| • Bureau Veritas               | France  |
| • China Classification Society | China   |
| • Det Norske Veritas           | Norway  |
| • Germanischer Lloyd           | Germany |
| • Korean Register              | Korea   |
| • Lloyds Register*             | UK      |
| • Nippon Kaiji Kyokai          | Japan   |
| • Russian Register of Shipping | Russia  |

\*Lloyds Register approval on a project-by-project basis

Our thin-wall technology includes low-smoke and zero halogen wire and cable—which emit low levels of toxic gases and generate considerably lower levels of smoke so that visibility is maintained in an emergency. Our zero-halogen cables are highly flame retardant and generate very low levels of smoke, acids and gases.



## Improved Fire Resistance

Standard limited-fire-hazard cables offer low combustibility to minimize the growth and spread of a fire. They also produce low levels of corrosive gases, carbon monoxide, and smoke and can fail within minutes.



The composite insulation system of C-Lite cables combines limited fire-hazard performance with fire resistance to allow prolonged operation during firefighting and evacuation. They are an excellent choice for alarms, emergency lighting, and controls. Fire resistance is achieved by coating the conductor with an inorganic mica-based material that resists the high temperatures of a fire. This material is also an efficient insulator which protects the conductors from short circuiting as the insulation system of the cable is burned away. C-Lite CL90F and CL105F cables meet the following flammability requirements:

- Flame Retarded IEC 60332-1 and IEC 60332-3-22 Cat A
- Fire Resistant IEC 60331-1 or -2\*

\*IEC 60331-1 applies to cables with an overall diameter greater than 20mm; IEC 60331-2 applies to cables with an overall diameter less than 20mm.

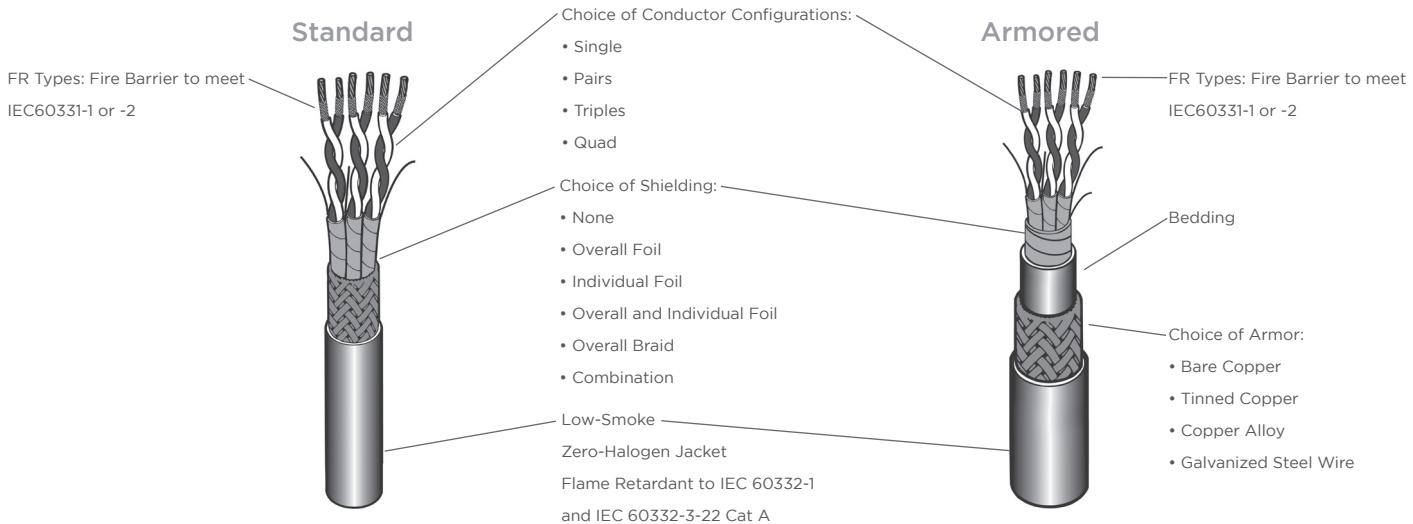
# CL105 and CL105F Cables

Standard, Armored, and Fire-Resistant Cables IEC 60092-350 SHF-2 Rated to Resist Oil, Fuels, Petroleum Mud.



C-Lite CL105 cables use a crosslinked jacket to achieve a smaller, lighter cable while offering excellent resistance to oils, solvents, fuels, and petroleum mud and meeting the demanding requirements of IEC 60092-350 SHF-2. Our ZeroHal EN jacket is highly flame retardant, generates low smoke, and has a low toxicity index and reduced corrosive gas emissions.

C-Lite CL105F cables offer all of the benefits of our standard CL105 range, with the addition of a mica-based fire barrier wrapped around each conductor that allows continued operation of critical safety and control circuits under some fire conditions. CL105F cables are designed to exceed the requirements of IEC 60331-1 or 2, delivering performance in excess of 120 minutes at a temperature of 1000°C.



# CL90 and CL90F Cables

Standard, Armored, and Fire-Resistant Cables IEC 60092-350 SHF-1 Jacketed.

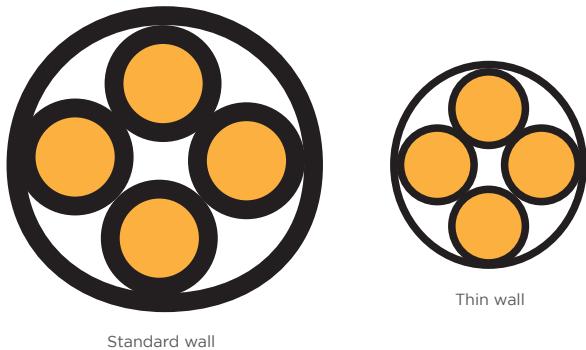


C-Lite CL90 cables are designed to exceed the requirements of IEC 60092-350 SHF-1. The cables are suited to applications not requiring a jacket resistant to oil and other corrosive fluids. CL90 cables feature a zero-halogen, low-fire hazard jacket and are available in a wide range of conductor sizes and configurations, including a fire resistant version.

Offering all the features of our standard range, CL90F cables use a mica-based fire barrier wrapped around each conductor allowing continued operation of critical safety and control circuits under some fire conditions. CL90F cables are designed to exceed the requirements of IEC 60331-1 or 2, delivering performance in excess of 120 minutes at a temperature of 1000°C.

# Thin-Wall Technology Allows You To Do More With Less

C-Lite cables use advanced thin-wall insulation and jacket technology to reduce the size and weight of cables—without reducing the electrical or mechanical properties. In large scale applications, such as offshore drilling platforms, the savings can be dramatic.



## Smaller Size

Compared to traditional cables, C-Lite cable provides the following benefits from an installation viewpoint:

- Installs quicker into the vessel or module (customer installations have shown that the cables can be routed 30% faster than traditional cable)
- Permits tighter bend radii
- Requires smaller cable tray and ancillaries (which also reduce installation time and physical purchase cost)
- Allows more equipment to be connected within the same space

## Environmental Ruggedness

- Provides less combustible material in the event of a fire
- Generates less smoke than traditional materials during a fire
- Offers inherently flame-retardant cores (this is in addition to the bedding and sheathing materials which also comply with the requirements of NEK606)
- Fluid- and oil-resistant cable components provide peace of mind

## All these benefits will become more important as:

- Drilling depths increase worldwide
- Deck space and footprint size become more important as more systems become automated

## Reduced Weight

The reduced weight of C-Lite cable:

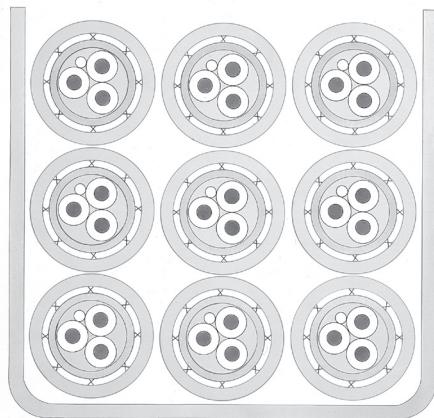
- Delivers more freedom to provide additional production equipment on the installation
- Allows more densely populated installations on cable trays designed for traditional cable products
- May allow the use of less steel in the superstructure or allow higher design safety margins

## The Full Range of C-Lite Cables:

- Multiconductor, Multipair, Multitriple, Quad
- Unshielded, Foil Shielded, Braid Shielded
- Armored or Unarmored
- 150/250 V for Signal Applications
- 600/1000 V for Power Applications
- Metric and AWG Conductor Sizes Available
- Cables from 0.5 to 10 mm<sup>2</sup>

## Save Space

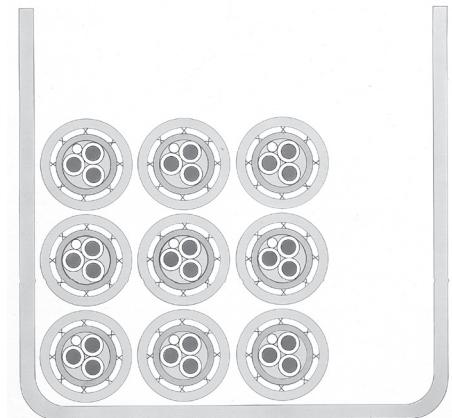
TE's thin-wall technology can save as much as 40% in cable trays. Such savings result in smaller trays, more cables per tray, lighter supports, and smaller cable glands. And higher temperature ratings mean higher current densities, increased safety, and long-term reliability.



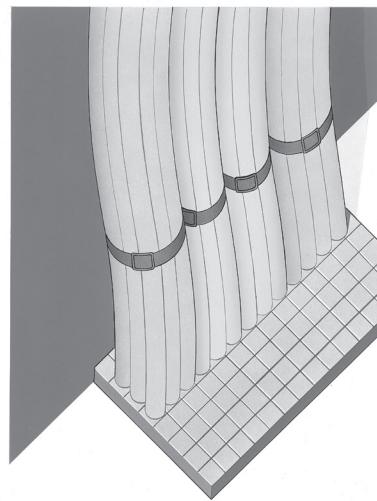
Cable trays

## Save Money

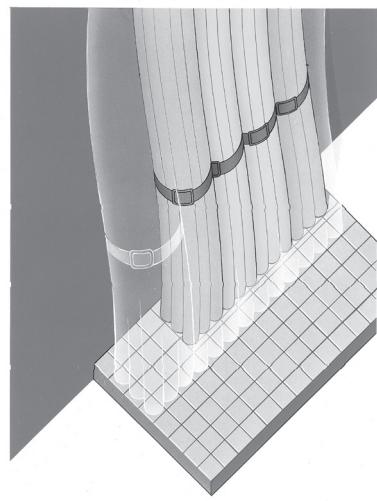
C-Lite cable thin-wall technology reduces installed costs up to 15%. Not only do the reduced size and weight make installation faster and easier, but additional savings are realized through the use of smaller, lighter trays, racks, and other cable management hardware. What's more, resistance to hot diesel fuels, oils, grease, drilling fluids, and mechanical abuse means long-term reliability and lower maintenance costs.



A typical saving in the cable tray volume can exceed 40%



Transits



Over 40% savings in area

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## ENGINEERED CABLE SOLUTIONS FOR HARSH ENVIRONMENTS



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