

# Special Cables and System Solutions for Defense

Marine, Submarine, Air,  
Land and Infrastructure Activities



## **LAPP MULLER**

Special cables & complete system solutions

alive

BY  **LAPP**

# 85 YEARS IN BUSINESS

**Founded in 1939 by Jean Muller**, the company moved to Grimaud in the Gulf of Saint-Tropez in 1992. In 2003, the company was acquired by the Lapp Group, a major player in the cable industry.

The company developed considerable expertise in the **conception and design of special cables**. Dynamic cables, hybrids, customized solutions, short lengths, integrating electrical, pneumatic, optical and hydraulic functions.

Over the years, the company has expanded and structured itself with the creation of a design office, a team of project engineers and an R&D department, evolving from a simple manufacturing business to a developer of cable/connector/anchor system solutions.

**Lapp Muller is present in a wide range of sectors:** defense, marine and submarine activities, oil and gas, robotics, nuclear power, electrification...

Here, **we develop solutions tailored to our customers' specific requirements**, taking into account all their needs and constraints - whether mechanical, chemical or environmental.

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**+9000 sq.m.**

of which 6500 factory  
& 1.200 warehouse

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**110 employees**

including 10 project and R&D  
engineers

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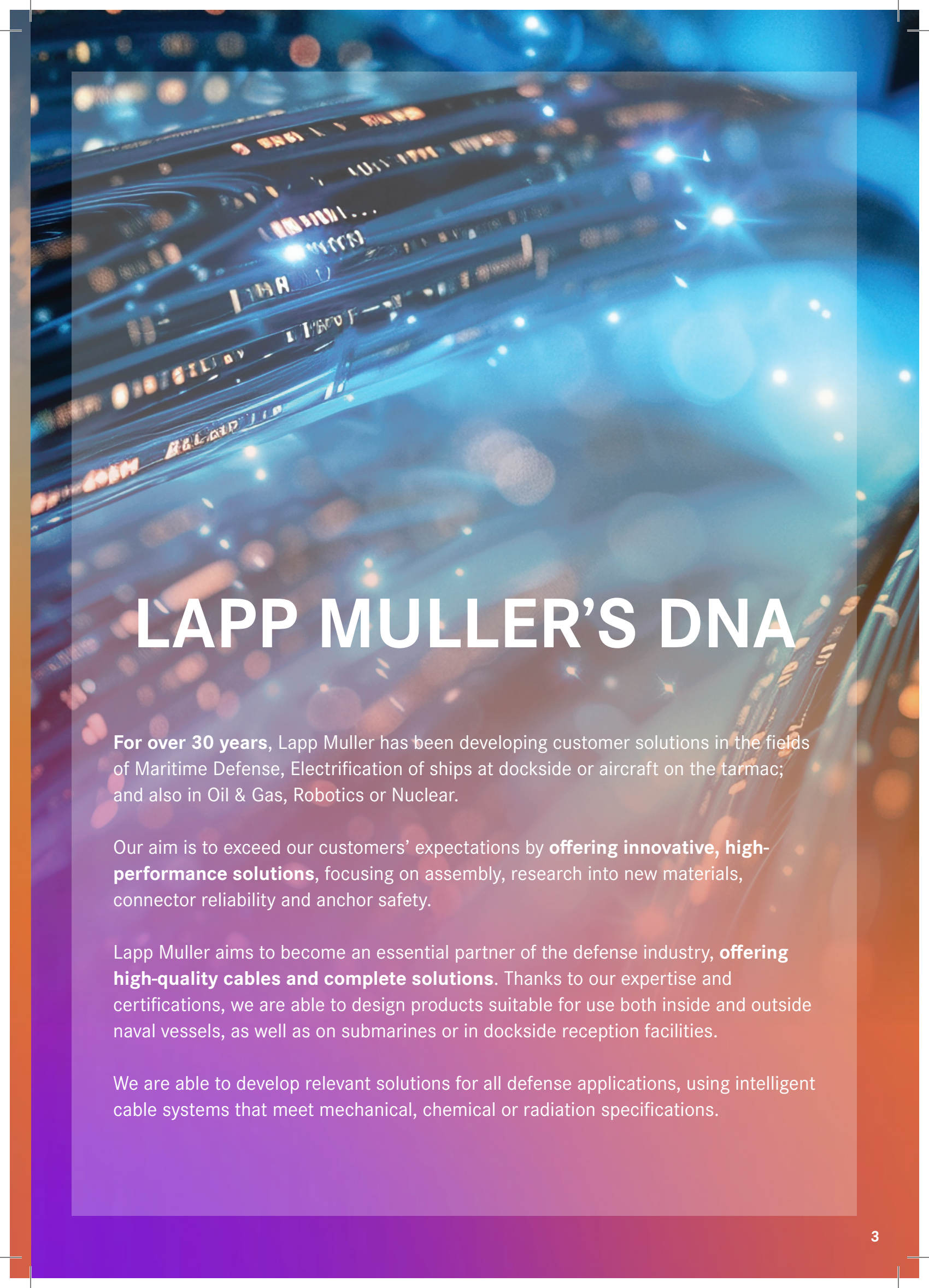
**3x8  
production  
shift**



# THEY TRUST US

- ALSEAMAR ALCEN
- AERO-NAUTIC SERVICES & ENGINEERING
- ATLAS ELEKTRONIK
- DIRECTION GÉNÉRALE DE L'ARMEMENT
- EXAIL TECHNOLOGIES
- MBDA
- NAVAL GROUP
- NAVANTIA
- NEXEYA
- THALES





# LAPP MULLER'S DNA

**For over 30 years**, Lapp Muller has been developing customer solutions in the fields of Maritime Defense, Electrification of ships at dockside or aircraft on the tarmac; and also in Oil & Gas, Robotics or Nuclear.

Our aim is to exceed our customers' expectations by **offering innovative, high-performance solutions**, focusing on assembly, research into new materials, connector reliability and anchor safety.

Lapp Muller aims to become an essential partner of the defense industry, **offering high-quality cables and complete solutions**. Thanks to our expertise and certifications, we are able to design products suitable for use both inside and outside naval vessels, as well as on submarines or in dockside reception facilities.

We are able to develop relevant solutions for all defense applications, using intelligent cable systems that meet mechanical, chemical or radiation specifications.

# DYNAMIC OUTBOARD CABLES AND SYSTEMS FOR SUBMARINES

Lapp Muller develops and produces different types of dynamic cables equipped with their mechanical termination and opto/electrical connectors.

Each cable/system is designed according to customer's specification.

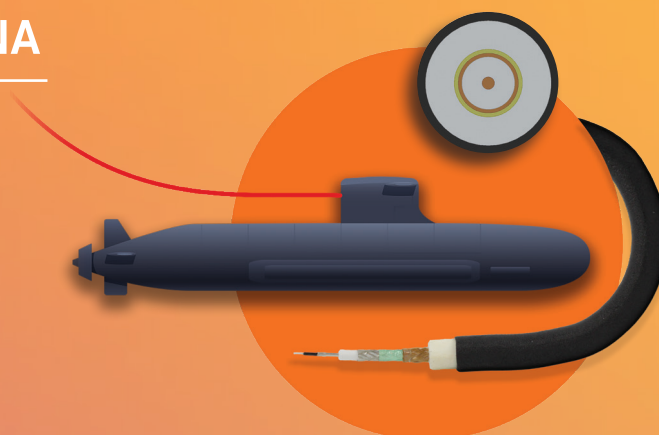
## COAXIAL ONE WIRE ANTENNA

### Components

Conductors/coaxial/optical fiber  
TPE insulation  
Low density TPU sheath

### Technical requirements

Density of the cable vs depth  
Complete harness  
Long term immersion reliability



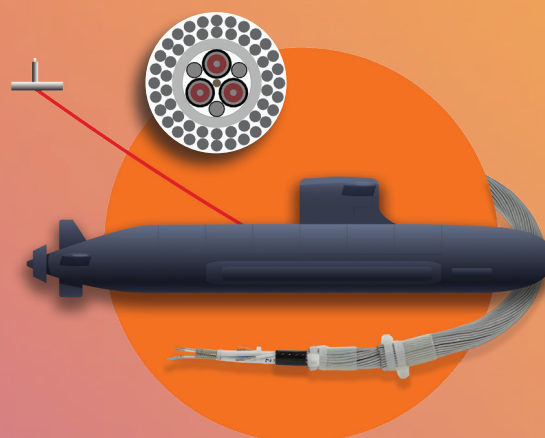
## ARMORED TOW CABLE FOR BUOY

### Components

Conductors/coaxial/optical fiber  
TPE or XLPE insulation  
TPU sheath  
Stainless steel armor

### Technical requirements

Breaking strength - low elongation  
Complete system with: Mechanical termination / subsea connectors / Fairings  
Long term immersion reliability



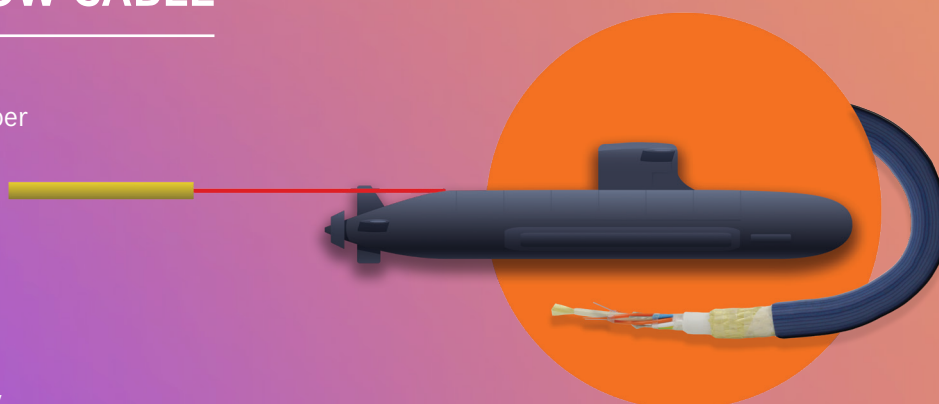
## LOW DENSITY TOW CABLE

### Components

Conductors/coaxial/optical fiber  
XLPE insulation  
Synthetic fiber braid  
Low density TPU sheath

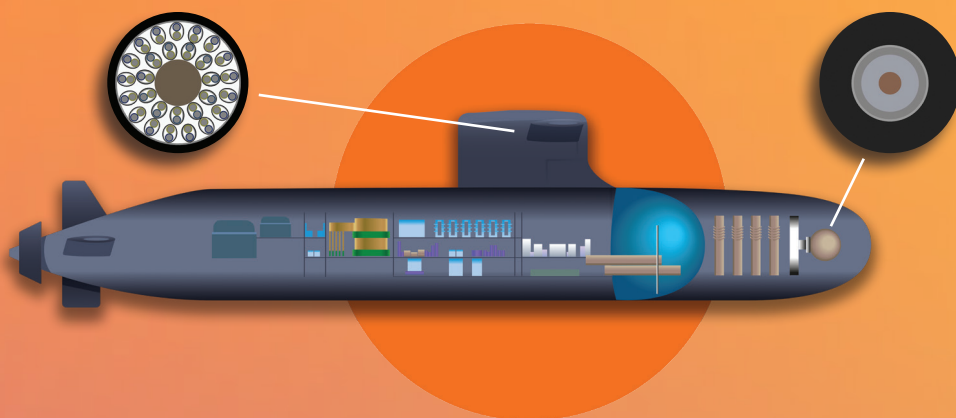
### Technical requirements

Density of the cable vs depth  
Complete harness  
Long term immersion reliability



# INBOARD SUBMARINE CABLES AND SYSTEMS

Lapp Muller designs and produces several types of inboard cables designed on specification and standards.



## SHIPBOARD CABLE-FIXED INSTALLATION

### Components

Conductors/coaxial/optical fiber  
XLPE insulation  
XLPE sheath or Silicon sheath

### Technical requirements

Flame or fire retardant (according IEC 60332 -3 or -2)  
No corrosivity of smoke (according IEC 60754 -2)  
Halogen free (according IEC 60754 -1)  
Low smoke (according IEC 61034)  
Vibration absorption

## SHIPBOARD CABLE-SENSORS

### Components

Conductors/coaxial/optical fiber  
TPE or fluoronated insulation  
TPU sheath

### Technical requirements

Flexion - torsion solicitations  
Complete harness  
Long term immersion reliability

Lapp Muller designs and produces ROV tether.  
The main criteria are:

## ROV TETHER CABLE

### Components

Conductors/coaxial/optical fiber  
XLPE insulation  
Synthetic fiber braid  
Low density TPU sheath

### Technical requirements

Density of the cable vs depth  
Complete harness  
Long term immersion reliability



# ACOUSTIC LINES

Lapp Muller designs and manufactures umbilicals with their connections for permanent acoustic systems.

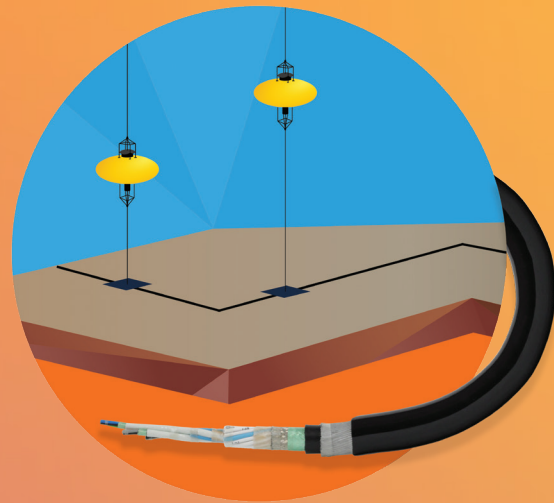
## STATIC UNDERWATER LINE

### Components

- Conductors/coaxial/optical fiber
- TPE or XLPE insulation
- PE Inner sheath
- Stainless steel armor
- TPU final sheath

### Technical requirements

- Breaking strength - low elongation
- Complete harness
- Long term immersion reliability



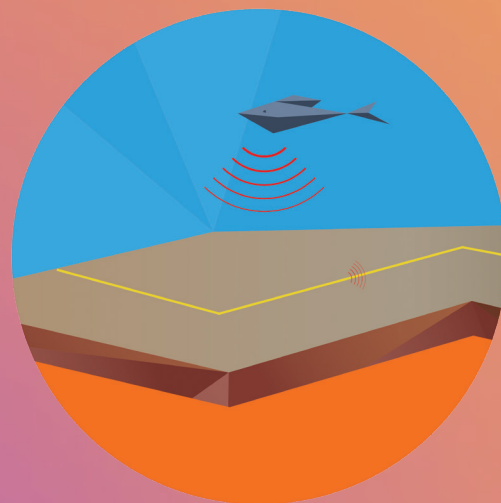
## SENSITIVE ACOUSTIC LINE

### Components

- Conductors/coaxial/special optical fiber
- TPE or XLPE insulation
- PE Inner sheath
- Stainless steel armor
- TPU final sheath

### Technical requirements

- Sensitive optical fibers
- Breaking strength - low elongation
- Complete harness
- Long term immersion reliability



# EXTERIOR VESSELS

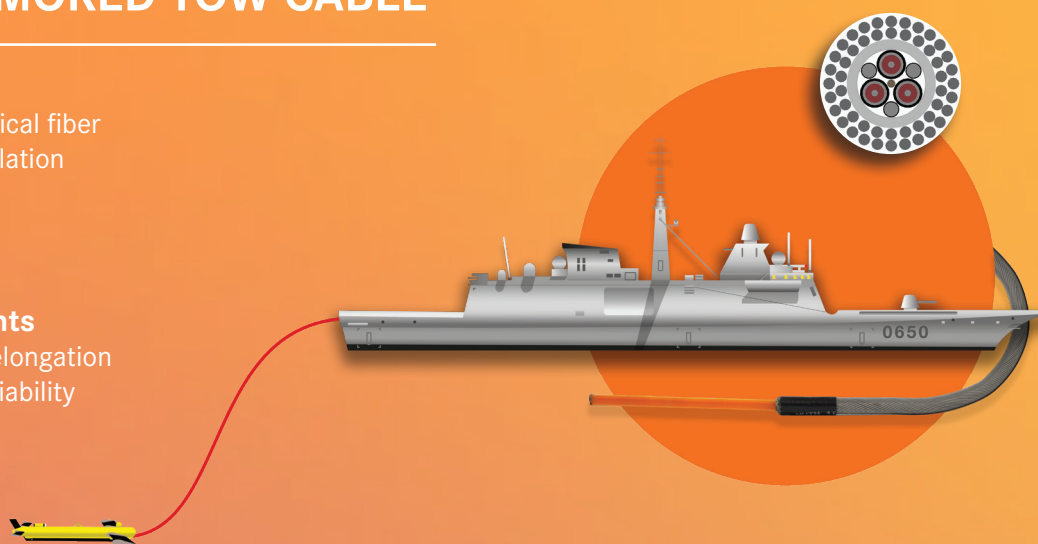
## DYNAMIC ARMORED TOW CABLE

### Components

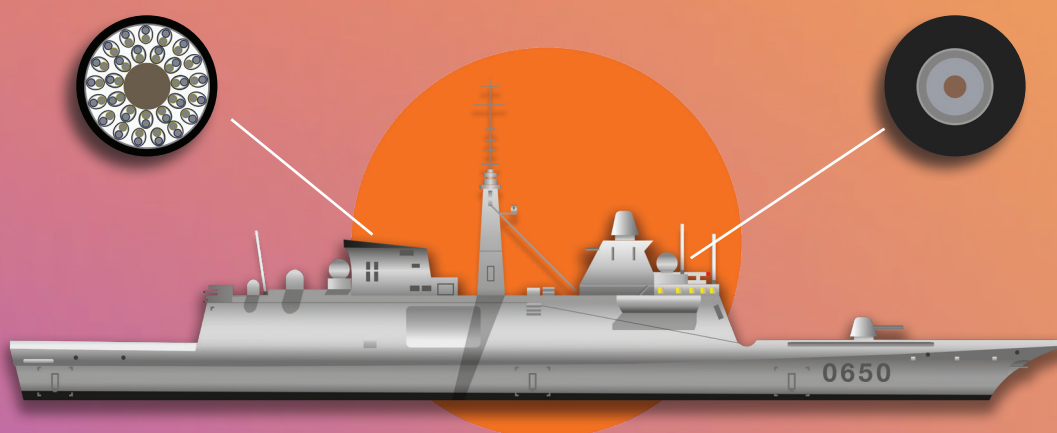
Conductors/coaxial/optical fiber  
XLPE or fluoronated insulation  
TPU sheath  
Contra helical armor  
Galvanized or SS wires

### Technical requirements

Breaking strength - low elongation  
Long term immersion reliability  
Complete harness :  
Mechanical termination  
Connectors  
Fairings



# INTERIOR VESSELS



## SHIPBOARD CABLE-FIXED INSTALLATION

### Components

Conductors/coaxial/optical fiber  
XLPE insulation  
XLPE sheath or Silicon sheath

### Technical requirements

Flame or fire retardant (according IEC 60332 -3 or -2)  
No corrosivity of smoke (according IEC 60754 -2)  
Halogen free (according IEC 60754 -1)  
Low smoke (according IEC 61034)  
Vibration absorption

## SHIPBOARD CABLE-SENSORS

### Components

Conductors/coaxial/optical fiber  
TPE or fluoronated insulation  
TPU sheath

### Technical requirements

Flexion - torsion sollicitations  
Complete harness  
Long term immersion reliability

# AEROSTAT TETHER

Lapp Muller designs and manufactures tether umbilicals for balloons.  
A specific quality system has been set up in order to meet the aeronautic standard ISO 9100.

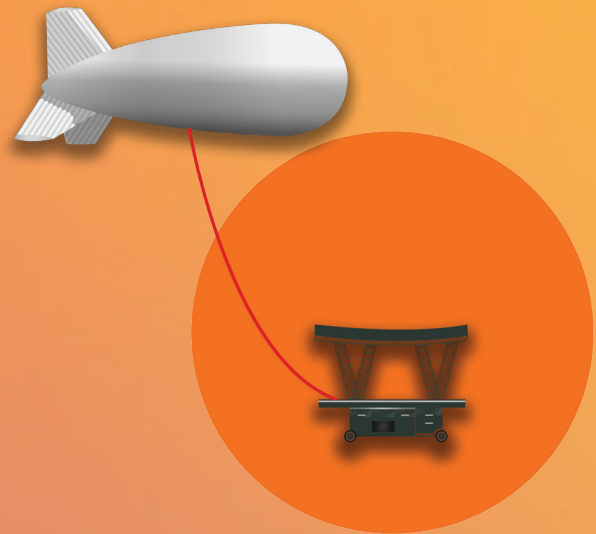
## AEROSTAT TETHERS-CABLE

### Components

- Conductors/coaxial/optical fiber
- TPE insulation
- Synthetic fiber braid
- Low density TPU sheath

### Technical requirements

- Light linear weight
- Lightning test
- Breaking strength



## CHARGING CABLES (TANK, HELICOPTER, AIRPLANE)

Lapp Muller has a long experience in designing and manufacturing flexible cables for charging applications. Our products are used to supply power to tanks, helicopters, and aircrafts.

## CHARGING CABLE

### Components

- Conductors plain copper
- TPE insulation
- TPU sheath

### Technical requirements

- Flexibility
- Complete harness
- Abrasion resistance
- Oil resistance

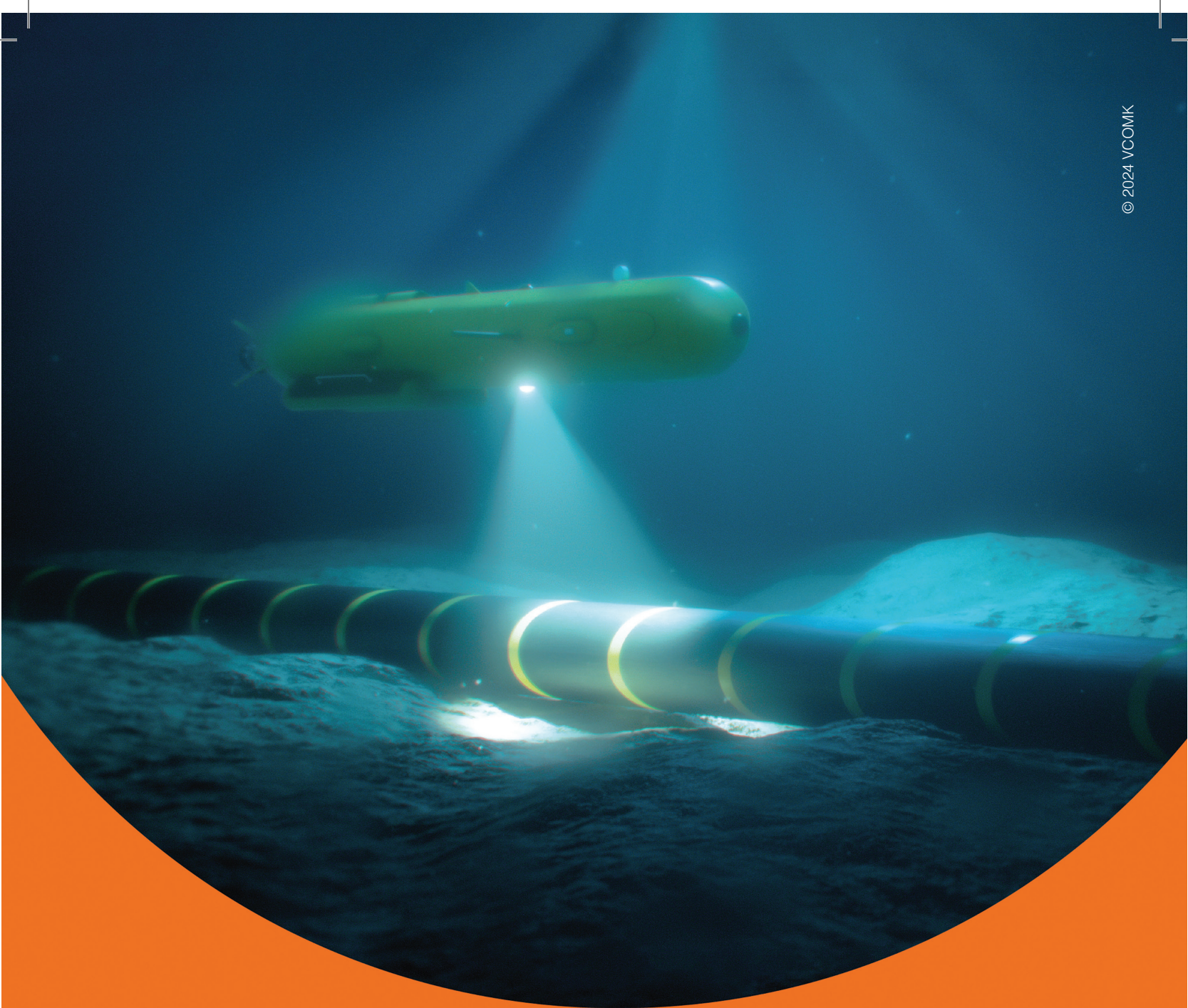




# UPCOMING DEVELOPMENTS

Thanks to the many developments carried out over the last twenty years for Marine & Submarine Defense, Lapp Muller has acquired technologies that can be applied in Land or Air Defense activities:

- Cable harnesses for armored vehicles
- Charging cables for all types of vehicles in constrained environments
- Cables for port infrastructures (dock equipment) or airports
- Robot cables
- Seismic lines
- Spiral cables and cords



**LAPP MULLER**

Special cables & complete system solutions

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