Marine and underwater cable solutions

LAPP MULLER

“A range of customized cables for the marine and underwater environment”

This catalogue contains a sample range of the 60000 LAPP MULLER special cables designed and manufactured over the last 10 years.

LAPP MULLER has successfully worked with many Coastal and Deep-sea engineering companies as well as Oceanographical Research Institutes and O.E.M. providers of equipment to the offshore gas and oil industry.

Providing both composite electrical and optical cables for many applications such as ROVs (Remote Operated Vehicles), seabed vehicle umbilicals to ship and submarine borne types for the French Navy, with their relevant specifications. These cables can be supplied as complete systems terminated with any prefered style of connector from galvanised, stainless steel to titanium types as either rigid or flexible assemblies dependent on customer specifications.

LAPP MULLER

UNDERWATER MACHINE CABLES

DETECTION AND INSTRUMENTATION CABLES

BOAT AND SHIP CABLES

SPECIAL CABLES

“A Complete range of cables for ROV, underwater Machines and other devices”

LAPP MULLER provides different types of cables such as: power, control, signal, fibre optics, strength member, etc.
Those cables are watertight and super flexible cables with floating capabilities or with neutral buoyancy to control ROV, trenching and burying machine, plough, submarine working machine (welding, cutting, ...).
They can be fitted with customized terminations, connectors and other equipments.

UNDERWATER MACHINE CABLES

ROV

On request

HEAVY ROV THETERS
Extra flexible and watertight cable, with stengthening member, including power, control, signal and video.

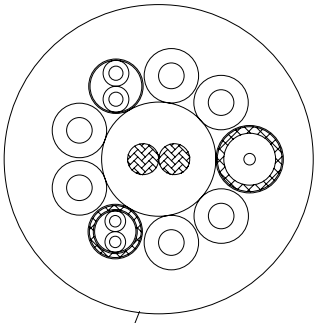
REF **32629 ROV CABLE** WITH COAXIAL AND FIBRE CORE STRENGTH MEMBER

Applications : Linking ship and ROV

metric : «LAPP MULLER» - ROV THETERS - REF 32629 - OF

Cable make up

Aramid fibre central strength member
2 conductors 0.25 mm², in extra flexible tinned copper, insulated in polyester elastomer
6 conductors 1.5 mm², in extra flexible plain copper, insulated in polyester elastomer
1 pair of conductors 0.15 mm², in flexible tinned copper, insulated in polyester elastomer
pair shielded by a tinned copper spinning
1 coaxial cable 75 Ω
Polyurethane outer sheath



Outer diameter : 11.9 +0.1/-0.3 mm

General characteristics

Conductors operating voltage : 250 Volts
Linear resistance :
Conductors 1.5 mm² ≤ 14 Ω/km
Conductors 0.25 mm² ≤ 84.5 Ω/km
Conductors 0.15 mm² ≤ 148.1 Ω/km

Coaxial cable
Characteristic impedance : 75 ± 7 Ω
Capacitance ≤ 0.05 dB/m
Attenuation at 10Mhz ≤ 0.05 dB/m

Operating temperature : -30 to +80°C
Strength member breaking load : 200 daN
Static bending radius ≥ 55 mm
Dynamic bending radius ≥ 110 mm
Weight : 0.22 kg/m

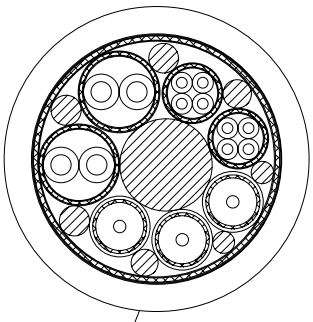
REF **37256 ROV CABLE** WITH COAXIAL AND OVERALL SHIELDED

Applications : Linking ship and ROV

metric : «LAPP MULLER» - SHIELDED ROV CABLE - REF 37256 - OF

Cable make up

2 pairs of conductors 0.75 mm², in extra flexible tinned copper, insulated in polyester elastomer, pairs shielded by a tinned copper spinning
2 quads of conductors 0.25 mm², in extra flexible tinned copper, insulated in polyester elastomer, quads shielded by a tinned copper spinning
3 coaxial cables 75 Ω
Stranding with watertightness compound
Overall shielding by a tinned copper spinning
Polyurethane outer sheath



Outer diameter : 14.5 ± 0.7 mm

General characteristics

Conductors operating voltage : 250 Volts
Linear resistance :
Conductors 0.25 mm² ≤ 85.3 Ω/km
Conductors 0.75 mm² ≤ 29.4 Ω/km

Coaxial cable
Characteristic impedance : 75Ω
Capacitance : 81 pF/m
Attenuation at 200 Mhz : 0.22 dB/m

Operating temperature : -30 to +80°C
Static bending radius ≥ 70 mm
Dynamic bending radius ≥ 140 mm
Weight : 0.2 kg/m

Other constructions and dimensions,
Please contact us.
Tel +33(0) 4 94 56 65 00
Fax +33(0) 4 94 43 38 16
e-mail : contact@mullercables.com

ROV

On request

FLOATING ROV THETERS
Extra flexible floating cable, including power, control, signal and fibre optic.

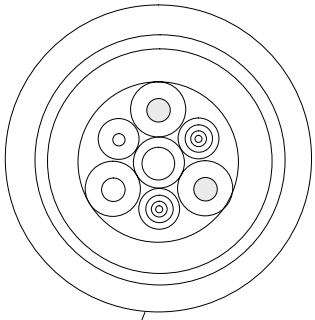
REF **50899 ROV CABLE** WITH FIBRE OPTIC AND FIBRE BRAIDED STRENGTH MEMBER

Applications : Linking ship and bomb disposal ROV

metric : «LAPP MULLER» - FLOATING ROV THETERS - REF 50899 - OF

Cable make up

1 conductor 0.22 mm², in flexible plain copper,
insulated in special polyolefine
3 conductors 0.93 mm², in flexible tinned copper,
insulated in special polyolefine
3 singlemode 9/125 optical fibres, tight-buffered
Special polyolefine inner sheath
Special fibre strength member
Special polyolefine outer sheath



Outer diameter : 15 mm maximum

General characteristics

Operating voltage :
0.93 mm² conductors : 2400 Volts
0.22 mm² conductors : 100 Volts
Linear resistance :
Conductors 0.93 mm² ≤ 22.7 Ω/km
Conductors 0.22 mm² ≤ 91.7 Ω/km

Singlemode optical fibres :
Attenuation at 1310 nm : 0.40 dB/km
Attenuation at 1550 nm : 0.25 dB/km

Strength member breaking load : 2300 daN
Operating temperature : -10 to +70 °C
Dynamic bending radius ≥ 250 mm
Linear weight in seawater (d : 1.026) : - 4g/m
Density: 0.98

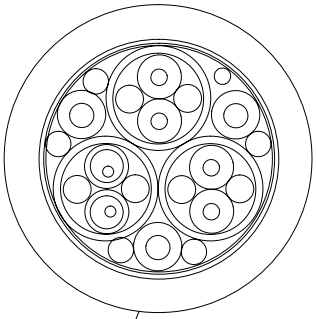
REF **51332 ROV CABLE** WITH FIBRE OPTIC, OVERALL SHIELDED AND FIBRE BRAIDED STRENGTH MEMBER

Applications : Linking ship and mine clearance ROV

metric : «LAPP MULLER» - FLOATING ROV THETERS - REF 51332 - OF

Cable make up

3 conductors 0.6 mm², in flexible special alloy,
insulated in special polyolefine
2 pairs of conductors 0.34 mm², in flexible special alloy,
insulated in special polyolefine,
pairs sheathed with special polyolefine
2 multimode 62.5/125 optical fibres in loose tube
Stranding with watertightness compound
Overall shielding by aluminum/polyester tape
and drain wire
Special fibre strength member
Special polyolefine outer sheath



Outer diameter : 14 ± 0.5 mm

General characteristics

0.6 mm² conductors operating voltage : 1500 Volts
Linear resistance :
Conductors 0.6 mm² ≤ 48 Ω/km
Conductors 0.34 mm² ≤ 84 Ω/km

Multimode optical fibres :
Attenuation at 1300 nm : 1.1 dB/km

Strength member breaking load : 1000 daN
Operating temperature : - 30 to +80 °C
Dynamic bending radius ≥ 170 mm
Density in seawater (d: 1.026) : 0.92

Other constructions and dimensions,
Please contact us.
Tel +33(0) 4 94 56 65 00
Fax +33(0) 4 94 43 38 16
e-mail : contact@mullercables.com

UMBILICALS

Umbilical cables for fixed installations and mobile underwater machines.

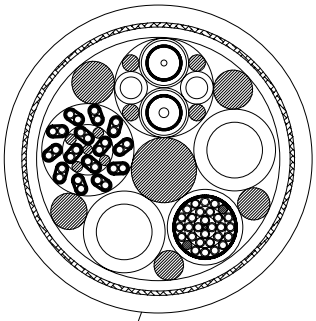
On request

REF **58361 UMBILICAL** WITH HYDRAULIC HOSES, VIDEO, AND FIBRE BRAIDED STRENGTH MEMBER

Applications : Underwater welding machine

Cable make up

2 hoses 1/2"
1 coaxial cable type KX4 50 Ω
1 coaxial cable type KX8 75 Ω
2 conductors 16 mm², insulated
in polyester elastomer
14 pairs of conductors 1.5 mm²,
insulated in polyester elastomer,
pairs shielded by a tinned copper spinning,
under a polyester elastomer sheath
28 conductors 1.5 mm², insulated
in polyester elastomer,
conductors stranded in layers,
under a polyurethane sheath
Polyurethane inner sheath
Aramid fibre braid
Polyurethane outer sheath



Outer diameter : 70 ± 1 mm

General characteristics

Conductors operating voltage :
1.5 mm² : 250 Volts
16 mm² : 1000 Volts
Linear resistance :
Conductors 1.5 mm² ≤ 15 Ω/km
Conductors 16 mm² ≤ 1.35 Ω/km

Coaxial cable type KX4 :
Characteristic impedance : 50 ± 2 Ω
Capacitance ≤ 100 pF/m
Coaxial cable type KX8 :
Characteristic impedance : 75 ± 3 Ω
Capacitance ≤ 67 pF/m

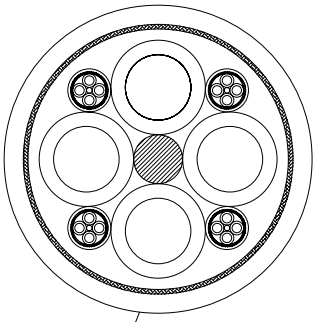
Theoretical breaking strength : 18000 daN
Hoses operating pressure : 190 Bars
Operating temperature : 0 à +80 °C
Static bending radius ≥ 560 mm
Dynamic bending radius ≥ 900 mm
Weight : 5.15 kg/m

REF **45981 UMBILICAL** WITH HYDRAULIC HOSES AND FIBRE BRAIDED STRENGTH MEMBER

Applications : Valves controlled by high pressure fluid

Cable make up

4 hoses 1/2" SAE100R8
4 quads of conductors 2.5 mm²,
insulated in polyester elastomer,
quads shielded by a tinned copper braid,
under a polyurethane sheath
Polyurethane inner sheath
Aramid fibre braid
Polyurethane outer sheath



Outer diameter : 67 ± 1 mm

General characteristics

Conductors operating voltage : 0.6/1 kVolts
Conductors linear resistance ≤ 9.6 Ω/km

Hoses operating pressure : 240 bars

Theoretical breaking strength : 18000 daN
Operating temperature : -15 to +40 °C
Static bending radius ≥ 550 mm
Dynamic bending radius ≥ 1000 mm
Weight : 3.22 kg/m

Other constructions and dimensions,
Please contact us.
Tel +33(0) 4 94 56 65 00
Fax +33(0) 4 94 43 38 16
e-mail : contact@mullercables.com

UMBILICALS

Umbilical cables for the control of underwate valves

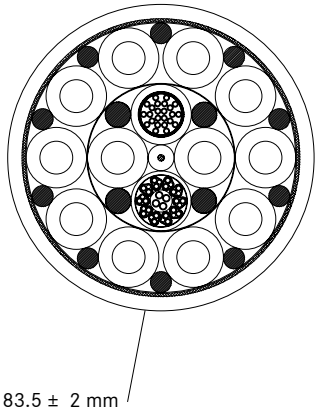
On request

REF **56769 UMBILICAL** WITH HYDRAULIC HOSES, SIGNAL, POWER AND FIBRE BRAIDED STRENGTH MEMBER

Applications : Oil or gas control valves

Cable make up

12 hoses 3/8 ”
12 pairs of conductors 1 mm², in extra flexible plain copper, insulated in polyester elastomer, pairs strand shielded by a tinned copper braid, under a polyurethane sheath
4 conductors 1.5 mm², in extra flexible plain copper, insulated in polyester elastomer,
10 pairs of conductors 1 mm², in extra flexible plain copper, insulated in polyester elastomer, pairs shielded by aluminium/polyester tape and drain wire,
conductors 1.5 mm² and shielded pairs 1 mm² stranded under a polyurethane sheath
Polyurethane inner sheath
Aramid fibre braid
Polyurethane outer sheath



Outer diameter : 83.5 ± 2 mm

General characteristics

Conductors operating voltage : 600 Volts
Linear resistance :
Conductors 1 mm ² ≤ 21.5 Ω/km
Conductors 1.5 mm ² ≤ 14.6 Ω/km

Theoretical breaking strength : 9000 daN

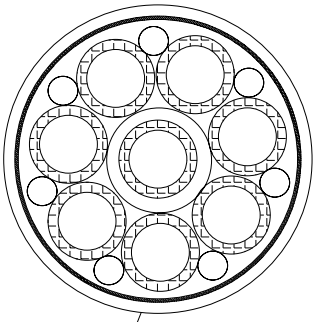
Operating temperature : -10°C to +70°C
Bending radius ≥ 830 mm
Weight : 5.36 kg/m

REF **57330 UMBILICAL** HYDRAULIC HOSES AND FIBRE BRAIDED STRENGTH MEMBER

Applications : Oil or gas control valves

Cable make up

8 hoses 1/2” SAE100R8
Copper fillers ballast
Polyurethane inner sheath
Aramid fibre braid
Polyurethane outer sheath



Outer diameter : 84 ± 2 mm

General characteristics

Theoretical breaking strength : 9000 daN
Operating temperature : -10°C to +70°C
Static bending radius ≥ 675 mm
Dynamic bending radius ≥ 1250 mm
Operating pressure : 240 bars

Other constructions and dimensions,
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TRENCHING AND BURYING MACHINE

On request

Flexible and tight cables with strenght member for various underwater tasks.

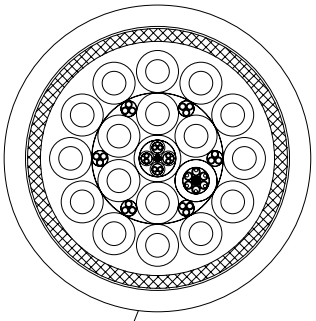
REF **37640 CABLE** WITH POWER, SIGNAL, CONTROL WITH FIBRE OPTIC AND FIBRE BRAIDED STRENGTH MEMBER

Applications : Trenching and burying tracted machine

metric : «LAPP MULLER» - UMBILICAL - REF 37640 - OF

Cable make up

12 multimode 62.5/125 optical fibres, in 6 loose tubes stranded under a polyurethane sheath
4 pairs of conductors 0.22 mm², in flexible tinned copper, insulated in XLPE,
pairs shielded by aluminum/polyester tape and drain wire, under a XLPE sheath
6 triplets of conductors 1 mm², in extra flexible plain copper, insulated in polyester elastomer
17 conductors 25 mm², in flexible plain copper, insulated in XLPE
Stranding with watertightness compound
Polyurethane inner sheath
Aramid fibre contra-helical double layer strength member
Polyurethane outer sheath



Outer diameter : 76 ± 1 mm

General characteristics

Operating voltage:
Conductors 0.22 mm² : 250 Volts
Conductors 1 mm² : 1 kVolts
Conductors 25 mm² : 3 kVolts
Linear resistance :
Conductors 0.22 mm² ≤ 93.3 Ω/km
Conductors 1 mm² ≤ 23.4 Ω/km
Conductors 25 mm² ≤ 0.819 Ω/km

Theoretical breaking strength : 60 000 daN

Operating temperature : -10°C to +70°C
Bending radius ≥ 1000 mm
Weight in air : 8.5 kg/m
Weight in seawater : 3.6 kg/m

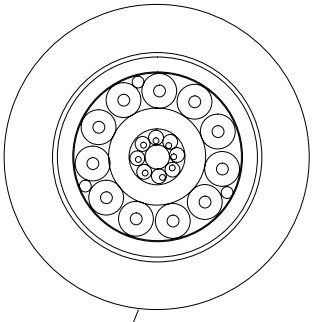
REF **43330 FLOATING CABLE** WITH POWER, SIGNAL, CONTROL, FIBRE OPTIC AND FIBRE BRAIDED STRENGTH MEMBER

Applications : Burying tracted Plough

metric : «LAPP MULLER» - UMBILICAL - REF 43330 - OF

Cable make up

8 singlemode 9/125 optical fibres in loose tubes, tubes stranded under a polyolefine sheath
11 conductors 1.2 mm², in flexible plain copper, insulated in special polyolefine
3 conductors 1.2 mm² in flexible plain copper
Aluminum tape armoring
Polyolefine inner sheath
Fibre braid strength member
Polyolefine outer sheath



Outer diameter : 42 ± 0.5 mm

General characteristics

Conductors operating voltage : 3000 Volts

Singlemode optical fibres :
Attenuation at 1285-1330 nm : 0.36 to 0.40 dB/km
Attenuation at 1550 nm : 0.22 to 0.30 dB/km

Theoretical breaking strength : 15 000 daN

Operating temperature : - 10 to 70 °C
Dynamic bending radius ≥ 600 mm
Weight in air : 1306 g/m
Weight in seawater (cable's interstices filled with oil-density : 0.887) : - 30 g/m

Other constructions and dimensions,
Please contact us.
Tel +33(0) 4 94 56 65 00
Fax +33(0) 4 94 43 38 16
e-mail : contact@mullercables.com

STATIC CABLES

On request

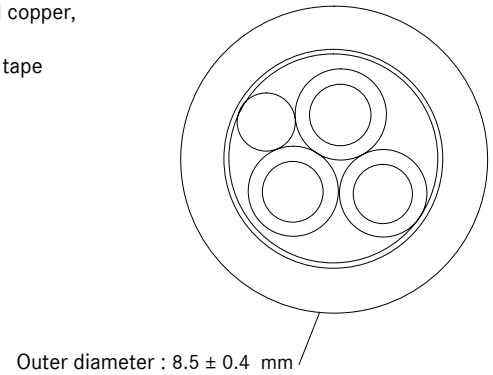
Static cables for equipment of machines and underwater robots for captor, sensor, video, equipped arm, etc...

REF **59986 UNDERWATER** SHIELDED POWER CABLE

Applications : Cable for underwater projectors

Cable make up

3 conductors 1 mm², in flexible tinned copper, insulated in XLPE
Overall shield by aluminum/polyester tape and drain wire
Polyurethane outer sheath



General characteristics

Conductors operating voltage : 1000 Volts
Conductors linear resistance ≤ 20 Ω/km

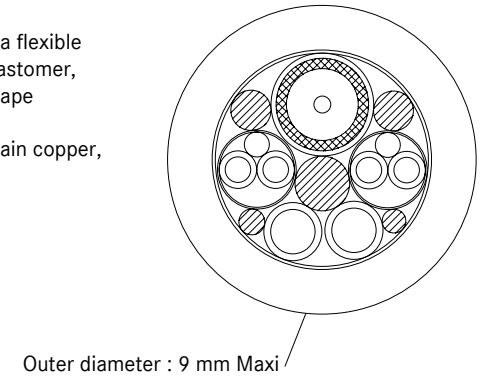
Operating temperature : -20 to +70°C
Static bending radius ≥ 65 mm
Flame retardant according to IEC 332-1
Weight : 0.11 kg/m

REF **55753** WATERTIGHT, POWER, SIGNAL, VIDEO CABLE

Applications : Cable for sensor, video and projectors

Cable make up

1 coaxial cable 75 Ω
2 pairs of conductors 0.34 mm², in extra flexible tinned copper, insulated in polyester elastomer, pairs shielded by aluminum/polyester tape and drain wire
2 conductors 1 mm², in extra flexible plain copper, insulated in polyester elastomer
Polyurethane outer sheath



General characteristics

Operating voltage :
Conductors 1 mm² : 600 Volts
Conductors 0.34 mm² : 250 Volts
Linear resistance :
Conductors 1 mm² ≤ 21 Ω/km
Conductors 0.34 mm² ≤ 63 Ω/km

Coaxial cable :
Characteristic impedance : 75 ± 7 Ω
Capacitance : 80 pF/m

Operating temperature : -20 to +80 °C
Static bending radius ≥ 45 mm
Dynamic bending radius ≥ 90 mm
Weight in air : 0.11 kg/m
Weight in seawater : 0.045 kg/m

Other constructions and dimensions,
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Fax +33(0) 4 94 43 38 16
e-mail : contact@mullercables.com

“A complete range of cables for measurement systems”

These cables are intended for detection, instrumentation, sonar, acoustic, security, oceanography, environnement analysis.
They are multifunction (power, signal, control, fibre optic) great depth watertight (6000m or 20000 ft), reinforced, high tensile strength, armoured, according to the request.

DETECTION AND INSTRUMENTATION CABLES

DETECTION SYSTEM

On request

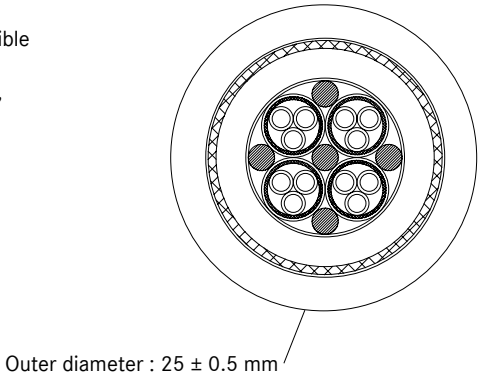
Special cables, watertight, manufactured with long lifespan materials for security and monitoring systems with magnetic or acoustic detection.

REF **56427 UNDERWATER CABLE** WATERTIGHT AND SHIELDED

Application : Magnetic detection system

Cable make up

4 triplets type KU 06-16
triplets of conductors 1.34 mm², in flexible tinned copper, insulated in ETFE
triplets shielded by tinned copper braid, sheathed in ETFE
Polyethylene inner sheath
Stainless steel braid armoring
with watertightness compound
Polyethylene outer sheath



Outer diameter : 25 ± 0.5 mm

General characteristics

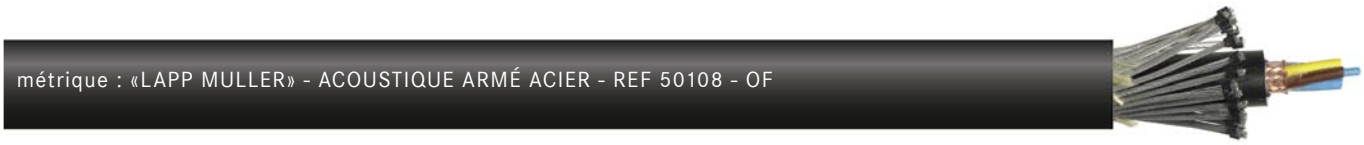
Conductors operating voltage : 600 Volts
Conductors linear resistance ≤ 15 Ω/km

Cable with good crushing resistance
Theoretical breaking strength :1500 daN

Operating temperature : -20 to +70 °C
Static bending radius ≥ 300 mm
Weight : 0.83 kg/m

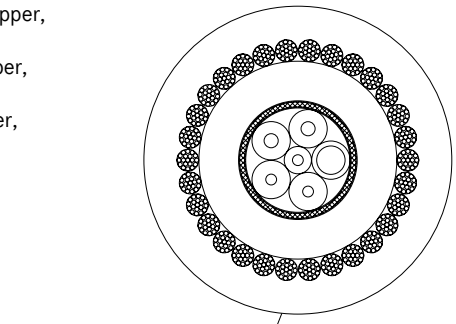
REF **50108 UNDERWATER CABLE** REINFORCED AND STEEL-ARMOURED

Application : Acoustic detection system



Cable make up

3 conductors 0.6 mm², in flexible plain copper, insulated in polyethylene
2 conductors 1 mm², in flexible plain copper, insulated in polyethylene
1 conductor 4 mm², in flexible plain copper, insulated in polypropylene
Stranding with watertightness compound
Overall shield by copper braid
HDPE inner sheath
Galvanized steel wires armoring
Polyurethane outer sheath



Outer diameter : 28 ± 1 mm

General characteristics

Operating voltage :
Conductors 0.6 mm² : 1000 Volts
Conductors 1 mm² : 500 Volts
Conductors 4 mm² : 500 Volts
Linear resistance :
Conductors 0.6 mm² ≤ 36 Ω/km
Conductors 1 mm² ≤ 21 Ω/km
Conductors 4 mm² ≤ 5.5 Ω/km

Theoretical breaking strength : 8900 daN
Operating temperature : -20 to +80 °C
Static bending radius ≥ 280 mm
Dynamic bending radius ≥ 560 mm
Weight in air : 1.28 kg/m
Weight in seawater : 0.65 kg/m

Other constructions and dimensions,
Please contact us.
Tel +33(0) 4 94 56 65 00
Fax +33(0) 4 94 43 38 16
e-mail : contact@mullercables.com

SONAR

Inboard ship sonar system cables, shielded and manufactured with high insulation resistance.

On request

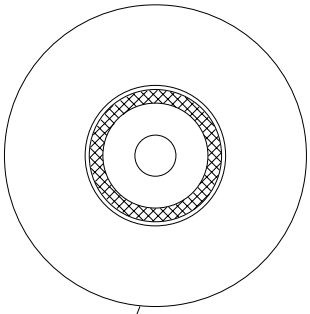
REF **6050 PLATED** COPPER COAXIAL

Application : Inboard ship sonar connection

metric : «LAPP MULLER» - COAX SONAR - REF 52566 - OF

Cable make up

Tinned copper conductor
Insulated in FEP
Tinned copper braid
Rubberized tape
Neoprene outer sheath



Outer diameter : 11 ± 0.25 mm

General characteristics

Coaxial cable type DSM 40-01
Operating voltage : 4.5 kV (peak)
Insulation resistance / 500 V > 1000 MΩ.km
Capacitance < 125 pF/m

Impedance at 20 to 50 MHz : 40 Ω
Attenuation at 20 MHz : 6.05 dB/100m
Attenuation at 30 MHz : 7.45 dB/100m
Attenuation at 50 MHz : 9.95 dB/100m
Weight : 0.15 kg/m

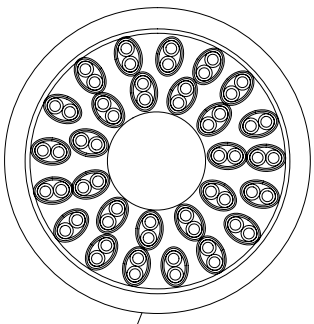
REF **57942 SHIELDED** MULTIPAIRS DYNAMIC CABLE

Application : Inboard ship sonar connection

metric : «LAPP MULLER» - MULTIPAIRES SONAR - REF 57942 - OF

Cable make up

28 pairs of conductors 0.34 mm²,
in extra flexible tinned copper,
insulated in polyester elastomer,
pairs shielded by tinned copper spinning ,
sheathed in polyester elastomer
Overall shield by tinned copper braid
Polyurethane outer sheath



Outer diameter : 25 ± 1 mm

General characteristics

Conductors operating voltage : 600 Volts
Conductors linear resistance ≤ 62.8 Ω/km
Characteristic impedance
between 2 conductors : 40 ± 5 Ω
Capacitance between 2 conductors ≤ 180 pF/m

Operating temperature : - 30 to +70 °C
Static bending diameter ≥ 100 mm
Dynamic bending diameter ≥ 160 mm
Weight : 740 g/m

Other constructions and dimensions,
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Tel +33(0) 4 94 56 65 00
Fax +33(0) 4 94 43 38 16
e-mail : contact@mullercables.com

OCEANOGRAPHIC

Electrical and fibre optic cables with strenght member reinforced for electromagnetic and optic detection instruments (radio- telescope, seismograph...).

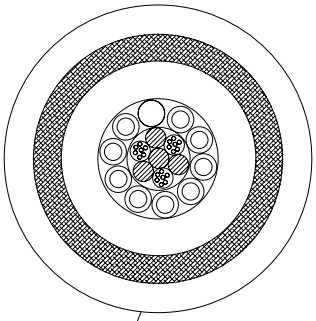
On request

REF **50580 ELECTRO OPTIC CABLE** REINFORCED, WATERTIGHT AND FIBRE BRAIDED STRENGTH MEMBER

Application : Connection for optical amplificators of underwater radiotelescope (-2500m)

Cable make up

21 singlemode 9/125 optical fibres
in stainless steel loose tube (7 fibres per tube)
9 conductors 1 mm², in flexible plain copper,
insulated in XLPE
Stranding with silicone compound
Polyethylene inner sheath
Aramid fibre braid
Polyurethane outer sheath



Outer diameter : 30 ± 0.5mm

General characteristics

Conductors operating voltage : 600 Volts
Conductors linear resistance ≤ 22 Ω/km

Optical fibres :
Attenuation between 1285 and 1330 nm ≤ 0.6 dB/km
Attenuation at 1550 nm ≤ 0.4 dB/km
Fibres proof test : 200 kpsi

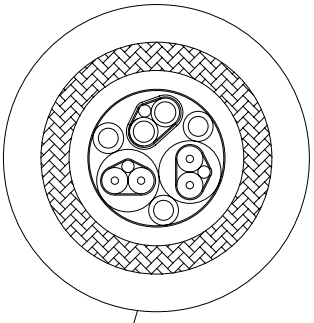
Theoretical breaking load ≥ 18 000 daN
Pressure rating : 260 bars
Operating temperature : -10 to +60 °C
Static bending radius ≥ 300 mm
Weight in air : 0.83 kg/m
Weight in seawater : 0.104 kg/m

REF **39465 POWER/SIGNAL CABLE**, REINFORCED, WATERTIGHT AND FIBRE BRAIDED STRENGTH MEMBER

Application : Detection line for seismic instrumentation (- 2000m)

Cable make up

2 pairs of conductors 0.22 mm², in flexible tinned copper, insulated in polypropylene,
pairs shielded by aluminum/polyester tape
and drain wire, sheathed in PVC
1 pair of conductors 1.5 mm², in extra flexible plain copper, insulated in polyester elastomer,
pair shielded by aluminum/polyester tape
and drain wire
3 Conductors 1.5 mm² (filling + ballast)
Stranding with watertightness compound
HDPE inner sheath
Aramid fibre braid
HDPE outer sheath



Outer diameter : 24 ± 1 mm

General characteristics

Conductors operating voltage : 600 Volts
Linear resistance :
Conductors 0.22 mm² ≤ 96 Ω/km
Conductors 1.5 mm² ≤ 15 Ω/km
Pairs 0.22 mm² theoretical impedance : 120 Ω
Pairs 0.22 mm² capacitance : 40 pF/m

Theoretical breaking load : 10 000 daN
Operating temperature : -30 to 70 °C
Static bending radius ≥ 150 mm
Dynamic bending radius ≥ 370 mm
Weight in air : 507 g/m
Weight in seawater : 43 g/m

Other constructions and dimensions,
Please contact us.
Tel +33(0) 4 94 56 65 00
Fax +33(0) 4 94 43 38 16
e-mail : contact@mullercables.com

BUOY

Buoy cables for measurement and oceanographical data acquisition.

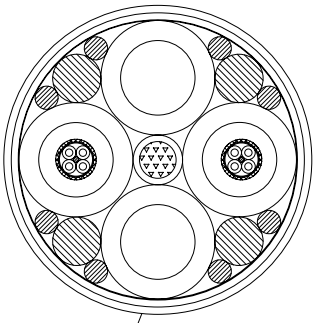
On request

REF **31555 UMBILICAL** POWER, SIGNAL, HOSES WITH FIBRE STRENGTH CORE MEMBER AND REINFORCED SHEATH

Application : Oceanographical measurement buoy

Cable make up

Central aramid strength member
4 PVC hoses
Fillers
PVC sheath
Polyurethane outer sheath



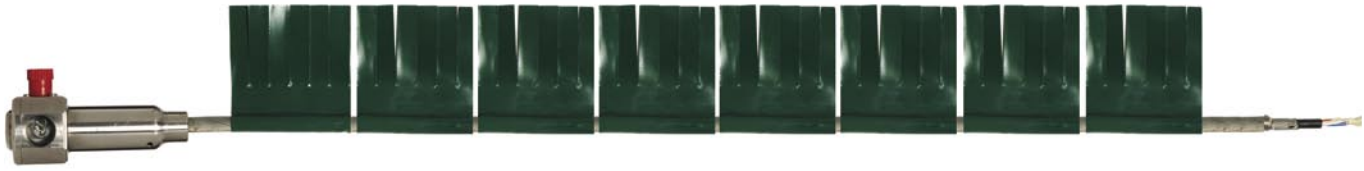
Outer diameter : 63 ± 1 mm

General characteristics

Theoretical breaking load : 5000 daN
Hoses working pressure : 15 bars
Hoses maximum pressure : 50 bars
Operating temperature : -15 to +60 °C
Static bending radius ≥ 250 mm
Dynamic bending radius ≥ 620 mm
Weight in air (hoses filled with water) : 3.64 kg/m
Weight in seawater (hoses filled with water) : 0.34 kg/m

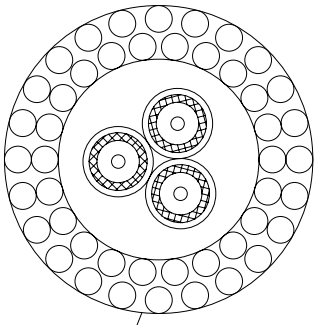
REF **26896 CABLE** WITH ARMOURED STEEL AND FLEXIBLE CAREENS

Application : Buoy of sonar towed, equiped with terminations and connectors



Cable make up

3 Coaxial cables with 0.34 mm² conductor
in silver-plated copper, insulated in FEP,
shield by silver-plated copper braid, and ETFE sheath
HDPE inner sheath
Double layer galvanized steel wire armoring



Armoring diameter :15 mm maximum
HDPE sheath diameter : 9.7 ± 0.1 mm

General characteristics

Coaxial cables :
Impedance at 10 MHz : 50 Ω ≤ Z ≤ 60 Ω
Impedance at 200 MHz : 50 Ω ≤ Z ≤ 60 Ω
Attenuation ≤ 65 dB/km at 10 MHz
Capacitance ≤ 100 pF/m
Linear resistance :
Conductor ≤ 55 Ω/km
Braid ≤ 35 Ω/km

Armoring breaking load > 9000 daN
Operating temperature : -30 to +70 °C
Pressure rating : 250 bars
Weight in air : 0.75 kg/m
Weight in seawater : 0.56 kg/m

Other constructions and dimensions,
Please contact us.
Tel +33(0) 4 94 56 65 00
Fax +33(0) 4 94 43 38 16
e-mail : contact@mullercables.com

“A complete range of cables for boats and ships equipments ”

These cables can carry (800 daN up to 150 000DaN), non-spinning, out of synthetic fibre with high tenacity for various applications as well as the lines of damping and mooring, the staying of masts...

Equipped with our terminations (marine eye, fork termination, turnbuckle....) as well as electric on board cables for ships and oil and gas platforms complying to international standards and specifications.

BOAT AND SHIP CABLES

MOORING LINE

High tenacity fibre mooring line, light, insulating, non-magnetic, corrosion resistant.

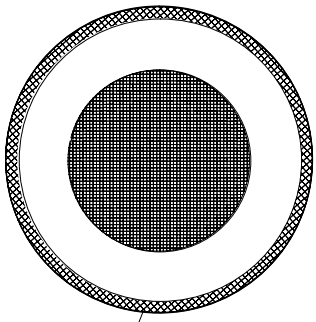
On request

REF **22399** **3 TONS ARAMID FIBRE** MOORING LINE WITH ANTIFOULING COPPER BRAID

Application : Mooring line for instrumentation basket

Cable make up

High modulus aramid fibre
Polyurethane sheath
Copper braid, coverage : 50 %



Outer diameter : 8.9 ± 0.1 mm

General characteristics

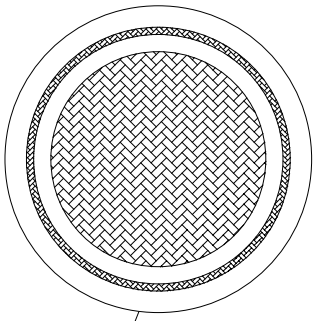
Theoretical breaking load : 3000 daN
Theoretical elongation at break : 2.3 %
Weight : 78 g/m

REF **57912** **35 TONS ARAMID FIBRE** ANTIGIRATORY MOORING LINE

Application : Mooring line buoy

Cable make up

High modulus aramid fibre
High density polyethylene sheath
Anti-torsion aramid fibre braid
High density polyethylene sheath



Outer diameter : 21.4 ± 0.5 mm

General characteristics

Theoretical breaking load : 35 000 daN
Theoretical elongation at break : 2.4 %
Weight : 0.39 kg/m

Other constructions and dimensions,
Please contact us.
Tel +33(0) 4 94 56 65 00
Fax +33(0) 4 94 43 38 16
e-mail : contact@mullercables.com

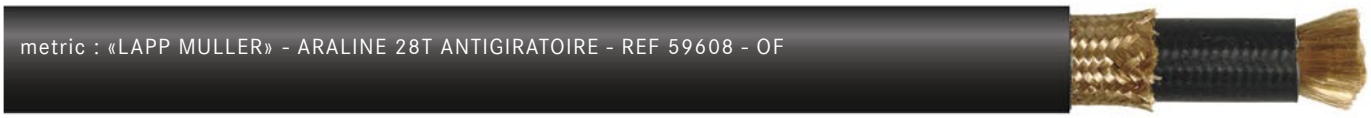
RIG STAY CABLE

On request

High tenacity fibre rig guys, light, insulating, non-magnetic, antigiratory, corrosion resistant.

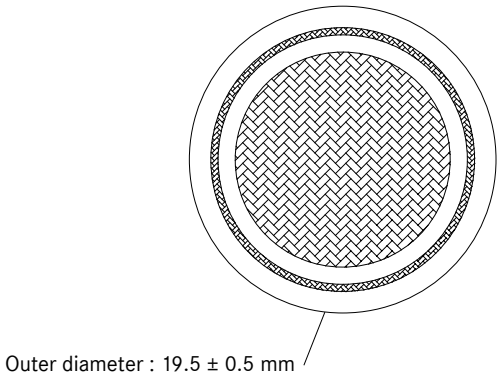
REF **59608** **28 TONS** HIGH MODULUS FIBRE, ANTIGIRATORY CABLE

Application : Race sailing yacht rig guy



Cable make up

Very high modulus synthetic fibre
High density polyethylene sheath
Anti-torsion synthetic fibre braid
High density polyethylene sheath



General characteristics

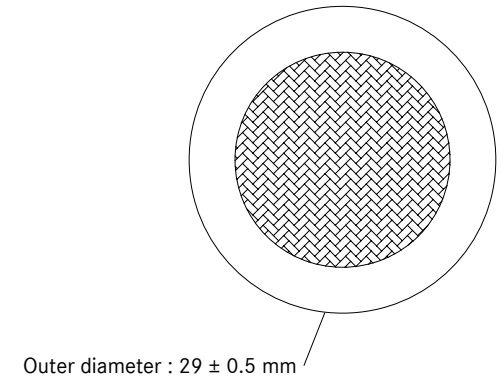
Theoretical breaking load : 28 000 daN
Theoretical elongation at break : 2.4 %
Weight : 0.33 kg/m

REF **55530** **88 TONS** HIGH MODULUS FIBRE CABLE

Application : Stay mast antenna

Cable make up

Very high modulus synthetic fibre
Polyurethane sheath



General characteristics

Theoretical breaking load : 88 000 daN
Theoretical elongation at break : 2.4 %
Weight : 0.780 kg/m

Other constructions and dimensions,
Please contact us.
Tel +33(0) 4 94 56 65 00
Fax +33(0) 4 94 43 38 16
e-mail : contact@mullercables.com

STAY CABLE

Cables of staying out of fibres synthetic with high tenacity, insulators, light, non-magnetic and corrosion resistant equipped with terminations and moulds.

On request

REF **17353 CARRYING CABLE** SYNTHETIC FIBRE 5T EQUIPPED WITH TERMINATIONS IN EYE TITANEART

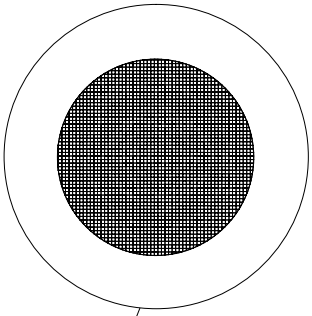
Application : Staying

Cable make up

High modulus aramid fibre
Polyurethane sheath

General characteristics

Theoretical breaking load : 5000 daN
Theoretical elongation at break : 3 %
Weight (bare cable) : 87 g/m



Outer diameter : 9.9 ± 0.1 mm

REF **17354 CARRYING CABLE** SYNTHETIC FIBRE 15T EQUIPPED WITH TERMINATIONS IN EYE TITANIUM

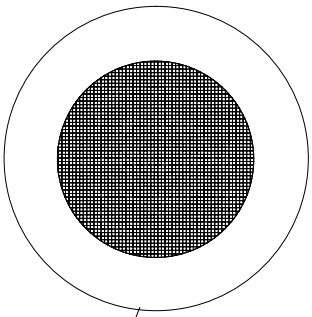
Application : Staying

Cable make up

High modulus aramid fibre
Polyurethane sheath

General characteristics

Theoretical breaking load : 15 000 daN
Theoretical elongation at break : 3 %
Weight (bare cable) : 220 g/m



Outer diameter : 12.2 ± 0.1 mm

Other constructions and dimensions,
Please contact us.
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e-mail : contact@mullercables.com

INBOARD INSTALLATION CABLE

On request

Electric cables of power/signal/instrumentation/without halogen,fire resistant , armoured tanks and not armoured for the electric installation embarked in the boats and submarines.

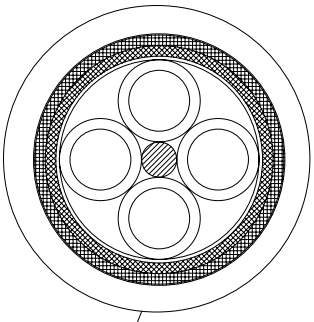
REF **57517 STANDARDIZED ELECTRIC CABLE** OF POWER SHIELDING GENERAL

Application : Food of power circuits of ships

metric : «LAPP MULLER» - PUISSANCE - REF 57517 - OF

Cable make up

4 conductors 25 mm², in flexible plain copper, insulated in XLPE
Shield by double tinned copper braid
XLPE outer sheath



Outer diameter : 27.8 ± 1 mm

General characteristics

Conductors operating voltage : 600/1000 Volts
Conductors linear resistance ≤ 0.84 Ω/km
Double shield theoretical linear resistance : 0.56 mΩ/m

Fire retardant according to IEC 60332-3
Operating temperature : - 25 to +90 °C
Static bending radius ≥ 115 mm
Weight : 1.7 kg/m

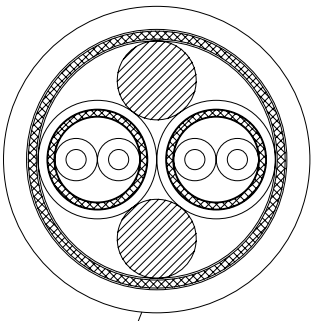
REF **57525 STANDARDIZED ELECTRIC CABLE** OF INSTRUMENTATION ARMOURED PER PAIRS AND GENERAL SHIELDING

Application : Power supply of the instruments

metric : «LAPP MULLER» - INSTRUMENTATION - REF 57525 OF

Cable make up

2 pairs of conductors 0.75 mm², in flexible tinned copper, insulated in XLPE
pairs shielded by tinned copper braid,
sheathed with fire-retardant polyolefine
Overall shield by tinned copper braid
Outer sheath in fire-retardant polyolefine



Outer diameter : 17.1 ± 0.7 mm

General characteristics

Conductors operating voltage : 600/1000 Volts
Conductors linear resistance ≤ 29 Ω/km
Overall shield theoretical linear resistance : 2.75 mΩ/m

Fire retardant according to IEC 60332-3
Operating temperature : -25 to +90 °C
Static bending radius ≥ 70 mm
Weight : 0.36 kg/m

Other constructions and dimensions,
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e-mail : contact@mullercables.com

“A complete range of special cables, studied and manufactured according to your needs.”

The experience of LAPP MULLER has enabled us to anticipate the evolution of marine and underwater technologies and thus be present with new solutions complying with the specific needs of the off-shore industry, ship building, institutes research, defence and security systems. The multi-disciplinary R&D team and modular production tool, are key to reacting properly to the most variable demand in special cables. We are able to tailor your cable design, bearing in mind all the electrical, mechanical and environmental constraints of your application.

We propose turnkey solutions, integrating the cable connections and terminations. LAPP MULLER makes your cords and harnesses from the connectors of your choice and those especially designed by us.

This catalogue contains a sample range of the 60000 LAPP MULLER special cables designed and manufactured over the last 10 years.

SPECIAL CABLES

SUBMARINE

Submarine cables for all types of work and underwater human interventions.

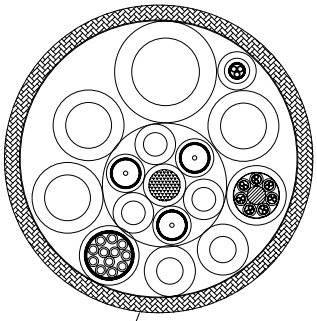
On request

REF **60480 UMBILICAL** MULTIFUNCTION/POWER/CONTROL/OPERATION/SIGNAL/VIDEO /FLUID MONOPIECE

Application : Diving Bell

Cable make up

Central aramid fiber strength member
1 hose 3/4"
3 hoses 1/2"
5 hoses 1/4"
3 coaxial cables type KX8
1 shielded power cable 12 x 2.5 mm²
1 communication cable of 7 shielded pairs 0.5 mm²
Overall assembling tape
Polypropylene protection braid



Outer diameter : 81 ± 2 mm

General characteristics

Conductors operating voltage : 250 Volts
Linear resistance :
Conductors 0.5 mm² ≤ 43 Ω/km
Conductors 1 mm² ≤ 21.5 Ω/km
Conductors 2.5 mm² ≤ 9 Ω/km

Coaxial cables :
Characteristic impedance : 75 Ω
Capacitance ≤ 71 pF/m

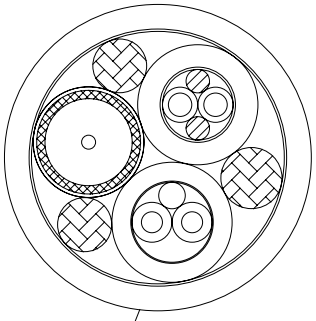
Strength member breaking load ≥ 6000 daN
Operating temperature : -10 to +60 °C
Static bending radius ? 500 mm
Weight in air (empty hoses) : 3990 g/m
Weight in seawater (empty hoses) : 250 g/m

REF **41136 CABLES** TIGHT POWER/SIGNAL/VIDEO

Application : Complement for narguilé of deep-sea diving

Cable make up

1 coaxial cable type KX6
1 pair of conductors 0.75 mm², in extra flexible plain copper, insulated in polyester elastomer, pair sheathed in polyurethane
1 pair of conductors 0.5 mm², in extra flexible tinned copper, insulated in polyester elastomer, pair shielded by aluminum/polyester tape and drain wire, sheathed with polyurethane
Polypropylene yarns fillers
Polyurethane outer sheath



Outer diameter : 13 ± 0.7 mm

General characteristics

Conductors operating voltage : 250 Volts
Linear resistance :
Conductors 0.5 mm² ≤ 44.5 Ω/km
Conductors 0.75 mm² ≤ 28.6 Ω/km

Coaxial cable:
Characteristic impedance : 75 ± 3 Ω
Capacitance : 70 pF/m

Theoretical breaking load of the polypropylene yarns : 55 daN
Operating temperature : -10 to +70 °C
Static bending radius ≥ 75 mm
Dynamic bending radius ≥ 130 mm
Weight in air : 0.16 kg / m
Weight in seawater : 25 g / m

Other constructions and dimensions,
Please contact us.
Tel +33(0) 4 94 56 65 00
Fax +33(0) 4 94 43 38 16
e-mail : contact@mullercables.com

SWIMMING POOL

Floating cables for cleaning robots of extra swimming pool flexible.

On request

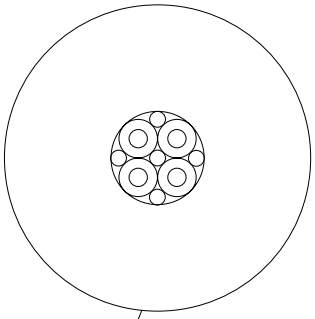
REF **50531 CABLES** FLOATING/POWER/COMMANDEAR

Application : Swimming pool robots

metric : «LAPP MULLER» - ROBOT DE PISCINE - REF 50531 OF

Cable make up

4 conductors 0.75 mm², in flexible plain copper, insulated in polyethylene
Low density fillers
Overall assembling tape
Low density polyolefine outer sheath



Outer diameter : 19 mm -0/+ 0.9 mm

General characteristics

Conductors operating voltage : 500 Volts
Conductors linear resistance ≤ 27.3 Ω/km

Operating temperature : -15°C to +70°C
Static bending radius ≥ 85 mm
Weight in air : 274 g/m
Weight in seawater : -9.2 g/m

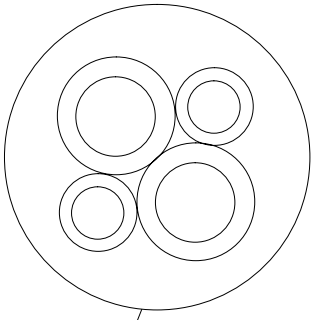
REF **49491 CABLES** NONFLOATING/POWER/ORDER

Application : Robots of swimming pool

metric : «LAPP MULLER» - ROBOT DE PISCINE - REF 49491 - OF

Cable make up

2 conductors 0.75 mm², in flexible plain copper, insulated in PVC
2 conductors 0.34 mm², in flexible plain copper, insulated in PVC
PVC outer sheath



Outer diameter : 6.4 ± 0.1 mm

General characteristics

Conductors operating voltage : 500 Volts
Linear resistance :
Conductors 0.75 mm² ≤ 27.3 Ω/km
Conductors 0.34 mm² ≤ 59.2 Ω/km

Flame retardant according to IEC 60332-1
Operating temperature : -15 to 75 °C
Static bending radius ≥ 33 mm
Weight : 0.064 kg/m

Other constructions and dimensions,
Please contact us.
Tel +33(0) 4 94 56 65 00
Fax +33(0) 4 94 43 38 16
e-mail : contact@mullercables.com

AQUACULTURE AND FISHING

Multifunction immergeables, tight composite cables
for aquacoles farms and halieutic observation
and information system.

On request

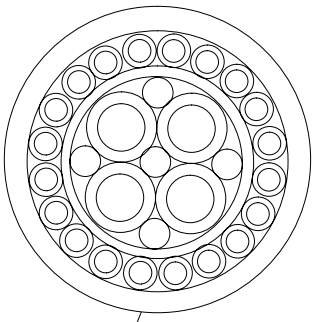
REF **15689 CABLES** POWER/CONTROL/SIGNAL WITH SHEATH REINFORCED

Application : Connection between the coast and the aquacole farm

metric : «LAPP MULLER» - AQUACULTURE - REF 15689 - OF

Cable make up

4 conductors 2.5 mm², in flexible tinned copper,
insulated in XLPE
Strand shielded by tinned copper braid
20 conductors 0.6 mm², in flexible tinned copper,
insulated in XLPE
Polyurethane outer sheath



Outer diameter : 15.7 ± 0.8 mm

General characteristics

Operating voltage :
Conductors 2.5 mm² : 1000 Volts
Conductors 0.6 mm² : 250 Volts
Linear resistance :
Conductors 2.5 mm² ≤ 8.21 Ω/km
Conductors 0.6 mm² ≤ 34 Ω/km

Operating temperature : -15 to 70 °C
Static bending radius ≥ 240 mm
Weight : 0.39 kg/m

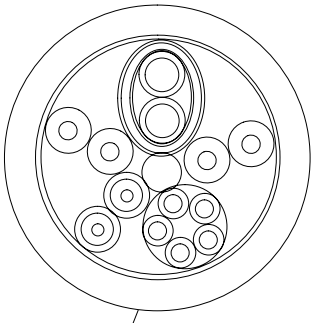
REF **59436 CABLES** VIDEO POWER/CONTROL/OPERATION/SIGNAL/BY OPTICAL FIBRES

Application : Halieutic observation and information system

metric : «LAPP MULLER» - FISHING - REF 59436 - OF

Cable make up

1 pair 0.75 mm², in extra flexible plain copper,
insulated in polyester elastomer,
pair shielded by tinned copper spinning
2 BUS pairs type RS 422,
pairs of conductors 0.25 mm², in extra flexible
tinned copper, insulated in polypropylene
2 singlemode 9/125 tight-buffered optical fibres,
sheathed with polyurethane
5 conductors 0.25 mm², in extra flexible tinned copper,
insulated in polyester elastomer
Aramid fibre braid
Polyurethane outer sheath



Outer diameter : 10 ± 0.5 mm

General characteristics

Conductors operating voltage : 250 Volts
Linear resistance :
Conductors 0.25 mm² ≤ 80.6 Ω/km
Conductors 0.75 mm² ≤ 27.3 Ω/km
Pairs type RS 422 :
Characteristic impedance : 100 Ω
Capacitance ≤ 60 pF/m

Optical fibres :
Attenuation at 1310 nm < 0.25 dB/km
Attenuation at 1550 nm < 0.40 dB/km

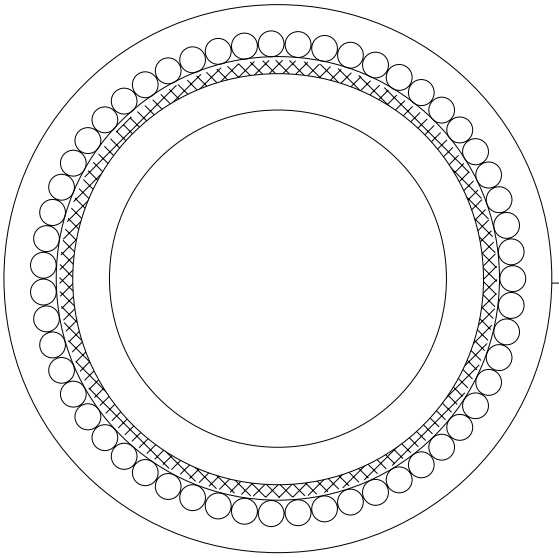
Strength member breaking load : 140 daN
Operating temperature : -15 to +60 °C
Static bending radius ≥ 80 mm
Dynamic bending radius ≥ 150 mm
Weight : 0.11 kg/m

Other constructions and dimensions,
Please contact us.
Tel +33(0) 4 94 56 65 00
Fax +33(0) 4 94 43 38 16
e-mail : contact@mullercables.com

On request

REF **58400 UMBILICAL** FOR GAS EXTRACTION EQUIPPED WITH ANCHORING STAINLESS AND LIMITING DEVICE OF CURVE OUT OF PU

Application : This system makes it possible to extract methane gas found during oil extraction, and then to burn it off.



Cable make up

Armored stainless steel hose 2"
Aramid fibre contra-helical double layer strength member
Galvanized steel wire armor
Polyurethane outer sheath

General characteristics

Theoretical breaking strength ≥ 57 000 daN
Dynamic bending radius ≥ 1700 mm
Weight : 7 kg/m

Other constructions and dimensions,
Please contact us.
Tel +33(0) 4 94 56 65 00
Fax +33(0) 4 94 43 38 16
e-mail : contact@mullercables.com

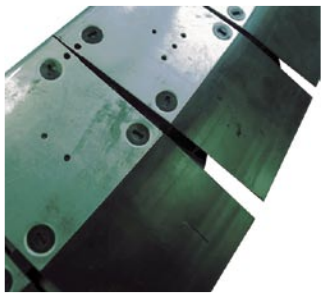
CONNECTORS, TERMINATIONS AND EQUIPMENTS

In the last ten years, LAPP MULLER has developed specific know-how renowned in the world of equipped electro-optical cables ready to be connected.

Our technical means allow us to propose performing cable-connector-termination solutions perfectly suiting our customers' specifications. We choose the standard connectors and assemble them with our cable in full observance of standards, in close collaboration with connector manufacturers, in order to guarantee the best solutions.

We also study strength members systems, specific connections, over moulding and/or bending limitations on self-bearing and bearer cables in braids or layers in steel or high tenacity synthetic fibres, to ensure the integrity of the interface.
We can also fit out our cables for towed devices with rigid or flexible fairing intended to improve hydrodynamic behaviour.
Our offer may be completed with adapted products such as:
- Cable glands in plastic or metal
- Obturators
- Fixing flanges and collars
- Protection sheaths and braids
- Cable pullers in steel braid
- Fleximark marking system

We have a standard range of terminations, strength members units and sleeves for our cables in high tenacity synthetic fibres.
These marine eye terminations, fork termination and turn are in different kinds of materials: anodised aluminium (colours), galvanised steel, stainless steel, titanium...
We define on request a file of specifications, including drawings, nomenclatures, recommendations for assembly and use to order, etc...



Our cables may be prescribed and approved to order by control bodies:

DNV · BUREAU VERITAS · DGA · Lloyd's Register · ABS TYPE APPROVAL PROGRAM

“ LAPP MULLER, your partner for total cabling solutions, customized cables and short lengths ”.

Nuclear
Present for more than 30 years in the nuclear field, LAPP MULLER SAS has equipped since 1985 the first fuel assembly handling bridges of the waste processing plant of LA HAGUE in France. LAPP MULLER SAS has built its reputation by designing and manufacturing high performance cables using constructions and materials to meet the requirement of nuclear engineering cables.

Robotic and automation
LAPP MULLER has more than 25 successful years in robotic and chain carry-cable applications. Working in partnership with many companies supplying original equipment into the industrial sector with applications such as machine tools, robots and gantries integrating power lines, power/control, signal, servomotors and safety control systems. Lapp Muller’s knowledge and expertise have seen the production of both hybrid and dynamic cable designs ideally suited to withstand the severe mechanical demands of continual and repeated bending as well as the harsh working environment where welding, moulding and chemical processes take place.

Oil & gas
LAPP MULLER cables have been used in many applications for both exploration as well as production on oil and gas platforms around the world. Found in day to day maintenance equipment to the actual positioning systems used for the location of platforms and pipelines to all important safety equipment. Additionally LAPP MULLER cables can also be seen in valve control and monitoring equipment used for gas transportation.

Harbour
LAPP MULLER technology can be found in many containerised ports , where the need for mixed umbilical links within the winding cables is required.

Airport
LAPP MULLER ultra flexible cables are to be found in many airside applications such as rollers on aerobridges and taxiway power-stations used to energize the aircraft’s electrical systems when on the ground. Both the construction and materials used in these cables make them ideal to withstand both the harsh mechanical and chemical conditions that these applications demand.

Miscellaneous
LAPP MULLER cables can also be found in many other industrial sectors such as medical, petrochemical, telecommunications, leisure and defence. Cables for applications such as silo control in agriculture, ski and chair lifts control in the leisure industry, safety systems used in large buildings from railway stations to municipal complexes. Due to their lightness and high mechanical specification, technologically advanced products such as Araline cables make them ultra competitive and ideal for these applications. In fact anywhere the need for integrity of the cables is paramount particularly because of safety demands or where severe environmental conditions are to be experienced LAPP MULLER cables are to be found

Certification ISO 9001 V2000

LAPP MULLER Through thousands of kilometres of cable
LAPP MULLER links man and machine in every field of activity

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Founded in 1939 by M. Jean Muller, the Muller et Landais company used to make electric cables for the construction industry. Then the company quickly turned to the manufacture of specially designed eletrical cables and more specifically to moving and composite cables.
In 1980, the firm became MULLER SA. Muller met a growing demand for special cables and expanded to produce high tech applications cable systems with fitted connectors.

In 2003, Muller became LAPP MULLER integrating into LAPP group, with its 2500 employees, its 15 productions sites, and its 35 sales companies.

Reference of the LAPP group for cables with technology, LAPP MULLER covers a number of speciality including design studies, tests and "turnkey" systems.

www.mullercables.com

A Lapp Group Company