Thermo Cables

Complete Cable Solutions

Global Expert In Speciality Cables Manufacturing

Thermo Cables is a recognized and preferred brand across various industries including Oil & Gas, Railways, Navy, Defence, Renewable Energy, Nuclear Power, Process Industries, Power etc, exporting 60% of products. Established in 1990, it is a leading manufacturer of various types of speciality cables. Thermo Cables is a part of Thermo Group - a multi-product & multi-service organization with other group companies:

Thermopads: A specialist in Commercial, Domestic and Industrial Heating

Thermosystems: An EPC company in the field of Fuel Oil Handling Systems, Fire Detection Protection Systems etc.

Major Approvals

ADNOC - OFFSHORE
ADNOC - ONSHORE
ALBA
AP GENCO
AP TRANSCO
ARO DRILLING
AVANT GARDE
BALTIC CHEMICAL PLANT
BAPCO ENERGIES
BDL, BEL, BEML, BHEL, BLW
BOROUGE, BPCL
CLW, CMRL, CSL
DESEIN LTD, DGMS, DVC
DLW, DMDE & DMW
DLRL, DMRL & DMRC
DOLPHIN ENERGY
DRDO - ASL & DRDL
DUBAI WORLD
EGA
ENGINEERS INDIA LTD
ENOC
EXPRO
FICHTNER CONSULTING
GRSE, GSPC
GOA SHIPYARD
HALLIBURTON
HINDUSTAN SHIPYARD
HPCL, HAL, HMRL
INTERNATIONAL MARITIME INDUSTRIES
IOCL, ICF, ISRO
JACOB'S H & G
KNPC - KUWAIT
KOC - KUWAIT
LAMPRELL
L & T
MATERIAL ORGANISATION - KARWAR
MATERIAL ORGANISATION - MUMBAI
MATERIAL ORGANISATION - VIZAG
MECON, MCF
MN DASTUR & CO.
MAZGOAN DOCK LIMITED
MUMBAI PORT TRUST
NMDC ENERGY
NORTH OIL
NPCIL, NSTL, NTPC
ONGC
ORLEN
OXY
PDIL
PGCIL
PDO OMAN, PETRONAS
PETROPERU
QATAR ENERGY, QATAR PETROLEUM
RCF
SABIC
SAIL
SAIPEM
SAPURA ENERGY
SHELL, SONATRACH
TATA CONSULTING ENGINEERS
TECNIMONT ICB LTD
TOYO ENGINEERING INDIA LTD
THYSSENKRUPP

Stringent quality requirements, global standards of precision and increasingly demanding customers are the order of the day. Thermo Cables, sensitive to this reality, designs, manufactures and supplies a wide range of cables to satisfy customers' specifications and requirements.

Product Range

- Instrumentation Cables
- Power, Control & Earthing Cables
- Thermocouple Cables
- Fire Resistant Cables
- High Temperature Cables
- Foundation Fieldbus Cables
- Special Application (LFH) Cables
- Renewable Energy Cables
- Naval Application Cables
- Marine/Shipboard Cables
- Pressure Tight (PT) Cables
- Railway Cables
- Material Handling Cables
- Type-P Cables
- VFD Cables
- Co-Axial Cables (RG Series)
- ESP Cables
- Downhole (TEC) Cables
- Custom Wiring & Cable Harnesses
  - Railway
  - Defence
  - Wind
- IV Coupler & Jumper Cable Assembly
- Cable Systems

Why Us

- Leading & reputed manufacturer of Specialty Cables
- One stop solution for all Low Voltage Cables
- Serving satisfied customers since 30 years across 60+ countries
- In-house wire drawing, compounding, Electron beaming and testing facilities
- Quick response time and offer submission in less than 24 hours

Quality & Reliability

- An ISO 9001: 2015 certified company with proven track record of delivering quality products
- NABL accredited full-fledged in-house testing laboratory
- Environment, Occupational Health and Safety Systems adhering to ISO 14001:2015, 45001:2018
- 15% of power consumption sourced through in-house generated renewable energy

Standards

- Cables designed and manufactured conforming to various National and International Standards

General Cables: ANSI MC 96.1, BS-6346, BS-5467, BS-7629, BS-6387, BS-7846, BS-5308-I & II, BS- 50288-7, IEC-60502-I, IEC-60189-I & II, IEC-60228, IEC-60584-I & III, IEC-60331, IS-8784, IS-613, IS-694, IS-1554-I, IS-7098-I, BS 16246, BS 7211.

Railway Cables: ELRS-0019 REV-4, CLW-0458 ALT-E, CLW-0459 ALT-C, EDTS - 132 REV - C, EDPS - 179, EDPS - 304, EN - 50264 - 3 - 1 & 2, EN - 50306 - 1, 2, 3 & 4, EN - 50382 - 1 & 2, EN - 45545 - 2, IEC 61156 - 6.

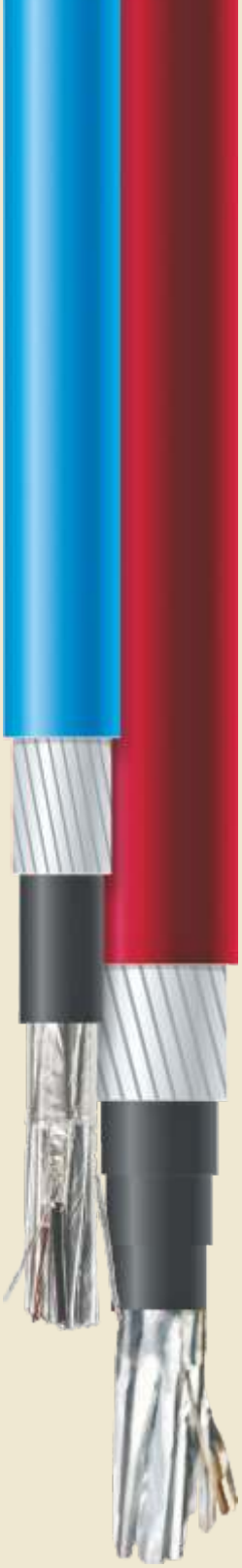
Navy & Marine Cables: EED 50-12 REV-3, EED 50-13 REV-2, DEF STAN 61-12 PART 18, DEF STAN 61-12 PART 31, DEF STAN 02-526, DEF STAN 02-527, MIL - DTL-24640C, MIL - DTL 24643C, IEC 60092 - 350, 353, 376 & 360, BS 6883, BS 7917, IS 9968 Part - I, IS 6380, EN 50525 - 2- 11-12-21-22-41-42, EN 50618.

Mining Cables: IS 14494, **Co-Axial Cables:** MIL - DTL - 17H,

High Temperature / Aerospace Cables: JSS 51034, 51038, SAE-AS 22759 / 32A, 34B, 41B, 43B, 44A, 45A, 80D, 83E, 84E, 85E, 86E, 87E, 88E, 89E, 90D, 91D, 92D, ANSI / NEMA - WC - 27500

Valuable Assets

- Over 3,00,000 sq ft of infrastructure facilities with latest technology
- 1000+ dedicated & high performing workforce
- Experienced & professional leadership team
- Offers technical support in cable selection through SAP



Instrumentation Cables

Instrumentation Cables are specially designed to transmit signals without any external interference. They are used in Data Acquisition Systems, Connections to Instruments, Computer Networking, PA Systems, Digital / Analog Control / Measuring & Communication Systems, Data Communication, Sensors, Transducers etc.

Construction : Cores, pairs, triads or quads

Voltage Grade : 90 V to 1100 Volts

Conductor : Electrolytic Grade Copper Bare / Tinned / Nickel Plated / Silver Plated
Solid / Stranded / Flexible Conductors

Range : 0.5 / 0.75 / 1.0 / 1.5 / 2.5 Sq. mm up to 100 pair

Primary Insulation : General Purpose PVC / Heat Resistant PVC / PE / XLPE / PTFE / FEP / PFA / EPR / Silicone Rubber / Fibre Glass

Screening : Individual and / or overall with following options -
- Aluminum Mylar with Drain Wire / Copper Tape with Tinned Copper Drain Wire
- Braided with Bare or Tinned or Nickel Plated or Silver Plated Copper

Inner Sheath : PVC / HRPVC / FRPVC / FRLS PVC / ZHFR / LSF

Armouring : GI Round Wire / Flat Strip or GI / SS Wire Braiding / GI Braiding

Outer Sheath : PVC / HRPVC / FRPVC / FRLS PVC / ZHFR / LSF

Rip Cord (Optional) : For easy removal of sheath

Standards : BS-EN 50288-7, BS-5308 Part-1 & 2, BS-7655, IEC-189 (1 & 2), VDE-0815 & 0816, IEC-60332-1, IEC-60332-3-22, 23, 24

Additional Features : Communication pairs, Bi-colour extrusion, Band marking

Optional Bedding : Aluminum Tape + HDPE + Polyamide Sheath for Alternate Lead Sheath Cables

Note: We also offer Data Communication and Low Capacitance Cables

Technical Data

Conductor Resistance at 20^0 C Ohms/Km	Conductor Size mm^2	0.5	0.75	1.0	1.5	2.5	
	Maximum Resistance (Plain Copper Conductor)	39.0	26.0	19.5	13.3	7.98	Class-5
		36.0	24.5	18.1	12.1	7.41	Class-2
Capacitance nf/Km	Between Conductors	< 250 for PVC < 150 for Polyolefin					
Inductance mH/Km		<1.0					
L/R Ratio μH/Ohm	Conductor Size mm^2	0.5	0.75	1.0	1.5	2.5	
	L/R	< 25	< 25	< 25	< 40	< 60	
Insulation Resistance at 20^0 C MOhm-Km	PVC	More than 100					
	PE/XLPE	More than 5000					
Electrostatic noise rejection ratio		More than 76.0 db					

Power, Control & Earthing Cables

Construction	:	Single Core / Multi Core
Voltage Grade	:	Upto 1800 / 3300 V AC
Conductor	:	Aluminum / Copper, Solid / Standard / Flexible Conductor
Range	:	Single Core up to 1000 Sq. mm Multi Core up to 400 Sq. mm Max 61 Cores of 1.5, 2.5, 4.0, & 6.0 Sq. mm
Primary Insulation	:	General Purpose PVC / Heat Resistant PVC / XLPE / EPR / HEPR
Inner Sheath	:	General Purpose / PVC / HRPVC / FRPVC / FRLS PVC / ZHFR / LSF
Armouring	:	GI Round Wire / Flat Strip or GI / SS Wire Braiding Non-Magnetic Armour / Braiding for Single Core
Outer Sheath	:	General Purpose / PVC / HRPVC / FRLS PVC / ZHFR / LSF
Standards	:	IS-694, IS-1554 (Part-I), IS-7098 (Part-I), IEC-60502-1 & BS-6346, BS-5467, IEC-60227, BS-6004, IEC-60332-1, IEC-60332-3-22, 23, 24
Optional Bedding	:	Aluminium Tape + HDPE + Polyamide Sheath for an alternate Lead Sheath Cables

Core Identification

Cores shall be identified by different colours of PVC insulation. Following colour scheme shall be adopted

1 Core	:	Black or any Single colour
2 Core	:	Red & Black
3 Core	:	Red, Yellow & Blue
4 Core	:	Red, Yellow, Blue & Black
5 Core	:	Red, Yellow, Blue, Black & Grey
6 Cores and above	:	Two adjacent Cores (counting and direction Core) in each layer, Blue & Yellow, remaining Cores Grey

In addition to these, combinations from the following colours can also be offered -
Red, Black, Blue, Brown, Green, Grey, Orange, Violet, White, Yellow.

Alternately, any single colour insulation on all Cores with number printing can also be provided.

Designation Code

Y	--	PVC insulation
W	--	Steel round wire armour
F	--	Steel strip armour
WW	--	Steel double round wire armour
FF	--	Steel double strip armour
Y	--	PVC outer sheath
Wa	--	Non-magnetic round wire armour
A	--	Aluminium conductor

No Abbreviations used when the conductor material is Copper

Thermocouple Extension/Compensating Cables

Construction : Single or Multiple Pairs

Voltage Grade : Up to 1100 V

Cable Code : Kx, Kx (A), Tx, Jx, Ex, Sx / Rx, Bx, Nx, Ux, Wx

Range : 16 AWG / 18 AWG / 20 AWG up to 48 Pair

Primary Insulation : General purpose PVC / Heat Resistant PVC / PE / XLPE / PTFE / FEP / PFA / Silicone Rubber / Fibre Glass

Screening : Individual and overall with following options -
- Aluminum Mylar / Copper Tape with Tinned Copper Drain Wire
- Braided with Bare or Tinned or Nickel Plated or Silver Plated Copper

Inner Sheath : PVC / HRPVC / FRPVC / FRLS PVC / ZHFR / LSF / PTFE / PFA / FEP / Fibre Glass

Armouring : GI Round Wire / Flat Strip or Wire Braiding and SS Wire Braiding

Outer Sheath : PVC / HRPVC / FRPVC / FRLSPVC / ZHFR / LSF/ PTFE / Fibre Glass / PFA / FEP

Standards : ANSI: MC-96.1, IEC-584-3, DIN, BS IEC-60332-1, IEC-60332-3-22, 23, 24, IS-8784

Note: Other conductor sizes and insulation materials on request

Technical Data

CABLE CODE		Kx	Kx (A)	Tx	Jx	Ex	Sx / Rx	N
CABLE TYPE		EXT.	COMP	EXT.	EXT.	EXT.	COMP	EXT.
Conductor	+Ve leg	Chromel	Copper	Copper	Iron	Chromel	Copper	Nicrosil
	-Ve leg	Alumel	Constantan	Constantan	Constantan	Constantan	Copper Alloy	Nisil
Suitable for Thermocouple Type		**Kx**	**Kx**	**Tx**	**Jx**	**Ex**	**Sx / Rx**	**N**
Conductor Combination		Chromel Alumel	Copper Alumel	Copper Constantan	Iron Constantan	Chromel Constantan	Platinum 10/13% Rhodium Platinum	Nicrosil / Nisil
Temperature range of measuring junction °C		0 to +1100	(0°C to +80°C) ☆	-185 to +300	+20 to +700	0 to +800	0 to + 1550 0 to + 1600	- 200 to + 1300
Applicable standards for ouput of Thermocouple conductors		BS 1843, ANSI / MC 96.1 type K, DIN 43710, NFC 42-324, JIS C 1610, IEC 60584-3, IS 8784/1987	Used for interconnecting Type K thermocouples ☆	BS 1843, ANSI / MC 96.1 type K, DIN 43710, NFC 42-324, JIS C 1610, IEC 60584-3, IS 8784/1987	BS 1843, ANSI / MC 96.1 type K, DIN 43710, NFC 42-324, JIS C 1610, IEC 60584-3, IS 8784/1987	BS 1843, ANSI / MC 96.1 type K, DIN 43710, NFC 42-324, JIS C 1610, IEC 60584-3, IS 8784/1987	BS 1843, ANSI / MC 96.1 type K, DIN 43710, NFC 42-324, JIS C 1610, IEC 60584-3, IS 8784/1987	BS 1843, ASTM E 230, IEC 60584-3
COLOUR CODING (Revised)	BS 1843							
	ANSI MC 96.1/ASTM E230							
	DIN 43710		-					No standard
	NFC 42-324							No standard
	JISC 1610							No standard
	IEC 60584-3		-					
	IS 8784							No standard
Approximate generated EMF change per deg. °C µV/°C at	**100° C**	42	☆	46	54	68	8/8	30
	500° C	43	☆	—	56	81	9/10	38

NOTES : ☆ Used for interconnecting Type 'K' thermocouples and instrumentation as an alternative to type 'K' material. Only used where the interconnection temperature is in the range 0° C to + 80° C

We can also offer NX, UX and WX Cables ◐ Kx (A) - also known as Vx

Fire Resistant Cables

Finds application where electrical integrity of the cable has to remain intact for at least three hours, so as to activate and maintain crucial functions such as fire fighting, public announcements, smoke extraction systems, sprinklers, emergency lighting, evacuation path lighting systems etc.

The areas for Fire Resistant cable applications include places where large number of people congregate for short or limited period of time such as shopping malls, cinema theaters, educational institutions, airport terminals, mass transit systems (metro rail networks), high rise office buildings etc. FR cables also find use in power generation facilities, petrochemical complexes, nuclear power facilities, mines etc. for phased shut down of the plant and to keep critical functions like communication, rescue and evacuation systems functional during a fire.

Construction	:	Single & Multi Cores / Pairs / Traids
Voltage Grade	:	300 / 500 / 600 / 1000 / 1100 V AC
Conductor	:	- Solid or Stranded Annealed Bare or Tinned Copper Conductor / - Stranded Aluminium Conductor
Fire Barrier	:	Glass Mica Tape
Insulation	:	XLPE or EPR or Silicone Rubber
Screening	:	Individual and/or overall with following options - - Aluminum Mylar / with Copper Drain Wire / Copper Tape with Tinned Copper Drain Wire - Braided with Bare or Tinned or Nickel Plated or Silver Plated Copper
Inner Sheath	:	FRLS PVC / LSOH / ZHFR / SHF1 / SHF2 or equivalent
Armouring	:	Galvanized Steel Wire Helical Armour / Steel Wire Braid / GI Wire Braid
Outer Sheath	:	FRLS PVC / LSOH / ZHFR / SHF1 / SHF2 or equivalent
Standards	:	BS-7846, BS-7629, BS-8434 or equivalent with fire test confirming resistance to BS-6387 category CWZ 'or' IEC-60331-21, BSEN 50200

- Fire Resistance cable type tested at BRE Global (UK) for BS-6387 CWZ category

0578

Complete In-house expertise & facilities to provide the entire range of High Temperature Insulations

High Temperature Cables

High temperature cables are used in areas where both working temperatures and ambient temperatures are too high. They are made with a wide range of conductors, insulating materials and screening materials depending on the temperatures and conditions under which the cable has to perform.

Single Core high temperature hook-up wires & Multi Core / Multi Pair, Screened & Unscreened and Armoured & Unarmoured Cables

Construction : Single Core or Multi Core / Pairs

Voltage Grade : 250 V AC, 600 V AC & 1000 V AC (Rating as per MIL-16878, VDE, DIN, JSS)

Conductors : Annealed Bare copper (up to 200° C) / Annealed tinned copper conductor (up to 180° C)

Annealed silver plated copper conductor (up to 200° C)

Nickel plated conductor (up to 260° C)

Insulation

Insulation Material	Temperature Range	Characteristics
PTFE	- 200° C to 260° C	Excellent chemical resistance. High temperature stability
FEP	- 200° C to 200° C	Good chemical resistance Thin wall insulation due to good electrical properties
PFA	- 200° C to 250° C	Good chemical resistance, Thin wall insulation due to good electrical properties. Good flexibility
PTFE	- 150° C to 150° C	Mechanically tough
XL ETFE	- 150° C to 200° C	Good electric insulation, radiation resistance, ARC tracking and cold flow
PEEK	- 160° C to 250° C	Mechanically very tough High temperature and radiation resistance
Kapton Tape	- 250° C to 300° C	Very thin wall insulation. High temperature resistance
Silicon Rubber	- 40° C to 180° C	Flexible and abrasion resistance
Ceramic Yarn / Quartz Yarn Braiding	600° C	Chemically stable and higher thermal resistance
Special High Temperature Yarn	1000° C	Superior resistance to temperatures. excellent resistant against radiant heat.

Screening : Individual and / or overall with following options
- Aluminum Mylar / Copper Tape with Tinned Copper Drain Wire
- Braided with Bare or Tinned or Nickel Plated or Silver Plated Copper

Armouring : Steel galvanized wire, stainless steel wire, high strength steel wire braiding

Standards : JSS-51034, JSS-51038, UL-1581

Industry & Applications

Steel / Cement : Cables for blast furnace, electric arc furnace, hot & cold rolling mills, steel refining facilities etc.

Communication : High frequency co-axial cables for VHF, UHF and SHF transmission

Marine : Engine proximity wiring for good resistance to high temperatures, fuel oils, chemicals, saline air / water etc.

Petrochemical : Instrumentation & control, temperature sensing, fire warning etc.

Power : In proximity to the turbines, boilers, ash handling etc.

Foundation Fieldbus Cables

These Cables are meant for bi-directional communications protocol used for communications among field devices and to the control system. Installed in many process applications in industries like oil and gas refineries petrochemicals, power generation and even in food & beverage, pharmaceuticals and nuclear applications.

Voltage Grade	:	300 V / 600 V
Conductor	:	Plain / Tinned Annealed Copper (up to 120° C) Silver Plated Annealed Copper (up to 200° C) Nickel Plated Annealed Copper (up to 260° C)
Range	:	22 AWG / 18 AWG / 16 AWG / 14 AWG
Operating Temperature	:	-20° C to 90° C and for high Temperature cables up to 260° C
Insulation	:	Solid Polyethylene (80° C) / XLPE (90° C) / Flouro Polymers FEP (200° C) / PFA (250° C)
Screening	:	Individual and / or overall with following options - Aluminum Mylar with Drain Wire / Copper Tape with Tinned Copper Drain Wire - Braided with Bare or Tinned or Nickel Plated or Silver Plated Copper
Inner Sheath	:	PVC / HR PVC / FR PVC / FRLS PVC / ZHFR / LSF / FEP / PFA
Armouring	:	Round Galvanized Steel Wire / Flat Strip / Steel Wire Braid / GI Wire Braid
Outer Sheath	:	PVC / HR PVC / FR PVC / FRLS PVC / ZHFR / LSF / FEP / PFA with Plain Orange Jacket or with strip for easy identification and Blue jacket available for Intrinsically Safe applications
Standards	:	Cable specification Foundation Fieldbus FF-844 H1, Cable design based on EN 50288-7 / BS-5308 Part 1, IEC-60332 Electrical properties: FF-844 H1 and IEC-61158-2, Type A
Our FF Cable Features	:	Excellent Electrical Characteristics with Low Capacitance (for long runs) RoHs complaint and CE marked

Special Application (LFH) Cables

Power, Control & Signal Cables, Limited Fire Hazard Insulation & Sheath materials with halogen free, fire retardant with low smoke generation and low toxic properties.

Specification	:	Def Stan 61-12 (PT-18 & PT-31)
Construction	:	Multi Core, Multi Pair, Composite Cables, Unscreened, Individually Screened & Collectively Screened
Voltage Grade	:	600 V
Conductor	:	Circular electroplated & annealed tinned copper
Temperature Range	:	-50^0 C to $+120^0$ C
Insulation	:	Special Halogen free and fire retardant with low smoke generation and low toxic polymers with E-beam curing process
Screening	:	Annealed tinned copper braid
Outer Sheath	:	Special halogen free and fire retardant with low smoke generation and low toxic polymers with E-beam curing process
Application	:	Used in defence especially in Radar & Missile launching system for Power, Control, Lighting and Communication and Instrumentation circuits

Renewable Energy Cables

Solar Photovoltaic Cables

Solar photovoltaic cables are used for transmitting electrical power generated from the solar panel to the charging units, battery banks, change over systems, inverters etc. These cables have to function effectively while remaining exposed to a wide range of severe environmental conditions.

Construction:

Size (Sq mm)	**Number of Strands/ Diameter**	**Nominal Outer Dia** (mm)	**Max Conductor Resistance** Ohms/Km
2.5	50/0.25	5.50	8.21
4.0	56/0.30	6.00	5.09
6.0	85/0.30	6.80	3.39
10.0	140/0.30	7.70	1.95
16.0	128/0.40	8.80	1.24

Size (Sq mm)	**Single Cable in Air** (Amps)	**Single Cable on Surface** (Amps)	**Multiple Cable on Surface** (Amps)
2.5	41	39	33
4.0	55	52	44
6.0	70	67	57
10.0	98	93	79
16.0	132	125	107

Voltage Grade : 1000 V AC / 1500 V DC

Temperature Range : - 40° C to 120° C

Conductor : Tin Coated Copper Class 5 conductor

Insulation and Sheath : Electron Beam Irradiated Cross linked Polyolefin Compound

Standards : TUV-2PIG 1169 / 07 2008 (Standard for Photovoltaic cables) or BSEN 50618-2014 (Covers upto 240 Sq. mm)

Features : Resistant to ozone, water absorption & severe environmental conditions

Wind Power Cables

Torsion Cables

These cables are used for transmitting power from the generator mounted in the nacelle of the wind tower to base station. These are flexible cables made of special elastomeric compounds, so as to meet the torsional stresses exerted on the cable due to rotation of the nacelle towards wind direction.

Voltage Grade : 600 V / 1100 V

Conductor : Flexible Class-5 tinned or bare copper conductors, made to IEC-60228 / IS-8130

Range (Single Core) : 10 Sq. mm to 400 Sq. mm

Insulation : EPR - in conformance to IEC-60502 / IS-6380

Sheath : Special elastomer compound with Oil, Fire, Hydrolysis & Torsion resistant properties (Zero halogen free sheath available on request)

Features

Short circuit temperature (max) for up to 5 seconds : + 250° C

Torsion angle : ± 150° C per meter (Degrees)

Minimum bending radius : 4D

Control & Instrumentation Cables

These cables are used in Wind Energy applications such as rotor blade pitch control, Yaw control, Top Box, Anemometer feedback, Remote data logging etc. Construction of Cables shall be as per Customers' requirement and conforming to various National/International Standards.

Naval Application Cables

On Board Indian Naval Ships and Crafts Cables

For use on onboard Surface Ships, Submarines and Crafts for Power, Lighting, Control, Communication and Instrumentation. Used in Fuel and Lubrication Oils, Hydraulic Fluids and Water Surfaces.

Standards	:	EED-50-12-Thin Walled, Insulated, Electron Beam Cross Linked Irradiated Electric Cables EED-50-13-Fire Survival, High Temperature Zone, Fire Retardant Halogen Free Sheathed Electron Beam Cross Linked
Construction	:	Single Core, Multi Core, Multi Pair & Triad Cables, Unscreened / Individually Screened or Collectively Screened
Voltage Grade	:	440 V AC, 600 V AC and 1800 V AC (for Single Core Cables)
Conductor	:	Circular Electroplated, Annealed Tinned Flexible (Class V) Copper Conductor conformity to IEC-60228
Temperature Range	:	- 65º C to 120º C (EED-50-12 Cables) - 30º C to 120º C (EED-50-13 Cables)
Insulation	:	Electron Beam Cross Linked Polyolefin compound (EPR / EPDM LFH) / Silicone Rubber
Screening	:	Annealed Tinned Copper / GI Wire Braids
Outer Sheath	:	Electron Beam Cross Linked Polyolefin Compound (EVA / EMA / EEA LFH)
Protective Barrier	:	Fibre Glass Braid / Lacquer Mica glass tape to meet the Fire Performance (applicable for EED-50-13 Cables)

Special Navy Cables

Power Navy Cables, Light Power Navy Cables, Telecommunication Navy Cables, Light Telecommunication Navy Cables.

Construction	:	Multi Core Cables, Multi Pair Cables Unscreened or Individually Screened or Collectively Screened (Optional GI braided armoured) Limited Fire Hazard Sheathed
Conductor	:	Circular Annealed Bare Copper conductor
Insulation	:	EPR / HEPR as per relevant spec
Screening	:	Annealed Tinned Copper Braid, Individually Screened or Collectively Screened as per relevant spec
Outer Sheath	:	LFH Elastomeric Thermoset Compound
Temperature Range	:	- 30° C to + 90° C
Application	:	For use on board surface ships and crafts and power, control, lighting, submarines for communication and instrumentation circuits

Marine / Shipboard Cables

DEF STAN 02-526 (NES 526) and DEF STAN 02-527 (NES 527)

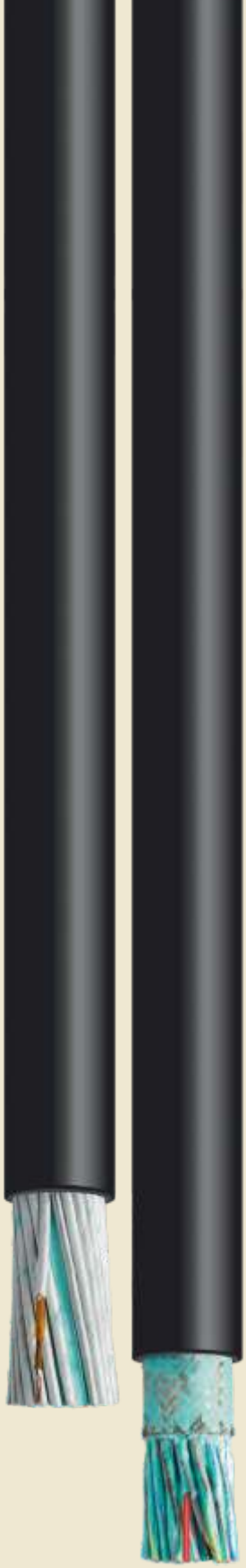
For use on onboard surface ships and crafts for power, control, lighting and communication and instrumentation circuits with or without fire survival characteristics.

Standards	:	NES 526 - Dual layer Insulated, Electron Beam Cross linked irradiated Electric cables NES 527 - Fire Survival, High Temperature, Fire Retardant Halogen Free Sheathed Electron Beam Cross Linked Irradiated Electric cables
Construction	:	Single Core, Multi Core, Multi Pair & Triad, Unscreened or Individually Screened or Collectively Screened.
Voltage Grade	:	440 V AC
Conductor	:	Circular Electroplated, Annealed Tinned Copper
Temperature Range	:	-30^0 C to $+105^0$ C
Insulation	:	Dual Layer Electron Beam Cross linked irradiated materials / Silicone Rubber
Screening	:	Annealed Tinned Copper Braid
Outer Sheath	:	Electron Beam Cross linked irradiated LFH Compound
Protective Barrier	:	Glass Braid/Lacquer, Mica Glass Tape to meet the fire performance applicable for DEF STAN 02-527 (NES 527) cables.

IEC 60092-350, 353, 360 & 376, BS-6883, BS-7917

For use in shipboard & offshore application at marine environment and use for Power, Control, Instrumentation and Communication with or without fire survival characteristics.

Standards	:	IEC 60092-350 - Construction & Test methods of Power, Control and Instrumentation cables. IEC 60092-353 - Power Cables for rated voltage of 0.6 / 1 KV, 1.8 / 3 KV. IEC 60092-376 - Control & Instrumentation Cables for rated voltage of 150 V / 250 V. IEC 60092-360 - Insulating and sheathing properties materials for shipboard and offshore cables. BS 6883 - Elastomeric insulated Cables for fixed wiring in ships & offshore units. BS 7917 - Elastomeric insulated fire resistant (Limited Circuit Integrity) Cables for fixed wiring in ships & offshore units.
Construction	:	Single Core, Multi Core, Single Pair, Multi Pair, Multi Triad and Quad Screened & Unscreened, Armoured & Unarmoured
Voltage Grade	:	150 V / 250 V AC, 0.6 / 1.0 KV and 1.8 / 3.0 KV AC
Conductor	:	Electroplated Annealed Bare / Tinned Copper of various classes
Temperature Range	:	-15^0 C to 95^0 C
Insulation	:	XLPE / EPR / HEPR, HF 90 / S 95
Screening	:	Al-Mylar Tape along with Drain Wire / ABC or ATC Braiding
Inner Sheath	:	SHF1 / SHF2 / SH / SF / SE
Braid Armour	:	Copper (Bare or Tinned) / Copper alloy / GI Wire Braid with >90% coverage.
Outer Sheath	:	SHF1 / SHF2 / SH / SF / SE



Pressure Tight (PT) Cables

Power, Control & Signal Cables, Data Communication, RF Cables, Halogen Free and Flame Retardant, Fire Survival with low smoke generation and low toxic properties of insulation & Sheath. These cables are suitable and designed to withstand radial and axial pressure up to 10 to 72 bar pressure.

Specification	:	EED 57-03 & EED 57-04, DMDE SOTR
Construction	:	Single Core, Multi Core, Multi Pair, Unscreened, Individually Screened & Collectively Screened
Voltage Grade	:	250 V AC, 600 V AC to 1000 V AC
Conductor	:	Circular electrolytic Bare and Tinned or Silver Plated Copper
Temperature Range	:	- 30° C to +120° C
Insulation	:	Special halogen free and fire retardant with low smoke generation and low toxic polymers with E-beam curing process
Screening	:	Annealed Bare / Tinned / Silver Plated Copper
Outer Sheath	:	Special halogen free and fire retardant with low smoke generation and low toxic polymers with E-beam curing process
Water Blocking Compound/Tape	:	Provided to withstand pressure requirement
Application	:	Used in Submarines for Power, Control, Lighting and Communication and Instrumentation circuits

UL/CSA Listed High Temperature Aerospace & Missile Wires & Cables

High Temperature Cables are used in areas where both working temperature and ambient temperatures are too high. They are made with a wide range of conductors, insulating materials and screening materials depending on the temperatures and conditions under which the cable has to perform.

Construction	:	Single Core high temperature hook-up wires & Multi Core / Multi Pair, Screened / Unscreened and Armoured / Braided Cables
Voltage Grade	:	250 V AC, 600 V AC & 1000 V AC (Rating as per MIL-16878, VDE, DIN, ANSI)
Insulation Materials	:	PTFE / FEP / PFA / PEEK / ETFE / XL-ETFE / Silicone Rubber / Varnished Fibre Glass Braid

Electron Beam Cross Linked ETFE (XL-ETFE), a type of Thermoset Insulation, provides excellent fluid / oil / moisture resistance also creates increased stability at higher temperatures. Wires and Cables conforming to MIL-W-22759/32-35 & 41-46 and MIL-STD-2223.

Railway Cables

Control & Power Cables for Diesel Electric Locomotives (EDPS 179 & EDPS 304)

This specifications covers the performance requirements for control & power cables used within the electrical power distribution system of Diesel-Electric Locomotives and other heavy duty industrial equipment with larger duty cycle.

Application : EDPS-179 (Control Wires): Used in the electrical control system of diesel-electric locomotives and other heavy-duty industrial equipment. They are typically of smaller sizes (up to and including AWG size 3).

EDPS-304 (Power Cables): Used in the power distribution system of diesel-electric locomotives and other heavy-duty industrial equipment with variable duty cycles. These are larger cables (AWG size 1 and larger)

- Drilling Rigs
- Railroad and Transit Car Wiring
- Electric Earth-Moving Equipment

Advantages : Fire-safe due to flame-retardant, low-smoke and low-acid gas properties

Performs reliably against oil, grease and extreme temperatures

Features highly flexible, Class 5 annealed tinned copper conductors

Engineered for a long service life, minimizing maintenance costs

Resistance to mineral oil, diesel oil, fluids & ozone

Diesel Electric Locomotive Cables ATC, 125° C, As Per EMD/9094883

Construction

Conductor : Annealed Tinned Copper Conductor

Insulation : Thermosetting Crosslinked Polyolefin compound as Per EDPS 179 Dual Layer Thermosetting Crosslinked Polyolefin compound as Per EDPS 304

Technical Data

Temperature Range : - 65° C to +125° C

Thermal Life Rating : 10,000 Hours at +125° C

Key features

High-Temperature Rating : It can withstand a wide Temperature range from -65° C to 125° C

Durable Construction Rating : Features a flexible, tinned copper conductor with robust dual-layer insulation

Environmental Resistance : Highly resistant to oil, fuel, grease, moisture, ozone and high ambient conditions

Safety Features : Excellent flame retardant and produces low smoke and acid gas generation

Performance and Usability : Flexible, easy to strip and abrasion resistant & crush resistant

Railway Cables

Thin Walled Flexible Electron Beam Irradiated Elastomeric Cables (ELRS/SPEC/ELC/0019 REV-4)

Electron beam irradiated thin walled flexible elastomeric cables with copper conductor, limited fire hazard, minimum flame spread, low smoke emission & limited toxic fumes emission.

Application : They are designed for fixed, protected internal use in power, auxiliary as well as control circuit of conventional tap changer electric locomotives, AC/DC EMU & BG AC EMU & MEMU / Coaching Stock.

They offer robust resistance to oil, fuel, ozone and temperature extremes. Critically, their construction ensures superior fire performance meeting ELRS / ELC / SPEC / 0019 requirements along with EN 45545-2 HL3

Advantages : It's construction provides extreme durability against mechanical stress, chemicals and temperature fluctuations

Halogen-free, fire safety by reducing flame spread, smoke and toxic gas emissions

Resistance to mineral oil, diesel oil, fluids & ozone

Thin-wall design allows for space-efficient installation

Robust build guarantees a long service life

Construction:	**Single Core Cables**		**Multi Core Cables**	
Component	up to 750 V	Above 750 & Up To 1.8/3 KV	Above 750 & Up To 1.8/3 KV	
Size (sq.mm)	1.5 sq. mm to 150 sq. mm	1.5 sq. mm to 300 sq. mm	19C X 2.5 sq. mm	19C X 4 sq. mm
Operating temperature	- 40° C to +120° C			
Electrolytic Flexible Annealed Tinned Copper (Class-5)	☑	☑	☑	☑
Insulation (Type EBXL EPDM)	☒	☑	☑	☑
Insulation (Type EBXL EVA)	☑	☒	☑	☑
Sheath (Type EBXL EVA)	☒	☑	☑	☑
HV Test	6 KV for 5min	8 KV for 15min		
HV Test-At room temp. at 90 ± 3° C	K ≥ 2000 MΩ-km K ≥ 30 MΩ-km	K ≥ 12000 MΩ-km K ≥ 200 MΩ-km		
Bending Radius:	3 X OD for cable diameter < 10mm 5 X OD for cable diameter > 10mm			

Colors: Various color options available as per customer requirement (Red, Yellow, Blue, Black, Grey, GNYE, Chocolate, White, etc.).

Compliance & Fire Safety

Low Flame Spread / Flame Retardancy : IEC 60332-1-2, IEC 60332-3 (various parts)

Low Smoke Emission : ASTMD 2843 / IEC 61034-2

Corrosivity of Combustion of gases (on Sheath only) : IEC 60754-2

Toxicity of Combustion of gases (on Sheath only) : NES 713

Key Features

RDSO Approved ELRS/SPEC/ELC/0019 REV-4 Compliant Electron Beam Irradiated (EBXL)

Halogen-Free, Low Smoke & Toxicity

High Temperature Rated - 40° C to +120° C Continuous Operation

Oil, Diesel & Chemical Resistant for Railway Environments

Flexible Tinned Copper Conductors (Class 5) for Easy Installation

Fire retardant | Good Chemical Resistance | Good Resistance to UV, humidity and ozone | High Flexible | Halogen Free | Low Corrosivity of combustion gases | Low toxicity | Operatingtemp.

Railway Cables

Single Core Cables for Electric Locomotives & Rolling Stock
Types WAG-9, WAG-9H, WAP-5 & WAP-7 (CLW/ES/03/0458 Alt.E)

These high-performance cables are built for demanding applications, ensuring efficient and reliable power transmission in power, auxillary, control, sensor and driver circuits for AC traction motors in Railway rolling stock.

Application : Designed for critical power transmission within diverse railway rolling stock. These cables are primarily used as connecting leads for AC traction motors, specifically in MEMU (Mainline Electric Multiple Unit) trains and are also employed in other electric locomotives for high-voltage power circuits. Suitable for protected permanent installation in railway rolling stock (interior & exterior) for connections between fixed and moving parts

Advantages : Electron beam irradiated flexible elastomeric construction ensures exceptional durability against mechanical stress, chemical exposure and temperature variations

Dual-wall insulated electrical cable with limited fire hazard properties

This construction ensures extreme durability low flame spread, low smoke halogen free, flame retardant, and excellent resistance to high and low temperature, oil, ozone, weathering and abrasion. flexible & easy strippable

Construction:

Component	4GKW- 1.8 KV (1.8/3 KV) (Single Core Cable)	9GKW- 4 KV (3.6/6 KV) (Single Core Cable)	3GKW (300/500 V) (Single Core Wire)
Size (sq.mm)	1.5 sq.mm to 150 sq.mm	10 sq.mm to 150 sq.mm	0.5 sq. mm
Operating temperature	- 40° C to +120° C		
Circular Annealed Tinned Copper (Class-5) Complying to IEC 60228	☑	☑	☑
Insulation - EBXL EPDM	☑	☑	☒
Insulation - (Electron Beam Cross Linked Copolymer - Type EBXL EVA)	☒	☒	☑
Sheath-Type EBXL EVA	☑	☑	☒
HV TEST	6 KV at 50HZ for 15min	12 KV at 50HZ for 15 min	3 KVat50HZfor15min
Min. Bending Radius	3 X OD for Cable dia ≤ 10mm 5 X OD for Cable dia > 10mm		3 X OD for fixed installation 4 X OD for flexing installation

*The 300/500 V grade: Insulation Color: Red / Yellow with Green Stripe / customer requirements
*For 1.8 KV (4 GKW) Insulation color: Grey & outer sheath color: Black
*For 4.0 KV (9 GKW) Insulation color: Red & outer sheath color: Black

Compliance & Fire Safety

Low Flame Spread / Flame Retardant - IEC 60332-1-2, IEC 60332-3 CAT-C
Smoke Intensity - IEC 61034-2
Corrosivity of combustion of gases IEC 60754-2
Toxicity of combustion of gases, sheath only adheres to UITP part 2 E7

Key Features

Insulation type : features Electron Beam cross-linked insulation
Environmental resistance : resists oil, diesel and various chemicals
Physical properties : flexible and highly durable
Conductor material : flexible ATC conductors

Fire retardant | Good Chemical Resistance | Good Resistance to UV, humidity and ozone | High Flexible | Halogen Free | Low Corrosivity of combustion gases | Low toxicity | Operatingtemp.

Railway Cables

Multi Core / Pair Cables for Electric Locomotives & Rolling Stock Types WAG-9, WAG-9H, WAP-5 & WAP-7 (CLW/ES/03/0459 Alt.C)

These cables are used in control, sensor & roof circuit of Electric Locomotive with excellent flame retardant and low smoke halogen-free properties. Designed for durability, they resist extreme temperatures, oil, ozone, weathering and abrasion while remaining flexible and easy to strip.

Application : Designed for flexible Control Cables 415/110 V Circuits

Primarily used for control, sensor & roof circuit of Electric Locomotive, including WAG-9, WAP-5, and WAP-7. Their multi-core configuration and robust construction make them ideal for permanent installation inside & outside of railway rolling stock to connect fixed & moving parts

For various low voltage signal transmission in railway rolling stock (Locomotives, Metros, EMU, MEMU, control circuit)

Advantages : Provides extreme durability against mechanical stress, chemicals and temperature fluctuations. Halogen-free, fire safety by reducing flame spread, smoke and toxic gas emissions

Ensures very good EMC compatibility for screened cables where signal integrity is essential for safe operation

Construction:

Component	300/300 V (0.5 sq.mm) Screened	300/300 V (0.5 sq.mm) Twisted	600/1000 V (1.0 sq.mm) Screened	600/1000 V (1.0 sq.mm) Twisted
Circular Annealed Tinned Copper (Class-5) Complying to IEC 228	☑	☑	☑	☑
Operating temperature	- 40° C to +120° C			
Insulation (Type EBXL EPDM)	☑	☑	☑	☑
Fillers	(Optional)	(Optional)	(Optional)	(Optional)
Separators	(Optional)	(Optional)	(Optional)	(Optional)
EMC Screening (Tin Copper Braiding)	☑	☒	☑	☑
Sheath (Type EBXL EVA) (BLACK)	☑	☑	☑	☑
HV Test	1.5 KV at 50HZ for 15 min		4 KV at 50HZ for 15min	
Min. Bending Radius (Fixed installations)	5 x Overall diameter			

☑ = Included | ☒ = Not Included | (Optional) = May be included as per specification or customer request

Compliance & Fire Safety

Low Flame Spread / Flame Retardant : IEC 60332-1-2, IEC 60332-3 (CAT-C)
Smoke Intensity : IEC 61034-1
Corrosivity of Combustion of gases : IEC 60754-2
Toxicity of Combustion : NES 713
Halogen Content : IEC-60754-1

Key Features

Electron Beam Cross-linked Insulation : Ensures excellent thermal, electrical and mechanical stability
Halogen-Free : Minimizes emission of toxic and corrosive gases in case of fire
Environmental Resistance : Resistant to oil, diesel, chemicals, weathering and abrasion
Temperature Performance : Excellent resistance to both high and low temperatures
Flexibility & Durability : Highly flexible design with robust mechanical strength for long service life

Railway Cables

Thin-Walled Electron Beam Irradiated Flexible Elastomeric Cables with copper conductor. (EDTS 132, REV-C)

Flexible copper cables with E-beam cross-linking, designed for passenger coaches, featuring thin walled insulation, low chemical residue and Limited Fire Hazard properties with minimum flame spread, smoke and toxic emissions.

Application : For Coaching Stock Applications. Suitable for use in power and control circuits for passenger coaches, AC/DC EMU, BG AC EMU and MEMU coaching stock. UIC cables are used in modern railway applications to ensure safe and reliable communication and control applications

Advantages

Enhanced Fire Safety : Limited fire hazard type with low smoke and toxicity
EMC Compatibility : Ensures very good EMC compatibility for screened cables
Extreme Durability : Resistant to high temperatures, mechanical stress and harsh chemicals
Space-Efficient Design : Thin-walled construction for easy & compact installation
Reliable Performance : Tinned copper conductors ensure efficient power and signal transmission
Resistance to mineral oil, diesel, fluids and chemicals

Construction:

Component	Data Sheet-1	Data Sheet-2	Data Sheet-3	Data Sheet-4	Data Sheet-5	Data Sheet-7
Voltage Rating	1.8/3.0 KV	600/1000 V	600/1000 V	600/1000 V	300/300 V	600/1000 V
Operating temperature	- 40° C to +120° C					
Core & Cable type	Single Core Unscreened	Single Core Unscreened	Multi Core Unscreened	Multi Core Screened	UIC Screened	Multi Core Unscreened
Circular Annealed Tinned Copper Conductor (120° C) (Class 5)	☑	☑	☑	☑	☑	☑
Insulation (EBXL EPDM)	☑	☑	☑	☑	☑	☑
EMC Screening (ATC Braiding)	☒	☒	☒	☑	☑	☒
Sheath (EBXL EVA)	☑	☒	☑	☑	☑	☑
Test Voltage	6 KV for 15 min	3 KV for 5 min	1.5 KV for 5 min	1.5 KV for 5 min	2.0 KV for 1 min	1.5 KV for 5 min
Bending Radius	3XD< 10 mm 5XD >10 mm	3XD< 10 mm 5XD >10 mm	4XD (fixed) 5XD (flexible)	3XD (fixed) 5XD (flexible)	4XD (fixed) 5XD (flexible)	4XD (fixed) 5XD (flexible)

☑ = Included | ☒ = Not Included * Insulation color shall conform to standard or be customized as per customer requirements. Outer sheath will be provided in black for all Data sheets except Datasheet-2: Outer sheath color : Grey

Compliance & Fire Safety

Low Flame Spread / Flame Retardancy : IEC 60332-1-2, IEC 60332-3 CAT C
Low Smoke Emission : ASTMD 2843 / IEC 61034-2
Corrosivity of Combustion of gases (on Sheath only) : IEC 60754-2
Toxicity of Combustion of gases (on Sheath only) : NES 713

Key Features

Fire Safety : Limited Fire Hazard type with low smoke and toxicity

Insulation : Electron beam irradiated, flexible elastomeric construction provides extreme durability against mechanical stress, chemicals and temperature fluctuations

Environmental Resistance : Resistant to oil, diesel and various chemicals

Flexibility : Class 5 tinned, flexible copper conductors for easy installation

Fire retardant | Good Chemical Resistance | Good Resistance to UV, humidity and ozone | High Flexible | Halogen Free | Low Corrosivity of combustion gases | Low toxicity | Operatingtemp | Screened Versions

Railway Cables

Single Core and Multi Core Power and Control Cables designed for railway rolling stock, traction & metro applications (EN 50264-3-1 & EN 50264-3-2)

Offering exceptional flame resistance, durability and EMC compatibility, these cables are ideal for fixed installations in locomotives, metros & EMUs.

EN 50264-3-1 Single Core Cables

Application : Used for power transmission, controlling in various application in Railway Rolling Stock (Locomotives, Metros, EMU, MEMU)

They are suitable for use in confined spaces due to their reduced bending radius.

They can withstand harsh operating conditions, including exposure to oil, ozone and wide temperature fluctuations.

The conductors are rated for continuous operation at temperatures 90° C (Optional: 120° C)

Advantages : Halogen-free, fire safety by reducing flame spread, smoke and toxic gas emissions.

They are resistant to oils, fuels and ozone, ensuring durability and reliable performance even when exposed to harsh chemicals.

They can withstand mechanical stresses like vibration and impact, which are common in railway environments.

Construction:

Single Core Cables

Component	0.6/1 KV (Unsheathed) M	1.8/3 KV (Unsheathed) M	1.8/3 KV (Sheathed) MM	3.6/6 KV (Sheathed) MM
Size (sq.mm)	1.0 sq.mm to 400 sq.mm	1.5 sq.mm to 400 sq.mm	1.5 sq.mm to 400 sq.mm	2.5 sq.mm to 400 sq.mm
Operating temperature	- 40° C to +90° C / +120° C			
Flexible Tinned Coated Annealed Copper Conductor (Class 5)	☑	☑	☑	☑
Conductor screening	☒	☒	☒	☑
Separator Tape	(Optional)	(Optional)	(Optional)	☒
Insulation (Type EI 106/107/108/109/110)	☑	☑	☑	☑
Separator Tape	☒	☒	(Optional)	(Optional)
Sheath (Type EM 101/102/103/104)	☒	☒	☑	☑
Test Voltage	3.5 KV for 5 min	6.5 KV for 5 min	6.5 KV for 5 min	11 KV for 5 min

☑ = Included | ☒ = Not Included | (Optional) = May be included as per specification or customer request

Key features & Fire Safety : IEC 60332-1-2 – Flame Retardant

IEC 60754-1/2 – Corrosivity of Combustion of gases

IEC 61034-2 – Low Smoke Emission

EN 45545-2 HL-2/HL-3 - Fire behavior of the Cable

Fire retardant | Good Chemical Resistance | Good Resistance to UV, humidity and ozone | High Flexible | Halogen Free | Low Corrosivity of combustion gases | Low toxicity | Operatingtemp | Screened Versions

Railway Cables

Medium Voltage Single Core and Multi Core Power and Control Cables designed for railway rolling stock, traction & metro applications (EN 50264-3-1 & EN 50264-3-2)

Offering exceptional flame resistance, durability and EMC compatibility, these cables are ideal for fixed installations in locomotives, metros & EMUs.

EN 50264-3-2 Multi Core Cables

Application : Used for power transmission, controlling in various application in Railway Rolling stock (Locomotives, Metros, EMU, MEMU)

The cables can withstand harsh operating conditions, including exposure to oil, ozone and wide temperature fluctuations.

The conductors are rated for continuous operation at temperatures 90° C. (Optional :120° C)

Their flexible, multi-core design enables easy routing in limited spaces, especially where movement or vibration is present.

Advantages : Halogen-free, fire safety by reducing flame spread, smoke and toxic gas emissions.

They are resistant to oils, fuels and ozone, ensuring durability and reliable performance even when exposed to harsh chemicals.

The cables can withstand mechanical stresses like vibration and impact, which are common in railway environments.

Construction:

Multicore Cables

Component	**300 / 500 V** (Unscreened) MM	**300 / 500 V** (Screened) MMS	**0.6 / 1 KV** (Unscreened) MM	**0.6 / 1 KV** (Screened) MMS
Size (sq.mm)	1.0 sq.mm to 2.5 sq.mm	1.0 sq.mm to 2.5 sq.mm	1.5 sq.mm to 50 sq.mm	1.5 sq.mm to 50 sq.mm
Operating temperature	- 40° C to +90° C / +120° C			
Flexible Tinned Coated Annealed Copper Conductor (Class 5)	☑	☑	☑	☑
Separator Tape	(Optional)	(Optional)	(Optional)	(Optional)
Insulation (Type EI 106/107/108/109/110)	☑	☑	☑	☑
Metallic Screening	☒	☑	☒	☑
Separator Tape	(Optional)	(Optional)	(Optional)	(Optional)
Sheath(Type EM 101/102/103/104)	☑	☑	☑	☑
Test Voltage	2 KV for 5 min		3.5 KV for 5 min	

☑ = Included | ☒ = Not Included | (Optional) = May be included as per specification or customer request

Key features & Fire Safety : IEC 60332-1-2 – Flame Retardant

IEC 60754-1/2 – Corrosivity of Combustion of gases

IEC 61034-2 – Low Smoke Emission

EN 45545-2 HL-2/HL-3– Fire behavior of the Cable

Fire retardant | Good Chemical Resistance | Good Resistance to UV, humidity and ozone | High Flexible | Halogen Free | Low Corrosivity of combustion gases | Low toxicity | Operatingtemp | Screened Versions

Railway Cables

Thin-Walled Single, Multi-Core and Multi-Pair, Railway Signal & Control Cables with Special Fire Performance for Railway Rolling Stock (EN -50306-1,2,3,4)

Ideal for modern railway applications where space, weight, safety and EMC performance are critical.

Application : They are designed for fixed & protected internal & external wiring in all railway vehicles, from locomotives to trams. Rated for occasional thermal stress, with a continuous operational life equivalent to temperatures of 105° C (Optional: 120° C). Their compact size and flexibility are perfect for confined spaces

These cables are crucial for power transmission, controlling & various low voltage signal transmission in various Rolling stock applications (Locomotives, Metros, EMU, MEMU, Control circuits)

Their halogen-free, cross linked construction ensures superior fire safety, providing essential protection for passengers and crew

Advantages : Resists mechanical stress, chemicals and extreme temperatures

Halogen-free, cross-linked construction with good flexibility and durability compact and light weight design, very good EMC compatibility for screened cable

Thin-wall design and low bending radius allow for space-saving installations. Robust build guarantees a long service life

EN 50306 Thin-Wall Railway Rolling Stock Cables

EN 50306 Cables offer diverse constructions (single / multi core, screened / unscreened, multipair), operate reliably from -40° C to +105° C (Optional 120° C) They are rated for 300 V to earth.

Available in 0.50 mm² to 2.5 mm² cross- sections, they feature electron-beam cross linked, halogen - free materials ensuring superior fire performance (low smoke, non-toxic, non-corrosive gases) and robust resistance to oils, fuels, ozone and UV, all in a compact, durable, thin- wall design.

Key features : IEC 60332-1-2 – Flame Retardant

IEC 60754-1/2 – Corrosivity of Combustion of gases

IEC 61034-2 – Low Smoke Emission

EN 45545-2 HL-2/HL-3– Fire behavior of the Cable

Construction Details:

Component	50306-2	50306-3	50306-4
Size (sq.mm)	0.5 sq.mm to 2.5 sq.mm	0.5 sq.mm to 2.5 sq.mm	0.5 sq.mm to 2.5 sq.mm
Operating temperature	- 40° C to +105° C /+120° C		
Cable Types	Single Core	Single Core & Multi Core Cables	Multi Core & Multi Pair Cables
Screening	Unscreened	Screened	Unscreened / Screened
Flexible Tinned Coated Annealed Copper Conductor (120° C) (Class 5)	☑	☑	☑
Separator Tape	☒	(Optional)	(Optional)
Insulation (as per 3.1 of EN 50306-1)	☑	☑	☑
Laying up & Fillers	☒	☑	☑
Metallic Screening	☒	☑	☑
Separator Tape	☒	(Optional)	(Optional)
Sheath (Type S1 or S2 as per 3.2 of EN 50306-1)	☒	☑	☑
Test Voltage	2 KV for 5 min		

☑ = Included | ☒ = Not Included

Fire retardant | Good Chemical Resistance | Good Resistance to UV, humidity and ozone | High Flexible | Halogen Free | Low Corrosivity of combustion gases | Low toxicity | Operatingtemp | Screened Versions

Railway Cables

High-Temperature Silicon Rubber insulated Power Cables having special Fire Performance for Railway Rolling Stock/Traction/Metro (EN 50382-1 and EN 50382-2)

These railway cables deliver superior performance in high-temperature environments, offering excellent flexibility and mechanical strength. Engineered for safe and efficient power transmission in traction systems, metro trains and rolling stock operating under extreme thermal and environmental conditions.

Application : Designed for railway rolling stock applications requiring superior fire performance and thermal endurance. Halogen-free with low smoke, toxicity and corrosivity. Ideal for power distribution in locomotives, metros, EMUs and MEMUs, they are well-suited for high-stress areas like traction converters, rooftop and under frame wiring and control systems.

Advantages : Engineered with advanced cross-linked silicone rubber compounds, superior mechanical durability-demonstrating high resistance to abrasion, tensile stress and cut-through damage. Outstanding chemical resistance ensures reliable performance in environments exposed to oils, fuels, acids and alkalis.

Designed for flexibility and ease of handling, these cables simplify installation and stripping processes, meeting the rigorous operational demands of modern railway systems

Construction: EN 50382-2

Component	1.8/3 KV (Unsheathed) F/FZ	1.8/3 KV (Sheathed) FF	3.6/6 KV (Unsheathed) F/FZ	3.6/6 KV (Unsheathed) FX/FXZ	3.6/6 KV (Sheathed) FF
Size (sq.mm)	1.5 sq.mm to 400 sq.mm	1.5 sq.mm to 400 sq.mm	2.5 sq.mm to 400 sq.mm	2.5 sq.mm to 400 sq.mm	2.5 sq.mm to 400 sq.mm
Flexible Bare copper (150° C) or Tinned copper conductor (120° C) (Class 5)	☑	☑	☑	☑	☑
Flexible Bare copper (150° C) or Tinned copper conductor (120° C) (Class 6)	☒	☒	☒	☑	☒
Conductor screening	☒	☒	(Optional)	☒	(Optional)
Separator Tape	(Optional)	(Optional)	☒	(Optional)	(Optional)
Insulation (Type EI 111)	☑	☑	☑	☑	☑
Insulation (Type EI 112)	☒	☑	☒	☒	☑
Textile braid on request for FZ, FXZ	☑	☒	☑	☑	☒
Sheath (EM 105/106/107)	☒	☑	☒	☒	☑
Test Voltage (R.M.S)	6.5 KV for 5 mins	6.5 KV for 5 mins	11 KV for 5 mins	11 KV for 5 mins	11 KV for 5 mins
Bending Radius:	4 x Outer diameter if OD ≤ 12 mm 6 x Outer diameter if OD > 12 mm				

☑ = Included | ☒ = Not Included | (Optional) = May be included as per specification or customer request
*Type FFXS jumper cable with EMC-protected metallic braided screen is available on request

Compliance & Fire Safety

EN 50382-1 - General construction and performance requirements
EN 50382-2 - Specifications for single-core silicone rubber insulated cables
IEC 60332-1-2 – Flame Retardant
IEC 60754-1/2 – Corrosivity of Combustion of gases
IEC 61034-2 – Low Smoke Emission
EN 45545-2 HL-2/HL-3– Fire behaviour of the Cable stems

Key Features

Safety-focused design for enclosed and public environments
Approved for flexible and fixed wiring in rolling stock, tunnels and depots
Low-toxicity materials preserve electronics and ensure occupant safety
Resistance to mineral oils, fuels, ozone and UV radiation

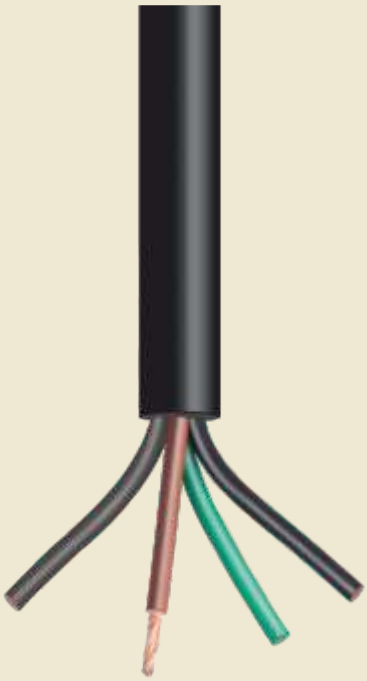
Fire retardant | Good Chemical Resistance | Good Resistance to UV, humidity and ozone | High Flexible | Halogen Free | Low Corrosivity of combustion gases | Low toxicity | Operatingtemp.

Material Handling Cables

CRD & Trailing Cables

These cables are used in conveyor machinery such as transfer cars, boom-stackers, side arm chargers, bulk material conveyors etc. They find application in almost every industry segment like Steel Mills, Cement Plants, Docks, Power Plants, Automobile Industries & Refineries and Petrochemicals.

Construction	:	Single cable comprising multiple elements like composite type, power cores, control cores, signaling pairs, etc for multipurpose functions
Voltage Grade	:	600 / 1100 V AC
Conductor	:	Class 5 flexible tinned or bare copper
Insulation	:	EPR
Screening	:	Tinned or bare copper wire braid (If Applicable)
Inner Sheath	:	HOFR Elastomer
Anti Kink Braid	:	Fabric braid embedded between inner and outer sheath
Outer Sheath	:	HOFR Elastomer
Features	:	Designed to withstand continuous reeling and unreeling sheath materials that have a high degree of flex fatigue resistance, excellent heat, oil and fire resistant properties
Operating Temperature	:	- 20° C to + 90° C
Test Voltage	:	3000 V AC / 3500 V AC
Bending Radius	:	8 D
Core Marking	:	1-5 Cores colour coded as Green / Yellow, Blue, Brown, Black, Grey or Coloured Rubberised cotton tapes. 6 Cores and above with numbered Cores, with one earth Core of Green / Yellow
Standards	:	IS 8130, IS 6380, IS 9968 I, IEC-60228, IEC-60502, IEC-60332



HO7RN-F-Heavy Duty Rubber Cables

These heavy duty elastomer cables are used in generators, heavy machinery, portable power tools and equipment, moving machinery in wet, hot or oily environments. Their flexibility permits use in constricted spaces with sharp and complex bends. They can be made with special abrasion resistant sheaths to withstand rough use in portable equipment.

Voltage Grade	:	450 / 750 V AC
Conductor	:	Bare or tinned flexible Class 5 conductor as per (EN 60228)
Range	:	Single Core: up to 300 Sq. mm Multi Core: 1 Sq. mm - 2.5 Sq. mm up to 61 Cores 4 Sq. mm - 6 Sq. mm up to 19 Cores 10 Sq. mm - 300 Sq. mm up to 5 Cores
Insulation	:	EPR
Sheath	:	Black heavy duty elastomer
Temperature Range	:	- 25° C to + 85° C
Colour Coding	:	1-5 Cores colour coded as Green / Yellow, Blue, Brown, Black, Grey or Coloured Rubberised cotton tapes. 6 Cores or more with numbered Cores and earth Core of Green / Yellow
Standards	:	EN 50525-2-21

Type - P Cables

Type P Cables are specifically designed for installation and use in harsh environments found within offshore and onshore drilling rigs. These extreme environments may include severe cold, high heat, constant vibration, drilling mud, mechanical stress and salt corrosion.

Specification	:	IEEE 1580, IEC 60092-353, IEC 60092-376, UL 1309
Temperature Range	:	90^0 C, 100^0 C, 110^0 C & 125^0 C
Conductor	:	Flexible stranded tinned copper
Application	:	Powering Machinery, Communication Devices, Navigation Systems, Offshore Drilling Rigs, Shipboard Wiring and Marine Vessels
Cable Type	:	Multi Core, Single Core, Power, Control, VFD and Instrumentation Cables
Voltage Grade	:	300 V, 0.6 / 1.0 KV & 2 KV
Insulation	:	XLPO
Sheath	:	Extruded Flame Retardant, Oil & Abrasion Resistant Synthetic Elastomer
Armour (Optional)	:	Tinned copper or bronze wire braid
Shield (applicable for Instrumentation Cables)	:	An aluminum/polyester tape with drain wire, 100% coverage, is applied over each twisted pair and the cabled core, the single pair construction has only the overall shield.

VFD Cables

VFD cables are used to connect the VFD drive to the variable frequency motors, drives precisely controls the speed and torque of the motors. During this operation of controlling the motor by changing the frequency there is every chance for noise generation, sudden induced voltage and spikes and intense electric field around the conductor which can be suppressed with special design.

Construction	:	Metallic layer over the core / cable will reduce the noise / strong electric field around the core / earthing of all spikes generated during the operation.
Voltage Grade	:	Up to 1800 / 3300 V AC
Conductor	:	Circular electrolytic bare copper / tinned copper (stranded / flexible)
Insulation	:	XLPE or EPR or HEPR
Screening	:	Combination of copper tape and copper wire braid or double layer of copper tape and concentric braiding
Outer Sheath	:	PVC / ZHFR / SHF1 / SHF2
Application	:	This construction of metallic layer over the core / cable will reduce the noise / strong electric field around the core / earthing of all spikes generated during the operation.

Co-Axial Cables (RG Series)

Radio Frequency or Signal Transmission Cables, Polyethylene / XLPE / Flourpolymer / Dielectric Insulation & Halogen Free Flame retardant with low smoke and low toxic polymers, Sheath materials.

Specification	:	Def Stan 02-512 (PT-5) & MIL-DTL-17H & customer specification
Construction	:	Single Core Screened Cables
Primary Conductor	:	ABC / ATC / SPC & special conductors like CCS (Copper Clad Steel) etc
Temperature Range	:	- 30^0 C to +120^0 C
Insulation	:	Polyethylene / XLPE / Flouropolymer
Outer Conductor	:	Aluminium Mylar Tape / Annealed Tinned / Bare Copper Braid
Outer Sheath	:	Special halogen free and fire retardant with low smoke generation and low toxic properties with E-beam curing process
Type of Cables	:	RG 11, RG 213, RG188, RG 58, RG 59, RG 214
Application	:	For use of VHF (Very High Frequency) signal transmission

Electrical Submersible Pump (ESP) Cables

High, medium & low temperature flat & round cables are 3 KV, 4 KV & 5 KV rated for operating temperatures up to 450º F, 284º F, 205º F & 160º F.

Sizes : 1, 2, 4, 6 AWG & other sizes and KV ratings available upon request

Application : Downhole extraction systems are critical for crude oil extraction. The reliability of the electrical power supply to an Electrical Submersible Pump (ESP) system depends on the performance and reliability of the power feed through the wellhead, power cable, motor lead cable, pig tail connectors and related equipment such as the pump and motor. These cables offer an efficient, rugged and easy to handle solution that delivers reliable performance in a package that is straight forward to install and maintain.

Construction :
- Solid or stranded plain or tinned copper conductor
- Proprietary PP / EPDM rubber insulation with a poly-adhesive layer to the conductor
- Lead Sheath (applicable only for SL.No 4,11 & 13 from the below table).
- HDPE / EPDM / Nitrile Rubber Jacket
- Longitudinally applied rubber backed fabric / Special heat resistant tape
- Galvanized steel / Stainless Steel / Monel armour

SL. No	Rated Temp. °F (°C)	Cable Construction	Voltage Rating KV	Conductor Size (AWG)	Conductor Coating	Insulation Material	Barrier Material	Tape	Jacket Material	Standard Armor
1	160(71)	Flat/Round	3,4,5	1,2,4,6	Bare/Tin	PP	NA	Rubber Backed Woven Fabric	HDPE	Galvanized
2	205(96)	Flat/Round	3,4,5	1,2,4,6	Bare/Tin	PP	NA	Rubber Backed Woven Fabric	EPDM	Galvanized
3	205(96)	Flat/Round	3,4,5	1,2,4,6	Bare/Tin	PP	NA	Rubber Backed Woven Fabric	Nitrile Rubber	Galvanized
4	250(121)	Flat/Round	3,4,5	1,2,4,6	Bare/Tin	PP	Lead Sheath	Rubber Backed Woven Fabric	Nitrile Rubber	Galvanized
5	250(121)	Flat/Round	3,4,5	1,2,4,6	Bare/Tin	PP	NA	Rubber Backed Woven Fabric	Nitrile Rubber	Galvanized
6	284(140)	Flat/Round	3,4,5	1,2,4,6	Bare/Tin	EPDM	NA	Rubber Backed Woven Fabric	Nitrile Rubber	Galvanized
7	284(140)	Flat/Round	3,4,5	1,2,4,6	Bare/Tin	EPDM	NA	Rubber Backed Woven Fabric	EPDM	Galvanized
8	300(148)	Flat/Round	3,4,5	1,2,4,6	Bare/Tin	EPDM	NA	Special Heat Resistant tape	EPDM	Galvanized
9	400(204)	Flat/Round	3,4,5	1,2,4,6	Bare	Polyimide Tape / EPDM	NA	Special Heat Resistant tape	EPDM	Galvanized
10	400(204)	Flat/Round	3,4,5	1,2,4,6	Bare	Polyimide Tape / EPDM	NA	Special Heat Resistant tape	EPDM	Galvanized
11	450(232)	Flat/Round	3,4,5	1,2,4,6	Bare	Polyimide Tape / EPDM	Lead Sheath	Special Heat Resistant tape	EPDM	Galvanized
12	450(232)	Flat/Round	3,4,5	1,2,4,6	Bare	Polyimide Tape / EPDM	NA	Special Heat Resistant tape	EPDM	Galvanized
13	450(232)	Flat/Round	4,5	1,2,4,6	Bare	Polyimide Tape / EPDM	Lead Sheath	Special Heat Resistant tape	EPDM	Monel

NOTES : 1. Materials and specifications are subject to change without notice. 2. Jacket is not applicable for Flat cable construction

Downhole Tubing Encapsulated Conductor (TEC) Cables

These cables are used in the Oil and gas refineries, Oil well monitoring, Powering downhole equipment and instrumentation, Underground power distribution, Pressure sensing equipment & Data collection etc.

They are used to monitor, provide power and transmit signals in a downhole application. Cables used in the oil & gas industry must be able to withstand extreme environments, temperatures and pressure which is why Thermo Cables is the choice of industry professionals.

TEC (Tubing Encapsulated Conductor) cables have the traditional characteristics of stranded wires or cables – they have some form or copper conductor surrounded by an insulation material or jacket. The difference comes when the stranded wire or the tubing layer that surrounds the product with an armored metal component. Lastly, the final layer encapsulates the entire cable. TEC tubing encapsulated cables can withstand temperature ranges from 150° C to 300° C.

These are made with 5 layers and can be constructed with the following materials:

Conductor Layer : can be comprised of 20 AWG to 12 AWG, solid or stranded, bare copper, tinned copper, nickel plated copper, or silver plated copper.

Insulation Layer : can be comprised of either FEP, PFA, ETFE or ECTFE.

Extruded Filler Layer : can be comprised of PFA, FEP or Polypropylene.

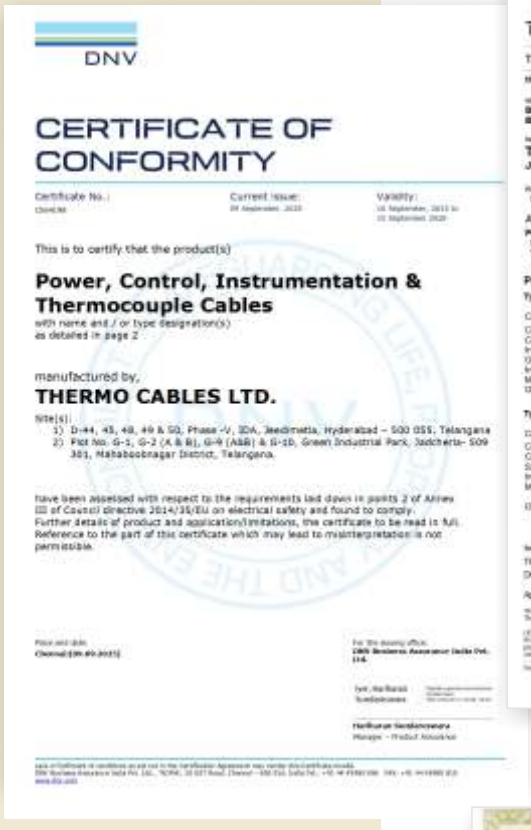
Armor Layer : can be comprised of 316L Stainless Steel, Alloy 825 or Alloy 625

Final Layer : an encapsulation layer can be comprised of FEP, PFA, ETFE, Polyolefin or Polyamide.

Cables Specification:

Voltage Rating V DC	1000	1000	1000	1000	1000	1000	1000	1000
Conductor Gauge (AWG)	18	16	18	16	18	16	18	16
Conductor Type	Solid or Stranded							
Conductor Coatings	Bare, Tinned, Nickel Plated, Silver Plated							
Insulation	ETFE, ECTFE, FEP, PFA							
Filler	Polypropylene, FEP, PFA							
Armor Type	316L (0.028" & 0.035") Alloy 825 (0.028" & 0.035")							
Max. Conductor Resistance Ohms / KFT 20° C	7	4.4	7	4.4	7	4.4	7	4.4
Max. Conductor Resistance Ohms / KFT 150° C	10.5	6.5	10.5	6.5	10.5	6.5	10.5	6.5
Capacitance pF / ft 20° C	26	27.2	32	29.3	26	27.2	32	29.3
Capacitance pF / ft 150° C	27.5	30.9	33.5	33.3	27.5	30.9	33.5	33.3
Min. Insulation Resistance Mohms / KFT	6500	15000	6500	15000	6500	15000	6500	15000
Encapsulation Cable Type	Polyolefin		Polyamide		FEP		PFA	
Encapsulation Cable Color	Yellow		Black		Natural			
Max. working temperature, degC (degF)	150 (302)				200 (392)		250 (482)	

Product Certifications



DNV

CERTIFICATE OF CONFORMITY

Certificate No.: Current Issue: Validity:

This is to certify that the product(s)

Power, Control, Instrumentation & Thermocouple Cables

with name and / or type designation(s)
as detailed in page 2

manufactured by,

THERMO CABLES LTD.

Site(s):
1) D-44, 45, 48, 49 & 50, Phase -V, IDA, Jeedimetla, Hyderabad – 500 055, Telangana
2) Plot No. G-1, G-2 (A & B), G-9 (A&B) & G-10, Green Industrial Park, Jadcherla- 509 301, Mahaboobnagar District, Telangana.

have been assessed with respect to the requirements laid down in points 2 of Annex III of Council directive 2014/35/EU on electrical safety and found to comply.
Further details of product and application/limitations, the certificate to be read in full. Reference to the part of this certificate which may lead to misinterpretation is not permissible.

DNV

TYPE APPROVAL CERTIFICATE

This is to certify:

that the Low Voltage Cable & the Electric Power Cable

with type designation(s):
BFOU-S/C; RFOU (/C); XLPE (FS; XLPE (Non-FS)
BFOU; RFOU; XLPE-FS; XLPE-NON FS

issued to
Thermo Cables Ltd
Jadcherla, Telangana, India

is found to comply with
DNV rules for classification – Ships, offshore units, and high speed and light craft

Application:
Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV.
Rated voltage 150/250V ; 0.6/1KV and 1.8/3KV
Temp. class (°C) 90

Product description
Type: BFOU (S/C) / RFOU (/C)
Construction
Conductors: Tinned, stranded copper class 2 or class 5
Core insulation: Mica tape + EPR / EPR
Ind. shielding: Al Mylar tape with drain wire
Overall shielding: Al Mylar tape with drain wire
Inner sheath: SHF2
Metal covering: Tinned copper or galvanised steel wire braid
Outer sheath: SHF2

Type: XLPE (FS) / XLPE (Non-FS)
Construction
Conductors: Tinned, stranded copper class 2 or class 5
Core insulation: Mica tape + XLPE / XLPE
Ind. shielding: Al Mylar tape with drain wire
Overall shielding: Al Mylar tape with drain wire
Inner sheath: SHF1
Metal covering: Tinned copper or galvanised steel
Outer sheath: SHF1

Type: BFOU / RFOU
Construction
Conductors: Tinned, stranded copper class 2 or class 5
Core insulation: Mica tape + EPR / EPR
Screen: Lapped inner covering + copper wire braid screen
Inner sheath: SHF2
Metal covering: Tinned copper or galvanised steel wire braid (not for single core versions)
Outer sheath: SHF2

Type: XLPE-FS / XLPE-NON FS
Construction
Conductors: Tinned, stranded copper class 2 or class 5
Core insulation: Mica tape + XLPE / XLPE
Screen: Lapped inner covering + copper w
Inner sheath: SHF1
Metal covering: Tinned copper or galvanised steel
Outer sheath: SHF1

Issued at Hamburg on 2020-12-17
This Certificate is valid until 2025-12-16.
for DNV
DNV local unit: India CMO MSO
Approval Engineer: Gorsim Humaiz

ABS

CERTIFICATE NUMBER 24-0857924-PDA
EFFECTIVE DATE 20-Aug-2024
EXPIRY DATE 19-Aug-2029
ABS TECHNICAL OFFICE Singapore Engineering Services

CERTIFICATE OF
Product Design Assessment

This is to certify that a representative of this Bureau did, at the request of

THERMO CABLES LIMITED

located at
PLOT NO. G1,G2(A&B), G9/A, G9/B AND G10, GREEN INDUSTRIAL PARK, JADCHERLA, DIST. MAHABUBNAGAR , MAHABUBNAGAR, TELANGANA, India, 509301

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate.

Product: Cable
Model: LV Power & Control Cables and Instrumentation Cables
Endorsements:
Tier: 2 - PDA Issued

This Product Design Assessment (PDA) Certificate remains valid until 19-Aug-2029 or until the Rules and/or Standards used in the assessment are revised or until there is a design modification warranting design reassessment (whichever occurs first).

Acceptance of products is limited to the "Intended Service" details prescribed in the certificate and as per applicable Rules and Standards.

This Certificate is valid for installation of the listed product on ABS units which may or are under contract for construction on or previous to the effective date of the ABS Rules and standards applicable at the time of PDA issuance. Use of the Product for non-ABS units is subject to agreement between the manufacturer and intended user.

American Bureau Of Shipping
Evaluated by ABS Approved Consultant

Certificate of Product Design Assessment Rev.2 Page 1 of 1

Lloyd's Register

Type Approval Certificate

This is to certify that the undernoted product(s) has/have been tested with satisfactory results in accordance with the relevant requirements of the Lloyd's Register Type Approval System.

Manufacturer	Thermo Cables Limited
Address	28, Rajajinuss Hills,, Punjagutta,, Hyderabad, Telangana, 500082, India
Place of Production	Thermo Cables Limited D-44,45,48,49 & 50 Phase -V, IDA, Jeedimetla, Hyderabad, Telangana, 500055 India
Place of Production	Thermo Cables Limited G1, G2, (A&B), Green Industrial Park, Jadcherla, Mahaboobnagar Dist, 50830 India
Type	Marine Cable
Description	XLPE Insulated Shipboard Cables
Trade Name	Refer to the Appendix for details
Application	Fixed wiring on ships and offshore installations
Specified Standard	Manufacturer's specifications, IEC 60092-350, IEC 60092-351, IEC 60092-353, IEC 60092-360, IEC 60092-376, IEC 60228, IEC 60332-1-2, IEC 60332-3-22, IEC 60754-1/2, IEC 61034

Ping Yeoh ID
Senior Specialist - Technical Support
Lloyd's Register Singapore Pte Ltd
Tower 1, 138668, Singapore

ЕВРАЗИЙСКИЙ ЭКОНОМИЧЕСКИЙ СОЮЗ

ЕАС

СЕРТИФИКАТ СООТВЕТСТВИЯ

RU C-IN.АЛ34.В.00946/25

Серия RU № 0068008

ОРГАН ПО СЕРТИФИКАЦИИ

ЗАЯВИТЕЛЬ

ИЗГОТОВИТЕЛЬ

ПРОДУКЦИЯ

КОД ТН ВЭД ЕАЭС

СООТВЕТСТВУЕТ ТРЕБОВАНИЯМ

СЕРТИФИКАТ СООТВЕТСТВИЯ ВЫДАН НА ОСНОВАНИИ

ДОПОЛНИТЕЛЬНАЯ ИНФОРМАЦИЯ

СРОК ДЕЙСТВИЯ С 15.04.2021 ПО

ВКЛЮЧИТЕЛЬНО

UL

Sample Outbound
THERMO CHICAGO CUST
IL, US (A & B)
GREEN INDUSTRIAL PARK
MAHABUBNAGAR DIST
JADCHERLA TELANGANA 509301 INDIA

Date: 2017/03/06
Subscriber: 8888
Party/Site:
File No:
Service Request No: 5703839
Product Number: 1700371958
PO No: 1701660
ID Number:

Subject: Multiple Listing Correction Sheet

Dear Sample Outbound,
Enclosed is a copy of your requested Multiple Listing Correction Sheet covering the basic File listed below. The following documents were added herein revised on 04/06/2017.

Basic File	Vol	ML File	Pages	Revised	New
E323344	1	8A7U20	ML CORRECTION PAGE(S)		

Please review this material and report any inaccuracies to: UL's Customer Service Professionals. Contact information for all of UL's global offices can be found at http://ul.com/aboutul/locations.

If you'd like to receive updated materials FASTER, UL offers electronic access and/or delivery of this material. For more details, contact UL's Customer Service Professionals as shown above, referring to the above service request number.

This material is provided on behalf of UL LLC(UL) or any authorized licensee of UL.

END File

UL India Private Limited
Gokul Chambers Block C 2nd Floor No.59/3RT Cross Phase II Electronic Bangalore - 560100, India
T: 91.80.40.88400 | F: 91.80.28411772 | UL.com

International Approvals


شركة البترول الوطنية الكويتية
KNPC

VENDORS & CONTRACTORS EVALUATION COMMITTEE

M/S. THERMO CABLES LTD.
PLOT NO.121, SY.NO GREEN INDUSTRIAL PARK
JADCHERLA, DIST-MAHABOOBNAGAR - 509301
INDIA

SUBJECT: VENDOR APPROVAL – RE-QUALIFICATION

GENTLEMEN,

REFERENCE TO YOUR PREVIOUS APPROVAL LETTER DATED 20/05/2016, YOUR COMPANY IS RE-QUALIFIED AS A VENDOR EFFECTIVE 18/08/2021 FOR THE SUPPLY OF THE FOLLOWING PRODUCT(S) FOR K.P.C. REQUIREMENTS:

PRODUCT	DESCRIPTION
70 40	CABLE, INSTRUMENTS (INCLUDING THERMOCOUPLE WIRE & CABLE)

THE COMPANY (VENDOR) CODE ALLOCATED TO YOUR COMPANY IS 177128.

PLEASE ENSURE TO QUOTE THIS CODE AND ABOVE FILE NO. ON ALL YOUR FUTURE CORRESPONDENCE.

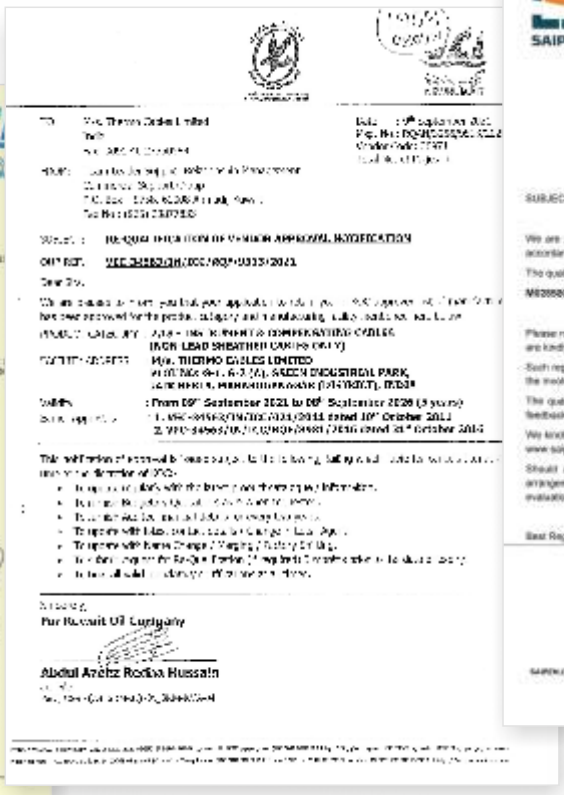
VERY TRULY YOURS,

BASSAM M. AL-QATTAN
CHAIRMAN V & CEO

THIS LETTER SUPERSEDES OUR LETTER DATED 20TH MAY 2016

NOTE: APPROVAL VALIDITY IS UP TO 18TH MAY 2026 (APPROVED SINCE 20TH MAY 2011)
REF: 412878

PLEASE REFER OVERLEAF FOR INSTRUCTIONS


For Kuwait Oil Company

Abdul Aziz Rooha Hussain


SAIPEM

SUBJECT: Qualification process for inclusion in Saipem Vendor List

We are pleased to inform you that your Company has successfully completed the qualification process in accordance with Saipem procedures.

The qualification stands for the supply of goods and/or services for the following commodity:

W02000020 - INSTRUMENT CABLES (ARMOURED AND UNARMOURED)

Please note that you have been registered in our Vendor Management Data Base with code 189023 that you are kindly requested to mention in all communication with Saipem.

Such registration shall not create or impose any obligation or liability on Saipem as well as it shall not ensure the involvement of your Company in future bids launched by Saipem.

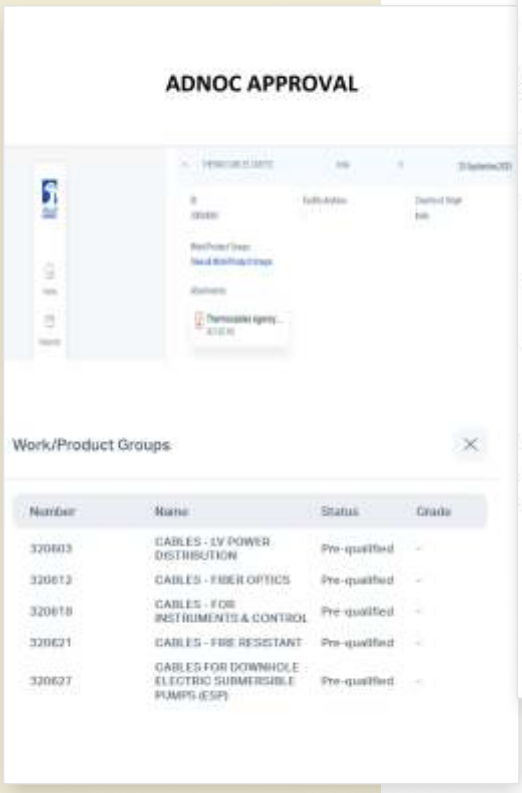
The qualification has a 36 (thirty-six) month validity, and this qualification status will be monitored through feedback analysis and, if required, audit visits at your offices and/or premises.

We kindly ask you to promptly inform us of any change of your Company organization by joining our website www.saipem.com and selecting "Qualification Management" area.

Should any serious facts concerning management, organization and assets occur (i.e. composition or arrangement of creditors, winding up orders, bankruptcy, etc.), the given qualification, subject to Saipem evaluation, could be revoked at any time since the date of the said event.

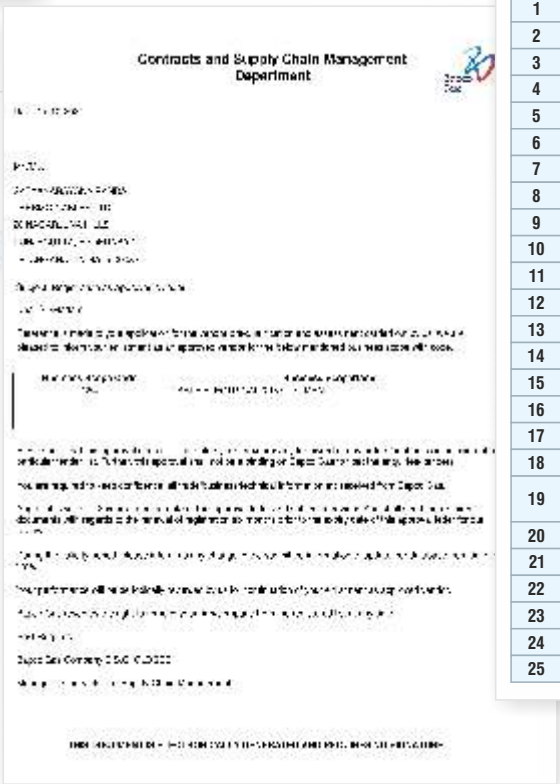
Best Regards.

SAIPEM S.P.A.
Procurement and Global Order Services


ADNOC APPROVAL

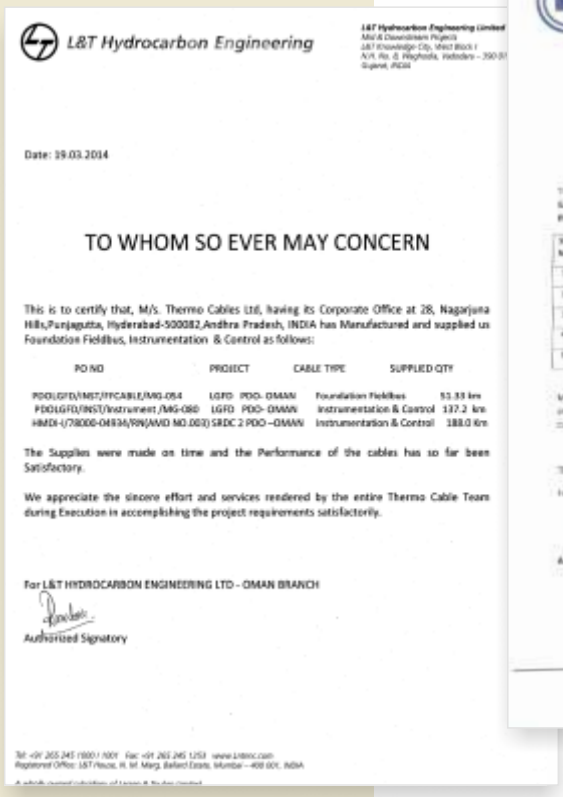
Work/Product Groups

Number	Name	Status	Grade
320603	CABLES - LV POWER DISTRIBUTION	Pre-qualified	-
320613	CABLES - FIBER OPTICS	Pre-qualified	-
320619	CABLES - FOR INSTRUMENTS & CONTROL	Pre-qualified	-
320621	CABLES - FIRE RESISTANT	Pre-qualified	-
320627	CABLES FOR DOWNHOLE ELECTRIC SUBMERSIBLE PUMPS (ESP)	Pre-qualified	-


Contracts and Supply Chain Management Department

S.No	Customer	Vendor Code
1	ADNOC	20009092
2	Advance Petrochemical	201463
3	Aluminium Bahrain B.S.C. (ALBA)	7791
4	Borogue	000003394
5	Dolphin Energy Ltd	112792
6	Dry Docks	99393
7	Emirates National Oil Company (ENOC)	1001101538
8	ExxonMobil	PC-2024.091753
9	FARABI	9000403
10	GE	SQ-076734.2
11	KOCH Engineered Solutions	SPS000472
12	Kuwait National Petroleum Company (KNPC)	177128
13	Kuwait Oil Company (KOC)	30971
14	MAADEN	20230002
15	NEOM	S10764408
16	National Water Company (NWC)	40317
17	Petroleum Development Oman (PDO)	104158
18	Petronas	1125426A
19	PTT Exploration and Production Public Company Limited (PTTEP)	309104
20	Qatar Energy	309104
21	Qatar Fuel Additives Company Limited (QAFAC)	106712
22	Saudi Arabian Railway (SAR)	4895
23	Saudi Electricity Company	2012054
24	SIBUR	61293
25	TASNEE	S11312730

Accolades



L&T Hydrocarbon Engineering

Date: 19.03.2014

TO WHOM SO EVER MAY CONCERN

This is to certify that, M/s. Thermo Cables Ltd, having its Corporate Office at 28, Nagarjuna Hills,Punjagutta, Hyderabad-500082,Andhra Pradesh, INDIA has Manufactured and supplied us Foundation Fieldbus, Instrumentation & Control as follows:

PO NO	PROJECT	CABLE TYPE	SUPPLIED QTY
PDOLGFD/INST/FFCABLE/MG-054	LGFD PDO- OMAN	Foundation Fieldbus	51.33 km
PDOLGFD/INST/Instrunet /MG-080	LGFD PDO- OMAN	Instrumentation & Control	137.2 km
HMDI-(/78000-04934/RN/AVID M0.003) SRDC 2 PDO –OMAN		Instrumentation & Control	188.0 Km

The Supplies were made on time and the Performance of the cables has so far been Satisfactory.

We appreciate the sincere effort and services rendered by the entire Thermo Cable Team during Execution in accomplishing the project requirements satisfactorily.

For L&T HYDROCARBON ENGINEERING LTD - OMAN BRANCH

Authorized Signatory

Chennai Metro Rail Limited

(A Joint Venture of Govt. of India and Govt. of Tamil Nadu)

TO Whomsoever It May Concern

Authorised Signatory

NATIONAL CEMENT COMPANY LTD

Building The Nation

SIMBA CEMENT

Dated: 25.02.2018

TO WHOM SO EVER IT MAY CONCERN

This is to certify that M/s.Thermo Cables Ltd., Hyderabad have supplied LT Power, Control, Signal, Thermocouple and Composite Cables to our **3000 TPD Clinkerisation Unit at Mereseki, Emali-Loitoktok Road, Kajiado County, KENYA vide our PO No.NCCL/PROJ/EML-E&I/044/2014-2015 dated 9th November, 2015.**

This PO contains supply of 13000 Mtrs. of 3.5 C X 300 Sq.mm alongside other type of Cables.

We appreciate Thermo Cables efforts in executing this Order with quick deliveries to meet our Project Schedules. The Cables are in operation for more than 1 Years and the performance is found to be satisfactory.

for NATIONAL CEMENT COMPANY LTD.,

Name: Lokesh kumar

Designation: Commercial Director

Seal:

MANUFACTURERS OF ALL TYPES OF QUALITY PPC AND OPC CEMENT INCLUDING 32.5N & 42.5N AND SIMBA PAVING BLOCK.

cpp

CHINA PETROLEUM PIPELINE ENGINEERING CO.,LTD

Date: 24 June 2025

To Whomsoever It May Concern

Subject: Performance Letter for Supply of Cables

This is to certify that **Thermo Cables Limited**, having its registered office at 28, Nagarjuna Hills Punjagutta, Hyderabad, Telangana, India – 500082 has successfully supplied cables for our various projects over the past years.

Details of the major supply orders executed are as follows:

Project Name	Purchase Order No.	Year of Supply	Quantity Supplied	Description of Material Supplied
RAS MARKAZ CRUDE OIL PARK PROJECT - OTTCO	CPP-RM-PO-0137	2020-2023	309.51 KM	Instrumentation and Control Cables

Thermo Cables Limited has met all the technical and delivery requirements of the above projects and has demonstrated good performance in terms of quality, timely delivery, and support for Smooth Execution of the project.

We acknowledge their contribution and professionalism and wish them all the best in their future endeavors.

For and on behalf of

China Petroleum Pipeline Engineering Company Limited - Middle East

Luze Yin 尹宇泽

Head of Procurement CPP MDE

Address: 48th Floor, Addax Tower, Al Reem Island, Abu Dhabi, UAE

Akkharayef Group

Date: 19.03.2014

TO WHOM SO EVER MAY CONCERN

This is to certify that, M/s. Thermo Cables Ltd, having its Corporate Office at 28, Nagarjuna Hills, Punjagutta, Hyderabad-500082,Andhra Pradesh, INDIA has Manufactured and supplied us Foundation Fieldbus, FS Instrumentation & Control of 400 km against our Purchase order PO/GC-16/058 For Kuwait Oil Company NEW GC 16 Project.

The Supplies were made on time and the Performance of the cables has so far been Satisfactory.

We appreciate the sincere effort and services rendered by the entire Thermo Cable Team during Execution in accomplishing the project requirements satisfactorily.

For Akkharayef Group Company

Authorised Signatory

HITACHI

Inspire the Next

Subject: Letter of Appreciation to Thermo Cables Limited.

To, Thermo Cables Limited
Hyderabad.

Dear Thermo Cables Team,

We extend our sincere gratitude for the exceptional support provided during the period of 2023-2024. As a key partner, Thermo Cables Limited has played a pivotal role in the success of Hitachi Energy India Ltd, particularly in the manufacturing of different type of cables for GIS at our Vadodara facility.

Hitachi Energy India Limited is a global leader in power technologies, providing the most energy-efficient grid portfolio across the entire value chain. Hitachi provides compact, reliable Gas Insulated Switchgear (GIS) with high end technology for which Thermo Cables is also an important stakeholder for the supplies of Control, Instrumentation bonded GIS cables.

Your commitment to excellence, the consistent quality of your products and on-time supply has significantly contributed to the smooth functioning of our manufacturing processes. Thermo Cables Limited's dedication to delivering top-notch solutions aligns seamlessly with our standards at Hitachi.

As we reflect on the successes of the past year, we eagerly anticipate continuing and strengthening this successful partnership in the years ahead.

In recognition of Thermo Cables Limited's substantial contributions, we present this letter of appreciation.

Best wishes to Thermo Cables Limited for continued success.

Regards

For Hitachi Energy India Limited, Vadodara
Formerly known as ABB Power Products and Systems India Ltd.,

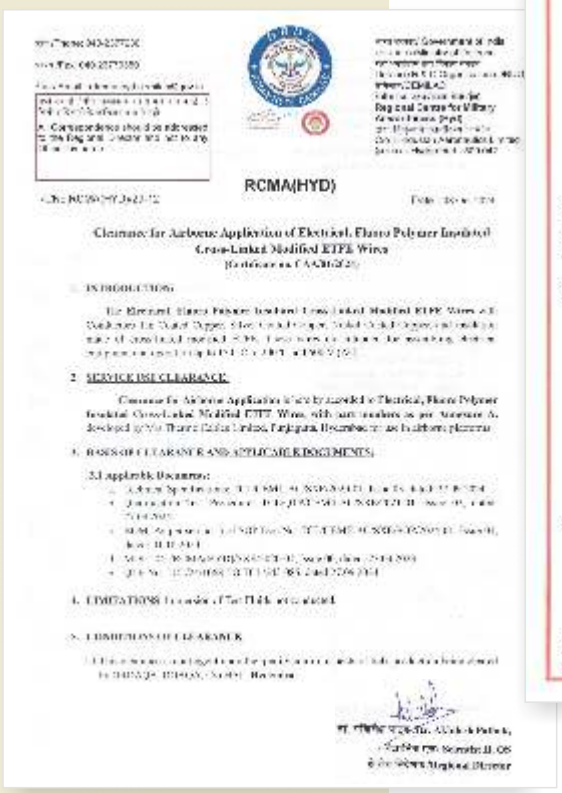
Sumanth Thomas

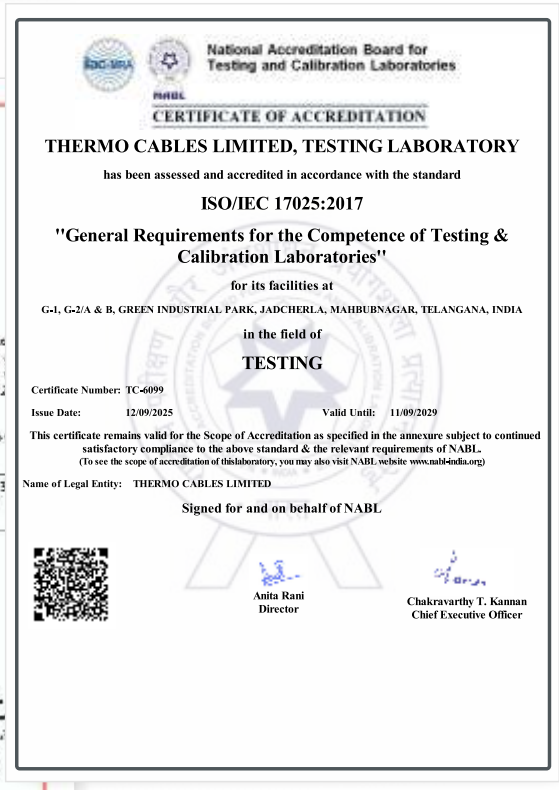
Category Manager

Hitachi Energy India Limited

Hitachi Energy

System Certications





Infrastructure

Machinery

Name of the Machine	Name of the Machine
Rod Break Down Machine (9 Die)	HOIST 'E' - 19 B Laying - 2 Nos
Rod Break Down Machine (11 Die)	HOIST 'G' - 30 Armouring - 2 Nos
Rod Break Down Machine (13 Die)	HOIST 'G' - 30 B Armouring
Skip Stranding Machine - 2 Nos	HOIST 'F' - 37 Laying
Electroplating Tinning Machine - 2 Nos	HOIST 'F' - 37 B Laying - 2 Nos
Multi Wire Drawing Machine 30 mm	HOIST 'K' - 40 Armouring
Multi Wire Drawing Machine 8 Wire - 2 Nos	HOIST 'H' - 48 Armouring - 2 Nos
Fine Wire Drawing Machine - 4 Nos	HOIST 'H' - 48 B Armouring - 2 Nos
Mixing Machine 75 mm - 3 Nos	HOIST 'J' - 72 B Armouring
Kneader Line - 2 Nos	HOIST 'F' - 96 Armouring
75 L Kneader	HOIST 'K' - HV Area
Ring Marker	HOIST 'L' - Drum Twister Area
High Speed Core Rewinding - 4 Nos	HOIST 'O' - RBD Area
Taping Machine - 7 Nos	HOIST 'I' - Despatch - 2 Nos
Vertical Taping Machine - 6 Nos	Chain Hoist 'A' - G I Rewinding - 2 Nos
Horizontal Taping Machine - 12 Nos	Chain Hoist 'C' - Simon Taping - 4 Nos
Single Twist Bunching Machine	High Speed Bunching Machine - 10 Nos
400 Single Twist Bunching Machine	Chiller - 2 Nos
Tandem Extrusion Line (Ø50 + 65/35 mm)	Chiller 5 TR
Tandem Extruder Line (Ø80+ Ø100/Ø35)	Chiller 10 TR - 2 Nos
Tandem Extruder Line (Ø35+ Ø50/Ø35)	Chiller 20 TR
Extruder Machine 20 mm Bi Color	PVC Mixer
Extruder Machine 45 mm	High Speed Mixer 60 kg
Extruder Machine 45 mm Bi Color	High Speed Mixer 120 kg
Extruder Machine 65 mm - 9 Nos	High Speed Mixer 200 kg
Extruder Machine 70 mm	16 A High Speed Braiding - 3 Nos
Extruder Machine 70/35 mm	16 F High Speed Braiding - 2 Nos
Extruder Machine 75 mm - 3 Nos	24 High Speed Braiding - 2 Nos
Extruder Machine 80 mm - 4 Nos	24 A High Speed Braiding - 5 Nos
Extruder Machine 100 mm	24 E High Speed Braiding - 4 Nos
Core Rewinding Machine - 7 Nos	24 F High Speed Braiding
Cooling Tower - 6 Nos	48 High Speed Braiding
GI Rewinding Machine - 20 Nos	3 HP Air Compressor
Ceramic Butt Welding Machine	10 HP Air Compressor - 3 Nos
Butt Welding Machine - 15 Nos	15 HP Air Compressor
Electron Beam Accelerator - 2 Nos	20 HP Air Compressor - 2 Nos
Pairing Machine - 4 Nos	25 HP Air Compressor
Pairing Back Twist Machine	100 HP Air Compressor - 3 Nos
Laying Machine (7 Bobbins)	Brazing Machine - 4 Nos
Laying Machine (7 Bobbins) - Single Twist	H V Testing - 3 Nos
Laying Machine (13 Bobbins)	Drum Twister Machine
Laying Machine (19 Bobbins) - 4 Nos	630 Single Twister Machine 7 Bobbin
Laying Machine (37 Bobbins) - 3 Nos	800 Single Twister Machine 12 Bobbin
Laying (42 Bobbin)	1250 Single Twister Machine 19 Bobbin
Armouring Machine (30 Bobbin) - 2 Nos	DT 500 Buncher Machine
Armouring Machine (40 Bobbin)	Scissor Lift 2 ton
Armouring Machine (48 Bobbin) - 4 Nos	Steam Boiler
Armouring Machine (72 Bobbin)	PVC Grinder
Armouring Machine (96 Bobbin)	Hydraulic Press
Extruder Sheathing Machine 80 mm - 2 Nos	PT Stranding & Taping Machine
Extruder Sheathing Machine 100 mm	Silicone Rubber Mixing Machine
Cable Rewinding Machine - 5 Nos	65/150 Two Stage Extruder (Compounding Line)
GI Rewinding Strip Machine - 2 Nos	60 KVA UPS
Off Line Annealer	80 KVA UPS - 2 Nos
Nickel Plating - 2 Nos	100 KVA UPS
Pointing Machine - 2 Nos	120 KVA UPS
Fork Lift - 2 Nos	160 KVA UPS
Auto Clave	200 KVA UPS
HOIST 'A' - Skip	250 KVA UPS - 2 Nos
HOIST 'B' - 54 Stranding	320 KVA DG Set
HOIST 'P' - Stores	365 KVA DG Set
HOIST 'C' - 7 B Laying	600 KVA DG Set
HOIST 'E' - 13 Laying	Inkjet Printers - 36 Nos
HOIST 'E' - 19 Laying - 2 Nos	Laser Printers - 4 Nos

Testing Equipment

Name of the Machine - Range/LC
Fourier Transmission infrared Spectrometer (FTIR)
Profile Projector
Digital Thermometer With Sensor - 2 Nos
Hot Air Ageing Oven 6 Nos - Up to 250° C & 300° C
Hot Set Oven
Ozone Resistance Test Equipment
Smoke Density Apparatus - 3 Nos
Oxygen & Temperature index Apparatus - 2 Nos
Flammability Tester - 3 Nos
Cold Chamber Bend Cold Impact Test Set - 2 Nos 20° C to +25° C
Hot Set Test Apparatus - 3 Nos
Toxicity Index Test Equipment
Halogen Acid Gas Emission Test Apparatus
pH & Conductivity Test Equipment - 2 Nos - 0 to 14 pH
Abrasion Resistatnce Tester - 2 Nos
Electronic Tensile Tester - 3 Nos - 0 to 1000 N
Dielectric Breakdown Tester & Leakage Current Tester
High Frequency Spark Tester - 8 Nos - 0 to 15 KV AC
Main Frequency Spark Tester - 2 Nos - 0 to 15 KV AC
Digital Micro Ohm Meter 5 Nos - 1 mΩ to 19.999 kΩ (2 Nos.) & 1 mΩ to 1.9999 kΩ (1 No.)
H V Tester 4 Nos - 0-5 / 10 KV
Million Mega Ohm Meter 6 Nos - 1 MΩ to 100 GΩ, 1 MΩ to 50 TΩ & 2 MΩ to 20 GΩ
Digital L C R Q Meter
Thermal E M F Error Test Apparatus - 0 to 200 mV DC
Digital M V Source Cum Meter - 0 to 199.9° C
Digimatic Caliper - 0 to 300 mm
Acid Gas Generation Apparatus 2 Nos
Swedish Chimney Test Equipment
Water Immersion Test Equipment - Up to 100° C
4 Cell Ageing Oven with Data Scanning Logger 2 Nos - 16 Channels
Heating Oven - Up to 200° C
Thermal Stability Test Apparatus
Water Absorption Test Apparatus Gravimetric
Electronic Balance Weighing Machine - 3 Nos 0 to 180 gms & 10 gms to 3 kgs
Kelvin Bridge - 0-11 Ω
Torsion Testing Machine (Digital Control Meter - Up to 99999 Count)
Fire Survival Test Equipment
Static Noise Rejection Ratio Meter - 60 to 100 dB
H V Break Down Tester - 0 to 2.5 KV DC
Transfer Impedance Tester
Steel Rule & Test Mandrel Set 0 to 1 Metre
Condition Chamber 2 Nos - 20° C to 40° C (Temp.) & 40 to 80 RH
Insulation Resistance Tester - 0 to 1000 MΩ / 500 V
Hydro Meter 4 Nos - 0.700 - 1.000 g / ml
Digital Stop Watch 5 Nos - 0 - 24 hrs
Mutual Capacitance Meter - 1.999 nF - 1999.9 nF
Length Counter Meter - Up to 99999 mtr
Tear Resistance Die
Coating Thickness Measurement Meter
Digital Multimeter 4 Nos - MΩ
Inductance Decade Box - 10 mH - 10 H
Capacitance Decade Box - 10 pF - 10 μF
Wet & Dry Thermometer 2 Nos - 40° C to +50° C
Glass Thermometer 05 Nos - 10° C to + 110° C & - 10° C to 250° C
Thermometer 02 Nos - 195° C to 205° C
Digital Anemo Meter - 0 - 45 m/s
Digital Thermo Hygrometer 02 Nos - 0 to 95° C / 20 to 99% RH
Senior Double Kelvin Bridge
UV Radiation Test Apparatus
Notch Propagation Tester (Analog)
Water Bath (Size 120 cm X 90 cm X 60 cm)
H V Probe Milimeter
Abrasion Resistance Tester
Dynamic Cut Through Tester
Cable Analyzer
Universal Testing Machine
PC Based Crosstalk Attentuation & Impedance Meter Attenuation 0.1 to 20 dB, Cross talk (- 40 to 100 dB), Impedance 199.9Ω to 1.999kΩ
Network Analyzer (AESA)
Fluke - DSX - 8000
Toxity Index Tester as per EN 45545-2
Step Load Tester
Bending Torsion Tester
Vibration Tester

OUR CUSTOMERS

Thermo Cables Ltd

An ISO 9001, 14001 & 45001 Certified Company

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Plant - II
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www.thermocables.com

TCL/Br/01.06/25