

Thermo Cables





Thermo Group, a name synonymous with Innovation, Excellence and Quality is the manifestation of a seed sown over 40 years ago.

With strong footings in Hyderabad, India, Thermo Group today has its reach in every corner of the Globe. The group companies are:

Thermo Cables - manufacturers of a wide range of cables under the brand "THERMOKABEL",

Thermopads - specialists in Industrial, Commercial and Domestic Heating, and Thermosystems - an EPC company in the field of Fuel Oil Handling System, Fire Detection and Protection Systems, Utility Piping, Heat Tracing, LP Piping and Misc. Tanks.



Major Approvals

AVANT GARDE
ADGAS
ADCO
ADMA OPCO
ALBA
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CET
BOROUGE
BPCL
DCPL
DESEIN LTD
DGMS
DVC
DRDO
DRDL
EGA
ENGINEERS INDIA LTD
FICHTNER CONSULTING
GSPC
GOA SHIPYARD
HOLTECH ENGINEERS
HINDUSTAN SHIPYARD
HPCL
INDIAN REGISTER OF SHIPPING
IOCL
ISRO
JACOB'S H & G
KNPC, KUWAIT
KOC, KUWAIT
MECON
METRO RAIL
MN DASTUR & CO.
MAZGOAN DOCK LIMITED
MUMBAI PORT TRUST
NPCIL
NTPC
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PDIL
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TECNIMONT ICB LTD
TOYO ENGINEERING INDIA LTD
THYSSENKRUPP
TAKREER
ZADCO

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
- LT PVC/XLPE Power & Control Cables
- Fire Resistant/Survival Cables
- Thermocouple Extension/Compensating Cables
- High Temperature Fluoropolymer (PTFE/FEP/PFA/ETFE) & Silicone Rubber Cables
- Fibreglass Varnished Cables
- Electron Beam Irradiated (EBXL) Cables
- Thin Walled Flexible Elastomeric, EBXL Cables for Locomotives & Coaching Stock
- Offshore, Marine, Shipboard Cables
- Solar Cables
- Railway Signalling Cables Indoor/Outdoor
- Wind Power Cables
- H07RN - F Cables
- CRD, Trailing, Festooning & Composite Cables
- VFD Cables
- Foundation Fieldbus, Modbus, Profibus, RS – 485 Canbus Cables
- Co-axial Cables/LFH Cables/Telephone Cables/Battery Cables

Quality

- Policy : To achieve excellence in quality and services, customer delight, upgradation of technology & techniques
- Cables licensed to carry ISI mark for IS 694/ IS 1554-I/ IS 7098-I/ IS 9968-I/ IS 14494.
- Full fledged In-house testing laboratory to conduct Routine, Type & Acceptance Tests as per relevant standards
- ISO 9001 Certified Company**

Accolades

- Best Technology Award from IBM Corp., USA at International Level
- Best Performance in SSI Sector - Sir Visvesvaraya Industrial Award
- Best entrepreneur award for the year 2016 to the Managing Director for outstanding leadership and exemplary standards of services.
- Many other Recognitions

Technology

- Cables designed and manufactured conforming to various National and International Standards such as IS 613, IEC – 60228, IS-694, IS-1554-I, IS-7098-I, IS-9968-I, IEC-60502-I, BS-6346, BS-5467, BSEN 50288-7, IEC 60189-I & II, BS 5308 – I & II, IS 8784, IEC 60584 – I & III, ANSI MC 96.1, VDE 0815, VDE 0816, BS 7919, BS 7629, BS 6387, BS 7846, JSS 51034, JSS 51038, IEC 60092 350, 353, 376, DEF-02 526, DEF 02 527, VG 95218 60-66, EED 50-12, 50-13, IEC 60331, UL 1581, UL 758, MIL-C-17, MIL-DTL-22759/86A, MIL-DTL-22579/87A, MIL-DTL-27500H, MIL-DTL-24640B, MIL-DTL-24643C etc.


Reliability

- In-house Wire Drawing, PVC and Rubber Compounding facilities ensure consistent quality and adherence to stringent time schedules
- Wide sales network ensures prompt and customized services
- In-house insulation facilities for special materials like FEP, PTFE, Silicone Rubber, EPR, PU, PFA, PCP, CSP, TPE, TPR, EPDM, EVA, FRLSCSP, NBR, CPE.





Power & Control Cables



Construction	: Single core / Multicore
Voltage Grade	: Up to 1100 V
Conductor	: Aluminum / Copper, Solid / Standard / Flexible Conductor
Range	: Single core up to 1000 Sq mm Multicore 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 / LDPE / XLPE
Inner Sheath	: PVC / HRPVC / FRPVC / FRLS PVC / ZHFR / LSF
Armouring	: GI Round Wire / Flat strip or Wire Braiding
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

Core Identification

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

1 Core	: Any single colour.
2 Core	: Red and 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	-- Aluminum conductor.

No Abbreviations used when the conductor material is Copper.

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.

Construction	: Cores, pairs, triads or quads
Voltage Grade	: Up to 1100 V
Conductor	: Electrolytic grade copper Bare / Tinned 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 / PFA/ EPR / Fibre Glass / FEP / Silicone Rubber
Screening	: Individual and/or overall with following options - - Aluminum Mylar/Copper Tape with Tinned Copper Drain Wire or - 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 Wire Braiding
Outer Sheath	: PVC / HRPVC / FRPVC / FRLS PVC / ZHFR / LSF
Rip Cord	: For easy removal of sheath
Standards	: BS-5308 Part-1 & 2, BS-7655, IEC-189 (1 & 2), VDE-0815 & 0816 and BS EN 50288-7
Additional Features	: Communication pairs, Bi-colour extrusion, Band marking
Optional Bedding	: Aluminum Tape + HDPE + Polyamide Sheath for Alternate Lead Sheath Cables

Note:- These cables are also designed as Data/Analogue cables.

Technical Data


































Conductor Resistance at 20° C Ohms/Km	Conductor Size mm ²	0.5	0.75	1.0	1.5	2.5
	Maximum Resistance	39.0	26.0	19.5	13.3	7.98
Capacitance nf/Km	Between Conductors	< 250 for PVC				
	Between Conductors & screen	< 150 for Polyolefin				
Inductance mH/Km		Less than 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	<40
Insulation Resistance at 20° C MOhm-Km	PVC	More than 100				
	PE/XLPE	More than 5000				
Electrostatic noise rejection ratio		More than 76.0 db				

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 / PFA / EPR Fibre Glass / FEP / Silicone Rubber
Screening	: Individual and/or overall with following options - - Aluminum Mylar/Copper Tape with Tinned Copper Drain Wire or - Braided with Bare or Tinned or Nickel Plated or Silver Plated Copper
Inner Sheath	: PVC / HRPVC / FRPVC / FRLSPVC / ZHFR / LSF/ PTFE / Fibre Glass / PFA / FEP
Armouring	: GI round Wire / Flat strip or Wire Braiding
Outer Sheath	: PVC / HRPVC / FRPVC / FRLSPVC / ZHFR / LSF/ PTFE / Fibre Glass / PFA / FEP
Rip Cord	: For easy removal of sheath
Standards	: ANSI:MC-96.1, IS-8784, DIN, BS & IEC 584-3

Note:- Other conductor sizes and insulation materials on request.

Technical Data

CABLE CODE		Kx	Kx(A)	Tx	Jx	Ex	Sx/Rx
CABLE TYPE		EXT.	COMP	EXT.	EXT.	EXT.	COMP
Conductor	+Ve leg	Chromel	Copper	Copper	Iron	Chromel	Copper
	-Ve leg	Alumel	Constantan	Constantan	Constantan	Constantan	Copper Alloy
Suitable for Thermocouple Type		Kx	Kx	Tx	Jx	Ex	Sx/Rx
Conductor Combination		Chromel	Copper	Copper	Iron	Chromel	Platinum 10/13% Rhodium
		Alumel	Alumel	Constantan	Constantan	Constantan	Platinum
Temperature range of measuring junction °C		0 to +1100	☆	-185 to +300	+20 to +700	0 to +800	0 to +1550/ 0 to +1600
Applicable standards for output of Thermocouple conductors		BS4937 part 4 ANSI/MC 96.1 type K DIN 43710 NF C 42-321 JISC 1602	☆	BS4937 part 5 ANSI/MC 96.1 type T NF C 42-321 JISC 1602	BS4937 part 3 ANSI/MC 96.1 type J NF C 42-321 JISC 1602	BS4937 part 6 ANSI/MC 96.1 type E NF C 42-321 JISC 1602	BS4937 part 1 ANSI/MC 96.1 type S, R, NF C 42-321 JISC 1602
COLOUR CODING	 BS						
	 ANSI						
	 DIN						
	 NF						
	 JISC						
Approximate generated 100°C EMF change per °C		42	☆	46	46	68	8/8
mV/C at 500°C		43	☆	—	56	81	9/10

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

Find applications 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 Core / Pair / Triad and Multi Cores / Pairs / Traids
Voltage Grade	: 600/1100 VAC
Conductor	: Stranded or solid annealed bare or Tinned Copper Conductor
Fire Barrier	: Glass mica tape
Insulation	: Silicone rubber or Cross linked polyolefin elastomer
Screening	: Individual and/or overall with following options - - Aluminum Mylar/Copper Tape with Tinned Copper Drain Wire or - Braided with Bare or Tinned or Nickel Plated or Silver Plated Copper
Inner Sheath	: LSOH / ZHFR or equivalent
Armouring	: Galvanized Steel wire helical armouring or wire braiding
Outer Sheath	: LSOH / ZHFR or equivalent
Standards	: BS 7846, BS 7629, BS 8434 or equivalent with fire resistance to BS:6387 category CWZ and IEC : 60331 tested for 950° C for 3 hrs.

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



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 such as refining, petrochemicals, power generation, even in food & beverage, pharmaceuticals and nuclear applications.

Construction

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
Insulation	: Solid Polyethylene/XLPE / PFA for temp. > 150° C
Screening	: Individual and/or overall with following options - - Aluminum Mylar/Copper Tape with Tinned Copper Drain Wire or - 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
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 Low Capacitance (for long runs) RoHs compliant and CE marked

Technical Data

Cable Type →		Trunk	Spur
Conductor Resistance @ 20° C Ohms/Km	Minimum Conductor Size Sq mm	18 AWG	22 AWG
	Maximum Resistance	23.5	59.4
Capacitance nf/Km	Between Conductors	Less Than 150 nf/Km	
	Between Conductors & Screen	Less Than 400 nf/Km	
Inductance mH/Km		Less than 1.0	
Insulation Resistance @20° C MOhm-Km		More Than 5000	
Characteristic impedance		100 Ω ± 20%	
Wave Attenuation @ 39 KHz:		< 3 dB/km	
Capacitive unbalance to shield		≤ 4 nF/km	
Temperature range		-30° C to + 90° C	

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** : 250VAC, 600VAC & 1000VAC (Rating as per MIL 16878, VDE, DIN, ANSI)
- Conductors** : Annealed bare and/or tinned copper conductor (up to 120° C)
 Annealed silver plated copper conductor (up to 200° C)
 Nickel plated conductors (up to 260° C)

Insulation

Insulation Material	Temperature Range	Characteristics
Varnished Fibre Glass Braid	-72° C to 350° C	High Temperature Resistance
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	-200° C to 260° C	Excellent chemical resistance, High temperature stability
Kapton tape	-250° C to 300° C	Very thin wall insulation, High temperature resistance
PEEK	-160° C to 250° C	Mechanically very tough High temperature and radiation resistance
ETFE	-150° C to 150° C	Mechanically tough
Silicone Rubber	-40° C to 180° C	Flexible & abrasion resistance

- Screening** : Individual and/or overall with following options -
 - Aluminum Mylar/Copper Tape with Tinned Copper Drain Wire or
 - 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** : 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 XHF 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.

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



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 in relation to wind direction.

Construction

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 300 Sq mm

Insulation

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

Sheath

: Special elastomer compound with Oil, Fire, Hydrolysis and Torsion Resistant properties. (Zero halogen sheath available on request)

Features

Maximum conductor temperature (continuous) : + 90° C

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

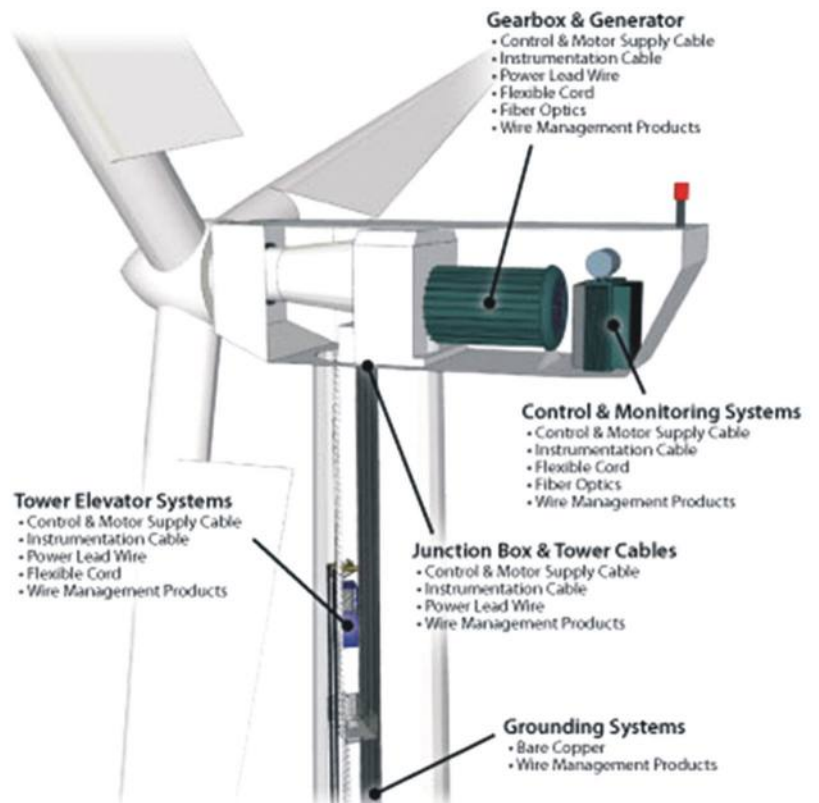
Maximum permissible tensile load on cable : 15 N/mm²

Torsion angle : ± 100° per meter

Minimum bending radius : 8 D

Control & Instrumentation Cables

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





CRD and 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 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
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
Temperature Range	: -20° C to +90° C
Test Voltage	: 2500 V-AC
Bending Radius	: 10 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	: IEC-60228, IEC-60502, IEC-60332

H07RN-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 conductors as per IEC-60228/1
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 - 35 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.



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. The cables that are used to carry power from the solar panels to the charging units 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	: 600/1000 VAC 1000/1800 VDC
Temperature Range	: -40° C to 90° C
Maximum Conductor Temperature	: 120° C Withstands 250° C for 5 seconds
Conductor	: Tin Coated Copper Class 5 conductor
Insulation	: 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 Working life of more than 25 years





Cables for Railways

Manufacturing wide range of Specialty Wire & Cable products such as

Railway Outdoor Signaling and Power Cables as per IRS Spec: IRS: S-63/2014 Rev 4 and IS 1554 -1

Voltage Grade	: 1100 Volts
Conductor	: Solid Single Strand Circular Copper and Multi strand Aluminum
Range	: Up to 61 Cores (Signaling) and Up to 4 cores (Power)
Insulation	: PVC
Inner Sheath	: PVC
Armouring	: GI Round Wire or Flat Strip / Double Steel Tape Armoured Cables.
Outer Sheath	: PVC
Application	: For Power Supply, Control Purpose in Power & Switching Stations, Local Distribution Systems in Outdoor Installations, Track Changing and Communication.

Indoor Single and Multi Core Signaling Cables as per IRS: S-76/89 Amnd 3

Voltage Grade	: 650 Volts
Conductor	: Solid Single Strand / Multi Strand / Flexible Circular Copper
Insulation	: PVC
Outer Sheath	: PVC (Multi Core)

Electron Beam Irradiated Cross-linked Thin walled Flexible Elastomeric Single Core & Multi Core Cables as per ELRS/SPEC/ELC/0019 - Rev 3, CLW 458, CLW 459

Voltage Grade	: Up to 750 V and 1.8/3.0 KV, 1.8/4.0 KV, 300 V, 600/1000 V
Conductor	: Electrolytic Annealed Tinned Copper (Class V)
Insulation	: EPDM/EVA dual or Single Layer
Sheath	: EVA
Temperature Range	: -40° C to 120° C
Application	: For Tap Changer Electric Locomotives and Coaching /AC/DC EMU, BG AC EMU & MEMU Stock.



Marine / Shipboard Cables

DEF STAN – 02 – 526 (NES 526)

Power Cables, EPR Insulated, LFH Elastomeric Sheathed Single Core and Multi Core

Construction	: Multi Core Cables, Unscreened or Individually Screened or Collectively Screened, Limited Fire Hazardous Sheathed.
Conductor	: Circular Electroplated & Annealed Tinned Copper
Insulation	: Dual Layer of GP5 and LFH Material
Screening	: Annealed Tinned Copper Braid, Individually Screened or Collectively Screened.
Armouring	: GI Wire Braided if applicable
Outer Sheath	: LFH Elastomeric Compound
Temperature Range	: -30° C to + 105° C
Application	: For use on board surface ships, submarines and crafts for power, control, lighting and communication and instrumentation circuits

DEF STAN – 02 – 527 (NES 527)

Cables for electric fire survival, high temperature zone and limited fire hazard sheathed.

Construction	: Single Core, Multi Core, Miniature Multi Core, Multi Pair, Triple, Unscreened or Screened or Individually Screened or Collectively Screened.
Conductor	: Circular Electroplated, Annealed Tinned Copper Wire.
Insulation	: Silicone Rubber Compound
Protective Barrier	: Glass Braid/Lacquer, Mica Glass Tape to meet the fire performance
Screening	: Annealed Tinned Copper Braid with Polyester Separated Tape.
Outer Sheath	: LFH Elastomeric Compound
Temperature Range	: -30° C to + 105° C
Application	: For use on board surface ships, submarines and crafts for power, control, lighting and communication and instrumentation circuits with fire survival characteristic.

IEC 60092 – 350, 353, 360 & 376

Construction	: Single Core, Multi Core, Single, Multi Pair, Screened & Unscreened, Armoured & Unarmoured
Conductor	: Electroplated Annealed Bare/ Tinned Copper of various classes.
Insulation	: XLPE/EPR/HEPR, HF 90/ S 95
Screening	: Almylar Screen along with Drain Wire
Inner Sheath	: SHF1/ SHF2/ SH/ SF
Armouring	: Bare Copper/ Tinned Copper/ GI Wire Braid Armoured with >90% coverage
Outer Sheath	: SHF1/ SHF2/ SH/ SF
Application	: For use on board surface ships for power, control, lighting and communication and instrumentation circuits



On Board Indian Naval Ships and Crafts Cables

EED – 50 -12 - Thin walled, Insulated, Electron Beam Cross–linked Irradiated Electric Cables

Construction	: Multipair, Multicore, Multitriad Cables, Unscreened/Individually screened/ Collectively Screened 600 V, 1800 V (for Single Core Cables)
Conductor	: Circular Electroplated, Annealed Tinned flexible copper conductor (class V) conformity to IEC - 60228
Insulation	: Electron Beam Cross linked Polyolefin compound (EPR/EPDM LFH)
Screening	: Annealed Tinned Copper Braid/ GI Wire Braid
Outer Sheath	: Electron Beam Cross Linked Polyolefin Compound (EVA/EMA/EEA LFH)
Temperature Range	: -65° C to 120° C
Application	: For use on board surface ships and crafts for power, control, lighting. For submarines for communication and instrumentation circuits

EED – 50 -13 - Fire Survival, High Temperature Zone, Fire Retardant Halogen Free Sheathed Electron Beam Cross–linked Irradiated Cables.

Construction	: Single Core, Twin and 3 Core, Multicore, Multipair, Multitraid, Multiquad cables, Screened/Individually Screened/Collectively Screened.
Voltage Grade	: 440 V
Conductor	: Circular Electroplated, Annealed Tinned Flexible Copper Wire (Class 5) confirming to IS : 8130-1984/ IEC - 60228
Temperature Range	: - 30° C to +120° C
Protective Barrier	: Fibre Glass Braid/Lacquer Mica glass tape to meet the Fire Performance
Insulation	: Electron Beam Cross Linked Silicone Rubber Compound
Separator Tape	: Polyester Tape
Braiding	: Annealed Tinned Copper Braid (wherever applicable)
Outer Sheath	: Electron Beam Cross Linked Polyolefin Compound EED 50-12
Application	: Power, Lighting, Control & Communication and Instrumentation Circuits in Surface Ships and Submarines. Used in Fuel and Lubrication Oils, Hydraulic Fluids and Water Surfaces



Special Navy Cables

VG 95218 Part 61 – 66 - Power Navy Cables, Light Power Navy Cables, Telecommunication Navy Cables, Light telecommunication Navy Cables.

Construction	: Multicore 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

Telephone Cables

These cables will be with 0.5 or 0.63 mm dia ATC Conductor with 0.3 to 0.4 mm Insulation thickness of PVC or HR PVC. Individual pair may be with or without polyester tape lapping. The cables will be Unarmoured for indoor applications and Armoured for outdoor applications and are with or without Screening.

Co-axial Cables

The Cable will be constructed with one Conductor (Normally ATC) with LDPE as Primary Insulation. A woven Mesh (Braiding) surrounding the Insulated Core forms the second Conductor and Outer PVC Sheathing will be done above Braiding. These Cables are used for VHF (Very High Frequency) Signal transmission.

Super Flexible Battery Cables

Rope-lay stranded, flexible class 6 bare copper conductors, insulated with flexible elastomer compound. To be used for inter connection of batteries (jumper cables) in moving platforms such as electric forklifts, golf carts or other battery powered vehicles.

Cables for Metro Rail

LT Power and Control, Fire Resistant/Survival Cables, Signalling Cables, BMS Cables, Fire Alarm Cables, for Elevated & Underground Stations as per National and International Standards.

Technical Data - Power Cables

DIMENSIONS, WEIGHTS AND ELECTRICAL CHARACTERISTICS

650/1100V, Aluminum / Copper Conductor, XLPE insulated and PVC sheathed, Unarmoured (A2XY/2XY) & Armoured (A2XWaY/2XWaY & A2XFaY/2XFaY) Cables

TABLE 1

Number of cores	Nominal Area of Conductor (mm ²)	Unarmoured				Armoured						A.C. Current rating of Aluminum m cables (in trefoil)			A.C. Current rating of Copper cables (in trefoil)		
		Nominal thickness of insulation (mm)	Approx Overall Diameter (mm)	Approximate Weight (kg/km)		Nominal thickness of insulation (mm)	Nominal Aluminum arm. Size (mm)		Approx Overall Diameter (mm)	Approximate Weight (kg/km)		In Air at 40° C (A)	In Ground at 30° C (A)	In Duct at 30° C (A)	In Air at 40° C (A)	In Ground at 30° C (A)	In Duct at 30° C (A)
				Aluminum	Copper		Wire	Strip		Aluminum	Copper						
1	10	0.7	9	95	157	1.0	1.4	12	160	222	59	61	61	75	77	76	
	16	0.7	11	130	229	1.0	1.4	13	210	309	80	79	77	103	101	99	
	25	0.9	12	170	325	1.2	1.4	15	260	415	98	96	88	126	124	114	
	35	0.9	13	205	422	1.2	1.4	16	300	517	121	114	105	152	148	136	
	50	1.0	15	255	564	1.3	1.4	17	365	674	147	135	124	189	174	160	
	70	1.1	16	330	763	1.4	1.1	19	460	893	187	166	153	240	213	196	
	95	1.1	18	420	1008	1.4		20	520	1108	230	198	182	297	256	236	
	120	1.2	20	510	1252	1.5		22	615	1357	268	225	207	346	289	266	
	150	1.4	22	630	1558	1.7		24	725	1653	309	253	233	390	326	300	
	185	1.6	24	765	1910	1.9		26	865	2010	360	286	263	460	366	337	
	240	1.7	27	955	2440	2.0		28	1065	2550	433	332	305	552	425	391	
	300	1.8	29	1140	2996	2.1		31	1290	3146	501	376	346	640	479	441	
	400	2.0	33	1470	3945	2.4		35	1620	4095	596	431	397	753	544	500	
	500	2.2	36	1830	4924	2.6		38	2005	5099	693	490	451	865	611	562	
	630	2.4	40	2285	6183	2.8		42	2505	6403	814	557	512	1001	684	629	
	800	2.6	45	2885	7835	3.1		47	3100	8050	968	632	581	1167	762	701	
	1000	2.8	50	3605	9792	3.3		52	3845	10032	1102	701	645	1299	828	762	

Note: The dimensions indicated above are considering following construction:

- Conductor:
 - 10mm² : Solid / Stranded Circular Aluminum and stranded circular Copper
 - 16mm² : Stranded Circular
 - 25mm² onwards : Stranded compact Circular

DIMENSIONS, WEIGHTS AND ELECTRICAL CHARACTERISTICS

650/1100V, Aluminum / Copper Conductor, XLPE insulated and PVC sheathed, Unarmoured (A2XY/2XY) & Armoured (A2XWY/2XWY & A2XFY/2XFY) Cables

TABLE 2

Number of cores	Nominal Area of Conductor (mm ²)	Unarmoured				Armoured						A.C. Current rating of Aluminum m cables (in trefoil)			A.C. Current rating of Copper cables (in trefoil)		
		Nominal thickness of XLPE insulation (mm)	Approx Overall Diameter (mm)	Approximate Weight (kg/km)		Nominal Aluminum arm. Size (mm)		Approx Overall Diameter (mm)	Approximate Weight (kg/km)		In Air at 40° C (A)	In Ground at 30° C (A)	In Duct at 30° C (A)	In Air at 40° C (A)	In Ground at 30° C (A)	In Duct at 30° C (A)	
				Aluminum	Copper	Wire	Strip		Aluminum	Copper							
2	10	0.7	15	230	354	1.4		17	565	689	59	65	54	75	83	69	
	16	0.7	16	260	458	1.4		19	615	813	74	83	69	98	107	89	
	25	0.9	19	355	664		4 x 0.8	20	540	849	98	107	90	131	137	115	
	35	0.9	21	430	863		4 x 0.8	21	635	1068	124	131	109	156	167	143	
	50	1.0	23	530	1149		4 x 0.8	24	780	1399	156	161	137	194	196	173	
	70	1.1	26	695	1561		4 x 0.8	28	1030	1896	188	190	167	244	244	214	
	95	1.1	29	915	2091		4 x 0.8	30	1255	2431	231	226	202	288	286	256	
	120	1.2	31	1085	2570		4 x 0.8	32	1470	2955	263	250	226	331	327	280	
	150	1.4	34	1305	3161		4 x 0.8	36	1760	3616	300	286	250	381	369	321	
	185	1.6	38	1630	3919		4 x 0.8	39	2080	4369	344	327	286	438	417	357	
	240	1.7	43	2055	5025		4 x 0.8	44	2605	5575	406	381	327	513	482	411	
	300	1.8	47	2525	6237		4 x 0.8	48	3115	6827	456	422	363	581	536	458	
	400	2.0	53	3185	8135		4 x 0.8	54	3855	8805	525	458	411	663	583	506	

Note: The dimensions indicated above are considering following construction:

- Conductor:
 - 10mm² : Solid / Stranded Circular Aluminum and stranded circular Copper
 - 16mm² onwards : Stranded Sector
- Innersheath : Taped / Extruded

Technical Data - Power Cables

DIMENSIONS, WEIGHTS AND ELECTRICAL CHARACTERISTICS

650/1100V, Aluminum / Copper Conductor, XLPE insulated and PVC sheathed, Unarmoured (A2XY/2XY) & Armoured (A2XWY/2XWY & A2XFY/2XFY) Cables

TABLE 3

Number of cores	Nominal Area of Conductor (mm ²)	Nominal thickness of XLPE insulation (mm)	Unarmoured			Armoured				A.C. Current rating of Aluminum m cables (in trefoil)			A.C. Current rating of Copper cables (in trefoil)			
			Approx Overall Diameter (mm)	Approximate Weight (kg/km)		Nominal Aluminum arm. Size (mm)		Approx Overall Diameter (mm)	Approximate Weight (kg/km)		In Air at 40° C (A)	In Ground at 30° C (A)	In Duct at 30° C (A)	In Air at 40° C (A)	In Ground at 30° C (A)	In Duct at 30° C (A)
				Aluminum	Copper	Wire	Strip		Aluminum	Copper						
3.5	25	0.9	22	530	1093	4 x 0.8		23	760	1323	96	94	89	123	122	112
	35	0.9	24	635	1384	4 x 0.8		25	910	1659	117	113	107	151	146	134
	50	1.0	27	810	1893	4 x 0.8		28	1125	2208	142	133	126	183	172	158
	70	1.1	32	1115	2631	4 x 0.8		33	1505	3021	179	164	156	231	211	194
	95	1.1	35	1425	3498	4 x 0.8		36	1850	3923	221	196	186	285	253	233
	120	1.2	39	1750	4410	4 x 0.8		40	2285	4945	257	223	212	330	287	264
	150	1.4	43	2135	5352	4 x 0.8		44	2670	5887	292	249	237	375	321	295
	185	1.6	48	2660	6682	4 x 0.8		49	3250	7272	337	282	268	430	361	332
	240	1.7	54	3390	8587	4 x 0.8		55	4080	9277	399	326	310	508	416	383
	300	1.8	60	4140	10636	4 x 0.8		60	4890	11386	455	367	349	575	464	427
	400	2.0	67	5290	13859	4 x 0.8		68	6095	14664	530	418	397	661	521	479

Note: The dimensions indicated above are considering following construction:

- Conductor:
 - 10mm² : Solid / Stranded Circular Aluminum and stranded circular Copper
 - 16mm² onwards : Stranded Sector
- Innersheath : Taped / Extruded

DIMENSIONS, WEIGHTS AND ELECTRICAL CHARACTERISTICS

650/1100V, Aluminum / Copper Conductor, XLPE insulated and PVC sheathed, Unarmoured (A2XY/2XY) & Armoured (A2XWY/2XWY & A2XFY/2XFY) Cables

TABLE 4

Number of cores	Nominal Area of Conductor (mm ²)	Nominal thickness of XLPE insulation (mm)	Unarmoured			Armoured				A.C. Current rating of Aluminum m cables (in trefoil)			A.C. Current rating of Copper cables (in trefoil)			
			Approx Overall Diameter (mm)	Approximate Weight (kg/km)		Nominal Aluminum arm. Size (mm)		Approx Overall Diameter (mm)	Approximate Weight (kg/km)		In Air at 40° C (A)	In Ground at 30° C (A)	In Duct at 30° C (A)	In Air at 40° C (A)	In Ground at 30° C (A)	In Duct at 30° C (A)
				Aluminum	Copper	Wire	Strip		Aluminum	Copper						
3	10	0.7	16	285	471	1.4		18	640	826	50	55	46	65	71	60
	16	0.7	17	320	617	4 x 0.8		18	510	807	64	71	60	83	92	76
	25	0.9	21	460	924	4 x 0.8		22	690	1154	96	94	89	123	122	112
	35	0.9	23	565	1215	4 x 0.8		24	815	1465	117	113	107	151	146	134
	50	1.0	26	715	1643	4 x 0.8		26	1005	1933	142	133	126	183	172	158
	70	1.1	30	985	2284	4 x 0.8		31	1350	2649	179	164	156	231	211	194
	95	1.1	33	1245	3008	4 x 0.8		34	1655	3418	221	196	186	285	253	233
	120	1.2	35	1495	3722	4 x 0.8		36	1925	4152	257	223	212	330	287	264
	150	1.4	39	1865	4649	4 x 0.8		40	2335	5119	292	249	237	375	321	295
	185	1.6	44	2300	5734	4 x 0.8		44	2835	6269	337	282	268	430	361	332
	240	1.7	49	2935	7390	4 x 0.8		50	3550	8005	399	326	310	508	416	383
300	1.8	54	3610	9178	4 x 0.8		55	4255	9823	455	367	349	575	464	427	
400	2.0	60	4550	11974	4 x 0.8		61	5295	12719	530	418	397	661	521	479	

DIMENSIONS, WEIGHTS AND ELECTRICAL CHARACTERISTICS

650/1100V, Aluminum / Copper Conductor, XLPE insulated and PVC sheathed, Unarmoured (A2XY/2XY) & Armoured (A2XWY/2XWY & A2XFY/2XFY) Cables

TABLE 5

Number of cores	Nominal Area of Conductor (mm ²)	Nominal thickness of XLPE insulation (mm)	Unarmoured			Armoured				A.C. Current rating of Aluminum m cables (in trefoil)			A.C. Current rating of Copper cables (in trefoil)			
			Approx Overall Diameter (mm)	Approximate Weight (kg/km)		Nominal Aluminum arm. Size (mm)		Approx Overall Diameter (mm)	Approximate Weight (kg/km)		In Air at 40° C (A)	In Ground at 30° C (A)	In Duct at 30° C (A)	In Air at 40° C (A)	In Ground at 30° C (A)	In Duct at 30° C (A)
				Aluminum	Copper	Wire	Strip		Aluminum	Copper						
4	10	0.7	17	335	582	1.4		20	745	992	50	55	46	65	71	60
	16	0.7	19	395	791	4 x 0.8		21	620	1016	64	71	60	83	92	76
	25	0.9	23	575	1194	4 x 0.8		24	825	1444	96	94	89	123	122	112
	35	0.9	26	710	1576	4 x 0.8		27	1005	1871	117	113	107	151	146	134
	50	1.0	29	900	2137	4 x 0.8		30	1260	2497	142	133	126	183	172	158
	70	1.1	34	1250	2982	4 x 0.8		35	1655	3387	179	164	156	231	211	194
	95	1.1	38	1595	3946	4 x 0.8		39	2065	4416	221	196	186	285	253	233
	120	1.2	41	1975	4945	4 x 0.8		42	2470	5440	257	223	212	330	287	264
	150	1.4	45	2435	6147	4 x 0.8		46	2990	6702	292	249	237	375	321	295
	185	1.6	50	3010	7588	4 x 0.8		51	3620	8198	337	282	268	430	361	332
	240	1.7	57	3865	9805	4 x 0.8		57	4550	10490	399	326	310	508	416	383
300	1.8	63	4745	12169	4 x 0.8		63	5480	12904	455	367	349	575	464	427	
400	2.0	70	6010	15909	4 x 0.8		71	6810	16709	530	418	397	661	521	479	

Note: The dimensions indicated above are considering following construction:

- Conductor :
 - 10mm² : Solid / Stranded Circular Aluminum and stranded circular Copper
 - 16mm² onwards : Stranded Sector
- Innersheath : Taped / Extruded

Details for specification / construction / delivery length other than above will be furnished on request. Specifications are subjected to change without any further notice.

Technical Data - Power Cables

DIMENSIONS, WEIGHTS AND ELECTRICAL CHARACTERISTICS
650/1100V, Copper Conductor, XLPE insulated and PVC sheathed, unarmoured (2XY) & Armoured (2XWY) Cables

TABLE 6

Number of cores	Nominal Area of Conductor (mm ²)	Nominal thickness of XLPE insulation (mm)	Unarmoured		Armoured			A.C. Current rating		
			Approx Overall Diameter (mm)	Approximate Weight (kg/km)	Nominal Steel round wire arm. Size (mm)	Approx Overall Diameter (mm)	Approximate Weight (kg/km)	In Air at 40° C (A)	In Ground at 30° C (A)	In Duct at 30° C (A)
2	4	0.7	13	205	1.4	15	475	44	49	42
	6	0.7	14	255	1.4	16	550	56	60	52
	10	0.7	16	380	1.4	19	740	75	83	69
3	4	0.7	13	255	1.4	15	545	38	43	36
	6	0.7	14	330	1.4	17	645	49	54	45
	10	0.7	17	505	1.4	19	900	65	71	60
4	4	0.7	14	305	1.4	16	620	38	43	36
	6	0.7	15	400	1.4	18	740	49	54	45
	10	0.7	19	625	1.4	21	1075	65	71	60

Note: The dimensions indicated above are considering following construction:

- Conductor:
6mm² : Solid Circular
10mm² onwards : Stranded Sector
- Innersheath : Extruded innersheath

DIMENSIONS, WEIGHTS AND ELECTRICAL CHARACTERISTICS

650/1100V, Aluminum Conductor, PVC insulated sheathed, Unarmoured (AYY) & Armoured (AYFaY & AYWaY)

TABLE 7

Number of cores	Nominal Area of Conductor Sq. mm	Unarmoured			Nominal thickness of PVC insu. (mm)	Armoured			Max. D.C. Conductor Resistance at 20° C ohm / KM	A.C. Current rating								
		Nominal thickness of PVC insu. (mm)	Approx Overall Diameter mm	Approx. Weight kg / km		Nominal Armour Size mm		Approx Overall Diameter mm		Approximate Weight kg / km	In Air at 40°C				In Ground at 30°C			
						W	F				PVC Insulation		PVC Insulation		HRPV		HRPV	
											Amps	Amps	Amps	Amps	Amps	Amps	Amps	Amps
2C	3C	2C	3C	2C	3C	2C	3C											
1 CORE	10	1.0	10	105	1.3	1.4	12	185	3.080	56	47	67	56	59	51	67	58	
	16	1.0	12	155	1.3	1.4	14	245	1.910	72	64	86	77	75	66	86	75	
	25	1.2	13	190	1.5	1.4	15	290	1.200	99	84	119	101	97	86	111	98	
	35	1.2	14	230	1.5	1.4	16	340	0.868	120	105	144	126	120	100	137	114	
	50	1.4	16	290	1.7	1.4	18	415	0.641	150	130	180	156	145	120	165	137	
	70	1.4	17	370	1.7	1.4	20	520	0.443	185	155	222	186	170	140	194	160	
	95	1.6	20	480	1.9	4x0.8	21	585	0.320	215	190	258	228	205	175	234	200	
	120	1.6	21	590	1.9	4x0.8	23	680	0.253	240	220	288	264	230	195	262	222	
	150	1.8	23	700	2.1	4x0.8	24	810	0.206	270	250	324	300	265	220	302	251	
	185	2.0	25	850	2.3	4x0.8	27	965	0.164	305	290	366	348	300	240	342	274	
	240	2.2	28	1060	2.5	4x0.8	29	1190	0.125	350	335	420	402	335	270	382	308	
	300	2.4	30	1280	2.7	4x0.8	32	1455	0.100	395	380	474	456	370	295	422	336	
	400	2.6	34	1640	3.0	4x0.8	36	1810	0.0778	455	435	546	522	410	325	467	371	
	500	3.0	38	2060	3.4	4x0.8	40	2260	0.0605	490	480	588	576	435	345	496	393	
	630	3.4	43	2625	3.9	4x0.8	45	2860	0.0469	560	550	672	660	485	390	553	445	
	800	3.4	47	3180	3.9	4x0.8	49	3480	0.0367	640	630	768	756	530	440	604	502	
	1000	3.4	51	3910	3.9	4x0.8	54	4225	0.0291	740	720	888	864	580	490	661	559	

TABLE 8

650/1100V, Aluminum Conductor, PVC insulated sheathed, unarmoured (AYY) & Armoured (AYFY & AYWY)

2 CORE	4	1.0	15.5	190	1.0	1.4	16	460	7.410	27	32	32	36
	6	1.0	15	230	1.0	1.4	17	535	4.610	35	42	40	46
	10	1.0	16	270	1.0	1.4	19	605	3.080	47	56	55	63
	16	1.0	20	385	1.0	4x0.8	21	630	1.910	59	71	70	80
	25	1.2	20	420	1.2	4x0.8	21	600	1.200	78	94	90	103
	35	1.2	22	500	1.2	4x0.8	23	700	0.868	99	119	110	125
	50	1.4	25	640	1.4	4x0.8	25	875	0.641	125	150	135	154
	70	1.4	27	800	1.4	4x0.8	28	1100	0.443	150	180	160	182
	95	1.6	32	1080	1.6	4x0.8	32	1410	0.320	185	222	190	217
	120	1.6	33	1245	1.6	4x0.8	34	1595	0.253	210	252	210	239
	150	1.8	36	1515	1.8	4x0.8	37	1900	0.206	240	288	240	274
	185	2.0	40	1845	2.0	4x0.8	41	2270	0.164	275	330	275	314
	240	2.2	45	2345	2.2	4x0.8	46	2810	0.125	325	390	320	365
	300	2.4	50	2890	2.4	4x0.8	51	3455	0.100	365	438	355	405
	400	2.6	56	3670	2.6	4x0.8	56	4230	0.0778	420	504	385	439

The dimensions indicated above are considering following constructions :

- As per IS 1554 Pt.1/1998 core cables will not have innersheath.
- Innersheath for 2 core cables - Upto and including 16 sq. mm - Extruded innersheath, 25 sq. mm and above - Taped innersheath
- Conductor - Upto and including 10 sq. mm - Solid Round Cond., for 16 sq. mm and above stranded Sector Shaped Cond.
- A.C. Current Ratings given for 2 core cables are for Single Cable only.

Technical Data - Power Cables

TABLE 9

DIMENSIONS, WEIGHTS AND ELECTRICAL CHARACTERISTICS
650/1100V, Aluminum Conductor, PVC insulated and sheathed, unarmoured (AYY) & Armoured (AYFY/AYWY)

Number of cores	Nominal Area of Conductor Sq. mm	Nominal thickness of PVC insu. (mm)	Unarmoured		Armoured			Max. D.C. Conductor Resistance at 20° C ohm / KM	A.C. Current rating				
			Approx Overall Diameter mm	Approx. Weight kg / km	Nominal Steel Armour Size mm		Approx Overall Diameter mm		Approximate Weight kg / km	In Air at 40°C		In Ground at 30°C	
					W	F				PVC Insulation Amps	HRPV Insulation Amps	PVC Insulation Amps	HRPV Insulation Amps
3 Core	4	1.0	15	220	1.4		17	520	7.410	23	28	28	32
	6	1.0	16	265	1.4		18	610	4.610	30	36	35	40
	10	1.0	17	320	1.4		20	720	3.080	40	48	46	52
	16	1.0	19	380		4 x 0.8	20	625	1.910	51	61	60	68
	25	1.2	22	550		4 x 0.8	23	770	1.200	70	84	76	87
	35	1.2	24	665		4 x 0.8	25	905	0.868	86	103	92	105
	50	1.4	27	865		4 x 0.8	29	1155	0.641	105	126	110	125
	70	1.4	31	1140		4 x 0.8	32	1470	0.443	130	156	135	154
	95	1.6	35	1485		4 x 0.8	36	1860	0.320	155	186	165	188
	120	1.6	37	1730		4 x 0.8	38	2160	0.253	180	216	185	211
	150	1.8	41	2115		4 x 0.8	42	2570	0.206	205	246	210	239
	185	2.0	45	2630		4 x 0.8	46	3070	0.164	240	288	235	268
	240	2.2	51	3360		4 x 0.8	52	3910	0.125	280	336	275	314
	300	2.4	56	4115		4 x 0.8	57	4770	0.100	315	378	305	348
	400	2.6	63	5210		4 x 0.8	64	5850	0.0778	375	450	335	382
3.5 Core	25	1.2	25	660		4 x 0.8	26	890	1.2	70	84	76	87
	35	1.2	26	780		4 x 0.8	28	1050	0.868	86	103	92	105
	50	1.4	29	1000		4 x 0.8	30	1300	0.641	105	126	110	125
	70	1.4	33	1310		4 x 0.8	34	1650	0.443	130	156	135	154
	95	1.6	38	1710		4 x 0.8	39	2095	0.320	155	186	165	188
	120	1.6	41	2100		4 x 0.8	42	2500	0.253	180	216	185	211
	150	1.6	45	2450		4 x 0.8	46	2945	0.206	205	246	210	239
	185	2.0	50	3060		4 x 0.8	51	3585	0.164	240	288	235	268
	240	2.2	57	3940		4 x 0.8	57	4480	0.125	280	336	275	314
	300	2.4	63	4695		4 x 0.8	63	5495	0.100	315	378	305	348
	400	2.6	70	6020		4 x 0.8	71	6805	0.0778	375	450	335	382

The dimensions indicated above are considering following construction: Innersheath - Upto and including 16 sq. mm - Extruded innersheath, 25 sq. mm and above - Tapped Innersheath. Conductor - Upto and including 10 sq. mm - Solid Round Cond., for 16 sq. mm and above - Stranded Sector Shaped cond.

TABLE 10

DIMENSIONS, WEIGHTS AND ELECTRICAL CHARACTERISTICS
650/1100V, Aluminum Conductor, PVC insulated and sheathed, unarmoured (AYY) & Armoured (AYFY/AYWY)

Number of cores	Nominal Area of Conductor Sq. mm	Nominal thickness of PVC insu. (mm)	Unarmoured		Armoured			Max. D.C. Conductor Resistance at 20° C ohm / KM	A.C. Current rating				
			Approx Overall Diameter mm	Approx. Weight kg / km	Nominal Steel Armour Size mm		Approx Overall Diameter mm		Approximate Weight kg / km	In Air at 40°C		In Ground at 30°C	
					W	F				PVC Insulation Amps	HRPV Insulation Amps	PVC Insulation Amps	HRPV Insulation Amps
4 Core	4	1.0	16	275	1.4		18	595	7.410	23	28	28	32
	6	1.0	17	340	1.4		19	700	4.610	30	36	35	40
	10	1.0	19	415		4 x 0.8	20	660	3.080	40	48	46	52
	16	1.0	21	470		4 x 0.8	22	740	1.910	51	61	60	68
	25	1.2	25	690		4 x 0.8	26	925	1.200	70	84	76	87
	35	1.2	27	840		4 x 0.8	28	1110	0.868	86	103	92	105
	50	1.4	32	1145		4 x 0.8	33	1465	0.641	105	126	110	125
	70	1.4	35	1455		4 x 0.8	36	1835	0.443	130	156	135	154
	95	1.6	41	1940		4 x 0.8	41	2360	0.320	155	186	165	188
	120	1.6	43	2290		4 x 0.8	44	2740	0.253	180	216	185	211
	150	1.8	47	2790		4 x 0.8	48	3250	0.206	205	246	210	239
	185	2.0	53	3460		4 x 0.8	53	3990	0.164	240	288	235	268
	240	2.2	59	4395		4 x 0.8	60	5020	0.125	280	336	275	314
	300	2.4	66	5475		4 x 0.8	66	6150	0.100	315	378	305	348
	400	2.6	73	6830		4 x 0.8	74	7625	0.0778	375	450	335	382

DIMENSION, WEIGHTS AND ELECTRICAL CHARACTERISTICS
650 / 1100 v, Copper Conductor, PVC Insulated and Sheathed, Unarmoured (YY) and Armoured (YWY & YFY)

2	4	1.0	14	235	1.4		16	510	4.61	35	42	41	47
	6	1.0	15	290	1.4		17	600	3.08	45	54	50	57
	10	1.0	18	430	1.4		20	785	1.83	60	72	70	80
	16	1.0	20	580		4 x 0.8	21	800	1.15	78	94	90	103
3	4	1.0	15	290	1.4		17	580	4.61	30	36	36	41
	6	1.0	16	365	1.4		18	695	3.08	39	47	45	51
	10	1.0	18	545	1.4		21	980	1.83	52	62	60	68
	16	1.0	19	660		4 x 0.8	20	955	1.15	66	79	77	88
4	4	1.0	16	370	1.4		18	680	4.61	30	36	36	41
	6	1.0	17	470	1.4		19	870	3.08	39	47	45	51
	10	1.0	20	720		4 x 0.8	22	950	1.83	52	62	60	68
	16	1.0	21	850		4 x 0.8	22	1140	1.15	66	79	77	88

The dimensions indicated above are considering following construction: Innersheath - For Aluminum Cable Conductor - Upto and including 10 sq. mm - Solid Round Cond., For 16 sq. mm and above - Stranded Sector Shaped cond. For Copper Cable Conductor - Upto and including 6 sq. mm - Solid Round cond., For 10 sq. mm - Stranded Round, Cond. and 16 sq. mm and above - Stranded Sector Shaped cond. Upto and including 16 sq. mm - Extruded Innersheath, 25 sq. mm and above - Taped Innersheath.

Technical Data - Control Cables

DIMENSIONS, WEIGHTS AND ELECTRICAL CHARACTERISTICS
650/1100V, Solid / Stranded Copper Conductor, XLPE insulated and PVC sheathed
Unarmoured (2XY) and Armoured (2XWY & 2XFY) Control Cables

TABLE 11

Number of cores	Nominal Area of Conductor (mm ²)	Nominal thickness of XLPE insulation (mm)	Unarmoured		Armoured			A.C. Current rating			
			Approx Overall Diameter (mm)	Approx. Weight (kg / km)	Nominal Steel Armour Size mm		Approx Overall Diameter (mm)	Approximate Weight kg / km	In Air at 40°C (A)	In Ground at 40°C (A)	In Duct at 30°C (A)
					Wire	Strip					
2	1.5	0.7	11	140	1.4		13	340	25	27	24
3	1.5	0.7	11	160	1.4		13	370	31	32	29
4	1.5	0.7	12	185	1.4		14	405	31	32	29
5	1.5	0.7	13	215	1.4		15	465	24	24	22
6	1.5	0.7	14	245	1.4		16	520	20	21	18
7	1.5	1.7	14	255	1.4		16	525	20	20	18
8	1.5	0.7	15	290	1.4		17	590	19	19	17
9	1.5	0.7	15	325	1.4		18	635	18	18	16
10	1.5	0.7	17	345	1.4		19	690	17	18	16
12	1.5	0.7	17	385	1.4		19	740	16	17	15
14	1.5	0.7	18	430	1.4		20	815	15	16	14
16	1.5	0.7	19	475		4 x 0.8	20	720	15	15	13
19	1.5	0.7	19	535		4 x 0.8	21	775	14	14	13
24	1.5	0.7	23	680		4 x 0.8	24	945	13	13	11
27	1.5	0.7	23	745		4 x 0.8	25	1035	12	12	11
28	1.5	0.7	23	755		4 x 0.8	25	1045	12	12	11
30	1.5	0.7	24	800		4 x 0.8	26	1180	11	11	10
37	1.5	0.7	26	945		4 x 0.8	27	1255	11	11	10
44	1.5	0.7	29	1125		4 x 0.8	30	1475	10	10	9
48	1.5	0.7	29	1200		4 x 0.8	30	1575	10	10	9
52	1.5	0.7	29	1280		4 x 0.8	31	1680	10	10	9
56	1.5	0.7	31	1355		4 x 0.8	32	1775	9	9	8
61	1.5	0.7	32	1485		4 x 0.8	33	1865	9	9	8
2	2.5	0.7	12	160	1.4		14	385	34	38	32
3	2.5	0.7	12	200	1.4		14	435	43	45	38
4	2.5	0.7	13	235	1.4		15	485	43	45	38
5	2.5	0.7	14	280	1.4		16	550	32	34	29
6	2.5	0.7	15	325	1.4		17	620	27	29	24
7	2.5	0.7	15	340	1.4		17	635	27	28	24
8	2.5	0.7	16	390	1.4		18	710	26	27	23
9	2.5	0.7	17	435	1.4		19	795	24	26	22
10	2.5	0.7	18	465		4 x 0.8	20	665	23	25	21
12	2.5	0.7	19	520		4 x 0.8	20	765	22	24	20
14	2.5	0.7	20	585		4 x 0.8	21	825	21	22	19
16	2.5	0.7	21	675		4 x 0.8	22	920	20	21	18
19	2.5	0.7	22	765		4 x 0.8	23	1030	19	20	18
24	2.5	0.7	25	945		4 x 0.8	26	1255	17	18	16
27	2.5	0.7	26	1045		4 x 0.8	27	1350	16	17	15
28	2.5	0.7	26	1055		4 x 0.8	27	1365	16	17	15
30	2.5	0.7	27	1120		4 x 0.8	28	1455	16	17	15
33	2.5	0.7	27	1225		4 x 0.8	29	1575	15	16	14
37	2.5	0.7	28	1340		4 x 0.8	30	1690	14	15	14
44	2.5	0.7	32	1640		4 x 0.8	33	2040	14	14	13
48	2.5	0.7	33	1755		4 x 0.8	34	2155	13	14	13
52	2.5	0.7	34	1875		4 x 0.8	35	2275	13	14	13
56	2.5	0.7	35	1990		4 x 0.8	36	2410	12	13	11
61	2.5	0.7	36	2125		4 x 0.8	37	2565	12	13	11

Note :

1. The technical detail specified above are considering extruded / taped innersheath.
2. Maximum DC resistance at 20°C for 1.5mm² & 2.5mm² will be 12.1 ohm / km & 7.41 ohm / km respectively.
3. Maximum AC resistance at 90°C for 1.5mm² & 2.5mm² will be 15.43 ohm / km & 9.45 ohm / km respectively
4. Delivery length = 1000

Technical Data - Control Cables

TABLE 12

DIMENSIONS, WEIGHTS AND ELECTRICAL CHARACTERISTICS


650/1100 V, Solid Copper Conductor, PVC insulated and sheathed, unarmoured (YY) & Armoured (YF/YWY)

Number of cores	Nominal Area of Conductor Sq. mm	Nominal thickness of PVC insu. (mm)	Unarmoured		Armoured			Max. D.C. Conductor Resistance at 20° C ohm / KM	A.C. Current rating				
			Approx Overall Diameter mm	Approx. Weight kg / km	Nominal Steel Armour Size mm		Approx Overall Diameter mm		Approximate Weight kg / km	In Air at 40°C		In Ground at 30°C	
					W	F				PVC Insulation Amps	HRPV Insulation Amps	PVC Insulation Amps	HRPV Insulation Amps
2	1.5	0.8	12	150	1.4		13	350	12.1	20	24	23	26
3	1.5	0.8	12	175	1.4		14	390	12.1	17	20	21	26
4	1.5	0.8	13	200	1.4		15	425	12.1	17	20	21	24
5	1.5	0.8	13	240	1.4		16	485	12.1	17	20	21	24
6	1.5	0.8	14	257	1.4		16	545	12.1	12	14	14	16
7	1.5	0.8	14	285	1.4		16	555	12.1	12	14	14	16
8	1.5	0.8	15	330	1.4		17	625	12.1	12	14	13	15
9	1.5	0.8	16	375	1.4		18	690	12.1	11	13	13	15
10	1.5	0.8	17	390	1.4		20	740	12.1	11	13	12	14
12	1.5	0.8	18	435		4x0.8	19	640	12.1	10	12	11	13
14	1.5	0.8	19	490		4x0.8	20	730	12.1	9	11	11	13
16	1.5	0.8	20	540		4x0.8	21	790	12.1	9	11	10	11
19	1.5	0.8	21	630		4x0.8	22	880	12.1	8	10	10	11
24	1.5	0.8	24	775		4x0.8	25	1070	12.1	8	10	9	10
27	1.5	0.8	24	845		4x0.8	26	1160	12.1	7	8	8	9
30	1.5	0.8	25	920		4x0.8	27	1235	12.1	7	8	8	9
33	1.5	0.8	26	990		4x0.8	27	1340	12.1	7	8	8	9
37	1.5	0.8	27	1090		4x0.8	28	1430	12.1	6	7	7	8
44	1.5	0.8	30	1275		4x0.8	32	1685	12.1	6	7	7	8
48	1.5	0.8	31	1390		4x0.8	32	1800	12.1	6	7	7	8
52	1.5	0.8	32	1500		4x0.8	33	1895	12.1	6	7	7	8
56	1.5	0.8	33	1600		4x0.8	34	2015	12.1	6	7	7	8
61	1.5	0.8	34	1710		4x0.8	35	2150	12.1	6	7	7	8
2	2.5	0.9	13	190	1.4		15	420	7.41	27	32	32	36
3	2.5	0.9	13	230	1.4		15	465	7.41	24	29	27	31
4	2.5	0.9	14	275	1.4		16	525	7.41	24	29	27	31
5	2.5	0.9	15	320	1.4		17	600	7.41	24	29	27	31
6	2.5	0.9	16	375	1.4		18	685	7.41	17	20	20	23
7	2.5	0.9	16	390	1.4		18	705	7.41	17	20	20	23
8	2.5	0.9	17	460	1.4		20	810	7.41	16	19	19	22
9	2.5	0.9	18	520		4x0.8	20	765	7.41	15	18	18	21
10	2.5	0.9	20	540		4x0.8	22	810	7.41	14	17	17	19
12	2.5	0.9	21	630		4x0.8	22	880	7.41	14	17	16	18
14	2.5	0.9	22	710		4x0.8	23	980	7.41	13	16	15	17
16	2.5	0.9	23	790		4x0.8	24	1060	7.41	12	14	15	17
19	2.5	0.9	24	895		4x0.8	25	1190	7.41	11	13	14	16
24	2.5	0.9	28	1110		4x0.8	29	1485	7.41	10	12	12	14
27	2.5	0.9	28	1210		4x0.8	29	1575	7.41	10	12	12	14
30	2.5	0.9	29	1325		4x0.8	31	1735	7.41	9	11	11	13
33	2.5	0.9	30	1440		4x0.8	32	1850	7.41	9	11	11	13
37	2.5	0.9	32	1620		4x0.8	33	2010	7.41	9	11	10	11
44	2.5	0.9	36	1900		4x0.8	37	2365	7.41	8	10	10	11
48	2.5	0.9	36	2040		4x0.8	37	2500	7.41	8	10	10	11
52	2.5	0.9	37	2190		4x0.8	38	2670	7.41	8	10	10	11
56	2.5	0.9	38	2335		4x0.8	39	2840	7.41	8	10	10	11
61	2.5	0.9	39	2500		4x0.8	40	3010	7.41	8	10	10	11

The Technical Details specified above are considering Extruded Innersheath (for Control Cables only)

Details for specification / construction / delivery length other than above will be furnished on request. Specifications are subjected to change without any further notice.

International Approvals



شركة التنول الوطنية الكويتية
KNPC
Kubayyah National Petroleum Company
Head Office: Kuwait National Petroleum Company - P.O. Box: 70 Salal 13001, Salal, Kuwait - Tel: 23066600 www.knpsc.com QR: 8149 Capital: 200,000,000

VENDOR'S & CONTRACTORS EVALUATION COMMITTEE

M/S THERMO CABLES LTD, INDIA. DATE: 29th May 2016
PLOT NO G-1, GREEN INDUSTRIAL PARK V/C-V 4790-16-063
JADCHERLA-509001, DIST: MAHABUBNAGAR - AP FILE NO: V-4790
INDIA

SUBJECT: VENDOR APPROVAL - RE - QUALIFICATION

GENTLEMEN,


REFERENCE TO YOUR PREVIOUS APPROVAL DATED 29/05/2011, YOUR COMPANY IS RE-QUALIFIED AS A VENDOR EFFECTIVE 29/05/2016 FOR THE SUPPLY OF THE FOLLOWING PRODUCT FOR K.N.P.C. REFINERIES:

PRODUCT DESCRIPTION
73 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,


OUSAMA H. SHAMMAM
CHAIRMAN V & CEO

CC: GULF ENERGY COMPANY, KUWAIT, (CODE 4 700661)
LOCAL AGENCY CERTIFICATE IS VALID UP TO 19th SEPTEMBER 2016

THIS LETTER SUPERSEDES OUR LETTER DATED 29th MAY 2011

NOTE: APPROVAL VALIDITY IS UP TO 29th MAY 2021 (APPROVED SINCE 29th MAY 2011)

PLEASE REFER OVERLEAF FOR INSTRUCTIONS



Aluminium for the world
ALUMINIUM SAHRAIN S.S.C.
CR No. 698

4 April 2017


THERMO CABLES LTD
28 NAGARJUNA HILLS PUNAJGUTTA HYDERABAD 50082 INDIA

Dear Sir/ Madam,

We are pleased to inform that after evaluation of your subject application for pre-qualification (MMVRS02326), your Company has now been registered as an approved vendor for materials / services in your range. You have been assigned with internal Vendor code and you will be invited to participate in our future tenders. However for all quality sensitive and critical items you will be separately approved for individual items based on our standard procedure of samples evaluation.

Although we recognize that proprietors, dealers, authorized agents or distributors may hold exclusive legal rights ownership over established product lines, we do not encourage the involvement of intermediaries, agents or other third parties and prefer to deal directly with producers, manufacturers, suppliers and service providers. If you envisage the involvement of intermediaries in your leading with Alba you must declare explicitly stating the reason for such involvement and confirmation of their role, and provide the terms of agreement between them and their intermediaries as well as official documentation confirming their ownership structure. This information must be sent to Alba's Manager - Procurement & Warehousing following this letter.

Your Vendor code with Alba is 7791, for all future references. You may also contact us with product updates, profile changes and other queries if any, through purchasing page on our website www.albamater.com or send by e-mail to update@albs.com.bn mentioning the vendor code. Also, we recommend visiting our purchasing page and reading all the information and guidelines to suppliers.



شركة تنمية نفط عمان
Petroleum Development Oman L.L.C.
CERTIFICATE OF REGISTRATION - PRODUCT VENDOR

CERTIFICATE NUMBER: **RE01000450-2017**
VENDOR CODE: **104158** DATE OF ISSUE: 28.09.2017

PETROLEUM DEVELOPMENT OMAN LLC

NOTED THAT:

MANUFACTURER: THERMO CABLES LIMITED
COUNTRY OF ORIGIN: India
LOCAL AGENT: GLOBAL PAVILION LLC
COMMERCIAL AGENCY NO.: 1074775
POSTAL ADDRESS: P.O. Box 645 ALATHIBBAH - SULTANATE OF OMAN

IS REGISTERED WITH THE COMPANY AS AN APPROVED PRODUCT VENDOR WITH EFFECT FROM THE DATE OF ISSUE OF THIS CERTIFICATE FOR THE FOLLOWING PRODUCT GROUP CATEGORIES:

GENERAL INSTRUMENTATION

ITEM NO.	PRODUCT CATEGORY	REGISTERED AT/TAKEOVER	CURRENTLY AGENT	NATIONAL	PREVIOUS AGENT/AGENTS
73 40 01	CABLE	CABLE THERMOCOUPLE (INCLUDES THERMOCOUPLE WIRE)			
73 40 02	CABLE	CABLE INSTRUMENTS (INCLUDES INSTRUMENTS)			
73 40 03	CABLE	CABLE THERMOCOUPLE (INCLUDES THERMOCOUPLE WIRE)			
73 40 04	CABLE	CABLE THERMOCOUPLE (INCLUDES THERMOCOUPLE WIRE)			
73 40 05	CABLE	CABLE THERMOCOUPLE (INCLUDES THERMOCOUPLE WIRE)			
73 40 06	CABLE	CABLE THERMOCOUPLE (INCLUDES THERMOCOUPLE WIRE)			
73 40 07	CABLE	CABLE THERMOCOUPLE (INCLUDES THERMOCOUPLE WIRE)			
73 40 08	CABLE	CABLE THERMOCOUPLE (INCLUDES THERMOCOUPLE WIRE)			
73 40 09	CABLE	CABLE THERMOCOUPLE (INCLUDES THERMOCOUPLE WIRE)			
73 40 10	CABLE	CABLE THERMOCOUPLE (INCLUDES THERMOCOUPLE WIRE)			

THIS CERTIFICATE IS VALID UNTIL: 03.09.2019
PAGE 1 OF 2

11/10/2011 09:38 80965-2398451 PURCHASING JORDIN

شركة التنول الوطنية الكويتية
KNPC
Kubayyah National Petroleum Company
Head Office: Kuwait National Petroleum Company - P.O. Box: 70 Salal 13001, Salal, Kuwait - Tel: 23066600 www.knpsc.com QR: 8149 Capital: 200,000,000

كويت ايل كيمبري
Kuwait Oil Company

TO: M/s. THERMO CABLES Limited, India. Date: 12th October 2011
Fax No: 0091 40 23380580. Mag. No: PQAN/100/2011
Total No. of Pages: 1

FROM: Team Leader Purchasing II, Commercial Affairs Group
P.O. Box - 9758
81000 Alhadi, Kuwait
Fax No.: (965) 23980677

SUBJECT: NOTIFICATION OF VENDOR APPROVAL

OUR REF: **VEC-34563/IN/CQ/021/2011**

Dear Sirs,

We are pleased to inform you that you have been approved for inclusion in KOC's Approved List of Manufacturer for the product category and manufacturing facility mentioned here below:

PRODUCT CATEGORY: INSTRUMENT & COMPENSATING CABLES (NON LEAD SHEATHED CABLES ONLY)

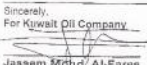
FACILITY ADDRESS: M/s. THERMO CABLES LIMITED, PLOT NO: G-1, G-2 (A), GREEN INDUSTRIAL PARK, JADCHERLA, MAHABUBNAGAR (DISTRICT), INDIA.

Validity: From 10th October 2011 to 9th October 2016 (5 years)

This notification of approval is issued subject to the following, failing which liable for cancellation at any time at the discretion of KOC.

- To update regularly with the latest product catalogue / information.
- To furnish Budgetary Quotations as & when requested.
- To furnish Audited financial details for every two years.
- To update with latest contact details / Change In Local Agent.
- To update with Name Change / Merging / Factory Shifting.
- To submit request for Re-Qualification (if required) 3 months prior the above expiry date.

Sincerely,
For Kuwait Oil Company


Jassem Mdlh Al-Fares
cc: M/s. Gulf Energy Co., Kuwait; Fax: 22499205
UN/CADP/09/05

Abu Dhabi Company for Onshore Petroleum Operations Ltd.(ADCO)
(ADCO)

THERMO CABLES LIMITED
P.O. Box No. _____
City _____
Country _____

To: _____
Fax: _____
E-mail: _____
ADCO Reg No. 31248
Manufacturer (ENABLED)

License Name	Issue Date	Expiry Date

Manufacturer	Status
320518 CABLES - FOR INSTRUMENTS & CONTROL	O
320621 CABLES - FIRE RESISTANT	O

Commercial Support Manager

Legends:
Agency Type: AGT(Agent, CSA-Certified Sale Agent, DSTR - Distributor, DSTR - Stockist)
Pre-Qual Status: F - Failed, N - Not Rated, G - Granted, Q - Pre-Qualified, R - Rejected, E - Under Assessment

Date: 02-Mar-16



SAIPEM S.p.A.
Via Martini & Ciferri, 67
10123 San Donato Polesine
41016 - I.T.E.

San Donato Polesine, 24070017 THERMO CABLES LTD,
JADCHERLA HILLS G-1 & 2
500202 HYDERABAD
INDIA

PROT W-291-1740-PP Kird Attn. of the Legal Representative

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:
M0285020 - INSTRUMENT CABLES (ARMOURD AND UNARMOURD)

Please note that you have been registered in our Vendor Management Data Base with code 106023 that you are kindly requested to mention in all communications 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 38 (thirty-eight) 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 process, bankruptcy, etc.), the given qualification, subject to Saipem evaluation, could be revoked at any time since the date of this said event.

Best Regards,

SAIPEM S.p.A.
Procurement and/or Vendor Services
Management
PASCORAZZINI

SAIPEM.COM



Corporate Registration No. 02087000000
Kubayyah National Petroleum Company
Head Office: Kuwait National Petroleum Company - P.O. Box: 70 Salal 13001, Salal, Kuwait - Tel: 23066600 www.knpsc.com QR: 8149 Capital: 200,000,000

Major Approvals

**BY REGISTERED POST
GOVERNMENT OF INDIA
MINISTRY OF DEFENCE
DEFENCE R&D ORGANISATION
ADVANCED SYSTEMS LABORATORY
KANCHANRAGH (P.O.)
HYDERABAD - 500 082.
PHONE : 24188 075 / 8472
FAX :240 - 24342603
Dated: 17th February, 2016**

No. ASI/DCMM/VR-2015-16/003
M/s. Thermo Cables Ltd.,
Plot No. 28, Nagarjuna Hills,
Panjagutta,
HYDERABAD - 500 082

SUB - REGISTRATION OF FIRM AS APPROVED VENDOR

- Reference your application for registration.
- We are pleased to inform you that you have been registered as an approved supplier/contractor to this Lab/Estt as per details given below:
 - (a) Registration No. : ASI/DCMM/2015-16/VR-051
 - (b) Date & Validity of Registration : 15th Feb, 2016 up to 5 years
 - (c) Category of items for which registered : Cable, Elec. & Electronics
 - (d) Registered as : Manufacturer & Supplier
 - (e) Stores/Items/Services for which Registration granted : Power Cable up to LT K.V., Control Cables, Intra sensitive Signal, Thermo Couple cables, Fire Survival, Foundation Field Bus Cables, Electromeric, High Temperature Cables (PTFE, FEP, PFA, ETFE & PEEK).
- The Director ASI reserves the right to cancel your registration at any time without notice as any of the following grounds:
 - (a) Failure to observe, while tendering, the instructions given in tender form
 - (b) Failing to quote in response to invitation to tender on three successive occasions
 - (c) Failure to execute the contracts/supply orders satisfactorily
 - (d) Rendering of false information in the application for registration/quotation
 - (e) Any other grounds which in the opinion of the Director, render retention undesirable in public interest.
- By registering your firm on our list we are not under any obligation to issue our tender enquiries to you each and every time. Enquiries will be issued depending upon the nature of procurement as per the discretion of the Director, ASI, Hyderabad.
- You are required to inform the Director in writing whether you or any of your partners/employees have/had close relations working with any DRDO Lab/Estt. This is for record only.
- This registration will be valid initially for a period of five years and renewed thereafter at the discretion of the Director considering your firm's performance during the preceding period of five years.
- Any change in the Name, Address, Telephone No., E-mail, Proprietor and Constitution in case of partnership be informed to the Director ASI, Hyderabad for records.
- Please acknowledge receipt.

(M. BALAKRISHNA) Sc 'E'
HEAD NSHG
For DIRECTOR, ASI

MAZAGON DOCK SHIPBUILDERS LIMITED
(FORMERLY KNOWN AS MAZAGON DOCK LIMITED)
(A Govt. of India Undertaking)
Dockyard Road, Mazagon, Mumbai - 400019
Certified ISO 9001:2008 For Shipbuilding Division

Ref No. GMM/VR&R/PLK/0172016-16/1910524 Date : 20.08.2015

"Make In India" Workshop cum Seminar on
Vendor Development & Import Substitution in Warship Building
2015

Supplier Registration Certificate
M/s. THERMO CABLE LTD.
205 MADHAV BAGH
BKC COMPLEX, MUMBAI, 400001.
TEL. NO. 022 26560022, FAX NO. 022 26560339.
E-MAIL: Mumbai@thermocable.com

We are pleased to inform you that on the basis of documents furnished, you stand as an approved Supplier with us with effect from 20.08.2015 for material group indicated below up to 19.06.2016.

Vendor Code No	Material Group	Description
1010524	C091004	CONTROL CABLES

The vendor code allotted to you should be quoted on all future correspondence with MDL.

For Mazagon Dock Shipbuilders Limited
Director (Shipbuilding)

DRDO.MM.01
GRAM: MISLAH
PHONE : 040-24583215
FAX : 040-24340078
BY REGISTERED POST/HAND DELIVERY
DEFENCE RESEARCH &
DEVELOPMENT LABORATORY
KANCHANRAGH,
HYDERABAD-500 082
Date : 29-NOV-17

Ref No: DRDL/1600/46/CMM/465

HERMO CABLES LTD.,
NAGARJUNA HILLS,
INJAGUTTA,
HYDERABAD PIN:500 082

SUB-REGISTRATION OF FIRM AS APPROVED VENDOR

Your application/Letter No. C22.OF.DRDL, Dated: 15-FEB-15 is.

are pleased to inform that you have been registered as an approved supplier/contractor to this Lab/Estt as per details given below :-
Registration No: THE9616X & Date : 13-NOV-17
Date of Validity of Registration: 3 Years upto 12-NOV-20
Category of items for which registered: SUPPLY OF ALL TYPES OF CABLES (POWER CONTROL, INSTRUMENTATION, FIRE RESISTANT & HIGH TEMPERATURE)
Registered as: MANUFACTURER
Stores items/Services for which registration granted
Monetary ceiling for existing individual orders/contracts
Director of this Lab/Estt reserve the right to cancel your registration at any time without notice on any of the following grounds:-
Failure to observe, while tendering, the instructions given in tender form.
Failure to quote in response to invitation to tender on three successive occasions.
Failure to execute the contracts/supply orders satisfactorily.
Rendering of false information in the application for registration. Quotation
Any other grounds which in the opinion of the Director,render retention undesirable in public interest.
Registering your firm on our site we are not under any obligation to issue our tender enquiries to you each and every time.Enquiries will be issued depending upon the nature of procurement/safety at the discretion of Director, DRDL, Hyderabad.
e. Inform the Director in writing whether you or any of your partners/employees have/had close relations with any DRDO Lab/Estt. This is for record only.
Registration will be valid initially for a period of three years and renewed thereafter at the discretion of Director considering your firm's performance during the preceding period.
e. Inform any change in your address, Telephone No., etc., to the Director DRDL, Hyderabad. We acknowledge receipt.

Thanking you
Yours Sincerely,
(M. BALAKRISHNA) Sc 'E'
HEAD NSHG
For Director

HINDUSTAN SHIPYARD LTD.
(A GOVT. OF INDIA UNDERTAKING VISAKHAPATNAM 530 005 (INDIA)
ISO 9001 2008 COMPANY
Tel: +91 9493922118, Tel: fax: +91 991 2577502 / 2577356
Email: purchase.hsl@govt.in, Web: www.hsl.in
Address for Correspondence: GANDHIGRAM, VISAKHAPATNAM 530 005, A.P., INDIA

MIPREGNT/192/ /15-16 /07 Jul 15
M/s. THERMO CABLES LIMITED, 28, Nagarjuna Hills, Panjagutta, Hyderabad - 500 082. Ph: 40-44429292
VENDOR CODE: T192 info@thermocables.com Fax: 40-23350593

Sir,
Sub: Enlistment as an approved Vendor.

- Please refer M/s. Thermo Cables Limited, Hyderabad application dated 29 Dec 14 for vendor registration with M/s HSL, Visakhapatnam.
- M/s. Thermo Cables Limited, Hyderabad has been enlisted as a registered vendor under category "Manufacturer & Supplier" for materials / equipment indicated hereunder up to a value of **Rs.87,04,00,000.00 (Rupees Eighty seven crore four Lakhs only).**
- LT PVC & XLPE Power & Control cables, Instrumentation cables, Fire resistant(Survival), Fire resistant(Survival), Thermo-Couple extension/Compensating cables, High Temperature Fluoropolymer (PTFE/PPFA/ETFE) cables, Rubber - Silicone/EP/PT/TP/TPTU Cables, Fiberglass varnished cables, Wind power cables, Solar DC cables, CRD, Trailing, Festooning & composite cables, Foundation fieldbus, Modbus, Profibus, RS-485 Cables, H07RN-F Cables, Marine Cables, Automation & Robotic Cables.
- The registration number / vendor Code, **T192** has been allotted and is valid up to **30 Jul 2018** subject to review on the basis of evaluation of performance against orders placed.
- HSL website www.hsl.in and E-portal www.eprocurehsl.gov.in may be visited for tender enquiries.
- This enlistment does not guarantee any award of contract / purchase order or any priority / preference during the transaction of business unless provided under the extant rules.
- As a Registered Vendor, you would avail EMD exemption and applicable for the items and value up to which you have been registered. A copy of valid registration certificate, as issued by HSL shall be submitted along with the list of items / services for which you are registered, in Part - I Techno-commercial bid / offer. However payment of Tender Fee will have to be paid as stipulated in the tender.
- Any change in address of the Office / Factory / Telephone / Fax Numbers etc., or any time sensitive information resulting in change of status etc., the same should promptly be informed to the Addl. General Manager (Purchase & Materials), Hindustan Shipyards Ltd., Gandhigram P.O., Visakhapatnam - 530 005, Fax: 0891-2577502.
- This registration unless cancelled is valid for the period mentioned at Para 3 above. Application for renewal of registration be submitted three months prior expiry date.

Page 1 of 2
Regd. Office: Hindustan Shipyards Ltd, GANDHIGRAM, VISAKHAPATNAM 530 005, A.P., INDIA
CIN : 1724666PVT0002079711

भारत सरकार
अंतरिक्ष विभाग
प्रधान संचालक पर कक्षावर्तन, इन्फो बुधवार
इसरो बिल्डिंग, 80 वीं फ्लोर
एएलए 2 - स्टेट एरवील
बंगलूरु - 560 008, आंध्रप्रदेश, भारत
फोन : 080-25203763 / 25262466
फैक्स : 080-

Government of India
Department of Space
Office of the Head CMD, ISRO HQ
LPSC Campus, 80 Feet Road
HLL II Stage HPO
Bangalore - 560 008, INDIA
Fax: 080 - 2520 3763 / 25262466
Telephone: 080-

Ref. No. CMG/ISRO HQ/E/OW/CABLES/2017-19/665
December 12, 2017

To:
M/s Thermo Cables Ltd.
28, Nagarjuna Hills, Panjagutta,
Hyderabad 500 082
Ph: 040 44429292

Sub - Enlistment of HT & LT Cable Manufacturers - Reg.

Ref. - 1. EOI No. CMG/ISRO HQ/E/IO/15-16 Dt. 12/06/2015
2. EOI Corrigendum I Dt. 30/7/2015

This is with reference to the Expression of Interest received from you in response to notification(s) cited above. Based on the verification of credentials submitted vide your Expression of Interest as stipulated and inspection at your manufacturing unit by the Department, your firm has been enlisted as an approved "LT" Cables Manufacturer with effect from 01-10-2017.

This is for your kind information and records.

Group Director, CMG, ISRO HQ

इंजीनियर्स इंडिया लिमिटेड
(A Govt. of India Undertaking)
वीडिओ कालोन : इंजीनियर्स इंडिया लि. 1, शंकरजी कामा प्लेस, न्यू देहली-110086
Regd. Office : Engineers India Bhawan, 1, Bhikaiji Cama Place, New Delhi-110086

ENGINEERS INDIA LIMITED
(A Govt. of India Undertaking)

Procurement Development Department
Ref: 4994/PDD/NRE/T212 28th October, 2014
M/s Thermo Cables Ltd.
28, Nagarjuna Hills,
Panjagutta
Hyderabad - 500 082

Subject: Revalidation of Enlistment with EIL

Dear Sirs,

We refer to your application on subject matter and are pleased to inform that your enlistment with EIL has been revalidated for the items as described below:

Item	Description
Control Cables	
Thermocouple Extension Cables	
Signal Cables	

This enlistment is valid for your works located at
1. Existing works: D-44, 48 & 49, Phase V, IDA, Jeedimetla, Hyderabad - 500 005
2. Additional works: G-1, G-2(A), Green Industrial Park, Jachera, Mahabubnagar, Hyderabad - 509 301

Please note that this enlistment is subject to satisfactory execution of orders in delivery and quality of above mentioned items when ordered for our various projects.

Further, it may be noted that any change in the product range, location of Works/Sales Office, Management/ Organisation structure etc. shall be intimated to us immediately along with relevant document for our necessary action. In case, information to any of the above referred changes is not intimated timely, our enquiries may not reach you.

Enlistment with EIL shall not guarantee any regular flow of enquiries.

In the event of direct / indirect orders for EIL associated projects, materials will be supplied strictly as per the material / range / works as stated above including agreed responsibility matrix, if applicable, failing which your enlistment with EIL is liable to be cancelled.

The validity of this ENLISTMENT is upto 31st December, 2016.

You are advised to apply for revalidation on-line 6 months before expiry of the enlistment. Detailed procedures for revalidation can be seen on our website www.engineersindia.com

Thanking you,
Very truly yours,
(Rajesh Kumar)
Jy. General Manager
Procurement Development Department

DELIVERING EXCELLENCE THROUGH PEOPLE
91-11-26761212/2669300
11-26761211/2669300
91-11-26187202
Fax : 91-11-26187202
E-mail: info@eils.com
Web site: http://www.engineersindia.com
शुद्धि सेवा की एका ही कड़ी है।

भारतीय अन्तरिक्ष अनुसंधान संस्थान Indian Space Research Organisation

Accolades

L&T Hydrocarbon Engineering

187 Hydrocarbon Engineering Limited
 P.O. 8, Durgam Cheruvu, Hyderabad - 500017
 187, P.O. 8, Durgam Cheruvu, Hyderabad - 500017
 187, P.O. 8, Durgam Cheruvu, Hyderabad - 500017

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
PD0LGF0/INST/FFCABLE/MG-054	LGFD PDD-OMAN	Foundation Fieldbus	51.33 km
PD0LGF0/INST/Instrument/MG-080	LGFD PDD-OMAN	Instrumentation & Control	137.2 km
HMDI-73000-04954/HMDI/MG-003	SRDC 2 PDD-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

المجموعة القطرية
Alkhorayef 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, F5 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 Alkhorayef Group Company

Authorized Signatory

RP - Sanjiv Goenka Group
 Growing Legacies

CESC LIMITED
 Hyderabad - 500017

TO WHOM SO EVER IT MAY CONCERN

This is to certify that M/s. Thermo Cables Ltd., Hyderabad have supplied LT Power, Control, Signal and Fire Survival Power Cables to our 2 X 300 MW Haldia Thermal Power Project through our EPC Contractor M/s. Punj Lloyd Ltd., Gurgaon. The supply details are as below:

PO No. & Date	Type of Cables	Quantity (kms)	Value of PO (Lacs)
PIIN09/386070 Dtd. 22.08.2013	Instrumentation Cables	18.514	102.5
	Screened Control Cables	56.150	
	Control Cables	17.647	
PIIN09/390811 Dtd. 22.11.2013	Power Cables	51.680	112.41
PIIN09/391630 Dtd. 11.12.2013	Fire Survival Power Cables	5.420	85.07
PIIN09/392665 Dtd. 03.01.2014	Instrumentation Cables	101.550	480.68
	Screened Control Cables	103.000	
	Control Cables	135.000	

We appreciate Thermo Cables efforts in executing the above Orders with quick deliveries to meet our Project Schedules. The Cables are in operation for more than 3 Years and the performance is found to be satisfactory.

for CESC LIMITED.

Chiranjib Bhowmik
 Dy. General Manager
 Projects Division
 DY. GENERAL MANAGER-PROJECTS CESC Limited

Dated: 30.10.2017

meil

Megha Engineering & Infrastructures Ltd.
 An ISO 9001:2008 Company
 S-2, Tech Zone, E-202, Sakinaka, Hyderabad-500037, Telangana, INDIA
 Tel: +91-44-4436770 Fax: +91-44-4436965
 Email: info@meil.com

TO WHOM SO EVER IT MAY CONCERN

This is to certify that M/s. Thermo Cables Ltd, Hyderabad have supplied Control, Signal, Instrument, Thermocouple and Foundation Fieldbus cables to our ONGC, Group A of Assam Refinery Project. The supply details are as below:

PO No. & Date	Type of Cables	Quantity (kms)	Value of PO (Lacs)
SPE-344-1 VMS07/CL/08/PP04-VDA00748 Dtd. 02.02.2012	FF Cables	21.00	226.51
	Signal Cables	20.99	
	Control Cables	11.55	
SPP-MEIL- VMS07/CL/08/PP04-VDA00748 Dtd. 11.09.2012	FF Cables	23.360	57.73
	Signal Cables	22.300	
	Control Cables	17.000	
VMS-08- VMS07/CL/08/PP04-VDA00748 Dtd. 11.07.2014	Signal Cables	91.70	336.75
	Control Cables	65.000	
	Thermo Couple Cables	1.000	
SPP-MEIL- VMS07/CL/08/PP04-VDA00748 Dtd. 20.05.2017	FF Cables	75.000	195.53
	Signal Cables	83.500	
	Control Cables	61.010	
	Thermo Couple Cables	3.000	

Thermo cables have supplied cables for above POs within stipulated delivery period and performance of the cables is Satisfactory till date in its Operation.

For MEGHA ENGINEERING & Infrastructures Ltd

Authorized Signatory

BHARAT HEAVY ELECTRICALS LIMITED
 RAMACHANDRAPURAM :: HYDERABAD - 32
 PURCHASE DEPARTMENT (PUMPS)

TO WHOM SO EVER IT MAY CONCERN

This is to certify that power, control and signal cables of various sizes have been, being supplied by M/s. Thermo Cable Limited Hyderabad against various Purchase Orders vide nos: P7/08/A091 Dtd: 17.07.2008 Project RINL, P7/08/A091 Dtd: 25.11.2008 Project Sikka, RINL, RIL, SAIL & TISCO by BHEL Hyderabad and the performance of these Cables has been found to be satisfactory with regard to quality and delivery.

ON BEHALF OF Bharat Heavy Electricals Limited

P.R.D. Raju
 Sr. DGM / Pur

HIMA
 Since 1964

The Hyderabad Management Association
 Affiliated to the All India Management Association, New Delhi

BESTOWS THE AWARD FOR
HMA's Entrepreneur of the Year - 2016
 on
Mrs Uma Gurka
 Managing Director, Thermo Cables Limited
 HMA Corporate Small Scale Member

In recognition of her outstanding leadership and entrepreneurship in promoting and managing a company in the large scale sector which has achieved exceptional performance and growth in recent years and for the exemplary standards of business and professional ethics of herself and her Enterprise.

Prasanna
 Ravi Kumar Peesapati
 Secretary

Prasanna
 Sravan Kumar Madap
 President

Infrastructure

Machinery

Testing Equipment

Name of the Machine	Name of the Machine - Range/LC	Name of the Machine - Range/LC
Rod Break Down Machine (9 die)	ELECTRONIC TENSILE TESTER - 0-1KN,30KN	SMOKE DENSITY TESTER (3m CUBE)
Rod Break Down Machine (11 die)	ELECTRONIC WEIGHING MACHINE - 10 gms - 3 kgs	CONDITION CHAMBER - 0 - 100 °C
Rod Break Down Machine (13 die)	ELECTRONIC DENSITO METER - 0.001 gms/cm3	HV BREAK DOWN TESTER - 0 - 2.5 kV DC
Skip Stranding Machine	ELECTRO STATIS NOISE REJECTION RATIO - 40 - 80 db	HV TESTER 60 kv - 0 - 60 KV
54 Stranding Machine	DI-ELECTRIC RETENTION TESTER - 0 to 35 KV AC	TOXICITY INDEX TEST APPARATUS
Tinning Machine - 3 Nos	FOUR CELL AGEING OVEN-1 - 2 Nos - 0 - 220 °C	OZONE RESISTANCE TEST APPARATUS
Electro Plating Tin/Ni/Silver Machines	FLAMABILITY TESTER AS PER IEC -332-3 - 0 - 60psi	NICOLET IS5 FTIR SPECTROMETER
Multi Wire Drawing Machine (MM 30)	FLAMABILITY TEST APPARATUS - 0 - 1200 °C	COLOUR FASTNESS TEST EQUIPMENT
Fine Wire Drawing Machine - 9 Nos	FLAMMABILITY TEST EQUIPMENT AS PER IEC 60332-1	ABRASION RESISTANCE TESTER - 0 - 99999 COUNT
Mixing Machine 75 mm - 2 Nos	UV RADIATION TEST SET - 0 - 199.9°C	NOTCH PROPAGATION TEST APPARATUS
Kneader Line	HOT AIR OVEN - 7 Nos - 0 - 300°C	DYNAMIC PNENTRATION TEST APPARATUS
Rubber Internal Mixture	HOT SET TEST APPARATUS - 6 Nos - 0 - 300°C	MUTUAL CAPACITENCE METER - 2 Nos - 1.999 nF - 1999.9 nF
Ring Marker	COLD CHAMBER - (-) 30 to (+) 30 °C	CAPACITANCE UNBALANCE TESTER
Rewinding Machine - 2 Nos	COLD CHAMBER - (-) 60 to (+) 50 °C	PC -BASED PROPAGATION DEAY TEST SET
High Speed Core Rewinding - 4 Nos	COLD BEND / COLD IMPACT TEST SET - (-) 40 to (+) 30°C	SWEDISH CHIMNEY - 2 Nos
Taping Machine - 7 Nos	HCL GAS EMMISON TEST APPARATUS - (-) 60 to (+) 50 °C	FIRE SURVIVAL TEST CWZ TESTER - 0.1-1300V
Vertical Taping Machine - 2 Nos	DIG LCR Q METER - 0 - 1 H	IMPEDANCE METER - 199.9? - 1.999KΩ
Bunching Machine	MELT FLOW INDEX - 0 - 300 °C	IMPEDANCE METER - 0 – 19.99KΩ
DT 400 Buncher Machine - 2 Nos	HIGH VOLTAGE TESTER - 0 - 7.5/15 KV	STATIC NOISE REJECTION RATIO METER - 60 - 100 dB
DT 500 Buncher Machine - 5 Nos	HIGH VOLTAGE TESTER - 4 Nos - 0 - 5/10 KV	OXYGEN AND TEMPERATURE INDEX APPARATUS - 40 - 100° C
DT 560 Buncher Machine	HIGH FREQUENCY SPARK TESTER - 9 Nos - 0 to 15 kV AC	OXYGEN AND TEMPERATURE INDEX APPARATUS - 0 - 300 °C
DT 630 Buncher Machine - 2 Nos	ACID GAS GENERATION APPARATUS - 2 Nos - 0 - 1000°C	NETWORK ANALYSER WITH AM/FM SIGNAL GENERATOR
Tandem Lines With Dual Extrusion	THERMAL STABILITY - 2 Nos - 0 - 220°C	FOURIER TRANSMISSION INFRARED SPECTROMETER (FTIR)
Extruder Machine 20 mm Bi color	THERMAL EMF ERROR TEST APPARATUS - 0 - 300 °C	DEEP FREEZER - 60 DEGREES C
Extruder Machine 45 mm	WATER ABSORPTION TESTER - 2 Nos - 0 - 250 °C	OTHER MISCELLANEOUS TESTING MACHINES
Extruder Machine 65 mm - 7 Nos	WATER IMMERSION TEST EQUIPMENT - 0 - 100°C	
Extruder Machine 70/35 mm	PH & CONDUCTIVITY TESTER - 2 Nos - 0 - 14 PH	
Extruder Machine 75 mm - 2 Nos	DIGITAL MICRO - OHM METER - 6 Nos - 1 μ - 19.999 K Ω	
Extruder Machine 80 mm - 2 Nos	DIGITAL MICRO METER - 6 Nos - 0 - 25 mm	
Core Rewinding Machine - 4 Nos	DIGITAL TEMP. CALIBRATOR	
Electron Beam Accelerator	HEATING OVEN - 0 - 200°C	
Pairing Machine - 4 Nos	PROFILE PROJECTOR - 2 Nos - 0 - 25 mm	
Vertical Taping Machine- 6 Nos	IMPEDENCE METER - 2 Nos - 0 - 19.99 K Ω	
Horizontal Taping Machine - 10 Nos	SENIOR DOUBLE KELVIN BRIDGE - 2 Nos - 0.02 μ to 1.1 Ω	
Laying Machine (7 Bobbins)	TORSON TESTING MACHINE - 2 Nos - 0 TO 99999 COUNT	
Laying Machine (7 Bobbins) - Single twist	ANALOG MILLION MEGOHM METER - 2 Nos - 0 - 10 ^ 8 M Ω	
Laying Machine (13 Bobbins)	OXYGEN & AIR BOMB APPARATUS - 2 Nos - 0 - 300 °C	
Laying Machine (19 Bobbins) - 4 Nos	SMOKE DENSITY TESTER - 2 Nos - 0 - 600 °C	
Laying Machine (37 Bobbins) - 3 Nos	FLAMMABILITY TEST EQUIPMENT AS PER IEC 60332-3 - 0 - 4.2 Kg/cm2	
Armoring Machine (30 Bobbin) - 2 Nos	TENSILE TESTING MACHINE - 2 Nos - 0 - 2500 N (1 No.) & 0 - 1000 N (1 No.)	
Armouring Machine (40 Bobbin)	FOUR CELL AGEING OVEN WITH DATA SCANNING LOGGER - 2 Nos - 0 - 300°C	
Armoring Machine (48 Bobbin) - 3 Nos	ATTENUATION AND CROSSTALK METER - 2 Nos - Attenuation 0.1 - 20 dB, cross talk (-40 to 100 dB)	
Armoring Machine (72 Bobbin)	*MILLION MEGA OHM METER - 2 Nos - Digital (1 No.) -1 MΩ to 100 GΩ Analog (1 No.) - 1 MΩ to 50 TΩ*	
Armouring Machine (96 Bobbin)	*DIGITAL L.C.R. - Q - METER - 2 Nos - L=0.1μH - 9999H, C=0.1pF - 9999μF, R=0.001Ω to 100mΩ & 0.001Ω*	
Extruder Sheathing Machine 80MM - 2 Nos	ATTENUATION AND CROSSTALK METER (LF SOURCE & SELECTIVE LEVEL METER) - 200 - 1000Hz & 1 - 1000 mV	
Extruder Sheathing Machine 100MM	*THERMAL EMF ERROR TEST APPARATUSI) DIGITAL mV SOURCE cum METER - 0 to 100 mV DC ii) TEMPERATURE CONTROLLER & SENSOR - 0 to 199.9°C*	
Cable Rewinding Machine - 3 Nos	OTHER MISCELLANEOUS TESTING MACHINES	
GI Rewinding Machine - 20 Nos		
GI Strip Rewinding Machine - 2 Nos		
Off Line Annealer		
Auto Clave		
MMH Line (8 WIRE)		
Drum Twister Machine		
HV Testing Machine - 3 Nos		
365 KVA DG SET		
600 KVA DG SET		
320 KVA DG SET		
Cooling Tower - 4 Nos		
50 HP Air Compressor - 2 Nos		
100 HP Air Compressor		
Steam Boiler		
24 A High Speed Braiding - 9 Nos		
24 E High Speed Braiding - 2 Nos		
Other Miscellaneous Machines		



OUR CUSTOMERS



Thermo Cables Ltd

An ISO 9001 Certified Company

28, Nagarjuna Hills, Punjagutta, Hyderabad – 500 082,
Telangana, INDIA. Ph: +91-40-44429292, Fax: +91-40-23350583

Email: info@thermocables.com; cabledesign@thermocables.com

Oversees Office London Ph: +44 7798771519
Email: medhapattam@thermopads.com

Plant - I
D - 44, 45, 48, 49 & 50,
Phase V, IDA, Jeedimetla
Hyderabad – 500 055 Telangana, India
Ph: 23095058, 23097745; Fax: 040-23090661

Plant - II
G 1 & G 2 A & B, G 9 A & B & G10
Green Industrial Park
Jadcherla, Mahboobnagar - 509 301
Telangana, India

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|------------------|----------------|------------------------------|
| Baroda | - 09374361884 | ; baroda@thermocables.com |
| Bengaluru | - 09341002070 | ; bangalore@thermocables.com |
| Chennai | - 044-26443282 | ; chennai@thermocables.com |
| Delhi | - 09313438322 | ; delhi@thermopads.com |
| Hyderabad | - 09396745763 | ; hydsales@thermocables.com |
| Kolkata | - 08367442226 | ; kolkata@thermocables.com |
| Mumbai | - 09320643117 | ; mumbai@thermocables.com |
| Pune | - 020-27502255 | ; pune@thermocables.com |
- www.thermocables.com**