Cables & Wires Catalogue

- LT Control & Power Cables
- PVC Lead Wires/Hook up Wires
- Instrumentation Signal Cables
- Thermocouple Extension & Compensating Cables
- Fire Survival Cables
- High Temperature Cables
- DC Solar Photovoltaic Cables
- Automotive Wires & Cables
- Mineral Insulated Metal Sheathed Cables
- Special Cables & Sleeves

TEMPSENS

www.tempsens.com

ABOUT THE COMPANY

Tempsens Instruments U# II - Cables & Wires

TEMPSENS Instruments (I) Pvt. Ltd is a part of Pyrotech group which was established by four technocrats in 1976 at Udaipur, with it's first product as Thermocouples and RTD's.

Today Tempsens is one of the largest Thermal and Cable solution provider having world class manufacturing facilities, Operations in India, Germany and Indonesia.

Tempsens is a TUV certified ISO 9001:2008 certified company with NABL Accredited Laboratories.

The company is involved into manufacturing of Thermocouples, RTD's, Thermowells, Cables, Non-Contact Pyrometers, Heaters and Calibration Equipments, Furnaces etc. with Covered Area of 2,70 ,000 Sq. Ft.

Tempsens is proud of it's technical solution, quick delivery, high technical standards and outstanding quality which have been appreciated and highly valued by it's customers worldwide.

Tempsens exports to more than 70 countries world wide.

Tempsens success is driven by it's people and their unrelenting focus on delivering results the right way - by operating responsibly, executing with excellence, applying innovative technologies and capturing new opportunities for profitable growth.

Milestones

1976	• Pyrotech international Established.
1985	• Established Tempsens as separate Unit.
1994	• Started Export. Awarded ISO 9002.
2003	• Manufacturing of Temperature Calibration Equipments.
2004	• Setup Calibration laboratory (NABL Accrediated).
2006	• Rajeev Gandhi National Quality Award.
2008	• Installing Fixed Point Calibration (Primary Standard) Setup for TPW, Ga, Sn, Zn & Al points, first time in the country in Private Lab.
2009	• New facilities started - Tempsens Unit #II for manufacturing cables. Joint venture with Marathon heater Inc, USA for Industrial Heaters and AST.
2011	• Awarded with prestigious MSME Award 2010.
2012	• Multilocational manufacturing facilities - India, Germany and China.
2013	• Pyrometer & Industrial Heater shifted to new building. MI Cable Plant started.
2014	• Joint venture with Linn High Therm, Germany for industrial furnaces. • Tempsens Lab(West) at Vadodara was NABL Accredited.
2015	• Expansion of Cable Plant. • Rajasthan Export Award for the year 2012-13. • Tempsens Lab(South) at Bangalore was NABL Accredited.
2016	• Star Performer conferred by EEPC India • Udaipur Business excellence Award 2016 – by FORTI & Pantomath • NABL Accreditation to Tempsens Testing Centre in Electrical Discipline for Cables & wires testing. • BIS license for IS 694 : 2010(PVC insulated cables upto 1.1 KV)
2017	• BIS License for IS1554-1:1988(PVC insulated cables upto 1.1 KV)
2018	• BIS License for IS7098-1:1988(XLPE insulated cables upto 1.1 KV)

IS694 : 2010
CML No. - 8400077612

IS1554-1:1988
CML No. - 8400106609

IS7098-1:1988
CML No. - 8400128712

RoHS

NABL T-4096

FACILITIES FOR CABLES

MANUFACTURING FACILITIES

PVC Cable Plant

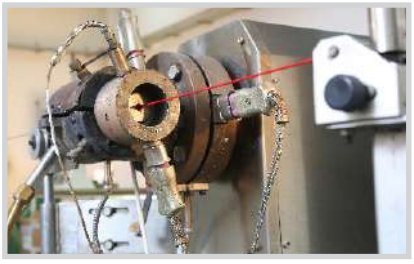
- Wire Drawing Machine
- High Speed Bunchers
- PVC/XLPE/LSZH Extruders
- Laying Machine
- Vertical Almylar Tapping Machine
- High Speed Metal Braiding Machine
- Armouring Machine
- Tinning Machine
- NABL Lab for Calibration & Electrical Testing
- Laser Printer
- UPS Backup

High Temperature Cable Plant

- High Speed Bunchers
- Teflon Tape Plant
- Silicon Extruder
- Fluoro Polymer Extruders
- Laying Machine
- Vertical Tapping Machine
- Horizontal Tapping Machines
- Horizontal Fibre Lapping Machines
- Fibre Braiding Machines
- Metal Braiding Machines
- Varnish / Sintering / Horizontal Dry Oven
- NABL Lab for Calibration & Electrical Testing
- Silver Plating Plant
- UPS Backup

MI Cable Plant

- Draw Bench 50 meters
- Horizontal Reducers
- Annealing Furnaces
- MI Polishing Machines
- MgO Sintering Furnace
- MgO Plant



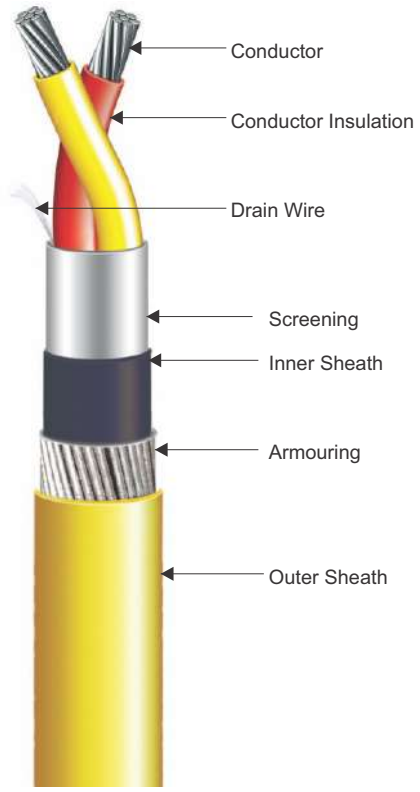
TESTING & CALIBRATION

NABL Accredited Testing Laboratory

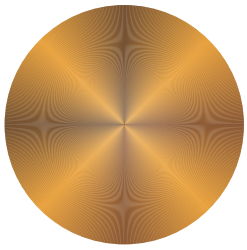
NABL T-4096

- Routine, Acceptance and Type Tests for Cables and Wires as per IS 1554, IS 694, IS 7098, IS 8130, IS 3975, IS 9968, IS 6380, JSS 51034, JSS 51038, MIL 16878, IEC 60332, IEC 754, IEC 60227, IEC 60811, ASTMD 2863, ASTMD 2843, IS 10810, IEC 60502, BS EN 50288-7 etc.

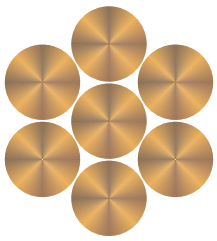
BASICS OF CABLES & WIRES



CONDUCTOR



Solid



Stranded

The center component of any cable is the conductor, which carries the signal or power through that cable. For signal & power transmission copper is the most commonly used conductor.

Copper Conductors

Annealed Bare Copper(ABC), Tinned Plated Copper(TPC), Nickel Plated Copper(NPC), Silver Plated Copper(SPC), NPC 27%

Thermocouple Conductors

Thermocouple grade conductor(TC)

Extension grade conductor(EX)

Compensating grade conductor (C)

Other Conductors

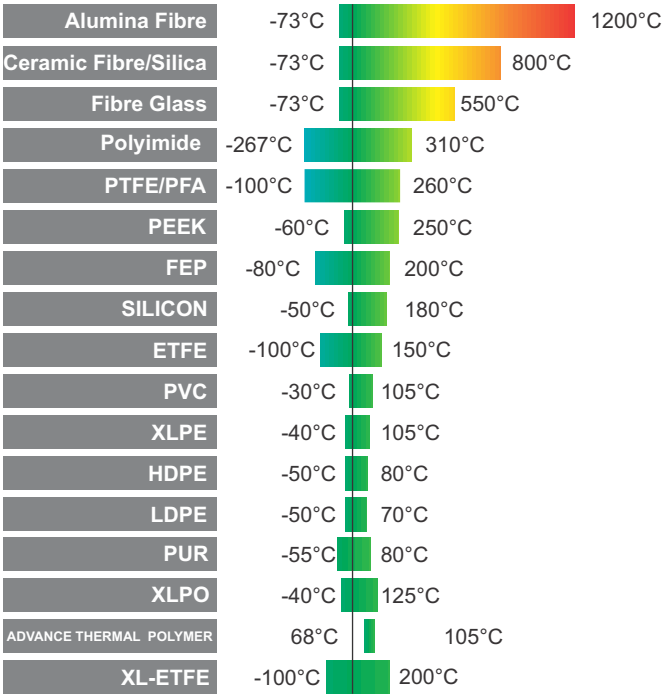
Pure Nickel Conductor (Ni) etc.

INSULATION

Insulation refers to the layer of plastic, polymer or high temperature compound that is applied directly over the conductor. Tempsens provide variety of insulations along with wide temperature range from -267°C to 1200°C.

Insulation Type

Temperature range for various insulations are listed below :



SCREENING

Screening is applied for magnetic and electrical protection. Generally, two types of Screening are available :

- Aluminum Foil Type : - Screening is done by helically applied aluminum foil along with copper drain wire with 100 % coverage.
- Mesh Braided Type :- Screening is done by Copper wire (Bare Copper, Tinned Copper, Nickel Plated Copper, Silver Plated Copper). It is in mesh braided form with 70 % to 95% coverage area.

INNER SHEATH

PVC, Silicon, Teflon, Polyimide, Fibre Glass, ETFE, HDPE, LDPE, XLPO etc. (as listed in insulation)

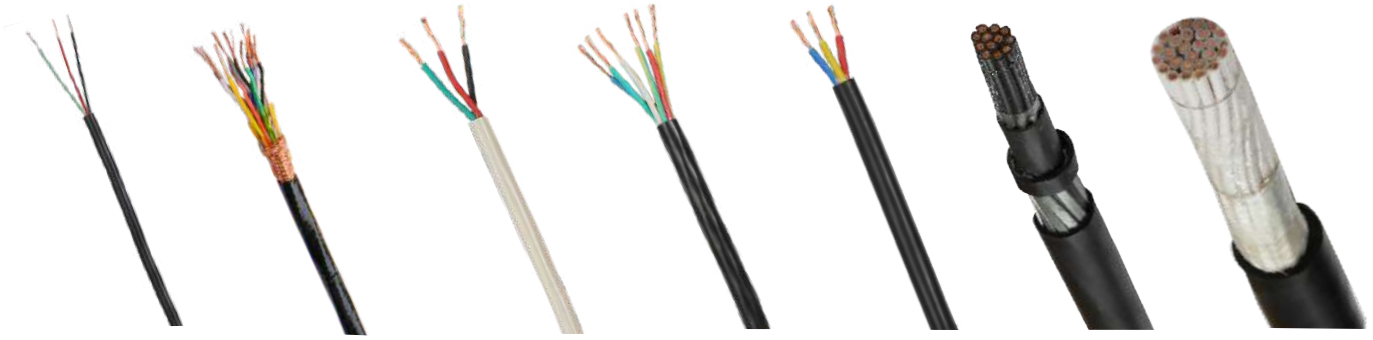
MECHANICAL PROTECTION

- G.I. Armouring (Round wire / Flat strip as per IS 3975:99)
- Wire Braiding as per JSS 51038, BS 50288-7

OUTER SHEATH

PVC, Silicon, Teflon, Polyimide, Fibre Glass, PUR, ETFE, HDPE, LDPE, XLPO etc. (as listed in insulation)

LT CONTROL & POWER CABLES



Control Cable used for transmission of low voltage signal data that have to control equipment whereas, power cable transfer high array signal from the source to the equipments.

TECHNICAL SPECIFICATION

Construction	:	Single Core / Multi Core
Voltage Grade	:	Upto 1.1 KV
Conductor	:	Electrolytic Grade Bare Copper/Tinned Copper
Conductor Size	:	0.50, 0.75, 1.0, 1.5, 2.5, 4.0, 6.0, 10.0, 16.0, 25.0, 35.0 upto 300 Sq. mm
Conductor Stranding	:	Solid or Multi Strand
Core Insulation	:	PVC/HR PVC/PE/XLPE/LSZH Polymer/FR PVC/FRLS PVC, XLPO etc.
Core Identification	:	Upto 5 cores by Different Colours Above 5 cores by Number Printing
Inner/Outer Sheath	:	PVC/HR PVC/PE/LSZH Polymer/FR PVC/FRLS PVC, PUR, XLPO etc.
Armouring	:	G.I. Round Wire / Flat Strip Armouring(As per IS 3975 : 99) / Wire Braiding
Standards	:	As per IS 694, IS 1554, IS 7098, IEC 60227, IEC 60502-1, IEC 60332

FEATURES

- ✓ Max. Temperature range up to 125°C
- ✓ High temperature also available
- ✓ Flame Retardant & Low smoke availability
- ✓ Fire Resist option available
- ✓ Heat resist
- ✓ Halogen free Low smoke availability
- ✓ Resist to oil, moisture, chemical, whether etc.
- ✓ Armoured / Un-Armoured option available
- ✓ Screened control Cable option available
- ✓ Available with different voltage cable up to 1.1 kv

PVC LEAD WIRES

Tempsens provide wide range of Lead wire or Hook up wires with different PVC insulations

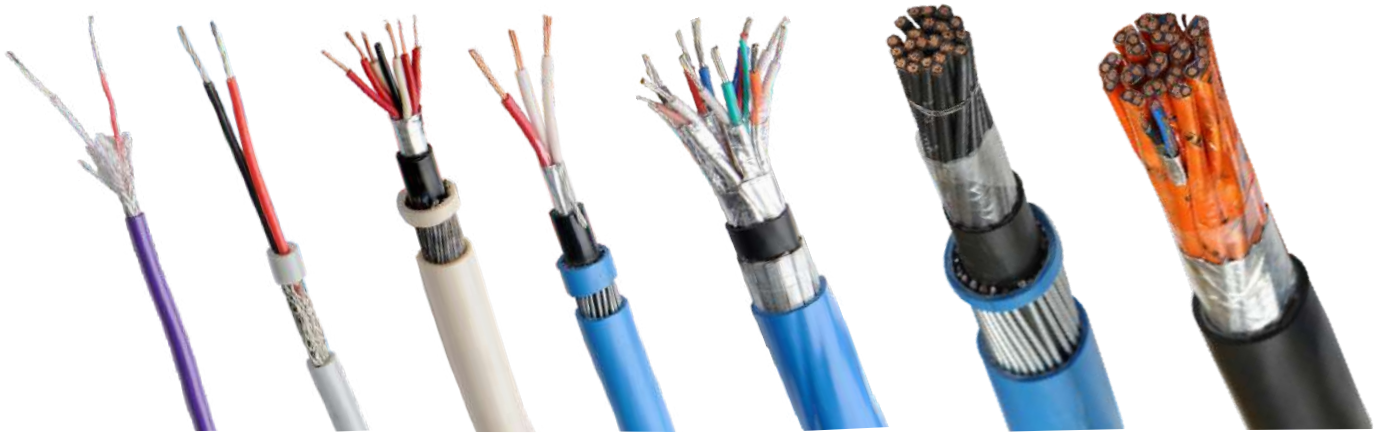
TECHNICAL SPECIFICATION

Conductor	: Electrolytic Grade Bare Copper, Tinned Copper
Conductor Size	: 0.20, 0.5, 1.0, 1.5, 2.5 upto 240 sq. mm
Conductor Stranding	: Solid, Multistrand, Flexible
Voltage Rating	: Up to 1.1 KV
Insulation	: PVC, HR PVC, FR PVC, FRLS PVC, LSZH Polymer, HFFR Polymer
Standards	: IS 694, IS 8130, IS 5831 : 84

FEATURES

- ✓ Max. Temp. Up to 90°C
- ✓ Good Flexibility
- ✓ Excellent Resist to Oil, Moist, Fluids and Chemicals
- ✓ Excellent Di-electric Properties
- ✓ Excellent Flame Retardant, Low smoke
- ✓ Halogen free
- ✓ Color as per requirement
- ✓ Color lining available(Optional)

INSTRUMENTATION SIGNAL CABLES



Instrumentation Signal Cables minimize external interference during transmitting signals, deliver clear signals, in harsh environments and general manufacturing operations. These cables are specially designed for use in communication and instrumentation systems. These cables are available in Shielded/Un-Shielded and Armoured /Un-Armoured options.

TECHNICAL SPECIFICATION

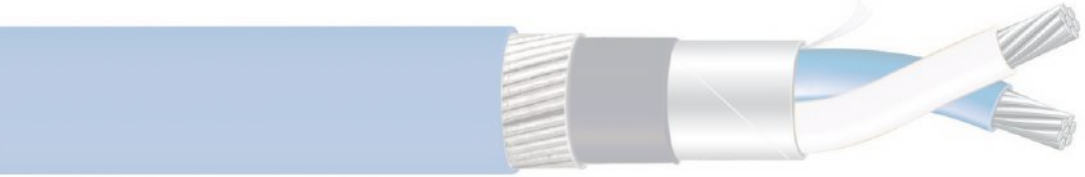
Construction	:	Single / Multi, Pair / Triads
Voltage Grade	:	Upto 1.1 KV
Conductor	:	Electrolytic Grade Bare Copper/Tinned Copper
Conductor Size	:	0.50, 0.75, 1.0, 1.5, 2.5 Sq. mm upto 48 pair
Conductor Stranding	:	Solid or Multi Strand
Core Insulation	:	PVC/HR PVC/PE/XLPE/LSZH Polymer/FR/FRLS PVC, XLPO etc.
Screening Method	:	Individual and Overall(F type)/Overall Shield (G type)
Screening	:	Aluminum Foil with Drain Wire/Mesh Braided
Inner/Outer Sheath	:	PVC/HR PVC/PE/LSZH Polymer/FR PVC/FRLS PVC, PUR, XLPO etc.
Rip Cord	:	For easy removal of sheath
Armouring	:	G.I. Round Wire / Flat Strip Armouring
Standards	:	As per BS 5308 Part 1 and Part 2, IS 1554, EN 50288-7, IS 7098

FEATURES

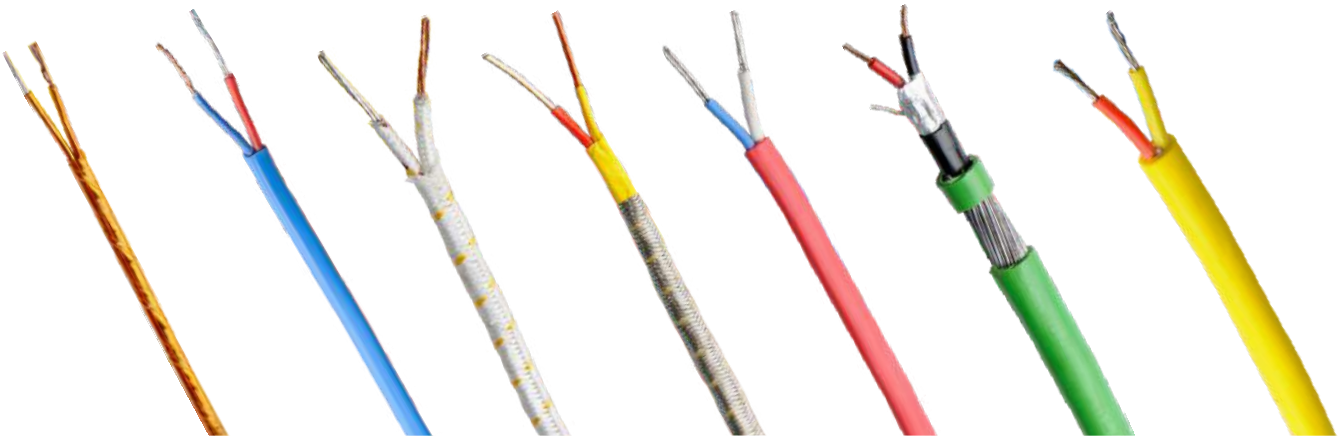
- ✓ Max. Temp. Range upto 125°C
- ✓ Flexible & Versatile
- ✓ Flame Retardant & Low smoke availability
- ✓ High Temperature option also available
- ✓ Resist to Oil, Corrosion & Moisture
- ✓ High mechanical strength
- ✓ Superior low temperature Properties
- ✓ Screened/Unscreened
- ✓ High Insulation resistance
- ✓ Low dielectric Losses
- ✓ Armoured/Unarmoured
- ✓ Fire resist option available

ELECTRICAL CHARACTERISTICS FOR INSTRUMENTATION CABLES

Conductor Size	Resistance at 20°C	Mutual Capacitance (PE)		Mutual Capacitance (PVC)		L/R Ratio
		Overall Screen	Individual Screen	Pair adjacent core	Between any core or screen	
(mm^2)	(Ω/km)	(nF/km)	(nF/km)	(nF/km)	(nF/km)	(mH/Ω)
0.50	36.8	75	115	250	400	25
0.75	25.0	75	115	250	400	25
1.00	18.4	75	115	250	400	25
1.50	12.3	85	120	250	400	40



THERMOCOUPLE CABLES



Thermocouple Cables are used to measure the temperature directly. Extension & Compensating wires are used to extend a thermocouple signal from a sensor to instrument for readings.

TECHNICAL SPECIFICATION

Construction	:	Single or Multi pair
Voltage Grade	:	Up to 1.1 KV
Conductor	:	TC, EX, C (Refer Table No.- 1)
Type of Conductor	:	K, T, J, E, N, R, S, B, D, C
Conductor Size	:	AWG 12 to AWG 32 upto 48 pair
Conductor Stranding	:	Solid or Multi strand
Core Insulation	:	PVC, PTFE, FEP, PFA, Silicon, PEEK, Polyimide, Fibre Glass, Ceramic Fibre, XLPO, XL-ETFE etc.
Screening	:	Aluminum Foil with drain wire / Mesh Braided
Inner/Outer Sheath	:	PVC, Teflon, Polyimide, Fibre Glass, Ceramic Fibre, PUR, XLPO, XLETFE etc.
Rip Cord	:	For easy removal of sheath
Armouring	:	G.I. Round Wire/Flat Strip Armouring/Wire Braiding
Color Code	:	Refer Table No. 1
Standards	:	ANSI MC 96.1, IS 8784, IEC 60584.3

FEATURES

- ✓ Available in Thermocouple extension and compensating grades.
- ✓ Available with special limit of tolerance as per ANSI MC 96.1/ IEC 60584.3
- ✓ Available in all colour codes.
- ✓ Complying with IS 8784, IEC 60584 & ANSI 96.1
- ✓ Flame retardant
- ✓ Fire Resist option available
- ✓ Halogen free option available
- ✓ Available with Chemical resist, Water resist, Abrasion resist & Heat resist option
- ✓ Optional NABL Calibration report

Colour Code & Accuracy of Thermocouple, Extension& Compensating Cables(Table No. 1)

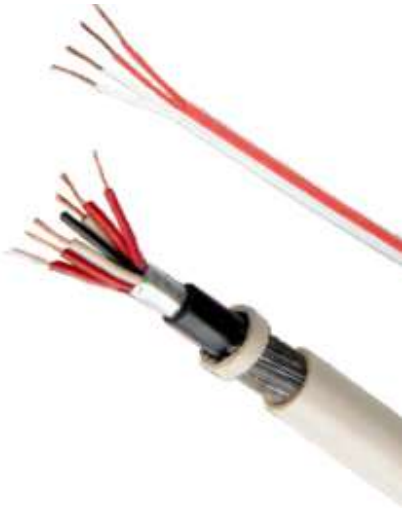
T/CTYPE	CONDUCTOR		CONDUCTOR COMBINATIONS		COLOR CODE		TOLERANCE CLASS AS PER IEC 584.3		CABLE TEMP. RANGE°C
	EXTENSION CABLE	COMPENSATING CABLE	+LEG	-LEG	IEC 5843:1989	ANSI/MC96.1	CLASS 1	CLASS 2	
K			CHROMEL	ALUMEL			±1.5°C or 0.4% of T	±2.5°C or 0.75% of T	0°C TO +1100°C
	KX		CHROMEL	ALUMEL			±1.5°C	±2.5°C	-25°C TO +200°C
		KCA	IRON	CONSTANTAN			-	±2.5°C	0°C TO +150°C
		KCB	COPPER	CONSTANTAN			-	±2.5°C	0°C TO +100°C
T			COPPER	CONSTANTAN			±0.5°C or 0.4% of T	±1.0°C or 0.75% of T	-185°C TO +300°C
	TX		COPPER	CONSTANTAN			±0.5°C	±1.0°C	-25°C TO +100°C
J			IRON	CONSTANTAN			±1.5°C or 0.4% of T	±2.5°C or 0.75% of T	+20°C TO +700°C
	JX		IRON	CONSTANTAN			±1.5°C	±2.5°C	-25°C TO +200°C
N			NICROSIL	NISIL			±1.5°C or 0.4% of T	±2.5°C or 0.75% of T	0°C TO +1100°C
	NX		NICROSIL	NISIL			±1.5°C	±2.5°C	-25°C TO +200°C
E			CHROMEL	CONSTANTAN			±1.5°C or 0.4% of T	±2.5°C or 0.75% of T	0°C TO +800°C
	EX		CHROMEL	CONSTANTAN			±1.5°C	±2.5°C	-25°C TO +200°C
R		RCA	COPPER	COPPER LOW VALUE NICKEL			-	±2.5°C	0°C TO +100°C
S		SCA	COPPER	COPPER LOW VALUE NICKEL			-	±2.5°C	0°C TO +100°C
B		BC	COPPER	COPPER			-		0°C TO +100°C
D		DC	ALLOY 203*	ALLOY 225*			-	±4.5°C	0°C TO +100°C
C		CC	ALLOY 405*	ALLOY 426*			-	±4.4°C	0°C TO +100°C

RTD TRIAD CABLES

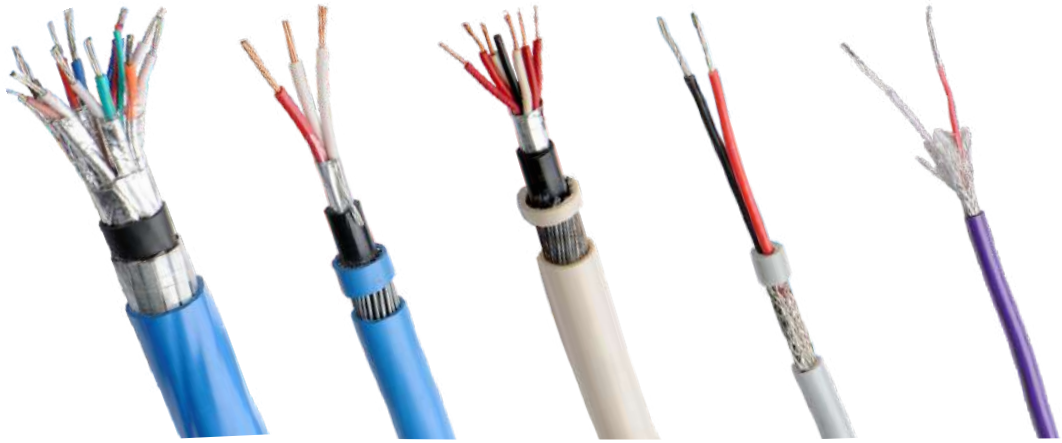
RTD triad cables are used to carry the RTD signals to the control room or field mounted instruments.

TECHNICAL SPECIFICATION

Construction	:	Single / Multi Triads
Voltage Grade	:	Upto 1.1 KV
Conductor	:	Electrolytic Grade Bare Copper/Tinned Copper
Conductor Size	:	0.50, 0.75, 1.0, 1.5 Sq. mm upto 36 triad
Conductor Stranding	:	Solid or Multi Strand
Core Insulation	:	PVC/HR PVC/PE/XLPE/LSZH Polymer/FR/FRLS PVC, XLPO etc.
Screening Method	:	Individual and Overall/Overall Shield
Screening	:	Aluminum Foil with Drain Wire/Mesh Braided
Inner/Outer Sheath	:	PVC/HR PVC/PE/LSZH Polymer/FR PVC/FRLS PVC, PUR, XLPO etc.
Rip Cord	:	For easy removal of sheath
Armouring	:	G.I. Round Wire / Flat Strip Armouring
Standards	:	As per BS 5308 Part 1 and Part 2, IS 1554, EN 50288-7, IS 7098, DIN 43760



FIRE SURVIVAL CABLES



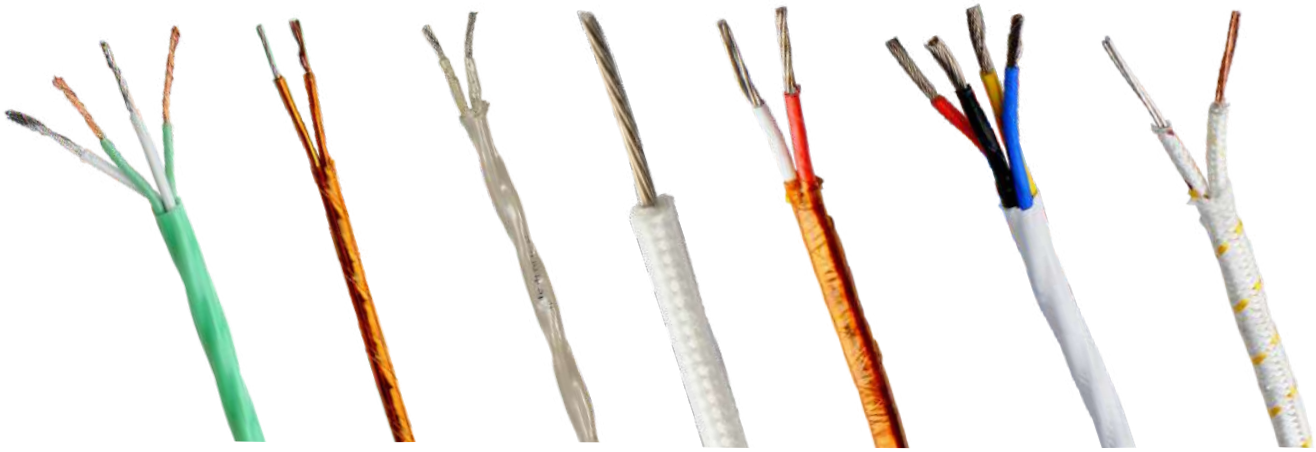
Fire Survival Cables are used in the installations where vital circuits are required to continue operation under fire conditions. In all disaster, fire smoke head & toxic fumes are the main obstacles to safe evacuation of a building area.

A major contribution towards overcoming these hazards is the use of fire survival cables & halogen free cables.

TECHNICAL SPECIFICATION

Conductor	:	Electrolytic Grade Bare Copper/Tinned Copper
Fire Resist Heat Barrier	:	Mica Heat Barrier Tape
Insulation	:	XLPE/SILICON
Screening	:	Al-myler/Metal braided
Inner/Outer Sheath	:	Halogen Free Low Smoke Polymeric compound
Armouring	:	G.I. Round Wire / G.I. Flat Strip
Standard	:	IEC 60331, IEC 60332, IEC 60754, BS 6387, EN 50290-2-27, BS 7655, BS 7629-1, IS 7098, IS9968

HIGH TEMPERATURE CABLES



High temperature cables are used in areas where both working temperature and ambient temperature are too high. We offer a variety of high temperature insulations such as alumina yarn, ceramic yarn, fibre glass, fluoroplastic polymers and elastomer to perform in continuos temperature up to 1200°C.

TECHNICAL SPECIFICATION

Construction	:	Single / Multi Cores, Single / Multi Pairs.
Voltage Grade	:	250/600/1100 V
Conductor Type	:	Annealed Bare Copper/Tinned Copper, Silver Plated Copper, Nickel Plated Copper, Pure Nickel, NPC 27%
Conductor Size	:	From 0.22 Sq. mm to 240 Sq. mm
Heat Barrier Tape (Optional)	:	Mica Tape, Polymide Tape
Core Insulation	:	FEP, PTFE, PFA, Silicon, Polyimide, Fibre Glass, Ceramic Fibre, Alumina Fibre, PEEK, XL-ETFE
Screening Method	:	Individual and / or Overall
Screening	:	Aluminum mylar with drain wire / Mesh Braided
Inner Sheath	:	FEP, PTFE, ETFE, PFA, Silicon Polyimide, Fibre Glass, Ceramic Fibre
Outer Sheath	:	FEP PTFE, ETFE, PFA, Silicon, Polyimide, Fibre Glass, Ceramic Fibre, Alumina Fibre, XL-ETFE
Armourning	:	Stainless Steel Wire Braiding
Generally Confirm to	:	JSS 51034, JSS 51038, JSS 51037, ASTM B298, ASTM B355, MIL 81381, MIL-DTL-27500H, MIL 16878, IS 9968, VDE 207 Part 6

FEATURES

- ✓ Available in multiple insulations having different properties.
- ✓ Suitable up to 1200°C.
- ✓ Low Di-electric Constant.
- ✓ Excellent Flame Retardant & Heat Resist Properties.
- ✓ Halogen Free Insulation available with Silicon, FEP, PTFE, ETFE & PFA materials
- ✓ Excellent Flexibility
- ✓ High Thermal Stability.
- ✓ Resist to Chemical, Acid, Weather etc.
- ✓ Radiation Resistant
- ✓ LCSO Approved

Insulation	Temperature Range	Characteristics
Alumina Fibre	-73°C to 1200°C	Excellent Temperature Resistance
Ceramic Fibre	-73°C to 800°C	Excellent Temperature Resistance
Fibre Glass	-73°C to 550°C	High Temperature Resistance
Polyimide	-267°C to 310°C	Thin insulation, Flame retardant, Different colors available
PFA	-100°C to 260°C	Chemical Resistance, High Dielectric strength, Thin Insulation
PTFE	-100°C to 260°C	Excellent chemical resistance
PEEK	-60°C to 250°C	High Mechanical Strength, Radiation resistance
FEP	-80°C to 200°C	Chemical Resistance, High Dielectric strength, Thin Insulation
ETFE	-100°C to 150°C	Good Mechanical Strength
Silicon Rubber	-40°C to 180°C	Flexible, Abrasion & Radiation resistance
XL-ETFE	-100°C to 200°C	High radiation resistance, improved mechanical & thermal properties

HEAT RESISTANCE POWER CABLES

We provide a range of single & multi core heat resistance cable for temperature range upto 800°C. Our Heat Resistance Power Cables are suitable to resist in chemical, fire and flame atmosphere.

TECHNICAL SPECIFICATION

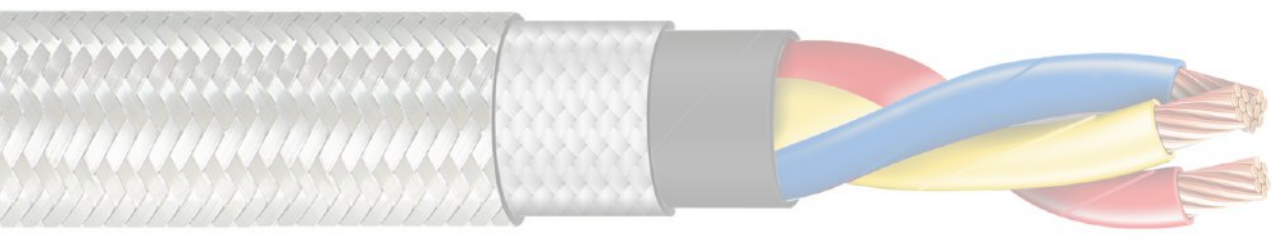
Construction	:	Single / Multi Cores
Voltage Grade	:	Up to 1.1 KV Grade
Conductor	:	ABC, NPC, Pure Nickel, NPC 27%
Conductor Size	:	1.5, 2.5, 4.0, 6.0, 10.0, 16.0, 25.0, 35.0 Sq mm upto 240 sq. mm
Heat Barrier Tape	:	Polyimide Tape
Conductor Stranding	:	Multistrand as per IS 8130:84/IEC60228
Core Insulation	:	PTFE, FEP, PFA, Silicon, Fibre Glass, Ceramic Fibre etc.
Isolator	:	Polyimide, Sintered PTFE Foil
Fire Barrier Tape	:	Glass Mica Tape
Screening	:	Mesh Braided(Overall)
Inner/Outer Sheath	:	Teflon, Fibre Glass, Ceramic Fibre etc.
Outer Breading	:	Asbestos
Armouring	:	SS Braiding
Standards	:	As per IS 8130:84, JSS 51038, JSS 51037

FEATURES

- ✓ Max. Temp. Up to 800°C
- ✓ Excellent Heat Resistant
- ✓ Excellent Abrasion Resistance
- ✓ Excellent Flame Retardant
- ✓ Good Thermal Stability
- ✓ Good Chemical Resistivity

APPLICATIONS

- ✓ Steel
- ✓ Glass
- ✓ Ceramic Metal Industries
- ✓ Chemical & Fertilizers
- ✓ Refractories
- ✓ Power
- ✓ Oil & Gas
- ✓ Cement



DC SOLAR PHOTOVOLTAIC CABLES

DC Solar Cable are single core copper cables each for +ve and -ve, They are insulated with cross linkable polyolefin compound and sheathed with halogen free polyolefin compound.(Generally conforming to BS EN 50618:2014 Standard)

SIZE cross-sectional area in (sqmm)	Max. Conductor D.C. Resistance at 20°C in ohm/(km)	Average Diameter of Conductor (in mm)	Approx. Overall Diameter of cable (in mm)		Approximate Overall weight (in kg/km)	Minimum Bending radius (in mm)	Current rating under continous operation 90°C and ambient temperature 40°C (in A)	Short circuit current rating for 1 sec. duration (in KA)
1.5	13.7	1.46	4.46	4.86	35	19	22	0.189
2.5	8.21	1.88	4.88	5.28	46	21	30	0.315
4.0	5.09	2.39	5.39	5.79	64	23	42	0.504
6.0	3.39	2.93	5.93	6.33	84	25	52	0.756
10	1.95	3.86	7.26	7.66	133	31	76	1.26
16	1.24	5.39	8.79	9.19	195	37	95	2.02
25	0.795	6.73	10.53	11.13	290	45	124	3.15
35	0.565	8.08	11.88	12.48	390	50	159	4.41
50	0.393	9.69	13.49	14.09	530	56	185	6.30
70	0.277	11.54	15.34	15.94	715	64	239	8.82
95	0.210	13.25	17.05	17.85	920	71	290	11.97
120	0.164	15.00	18.80	19.60	1150	78	335	15.12
150	0.132	16.77	21.37	22.37	1460	89	385	18.90
185	0.108	18.54	23.54	24.54	1770	98	440	23.31
240	0.0817	21.33	26.33	27.33	2300	110	520	30.24

SPECIAL PROPERTIES OF SOLAR CABLES

- Lasts up to 30 years even under tough external conditions.
- Annealed Tinned Copper Conductor (Class 5 as per IEC-60228)
- Resists extreme temperatures (-40°C to 120°C maximum at the core) and ozone resistant.
- Full protection against ultraviolet rays.
- Low smoke emission & low toxicity / corrosivity during fire.
- Flame retardant, fire retardant.
- Fast & Easy installation with color identification.
- In accordance with new environmental regulations.
- Suitable to common connector types.
- Electron-Beam & Silane Cross Linked

CHEMICAL PROPERTIES

- Weather resistant & UV resistant
- Resistant to mineral oils & chemicals
- Resistant to acids & alkaline
- Ammonia Resistance

THERMAL PROPERTIES

- Maximum Conductor temperature of operation at 120°C during 20000 hours
- Ambient temperature: -40°C to +90°C
- Generally conforming to National/International standards

ELECTRICAL PROPERTIES

- Voltage rating: 1.5 (1.8) KV DC / 0.6 / 1.0 (1.2) KV AC
- High voltage test 6.5KV AC/15KV DC for 5 minutes.
- Min. Insulation resistance @ 90°C = 0.20MΩ/km
- Spark test - 6000 V AC(8000 V DC)

MECHANICAL PROPERTIES

- Resistant to Impact, tear & abrasion
- Minimum bending radius - 4 times of overall diameter.
- Safe pulling force -50 N/sqmm.

OTHER AVAILABLE DESIGNS

Design I : Insulated and sheathed with cross linkable LSZH which has UV as well as ozone protection properties (generally conforming to BS EN 50618:2014).

Design II : Insulated with HR105°C PVC Compound and sheathed with UV Stabilized HR 105°C PVC Compound (generally confirming to IS-694 and IS-1554).

Design III : Insulated with XLPE compound and Sheathed with UV Stabilized PVC ST2 Compound(generally confirming to IS 7098 Part 1 Guidelines)

AUTOMOTIVE WIRES AND CABLES

We are a leading manufacturer of automotive wire and cable. Automotive wiring to be used at 60 V DC or less in surface vehicles electrical system in various applications. We provide Automotive wires in a variety of gauge sizes and colors premium-grade PVC insulation. Automotive wires and cables are used in wiring harness assemblies for cars, light, medium, heavy and industrial trucks, motorcycles, buses, agricultural equipment, recreational vehicles, construction equipment, Train equipment, and off-road vehicles etc.

GERMAN STANDARD

Standard Compliance : ISO 6722 (Class B, C, D,F,H, E)

Single-Core Cables : FLY, FLYY, FLYW, FLRYW, FLYK, FLRYK, FLRY-A,FLRY-B,FLR2X-A,FLR2X-B,FL2G, FL2X, FLRYW-A, FLRYWd, FLRYW-B, FLR4Y, FLR5Y-A, FLR5Y-B, FLR6Y-A, FLR6Y-B, FLU6Y, FLR7Y-A, FLR7Y-B, FLR14Y, FLR51Y-A, FLR51Y-B, FLYWK & FLRYWK, FLYOY/FLYKOY

Multi-Core Cables : FLYY, FLYZ, FLRYB11Y, FLR2X11Y, FL6Y2G

Code Designation : **FL** – Automotive Wire, **FLZ** – Automotive Ignition Wire, **Y**=soft-PVC (polyvinyl chloride) **YW**=soft-PVC, heat-resistant, hot-pressure resistant, **4Y**=PA (polyamide) **6Y**=FEP, **7Y**=ETFE, **2X**=XLPE, **4, 2G**=SiR(Silicone rubber), **14Y**= PFA, **R**=Reduced insulation trickiness, **U**=Ultra thin Insulation, **C**=Copper braiding, **B**=Screen(film/foil shield)

JAPANESE STANDARD

Standard Compliance : JASO D611-94, JASO D611-09, JASO D611-92, JASO D608 JIS 3406

Cables : AV, AV-V, AVS, AVSS, AVSSH, AEX, AEXF, AEXSF, AEXHF, AESSXF, AEXHSF, ATW-FEP, AHFX, HAEXF, HFSSF-T3, AVSSX/AESSX, CAVS, EB/HDEB, AEX-BS, AEXHF-BS, AESSXF/ALS, AVSS-BS, APEX-BS, AVSSXFT

Code Designation : **A**= automotive low tension cable, **V**=polyvinyl chloride insulation, **S**=thin wall insulation, **SS**=extreme thin wall insulation, **XX**=cross linked insulation, **T**=twisted

AMERICAN STANDARD

Standard Compliance : SAE J1127 – Automotive Wire, SAE J1128 – Battery Cable

Cables : **TWP**=thin wall, thermoplastic insulation low-tension cable for accumulator.

GPT=thermoplastic insulation low-tension cable.

TXL=thin-wall low-tension cables for automobiles.

GXL=cross linked polyolefin insulation low-tension cables for automobiles.

SXL=cross linked polyolefin insulation special purpose low-tension cables for automobiles.

HDT=heavy duty, thermoplastic insulation low-tension cable for automobiles.

SGT=starter or ground, general purpose thermoplastic insulated

STX=APC conductor,thin wall XLPO insulation

SGX=APC conductor, general purpose XLPO insulation

WTA=soft annealed copper conductor ultra thin wall PVC insulation

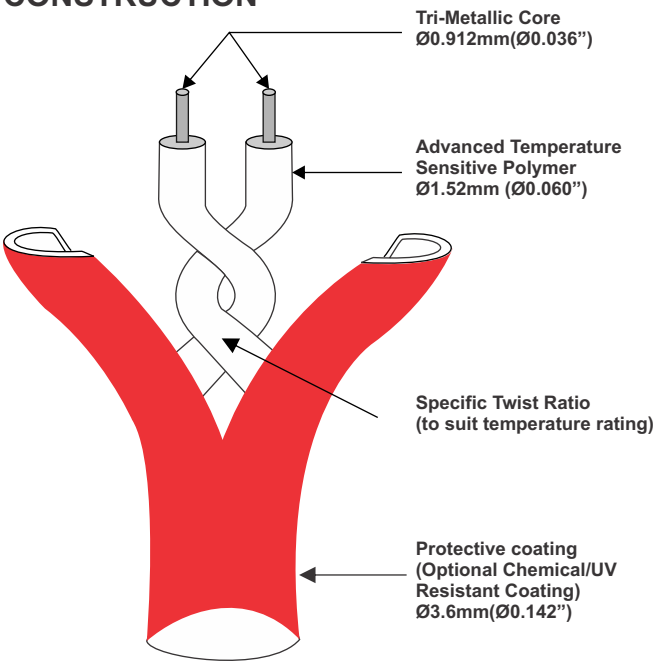
WTC=soft annealed copper conductor ultra thin wall PVC insulation

DIGITAL LINEAR HEAT SENSING CABLE

Linear Heat Detection Cable consist of a twisted pair of extremely low resistance tri metallic conductors, coated in advanced temperature sensitive thermal polymers which is chemically engineered to breakdown at particular fixed temperatures allowing the twisted conductors to make contact and initiate an alarm at the control panel. This linear cable can detect a fire anywhere along its entire length.

The proper temperature model must be chosen to provide the fastest alarm response to a potential fire conditions without creating false alarm conditions as it's a co-axial cable which exerts a defined change in electrical resistance of internal polymer when subjected to changes in surface temperatures. Fault indication of open and short circuit condition on the sensor cable can be provided by system monitoring through an associated electronic interface unit.

CONSTRUCTION



TECHNICAL SPECIFICATION

Construction	:	Dual Insulated, twisted pair tri-matellic cores
Insulation	:	1.1 Kv tested Advance Thermal Polymers
Wire Overall Diameter	:	3.60 mm (Approx)
Minimum Bending Radius	:	50 mm > 0°C 100 mm < 0°C
Ambient Temperature	:	68°C to 78°C version 88°C to 105°C version
Maximum Rated Voltage	:	30 Vac /42 Vdc
Resistance	:	100 Ohm/Km
Maximum Zone Length	:	3000 mtr
Capacitance	:	88-150 pF/mtr
Inductance	:	540-1050 H/mtr
Outer Color	:	Red for 68°C Yellow for 78°C Light Green for 88°C Dark Green for 105°C
Available	:	200 / 300 / 500 Mtr Length

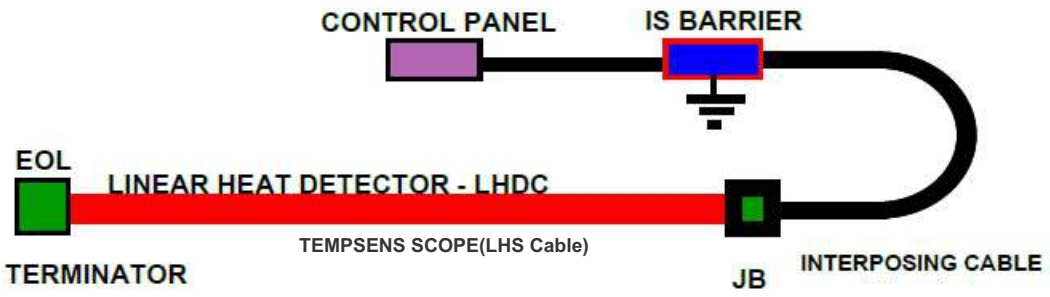
INDUSTRY SECTOR

- Tunnels
- Mining
- Manufacturing
- Warehousing
- Cold Stores
- Communications & General Industries

INDUSTRY APPLICATION

- Cable Trays
- Conveyor Belts
- Rack Storage
- Floating Roof Storage Tanks
- Refrigerated storage
- Pipelines
- Power equipments Switchgear, transformer, motors and fans

INTRINSICALLY SAFE CONFIGURATION



SPECIAL CABLES

✓ RS-485 Cable

Electrically radiated noise frequently present in factory floor environments can interfere with device to device communication circuit, causing delayed signals & data loss. So to keep away from these problems RS 485 cable with low capacitance, high quality & specific impedance are used for RS-232/RS-422 and RS 485 communication application in industrial networking field.

Construction

Design: 1 Pair, 2 Pair, 3 Pair

Conductor Size : 24 AWG/22 AWG

Insulation : PE

Screening : Aluminium Myler with Drain Wire.

Braiding : Annealed Tinned Copper with more than 65% coverage

Outer Sheath : PVC

Armouring (Optional) : GI Armouring (IS 3975)

✓ Load Cell Cable

Tempsens provide Load cell cables generally of 6 cores and 7 cores. In industries multiple load cells are need to be connected together by Parallel or serial connection for that Load cell cables are required. A six wire load cell cable, besides having +/- excitation and +/- signal lines also has +/- sense lines.

Conductor Type : Electrolytic Stranded Annealed Bare Copper Conductor, Tinned Plated Copper and other on request

Conductor Size : AWG 24,22,20,18

Insulation Material : PVC / PTFE / PE

Isolator : Polyimide Tape / Polyester Tape

Foil Shield (Optional) : Aluminum foil with drain wire

Overall Metal Shielding : Tinned Plated Copper Shielding / Bare Copper Shielding

Armouring (Optional) : G.I. Round Wire/G.I. Flat Strip/SS Wire Braiding

Outer Sheath : PVC/PTFE/FEP etc.

- ✓ EB-XL Irradiated Cables
- ✓ Lance Cable
- ✓ Composite Cable
- ✓ Co-axial Cable
- ✓ Cat 5 & Cat 6 Cable
- ✓ Customized Cable according to meet special requirements

SLEEVES

Tempsens offer variety of Sleeves suitable for wide temperature range with various insulation such as PTFE, FEP, Silicon, Fibre Glass, S.S. braided, Polyimide & PVC.

Inner Diameter : 0.50 mm to 30 mm or as per requirement

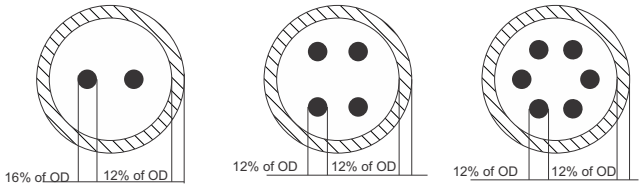
Color : As per Customer requirement

FEATURES

- ✓ Max. Temp. Up to 500°C
- ✓ Excellent Heat Resistant
- ✓ Excellent Dielectric Strength
- ✓ Excellent Chemical Resistant
- ✓ Non Stick Property
- ✓ Weather Resistant
- ✓ Flame Retardant
- ✓ Good Thermal Stability

MINERAL INSULATED METAL SHEATHED CABLES

Mineral insulated cables are designed for high-temperature applications and particularly strict requirements with regard to mechanical, chemical and electrical stability.



MINERAL INSULATED THERMOCOUPLE CABLES

Mineral insulated thermocouple cables have inner conductors of Thermocouple base material as per standard ASTM E 585/585M and ASTM E 839.

OD (MM)	TYPE	SHEATH	MGO GRADE	ACCURACY
1.5 2.0 2.2 3.0 4.5 5.0 6.0 8.0 9.5 10.0 12.7	K - Simplex KK - Duplex J - Simplex JJ - Duplex E - Simplex EE - Duplex N - Simplex NN - Duplex T - Simplex TT - Duplex R - Simplex RR - Duplex S - Simplex SS - Duplex	304 – SS304L 310 - SS310 316 - SS316L 321 - SS321 600 - INCONEL 600 **Note:-** Diagonal Element Supplied Unless Specified	STANDARD (⩾ 96% PURE) HIGH PURITY (⩾ 99.4% PURE)	CLASS 1 CLASS 2 As per IEC 584-2 or ANSI MC 96.1

MINERAL INSULATED RTD CABLES

Mineral insulated cables for RTDs have inner conductors of copper, copper-nickel alloys, nickel etc. metals.

OD (MM)	NO. OF CONDUCTOR	CONDUCTOR MATERIAL	SHEATH	MGO GRADE
1.5 2.0 2.2 3.0 4.5 5.0 4.8 6.0 8.0 9.5	3 4 6 8	Ni - Nickel Cu - Copper NiCu - Constantan	304 - SS304L 316 - SS316L 321 - SS321 600 - INC 600	STANDARD (⩾96% PURE) HIGH PURITY (⩾ 99.4% PURE)

OTHER SPECIAL TYPE OF MI CABLES

Mineral Insulated Heating Cables

Mineral Insulated Heating Cables are constructed with a solid resistor element embedded in highly compacted mineral insulation. MI cables are built to handle high temperature, high wattage applications.

Mineral Insulated Copper Cables (MI Power Cables)

Mineral Insulated Copper cable is used as an electric cable for critical areas of plant and follows standard of IEC/EN 60702 Part 1. It has two voltage grade 500V & 750V

Coaxial Cables/Triaxial Cables

Triaxial cable is a type of electrical cable similar to coaxial cable, but with the addition of an extra layer of insulation and a second conducting sheath. It provides greater bandwidth and rejection of interference than coaxial cable.

SPNDS

Self-Powered Neutron Detectors are in-core flux monitors in nuclear power reactors.The typical SPND is a coaxial cable consisting of an inner electrode (the emitter), surrounded by insulation and an outer electrode (the collector).

LINEAR HEAT DETECTOR CABLE

- Semiconductor insulation
- Double Metallic Sheathed
- Negative Temperature Gradient
- Male - Female Edison Connectors

Application : To detect fire in Ship Engine area and provide alarm to take necessary action

THERMAL & CABLE SOLUTIONS

www.tempsens.com

INDIA

Tempsens Instruments (I) Pvt. Ltd. U# II
A-190, Road No. 5, M.I.A.,
Udaipur-313003 (Rajasthan) INDIA
Ph. : +91-294-3052900,
Fax : +91-294-3052950
Email : info@tempsens.com

GERMANY

Tempsens Instruments GmbH
Loehestrasse 37,
53773 Hennef, GERMANY
Ph. : +49 2242 8703-22,
Fax : +49-2242-8703-20,
Email: basant@tempsens.com
hmueller@tempsens.de

INDONESIA

Pt. Tempsens Asia Jaya
Jl. Jembatan III Komplex F.77 No. 6C
Jakarta Utara14450, INDONESIA
Hp. : (+62)877 8080 4433
Telp. : (+62) 21 666 04006
Fax : (+62) 21 661 6789
Email : support@tempsens-asia.com

UAE

Tempsens Gulf Oilfield Equipment LLC
United Arab Emirates
Email:uae@tempsens.com

TEMPSENS

Pyrotech Group Company
www.pyrotechindia.com