



Product Catalogue



✦ Thermocouples ✦ M. I. Thermocouples ✦ RTDs ✦ Thermowells & Protection Tubes
✦ Industrial Heaters ✦ Compensating Cables ✦ Connection Heads & Accessories



HEAT CONTROLS

E-mail : heatkolkata@yahoo.co.in, heatkolkata1996@gmail.com

COMPANY PROFILE

Heat Controls established in 1975, is the leader in manufacturing of high quality temperature sensors for over 30 years. With its strong experience & technological skills, it has succeeded in building strong relationship with more than 800 customers all over India. Our exhaustive range of products provide solutions to conventional temperature sensors to high-tech industrial thermocouples for a variety of industries like Steel, Glass, Power, Cement, Chemicals and many other OEM's. Our state-of-the-art manufacturing unit located in Kolkata is equipped with modern equipments & testing systems, which not only assembles sensors, but provides temperature solutions to the Industries. Constant upgradation to the newer technology & measuring systems along with proven past records makes us leader in the field of temperature measurement.

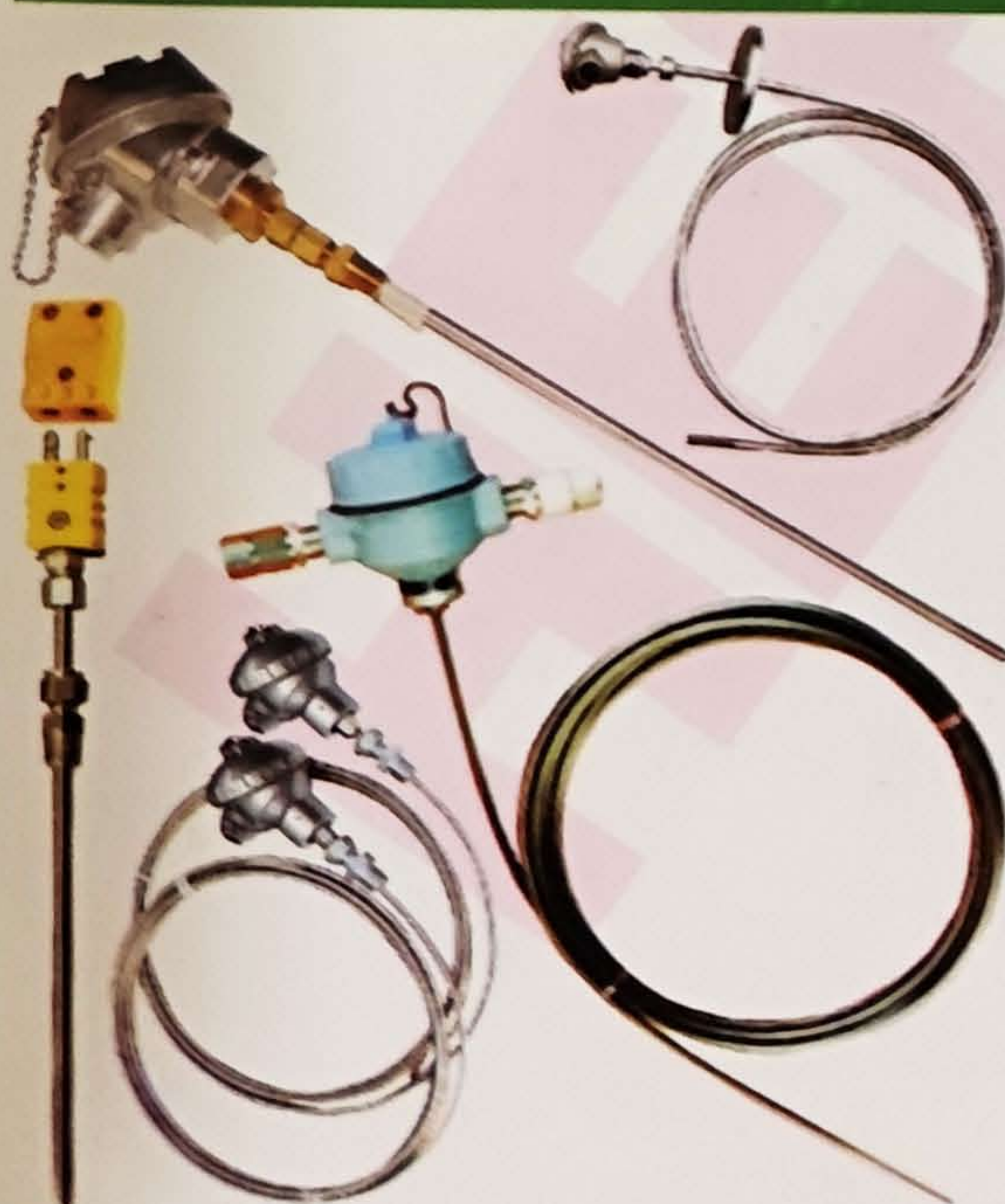
We also have testing systems and provides temperature solutions to all the Industries. we can offer you various types of thermocouples in different insulations. All the thermocouples are checked with master Sensors calibrated from the NABL Accredited Lab.

MOLTEN ALUMINUM & ZINC THERMOCOUPLE :



- Type : R,K,J
- Element : Simplex/Duplex
- Hot Arm OD : 28mm & above upto 50mm
- Hot Arm Length : AS PER REQUIREMENT
- Cold Arm OD : 21.3mm
- Cold Arm Length : As per requirement
- Hot Arm Material : Tube with one end plugged, Drilled bar stock
Sheath Material: SS 304, SS 316, SS 310, Inconel 600, HRS 446, Ceramic Coated Cast Iron, Silicon Carbide, Silicon Nitride, Graphite, Titanium, Tungsten, PTFE etc.
- Cold Arm Material : MS/GI/SS 304/ SS 316/ SS 310 etc.
- Termination : Al. Head/Flp. Head etc.

MINERAL INSULATED THERMOCOUPLE CABLES & ASSEMBLIES :

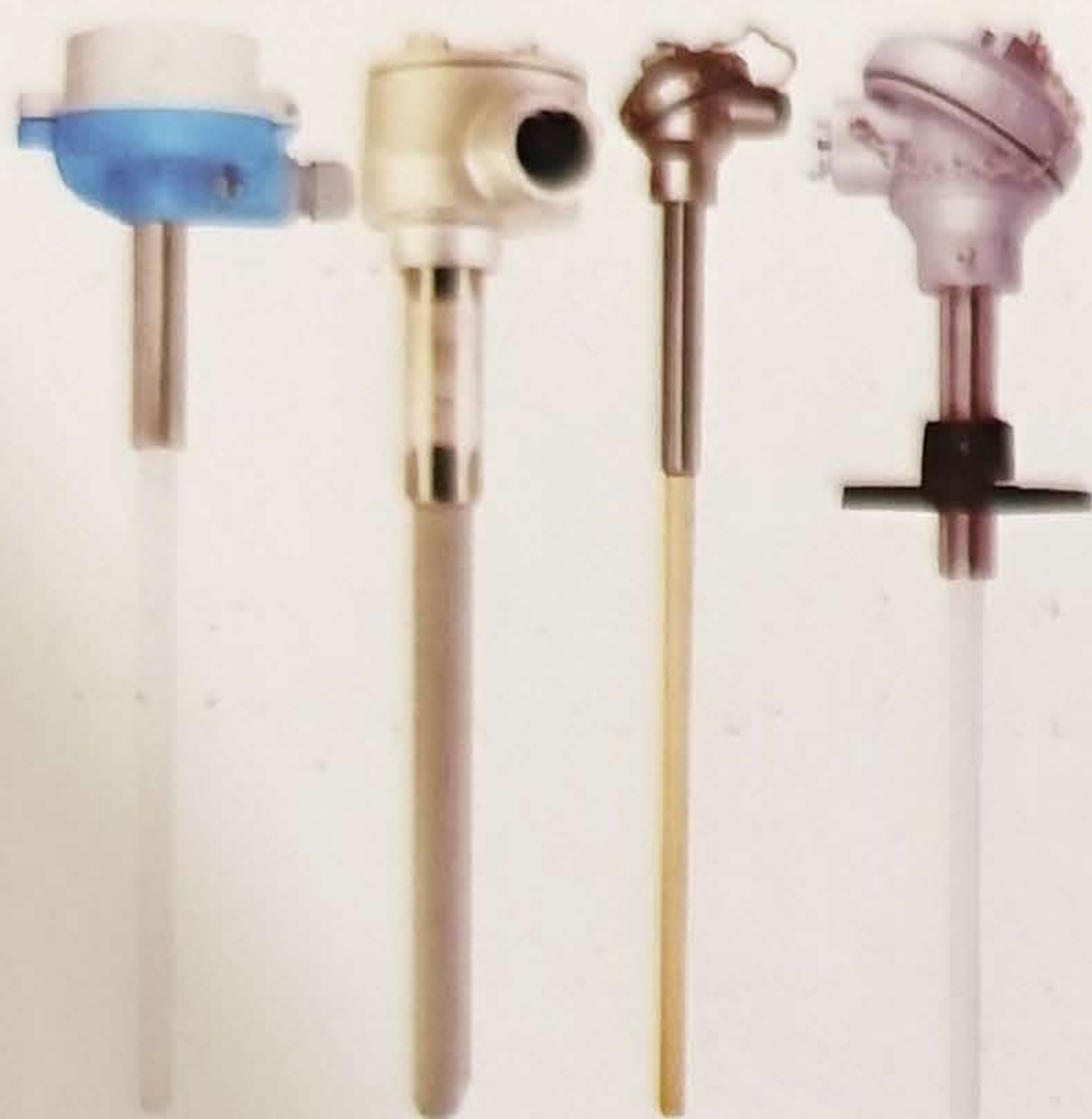


M.I. Cables are used as extension of thermocouples or itself used as thermocouples. Makes of .i. Cables are of "isomil" or "tyco". The benefits of using m.i. Thermocouple cables, that is available in single length assembly from minimum 1 feet to maximum length 50 mtrs length & is easy to transport. Thermocouple can be made in coil form. The accuracy of m.i. Assembly is available in 2 classes 1] $\pm 2.2^\circ\text{C}$ 2] $\pm 1^\circ\text{C}$. Its so flexible that it can measure temperatures where base metal thermocouple can not sense job temperature. It measure temperatures in curve areas / deep vessel tanks / drum industries/boilers/bell furnaces/vacuum furnaces/rotary furnaces mm-0.75mm-1mm-1.5mm-3mm-4.5mm-6mm-8mm Sheathings available : SS.316, SS 310 & inconel 600. Available in simplex & duplex types. Types available : K,J,R,S,B,T,E, RTD. Cold end junctions : ceramic block with spring loaded screws, head type, transmitter type, flying lid type, post seal type male-female connector type etc.. Temp. Range from -200°C to $+2300^\circ\text{C}$.

THERMOCOUPLE

High accurate Thermocouples for variety of application

NOBLE METAL THERMOCOUPLES :



TYPE	:	B, R, S
ELEMENT SIZE	:	0.30, 0.35, 0.4, 0.45, 0.5mm, other on request
PROTECTION SHEATH	:	Ceramic (C-799), 610, Inconel, Silicon carbide, etc.
CONFIGURATION	:	Simplex/Duplex/Multipoints.
SPECIAL	:	Tri level Thermocouples, Special cladding (Thimble) etc. Hot Blast & Stove dome Thermocouples, Furnace Temperature Thermocouples

METAL THERMOCOUPLES :



TYPE	:	K, J, N, T, E
ELEMENT SIZE (M1)	:	0.25, 0.5, 1, 1.5, 3, 4, 5, 6, 8 mm, Other Sizes on request
(Non-M1)	:	1.2, 1.6, 2, 2.5, 3.2 (mm), Other Sizes on Request
PROTECTION SHEATH	:	Seamless SS304, SS321, SS316, SS310 HRS 446, INCONEL 600/800, Nickel, Hastalloy, Titanium, Ceramic 610 & C-799, Silicon Carbide Monel etc.
CONFIGURATION	:	Simplex/Duplex/Multipoints

SPECIAL THERMOCOUPLES :



- Miniature Thermocouples with minimum 0.25mm Dia
- Squeezd Thermocouples with small tip dia
- Trilevel Thermocouples
- Coated Thermocouples (PTFE, Tungsten Carbide, Ceramic, Steatite etc.)
- Thermocouple with IBR Approved Thermowells
- High Temperature Ceramic Spouts Limit.
- Special sensors as per ASTM-E235
- W-WRe thermocouples

RESISTANCE TEMPERATURE DETECTORS

High accurate RTDs for General and Critical applications

SPECIAL RTDs :



- Slide shoe Bearing RTDs
- Vibration proof RTDs for Bearing & DG sets
- Motor & Transformer winding temperature RTDs
- Handheld & Probe in various designs
- RTDs with IBR approved Thermowells
- Strap on RTDs for nuclear
- High Temperature RTDs upto 650°C
- High Accuracy RTDs upto 1/10 DIN
- Semi Standard PRTs.

MINERAL INSULATED RTDs



- Type : Pt 100, 200, 500, 1000, copper 50,53. etc
- Element size (Ml) : Wire wound ceramic encapsulated
Wire wound Glass encapsulated
Thin film ceramic encapsulated
- Connection : 2, 3, 4, 6, 8 wire
- Accuracy : Class A, B 1/2, 1/3, 1/5, 1/10 DIN
- Protection Sheath: SS 304, SS 321, SS 316, SS 310, Inconel 600/800, MRS 446, Hastalloy, Monel Etc.

THERMOWELLS AND PROTECTION TUBES

A wide choice of Thermowells and variety of Protection tubes like Refractory, Stainless Steel, special Ni alloy protection tubes are available for various applications.

SPECIAL THERMOWELLS & PROTECTION TUBES :



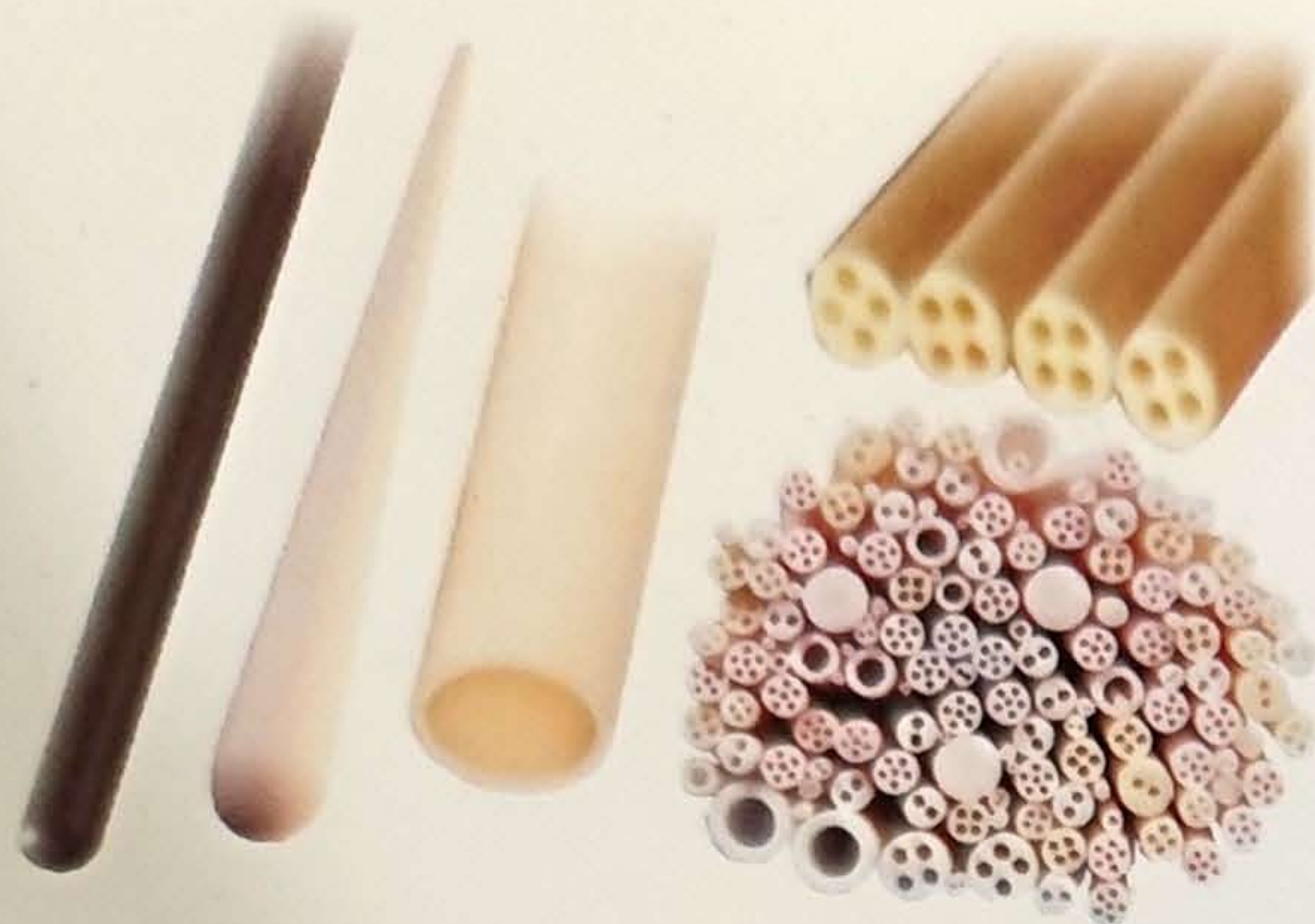
- Metal Thermowells with Tungsten carbide / Ceramic / PTFE / PVDF / PFA coatings
- Solid sintered tungsten carbide
- Silicon carbide (Recrystallised & Nitride Bonded)
- Platinum thimble
- Tantalum, Titanium, Nickle cladding,
- Tantalum Tungsten (Ta 10W) alloy
- Graphite
- Silicon Nitride
- Other Material in various sizes available on request

THERMOWELLS :



- Material : SS304, SS 316, SS 316L, SS 321, SS310
MRS 446, INCONEL 600/800, 601
Hastalloy, Monel, Alloy 20
Titanium etc.
- Type : Drilled barstock, Fabricated
- Construction : Tapered, Straight
- Process connection : Screwed, Flanged

PROTECTION TUBES :



Material	: Recrystallised Alumina 99.7%
Type	: KER 710(0-799)
Length	: 350, 530, 600, 650, 740, 900, 1030, 1200 1430 mm etc.
ODxID	: 6x4, 8x5, 10x6, 12x8, 15x10, 20x15 24x18mm etc.
Insulating Tubes OD	: 2/4/6 Holes etc. 2.8, 3.5, 5.5, 8.5, etc,

ACCESSORIES

CONNECTORS :



Plug and jack compensated connectors for thermocouples.

J,K,R,S,B,T,E,Types

Standard, Miniature, Panel Mounted, Simplex, Duplex

Material : Glass filled Nylon and Ceramic

Colour coding : Various Standards

ELECTRONICS :



- Temperature indicators - Panel mounted, hand held
- Temperature controllers
- Universal controllers
- Signal Isolators
- Signal Converters RS 232 / 485
- Head mounted transmitters
- Temperature Scanners
- Recorders etc.

CONNECTION HEADS :



MATERIAL	: Die cast Aluminium , Stainless Steel, Plastic etc.
TYPE	: A,B,AA, DNAG, KNE etc. Single entry, double entry, Miniature
CABLE ENTRY	: 3/4" ET, 1/2" NPT/BSP
PROTECTION CLASS	: IP 67, Ex-proof II A/B, II C

PYROMETERS

A wide range of non-contact pyrometers are available for hand held on line application for temperature range from - 100.....4000⁰C.

PYROMETERS :



Temperature Range : -60.....750⁰C with laser targeting light
 -60.....1500⁰C with Dual laser Pointer, Buzzer, Flash LED, Backlight and Data Storage
 200.....2400⁰C with Dual laser Pointer, Buzzer, Backlight and Data Storage.

INDUSTRIAL HEATERS

CABLE FOR TEMPERATURE SENSORS & INSTRUMENTATION



Compensating and Extension Cables for thermocouples J,K,T,E,N,R,S,B Types, RTD Cables in three Wire & four wire configuration for simplex and six & eight Wire for duplex are available.

Wire : 14 to 36 gauge (AWG/SWG)
 Gauge : Solid / Multistrand
 Conductor : Single and double fibre glass,teflon,ceramic fibre, silica fibre, SS braided, PVC etc.
 Insulation : Armored / Unarmored
 Other Cables for Signal, Control and Instrumentation are available with variety of insulation and various configurations

HEATER :



CONFIGURATIONS : Swaged in Leads, Crimped on Leads, Post terminals, Right Angle Leads, Teflon Seal, Silicon Rubber Seal, Epoxy Seal, Swaged in Braid, Right Angle Stainless Steel Braid, SS Flexible Conduit, Hex head pipe fittings, Flanges etc.

TECHNICAL REFERENCES

TOLERANCE VALUES OF RTD PT-100 (IEC 751)

TEMP (°C)	BASIC VALUES	TOLERANCE			
		CLASS A		CLASS B	
		(+°C)	(+Ω)	(+°C)	(+Ω)
-200	18.52	0.55	0.24	1.3	0.56
-100	60.26	0.35	0.14	0.8	0.32
0	100	0.15	0.06	0.3	0.12
100	138.51	0.35	0.13	0.8	0.30
200	175.86	0.55	0.20	1.3	0.48
300	212.05	0.75	0.27	1.8	0.64
400	247.09	0.95	0.33	2.3	0.79
500	280.98	1.15	0.38	2.8	0.93
600	313.71	1.35	0.43	3.3	1.06
700	345.28	-	-	3.8	1.17
800	375.70	-	-	4.3	1.28
850	390.45	-	-	4.6	1.34

EMISSION CHART

EMI in %		EMI in %	
"Black body"	100	Oil Paints	85..95
Human skin	98	Asphalt	85
Black matter	95	Textiles	75..95
Carbon black	95	Graphite	75..92
Wood	80..92	Cement	90
Masonry	85..95	Water	95
Chamotte	85..95	Glass	80
Rubber	85..95	Quartz	80
Porcelain	85..95	Steel (Oxidized)	60..80
Ceramics	85..95	Steel (Blank)	10..30
Paper	85..95	Aluminium (Blank)	2..15
Plaster of Paris	85..95	Aluminium (Elox)	92

WIRE INSULATION IDENTIFICATION AND APPLICATION GUIDE :

INSULATION CODE	INSULATION	APPEARANCE OF CABLE	TEMP. RANGE INSULATION	ABRASION RESISTANCE	FLEXIBILITY	WATER SUBMERSION	RESISTANCE TO:	
							FLAME	HUMIDITY
P	Polyvinyl Chloride (PVC)		-40 to 105°C	GOOD	EXCELLENT	GOOD	GOOD	GOOD
EF	FEP		-200 to 200°C	EXCELLENT	GOOD	EXCELLENT	EXCELLENT	EXCELLENT
S	Silicon		-40 to 200°C	GOOD	GOOD	EXCELLENT	GOOD	EXCELLENT
T	PTFE		-267 to 260°C	EXCELLENT	GOOD	EXCELLENT	EXCELLENT	EXCELLENT
PF	PFA		-260 to 260°C	EXCELLENT	GOOD	EXCELLENT	EXCELLENT	EXCELLENT
K	Kapton		-267 to 316°C	EXCELLENT	GOOD	GOOD	EXCELLENT	EXCELLENT
F	Fiber Glass		-73 to 600°C	GOOD	GOOD	EXCELLENT	EXCELLENT	EXCELLENT
CF/SF	Ceramic Fiber/Silica		-72 to 800°C	POOR	GOOD	POOR	EXCELLENT	EXCELLENT
RF/NF	Refrasil/Nextel Silica yarn		-73 to 1200°C	POOR	GOOD	POOR	EXCELLENT	FAIR

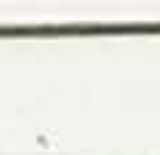
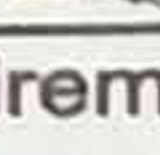
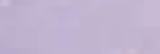
THERMOCOUPLES REFERENCE DATA (ITS 90) mV v/s Temperature

TYPE	"T" Cu-CuNi	"J" Fe-CuNi	"K" NiCr-NiAl	"N" NiCrSi-NiSi	"S" PtRh10%-Pt	"R" PtRh13%-Pt	"B" PtRh30%-PtRh6%	"E" NiCr-CuNi
Calibration	IS 2056/ASTME 230	IS 2057/ASTME 230	IS 2054/ASTME 230	ASTME 230	IS 2055/ASTME 230	IS 2055	IS 6720	ASTME 230
Tolerances	Standard	± 1°C or ± 0.75%	± 2.2°C or ± 0.75%	± 2.2°C or ± 0.75%	± 1.5°C or ± 0.25%	± 1.5°C or ± 0.25%	± 0.5%	± 1.7°C or ± 0.5%
	Special	± 0.5°C or ± 0.4%	± 1.1°C or ± 0.4%	± 1.1°C or ± 0.4%	± 0.6°C or ± 0.1%	± 0.6°C or ± 0.1%	Over 800°C	± 1°C or ± 0.4%
TEMPERATURE °C	-100	-3,379	-4,633	-3,554	-2,407	-	-	-5,237
	0	0	0	0	0	0	0	0
	100	4,279	5,269	4,096	2,774	0,646	0,647	6,319
	200	9,288	10,799	8,138	5,913	1,441	1,469	13,421
	300	14,862	16,327	12,209	9,341	2,323	2,401	21,036
	400	20,872	21,848	16,397	12,974	3,259	3,408	28,946
	500	-	27,393	20,644	16,748	4,233	4,471	37,005
	600	-	33,102	24,905	20,613	5,239	5,583	45,093
	700	-	39,132	29,129	24,527	6,275	6,743	53,112
	800	-	45,494	33,275	28,455	7,345	7,950	61,017
	900	-	-	37,326	32,371	8,449	9,205	68,787
	1000	-	-	41,276	36,256	9,587	10,506	76,373
	1100	-	-	45,119	40,087	10,757	11,850	5,780
	1200	-	-	48,838	43,846	11,951	13,228	6,786
	1250	-	-	50,644	45,694	12,554	13,926	7,311
	1300	-	-	52,410	47,513	13,159	14,629	7,848
	1400	-	-	-	-	14,373	16,040	8,956
	1500	-	-	-	-	15,582	17,451	10,099
	1600	-	-	-	-	-	11,263	-
	1700	-	-	-	-	-	12,433	-

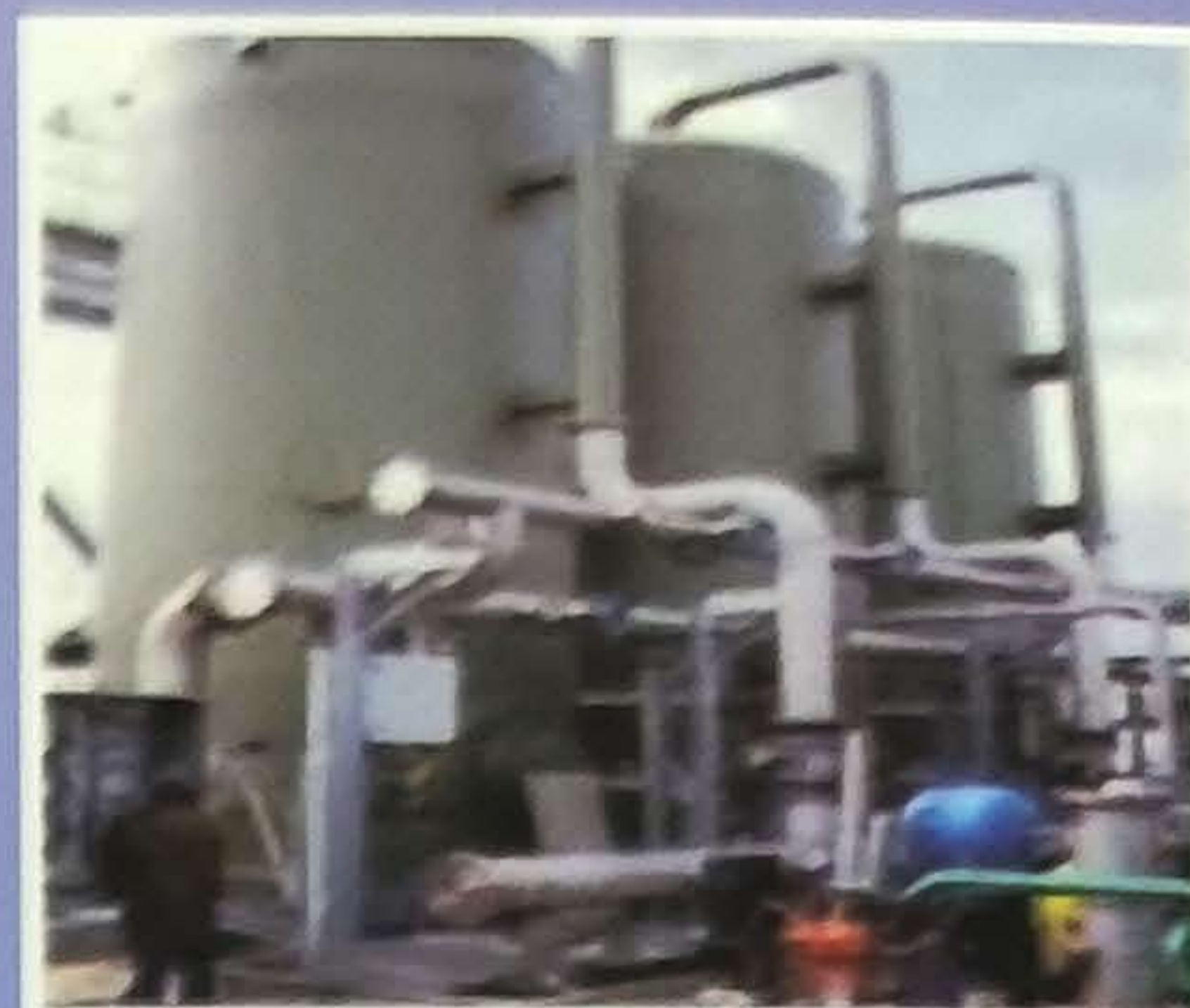
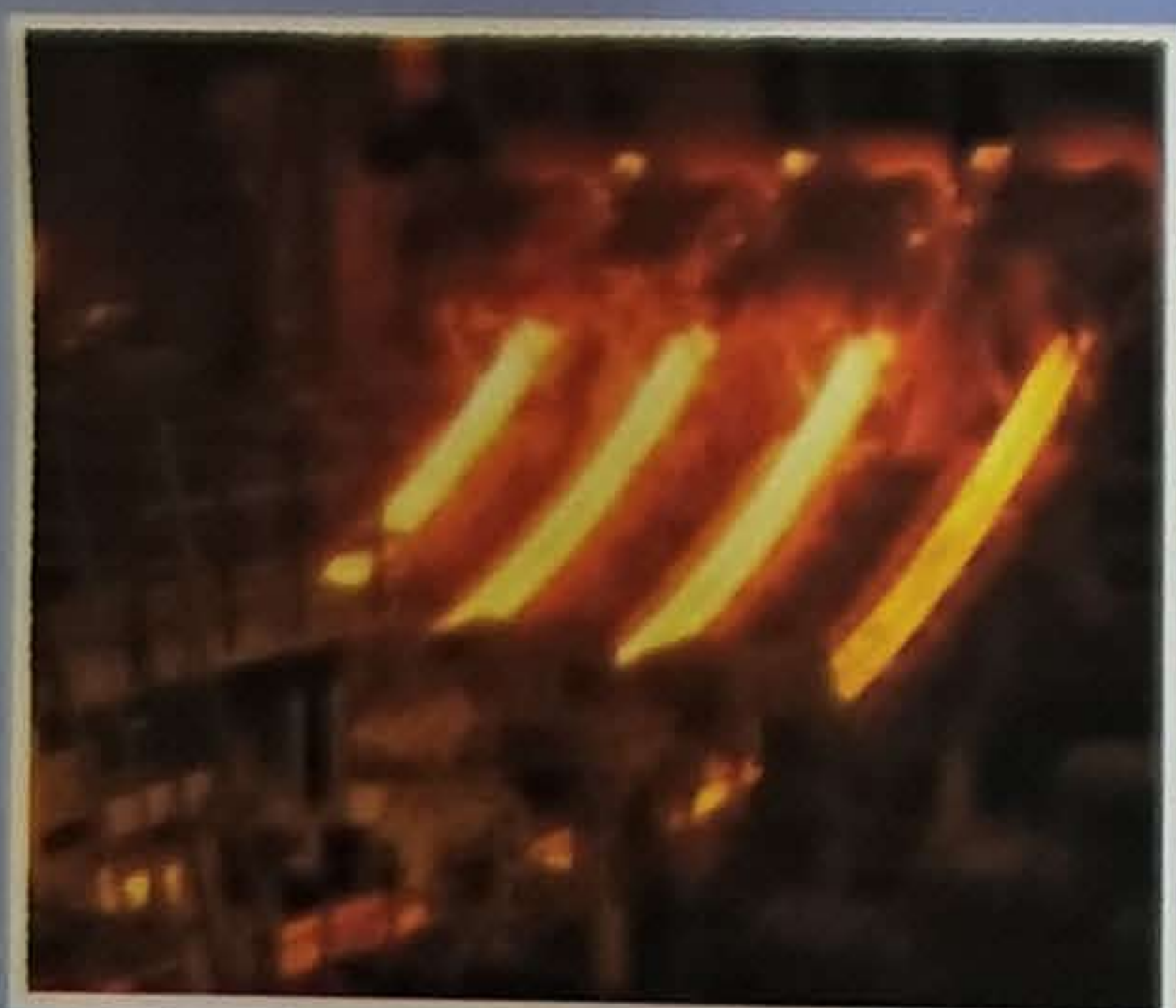
SHEATH MATERIALS

SHEATH	MELTING POINT °C	USABLE TEMP °C	CHARACTERISTICS
SS-304	1430	800	High resistance to heat and corrosion
SS-316	1430	900	Excellent resistance to Heat, Acids & Alkalies
SS-321	1400	900	Excellent resistance to corrosion
SS-310	1410	1100	Good oxidation resistance at low temperature and sulphur atmosphere
HRS446	1400	1150	Excellent oxidation resistance at elevated temperature and sulphur atmosphere
Inconel 600/800	1400	1100	Excellent oxidation resistance (do not use in sulphur atmospheres)
High Alumina 610	-	1500	General purpose
Sintered Alumina 710/C-799	1800	1500	Excellent thermal, mechanical, electrical and corrosion resistant.
Recrystallised Silicon Carbide	1850	1500	Outstanding resistance to thermal shock, good mechanical strength.
Silicon Nitride	-	-	Recommended for molten aluminium application

COLOUR CODE OF COMPENSTING CABLES & THERMOCOUPLES

THERMOCOUPLE CONDUCTOR COMBINATION TYPE	CONDUCTOR		INTERNATIONAL COLOUR CODE TO IEC 5843:1988	AMERICAN TO ANSI/ISA-5.1	JAPANESE TO JIS C 5843-1988
	EXTENSION CABLE	COMPENSATING CABLE			
K	KX				
		KCA			
		KCB			
T	TX				
J	JX				
N	NX				
		NC			
E	EX				
R		RCA			
		RCB			
S		SCA			
		SCB			
B		BC			

Other sheath materials like Titanium, Tantalum, Molybdenum, Graphite, Aluminum etc. are available against specific requirement  **HEAT CONTROLS**



HEAT CONTROLS

8 A, Madhab Das Lane, Kolkata-700 006

M.:9331016908,9433756156

Ph.:(O) 2555-2747,Telefax : 033-2555-7903

E-mail : heatkolkata@yahoo.co.in,
heatkolkata1996@gmail.com

