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*We manufacture mineral insulated
cable for the most critical
temperature environments*

M.I. Cable Technologies Inc.

Sales Catalog





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Introduction



What We Offer You

A company devoted exclusively to manufacturing MI cable for the OEM market

MICT is committed to its customers and does not manufacture finished temperature probes. We simply do not compete in the temperature measurement industry against those whom we value so highly, our customers. Our only product is MI cable and all of our attention and efforts are concentrated on being the best manufacturer and supplier of MI cable in the world.

Founded in 1996, MICT has significant experience in the MI cable industry

The senior managers of MICT bring over sixty years of MI cable experience to the company, in the key areas of R&D, purchasing, production, sales, and customer service. We understand both a customer's needs and problems, and can provide products and solutions based on a solid history of success in the MI business.

Powder filled and block filled products

MICT manufactures its cable using either MgO block insulators or MgO powder, depending on the requirements and design of the product. Powder filling is best suited to custom configurations; block filling provides improved conductor positioning and highly consistent compaction density. MICT is one of the few thermoelectric cable manufacturers in the world with the technology available to take advantage of either filling method.

Seamless cable sheaths

All of our cable products are manufactured from large diameter tube, guaranteeing a consistent sheath thickness, eliminating internal weld beads, and ensuring that sheath splitting will never be a problem.

A wide range of thermoelectric cable

We manufacture cable in a variety of sheath materials, calibrations, configurations, accuracies, and powder grades. Our standard range alone encompasses thousands of products and a large number of specials are available by request. Just ask and we can probably supply it.

High quality cable products

MICT's thermocouple cable is manufactured to the strict specifications of ASTM E585 using either standard grade or high purity MgO. For high reliability applications, including nuclear, cable with high purity powder insulation is manufactured to meet the requirements of ASTM E235. Our RTD extension cable fully complies to ASTM E2821 and is available in various conductor configurations.

In addition, MICT produces a wide array of heating cable and cold leads. Our Incoloy 825 sheathed bulk heating cable is listed as a component under CSA Std. C22.2 No. 130-16.

Custom design capability

If you have a unique MI cable application, call us. Our cable designers have the knowledge, and our manufacturing processes have the flexibility, to provide innovative solutions to many cable design problems. Our experience will show.

Very competitive prices

We are absolutely committed to providing the highest quality MI cable products at reasonable prices. Our raw material purchases, manufacturing processes, and administrative procedures are continuously monitored to ensure our costs stay in line so that even small savings can be passed on to our customers. Call us for a competitive quote and let us know what you think.

A commitment to superior customer service

We recognize that all the manufacturing capability in the world is meaningless unless we attend to our number one job: satisfying our customers. Everything else about our business follows; we really do believe: "If you have a problem, we have a problem". Call us to compare and let us know how we do; we want our service to be the best anywhere.

Raw materials fully compliant with latest RoHS and REACH requirements

MICT continuously ensures that raw materials used conform to RoHS on the restriction of Hazardous Substances as well as REACH on the content of high-risk chemicals. It is important to us that such substances are not contained within our raw material, and therefore, in your products.



Quality Assurance

MICT assures high quality through a company wide QA program supervised by the Chief Quality Officer. Thermocouple cable is manufactured to the requirements of either ASTM E585 / IEC 61515 or E235 (standard grade MgO excepting; high purity powder meets the specifications of both E585 / IEC 61515 and E235). Every coil of thermocouple cable is monitored through production, inspected and finally tested for conductor uniformity, physical dimensions, dielectric strength, insulation resistance, electrical continuity, and sheath integrity. Calibration of thermocouple cable is performed against certified reference standards in general accordance with ASTM E220.

Each shipment of mineral insulated cable is accompanied by a detailed Certification Report showing the calibration results as well as the chemical analysis of the tube, conductors, and MgO. A Certificate of Conformance can be issued if requested at time of order.

MICT is proud to announce that it is registered to ISO 9001:2015 and ISO17025:2017.

MICT Quality Policy

We manufacture mineral insulated cable for the most critical temperature environments.

We are committed to:

- Continually maintain a quality system that complies with ISO 9001:2015
- Exceed industry technical standards (ASTM E585 / IEC 61515, E2821, CSA 22.2 no. 130)
- Ensure employee understanding and support of our quality system
- Establish suppliers who share a commitment to quality
- Enhance customer satisfaction through continual improvement of the quality management system

Our calibration laboratory is registered to ISO17025:2017 for increased calibration accuracy and reliability of product certification. Additionally, heating cable and cold leads with Incoloy 825 sheathing is listed as a component under CSA Std. C22.2 No. 130-16, certificate #70119587 Class 2872 01 and 2878 heaters.





Calibration Laboratory



MICT provides calibration results for all thermocouple cables manufactured in our factory with each shipment. Our laboratory uses the comparison calibration method in general accordance with ASTM E220. Calibration capability is available up to 1200°C (2200°F) on suitable thermocouple types and sheath materials. The laboratory is composed of two fully independent lines structured for high volume calibrations. Both lines routinely calibrate at the following fixed points: 100°C, 300°C, 500°C, 700°C, 1093°C and 1200°C.

To complement the 10 furnaces in operation, the lab is also equipped with two oil baths that routinely calibrate T-type at 100°C, 200°C, and 280°C. Cryogenic T-type calibrations are achieved through the use of a liquid nitrogen bath (-196°C).

MICT works continuously to reduce the measurement uncertainty at each calibration temperature and new estimates are made every six months, ensuring any deviations are identified early so that results generated by the laboratory remain consistent and accurate.

The laboratory is accredited to ISO17025:2017 and both ends of each coil MICT produces are calibrated. For thermocouple cables, the certificate provides calibration test results, with errors stated in percent, and raw materials chemistry, traceable by heat or lot number. For Heating and RTD extension cables, the certificate provides unit conductor resistance values, as well as the raw materials chemistry.

Certificates issued by MICT comply with EN10204 Type 3.1 requirements. For the most recent k=2 expanded uncertainty of measurement values contact our Sales department.

THERMOCOUPLE CABLE CERTIFICATION

Calibration No. AC-2017

Calibration Date: 11 Apr 2018

Calibrated For: South, Minnesota

CALIBRATION REPORT

Temperatures	ASTM Accuracy				Special				IEC Accuracy				Class 1			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
100°C	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
300°C	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
500°C	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
700°C	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1093°C	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1200°C	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

RAW MATERIALS REPORT

Element	Heat No.	Chemical Analysis	Heat No.	Chemical Analysis
C	0.014 %	0.002 %	C	0.002 %
Si	0.27 %	0.02 %	Si	0.02 %
Mn	0.18 %	0.02 %	Mn	0.02 %
S	0.0005 %	0.001 %	S	0.001 %
Cr	0.001 %	0.004 %	Cr	0.004 %
Ni	0.001 %	0.005 %	Ni	0.005 %
Pb	0.001 %	0.001 %	Pb	0.001 %
Cu	0.001 %	0.001 %	Cu	0.001 %
Al	0.001 %	0.001 %	Al	0.001 %
Fe	0.001 %	0.001 %	Fe	0.001 %
Co	0.001 %	0.001 %	Co	0.001 %
W	0.001 %	0.001 %	W	0.001 %
Mo	0.001 %	0.001 %	Mo	0.001 %
Ag	0.001 %	0.001 %	Ag	0.001 %

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Products



Products - Introduction

MICT manufactures and stocks a wide range of thermocouple, RTD and heating cables in both Imperial (inch) and Metric (millimeter) sizes.

Thermocouple cables are manufactured to meet the requirements specified in ASTM E585/E585M and IEC 61515, internationally recognized standards which specify the base metal thermocouple types. Emf outputs comply with ASTM E230/E230M and IEC 584-1; MICT classifies its thermocouple cables separately as meeting the calibration tolerances of ASTM E230/E230M and IEC 584-2. Thermocouple cable users should note that Emf tolerances on initial calibration are not identical between ASTM and IEC and care should be taken in specifying accuracies as "special", "standard", "class 1", or "class 2".

MICT's cables manufactured under ASTM E585/E585M and IEC 61515 may be used, with proper testing and documentation, in high reliability applications requiring compliance with ASTM E235.

MICT's RTD extension cables adhere to very high quality standards and conform to ASTM E2821 which ensure the best performance of finished IPRT (RTD) sensors which are required to comply with ASTM E1137/E1137M, an internationally recognized standard dealing with the manufacture and performance of industrial platinum resistance thermometers (IPRT).

Complete technical specifications for all of MICT's RTD extension cables are available and our sales staff has the knowledge and experience to help the user make a correct product selection. Factors to consider include cable diameter, number of wires, wire material, wire diameter, sheath material, sheath thickness, resistance balance, and MgO purity.

In general, most IPRT sensors will employ a 316L or Inconel 600 sheath, nickel or copper wires, and MgO more than 97% pure as temperature ratings are limited to less than 650°C.



All raw materials used in the manufacture of either MICT's thermocouple or RTD extension cables are of the highest quality and meet our own strict specifications as well as all industry standards. We provide full traceability of the raw materials used in each coil on the cable certificate which accompanies each shipment.

MICT currently holds a bulk cable listing with CSA Std. C22.2 No. 130-16 certificate #70119587 for Class 2872 01 and 2878 01 heaters and can supply a wide range of products specific to your projects in Incoloy 825. For products not requiring CSA certification, heating cable manufactured with an Inconel 600, 316SS or 321SS sheath is available. Low to high electrical resistance and cold lead options are available.

MICT has available the engineering capability, test equipment, procedures, and experience to design custom cables for special applications. Trials will often be necessary to verify design performance. Contact the Sales department for assistance at your convenience.

It is to be noted that MICT's mineral insulated cable products are RoHS compliant and meet the requirements of EU Directives 2002/95/EC and 2003/11/EC. Up to date Declarations available upon request.



Typical Chemistry of Magnesium Oxide (MgO) Insulation

	Standard Purity	High Purity
MgO	98.77%	99.69%
Al ₂ O ₃	0.06%	0.05%
CaO	0.82%	0.18%
Fe ₂ O ₃	0.10%	0.03%
SiO ₂	0.25%	0.13%
S	5 ppm	10 ppm
C	50 ppm	-----
B + Cd	36 ppm	<10 ppm

Standard purity MgO conforms to ASTM E1652 Type 2 requirements

High purity MgO conforms to ASTM E1652 Type 1 requirements

Cable Sheath Material Specifications

ASTM TP -	UNS	Werkstoff - Nr
304 L	S 30403	1.4306
310 S	S 31008	1.4845
316 L	S 31603	1.4404
321	S 32100	1.4541
347	S 34700	1.4550
446	S 44600	1.4762
Inconel 600	N 06600	2.4816
Inconel 601	N 06601	2.4851
Incoloy 800H	N 08800	1.4876
Incoloy 825	N 08825	2.4858
253MA *	S 30815	1.4893
Alloy TD® *	N/A	N/A

* 253MA and Alloy TD® is NOT designated by ASTM type number



Thermocouple Cables

MICT manufactures and stocks a wide range of thermocouple cable in both Imperial (inch) and Metric (millimeter) sizes.

Cables manufactured to Imperial sizes meet the requirements of ASTM E585/E585M. Those manufactured to Metric sizes meet the requirements of IEC 1515.

Standard sizes, calibration types and sheath materials are shown below:

Custom sizes are available on special request. Please contact the Sales department.

Cables are also available which contain multiple thermocouple pairs within a single sheath as shown below:

Imperial Size Range (inch)	Metric Size Range (mm)	Type	Sheath Material
0.063 (1.6 mm)	1.5 (0.059 in)	K	304 L
0.125 (3.2 mm)	2.0 (0.079 in)	J	310 S
0.188 (4.8 mm)	2.2 (0.087 in)	E	316 L
0.250 (6.4 mm)	3.0 (0.118 in)	N	321
0.313 (8.0 mm)	4.5 (0.177 in)	T	3474
0.375 (9.5 mm)	6.0 (0.236 in)	T-Cryogenic	446
0.500 (12.7 mm)	8.0 (0.313 in)		Inconel 600
0.750 (19.0 mm)	9.5 (0.375 in)		Inconel 601
	10.8 (0.425 in)		Incoloy 800H
	12.7 (0.500 in)		Incoloy 825
			253MA
			Alloy TD®

# of Thermocouple Pairs	Referred to As	Typical Designation
One	Simplex	K, E, etc.
Two	Duplex	KK, EE, etc.
Three	Triplex	KKK, EEE, etc.
Four	Quadruplex	KKKK, EEEE, etc.

The magnesium oxide (MgO) insulation used in all cables is available in either standard purity (> 97% pure MgO) or high purity grade (> 99.4% pure MgO).

All raw materials used in the manufacture of MICT's thermocouple cables are of the highest quality and must meet our own strict specifications. MICT provides full traceability of raw materials used in each coil on the cable certificate which accompanies each shipment. Cables manufactured under ASTM E585/E585M can be used, with proper testing and documentation, in high reliability applications requiring compliance with ASTM E235.



RTD Extension Cables

MICT manufactures and stocks a wide range of RTD extension cables in both Imperial (inch) and Metric (millimeter) sizes.

Custom sizes available, but standard sizes, wire types and sheath materials are shown below and are available with 2 to 8 wires:

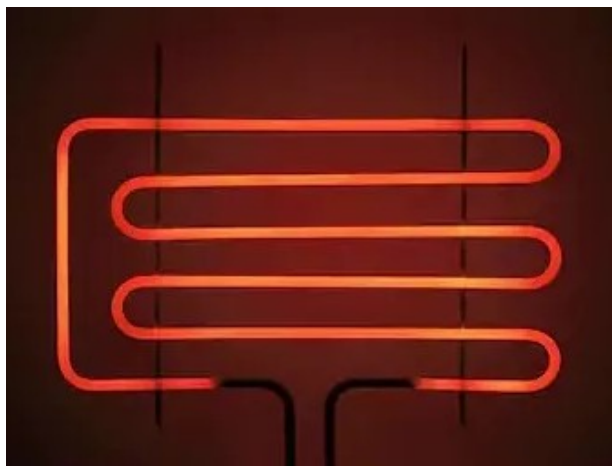
Imperial Size Range (inch)	Metric Size Range (mm)	Wire type	Sheath Material
0.125	2.0	Copper	304L
0.188	2.2	Constantan	310S
0.250	3.0	Nickel	316L
0.313	4.5	SUS 304	321
0.375	6.0		Inconel 600
	8.0		
	9.5		

All raw materials used in the manufacture of MICT's RTD extension cables are of the highest quality and must meet our own strict specifications. MICT provides full traceability of raw materials used in each coil on the cable certificate which accompanies each shipment.

Cables are manufactured in accordance with ASTM E2821/E2821M in order to comply with ASTM E1137/E1137M, an internationally recognized standard dealing with the manufacture and performance of industrial platinum resistance thermometers (IPRT).



Microheater Cables



MICT manufactures and stocks a wide range of Microheater cables in both Imperial (inch) and Metric (millimeter) sizes. Internally, we refer to heating cable using either an Inconel 600 or 316SS sheath as a microheater cable to differentiate it against the CSA listed bulk heating cable which has an Incoloy 825 sheath.

Custom sizes, sheathing, insulation and resistance ranges available upon request. Our experienced personnel can assist in design of product that will meet your specific requirements.

Contact us today for assistance in meeting your needs.

Size Range	No. of Conductors	Wire Material	Resistance range (ohms/meter)	Sheath Material
Min. 0.063" (1.6 mm)	1	Nickel-Chromium	Up to 15.5 Ω /m	316 L
Max. 0.375" (9.5 mm)	2	Constantan (Cu-Ni)		Inconel 600*

- Inconel 600 - inquire on availability

Type C Tungsten-Rhenium Thermocouple Wire

MICT can provide high quality type C thermocouple wire for measurement of very high temperatures.

Composition: Tungsten 5% Rhenium (positive), Tungsten 26% Rhenium (negative)

Available in either # 24 AWG (0.50 mm) or # 30 AWG (0.25 mm) wire gauges, uninsulated.

Type C thermocouple wire is supplied in matched pairs to meet standard limits of error according to ASTM E696. Shipment includes a calibration certificate reporting results from 400°C to 2000°C.

Minimum order quantity applies. Contact our Sales department.

Magnesium Oxide Powder

Need MgO for your fabrication shop? MICT can provide two grades in bulk form as follows:

- MgO powder, standard purity ASTM Type 2 (> 97% pure), -80 mesh size
- MgO powder, high purity ASTM Type 1 (> 99.4% pure), -80 mesh size

Minimum order quantities apply. Contact our Sales department.



Shipping



Standard Shipping Practices

Most shipments are made in cardboard cartons measuring either 28" x 28" x 4" (710mm x 710mm x 100mm) or 28" x 28" x 2" (710mm x 710mm x 50mm). Several cartons in the same shipment may be palletized.

Large shipments are made in either wood crates measuring 31" x 48" x 34" (787mm x 1220mm x 864mm) or in cardboard "crates" mounted on a specially designed pallet, also measuring 31" x 48" x 34" (787mm x 1220mm x 864mm).



Wooden crates and pallets used by MICT are correctly marked with an IPPC stamp and comply with "Guidelines for Regulating Wood Packaging Material in International Trade ISPM Publication Number 15".

Cardboard crates are most often used for air freight shipments as they weigh only about 40 lbs (18.2 kg) when empty and can hold 10-12 full coils. Our wooden crates are durable and strong, weighing 136 lbs (61.8 kg) when empty and are best suited to the rigorous demands of sea freight shipments. Most often, large shipments sent by ground transport employ the cardboard crates to lower shipping costs.

All coils shipped are uniquely identified with MICT's shipping tag.

The shipping tag affixed to each coil by MICT shows the cable part or reference number, the length of the coil, the customer's purchase order number, MICT's invoice number, and if requested the customer's own part or stock number for easy identification upon delivery.

We recommend that your shipments be made on MICT's account *(prepaid and added in some cases) because our large volumes provide the best freight rates available from Calgary.





Standard Weights for Shipping

The following table offers a guideline for unit weights and cable coil diameters (if applicable). The Sales department will be pleased to assist with any shipping inquiries and provide relevant details.

Sheath Diameter		Approximate Weight		Coil Inside Diameter	
inch	mm	lb / 100 ft	kg / 100 m	inch	mm
0.750	19.0	115	171	straight lengths	straight lengths
0.625	15.9	80	119	straight lengths	straight lengths
0.500	12.7	51.0	76.0	54	1370
0.425	10.8	37.0	55.2	54	1370
0.375	9.5	29.0	43.2	23	570
0.313	8.0	20.0	29.8	23	570
0.250	6.4	13.0	19.4	23	570
0.236	6.0	12.0	17.9	23	570
0.188	4.8	7.7	11.5	23	570
0.177	4.5	6.8	10.1	23	570
0.125	3.2	3.4	5.1	23	570
0.118	3.0	2.9	4.3	23	570
0.079	2.0	1.3	1.9	23	570
0.063	1.6	0.8	1.2	23	570
0.059	1.5	0.7	1.0	23	570





Technical Information



Recommendations for Working with Mineral Insulated Cables

Keeping moisture out of the MgO insulation and maintaining the metal sheath in good condition requires the MI cable user to take special care and adopt good practices. Rather than trying to give good advice in our own words, following are some key guidelines provided by people who are acknowledged experts in dealing with mineral insulated, metal-sheathed cables.

Although the following sections were written specifically for thermocouple cables, the recommended practices can be easily adapted to apply to mineral insulated RTD extension cables and heating cables.

Insulation:

For most practical purposes the sheathed thermocouple material should have a minimum insulation resistance of 100 megohms. This is readily obtained using dry, uncontaminated compacted ceramic. The capture of oil, oil vapors, moisture, perspiration, and lint during manufacture can cause low insulation resistance. The hygroscopic nature of the insulants, especially MgO, and capillary attraction cause rapid absorption of moisture through exposed ends of the sheath. Also, the insulation resistance of all ceramics, compacted and uncompact, reduces with an increase in temperature, especially if contaminated.



When purity has been maintained so that the insulation resistance is greater than 1000 megohms, special techniques are required to maintain these values. Such material exposed to 21°C (70°F) air and a relative humidity above 50% will experience a degradation of insulation resistance to less than 0.1 megohm in 15 min. Higher humidity will cause a more rapid degradation. The following precautions should be exercised when handling compacted ceramic insulated thermocouples:

1. Do not leave an end exposed for periods longer than one minute. Immediately seal the end, preferably immediately after heating to expel any moisture.
2. Expose ends only in a region of low relative humidity.
3. Store sealed assembly in a warm (above 38°C (100°F)) and dry (relative humidity less than 25%) area.



Once a surface of the compacted oxide insulator is exposed to normal ambient humidity, moisture enters and diffuses inward through the insulator. The rate of diffusion depends on the humidity, the insulation temperature, and the material and degree of compaction of the oxide. As indicated, it is usually rapid. In fact, the ultimate purity can be only maintained if all operations are performed in an inert-gas dry box [1]. After having been absorbed and diffused, the moisture is very difficult to remove. Heat added to drive out the moisture will only increase its rate of reaction (oxidation) with the sheath wall and thermoelements. Even though the insulation resistance may be restored, the damage has been done. Failure to recognize the effect and nature of this phenomenon is responsible for the poor performance reported by many users of sheathed thermocouples.

In the special case of a brief exposure of high-density material, limited success has been achieved by moving a moderate heat source 200 to 300°C (400 to 600°F) toward the exposed end and immediate sealing with epoxy. - from the Manual on The Use of Thermocouples in Temperature Measurement, Fourth Edition, Copyright 1993 by the American Society for Testing and Materials

Characteristics of the Basic Material:

1. The sheath can usually be bent around a mandrel twice the sheath diameter without damage.
2. The life of material having a diameter of 0.81 mm (0.032 in.) or less may be limited by grain growth in the sheath wall.
3. Four wires in 1.57 mm (0.062 in.) sheath diameter and smaller are not practical to handle.
4. Two wires in 0.81 mm (0.032 in.) sheath diameter and smaller are difficult to handle but are used in laboratory environments.

Stock material and completed thermocouples are supplied usually to the end user in the fully annealed state with proper metallurgical grain size and no surface corrosion. Improper handling can easily destroy this condition. When wire is delivered coiled, it should not be uncoiled until needed for fabrication. Repeated or excessive bending will affect the annealed state. Sometimes the wire has been further heat treated after solution annealing, to control or stabilize calibration. If this is the case, further heat treatment to remove cold work will destroy these characteristics. - from the Manual on The Use of Thermocouples in Temperature Measurement, Fourth Edition, Copyright 1993 by the American Society for Testing and Materials





Notes on Collapse Resistance of Mineral Insulated Cable

Whether or not mineral insulated cable can withstand high pressures is a common concern. Though it may be difficult to accurately predict actual collapse resistance without an actual test, analysis of the problem can shed insight.

When considering the topic of working pressure for MI Cable, or rather, any tubular structure put under pressure, some analogies can be drawn from what is done for analysis of casing for high pressure oils wells, calculations of anticipated collapse pressures of pipe can be performed (not burst, somewhat of a different topic). Ultimately, due to all the variables involved, a full scale test is normally required. Be that as it may, the theoretical calculations do give values in the ballpark of actual collapse pressures during test and offer a good guide in structuring quality control tolerances and design improvements.

From what we know, collapse performance is influenced by:

- diameter (lower the better)
- wall thickness (higher the better)
- D/t (diameter/thickness) ratio commonly used (lower the better)
- yield strength (higher the better)
- ovality of the tube (lower the better)
- eccentricity if wall thickness is not uniform (lower the better)
- residual stresses (tube can be pre-stressed essentially acting as a pre-load to collapse) (lower the better)

In actual practice for oil industry pipe manufacturers, an equation is often used with several more terms than the one shown below but for the purposes of this exercise, the simplest form will be used (the missing terms are related to ovality, eccentricity, residual stresses etc... which in this particular case of MI cable we can consider negligible). On the subject of material strength which is one of the primary variables to how much pressure the pipe/cable can withstand, the only thing to factor here is yield, not tensile strength. Reason for this is that once the material yields, the tube/cable itself becomes deformed in one or more planes and at that exact point in time, the tube/cable can be considered 'oval'. And since ovality reduces collapse resistance, the tube collapses once it starts yielding (normally in a catastrophic fashion...within milliseconds).

The tube collapse equation for a non-axially loaded tube works out to be:

$$P = \frac{\sigma(D^2 - d^2)}{2D}$$

where,

P = collapse pressure

D = Outside diameter

d = Inside diameter

σ = yield strength

For the purposes of an example, we can consider using a yield strength of 35,000psi, a low value for 300 series stainless steel but it is important to note that this value certainly changes between suppliers, from heat to heat and can also be quite different depending on level of annealing (could be higher or lower but this would be a conservative "low" yield value). For a 0.118" diameter cable, we assume the wall thickness is 0.014" (therefore internal diameter of 0.090" if we were to view the cable's sheath as a tube). Using these values, P = 7320psi. That's a fairly high pressure but is due to the fact that the diameter is quite small and therefore entirely expected.



The story here isn't over however as we are not dealing with a tube as the equation implies but one that is filled with compacted MgO powder and some wires. It could be appropriate to consider treating the cable as a solid steel bar to have a basis in reality from a practical sense, though we must concede that it's unclear precisely how the MgO reacts in such a situation, whether or not it acts as a pure solid or if it has any axial displacement as it's compressed and 'flowing' towards either end to the cable, however little. This could all be semantics as actual cable has been known to perform at over 60,000psi in autoclaves for example.

We hope this adds some understanding. In short, because the cable is a solid, there is little concern in placing it in an pressurized environment, with the understanding that all materials ultimately have their limits. Please note however that pressure related failure modes for thermocouples tend to be at the hot junction where the MgO compaction when fabricating the sensor can never reach the compaction density of the cable itself.

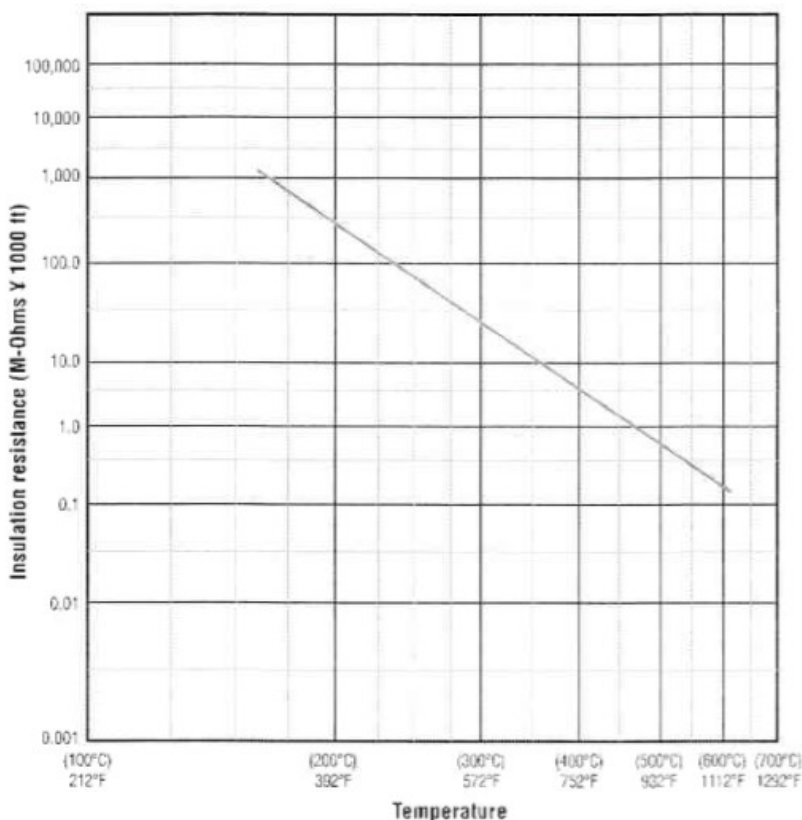
The picture shown here is an example of what happens in extreme cases. The concern may be alleviated if the hot junction is properly made. Even if the hot junction is made with the best methods, it is typically the initial point of failure of a sensor in service.



Magnesium Oxide (MgO) Insulation Characteristics

Magnesium oxide is very hygroscopic resulting in rapid absorption and retention of moisture. Sealing of the ends of the cable is critical to prevent moisture ingress which may easily penetrate should the sealing be insufficient. The process however is normally reversible by heating the end of the cable with the aid of a heat gun (or torch) by moving the heat from further down the cable and driving the moisture to the end. The insulation resistance of the cable will be restored in most situations once the moisture has been driven out.

Insulation resistance, especially at higher temperature is typically of great concern. MgO has the advantage of being thermally conductive while acting as an excellent electric insulator. However, the electrical resistance of MgO does decrease with temperature, and significantly so at high temperature where high purity MgO (>99.4% pure) becomes even more critical. The plot shown here is a typical representation of the insulation resistance vs. temperature.





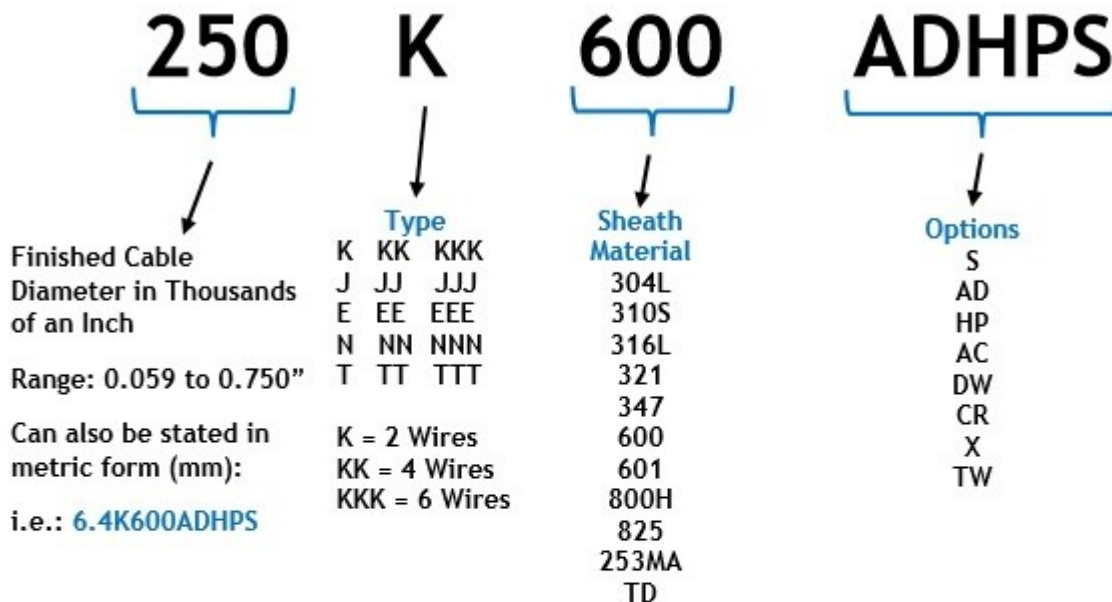
Product Specifications



Product References

Though we are well versed in the various ways the industry identifies different product types, MICT has developed its own nomenclature for all of its cables. This aids in communication to all of our employees and customers. Below is a breakdown of how to decipher our various product references. Diagrams below describe the features of various product references:

Thermocouple Cable



Option Descriptions:

- S = ASTM Special Limits of Error or IEC Class 1
- AD = ADthermic wires, available on K only - contact Sales Engineering
- HP = High Purity MgO ($\geq 99.4\%$ pure, ASTM Type 1)
- AC = Adjacent (parallel) conductors (duplex cable only)
- DW = Double wall: ~19% of nominal cable diameter sheath thickness
- CR = Cryogenic (available on T-type only, liquid N₂ calibration)
- X = Extra large conductors (duplex cable only) - contact Sales Engineering
- TW = Twisted conductors - contact Sales Engineering



RTD Extension Cable

236 / 4 CU / 316 Y-C9

Finished Cable Diameter
in Thousands of an Inch

No. of
wires

Range: 0.059" to 0.375"

Can also be stated in
metric form (mm):

2
3
4
6
8

Wire
Material

Ni (nickel 201)
Cu (copper)
B (Cu-Ni)
304SS

Sheath
Material

304L
316L
321
600

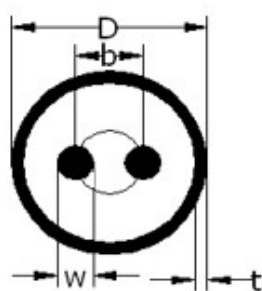
Options

Y
C2 - C12
HP
TC

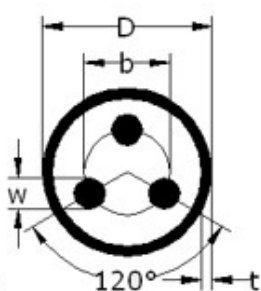
i.e.: **6.0/4CU/316Y-C9**

Option Descriptions:

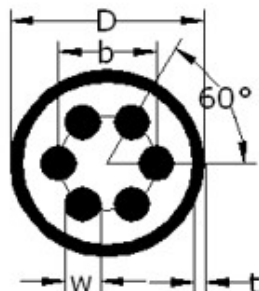
- Y = Implies thick sheath - ~11% of nominal cable diameter (compared to 9% standard) required for 304, 600 sheaths
- C5 - C12 = Various wire configurations - availability varies by number of conductors - contact Sales Engineering
- HP = High purity MgO ($\geq 99.4\%$ pure, ASTM type 1) - contact Sales Engineering
- TC = Thin conductor - conductor diameter will be ~83% of regular conductor diameter



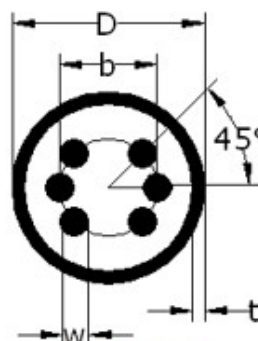
2-wire



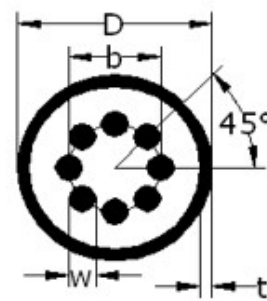
3-wire



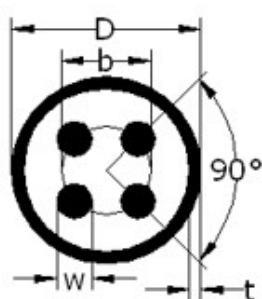
6-wire



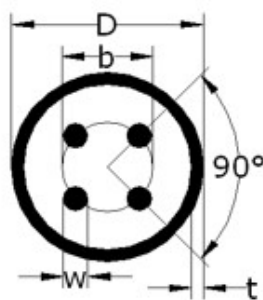
6-wire C7



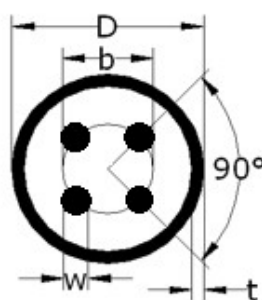
8-wire C6



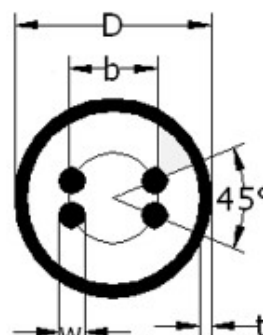
4-wire



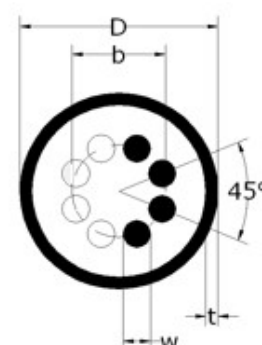
4-wire C5



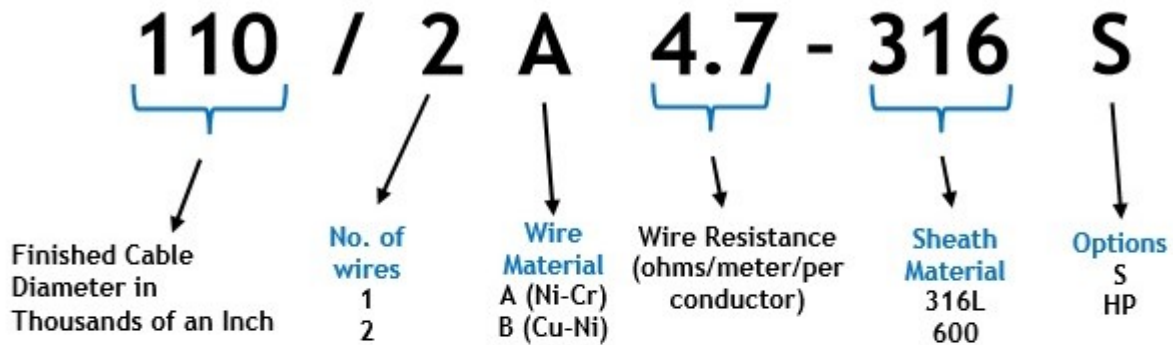
4-wire C8



4-wire C9



4-wire C12

**Microheater Cable (contact Sales Engineering)**

Can also be stated in metric form (mm):

i.e.: **2.8/2A4.7-316S**

Option Descriptions:

- S** = Special Limits: $\pm 5\%$ resistance tolerance (standard is $\pm 10\%$ tolerance)
- HP** = High Purity MgO ($\geq 99.4\%$ pure, ASTM Type 1)



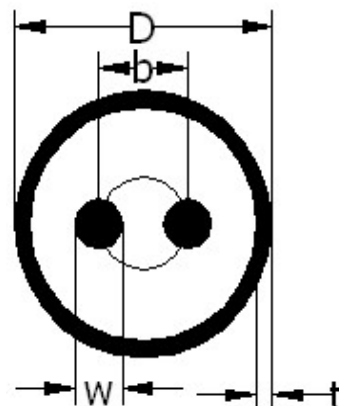
MI Cable Technologies, Inc.
 Bay 5, 5905 - 11 Street SE, Calgary, Canada T2H 2A6
Tel: 403-571-8266
Fax: 403-571-8267
email: sales@micabletechnologies.com

Drawing # S-0100-01-06

ISO9001:2015
 ISO17025:2017

Simplex (2-wire) Thermocouple Cable Design Specification

Sheath Types	Thermocouple Types	MgO Purity
304	T	Standard (> 97%)
310	E	High Purity (> 99.4%)
316	J	
321	K	
347	N	
Inconel 600		
Inconel 601		
Incoloy 800		
Incoloy 825		
253MA		
Alloy TD		



Additional Options

IEC Class 1 or Class 2, ASTM Standard or Special Limits of Error, AMS2750 (NADCAP), Cryogenic (T-type only)

Coil diameter

Cable of 0.375" (9.5mm) or less in diameter supplied in 24" diameter coils, otherwise supplied in 54" diameter coils

D Cable Diameter	t Sheath Thickness	b Bolt Circle Diameter	W Wire Diameter	Nominal Coil Length	IR Test Voltage	Dielectric Test Voltage
0.059" (1.5mm)	0.007" (0.17mm)	0.018" (0.46mm)	0.010" (0.25mm)	2000' (610m)	500V	500V
0.063" (1.6mm)	0.007" (0.18mm)	0.019" (0.48mm)	0.010" (0.26mm)	2000' (610m)	500V	500V
0.079" (2.0mm)	0.009" (0.23mm)	0.025" (0.64mm)	0.013" (0.33mm)	2000' (610m)	500V	500V
0.118" (3.0mm)	0.014" (0.34mm)	0.037" (0.94mm)	0.019" (0.49mm)	2246' (685m)	500V	500V
0.125" (3.2mm)	0.015" (0.38mm)	0.039" (0.99mm)	0.021" (0.52mm)	2002' (610m)	500V	500V
0.177" (4.5mm)	0.020" (0.52mm)	0.055" (1.40mm)	0.029" (0.74mm)	998' (304m)	500V	750V
0.188" (4.8mm)	0.022" (0.55mm)	0.059" (1.50mm)	0.031" (0.79mm)	885' (270m)	500V	750V
0.236" (6.0mm)	0.027" (0.69mm)	0.074" (1.88mm)	0.039" (0.99mm)	562' (171m)	500V	1000V
0.250" (6.4mm)	0.029" (0.73mm)	0.078" (1.98mm)	0.041" (1.05mm)	500' (152m)	500V	1000V
0.313" (8.0mm)	0.036" (0.91mm)	0.098" (2.49mm)	0.052" (1.31mm)	319' (97m)	500V	1000V
0.375" (9.5mm)	0.043" (1.10mm)	0.118" (3.00mm)	0.062" (1.57mm)	222' (68m)	500V	1000V
0.425" (10.8mm)	0.049" (1.24mm)	0.133" (3.38mm)	0.070" (1.78mm)	173' (53m)	500V	1000V
0.500" (12.7mm)	0.058" (1.46mm)	0.157" (3.99mm)	0.083" (2.10mm)	125' (38m)	500V	1000V

Cable dimensions shown are nominal. Actual dimensions may vary within tolerance limits. Specifications subject to change without notice.



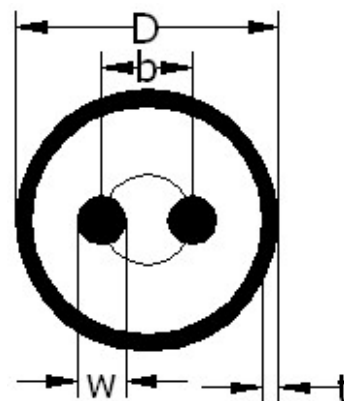
MI Cable Technologies, Inc.
 Bay 5, 5905 - 11 Street SE, Calgary, Canada T2H 2A6
Tel: 403-571-8266
Fax: 403-571-8267
email: sales@micabletechnologies.com

Drawing # S-0101-01-04

ISO9001:2015
 ISO17025:2017

Simplex (2-wire) Thermocouple Cable Design Specification, Double Wall

Sheath Types	Thermocouple Types	MgO Purity
310	T	Standard (> 97%)
316	E	High Purity (> 99.4%)
Inconel 600	J	
Inconel 601	K	
Incoloy 825	N	



Additional Options

IEC Class 1 or Class 2, ASTM Standard or Special Limits of Error, AMS2750 (NADCAP), Cryogenic (T-type only)

Coil diameter

Cable of 0.375" (9.5mm) or less in diameter supplied in 24" diameter coils, otherwise supplied in 54" diameter coils

D Cable Diameter	t Sheath Thickness	b Bolt Circle Diameter	W Wire Diameter	Nominal Coil Length	IR Test Voltage	Dielectric Test Voltage
0.118" (3.0mm)	0.022" (0.57mm)	0.030" (0.76mm)	0.014" (0.36mm)	2246' (685m)	500V	500V
0.125" (3.2mm)	0.024" (0.60mm)	0.032" (0.80mm)	0.014" (0.36mm)	2002' (610m)	500V	500V
0.177" (4.5mm)	0.034" (0.85mm)	0.045" (1.14mm)	0.021" (0.53mm)	998' (304m)	500V	750V
0.188" (4.8mm)	0.036" (0.91mm)	0.048" (1.21mm)	0.022" (0.56mm)	885' (270m)	500V	750V
0.236" (6.0mm)	0.045" (1.14mm)	0.060" (1.52mm)	0.028" (0.71mm)	562' (171m)	500V	1000V
0.250" (6.4mm)	0.048" (1.21mm)	0.063" (1.61mm)	0.030" (0.76mm)	500' (152m)	500V	1000V
0.313" (8.0mm)	0.059" (1.51mm)	0.079" (2.02mm)	0.037" (0.94mm)	319' (97m)	500V	1000V
0.375" (9.5mm)	0.071" (1.81mm)	0.095" (2.42mm)	0.045" (1.14mm)	222' (68m)	500V	1000V
0.425" (10.8mm)	0.081" (2.05mm)	0.108" (2.74mm)	0.051" (1.30mm)	173' (53m)	500V	1000V
0.500" (12.7mm)	0.095" (2.41mm)	0.127" (3.22mm)	0.060" (1.52mm)	125' (38m)	500V	1000V

Cable dimensions shown are nominal. Actual dimensions may vary within tolerance limits. Specifications subject to change without notice.



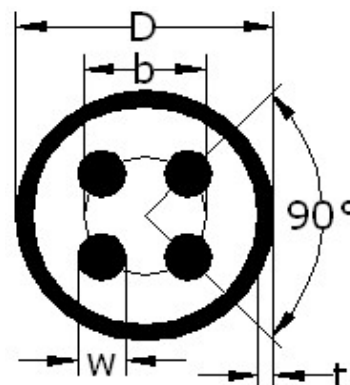
MI Cable Technologies, Inc.
 Bay 5, 5905 - 11 Street SE, Calgary, Canada T2H 2A6
Tel: 403-571-8266
Fax: 403-571-8267
email: sales@micabletechnologies.com

Drawing # S-0200-01-06

ISO9001:2015
 ISO17025:2017

Duplex (4-wire) Thermocouple Cable Design Specification

Sheath Types	Thermocouple Types	MgO Purity
304	T	Standard (> 97%)
310	E	High Purity (> 99.4%)
316	J	
321	K	
347	N	
Inconel 600		
Inconel 601		
Incoloy 800		
Incoloy 825		
253MA		
Alloy TD		



Additional Options

IEC Class 1 or Class 2, ASTM Standard or Special Limits of Error, AMS2750 (NADCAP), Cryogenic (T-type only), Large Conductors, Parallel Conductors

Coil diameter

Cable of 0.375" (9.5mm) or less in diameter supplied in 24" diameter coils, otherwise supplied in 54" diameter coils

D Cable Diameter	t Sheath Thickness	b Bolt Circle Diameter	W Wire Diameter	Nominal Coil Length	IR Test Voltage	Dielectric Test Voltage
0.059" (1.5mm)	0.007" (0.17mm)	0.023" (0.58mm)	0.009" (0.23mm)	2000' (610m)	500V	500V
0.063" (1.6mm)	0.007" (0.18mm)	0.024" (0.61mm)	0.010" (0.25mm)	2000' (610m)	500V	500V
0.079" (2.0mm)	0.009" (0.23mm)	0.030" (0.76mm)	0.012" (0.31mm)	2000' (610m)	500V	500V
0.118" (3.0mm)	0.014" (0.34mm)	0.045" (1.14mm)	0.018" (0.47mm)	2246' (685m)	500V	500V
0.125" (3.2mm)	0.015" (0.38mm)	0.048" (1.22mm)	0.020" (0.50mm)	2002' (610m)	500V	500V
0.177" (4.5mm)	0.020" (0.52mm)	0.067" (1.70mm)	0.028" (0.70mm)	998' (304m)	500V	750V
0.188" (4.8mm)	0.022" (0.55mm)	0.071" (1.80mm)	0.029" (0.75mm)	885' (270m)	500V	750V
0.236" (6.0mm)	0.027" (0.69mm)	0.090" (2.29mm)	0.037" (0.94mm)	562' (171m)	500V	1000V
0.250" (6.4mm)	0.029" (0.73mm)	0.095" (2.41mm)	0.039" (1.00mm)	500' (152m)	500V	1000V
0.313" (8.0mm)	0.036" (0.91mm)	0.119" (3.02mm)	0.049" (1.25mm)	319' (97m)	500V	1000V
0.375" (9.5mm)	0.043" (1.10mm)	0.143" (3.63mm)	0.059" (1.49mm)	222' (68m)	500V	1000V
0.425" (10.8mm)	0.049" (1.24mm)	0.162" (4.11mm)	0.067" (1.69mm)	173' (53m)	500V	1000V
0.500" (12.7mm)	0.058" (1.46mm)	0.190" (4.83mm)	0.078" (1.99mm)	125' (38m)	500V	1000V

Cable dimensions shown are nominal. Actual dimensions may vary within tolerance limits. Specifications subject to change without notice.



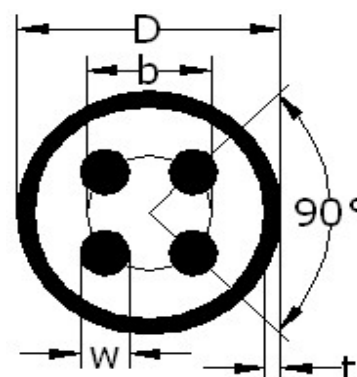
MI Cable Technologies, Inc.
 Bay 5, 5905 - 11 Street SE, Calgary, Canada T2H 2A6
 Tel: 403-571-8266
 Fax: 403-571-8267
 email: sales@micabletechnologies.com

Drawing # S-0201-01-04

ISO9001:2015
 ISO17025:2017

Duplex (4-wire) Thermocouple Cable Design Specification, Double Wall

Sheath Types	Thermocouple Types	MgO Purity
310	T	Standard (> 97%)
316	E	High Purity (> 99.4%)
Inconel 600	J	
Inconel 601	K	
Incoloy 825	N	



Additional Options

IEC Class 1 or Class 2, ASTM Standard or Special Limits of Error, AMS2750 (NADCAP), Cryogenic (T-type only), Parallel Conductors

Coil diameter

Cable of 0.375" (9.5mm) or less in diameter supplied in 24" diameter coils, otherwise supplied in 54" diameter coils

D Cable Diameter	t Sheath Thickness	b Bolt Circle Diameter	W Wire Diameter	Nominal Coil Length	IR Test Voltage	Dielectric Test Voltage
0.118" (3.0mm)	0.022" (0.57mm)	0.037" (0.93mm)	0.013" (0.33mm)	2246' (685m)	500V	500V
0.125" (3.2mm)	0.024" (0.60mm)	0.039" (0.99mm)	0.014" (0.36mm)	2002' (610m)	500V	500V
0.177" (4.5mm)	0.034" (0.85mm)	0.055" (1.41mm)	0.020" (0.51mm)	998' (304m)	500V	750V
0.188" (4.8mm)	0.036" (0.91mm)	0.059" (1.49mm)	0.021" (0.53mm)	885' (270m)	500V	750V
0.236" (6.0mm)	0.045" (1.14mm)	0.073" (1.86mm)	0.026" (0.66mm)	562' (171m)	500V	1000V
0.250" (6.4mm)	0.048" (1.21mm)	0.078" (1.98mm)	0.028" (0.71mm)	500' (152m)	500V	1000V
0.313" (8.0mm)	0.059" (1.51mm)	0.098" (2.48mm)	0.036" (0.91mm)	319' (97m)	500V	1000V
0.375" (9.5mm)	0.071" (1.81mm)	0.117" (2.97mm)	0.043" (1.09mm)	222' (68m)	500V	1000V
0.425" (10.8mm)	0.081" (2.05mm)	0.133" (3.37mm)	0.048" (1.22mm)	173' (53m)	500V	1000V
0.500" (12.7mm)	0.095" (2.41mm)	0.156" (3.97mm)	0.057" (1.45mm)	125' (38m)	500V	1000V

Cable dimensions shown are nominal. Actual dimensions may vary within tolerance limits. Specifications subject to change without notice.



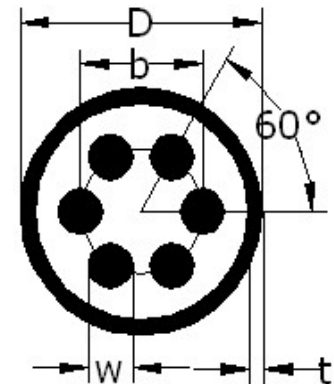
MI Cable Technologies, Inc.
 Bay 5, 5905 - 11 Street SE, Calgary, Canada T2H 2A6
Tel: 403-571-8266
Fax: 403-571-8267
email: sales@micabletechnologies.com

Drawing # S-0300-01-05

ISO9001:2015
 ISO17025:2017

Triplex (6-wire) Thermocouple Cable Design Specification

Sheath Types	Thermocouple Types	MgO Purity
304	T	Standard (> 97%)
310	E	High Purity (> 99.4%)
316	J	
321	K	
347	N	
Inconel 600		
Inconel 601		
Incoloy 800		
Incoloy 825		
253MA		
Alloy TD		



Additional Options

IEC Class 1 or Class 2, ASTM Standard or Special Limits of Error, AMS2750 (NADCAP), Cryogenic (T-type only)

Coil diameter

Cable of 0.375" (9.5mm) or less in diameter supplied in 24" diameter coils, otherwise supplied in 54" diameter coils

D Cable Diameter	t Sheath Thickness	b Bolt Circle Diameter	W Wire Diameter	Nominal Coil Length	IR Test Voltage	Dielectric Test Voltage
0.118" (3.0mm)	0.014" (0.34mm)	0.053" (1.35mm)	0.013" (0.33mm)	2246' (685m)	500V	500V
0.125" (3.2mm)	0.015" (0.38mm)	0.056" (1.42mm)	0.014" (0.36mm)	2002' (610m)	500V	500V
0.177" (4.5mm)	0.020" (0.52mm)	0.078" (1.98mm)	0.020" (0.51mm)	998' (304m)	500V	750V
0.188" (4.8mm)	0.022" (0.55mm)	0.083" (2.11mm)	0.021" (0.53mm)	885' (270m)	500V	750V
0.236" (6.0mm)	0.027" (0.69mm)	0.104" (2.64mm)	0.026" (0.66mm)	562' (171m)	500V	1000V
0.250" (6.4mm)	0.029" (0.73mm)	0.111" (2.82mm)	0.028" (0.71mm)	500' (152m)	500V	1000V
0.313" (8.0mm)	0.036" (0.91mm)	0.139" (3.53mm)	0.035" (0.89mm)	319' (97m)	500V	1000V
0.375" (9.5mm)	0.043" (1.10mm)	0.166" (4.22mm)	0.042" (1.07mm)	222' (68m)	500V	1000V
0.425" (10.8mm)	0.049" (1.24mm)	0.188" (4.78mm)	0.048" (1.22mm)	173' (53m)	500V	1000V
0.500" (12.7mm)	0.058" (1.46mm)	0.221" (5.61mm)	0.056" (1.42mm)	125' (38m)	500V	1000V

Cable dimensions shown are nominal. Actual dimensions may vary within tolerance limits. Specifications subject to change without notice.



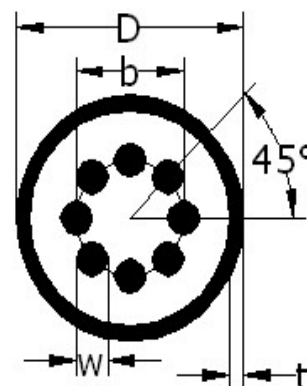
MI Cable Technologies, Inc.
 Bay 5, 5905 - 11 Street SE, Calgary, Canada T2H 2A6
Tel: 403-571-8266
Fax: 403-571-8267
email: sales@micabletechnologies.com

Drawing # S-0400-01-05

ISO9001:2015
 ISO17025:2017

Quadruplex (8-wire) Thermocouple Cable Design Specification

Sheath Types	Thermocouple Types	MgO Purity
304	T	Standard (> 97%)
310	E	
316	J	
321	K	
347	N	
Inconel 600		
Inconel 601		
Incoloy 800		
Incoloy 825		
253MA		
Alloy TD		



Additional Options

IEC Class 1 or Class 2, ASTM Standard or Special Limits of Error, AMS2750 (NADCAP), Cryogenic (T-type only)

Coil diameter

Cable of 0.375" (9.5mm) or less in diameter supplied in 24" diameter coils, otherwise supplied in 54" diameter coils

D Cable Diameter	t Sheath Thickness	b Bolt Circle Diameter	W Wire Diameter	Nominal Coil Length	IR Test Voltage	Dielectric Test Voltage
0.177" (4.5mm)	0.020" (0.52mm)	0.089" (2.26mm)	0.019" (0.48mm)	998' (304m)	500V	750V
0.188" (4.8mm)	0.022" (0.55mm)	0.094" (2.39mm)	0.020" (0.51mm)	885' (270m)	500V	750V
0.236" (6.0mm)	0.027" (0.69mm)	0.119" (3.02mm)	0.025" (0.64mm)	562' (171m)	500V	1000V
0.250" (6.4mm)	0.029" (0.73mm)	0.126" (3.20mm)	0.027" (0.69mm)	500' (152m)	500V	1000V
0.313" (8.0mm)	0.036" (0.91mm)	0.158" (4.01mm)	0.033" (0.84mm)	319' (97m)	500V	1000V
0.375" (9.5mm)	0.043" (1.10mm)	0.199" (5.05mm)	0.040" (1.02mm)	222' (68m)	500V	1000V
0.425" (10.8mm)	0.049" (1.24mm)	0.214" (5.44mm)	0.045" (1.14mm)	173' (53m)	500V	1000V
0.500" (12.7mm)	0.058" (1.46mm)	0.252" (6.40mm)	0.053" (1.35mm)	125' (38m)	500V	1000V

Cable dimensions shown are nominal. Actual dimensions may vary within tolerance limits. Specifications subject to change without notice.



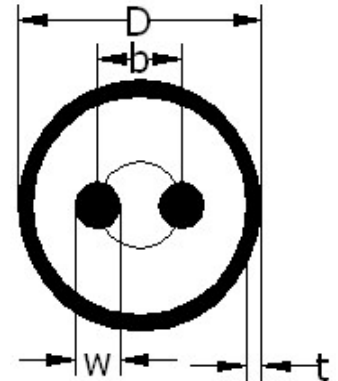
MI Cable Technologies, Inc.
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Drawing # S-0604-01-05

ISO9001:2015
 ISO17025:2017

Two Wire RTD Cable Design Specification, Standard Sheath

Sheath Types	Conductor Types	MgO Purity
316	Ni (nickel)	Standard (> 97%)
321	Cu (copper)	High Purity (> 99.4%)
	B (Cu-Ni)	



Coil diameter

Cable supplied in 24" diameter coils

D Cable Diameter	t Sheath Thickness	b Bolt Circle Diameter	W Wire Diameter	Nominal Coil Length	IR Test Voltage	Dielectric Test Voltage
0.118" (3.0mm)	0.010" (0.25mm)	0.048" (1.22mm)	0.020" (0.51mm)	1998' (609m)	500V	500V
0.125" (3.2mm)	0.011" (0.28mm)	0.051" (1.30mm)	0.021" (0.53mm)	1781' (543m)	500V	500V
0.177" (4.5mm)	0.015" (0.38mm)	0.072" (1.83mm)	0.028" (0.71mm)	888' (271m)	500V	500V
0.188" (4.8mm)	0.016" (0.41mm)	0.076" (1.93mm)	0.031" (0.79mm)	787' (240m)	500V	500V
0.236" (6.0mm)	0.020" (0.51mm)	0.095" (2.41mm)	0.039" (0.99mm)	500' (152m)	500V	750V
0.250" (6.4mm)	0.021" (0.53mm)	0.101" (2.57mm)	0.042" (1.07mm)	445' (136m)	500V	750V
0.313" (8.0mm)	0.027" (0.69mm)	0.127" (3.23mm)	0.052" (1.32mm)	284' (87m)	500V	750V
0.375" (9.5mm)	0.032" (0.81mm)	0.152" (3.86mm)	0.062" (1.57mm)	198' (60m)	500V	750V

Cable dimensions shown are nominal. Actual dimensions may vary within tolerance limits. Specifications subject to change without notice.



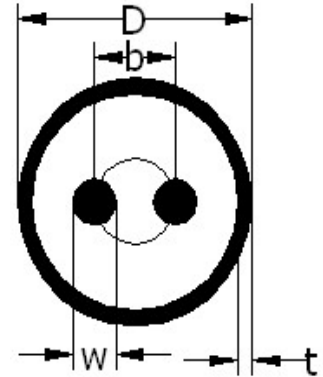
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Drawing # S-0604-02-05

ISO9001:2015
 ISO17025:2017

Two Wire RTD Cable Design Specification, Y Series, Thick Sheath

Sheath Types	Conductor Types	MgO Purity
316	Ni (nickel)	Standard (> 97%)
321	Cu (copper)	High Purity (> 99.4%)
600	B (Cu-Ni)	



Coil diameter

Cable supplied in 24" diameter coils

D Cable Diameter	t Sheath Thickness	b Bolt Circle Diameter	W Wire Diameter	Nominal Coil Length	IR Test Voltage	Dielectric Test Voltage
0.118" (3.0mm)	0.014" (0.36mm)	0.045" (1.14mm)	0.017" (0.43mm)	2246' (685m)	500V	500V
0.125" (3.2mm)	0.015" (0.38mm)	0.048" (1.22mm)	0.018" (0.46mm)	2002' (610m)	500V	500V
0.177" (4.5mm)	0.020" (0.51mm)	0.067" (1.70mm)	0.026" (0.66mm)	998' (304m)	500V	500V
0.188" (4.8mm)	0.022" (0.56mm)	0.071" (1.80mm)	0.028" (0.71mm)	885' (270m)	500V	500V
0.236" (6.0mm)	0.027" (0.69mm)	0.090" (2.29mm)	0.035" (0.89mm)	562' (171m)	500V	750V
0.250" (6.4mm)	0.029" (0.74mm)	0.095" (2.41mm)	0.037" (0.94mm)	500' (152m)	500V	750V
0.313" (8.0mm)	0.036" (0.91mm)	0.119" (3.02mm)	0.046" (1.17mm)	319' (97m)	500V	750V
0.375" (9.5mm)	0.043" (1.09mm)	0.143" (3.63mm)	0.055" (1.40mm)	222' (68m)	500V	750V

Cable dimensions shown are nominal. Actual dimensions may vary within tolerance limits. Specifications subject to change without notice.



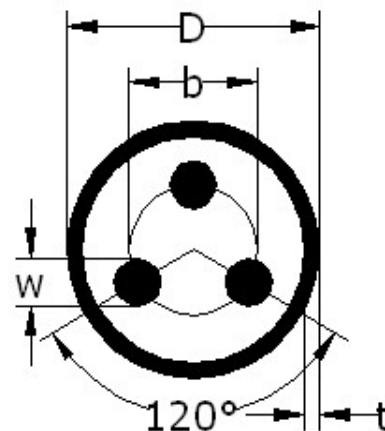
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Drawing # S-0600-01-05

ISO9001:2015
 ISO17025:2017

Three Wire RTD Cable Design Specification, Standard Sheath

Sheath Types	Conductor Types	MgO Purity
316	Ni (nickel)	Standard (> 97%)
321	Cu (copper)	High Purity (> 99.4%)
	B (Cu-Ni)	



Coil diameter

Cable supplied in 24" diameter coils

D Cable Diameter	t Sheath Thickness	b Bolt Circle Diameter	W Wire Diameter	Nominal Coil Length	IR Test Voltage	Dielectric Test Voltage
0.118" (3.0mm)	0.010" (0.25mm)	0.057" (1.45mm)	0.014" (0.36mm)	1998' (609m)	500V	500V
0.125" (3.2mm)	0.011" (0.28mm)	0.060" (1.52mm)	0.015" (0.38mm)	1781' (543m)	500V	500V
0.177" (4.5mm)	0.015" (0.38mm)	0.084" (2.13mm)	0.021" (0.53mm)	888' (271m)	500V	500V
0.188" (4.8mm)	0.016" (0.41mm)	0.089" (2.26mm)	0.023" (0.58mm)	787' (240m)	500V	500V
0.236" (6.0mm)	0.020" (0.51mm)	0.112" (2.84mm)	0.028" (0.71mm)	500' (152m)	500V	750V
0.250" (6.4mm)	0.021" (0.53mm)	0.119" (3.02mm)	0.030" (0.76mm)	445' (136m)	500V	750V
0.313" (8.0mm)	0.027" (0.69mm)	0.148" (3.76mm)	0.037" (0.94mm)	284' (87m)	500V	750V
0.375" (9.5mm)	0.032" (0.81mm)	0.178" (4.52mm)	0.045" (1.14mm)	198' (60m)	500V	750V

Cable dimensions shown are nominal. Actual dimensions may vary within tolerance limits. Specifications subject to change without notice.



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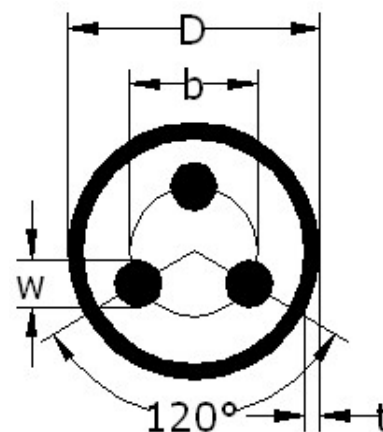
Drawing # S-0600-02-05

ISO9001:2015

ISO17025:2017

Three Wire RTD Cable Design Specification, Y Series, Thick Sheath

Sheath Types	Conductor Types	MgO Purity
316	Ni (nickel)	Standard (> 97%)
321	Cu (copper)	High Purity (> 99.4%)
600	B (Cu-Ni)	



Coil diameter

Cable supplied in 24" diameter coils

D Cable Diameter	t Sheath Thickness	b Bolt Circle Diameter	W Wire Diameter	Nominal Coil Length	IR Test Voltage	Dielectric Test Voltage
0.118" (3.0mm)	0.014" (0.36mm)	0.053" (1.35mm)	0.013" (0.33mm)	2246' (685m)	500V	500V
0.125" (3.2mm)	0.015" (0.38mm)	0.056" (1.42mm)	0.014" (0.36mm)	2002' (610m)	500V	500V
0.177" (4.5mm)	0.020" (0.51mm)	0.078" (1.98mm)	0.020" (0.51mm)	998' (304m)	500V	500V
0.188" (4.8mm)	0.022" (0.56mm)	0.083" (2.11mm)	0.021" (0.53mm)	885' (270m)	500V	500V
0.236" (6.0mm)	0.027" (0.69mm)	0.104" (2.64mm)	0.026" (0.66mm)	562' (171m)	500V	750V
0.250" (6.4mm)	0.029" (0.74mm)	0.111" (2.82mm)	0.028" (0.71mm)	500' (152m)	500V	750V
0.313" (8.0mm)	0.036" (0.91mm)	0.139" (3.53mm)	0.035" (0.89mm)	319' (97m)	500V	750V
0.375" (9.5mm)	0.043" (1.09mm)	0.166" (4.22mm)	0.042" (1.07mm)	222' (68m)	500V	750V

Cable dimensions shown are nominal. Actual dimensions may vary within tolerance limits. Specifications subject to change without notice.



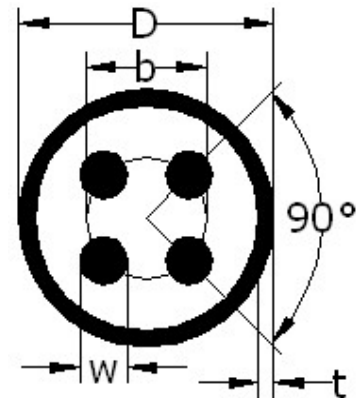
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Drawing # S-0601-01-05

ISO9001:2015
 ISO17025:2017

Four Wire RTD Cable Design Specification, Standard Sheath

Sheath Types	Conductor Types	MgO Purity
316	Ni (nickel)	Standard (> 97%)
321	Cu (copper)	High Purity (> 99.4%)
	B (Cu-Ni)	



Coil diameter

Cable supplied in 24" diameter coils

D Cable Diameter	t Sheath Thickness	b Bolt Circle Diameter	W Wire Diameter	Nominal Coil Length	IR Test Voltage	Dielectric Test Voltage
0.118" (3.0mm)	0.010" (0.25mm)	0.048" (1.22mm)	0.020" (0.51mm)	1998' (609m)	500V	500V
0.125" (3.2mm)	0.011" (0.28mm)	0.051" (1.30mm)	0.021" (0.53mm)	1781' (543m)	500V	500V
0.177" (4.5mm)	0.015" (0.38mm)	0.072" (1.83mm)	0.028" (0.71mm)	888' (271m)	500V	500V
0.188" (4.8mm)	0.016" (0.41mm)	0.076" (1.93mm)	0.031" (0.79mm)	787' (240m)	500V	500V
0.236" (6.0mm)	0.020" (0.51mm)	0.095" (2.41mm)	0.039" (0.99mm)	500' (152m)	500V	750V
0.250" (6.4mm)	0.021" (0.53mm)	0.101" (2.57mm)	0.042" (1.07mm)	445' (136m)	500V	750V
0.313" (8.0mm)	0.027" (0.69mm)	0.127" (3.23mm)	0.052" (1.32mm)	284' (87m)	500V	750V
0.375" (9.5mm)	0.032" (0.81mm)	0.152" (3.86mm)	0.062" (1.57mm)	198' (60m)	500V	750V

Cable dimensions shown are nominal. Actual dimensions may vary within tolerance limits. Specifications subject to change without notice.



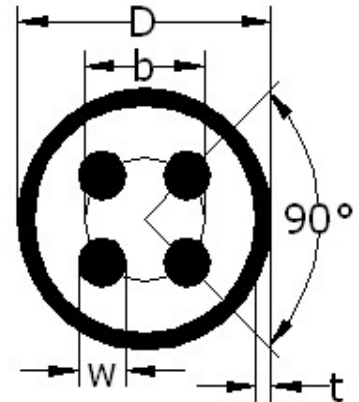
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Drawing # S-0601-04-05

ISO9001:2015
 ISO17025:2017

Four Wire RTD Cable Design Specification, Y Series, Thick Sheath

Sheath Types	Conductor Types	MgO Purity
316	Ni (nickel)	Standard (> 97%)
321	Cu (copper)	High Purity (> 99.4%)
600	B (Cu-Ni)	



Coil diameter

Cable supplied in 24" diameter coils

D Cable Diameter	t Sheath Thickness	b Bolt Circle Diameter	W Wire Diameter	Nominal Coil Length	IR Test Voltage	Dielectric Test Voltage
0.118" (3.0mm)	0.014" (0.36mm)	0.045" (1.14mm)	0.017" (0.43mm)	2246' (685m)	500V	500V
0.125" (3.2mm)	0.015" (0.38mm)	0.048" (1.22mm)	0.018" (0.46mm)	2002' (610m)	500V	500V
0.177" (4.5mm)	0.020" (0.51mm)	0.067" (1.70mm)	0.026" (0.66mm)	998' (304m)	500V	500V
0.188" (4.8mm)	0.022" (0.56mm)	0.071" (1.80mm)	0.028" (0.71mm)	885' (270m)	500V	500V
0.236" (6.0mm)	0.027" (0.69mm)	0.090" (2.29mm)	0.035" (0.89mm)	562' (171m)	500V	750V
0.250" (6.4mm)	0.029" (0.74mm)	0.095" (2.41mm)	0.037" (0.94mm)	500' (152m)	500V	750V
0.313" (8.0mm)	0.036" (0.91mm)	0.119" (3.02mm)	0.046" (1.17mm)	319' (97m)	500V	750V
0.375" (9.5mm)	0.043" (1.09mm)	0.143" (3.63mm)	0.055" (1.40mm)	222' (68m)	500V	750V

Cable dimensions shown are nominal. Actual dimensions may vary within tolerance limits. Specifications subject to change without notice.



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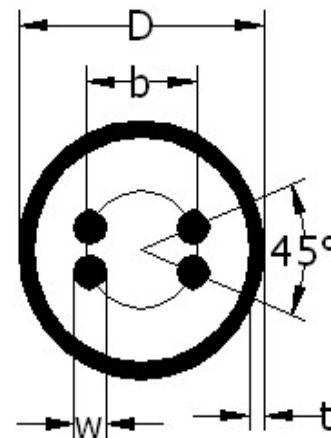
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ISO9001:2015

ISO17025:2017

Four Wire RTD Cable Design Specification, C9 Series, Standard Sheath

Sheath Types	Conductor Types	MgO Purity
316	Ni (nickel)	Standard (> 97%)
321	Cu (copper)	
	B (Cu-Ni)	



Coil diameter

Cable supplied in 24" diameter coils

D Cable Diameter	t Sheath Thickness	b Bolt Circle Diameter	W Wire Diameter	Nominal Coil Length	IR Test Voltage	Dielectric Test Voltage
0.118" (3.0mm)	0.010" (0.25mm)	0.064" (1.63mm)	0.014" (0.36mm)	1998' (609m)	500V	500V
0.125" (3.2mm)	0.011" (0.28mm)	0.067" (1.70mm)	0.015" (0.38mm)	1781' (543m)	500V	500V
0.177" (4.5mm)	0.015" (0.38mm)	0.095" (2.41mm)	0.021" (0.53mm)	888' (271m)	500V	500V
0.188" (4.8mm)	0.016" (0.41mm)	0.101" (2.57mm)	0.023" (0.58mm)	787' (240m)	500V	500V
0.236" (6.0mm)	0.020" (0.51mm)	0.127" (3.23mm)	0.028" (0.71mm)	500' (152m)	500V	750V
0.250" (6.4mm)	0.021" (0.53mm)	0.135" (3.43mm)	0.030" (0.76mm)	445' (136m)	500V	750V
0.313" (8.0mm)	0.027" (0.69mm)	0.169" (4.29mm)	0.038" (0.97mm)	284' (87m)	500V	750V
0.375" (9.5mm)	0.032" (0.81mm)	0.202" (5.13mm)	0.045" (1.14mm)	198' (60m)	500V	750V

Cable dimensions shown are nominal. Actual dimensions may vary within tolerance limits. Specifications subject to change without notice.



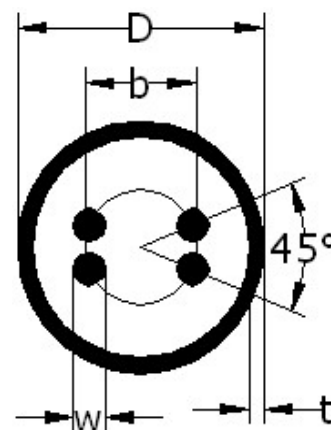
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Drawing # S-0601-03-04

ISO9001:2015
 ISO17025:2017

Four Wire RTD Cable Design Specification, YC9 Series, Thick Sheath

Sheath Types	Conductor Types	MgO Purity
316	Ni (nickel)	Standard (> 97%)
321	Cu (copper)	
600	B (Cu-Ni)	



Coil diameter

Cable supplied in 24" diameter coils

D Cable Diameter	t Sheath Thickness	b Bolt Circle Diameter	W Wire Diameter	Nominal Coil Length	IR Test Voltage	Dielectric Test Voltage
0.118" (3.0mm)	0.014" (0.36mm)	0.060" (1.52mm)	0.012" (0.30mm)	2246' (685m)	500V	500V
0.125" (3.2mm)	0.015" (0.38mm)	0.063" (1.60mm)	0.013" (0.33mm)	2002' (610m)	500V	500V
0.177" (4.5mm)	0.020" (0.51mm)	0.089" (2.26mm)	0.019" (0.48mm)	998' (304m)	500V	500V
0.188" (4.8mm)	0.022" (0.56mm)	0.094" (2.39mm)	0.020" (0.51mm)	885' (270m)	500V	500V
0.236" (6.0mm)	0.027" (0.69mm)	0.119" (3.02mm)	0.025" (0.64mm)	562' (171m)	500V	750V
0.250" (6.4mm)	0.029" (0.74mm)	0.126" (3.20mm)	0.027" (0.69mm)	500' (152m)	500V	750V
0.313" (8.0mm)	0.036" (0.91mm)	0.158" (4.01mm)	0.033" (0.84mm)	319' (97m)	500V	750V
0.375" (9.5mm)	0.043" (1.09mm)	0.189" (4.80mm)	0.040" (1.02mm)	222' (68m)	500V	750V

Cable dimensions shown are nominal. Actual dimensions may vary within tolerance limits. Specifications subject to change without notice.



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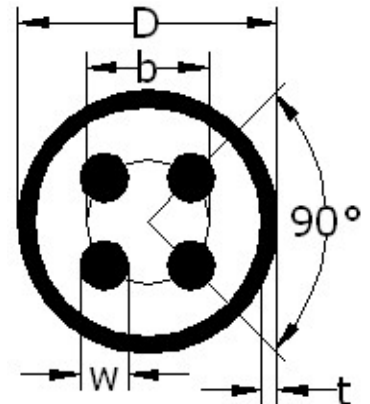
Drawing # S-0601-05-05

ISO9001:2015

ISO17025:2017

Four Wire RTD Cable Design Specification, C8 Series, Standard Sheath

Sheath Types	Conductor Types	MgO Purity
316	Ni (nickel)	Standard (> 97%)
321	Cu (copper)	
	B (Cu-Ni)	



Coil diameter

Cable supplied in 24" diameter coils

D Cable Diameter	t Sheath Thickness	b Bolt Circle Diameter	W Wire Diameter	Nominal Coil Length	IR Test Voltage	Dielectric Test Voltage
0.118" (3.0mm)	0.010" (0.25mm)	0.058" (1.47mm)	0.016" (0.41mm)	1998' (609m)	500V	500V
0.125" (3.2mm)	0.011" (0.28mm)	0.061" (1.55mm)	0.017" (0.43mm)	1781' (543m)	500V	500V
0.177" (4.5mm)	0.015" (0.38mm)	0.086" (2.18mm)	0.024" (0.61mm)	888' (271m)	500V	500V
0.188" (4.8mm)	0.016" (0.41mm)	0.091" (2.31mm)	0.026" (0.66mm)	787' (240m)	500V	500V
0.236" (6.0mm)	0.020" (0.51mm)	0.114" (2.90mm)	0.033" (0.84mm)	500' (152m)	500V	750V
0.250" (6.4mm)	0.021" (0.53mm)	0.121" (3.07mm)	0.035" (0.89mm)	445' (136m)	500V	750V
0.313" (8.0mm)	0.027" (0.69mm)	0.152" (3.86mm)	0.043" (1.09mm)	284' (87m)	500V	750V
0.375" (9.5mm)	0.032" (0.81mm)	0.182" (4.62mm)	0.052" (1.32mm)	198' (60m)	500V	750V

Cable dimensions shown are nominal. Actual dimensions may vary within tolerance limits. Specifications subject to change without notice.



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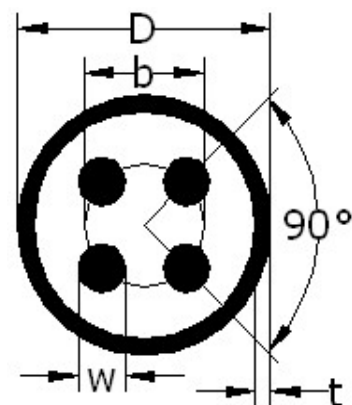
Drawing # S-0601-06-04

ISO9001:2015

ISO17025:2017

Four Wire RTD Cable Design Specification, YC8 Series, Thick Sheath

Sheath Types	Conductor Types	MgO Purity
316	Ni (nickel)	Standard (> 97%)
321	Cu (copper)	
600	B (Cu-Ni)	



Coil diameter

Cable supplied in 24" diameter coils

D Cable Diameter	t Sheath Thickness	b Bolt Circle Diameter	W Wire Diameter	Nominal Coil Length	IR Test Voltage	Dielectric Test Voltage
0.118" (3.0mm)	0.014" (0.36mm)	0.054" (1.36mm)	0.014" (0.36mm)	2246' (685m)	500V	500V
0.125" (3.2mm)	0.015" (0.38mm)	0.057" (1.44mm)	0.015" (0.38mm)	2002' (610m)	500V	500V
0.177" (4.5mm)	0.020" (0.51mm)	0.080" (2.04mm)	0.022" (0.56mm)	998' (304m)	500V	500V
0.188" (4.8mm)	0.022" (0.56mm)	0.085" (2.17mm)	0.023" (0.58mm)	885' (270m)	500V	500V
0.236" (6.0mm)	0.027" (0.69mm)	0.107" (2.72mm)	0.029" (0.74mm)	562' (171m)	500V	750V
0.250" (6.4mm)	0.029" (0.74mm)	0.113" (2.88mm)	0.031" (0.79mm)	500' (152m)	500V	750V
0.313" (8.0mm)	0.036" (0.91mm)	0.142" (3.60mm)	0.038" (0.97mm)	319' (97m)	500V	750V
0.375" (9.5mm)	0.043" (1.09mm)	0.170" (4.32mm)	0.046" (1.17mm)	222' (68m)	500V	750V

Cable dimensions shown are nominal. Actual dimensions may vary within tolerance limits. Specifications subject to change without notice.



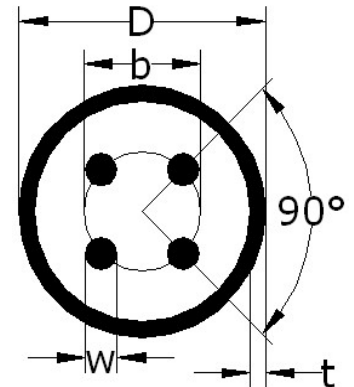
MI Cable Technologies, Inc.
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Drawing # S-0601-07-05

ISO9001:2015
 ISO17025:2017

Four Wire RTD Cable Design Specification, C5 Series, Standard Sheath

Sheath Types	Conductor Types	MgO Purity
316	Ni (nickel)	Standard (> 97%)
321	Cu (copper)	
	B (Cu-Ni)	



Coil diameter

Cable supplied in 24" diameter coils

D Cable Diameter	t Sheath Thickness	b Bolt Circle Diameter	W Wire Diameter	Nominal Coil Length	IR Test Voltage	Dielectric Test Voltage
0.177" (4.5mm)	0.015" (0.38mm)	0.095" (2.41mm)	0.021" (0.53mm)	888' (271m)	500V	500V
0.188" (4.8mm)	0.016" (0.41mm)	0.101" (2.57mm)	0.023" (0.58mm)	787' (240m)	500V	500V
0.236" (6.0mm)	0.020" (0.51mm)	0.127" (3.23mm)	0.028" (0.71mm)	500' (152m)	500V	750V
0.250" (6.4mm)	0.021" (0.53mm)	0.135" (3.43mm)	0.030" (0.76mm)	445' (136m)	500V	750V
0.313" (8.0mm)	0.027" (0.69mm)	0.169" (4.29mm)	0.038" (0.97mm)	284' (87m)	500V	750V
0.375" (9.5mm)	0.032" (0.81mm)	0.202" (5.13mm)	0.045" (1.14mm)	198' (60m)	500V	750V

Cable dimensions shown are nominal. Actual dimensions may vary within tolerance limits. Specifications subject to change without notice.



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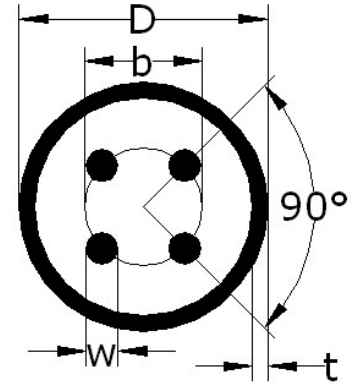
Drawing # S-0601-08-04

ISO9001:2015

ISO17025:2017

Four Wire RTD Cable Design Specification, YC5 Series, Thick Sheath

Sheath Types	Conductor Types	MgO Purity
316	Ni (nickel)	Standard (> 97%)
321	Cu (copper)	
600	B (Cu-Ni)	



Coil diameter

Cable supplied in 24" diameter coils

D Cable Diameter	t Sheath Thickness	b Bolt Circle Diameter	W Wire Diameter	Nominal Coil Length	IR Test Voltage	Dielectric Test Voltage
0.177" (4.5mm)	0.020" (0.51mm)	0.095" (2.41mm)	0.019" (0.48mm)	998' (304m)	500V	500V
0.188" (4.8mm)	0.022" (0.56mm)	0.101" (2.57mm)	0.020" (0.51mm)	885' (270m)	500V	500V
0.236" (6.0mm)	0.027" (0.69mm)	0.127" (3.23mm)	0.025" (0.64mm)	562' (171m)	500V	750V
0.250" (6.4mm)	0.029" (0.74mm)	0.135" (3.43mm)	0.027" (0.69mm)	500' (152m)	500V	750V
0.313" (8.0mm)	0.036" (0.91mm)	0.169" (4.29mm)	0.033" (0.84mm)	319' (97m)	500V	750V
0.375" (9.5mm)	0.043" (1.09mm)	0.202" (5.13mm)	0.040" (1.02mm)	222' (68m)	500V	750V

Cable dimensions shown are nominal. Actual dimensions may vary within tolerance limits. Specifications subject to change without notice.



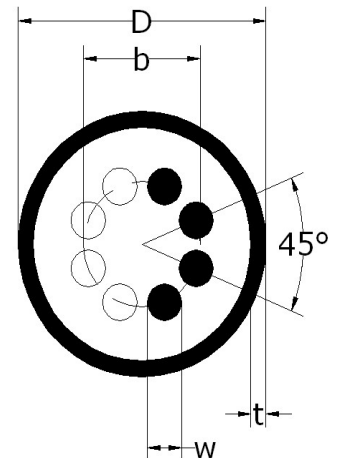
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Drawing # S-0601-09-03

ISO9001:2015
 ISO17025:2017

Four Wire RTD Cable Design Specification, C12 Series, Standard Sheath

Sheath Types	Conductor Types	MgO Purity
316	Ni (nickel)	Standard (> 97%)
321	Cu (copper)	
	B (Cu-Ni)	



Coil diameter

Cable supplied in 24" diameter coils

D Cable Diameter	t Sheath Thickness	b Bolt Circle Diameter	W Wire Diameter	Nominal Coil Length	IR Test Voltage	Dielectric Test Voltage
0.177" (4.5mm)	0.015" (0.38mm)	0.095" 2.41mm)	0.021" (0.53mm)	888' (271m)	500V	500V
0.188" (4.8mm)	0.016" (0.41mm)	0.101" (2.57mm)	0.023" (0.58mm)	787' (240m)	500V	500V
0.236" (6.0mm)	0.020" (0.51mm)	0.127" (3.23mm)	0.028" (0.71mm)	500' (152m)	500V	750V
0.250" (6.4mm)	0.021" (0.53mm)	0.135" (3.43mm)	0.030" (0.76mm)	445' (136m)	500V	750V
0.313" (8.0mm)	0.027" (0.69mm)	0.169" (4.29mm)	0.038" (0.97mm)	284' (87m)	500V	750V
0.375" (9.5mm)	0.032" (0.81mm)	0.202" (5.13mm)	0.045" (1.14mm)	198' (60m)	500V	750V

Cable dimensions shown are nominal. Actual dimensions may vary within tolerance limits. Specifications subject to change without notice.



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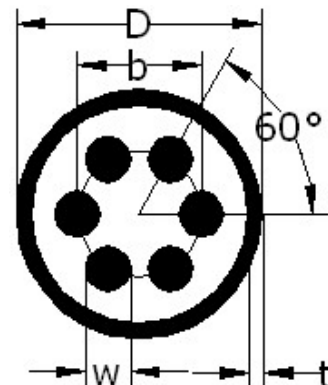
Drawing # S-0602-01-05

ISO9001:2015

ISO17025:2017

Six Wire RTD Cable Design Specification, Standard Sheath

Sheath Types	Conductor Types	MgO Purity
316	Ni (nickel)	Standard (> 97%)
321	Cu (copper)	High Purity (> 99.4%)
	B (Cu-Ni)	



Coil diameter

Cable supplied in 24" diameter coils

D Cable Diameter	t Sheath Thickness	b Bolt Circle Diameter	W Wire Diameter	Nominal Coil Length	IR Test Voltage	Dielectric Test Voltage
0.118" (3.0mm)	0.010" (0.25mm)	0.057" (1.45mm)	0.014" (0.36mm)	1998' (609m)	500V	500V
0.125" (3.2mm)	0.011" (0.28mm)	0.060" (1.52mm)	0.015" (0.38mm)	1781' (543m)	500V	500V
0.177" (4.5mm)	0.015" (0.38mm)	0.084" (2.13mm)	0.021" (0.53mm)	888' (271m)	500V	500V
0.188" (4.8mm)	0.016" (0.41mm)	0.089" (2.26mm)	0.022" (0.56mm)	787' (240m)	500V	500V
0.236" (6.0mm)	0.020" (0.51mm)	0.112" (2.84mm)	0.028" (0.71mm)	500' (152m)	500V	750V
0.250" (6.4mm)	0.021" (0.53mm)	0.119" (3.02mm)	0.030" (0.76mm)	445' (136m)	500V	750V
0.313" (8.0mm)	0.027" (0.69mm)	0.148" (3.76mm)	0.037" (0.94mm)	284' (87m)	500V	750V
0.375" (9.5mm)	0.032" (0.81mm)	0.178" (4.52mm)	0.045" (1.14mm)	198' (60m)	500V	750V

Cable dimensions shown are nominal. Actual dimensions may vary within tolerance limits. Specifications subject to change without notice.



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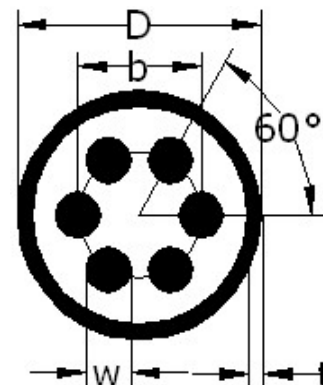
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ISO9001:2015

ISO17025:2017

Six Wire RTD Cable Design Specification, Y Series, Thick Sheath

Sheath Types	Conductor Types	MgO Purity
316	Ni (nickel)	Standard (> 97%)
321	Cu (copper)	High Purity (> 99.4%)
600	B (Cu-Ni)	



Coil diameter

Cable supplied in 24" diameter coils

D Cable Diameter	t Sheath Thickness	b Bolt Circle Diameter	W Wire Diameter	Nominal Coil Length	IR Test Voltage	Dielectric Test Voltage
0.118" (3.0mm)	0.014" (0.36mm)	0.053" (1.35mm)	0.013" (0.33mm)	2246' (685m)	500V	500V
0.125" (3.2mm)	0.015" (0.38mm)	0.056" (1.42mm)	0.014" (0.36mm)	2002' (610m)	500V	500V
0.177" (4.5mm)	0.020" (0.51mm)	0.078" (1.98mm)	0.020" (0.51mm)	998' (304m)	500V	500V
0.188" (4.8mm)	0.022" (0.56mm)	0.083" (2.11mm)	0.021" (0.53mm)	885' (270m)	500V	500V
0.236" (6.0mm)	0.027" (0.69mm)	0.104" (2.64mm)	0.026" (0.66mm)	562' (171m)	500V	750V
0.250" (6.4mm)	0.029" (0.74mm)	0.111" (2.82mm)	0.028" (0.71mm)	500' (152m)	500V	750V
0.313" (8.0mm)	0.036" (0.91mm)	0.139" (3.53mm)	0.035" (0.89mm)	319' (97m)	500V	750V
0.375" (9.5mm)	0.043" (1.09mm)	0.166" (4.22mm)	0.042" (1.07mm)	222' (68m)	500V	750V

Cable dimensions shown are nominal. Actual dimensions may vary within tolerance limits. Specifications subject to change without notice.



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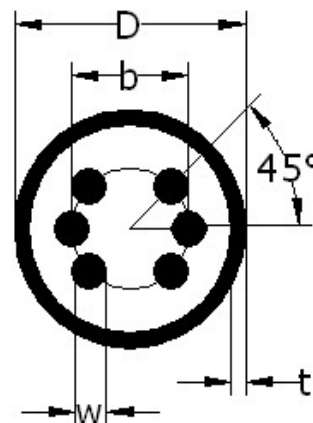
Drawing # S-0602-02-05

ISO9001:2015

ISO17025:2017

Six Wire RTD Cable Design Specification, C7 Series, Standard Sheath

Sheath Types	Conductor Types	MgO Purity
316	Ni (nickel)	Standard (> 97%)
321	Cu (copper)	
	B (Cu-Ni)	



Coil diameter

Cable supplied in 24" diameter coils

D Cable Diameter	t Sheath Thickness	b Bolt Circle Diameter	W Wire Diameter	Nominal Coil Length	IR Test Voltage	Dielectric Test Voltage
0.118" (3.0mm)	0.010" (0.25mm)	0.064" (1.63mm)	0.014" (0.36mm)	1998' (609m)	500V	500V
0.125" (3.2mm)	0.011" (0.28mm)	0.067" (1.70mm)	0.015" (0.38mm)	1781' (543m)	500V	500V
0.177" (4.5mm)	0.015" (0.38mm)	0.095" (2.41mm)	0.021" (0.53mm)	888' (271m)	500V	500V
0.188" (4.8mm)	0.016" (0.41mm)	0.101" (2.57mm)	0.023" (0.58mm)	787' (240m)	500V	500V
0.236" (6.0mm)	0.020" (0.51mm)	0.127" (3.23mm)	0.028" (0.71mm)	500' (152m)	500V	750V
0.250" (6.4mm)	0.021" (0.53mm)	0.135" (3.43mm)	0.030" (0.76mm)	445' (136m)	500V	750V
0.313" (8.0mm)	0.027" (0.69mm)	0.169" (4.29mm)	0.038" (0.97mm)	284' (87m)	500V	750V
0.375" (9.5mm)	0.032" (0.81mm)	0.202" (5.13mm)	0.045" (1.14mm)	198' (60m)	500V	750V

Cable dimensions shown are nominal. Actual dimensions may vary within tolerance limits. Specifications subject to change without notice.



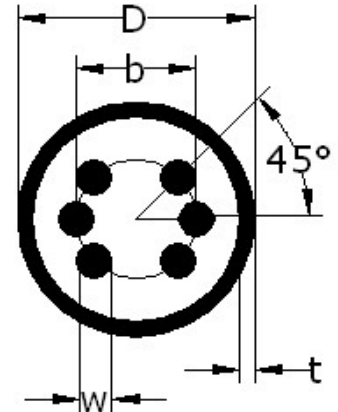
MI Cable Technologies, Inc.
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Drawing # S-0602-03-04

ISO9001:2015
 ISO17025:2017

Six Wire RTD Cable Design Specification, YC7 Series, Thick Sheath

Sheath Types	Conductor Types	MgO Purity
316	Ni (nickel)	Standard (> 97%)
321	Cu (copper)	
600	B (Cu-Ni)	



Coil diameter

Cable supplied in 24" diameter coils

D Cable Diameter	t Sheath Thickness	b Bolt Circle Diameter	W Wire Diameter	Nominal Coil Length	IR Test Voltage	Dielectric Test Voltage
0.118" (3.0mm)	0.014" (0.36mm)	0.060" (1.52mm)	0.012" (0.30mm)	2246' (685m)	500V	500V
0.125" (3.2mm)	0.015" (0.38mm)	0.063" (1.60mm)	0.013" (0.33mm)	2002' (610m)	500V	500V
0.177" (4.5mm)	0.020" (0.51mm)	0.089" (2.26mm)	0.019" (0.48mm)	998' (304m)	500V	500V
0.188" (4.8mm)	0.022" (0.56mm)	0.094" (2.39mm)	0.020" (0.51mm)	885' (270m)	500V	500V
0.236" (6.0mm)	0.027" (0.69mm)	0.119" (3.02mm)	0.025" (0.64mm)	562' (171m)	500V	750V
0.250" (6.4mm)	0.029" (0.74mm)	0.126" (3.20mm)	0.027" (0.69mm)	500' (152m)	500V	750V
0.313" (8.0mm)	0.036" (0.91mm)	0.158" (4.01mm)	0.033" (0.84mm)	319' (97m)	500V	750V
0.375" (9.5mm)	0.043" (1.09mm)	0.189" (4.80mm)	0.040" (1.02mm)	222' (68m)	500V	750V

Cable dimensions shown are nominal. Actual dimensions may vary within tolerance limits. Specifications subject to change without notice.



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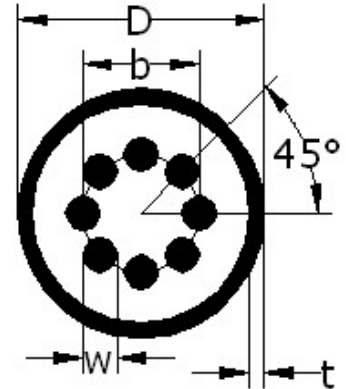
Drawing # S-0603-01-05

ISO9001:2015

ISO17025:2017

Eight Wire RTD Cable Design Specification, C6 Series, Standard Sheath

Sheath Types	Conductor Types	MgO Purity
316	Ni (nickel)	Standard (> 97%)
321	Cu (copper)	
	B (Cu-Ni)	



Coil diameter

Cable supplied in 24" diameter coils

D Cable Diameter	t Sheath Thickness	b Bolt Circle Diameter	W Wire Diameter	Nominal Coil Length	IR Test Voltage	Dielectric Test Voltage
0.177" (4.5mm)	0.015" (0.38mm)	0.095" (2.41mm)	0.021" (0.53mm)	888' (271m)	500V	500V
0.188" (4.8mm)	0.016" (0.41mm)	0.101" (2.57mm)	0.023" (0.58mm)	787' (240m)	500V	500V
0.236" (6.0mm)	0.020" (0.51mm)	0.127" (3.23mm)	0.028" (0.71mm)	500' (152m)	500V	750V
0.250" (6.4mm)	0.021" (0.53mm)	0.135" (3.43mm)	0.030" (0.76mm)	445' (136m)	500V	750V
0.313" (8.0mm)	0.027" (0.69mm)	0.169" (4.29mm)	0.038" (0.97mm)	284' (87m)	500V	750V
0.375" (9.5mm)	0.032" (0.81mm)	0.202" (5.13mm)	0.045" (1.14mm)	198' (60m)	500V	750V

Cable dimensions shown are nominal. Actual dimensions may vary within tolerance limits. Specifications subject to change without notice.



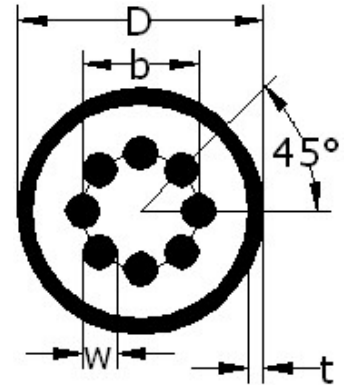
MI Cable Technologies, Inc.
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Drawing # S-0603-02-04

ISO9001:2015
 ISO17025:2017

Eight Wire RTD Cable Design Specification, YC6 Series, Thick Sheath

Sheath Types	Conductor Types	MgO Purity
316	Ni (nickel)	Standard (> 97%)
321	Cu (copper)	
600	B (Cu-Ni)	



Coil diameter

Cable supplied in 24" diameter coils

D Cable Diameter	t Sheath Thickness	b Bolt Circle Diameter	W Wire Diameter	Nominal Coil Length	IR Test Voltage	Dielectric Test Voltage
0.177" (4.5mm)	0.020" (0.51mm)	0.089" (2.26mm)	0.019" (0.48mm)	998' (304m)	500V	500V
0.188" (4.8mm)	0.022" (0.56mm)	0.094" (2.39mm)	0.020" (0.51mm)	885' (270m)	500V	500V
0.236" (6.0mm)	0.027" (0.69mm)	0.119" (3.02mm)	0.025" (0.64mm)	562' (171m)	500V	750V
0.250" (6.4mm)	0.029" (0.74mm)	0.126" (3.20mm)	0.027" (0.69mm)	500' (152m)	500V	750V
0.313" (8.0mm)	0.036" (0.91mm)	0.158" (4.01mm)	0.033" (0.84mm)	319' (97m)	500V	750V
0.375" (9.5mm)	0.043" (1.09mm)	0.189" (4.80mm)	0.040" (1.02mm)	222' (68m)	500V	750V

Cable dimensions shown are nominal. Actual dimensions may vary within tolerance limits. Specifications subject to change without notice.



Conditions of Sale



U.S. and Canadian Terms and Conditions of Sale

General:

M.I. Cable Technologies, Inc. ("MICT") and Customer agree that the terms and conditions identified in this document and in any written MICT specification of products to be furnished hereunder shall govern exclusively the sale of all Goods within the United States and Canada. No addition or modification to any of the terms and conditions as they appear in this document shall be binding upon MICT unless in writing and signed by an authorized representative of MICT, except in the case of emailed correspondence from an authorized representative of MICT. Reference is made in the following paragraphs to trade terms as defined under *Incoterms 2020*. MICT objects to other terms and conditions that may be proposed by Customer.

Terms:

Payment terms to Customers with satisfactory credit are net thirty (30) days from date of invoice. If payment of any amount owed MICT is not made when due, MICT reserves the right (in addition to and without limitation of its other rights) to suspend further performance, without liability, until such payment has been made.

Shipment:

Scheduled or stipulated shipping dates are approximate and based upon prompt receipt of all necessary information from Customer. If shipment is delayed at the request of, or due to acts or omissions by Customer, MICT shall have the right to store the Goods at a place of its own choice at Customer's risk and expense. For Canadian Customers only, shipment will be FCA (free carrier) MICT's factory in Calgary on orders with net value less than \$2,000 unless specifically agreed otherwise in writing at time of order. Unless instructed otherwise by Customer, freight charges will be prepaid by MICT and added to the invoice for payment by Customer. Shipment will be CPT (carriage paid to) Customer's warehouse, via a carrier of MICT's choice, on orders with net value exceeding \$2,000 unless specifically agreed otherwise in writing at time of order. For US Customers only, shipment will be FCA (free carrier) MICT's factory in Calgary on orders with net value less than \$2,000 unless specifically agreed otherwise in writing at time of order. Unless instructed otherwise by Customer, freight charges will be prepaid by MICT and added to the invoice for payment by Customer. Shipment will be DDP (delivered duty paid) Customer's warehouse, via a carrier of MICT's choice, on orders with net value exceeding \$2,000 unless specifically agreed otherwise in writing at time of order. In cases in which Customer stipulates the carrier to be employed, shipment terms automatically revert to FCA (free carrier) MICT's factory in Calgary unless specifically agreed otherwise in writing.

Title and Responsibility:

Title to Goods shall remain with MICT as security only and until full payment for Goods has been received. Risk of loss or damage shall pass to Customer: (1) upon delivery to Carrier at the named location under terms of FCA MICT's factory or (2) upon delivery to named destination under terms of either CPT or DDP Customer's warehouse.

Shipping Lengths:

Published coil lengths are nominal only and are not warranted. A shipping tolerance of minus zero +10% of length per item may be applied to Customer's order. MICT reserves the right to ship random coil lengths in filling Customer's order unless specifically instructed by Customer to ship complete coils only. A premium may be applied in these cases.

Quotations:

All written quotations automatically expire unless accepted within thirty (30) days from the date quoted unless a specific expiry date is noted on the quotation. Verbal quotations expire the same day they are made. All stenographic and clerical errors are subject to correction.

Published Prices:

Prices shown in any MICT publication are subject to change without notice.

Cutting Charges:

A per piece cutting charge may be applied to an order which requires MICT to supply specific cut lengths of cable.

Packing Charges:

A packing charge may be applied to any order which requires specific packaging in accordance with the Customer's instructions.

Taxes:

The Customer shall pay or reimburse MICT for all sales, use, excise, or similar taxes.

Scope Change:

All changes affecting Goods, delivery date or otherwise affecting the scope of the order are to be documented in writing and subject to prior approval by MICT. All changes approved by MICT may result in price, delivery, specification, and/or other changes of which Customer will be advised.

Warranty:

Unless otherwise provided in writing and approved by MICT, MICT warrants for a period of one (1) year from the date of MICT invoice that all products furnished under the order will be of merchantable quality, free from defects in material, workmanship, and design, each as determined, at the date of shipment by MICT, by generally recognized, applicable and accepted practices and procedures in the industry - to include any specifications as specifically agreed to in writing by MICT prior to the date of shipment.



Satisfaction of this warranty, consistent with other provisions herein, will be limited to the replacement of, or issuance of a credit for the Goods involved, at MICT's option, only after the return of such Goods with MICT's consent in accordance with **RETURN OF GOODS**. Such warranty satisfaction is available only if (a) MICT is promptly notified in writing upon discovery of an alleged defect and (b) MICT's examination of the subject Goods discloses, to its satisfaction, that any alleged defect has not been caused by misuse, neglect, accident, or unusual deterioration or degradation of the Goods due to physical environment. **THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES WHETHER EXPRESSED, IMPLIED OR STATUTORY INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS** and thereby excludes certifications or the like for product performance, use or design with respect to any standard, regulation or the like (unless and to the extent independently approved in writing by MICT) AND EXTENDS ONLY TO CUSTOMER PURCHASING FROM MICT.

Limit of Liability:

IN NO EVENT, REGARDLESS OF CAUSE, SHALL MICT ASSUME RESPONSIBILITY FOR OR BE LIABLE (a) FOR PENALTIES OR PENALTY CLAUSES OF ANY DESCRIPTION, OR (b) FOR INDEMNIFICATION OF CUSTOMER OR OTHERS FOR COSTS, DAMAGES, OR EXPENSES EACH ARISING OUT OF OR RELATED TO THE GOODS OF THIS ORDER, OR FOR CERTIFICATION, UNLESS OTHERWISE SPECIFICALLY PROVIDED HEREIN, OR (c) FOR INDIRECT OR CONSEQUENTIAL DAMAGES UNDER ANY CIRCUMSTANCE, INCLUDING ANY LOSS, INJURY, OR OTHER DAMAGES. MICT'S MAXIMUM LIABILITY, INCLUDING DIRECT DAMAGES, SHALL NOT EXCEED THE AMOUNT OF THE PURCHASE ORDER. THIS LIMITATION OF MICT'S LIABILITY WILL APPLY REGARDLESS OF THE FORM OF ACTION, WHETHER IN CONTRACT OR TORT, INCLUDING NEGLIGENCE.

Return of Goods:

Approval for return of Goods, whether under the **Warranty** clause or otherwise, must be obtained from MICT. No approval shall be granted for the non-warranty return of Goods under any circumstances where the original invoice date for such Goods is more than sixty (60) days prior to the date that a request is made to MICT for such approval. All Goods returned must include reference to all pertinent order information for those Goods to include order, catalog, and tag numbers. Except for Goods under warranty, cost for placing Goods returned for credit in a salable condition will be charged to Customer. Goods returned must be carefully packed so as to reach MICT without damage and must be accompanied by a completed RETURNED MATERIAL AUTHORIZATION document (available from MICT). Goods accepted for return, which are not covered by warranty, are subject to a **minimum** restocking charge plus all transportation and customs clearance charges and must be shipped prepaid. Unless covered under the provisions of warranty, Goods especially manufactured to Customer's requirements cannot be returned for credit under any conditions. All Goods to be returned must be shipped to the location stipulated by MICT at the time MICT approves the return of the Goods. The shipping container of all returned Goods must be clearly marked in accordance with MICT directives.

Cancellation and Termination:

Any order or contract may be terminated by the Customer only by written notice and upon payment to MICT of reasonable and proper cancellation charges unless waived by MICT. Payment shall be made within thirty (30) days from date of invoice. MICT shall have the right to cancel any order or contract at any time by written notice for any breach of the order or contract by the Customer and MICT shall be entitled to collect reasonable and proper cancellation charges. No termination by Customer for default shall be effective unless and until MICT shall have failed to correct such alleged default within forty-five (45) days after receipt by MICT of the written notice specifying such default.

Force Majeure:

MICT shall not be liable for any loss, damage or delay in delivery due to acts of God or causes beyond its reasonable control including acts of the Customer, acts of civil or military authority, fires, strikes, floods, epidemics, quarantine restrictions, war, riots, delays in transportation, transportation embargoes, or inability due to causes beyond its reasonable control to obtain necessary labor, materials, or manufacturing facilities. In the event of such delay, the delivery date shall be extended for that length of time as may be reasonably necessary to compensate for the delay.

Government Clauses and Contracts:

No Government contract regulations or clauses shall apply to the Goods of this order or bind MICT unless specifically agreed in writing by MICT.

Assignment:

This agreement may not be assigned by either party without the written consent of the other party.

Governing Law:

This agreement shall be deemed to be made in and performed in the Province of Alberta, Canada and shall be governed by and interpreted in accordance with the laws of the Province of Alberta and shall specifically exclude the provisions of the 1980 UN Convention on Contracts for the International Sale of Goods.



Terms and Conditions of International Sale

General:

M.I. Cable Technologies, Inc. ("MICT") and Customer agree that the terms and conditions identified in this document and in any written MICT specification of products to be furnished hereunder shall govern exclusively the sale of all Goods outside the United States and Canada. No addition or modification to any of the terms and conditions as they appear in this document shall be binding upon MICT unless in writing and signed by an authorized representative of MICT, except in the case of emailed correspondence from an authorized representative of MICT. Reference is made in the following paragraphs to trade terms as defined under *Incoterms 2020*. MICT objects to other terms and conditions that may be proposed by Customer.

Terms:

Payment terms to Customers with approved credit are net sixty (60) days from date of invoice. Payment terms to customers not having an open account with MICT are payment in advance of shipment unless MICT specifically agrees otherwise in writing. If payment of any amount owed MICT is not made when due, MICT reserves the right (in addition to and without limitation of its other rights) to suspend further performance, without liability, until such payment has been made.

Shipment:

Scheduled or stipulated shipping dates are approximate and based upon prompt receipt of all necessary information from Customer. If shipment is delayed at the request of, or due to acts or omissions by Customer, MICT shall have the right to store the Goods at a place of its own choice at Customer's risk and expense. Shipment will be FCA (free carrier) MICT's warehouse loading dock in Calgary, Canada. Unless instructed otherwise by Customer, freight charges will be prepaid by MICT and added to the invoice for payment by Customer.

Title and Responsibility:

Title to Goods shall remain with MICT as security only and until full payment for Goods has been received. Risk of loss or damage shall pass to Customer upon delivery to Carrier at the named location.

Shipping Lengths:

Published coil lengths are nominal only and are not warranted. A shipping tolerance of minus zero +10% of length per item may be applied to Customer's order. MICT reserves the right to ship random coil lengths in filling Customer's order unless specifically instructed by Customer to ship complete coils only. A premium may be applied in these cases.

Quotations:

All written quotations automatically expire unless accepted within thirty (30) days from the date quoted unless a specific expiry date is noted on the quotation. Verbal quotations expire the same day they are made. All stenographic and clerical errors are subject to correction.

Published Prices:

Prices shown in any MICT publication are subject to change without notice.

Cutting Charges:

A per piece cutting charge may be applied to an order which requires MICT to supply specific cut lengths of cable.

Packing Charges:

A packing charge may be applied to any order which requires specific packaging in accordance with the Customer's instructions.

Minimum Order:

A minimum order value of up to \$200 may apply to all orders at the discretion of MICT. The minimum order value will not apply to back orders or short shipments.

Taxes and Duties:

The Customer shall pay or reimburse MICT for all sales, use, excise, import, or similar taxes and duties.

Scope Change:

All changes affecting Goods, delivery date or otherwise affecting the scope of the order are to be documented in writing and subject to prior approval by MICT. All changes approved by MICT may result in price, delivery, specification, and/or other changes of which Customer will be advised.

Warranty:

Unless otherwise provided in writing and approved by MICT, MICT warrants for a period of one (1) year from the date of MICT invoice that all products furnished under the order will be of merchantable quality, free from defects in material, workmanship, and design, each as determined, at the date of shipment by MICT, by generally recognized, applicable and accepted practices and procedures in the industry - to include any specifications as specifically agreed to in writing by MICT prior to the date of shipment. Satisfaction of this warranty, consistent with other provisions herein, will be limited to the replacement of, or issuance of a credit for the Goods involved, at MICT's option, only after the return of such Goods with MICT's consent in accordance with **RETURN OF GOODS**.



Such warranty satisfaction is available only if (a) MICT is promptly notified in writing upon discovery of an alleged defect and (b) MICT's examination of the subject Goods discloses, to its satisfaction, that any alleged defect has not been caused by misuse, neglect, accident, or unusual deterioration or degradation of the Goods due to physical environment. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES WHETHER EXPRESSED, IMPLIED OR STATUTORY INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS and thereby excludes certifications or the like for product performance, use or design with respect to any standard, regulation or the like (unless and to the extent independently approved in writing by MICT) AND EXTENDS ONLY TO CUSTOMER PURCHASING FROM MICT.

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Goods accepted for return, which are not covered by warranty, are subject to a **minimum** restocking charge plus all transportation and customs clearance charges and must be shipped prepaid.

Unless covered under the provisions of warranty, Goods especially manufactured to Customer's requirements cannot be returned for credit under any conditions.

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MICT shall have the right to cancel any order or contract at any time by written notice for any breach of the order or contract by the Customer and MICT shall be entitled to collect reasonable and proper cancellation charges.

No termination by Customer for default shall be effective unless and until MICT shall have failed to correct such alleged default within forty-five (45) days after receipt by MICT of the written notice specifying such default.

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This agreement may not be assigned by either party without the written consent of the other party.

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Dispute Resolution:

In the event that any disagreement arises between the parties of this agreement, then any such dispute shall be referred to arbitration in accordance with the provisions of the Rules of Conciliation and Arbitration of the International Chamber of Commerce to take place at the respondent's place of main office and to be conducted in English.



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