

GP 15-12-01	Instrument Wire and Cable	August 2003
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Instrument Wire and Cable

GP 15-12-01

Scope

- 1) [I] This Global Practice (GP) covers the specification and selection of instrument signal wire, thermocouple extension wire, and multi-conductor cables suitable for service in transmission of low-level analog, discrete, and digital signals. This Practice also covers fiber-optic cables used for interfacing between control equipment and systems.
- 2) * [I] This Practice does not cover control systems coax, or pre-terminated duplex fiber-optic cables used within buildings. Fiber-optic cables used for telecommunications systems are also not covered by this Practice. Type and materials of construction, installation details, electrical characteristics, and insulation needs for these others shall be defined by equipment or systems Vendor, and approved by the Owner's Engineer.
- 3) * [I] An asterisk (*) indicates that a decision by Purchaser is required, or that additional information is to be supplied by Purchaser.

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1. Required References

This Section lists Practices and Standards that are generically referenced and assumed to be a part of this document. Unless otherwise specified herein, use the latest edition

1.1. Global Practices–ExxonMobil Engineering Practices

GP 16-01-03	Protection of Electrical Equipment in Contaminated Environments
GP 16-03-01	Wiring Methods and Material Selection

1.2. API–American Petroleum Institute

API RP 552	Transmission Systems
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1.3. BSI–British Standards Institution

BSI BS 5308 Part 1	1986 Instrumentation Cables Part 1: Polyethylene Insulated Cables
BSI BS 5308 Part 2	1986 Amd 1 Instrumentation Cables Part 2: Specification for PVC Insulated Cables

1.4. CENELEC–European Comm for Electrotechnical Standardization

CENELEC HD 446.3 S1	Thermocouples Part 3: Extension and Compensating Cables Tolerances and Identification System
CENELEC EN 60794-1-1	Optical Fibre Cables - Part 1-1: Generic Specification - General
CENELEC EN 60794-1-2	Optical Fibre Cables Part 1-2: Generic Specification - Basic Optical Cable Test Procedures
CENELEC EN 61515	Mineral Insulated Thermocouple Cables and Thermocouples

1.5. ISA–Instrument Society of America

ISA MC96.1	Temperature Measurement Thermocouples
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1.6. NFPA–National Fire Protection Association

NFPA 70	National Electrical Code
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1.7. UL–Underwriters Laboratories, Inc.

UL 4	UL Standard for Safety Armored Cable
UL 13	UL Standard for Safety Power-Limited Circuit Cables
UL 44	UL Standard for Safety Thermoset-Insulated Wires and Cables
UL 83	UL Standard for Safety Thermoplastic-Insulated Wires and Cables
UL 719	UL Standard for Safety Nonmetallic-Sheathed Cables Tenth Edition; Reprint with Revisions Through and Including
UL 1651	UL Standard for Safety Optical Fiber Cable
UL 2250	UL Standard for Safety Instrumentation Tray Cable

- 1) * [I] The purchase and use of instrument signal wire and cable, and thermocouple extension wire and cable, shall conform to nationally recognized codes and standards which are specified by the Owner's Engineer, and which are acceptable within the country where the equipment and materials will be used.
- 2) [I] Cable shall be shipped in continuous lengths as specified in the material purchase order. Splices in the cable, shield, or individual conductors are not permitted to achieve these lengths.

2. Materials for Fiber-Optic Cables, Instrument Signal Wire and Thermocouple Extension Wire

[I], [R] Conductor requirements shall be as follows:

- 1) Conductors for instrument signal wire shall be copper. Tin-plated copper shall be considered for use in corrosive environments, such as salt or H₂S atmospheres
- 2) Conductors for thermocouple extension wire shall be in accordance with ISA MC96.1 or applicable national standards.
- 3) Optical fiber for fiber-optic cable shall be glass on glass, graded index fiber.

3. Insulation and Jacket Requirements

- 1) General requirements for insulation and jackets are as follows.
 - a) [C], [R] Acceptable classes of insulation materials are limited to:
 - i) Moisture resistant rubber
 - ii) Moisture resistant thermoplastic, or thermosetting
 - iii) Mineral insulation, if copper or stainless steel sheathed
 - b) Insulation rating of single wires shall not be less than 300 volts.
 - c) For acceptable fire resistant cable insulation and construction, refer to [GP 16-03-01](#).

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