# HARSH ENVIRONMENT DATA AND AUTOMATION CABLE

From the Stranded Data Cable Experts


QUABBIN® WIRE & CABLE CO., INC.

**Featuring DataMax® Extreme**

Catalog and Reference Guide

MADE IN THE USA

www.quabbin.com/
harsh-environment-cable

# Choose Quabbin — the Stranded Data Cable Experts

**Superior performance — expect it from our cable and from our company.**
At Quabbin, our focus is on being the industry leader and manufacturing the best and most reliable cable for the industrial market. Our advanced design, manufacturing, and customer service bring you world-class harsh environment and automation cable. We believe we only succeed when our customers succeed.

Our reputation is built on delivering products that perform flawlessly, time after time. We're proud to offer cable that is 100% USA-made in a single manufacturing location. Advanced real-time process controls monitor quality and dimensional integrity throughout the production cycle, ensuring that every reel of cable meets the highest standards of quality and craftsmanship. Our focus on precision ensures you receive reliable products that drive assembly efficiency by increasing yield and reducing rework and scrap.

PROUDLY MADE IN THE U.S.A.

Quabbin's customers invest in dependability. Our ISO 9001 quality system ensures superior consistency and a sharp focus on customer needs. With inventory strategically stocked across North America, ordering and delivery are quick and hassle-free. Our reliable, on-time delivery keeps your work on schedule.

We make doing business easy. Whether you need to connect with our cable design engineering experts or our dedicated sales support team, you'll find no gatekeepers—just direct, responsive communication. Our talented team aims to understand your unique needs, offering tailored solutions that include custom packaging and design options to meet your specifications.

For more than five decades, Quabbin Wire & Cable has been the trusted partner of assemblers, OEMs, and cable distributors. Our goal is to provide not just products, but solutions that align with your engineering requirements and operational goals. Trust us to be your partner in success.

**www.quabbin.com • (800) 368-3311**

**www.quabbin.com/harsh-environment-cable**

## Cable Finder

*Search our products:*

- Application
- Part Number
- Construction
- Ratings & Approvals
- Physical Properties
- Category

www.quabbin.com/cable-finder

## Inventory Finder

*Check our inventory:*

- Part Number
- Warehouse Location
- Quantity Available

www.quabbin.com/inventory

# Cable Engineered for Your Harsh Environment

**Quabbin Wire & Cable designs and manufactures** the best harsh environment Ethernet and Profinet® cable in the world. Our continuous-flex cable cores and custom TPE cable jackets have a proven record in automation applications. Engineered to withstand greater than 10 million rolling bend flexes, 3 million torsional flexes and exposure to UV, oils, chemicals, moisture and weld spatter, our cable can save thousands of hours in production downtime. Choose Quabbin for harsh applications such as military, oil and gas, food and beverage, live entertainment, and AgTech. Our cable design experts are eager to consult with you about your project needs.

## CONTENTS

# **Our expert engineers** can design cables that meet your needs.

**Call 1-800-368-3311** to speak with a Cable Design Expert.

**Quabbin's product development team** continually collects data from customers, end users and market experts to inform and shape new generations of products. We are committed to the industry and to working together to meet future needs. Contact our cable design experts at **1-800-368-3311** for technical support for your application and project needs, or to discuss your cable design and packaging requirements.



## Cable Types & Applications

- Ethernet IP Cable
  - 8
  - 7a
  - 7
  - 6l6a
  - 6a
  - 6
  - 5e
- Profinet® Cable
  - Type B & C
  - Type A
  - 6a
  - 5e

## Construction

- Single Pair Ethernet (SPE)
- Hybrid Ethernet
  - 1, 2 and 4 Pair (similar diameter allows shared assembly tooling)
  - Quad
  - Spline
  - Drain Wire
  - Unshielded and Shielded (see Shielding)
  - Individually Shielded Components

## Available Features

- Rolling Bend Hi-flex
- Torsional Hi-flex
- Patented shield system
- Low temperature flexibility and brittle point
- Ability to be redeployed
- RoHS compliant
- Low smoke
- Resistance to
  - Abrasion and Scuff
  - Acids
  - Bases
  - Chemicals
  - Crush
  - Cut and Tear
  - Cutting/Machining Oils
  - Flame and Fire
  - Fluids
  - Moisture
  - Mud Oil
  - Oil
  - Ozone
  - Petrochemicals
  - Sunlight
  - UV
  - Washdown
  - Weather
  - Weld Spatter

## Insulation Materials

- FEP (fluorinated ethylene propylene)
- HDPE (high-density polyethylene)
- PO (polyolefins)

## Copper

- 28-18 AWG
- Tinned
- Bare
- Stranded
- Solid

## Shielding

- Aluminum polyester foil with a drain wire
- Aluminum polyester foil with a tinned copper braid with or without a drain wire
- Unshielded

## Jacket Type

- Pressure
- Tubed

## Jacket Materials

- CPE (chlorinated polyethylene)
- PUR (polyurethane)
- PVC (polyvinylchloride)
- PVDF (polyvinylidene fluoride)
- TPV (santoprene)
- TPE (thermoplastic elastomer)
- ZHFR PUR (zero-halogen flame retardant polyurethane)

## Color

- Longitudinal stripes
- Custom jacket colors
- Color matching to standards and samples

## Print & Identification

- Private labeling
- Printed insulated conductors
- Custom print legends
- Sequential footage or meter marking
- Date codes
- Preprinted tape wraps
- Threads
- Logos and graphics

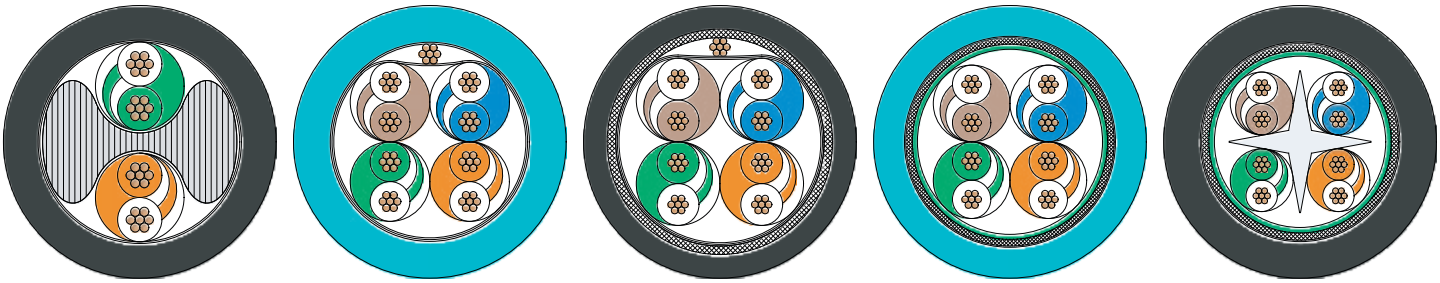
## Packaging

- Plywood reels
- Wooden reels
- Plastic reels
- Boxed reels
- Labels/bar coding/QR codes

## Ratings, Listings & Approvals

- CL3
- CM, CMR, CMX, CMX Outdoor-CM, CMX Outdoor-CMR
- ITC
- Pennsylvania DEP-MSHA
- PLTC, PLTC-ER
- UL AWM Styles
- UL Oil Res. I & II
- VW-1 Flame Test

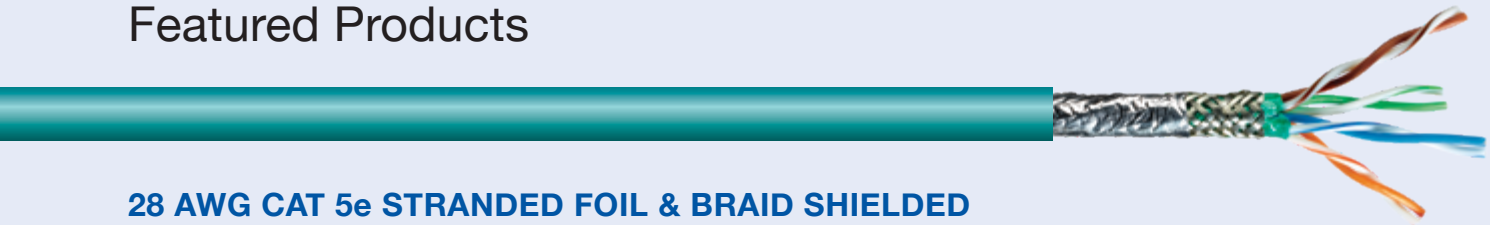
## REPRESENTATIVE CABLE CONFIGURATIONS



Hi-flex Unshielded with Separator Tape | Foil Shielded with Drain Wire* | Foil & Braid Shielded with Drain Wire* | Hi-flex Foil & Braid Shielded* | Hi-flex Foil & Braid Shielded with Spline

**Also available in a similar 2 pair construction.*

# Featured Products

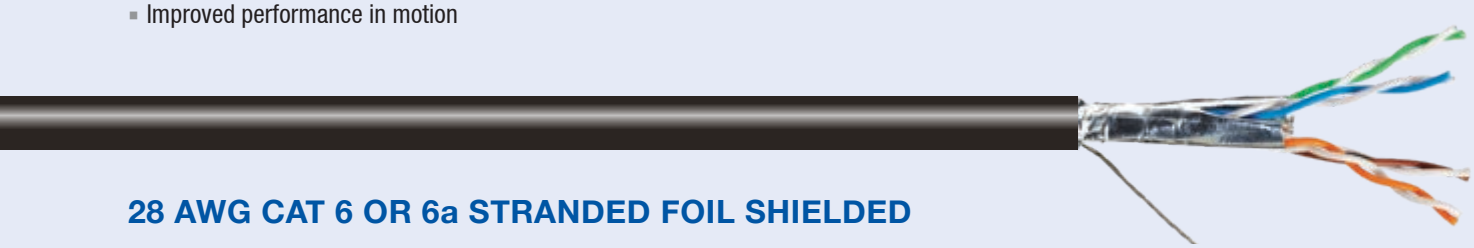


## 28 AWG CAT 5e STRANDED FOIL & BRAID SHIELDED

**Design Advantages**
- Miniature harsh environment Ethernet cable
- Tighter bend radius
- Space saving
- Greater flexibility and easier routing
- Reduced cable weight
- Improved performance in motion

**Ratings, Listings & Approvals**
- CM
- CMX-Outdoor

**Applications**
- AgTech
- Automation
- Ethernet/IP
- Harsh Environment
- Machine Vision
- Military
- Robotic Control
- Transportation

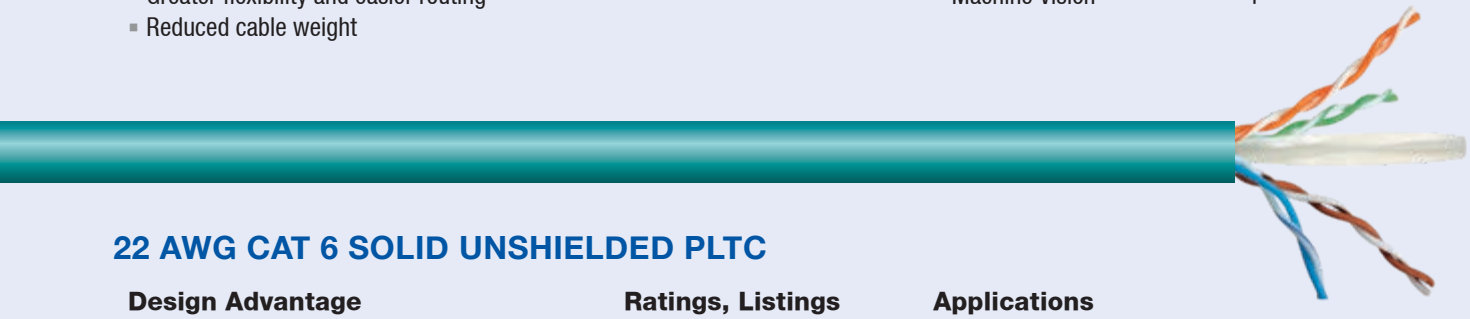


## 28 AWG CAT 6 OR 6a STRANDED FOIL SHIELDED

**Design Advantages**
- Miniature harsh environment Ethernet cable
- Tighter bend radius
- Space saving
- Greater flexibility and easier routing
- Reduced cable weight

**Ratings, Listings & Approvals**
- CM

**Applications**
- Automation
- Ethernet/IP
- Harsh Environment
- Machine Vision
- Military
- Semiconductor Manufacturing
- Transportation



## 22 AWG CAT 6 SOLID UNSHIELDED PLTC

**Design Advantage**
- Extended reach
- Tray rated
- Supports high-speed Ethernet protocols
- Durable, oil-resistant construction
- Lower DC resistance
- Ideal for modern automation networks

**Ratings, Listings & Approvals**
- PLTC
- CMX Outdoor-CMR
- UL AWM 2463

**Applications**
- Automation
- Ethernet/IP
- Food and Beverage
- Harsh Environment
- Live Entertainment
- Military
- Oil & Gas
- Profinet®
- Renewable Energy
- UL Oil Res. I

# DataMax® Extreme Quick Reference Guide

A side by side sampling of our most popular Industrial Ethernet constructions

| Category | AWG | Pair Count | Foil & Braid Shielded | Foil Shielded | Profinet® Type B & C | Jacket Material | Overall Cable Dia. in/mm | Rolling Bend Hi-flex | Torsional H-flex | Ratings, Listings & Approvals | Part Numbers |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 6/6a | 26 | 4 | • | | | PUR | .239/6.07 | • | • | | 5919 |
| 6/6a | 26 | 4 | • | | | TPE | .275/6.99 | • | • | CMX Outdoor-CM | 5026, 5047, 5048 |
| 6/6a | 26 | 4 | • | | | ZHFR PUR | .269/6.83 | • | • | CMX, UL Oil Res. I, VW-1 Flame Test | 5123-5127 |
| 6/6a | 24 | 4 | • | | | PUR | .291/7.39 | • | • | | 5936 |
| 6/6a | 24 | 4 | • | | | TPE | .325/8.26 | • | • | CMX Outdoor-CM, UL AWM Style 2463 600V | 5922, 5925, 5935 |
| 6/6a | 24 | 4 | • | | • | TPE | .325/8.26 | • | • | CMX Outdoor-CM, UL AWM Style 2463 600V | 5937 |
| 5e | 26 | 4 | • | | | TPE | .245/6.22 | • | • | CMX Outdoor-CM | 5045, 5046, 5083, 5084, 5088 |
| 5e | 26 | 4 | • | | | ZHFR PUR | .245/6.22 | • | • | CMX, UL Oil Res. I, VW-1 Flame Test | 5075-5079 |
| 5e | 26 | 4 | • | | | PUR | .220/5.59 | | | | 5730-5732 |
| 5e | 26 | 4 | • | | | PVC | .221/5.61 | | | CMX | 5005 |
| 5e | 26 | 4 | • | | | PVC | .228/5.79 | | | CMR | 5739-5741 |
| 5e | 26 | 4 | • | | | TPE | .245/6.22 | | | CMX Outdoor-CM | 5734-5736 |
| 5e | 26 | 2 | • | | | TPE | .225/5.72 | • | • | CMX Outdoor-CM | 5085-5087 |
| 5e | 26 | 2 | • | | | ZHFR PUR | .233/5.92 | • | | CMX, UL Oil Res. I | 5080-5082 |
| 5e | 26 | 2 | • | | | PUR | .225/5.72 | • | | | 5055-5057 |
| 5e | 26 | 2 | • | | | PVC | .224/5.69 | | | CMR | 5060-5062 |
| 5e | 26 | 4 | | • | | TPE | .237/6.02 | | | CMX Outdoor-CM | 5760-5763 |
| 5e | 26 | 4 | | • | | PVC | .220/5.59 | | | CMR | 5725-5727 |
| 5e | 26 | 4 | | • | | PUR | .220/5.59 | | | | 5710-5712 |
| 5e | 26 | 2 | | • | | PVC | .209/5.31 | | | CMR | 5030-5032 |
| 5e | 26 | 2 | | • | | TPE | .209/5.31 | | | CM | 5035-5039 |
| 5e | 26 | 2 | | • | | PUR | .229/5.82 | | | | 5040-5042 |
| 5e | 24 | 4 | • | | | TPE | .290/7.37 | • | • | CMX Outdoor-CM, UL AWM Style 2463 600V | 5089-5093, 5097, 5934 |
| 5e | 24 | 4 | • | | | CPE | .290/7.37 | • | • | CMX Outdoor-CMR | 5003 |
| 5e | 24 | 4 | • | | | PVC | .276/7.01 | | | CMX, UL AWM Style 2463 600V | 5004 |
| 5e | 24 | 4 | • | | | TPE | .285/7.24 | | | CM, UL AWM Style 2463 600V | 5927 |
| 5e | 24 | 2 | • | | | TPE | .265/6.73 | • | • | CMX Outdoor-CM, UL AWM Style 2463 600V | 5023-5025, 5027-5029 |
| 5e | 24 | 2 | • | | | TPE | .270/6.86 | | | CM | 5926 |
| 5e | 24 | 4 | | • | | TPE | .273/6.93 | | | CMX Outdoor-CM | 5928-5929 |
| 5e | 24 | 4 | | • | | PVC | .285/7.24 | | | CMR, CMX | 5946-5947 |
| 5e | 24 | 4 | | | | TPE | .248/6.30 | • | • | CMX Outdoor-CM, UL AWM Style 2463 600V | 5750-5753 |
| 5e | 24 | 4 | | | | PUR | .240/6.10 | • | | | 5700, 5703, 5706, 5716 |
| 5e | 24 | 4 | | | | PVC | .230/5.84 | | | CMX Outdoor-CMR | 5943 |
| 5e | 24 | 4 | | | | PVC | .234/5.94 | | | CMX Outdoor-CMR | 5944 |

| Category | AWG | Pair Count | Foil & Braid Shielded | Foil Shielded | Profinet® Type B & C | Jacket Material | Overall Cable Dia. in/mm | Rolling Bend Hi-flex | Torsional H-flex | Ratings, Listings & Approvals | Part Numbers |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5e | 24 | 4 | | | | PVC | .253/6.43 | | | CMR | 5915-5918 |
| 5e | 24 | 2 | | | | TPE | .240/6.10 | • | • | CMX Outdoor-CM, UL AWM Style 2463 600V | 5770-5773 |
| 5e | 24 | 2 | | | | PUR | .220/5.59 | • | | | 5000, 5001, 5006, 5016 |
| 5e | 24 | 2 | | | | TPE | .235/5.97 | | | CM, UL AWM Style 2463 600V | 5774 |
| 5e | 24 | 2 | | | | PVC | .220/5.59 | | | CMR | 5780-5783 |
| 5e | 22 | 4 | • | | | TPE | .354/8.99 | • | • | ITC, PLTC, UL AWM Style 2463 600V, UL Oil Res. I & II | 5921 |
| 5e | 22 | 2 | • | | | TPE | .317/8.05 | • | • | ITC, PLTC, CMX Outdoor-CM, UL AWM Style 2463 600V, UL Oil Res. I & II | 5920 |
| 5e | 22 | 2 | • | | • | TPE | .317/8.05 | • | • | ITC, PLTC, Pennsylvania DEP-MSHA, UL AWM Style 2463 600V, UL Oil Res. I & II | 5924 |
| 5e | 22 | 4 | | | | TPE | .290/7.37 | • | | PLTC, CMX Outdoor-CM, Pennsylvania DEP-MSHA, UL AWM Style 2463 600V, UL Oil Res. I & II | 5800-5802 |
| 5e | 22 | 4 | | | | PVC | .267/6.78 | | | PLTC, CMX Outdoor-CMR, UL AWM Style 2463 600V, UL Oil Res. I | 5941, 5942 |
| 5e | 22 | 4 | | | | PUR | .260/6.60 | • | | | 5120-5122 |
| 5e | 22 | 2 | | | | TPE | .270/6.86 | • | | PLTC, CMX Outdoor-CM, Pennsylvania DEP-MSHA, UL AWM Style 2463 600V, UL Oil Res. I & II | 5900-5902 |
| 5e | 22 | 2 | | | | PUR | .235/5.97 | • | | | 5020-5022 |
| 5e | 22 | 2 | | | | PVC | .256/6.50 | | | CMR | 5904-5906 |
| 5e | 22 | Quad | • | | • | ZHFR PUR | .272/6.91 | • | • | UL AWM Style 20532 600V, VW-1 Flame Test | 5007 |
| 5e | 22 | Quad | • | | • | TPE | .250/6.35 | • | • | PLTC, CL3, UL AWM Style 2463 600V, UL Oil Res. I & II | 5094 |
| 5e | 22 | Quad | • | | • | TPE | .305/7.75 | • | • | PLTC-ER, CM | 5099 |

# DataMax® Extreme Harsh Environment Ethernet
# 6/6a / 26 AWG

### Construction
- 26 AWG Stranded Tinned Copper
- HDPE Insulation
- 4 Pair
- Spline
- Custom constuctions available upon request
- Consult our cable design experts for technical support

### Physical & Electrical Properties
- Rolling Bend Hi-flex†
- Torsional Hi-flex‡
- Temp. Min (Static) -40°C
- Temp. Min (UL 444 Cold Bend) -20°C*
- Temp. Max 75°C
- See *Jacket Material Comparison* on page 20 for physical properties
- See Product Specification for detailed electrical performance characteristics
- PoE Compliant. See *Quabbin DataMax® Extreme: An Easy Choice for Single-Cable Power Delivery Using PoE for Harsh Environments* on page 24

### Ratings, Listings & Approvals
- RoHS Compliant
- Other Ratings, Listings & Approvals as shown below

## Foil & Braid Shielded

| Part Number | Stranding | Insulated OD in/mm | Jacket Material | Jacket Color | Overall Cable Dia. in/mm | Net. Wt./M', Nom. lb | Max Plug-to-Plug Transmission Distance m | Notes |
|---|---|---|---|---|---|---|---|---|
| 5123 | 7/34 | .036/.91 | ZHFR PUR | Black | .269/6.83 | 37.3 | 70 | Low Smoke Jacket, Oil Resistant Jacket, CMX, UL Oil Res. I, VW-1 Flame Test |
| 5124 | 7/34 | .036/.91 | ZHFR PUR | Blue | .269/6.83 | 37.3 | 70 | Low Smoke Jacket, Oil Resistant Jacket, CMX, UL Oil Res. I, VW-1 Flame Test |
| 5125 | 7/34 | .036/.91 | ZHFR PUR | Teal | .269/6.83 | 37.3 | 70 | Low Smoke Jacket, Oil Resistant Jacket, CMX, UL Oil Res. I, VW-1 Flame Test |
| 5126 | 7/34 | .036/.91 | ZHFR PUR | Red | .269/6.83 | 37.3 | 70 | Low Smoke Jacket, Oil Resistant Jacket, CMX, UL Oil Res. I, VW-1 Flame Test |
| 5127 | 7/34 | .036/.91 | ZHFR PUR | Yellow | .269/6.83 | 37.3 | 70 | Low Smoke Jacket, Oil Resistant Jacket, CMX, UL Oil Res. I, VW-1 Flame Test |
| 5026 | 7/34 | .036/.91 | TPE | Teal | .275/6.99 | 40.2 | 70 | Cutting/Machining Oil Resistant Jacket, Sunlight Resistant Jacket, Weld Spatter Resistant Jacket, CMX Outdoor-CM |
| 5047 | 7/34 | .036/.91 | TPE | Gray | .275/6.99 | 40.2 | 70 | Cutting/Machining Oil Resistant Jacket, Sunlight Resistant Jacket, Weld Spatter Resistant Jacket, CMX Outdoor-CM |
| 5048 | 7/34 | .036/.91 | TPE | Black | .275/6.99 | 40.2 | 70 | Cutting/Machining Oil Resistant Jacket, Sunlight Resistant Jacket, Weld Spatter Resistant Jacket, CMX Outdoor-CM |
| 5919 | 7/34 | .036/.91 | PUR | Black | .239/6.07 | 32.4 | 70 | UV Resistant Jacket, Cable can withstand storage temperatures up to 85°C for 16 hrs, No UL 444 Cold Bend |

**Unless noted otherwise in Notes column*

*†Rolling Bend Hi-flex: 1 million cycle test (10x cable OD, minimum radius); 10 million cycle test (20x cable OD, minimum radius)*

*‡Torsional Hi-flex: 3 million cycle torsion test*

# DataMax® Extreme Harsh Environment Ethernet
# 6/6a / 24 AWG

### Construction
- 24 AWG Stranded Tinned Copper
- HDPE Insulation
- 4 Pair
- Spline
- TPE Jacket*
- Custom constructions available upon request
- Consult our cable design experts for technical support

### Physical & Electrical Properties
- Rolling Bend Hi-flex†
- Torsional Hi-flex‡
- Cutting/Machining Oil Resistant Jacket*
- Sunlight Resistant Jacket*
- Weld Spatter Resistant Jacket*
- Temp. Min (Static) -40°C
- Temp. Min (UL 444 Cold Bend) -20°C*
- Temp. Max 75°C & 80°C*
- See *Jacket Material Comparison* on page 20 for physical properties
- See Product Specification for detailed electrical performance characteristics
- PoE Compliant. See *Quabbin DataMax® Extreme: An Easy Choice for Single-Cable Power Delivery Using PoE for Harsh Environments* on page 24

### Ratings, Listings & Approvals
- RoHS Compliant
- CMX Outdoor-CM*
- UL AWM Style 2463 600V*

## Foil & Braid Shielded

| Part Number | Stranding | Insulated OD in/mm | Jacket Color | Overall Cable Dia. in/mm | Net. Wt./M', Nom. lb | Max Plug-to-Plug Transmission Distance m | Notes |
|---|---|---|---|---|---|---|---|
| 5922 | 7/32 | .046/1.17 | Teal | .325/8.26 | 51.2 | 88 | |
| 5925 | 7/32 | .046/1.17 | Black | .325/8.26 | 51.2 | 88 | |
| 5935 | 7/32 | .046/1.17 | Gray | .325/8.26 | 51.2 | 88 | |
| 5936 | 7/32 | .046/1.17 | Black | .291/7.39 | 42.3 | 88 | PUR Jacket, Temp. Max 75°C, UV Resistant Jacket, No UL 444 Cold Bend, Jacket not Cutting/Machining Oil Resistant, Sunlight Resistant, or Weld Spatter Resistant, No CMX Outdoor-CM, No UL AWM Style 2463 600V |

**Unless noted otherwise in Notes column*

*†Rolling Bend Hi-flex: 1 million cycle test (10x cable OD, minimum radius); 10 million cycle test (20x cable OD, minimum radius)*

*‡Torsional Hi-flex: 3 million cycle torsion test*

# DataMax® Extreme Harsh Environment Ethernet
# Cat 5e / 26 AWG

### Construction
- 26 AWG Stranded Tinned Copper
- HDPE Insulation
- 26 AWG 7/34 Drain Wire
- Custom constructions available upon request
- Consult our cable design experts for technical support

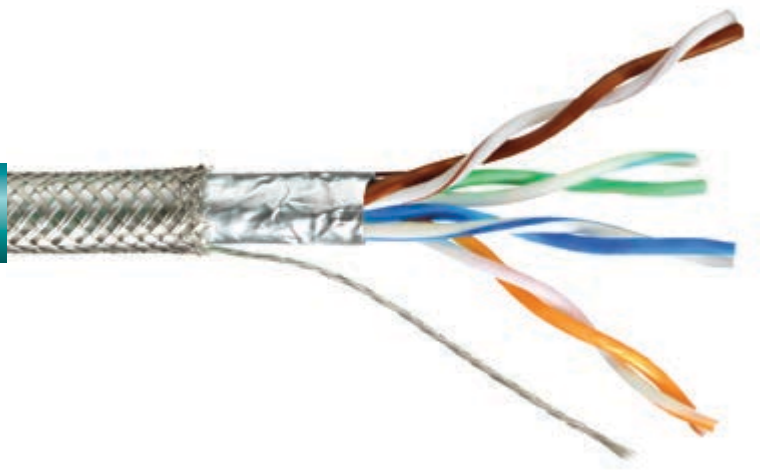
### Physical & Electrical Properties
- Temp. Min (UL 444 Cold Bend) -20°C*
- Temp. Max 75°C
- See *Jacket Material Comparison* on page 20 for physical properties
- See Product Specification for detailed electrical performance characteristics
- PoE Compliant. See *Quabbin DataMax® Extreme: An Easy Choice for Single-Cable Power Delivery Using PoE for Harsh Environments* on page 24

### Ratings, Listings & Approvals
- RoHS Compliant
- Other Ratings, Listings & Approvals as shown below

## Foil & Braid Shielded

| Part Number | Stranding | Insulated OD in/mm | Pair Count | Jacket Material | Jacket Color | Overall Cable Dia. in/mm | Temp. Min (Static) °C | Net. Wt./M', Nom. lb | Max Plug-to-Plug Trans. Dist. m | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| 5739 | 7/34 | .039/.99 | 4 | PVC | Black | .228/5.79 | -20 | 33.4 | 68 | CMR |
| 5740 | 7/34 | .039/.99 | 4 | PVC | Blue | .228/5.79 | -20 | 33.4 | 68 | CMR |
| 5741 | 7/34 | .039/.99 | 4 | PVC | Teal | .228/5.79 | -20 | 33.4 | 68 | CMR |
| 5730 | 7/34 | .039/.99 | 4 | PUR | Black | .220/5.59 | -40 | 30.8 | 68 | UV Resistant Jacket, No UL 444 Cold Bend |
| 5731 | 7/34 | .039/.99 | 4 | PUR | Blue | .220/5.59 | -40 | 30.8 | 68 | UV Resistant Jacket, No UL 444 Cold Bend |
| 5732 | 7/34 | .039/.99 | 4 | PUR | Teal | .220/5.59 | -40 | 30.8 | 68 | UV Resistant Jacket, No UL 444 Cold Bend |
| 5734 | 7/34 | .039/.99 | 4 | TPE | Black | .245/6.22 | -40 | 37.6 | 68 | Cutting/Machining Oil Resistant Jacket, Sunlight Resistant Jacket, Weld Spatter Resistant Jacket, CMX Outdoor-CM |
| 5735 | 7/34 | .039/.99 | 4 | TPE | Blue | .245/6.22 | -40 | 37.6 | 68 | Cutting/Machining Oil Resistant Jacket, Sunlight Resistant Jacket, Weld Spatter Resistant Jacket, CMX Outdoor-CM |
| 5736 | 7/34 | .039/.99 | 4 | TPE | Teal | .245/6.22 | -40 | 37.6 | 68 | Cutting/Machining Oil Resistant Jacket, Sunlight Resistant Jacket, Weld Spatter Resistant Jacket, CMX Outdoor-CM |
| 5060 | 7/34 | .039/.99 | 2 | PVC | Black | .224/5.69 | -20 | 27.1 | 68 | CMR |
| 5061 | 7/34 | .039/.99 | 2 | PVC | Blue | .224/5.69 | -20 | 27.1 | 68 | CMR |
| 5062 | 7/34 | .039/.99 | 2 | PVC | Teal | .224/5.69 | -20 | 27.1 | 68 | CMR |

**Unless noted otherwise in Notes column*



# DataMax® Extreme Harsh Environment Ethernet
# Cat 5e / 26 AWG

### Construction
- 26 AWG Stranded Tinned Copper
- HDPE Insulation
- Custom constructions available upon request
- Consult our cable design experts for technical support

### Physical & Electrical Properties
- Rolling Bend Hi-flex†*
- Torsional Hi-flex‡*
- Temp. Min (Static) -40°C
- Temp. Min (UL 444 Cold Bend) -20°C*
- Temp. Max 75°C*
- See *Jacket Material Comparison* on page 20 for physical properties
- See Product Specification for detailed electrical performance characteristics
- PoE Compliant. See *Quabbin DataMax® Extreme: An Easy Choice for Single-Cable Power Delivery Using PoE for Harsh Environments* on page 24

### Ratings, Listings & Approvals
- RoHS Compliant
- Other Ratings, Listings & Approvals as shown below

## Foil & Braid Shielded

| Part Number | Stranding | Insulated OD in/mm | Pair Count | Jacket Material | Jacket Color | Overall Cable Dia. in/mm | Net. Wt./M', Nom. lb | Max Plug-to-Plug Trans. Dist. m | Notes |
|---|---|---|---|---|---|---|---|---|---|
| 5075 | 7/34 | .037/.94 | 4 | ZHFR PUR | Black | .245/6.22 | 32.6 | 68 | Low Smoke Jacket, Oil Resistant Jacket, CMX, UL Oil Res. I, VW-1 Flame Test |
| 5076 | 7/34 | .037/.94 | 4 | ZHFR PUR | Blue | .245/6.22 | 32.6 | 68 | Low Smoke Jacket, Oil Resistant Jacket, CMX, UL Oil Res. I, VW-1 Flame Test |
| 5077 | 7/34 | .037/.94 | 4 | ZHFR PUR | Teal | .245/6.22 | 32.6 | 68 | Low Smoke Jacket, Oil Resistant Jacket, CMX, UL Oil Res. I, VW-1 Flame Test |
| 5078 | 7/34 | .037/.94 | 4 | ZHFR PUR | Red | .245/6.22 | 32.6 | 68 | Low Smoke Jacket, Oil Resistant Jacket, CMX, UL Oil Res. I, VW-1 Flame Test |
| 5079 | 7/34 | .037/.94 | 4 | ZHFR PUR | Yellow | .245/6.22 | 32.6 | 68 | Low Smoke Jacket, Oil Resistant Jacket, CMX, UL Oil Res. I, VW-1 Flame Test |
| 5045 | 7/34 | .037/.94 | 4 | TPE | Blue | .245/6.22 | 35.3 | 68 | Cutting/Machining Oil Resistant Jacket, Sunlight Resistant Jacket, Weld Spatter Resistant Jacket, CMX Outdoor-CM |
| 5046 | 7/34 | .037/.94 | 4 | TPE | Red | .245/6.22 | 35.3 | 68 | Cutting/Machining Oil Resistant Jacket, Sunlight Resistant Jacket, Weld Spatter Resistant Jacket, CMX Outdoor-CM |
| 5083 | 7/34 | .037/.94 | 4 | TPE | Black | .245/6.22 | 35.3 | 68 | Cutting/Machining Oil Resistant Jacket, Sunlight Resistant Jacket, Weld Spatter Resistant Jacket, CMX Outdoor-CM |
| 5084 | 7/34 | .037/.94 | 4 | TPE | Violet | .245/6.22 | 35.3 | 68 | Cutting/Machining Oil Resistant Jacket, Sunlight Resistant Jacket, Weld Spatter Resistant Jacket, CMX Outdoor-CM |
| 5088 | 7/34 | .037/.94 | 4 | TPE | Teal | .245/6.22 | 35.3 | 68 | Cutting/Machining Oil Resistant Jacket, Sunlight Resistant Jacket, Weld Spatter Resistant Jacket, CMX Outdoor-CM |
| 5005 | 7/34 | .037/.94 | 4 | PVC | Black | .221/5.61 | 28.3 | 68 | UV Resistant Jacket, Temp. Min (Static) -20°C, Temp. Max 60°C, CMX, No Rolling Bend Hi-flex, No Torsional Hi-flex |
| 5080 | 7/34 | .037/.94 | 2 | ZHFR PUR | Black | .233/5.92 | 28.5 | 68 | Low Smoke Jacket, Oil Resistant Jacket, CMX, UL Oil Res. I, VW-1 Flame Test, No Torsional Hi-flex |
| 5081 | 7/34 | .037/.94 | 2 | ZHFR PUR | Blue | .233/5.92 | 28.5 | 68 | Low Smoke Jacket, Oil Resistant Jacket, CMX, UL Oil Res. I, VW-1 Flame Test, No Torsional Hi-flex |
| 5082 | 7/34 | .037/.94 | 2 | ZHFR PUR | Teal | .233/5.92 | 28.5 | 68 | Low Smoke Jacket, Oil Resistant Jacket, CMX, UL Oil Res. I, VW-1 Flame Test, No Torsional Hi-flex |
| 5055 | 7/34 | .037/.94 | 2 | PUR | Black | .225/5.72 | 30.4 | 68 | No Torsional Hi-flex, No UL 444 Cold Bend |
| 5056 | 7/34 | .037/.94 | 2 | PUR | Blue | .225/5.72 | 30.4 | 68 | No Torsional Hi-flex, No UL 444 Cold Bend |
| 5057 | 7/34 | .037/.94 | 2 | PUR | Teal | .225/5.72 | 30.4 | 68 | No Torsional Hi-flex, No UL 444 Cold Bend |
| 5085 | 7/34 | .037/.94 | 2 | TPE | Black | .225/5.72 | 28.5 | 68 | Cutting/Machining Oil Resistant Jacket, Sunlight Resistant Jacket, Weld Spatter Resistant Jacket, Temp. Max 75°C & 80°C, CMX Outdoor-CM |
| 5086 | 7/34 | .037/.94 | 2 | TPE | Blue | .225/5.72 | 28.5 | 68 | Cutting/Machining Oil Resistant Jacket, Sunlight Resistant Jacket, Weld Spatter Resistant Jacket, Temp. Max 75°C & 80°C, CMX Outdoor-CM |
| 5087 | 7/34 | .037/.94 | 2 | TPE | Teal | .225/5.72 | 28.5 | 68 | Cutting/Machining Oil Resistant Jacket, Sunlight Resistant Jacket, Weld Spatter Resistant Jacket, Temp. Max 75°C & 80°C, CMX Outdoor-CM |

**Unless noted otherwise in Notes column*

*†Rolling Bend Hi-flex: 1 million cycle test (10x cable OD, minimum radius); 10 million cycle test (20x cable OD, minimum radius)*

*‡Torsional Hi-flex: 3 million cycle torsion test*

# DataMax® Extreme Harsh Environment Ethernet

## 5e / 26 AWG

### Construction

- 26 AWG Stranded Tinned Copper
- HDPE Insulation
- 26 AWG 7/34 Drain Wire
- Custom constructions available upon request
- Consult our cable design experts for technical support

### Physical & Electrical Properties

- Temp. Min (Static) -40°C*
- Temp. Min (UL 444 Cold Bend) -20°C*
- Temp. Max 75°C
- See *Jacket Material Comparison* on page 20 for physical properties
- See Product Specification for detailed electrical performance characteristics
- PoE Compliant. See *Quabbin DataMax® Extreme: An Easy Choice for Single-Cable Power Delivery Using PoE for Harsh Environments* on page 24

### Ratings, Listings & Approvals

- RoHS Compliant
- Other Ratings, Listings & Approvals as shown below

## Foil Shielded

| Part Number | Stranding | Insulated OD in/mm | Pair Count | Jacket Material | Jacket Color | Overall Cable Dia. in/mm | Net. Wt./M', Nom. lb | Max Plug-to-Plug Transmission Distance m | Notes |
|---|---|---|---|---|---|---|---|---|---|
| 5760 | 7/34 | .039/.99 | 4 | TPE | Black | .237/6.02 | 24.5 | 68 | Cutting/Machining Oil Resistant Jacket, Sunlight Resistant Jacket, Weld Spatter Resistant Jacket, CMX Outdoor-CM |
| 5761 | 7/34 | .039/.99 | 4 | TPE | Blue | .237/6.02 | 24.5 | 68 | Cutting/Machining Oil Resistant Jacket, Sunlight Resistant Jacket, Weld Spatter Resistant Jacket, CMX Outdoor-CM |
| 5762 | 7/34 | .039/.99 | 4 | TPE | Teal | .237/6.02 | 24.5 | 68 | Cutting/Machining Oil Resistant Jacket, Sunlight Resistant Jacket, Weld Spatter Resistant Jacket, CMX Outdoor-CM |
| 5763 | 7/34 | .039/.99 | 4 | TPE | Red | .237/6.02 | 24.5 | 68 | Cutting/Machining Oil Resistant Jacket, Sunlight Resistant Jacket, Weld Spatter Resistant Jacket, CMX Outdoor-CM |
| 5710 | 7/34 | .039/.99 | 4 | PUR | Black | .220/5.59 | 22.7 | 68 | UV Resistant Jacket, No UL 444 Cold Bend |
| 5711 | 7/34 | .039/.99 | 4 | PUR | Blue | .220/5.59 | 22.7 | 68 | UV Resistant Jacket, No UL 444 Cold Bend |
| 5712 | 7/34 | .039/.99 | 4 | PUR | Teal | .220/5.59 | 22.7 | 68 | UV Resistant Jacket, No UL 444 Cold Bend |
| 5725 | 7/34 | .039/.99 | 4 | PVC | Black | .220/5.59 | 24.0 | 68 | Temp. Min (Static) -20°C, CMR |
| 5726 | 7/34 | .039/.99 | 4 | PVC | Blue | .220/5.59 | 24.0 | 68 | Temp. Min (Static) -20°C, CMR |
| 5727 | 7/34 | .039/.99 | 4 | PVC | Teal | .220/5.59 | 24.0 | 68 | Temp. Min (Static) -20°C, CMR |
| 5035 | 7/34 | .040/1.02 | 2 | TPE | Black | .209/5.31 | 20.7 | 68 | UV Resistant Jacket, CM |
| 5036 | 7/34 | .040/1.02 | 2 | TPE | Blue | .209/5.31 | 20.7 | 68 | UV Resistant Jacket, CM |
| 5037 | 7/34 | .040/1.02 | 2 | TPE | Teal | .209/5.31 | 20.7 | 68 | UV Resistant Jacket, CM |
| 5038 | 7/34 | .040/1.02 | 2 | TPE | Red | .209/5.31 | 20.7 | 68 | UV Resistant Jacket, CM |
| 5039 | 7/34 | .040/1.02 | 2 | TPE | Gray | .209/5.31 | 20.7 | 68 | UV Resistant Jacket, CM |
| 5040 | 7/34 | .039/.99 | 2 | PUR | Black | .229/5.82 | 18.4 | 68 | UV Resistant Jacket, No UL 444 Cold Bend |
| 5041 | 7/34 | .039/.99 | 2 | PUR | Blue | .229/5.82 | 18.4 | 68 | UV Resistant Jacket, No UL 444 Cold Bend |
| 5042 | 7/34 | .039/.99 | 2 | PUR | Teal | .229/5.82 | 18.4 | 68 | UV Resistant Jacket, No UL 444 Cold Bend |
| 5030 | 7/34 | .040/1.02 | 2 | PVC | Black | .209/5.31 | 22.8 | 68 | Temp. Min (Static) -20°C, CMR |
| 5031 | 7/34 | .040/1.02 | 2 | PVC | Blue | .209/5.31 | 22.8 | 68 | Temp. Min (Static) -20°C, CMR |
| 5032 | 7/34 | .040/1.02 | 2 | PVC | Teal | .209/5.31 | 22.8 | 68 | Temp. Min (Static) -20°C, CMR |

**Unless noted otherwise in Notes column*

# DataMax® Extreme Harsh Environment Ethernet
# 5e / 24 AWG

### Construction
- 24 AWG Stranded Tinned Copper
- HDPE Insulation
- TPE Jacket*
- Custom constructions available upon request
- Consult our cable design experts for technical support

### Physical & Electrical Properties
- Rolling Bend Hi-flex†*
- Torsional Hi-flex‡*
- Cutting/Machining Oil Resistant Jacket*
- Sunlight Resistant Jacket*
- Weld Spatter Resistant Jacket*
- Temp. Min (Static) -40°C*
- Temp. Min (UL 444 Cold Bend) -20°C
- Temp. Max 75°C & 80°C*
- See *Jacket Material Comparison* on page 20 for physical properties
- See Product Specification for detailed electrical performance characteristics
- PoE Compliant. See *Quabbin DataMax® Extreme: An Easy Choice for Single-Cable Power Delivery Using PoE for Harsh Environments* on page 24

### Ratings, Listings & Approvals
- RoHS Compliant
- CMX Outdoor-CM*
- UL AWM Style 2463 600V*
- Other Ratings, Listings & Approvals as shown below

## Foil & Braid Shielded

| Part Number | Stranding | Insulated OD in/mm | Pair Count | Jacket Color | Overall Cable Dia. in/mm | Net. Wt./M', Nom. lb | Max Plug-to-Plug Transmission Distance m | Notes |
|---|---|---|---|---|---|---|---|---|
| 5089 | 7/32 | .046/1.17 | 4 | Black | .290/7.37 | 46.7 | 85 | |
| 5090 | 7/32 | .046/1.17 | 4 | Teal | .290/7.37 | 46.7 | 85 | |
| 5091 | 7/32 | .046/1.17 | 4 | Blue | .290/7.37 | 46.7 | 85 | |
| 5092 | 7/32 | .046/1.17 | 4 | Red | .290/7.37 | 46.7 | 85 | |
| 5093 | 7/32 | .046/1.17 | 4 | Violet | .290/7.37 | 46.7 | 85 | |
| 5097 | 7/32 | .046/1.17 | 4 | Gray | .290/7.37 | 46.7 | 85 | |
| 5934 | 7/32 | .046/1.17 | 4 | Green | .290/7.37 | 46.7 | 85 | |
| 5003 | 7/32 | .046/1.17 | 4 | Black | .290/7.37 | 46.1 | 85 | CPE Jacket, Oil Resistant Jacket, Temp. Min (Static) -35°C, Temp. Max 75°C (Jacket temperature rating 90°C), CMX Outdoor-CMR, Jacket not Cutting/Machining Oil Resistant or Weld Spatter Resistant, No CMX Outdoor-CM, No UL AWM Style 2463 600V |
| 5004 | 7/32 | .046/1.17 | 4 | Black | .276/7.01 | 38.8 | 85 | PVC Jacket, UV Resistant Jacket, Temp. Min (Static) -20°C, Temp. Max 60 & 80°C, CMX, No Rolling Bend Hi-Flex, No Torsional Hi-flex, Jacket not Cutting/Machining Oil Resistant, Sunlight Resistant, or Weld Spatter Resistant, No CMX Outdoor-CM |
| 5023 | 7/32 | .047/1.19 | 2 | Black | .265/6.73 | 37.2 | 85 | |
| 5024 | 7/32 | .047/1.19 | 2 | Gray | .265/6.73 | 37.2 | 85 | |
| 5025 | 7/32 | .047/1.19 | 2 | Teal | .265/6.73 | 37.2 | 85 | |
| 5027 | 7/32 | .047/1.19 | 2 | Red | .265/6.73 | 37.2 | 85 | |
| 5028 | 7/32 | .047/1.19 | 2 | Blue | .265/6.73 | 37.2 | 85 | |
| 5029 | 7/32 | .047/1.19 | 2 | Orange | .265/6.73 | 37.2 | 85 | |

**Unless noted otherwise in Notes column*

*†Rolling Bend Hi-flex: 1 million cycle test (10x cable OD, minimum radius); 10 million cycle test (20x cable OD, minimum radius)*

*‡Torsional Hi-flex: 3 million cycle torsion test*

# DataMax® Extreme Harsh Environment Ethernet
# 5e / 24 AWG

### Construction
- 24 AWG Stranded Tinned Copper
- HDPE Insulation
- 4 Pair
- 26 AWG 7/34 Drain Wire
- Custom constructions available upon request
- Consult our cable design experts for technical support

### Physical & Electrical Properties
- Temp. Min (UL 444 Cold Bend) -20°C
- Temp. Max 75°C
- See *Jacket Material Comparison* on page 20 for physical properties
- See Product Specification for detailed electrical performance characteristics
- PoE Compliant. See *Quabbin DataMax® Extreme: An Easy Choice for Single-Cable Power Delivery Using PoE for Harsh Environments* on page 24

### Ratings, Listings & Approvals
- RoHS Compliant
- Other Ratings, Listings & Approvals as shown below

## Foil Shielded

| Part Number | Stranding | Insulated OD in/mm | Jacket Material | Jacket Color | Overall Cable Dia. in/mm | Temp. Min (Static) °C | Net. Wt./M', Nom. lb | Max Plug-to-Plug Transmission Distance m | Notes |
|---|---|---|---|---|---|---|---|---|---|
| 5928 | 7/32 | .047/1.19 | TPE | Black | .273/6.93 | -40 | 35.2 | 85 | Cutting/Machining Oil Resistant Jacket, Sunlight Resistant Jacket, Weld Spatter Resistant Jacket, CMX Outdoor-CM |
| 5929 | 7/32 | .047/1.19 | TPE | Teal | .273/6.93 | -40 | 35.2 | 85 | Cutting/Machining Oil Resistant Jacket, Sunlight Resistant Jacket, Weld Spatter Resistant Jacket, CMX Outdoor-CM |
| 5946 | 7/32 | .047/1.19 | PVC | Black | .285/7.24 | -20 | 36.7 | 85 | Oil Resistant Jacket, UV Resistant Jacket, CMR, CMX |
| 5947 | 7/32 | .047/1.19 | PVC | Teal | .285/7.24 | -20 | 36.7 | 85 | Oil Resistant Jacket, UV Resistant Jacket, CMR, CMX |

**Unless noted otherwise in Notes column*

# DataMax® Extreme Harsh Environment Ethernet

## 5e / 24 AWG

### Construction

- 24 AWG Stranded Tinned Copper
- HDPE Insulation
- Custom constructions available upon request
- Consult our cable design experts for technical support

### Physical & Electrical Properties

- Rolling Bend Hi-flex†*
- Torsional Hi-flex‡*
- Temp. Min (UL 444 Cold Bend) -20°C*
- See *Jacket Material Comparison* on page 20 for physical properties
- See Product Specification for detailed electrical performance characteristics
- PoE Compliant. See *Quabbin DataMax® Extreme: An Easy Choice for Single-Cable Power Delivery Using PoE for Harsh Environments* on page 24

### Ratings, Listings & Approvals

- RoHS Compliant
- Other Ratings, Listings & Approvals as shown below

## Unshielded

| Part Number | Stranding | Insulated OD in/mm | Pair Count | Jacket Material | Jacket Color | Overall Cable Dia in/mm | Temp. Min (Static) °C | Temp. Max °C | Net. Wt./M', Nom. lb | Max Plug-to-Plug Trans. Dist. m | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5750 | 7/32 | .040/1.02 | 4 | TPE | Black | .248/6.30 | -40 | 75 & 80 | 30.4 | 85 | Cutting/Machining Oil Resistant Jacket, Sunlight Resistant Jacket, Weld Spatter Resistant Jacket, CMX Outdoor-CM, UL AWM Style 2463 600V |
| 5751 | 7/32 | .040/1.02 | 4 | TPE | Blue | .248/6.30 | -40 | 75 & 80 | 30.4 | 85 | Cutting/Machining Oil Resistant Jacket, Sunlight Resistant Jacket, Weld Spatter Resistant Jacket, CMX Outdoor-CM, UL AWM Style 2463 600V |
| 5752 | 7/32 | .040/1.02 | 4 | TPE | Teal | .248/6.30 | -40 | 75 & 80 | 30.4 | 85 | Cutting/Machining Oil Resistant Jacket, Sunlight Resistant Jacket, Weld Spatter Resistant Jacket, CMX Outdoor-CM, UL AWM Style 2463 600V |
| 5753 | 7/32 | .040/1.02 | 4 | TPE | Red | .248/6.30 | -40 | 75 & 80 | 30.4 | 85 | Cutting/Machining Oil Resistant Jacket, Sunlight Resistant Jacket, Weld Spatter Resistant Jacket, CMX Outdoor-CM, UL AWM Style 2463 600V |
| 5700 | 7/32 | .039/.99 | 4 | PUR | Black | .240/6.10 | -40 | 75 | 31.5 | 85 | UV Resistant Jacket, No Torsional Hi-flex, No UL 444 Cold Bend |
| 5703 | 7/32 | .039/.99 | 4 | PUR | Red | .240/6.10 | -40 | 75 | 31.5 | 85 | UV Resistant Jacket, No Torsional Hi-flex, No UL 444 Cold Bend |
| 5706 | 7/32 | .039/.99 | 4 | PUR | Blue | .240/6.10 | -40 | 75 | 31.5 | 85 | UV Resistant Jacket, No Torsional Hi-flex, No UL 444 Cold Bend |
| 5716 | 7/32 | .039/.99 | 4 | PUR | Teal | .240/6.10 | -40 | 75 | 31.5 | 85 | UV Resistant Jacket, No Torsional Hi-flex, No UL 444 Cold Bend |
| 5915 | 7/32 | .040/1.02 | 4 | PVC | Black | .253/6.43 | -20 | 75 | 29.6 | 85 | CMR, No Rolling Bend Hi-flex, No Torsional Hi-flex |
| 5916 | 7/32 | .040/1.02 | 4 | PVC | Teal | .253/6.43 | -20 | 75 | 29.6 | 85 | CMR, No Rolling Bend Hi-flex, No Torsional Hi-flex |
| 5917 | 7/32 | .040/1.02 | 4 | PVC | Blue | .253/6.43 | -20 | 75 | 29.6 | 85 | CMR, No Rolling Bend Hi-flex, No Torsional Hi-flex |
| 5918 | 7/32 | .040/1.02 | 4 | PVC | Red | .253/6.43 | -20 | 75 | 29.6 | 85 | CMR, No Rolling Bend Hi-flex, No Torsional Hi-flex |
| 5944 | 7/32 | .039/.99 | 4 | PVC | Black | .234/5.94 | -40 | 75 | 26.9 | 85 | Tubed jacket, Oil Resistant Jacket, UV Resistant Jacket, CMX Outdoor-CMR, No Rolling Bend Hi-flex, No Torsional Hi-flex |
| 5770 | 7/32 | .039/.99 | 2 | TPE | Black | .240/6.10 | -40 | 75 & 80 | 26.2 | 85 | Cutting/Machining Oil Resistant Jacket, Sunlight Resistant Jacket, Weld Spatter Resistant Jacket, CMX Outdoor-CM, UL AWM Style 2463 600V |
| 5771 | 7/32 | .039/.99 | 2 | TPE | Blue | .240/6.10 | -40 | 75 & 80 | 26.2 | 85 | Cutting/Machining Oil Resistant Jacket, Sunlight Resistant Jacket, Weld Spatter Resistant Jacket, CMX Outdoor-CM, UL AWM Style 2463 600V |
| 5772 | 7/32 | .039/.99 | 2 | TPE | Teal | .240/6.10 | -40 | 75 & 80 | 26.2 | 85 | Cutting/Machining Oil Resistant Jacket, Sunlight Resistant Jacket, Weld Spatter Resistant Jacket, CMX Outdoor-CM, UL AWM Style 2463 600V |
| 5773 | 7/32 | .039/.99 | 2 | TPE | Red | .240/6.10 | -40 | 75 & 80 | 26.2 | 85 | Cutting/Machining Oil Resistant Jacket, Sunlight Resistant Jacket, Weld Spatter Resistant Jacket, CMX Outdoor-CM, UL AWM Style 2463 600V |
| 5000 | 7/32 | .039/.99 | 2 | PUR | Black | .220/5.59 | -40 | 75 | 20.5 | 85 | UV Resistant Jacket, No Torsional Hi-flex, No UL 444 Cold Bend |
| 5001 | 7/32 | .039/.99 | 2 | PUR | Red | .220/5.59 | -40 | 75 | 20.5 | 85 | UV Resistant Jacket, No Torsional Hi-flex, No UL 444 Cold Bend |
| 5006 | 7/32 | .039/.99 | 2 | PUR | Blue | .220/5.59 | -40 | 75 | 20.5 | 85 | UV Resistant Jacket, No Torsional Hi-flex, No UL 444 Cold Bend |
| 5016 | 7/32 | .039/.99 | 2 | PUR | Teal | .220/5.59 | -40 | 75 | 20.5 | 85 | UV Resistant Jacket, No Torsional Hi-flex, No UL 444 Cold Bend |
| 5780 | 7/32 | .039/.99 | 2 | PVC | Black | .220/5.59 | -20 | 75 | 18.5 | 85 | UV Resistant Jacket, CMR, No Rolling Bend Hi-flex, No Torsional Hi-flex |
| 5781 | 7/32 | .039/.99 | 2 | PVC | Blue | .220/5.59 | -20 | 75 | 18.5 | 85 | UV Resistant Jacket, CMR, No Rolling Bend Hi-flex, No Torsional Hi-flex |
| 5782 | 7/32 | .039/.99 | 2 | PVC | Teal | .220/5.59 | -20 | 75 | 18.5 | 85 | UV Resistant Jacket, CMR, No Rolling Bend Hi-flex, No Torsional Hi-flex |
| 5783 | 7/32 | .039/.99 | 2 | PVC | Red | .220/5.59 | -20 | 75 | 18.5 | 85 | UV Resistant Jacket, CMR, No Rolling Bend Hi-flex, No Torsional Hi-flex |

**Unless noted otherwise in Notes column*

*†Rolling Bend Hi-flex: 1 million cycle test (10x cable OD, minimum radius); 10 million cycle test (20x cable OD, minimum radius)*

*‡Torsional Hi-flex: 3 million cycle torsion test*

# DataMax® Extreme Harsh Environment Ethernet
# 5e / 22 AWG

### Construction
- 22 AWG Stranded Tinned Copper
- HDPE Insulation
- TPE Teal Jacket
- Custom constructions available upon request
- Consult our cable design experts for technical support

### Physical & Electrical Properties
- Rolling Bend Hi-flex†
- Torsional Hi-flex‡
- Cutting/Machining Oil Resistant Jacket
- Sunlight Resistant Jacket
- Weld Spatter Resistant Jacket
- Temp. Min (Static) -40°C
- Temp. Max 75°C & 80°C
- See *Jacket Material Comparison* on page 20 for physical properties
- See Product Specification for detailed electrical performance characteristics
- PoE Compliant. See *Quabbin DataMax® Extreme: An Easy Choice for Single-Cable Power Delivery Using PoE for Harsh Environments* on page 24

### Ratings, Listings & Approvals
- RoHS Compliant
- ITC
- PLTC
- UL AWM Style 2463 600V
- UL Oil Res. I & II
- Other Ratings, Listings & Approvals as shown below

## Foil & Braid Shielded

| Part Number | Stranding | Insulated OD in/mm | Pair Count | Overall Cable Dia. in/mm | Net. Wt./M', Nom. lb | Max Plug-to-Plug Transmission Distance m | Notes |
|---|---|---|---|---|---|---|---|
| 5921 | 19/.0058 | .057/1.45 | 4 | .354/8.99 | 59.7 | 100 | |
| 5920 | 19/.0058 | .054/1.37 | 2 | .317/8.05 | 49.2 | 100 | Temp. Min (UL 444 Cold Bend) -20°C, CMX Outdoor-CM |

**Unless noted otherwise in Notes column*

*†Rolling Bend Hi-flex: 1 million cycle test (10x cable OD, minimum radius); 10 million cycle test (20x cable OD, minimum radius)*

*‡Torsional Hi-flex: 3 million cycle torsion test*

# DataMax® Extreme Harsh Environment Ethernet

## 5e / 22 AWG

### Construction

- 22 AWG Stranded Tinned Copper
- HDPE Insulation
- Custom constructions available upon request
- Consult our cable design experts for technical support

### Physical & Electrical Properties

- Rolling Bend Hi-flex†*
- Temp. Min (Static) -40°C*
- Temp. Min (UL 444 Cold Bend) -20°C*
- Temp. Max 75°C*
- See *Jacket Material Comparison* on page 20 for physical properties
- See Product Specification for detailed electrical performance characteristics
- PoE Compliant. See *Quabbin DataMax® Extreme: An Easy Choice for Single-Cable Power Delivery Using PoE for Harsh Environments* on page 24

### Ratings, Listings & Approvals

- RoHS Compliant
- Other Ratings, Listings & Approvals as shown below

## Unshielded

| Part Number | Stranding | Insulated OD in/mm | Pair Count | Jacket Material | Jacket Color | Overall Cable Dia. in/mm | Net. Wt./M', Nom. lb | Max Plug-to-Plug Trans. Dist. m | Notes |
|---|---|---|---|---|---|---|---|---|---|
| 5800 | 19/.0058 | .048/1.22 | 4 | TPE | Black | .290/7.37 | 41.5 | 100 | Cutting/Machining Oil Resistant Jacket, Sunlight Resistant Jacket, Weld Spatter Resistant Jacket, Temp. Max 75°C & 80°C, CMX Outdoor-CM, Pennsylvania DEP-MSHA, PLTC, UL AWM Style 2463 600V, UL Oil Res. I & II |
| 5801 | 19/.0058 | .048/1.22 | 4 | TPE | Blue | .290/7.37 | 41.5 | 100 | Cutting/Machining Oil Resistant Jacket, Sunlight Resistant Jacket, Weld Spatter Resistant Jacket, Temp. Max 75°C & 80°C, CMX Outdoor-CM, Pennsylvania DEP-MSHA, PLTC, UL AWM Style 2463 600V, UL Oil Res. I & II |
| 5802 | 19/.0058 | .048/1.22 | 4 | TPE | Teal | .290/7.37 | 41.5 | 100 | Cutting/Machining Oil Resistant Jacket, Sunlight Resistant Jacket, Weld Spatter Resistant Jacket, Temp. Max 75°C & 80°C, CMX Outdoor-CM, Pennsylvania DEP-MSHA, PLTC, UL AWM Style 2463 600V, UL Oil Res. I & II |
| 5120 | 19/.0058 | .047/1.19 | 4 | PUR | Black | .260/6.60 | 33.5 | 100 | UV Resistant Jacket, No UL 444 Cold Bend |
| 5121 | 19/.0058 | .047/1.19 | 4 | PUR | Blue | .260/6.60 | 33.5 | 100 | UV Resistant Jacket, No UL 444 Cold Bend |
| 5122 | 19/.0058 | .047/1.19 | 4 | PUR | Teal | .260/6.60 | 33.5 | 100 | UV Resistant Jacket, No UL 444 Cold Bend |
| 5900 | 19/.0058 | .048/1.22 | 2 | TPE | Black | .270/6.86 | 31.3 | 100 | Cutting/Machining Oil Resistant Jacket, Sunlight Resistant Jacket, Weld Spatter Resistant Jacket, CMX Outdoor-CM, Pennsylvania DEP-MSHA, PLTC, UL AWM Style 2463 600V, UL Oil Res. I & II |
| 5901 | 19/.0058 | .048/1.22 | 2 | TPE | Blue | .270/6.86 | 31.3 | 100 | Cutting/Machining Oil Resistant Jacket, Sunlight Resistant Jacket, Weld Spatter Resistant Jacket, CMX Outdoor-CM, Pennsylvania DEP-MSHA, PLTC, UL AWM Style 2463 600V, UL Oil Res. I & II |
| 5902 | 19/.0058 | .048/1.22 | 2 | TPE | Teal | .270/6.86 | 31.3 | 100 | Cutting/Machining Oil Resistant Jacket, Sunlight Resistant Jacket, Weld Spatter Resistant Jacket, CMX Outdoor-CM, Pennsylvania DEP-MSHA, PLTC, UL AWM Style 2463 600V, UL Oil Res. I & II |
| 5020 | 19/.0058 | .047/1.19 | 2 | PUR | Black | .235/5.97 | 23.8 | 100 | UV Resistant Jacket, No UL 444 Cold Bend |
| 5021 | 19/.0058 | .047/1.19 | 2 | PUR | Blue | .235/5.97 | 23.8 | 100 | UV Resistant Jacket, No UL 444 Cold Bend |
| 5022 | 19/.0058 | .047/1.19 | 2 | PUR | Teal | .235/5.97 | 23.8 | 100 | UV Resistant Jacket, No UL 444 Cold Bend |
| 5904 | 19/.0058 | .048/1.22 | 2 | PVC | Black | .256/6.50 | 27.1 | 100 | Temp. Min (Static) -20°C, CMR, No Rolling Bend Hi-flex |
| 5905 | 19/.0058 | .048/1.22 | 2 | PVC | Blue | .256/6.50 | 27.1 | 100 | Temp. Min (Static) -20°C, CMR, No Rolling Bend Hi-flex |
| 5906 | 19/.0058 | .048/1.22 | 2 | PVC | Teal | .256/6.50 | 27.1 | 100 | Temp. Min (Static) -20°C, CMR, No Rolling Bend Hi-flex |

**Unless noted otherwise in Notes column*

*†Rolling Bend Hi-flex: 1 million cycle test (10x cable OD, minimum radius); 10 million cycle test (20x cable OD, minimum radius)*

# DataMax® Extreme Harsh Environment Ethernet
## 5e / 24-22 AWG

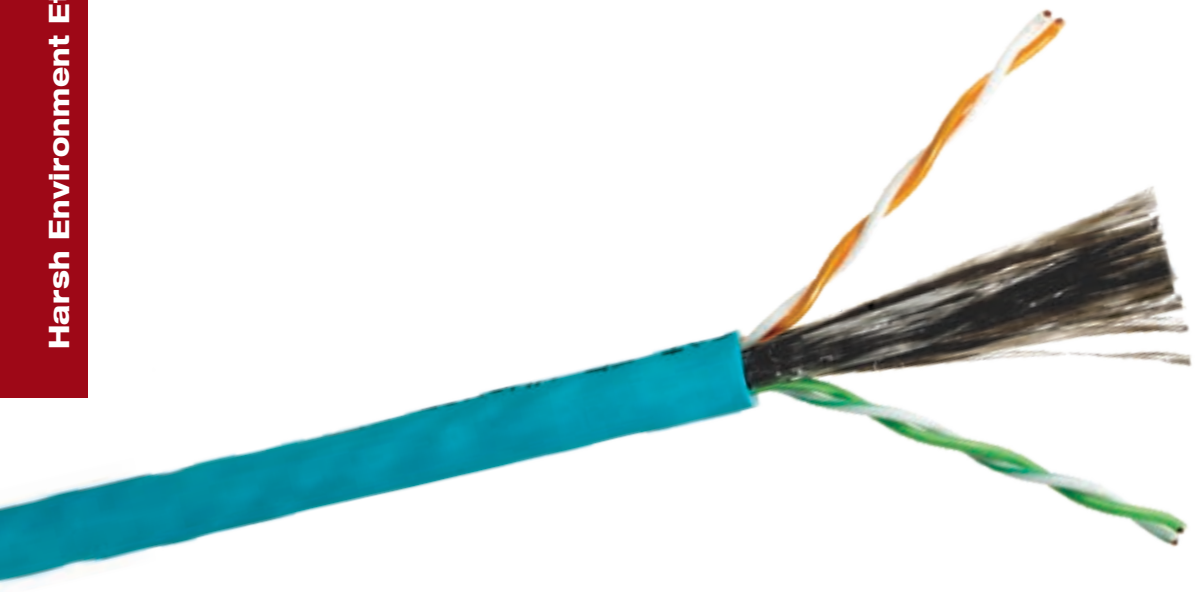
### Construction
- 24 - 22 AWG Solid Bare or Tinned Copper
- HDPE Insulation
- Custom constructions available upon request
- Consult our cable design experts for technical support

### Physical & Electrical Properties
- Temp. Min (Static) -40°C*
- Temp. Min (UL 444 Cold Bend) -20°C
- See *Jacket Material Comparison* on page 20 for physical properties
- See Product Specification for detailed electrical performance characteristics
- PoE Compliant. See *Quabbin DataMax® Extreme: An Easy Choice for Single-Cable Power Delivery Using PoE for Harsh Environments* on page 24

### Ratings, Listings & Approvals
- RoHS Compliant
- Other Ratings, Listings & Approvals as shown below

| Part Number | AWG | Solid | Insulated OD in/mm | Pair Count | Shield | Jacket Material | Jacket Color | Overall Cable Dia. in/mm | Temp. Max °C | Net. Wt./M', Nom. lb | Max Plug-to-Plug Trans. Dist. m | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5927 | 24 | Tinned | .047/1.19 | 4 | Foil & Braid Shielded | TPE | Teal | .285/7.24 | 75 | 43.3 | 100 | 24 AWG Drain Wire, Cutting/Machining Oil Resistant Jacket, Sunlight Resistant Jacket, Weld Spatter Resistant Jacket, CM, UL AWM Style 2463 600V |
| 5926 | 24 | Tinned | .049/1.23 | 2 | Foil & Braid Shielded | TPE | Teal | .270/6.86 | 75 | 34.6 | 100 | 24 AWG Drain Wire, Cutting/Machining Oil Resistant Jacket, Sunlight Resistant Jacket, Weld Spatter Resistant Jacket, CM |
| 5943 | 24 | Bare | .038/.97 | 4 | Unshielded | PVC | Black | .230/5.84 | 75 | 25.4 | 100 | Tubed Jacket, Oil Resistant Jacket, UV Resistant Jacket, CMX Outdoor-CMR |
| 5774 | 24 | Bare | .038/.97 | 2 | Unshielded | TPE | Teal | .235/5.97 | 75 & 80 | 24.0 | 100 | Cutting/Machining Oil Resistant Jacket, Sunlight Resistant Jacket, UV Resistant Jacket, Weld Spatter Resistant Jacket, CM, UL AWM Style 2463 600V |
| 5942 | 22 | Bare | .045/1.14 | 4 | Unshielded | PVC | Teal | .267/6.78 | 75 & 80 | 36.1 | 100 | Tubed Jacket, Temp. Min (Static) -20°C, CMX Outdoor-CMR, PLTC, UL AWM Style 2463 600V, UL Oil Res. I |
| 5941 | 22 | Bare | .045/1.14 | 4 | Unshielded | PVC | Black | .267/6.78 | 75 & 80 | 36.1 | 100 | Tubed Jacket, Temp. Min (Static) -20°C, CMX Outdoor-CMR, PLTC, UL AWM Style 2463 600V, UL Oil Res. I |

**Unless noted otherwise in Notes column*



# DataMax® Extreme Harsh Environment Ethernet
# Profinet® Type B & C

### Construction
- 24 - 22 AWG Stranded Tinned Copper
- HDPE Insulation
- TPE Green Jacket*
- Custom constructions available upon request
- Consult our cable design experts for technical support

### Physical & Electrical Properties
- Rolling Bend Hi-flex†
- Torsional Hi-flex‡
- Cutting/Machining Oil Resistant Jacket*
- Sunlight Resistant Jacket*
- Weld Spatter Resistant Jacket*
- Temp. Min (Static) -40°C
- Temp. Max 75°C & 80°C*
- See *Jacket Material Comparison* on page 20 for physical properties
- See Product Specification for detailed electrical performance characteristics
- PoE Compliant. See *Quabbin DataMax® Extreme: An Easy Choice for Single-Cable Power Delivery Using PoE for Harsh Environments* on page 24

### Ratings, Listings & Approvals
- RoHS Compliant
- Other Ratings, Listings & Approvals as shown below

## Foil & Braid Shielded

| Part Number | Category | AWG | Stranding | Insulated OD in/mm | Pair Count | Overall Cable Dia. in/mm | Net. Wt./M', Nom. lb | Max Plug-to-Plug Trans. Dist. m | Notes |
|---|---|---|---|---|---|---|---|---|---|
| 5937 | 6/6a | 24 | 7/32 | .046/1.17 | 4 | .325/8.26 | 51.2 | 88 | Spline, Temp. Min (UL 444 Cold Bend) -20°C, CMX Outdoor-CM, UL AWM Style 2463 600V |
| 5924 | 5e | 22 | 19/.0058 | .054/1.37 | 2 | .317/8.05 | 49.4 | 100 | ITC, Pennsylvania DEP-MSHA, PLTC, UL AWM Style 2463 600V, UL Oil Res. I & II |
| 5094 | 5e | 22 | 7/30 | .066/1.68 | Quad | .250/6.35 | 39.0 | 100 | CL3, PLTC, UL AWM Style 2463 600V, UL Oil Res. I & II |
| 5099 | 5e | 22 | 7/30 | .050/1.27 | Quad | .305/7.75 | 56.2 | 100 | Temp. Min (UL 444 Cold Bend) -20°C, Temp. Max 75°C, CM, PLTC-ER, Jacket not Cutting/Machining Oil Resistant or Weld Spatter Resistant |
| 5007 | 5e | 22 | 7/30 | .066/1.68 | Quad | .272/6.91 | 42.9 | 100 | ZHFR PUR Low Smoke Jacket, Oil Resistant Jacket, Temp. Max 60°C, UL AWM Style 20532 600V, VW-1 Flame Test, Jacket not Cutting/ Machining Oil Resistant, Sunlight Resistant, or Weld Spatter Resistant |

**Unless noted otherwise in Notes column*

*†Rolling Bend Hi-flex: 1 million cycle test (10x cable OD, minimum radius); 10 million cycle test (20x cable OD, minimum radius)*

*‡Torsional Hi-flex: 3 million cycle torsion test*

# Cable Testing

**What advances DataMax® to the next level earning the name "DataMax® Extreme?"** This section outlines the stringent testing, not required by any formal standard, yet routinely performed as part of Quabbin's quality commitment. When you need a cable to be dependable in a harsh environment, we can provide you with confidence, peace of mind and test data that our cable is the best choice for the application.

**Chemical tests** being conducted to validate the resistance of the TPE (thermoplastic elastomer) cable jacket to chemicals commonly found in a heavy manufacturing environment such as cutting fluid, oil and robotic grease.

**Torsion tests** are performed on Quabbin 2 pair UTP industrial Ethernet cable and Quabbin 4 pair double shielded cable. This 34" test sample is subjected to a 360 degree twist per cycle (180° in each direction). Three million cycles are completed on each design with no apparent physical degradation and the cable continues to exceed electrical performance specifications.

**Rolling bend flex tester** showing a 4 pair, double shielded (foil & braid), DataMax® Extreme with ZHFR-PUR jacket being tested to 10 million cycles. Results were a cable with no physical damage that continued to surpass category 5e test parameters.

## Chemical Testing

Quabbin's harsh environment cables find their way into many interesting applications such as military, wastewater treatment and energy exploration, just to name a few.

Historically, the most popular application for harsh environment Ethernet has been on the factory floor — an environment also regarded as 'harsh' not only due to mechanical abuse but also because of chemical exposure. This knowledge has guided us to test cable capabilities beyond electrical and mechanical stress and evaluate performance and longevity when faced with chemicals and solvents.

The photo at left illustrates the chemical testing performed on our harsh environment Ethernet cable. The tests include prolonged exposure to a battery of chemicals and the resultant effect on tensile, elongation, diameter and wall thickness as well as overall characteristic changes.

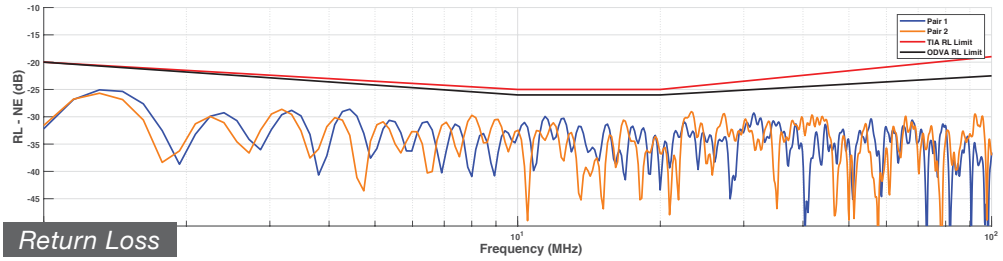
## Mechanical Testing

The purpose behind mechanical testing is to manipulate and work the cable in a manner that duplicates real world scenarios and determine if it will continue to perform at the required standards. If a cable is being used in a continuous movement application, it's important that it be able to bend and flex repeatedly without compromising the integrity of the design.

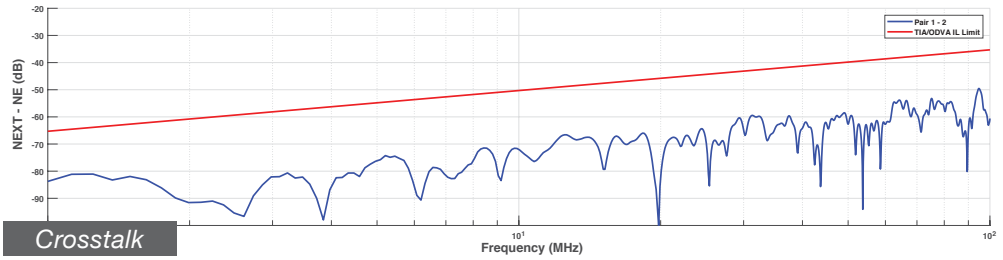
Quabbin's in-house testing facilities can replicate these movements and evaluate each cable to provide realistic information and data to extrapolate performance expectations in the field.

The image at left middle shows a 'torsion tester' which simulates a rotational stress comparable to what a cable would experience while controlling end of arm tooling. The image at left bottom shows a rolling bend 'flex tester' which simulates an unsupported bending motion, which is typical on a robotic arm.

## CAT 5e — 2-PAIR TPE CABLE

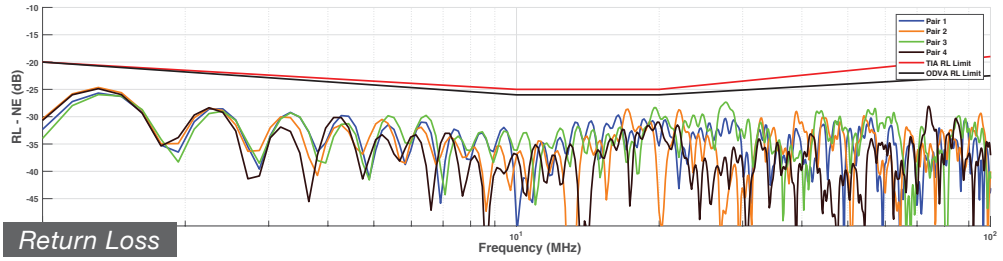



*Return Loss*

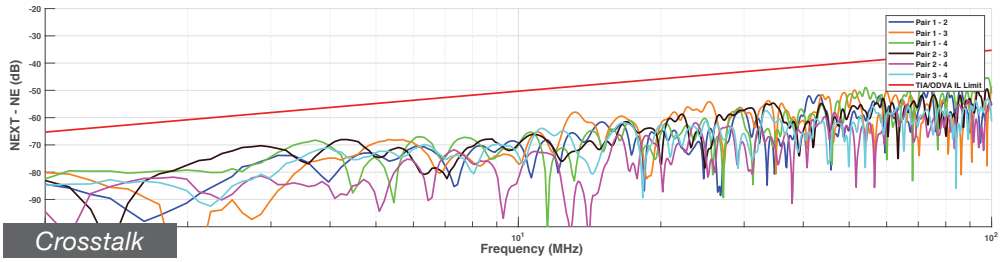



*Crosstalk*

## CAT 5e — 4-PAIR TPE CABLE

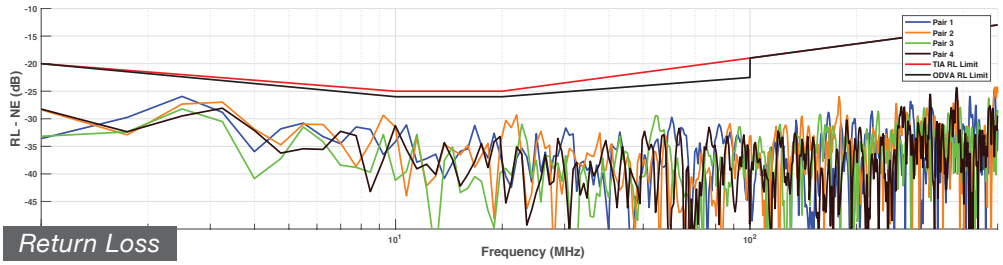



*Return Loss*

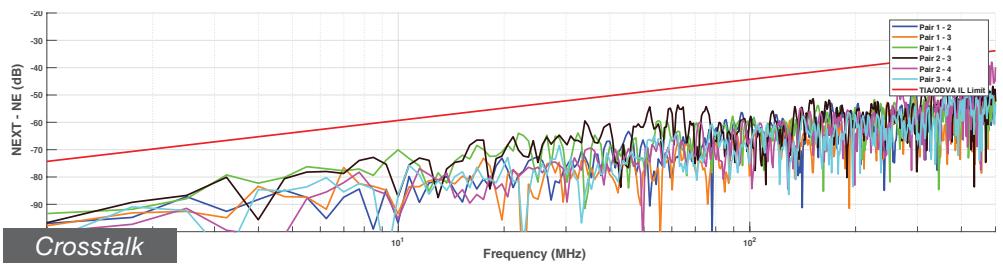



*Crosstalk*

## CAT 6a — 4-PAIR TPE CABLE




*Return Loss*




*Crosstalk*

## Electrical Testing

Transmitting 10Base-T, 100Base-T, 1000Base-T or 10GBase-T signals over distances in an industrial application presents challenges in terms of both assembly and electrical performance.

The charts at left illustrate typical Return Loss and Near-end Crosstalk performance for DataMax® Extreme 2-pair and 4-pair, 24 AWG TPE jacketed cables. Note the significant performance headroom compared to Category 5e, 6 and 6a requirements. Industrial Grade PVC or Polyurethane jacketed DataMax® Extreme cables also exceed Category 5e, 6, and 6a limits.

Use DataMax® Extreme cable to ensure that your harsh environment Ethernet cords comply with applicable requirements of the TIA 568.2-D commercial, TIA 1005-A, and ODVA industrial communication specifications.

# Harsh Environment Ethernet Application

**Quabbin's family of harsh environment Ethernet cable** was developed to reliably survive industrial hazards. Cable may be terminated using special RJ-45 modular plugs that have been adapted for harsh environments or industrial M12 connectors that have been modified for Ethernet transmission. These connectors use O-rings, overmolding, and/or sealing gaskets to bond to the cable jackets, providing a mated connection that resists fluids, dust, vibration, and other hazards, yet often may be field assembled. Assembly ratings of IP67 and IP69 are achievable when properly terminated using sealed connectors, assuring resistance to both fluid and dust particle penetration.

*IP20 RJ45*

*IP67 M12 X Code*

## Cable Construction Options

DataMax® Extreme cable is available in a variety of constructions. All five cable jacket options can be applied to 2-pair or 4-pair unshielded designs with 24 AWG or 22 AWG stranded conductors. Shielded designs are also offered in 2 or 4-pair with four available jackets using 22, 24 or 26 AWG stranded conductors.

For applications calling for 24 AWG solid conductor cable, DataMax® Extreme 22 AWG stranded conductor cable is an ideal Hi-Flex alternative. The low insertion loss of 22 AWG allows runs up to 100 meters, matching the performance of 24 AWG solid conductor cable without sacrificing flexibility or flex life.

Quabbin's unshielded cable pairs have exceptional "balance" that provides a high degree of isolation from EMI and other emissions. The outstanding balance means, no matter your choice, shielded or unshielded, you can be sure you are getting the best cable for your application.

## Pressure Extruded Jackets

Quabbin DataMax® Extreme jackets were developed to survive many of the industrial hazards that commercial jackets will not. DataMax® Extreme jackets are pressure extruded over the cable core, effectively locking the pairs in place. This provides very stable electrical performance, even when the cable is impacted, bent, or repeatedly flexed. Pressure extrusion also provides a very smooth, round jacket that aids termination and sealing.

## Jacket Material Comparison

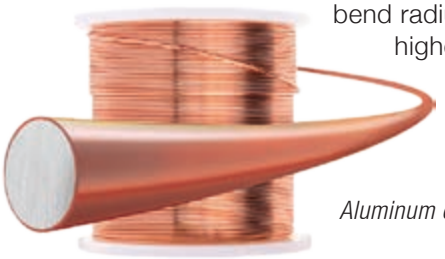
Many jacketing options are available. Contact our cable design experts for technical support.

| Performance Criteria | Jacket Material | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | PVC | Industrial PVC | TPE | PUR (TPU) | ZHFR PUR (TPU) | CPE | PVDF | Kynar |
| Ultraviolet and Weather Resistance | Fair | Good | Excellent | Good | Good | Excellent | Excellent | Excellent |
| Resistance to Petrochemicals | Poor | Good | Good/Excellent | Fair | Fair | Good/Excellent | Excellent | Excellent |
| Resistance to Flame and Fire | Excellent | Excellent | Good/Excellent | Fair | Good | Excellent | Excellent | Excellent |
| Resistance to Moisture | Fair | Good | Excellent | Excellent | Good | Excellent | Excellent | Excellent |
| Resistance to Bases | Fair | Good | Good | Good | Fair | Fair | Excellent | Good |
| Resistance to Acids | Fair | Fair | Good | Fair | Fair | Excellent | Excellent | Excellent |
| Resistance to Ozone | Excellent | Excellent | Good | Good | Good | Fair | Excellent | Excellent |
| Tensile Strength and Toughness | Good | Good | Fair | Excellent | Good | Excellent | Excellent | Excellent |
| Flexibility and Flex Life | Fair | Fair | Excellent | Excellent | Excellent | Excellent | Good | Fair |
| Resistance to Abrasion and Scuff | Good | Good | Good | Excellent | Excellent | Excellent | Excellent | Excellent |
| Resistance to Tear | Fair | Fair | Good | Excellent | Excellent | Excellent | Excellent | Excellent |
| Low Temperature Flexibility and Brittle Point | Fair | Fair | Excellent | Excellent | Excellent | Excellent | Excellent | Excellent |
| RoHS Compliant and Lead Free | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Resistance to Crush | Fair | Fair | Fair | Good | Good | Good | Excellent | Good |
| Resistance to Cut | Fair | Fair | Fair | Good | Good | Good | Excellent | Good |
| Heat > 105° C | Good | Good | Good | Fair | Fair | Good | Excellent | Excellent |
| Resistance to Weld Spatter | Fair | Fair | Excellent | Fair | Fair | Fair | Fair | Fair |

# Copper Conductor Facts

## Copper Clad Aluminum

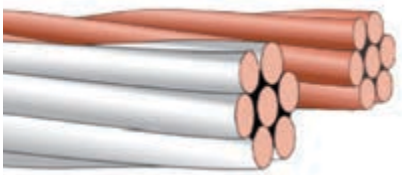
One way to spot a subpar patch cord cable is by scraping the conductor. If the copper flakes off to expose a metal core, this means you have likely purchased aluminum disguised as copper. These cables degrade performance, are more fragile and have a lower bend radius. Quabbin uses only the highest grade copper conductor — never copper clad aluminum.



*Aluminum disguised as copper*

## Tin vs. Bare Copper Conductors

While you shouldn't trust aluminum coated with copper, you should trust copper coated with tin — which is an essential step in protecting against oxidation and corrosion. Quabbin has long studied the benefits of plating copper conductors with tin vs. using bare copper alone, and we use this upgrade/enhancement extensively throughout our product line.



*Bare copper (top) and copper coated with tin (bottom)*

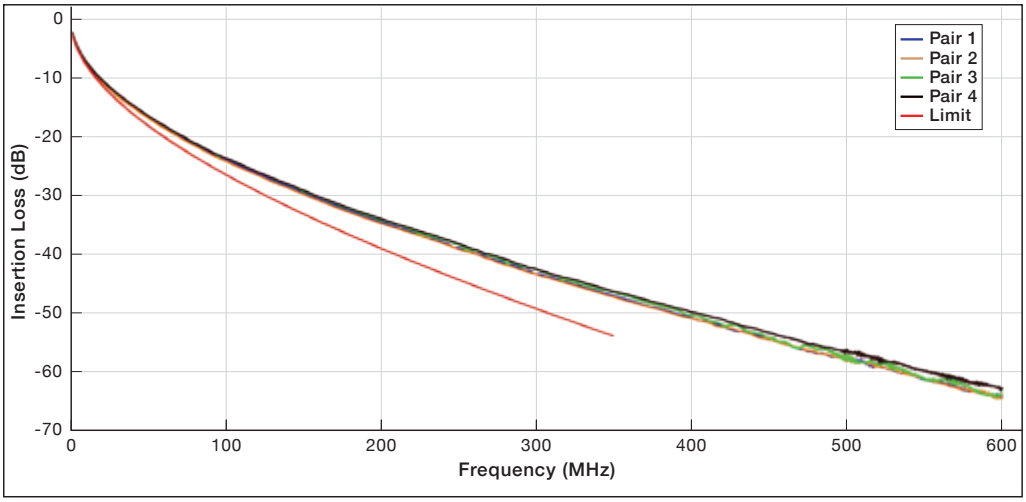
## Aged Copper: Stranded vs. Solid

While other suppliers may have difficulty with aging cable in the field, Quabbin has avoided this issue by using tinned copper and other premium materials, as well as design and manufacturing processes continually refined for decades.

In October 2020 a member of the user community submitted a presentation at the Telecommunications Industry Association's TR-42.7 Copper Cabling Systems meeting recommending against the use of stranded copper. The member measured a solid and stranded cable after an accelerated aging test (40oC, 90% RH, 2 Weeks). Data showed that a significant degradation in insertion loss due to aging can cause channels using stranded cable to fail.

Our engineering team located a Quabbin cable manufactured in May 1997, which was stored in temperatures ranging from 0°F to 90°F and unknown humidity levels. The 24 AWG 7/32 tinned copper 4-pair UTP cable was tested against the current TIA patch cord limits and passed. This cable was aged in a more realistic temperature environment and after 23 years still passed the TIA patch cord insertion loss limits. Test data is shown below.

Quabbin presented data that proved when using quality materials and processes, stranded copper cable will meet all TIA requirements and stand the test of time. As a result, the TIA decided against the ban on stranded cable. ***Our expertise in designing and manufacturing stranded data cable distinguishes us from our competitors***.




*The measured insertion loss of 23-year-aged Quabbin stranded cable exceeds TIA standards.*

# Hi-flex Ethernet Cable for Dynamic Industrial Applications

**In modern manufacturing environments**, the need for high-performance data communication has grown alongside the complexity and mobility of automated systems. Traditional Ethernet cabling, while sufficient for static applications, falls short in settings that demand constant motion, extreme durability, and compact installation. High-flex Ethernet cable (often abbreviated as “Hi-flex Ethernet”) addresses this challenge by delivering consistent network performance in applications involving robotics, cable tracks and drag chains. These specialized environments demand superior mechanical properties and long-term reliability, which Hi-flex cables are uniquely engineered to provide.

## Introduction to Hi-flex Ethernet Cable

Ethernet cables are the backbone of local area networks (LANs), serving as the pathway for data transmission between PLCs, sensors, and control systems. However, in dynamic industrial environments, cables are no longer static. The rise of automated equipment, robotics, and moving assemblies requires Ethernet cabling that can bend, twist, and flex repeatedly without degradation.

Hi-flex Ethernet cables are designed to meet these exacting demands. These cables retain the core data transmission capabilities of standard Ethernet (such as Cat 5e, Cat 6 or Cat 6a) while incorporating construction methods that support high-cycle flexing, torsion, and resistance to harsh industrial conditions.

## Construction Features of Hi-flex Ethernet Cables

Hi-flex Ethernet cables are engineered from the inside out to survive the challenges of continuous motion applications. Key construction features include:

- **Conductors**: Stranded copper conductors offer greater flexibility than solid-core conductors. The small conductor strand diameter allows the cable to bend repeatedly without cracking or breaking.
- **Insulation**: Hi-flex data cables use high-performance insulation materials such as polyethylene (PE) or fluorinated ethylene propylene (FEP). These materials provide both electrical insulation and mechanical resilience.
- **Shielding**: Shielding is critical in industrial settings where electromagnetic interference (EMI) can disrupt data signals, therefore hi-flex cables often include foil and braided shielding in special configurations. Quabbin’s patented shield design is built to withstand continuous flexing while providing 360-degree protection. Rolling Bend Hi-flex: 1 million cycle test (10x cable OD, minimum radius); 10 million cycle test (20x cable OD, minimum radius). Torsional Hi-flex: 3 million cycle torsion test.
- **Jacket Material**: The outer jacket protects the cable from physical damage and chemical exposure. Materials such as polyurethane (PUR) and thermoplastic elastomer (TPE) are commonly used for their durability under repetitive motion and resistance to oil, abrasion, UV, and weld spatter.
- **Cable Design**: Special attention is given to the cable’s lay length and construction geometry. Balanced lay lengths and optimized geometry help distribute stress uniformly during flexing, extending the cable’s operational life.

## Performance Benefits of Hi-flex Ethernet Cables

Hi-flex Ethernet cables deliver a range of operational and economic benefits in demanding applications:

- **Mechanical Durability**: The advanced materials and construction techniques used in Hi-flex Ethernet cables allow them to endure millions of flex cycles without failure. This durability translates into reduced maintenance and downtime.
- **Consistent Electrical Performance**: Despite the mechanical stress of continuous motion, Hi-flex cables maintain consistent impedance, attenuation, and crosstalk performance in accordance with TIA/EIA standards. This ensures reliable

data transmission even in electrically noisy environments.

- **Space Optimization**: The flexible nature of these cables allows them to be routed through tight spaces. This is particularly valuable in compact control cabinets, robotic joints, and complex machine builds.
- **Chemical and Environmental Resistance**: Jackets made from CPE, PUR or TPE offer resistance to oils, fuels, coolants, and cleaning agents. Many Hi-flex cables are also UV-resistant and flame-retardant, enabling outdoor or indoor high-temperature use.
- **Reduced Total Cost of Ownership** (TCO): While the upfront cost of Hi-flex Ethernet cable may be higher than standard alternatives, the long lifespan and reduced downtime result in a lower overall TCO.

## Applications of Hi-flex Ethernet Cable

Hi-flex Ethernet cables are essential wherever motion and data transmission intersect. Common applications include:

- **Factory and Process Automation**: In automated factories, Ethernet is the protocol of choice for connecting programmable logic controllers (PLCs), human-machine interfaces (HMIs), sensors, and actuators. Hi-flex Ethernet cables ensure network integrity in moving arms, pick-and-place systems, and material handling robots.
- **Robotics**: Modern robots feature multiple degrees of freedom and constant motion. Ethernet cables run through robot arms to connect vision systems, grippers, and force sensors. Hi-flex designs prevent fatigue and signal loss.
- **Packaging Equipment**: Automated packaging lines require real-time communication between conveyor belts, labeling systems, and inspection cameras. Hi-flex cables allow motion without compromising system uptime.
- **Mobile Equipment and Vehicles**: AGVs (automated guided vehicles) and other mobile systems require flexible cables for navigation and communication. Hi-flex Ethernet maintains robust data transfer in motion.
- **Renewable Energy Systems**: In wind turbines and solar tracking systems, Ethernet cables must tolerate movement, vibration, and temperature fluctuations. Hi-flex designs excel in these conditions.
- **Test and Measurement**: Mobile or moving test rigs use Hi-flex cables for high-speed data collection in harsh conditions.
- **Cable Tracks and Drag Chains**: These systems are designed to guide and protect cables and hoses during the repetitive motion of machinery. Many of Quabbin's Hi-flex Ethernet products are suitable for drag chain applications when properly installed. Consult the factory to discuss your project needs.
- **Audio and Live Entertainment**: Hi-flex cables naturally settle into position and stay put, helping reduce trip hazards and preventing unwanted movement during performances.

## Selection Criteria and Best Practices

Selecting the right Hi-flex Ethernet cable requires an understanding of the application's mechanical, electrical, and environmental requirements. Key considerations include:

- **Motion Profile**: Determine the type of motion—bending, torsion, rolling, or a combination. This affects the cable's construction needs.
- **Flexing Cycles**: Estimate the number of cycles expected during the cable's life. Look for cables rated for 1 million, 5 million, or even 10+ million flex cycles.
- **Bend Radius**: Adhere to manufacturer-recommended bend radii to prevent core or shield damage.
- **Environmental Conditions**: Consider temperature ranges, chemical exposure, UV light, and other hazards.
- **Data Rate Requirements**: Choose Cat 5e, Cat 6, or Cat 6a depending on bandwidth and transmission speed requirements.
- **Certification and Compliance**: Ensure cables comply with industry standards such as Ethernet IP, UL, CE, RoHS, and TIA/EIA.
- **Installation Practices**: Proper strain relief, minimum radius adherence, and correct orientation in drag chains are crucial to maximize service life.

## Testing and Validation

Reputable manufacturers test Hi-flex Ethernet cables under simulated real-world conditions. Common tests include:

- **Flex testing**: Subjecting the cable to repeated motion in flexing equipment to simulate years of operation including rolling bend (unsupported bending of the cable at a defined radius) and torsion testing (rotating the cable along its axis to assess torsional endurance)
- **Electrical testing**: Measuring impedance, signal integrity, crosstalk, and attenuation
- **Abrasion and oil resistance**: Exposing the cable to mechanical and chemical challenges

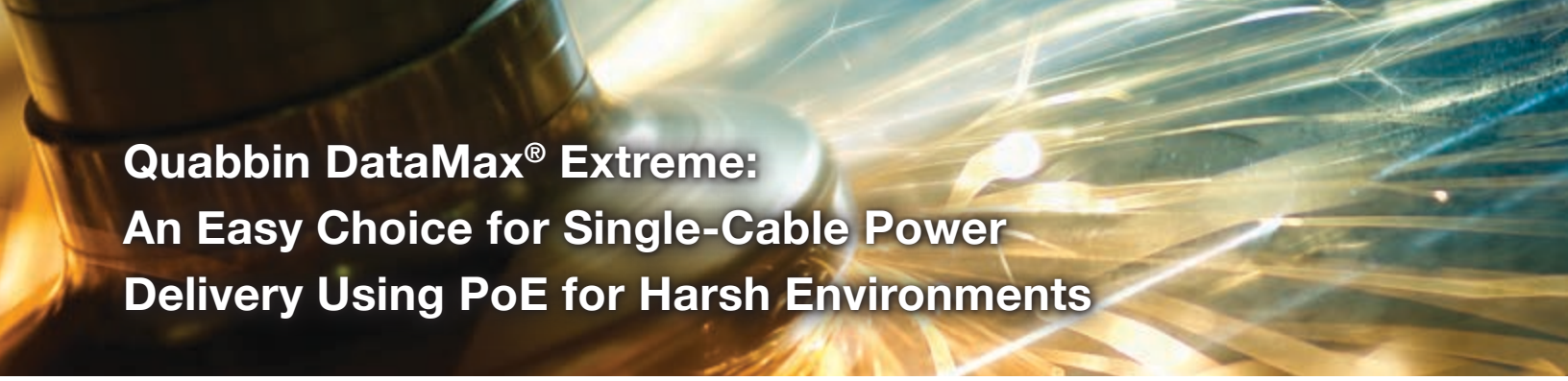
Validation ensures that Hi-flex Ethernet cables not only meet but exceed performance expectations. Ask the manufacturer for test reports.

## Conclusion

As factories, robots, and intelligent systems continue to evolve, so too must the infrastructure that connects them. Hi-flex Ethernet cables play a pivotal role in enabling real-time data exchange in motion-rich environments. By combining mechanical durability with high-speed signal integrity, these cables ensure that automation systems remain reliable, efficient, and connected.

From robotic arms to packaging lines, Hi-flex Ethernet cabling is a foundational element in the industrial digital revolution. Selecting the right cable and installing it properly can significantly enhance system uptime, performance, and longevity.

Investing in Hi-flex Ethernet cable isn't just a technical choice, it's a strategic one.



# Quabbin DataMax® Extreme: An Easy Choice for Single-Cable Power Delivery Using PoE for Harsh Environments

**The 2017 National Electric Code** (NEC) imposes new requirements on cable running high power levels of the next-generation PoE standard. NEC recognizes the new UL LP listing. The 2017 NEC is focused on the overall bundling sizes of cable running high PoE power levels and applies only to permanently installed cable.

The NEC 2017 edition contains new requirements that address heat rise when power is greater than 60 W (Type 3) and includes ampacity tables, specifying the maximum ampacity allowed for a certain cable bundle size, conductor gauge and cable temperature rating installed in an ambient temperature of 30° C (86° F). Complying with these ampacity tables is required, however the use of an LP-certified cable as an alternative to following the ampacity table is allowed.

***Bringing commercial solutions into a harsh environment will result in cable degradation, electrical failures and safety hazards.***

Bringing commercial solutions into a harsh environment will result in cable degradation, electrical failures and safety hazards. Instead, consider a cable created specifically for the application — Quabbin's DataMax® Extreme Harsh Environment Cable.

Quabbin makes translation, selection, and design options clear and useful to the design engineer by providing guidance that already exists for long-standing commercial applications, test data and reports that support the functional abilities of our cable, and our Product Matrix to facilitate cable selection specific to the application's primary constraints by reviewing the impact of temperature, DC resistance (DCR) and insertion loss.

## THE QUABBIN PRODUCT MATRIX

| Popular Quabbin products (Part Numbers) | | 5030<br>5031<br>5032 | 5730<br>5731<br>5732 | 5023<br>5025<br>5027<br>5028 | 5750<br>5751<br>5752<br>5753 | 5094<br>5099<br>5924 | 5800<br>5801<br>5802 |
|---|---|---|---|---|---|---|---|
| Cable specifications | Wire size (AWG) | 26 | 26 | 24 | 24 | 22 | 22 |
| | Pair count | 2 | 4 | 2 | 4 | 2/Quad | 4 |
| | Ambient temp. (°C) | 20 | 20 | 20 | 20 | 20 | 20 |
| | Cable temp. rating (°C) | 75 | 75 | 75 | 75 | 75 | 75 |
| | DCR (LOOP) per meter | 0.278 | 0.278 | 0.172 | 0.172 | 0.12 | 0.12 |
| | Max. distance (m) | 68 | 68 | 85 | 85 | 100 | 100 |
| Max. bundle size at 0.5 A per wire or 1 A per pair (Type 4) per NEC 2017 | | n/a (Note 4) | 91 | n/a (Note 4) | 91 | n/a (Note 4) | 192 |
| Voltage drop per meter | PoE IEEE 802.3at Type 1 (350 mA, 15.4 W) | 0.0973 | 0.0973 | 0.0602 | 0.0602 | 0.042 | 0.042 |
| | PoE + IEEE 802.3at Type 2 (600 mA, 30 W) | 0.1668 | 0.1668 | 0.1032 | 0.1032 | 0.072 | 0.072 |
| | 4PPoE 802.3bt Type 3 (600 mA per pair, 60 W) | 0.1668 | 0.1668 | 0.1032 | 0.1032 | 0.072 | 0.072 |
| | 802.3bt Type 4 (960 mA per pair, 100 W) | n/a (Note 4) | 0.26688 | n/a (Note 4) | 0.16512 | n/a (Note 4) | 0.1152 |
| Supported modes (Notes 1, 2, 3) | | Mode A | Mode A<br>Mode B<br>4 pair mode | Mode A | Mode A<br>Mode B<br>4 pair mode | Mode A | Mode A<br>Mode B<br>4 pair mode |

*Note 1: Mode A uses pair two (orange in Quabbin cable) and pair three (green) so it can be used with two pair cable.*
*Note 2: Mode B uses pair one (blue in Quabbin cable) and pair four (brown) so it cannot be used with two pair cable.*
*Note 3: Standards compliant devices will determine which mode can be used.*
*Note 4: Two pair cable cannot support Type 4 and therefore the bundle size is not restricted by the NEC.*

## AMPACITY TABLE 725.144

Table 725.144 Ampacities of Each Conductor in Amperes in 4-Pair Class 2 or Class 3 Balanced Twisted Pair Cables Based on Copper Conductors at an Ambient Temperature of 30°C (86°F) with All Conductors in All Cables Carrying Current, 60°C (140°F), 75°C (167°F), and 90°C (194°F) Rated Cables

| AWG | Number of 4-Pair Cables in a Bundle | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1-7 | | | 8-19 | | | 20-37 | | | 38-61 | | | 62-91 | | | 92-192 | | |
| | Temperature Rating | | | Temperature Rating | | | Temperature Rating | | | Temperature Rating | | | Temperature Rating | | | Temperature Rating | | |
| | 60°C | 75°C | 90°C | 60°C | 75°C | 90°C | 60°C | 75°C | 90°C | 60°C | 75°C | 90°C | 60°C | 75°C | 90°C | 60°C | 75°C | 90°C |
| 26 | 1.00 | 1.23 | 1.42 | 0.71 | 0.87 | 1.02 | 0.55 | 0.68 | 0.78 | 0.46 | 0.57 | 0.67 | 0.45 | 0.55 | 0.64 | NA | NA | NA |
| 24 | 1.19 | 1.46 | 1.69 | 0.81 | 1.01 | 1.17 | 0.63 | 0.78 | 0.91 | 0.55 | 0.67 | 0.78 | 0.46 | 0.56 | 0.65 | 0.40 | 0.48 | 0.55 |
| 23 | 1.24 | 1.53 | 1.78 | 0.89 | 1.11 | 1.28 | 0.77 | 0.95 | 1.10 | 0.66 | 0.80 | 0.93 | 0.58 | 0.71 | 0.82 | 0.45 | 0.55 | 0.63 |
| 22 | 1.50 | 1.86 | 2.16 | 1.04 | 1.28 | 1.49 | 0.77 | 0.95 | 1.11 | 0.66 | 0.82 | 0.96 | 0.62 | 0.77 | 0.89 | 0.53 | 0.63 | 0.72 |

*Note 1: For bundle sizes over 192 cables, or for conductor sizes smaller than 26 AWG, ampacities shall be permitted to be determined by qualified personnel under engineering supervision*

*Note 2: Where only half of the conductors in each cable are carrying current, the values in the table shall be permitted to be increased by a factor of 1.4*

*Informational Note 1: Elevated cable temperatures can reduce a cable's data transmission performance. For information on practices for 4-pair balanced twisted pair cabling, see TIA-TSB-184-A and 6.4.7, 6.6.3, and Annex G of ANSI/TIA-568-C.2, which provide guidance on adjustments for operating temperatures between 20°C and 60°C*

*Informational Note 2: The per-contact current rating of connectors can limit the maximum allowable current below the ampacity shown in Table 725.144*

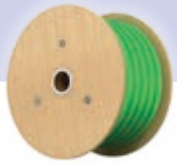
# Quabbin Website Tools

## Cable Finder

*Search our products:*

- Application
- Construction
- Physical Properties
- Category
- Part Number
- Ratings & Approvals

www.quabbin.com/cable-finder



## Inventory Finder

*Check our inventory:*

- Part Number
- Quantity Available
- Warehouse Location

www.quabbin.com/inventory

# Connectors for Harsh Environment Ethernet Cable

Contact us for suitable options from other connector manufacturers

| Quabbin Part Number | | Platinum Tools Wide Range OD Cat 6a | Platinum Tools Wide Range OD Cat 8 | Stewart RJ45 | Sentinel RJ45 | Telegaertner RJ45 (Straight) |
|---|---|---|---|---|---|---|
| Black | Teal | | | | | |
| 2014 | 2101 | 106260 | | | | |
| 2102 | 2104 | 106260 | | | | |
| 5030 | 5032 | 106260 | | SS-39200-012 | 111-08080028L34 | 100023038 |
| 5035 | 5037 | 106260 | | SS-39200-054 | 111-08080028L34 | 100023038 |
| 5040 | 5042 | 106260 | | SS-39200-012 | 111-08080028L34 | 100023038 |
| 5055 | 5057 | 106260 | | SS-39200-054 | 111-08080028L34 | |
| 5060 | 5062 | 106260 | | SS-39200-054 | 111-08080028L34 | 100023038 |
| 5080 | 5082 | 106260 | | SS-39200-054 | 111-08080028L34 | |
| 5085 | 5087 | 106260 | | SS-39200-054 | 111-08080028L34 | |
| 2600 | | | 106270 | | | |
| 5005 | | 106260 | | | | 100023038 |
| 5048 | 5026 | 106260 | | SS-39200-053 | 111S08080095LA4 | |
| 5075 | 5077 | 106260 | | SS-39200-024 | 111-08080028L34 | |
| 5083 | 5088 | 106260 | | SS-39200-010 | 111-08080028L34 | |
| 5123 | 5125 | 106260 | | SS-39200-053 | | |
| 5710 | 5712 | 106260 | | SS-39200-054 | 111-08080028L34 | 100023038 |
| 5725 | 5727 | 106260 | | SS-39200-054 | 111-08080028L34 | 100023038 |
| 5730 | 5732 | 106260 | | SS-39200-054 | 111-08080028L34 | 100023038 |
| 5734 | 5736 | 106260 | | SS-39200-010 | 111-08080028L34 | 100023038 |
| 5739 | 5741 | 106260 | | SS-39200-020 | 111-08080028L34 | 100023038 |
| 5760 | 5762 | 106260 | | SS-39200-054 | 111-08080028L34 | 100023038 |
| 5919 | | 106260 | | SS-39200-024 | | |
| 5774 | | 106260 | | SS-39200-012 | 111-08080028L34 | 100023038 |
| 5926 | | | 106270 | | | 100023038 |
| 5927 | | 106260 | 106270 | SS-39200-030 | 111S08080090C34 | 100023038 |
| 5943 | | 106260 | | SS-39200-054 | 111-08080028L34 | 100023038 |
| 5000 | 5016 | 106260 | | SS-39100-048 | 111-08080028L34 | 100023038 |
| 5023 | 5025 | 106260 | | SS-39200-030 | 111S08080090C34 | 100023038 |
| 5770 | 5772 | 106260 | | SS-39200-011 | 111-08080028L34 | 100023038 |
| 5780 | 5782 | 106260 | | SS-37000-007 | 111-08080028L34 | 100023038 |
| 5003 | | 106260 | | SS-39200-030 | 111S08080090H34 | 100023085 |
| 5004 | | 106260 | | | | |
| 5089 | 5090 | 106260 | | SS-39200-030 | 111S08080090H34 | 100023085 |
| 5130 | | 106260 | | SS-39200-030 | 111S08080090C34 | 100023038 |
| 5700 | 5716 | 106260 | | SS-39200-022 | 111S08080028L34 | 100023038 |
| 5750 | 5752 | 106260 | | SS-39200-010 | 111-08080028L34 | 100023038 |
| 5915 | 5916 | 106260 | | SS-39200-054 | 111S08080028L34 | 100023038 |
| 5925 | 5922 | 106260 | | | | 100023085 |
| 5928 | 5929 | 106260 | 106270 | SS-39200-030 | 111S08080090C34 | 100023038 |
| 5936 | | 106260 | 106270 | SS-39200-030 | 111S08080090H34 | 100023085 |
| 5937 | | 106260 | 106270 | | | 100023085 |
| 5944 | | 106260 | | SS-39200-054 | 111-08080028L34 | 100023038 |
| 5946 | 5947 | 106260 | 106270 | SS-39200-030 | 111S08080090H34 | 100023038 |
| 5911 | | 106260 | | | | |
| 5941 | 5942 | 106260 | | | 111-08080090L34 | 100023038 |
| 5020 | 5022 | 106260 | 106270 | SS-39200-043 | | 100023038 |
| 5900 | 5902 | | 106270 | SS-39200-030 | 111S08080090C34 | 100023038 |
| 5904 | 5906 | | 106270 | | 111S08080090C34 | 100023038 |
| 5920 | | | 106270 | | | 100023038 |

↓ *Table continues on page 28*

***This cross reference resource*** *is provided to aid in selecting compatible connectors for DataMax® Extreme harsh environment Ethernet cable. While we are committed to updating any known changes, we cannot guarantee accuracy. Contact the connector manufacturer to ensure suitability.*

| Quabbin Part Number | | Telegaertner RJ45 (Right Angle) | Telegaertner M12 D-Code | Telegaertner M12 X-Code | MURR Elektronik RJ45 (Straight Industrial) | Binder M12 |
|---|---|---|---|---|---|---|
| Black | Teal | | | | | |
| 2014 | 2101 | | | | | |
| 2102 | 2104 | | | | | |
| 5030 | 5032 | 100023062 | 100007501 | 100007499 | 7000-74011-0000000 | 99-3727-810-04 |
| 5035 | 5037 | 100023062 | 100007501 | 100007499 | 7000-74011-0000000 | 99-3727-810-04 |
| 5040 | 5042 | 100023062 | 100007501 | 100007499 | 7000-74011-0000000 | 99-3727-810-04 |
| 5055 | 5057 | | 100007501 | 100007499 | 7000-74011-0000000 | 99-3727-810-04 |
| 5060 | 5062 | 100023062 | 100007501 | 100007499 | 7000-74011-0000000 | 99-3727-810-04 |
| 5080 | 5082 | | 100007501 | 100007499 | 7000-74011-0000000 | 99-3727-810-04 |
| 5085 | 5087 | | 100007501 | 100007499 | 7000-74011-0000000 | 99-3727-810-04 |
| 2600 | | | | | | |
| 5005 | | | 100007501 | 100007499 | 7000-74011-0000000 | 99-3787-810-08 |
| 5048 | 5026 | | 100007501 | 100007499 | 7000-74011-0000000 | 99-3787-810-08 |
| 5075 | 5077 | | 100007501 | 100007499 | 7000-74011-0000000 | 99-3787-810-08 |
| 5083 | 5088 | | 100007501 | 100007499 | 7000-74011-0000000 | 99-3787-810-08 |
| 5123 | 5125 | | 100007501 | 100007499 | 7000-74011-0000000 | 99-3787-810-08 |
| 5710 | 5712 | 100023062 | 100007501 | 100007499 | 7000-74011-0000000 | 99-3787-810-08 |
| 5725 | 5727 | 100023062 | 100007501 | 100007499 | 7000-74011-0000000 | 99-3787-810-08 |
| 5730 | 5732 | 100023062 | 100007501 | 100007499 | 7000-74011-0000000 | 99-3787-810-08 |
| 5734 | 5736 | 100023062 | 100007501 | 100007499 | 7000-74011-0000000 | 99-3787-810-08 |
| 5739 | 5741 | 100023062 | 100007501 | 100007499 | 7000-74011-0000000 | 99-3787-810-08 |
| 5760 | 5762 | 100023062 | 100007501 | 100007499 | 7000-74011-0000000 | 99-3787-810-08 |
| 5919 | | | 100007501 | 100007499 | 7000-74011-0000000 | 99-3787-810-08 |
| 5774 | | 100023062 | 100007501 | 100007499 | 7000-74011-0000000 | 99-3729-810-04 |
| 5926 | | 100023062 | 100007501 | 100007499 | 7000-74011-0000000 | 99-3729-810-04 |
| 5927 | | 100023062 | 100007501 | 100007499 | 7000-74011-0000000 | 99-3787-810-08 |
| 5943 | | 100023062 | 100007501 | 100007499 | 7000-74011-0000000 | 99-3787-810-08 |
| 5000 | 5016 | 100023062 | 100007501 | 100007499 | 7000-74011-0000000 | 99-3727-810-04 |
| 5023 | 5025 | 100023062 | 100007501 | 100007499 | 7000-74011-0000000 | 99-3729-810-04 |
| 5770 | 5772 | 100023062 | 100007501 | 100007499 | 7000-74011-0000000 | 99-3729-810-04 |
| 5780 | 5782 | 100023062 | 100007501 | 100007499 | 7000-74011-0000000 | 99-3727-810-04 |
| 5003 | | 100023062 | 100007501 | 100007499 | 7000-74011-0000000 | 99-3787-810-08 |
| 5004 | | | | | 7000-74011-0000000 | 99-3787-810-08 |
| 5089 | 5090 | 100023062 | 100007501 | 100007499 | 7000-74011-0000000 | 99-3787-810-08 |
| 5130 | | 100023062 | 100007501 | 100007499 | 7000-74011-0000000 | 99-3729-810-04 |
| 5700 | 5716 | 100023062 | 100007501 | 100007499 | 7000-74011-0000000 | 99-3787-810-08 |
| 5750 | 5752 | 100023062 | 100007501 | 100007499 | 7000-74011-0000000 | 99-3787-810-08 |
| 5915 | 5916 | 100023062 | 100007501 | 100007499 | 7000-74011-0000000 | 99-3787-810-08 |
| 5925 | 5922 | 100023062 | 100007501 | 100007499 | 7000-74011-0000000 | 99-3787-810-08 |
| 5928 | 5929 | 100023062 | 100007501 | 100007499 | 7000-74011-0000000 | 99-3787-810-08 |
| 5936 | | 100023062 | 100007501 | 100007499 | 7000-74011-0000000 | 99-3787-810-08 |
| 5937 | | 100023062 | 100007501 | 100007499 | 7000-74011-0000000 | 99-3787-810-08 |
| 5944 | | 100023062 | 100007501 | 100007499 | 7000-74011-0000000 | 99-3787-810-08 |
| 5946 | 5947 | 100023062 | 100007501 | 100007499 | 7000-74011-0000000 | 99-3787-810-08 |
| 5911 | | | 100007501 | 100007499 | | 99-3787-810-08 |
| 5941 | 5942 | 100023062 | 100007501 | 100007499 | 7000-74011-0000000 | 99-3787-810-08 |
| 5020 | 5022 | 100023062 | 100007501 | 100007499 | 7000-74011-0000000 | 99-3729-810-04 |
| 5900 | 5902 | 100023062 | 100007501 | 100007499 | 7000-74011-0000000 | 99-3729-810-04 |
| 5904 | 5906 | 100023062 | 100007501 | 100007499 | 7000-74011-0000000 | 99-3729-810-04 |
| 5920 | | 100023062 | 100007501 | 100007499 | 7000-74011-0000000 | 99-3729-810-04 |

↓ *Table continues on page 29*

## Connectors for Harsh Environment Ethernet Cable *(Table continued from page 26)*

| Quabbin Part Number | | Platinum Tools Wide Range OD Cat 6a | Platinum Tools Wide Range OD Cat 8 | Stewart RJ45 | Sentinel RJ45 | Telegaertner RJ45 (Straight) |
|---|---|---|---|---|---|---|
| Black | Teal | | | | | |
| 5924 | | | | | | 100023086 |
| 5120 | 5122 | 106260 | | | 111S08080090C34 | 100023038 |
| 5800 | 5802 | | 106270 | SS-39200-030 | | 100023085 |
| 5921 | | | 106270 | | | 100023085 |
| 5007 | | | | | | 100023086 |
| 5094 | | | | | | 100023086 |
| 5099 | | | | | | 100023086 |

# Glossary

**Abrasion Resistance**: The ability of a cable jacket or insulation to withstand wear and surface damage caused by rubbing, scraping, or repeated contact with rough surfaces.

**AC** (Alternating Current): An electric current that periodically reverses direction, used in more power supply systems.

**Ambient Temperature**: The temperature of the surrounding environment.

**Ampacity**: The maximum amount of electrical current a conductor can carry.

**ANSI** (The American National Standards Institute): An organization that oversees standards and conformity assessment activities in the United States.

**Armored Cable**: A cable with metal protection against damage.

**ASTM** (ASTM International): A standards organization that develops and publishes voluntary consensus technical international standards for wide range of materials, products, systems and services. Formerly known as American Society for Testing and Materials.

**Attenuation** (Insertion Loss): The reduction in signal strength as it travels through a cable.

**AWG** (American Wire Gauge): A standard for measuring wire diameter, critical in determining current-carrying capacity.

**Bend Radius**: The inside radius of the cable when bent. It is a stationary bend not continuous motion.

**Binder**: A material used to hold cable components together.

**Bit Error Rate** (BER): The rate of signal transmission errors.

**Braided Shield**: A layer of woven copper strands around a cable's core to protect against EMI and aid structural integrity.

**Brittle Point**: The lowest temperature at which a cable material becomes brittle and prone to cracking, used to determine suitability for cold environments.

**Bus Cable**: Cable used in communication systems like CAN or Profibus.

**Cable Assembly**: A cable fitted with connectors for application.

**Cable Degradation**: The deterioration of a cable's physical, chemical, or electrical properties over time due to exposure to harsh environmental factors such as UV radiation, moisture, extreme temperatures, chemicals, or mechanical stress.

**Cable Harness**: An organized assembly of cables or wires to transmit signals or power.

**Cable Jacket** (Sheath): The outer protective layer of a cable.

**Capacitance**: The ability of two conductors separated by an insulating material to store a charge.

**Category Cable** (Cat 5e, Cat 6, Cat 6a, Cat 6l6a, Cat 7, Cat 8): A family of twisted-pair copper cables standardized for Ethernet and data transmission. Each category supports different bandwidths and data rates, with higher categories offering improved performance and shielding.

**CE Marking**: An EU product compliance indicator.

**Chemical Resistance**: The ability of a cable jacket to withstand exposure to harsh chemicals such as oils, solvents, acids, and cleaning agents.

**CL3**: A cable rating defined by NEC for Class 3 circuits, which are power-limited and typically used for low-voltage applications such as security systems, building automation, and control wiring. CL3 cables can carry up to 300 volts and must meet specific flame-retardant and insulation standards.

**CM** (Communications Multipurpose): A general-purpose cable for indoor use with basic flame resistance.

**CMR** (Communications Riser): A cable designed for vertical runs between floors, with better flame resistance to stop fire from spreading.

**CMX** (Communications Multipurpose Extra): A cable made for outdoor use or places with moisture and sunlight exposure.

**CMX Outdoor-CM**: An outdoor cable with protection against weather, also suitable for general indoor communication use.

**CMX Outdoor-CMR**: A cable that combines outdoor weather protection with strong flame resistance for safe use between floors and outdoors.

**Cold Flexibility**: The ability of a cable to remain flexible and resistant to cracking or damage when exposed to low temperatures, ensuring reliable performance in cold or freezing environments.

**Color Code**: A standardized system of using different colored insulation or markings on individual wires within a cable to identify their function or connection.

*(Table continued from page 27)*

| Quabbin Part Number | | Telegaertner RJ45 (Right Angle) | Telegaertner M12 D-Code | Telegaertner M12 X-Code | MURR Elektronik RJ45 (Straight Industrial) | Binder M12 |
|---|---|---|---|---|---|---|
| Black | Teal | | | | | |
| 5924 | | 100023063 | 100007501 | 100007499 | 7000-74011-0000000 | 99-3729-810-04 |
| 5120 | 5122 | 100023062 | 100007501 | 100007499 | 7000-74011-0000000 | 99-3787-810-08 |
| 5800 | 5802 | 100023062 | 100007501 | 100007499 | 7000-74011-0000000 | 99-3787-810-08 |
| 5921 | | 100023062 | 100007501 | 100007499 | 7000-74011-0000000 | 99-3787-810-08 |
| 5007 | | | | | | 99-3729-810-04 |
| 5094 | | | | | | 99-3729-810-04 |
| 5099 | | 100023063 | 100007501 | 100007499 | 7000-74011-0000000 | 99-3729-810-04 |

**Conductor**: A path for electrical signal or power.

**Connector**: A device used to join electrical cables or equipment, providing a secure and reliable connection for signal or power transmission.

**Contact Resistance**: The electrical resistance at the connection point between two conductive surfaces, impacting signal quality and reliability.

**Continuous Flex Cable**: A cable designed to withstand repeated bending and flexing without damage, ideal for robotic or automated applications.

**Copper Clad Aluminum**: A conductor made of aluminum coated with a thin layer of copper, combining lightweight with good conductivity, however is not permitted by US Code.

**Core**: The cable components; typically, a group of insulated wires that may include a shield, tape, drain, wire, and filler.

**CPE** (Chlorinated Polyethylene): A thermoplastic polymer made by chlorinating polyethylene, used for cable insulation and jackets. It is known for its high chemical resistance flexibility, and durability.

**Crimping**: A method of attaching connectors to cables by compressing metal sleeves to form a secure electrical and mechanical bond.

**Cross-talk**: Unwanted interference caused by signal leakage between adjacent cables or conductors.

**Crush Resistance**: The ability of a cable jacket to withstand compressive forces without damage to its internal components.

**CSA** (Canadian Standards Association): A global organization dedicated to safety, social good and sustainability.

**Cutting/Machine-Oil Resistance**: The ability of a cable jacket to withstand degradation from exposure to oils used in cutting or machining processes.

**Data Rate**: The speed at which data is transmitted over a cable, typically measured in megabits or gigabits per second.

**DC** (Direct Current): A type of electrical current that flows in one direction, commonly used in low-voltage applications.

**DCR** (DC Resistance): The direct current resistance of a cable conductor measured in ohms (Ω), affecting signal loss.

**DCR** (LOOP): The total DC resistance measured through a conductor loop, often used to evaluate cable quality.

**DeviceNet**: An industrial communication protocol based on the CAN (Controller Area Network) bus, used for connecting sensors, actuators, and controllers in automation systems. DeviceNet cables include power and data conductors in a single cable and are designed for rugged environments.

**Dielectric**: The insulating material between conductors in a cable that resists electrical flow.

**Dielectric Strength**: The maximum voltage an insulating material can withstand without breaking down.

**Double Shielded**: A cable construction featuring two layers of shielding to provide enhanced protection against electromagnetic interference (EMI).

**Drain Wire**: A conductor used in shielded cables to facilitate grounding and minimize noise.

**EMI** (Electromagnetic Interference): A disruption caused by external electromagnetic fields, affecting signal integrity.

**Ethernet**: Standard for local area network communication.

**ETL** (Electrical Testing Labs): Administered by Intertek, a global Total Quality Assurance provider. An ETL listing is proof of product compliance with official quality and safety standards.

**Extrusion**: The process of forming cable jackets or insulation by forcing melted material through a shaped die.

**FEP** (Fluorinated Ethylene Propylene): A material used for wire and cable insulation and jacketing for its excellent chemical- and flame-resistance and low friction.

**Field Termination**: The process of attaching connectors to cables on-site during installation.

**Fieldbus**: A network system used for real-time distributed control in industrial environments.

**Filler**: Non-conductive materials inside a cable used to maintain shape and provide mechanical stability.

**Flame Retardant**: A characteristic of cable materials that resist burning and reduce flame spread.

**Flex Life**: The number of bending cycles a cable can endure before failure.

**Foil Shield**: A thin layer of metal used in cables to shield against EMI.

**Frequency**: The number of signal cycles per second, measured in Hertz (Hz).

**Halogen-Free**: Cables made without halogens to reduce toxic smoke and corrosive gas during a fire.

**HDPE** (High Density Polyethylene): A rigid thermoplastic material used for insulation and cable jackets, known for its robust physical properties and reliability.

**Hi-Flex Cable**: A highly flexible cable designed for continuous movement applications.

**High Temperature Rating**: The maximum temperature at which a cable can operate safely without degradation.

**Hybrid or Composite Cable**: A cable combining different types of conductors or media, such as power and data, in a single jacket.

**Hz** (Hertz): The unit of frequency, representing one cycle per second.

**IEEE**: The Institute of Electrical and Electronics Engineers, which sets standards for electrical and electronic technologies.

**Impedance**: The resistance of a circuit to alternating current, measured in ohms (Ω).

**Inductance**: The property of a conductor to oppose changes in current flow, measured in henries (H).

**Ingress Protection (IP) Rating**: A classification defined by IEC 60529 that indicates the level of protection of a cable assembly against solids and liquids.

**IP67**: Indicates that a cable assembly is fully sealed against dust ingress and capable of withstanding temporary immersion in water up to 1 meter for 30 minutes. Ideal for harsh industrial, outdoor, or washdown environments.

**IP69**: Indicates that a cable assembly is completely dust-tight and protected against high-pressure, high-temperature water jets from multiple directions. Designed for extreme washdown conditions in industries such as food processing, pharmaceuticals, and heavy manufacturing.

**IP69-K**: Indicates that a cable or connector assembly is fully protected against dust ingress (6) and high-pressure, high-temperature water jets (9K). Common in food processing, automotive, and washdown environments, IP69K assemblies are ideal for harsh, wet, and hygienic conditions.

**Insulation**: The material that encases the conductor to prevent electrical leakage and protect against short circuits.

**ISO/IEC Standards**: The international standards organizations that develop global cabling and testing guidelines.

**ITC** (Industrial Telecommunications Cable): Cable designed for rugged industrial communications environments.

**LAN** (Local Area Network): A network that connects computers and devices within a limited area such as a building.

**Low Capacitance**: Cable characteristic that reduces capacitive effects, improving signal quality over long runs for some protocols.

**Low Smoke**: Cable materials that emit minimal smoke when exposed to fire, improving safety. Low smoke-producing cables tested to ASTM E662 are critical for safety in confined or poorly ventilated areas, helping to reduce visibility loss and toxic exposure during a fire.

**Low Temperature Rating**: The minimum temperature at which a cable can operate without becoming brittle or losing flexibility, ensuring reliable performance in cold or freezing harsh environments.

**LP Certified**: Indicates the cable has been tested by UL to support a specified current level (in amps) under PoE without exceeding temperature limits.

**LSZH** (Low Smoke Zero Halogen): A type of insulation used for cable insulation and jackets that emits low smoke and no halogen when exposed to fire, enhancing safety.

**M12 Connector**: A circular, screw-locking connector commonly used in industrial automation and harsh environments for sensors, actuators, and data connections. Known for durability and resistance to dust and moisture.

**MIL-Spec Cable**: Cable manufactured to meet military specifications (MIL-SPEC) for extreme durability, environmental resistance, and performance in demanding applications.

**Modular Plug** (RJ45): A standardized 8-position, 8-contact plug used primarily for Ethernet data connections, designed for easy installation and reliable networking.

**Moisture Resistance**: The ability of a cable jacket to withstand water ingress and prevent damage or degradation in wet or humid environments.

**NEC** (National Electrical Code): A set of standards for safe electrical design, installation, and inspection.

**Noise**: Unwanted electrical interference that distorts or disrupts signal transmission, often caused by nearby power lines, motors, or other electronics.

**Nominal OD** (Outside Diameter): The typical or average outer diameter of a cable, used for sizing in routing, conduit selection, and mechanical design.

**NSF** (National Sanitation Foundation): NSF International is an independent, nonprofit organization that develops public health standards and provides testing, certification, and auditing services for products, systems, and facilities.

**NSF/ANSI 51**: A sanitation standard established by NSF International that defines material requirements for equipment and components intended for use in food processing and food handling environments.

**NSF/ANSI 61**: A standard developed by NSF International that specifies material requirements for equipment and components used in food and beverage processing environments.

**Oil Resistance**: The ability of a cable to resist breakdown or swelling when exposed to oils, lubricants, or hydrocarbons, critical in industrial environments. UL Oil Res. I indicates a cable can withstand light oil exposure, whereas Oil Res. II indicates a cable can resist heavy or prolonged oil exposure.

**Outdoor Rated**: Cables specifically designed to withstand prolonged exposure to sunlight, temperature extremes, moisture, and other outdoor conditions.

**Overbraid**: A woven metal or synthetic layer applied over a cable for added mechanical protection and/or shielding from electromagnetic interference (EMI).

**Overmold**: A molded protective layer, usually at a cable-to-connector junction, that enhances durability, strain relief, and environmental sealing.

**Patch Cable**: A short, flexible cable used to connect devices in data networks, often terminated with modular plugs like RJ45.

**PE** (Polyethylene): Durable, low-loss cable insulation.

**Pennsylvania DEP-MSHA**: Certification from the Pennsylvania Department of Environmental Protection and the Mine Safety and Health Administration, indicating the cable meets safety requirements for use in mining environments.

**Plenum Rated**: A cable rated by fire codes (such as NFPA 70) for use in plenum spaces (air handling areas), with low smoke and flame-spread characteristics.

**PLTC** (Power-Limited Tray Cable): A type of 22 AWG or larger cable used in control and signal applications with limited power.

**PLTC-ER** (Power-Limited Tray Cable Exposed Run): A cable with a tougher jacket than PLTC, the "-ER" designation stands for "Exposed Run," indicating it's designed for exposure to the elements or physical damage. Its robust outer jacket resists environmental factors and abrasion, making it ideal for use in areas not fully enclosed.

**Plug**: The male portion of a cable connector that inserts into a matching jack or receptacle to complete an electrical connection.

**PO** (Polyolefins): A family of thermoplastic materials used for cable insulation and jacketing, known for their chemical resistance, electrical properties, and durability in harsh environments.

**PoDL** (Power over Data Lines): A technology that delivers both power and data over a single twisted pair Ethernet cable, commonly used in Single Pair Ethernet (SPE) systems. Designed for space- and weight-constrained applications like automotive, industrial, and harsh environments, PoDL enables efficient device connectivity with reduced cabling complexity.

**PoE** (Power over Ethernet): A technology that allows Ethernet cables to carry both data and electrical power to devices like IP cameras and access points.

**PoE IEEE 802.3af** (Type 1): A PoE standard delivering up to 15.4 watts of power over Cat5e or higher Ethernet cables to low-power devices.

**PoE+ IEEE 802.3at** (Type 2): An enhanced PoE standard delivering up to 25.5 watts of power over Ethernet for devices with higher power requirements.

**4PPoE 802.3bt** (Type 3): A PoE standard delivering up to 60 watts of power using all four twisted pairs in an Ethernet cable, ideal for powering high-demand devices like PTZ cameras and wireless access points.

**802.3bt** (Type 4): A higher-power PoE standard delivering up to 100 watts over four pairs of twisted-pair Ethernet cable, suitable for devices like LED lighting, HVAC controls, or thin clients.

**Pressure Jacket**: A tough outer cable jacket designed to fill interstices in the core. Able to withstand high mechanical pressure, abrasion, or compression in rugged environments.

**Profinet**: An industrial Ethernet communication protocol used for real-time data exchange between controllers and field devices in automation systems. Profinet supports high-speed, deterministic communication and is widely used in manufacturing, process control, and factory automation environments requiring robust, reliable connectivity.

**PUR** (Polyurethane): A type of thermoplastic elastomer used in wire and cable applications due to its flexibility, durability, chemical resistance, and wide temperature range.

**PVC** (Polyvinyl Chloride): A common plastic used for cable insulation and jackets, known for its durability.

**PVDF** (Polyvinylidene Fluoride): A high-performance thermoplastic material used for wire and cable jackets, offering exceptional electrical insulation, chemical resistance, thermal stability, and flame resistance. It is ideal for demanding and specialized environments.

**Quad**: A four-conductor cable configuration often used for balanced audio, control signals, or specialty data applications to reduce interference.

**Resistance**: The opposition to electrical current flow, measured in ohms (Ω).

**Riser Cable**: A cable designed for use in vertical shafts or risers, with flame-retardant properties.

**RJ45**: A common 8-pin modular plug used primarily for Ethernet network connections in structured cabling systems.

**RoHS** (Restriction of Hazardous Substances): Originated in the European Union (EU), a directive that regulates the use of certain hazardous substances in electrical and electronic equipment.

**Rolling Bend Test**: A mechanical test used to evaluate a cable's durability and flex life by subjecting it to repeated bending around a moving or rotating drum. This simulates dynamic motion in harsh environments, such as robotics or drag chain systems, to ensure long-term flexibility and mechanical integrity.

**Santoprene**: A thermoplastic elastomer known for flexibility and resistance to chemicals, oils, and weather—ideal for harsh environment cable jackets.

**Shield**: A metallic layer of braid, spiral serve or tape that is applied over a core of a single insulated conductor or a group of conductors to prevent electrostatic or electromagnetic interference between adjacent wires and external sources.

**SPE** (Single Pair Ethernet): An Ethernet technology that transmits data and, optionally, power over a single twisted copper pair, enabling reduced cable size, weight, and complexity compared to traditional multi-pair Ethernet.

**Sunlight Resistance**: The ability of a cable jacket to resist degradation and brittleness when exposed to UV radiation over time.

**Torsion Test**: A mechanical test that measures a cable's ability to withstand twisting forces without failure, critical for robotic and rotating applications.

**TPE** (Thermoplastic Elastomer): A type of material used for cable insulation and jacketing that combines the properties of both thermoplastics and elastomers, providing cable flexibility and performance in challenging environments, such as in automotive, industrial, and robotics applications.

**Tubed Jacket**: A cable jacket formed by tooling that does not fill interstices in the core.

**UL** (Underwriters Laboratories): An organization that certifies products for safety, including cables.

**UL 444 Cold Bend**: A UL test requirement ensuring cables remain flexible and free from cracking after being bent at low temperatures, typically used for communication cables.

**UL AWM Style 2463**: A UL-recognized Appliance Wiring Material (AWM) style for multi-conductor cables rated for 600V often used in internal wiring of equipment, with flame and temperature resistance.

**UL AWM Style 20532**: A specific UL AWM style for shielded cables rated for 300V, designed for internal wiring in electronic equipment, often with enhanced temperature and environmental durability.

**UV Resistance**: The ability of a cable jacket to withstand degradation from ultraviolet light exposure, preventing cracking, fading, or brittleness in outdoor use.

**VW-1 Flame Test**: A vertical wire flame test defined by UL to determine a cable's flame-retardant properties. Cables passing this test self-extinguish after being exposed to a flame source.

**Weld Spatter Resistance**: The ability of a cable jacket to resist damage from molten metal spatter produced during welding, critical for use in fabrication, robotics, and automation.

**ZHFR PUR** (Zero-Halogen Flame Retardant Polyurethane): A halogen-free cable jacketing material that inhibits the spread of flames and limits toxic emission; ideal for safety-critical environments such as in public buildings, transportation, and industrial settings.

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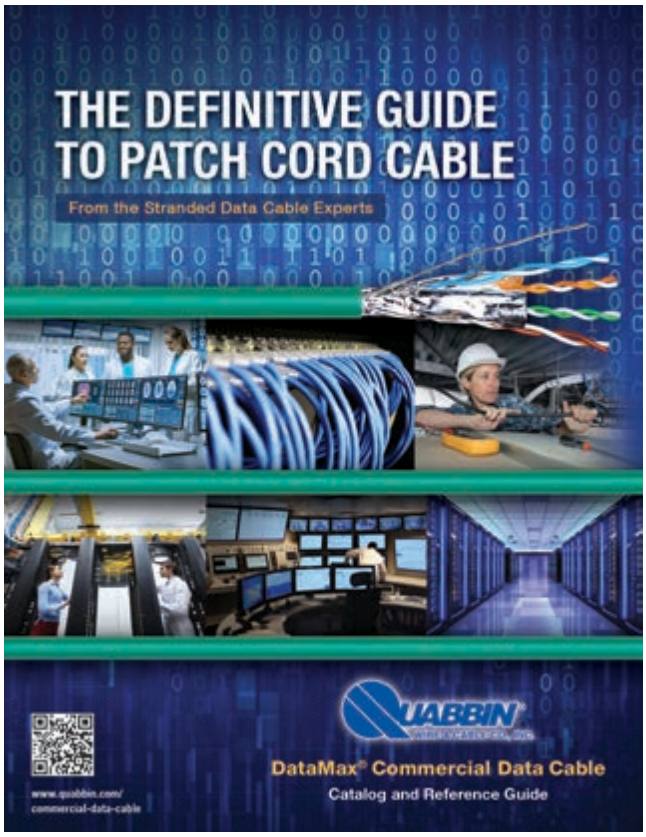


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### Commercial Data Cable

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- Cat 6a / 26 AWG
- Cat 6 Mini / 28 AWG
- Cat 6 / 26 AWG
- Cat 6 / 24 AWG
- Cat 5e / 26 AWG
- Cat 5e / 24 AWG
- Cat 5 / 26 AWG
- T1
- E1


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- 600V-Trol®
- Audio & Broadcast
- Building Automation & Control
- Computer, POS System Interconnect
- Instrumentation & Machine Control
- Portable Cordage
- Sensor/Actuator
- Serial Communication
- Traffic Control
- Transducer
- Tray Rated/PLTC

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