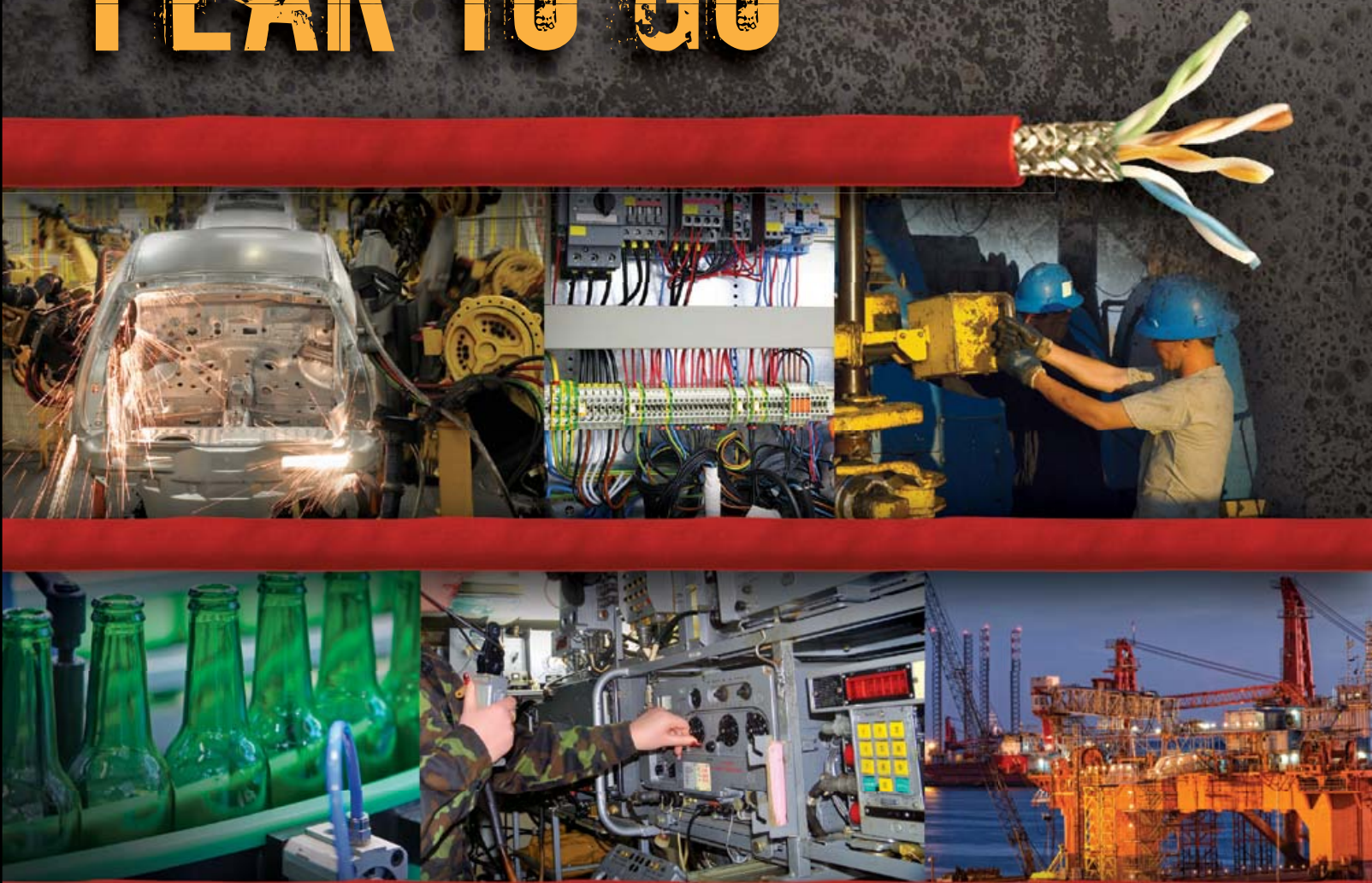


# GOES WHERE OTHER CABLES FEAR TO GO



**Ethernet for Harsh Environment**  
Rugged. Reliable. Trusted to Eliminate Downtime.





## ETHERNET FOR HARSH ENVIRONMENT

Rugged. Reliable. Trusted to Eliminate Downtime.



### DataMax® Extreme Industrial Ethernet Patch Cable

**Superior construction and design** ensures DataMax® Extreme Industrial Ethernet cables possess all of the characteristics necessary to withstand harsh environments while performing above industry standards for signal transmission. The result is a family of cable products that fully comply with TIA 568-C.2 commercial and TIA 1005 industrial communication specifications, while reducing downtime and increasing productivity.

#### APPLICATIONS

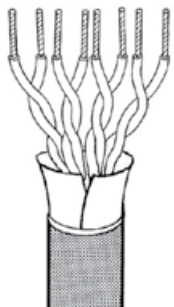
- Factory Automation
- Robotic Control
- Machine Vision
- Food and Beverage
- Oil & Gas
- Mil-tec
- Energy
- Transportation
- Harsh Environments

#### LISTINGS/RATINGS AVAILABLE

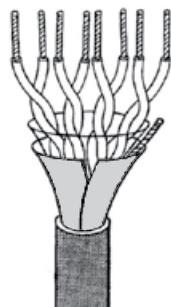
- UL 1685
- VW-1
- CM
- CMR
- CMX
- CMX Outdoor
- 600V AWM
- PLTC

#### DESIGN OPTIONS

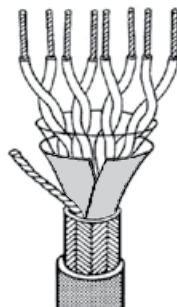
- 22, 24, & 26 AWG tinned copper
- 2 or 4 pair (similar diameter allows shared tooling)
- Unshielded, foil shield w/drain, and foil shield w/braid
- PVC, FR TPE, TPU, or Halogen Free TPU Jacket
- Flexible or continuous flex
- Weld spatter resistant
- Chemical/oil resistant
- RoHS compliant
- UV resistant



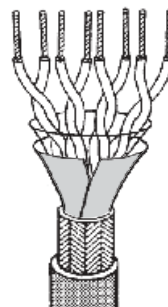
Hi-flex Unshielded  
with Separator Tape



Overall Foil Shield  
with Drain Wire



Double Shield: Foil,  
Drain Wire, Braid



Hi-flex Double Shield:  
Foil, Braid

**Depicted at left are the various 4 pair cable constructions.** Each design is also available in a similar 2 pair configuration. For guidance on selecting the perfect cable to fit your needs, please contact the Quabbin Sales/Service department.

# DATAMAX® EXTREME INDUSTRIAL ETHERNET PART NUMBERS (Partial listing – see catalog for all part numbers)

| Quabbin Part Number   | Color | Number of Pairs | AWG    | Unshielded | Foil Shield & Braid | CM – Includes UL 1685 | CMX Outdoor | CMX – Includes VW-1 | 600V AWM | PLTC | Continuous Flex | Halogen Free | Weld Spatter Resistant | Plug To Plug Max Length | Nominal Cable Diameter inches/mm |
|---|-------|-----------------|--------|------------|---------------------|-----------------------|-------------|---------------------|----------|------|-----------------|--------------|------------------------|-------------------------|----------------------------------|
| All DataMax® Extreme Industrial Ethernet cables are chemical resistant and RoHS compliant |       |                 |        |            |                     |                       |             |                     |          |      |                 |              |                        |                         |                                  |
| STRANDED, FR-TPE JACKET   |       |                 |        |            |                     |                       |             |                     |          |      |                 |              |                        |                         |                                  |
| 5770  | Black | 2               | 24 AWG | •          |                     | •                     | •           |                     | •        |      | •               |              | •                      | 85 meters               | .230"/5.84mm                     |
| 5772  | Teal  | 2               | 24 AWG | •          |                     | •                     | •           |                     | •        |      | •               |              | •                      | 85 meters               | .230"/5.84mm                     |
| 5750  | Black | 4               | 24 AWG | •          |                     | •                     | •           |                     | •        |      | •               |              | •                      | 85 meters               | .248"/6.30mm                     |
| 5752  | Teal  | 4               | 24 AWG | •          |                     | •                     | •           |                     | •        |      | •               |              | •                      | 85 meters               | .248"/6.30mm                     |
| 5900  | Black | 2               | 22 AWG | •          |                     | •                     | •           |                     | •        | •    | •               |              | •                      | 100 meters              | .270"/6.86mm                     |
| 5902  | Teal  | 2               | 22 AWG | •          |                     | •                     | •           |                     | •        | •    | •               |              | •                      | 100 meters              | .270"/6.86mm                     |
| 5800  | Black | 4               | 22 AWG | •          |                     | •                     | •           |                     | •        | •    | •               |              | •                      | 100 meters              | .295"/7.49mm                     |
| 5802  | Teal  | 4               | 22 AWG | •          |                     | •                     | •           |                     | •        | •    | •               |              | •                      | 100 meters              | .295"/7.49mm                     |
| 5085  | Black | 2               | 26 AWG |            | •                   | •                     | •           |                     | •        |      | •               |              | •                      | 68 meters               | .225"/5.72mm                     |
| 5087  | Teal  | 2               | 26 AWG |            | •                   | •                     | •           |                     | •        |      | •               |              | •                      | 68 meters               | .225"/5.72mm                     |
| 5083  | Black | 4               | 26 AWG |            | •                   | •                     | •           |                     | •        |      | •               |              | •                      | 68 meters               | .244"/6.20mm                     |
| 5088  | Teal  | 4               | 26 AWG |            | •                   | •                     | •           |                     | •        |      | •               |              | •                      | 68 meters               | .244"/6.20mm                     |
| 5089  | Black | 4               | 24 AWG |            | •                   | •                     | •           |                     | •        |      | •               |              | •                      | 90 meters               | .301"/7.65mm                     |
| 5090  | Teal  | 4               | 24 AWG |            | •                   | •                     | •           |                     | •        |      | •               |              | •                      | 90 meters               | .301"/7.65mm                     |
| SOLID, FR-TPE JACKET  |       |                 |        |            |                     |                       |             |                     |          |      |                 |              |                        |                         |                                  |
| 5774  | Teal  | 2               | 24 AWG | •          |                     | •                     |             |                     | •        |      |                 |              | •                      | 100 meters              | .225"/5.72mm                     |
| 9415  | Teal  | 4               | 24 AWG | •          |                     | •                     |             |                     | •        |      |                 |              | •                      | 100 meters              | .240"/6.10mm                     |
| STRANDED, TPU JACKET  |       |                 |        |            |                     |                       |             |                     |          |      |                 |              |                        |                         |                                  |
| 5000  | Black | 2               | 24 AWG | •          |                     |                       |             |                     |          |      | •               |              |                        | 70 meters               | .220"/5.59mm                     |
| 5016  | Teal  | 2               | 24 AWG | •          |                     |                       |             |                     |          |      | •               |              |                        | 70 meters               | .220"/5.59mm                     |
| 5700  | Black | 4               | 24 AWG | •          |                     |                       |             |                     |          |      | •               |              |                        | 70 meters               | .228"/5.79mm                     |
| 5716  | Teal  | 4               | 24 AWG | •          |                     |                       |             |                     |          |      | •               |              |                        | 70 meters               | .228"/5.79mm                     |
| 5020  | Black | 2               | 22 AWG | •          |                     |                       |             |                     |          |      | •               |              |                        | 82 meters               | .270"/6.86mm                     |
| 5022  | Teal  | 2               | 22 AWG | •          |                     |                       |             |                     |          |      | •               |              |                        | 82 meters               | .270"/6.86mm                     |
| 5120  | Black | 4               | 22 AWG | •          |                     |                       |             |                     |          |      | •               |              |                        | 82 meters               | .276"/7.01mm                     |
| 5122  | Teal  | 4               | 22 AWG | •          |                     |                       |             |                     |          |      | •               |              |                        | 82 meters               | .276"/7.01mm                     |
| 5080  | Black | 2               | 26 AWG |            | •                   |                       |             | •                   | PENDING  |      | •               | •            |                        | 68 meters               | .225"/5.72mm                     |
| 5082  | Teal  | 2               | 26 AWG |            | •                   |                       |             | •                   | PENDING  |      | •               | •            |                        | 68 meters               | .225"/5.72mm                     |
| 5075  | Black | 4               | 26 AWG |            | •                   |                       |             | •                   | PENDING  |      | •               | •            |                        | 68 meters               | .244"/6.20mm                     |
| 5077  | Teal  | 4               | 26 AWG |            | •                   |                       |             | •                   | PENDING  |      | •               | •            |                        | 68 meters               | .244"/6.20mm                     |
| 5730  | Black | 4               | 26 AWG |            | •                   |                       |             |                     |          |      |                 |              |                        | 68 meters               | .220"/5.59mm                     |
| 5732  | Teal  | 4               | 26 AWG |            | •                   |                       |             |                     |          |      |                 |              |                        | 68 meters               | .220"/5.59mm                     |

INDUSTRIAL ETHERNET (IE) APPLICATION

Non-proprietary Ethernet offers a huge increase in signaling speeds over older industrial control systems. Ethernet is reliable and easily migrates from 10Base-T to higher speeds. However, commercial office Ethernet systems cannot survive harsh conditions on the factory floor without being specially hardened or protected.

Quabbin’s family of Industrial Ethernet cables were developed to reliably survive industrial hazards and may be terminated using encapsulated



Encapsulated RJ-45

RJ- 45 modular plugs or industrial M12 connectors which have been adapted for Ethernet transmission. These connectors use O-rings, overmolding, and/or sealing gaskets to bond to the cable jackets, providing a mated connection



Industrial M12

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.

CABLE CONSTRUCTION OPTIONS

DataMax® Extreme cables are available in a variety of constructions. All four 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 and four available jackets using 26 AWG stranded conductors to maintain a consistent product line OD. Operational environment usually determines if shielded cable must be considered, however Quabbin’s unshielded

cable pairs have exceptional “balance” that provides a high degree of isolation from EMI and other emissions. Due to the outstanding balance, many customers have found they can use unshielded cables where they thought they needed shielded. This can be a critical performance advantage since unshielded cables typically have a longer flex life than shielded cables.

PRESSURE EXTRUDED JACKETS

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.

Cable jackets protect the cable core from environmental, operational, and installation hazards. The DataMax® Extreme jackets were developed to survive many of the industrial hazards that commercial jackets will not. Compare the performance characteristics of the four optional compounds used for cable jacketing in the chart below.

DATAMAX® EXTREME JACKET COMPARISON INFORMATION

| Performance Criteria                           | Industrial PVC | FR-TPE         | TPU       | Halogen-free TPU |
|--|----------------|----------------|-----------|------------------|
| Low Cost Construction                          | Excellent      | Good           | Fair      | Fair             |
| RoHS Compliant and Lead Free                   | Yes            | Yes            | Yes       | Yes              |
| Dielectric Strength and Electrical Performance | Good           | Good           | Fair      | Fair             |
| Low Temperature Flexibility and Brittle Point  | Fair           | Excellent      | Excellent | Excellent        |
| Tear Resistance                                | Fair           | Good           | Excellent | Excellent        |
| Abrasion and Scuff Resistance                  | Good           | Good           | Excellent | Excellent        |
| Flexibility and Flex-Life                      | Fair           | Excellent      | Excellent | Excellent        |
| Tensile Strength and Toughness                 | Good           | Good           | Excellent | Excellent        |
| Resistance to Ozone                            | Excellent      | Good           | Good      | Good             |
| Ultraviolet and Weather Resistance             | Fair           | Excellent      | Good      | Good             |
| Resistance to Acids                            | Fair           | Good           | Fair      | Fair             |
| Resistance to Bases                            | Good           | Good           | Good      | Good             |
| Resistance to Moisture                         | Good           | Excellent      | Excellent | Excellent        |
| Resistance to Petrochemicals                   | Good           | Good/Excellent | Fair      | Fair             |
| Flame and Fire Resistance                      | Excellent      | Good/Excellent | Fair      | Excellent        |

Jackets include industrial-grade PVC, flame retardant thermoplastic elastomer (FR-TPE), polyurethane (TPU), and halogen-free polyurethane. You can see that no single jacket compound is optimum in all characteristics. Since there is no single “best” jacket for all applications, contact Quabbin’s Sales Service Department at 1-800-368-3311 or Sales@quabbin.com to help determine the proper compound that provides the optimum balance of electrical, mechanical, and cost considerations for your project.



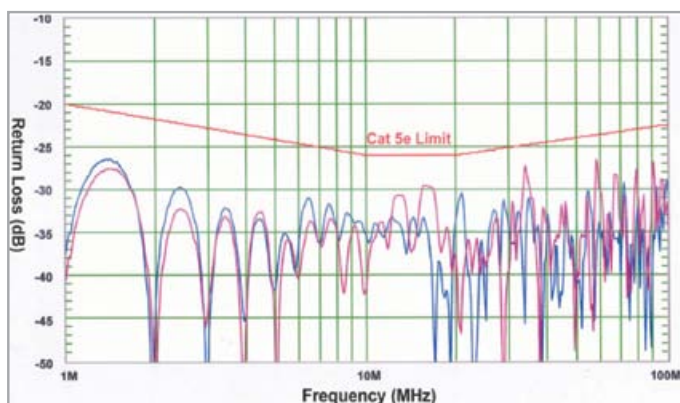
**When you choose Quabbin® cable** you are not only selecting a premier industrial Ethernet cable, but you are also investing in productivity and peace of mind. Quabbin® is dedicated to producing best of breed cables for the industrial market. We achieve this through constant innovation, in-line monitoring and rigorous testing ensuring our cables meet your needs, requirements and expectations. We know the importance of mitigating downtime and our top priority is to deliver a cable you can depend on in any environment. For complete test reports visit the lab section of our website or contact a Quabbin® sales representative.

## ELECTRICAL TESTING

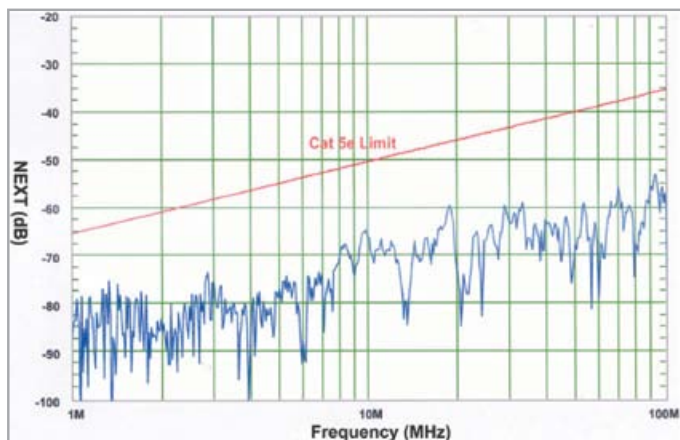
Transmitting 10Base-T, 100Base-T, or Gigabit Ethernet signals over distances in an industrial application presents two challenges. Building a cable or cord assembly is only half of the battle. The other challenge is, “How good is it electrically?” The charts below illustrate typical Return Loss and Near End Crosstalk performance for DataMax® Extreme 2-pair and 4-pair, 24 AWG FR-TPE jacketed

cables. Note the huge performance headroom compared to Category 5e requirements. Industrial Grade PVC or Polyurethane jacketed DataMax® Extreme cables also exceed Category 5e limits. Use DataMax® Extreme cables to ensure that your Industrial Ethernet cords comply with applicable requirements of both the TIA 568-C.2 commercial and TIA 1005 industrial specifications.

### 2-PAIR FR-TPE CABLE

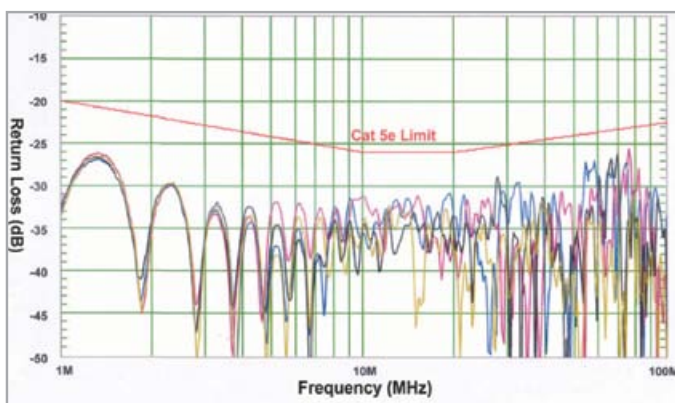


*Return Loss*

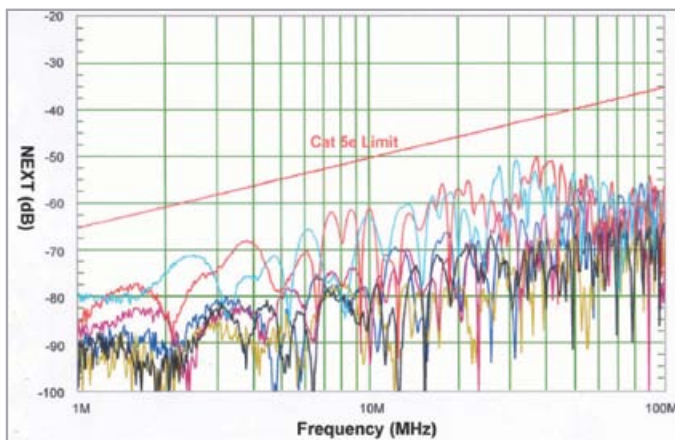


*Near-end Crosstalk*

### 4-PAIR FR-TPE CABLE



*Return Loss*



*Near-end Crosstalk*

# ETHERNET FOR HARSH ENVIRONMENT

Rugged. Reliable. Trusted to Eliminate Downtime.

**What advances DataMax®** to the next level earning the name “DataMax® Extreme?” The section below outlines the intense testing that isn’t required by any formal standard, but is performed as part of the Quabbin® quality commitment. You need a cable you can be tough on and trust in a harsh environment. We need to provide you with the evidence that our cable is the best choice for the job.

## 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. To the right are two images, the first is showing a ‘Torsion tester’ which simulates a rotational stress comparable to what a cable would experience while controlling end of arm tooling. The second photo shows a rolling bend ‘Flex tester’ which simulates an unsupported bending motion – typical of what you would see on a robotic arm.

## CHEMICAL TESTING

Quabbin’s harsh environment cables find their way into many interesting applications such as mil-tec, wastewater treatment and energy exploration, just to name a few. Historically the most popular application for Industrial 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. To the right is a picture illustrating the chemical testing performed on our industrial Ethernet cables. 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.

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



**Rolling Bend Flex Tester** showing a 4 pair, double shielded (foil & braid), DataMax® Extreme with Non Halogen TPU jacket being tested to 10 million cycles. Results were a cable with no physical damage that continued to surpass category 5e test parameters.



**Chemical tests** (affectionately nicknamed the “bean sprout 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.

**Learn more about DataMax® Extreme**

**Contact Quabbin’s Sales Service Department at  
1-800-368-3311 or Sales@quabbin.com**

**[www.quabbin.com/harsh](http://www.quabbin.com/harsh)**



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