

# QR2, QRA2



**MEDIUM WALL, POLYOLEFIN TUBING WITH OR WITHOUT  
HOT MELT ADHESIVE  
SHRINK RATIO 3:1**

## Features/Applications

QR2 has properties of excellent insulation, environmental sealing and resistance to impact and abrasion. Designed for applications to seal and protect electrical and communication connections, providing excellent mechanical protection to cable joints and terminations. 3:1 shrink ratio allows it to easily fit over irregular shapes and large connectors.

QRA2 is recommended for applications with light cable and wire harnesses that require waterproofing and protection of connector components and encapsulates and seals components within the tubing.

- Operating temperature: -55°C to +110°C
- Full recovery temperature: 120°C
- Standard color: Black, red
- RoHS Compliant
- Resistant to UV radiation
- High electrical insulation
- Superior mechanical property



## Technical Data

| Property                                         | Test Method | Typical Data            |
|--------------------------------------------------|-------------|-------------------------|
| Operating Temperature                            | IEC 216     | -55°C TO +110°C         |
| Tensile Strength                                 | ASTM D 2671 | ≥ 14 MPa                |
| Tensile Strength After Aging (150°C, 168hrs.)    | ASTM D 2671 | ≥ 12MPa                 |
| Elongation at Break                              | ASTM D 2671 | ≥ 400%                  |
| Elongation at Break After Aging (150°C, 168hrs.) | ASTM D 2671 | ≥ 300%                  |
| Density                                          | ASTM D 792  | 1.05g/cm <sup>3</sup>   |
| Longitudinal Shrinkage                           | UL 224      | 0 to -10%               |
| Dielectric Strength                              | IEC 243     | ≥ 20kV/mm               |
| Volume Resistance                                | IEC 93      | ≥ 10 <sup>14</sup> Ω.cm |
| Eccentricity                                     | ASTM D 2671 | < 30%                   |
| Copper Stability                                 | ASTM D 2671 | Pass                    |
| Resistance to Stress Cracking (50°C)             | ASTM D 1693 | No cracking             |
| Water Absorption (23°C, 4days)                   | ISO 62      | < 0.15%                 |

## Thermoplastic Adhesive for QRA2

| Property                       | Test Method | Typical Data  |
|--------------------------------|-------------|---------------|
| Water Absorption               | ISO 62      | <0.2%         |
| Softening Point                | ASTM D E28  | 85°C          |
| Peel Strength (PE)             | DIN 30672   | 4N/cm         |
| Copper Stability               | ASTM D 2671 | Non-corrosive |
| Resistance to Fungus and Decay | ISO 846     | Pass          |

### Notes:

- \* See Part Number Guide for standard packaging codes.
- Special sizes, packaging, colors and cut pieces are available upon request.

## QRA2, Medium-Wall Tubing With Hot-Melt Adhesive

| Size (mm) | As Supplied (mm)       | After Recovered (mm)   |                       | Tubing Shape | Standard Packaging                             |
|-----------|------------------------|------------------------|-----------------------|--------------|------------------------------------------------|
|           | Inside Diameter (min.) | Inside Diameter (max.) | Wall Thickness (min.) |              | Cut to Length Pcs. *(QB)<br>Qty per bag<br>48" |
| 8/2       | 8                      | 2                      | 1.7                   | Round        | 20                                             |
| 12/3      | 12                     | 3                      | 2.0                   | Round        | 20                                             |
| 16/5      | 16                     | 5                      | 2.2                   | Round        | 20                                             |
| 19/5      | 19                     | 5                      | 2.5                   | Round        | 20                                             |
| 22/6      | 22                     | 6                      | 2.5                   | Round        | 20                                             |
| 28/6      | 28                     | 6                      | 2.5                   | Round        | 20                                             |
| 33/8      | 33                     | 8                      | 2.5                   | Round        | 20                                             |
| 40/12     | 40                     | 12                     | 2.5                   | Round        | 15                                             |
| 55/16     | 55                     | 16                     | 2.7                   | Round        | 15                                             |
| 65/19     | 65                     | 19                     | 2.8                   | Round        | 15                                             |
| 75/22     | 75                     | 22                     | 3.0                   | Round        | 15                                             |
| 85/25     | 85                     | 25                     | 3.0                   | Round        | 15                                             |
| 95/25     | 95                     | 25                     | 3.0                   | Round        | 10                                             |
| 115/34    | 115                    | 34                     | 3.0                   | Round        | 10                                             |
| 140/42    | 140                    | 42                     | 3.0                   | Round        | 10                                             |
| 160/50    | 160                    | 50                     | 3.0                   | Round        | 5                                              |
| 180/58    | 180                    | 58                     | 3.0                   | Round        | 5                                              |
| 205/65    | 205                    | 65                     | 3.0                   | Round        | 5                                              |
| 235/65    | 235                    | 65                     | 3.0                   | Round        | 5                                              |
| 265/75    | 265                    | 75                     | 3.0                   | Round        | 5                                              |
| 300/85    | 300                    | 85                     | 3.0                   | Round        | 5                                              |
| 350/100   | 350                    | 100                    | 3.0                   | Round        | 5                                              |

## QR2, Medium-Wall Tubing Without Hot-Melt Adhesive

| Size (mm) | As Supplied (mm) | Inside Diameter (min.) | Inside Diameter (max.) | Wall Thickness (min.) | Tubing Shape | Qty per bag |
|-----------|------------------|------------------------|------------------------|-----------------------|--------------|-------------|
| 8/2       | 8                | 2                      | 1.7                    | 1.7                   | Flat         | 20          |
| 12/3      | 12               | 3                      | 2.0                    | 2.0                   | Flat         | 20          |
| 16/5      | 16               | 5                      | 2.2                    | 2.2                   | Flat         | 20          |
| 22/6      | 22               | 6                      | 2.2                    | 2.2                   | Round        | 20          |
| 33/8      | 33               | 8                      | 2.5                    | 2.5                   | Round        | 20          |
| 40/12     | 40               | 12                     | 2.5                    | 2.5                   | Round        | 20          |
| 55/16     | 55               | 16                     | 2.7                    | 2.7                   | Round        | 15          |
| 65/19     | 65               | 19                     | 2.8                    | 2.8                   | Round        | 15          |
| 75/22     | 75               | 22                     | 3.0                    | 3.0                   | Round        | 15          |
| 85/25     | 85               | 25                     | 3.0                    | 3.0                   | Round        | 15          |
| 95/25     | 95               | 25                     | 3.0                    | 3.0                   | Round        | 15          |
| 115/34    | 115              | 34                     | 3.0                    | 3.0                   | Round        | 10          |
| 140/42    | 140              | 42                     | 3.0                    | 3.0                   | Flat         | 10          |
| 160/50    | 160              | 50                     | 3.0                    | 3.0                   | Flat         | 10          |
| 180/58    | 180              | 58                     | 3.0                    | 3.0                   | Flat         | 5           |
| 205/65    | 205              | 65                     | 3.0                    | 3.0                   | Flat         | 5           |
| 235/65    | 235              | 65                     | 3.0                    | 3.0                   | Flat         | 5           |
| 265/75    | 265              | 75                     | 3.0                    | 3.0                   | Flat         | 5           |
| 300/85    | 300              | 85                     | 3.0                    | 3.0                   | Flat         | 5           |
| 350/100   | 350              | 100                    | 3.0                    | 3.0                   | Flat         | 5           |