



## 09-471 Product Data Sheet

### NEQ-610 Heat-Shrinkable Nuclear Environmentally Qualified Heavy Wall Tubing

#### Description

NEQ-610 is a specially designed, heat-shrinkable tubing for insulation and environmental sealing of nuclear plant splicing applications up to and including 600 volts.

It has a shrink ratio of up to 4:1 and has superior mechanical strength providing excellent strain relief. It is supplied with an interior lining of hot melt adhesive which provides superior protection against the entrance of liquids. The tubing is resistant to most acids, alkalis and is self-extinguishing.

<b>Base material</b>	<b>Polyolefin</b>
<b>Color</b>	<b>Black</b>

#### Typical Properties

Physical	Value	Standard	Test Method
Shrink ratio	Up to 4:1		
Tensile strength	18 N/mm <sup>2</sup> min. (2631psi)	-	IEC 60684-2-19
Elongation at break	550% min.	-	IEC 60684-2-19
Longitudinal change	-10% max.	-	IEC 60684-2-9
Concentricity	50% min.	-	IEC 60684-2-3
Secant Modulus	50 N/mm <sup>2</sup> min. (7250psi)	-	IEC 60684-2-37
Relative Density	1.2 - 1.3 g/cm <sup>3</sup>	-	IEC 60684-2-4

Thermal	Value	Standard	Test Method
Continuous Operating Temperature	-55°C to +130°C	-	IEC 60684-2-37
Shrink Temperature	135°C min.		
Heat Shock		-	IEC 60684-2-6
Tensile strength	10 N/mm <sup>2</sup> min. (1450psi)	-	IEC 60684-2-19
Elongation at break	200% min.	-	IEC 60684-2-19
Heat Aging		-	IEC 60684-2-39
Elongation at break	400% min.	-	IEC 60684-2-19
Low Temperature Flexibility	No cracking, detachment of coating or delamination	-	IEC 60684-2-14
Copper Corrosion	No corrosion	-	IEC 60684-2-33
Flammability	Self extinguishing	-	IEC 60684-2-26



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Electrical	Value	Standard	Test Method
Dielectric Strength	110 kV/cm	-	IEC 60684-2-21
Volume resistivity	$1 \times 10^{14}$ Ohm.cm	-	IEC 60684-2-23

Chemical	Value	Standard	Test Method
Chemical Resistance	Good	-	IEC 60684-2-36

Technical Information provided consists of typical product data and should not be used for specification purposes. Unless otherwise specified in the test method, all tests are performed at room temperature.

### Documentation

Test methods are in accordance with IEC 60684 Part 2 International Standard and MIL-I-23053/15 Class 1 requirements.

Nuclear Environmental Qualification: Qualified life of 40 years at an operating temperature of 90°C, a total (normal plus accident) integrated radiation dose of 135 Megarads and subsequent successful performance during LOCA/MSLB exposure, flexing and seismic exposure.

Qualification testing by RCM Technologies Engineering Services Canada  
Reference Test reports documents:

RCM document 08490-FTR-Revision 02 March 1995.

### Product Guide - Table 1

Part Number	Expanded ID (min.)		Recovered ID (max.)		Total Recovered Wall Thickness (nominal)		Recovered Adhesive Wall Thickness (nominal)	
	Inch	mm.	Inch	mm.	Inch	mm.	Inch	mm.
NEQ-610-12/3	0.47	12.0	0.09	3.0	0.13	3.2	0.03	0.7
NEQ-610-19/6	0.75	19.0	0.24	6.0	0.13	3.3	0.03	0.8
NEQ-610-30/8	1.18	30.0	0.31	8.0	0.19	4.8	0.03	0.8
NEQ-610-38/12	1.50	38.0	0.47	12.0	0.19	4.8	0.03	0.8
NEQ-610-48/15	1.89	48.0	0.59	15.0	0.19	4.8	0.03	0.8
NEQ-610-85/26	3.35	85.0	1.02	26.0	0.19	4.8	0.03	0.8
NEQ-610-115/38	4.53	26.0	1.50	38.0	0.19	4.8	0.03	0.8

Tubing lengths are available per station/system design requirements.

Electrical Markets Division  
PO Box 5757  
London, Ont. N6A 4T1  
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#### **Storage**

Under normal storage conditions (23°C, @ 50% RH), the product will remain stable for a minimum of 10 years when the material is stored in its original container.

#### **Ordering Information**

The product is ordered by part number as specified in table 1.

Example: To order NEQ-610 for an 18.0 mm diameter cable (select size 48/15 based on recovered ID of 15.0 - maximum tubing size that will shrink to minimum diameter) and a 6 inch or 150 mm. length order NEQ-610-48/15-6 (please reference application and installation instructions to ensure correct selection).

#### **IMPORTANT NOTICE TO THE PURCHASER:**

*The following is made in lieu of all express or implied rights, warranties and conditions, statutory or otherwise: Seller's and manufacturer's only obligations shall be to replace such quantity of the product proved to be defective. Neither seller nor manufacturer shall be liable for any injury, loss or damage, direct or consequential arising out of the use of or the inability to use the product. Before using, user shall determine the suitability of the product for his intended use, and the user assumes all risk and liability whatsoever in connection therewith. The foregoing may not be altered except by an agreement signed by the officers of seller and manufacturer.*

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