

**ALPHA WIRE COMPANY**  
**CUSTOMER PRODUCT SPECIFICATION**

**Part Number: FIT221V**  
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**Issue: 4**  
**Issue Date: 12/31/2008**  
**Effective Date: 3/1/2009**

**A. Construction**

- |                    |                                        |
|--------------------|----------------------------------------|
| 1) Tubing Type     | Heat Shrinkable Tubing                 |
| 2) Tubing Material | Cross Linked Polyolefin                |
| 3) Color(s)        | BLACK, WHITE, RED, YELLOW, GREEN, BLUE |

| Part Number   | Minimum Supplied ID (In) | Maximum Recovered ID (In) | Nominal Recovered Wall Thickness (In) |
|---------------|--------------------------|---------------------------|---------------------------------------|
| FIT221V-3/64  | 0.046                    | 0.023                     | 0.016                                 |
| FIT221V-1/16  | 0.063                    | 0.031                     | 0.017                                 |
| FIT221V-3/32  | 0.093                    | 0.046                     | 0.020                                 |
| FIT221V-1/8   | 0.125                    | 0.062                     | 0.020                                 |
| FIT221V-3/16  | 0.187                    | 0.093                     | 0.020                                 |
| FIT221V-1/4   | 0.250                    | 0.125                     | 0.025                                 |
| FIT221V-3/8   | 0.375                    | 0.187                     | 0.025                                 |
| FIT221V-1/2   | 0.500                    | 0.250                     | 0.025                                 |
| FIT221V-3/4   | 0.750                    | 0.375                     | 0.030                                 |
| FIT221V-1IN   | 1.000                    | 0.500                     | 0.035                                 |
| FIT221V-1 1/2 | 1.500                    | 0.750                     | 0.040                                 |
| FIT221V-2IN   | 2.000                    | 1.000                     | 0.045                                 |

**B. Industry Approvals**

- |                                   |                                                                                                                                                                                                                                                                              |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1) UL                             | Standard 224<br>VW-1                                                                                                                                                                                                                                                         |
| 2) CSA International              | Standard 198                                                                                                                                                                                                                                                                 |
| 3) Other                          | AMS-DTL-23053/5 Class 1 & 3<br>REACH Regulation (EC 1907/2006)                                                                                                                                                                                                               |
| 4) EU Directive 2002/95/EC(RoHS): | All materials used in the manufacture of this part are in compliance with EU Directive 2002/95/EU regarding the restriction of use of certain hazardous substances in electrical and electronic equipment. Consult Alpha Wire's web site for compliance Date of Manufacture. |

**C. Physical & Mechanical Properties**

- |                                  |                              |               |
|----------------------------------|------------------------------|---------------|
| 1) Temperature Range             | -55 to 135°C                 |               |
| 2) Shrink Ratio                  | Approximately 2:1            |               |
| 3) Full Recovery Temperature     | 121°C                        |               |
| 4) Minimum Shrink Temperature    | 90°C                         |               |
| 5) Tensile Strength              | 1500psi, Min                 | ASTM D638     |
| 6) Elongation                    | 200%, Min                    | ASTM D638     |
| 7) Low Temperature Flex(-55°C)   | no cracking                  | AMS-DTL-23053 |
| 8) Heat Resistance(175°C,168hrs) | 100% Elongation, Min         | ASTM D638     |
| 9) Heat Shock(250°C,4hrs)        | no cracking                  | AMS-DTL-23053 |
| 10) Secant Modulus               | 2.5x10 <sup>4</sup> psi, Min | ASTM D882     |
| 11) Longitudinal Change          | +/-5%                        | AMS-DTL-23053 |
| 12) Specific Gravity(Colors)     | 1.35, Max                    | ASTM D792     |
| Specific Gravity(Clear)          | 1.00, Max                    |               |
| 13) Shelf Life                   | 5 Years @ 0 to 35°C          |               |

**D. Electrical Properties**

- |                        |                                |           |
|------------------------|--------------------------------|-----------|
| 1) Dielectric Strength | 500 V/mil, Min                 | ASTM D876 |
| 2) Volume Resistivity  | 1x10 <sup>14</sup> ohm-cm, Min | ASTM D876 |

**E. Chemical Properties**

- |                                  |               |               |
|----------------------------------|---------------|---------------|
| 1) Water Absorption              | 0.50%, Max    | ASTM D570     |
| 2) Fluid Resistance(23°C,24 Hrs) | 1000 PSI, Min | AMS-DTL-23053 |

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|----------------------------|-----------|-----------|
| 3) Vacuum Outgassing - CVC | 0.1%, Max | ASTM E595 |
| 4) Halogen Free            | No        |           |
| 5) Lead Free               | No        |           |

**F. Other**

- 1) Packaging
  - a) FIT221V-3/64  
3X1000 FT, 1000 FT, 250X4 FT, 25X4 FT, 40X6 IN
  - b) FIT221V-1/16  
3X1000 FT, 1000 FT, 250X4 FT, 25X4 FT, 36X6 IN
  - c) FIT221V-3/32  
3X500 FT, 250X4 FT, 500 FT, 25X4 FT, 32X6 IN
  - d) FIT221V-1/8  
3X500 FT, 250X4 FT, 500 FT, 25X4 FT, 28X6 IN
  - e) FIT221V-3/16  
250X4 FT, 2X500 FT, 500 FT, 25X4 FT, 24X6 IN
  - f) FIT221V-1/4  
250X4 FT, 2X250 FT, 250 FT, 25X4 FT, 20X6 IN
  - g) FIT221V-3/8  
250X4 FT, 2X200 FT, 200 FT, 25X4 FT, 16X6 IN
  - h) FIT221V-1/2  
200X4 FT, 2X150 FT, 150 FT, 5X4 FT, 14X6 IN
  - i) FIT221V-3/4  
125X4 FT, 250 FT, 5X4 FT, 12X6 IN
  - j) FIT221V-1IN  
75X4 FT, 250 FT, 5X4 FT, 8X6 IN
  - k) FIT221V-1 1/2  
125 FT, 5X4 FT, 5X6 IN
  - l) FIT221V-2IN  
125 FT, 5X4 FT, 3X6 IN

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