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3M FP-301

3M Heat Shrink Tubing FP-301-Color Assortment Kit User Manual

Model: FP-301 (3M 37677)

1. INTRODUCTION

This manual provides detailed instructions for the proper use and application of the 3M Heat Shrink Tubing FP-301-Color Assortment Kit. This kit offers a versatile selection of thin-wall heat shrink tubing designed for various electrical, physical, and chemical applications. It is intended for industrial and occupational use only.

2. PRODUCT OVERVIEW

The 3M FP-301 Heat Shrink Tubing Kit is a comprehensive assortment of flexible polyolefin heat shrink tubing. It is engineered to provide balanced electrical, physical, and chemical properties, making it suitable for a wide range of industrial and military applications. The tubing features a 2:1 shrink ratio and is rated for 600V applications, offering effective insulation and moisture-seal protection.

Key Features:

- **Reliable Performance:** Maintains balanced electrical, physical, and chemical properties for diverse industrial and military uses.
- **Primary Use:** Ideal for shrink-fit electrical insulation over cable splices and terminations.
- **Multiple Applications:** Suitable for lightweight wire harness covering, wire marking, wire bundling, and component packaging.
- **Flame-Retardant:** Most colors are self-extinguishing and meet UL 224 All-Tubing Flame Test (Clear tubing is an exception).
- **Industrial Use:** Designed exclusively for industrial/occupational use; not for consumer sale or use.

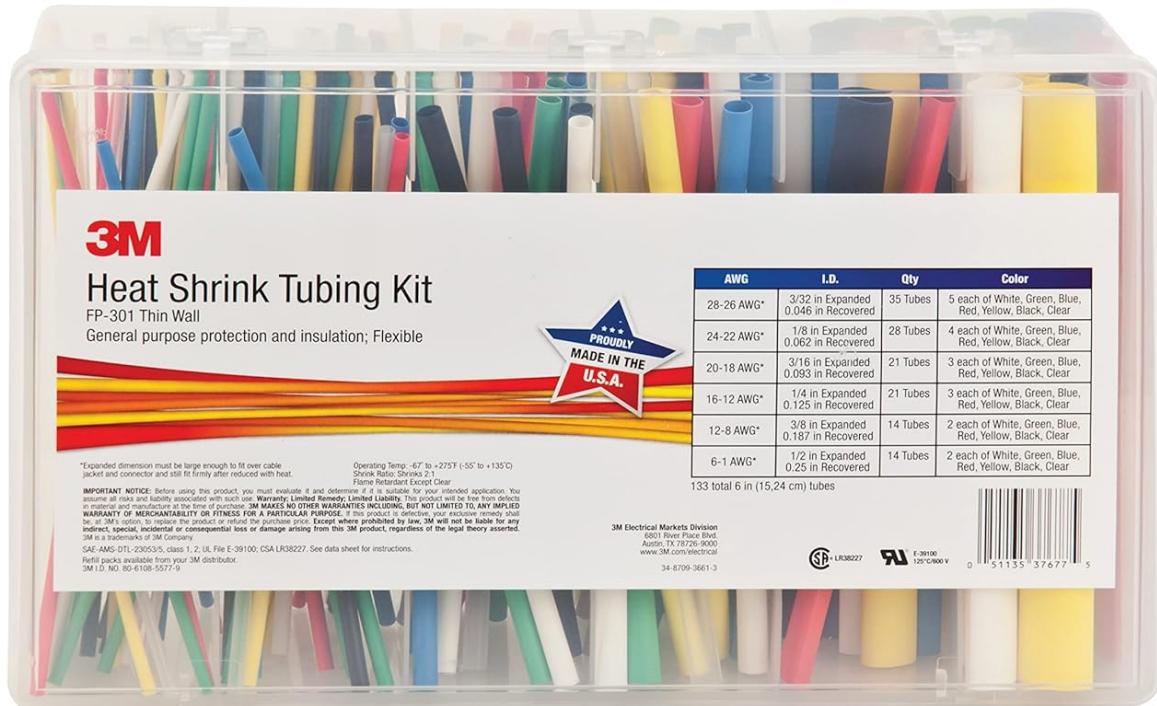


Image 1: The 3M Heat Shrink Tubing FP-301-Color Assortment Kit, showing various sizes and colors of tubing in an organized case.

3. SETUP AND INSTALLATION

Proper installation ensures optimal performance and longevity of the heat shrink tubing. Follow these general guidelines for setup and application.

Preparation:

- Select Tubing Size:** Choose a tube with an expanded diameter large enough to fit over the component or wire bundle, but small enough to shrink down to a snug fit. The FP-301 tubing has a 2:1 shrink ratio.
- Cut to Length:** Cut the heat shrink tubing to the desired length, ensuring it covers the area requiring insulation or protection.
- Clean Surface:** Ensure the surface of the wire or component is clean, dry, and free from oils or contaminants for best adhesion and insulation.

Application Steps:

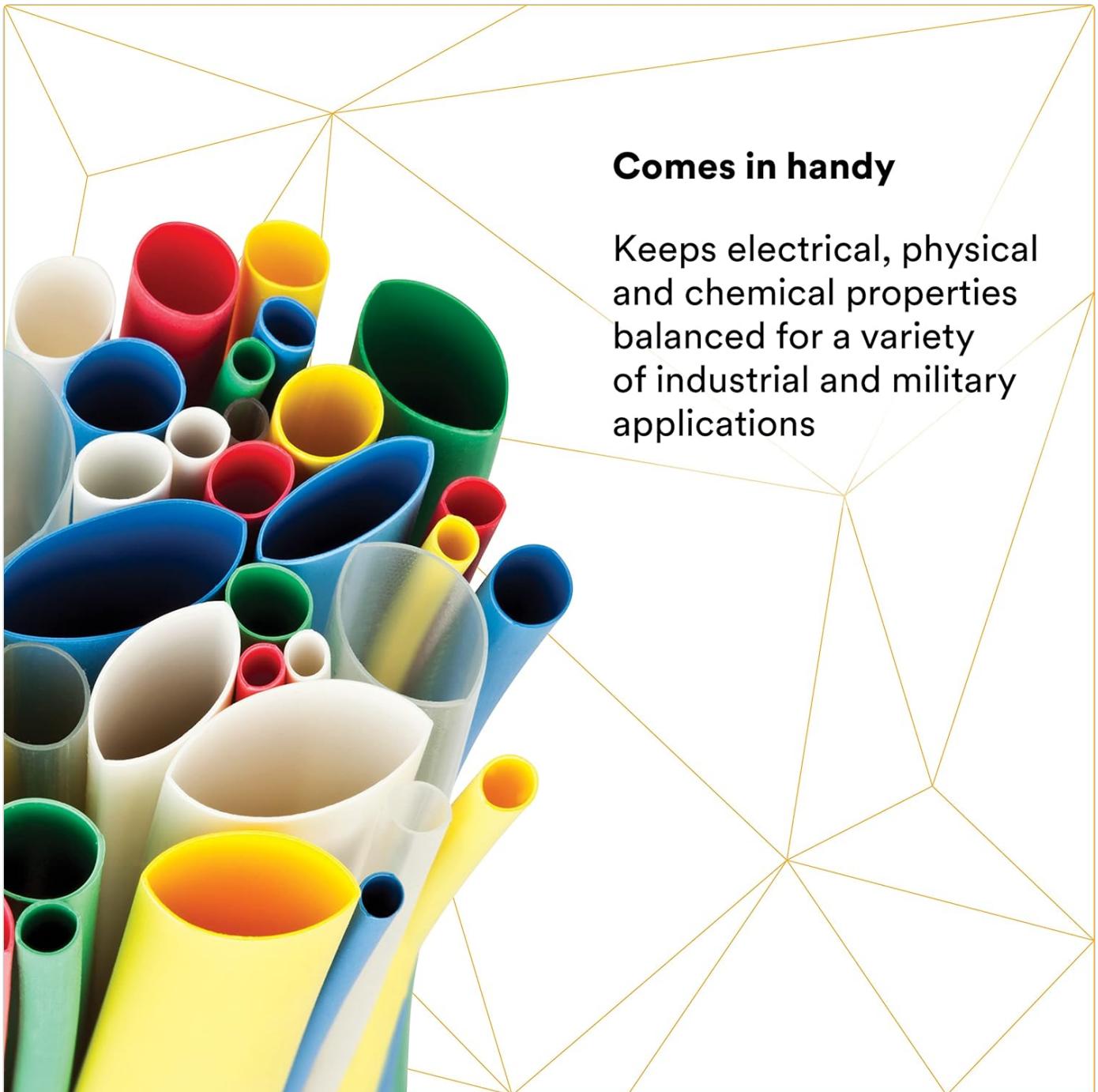
4. **Position Tubing:** Slide the cut piece of heat shrink tubing over the wire splice, termination, or component to be covered. Center it over the area.
5. **Apply Heat:** Using a heat gun or other controlled heat source, apply heat evenly to the tubing. Begin heating from the center of the tubing and work outwards towards the ends.
6. **Observe Shrinkage:** The tubing will begin to shrink and conform tightly to the shape of the underlying component. Continue applying heat until the tubing is uniformly shrunk and there are no loose areas or air bubbles. The material will become rigid and secure once cooled.
7. **Cool Down:** Allow the tubing to cool completely before handling or subjecting it to stress.



Used for

Shrink-fit protection
and strain relief of wires,
solder joints and more

Image 2: Illustrates the application of heat shrink tubing for shrink-fit protection and strain relief on wires and solder joints.



Comes in handy

Keeps electrical, physical and chemical properties balanced for a variety of industrial and military applications

Image 3: Shows the versatility of the heat shrink tubing, balancing electrical, physical, and chemical properties for various industrial and military applications.



Image 4: Depicts the tubing's utility for lightweight wire-harness coverings, fire-resistant coverings, and wire bundling.

4. OPERATING GUIDELINES

The 3M FP-301 heat shrink tubing is designed for reliable operation within specified parameters.

- **Voltage Rating:** This tubing provides insulation for applications rated up to 600V.
- **Operating Temperature:** The tubing is designed to operate effectively within a temperature range of -67°F to 275°F (-55°C to 135°C).
- **Shrink Temperature:** The recommended minimum shrink temperature is 212°F (100°C).
- **Flame Retardancy:** Most colors are self-extinguishing, meeting UL 224 All-Tubing Flame Test standards. Clear tubing does not meet this specific flame test.

Operating temperature

Ranging from -67 to 275
°F (-55 to 135 °C)

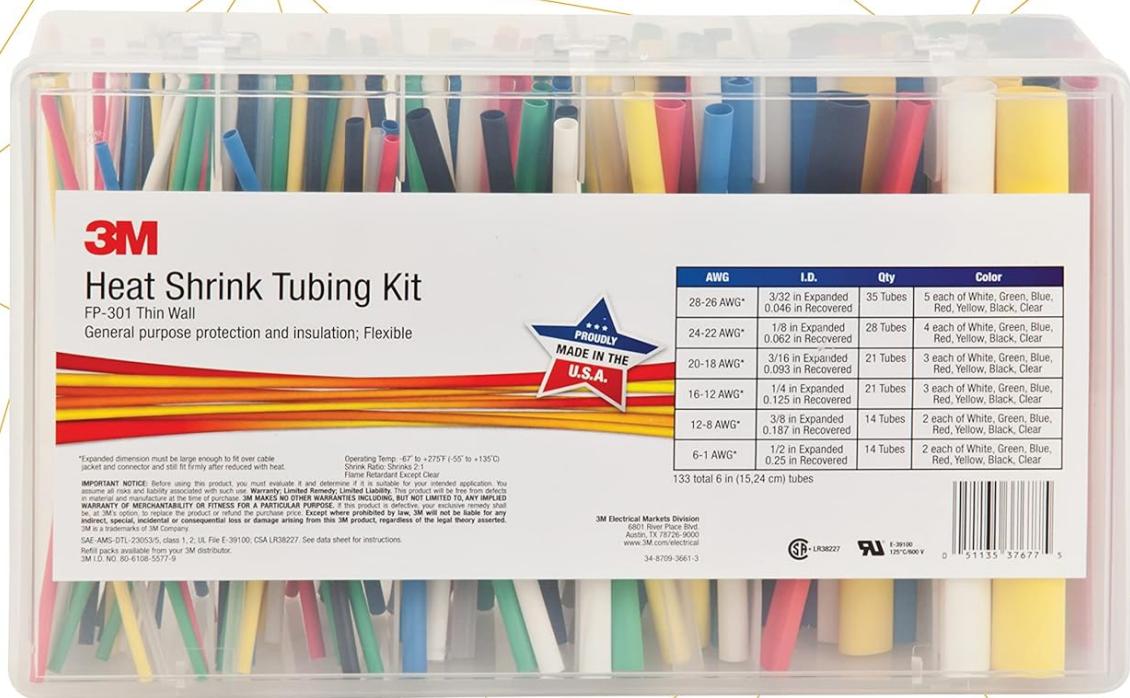


Image 5: Details the operating temperature range of the 3M FP-301 heat shrink tubing, from -67°F to 275°F (-55°C to 135°C).

5. MAINTENANCE AND STORAGE

To ensure the longevity and effectiveness of your 3M Heat Shrink Tubing, proper maintenance and storage are recommended.

- Storage:** Store the tubing in its original packaging in a cool, dry place, away from direct sunlight and extreme temperatures.
- Handling:** Avoid creasing or sharply bending the tubing before application, as this may affect its shrinking properties.
- Cleanliness:** Keep the tubing free from dust, dirt, and moisture to prevent contamination during application.

6. TROUBLESHOOTING

If you encounter issues during the application of the heat shrink tubing, consider the following:

- **Incomplete Shrinkage:** Ensure sufficient and even heat is applied. A heat gun with adjustable temperature control is recommended. Apply heat from the center outwards.
- **Uneven Shrinkage:** This can occur if heat is not applied uniformly. Rotate the component or move the heat source consistently to ensure even heat distribution.
- **Tubing Too Loose After Shrinkage:** The initial tubing size selected might be too large for the component. Refer to the specifications for appropriate sizing based on the 2:1 shrink ratio.
- **Damage During Heating:** Excessive heat or prolonged exposure to heat can damage the tubing or the underlying component. Use appropriate heat settings and avoid direct flame contact.

7. SPECIFICATIONS

Detailed specifications for the 3M FP-301 Heat Shrink Tubing Kit are provided below.

- **Brand:** 3M
- **Model Number:** 3M 37677 (FP-301)
- **Material:** Flexible Polyolefin
- **Color:** Assorted (Black, White, Clear, Red, Blue, Yellow, Green)
- **Shrink Ratio:** 2:1
- **Voltage Rating:** 600V
- **Operating Temperature Range:** -67°F to 275°F (-55°C to 135°C)
- **Installation Type:** Heat-Shrink
- **Product Dimensions:** 12.5 x 11.3 x 7.4 inches (Kit packaging)
- **Weight:** 1.3 Pounds (Kit packaging)
- **Certifications:** UL Listed, SAE-AMS-DTL-23053/5 (Class 1, 2), AMS-3636, AMS-3637, ABS, CSA Certified, RoHS 2011/65/EU Compliant.

Kit Contents (133 Tubes Total):

AWG	I.D. (Expanded)	Quantity	Colors Included
28-26 AWG	3/32-Inch (0.046 in Recovered)	35 pieces (5 each of 7 colors)	Black, White, Clear, Red, Blue, Yellow, Green
24-22 AWG	1/8-Inch (0.062 in Recovered)	28 pieces (4 each of 7 colors)	Black, White, Clear, Red, Blue, Yellow, Green
20-18 AWG	3/16-Inch (0.093 in Recovered)	21 pieces (3 each of 7 colors)	Black, White, Clear, Red, Blue, Yellow, Green
16-12 AWG	1/4-Inch (0.125 in Recovered)	21 pieces (3 each of 7 colors)	Black, White, Clear, Red, Blue, Yellow, Green
12-8 AWG	3/8-Inch (0.187 in Recovered)	14 pieces (2 each of 7 colors)	Black, White, Clear, Red, Blue, Yellow, Green
6-1 AWG	1/2-Inch (0.25 in Recovered)	14 pieces (2 each of 7 colors)	Black, White, Clear, Red, Blue, Yellow, Green

UL Listed, SAE-AMS-
DTL-23053/5, Class 1, 2,
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RoHS 2011/65/EU Compliant



Image 6: Displays the various certifications met by the 3M FP-301 heat shrink tubing, including UL, SAE-AMS-DTL, AMS, ABS, CSA, and RoHS compliance.

8. SAFETY INFORMATION AND LEGAL DISCLAIMER

Important Notice: 3M industrial and occupational products are intended, labeled, and packaged for sale to trained industrial and occupational customers for workplace use. Unless specifically stated otherwise on the applicable product packaging or literature, these products are not intended, labeled, or packaged for sale to or use by consumers (e.g., for home, personal, primary or secondary school, recreational/sporting, or other uses not described in the applicable product packaging or literature), and must be selected and used in compliance with applicable health and safety regulations and standards (e.g., U.S. OSHA, ANSI), as well as all product literature, user instructions, warnings, and other limitations, and the user must take any action required under any recall, field action, or other product use notice. Misuse of 3M industrial and occupational products may result in injury, sickness, death, or property damage. For help with product selection and use, consult your on-site safety professional, industrial hygienist, or other subject matter expert. For additional product information, visit www.3M.com.

Always use appropriate personal protective equipment (PPE) when working with heat sources and electrical components. Ensure adequate ventilation when applying heat to the tubing.

9. WARRANTY AND SUPPORT

For specific warranty information or technical support regarding the 3M Heat Shrink Tubing FP-301-Color Assortment Kit, please refer to the official 3M website or contact 3M customer service directly.

You can find more information and contact details on the official 3M website www.3M.com.

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