## INTRODUCTION

BURNDY® wiring accessories have been designed to supplement and enhance BURNDY® connector selection and use. All have been designed and engineered for easy

installation and long life, reflecting over 65 years of experience and resulting contributions to all aspects of the electrical industry.

## **PENETROX**<sup>TM</sup>

# HOW TO INSTALL CONNECTORS:

## 1. Select the right connector.

Always use an aluminum connector for aluminum or copper conductor. And choose a connector that's marked for the wire size you're using. Never use a copper connector on aluminum conductor.



Remove the insulation without nicking the wire.



### 3. Brush thoroughly.

Always wire-brush the stripped portion of the wire. An unplated terminal pad, and the surface to which the terminal will be attached should also be wire-brushed.



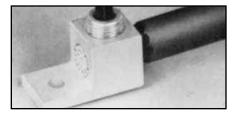
### 4. Apply PENETROX™

For mechanical connectors, apply PENETROX<sup>TM</sup> joint compound liberally to the conductor to prevent the formation of surface oxides once the connection is made. Also apply PENETROX<sup>TM</sup> to any terminal pad.



## 5. Tighten completely.

For mechanical connectors, use wrench or screwdriver to securely tighten the aluminum connectors, as recommended by BURNDY®.



#### 6. Crimp.

For compression connectors, choose the right die and the right tool. Insert the wire completely and make the recommended number of crimps. BURNDY® takes the guesswork out of aluminum connections because the connectors and crimp dies are color coded. Crimps can be easily located between marks.



Blue highlighted items are industry standard and most frequently ordered.

# TYPES PENETROX™ A, A-13, E AND HT

# OXIDE-INHIBITING JOINT COMPOUNDS

PENETROX<sup>TM</sup> oxide-inhibiting compounds produce low initial contact resistance, seal out air and moisture, prevent oxidation or corrosion, exhibit superior weathering characteristics, are usable over wide temperature ranges, and provide a high conductivity "gas-tight" joint. All PENETROX<sup>TM</sup> compounds contain homogeneously suspended metal particles. The suspended metal particles assist in penetrating thin oxide films, act as electrical "bridges" between conductor strands, aid in gripping the conductor, improve electrical conductivity and enhance the integrity of the connection.

The specially formulated PENETROX™ compounds are for use with compression and bolted connectors providing an improved service life for both copper and aluminum connections. Additionally, the nontoxic compounds are an excellent lubricant for threaded applications reducing galling and seizing.





#### **PENACARTRIDGE**

PENACARTRIDGE is a 1 lb. cartridge filled with PENETROX-A. It's designed to fit standard caulking guns for easy insertion into transmission and distribution connectors. Additionally, this packaging design provides a convenient method for applying PENETROX<sup>TM</sup> to many different applications.



## PENETROX™ A

PENETROX A is a natural (petroleum) base compound with evenly suspended zinc particles. It is recommended for aluminum to aluminum, aluminum to copper connections and aluminum conduit threads. It is not recommended for use with rubber or polyethylene insulated conductors. UL listed to 600V.



## PENETROX™ HT

PENETROX™ HT is a synthetic silicone based compound with evenly suspended zinc particles and nickel-aluminum alloy particles. It is recommended for aluminum to aluminum connection. It is compatible with rubber. Designed for use with High Temperature ACSS and ACCC connectors. Not UL Listed.



## PENETROX™ A-13

PENETROX™ A-13 is a synthetic base compound with evenly suspended zinc particles. It is recommended for aluminum to aluminum, aluminum to copper connection plus aluminum conduit threads. It is compatible with rubber, polyethylene and other insulating materials. UL Listed for all voltages.



## PENETROX™ E

PENETROX™ E is a synthetic base compound with evenly suspended copper particles. It is recommended for copper to copper, copper threads and all grounding applications. UL listed.

# PENETROX A, A-13, E AND HT

### **TECHNICAL INFORMATION**

#### **PENETROX A**

PENETROX A consists of a natural (petroleum) base vehicle in which zinc particles are suspended. For aluminum to aluminum, aluminum to copper applications and aluminum conduit threads. It is not recommended for use with rubber and polyethylene insulated conductors. UL Listed to 600 volts.

#### **PENETROX A-13**

PENETROX A-13 consists of a nonpetroleum base vehicle in which zinc particles are suspended. Recommended for aluminum to aluminum, aluminum to copper applications and aluminum conduit threads. Compatible with insulating materials such as rubber, or polyethylene. UL Listed and recommended for all voltages.

#### **PENETROX E**

PENETROX E consists of a non-petroleum base vehicle in which copper granules are suspended. Recommended for copper to copper applications, grounding and for use on copper conduit threads. UL Listed.

### **PENETROX HT**

PENETROX HT consists of a non-petroleum base vehicle in which zinc and nickel-aluminum particles are suspended. Recommended for use with aluminum to aluminum High Temperature rated ACSS and ACCC conductors. Not UL Listed.

### Easy to apply:

- 1. Scratch brush the conductor surfaces until bright and clean.
- 2. Immediately apply PENETROX<sup>™</sup> to the conductive surfaces.
- 3. For EHV applications, remove all excess PENETROX™ after installation is complete.





### **SHELF LIFE**

When stored in its original container in cool (under 100°F) dry environment, PENETROX<sup>TM</sup> oxide inhibiting compound will remain workable and functional for 5 years from the date marked on the container provided it is mixed per instructions prior to use.

## PROPERTIES OF PENETROX™

Property	Value PENETROX™ Definition	PENETROX <sup>™</sup> HT	PENETROX <sup>TM</sup> E & A13	PENETROX™ A
Penetration (Unworked)	The value in accordance to ASTM D217 indicates the consistency of a grease. The higher the number, the softer the grease.	240	250	230
Dropping Point (Minimum)	The temperature at which the grease passes from the semi-solid to a liquid state under test conditions.	>580° F	500° F	230° F
Pour Point (Maximum)	The lowest termperature at which the compound will flow. Pour point is the lubricant's ability to perform in cold conditions.	–58° F	−10° F	–15° F

<sup>\*</sup> MSDS sheets available through customer service.

## ORDERING INFORMATION

	Catalog I	Container	Container		
PENETROX™ A	PENETROX™ A-13	PENETROX™ E	PENETROX™ HT	Туре	Size
PENA 1/2	_	_	_	Tube	1/2 oz.
PEN A-4	PEN A13-4	PEN E-4	PENHT-4	Squeeze Bottle	4 oz.
P8A	PEN A13-8	PEN E-8	PENHT-8	Squeeze Bottle	8 oz.
PENACARTRIDGE	PENA13CARTRIDGE	_	PENHT-1LB	Cartridge	1 lb.*
PEN A-QT	PEN A13-QT	PEN E-QT	_	Plastic Tub	1 Quart
PEN A-GAL	PEN A13-GAL	PEN E-GAL	PENHT-GAL	Can	1 Gallon
PEN A-5GAL	PEN A13-5GAL	PEN E-5GAL	_	Pail	5 Gallons
PEN A-55GAL	PEN A13-55GAL	PEN E-55GAL	_	Drum	55 Gallons

 $<sup>^{\</sup>star}$  1 lb. cartridge will fit standard caulking guns.

Canada: 1-800-387-6487



# **TYPE HS-T-PF**

# THIN WALL HEAT SHRINK TUBING

Cross-Linked Polyolefin

## 6 Inch Lengths

Type HS-T-PF is a flexible thin wall, flame retardant heat shrink tubing made of cross-linked polyolefin. The 2:1 shrink ratio allows for faster shrink recovery, covering wire sizes: #18 AWG to 300 kcmil. Operating temperatures from –55° C to 135° C with a shrink temperature of 120° C.





Meets MIL-I-23053/5 600 VOLTS

	Nominal	Min.	Max.	Nom. Wall		Pcs. per	Package
Catalog	Diameter	Exp.	Recov.	Thickness	Conductor	# Pcs.	# Pcs. Ea.
Number	Inches	I.D. In.	I.D. In.	ln.	Range	Black	Color
HSM116T6PF26	1/16	0.06	0.03	0.018	#18	8	3
HSB116T6PF26	1/16	0.06	0.03	0.018	#18	26	0
HSM332T6PF24	3/32	0.09	0.05	0.020	#18 - 16	6	3
HSB332T6PF24	3/32	0.09	0.05	0.020	#18 - 16	24	0
HSM18T6PF20	1/8	0.12	0.06	0.020	#18 - 14	2	3
HSB18T6PF20	1/8	0.12	0.06	0.020	#18 - 14	20	0
HSM316T6PF18	3/16	0.19	0.09	0.020	#18 - 12	6	2
HSB316T6PF18	3/16	0.19	0.09	0.020	#18 - 12	18	0
HSM14T6PF14	1/4	0.25	0.12	0.180	#14 - 10	2	2
HSB14T6PF14	1/4	0.25	0.12	0.180	#14 - 10	14	0
HSM38T6PF12	3/8	0.38	0.19	0.020	#8 - 6	6	1
HSB38T6PF12	3/8	0.38	0.19	0.020	#8 - 6	12	0
HSM12T6PF10	1/2	0.50	0.12	0.020	#6 - 2	4	1
HSB12T6PF10	1/2	0.50	0.12	0.020	#6 - 2	10	0
HSM34T6PF8	3/4	0.75	0.38	0.020	#1 - 3/0	2	1
HSB34T6PF8	3/4	0.75	0.38	0.020	#1 - 3/0	8	0
HSM100T6PF7	1	1.00	0.50	0.180	2/0 - 300	1	1
HSB100T6PF7	1	1.00	0.50	0.180	2/0 - 300	7	0

HSB series - all black

HSM series - multiple colors: black, blue, clear, green, red, white, yellow

HSB11612T6PF14	1/16, 3/32, 1/8, 3/16, 1/4, 3/8, 1/2		14	0
HSB38100T6PF8	3/8, 1/2, 3/4, 1"		8	0

Multiple diameter packages contain two pieces of each size listed: Black only.

# **TYPE HS-T-PF**

# THIN WALL HEAT SHRINK TUBING

Cross-Linked Polyolefin

4 Foot Reels

Type HS-T-PF is a flexible thin wall, flame retardant heat shrink tubing made of cross-linked polyolefin. The 2:1 shrink ratio allows for faster shrink recovery, covering wire sizes #18 AWG to 300 kcmil. Operating temperatures from -55° C to 135° C with a shrink temperature of 120° C.





# Specify Color Code in Third Position of Catalog Number:

Example: HSC316T48PF

B: BLACK
BL: BLUE
C: CLEAR
G: GREEN
R: RED
W: WHITE
Y: YELLOW

	Nominal	Min.	Max.	Nom. Wall	
Catalog	Diameter	Exp.	Recov.	Thickness	Conductor
Number	Inches	I.D. In.	I.D. In.	ln.	Range
HS_116T48PF	1/16	0.06	0.03	0.018	#18
HS_332T48PF	3/32	0.09	0.05	0.020	#18 - 16
HS_18T48PF	1/8	0.12	0.06	0.020	#18 - 14
HS_316T48PF	3/16	0.19	0.09	0.020	#18 - 12
HS_14T48PF	1/4	0.25	0.12	0.180	#14 - 10
HS_38T48PF	3/8	0.38	0.19	0.020	#8 - 6
HS_12T48PF	1/2	0.50	0.12	0.020	#6 - 2
HS_34T48PF	3/4	0.75	0.38	0.020	#1 - 3/0
HS_100T48PF	1	1.00	0.50	0.180	2/0 - 300
HS_150T48PF	1-1/2	1.50	.75	0.180	350 - 750
HS_200T48PF	2	2.00	1.00	0.180	250 - 500

# **TYPE HS-T-PF**

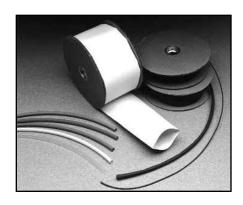
# THIN-WALL HEAT SHRINK TUBING

Cross-Linked Polyolefin

## 25 Foot Reels

Type HS-T-PF is a flexible thin wall, flame retardant heat shrink tubing made of cross-linked polyolefin. The 2:1 shrink ratio allows for faster shrink recovery, covering wire sizes #18 AWG to 300 kcmil. Operating temperatures from -55° C to 135° C with a shrink temperature of 120° C.





# Specify Color Code in Third Position of Catalog Number:

Example: HSC116T300PF

B: BLACK
BL: BLUE
C: CLEAR
G: GREEN
R: RED
W: WHITE
Y: YELLOW

	Nominal	Min.	Max.	Nom. Wall	
Catalog	Diameter	Exp.	Recov.	Thickness	Conductor
Number	Inches	I.D. In.	I.D. In.	ln.	Range
HS_116T300PF	1/16	0.06	0.03	0.018	#18
HS_332T300PF	3/32	0.09	0.05	0.020	#18 - 16
HS_18T300PF	1/8	0.12	0.06	0.020	#18 - 14
HS_316T300PF	3/16	0.19	0.09	0.020	#18 - 12
HS_14T300PF	1/4	0.25	0.12	0.180	#14 - 10
HS_38T300PF	3/8	0.38	0.19	0.020	#8 - 6
HS_12T300PF	1/2	0.50	0.12	0.020	#6 - 2
HS_34T300PF	3/4	0.75	0.38	0.020	#1 - 3/0
HS_100T300PF	1	1.00	0.50	0.180	2/0 - 300

# **TYPE HS-H-PF**

# HEAVY WALL HEAT SHRINK TUBING

Cross-Linked Polyolefin

## Cut Lengths and 4 Foot Sticks

Type HS-H-PF is a heavy wall, flame retardant heat shrink tubing made of cross-linked polyolefin. The shrink ratio is 3:1, and the inside diameter is coated with an adhesive sealant to protect against moisture and corrosion. UL486D Listed for direct burial applications. Accommodates #14 AWG - 500 kcmil conductors. Operating temperatures from -55° C to 135° C with a shrink temperature of 120° C.







Meets MIL-I-23053/5 1000 V

Catalog		Nominal Diameter	Min. Exp.	Max. Recov.	Nom. Wall Thickness	Conductor	Number of Pcs.
Number	Length	Inches	ID In.	ID In.	ln.	Range	Per Package
HSB35H3PF25	3"	.350	.350	.150	0.070	#14-10	25
HSB35H6PF25	6"	.350	.350	.150	0.070	#14-10	25
HSB35H48PF5	4′	.350	.350	.150	0.070	#14-10	5
HSB34H6PF10	6"	.750	.750	.220	0.090	#6-2	10
HSB34H9PF10	9"	.750	.750	.220	0.090	#6-2	10
HSB34H48PF5	4′	.750	.750	.220	0.090	#6-2	5
HSB110H6PF5	6"	1.100	1.100	.400	0.120	#1-3/0	5
HSB110H9PF5	9"	1.100	1.100	.400	0.120	#1-3/0	5
HSB110H48PF5	4′	1.100	1.100	.400	0.120	#1-3/0	5
HSB150H9PF3	9"	1.500	1.500	.500	0.160	2/0-350	3
HSB150H12PF3	12"	1.500	1.500	.500	0.160	2/0-350	3
HSB150H48PF5	4′	1.500	1.500	.500	0.160	2/0-350	5
HSB200H9PF2	9"	2.000	2.000	.750	0.160	250-500	2
HSB200H12PF2	12"	2.000	2.000	.750	0.160	250-500	2
HSB200H48PF2	4′	2.000	2.000	.750	0.160	250-500	2

Available in black only.

## **TYPE HSIC - FR**

## HEAVY WALL HEAT SHRINKABLE END CAP

## UL Listed to 600 Volts

Type HSIC-FR, Heat Shrink Insulating End Cap Fire Retardant is a heavy wall, fire retardant end cap made of cross-linked thermally stabilized black polyolefin. Used to insulate exposed conductors in energized applications. The 3:1 shrink ratio offers greater range, accommodating copper wire sizes, #8 AWG thru 2500+ kcmil. Performs effectively over lead, aluminum, steel, polyethylene, EPR, and PVC jacketed materials. Blue thermal chromatic lines disappear indicating correct installation temperature and provide inspectability. I.D. adhesive provides superior moisture and weather resistant characteristics.





## **Features and Benefits**

- Minimum 28 Oxygen index, UL94-VO rated.
  - Self-extinguishing flame retardant properties.
- 3:1 shrink ratio.
- ♦ Minimum inventory required.
- Thermal chromatic lines.
  - ◊ Indicate proper installation.
- Low shrink temperature, 150°C.
- Only requires common hot air gun to apply.
- Meets sealing requirements: ANSI-C119.1, UL486D
- ♦ Weather and moisture resistant.

			Internal Diameter		Wall Thickness		Length		Number of
Catalog	600V	Cable	(Min.)	(Max.)		Rec.	± 2	0%	Pcs. per
Number	Code	Flex	Exp.	Rec.	Exp.	± <b>20%</b>	Ехр.	Rec.	Package
HSIC8-1FR	#8 - #1	#8 - #4	.50	.16	.034	.080	3.0	2.50	10
HSIC4-40FR	#4 - 4/0	#4 - 2/0	.75	.24	.030	.080	3.5	2.50	10
HSIC10-500FR	1/0 - 500 kcmil	#1 - 313.1 kcmil	1.10	.35	.039	.120	4.0	3.00	5
HSIC30-1000FR	3/0 - 1000 kcmil	2/0 - 646 kcmil	1.50	.47	.054	.160	4.5	3.25	5
HSIC200FR	300 - 1750 kcmil	250 - 1111 kcmil	2.00	.63	.050	.160	4.5	3.50	5
HSIC269FR	600 - 2500 kcmil	_	2.68	.87	.050	.160	5.0	4.00	5
HSIC350FR	1250 kcmil (min)	_	3.50	1.18	.051	.160	5.0	4.50	5



 Slide the HSIC-FR end cap onto the cable and hold in place using forefinger or thumb.



 Beginning at closed end apply heat, blue thermochromatic lines will begin to disappear at 150° C. Gradually, move heat source to open end and around cap. Once lines are no longer visible and adhesive flows out of open end, discontinue heating.



3. HSIC-FR end cap installed on cable.

### E\_10

## TYPE HSC-FR

## **VISI-SHRINK**

Fire Retardant Clear Heat Shrink Tubing

UL Recognized to 600 Volts

Type HSC-FR is a flexible polyvinyl chloride clear heat-shrink tubing. Excellent flame retardant properties and a 2:1 shrink ratio, the VISI-SHRINK tubing enables inspectors to read die index embossments on installed connectors easily. UL recognized, 105° C, 600V, the operating temperature from –20° C to 105° C with a shrink temperature of 135° C.

## **Features and Benefits**

- UL 224, VW-1 Rated.
- ♦ Self-extinguishing flame retardant properties.
- Clear Tubing.
- Allows inspection of die index embossed and shiner after installation is complete. Should any corrosion occur it will be visible during inspection.
- Low Shrink Temperature.
- Only requires common hot air guns to apply.
- Meets MIL-M-23053/Z-206C







Catalog	I.D.	I.D. After	Wall	Conductor Range		Standard Reel Size
Number	Expanded	Recovery	Thickness	Code	Flex	(Feet)
HSC18FR	.125	.062	.025	#16 - #14	#16 - #14	50
HSC18FR250	.125	.062	.025	#16 - #14	#16 - #14	250
HSC14FR	.250	.125	.025	#12 - #8	#12 - #10	50
HSC14FR250	.250	.125	.025	#12 - #8	#12 - #10	250
HSC38FR	.375	.187	.025	#6 - #4	#8 - #6	50
HSC38FR250	.375	.187	.025	#6 - #4	#8 - #6	250
HSC12FR	.500	.250	.025	#4 - #1	#6 - #4	50
HSC12FR250	.500	.250	.025	#4 - #1	#6 - #4	250
HSC34FR	.750	.375	.030	1/0 - 3/0	#2 - 1/0	50
HSC34FR250	.750	.375	.030	1/0 - 3/0	#2 - 1/0	250
HSC100FR	1.00	.500	.035	4/0 - 300	1/0 - 4/0	25
HSC100FR100	1.00	.500	.035	4/0 - 300	1/0 - 4/0	100
HSC112FR	1.50	.750	.040	350 - 750	250 - 500	25
HSC112FR100	1.50	.750	.040	350 - 750	250 - 500	100
HSC200FR	2.00	1.00	.045	800 - 1000	500 - 750	25
HSC200FR100	2.00	1.00	.045	800 - 1000	500 - 750	100

### NOTES:

1 Shrink temperature is 135° C (275° F).

Canada: 1-800-387-6487

- 2 For best results move heat gun along the length of heat shrink to avoid concentrations.
- 3 To extend useful life, store material below 70°F.
- 4 For additional Heat Shrinkable Tubing see "URD" section Type RYAC and RK169-2, RK170-2 in this section.

# **TYPE HS-FR**

## THIN-WALL HEAT SHRINK

Fire Retardant Heat Shrink Tubing

## UL Recognized to 600 Volts

Type HS-FR is a flexible polyvinyl chloride thin-wall heat-shrink. Offering insulating, color identification and strain relieving properties for terminations and splices. The 2:1 shrink ratio allows for faster shrink recovery, covering wire sizes: #16 AWG to 1000 kcmil. UL recognized, 105° C, 600V, operating temperatures from -20° C to 105° C with a shrink temperature of 135° C.

## **Features and Benefits**

- UL 224, VW-1 Rated
- ♦ Self-extinguishing flame retardant properties.
- Multi-use Tubing
   Insulate, strain relief.
- Easy Identification
- ♦ Available in wide range of colors.
- Low Shrink Temperature
- Only requires common hot air guns to apply.
- Meets MIL-M-23053/Z-206C



Example: HSB18FR

 B
 Black

 BLU
 Blue

 G
 Green

 R
 Red

 W
 White

 Y
 Yellow







Catalog	I.D.	I.D. After	Wall	Conduct	or Range	Standard Reel Size
Number	Expanded	Recovery	Thickness	Code	Flex	(Feet)
HS_18FR	.125	.062	.025	#16 - #14	#16 - #14	50
HS_18FR250	.125	.062	.025	#16 - #14	#16 - #14	250
HS_14FR	.250	.125	.025	#12 - #8	#12 - #10	50
HS_14FR250	.250	.125	.025	#12 - #8	#12 - #10	250
HS_38FR	.375	.187	.025	#6 - #4	#8 - #6	50
HS_38FR250	.375	.187	.025	#6 - #4	#8 - #6	250
HS_12FR	.500	.250	.025	#4 - #1	#6 - #4	50
HS_12FR250	.500	.250	.025	#4 - #1	#6 - #4	250
HS_34FR	.750	.375	.030	1/0 - 3/0	#2 - 1/0	50
HS_34FR250	.750	.375	.030	1/0 - 3/0	#2 - 1/0	250
HS_100FR	1.00	.500	.035	4/0 - 300	1/0 - 4/0	25
HS_100FR100	1.00	.500	.035	4/0 - 300	1/0 - 4/0	100
HS_112FR	1.50	.750	.040	350 - 750	250 - 500	25
HS_112FR100	1.50	.750	.040	350 - 750	250 - 500	100
HS_200FR	2.00	1.00	.045	800 - 1000	500 - 750	25
HS_200FR100	2.00	1.00	.045	800 - 1000	500 - 750	100

### NOTES:

- 1 Shrink temperature is 105° C (221° F).
- 2 For best results move heat gun along the length of heat shrink to avoid concentrations.
- 3 To extend useful life, store material below 70° F.
- 4 For additional Heat Shrinkable Tubing see "URD" section Type RYAC and RK169-2, RK170-2 in this section.

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**Accessories BURNDY®** 

# **MISCELLANEOUS ACCESSORIES**

# **TYPE BHSG1100**

## **HEAT GUN**

F-12 250° - 1100° F (121° - 650° C)

Multi-purpose, low cost heat gun has an electronic variable thermal control dial. BHSG1100 is UL and CSA Listed. It has a temperature range of 250° - 1100° (121° -650°C). 2 speed motor. Built-in safety stand heat guard included. Professional heat gun and accessories are recommended for all of your BURNDY® heat shrink applications.



# TYPE 145PTAG

## 94V0 Rated Plastic Tag for **Telecom, Transportation & OEM Markets**

The new 145PTAG has been designed specifically for the Telecom market. The tag is manufactured from Flame Retardant Nylon with a 94V0 rating. The tag is durable, non-flammable and can be secured to cabling using a multi-ply cord. Within the telecom market these tags typically have P-Touch labels applied or are manually stenciled on both sides. The usual application is to mark the tags in the field with far end termination information, panel identification, voice and data identification and wire & cable marking.



For the OEM user, in addition to the P-Touch label or stenciling, tags can be marked with information using most inks or permanent markers, tags can be secured with a waxed cord, UNIRAP™ cable tie or some other equivalent.

## **Specifications**

Dimensions:  $1" \times 1-3/4"$  by .060" thick Material: White Nylon UL 94V0 Packaging: 25 tags per polybag Tag Marking: Tags are shipped with no markings; markings

applied in the field based on application.

Catalog Number Description 145PTAG

94V0 Rated Plastic

Blue highlighted items are industry standard and most frequently ordered.