



BROTHER HSe 3:1 Tube – Technical Data Sheet

BROTHER INDUSTRIES LTD.

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1. General

Printing Technology:	Thermal Transfer
Label Type:	Heat Shrink Tube (3:1 shrink ratio)
Application:	Cable identification and insulation purposes *NOTE1

NOTE1: Although HSe tube is made of insulated material, this does not guarantee safety for all types of uses. Check to make sure this tube is suitable for your intended use.

2. Regulatory/Agency Approvals

The HSe Tube is UL-Recognized to the UL224 Extruded Insulated Tubing. For more information, see the UL file E526775.

The HSe Tube complies with the regulations for hazardous chemicals described in the EU RoHS directive. For more information, see “BROTHER GROUP GREEN PROCUREMENT STANDARD” at <http://global.brother>.

3. Colors and Sizes

Cassette Model name	Print Color	Tube Color	Media Width	Range of wire diameter (mm)
HSE211E	Black	White	5.2mm	φ0.8-3.1
HSE221E	Black	White	9.0mm	φ1.6-5.4
HSE231E	Black	White	11.2mm	φ2.1-7
HSE251E	Black	White	21.0mm	φ4.2-13.5
HSE261E	Black	White	31.0mm	φ6.3-20
HSE611E	Black	Yellow	5.2mm	φ0.8-3.1
HSE621E	Black	Yellow	9.0mm	φ1.6-5.4
HSE631E	Black	Yellow	11.2mm	φ2.1-7
HSE651E	Black	Yellow	21.0mm	φ4.2-13.5
HSE661E	Black	Yellow	31.0mm	φ6.3-20

4. Physical Properties

- Tube material: Polyolefin
- Shrink ratio: 3:1
- Continuous operating temperature: -55°C~135°C
- Minimum shrink temperature: 70 °C
- Full recovery temperature: Above 110°C
- UL Temperature rating: 125 °C
- UL Voltage Rating: 600V
- Thickness before shrinking: Approx. 0.2mm
- Thickness after shrinking: Approx. 0.5mm

Property	Specification Requirement	Test Method
Longitudinal change	-10%~10%	ASTM D2671
Tensile strength	$\geq 10.3\text{MPa}$	ASTM D2671
Elongation	$\geq 200\%$	ASTM D2671
Elongation at break after aging (175°C, 168hrs)	$\geq 100\%$	ASTM D2671
Heat shock (250°C, 4hrs)	No cracking	ASTM D2671
Low temperature flexibility (-55°C, 4hrs)	No cracking	ASTM D2671
Dielectric voltage withstand (2500V,60s)	No breakdown	ASTM D2671
Dielectric strength	$\geq 19.7\text{ kV/mm}$	ASTM D2671
Volume resistivity	$\geq 10^{14}\Omega \cdot \text{cm}$	ASTM D2671
Corrosion	No corrosion	ASTM D2671
Print performance	50 rubs, legible	SAE-AS81531
	30 strokes, legible	MIL-STD-202
Fluid resistance	23°C, 24hrs, Print legible	SAE-AS81531
Flammability	VW-1	UL224

5. Test Results

5.1 Chemical/Solvent Resistance (Soaking)

Test Method

1. Printed on a 21mm width x 55mm length tube using PT-P900W label printer and shrunk it by leaving it for one hour in an oven at 130°C
2. Left the specimen for twenty-four hours at the room temperature
3. Soaked the specimen in the chemical reagent for two hours
4. Wiped the printed area with cotton swab

CHEMICAL REAGENT	TUBING AND PRINTING WITHOUT SWAB RUB	PRINTING WITH SWAB RUB
Methyl Ethyl Ketone (MEK)	No visible effect	No visible effect
Isopropyl Alcohol (IPA)	No visible effect	No visible effect
5% Salt Water Solution	No visible effect	No visible effect
Honilo981	No visible effect	No visible effect
Alusol B	No visible effect	No visible effect **NOTE:2
Variocut B30	No visible effect	No visible effect **NOTE:2
Syntilo 81E	No visible effect	No visible effect **NOTE:2
CareCut ES1	No visible effect	No visible effect **NOTE:2
Syntilo 9954	No visible effect	No visible effect **NOTE:2
Hysol X	No visible effect	No visible effect **NOTE:2

*NOTE:2 Ink transferred to the cotton swab is observed.

5.2 Temperature resistance

Test Method

1. Printed on a 21mm width x 55mm length tube using PT-P900W label printer and shrunk it by leaving it for one hour in an oven at 130°C
2. Left the specimen for the period of time in the conditions described in the chart

Time and conditions	RESULTS
24hours, 200°C	No visible change to printing White and yellow: Slight tube darkening.
24 hours, -70°C	No visible effect

5.3 Humidity Resistance

Test Method

1. Printed on a 21mm width x 55mm length tube using PT-P900W label printer and shrunk it by leaving it for one hour in an oven at 130°C
2. Left the specimen for the period of time in the conditions described in the chart

Time and conditions	AVERAGE RESULTS
1000 hours at 35°C humidity 95% R.H.	No visible effect

5.4 Weatherability

Test Method

1. Printed on a 21mm width x 55mm length tube using PT-P900W label printer and shrunk it by leaving it for one hour in an oven at 130°C
2. Left the specimen for the period of time in the conditions described in the chart

Time and conditions	RESULTS
500 hours in Xenon Arc Weatherometer 180W/m ²	No visible change to printing White: No visible effect Yellow: Severe discoloration of the tube (yellow color disappears)

6. Notes

1. From the many different types of available tapes and tubes, a random sample was selected and used to perform these tests. Therefore, the results of these tests may differ slightly, depending on the type of tape or tube used.
2. The test results were acquired under specific conditions arranged by Brother. Brother does not guarantee the strength, safety, or accuracy of the numerical data presented in this report.
3. The tape adherence performance can be affected by the material that the tape is attached to, the material's surface condition (whether it is greasy, dusty, rough or curved), the material's shape, and the environmental conditions. Users should confirm the adherence performance under their actual usage conditions after purchasing this product and use the product under their own responsibility.
4. We assume no responsibility for any damage, injuries, or lost profit arising from the use of labels created according to the information contained in this document.

Trademarks:

ASTM: American Society for Testing and Materials (U.S.A.)

SAE: Society of Automotive Engineers (U.S.A.)