



Performance Requirements of Ultra High Molecular Weight Polyethylene (UHMW PE) Tape

1 Scope

This specification covers the material properties and durability requirements of an ultra-high molecular weight polyethylene (UHMW PE) film coated with an adhesive (Type I) or laminated to a single coat foam tape (Type II). The adhesive shall be a permanent acrylic pressure sensitive adhesive. This tape is designed to provide surface protection against scratches, chafing, itching, squeaking and mechanical wear. When laminated to foam, the tape can also provide vibration and rattle reduction.

1.1 Material Description. The UHMW film has a maximum service temperature of 105 °C. It is not to be used in decorative applications or areas exposed to ultraviolet (UV) light. The film color can be either translucent or black. Available film thicknesses are 0.08 mm, 0.125 mm, 0.25 mm and 0.50 mm. The 0.125 mm thick film is typically used, and most of the data below is based on this thickness. The film can be laminated to foams of various chemistries, typically acrylic or urethane.

1.1.1 Type I. Material is UHMW PE film coated with a permanent acrylic pressure sensitive adhesive.

1.1.2 Type II. Material is UHMW PE film laminated to a single coated foam tape.

1.1.3 If there is no type call-out on the drawing, the construction is assumed to be Type I.

1.2 Symbols. Not applicable.

1.3 Applicability. Materials approved to this specification are to mitigate buzz, squeak and rattle issues.

1.4 Remarks. Not applicable.

2 References

Note: Only the latest approved standards are applicable unless otherwise specified.

2.1 External Standards/Specifications.

FMVSS 302	ISO 8295	ISO 8510-1	ISO 8510-2
ISO 34-1			

2.2 GM Standards/Specifications.

GMW3010	GMW3235	GMW14729	GMW16208
GMW3059	GMW14124	GMW15548	
GMW3232	GMW14270	GMW15572	

2.3 Additional References.

Part Drawing

Safety and Industrial Hygiene (S&IH) Technical Standard (TS), S&IH TS 3.4-160-02

3 Requirements

3.1 Tape Performance. All tests shall be performed at ambient condition, 22 °C ± 3 °C and 55% ± 5% relative humidity (RH), unless otherwise indicated.

3.2 Properties. See Table 1.

Table 1: Performance Requirements

Properties	Values		Test Methods
	Type I	Type II	
Liner Removability	200 N/m maximum	200 N/m maximum	180 Degree Peel at 300 mm/minute per ISO 8510-2.
Adhesion (90 Degree Peel or 180 Degree Peel ^{Note 1})			
After 72 h Room Temperature	350 N/m minimum	350 N/m minimum	90 Degree Peel at 300 mm/minute per ISO 8510-1 180 Degree Peel at 300 mm/minute per ISO 8510-2.
After 24 h Humidity, GMW14729, Option A or B.	350 N/m minimum	300 N/m minimum	
After 168 h Oven Aging at 70 °C	350 N/m minimum	875 N/m minimum	
After Two (2) Cycles of GMW14124, Cycle M	350 N/m minimum	875 N/m minimum	
Dynamic Shear Strength ^{Note 2} 323 mm² Bond Area, 50 mm/minute Crosshead Speed	200 KPa minimum	200 KPa minimum	GMW3010
Tear Resistance	2.0 kg minimum	2.0 kg minimum	ISO 34-1, Method B (no nick)
Tensile Strength	15 MPa minimum	10 MPa minimum	GMW3010, Code L
After 168 h Oven Aging	No increase more than 100% of initial value		
Elongation	150% minimum	150% minimum	GMW3010, Code L
After 168 h Oven Aging	50% minimum	50% minimum	
Coefficient of Kinetic Friction, Maximum Between Tape and Stainless Steel	0.25 N/m maximum	0.25 N/m maximum	ISO 8295
Fogging	See Note 3	See Note 3	GMW3235, Method A
Flammability	See Note 4	See Note 4	GMW3232

Note 1: Bond tape to production intent substrate (if not available use Acrylonitrile Butadiene Styrene (ABS) (GMW15572P-ABS-T1 or T2) and polypropylene (GMW16208P-PP-T1 or GMW15548P-PP-T3)). Allow a 72 h dwell at ambient conditions prior to exposure. After exposure to any condition, allow a 24 h dwell at ambient conditions prior to testing. Use 180 degree peel for Type I tape and a 90 degree peel for Type II tape.

Note 2: Bond 25.4 mm wide tape to production intent substrate (if not available use ABS (GMW15572P-ABS-T1 or T2) and polypropylene (GMW16208P-PP-T1 or GMW15548P-PP-T3)). Allow a 72 h dwell at ambient conditions prior to testing.

Note 3: Photometric procedure: bath temperature at 85 °C, or as specified on the part drawing; cooling temperature of 38 °C, 6 h test time; 16 h post conditioning time. The amount of fog when measured with a 60 degree gloss meter shall have a rating of 60 units or more. Samples that result in any visual signs of crystallinity, when viewed under 40x magnifications shall be judged to have not passed this requirement.

Note 4: Must comply with FMVSS 302.

3.3 Shelf Life. Material shall pass all requirements of this specification after aging material in the original container for 90 days at 35 °C.

3.4 Other test(s) may be required to validate the specific application.

3.5 All materials supplied to this standard must comply with GMW3059, **Restricted and Reportable Substances**, including the requirement to obtain a GM-approved International Material Data System (IMDS) submission.

4 Manufacturing Process

Not applicable.

5 Rules and Regulations

5.1 Legal Regulations. All materials must satisfy applicable laws, rules, regulations and recommendations valid in the country of usage.

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