



High Density Olefinic Foam

1 Scope

1.1 Material Description. This standard covers the properties of a high density olefinic foam which is processed by combining an olefinic resin and a blowing agent. The olefinic resin can be either polyethylene or polypropylene based.

1.2 Symbols. The material abbreviations according to ISO 11469 are listed in Table 1.

1.3 Typical Applications. Typical applications include the following: Bumper energy absorbers, knee bolsters.

1.4 Remarks. The classification into types is according to the different ranges of density.

2 References

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

2.1 External Standards/Specifications.

ISO 844	ISO 845	ISO 11469
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2.2 GM Standards/Specifications.

GMW3013	GMW3221	GMW14444
GMW3059	GMW3232	GMW14650
GMW3205	GMW3235	GMW15634

2.3 Additional References.

TMC003 Material Safety Data Sheet guidance documents (available at www.gmsupplypower.com).

3 Requirements

Materials approved to this specification shall meet the requirements of GMW3013, General Requirements for Handling of Technical Terms of Delivery of Plastics.

3.1 Requirements on Test Specimens. Important physical and mechanical properties that characterize the material are summarized in Table 1.

3.2 Chemical Requirements. All parts manufactured from molding compounds shall be resistant to the media they contact at their place of use.

3.3 Requirements on Materials. See Table 1.

3.4 Requirements for Use in Interior. See Table 2. These requirements shall be met in addition to the requirements in Table 1.

3.4.1 All finished parts for Interior applications shall meet the requirements according to GMW14444.

3.5 Requirements for Use on Exterior. The following requirements shall be met in addition to the requirements in Table 1.

3.5.1 All finished parts for exterior applications shall meet the requirements according to GMW14650.

3.6 Conditioning. All test pieces shall be conditioned to GMW3221 Code A.

3.7 Required Performance Values. All requirements listed in Table 1 and Table 2, if necessary, shall be fulfilled by the delivered foam and shall be documented by the supplier in the Foam Certification Data Form according to Appendix A.

3.8 Compressive Strength, Stress, Modulus Test Method (ISO 844 Modification). For Type 2 construction, the sample specimen specified in “Dimensions” section according to ISO 844 is modified from a 100 mm x 100 mm x 50 mm solid block to a cartridge style design 100 mm x 100 mm x 50 mm thickness and divided into nine equal cells (matrix of 3 x 3), see Figure 1. The wall stock is drafted at 0.5° to simulate production intent. The internal radii of this cartridge should be half the nominal wall thickness, internal radius = 0.5 x nominal wall; e.g. 4 mm nominal wall yields 2 mm internal radius. Also “Preparation” section of ISO 844 is modified to include “test specimen shall be molded to maintain 100 % skin on the compression test cartridge.”

Figure 1: Compression Property Specimen

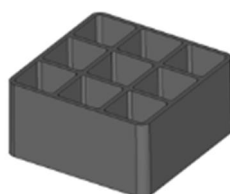


Table 1: Physical and Mechanical Properties

Properties	Standard	Type		
		1	2	3
Tested Thickness		4 mm and 5 mm	4 mm	5 mm
Plastic Symbol		>PE-LLD<	>PE-LLD<	>PE-LLD<
Density	ISO 845 ^{Note 1}	575 kg/m ³ ± 5 %	720 kg/m ³ ± 5 %	625 kg/m ³ ± 5 %
Compressive Strength	ISO 844 ^{Note 2}	> 3600 kPa	> 5400 kPa	> 4200 kPa
Compressive Stress	ISO 844 ^{Note 3}	> 3500 kPa	> 5300 kPa	> 4100 kPa
Compressive Modulus	ISO 844 ^{Note 2}	> 95 000 kPa	> 140 000 kPa	> 100 000 kPa

Note 1: Based on overall part and volume

Note 2: ISO 844 modified as described in paragraph 3.8.

Note 3: ISO 844 modified as described in paragraph 3.8, test at 10 % relative deformation

Table 2: Additional Requirements for Use in Interior

Properties	Standard	Type		
		1	2	3
Flammability	GMW3232	SE or < 100 mm/minute		
Resistance to Odor	GMW3205-B2	Rating 6 minimum		
Emissions	GMW15634	VOC ≤ 300 µg/g SVOC ≤ 750 µg/g	VOC ≤ 200 µg/g SVOC ≤ 500 µg/g	VOC ≤ 200 µg/g SVOC ≤ 500 µg/g
Fogging	GMW3235 Method B-Y1-T1	≤ 2 mg		

4 Manufacturing Process

Not applicable.