

ASTM D1505 HDPE Geomembranes Specifications

GRI-GM13 HDPE Geomembranes Specifications

Overview

GRI-GM13 is a standard specification developed by the Geosynthetic Research Institute (GRI) for high-density polyethylene (HDPE) geomembranes. This specification outlines the test properties, testing frequency, and recommended warranties for HDPE smooth and textured geomembranes used in various containment applications.

1. Scope

This specification covers the requirements for HDPE geomembranes used in applications such as landfills, ponds, canals, and other containment projects. The specification includes criteria for physical, mechanical, and chemical properties, ensuring the geomembranes meet the necessary performance standards.

2. Significance and Use

GRI-GM13 provides a comprehensive set of requirements that ensure HDPE geomembranes have the durability, strength, and chemical resistance needed for effective containment. Adherence to this specification helps in maintaining the quality and reliability of geomembranes in critical environmental and industrial applications.

3. Physical Properties

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The following physical properties are specified in GRI-GM13:

- Thickness: Varies based on application, typically 0.5 mm to 3.0 mm.
- Density: Minimum of 0.940 g/cm³ (ASTM D1505).
- Melt Flow Index: Less than or equal to 1.0 g/10 min (ASTM D1238).
- Carbon Black Content: 2-3% (ASTM D1603).
- Carbon Black Dispersion: Categories 1 or 2 (ASTM D5596).

4. Mechanical Properties

The mechanical properties specified in GRI-GM13 include:

- Tensile Strength at Yield: At least 16 kN/m (ASTM D6693).
- Tensile Strength at Break: At least 30 kN/m (ASTM D6693).
- Elongation at Yield: At least 12% (ASTM D6693).
- Elongation at Break: At least 700% (ASTM D6693).
- Tear Resistance: At least 125 N (ASTM D1004).
- Puncture Resistance: At least 240 N (ASTM D4833).

5. Chemical Properties

The chemical properties specified in GRI-GM13 include:

- Stress Crack Resistance: At least 500 hours (ASTM D5397).
- Oxidative Induction Time (OIT): At least 100 minutes (Standard OIT, ASTM D3895) or at least 400 minutes (High Pressure OIT, ASTM D5885).
- UV Resistance: At least 90% retained strength after 1600 hours (ASTM D7238).

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6. Testing Frequency

GRI-GM13 specifies the frequency of testing to ensure consistent quality and performance. The testing frequency varies depending on the property being tested and the production volume. Regular testing helps in identifying any deviations from the specified standards.

7. Warranties

GRI-GM13 recommends warranties that cover manufacturing defects and ensure the geomembranes perform as expected over their intended lifespan. Warranties typically cover a period of up to 20 years, depending on the application and environmental conditions.

8. References

For detailed information on GRI-GM13 and related specifications, refer to the Geosynthetic Research Institute website and the official GRI-GM13 documentation. Additional references may include technical papers, industry guidelines, and manufacturer specifications for HDPE geomembranes.