### Insulation Materials Specification Chart from the NIA National Insulation Training Program

This chart provides the reader with a comprehensive comparison of various insulation materials based on their physical properties and performance characteristics. The chart is designed to aid in the selection of appropriate insulation materials for specific applications.

#### Physical Properties
- **Type of Material:** Various types of insulation materials are listed, including Cellular, Polyurethane, Polyisocyanurate, Polymeric, Rigid, Glass, and other materials.
- **Density:** Density values are provided in pounds per cubic foot (lbs/ft³).
- **Water Vapor Permeability:** Values are given in perms (1 perm = 1 g/m²/day/atmosphere).
- **Compressive Resistance:** Values are given in psi.
- **Conductivity:** Conductivity values are given in Btu/ft²hr°F.
- **Behavior in a Vertical Furnace:** Indications of the material’s behavior in a vertical furnace are provided.

#### Type of Insulation Material
- **ASTM Standard:** ASTM standards are referenced to classify the materials.
- **Temp (°F):** Temporal performance characteristics are listed.
- **Physical Properties:** These include density, water vapor permeability, and compressive resistance.
- **Compressible Resistance:** Compressible resistance is given in psi.
- **Corrosion Resistance:** Corrosion resistance values are given for specific materials.
- **Behavior in a Vertical Furnace:** Behavior in a vertical furnace is indicated.

#### Key Characteristics
- **Water Vapor Permeability:** Values range from 0.03 to 5 perms.
- **Compressive Resistance:** Values range from 0.2 to 150 psi.
- **Conductivity:** Values range from 0.05 to 0.5 Btu/ft²hr°F.

#### Revisions
- **September 22, 2021:** Revised Insulation Materials Specification Chart from the NIA National Insulation Training Program.
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This chart provides the reader with material properties as typically specified in ASTM material specifications and is a guide to performance characteristics but may not be sufficient for writing specifications. This was created by NIA for use by NIA and its members. The content is reviewed and updated quarterly. Non-members and other organizations may not print and distribute this material without written permission from NIA.

Notes:
1. All properties are for the generic material type as specified by industry and by manufacturer. All properties should be verified with individual manufacturers. Properties that are not stated may or may not be an indication that a material is not appropriate for applications depending on that property. This should be verified with the specific manufacturer.
2. Surface burning characteristics may vary with thickness and/or formulation. See the manufacturer’s data sheets.
3. The following are the definitions used in this chart for special situations:
   N/A = Not Applicable—The mean temperature for thermal conductivity is outside the scope of the ASTM standard for this material classification.
   N/S = Not Stated—The ASTM standard makes no mention of this property.
   N/R = Not Required —The ASTM standard for this material classification does not have a requirement for performance for this property but the ASTM standard does classify this property or another material classification within the standard has a requirement for this property.

All properties listed above are for core insulation material only and may not be indicative of the performance of an insulation system including vapor retarders, adhesives and sealants.

Many materials can be used for applications outside of the ranges listed above but additional precautions must be followed. The specific manufacturer should be consulted for detailed recommendations.

Some values such as specific thermal conductivities at various mean temperatures may be interpolated or extrapolated by a small amount.

This chart has been established for products with current ASTM standards.

Data found in this chart is generally derived from ASTM Standards. Some exceptions were made to provide more complete information on materials for better comparison purposes. In those cases, the information was derived by consensus of manufacturers and the NIA TIC Committee approval. This table does not contain all ASTM data points.

For Surface Burning Characteristics testing of products used in Canada, refer to the appropriate ASTM product specification or use CAN/ULC-S102, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

In ASTM E96, Procedure A is the dry cup method and Procedure B is the wet cup method.