



## Technical Data: EPS (Expanded Polystyrene)

EPS isn't just foam insulation, it's an innovative building material that lends to the design and structural integrity of many building projects. Since the 1950's, EPS has been recognized as a mainstream insulation material, but over the past decade new applications using EPS have exploded, and EPS now serves as a powerful design element. Polycore Canada Inc. utilizes a Type I EPS in its standard line of building systems, product sourced for our operation from EPS Molders Inc. of Edmonton Alberta.

### Strength Properties of EPS

Expanded polystyrene is a closed cell, thermal plastic material that can be manufactured to meet specific requirements of commercial, residential, and civil engineering projects. Offering comprehensive strength from 10 to 60 PSI, EPS is produced in a wide range of densities to achieve the structural integrity and thermal performance. Polycore Canada utilizes a Type I EPS product, with a typical density of 1.0 pcf and a minimal density of 0.90 pcf. Strength properties of that product and other densities are as follows:

Note: The highlighted portion of the table below indicates the EPS product used by Polycore Canada in its Polycore building systems products

| <b>Table 1. Strength Properties of EPS (70 o F Test Temperature)</b> |                                       |                                |                               |                             |
|--|---------------------------------------|--------------------------------|-------------------------------|-----------------------------|
| <b>Density (pcf)</b>   | <b>Stress @ 10% Compression (psi)</b> | <b>Flexural Strength (psi)</b> | <b>Tensile Strength (psi)</b> | <b>Shear Strength (psi)</b> |
| 1.0  | 10-14                                 | 25-30                          | 16-20                         | 18-22                       |
| 1.5  | 15-21                                 | 40-50                          | 18-22                         | 26-32                       |
| 2.0  | 25-33                                 | 50-75                          | 23-27                         | 33-37                       |
| 2.5  | 42                                    | 75                             | 74                            | 92                          |
| 3.0  | 64                                    | 88                             | 88                            | 118                         |
| 3.3  | 67                                    | 105                            | 98                            | 140                         |
| 4.0  | 80                                    | 125                            | 108                           | 175                         |

*Note: Values based on ASTM short-term, laboratory-load conditions. Both temperature and time period of loading may affect end-point values.*

### Water Absorption and Vapor Transmission of EPS

EPS is non-hygroscopic and does not readily absorb moisture from the atmosphere. Its closed-cell structure reduces absorption and/or migration of moisture. Extensive testing has confirmed that even small quantities of moisture absorption have a minimal effect on the thermal performance of EPS insulation.

EPS is resistant to liquid water, and it is moderately permeable to water vapor under pressure differentials. Vapor permeability is determined by both density and thickness. Generally, neither water nor water vapors affect the mechanical properties of EPS. The table that follows provides a summary of data on absorption and transmission properties of EPS:

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| <b>Table 2. Water Absorption and Vapor Transmission</b> |                          |                      |                    |                    |
|---|--------------------------|----------------------|--------------------|--------------------|
|   | <b>Type I (0.90 pcf)</b> | Type VIII (1.15 pcf) | Type II (1.35 pcf) | Type IX (1.80 pcf) |
| Max Water Vapor Transmission                            | 2.0 - 5.0 perms          | 1.5 - 3.5 perms      | 1.0 - 3.5 perms    | 0.6 - 2.0 perms    |
| Max Absorption % by volume                              | <4.0%                    | <3.0%                | <3.0%              | <2.0%              |
| Capillary action  | None                     | None                 | None               | None               |

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