

CertiFoam®

Extruded Polystyrene Insulation

Physical Properties and ASTM Specifications

| Typical properties of CertiFoam brand insulation¹ | | | | | | |
|---|--|--------------|---------------------|------------------------|--------------|-----------------------------------|
| | ASTM test method | CertiFoam 15 | CertiFoam 25 SE, SL | CertiLite System Board | CertiFoam 40 | CertiFoam 60 CertiFoam Plaza Deck |
| Insulation Properties | C 177-76 ² or C 518-76 ² | | | | | |
| Thermal Conductivity k (Btu/hr. sq. ft. °F) | | | | | | |
| 5-Year Aged (Design) Values ³ | | 0.178 | 0.178 | 0.178 | 0.178 | 0.178 |
| @ 25° F mean | | 0.185 | 0.185 | 0.185 | 0.185 | 0.185 |
| @ 40° F mean | | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 |
| @ 75° F mean | | | | | | |
| 6-Month Aged Values ⁴ | | 0.192 | 0.192 | 0.192 | 0.192 | 0.192 |
| @ 75° F mean | | | | | | |
| Fresh (As Manufactured) Values ⁵ | | 0.110 | 0.110 | 0.110 | 0.110 | 0.110 |
| @ 40° F mean | | | | | | |
| Water Resistant Properties | D 2842-69 ⁶ | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Water Absorption (% by volume) | C272-76 ⁷ | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Water Vapor Permeance (perm Maximum) | E 96-80 ⁸ | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |

1. Typical property values are based principally on most recent product audit and sampling data. For specific property ranges and bounds, contact you DiversiFoam Products representative.
2. Because of ongoing technical discussions regarding the complete application of test methods C117-76 and C518-76, traditional industry methods for determining the thermal conductivity of low density insulations are used. test uncertainty of thicker foam insulations is expected to be less than 5

| | | | | | | |
|---|--------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| Mechanical Properties | D 1621-73 | 20 ⁹ | 40 ⁹ | 40 ⁹ | 50 ¹⁰ | 70 ¹⁰ |
| Compressive Strength (lb./sq. in.) Minimum (specification) Value | | 15 | 25 | 25 | 40 | 60 |
| Miscellaneous Properties | | 165 | 165 | 165 | 165 | 165 |
| Maximum Recommended Use Temperature (°F) Linear Coefficient of Thermal Expansion (in./in. °F) | D696 | 3.5x10 ⁻⁵ | 3.5x10 ⁻⁵ | 3.5x10 ⁻⁵ | 3.5x10 ⁻⁵ | 3.5x10 ⁻⁵ |

Thermal Resistance (R-value) of five-year aged CertiFoam

- percent from listed values.
3. Recommended typical design values after five-year aging at 75°F.
 4. Partially aged values after six-month aging at 75°F or three-month aging at 140°F. These values are not recommended for use in design calculations. They are included for comparison with published values for polyisocyanurate and polyurethane foams measured after aging for these periods according to RIC/TIMA procedure 281-1.
 5. Fresh or "as manufactured" k factors for comparison purposes only. DiversiFoam Products and XEPS industry organizations continue to recommend that long-term aged values be used for design calculations.
 6. Test precision is

plus or minus
1.0 percent by
volume.

7. Values will be between 0.0 and the values shown.
8. Desiccant method. For all CertiFoam products one inch or greater in thickness.
9. Vertical compressive strength at 10% deformation or yield, whichever occurs first. Structural applications involving high continuous loads, high temperatures, or non-uniform loads may require higher safety factors based on minimum specification values.
10. Vertical compressive strength at 5% deformation or yield, whichever occurs first. To minimize viscoelastic deformation with time in load-bearing applications, higher safety factors are

| Nominal Thickness (in.) | @ 25°F Mean Temperature | @ 40°F Mean Temperature | @ 75°F Mean Temperature |
|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| 1/2 | 2.8 | 2.7 | 2.5 |
| 3/4 | 4.2 | 4.1 | 3.8 |
| 1 | 5.6 | 5.4 | 5.0 |
| 1 1/2 | 8.4 | 8.1 | 7.5 |
| 2 | 11.2 | 10.8 | 10.0 |
| 2 1/2 | 14.0 | 13.5 | 12.5 |
| 3 | 16.9 | 16.2 | 15.0 |

recommended:
3:1 for dead
loads, and 5:1
for live or
combined loads.
Elevated
temperatures
may also require
higher safety
factors.

ASTM C 578-95 specifications for rigid cellular polystyrene thermal insulation

This standard supercedes Federal Specifications HH-I-524 B, HH-I-524 C, and ASTM C 578-95

| | Type I | Type VII | Type II | Type X | Type IX | Type IV | Type VI | Type VII | Type V |
|---|--------------|--------------|---------------|-----------------------------|---------------|-----------------------------|-----------------------------|-----------------------------|------------------------------|
| Insulation Material | | | | | | | | | |
| Expanded polystyrene (EPS) | EPS | EPS | EPS | | EPS | | | | |
| Extruded polystyrene (XEPS) | | | | XEPS | | XEPS | XEPS | XEPS | XEPS |
| Physical Properties | | | | | | | | | |
| Density, minimum lb/ft ³ (kg/m ³) | 0.9 (15) | 1.15 (18) | 1.35 (22) | 1.30 (21) | 1.8 (29) | 1.6 (29) | 1.8 (29) | 2.2 (35) | 3.0 (48) |
| Thermal resistance of 1.00 in. (25.4 mm) thickness, minimum °F- ft ² h/Btu (k-m ² /W) at mean temperature: 40°F (4.4°C) 75°F (23.9°C) | 4.0 (.70) | 4.2 (.74) | 4.4 (.77) | 5.4 (.95) | 4.6 (.81) | 5.4 (.95) | 5.4 (.95) | 5.4 (.95) | 5.4 (.95) |
| Compressive resistance at yield or 10% deformation, whichever occurs first (with skins intact), minimum, psi (kPa) | 10.0 (69) | 13.0 (90) | 15.0 (104) | 15.0 (104) | 25.0 (173) | 25.0 (173) | 40.0 (276) | 60.0 (414) | 100.0 (690) |
| Flexural strength, minimum, psi (kPa) | 5.0 (287) | 3.5 (201) | 3.5 (201) | 1.1 (.63) | 2.0 (115) | 1.1 (.63) | 1.1 (.63) | 1.1 (.63) | 1.1 (.63) |
| Water vapor permeance of 1.00 in. (25.4 mm) thickness, max, perm (ng/Pa- s-m ²) | 4.0 | 3.0 | 3.0 | 0.3 | 2.0 | 0.3 | 0.3 | 0.3 | 0.3 |
| Water absorption by total immersion, | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 |

| | | | | | | | | |
|--|---|---|---|----------|---|----------|----------|----------|
| maximum, volume % Dimensional stability, (change in dimensions), maximum, % Oxygen index, minimum, volume % | | | | | | | | |
| Product meets or exceeds | | | | | | | | |
| Type: | X | X | X | X | | | | |
| CertiFoam 15 | X | X | X | X | X | X | | |
| CertiFoam 25 SE, SL | X | X | X | X | X | X | | |
| CertiLite System Board | X | X | X | X | X | X | X | |
| CertiFoam 40 | X | X | X | X | X | X | X | X |
| CertiFoam 60/CertiFoam Plaza Deck | | | | | | | | |