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Thermafiber Technical Bulletin

Do the requirements of ASTM C 612 apply to commercial construction?

ASTM C 612 is the Standard Specification for Mineral Fiber Block and Board Thermal Insulation. The scope of the standard states, "This specification covers the classification, composition, dimension, and physical properties of mineral fiber (rock, slag, or glass) semi-rigid and rigid board intended for use as thermal insulation on surfaces operating at temperatures between 0° F (-18° C) to 1800°F (982° C)." At times, this standard is written into commercial specifications under thermal insulation however, does it really apply to commercial construction?

C 612, Table 1 outlines the physical property requirements for thermal insulation. Maximum use temperature is one property outlined and classifies thermal insulation from Type 1A through Type V. These maximum use temperatures are listed below:

| <u>Type</u> | <u>Maximum Use Temperatures</u> |
|-------------|---------------------------------|
| IA | 450 ° F (232° C) |
| IB | 450 ° F (232° C) |
| II | 850 ° F (454° C) |
| III | 1000 ° F (538° C) |
| IVA | 1200 ° F (649° C) |
| IVB | 1200 ° F (649° C) |
| V | 1800 ° F (982° C) |

Thermal Insulation is classified into types depending on the thermal performance (k values) at various mean temperatures when exposed to the temperatures listed in the table above. There are other property requirements such as minimum compressive resistance, linear shrinkage, water vapor sorption, and surface burning characteristics that are important for insulation performance, however, these temperature requirements do not apply to materials being used as thermal insulation in commercial construction. If insulation sees temperatures above 450° F, the surrounding structure and occupants may be at serious risk.

A possible argument could be made that these maximum temperature performance criteria are important in a commercial building, particularly in the event of a fire. However, other ASTM, NFPA and UL standards deal with fire protection, such as ASTM E 84 for dealing with surface flammability, ASTM E 2307 for perimeter fire barrier performance, ASTM E 136 for non-combustibility, ASTM E 814 for through penetration firestopping,

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or UL 2079 for firestopping construction joints. In fact, ASTM C 612, Section 1.4 states “This standard does not purport to provide the performance requirements of hourly-rated fire systems.”

ASTM C 612 is a standard that applies to thermal insulation in high temperature applications. Examples are industrial settings where energy efficiency and personnel protection are required in applications such as heat treating furnaces, process ovens, and kilns that require the insulation to perform at high temperatures.

If temperatures in a commercial building exceed 450° F, there are other issues than just thermal performance of insulation. At this point we are dealing with fire performance standards that are clearly addressed by other applicable ASTM standards.