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No. 1294-E
Revised: May, 2025

RESTRICTIONS ON THE USE OF DARK COLORS WITH EXTERIOR INSULATION AND FINISH SYSTEMS (EIFS)

Most EIF Systems incorporate expanded polystyrene insulation (EPS), graphite polystyrene (GPS), or extruded polystyrene (XPS) as the insulating component. The manufacturers of polystyrene board recommend a maximum sustained service temperature of no more than 167˚ F (75˚C) because the board will begin to deform at high temperatures.

The use of dark colors for EIF systems with polystyrene board should therefore be avoided to prevent high temperatures on the insulation board surface. UV light and heat absorption of dark colors along with climate and surface orientation affect surface temperature. Under certain conditions temperatures at the face of the insulation board can exceed its service temperature limits.

Specific variables that influence surface temperature are:

1. **Ambient temperature –** the higher the ambient temperature the higher the surface temperature.

2. **Angle of Incidence of the Sun to the Surface –** the more direct (or closer to 90 degrees) the angle of the sun to the wall surface, the higher the surface temperature; sloped or horizontal surfaces exposed to direct sunlight, for example, will generally have higher mid-day surface temperature than vertical surfaces because the angle of the sun is more direct.

3. **Cloud Cover and Air Pollution –** the more cloud cover and pollution the less the surface temperature. Typically, in areas of the country with infrequent cloud cover, such as Las Vegas, the surface temperature will be higher than, for example, Los Angeles, where a high air pollution index exists, although ambient temperatures and cloud cover could be the same in both locations on a given day.

4. **Color –** darker colors reflect less light than lighter colors, so more energy is absorbed and transformed into heat energy, thus creating higher surface temperature.

All parties involved in color selection for use with EIFS must be aware of the possibility that the use of dark colors on EIFS could result in temperatures beyond the service limits of polystyrene insulation board.

By selecting colors with a lightness value of 20 or greater designers are safe in their color selection for any location in North America, assuming a vertical wall orientation and no significant additional radiation from adjacent reflective surfaces, such as reflective glass, or other abnormalities. This leaves a wide range of colors still available for designers to choose from, while avoiding the risks associated with the use of dark finish colors on EIFS with polystyrene insulation board.