



# UNIVERSAL

## TEXTILE TECHNOLOGIES

### Thermal Insulating Properties

#### Heating and Cooling

Heating and cooling commercial buildings is expensive. Products that contribute thermal resistance can help improve energy costs.

Products with BioCel™ or EnviroCel™ polyurethane cushioned backings demonstrate an R-value up to 65 percent greater than conventional carpet products.

#### R-Value Assessment

#### Test Method ASTM C 518

Thermal resistance is measured with a heat flow meter. The higher the R-value, the greater the insulating properties. Typical ratings as measured by an independent test lab include:

Carpet with conventional backing (Style, A, 26 oz. face wt.)	0.51 R-Value	Carpet
with BioCel Attached Cushion Carpet Backing (Style A, 26 oz. face wt)	0.84 R-Value	

Thermal resistance can also be expressed as an R-per-inch value, or the R-value of a 1-inch thickness of material. By converting the above R-values to R-per-inch equivalents, the insulating ability of carpet products can be compared to that of other common building products:

Concrete	0.10 R-per-inch
Plywood	1.25 R-per-inch
Carpet with conventional backing (Style A, 26 oz. face wt.)	1.89 R-per-inch
Carpet with BioCel Attached Cushion Carpet Backing (Style A, 26 oz. face wt)	2.11 R-per-inch
Fiberglass Insulation	3.20 R-per-inch

**Note:** In general, testing has shown that R-value is influenced more by pile height and underlayment thickness than by fiber or yarn type. The presence of a cushioned backing serves to increase insulating properties.

#### Radiant Floor Heating

Radiant floor heating is a method of heating a space by using heated water circulated through tubes imbedded in the *subfloor*. According to the The Carpet and Rug Institute in *CRI 104, Standard for Installation of Commercial Textile Floorcovering Materials*, commercial carpet products installed over cushion are compatible with radiant floor heating systems.

Although carpet with BioCel or EnviroCel polyurethane carpet backings have a greater R-value

than conventional **broadloom** installed without cushion, the Radiant Panel Association in a letter has commented: "The **R-value** of [carpet products with] these backings are well **within...the** acceptable limits for most radiant heating systems."

**Note:** Subflooring with radiant floor heating requires the same preparation, techniques, and adhesive application as conventional subflooring. However, heat must be lowered before installation to prevent adhesive from setting too quickly.

For additional information:

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