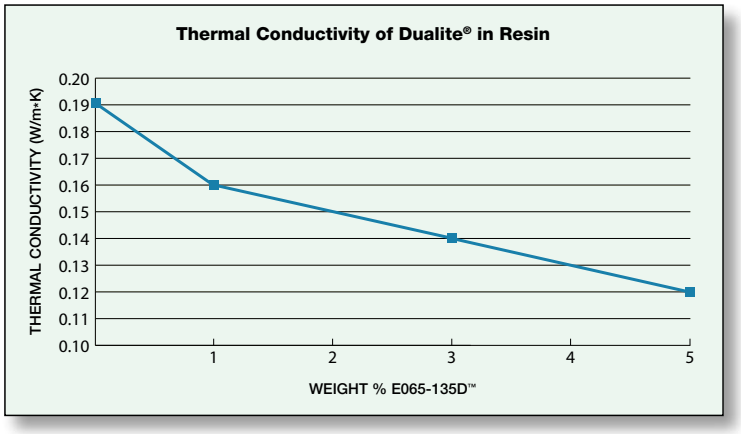
Thermal Insulation Properties of Dualite® E™

In addition to the primary benefits of cost savings and weight reduction, Dualite® E™ has many ancillary benefits. One of these benefits can include lowering the thermal conductivity of the final product. Using Dualite® E™ in a formula introduces stable, hollow, closed-cell voids into the material.

Thermal conductivity is a measure of the rate at which heat is conducted through a material. A material that is a good conductor of heat will have a high thermal conductivity value. A material that is a good insulator will have a low thermal conductivity value.



Several loading levels of Dualite® E065-135D™ were mixed with resin and tested for thermal conductivity according to ASTM™ E1530 at 50°C.

The addition of only 1% of E065-135D™ decreased thermal conductivity (increases insulation) by more than 15%. The addition of 3% E065-135D decreased thermal conductivity by over 25%, and the addition of 5% decreased it by more than 35%.

Dualite® E™	Thermal Conductivity (W/(m*K))	R-value (1-inch) (ft2*F*h/BTU)
E030™	0.0334	4.315
E065-135D™	0.0332	4.328
E130-055D™	0.0342	4.214
E130-095D™	0.0350	4.118
E135-040D™	0.0361	3.993

Dualite® E™ was also tested for thermal properties according to ASTM™ D5334. This method measures the thermal conductivity of Dualite® E™ in its bulk form, which includes about 50% air that is trapped in between the Dualite® E™ particles. The samples were tested at 23°C.

The R-value was calculated from the thermal conductivity data. R-value is a measure of apparent thermal conductivity and describes the rate of heat energy transfer through a material. The higher the R-value, the greater the insulation the material will provide.

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