



### An explanation of R-values

R-value is a measure of resistance to heat flow through a given thickness of material. In theory, the higher the R-value, the greater that resistance to heat flow.

While an R-Value is good measure for comparing insulations (the higher the R-Value, the better the insulation), it is not the only measure of effective insulation. But R-Values only measure one of the factors that determine how insulation will perform in your home or building. Your home or commercial building may look solid but there are thousands of tiny gaps, cracks and penetrations between building materials.

Insulation is meant to stop the movement of heat. The problem with using R-Value as the sole yardstick of insulation's effectiveness is that heat moves in and out of your home or commercial building in four ways:

1. By conduction (which R-Value measures) *Conduction* is the transfer of heat through a solid material, such as heat being transferred from warmer sections of walls and ceilings to cooler areas.
2. By convection (which R-Value does not measure) *Convection* is the transfer of heat by moving air, like warm air rising to the ceiling.
3. By radiation (which R-Value does not measure) *Radiation* is the transfer of heat in the form of electromagnetic waves, such as heat being transferred from the roof of a home to the ceiling.
4. By air infiltration (which R-Value does not measure) *Air tends to move from the hot side to the cold side, so for example, in winter air is more likely to move from the interior to the exterior, while in the summer the reverse is true. Air infiltration is a direct result of several factors, including unsealed penetrations (joints, cracks, and holes), insulation materials of insufficient density to effectively limit or prevent infiltration, poor installation, lack of air sealing, etc.*

A superior insulation system will have good R-Value which prevents heat loss via conduction. It will be mechanically spray applied so as to fully fill the space needing insulation, leaving no gaps or spaces, which helps to prevent heat loss via convection. The insulation will be densely packed once applied, which prevents heat loss via air infiltration and radiation). **SmartShredz meets all of these performance criteria's!**