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INSUGARD MACHINE SPRAY POLYURETHANE FOAM SYSTEM



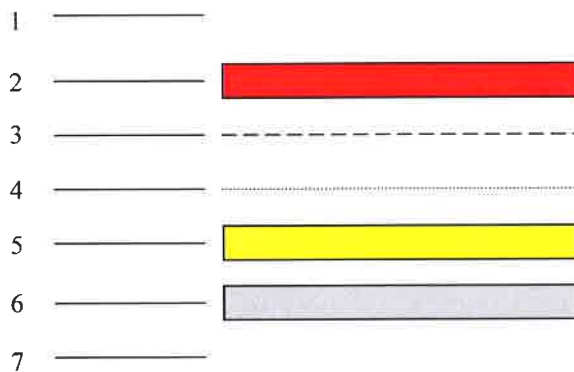
Insugard Spray Polyurethane foam is a spray-applied insulating foam that is installed as a liquid and then expands from its original size. It can be adjusted and have many different physical properties depending on the use desired.

The same basic raw materials that can make insulation foam semi-rigid and soft to the touch also creates high density roofing foam that is resistant to foot traffic and water. Specialized equipment is used to apply the spray polyurethane foam and proper technical training is important in order to get the best results.





OVERALL THERMAL TRANSMITTANCE VALUE (OTTV) CALCULATION



INSULATION VALUE WITH INSUGARD POLYURETHANE

NO		K-Value	Thermal Resistance
1	Outside air	-	0.055
2	Cast-in-situ 50mm cement sand panel	0.533	0.019
3	Separation layer	-	-
4	Waterproofing membrane	-	-
5	Insulation foam 50mm/Insugard Polyurethane	0.019	2.630
6	Reinforced concrete 150mm	1.443	0.076
7	Inside air	-	0.162

Total Thermal Resistance = 3,016

U Value = 1/Thermal Resistance = 0.331

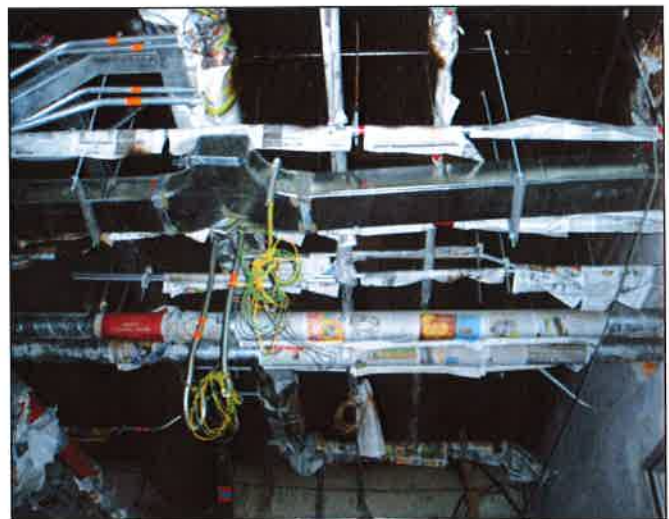
NOTE : Thermal conductivity of Insugard Polyurethane is according to product data sheet attached.
Water proofing membrane can be laid before or after the 50mm Insugard Polyurethane have been applied to prevent moisture from penetrating and would not degrade the PU insulation

TYPICAL PHYSICAL PROPERTIES

Property	Test Standard	Unit	Value	Value
Blowing Agent			CFC 11	HCFC 14 lb
Sprayed Core Density	ASTM D 1622	kg/m ³	46.9	45.3
Compressive Strength - Parallel to foam rise	ASTM D 1621	kPa	349	321
Dimensional Stability 48 hours exposure @-150C @1000C	ASTM D 2126	% volume change	-0.4 +2.4	-0.3 +4.1
Thermal conductivity	ASTM C 518	W/m0C	0.018	0.019
Flammability	DIN 4102		B2	B2



Insugard is the king of building materials for multitasking. For moisture it can provide high levels of R-Value, while providing air barriers and assistance in moisture control in buildings. For roofing, spray polyurethane foam insulates and eliminates thermal bridging through fastener or gaps in decking while providing a long-lasting roofing system that has a life that can be extended by re-coating or recovering in an average of >10-15 years.



Protecting by wrapping the ceiling tee and other services with plastic cover before spray.

THE FEATURES AND BENEFITS OF INSUGARD

Insugard Spray polyurethane foam is environmental friendly, contains no formaldehyde or ozone depleting chemical, and reduces the use of fossil fuels, thereby reducing global warming gases. It also assists in providing good indoor air quality, requires less energy to produce than the leading insulation, and decrease the amount of energy required to transport and install it. **Insugard** Polyurethane is the best insulation for sound insulation, prevention of heat loss and condensation.



It also can reduce energy use in the following ways :

- Has high R-value per inch (open-cell 3.5 per inch and closed-cell 6.0 per inch)
- Eliminates air infiltration
- Helps control moisture and condensation
- Reduce convective currents in walls and attics
- Eliminates wind washing
- Effective at low and high temperatures
- Provide the correct environment thus the ventilation system performs more efficiently

APPLICATION



- Roofing
- Air barriers
- Commercial and residential insulation in walls, ceilings, attics and basements
- Industrial insulation for pipes and tanks, cold storage facilities, freezers, walk-in coolers, and climate controlled buildings such as produce storage and clean rooms.
- Flotation for boats, ships, barges, floating docks, etc
- Higher density spray polyurethane foam has been used to increase the structural strength of wings in airplanes.
- Insulation
- Roofing adhesive
- Construction adhesive
- Refrigeration
- Taxidermy
- Movie/theatre sets