

# Isocyanurate vs. Extruded Polystyrene

## (A foam insulation board ONLY comparison)

<u>PROPERTY</u>	<u>TEST</u>	<u>ISOCYANURATE</u> (Thermoset)	<u>EXTRUDED POLYSTYRENE</u> (Thermoplastic)
Material Type			
Dimensional stability	ASTM D2126	< 2.0 % (7 day test)	0.1% - 2% (7 day test)
Compressive Strength	ASTM D1621	18 -25 psi	18 psi & up
Water Absorbtion	ASTM 209 ASTM 2842 ASTM C 272	< 1.0% < 3.5% -----	---- ---- 0. 1%
Moisture Transmission	ASTM E 96	< 1.5 perms	1.1 perms
*Flame Spread	E 84	25-50	5**
*Smoke Developed	E 84	50-170	45 - 175**
LTTR-value per inch	CAN/ULC-S770	R = approx. 6 (varies with thickness)	R = approx. 5

\* Values range widely because E84 testing is based on thickness of foam.

\*\* Values before insulation reaches its melting point

### **ADVANTAGES AND DISADVANTAGES:**

#### **ISOCYANURATE:**

##### *Advantages-*

It has a better R-value per inch, it can be placed directly down on a metal structural deck (FM 4450), fascia lines can be designed thinner.

##### *Disadvantages-*

When not properly covered it readily absorbs water/ vapor which can damage it. Also, if not covered strong winds can damage the foam by grooving the edges. Properly covered this is seldom a problem. Costs are generally higher than extruded polystyrene.

#### **EXTRUDED POLYSTYRENE:**

##### *Advantages-*

Greater compression strengths are available if desired although compressive strengths above 25psi are not utilized in the nail board industry. It is almost undamaged by water, moisture or strong wind currents that can damage other types of foam. Costs are generally less than isocyanurate insulation.

##### *Disadvantages-*

The R-value is less so fascia lines need to be thicker. A fire barrier such as Dens-deck must be placed on top of a structural steel deck.