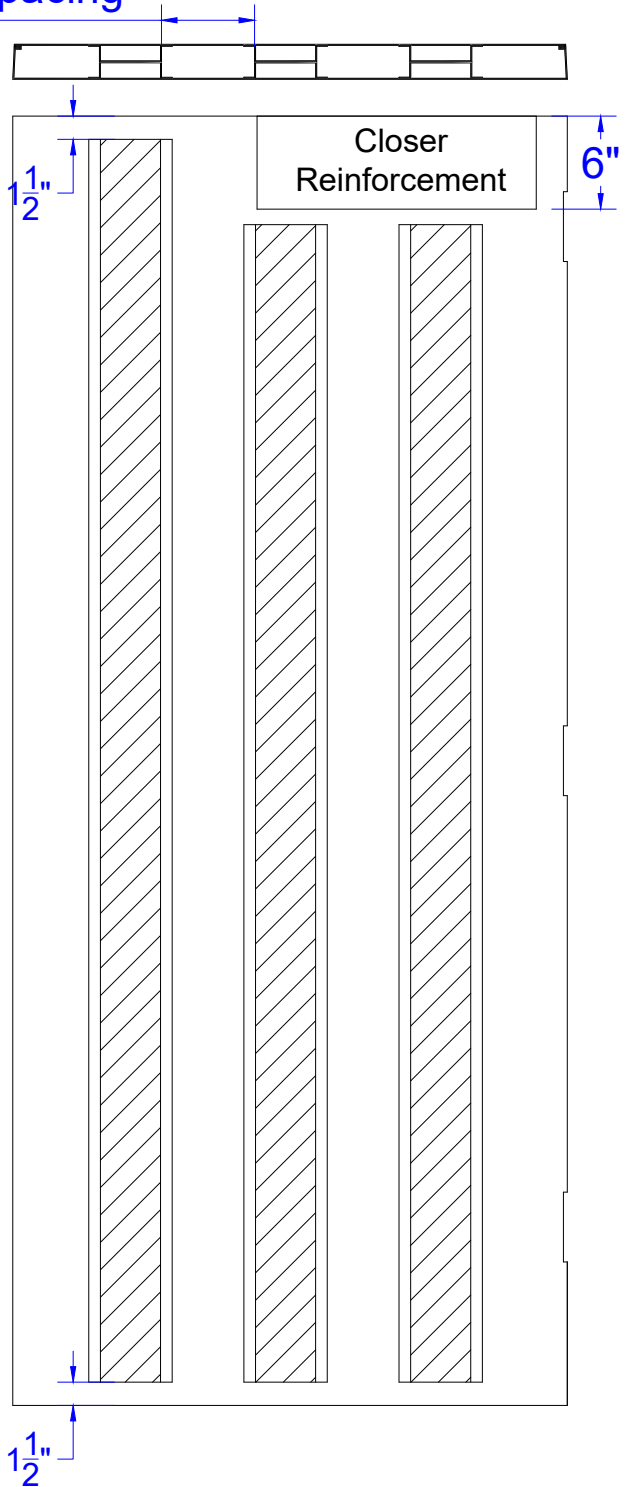


6" maximum spacing



Width of door	Stiffener Width	# of stiffeners
24"	4"	4
26"	4"	4
28"	4"	6
30"	4"	6
32"	4"	6
34"	4"	6
36"	4"	6
38"	4"	8
40"	4"	8
42"	4"	8
44"	4"	8
46"	4"	8
48"	4"	10
50"	4"	10
52"	4"	10
54"	4"	10
56"	4"	10
58"	4"	12
58 7/16"	4"	12

Distance from lock edge is 6" maximum

Spacing between stiffeners is 6" maximum

Stiffener height = vertical space - 3"
 (For example, if net height is 83 1/4" stiffeners will be 80")

If door is closer reinforced, 4 stiffeners need to be downsized an additional 6"
 (For example, if door has 6 stiffeners and is 83 1/4" tall, 4 stiffeners will be 74")

Concept Frames

2015 Industrial Drive, Newton, NC 28658
 PH: 888-234-9455 Fax: 800-631-9089
www.ConceptFrames.Com

Drawn By: KX

Date: 2-20-2015

Door Stiffener Worksheet

PermaTherm

EPS

PermaTherm EPS is a closed cell, lightweight, resilient, foamed plastic composed of hydrogen and carbon atoms. PermaTherm EPS has a compressive strength of 10-60 psi for most construction applications. Within that range PermaTherm EPS can be molded to meet specific application requirements.

Applied in roofs, walls, and foundations, PermaTherm EPS has a successful history of efficient use in industrial, commercial, cold storage and residential construction. Where energy efficiency and cost effectiveness have long been primary design considerations, architects have made PermaTherm EPS the dominant thermal insulation.

Long-term Insulation Value

PermaTherm EPS insulation (1.0 pcf) provides a typical R-value of 4.17 per inch (k-factor=0.24) at a

mean temperature of 40°F, and a typical R-value of 3.85 per inch (k-factor=0.26) at a mean temperature of 75°F. The higher the R-value, the higher the insulating effect. When properly installed and protected from moisture, the R-value of PermaTherm EPS insulation remains constant. The R-value will not decrease with age. As a result, the thermal resistance, or R-value of PermaTherm EPS may be used without any adjustment for aging.

Moisture Resistance

A study by the Energy Materials Testing Lab (EMTL) has shown that EPS insulation material installed in well constructed roofs does not absorb appreciable moisture, even under conditions characteristic of prolonged, cold, damp winters. The small amount of moisture absorbed (an average of 0.2% by weight) has little or no effect on the compressive or flexural strength and the EPS insulation retains between 95% and 97% of its thermal efficiency.

Though EPS has low water vapor transmission, EPS is not a vapor barrier. Rather, it "breathes" and, therefore needs no costly venting as do some other relatively impermeable insulation materials which could otherwise trap moisture within walls and roof assemblies.

Temperature Cycling

PermaTherm EPS is able to withstand the abuse of temperature cycling, assuring long-term performance. In a series of tests conducted by Dynatech Research and Development Co. Cambridge, Mass., core specimens removed from existing freezer walls, some as old as 16 years, demonstrate EPS freeze thaw cycles without loss of structural integrity or other physical properties.

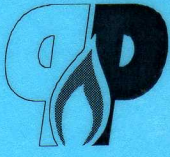
Typical Physical Properties of PermaTherm EPS Insulation

Specification Reference:	ASTM C 578-92	Type I	Type VIII	Type II	Type IX	
Property	Units	ASTM Test				
Density, minimum	(pcf)	D303 or D 1622	0.90	1.15	1.35	1.80
Density Range			0.90-1.14	1.15-1.34	1.35-1.79	1.80-2.20
Thermal Conductivity	at 25 F	C177 Or C518	0.23	0.22	0.21	0.20
K Factor	at 40 F	@ 1.625"	0.24	0.235	0.22	0.21
	at 75 F		0.26	0.255	0.24	0.23
Thermal Resistance	at 25 F	@ 1.625"	4.35	4.54	4.76	5.00
R-value*	at 40 F	6 8	4.17	4.25	4.55	4.76
	at 75 F		3.85	3.92	4.17	4.35
Strength Properties						
Compressive 10% Deformation	psi	D 1621	10 - 14	13 - 18	15 - 21	25 - 33
Flexural	psi	C 203	25 - 30	30 - 38	40 - 50	50 - 75
Tensile	psi	D 1623	16 - 20	17 - 21	18 - 22	23 - 27
Shear	psi	D 723	18 - 22	23 - 25	26 - 32	33 - 37
Shear Modulus	psi		280 - 320	370 - 410	460 - 500	600 - 640
Modulus of Elasticity	psi		180 - 220	250 - 310	320 - 360	460 - 500
Moisture Resistance						
WVT	perm. in.	E 96	2.0 - 5.0	1.5 - 3.5	1.0 - 3.5	0.6 - 2.0
Absorption (vol.)	%	C 272	< 4.0	< 3.0	< 3.0	< 2.0
Capillarity	—	—	none	none	none	none
Coefficient of Thermal Expansion	in./in.)(f)	D 696	0.000035	0.000035	0.000035	0.000035
Maximum Service Temperature						
Long term exposure	F		167	167	167	167
Intermittent exposure			180	180	180	180
Oxygen Index	%	D 2863	24.0	24.0	24.0	24.0

R-value is a measure of resistance to heat flow. The higher the R-value, the greater the insulating effect.

JULY, 1998

<p>PERMATHERM, INC. 269 INDUSTRIAL PARK ROAD MONTICELLO, GA 31064</p> <p>EMERGENCY TELEPHONE NUMBER (706-468-7500)</p>	<p>EMERGENCY & FIRST AID PROCEDURES.....NONE</p>
<p>SECTION NOMENCLATURE</p> <p>CHEMICAL NAME.....Expanded Polystyrene foam (EPS) CHEMICAL FAMILY.....Polystyrene FORMULA.....(C₈H₈)_n with flame retardant</p>	<p>SECTION VI REACTIVITY DATA</p> <p>STABLE.....YES INCOMPATIBILITY.....NONE HAZARDOUS DECOMPOSITION...NONE CONDITIONS TO AVOID.....Do Not Expose to Flame or Other Ignition Source</p>
<p>SECTION II HAZARDOUS INGREDIENTS</p> <p>None when residual pentane blowing agent is reduced to level described in Section IX.</p>	<p>SECTION VII SPILL OR LEAK</p> <p>Normal good housekeeping should be observed in properly disposing of scrap material. Dispose of waste in accordance with local ordinances.</p>
<p>SECTION III PHYSICAL DATA</p> <p>BOILING POINT.....Not Applicable SOLUBILITY IN WATER.....None DENSITY.....0.75 - 2.0 PCF PERCENT VOLATILE (VOL)...0.18% Pentane & Water EVAPORATION RATE.....Not Applicable APPEARANCE & COLOR.....Rigid Cellular Foam Block or Board, White, No Odor.</p>	<p>SECTION VII SPECIAL PROTECTION INFORMATION</p> <p>RESPIRATORY PROTECTION ... NONE May act as obstruction of swallowed. VENTILATION.....None PROTECTIVE GLOVES.....None EYE PROTECTION.....Safety Glasses recommended to avoid dust if saw is used for fabrication.</p>
<p>SECTION IV FIRE AND EXPLOSION</p> <p>EXTINGUISHING MEDIA.....Water Fog, CO₂, Dry Chemical SPECIAL FIRE FIGHTING PROCEDURES..None UNUSUAL FIRE & EXPLOSION HAZARDS..May Emit Large Volumes of Dense, Black Smoke</p>	<p>SECTION IX SPECIAL PRECAUTIONS</p> <p>Immediately after molding EPS into blocks the residual blowing agent, pentane, entrapped within the blocks ranges from about 2.0 to 3.0% by weight. The blocks are then stored at room temperature or at elevated temperatures (e.g. < 150° F.) to reduce the entrapped pentane and moisture to less than 1% by weight (0.18% by volume) for dimensional stabilization. The block storage areas must be adequately ventilated to avoid a hazardous build-up of flammable pentane vapors. If the product in block or board form is to be fabricated by hot-wire cutting, work areas should be ventilated to avoid a buildup of processing fumes.</p>
<p>SECTION V HEALTH HAZARD</p> <p>THRESHOLD LIMIT VALUE.....None EFFECTS OF OVEREXPOSURE.....None</p>	



PYROPHOBIC SYSTEMS LIMITED

649 Welham Road, Barrie, Ontario L4N 0B7 Tel (705) 730-0840 Fax (705) 730-0855

Core Specifications:

Size: 74.5" - 80" (H) x 33 1/2" (W)
Density: 21 - 24 pounds per cubic foot.
Weight: 51 - 58 lbs/core (pallet of 40 cores each). Average 55 lbs/core
Colour: Pink
Thickness: 1 - 21/32"
Tensile Strength: 150 psi

Characteristics:

- Inorganic based composite core (Patented)
- Fibreglass sheeting on both sides.
- Maximum 3 joined pieces per door.
- Available in sheets of up to 80" in length.

*For further information, please contact
Kristen Lock, Sales
Tel: (705) 730-0840 Fax: (705) 730-0855
Email: pyrophobic@aol.com*

Labelling:

Approved by ITS (Warnock Hersey) and UL for 1.5 hour and 3 hour positive pressure (including negative pressure) steel doors (UBC 7-2 (1997), NFPA 252 (1999), UL 10C (1998) and ULC CAN4-S104-M80 (1985) for the following:

single doors (up to 4'x8')
standard double doors (up to 8' x 8'),

and approved by ITS (Warnock Hersey) for 1.5 hour positive and negative pressure for:

double egress (up to 8' x 8').

Please contact Pyrophobic Systems Limited, ITS (Warnock Hersey) or UL for labelling.

DOOR SPECIFICATIONS:

The following specifications are required for ITS (Warnock Hersey) or UL listing. For further information, please contact ITS, UL or Pyrophobic Systems.

Fire Door:

Hollow Metal Temperature Rise Doors for Installation at 1-1/2 and 3 hour locations

Temperature Rise:

250°F @ 30 minutes (U.S. Standard)
450°F @ 60 minutes (U.S. Standard)
250°C @ 60 minutes (Canadian Standard)

Size:

Single: up to 4' x 8' high
Standard Pairs: up to 8' x 8' high, astragal required
Double Egress Pairs: up to 8' x 8' high, vertical rods, fire exit hardware & astragal required

Thickness: 1 21/32"

Skins:

Flush, 20 gauge minimum to 16 gauge maximum

Core:

Pyrophobic core bearing a WH and UL ink stamp on each core, maximum 3 peices per door, (9" vertical joint, 7" horizontal joint).

Adhesive:

- As approved by ITS or UL for positive pressure rated fire doors.

Vision Panels:

- 100 sq. in. maximum, 5" x 20", 10" x 10", 3" x 20", or 11.25" round listed lites.
- Listed lite kit 0.038" - 0.003".

Astragal:

- Z type (14 gauge)
- Blank, ASA or ASA/Flush bolts or flat bar type 10 gauge

Hardware:

- Hinges: Ball bearing hinges per NFPA 80 or listed spring hinges, or continuous hinges.
- Latches: Listed cylindrical latch 1/2" throw, listed mortise latch 3/4" throw.