ENERGY ICE™

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a division of CUSTOM ICE inc.

EnerShield™- PR Low Emissivity Ceiling System Specifications

PART 1 GENERAL

1.1 Scope

a) The contractor shall furnish and install a complete overhead suspended **EnerShield** low emissivity ceiling curtain system with the appropriate coverage as called for in the associated project drawings and specifications. The EnerShield low emissivity ceiling curtain system is provided by **Energy Ice Inc.** of Burlington, Ont. Office (905) 632-0423.

b) The contractor shall also include in their bid, a installation reference list with a minimum of 10 previous EnerShield installations which have been installed by this contractor. Included in this list must be the facility name, facility location, contact name, and contact phone number.

1.2 Submittals

a) Shop Drawings: The manufacturer (Energy Ice) shall upon receipt of contract from the owner or his contractor, prepare submittals of materials as well as construction detail for installation. Manufacturer will provide submittals to owner and/or his contractor for any changes in print dimensions for approval before fabrication of materials.

b) Warranty: Entire ceiling system shall be warranted against defects in material and workmanship for a period of three (3) years from the date of installation.

1.3 Qualifications

All materials will be per plans and specifications of Energy Ice Inc. and constructed, manufactured and installed per project plans and specifications. All equipment and materials supplied under these specifications shall be new and of the best grade material and construction.

1.4 Delivery

To be arranged with owner and/or his representative to coincide with timely completion of entire project.

PART 2 PRODUCT

2.0 General

The system specified is based solely upon the characteristics and standards listed herein. The listed criteria has been established as the minimum acceptable values for any low emissivity ceiling system to be offered on this project. As all aspects and equipment within the ice rink have been designed to utilize the low emissivity ceiling principle, products not meeting the minimum requirements listed will not be accepted as they could adversely affect the performance of the rink.

Only those materials or exceeding the following ASTM values and surface burning characteristics shall be acceptable.

2.1 Materials

Low Emissivity material shall be **EnerShield-PR** by Energy Ice Inc. It shall have an emissivity of 0.03 and a bursting strength of 550 beach units. Low emissivity ceiling material shall be composed of 0.0003" polished aluminum foil laminated to a polyester/fibreglass blend fabric with a flame resistant adhesive. It shall have the physical properties as listed below.

ENERSHIELD™-PR
FOIL/FIBERGLASS-POLYESTER BLEND FABRIC

FACING COMPOSITION	DESCRIPTION	VAL UES (ENGLISH)	VALUES(METRIC)
Foil	Aluminum	0.0003 inch	7.6 micron
Adhesive	Flame Resistant		
Fabric	Fiberglass/Polyester	75 lbs/3000ft	122 gm/m

PHYSICAL PROPERTIES	TEST METHOD	VALUES (ENGLISH)	VALUES (METRIC)
Basis Weight	Scale	32 lbs/1000ft	156 gm/m
Permeance (WVTR)	ASTM E 96 Procedure A	0.02 perm (grains/hrftin Hg)	1.15 ng/Ns
Bursting Strength	ASTM D774	250 psi	17.6 kg/cm
Puncture Resistance	ASTM C1136	550 beach units	16.4 Joules
	ASTM C1136	195 lbs/inch width (MD)	34.1 kn/m (MD)
		150 lbs/inch width(XD)	26.3 kn/m (XD)
Caliper/Thickness	Micrometer	0.006 inch	152 micron
Accelerated Aging	30 Days @ 95% RH, 120°F (49°C)	No Corrosion No Delamination	No Corrosion No Delamination
Low Temperature Resistance	ASTM D1790 -40°F(-40°C)	Remains Flexible No Delamination	Remains Flexible No Delamination
High Temperature Resistance	ASTM D1790 240°F(116°C)	Remains Flexible No Delamination	Remains Flexible No Delamination
Water Immersion	24 hours @ 73°F(23°C)	No Delamination	No Delamination
Mold Resistance	ASTM C665	No Growth	No Growth
Dimensional Stability	ASTM D1204	0.25%	0.25%
Emissivity	ASTM E408	0.03	0.03

FIRE TESTING	UL-723		CAN ULC-S102M	
	Flame Spread	Smoke Developed	Flame Spread	Smoke Developed
Foil Exposed	5	5	5	5
Fabric Exposed	5	5	5	5

2.2 Suspension System

Individual ceiling sections shall supported by a suspension system consisting of PVC coated aircraft cables running the length of the ice rink at approximately 4' centers. Cables shall be galvanized 3/32" in diameter – PVC coated to a diameter of 3/16". Cables shall have a minimum breaking strength of 920 lbs tension. Cables shall be secured at each end to structural building members and vertically with intermediate supports at a maximum spacing of 30' c/c. Intermediate support shall be accomplished by drilling a ¼" hole through the structural beams at 4' c/c at a level 2-3" above the existing sprinkler heads and just below the existing roof deck.

All cables shall be connected using a minimum of one 6" hook and eye turnbuckle. Each connection shall be made with a minimum of two micro press aluminum crimping sleeves. Side cables shall be tensioned with a minimum of two (2) – 6" turnbuckles. All cable connections, supports and terminations shall be as specified in the project drawings.

2.3 Clamping System

Each individual low emissivity ceiling section shall be terminated at each side by clamping to a 3/16" OD aircraft side cable using the Energy Ice extruded snap clip. Side termination cables shall be 3/16", 7x19 strand, plain galvanized steel aircraft cable. Clamps shall be designed to tightly hold low emissivity material in place at adequate tension to prevent sags or gaps in low emissivity ceiling material. Clamps shall be removable to permit roof & beam inspections or other low emissivity ceiling adjustments. Permanent or non-removable fastening systems will not be accepted. (Ref drawing P1)

2.4 Installation

EnerShield low emissivity ceiling shall be installed from side wall to side wall and end wall to end wall in the rink with a coverage of approximately _____' x _____'.

Low emissivity ceiling panels shall be suspended side by side above the cables with a minimum 6" overlap between panels. Panels shall be tensioned above cables to create a smooth finished surface and prevent any unevenness or gaps in the overlapping edges.

Small cuts or slits may be made in each panel to accommodate obstructions such as lights, fans, heaters, knee braces etc. All edge cuts shall be supported by the adjacent panel and shall be reinforced with EnerShield edge tape suitable for low emissivity ceiling applications.

2.5 Manlift Equipment

This installation contractor will provide articulating or boom manlift equipment required for the installation. Manlift shall be required for a minimum 2 week time period. It shall be propane powered and suitable for reaching to all surfaces at the existing rink interior roof deck.

Should you require further information please contact:

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