

*Design
Fabrication*

Insulated Tensioned Membrane

*Installation
Service*



BIRDAIR

Tensile Architectural Structures

TENSOTHERM™
INSULATED TRANSLUCENT MEMBRANE ROOFING SYSTEM



*Dedmon Center Basketball Arena
Radford, Virginia*

System Description

Tensotherm™ is the world's first and only anticlastic and translucent insulated tensioned membrane system. To create Tensotherm, a thin translucent blanket, embedded with aerogel, is placed between a PTFE or PVC-coated fabric membrane exterior skin and a thinner and lighter acoustic or vapor barrier interior liner. The resulting composite material - Tensotherm - is a thin, flexible and highly translucent glazing system that provides extraordinary benefits.

PTFE Fiberglass Membrane or PVC

Translucent Aerogel Insulation

Acoustic or Vapor Barrier Liner Membrane

Features and Benefits

- ▶ Enhances a tensioned membrane systems thermal, solar and acoustic capabilities while maintaining its translucent daylighting capability
- ▶ Provides diffused glare-free natural daylighting resulting in energy cost savings while creating a beautiful interior environment
- ▶ Reduces solar heat gain coefficient (SHGC) by at least 18.3% over non-insulated tensioned membrane systems
- ▶ Absorbs 70%¹ of broadband noise and reduces sound transmission up to 21 Db² and performs exceptionally in sound absorption at low frequencies
- ▶ Aerogel insulation maintains its performance characteristics for the entire 25-plus-year lifespan of the system
- ▶ Weighs normally 1lb/ft² ideal for small/mid-size to long-span applications
- ▶ Achieves up to a tenfold increase in thermal performance over a non-insulated tensioned membrane roof utilizing aerogel, the world's best and lightest insulating solid
- ▶ Retains design capabilities (i.e., non-rectilinear forms) of non-insulated tensioned membrane systems
- ▶ Hydrophobicity of aerogel insulation, combined with waterproof membranes, creates a continuous vapor barrier and mitigates problems associated with moisture
- ▶ Meets a return on investment (ROI) through energy and HVAC equipment savings within a five to 12 year timeframe, depending upon system specification, local climate and energy costs

¹ per ASTM 423

² per ASTM E90



Tensotherm's Technical Performance

Performance Category	Blanket Thickness			Test Method
	8mm	16mm	24mm	
Thermal Performance				
U-Value (w/m ² K)	1.16	0.76	0.56	ASTM C1363
R-Value (ft ² °Fhr/Btu)	4.90	7.50	10.10	ASHRAE 90.1
Solar Heat Gain Coefficient	5.30%	3.40%	2.30%	SHGC = T + (U/h) x A
Acoustic Performance				
Absorption (Sabins/ft ²)	0.55	0.69	0.73	ASTM C423
STC	18.0 dB	19.0 dB	21.0 dB	ASTM E90
Fire Performance	Class A	Class A	Class A	ASTM E84, ASTM E108, NFPA 701 DIN EN-13501-1 in accordance with EN 13823 EU Building Class B, S1
Visual Transmittance	4.3%	3.0%	2.2%	ASTM E424 Method B

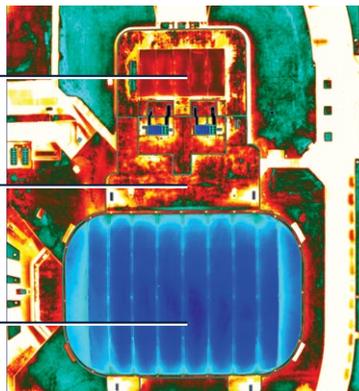
Note: The values for 16mm Acoustical Absorption and Sound Transmission Class were measured in a laboratory. The 8mm and 24mm values were modeled based on the 16mm performance. The values also assume that the Tensotherm is used in a roof / ceiling configuration with the inner surface facing the interior of the structure and the outer surface facing outside the structure (no near field reflective surfaces behind the outside of the Tensotherm). For the basis of performance, the outer material is Sheerfill II-HT (PTFE) and the liner material is Fabrasorb 1A (PTFE).

An aerial thermograph reveals Tensotherm's effective insulating capability.

Standard Tension Membrane: Outer & Liner
(1 foot gap, no insulation)

Traditional built-up roof

Tensotherm roof





Who is Birdair?

Birdair is the leading specialty contractor for custom tensile membrane structures throughout the world.

With more than 50 years of experience, Birdair has worked with owners, architects, engineers and contractors to design and build custom tensile structures used to create innovative roofing systems, canopies and skylights. As a turn-key specialty contractor, Birdair provides pre-construction assistance; including design assistance, budgeting, construction methodologies and project

schedule development. Our in-house capabilities consist of design, engineering, fabrication, installation and maintenance.

Working closely with architects and their clients, Birdair assists in delivering award-winning solutions by taking an idea and building an icon. Our work ranges from secure transportation terminals to sports venues and convention centers; from festive entertainment, performing arts facilities and museums to offices, hotels, resorts and visitor centers; from eye-catching retail complexes to walkways and porte-cochères. To date, the company has completed more than 1,300 major installations in more than 30 countries, requiring over 30 million square feet of architectural fabric membrane.

Birdair is committed to the ongoing development of tensile architecture, working diligently to further promote the most modern technologies available and to continually innovate signature, high-quality designs.



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