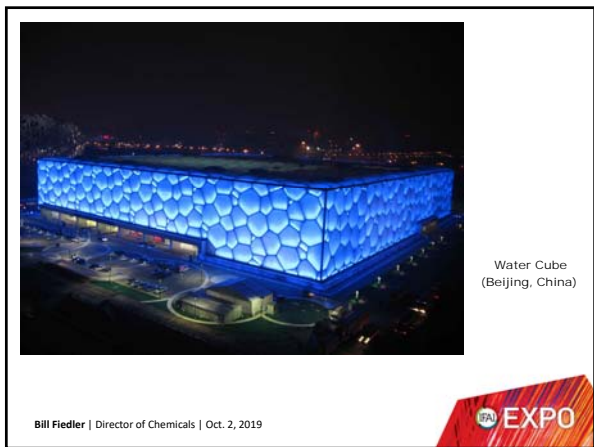




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ETFE

A Brief Chemistry Lesson

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MONOMERS WORKING TOGETHER

ETFE
MONOMERS MAKING
A COPOLYMER

E = ETHYLENE UNIT

TFE = TETRAFLUOROETHYLENE UNIT

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POWER OF THE ETFE CHEMICAL CHAIN

ETHYLENE
MONOMER UNIT

$$\left(\begin{array}{cc} \text{H} & \text{H} \\ | & | \\ -\text{C} & - & \text{C}- \\ | & | \\ \text{H} & \text{H} \end{array} \right)_m \left(\begin{array}{cc} \text{F} & \text{F} \\ | & | \\ -\text{C} & - & \text{C}- \\ | & | \\ \text{F} & \text{F} \end{array} \right)_n$$

TFE MONOMER UNIT


**ALTERNATING
COPOLYMER STRUCTURE**

C = Carbon Atoms - Form The Main Chain

F = Fluorine Atoms - Have Higher Molecular Weight
And Are Larger In Size

H = Hydrogen Atoms - Are Smaller In Size

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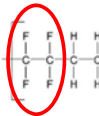


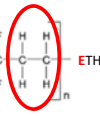
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POWER OF THE MONOMER UNITS

TFE MONOMER UNIT






ETHYLENE MONOMER UNIT

ALTERNATING COPOLYMER STRUCTURE

- ETHYLENE Provides Mechanical Strength
- TFE Provides High and Low Thermal Stability
- TFE Provides Excellent Weatherability
- TFE Provides Broad Chemical Resistance

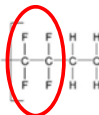
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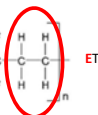


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POWER OF THE MONOMER UNITS

TFE MONOMER UNIT






ETHYLENE MONOMER UNIT

ALTERNATING COPOLYMER STRUCTURE

- TFE Monomer Unit Is Larger In Size, Protecting The Smaller ETHYLENE Monomer Units
- A TERMONOMER Is Added To Provide Transparency And Elasticity

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TRANSFORMING COPOLYMER RESIN INTO FILM



→



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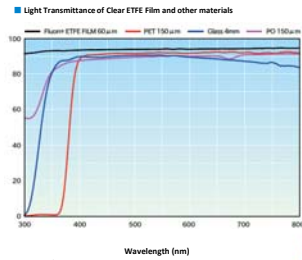


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WHY ETFE FILM ? LET THERE BE LIGHT

**High Quality
Light Transmittance**

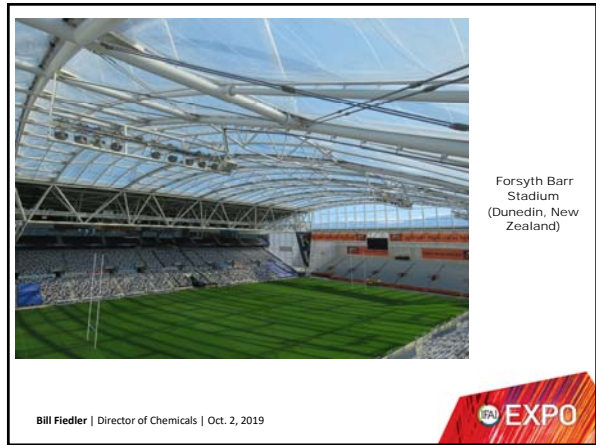
Good Values Across The Wavelength Spectrum
Stable Light Transmission Above 90%



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Forsyth Barr Stadium
(Dunedin, New Zealand)

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Buffalo Zoo - Tropical Rain Forest
(Buffalo, NY)

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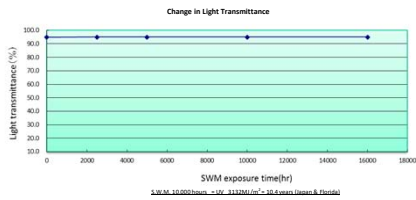


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WHY ETFE FILM ? LET THERE BE LIGHT

**High Quality
Light Transmittance**

Long Term Light Transmission Stability
Not Impacted By UV Degradation



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Greenhouse Covering

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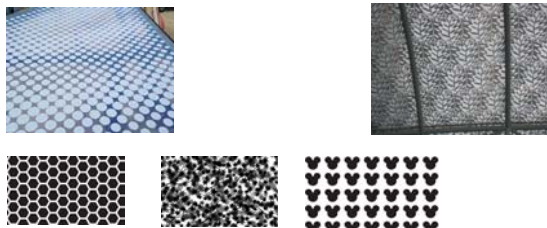


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WHY ETFE FILM? LIGHT CONTROL OPTIONS

**High Quality
Light Transmittance That Can
Be Controlled**

Reflective Frit Print Options
Options of Blue and White Colored Films



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Emerald Glen Park - The Wave
(Dublin, CA)



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Emerald Glen Park - The Wave
(Dublin, CA)

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WHY ETFE FILM? STRONG


Excellent Mechanical Properties	High Tensile Strength & Tensile Elongation
	High Tear Propagation Resistance

■ Mechanical Properties

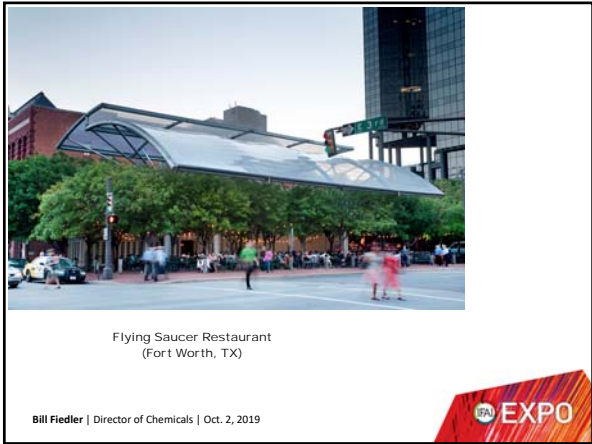
	Fluon® ETFE Film 250um	Test Method
Tensile Strength (Min.)	50 MPa 7250 psi	ASTM D638
Tensile Elongation (Min.)	350 %	ASTM D638
Tear Strength (Min.)	140 N/mm	ASTM D1004



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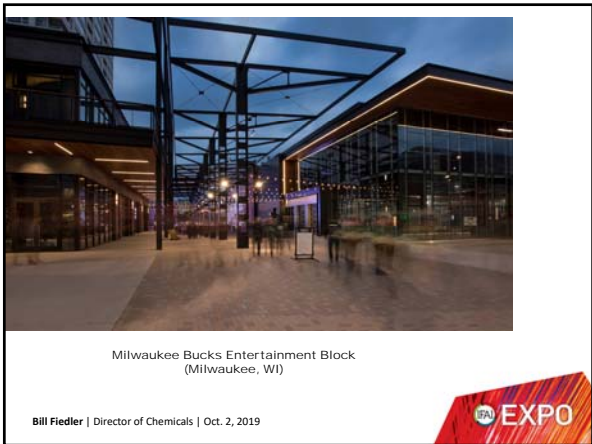
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Shin-toyosu Brilliant Running Stadium
(Tokyo, Japan)





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WHY ETFE FILM? OTHER VALUABLE FEATURES


High Performance Features	Light weight: Only 0.97lbs(440g)/m ² *250um
	Low Surface Energy, Non-stick Surface
	Flexible Design, Lighting Options
	Thermal Insulation Values




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Singapore Sports Hub
(Kallang, Singapore)



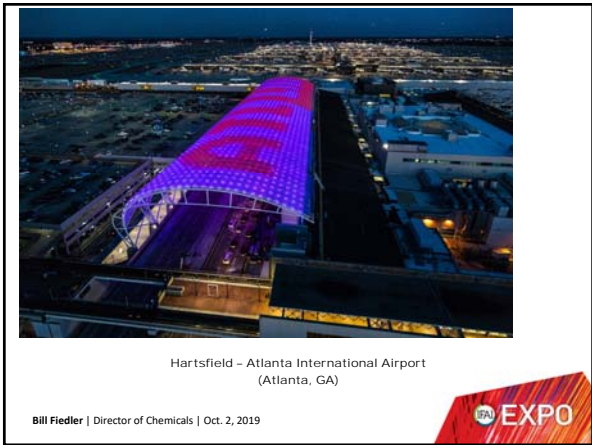
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Product Alternatives and Development

- DIFFUSED LIGHT FILM – SCATTERS THE LIGHT TRANSMISSION
- UV CUT FILM – REDUCE THE IMPACT OF UV
- FRIT INK OPTIONS – HIGHER REFLECTION, SEAL COAT FOR FRIT PROTECTION, WHITE INK
- LOW HAZE – 12% HAZE DOWN TO 6%, MOVE TO 2% LIKE GLASS
- HIGHER STRENGTH FILM – EXTEND THE YIELD POINTS
- FILM LAMINATION – OPEN WEAVE GLASS CLOTH, DOUBLE FILM LAMINATION

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ETFE Film
Properties and Features

Creating Beauty Through Innovation

THANK YOU!



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See you next year!



NOV. 3-6, 2020 | INDIANAPOLIS, IN USA

100 Years of Textile Innovation



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