



SKYTOP

Architectural Fabrics for Permanent Membrane Structures



What is Fluoropolymer Membrane



Types of Membrane Structures

Framed Membrane Structure

Types of framed structures that are composed of frames formed into three-dimensional shapes such as mountain-shapes, arch-shapes, etc. and membrane materials covering those frames as roofs and walls.

Suspension Membrane Structure

Types of structures that use suspending membrane materials as their main structural elements.

Air-supported Structure

Types of Structures that are supported by air fed into space totally covered with membrane materials.

Pioneer of the Membrane Structure era of Japan.

Since our foundation as a manufacturer of all kinds of fluoroplastic products, we have always made great effort to develop new products and novel technologies.

Above all, our fabric products, fluoroplastic coated glass cloths, are evaluated as top products worldwide in both quality and the scale of production.

We developed permanent architectural membrane materials for roofs, SKYTOP products, for the first time in our country by capitalizing on the manufacturing technologies of these fabric products.

The full-fledged membrane structure age in our country began with our SKYTOP products.

The safety and functionality of SKYTOP Architectural Membranes have been verified by a long history of successful projects in many countries.



Suvarnabhumi International Airport / Thailand

Advantages of Membrane Structures

Saving of Energy Cost

SKYTOP products have the high reflectivity and low absorption rate of sunlight as well as small heat capacity. So, the influx of solar energy into the inside of buildings is held low.

Comfortable Space Filled with Natural Light

The sunlight through SKYTOP changes into naturally diffused light with faint shadows, so that you can see things in their original colors that they have outdoors. In addition, since SKYTOP let in enough amount of light to grow plants indoors, comfortable spaces with outdoor feelings can be obtained.

Flexible Design Spreading Image

Since membrane structures generally cover large space with membrane materials without using internal support elements, flexible design and versatile space utilization are realized.

Everlastingly Clean Appearance

Thanks to the anti-stick property and water repellency of fluoroplastics, dust and smudge piled up on the SKYTOP surface are washed away every time it rains. As a result, the SKYTOP surface is kept clean and white.

Characteristics

Incombustibility

SKYTOP products, which are composed of incombustible polytetrafluoroethylene resins and glass cloths properties have excellent incombustibility.

Toughness

In general, as the diameter of the fiber filament decreases, its tensile strength per unit area increases and its diameter of loop decreases. Since SKYTOP uses B filaments that are currently the finest glass fiber filament in the world, the sufficient strength and safety of membrane structures are ensured when the structures are composed of SKYTOP products.

Solar Transmission

SKYTOP is translucent, so that sufficient natural light to grow plants can be obtained inside the structures. Since the light through SKYTOP changes into naturally diffused light with faint shadows, inner space with soft feelings can also be created.

Thermal Properties

The original white color of SKYTOP reflects most of the solar energy, so, the influx of heat into the building is minimized. In addition, the adoption of the double-layer membrane structures, which use inner membrane materials, further improves the thermal insulation effect under air-conditioning.

Weatherability

As SKYTOP is fully coated with polytetrafluoroethylene resins, it is unaffected by ultraviolet light and airborne pollutants. Therefore, it is capable of maintaining the function and safety as a roof material for a long period.

Self-cleaning Property

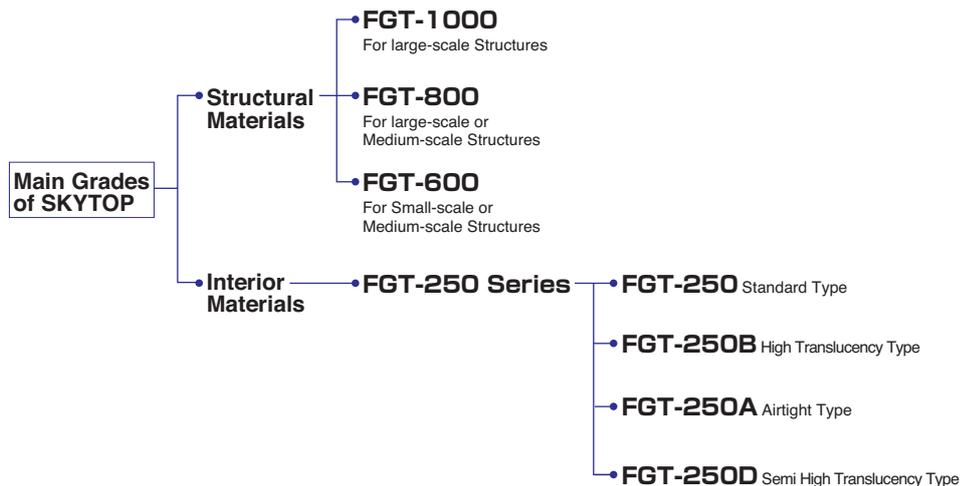
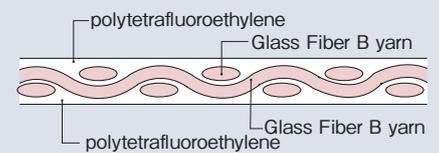
Dust and airborne pollutants that are deposited on the SKYTOP surface are washed away every time it rains, so that the SKYTOP surface is kept clean everlastingly without any special cleaning.

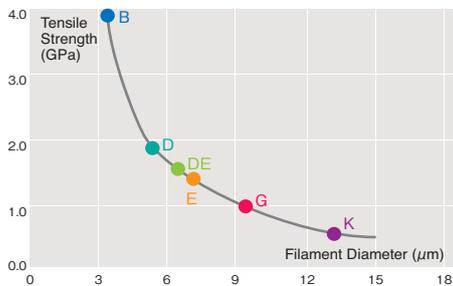
Sound Absorption Property

Since Interior membrane materials have moderate flexibility and air permeability, they give excellent sound absorption property to the membrane structures. The adoption of them as inner membranes of double-layer membrane structures will enhance acoustic effects inside the structures.

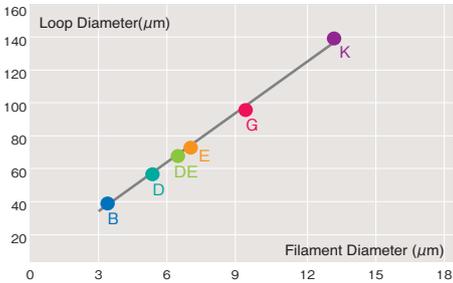


The Structure of SKYTOP (Cross-sectional view)

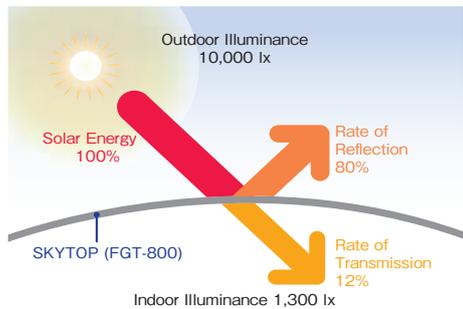




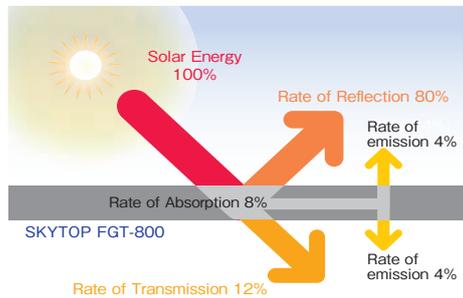
Filament Diameter vs. Tensile Strength



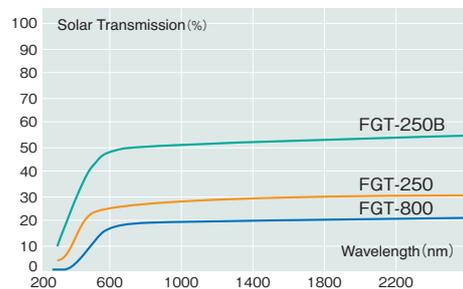
Filament Diameter vs. Loop Diameter



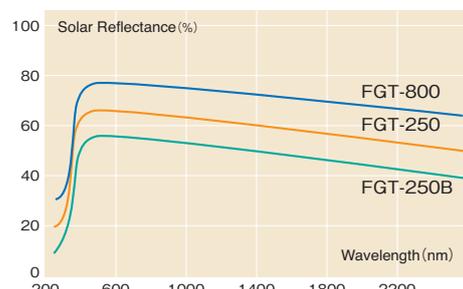
Indoor Illuminance (FGT-800)



Solar Energy Balance (FGT-800)



Solar Transmission



Solar Reflectance

Structural Materials

Items	Unit	FGT-1000	FGT-800	FGT-600	Test Method	
Thickness	mm	1.00	0.80	0.60	ISO 2286-3	
Weight	g/m ²	1700	1300	1000	ISO 2286-2	
Tensile Strength	Warp	N/2.5cm	4650	3530	3150	ASTM D 4851
	Fill		4000	3000	2630	
Tensile Strength	Warp	N/5cm	10300	7830	7000	ISO 1421 or DIN 53354
	Fill		8830	6670	5830	
Elongation at break	Warp	%	6.0	5.0	5.0	ISO 1421 or DIN 53354
	Fill		12.0	10.0	10.0	
Tear Strength	Warp	N	500	350	300	ASTM D 4851
	Fill		600	400	300	
Tear resistance	Warp	N	650	460	390	DIN 53363
	Fill		780	520	390	
Solar Transmission after bleaching	%	10	14	18	ASTM E 424	
Solar Reflectance after bleaching	%	76	75	72	ASTM E 424	

Values shown above are not standard values but measured values.

Interior Materials

Items	Unit	FGT-250	FGT-250A	FGT-250B	FGT-250D	Test Method	
Thickness	mm	0.37	0.40	0.23	0.28	ISO 2286-3	
Weight	g/m ²	470	600	250	340	ISO 2286-2	
Tensile Strength	Warp	N/2.5cm	2420	2420	1170	1850	ASTM D 4851
	Fill		1670	1670	1000	1350	
Tensile Strength	Warp	N/5cm	4830	4830	2330	3700	ISO 1421 or DIN 53354
	Fill		3330	3330	2000	2700	
Elongation at break	Warp	%	4.0	4.0	3.0	2.5	ISO 1421 or DIN 53354
	Fill		5.0	5.0	4.0	3.5	
Tear Strength	Warp	N	180	150	100	230	ASTM D 4851
	Fill		150	120	100	170	
Tear resistance	Warp	N	240	200	130	300	DIN 53363
	Fill		200	160	130	220	
Solar Transmission after bleaching	%	23	18	41	30	ASTM E 424	
Solar Reflectance after bleaching	%	68	80	52	60	ASTM E 424	
Air Permeability	cm ³ /cm ² ·s	8	—	10	10	JIS L 1096	
Sound Absorption Coefficient	NRC	0.45	—	0.45	0.45	JIS A 1409	

Values shown above are not standard values but measured values.

Obtained Certifications

Fire Performance	FGT-1000	FGT-800	FGT-600	FGT-250	Test Method
Incombustibility of substrates	Pass	Pass	Pass	Pass	ASTM E 136
Burning characteristics	Flame spread	0	0	0	ASTM E 84
	Smoke density	15	0	5	
Fire resistance of roof coverings	ClassA	ClassA	ClassA	-	ASTM E 108
Flame resistant	Large scale	Pass	Pass	Pass	NFPA 701
	Small scale	Pass	Pass	Pass	
Non-combustibility of substrates	Pass	Pass	Pass	-	BS 476 Part 4
Ignitability	P	P	P	-	BS 476 Part 5
Fire propagation	l=3.5	l=2.8	l=2.2	-	BS 476 Part 6
Spread of flame	Class 1	Class 1	Class 1	-	BS 476 Part 7
Incombustibility certification	Pass	Pass	Pass	Pass	Building Standard Law of Japan
Fire behaviour of building materials and elements	Class B1	Class B1	Class B1	Class B1	DIN 4102

※For other grades, please contact us.

SKYTOP Architectural Membrane Structures



■ Tokyo Dome
Location: Tokyo



■ Kawachi Sports Park Indoor Pool
Location: Tochigi



■ Shellcom Sendai
Location: Miyagi



■ Nagasaki Prefectural Sport Stadium
Location: Nagasaki



■ Jeju World Cup Stadium
Location: Korea



■ Komachi Stadium
Location: Akita



■ Kashima Soccer Stadium
Location: Ibaragi



■ Nelson Mandela Bay Stadium
Location: Republic of South Africa



■ Shizuoka Ecopa Stadium
Location: Shizuoka



■ Kokura Racecourse
Location: Fukuoka



■ Yas Marina Circuit
Location: Abu Dhabi





■ Hakata Station
Location: Fukuoka



■ Inazawa Station
Location: Aichi



■ Koriyama Station Taxi Stand
Location: Fukushima



■ Motosumiyosi Station
Location: Kanagawa



■ Shanghai Pudong International Airport
Location: China



■ Pompidou Centre Metz
Location: France



■ Yamaguchi Prefectural Kirara Park
Location: Yamaguchi



■ Cottbus Tower
Location: Germany



■ Gotemba Fuji Exchange Facility
Location: Shizuoka



■ Inzai Elementary School
Location: Chiba



■ Hokkaido Technical College
Location: Hokkaido



■ Kanaya Kindergarten
Location: Fukushima





Creating a future
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Warnings

- Do not use in applications in contact with the human body such as medical care, etc.
- Dispose products in compliance with the related laws and regulations and absolutely do not incinerate them.
- Do not use the product higher than the maximum continuous service temperature.
- Carefully read the catalog, product safety data sheet (MSDS), and fluoroplastic instruction manual in order to maintain functions essential to products and use products safely.

Website address <http://www.chukoh.com/>

ISO 9001 and 14001 registration

We have been registered / certified to ISO 9001 and ISO 14001 with respect to the following the scope of registration.

The Scope of the Registration
Design & Development, Production for all products, such as, the Products contained fluorocarbon plastics, the Fabrics coated with fluorocarbon resin, the Products coated with Silicone
the Products contained Biodegradable resin.

