



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

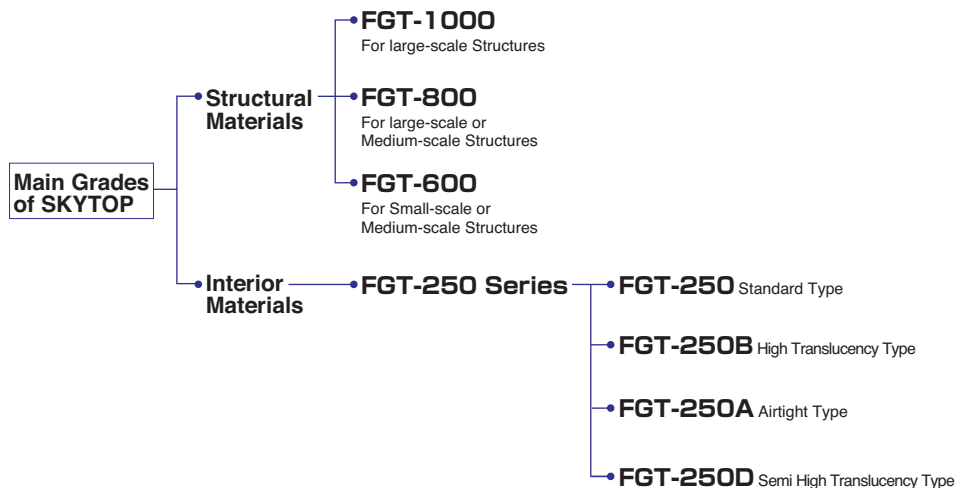
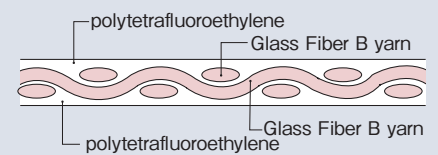
Dust and airborne pollutants that are deposited on the SKYTOP surface are washed away every time it rains, so that the SKYTOP surface is kept clean everlastingly without any special cleaning.

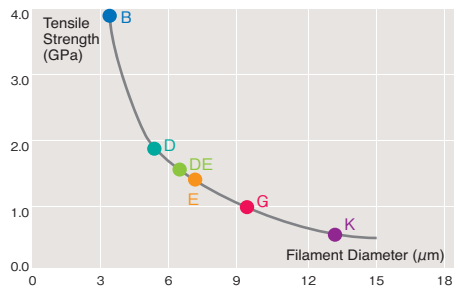
Sound Absorption Property

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.

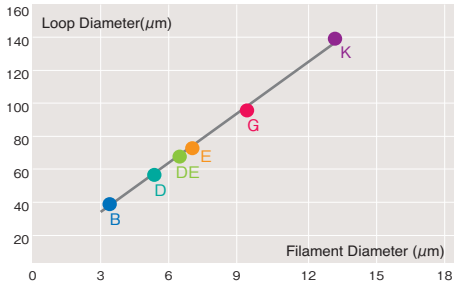


The Structure of SKYTOP (Cross-sectional view)

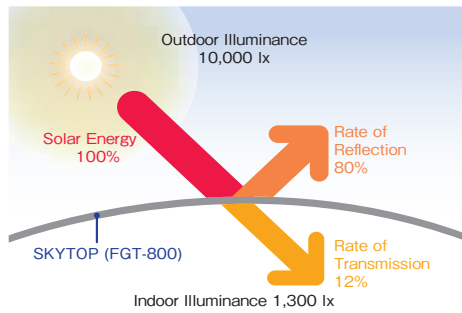




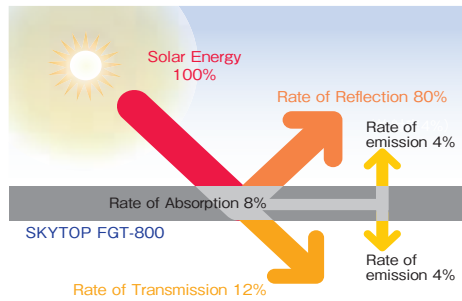
Filament Diameter vs. Tensile Strength



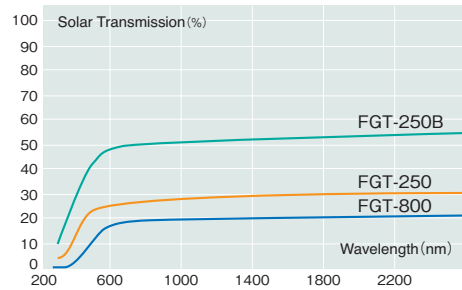
Filament Diameter vs. Loop Diameter



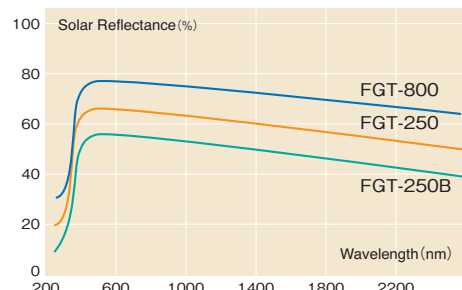
Indoor Illuminance (FGT-800)



Solar Energy Balance (FGT-800)



Solar Transmission



Solar Reflectance

Structural Materials

Items	Unit	FGT-1000	FGT-800	FGT-600	Test Method	
Thickness (nominal)	mm	1.00	0.80	0.60	ISO 2286-3	
Weight (nominal)	g/m ²	1700	1300	1000	ISO 2286-2	
Tensile Strength (minimum)	Warp	N/2.5cm	4400	3520	2940	ASTM D 4851
	Fill		4000	2820	2350	
Tensile Strength (minimum)	Warp	N/5cm	8200	7000	5800	ISO 1421 or DIN 53354
	Fill		7500	6000	4600	
Tear Strength (minimum)	Warp	N	360	260	200	ASTM D 4851
	Fill		400	260	200	
Tear resistance (minimum)	Warp	N	500	400	350	DIN 53363
	Fill		550	400	380	
Solar Transmission after bleaching (nominal)	%	10	12	15	ASTM E 424	
Solar Reflectance after bleaching (nominal)	%	82	80	78	ASTM E 424	

Numerical value of the table is a Standard value.

Interior Materials

Items	Unit	FGT-250	FGT-250A	Test Method	
Thickness (nominal)	mm	0.35	0.40	ISO 2286-3	
Weight (nominal)	g/m ²	470	600	ISO 2286-2	
Tensile Strength (minimum)	Warp	N/2.5cm	1920	1640	ASTM D 4851
	Fill		1440	1250	
Tensile Strength (minimum)	Warp	N/5cm	3600	3000	ISO 1421 or DIN 53354
	Fill		2700	2300	
Tear Strength (minimum)	Warp	N	170	110	ASTM D 4851
	Fill		100	80	
Tear resistance (minimum)	Warp	N	280	190	DIN 53363
	Fill		180	140	
Solar Transmission after bleaching (nominal)	%	19	18	ASTM E 424	
Solar Reflectance after bleaching (nominal)	%	78	78	ASTM E 424	
Air Permeability (nominal)	cm ³ /cm ² ·s	8	—	JIS L 1096	
Sound Absorption Coefficient (nominal)	NRC	0.45	—	JIS A 1409	

Numerical value of the table is a Standard value.

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.

