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Corporate site



Japanese



Chinese



Thai

**Caution**

- Do not use for medical applications or other usages involving a contact with human body.
- Observe the related laws and regulations for disposal. Do not incinerate in any case.
- Do not use at the temperature exceeding the maximum service temperature.
- Please read the catalogue and product safety data sheet (SDS) on our website to maintain the original functions of product and ensure safe use.

**Contact Information**

For inquiries on our products in general, please make inquiries by e-mail or through our WEB form, or contact the nearest office. Please feel free to contact us.

✉ support@chukoh.co.jp



WEB form

**Introduction of catalogues by product:**

We provide catalogues by product and leaflets with more details than the general catalogue. Please download from our website or feel free to contact support @chukoh.co.jp.

**About RoHS Directive compliant products:**

We aim to make all of our products compliant to RoHS Directive. You can download certificate of non-use of RoHS directive substances from this QR code.



Please note that information in the catalog is subject to change without notice.

[www.chukoh.com/](http://www.chukoh.com/)




**CHUKOH FLO™**  
**Products General Catalogue**  
Chukoh Chemical Industries, Ltd.

# AIMING TO CREATE A FUTURE!

Since the foundation, we have been devoting particular attention to **fluoroplastics** which is a polymeric material with unique characteristics, and striving for research and development thereof. As a result, we have successfully combined fluoroplastics with other materials and commercialized highly value-added products made from fluoroplastics. Meanwhile, fluoroplastics has been increasing its possibilities and is expected to be used for new applications in many industries, including **electricity, communication, machinery, foodstuffs, construction, and medical care**. Further, based on the technical assets we have accumulated on fluoroplastics, we have entered new fields using high-performance plastics including silicone and super engineering plastics.

In keeping with our slogan, "**Develop new products and open new fields,**" we will commit ourselves to the development of products in close cooperation with customers and strive to satisfy industrial needs, which are becoming increasingly diversified and sophisticated.


- FLUOROPLASTIC MEMBRANE 01-02
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**Heat resistance / Low temperature resistance**

Continuous use possible at high temperature


Fluoroplastics have high heat resistance and low temperature resistance. That means it can be used in a wide range of temperature.



**Insulation**

Excellent electrical insulation

Fluoroplastics have high electrical insulation properties. They give outstanding performances as high frequency insulation material and insulation coating.



**Chemical resistance**

Resistant to chemicals

The stable molecular structure of the fluoroplastic material is not affected by most of the commonly used chemicals and solvents. It can be safely used even under chemical environment.



**Lowest friction**

Highest slippage


Fluoroplastics having the lowest dynamic friction coefficient among all solid materials show the least slippage



**Non-stick property**

Non-stick properties provide easy release

Fluoroplastic materials have unique non-stick surface characteristic that allows easy release.



**Weatherability**

Resistant to ultraviolet resistance

Fluoroplastics are substantially free of effects of visible light, ultraviolet ray or moisture. Suitable for long-time outdoor use.

# FLUOROPLASTIC MEMBRANE

## CHUKOH FLO™ SKYTOP™

Japan's first permanent architectural fabric developed by Chukoh for membrane structures. It is a composite material produced by impregnating and sintering fluoroplastic on glass cloth (B yarn) by a unique method developed by Chukoh. Various types and grades are available according to the design and size of membrane structures.



### Primary applications

Stadium / terminal / station platform / shopping street arcade / shopping center / swimming pool / tennis court / aquarium / gymnasium / exhibition hall / meeting place / factory / warehouse / etc.

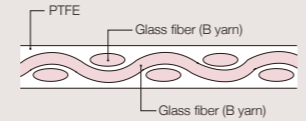
### Characteristics

- SKYTOP™ for structural materials is qualified by the Minister of Land, Infrastructure and Transport as the designated building material provided in Item 2, Article 37 of the Building Standard Law.
- SKYTOP™ is also qualified by the same Minister as the noncombustible material provided in Item 9, Article 2 of the same Law.
- Excellent in durability and weather resistance.
- Excellent translucency that allows ample sunlight into inner space.
- Hard to attract dust or dirt, which keeps good appearance for long.

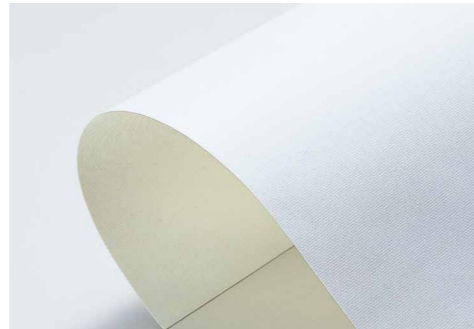
### Main grades

- FGT-1000: for large-scale structures
- FGT-800: for medium to large-scale structures
- FGT-600: for small to medium-scale structures
- FGT-250 series: for interior ceiling material

### The structures of SKYTOP™ (cross-section)



For more information



### General characteristics

Item	Unit	Structural material			Interior material			Test method	
		FGT-1000	FGT-800	FGT-600	FGT-250-1	FGT-250A-1	FGT-250B		
Standard width	mm	3800	3800	3800	3800	3800	—	—	
Thickness (median)	mm	1.00	0.80	0.60	0.35	0.40	0.23	JIS K 6404-2-3	
Mass (median)	g/m <sup>2</sup>	1700	1300	1000	470	600	250	JIS K 6404-2-2	
Tensile strength (minimum)	Warp	N/3cm	5500	4410	3681	2400	2058	1176	JIS L 1096 (Cut-strip method)
	Fill		5000	3528	2940	1800	1568	980	
Elongation at break (median)	Warp	%	6.0	5.0	5.0	3.0	3.0	—	JIS L 1096 (Non-contact extensometer method)
	Fill		12.0	10.0	10.0	4.0	4.0	—	
Tear strength (minimum)	Warp	N	400	294	225	153	127	59	JIS L 1096 (Trapezoid method)
	Fill		450	294	225	96	98	59	
Visible light transmission after bleaching (median)	%		10	12	15	19	18	40	JIS R 3106 (Spectrophotometer)
Visible light reflectance after bleaching (median)	%		82	80	78	78	78	60	JIS R 3106 (Spectrophotometer)
Ventilation measure (median)	cm <sup>3</sup> /cm <sup>2</sup> ·s		—	—	—	8	—	10	JIS L 1096 (Fragile method)
Sound absorption (median)	NRC		—	—	—	0.45	—	0.45	JIS A 1409 (Reverberation room method)

\* Values in the table are standard values.

### List of qualifications acquired

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	Class A	Class A	Class A	—	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	I=3.5	I=2.8	I=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

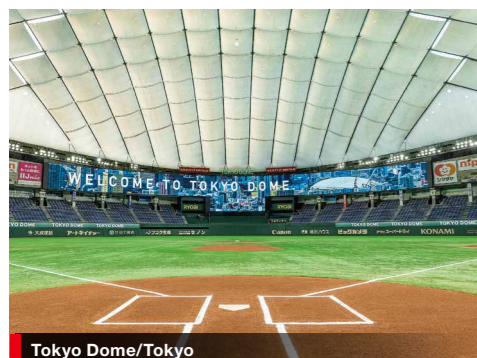
\* For other grades, please contact us.

### Comparison of general characteristics between SKYTOP™ and other building materials

Building material	Mass	Strength	Elongation	Flexibility	Weatherability	Incombustibility	Heat resistance	Chemical resistance	Self-cleaning property	Translucency	Cost performance
FGT	○	○	○	◎	◎	○	◎	◎	◎	○	△
Polycarbonate sheet	△	○	△	×	○	○	○	△	△	○	○
Color steel plate	△	◎	×	○	○	◎	◎	○	△	×	○
Sheet glass (float)	×	○	×	×	◎	○	○	◎	△	◎	△



Suvarnabhumi International Airport / Thailand



Tokyo Dome/Tokyo



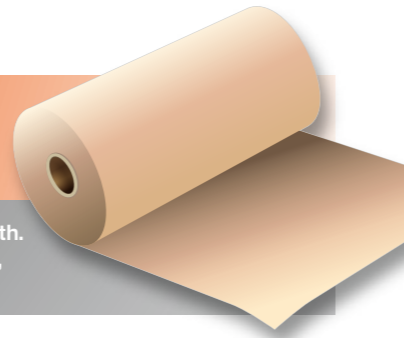
Nagasaki Prefectural Sport Stadium



Kanaya Kindergarten / Fukushima Prefecture

# CHUKOH FLO™ Fabrics

These are composite materials of fluororesin or silicone resin on industrial cloth such as glass cloth or aramid cloth. We further fabricate these composite materials to offer our products in a wide variety of fields including chemical, machinery, electric, telecommunication and construction fields.



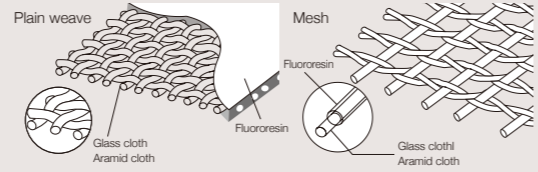
### Main applications

release sheets / insulating materials / conveyor belts / sliding materials / heat seal release materials / etc.

### Maximum service temperature

- Glass cloth fabric: +260°C
- Aramid cloth fabric: +200°C

### Structures



For more information

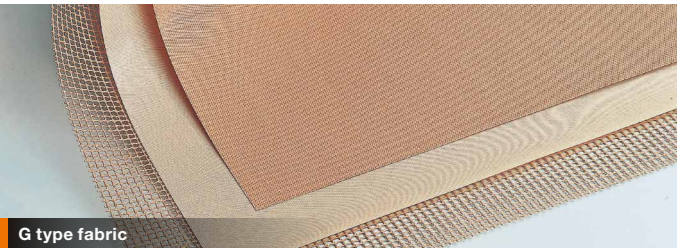


### G type fabric

This is a high-performance composite material obtained by impregnating and sintering fluororesin dispersion onto a glass cloth. This product has both mechanical strength of glass cloth and excellent characteristics of fluororesin. We also offer colored items.

### Characteristics

- It has excellent non-stick property, highest slippage, heat resistance and chemical resistance.
- It has excellent electric property with outstanding dielectric characteristic and dielectric breakdown strength.



G type fabric

### A type fabric / K type fabric

This is a high-performance material added antistatic effect. You can use this for any application where you have a static electricity problem.

### Characteristics

- Basic properties are similar to those of G-type.
- This product has superior mechanical strength and vapor resistance, in particular, to G type fabric.



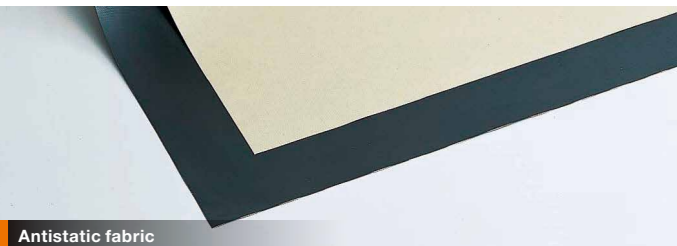
A type fabric

### Antistatic type fabric

This is a high-performance material added antistatic effect. You can use this for any application where you have a static electricity problem.

### Characteristics

- Basic properties are similar to those of G-type.
- We can offer black or gray colored product depending on the application.



Antistatic fabric

### Super fabric

This fabric has superior anti-penetration property, durability and the highest slippage characteristic to G type fabric.

### Characteristics

- Especially, it has excellent non-stick property and releasing ability.
- It has excellent anti-penetration and gas barrier properties.



Super fabric

### MS fabric

This fabric has the enhanced release effect by forming a special resin layer on the surface of G type fabric.

### Characteristics

- Especially, it has excellent non-stick property and releasing ability.



MS fabric

### Explanation of product code

e.g.)

<b>F</b>	<b>G</b>	<b>F</b>	<b>-</b>	<b>4</b>	<b>00</b>	<b>-</b>	<b>3</b>
Abbreviation	Base material	Appearance	Resin impregnation level	Cloth structure	Total thickness		
F: Fabric H: Super fabric	G: Glass cloth A/K: Aramid cloth	F: Natural B: Black C: Gray Y: Blue	3: Below the standard 4: Standard 5: Above the standard	00: Plain weave 10: Mesh	Indication x25/1000 (mm)		

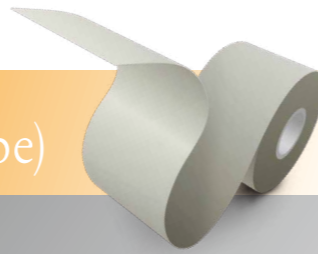
### Typical dimensions and properties

Grade	Product code	Total thickness (mm)	Maximum width (mm)	Standard width (mm)	Mass (g/m <sup>2</sup> )	Tensile strength (N/cm)		Tear strength (N)		Breakdown voltage substrate only (kV)	Volume resistivity (Ω·cm)	Surface resistivity (Ω)	FSA of Japan *1	
						Warp	Fill	Warp	Fill					
G type fabric	FGF-400-2	0.045	1040	300,500, 600,1040	70	60	50	4	4	1.0	10 <sup>15</sup>	10 <sup>14</sup>	○	
	FGF-500-2	0.050		1040	100	65	50	4	4	1.5			○	
	FGF-300-3	0.070		300,600, 1000	110	150	100	8	6	—			○	
	FGF-400-3	0.075		300,500, 600,1000	130	150	130	7	5	3.8			○	
	FGF-500-3	0.080		300,500, 600,1040	165	150	130	6	4	4.9			○	
	FGF-300-4	0.095		300,500, 600,1040	135	240	140	20	7	—			○	
	FGF-400-4	0.095		175	290	160	13	5	4.3	○				
	FGF-500-4	0.100		215	290	160	10	5	5.0	○				
	FGF-300-6	0.110		300,500, 600,1000	170	300	280	20	12	—			○	
	FGF-400-6	0.115			230	280	250	9	9	4.4			○	
	FGF-500-6	0.125	265		280	250	9	9	4.5	○				
	FGF-300-8	0.155	190		310	310	40	40	—	○				
	FGF-400-8	0.160	265		330	310	20	20	3.5	○				
	FGF-500-8	0.170	320		330	310	16	16	4.8	○				
	FGF-400-10	0.230	2100		425	500	410	35	31	5.9	○			
	FGF-500-10	0.240	2300		500	500	410	30	30	6.2	○			
	FGF-400-14	0.330	2500		485	710	540	80	65	5.1	○			
	FGF-500-14	0.350			580	710	540	62	51	5.3	○			
	FGF-400-22	0.540		700	1000	690	175	140	5.6	○				
	FGF-501-21	0.580	3200	2300*	1125	820	650	150	95	6.0	○			
FGF-400-35	0.915	2500	2500*	1220	1190	1050	220	190	7.1	○				
Natural / mesh	FGF-410-18	0.550	1550	1000	485	600	840	—	—	—	—	—	○	
	FGF-410-20	0.750	2000	1020	630	1230	830	—	—	—	—	—	○	
	FGF-410-30	0.950	3800	1070	510	480	580	—	—	—	—	—	○	
Antistatic (black) / plain	FGB-500-3	0.080	1040	1040*	150	160	130	9	7	—	10 <sup>8</sup>	10 <sup>8</sup>	○	
	FGB-500-6	0.130	1550	1040	255	300	250	12	12	—	10 <sup>8</sup>	10 <sup>8</sup>	○	
	FGB-500-10	0.245	2300	1000	485	470	450	43	40	—	10 <sup>8</sup>	10 <sup>8</sup>	○	
Antistatic (black) / mesh	FGB-410-30	0.950	3800	3800*	520	440	550	—	—	—	—	—	○	
Antistatic (gray) / plain	FGC-500-10	0.240	1040	1040*	500	490	410	26	25	—	10 <sup>8</sup>	10 <sup>8</sup>	—	
Air-permeable(black)/plain	FGB-207-6-1	0.110	1040	1040*	125	190	190	74	55	—	—	—	—	
Colored (blue) / plain	FGY-500-10 Blue	0.245	1000	1000	485	440	340	22	20	5.2	10 <sup>15</sup>	10 <sup>14</sup>	○	
A type fabric	FAF-500-6	0.125	1000	1000*	170	610	480	79	53	3.9	10 <sup>15</sup>	10 <sup>14</sup>	○	
	FAF-500-8	0.175			240	840	700	180	170	4.5			○	
	FAF-500-12	0.310			440	1800	1400	420	400	5.1			○	
Natural / mesh	FAF-410-30	1.100	2100	2100*	415	1100	1200	—	—	—	—	—	○	
K type fabric	Natural / plain	FKF-500-12	0.330	2000	2000*	505	1330	1330	180	230	5.4	10 <sup>15</sup>	10 <sup>14</sup>	○
Super fabric	Natural / plain	HGF-500-3	0.115	1000	1000*	180	190	150	12	9	4.0	10 <sup>15</sup>	10 <sup>14</sup>	○
	HGF-500-6	0.140	230			310	230	25	16	6.0	○			
	HGF-500-10	0.230	410			480	430	35	17	6.6	○			
MS fabric	Natural / plain	MS-053	0.080	1040	1040*	165	140	110	6	5	5.1	10 <sup>15</sup>	10 <sup>14</sup>	○
	MS-056	0.125	265			280	270	11	12	4.7	○			
	MS-038	0.165	275			320	310	23	27	3.2	○			
Dual fabric (One side silicon)	Natural / G type fabric	FGS-7001	0.2	950	950*	360	268	259	18	20	6.7	10 <sup>15</sup>	10 <sup>14</sup>	○
	FGS-7001	0.35	600			524	467	48	46	7.9	○			
	Antistatic (black) / G type fabric	FGBS-7001	0.2			350	310	335	25	26	4.8			10 <sup>15</sup>
Test method						—	—	—	—	JIS L 1096 (Cut-strip method)	JIS L 1096 (Trapezoidal method)	JIS C 2110-1	JIS K 6911	—

\* Values shown in this table represent measurements and do not constitute guaranteed values. \* Please consult us separately for the dimensions other than above. \* It may take some time to deliver products with \* mark. \*1 Complies with the Food Sanitation Act of Japan as utensils. Please contact us if you use products other than those marked with a circle for food.

# ADHESIVE TAPE

## CHUKOH FLO™ Adhesive Tapes (Chukoh Tape)



Chukoh Tape is a general term for high-performance adhesive tapes manufactured by us.

They are made and processed by applying adhesive to fabric, fluoroplastic film, polyimide film and other products.

### Main applications

Enhance slippage in chutes and hoppers/Covering of drier rolls used for nonwoven cloth and paper/Covering for pressure-bonded heat seals/Heat-resistant bundling of wires and cables/Wrapping of wiring connections/etc.

### Characteristics

- The surface of fluoroplastic tape has excellent non-stick property, lowest friction and chemical resistance.
- Some types can be used up to 250°C.
- It has excellent electric insulation.
- We also manufacture adhesive tapes of silicone and polyimide.

### UL standard certification (UL File No.E105318)

CHUKOH FLO™ Adhesive Tape ASF-110FR, ASF-121FR, ASF-116T FR, ASF-118A FR, AGF-100FR, AGF-100FR ORANGE, API-114A FR, and ACH-5001FR are UL510A certified.



For more information



Teflon™ is a trademark of The Chemours Company FC, LLC used under license by Chukoh Chemical Industries, LTD.



### The "FR" suffix

In response to being certified for the UL standard, the "FR" suffix was added to the names of a number of products on July 1, 2009. These products remain the same as previous products as no changes have been made to their specifications, quality, or manufacturing processes.

A special catalogue for adhesive tapes with more details is also available.



## Typical dimensions and properties

Product code	Base material	Total thickness (mm)	Standard width (mm)	Maximum width (mm)	Length (m)	Tensile strength (N/25mm)	Elongation (%)	Adhesion 180° peel test (N/25mm)	Breakdown voltage/substrate only (kV)	Maximum service temperature (°C)	FSA of Japan *1					
ASF-110FR	PTFE film	0.08	10·13·19·25·30·38·50·100·150·200·250·300	420	10	70	180	7	10	200	○					
		0.13				160		8	15							
		0.18	13·19·25·30·38·50·100·150·200·250·300			250		9	18							
		0.23	13·19·25·30·38·50			340		10	21							
ASB-110	Antistatic PTFE film	0.13	13·25·38·50	450	10	70	340	8	—	200	○					
ASB-121		0.08	13·25·50	350	10	70	130	6	—	200	○					
ASF-110B	PTFE film	0.13	25	350	10	160	180	9	15	80	○					
ASF-121P	PTFE film	0.06	25	350	10	90	150	5	9	180	○					
ASF-115 (MX)	High-strength, low-stretch PTFE film	0.10	38·50	250	33	135	40	7	11	200	○					
ASF-125A (MX)	Ultra-high-strength, low-stretch PTFE film	0.10	38·50	250	33	250	60	6	12	250	○					
ASF-116T FR	Super-thin reinforced PTFE film	0.04	5·10·20	40	5	40	110	3	5	200	○					
ASF-118A FR	PTFE film with special reinforcement	0.10	34·38·50	80	33	220	70	7	10	250	○					
ASF-121FR	PTFE film	0.08	10·13·19·25·30·38·50	350	10	90	220	150	7	9	200	○				
		0.13		160		9		13								
		0.18	13·19·25·30·38·50	250		10		16								
		0.23		300		10		18								
ASF-119T	Embossed PTFE film	0.35	25·50	250	10	—	—	8	12	200	○					
ASF-130T	Porous PTFE film	1.0	25	100	4	245	45	10	10	250	○					
AFA-113A	PFA film	0.10	50	300	10	50	400	6	10	200	○					
AGF-100FR	PTFE + Glass cloth	0.13	10·13·19·25·30·38·50·75·100·150·200·250·300	560	10	360	—	9	6	200	○					
		0.15				530		11								
		0.18	10·13·19·25·30·38·50·100·150·200·250·300	860		13										
		0.30	13·19·25·50 19·25·50	450		5		1220				14				
AGF-100A	PTFE + Glass cloth	0.13	13·19·25·30·38·50·100	560	10	360	—	10	6	250	○					
		0.15				530		10	6							
		0.18	13·19·25·38·50	860		11		6								
		0.30		450		1220		12	6							
AGF-100T	PTFE + Glass cloth	0.13	25·30·38·50·60	450	10	380	—	11	6	250	○					
AGF-101	PTFE + Glass cloth	0.16	25·30·50·60	450	10	540	—	11	8	200	○					
		0.24		1000		13										
AGF-102	PTFE + Glass cloth	0.13	38 Uncoated part 20 (mm) 50 Uncoated part 20 (mm)	50	10	380	—	9	—	200 (Adhesive part)	○					
AGF-103T	PTFE with special treatment + Glass cloth	0.13	13·19·25·50	560	10	360	—	9	5	250	○					
		0.18	25·50			700		11	7							
AGF-400-3	PTFE + Glass cloth	0.12	1000	1000	1~	400	—	10	5	200	○					
AGF-500-3		0.13				400		11								
AGF-500-4		0.15				600		12								
AGF-400-6		0.17				730		13								
AGF-500-6		0.18				730		13								
AGF-400-10		0.29				1200		14								
AGF-500-10		0.30				1200		14								
AGB-100		Antistatic PTFE + Glass cloth				0.13		13·25·38·50				450	1~	400	—	11
	0.18		13·25·50·100	730	13											
AGB-500-3	Antistatic PTFE + Glass cloth	0.13	1000	1000	10	400	—	11	—	200	○					
AGB-500-6		0.18				730	—	13	—		○					
AGF-100 BLUE	PTFE containing blue pigment + Glass cloth	0.16	25·50	450	10	460	—	11	6	200	○					
AGF-100FR ORANGE	PTFE containing orange pigment + Glass cloth	0.11	19	100	30	285	—	9*	6	200	—					
AGB-207-6-1	Breathable fabric (PTFE + Glass cloth)	0.11	480·1000	1000	1~	450	—	1.2	—	80	—					
ACH-6000	Embossed silicon + film	0.70	50·100	100	10·25	—	—	5	11	130	○					
ACH-6100	Silicone + Glass cloth	0.28	25·50	300	25	790	—	3	8	200	○					
		0.06		10	125	6	7	—	—							
API-114A FR	Polyimide film	0.08	13·19·25	450	20	240	35	7	10	250	—					
API-214A	Polyimide film *	0.085	25·50	450	10	125	35	5	8	250	—					
API-214AE	Polyimide film *	0.175	—	400	10	240	35	*	10	250	—					
ACH-5201A	Polyester film	0.055	25·50	450	33	80	50	7	6	130	—					
ACH-5001FR	High-strength glass cloth	0.20	13·19·25·38·50·100	500	10	700	—	10*	6	200	—					
AUE-112B	Ultra-high molecular weight polyethylene film	0.18	19·25·50	500	20	40	210	350	10	19	80	○				
		0.30	25·50			20							400	360	10	25
		0.55	25·50			20							740	390	10	34
AUB-112B	Ultra-high molecular weight polyethylene film with antistatic treatment	0.16	25·50	270	20	170	300	300	11	—	80	○				
		0.28				300										

\* Values shown in this table represent measurements and do not constitute guaranteed values. \* Please consult us separately for the dimensions other than above. \* The adhesive force for AGF-100FR ORANGE, ACH-5001FR were measured by peeling it at 90° (N/25mm). \* API-214A and API-214AE are double-sided adhesive tapes. \* API-214AE. Adhesion at peeling angle of 180° (N/25mm); Light adhesive side/0.15, Strong adhesive side/7 \*1 The front side complies with the Food Sanitation Act of Japan as utensils (the adhesive side is not applicable).

FLUOROPLASTIC MEMBRANE  
FABRIC  
ADHESIVE TAPE  
BELT  
COPPER-GLAD LAMINATE  
TUBE  
INJECTION MOLDING PRODUCTS  
PTFE SPECIAL PROCESSED PRODUCTS  
POROUS PRODUCTS  
HIGHLY FUNCTIONAL FILM & OTHER PRODUCTS  
BIODEGRADABLE & BIOPLASTICS  
CHARACTERISTICS

# CHUKOH FLO™ Belts

The belt products are manufactured by using our fabrics, etc. as the base material and processing them into an endless belt shape. By applying excellent properties of fluororesin, such as heat resistance and non-adhesive characteristic, they are used in manufacturing process of a wide range of fields. We can offer you a wide variety of our belt products according to your needs. \* The continuous service temperature varies depending on the condition.



### Characteristics

- The belt surface has excellent non-stick characteristics and highest slippage.
- It is also excellent in dimensional stability, non-flammability and heat resistance.
- Various joint methods are available according to the applications.
- True tracking is available to prevent the belt from meandering.

### Maximum service temperature

- G type belt: +260°C
- Super belt: +260°C
- A type belt: +200°C

A special catalogue for belts with more details is also available.



For more information



### G type belt

This is the standard type which is used in the most applications. Upon your request, we can manufacture antistatic or seamless type belts.

**Base material** ● Fluororesin impregnated glass cloth

**Main applications** Food manufacturing / plastic film manufacturing / rubber product manufacturing / ceramic product manufacturing / heat seal process / adhesive applying process / UV drying process / food thawing process / etc.



G type belt

### Super belt

Anti-penetration property and non-stick property of this belt have been remarkably improved from those of conventional belts. This is especially suitable for usage where a large amount of oils and fats are used.

**Base material** ● Fluororesin impregnated glass cloth + special treatment

**Main applications** Conveyor belts for pizza dough making / hamburger steak, biscuit, fried dumpling baking



Super belt

### A type belt / K type belt

The bending fatigue resistance and vapor resistance are superior to the G type.

**Base material** ● Fluororesin impregnated Para-Aramid cloth

**Main applications** Conveyor belts for steam cookers / drying belts for woven or nonwoven cloths, etc.



A type belt / K type belt

# CHUKOH FLO™ Copper clad laminates

The products have been made by the method that electrolytic copper foil is fused on one or both sides of laminated Fabrics or fluoroplastic films. They are used as a substrate of printed circuit board, especially for high-frequency band use and also for other applications. You can select from a wide variety of types according to the required properties.



### Main applications

Satellite communications / satellite broadcasting / next generation mobile phone and other mobile communication systems / non-stop Electronic Toll Collection (ETC) system and Automated Highway System (AHS) of the ITS (Intelligent Transportation System) / Wireless Local Loop (WLL) / CPU / measurement instruments / artificial satellite mounted devices, etc.

### Characteristics

- This product has excellent heat resistance.
- A stable dielectric constant is ensured in a wide frequency band range.
- An extremely low dielectric tangent is ensured in a high frequency band range.

UL Standard certification (UL File No.E78936)



CHUKOH FLO™ Copper-clad laminates, CGP-500A and CGS-500A, have been certified by the UL Standard.

For more information



### CGP-500 series

This is our standard grade copper-clad laminated board using fluororesin impregnated glass cloth. It has excellent peel strength, low water absorption, through-hole processability and high dimensional stability and mechanical strength.

### CGS-500 series

This is a copper-clad laminated board using fluororesin impregnated glass cloth and fluororesin sheet. This product has improved dielectric constant and dielectric tangent compared to the CGP-500 series.

### CGN-500 series

This is a copper-clad laminated board using fluororesin impregnated glass cloth. The dielectric loss has been reduced to less than a half of that of CGP-500 series and this product shows an excellent performance with 20 GHz or over.

### CGA-500 series

This is a copper-clad laminated board using fluororesin impregnated glass cloth containing special inorganic filler. While maintaining excellent high frequency characteristics, this product can be applied for mass production.

### CGH-500 series

This is a copper-clad laminated board using fluororesin impregnated glass cloth containing special inorganic filler. As the dielectric constant is equivalent to the general purpose board and the dielectric tangent is lower, a Copper clad laminated board with lower loss can be obtained in the same design.

### CGK-500 series

This is a copper-clad laminated board using fluororesin impregnated glass cloth containing special inorganic filler. Due to the high dielectric constant, smaller and lighter high-performance circuit with lower loss can be obtained.



### General characteristics

Test item	Unit	Test condition	CGS-500A	CGN-500	CGP-500A	CGA-500	CGH-500	CGK-500	Test method	
Relative dielectric constant	—	*2	2.15	2.3	2.6	3.0	3.45	5.0	Disk Resonator Method	
Dielectric tangent	—		0.0010	0.0008	0.0018	0.0030	0.0027	0.0040		
Volume resistivity	Ω·cm	A	10 <sup>15</sup>	10 <sup>15</sup>	10 <sup>15</sup>	10 <sup>15</sup>	10 <sup>15</sup>	10 <sup>13</sup>	JIS C 6481	
		C-96/40/90	10 <sup>14</sup>	10 <sup>14</sup>	10 <sup>14</sup>	10 <sup>14</sup>	10 <sup>14</sup>	10 <sup>13</sup>		
Surface resistivity	Ω	A	10 <sup>14</sup>	10 <sup>14</sup>	10 <sup>14</sup>	10 <sup>14</sup>	10 <sup>14</sup>	10 <sup>12</sup>	JIS C 6481	
		C-96/40/90	10 <sup>13</sup>	10 <sup>13</sup>	10 <sup>14</sup>	10 <sup>14</sup>	10 <sup>14</sup>	10 <sup>12</sup>		
Insulation resistance	Ω	A	10 <sup>13</sup>	10 <sup>14</sup>	10 <sup>13</sup>	10 <sup>13</sup>	10 <sup>13</sup>	10 <sup>11</sup>	JIS C 6481	
		D-2/100	10 <sup>13</sup>	10 <sup>12</sup>	10 <sup>13</sup>	10 <sup>10</sup>	10 <sup>12</sup>	10 <sup>10</sup>		
Bending strength	N/mm <sup>2</sup>	A	50	100	120	60	120	240		
Water absorption	%	E-24/50+D-24/23	0.01	0.01	0.01	0.02	0.02	0.04		
Linear expansion coefficient	ppm/°C	-65°C~150°C	X-axis	40	20	16	16	13	12	—
			Y-axis	38	14	20	20	14	13	
			Z-axis	217	210	216	216	174	120	
Specific gravity	—	A	2.2	2.2	2.2	2.3	2.3	2.4	—	
Peel strength*1	kN/m	A	1.0	1.0	3.0	1.5	1.5	1.5	JIS C 6481	
		200°C atmosphere	0.5	0.5	1.5	1.0	1.0	1.2	—	
Flammability	—	—	Incombustible	Incombustible	Incombustible	Incombustible	Incombustible	Incombustible	JIS C 6481	
Chemical resistance	—	—	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	JIS C 6481	

\*1 Peel strength is the measured value of 1 oz. (0.035mm) copper foil. \*2 Sample thickness / measured frequency : CGS: 0.8mm/12GHz, CGN: 0.8mm/10GHz, CGP: 1.6mm/12GHz, CGA: 0.54mm/12GHz, CGH: 1.6mm/9GHz, CGK: 1.6mm/8GHz

\* Values shown in this table represent measurements and do not constitute guaranteed values.

# CHUKOH FLO™ Tube

This is a tube product with a thin wall made by molding of fluoro resin of various types. Due to its excellent heat resistance, non-adhesive characteristics, chemical resistance, electric insulation, etc., this is used in a wide range of industrial areas.

### Main applications

Chemical plants / semiconductor manufacturing equipment and devices / food manufacturing equipment and devices / laboratory instruments / automobile parts / transfer tubes for chemicals, fuels, oils and steam / insulating coatings

### Maximum service temperature

- PTFE tube: +260°C
- PFA tube: +260°C
- FEP tube: +200°C

**UL standard certification**  
(UL File No. E71017)



We can also offer UL Standard certified CHUKOH FLO™ Tube (PTFE).

For more information



### PTFE tube TUF-100

This is a tube made by extrusion molding of fluoro resin PTFE. We also manufacture colored tubes (made-to-order).

### PFA tube TUF-200 (EN·ES)

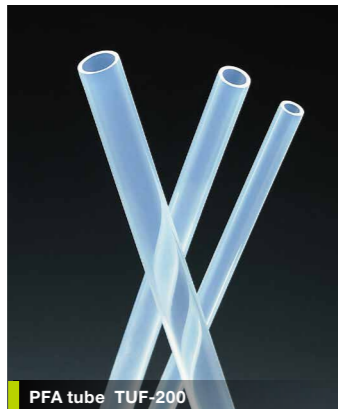
This is a highly transparent tube formed by melt-extrusion of fluoro resin PFA. We manufacture EN, a resin grade for general use, and ES, a resin grade for semiconductor use. ES is a high-purity PFA tube for semiconductor manufacturing equipment with excellent smoothness on the inner surface of the tube and low elution ions.

### FEP tube TUF-300

This is a highly transparent tube formed by melt-extrusion of fluoro resin FEP. Basically, it has almost the same characteristics as those of PFA. \* This is a made-to-order product.



PTFE tube TUF-100

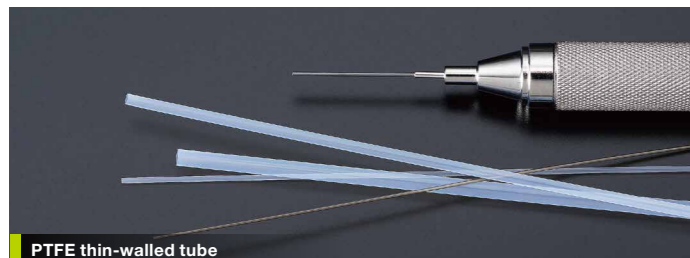


PFA tube TUF-200

### PTFE thin-walled tube

This product is a fluoro resin PTFE tube with ultra-thin wall thickness. This tube can also be bonded, so it can be used for combination with other materials. This tube can be manufactured with an inner diameter of 0.4 mm to 2.3 mm and a wall thickness of several μm to 100 μm.

\*The wall thickness that can be manufactured varies depending on the inner diameter, so please consult us first.



PTFE thin-walled tube

### PTFE tube TUF-100 outer diameter tolerance (mm)

Type A		Type B		Type C	
Outer diameter	Dimension tolerance	Outer diameter	Dimension tolerance	Outer diameter	Dimension tolerance
0.65~1.10	+0.13, -0.12	0.65~2.00	±0.05	0.65~2.00	±0.03
1.11~1.50	±0.15			2.01~3.60	±0.05
1.51~3.00	+0.18, -0.17	2.01~5.30	±0.10	3.61~6.00	+0.08, -0.07
3.01~4.00	±0.30			6.01~8.00	±0.10
4.01~13.00	±0.35	5.31~10.00	±0.20	8.01~10.00	±0.15
				10.01~15.00	±0.25
13.01~16.00	±0.40	15.01~16.00	+0.38, -0.37	15.01~21.50	±0.35
				21.51~23.00	±0.40
16.01~23.00	±0.50	16.01~23.00	±0.45		
23.01~30.00	±0.70	23.01~30.00	±0.60		

\* Please consult us separately for the delivery date and minimum lot.

### PTFE tube TUF-100 wall thickness tolerance (mm)

Type A		Type B		Type C	
Wall thickness	Dimension tolerance	Wall thickness	Dimension tolerance	Wall thickness	Dimension tolerance
0.15~0.19	±0.05	0.15~0.19	±0.04	0.15~0.28	+0.03, -0.02
0.20~0.49	±0.08	0.20~0.45	±0.05	0.29~0.36	±0.03
				0.46~0.75	±0.06
0.50~1.00	±0.11	0.76~1.20	±0.10	0.81~1.20	±0.05
				1.21~1.60	+0.13, -0.12
1.01~1.50	±0.15	1.21~1.60	±0.15	1.76~2.50	±0.15
				1.61~1.75	±0.15
1.76~2.50	±0.25	1.76~2.50	±0.20	1.76~2.50	±0.15
2.51~3.00	±0.30	2.51~3.00	±0.25	2.51~3.00	±0.20

\* Please consult us separately for the delivery date and minimum lot.

## Typical dimensions and properties \* Please consult us separately for the items other than PTFE / PFA tubes.

PTFE tube TUF-100 series						
Product code	Inner diameter x Outer diameter (mm)	Wall thickness (mm)	Room temperature burst pressure (MPa)	Normal pressure (room temperature) (MPa) (Burst pressure x 1/3)	Minimum bending radius (mm)	Standard length (m)
	0.25x0.75	0.25	19.6	6.5	≤ 2	10
	0.5x1	0.25	9.8	3.3	—	
	0.5x1.5	0.5	19.6	6.5	2	
	0.5x1.59	0.55	21.4	7.1	2	
	0.5x2	0.75	29.4	9.8	—	
	1x1.5	0.25	4.9	1.6	—	10·50
	1x2	0.5	9.8	3.3	3	
	1x3	1.0	19.6	6.5	4	
	1.5x2.5	0.5	6.5	2.2	4	10
	2x3	0.5	4.9	1.6	7	
	2x4	1.0	9.8	3.3	8	
	2x5	1.5	14.7	4.9	8	10
	2.5x3.5	0.5	3.9	1.3	10	
	3x4	0.5	3.3	1.1	15	10·50
	3x5	1.0	6.5	2.2	13	
	3x6	1.5	9.8	3.3	14	
	4x5	0.5	2.5	0.8	26	10·50
	4x6	1.0	4.9	1.6	18	
	4x7	1.5	7.4	2.5	21	10
	5x6	0.5	2.0	0.7	41	
	5x7	1.0	3.9	1.3	25	10·50
	5x8	1.5	5.9	2.0	27	
	6x7	0.5	1.6	0.5	60	10
	6x8	1.0	3.3	1.1	32	
	6x9	1.5	4.9	1.6	34	10
	7x8	0.5	1.4	0.5	82	
TUF-100	7x9	1.0	2.8	0.9	40	10·50
	7x10	1.5	4.2	1.4	40	
	8x9	0.5	1.2	0.4	108	10
	8x10	1.0	2.5	0.8	49	
	8x11	1.5	3.7	1.2	47	10
	9x10	0.5	1.1	0.4	138	
	9x11	1.0	2.2	0.7	59	10·50
	9x12	1.5	3.3	1.1	54	
	10x11	0.5	1.0	0.3	171	10
	10x12	1.0	2.0	0.7	69	
	11x12	0.5	0.9	0.3	208	10
	11x13	1.0	1.8	0.6	81	
	12x13	0.5	0.8	0.3	249	10·50
	12x14	1.0	1.6	0.5	93	
	12x15	1.5	2.5	0.8	77	10
	13x15	1.0	1.5	0.5	106	
	13x16	1.5	2.3	0.8	84	10
	14x16	1.0	1.4	0.5	120	
	15x17	1.0	1.3	0.4	135	10
	15x18	1.5	2.0	0.7	100	
	16x18	1.0	1.2	0.4	151	10
	16x19	1.5	1.8	0.6	108	
	17x19	1.0	1.2	0.4	167	10
	18x20	1.0	1.1	0.4	184	
	19x21	1.0	1.0	0.3	202	10
	1.58x3.18	0.8	9.9	3.3	—	
	4.35x6.35	1.0	4.5	1.5	20	10
	6.35x9.53	1.59	4.9	1.6	—	

- \* Characteristic values shown in this table represent calculated or measured values and do not constitute guaranteed values.
- \* The burst pressure value is a value at room temperature (25 °C). It is approximately 1/2 at 100 °C and approximately 1/4 at 200 °C.
- \* The minimum bending radius is a value at room temperature. Use the product with a bending radius higher than the minimum bending radius.
- \* Values in the table may vary depending on the usage environment. Perform tests sufficiently in the same environment before use to make sure that no problem occurs.
- \* Please consult us separately for UL Standard certified PTFE tubes.
- \* The tolerance of the standard TUF-100 series is that of the Type A size shown in the left table.

PTFE tube AWG size				
Product code	Inner diameter x Outer diameter (mm)	Wall thickness (mm)	Minimum bending radius (mm)	Standard length (m)
AWG-30	0.30x0.76	0.23	2	10
AWG-28	0.38x0.84			
AWG-26	0.46x0.92			
AWG-24	0.56x1.06	0.25	4	10
AWG-22	0.68x1.18			
AWG-20	0.86x1.46	0.30	6	10·50
AWG-19	0.96x1.56			10
AWG-18	1.07x1.67			7
AWG-17	1.19x1.79			
AWG-16	1.35x1.95	8	10	
AWG-15	1.50x2.10			
AWG-14	1.68x2.28	12	10	
AWG-13	1.93x2.53			
AWG-12	2.16x2.76	14	10	
AWG-11	2.41x3.01			
AWG-10	2.69x3.29	18	10	
AWG-9	3.00x3.72			
AWG-8	3.38x4.10	25	10·50	
AWG-7	3.76x4.48			
AWG-6	4.22x4.94	30	10	
AWG-5	4.72x5.44			
AWG-4	5.28x6.00	40	10	
AWG-3	5.94x6.66			
AWG-2	6.68x7.40	50	10	
AWG-1	7.47x8.19			
AWG-0	8.38x9.10	60	10	
		110	10	
		180	10	
		180	10	
		300	10	

\* AWG is the name of American wire gauge standards.

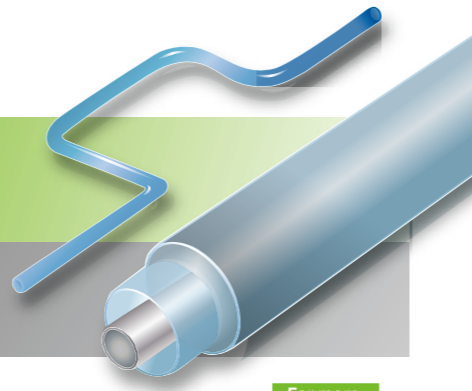
PFA tube TUF-200 EN (millimeter-size)							
Product code	Inner diameter x Outer diameter (mm)	Wall thickness (mm)	Outer diameter tolerance (mm)	Wall thickness tolerance (mm)	Room temperature burst pressure (MPa)	Normal pressure (room temperature) (MPa) (Burst pressure x 1/3)	Standard length (m)
TUF-200	2x4	1.0	±0.10	±0.10	12.7	4.2	14
	4x6	1.0			6.9	2.3	20
	6x8	1.0			4.7	1.5	40
	8x10	1.0			3.6	1.2	65
	10x12	1.0			2.9	0.9	110

PFA tube TUF-200 EN (inch-size)							
Product code	Inner diameter x Outer diameter (mm)	Outer diameter (inch)	Wall thickness (mm)	Outer diameter tolerance (mm)	Wall thickness tolerance (mm)	Room temperature burst pressure (MPa)	Normal pressure (room temperature) (MPa) (Burst pressure x 1/3)
TUF-200	3.95x6.35	1/4	1.20	±0.10	±0.12	7.9	2.6
	6.33x9.53	3/8	1.60			6.7	2.2
	9.5x12.7	1/2	1.60			4.6	1.5
	15.85x19.05	3/4	1.60			2.8	0.9
	22.2x25.4	1	1.60			2	0.6

# TUBE

## CHUKOH FLO™ Processed Tubes

We perform processing of fluoro resin tubes by our original molding method. You can select from various dimensions and standards.



### Main applications

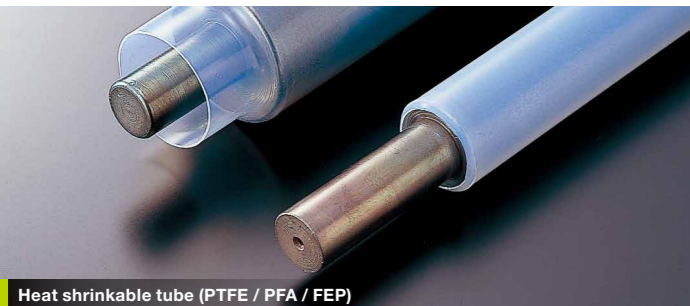
Semiconductor manufacturing equipment and devices / optical equipment / chemical-resistant piping for electric and electronic applications, and laboratory applications

For more information



### Heat shrinkable tube (PTFE / PFA / FEP)

The characteristics of fluoro resin can be given to the surface of the material to be coated (PTFE / PFA / FEP) by thermal shrinkage.



Heat shrinkable tube (PTFE / PFA / FEP)

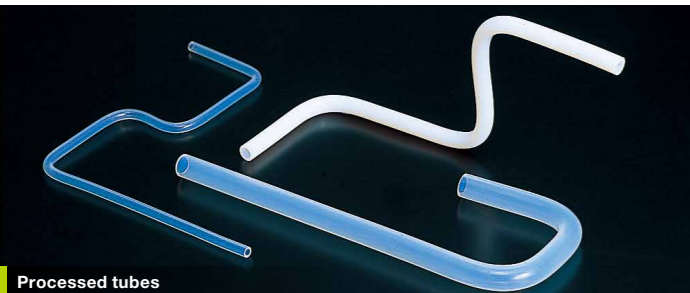
### Typical dimensions for PTFE heat shrinkable tube TKF-100 series

Product code	Pre-shrinkage inner diameter (mm)	After shrinkage diameter (mm)	Wall thickness (mm)	Length (m)	Standard items
TKF-100-2	2.0	1.2	0.5	1	○
TKF-100-4	4.0	2.2			○
TKF-100-6	6.0	3.2			○
TKF-100-8	8.0	4.2			○
TKF-100-10	10.0	5.2			○
TKF-100-12	12.0	6.2			○
TKF-100-14	14.0	7.2			○
TKF-100-16	16.0	8.2			○
TKF-100-18	18.0	9.2			○
TKF-100-20	20.0	10.3			○
TKF-100-22	22.0	11.3			○
TKF-100-24	24.0	12.3			—
TKF-100-26	26.0	13.3	—		
TKF-100-28	28.0	14.3	—		

\* After shrinkage inner diameter is not a guaranteed value, as the value is measured at 350 °C after heating in an electric furnace.  
 \* Please consult us separately for the products with wall thickness / cut length other than those described in the table above.  
 \* The wall thickness is measured after shrinkage.

### Processed tubes

Flared processing, three-dimensional bend processing and other processing according to your needs.



Processed tubes

### Thin FEP heat shrinkable tube TKF-310

This product is a thin FEP heat shrinkable tube. It can be manufactured with an inner diameter of approx. 0.5 mm after shrinking.



Thin FEP heat shrinkable tube TKF-310

Product code	Pre-shrinkage inner diameter (mm)	After shrinkage diameter (mm)	Wall thickness (mm)	Length (mm)	Standard items
TKF-310-050	1.1 or more	0.5 or less	0.32±0.03	1800	○
TKF-310-085	1.7 or more	0.85 or less	0.28±0.03		○

\* This is a made-to-order product.  
 \* After shrinking, the value for the diameter is not guaranteed, as the value is measured after heating at 260°C for 10 minutes.  
 \* Please consult us separately for the dimensions other than above.

### Snake hose: S series

This is a PTFE hose molded in a spiral shape. Due to its flexibility, the product has less liquid accumulation.



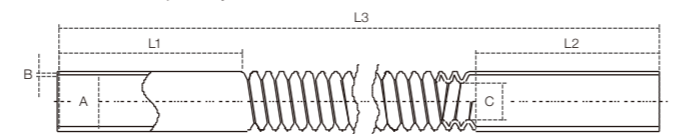
S series

\* We offer PFA hose I series molded into a continuous independent bellow shape.

### Snake hose S series (PTFE type)

Nominal dimensions (mm)	Processing range for inner diameter of straight part A (mm)	Wall thickness (mm)	Effective inner diameter C (mm)	Bending radius (mm)	Burst pressure (MPa)	Length L1, L2 (mm)	Overall length L3 (m)
4×7	4.5~6.0	0.5	4.0	10	1.5	15~30	Maximum 10
5×8.5	5.5~8.0		5.0	14	1.1		
7×11	7.5~10.0		7.0	16	0.8	15~35	
9×13	9.5~12.0		9.0	18	0.6	15~40	
11×16.5	11.5~14.5		11.0	20	0.5		

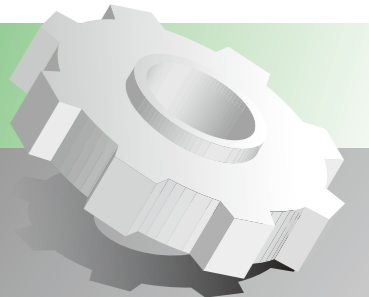
\* The effective inner diameter is a reference value.  
 \* As the burst pressure and bending radius measurements were obtained at room temperature, these values are not standard values.  
 \* Please consult us separately for the dimensions other than above.



# INJECTION MOLDING PRODUCTS

## CHUKOH FLO™ Injection molding products

In addition to fluoro resin, we perform injection molding of high-performance engineering plastics with excellent characteristics. Also, since we perform in-house production of molds, we can make quick response. There are a wide range of applications such as semiconductor, automobile, laboratory apparatus and OA equipment applications.



### An example of materials we actually use

Fluoro resin: PFA/PVDF/ETFE  
 High-performance resin: PEEK/PSU/PPS/4-6PA/PEI  
 General-purpose resin: PP/PE/PC/PVC

### Main applications

Conveyor equipment for thin plate items / driving gears for rotary shaft, etc.

For more information



Injection molding products



Plastic conveyor rollers

### Plastic conveyor rollers

Since rollers can be jointed each other, original conveyor parts with number of rollers arranged can be manufactured. Please consult us separately for sizes, materials and other details.



Plastic roller



Spur gear



Helical gear

### Injection molding products

It is an injection molding product of high-performance plastics such as fluoro resin. As an extremely high clean level is required for semiconductor related products, all the processes from molding to inspection and packing are controlled in the clean room.



Fitting



Laboratory items



Manufacturing in the clean room

FLUOROPLASTIC MEMBRANE

FABRIC

ADHESIVE TAPE

BELT

COPPER-CLAD LAMINATE

TUBE

INJECTION MOLDING PRODUCTS

PTFE-SPECIAL PROCESSED PRODUCTS

POROUS PRODUCTS

HIGHLY FUNCTIONAL FILM & OTHER PRODUCTS

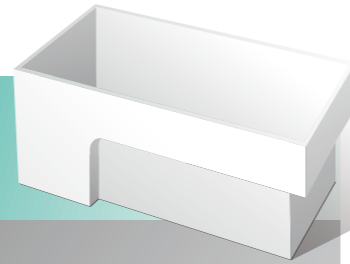
BIODEGRADABLE & BIOPLASTICS

CHARACTERISTICS

# PTFE SPECIAL PROCESSED PRODUCTS

## CHUKOH FLO™ PTFE special processed products

We can also offer various PTFE special processed products mainly by manufacturing of tanks with the PTFE properties.  
We respond to your needs with our expertise technology.



### Main applications

Semiconductor applications / washing tanks (silicon wafer, etc.) / temperature control washing tanks / chemical storage / mechanical processed parts such as packing, gasket and bearing

For more information



PTFE Integrated Tank



PTFE processed materials



Bubbling sheet



Processed products and others

### PTFE integrated tank

This is the PTFE tank that is manufactured by the isostatic molding method. As it is made by integrated and seamless molding, there is no worry about leakage, etc. As we also manufacture overflow tanks, single tanks and round tanks, you can select the size, shape and processing method according to your purpose.

#### Characteristics

- Seamless molding can be performed.
- The cost of molds is not required and cost performance is ensured.
- Various sizes and shapes are available.



PTFE integrated tank

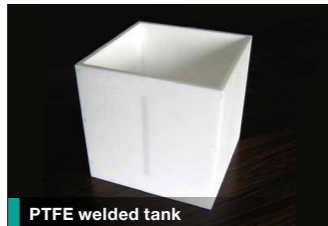
Type	Maximum dimensions (external dimensions, mm)
Single tank	730W × 730L × 700H
Overflow tank	500W × 830L × 700H
Round tank (pipe type)	Φ800 × 700H

### PTFE welded tank

Custom-made product to be manufactured by our experienced welders to the satisfaction of the customer. The maximum size we delivered is 2.0 m × 2.5 m × 0.2 m.

#### Characteristics

- We manufacture in a clean environment from welding to cleansing and packaging.
- With our original jigs and advanced technology, welding can be implemented even on a section where it is usually difficult to perform welding.
- Welders who obtain in-house qualification have advanced technique and perform welding.



PTFE welded tank

### PTFE Cup

This PTFE cup is used in single-wafer cleaning processes to prevent and collect chemical splashes. It can be manufactured in sizes up to ø920 mm × 180 mm. Welding of tubes and other components is possible, and internal reinforcement (e.g., SUS) can be added depending on the shape.

#### Characteristics

- It has excellent water-draining properties compared to other resin products.
- High-strength products with core materials can also be produced. (Japanese Patent No. 4918576)



PTFE Cup

### Cartridge heater

This is a cartridge heater made of 100% fluoro resin except for the heating element. It is used for heating of chemicals. We can design the size, shape and heater capacity according to your needs.

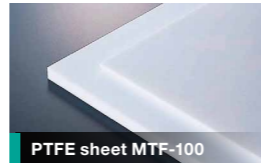


Cartridge heater

### PTFE sheet MTF-100

This is the PTFE material that is made by compression molding. We offer sheets with the thickness from 1 to 55 mm.

\* Maximum moldable thickness: up to 60 mm for 1000 mm × 1000 mm sheets, and up to 160 mm for 520 mm × 550 mm sheets (block material).



PTFE sheet MTF-100

### PTFE rod MRF-100

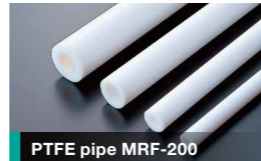
This is the PTFE rod that is made by extruding and molding PTFE.



PTFE rod MRF-100

### PTFE pipe MRF-200

This is the PTFE pipe that is made by extruding and molding PTFE.



PTFE pipe MRF-200

### Machined products

Materials cut and processed into various shapes according to user specifications. They are used in various fields as parts having heat resistance, chemical resistance and non-stick characteristics.



Machined products

### Welded products

This allows us to produce shapes that are difficult to achieve through machining or injection molding. In some cases, welding these shapes can reduce costs.



Welded products

### Bubbling sheet

This is a bubbling unit that is made by molding fluoro resin porous material. The air generated from micron-order fine pores ensures effective stirring of chemicals and cleansing.



Bubbling sheet

# POROUS PRODUCTS

## C-Porous™ PTFE porous products

This is the product that is made by giving a porous structure to PTFE with our original technology. As shown by the meaning of porous that it has "many" "pores", it has both air permeability and water repellency while maintaining characteristics of fluoro resin.

\* C-Porous™ is a collective designation of our fluoro resin porous products.

### Main applications

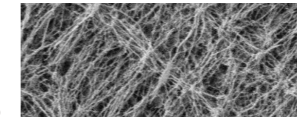
- PTFE porous films: filters / waterproof breathable membrane / electric wire coatings / cable protection / heat insulation
- PTFE porous tubes: filters / oxygen sensors / bubbling / degassing / inlet-exhaust equipment
- PTFE thick porous tubes: chemical protection / heat insulation / piping protection

For more information



### PTFE porous film

This porous film constitutes of PTFE. While it keeps air permeability due to the pores, it maintains waterproof and water repellent performance. punching processed products are also available.



Enlarged (x1,000) photo of porous

Product code	Thickness × Width (mm)	Length (m)	Porosity (%)	Air permeability (sec)	Waterproofness (kPa)	Characteristics
SEF-010	0.1 × 100	10~100	65	18	120	Water repellent
SEF-010(HB)	0.2 × 100		76	13	80	Water repellent
SEF-010-3	0.2 × 100		65	20	140	Water and oil repellent
SEF-600	0.12 × 250	10~	—	10	170	Water repellent
SEF-1000-01	0.5 × 100	10	70	35	92	Water repellent
SEF-1000-02	0.3 × 120		60	50	120	Water repellent
SEF-1000-03	1 × 120		5	73	31	58

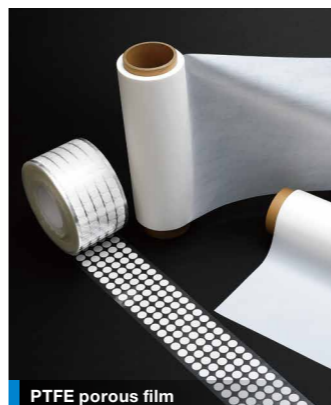
\* Values shown in the table above represent measured values and do not constitute standard values.  
\* Air permeability values are those measured by a Gurley air permeability tester compliant with JISP8117.  
\* For performance and sizes other than those described above, please consult us separately.

### PTFE porous film composite product

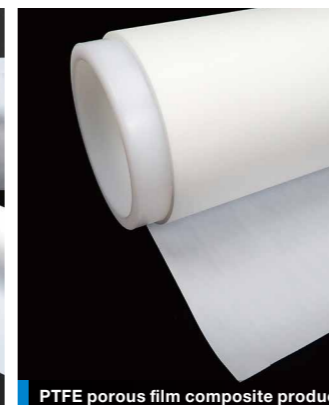
This is a product that is made by combining a PTFE porous film with a backing material. This product has better air permeability and water-resistant property as compared to the SEF-010 series. This product is available in sheet or punched shape.

Product code	Thickness × Width (mm)	Length (m)	Air permeability (sec)	Waterproofness (kPa)	Characteristics	Backing material
SEF-501N	0.05 × 300	10~50	5	380	—	PET non-woven cloth
SEF-503N			6	350	Oil repellent	
SEF-501M	0.08 × 300	10~50	3	330	—	PET mesh
SEF-503M			4	280	Oil repellent	

\* Characteristic values shown in this table represent calculated or measured values and do not constitute guaranteed values.  
\* Air permeability values are those measured by a Gurley air permeability tester compliant with JISP8117.  
\* For performance and sizes other than those described above, please consult us separately.



PTFE porous film



PTFE porous film composite product

### PTFE porous tube

This porous tube constitutes of PTFE. It has high water repellency and air permeability, and it can be changed by adjusting the porosity. We can also manufacture rod-shaped products and multi-lumen products.

Product code	Inner diameter × Outer diameter (mm)	Length (m)	Porosity (%)	Air permeability (sec)	Waterproofness (kPa)
TEF-100	Φ1 × Φ2	10	50	100	80
	Φ2 × Φ3			60	
	Φ3 × Φ4			130	
	Φ8 × Φ10	70	—	90	
	Φ10 × Φ12		—	80	

\* Values shown in the table above represent measured values and do not constitute standard values.  
\* Air permeability is measured by a JISP8117 compliant Oken air permeability tester.



PTFE porous tube

### PTFE thick porous tube

This product is a thick porous tube. By giving a porous structure to PTFE by expansion, it has excellent flexibility and heat insulating characteristics. We can manufacture in a complex shape and split processing is also available.

Product code	Inner diameter × Outer diameter (mm)	Inner diameter tolerance (mm)	Wall thickness (tolerance) (%)	Length (tolerance) (m)	Porosity (tolerance) (%)
TEF-110	Φ10.0 × Φ17.0	-0.7/+1.0	3.5 (-0.5/+0.4)	500 (0/+100)	80 (±10)
	Φ13.7 × Φ20.7				
	Φ20.0 × Φ27.0				
	Φ26.4 × Φ33.4				

\* Values shown in the table above represent measured values and do not constitute standard values.



PTFE thick porous tube

FLUOROPLASTIC MEMBRANE

FABRIC

ADHESIVE TAPE

BELT

COPPER-CLAD LAMINATE

TUBE

INJECTION MOLDING PRODUCTS

PTFE SPECIAL PROCESSED PRODUCTS

POROUS PRODUCTS

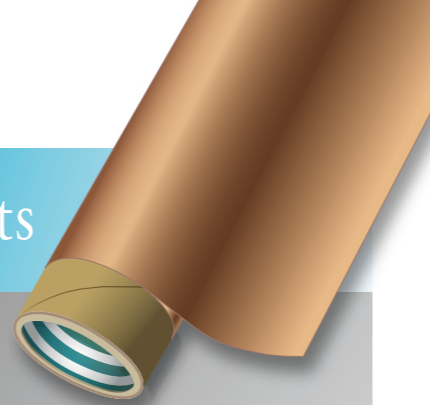
HIGHLY FUNCTIONAL FILM & OTHER PRODUCTS

BIODEGRADABLE & BIOPLASTICS

CHARACTERISTICS

## Highly functional films and other products

We manufacture a variety of highly functional resin products such as films and sealing tapes for piping using fluoro resin and polyimide as base materials.



### Main applications

- MSF series: Release at ACF pressure bonding / sliding in OA equipment
- FPI series: Release sheet / insulation sheet
- Sealing tape: Piping for water pipes and hydraulic equipment
- G type laminate: High-voltage insulating plates / bearing materials / seismic isolation materials

■ **UL standard certification**  
(UL File No. E496281)



CHUKOH FLO™ Skived tape MSF-100: The tape with the thickness between 0.05 mm and 1.00 mm is a UL Standard certified product.

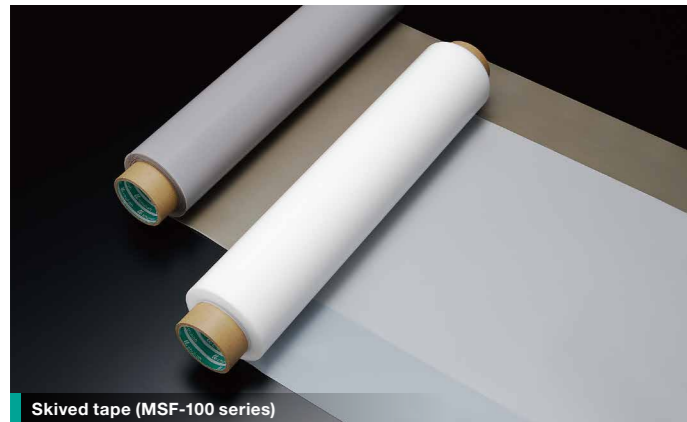
For more information



MSF series・FPI series    Sealing tape    G type laminate

### Skived tape MSF-100

This product is made by skiving and processing PTFE into a thin film. There are a wide variety of width and thickness. It is used for releasing at ACF pressure bonding, electric insulation, and sliding applications in OA equipment.



Skived tape (MSF-100 series)

### Typical dimensions for skived tape MSF-100

Thickness (mm)		Standard width (mm)	Tolerance of width (mm)		Length (m)
Dimension	Tolerance		300 or more	360 or more	
0.05	±0.01	50・100・300・500	Less than 360	600 or less	10
0.08	±0.01	300			
0.10	±0.01	50・100・300・500			
0.13	±0.02	300			
0.20	±0.02	50・100・300・500	+15	+20	
0.30	±0.03	300・500	0	0	
0.40	±0.04	300			
0.50	±0.05	50・100・300・500			
0.80	±0.08	300・500			
1.00	±0.10	300			

\* We can manufacture products with widths up to 1,000 mm when thicknesses are 0.30 mm or less.

### Skived tape MSF-100 one side (E)

This is the PTFE skived film that allows bonding with other materials by performing surface treatment on one side of MSF-100.

\* Please consult us separately for dimensions and stock condition.

### Skived tape MSF-200

This is the PTFE skived film that has improved strength and reduced flare and warpage during the processing by performing special treatment.

\* Please consult us separately for dimensions and stock condition.

### Skived tape MSE-100

This is the PTFE skived film that has an embossed surface. Due to its fine unevenness, the release characteristics have been improved compared to that of MSF-100. (Compared within our products)

\* Please consult us separately for dimensions and stock condition.

### FPI series

This is the product that is made by coating fluoro resin onto a polyimide film. While maintaining dimensional stability equivalent to that of glass cloth coated products, it also ensures surface smoothness of film.



FPI series

### Sealing tape SST-100

This is an unsintered PTFE tape that is used for sealing of various kinds of piping screws. As it is soft and self-adhesive, sealing work can be easily done. As it does not deteriorate in quality for a long period of time, removing work is also easy.

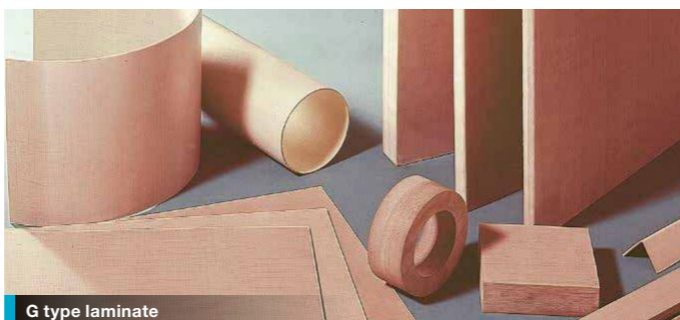


JIS standard product

Sealing tape SST-100

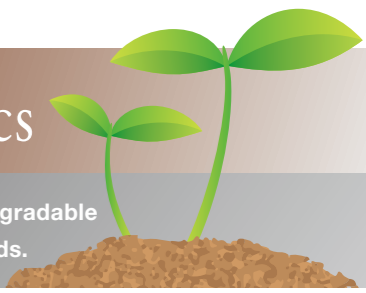
### G type laminate

G type fabrics are laminated in many layers and shaped into various configurations. It has excellent electrical and mechanical characteristics and it is also completely self-lubricating.



G type laminate

## Amity™ biodegradable and biobased plastics



We are promoting research and development of environmentally friendly products such as biodegradable plastic products and biobased plastic products. We offer products in shapes that meet your needs.

### Main applications

- Biodegradable plastic products: For civil engineering and composting utilizing biodegradable properties
- Biobased plastic products: Daily necessities for general household use



For more information



### Biodegradable plastic products

They are made from plastic that is degraded into water and CO<sub>2</sub> by the action of microorganisms. Therefore, they do not remain as microplastics when used in a natural environment.



Compostable bag



Sandbag



Stretch film

These compostable bags are used by local governments throughout Japan as bags for collection of food waste.

After collection, the bags with food waste in them can be composted at composting facilities.

Since biodegradable plastic sandbags are degraded by the action of microorganisms, they do not require collection or disposal as industrial waste, contributing to reduction of disposal costs. We can also provide flat yarn, the material used for sandbags.

This product is a stretch film made of biodegradable plastic to prevent cargo collapse. The elongation and strength of this product is comparable to those of general polyethylene films.

### Biobased plastic products

These products are made from plant-derived raw materials, such as corn.

They contribute to reduction of CO<sub>2</sub> because they are made from plants that grow up absorbing CO<sub>2</sub> during the process of photosynthesis.



Shopping bags



Cutlery



Injection-molding products

These bags contain biobased plastic. They are made from plant-derived raw materials, contributing to reduction of CO<sub>2</sub>.

Although this product is made from environmentally friendly corn-derived polylactic acid (PLA), it has superior water resistance and durability compared to paper products.

Our injection-molding products are made from biobased plastic. They can be molded into a wide range of shapes to meet your requirements.

\* Please contact us separately for details, such as shapes other than the above and sizes that can be manufactured. \* The cutlery is also biodegradable.

# General characteristics of fluororesin

## General characteristics

	Characteristics	Unit	Test method			PTFE	PFA	FEP	PCTFE	ETFE	ECTFE	PVDF
			JIS K6935	Conforming to ISO 12086	ASTM D4591							
Physical	Melting point	°C	K7112	1183	D792	2.13-2.20	2.12-2.17	2.15-2.17	2.10-2.20	1.73-1.74	1.68-1.69	1.75-1.78
	Density	g/cm <sup>3</sup>	K7112	1183	D792	2.13-2.20	2.12-2.17	2.15-2.17	2.10-2.20	1.73-1.74	1.68-1.69	1.75-1.78
Mechanical	Tensile strength	MPa	K7162	527	D638	20-35	25-35	20-30	31-41	38-42	41-48	30-70
	Elongation	%	Same as above	Same as above	Same as above	200-400	300-350	250-330	80-250	300-400	200-300	20-370
	Compression strength	MPa (10% deformation)	K7181	604	D695	10-15	15-20	14-19	31-51	40-50	35-40	32-74
	Izod impact strength	J/m	K7110	180	D256	150-160	Not broken	Not broken	135-145	Not broken	Not broken	160-375
	Rockwell hardness	(R scale)	K7202	2039	D785	R20	R50	R50	R80	R50	R50	R93-116
	Shore hardness	(D scale)	K7215	2039	D2240	D50-55	D62-66	D60-65	D75-80	D67-78	D53-57	D64-79
	Flexural modulus	GPa	K7171	178	D790	0.53-0.58	0.54-0.64	0.55-0.67	1.25-1.79	0.90-1.20	0.66-0.69	0.60-1.99
	Tensile modulus	GPa	K7162	527	D638	0.40-0.60	0.31-0.35	0.32-0.36	1.03-2.10	0.70-0.85	1.55-1.70	0.37-2.58
	Coefficient of kinetic friction	(0.69MPa, 3m/min)	K6935		D1894	0.1	0.2	0.3	0.4	0.4	0.4	0.4
	Thermal	Thermal conductivity	W/m·K	A1412	8302	C177	0.23	0.19	0.2	0.22	0.24	0.16
Specific heat		10 <sup>3</sup> J/kg·K	K7123			1.0	1.0	1.2	0.9	2.0	2.0	1.2
Linear expansion coefficient		10 <sup>-5</sup> /°C			D696	10	12	9	6	6	8	16
Ball pressure temperature		°C	Conforming to the "Report on Registration System for the Pressure of Thermoplastic Resin Balls Used for Electric Appliances"			180	230	170	170	185	180	150
Thermal distortion temperature		°C	K7191	75	D648							
		(1.81MPa)				55	47	50	90	74	77	100
		(0.45MPa)				120	74	72	126	104	116	156
Maximum service temperature (continuous)	°C	K7226	2578		260	260	200	120	150	150	150	
Electrical	Volume resistivity	Ω·cm (50%RH, 23°C)	K6911	IEC60093	D257	> 10 <sup>18</sup>	> 10 <sup>18</sup>	> 10 <sup>18</sup>	> 10 <sup>18</sup>	> 10 <sup>17</sup>	> 10 <sup>15</sup>	> 10 <sup>15</sup>
	Dielectric strength (at short-time)	MV/m (Thickness: 3.2 mm)	K6935	IEC60243	D149	19	20	22	22	16	20	11
		(60Hz)	K6935	IEC60250	D150	2.1	2.1	2.1	2.6	2.6	2.6	8.4
		(10 <sup>3</sup> Hz)				2.1	2.1	2.1	2.6	2.6	2.6	7.7
	Relative dielectric constant	(10 <sup>3</sup> Hz)				2.1	2.1	2.1	2.6	2.6	2.6	6.4
		(60Hz)	K6935	IEC60250	D150	0.0002	0.0002	0.0002	0.0012	0.0006	0.0005	0.049
		(10 <sup>3</sup> Hz)				0.0002	0.0002	0.0002	0.025	0.0008	0.0015	0.018
Dielectric tangent	(60Hz)	K6935	IEC60250	D150	0.0002	0.0002	0.0002	0.025	0.0008	0.0015	0.018	
	(10 <sup>3</sup> Hz)				0.0002	0.0003	0.0005	0.020	0.005	0.015	0.017	
	(10 <sup>3</sup> Hz)				0.0002	0.0003	0.0005	0.020	0.005	0.015	0.017	
ARC resistance	s			D495	> 300	> 300	> 300	> 300	75	18	60	
Chemical resistance, and other properties	Water absorption	%(24h)	K7209	62	D570	0.01	0.01	0.01	0.01	0.03	0.01	0.03
	Combustibility	(Thickness: 3.2 mm)	K7140	1210	UL-94	V-0	V-0	V-0	V-0	V-0	V-0	V-0
	Limiting oxygen index		K6935	4589	D2863	> 95	> 95	> 95	> 95	32	60	43
	Influence of direct sunlight					N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes: Parenthesized values represent test conditions  
 \* The table above is extracted from "Fluoroplastics Handbook" by the Japan Fluoropolymers Industry Association.

# Chemical resistance

## Chemical resistance table

Chemical	Resin Concentration (%)	PTFE		PFA		FEP		ETFE		PVDF	
		Ordinary temperature	100°C	Ordinary temperature	100°C	Ordinary temperature	100°C	Ordinary temperature	100°C	Ordinary temperature	100°C
Acetone	100	○	○	○	○	○	○	○	○	○	○
Sulfurous acid gas	100	○	○	○	○	○	○	○	○	○	○
Acetaldehyde	100	○	○	○	○	○	○	○	○	○	○
Ammonia water	28	○	○	○	○	○	○	○	○	○	○
Ethanol	100	○	○	○	○	○	○	○	○	○	○
Chlorine	—	○	○	○	○	○	○	○	○	○	○
Ammonium chloride	Saturation	○	○	○	○	○	○	○	○	○	○
Calcium chloride	Saturation	○	○	○	○	○	○	○	○	○	○
Hydrochloric acid	10	○	○	○	○	○	○	○	○	○	○
	35	○	○	○	○	○	○	○	○	○	○
Ozone	—	○	○	○	○	○	○	○	○	○	○
Sodium hydroxide	5	○	○	○	○	○	○	○	○	○	○
	15	○	○	○	○	○	○	○	○	○	○
	30	○	○	○	○	○	○	○	○	○	○
	50	○	○	○	○	○	○	○	○	○	○
Formic acid	20	○	○	○	○	○	○	○	○	○	○
	60	○	○	○	○	○	○	○	○	○	○
Xylene	100	○	○	○	○	○	○	○	○	○	
Glycerin	100	○	○	○	○	○	○	○	○	○	
Chloroform	100	○	○	○	○	○	○	○	○	○	
Chromic acid	20	○	○	○	○	○	○	○	○	○	○
	50	○	○	○	○	○	○	○	○	○	○
Acetic acid	50	○	○	○	○	○	○	○	○	○	○
	75	○	○	○	○	○	○	○	○	○	○
Ethyl acetate	100	○	○	○	○	○	○	○	○	○	
Hypochlorous acid	10	○	○	○	○	○	○	○	○	○	○
	50	○	○	○	○	○	○	○	○	○	○
Oxalic acid	100	○	○	○	○	○	○	○	○	○	
Bromine	—	○	○	○	○	○	○	○	○	○	
Nitric acid	5	○	○	○	○	○	○	○	○	○	○
	20	○	○	○	○	○	○	○	○	○	○
	60	○	○	○	○	○	○	○	○	○	○
Aluminum nitrate	Saturation	○	○	○	○	○	○	○	○	○	
Ammonium nitrate	Saturation	○	○	○	○	○	○	○	○	○	
Sodium nitrate	Saturation	○	○	○	○	○	○	○	○	○	
Carbon tetrachloride	100	○	○	○	○	○	○	○	○	○	
Calcium hydroxide	30	○	○	○	○	○	○	○	○	○	
Ammonium carbonate	50	○	○	○	○	○	○	○	○	○	
Sodium carbonate	30	○	○	○	○	○	○	○	○	○	
Toluene	100	○	○	○	○	○	○	○	○	○	
Trichloroethylene	100	○	○	○	○	○	○	○	○	○	
Nitrobenzene	100	○	○	○	○	○	○	○	○	○	
Carbon disulfide	100	○	○	○	○	○	○	○	○	○	
Lactic acid	100	○	○	○	○	○	○	○	○	○	
Benzene	100	○	○	○	○	○	○	○	○	○	
Methanol	100	○	○	○	○	○	○	○	○	○	
Methyl ethyl ketone	100	○	○	○	○	○	○	○	○	○	
Sulfuric acid	10	○	○	○	○	○	○	○	○	○	○
	50	○	○	○	○	○	○	○	○	○	○
	90	○	○	○	○	○	○	○	○	○	○
Ammonium sulfate	Saturation	○	○	○	○	○	○	○	○	○	
Phosphoric acid	50	○	○	○	○	○	○	○	○	○	○
	80	○	○	○	○	○	○	○	○	○	○

○...Excellent ○...Can be used depending on the condition x...Not available —...No data

● Reference : Dictionary of Polymer technology  
 ● Although the chemicals listed in the table are chemically inactive (it is clear that it does not cause any chemical reaction), it may cause a problem when it is subject to physical action such as permeation due to temperature, pressure, or chemical concentration.  
 ● As the descriptions in the table are used only for "reference" and do not "guarantee" the product, please perform sufficient tests in the same environment and ensure that no problem is caused prior to the use.

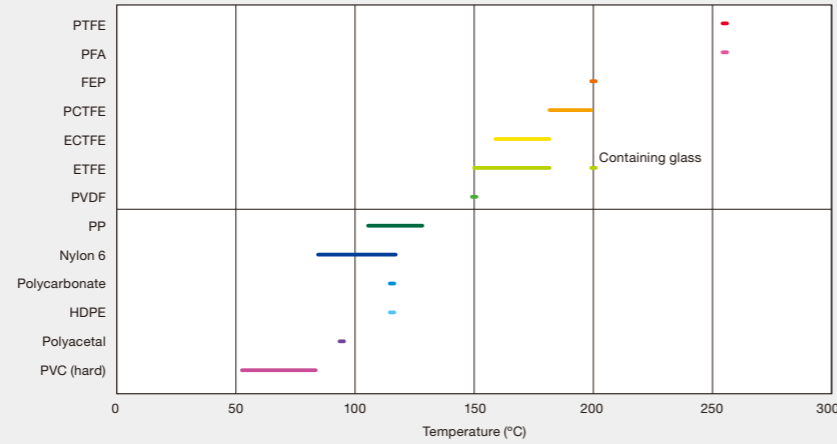
FLUOROPLASTIC MEMBRANE  
 FABRIC  
 ADHESIVE TAPE  
 BELT  
 COPPER-CLAD LAMINATE  
 TUBE  
 INJECTION MOLDING PRODUCTS  
 PROCESSED PRODUCTS  
 PTFE SPECIAL PRODUCTS  
 POROUS PRODUCTS  
 HIGHLY FUNCTIONAL FILM & OTHER PRODUCTS  
 BIODEGRADABLE & BIOPLASTICS  
 CHARACTERISTICS

# Comparison of properties between Fluoroplastics and other plastics

## Comparison of Properties between Fluoroplastics and Other Plastics\*1

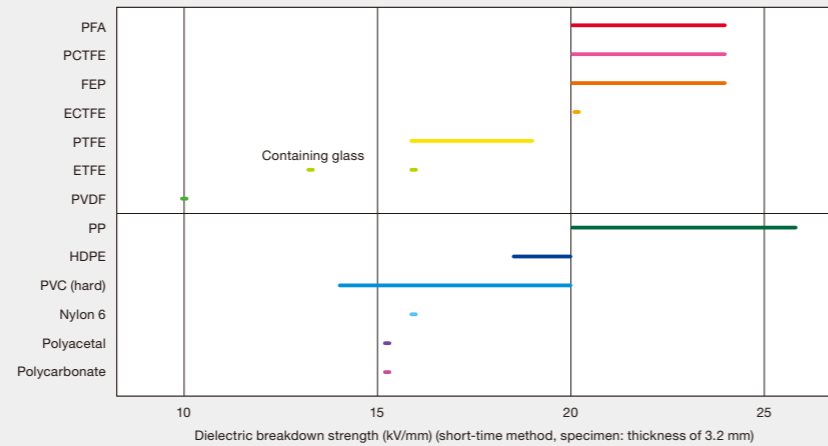
### Continuous Service Temperature (not loaded)

- Fluoroplastics are in the top group among plastics on this property.
- In particular PTFE and PFA are the highest at 260 °C.



### Dielectric breakdown strength

- As the values are generally high, it is an excellent insulating material.
- PVDF has a slightly low value.
- Addition of other substances makes the value lower. (e.g.: glass)



## Surface wettability of various plastics\*1

Name	Water contact angle (degree)	Adhesion energy (N/m)
FEP	115	0.042
PTFE	114	0.043
PFA	The same level as FEP and PTFE	
Silicone resin	90~110	0.048~0.073
Paraffin	105~106	0.053~0.054
Polyethylene	88	0.075
Polyamide	77	0.098
Phenol resin	60	0.109

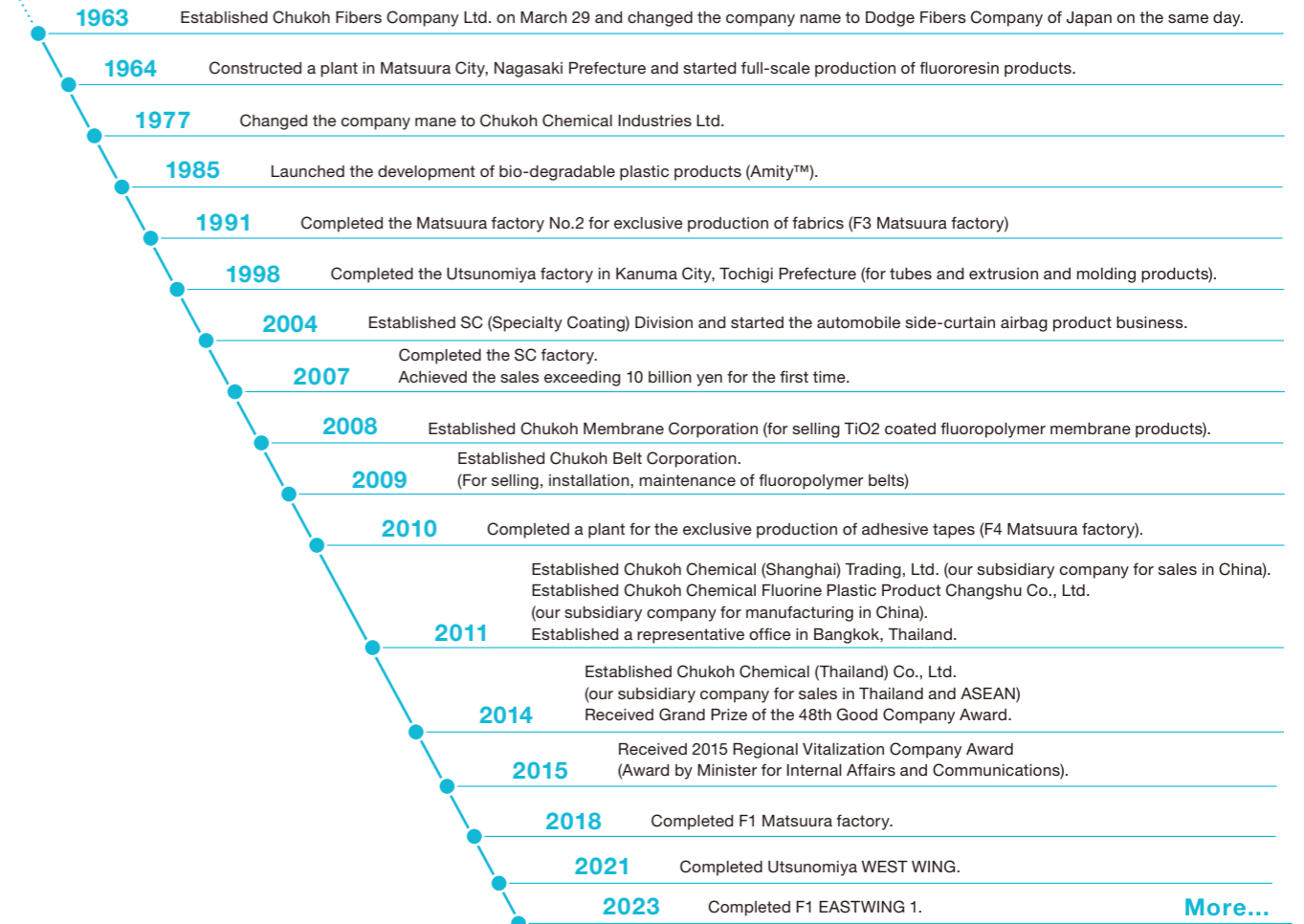
## Friction coefficient data

Test piece (material)	Measurement result	
	Static friction coefficient (μS)	Dynamic friction coefficient (μD)
PTFE plate	0.11	0.09
G fabric	0.15	0.14
A fabric	0.15	0.13
Polyurethane	0.82	0.70
PVC plate	0.31	0.33
Nylon plate	0.17	0.15
Polyacetal plate	0.20	0.16
Silicone rubber	7.96	7.89
SS steel plate	0.24	0.20

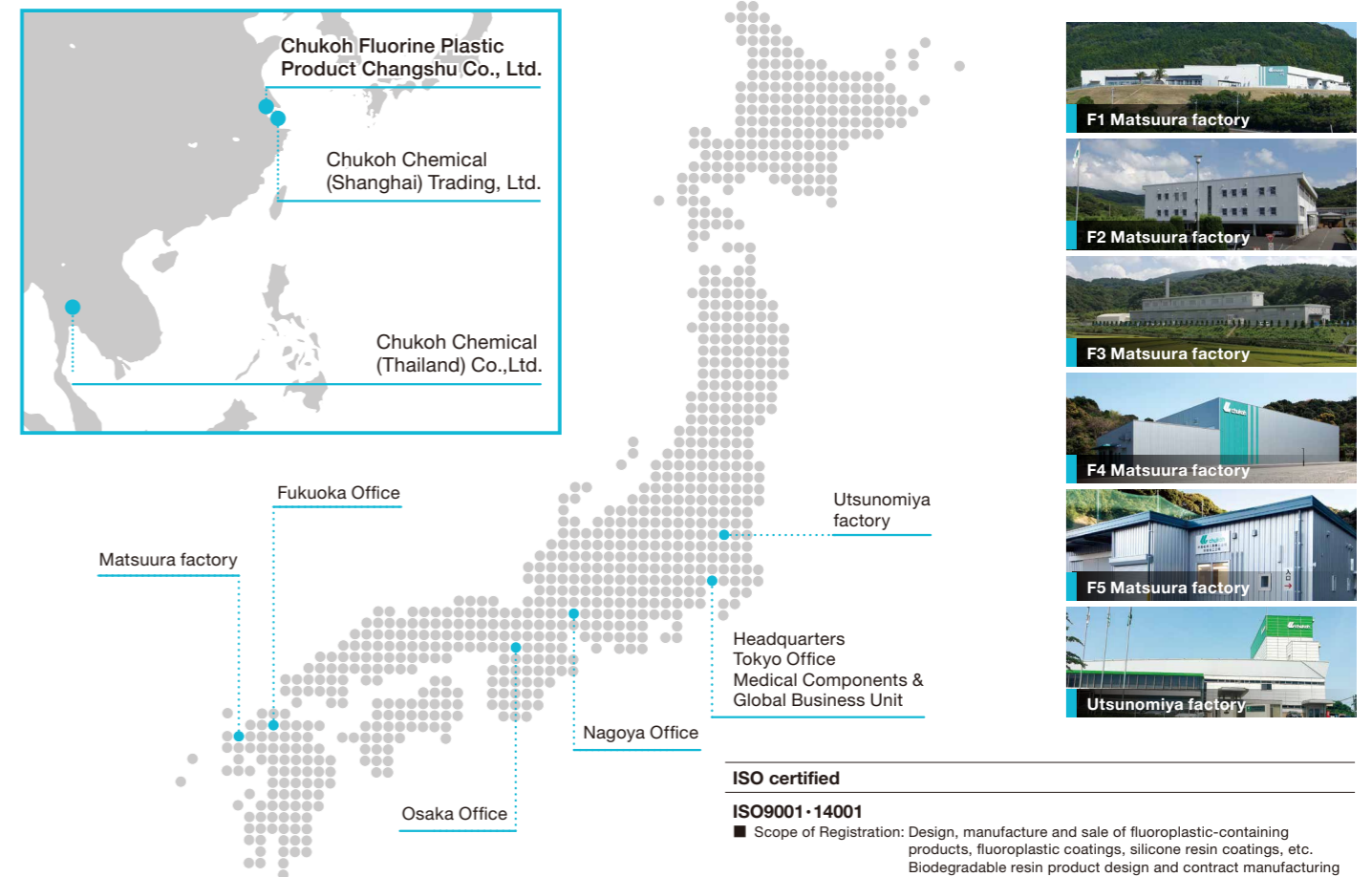
\*1 The data described above are partially cited from "Handbook on Fluoropolymers" of the Japan Fluoropolymers Industry Association.

\* The numerical values were measured by us in accordance with the JIS K7125 and they are not a guaranteed value.

# HISTORY and DEVELOPMENT



## OFFICES



**ISO certified**

**ISO9001-14001**  
 ■ Scope of Registration: Design, manufacture and sale of fluoroplastic-containing products, fluoroplastic coatings, silicone resin coatings, etc. Biodegradable resin product design and contract manufacturing management  
 ■ Certification: All domestic sites

**ISO13485**  
 ■ Scope of Registration: Manufacturing of tubing for medical devices  
 ■ Certification: Utsunomiya Factory