



KURALON FILAMENT

KURARAY CO., LTD.

<http://www.kuraray.co.jp/>

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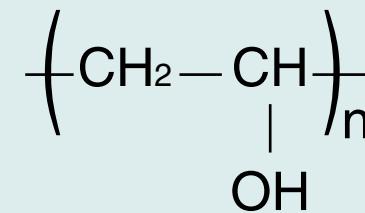
What is “KURALON”?

Polyvinyl Alcohol Fiber

“KURALON” is a synthetic fiber made of **Polyvinyl Alcohol**, which is used in many industrial applications owing to its unique and excellent performance.

Kuraray is the No.1 producer in the world of Polyvinyl Alcohol resin as well as fiber ; filament yarn, short-cut fiber, spun yarn and staple fiber.

Chemical Structure



General Characteristics

“KURALON” filament has excellent characteristics for industrial applications.

These characteristics are ;

1 Tensile Properties

- 1-1 High tenacity
- 1-2 Low elongation
- 1-3 High Young’s modulus

2 Dimensional Stability

- 2-1 Low creep
- 2-2 Low heat shrinkage (dry state)

3 Chemical Resistance

4 Affinity to Rubbers and Resins

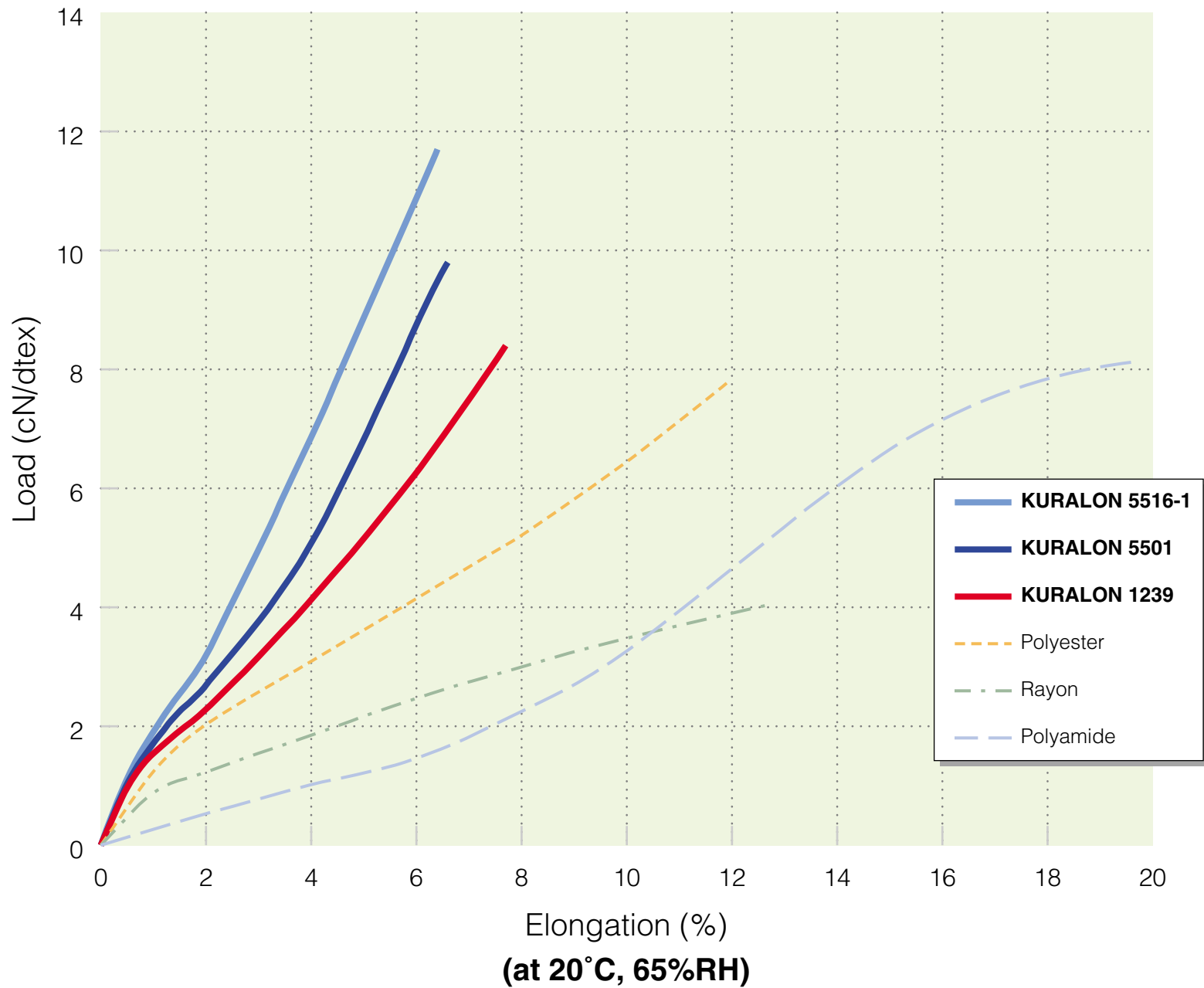
5 Weatherability

Physical Properties in Comparison With Various Filament Yarns

Type	KURALON			Rayon	Polyester	Polyamide 6	p-Aramid
	1239	5501	5516-1	Super-III	HMLS		Regular
Thickness (dtex)	1330	2000	2000	1830	1110	930	1670
Number of Filament	200	1000	1000	1100	250	96	1000
Breaking strength (N)	110	196	238	75	86	75	324
Tenacity (cN/dtex)	8.2	9.8	11.9	4.1	7.8	8.1	19.4
Elongation at break (%)	7.7	6.6	6.4	12.9	11.9	19.4	3.9
Young's modulus (cN/dtex)	177	203	260	85	110	34	493
Dry heat shrinkage (%)	0.8	0.6	0.4	1.8	7.0	6.5	0.0
Specific gravity	1.30			1.52	1.38	1.14	1.41
Commercial moisture regain (%)	5.0			11.0	0.4	4.5	4.9

* Dry heat shrinkage at 160°C for 30min / * Boiling shrinkage at 100°C for 30min

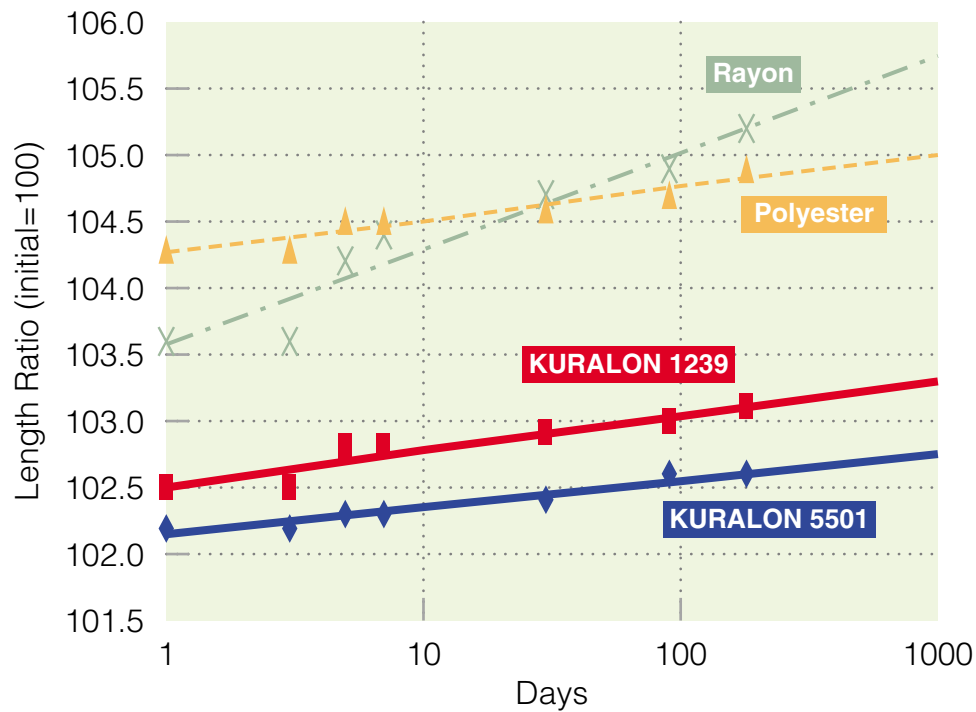
Load-Elongation Curve



Dimensional Stability

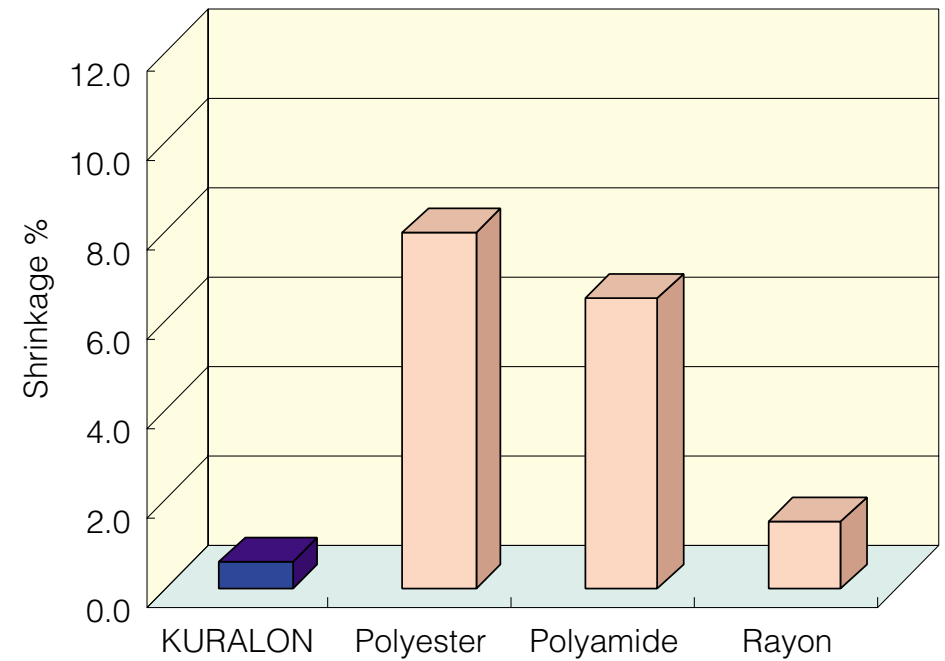
Creep

Elongation Under a 10% Load of Breaking Strength, at Room Temperature



Dry Heat Shrinkage

Shrinkage at 160°C for 30 minutes



Chemical Resistance

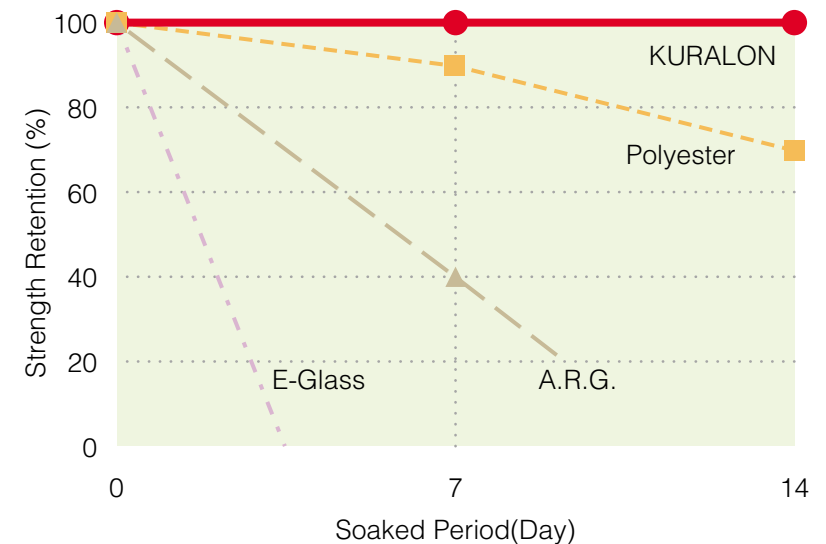
Resistance Against Various Chemicals

Chemicals		Test condition			Strength retention			
		Conc.	Temp.	Time	KURALON	Polyester	Polyamide	Rayon
		%	°C	hrs.	%	%	%	%
Acids	Sulphuric acid	1	20	10	100	100	97	84
		10	20	10	100	100	56	55
	Hydrochloric acid	10	20	1	100	100	76	83
		10	20	10	100	95	77	69
	Nitric acid	10	20	10	100	100	86	90
Alkalis	Sodium hydroxide	1	100	100	100	29	75	71
		40	20	10	100	97	82	0
Salts	Sodium carbonate	1	100	10	97	95	99	85
	Sodium chloride	3	100	10	100	100	84	98
	Ferric chloride	3	100	10	89	100	55	0
Organic solvents	Aceton	100	20	1000	89	100	88	100
	Benzene	100	20	1000	100	93	88	90
Oils	Mineral oil	100	100	10	100	100	100	10
	Linseed oil	100	20	1000	100	93	92	100

*Treatment of yarns fixed with load

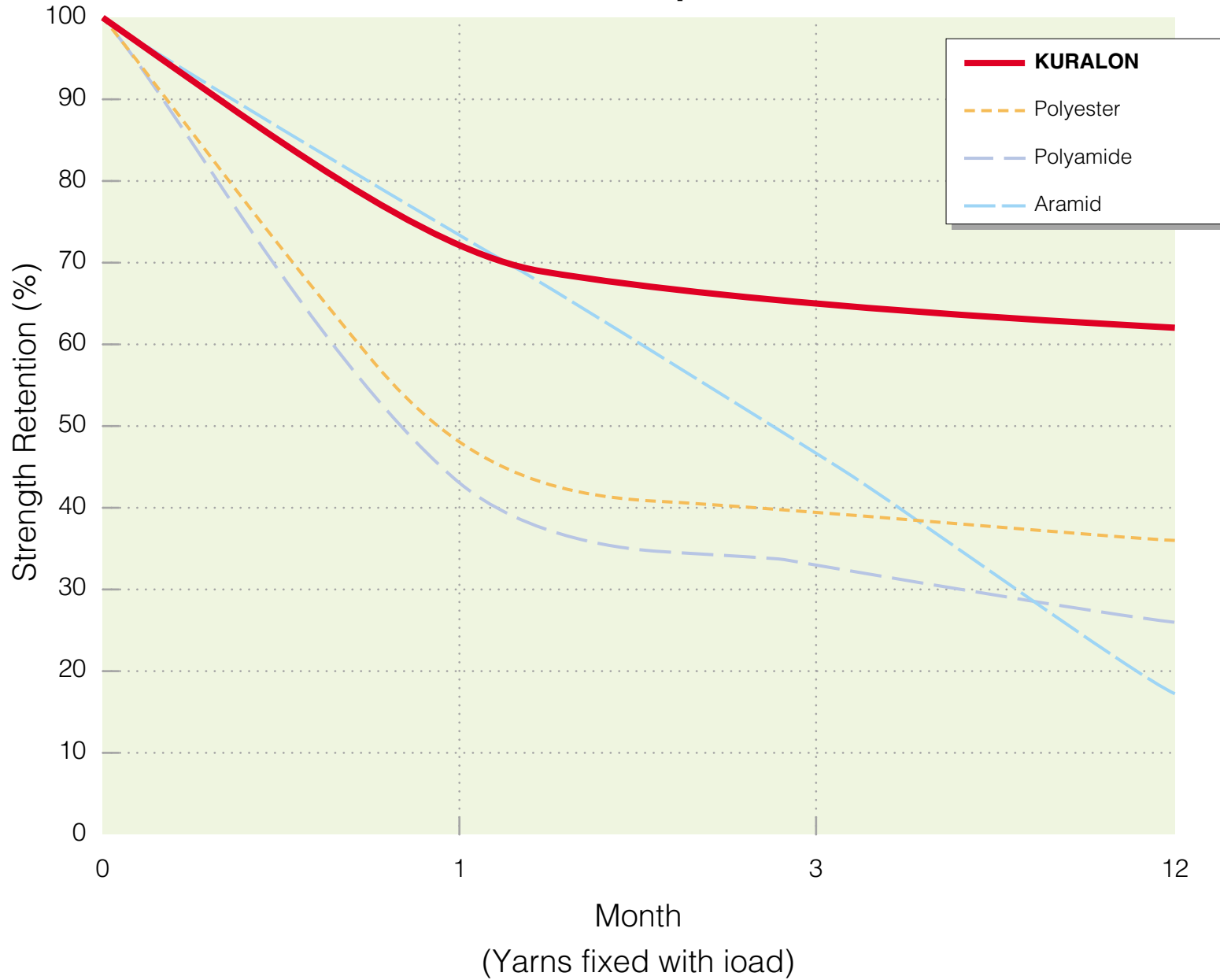
Alkali Resistance

In Cement Water at 80°C With Load



Weatherability

Outdoor Exposure



Health Aspect

1 Polyvinyl Alcohol Resin

Polyvinyl Alcohol (PVA), raw material of “KURALON”, is a safe material, as it is approved by the US Food and Drug Administration (FDA) for use in articles in connection with the producing, processing and packing foods.

2 Thermal Decomposition

“KURALON” is the least harmful fiber among synthetic fibers in case of gas generation in thermal decomposition at 600°C.

(%)

	CO	CO2	NH3	HCN	H2S
KURALON	0.45	0.59	—	—	—
PAN	1.33	0.15	0.06	0.09	—
Polyamide	0.88	0.40	0.05	0.03	—
Cotton	4.33	0.75	—	—	—
Wool	2.00	0.59	0.10	0.05	0.04

*Sample weight: 10mg

Types of “KURALON” Filament

Type		1239	1225-7	1203-2	5501	5506	5508-1	5516-1
Thickness	dtex	1330	1100	1330	2000	1330	1100	2000
Number of filament		200	200	200	1000	600	600	1000
Breaking strength	N	110	78	90	196	128	105	238
Tenacity	cN/dtex	8.2	7.1	6.8	9.8	9.6	9.5	11.9
	g/dr	9.3	8.0	7.7	11.1	10.9	10.8	13.5
	GPa	1.06	0.93	0.88	1.27	1.25	1.23	1.55
Elongation at break	%	7.7	10.0	13.5	6.6	8.0	9.0	6.4
Young's modulus	cN/dtex	177	159	137	203	177	168	260
	GPa	23.0	20.7	17.8	26.4	23.0	21.8	33.8
Dry heat shrinkage (at 160°C for 30min)	%	0.8	0.8	0.8	0.6	0.6	0.4	0.4
Boiling shrinkage (at 100°C for 30min)	%	4.5	4.5	4.5	2.5	2.5	2.0	2.2
Specific gravity		1.30						
Melting point	°C	over 240						
Commercial moisture regain	%	5.0						

Applications

1 Rubber Reinforcement

1.Hoses

Automotive	Industrial
<ul style="list-style-type: none">· Hydraulic Brake ※1· Air Conditioning· Suspension· Fuel· Others	<ul style="list-style-type: none">· Hydraulic (Machinery etc)· LPG· Sewage Cleaning· Welding· Pumping· Others



(※1 Hydraulic Brake Hose)

2.Belts

- Conveyor Belt
- V-Belt

3.Tire Cord

4.Short-cut Fiber for Rubber Reinforcement

2 Construction and Civil Engineering

Cement and Concrete Reinforcement

3 Plastic Reinforcement

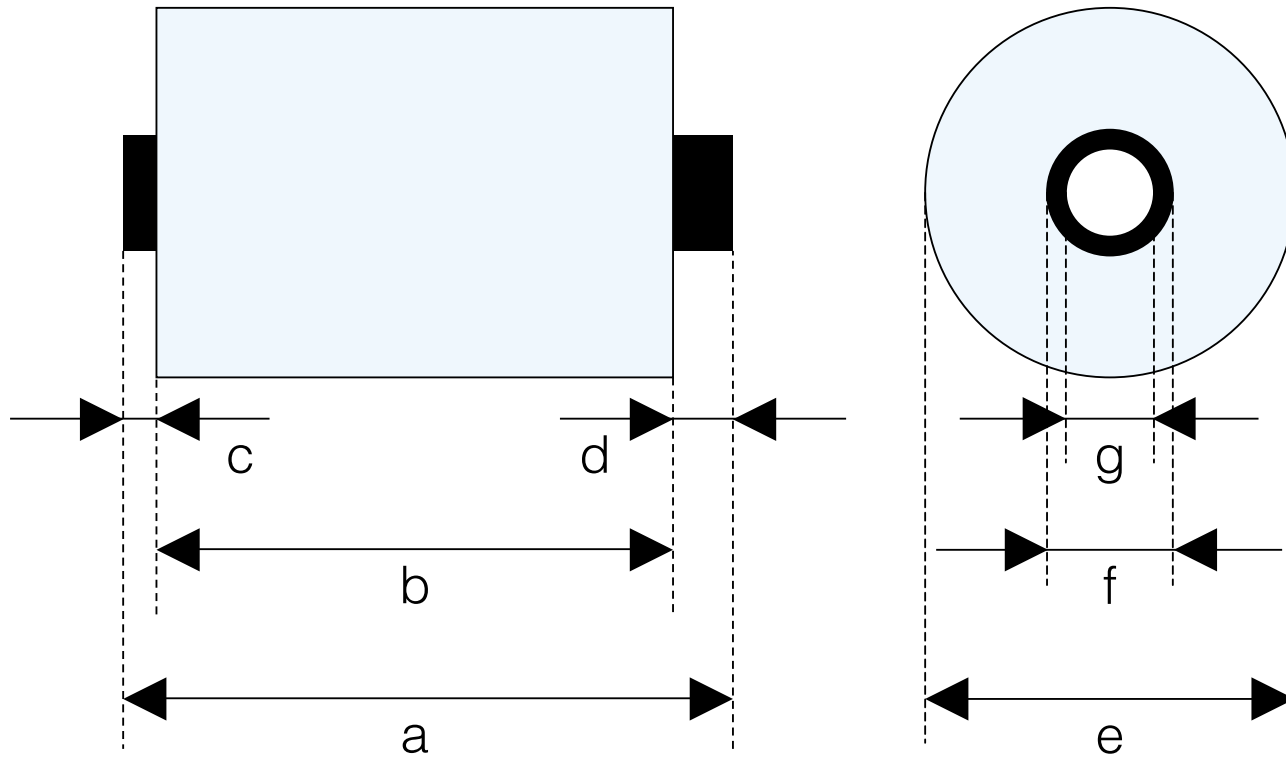
- 1.FRP ※2
- 2.Plastic Hose

4 Rope, Cord and Thread



(※2 FRP Helmet)

Package



	Package unit	Dimension(mm)							Carton/Pallet
		a	b	c	d	e	f	g	
Regular package	5kg/cheese	240	204	18	18	203	63	51	30kg/carton
Large package	10kg/cheese	339	305	14	20	236	89	73	480kg/pallet 720kg/pallet

*10kg of Large package is available for 5501 2000dtex.



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