TIGERS POLYMER CORPORATION
タイガースポリマー株式会社

EXTRUSION PRODUCTS & TUBING CATALOG

TIGERS POLYMER CORPORATION

TIGERS POLYMER'S

EXTRUSION PRODUCTS &TUBING

We currently offer a wide range of products including silicone rubber and fluoro rubber tubing, round cords, square cords, made-to-order shape cord, sponges, transparent fluoro rubber tubing, and elastomer tubing. These products are utilized in fields such as physical and chemical research, as well as general industrial applications where heat resistance, chemical resistance, and inert materials are required.

メイドインジャパン

MADE IN JAPAN

Reliable Domestic Production in Japan

The extrusion products in this catalog are researched and developed at our Tochigi plant and manufactured at our domestic factories. Additionally, our R&D center is responsible for investigation and analysis.

Usage Precaution

(Read these instructions carefully before using.)

- The data in this catalog are test values and not standard ones. Additionally, the contents are subject to be modified without notice for improvements.
- To ensure the original functionality and safe use, please refer to the catalogs and/or the documents issued by our company.
- The products in this catalog are manufactured for general industrial use and are not intended for special applications, such as medical devices. For use in medical, pharmaceutical, and other safety-conscious applications, please test and verify their safety at your company before use. We do not guarantee their suitability or safety for these applications.
- When cutting and using the products from this catalog as parts, please check the suitability and safety for the intended purpose on the user's side.

Storage

⚠ Warning	Fire is strictly prohibited. Please store away from sources of heat such as stoves and/or devices that produce electric sparks.
Precaution	Please store indoors to avoid exposure to direct sunlight, wind, and rain.
Precaution	Please do not bend or deform locally.
Precaution	Please do not drag or pull on the ground.

Processing

⚠ Warning	When processing products through polishing, cutting, or other methods, there is a possibility of harm to the human body from smoke and cut dust. Please wear protective glasses and a mask.
⚠ Warning	If polishing or cutting dust from products accumulates, there is a risk of spontaneous combustion, which can cause burns and fires. Therefore, please remove the accumulation when it occurs.

Usage

Precaution	These products are not suitable for medical devices or food equipment.
Precaution	These products are not suitable for applications involving prolonged direct contact with the body.
Precaution	The lifespan and safety of these products are greatly influenced by their applications, conditions of use, installation methods, and environment. Please ensure thorough confirmation from the user.
Precaution	When using these products in close contact with other products or components, discoloration or deterioration may occur due to leaching or migration of the contents of these products.
Precaution	Regarding chemical resistance, the technical data provides very general performance information. It is necessary for users to confirm for each individual use.

Disposal

⚠ Warning	When disposing of these products, please ensure proper handling in accordance with the law and the responsibility of a waste disposal service provider.

EXTRUDED PRODUCTS

Environmental Considerations

Efforts to reduce environmental impact substances with consideration for biodiversity are progressing globally.
In Japan, environmental impact substances are specified by laws, industry associations, and green procurement standards of each company.
In our company, we grasp the raw materials of tubing and extrusion products, and there is no intentional use or inclusion of the 10 substances targeted by the RoHS Directive (RoHS2). Moving forward, we will continue to monitor the trends of regulations, industries, and green procurement of each company, and respond flexibly to changes.

Features

● These products comply with the RoHS Directive (RoHS2) and the ELV Directive (*1).

- The raw materials for our tubing and extrusion products do not contain any intentionally used substances restricted under the RoHS Directive (RoHS2) and the ELV Directive.
- For our tubing and extrusion products, we can provide evidence documentation upon request. Please contact us.

● Regarding to other regulations

In June 2007, the REACH regulation (*2) was implemented in Europe.

The addition of more regulated substances is considered even in the existing ELV Directive. Each country is also independently strengthening its own regulations, and the list of regulated substances is expected to continue growing. In response, industry associations and each company are working to establish and update their green procurement standards.

We have a detailed understanding of the raw materials used in our tubing and extrusion products, and have been proactively working to reduce, minimize, and manage the chemical substances that are anticipated to be regulated, even before the regulations were put in place.

Our standard tubing and extrusion products do not intentionally use or contain the following chemical substances that are anticipated to be regulated in the future.

PCB : Polychlorinated Biphenyl	Asbestos
PFOA : Perfluorooctanoic acid and its salts	HBCD : Hexabromocyclododecane
PFOS : Perfluorooctanesulfonic acid and its salts	Deca-BDE : Decabromodiphenyl ether

Regarding the REACH regulation Substances of Very High Concern (SVHC), the list is updated approximately every 6 months with additional substances. As a result, we need to investigate the compliance status with each update. Please contact us.

Notes

* 1: RoHS Directive = Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment in EU (RoHS2) (Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment in EU)
ELV Directive = End of Life Vehicles in EU

RoHS Control subjects	Threshold (*3)	RoHS Control subjects	Threshold (*3)
Lead and its compound	1,000ppm	PBDE (Polybrominated diphenyl ether)	1,000ppm
Mercury and its compound	1,000ppm	DEHP (Diethylhexyl phthalate)	1,000ppm
Cadmium and its compound	100ppm	BBP(Benzyl butyl phthalate)	1,000ppm
Hexavalent chromium compound	1,000ppm	DBP(Dibutyl phthalate)	1,000ppm
PBB (Polybrominated biphenyl)	1,000ppm	DIBP(Diisobutyl Phthalate)	1,000ppm

(1,000ppm = 0.10%)

* 2 : REACH = Registration, Evaluation, Authorisation and Restriction of Chemicals in EU

* 3 : Threshold = The boundary value
In the case of RoHS Directive (RoHS2), if the content rate is less than the above value, it is considered to be compliant.

Please be sure to review the "Usage precautions" on p.02 before selecting the appropriate product.
Additionally, please refer to the "Product selection guide by material" on p.05 and
the "Product selection guide by purpose" on p.06 to help you choose the most suitable product.

CONTENTS

Table of Contents / Selection Guide

01 Introduction
02 Usage precautions
03 Environmental considerations
04 Table of contents
05 Product selection guide by material
06 Product selection guide by purpose
Explanation of terms

Silicone Rubber Extrusion Products

Silicone rubber
07 General purpose tube
08 Roller pump tube
09 Color silicone rubber tube
Highly transparent tube
10 Round cord, Square cord
11 Made-to-order shape
Flame retardant
12 Conductive
Antistatic

Silicone rubber sponge
13 Round cord
Square cord
Made-to-order shape

Fluoro Rubber Extrusion Products

Fluoro rubber
14 Tube
Transparent tube
15 Round cord
Square cord
Made-to-order shape

Fluoro rubber sponge
16 Round cord
Square cord
Made-to-order shape

Elastomer Extrusion Products

MediL™ series
17 Laboratory tube
Industrial tube
18 Laboratory soft PVC tube
BM(Biomass)series Environmental impact reduction/soft PVC tube
19 Chemical resistant・Roller pump tube
20 Size table

Techiniclal Data

Material Properties and Features
22 Silicone rubber and silicone sponge rubber
23 Fluoro rubber, fluoro sponge rubber and transparent fluoro rubber
24 MediL™ tube

Other characteristics
25 Gas permeability
Guideline for operating temperature
26 Chemical resistance
27 Pressure resistance
Minimum bending radius

Please be sure to read the “Usage Precaution” on page 02 before selecting the right product for your needs. For assistance with product selection, please refer to the "Product Selection Guide by Purpose" on page 06.

Product Selection Guide by Material

(○ : Available　— : Need to be checked　× : Not available)

Material	Product name	Features	Page	Heat resistant temperature (°C)	Embrittlement temperature (°C)	Color	Hardness	Product shape			Purpose			
								Tube	Round & Square cord	Made-to-order	Physics & chemistry analysis	Roller pump	Food hygiene test compliant	Industrial
Silicone rubber	SR1554	General purpose tube	07	200	−65	Translucent	54	○	—	—	○	○	○	○
	SR1563	Medium hardness tube	—	200	−65	Translucent	59	○	—	—	○	×	○	○
	SR1573	High hardness tube	—	200	−65	Translucent	70	○	—	—	○	×	○	○
	SR141	Low hardness tube, extrusion	11	200	−65	Translucent	40	○	○	○	○	×	○	○
	SR151	Medium hardness tube, extrusion	10・11	200	−65	Translucent	53	○	○	○	○	×	○	○
	SR161	Medium hardness tube, extrusion	11	200	−65	Translucent	58	○	○	○	○	×	○	○
	SR171	High hardness tube, extrusion	11	200	−65	Translucent	70	○	○	○	○	×	○	○
	SR1050	High tensile strength tube, extrusion	—	200	−65	Pale yellow	49	○	○	○	○	×	—	○
	SR1055	Roller pump tube	08	200	−65	Translucent	55	○	—	—	○	○	○	○
	SR1102	Flame retardant tube, extrusion	11	200	−65	White	59	○	○	○	○	×	—	○
	SR1158	Flame retardant tube, extrusion	11	200	−65	Gray	60	○	○	○	○	×	—	○
	SR1260	Steam-proof tube, extrusion	—	200	−65	Pale yellow	70	○	○	○	○	×	—	○
	SR1351	Heat resistant tube, extrusion	—	200	−65	Brown	48	○	○	○	○	×	—	○
	SR1402	Conductive tube, extrusion	12	200	−65	Black	68	○	—	○	○	×	—	○
	SR1560	Highly transparent tube	09	200	−65	Transparent	59	○	—	—	○	—	—	○
	SR2160	Antistatic tube, extrusion	12	200	−65	Translucent	60	○	—	—	○	×	—	○
	SR210	Low hardness sponge	13	200	−65	Red	10	○	○	○	○	×	—	○
	SR215	Low hardness sponge	13	200	−65	Red	15	○	○	○	○	×	—	○
	SR225	General sponge without talc treatment	13	200	−65	Red	21	○	○	○	○	×	○	○
	SH25	General sponge with talc treatment	13	200	−65	Red	25	○	○	○	○	×	○	○
Fluoro rubber	FR27	General purpose tube, extrusion	14・15	200	−20	Black	71	○	○	○	○	×	—	○
	FR57	Low compression set tube, extrusion	—	200	−20	Black	76	○	○	○	○	—	—	○
	Tiger- Flon	Transparent fluoro rubber	14	180	−58	Transparent	67	○	—	—	○	×	○	○
	FR235	Sponge	16	200	−9	Black	33	×	○	○	○	×	○	○
Elastomer	P642I	High durability tube	17	130	−62	Pale yellow	63	○	—	—	○	○	○	○
	E640K	High durability tube	17	130	−62	Black	59	○	—	—	○	○	×	○
	V580C	General tube	18	70	−40	Transparent	56	○	—	—	○	○	×	○
	V580C-BM	Environmental impact reduction general tube	18	—	—	Transparent	56	○	—	—	○	—	×	○
	T740C	High purity tube	19	50	−28	Transparent	85	○	—	—	○	○	○	○

*Notes

Please note that the temperature of heat resistance and/or embrittlement is merely guideline value.

Please conduct tests and confirm the suitability of the material under your specific usage conditions before use.

Hardness values are measured using Type A durometer, except for sponge products, which are measured using Type E durometer. For a complete list of material properties, please refer to pages 22-24.

Please note that the test values are for reference only and are not guaranteed ones. They may be subject to change without notice.

While P640I and T740C have passed food hygiene tests, they are subject to transitional measures. For more details, please refer to the footnote 4 in the Medil Tube Material Properties list on page 24.

We recommend that you read the "Product Selection Guide by Purpose" below to help you choose the right product for your needs. It is categorized by main items. Please conduct evaluation tests under actual usage conditions before deciding on the product to use. For information regarding materials and properties, please refer to the technical starting on page 21.

Product Selection Guide by Purpose

*Due to space limitations, this catalog does not contain all data. If you have any questions, please contact us.

What kind of product are you looking for? ➡		Please refer to this
Item	Purpose	Page
Shape	What shape is required for? ● Tube ● Round cord, Square Cord ● Other shape	(Rubber) 07、08、09、14 (Elastomer) 17～20 10、13、15、16 11、13、15、16
Hardness	What hardness is required? ● Required something softer or harder than usual. ● Required something like sponge	Please refer to the hardness column and features in the table on page 05.
Operating temperature	What temperature is required for use? ● Below 100℃ ● Over 100℃	Please refer to the operating temperature range graph in the technical data on page 25.
Chemical resistance	What chemicals pass through the tubing or come in contact with these products? ● Acids (only major inorganic and organic acids are listed) ● Alkalis (only major inorganic and organic bases are listed) ● Oils (only major oils and fats are listed) ● Other chemicals (only major chemicals are listed)	Please refer to the chemical resistance table in the technical data on page 26.
Flame resistance	● Flame resistance required, must not burn	Flame resistant silicone on page 11.
Electric property	● Electric conductivity required ● Need to prevent static electricity while maintaining insulation	Conductive silicone on page 12. Antistatic silicone on page 12.
Strength	● Pressure inside the tube/hose ● Using in a roller pump ● Using it bent	Please refer to the pressure resistance table in the technical data on page 27. (Rubber) 08 (Elastomer) 17、19 Guideline on page 27.
Color	● Required to be transparent ● Not required to be transparent ● Required to be highly transparent	Please refer to the “Color ”column of the table on page 05. Highly transparent silicone rubber on page 90

Glossary of terms

Hardness	This refers to a numerical value that represents the resistance of rubber to the pressure of a needle or a ball pressed against the surface of the rubber surface. According to JIS K 6253:2012 (Vulcanized rubber and thermoplastic rubber - Method for determining hardness), the measurement is taken after 3 seconds, but the hardness commonly referred to is generally measured within 1 second, so that value is displayed.
Tensile Strength at Break	This refers to the maximum stress a specimen can withstand before breaking under tensile force. It is typically expressed as the maximum load divided by the original cross-sectional area of the specimen.
Elongation at Break	This refers to the deformation in the tensile direction that occurs when a specimen is subjected to tensile force. It is expressed as a percentage of the increase in length relative to the original length. JIS refers to "elongation at break" simply as "elongation."
Compression Set	This refers to the permanent compression set of rubber. It is the percentage of compression deformation, expressed as the reduction in thickness relative to the original thickness, after a specimen is compressed to a certain compression ratio, held at a specified temperature for a specified time, and then left to stand for a specified time after the load is removed.
Tear Resistance	This refers to the strength of a specimen against tearing when subjected to tensile force. It is expressed as the maximum stress that causes the specimen to tear when pulled, divided by the thickness of the specimen.
Flame Resistance	This refers to the property of a material being difficult to ignite when exposed to flame, and also not readily sustaining combustion with a flame if ignited.

General purpose silicone rubber tube (SR1554)

RoHS Directive（RoHS2）

Features

- Translucent material with a good balance of hardness and strength.
- Due to addition-type crosslinking, eluted substance and odors are reduced.
- Available in stock in a wide range of sizes (see the size table below).
- Also possible to custom-make with other sizes than in the size table. Please consult us.
- Can be used for roller pumps for short periods of time. (Material properties are listed on page 22.)

■ Size table 〈SR1554〉

ID (mm)	OD (mm)	Wall thickness (mm)	Tolerance (mm)		Standard length (m)
			ID	Wall thickness	
1	2	0.5	±0.1	±0.05	100
1	3	1	±0.1	±0.1	100
1	4	1.5	±0.1	±0.2	100
2	3	0.5	±0.1	±0.05	100
2	3.5	0.75	±0.1	±0.1	100
2	4	1	±0.1	±0.1	100
2	5	1.5	±0.1	±0.2	100
2	6	2	±0.1	±0.2	100
3	5	1	±0.1	±0.1	100
3	6	1.5	±0.1	±0.2	100
3	7	2	±0.1	±0.2	100
3	8	2.5	±0.1	±0.2	100
4	6	1	±0.1	±0.1	100
4	7	1.5	±0.1	±0.2	100
4	8	2	±0.1	±0.2	100
4	9	2.5	±0.1	±0.2	100
5	7	1	±0.15	±0.1	100
5	8	1.5	±0.15	±0.2	100
5	9	2	±0.15	±0.2	100
5	10	2.5	±0.15	±0.2	100
5	11	3	±0.15	±0.2	100
6	8	1	±0.15	±0.1	100
6	9	1.5	±0.15	±0.2	100
6	10	2	±0.15	±0.2	100
6	11	2.5	±0.15	±0.2	100
6	12	3	±0.15	±0.2	100
7	9	1	±0.2	±0.1	100
7	10	1.5	±0.2	±0.2	100
7	11	2	±0.2	±0.2	100
7	12	2.5	±0.2	±0.2	50・100

ID (mm)	OD (mm)	Wall thickness (mm)	Tolerance (mm)		Standard length (m)
			ID	Wall thickness	
7	13	3	±0.2	±0.2	50
7	14	3.5	±0.2	±0.2	50
8	10	1	±0.2	±0.1	50・100
8	11	1.5	±0.2	±0.2	100
8	12	2	±0.2	±0.2	50・100
8	13	2.5	±0.2	±0.2	100
8	14	3	±0.2	±0.2	50
8	15	3.5	±0.2	±0.2	50
9	12	1.5	±0.2	±0.2	50・100
9	13	2	±0.2	±0.2	50
9	15	3	±0.2	±0.2	50
10	12	1	±0.2	±0.1	100
10	13	1.5	±0.2	±0.2	100
10	14	2	±0.2	±0.2	50
10	15	2.5	±0.2	±0.2	50
10	16	3	±0.2	±0.2	50
12	14	1	±0.3	±0.1	100
12	15	1.5	±0.3	±0.2	50
12	16	2	±0.3	±0.2	50・100
12	18	3	±0.3	±0.2	50
12	20	4	±0.3	±0.2	50
15	20	2.5	±0.3	±0.2	50
18	24	3	±0.3	±0.2	30・50
19	25	3	±0.3	±0.2	30・50
20	28	4	±0.3	±0.2	30
25	33	4	±0.4	±0.2	30・50
30	40	5	±0.4	±0.3	10
32	38	3	±0.5	±0.2	10
32	42	5	±0.5	±0.3	10
38	48	5	±0.5	±0.3	10

Made-to-order The sizes shown in [ ] are made-to-order.

●Size: Also possible to custom-make with other sizes than in the above size table. Please consult us.
●Material: In addition to SR1554, others such as SR141, 151, 161, 1563, 1573, etc. are also available.
●Note: SR141, 151, 161, 1563, and 1573 are made-to-order products. Please contact us for details.

Roller pump silicone rubber tube〈SR1055〉

RoHS directive（RoHS2）

Features

- Low eluted substance due to addition-type cross-linking, suitable for chemical, biochemical, analytical, and other applications where elution is a problem.
- Suitable for roller pump tube. A part of the tube test data is listed below.
  （The material properties are listed on page 22.）

Tube durability data for roller pumps

In-house tests have confirmed a durability time approximately twice that of our SR1554 and approximately four times that of general-purpose tubes from other companies.

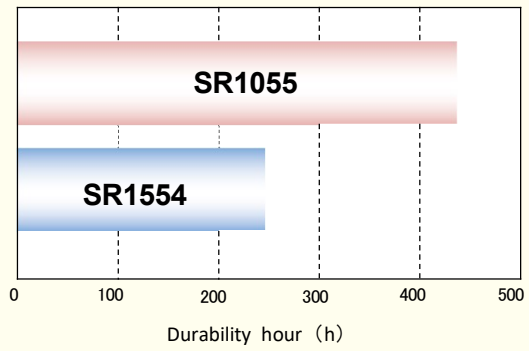
（The durability time of roller pumps varies depending on the type of pump, type of fluid, and temperature. Please check the compatibility of tube and the pumps in advance.）

Tube type	Grade	Hardness (Type A Durometer)	Color	Tube durability life *
For roller pump	**SR1055**	55	Translucent	430 hours
For general purpose	**SR1554**	54	Translucent	240 hours

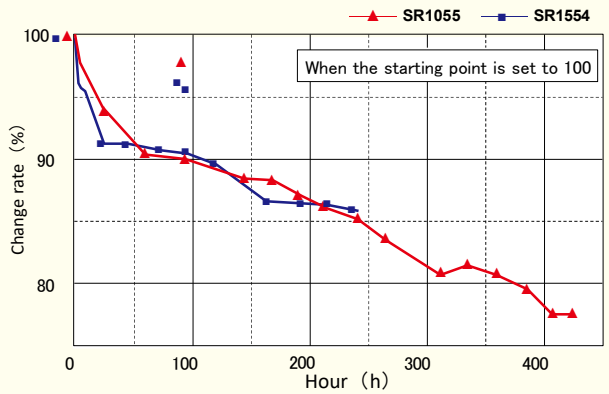
* Tube durability life
The time until cracking occurred was compared for a tube with an inner diameter of 6 x outer diameter of 10 at 380 rpm in a roller pump (6 rollers) at room temperature.

Note）The test data are not standard values but for reference. These descriptions can be altered without any notification.

■ Comparison of tube durability for roller pump



■ Change in discharge amount



■Size table (This is an example of the sizes that can be manufactured)

ID (mm)	OD (mm)	Wall thickness (mm)	Tolerance (mm) ID	Tolerance (mm) Wall thickness	Standard length (m)
1	3	1	±0.1	±0.1	100
2	4	1	±0.1	±0.1	100
3	5	1	±0.1	±0.1	100
4	6	1	±0.1	±0.1	100
5	7	1	±0.15	±0.1	100
6	8	1	±0.15	±0.1	100
7	9	1	±0.2	±0.1	100

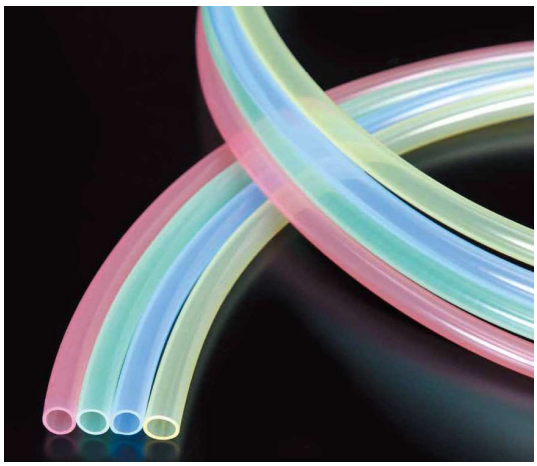
ID (mm)	OD (mm)	Wall thickness (mm)	Tolerance (mm) ID	Tolerance (mm) Wall thickness	Standard length (m)
8	10	1	±0.2	±0.1	100
9	12	1.5	±0.2	±0.2	100
10	13	1.5	±0.2	±0.2	100
12	15	1.5	±0.3	±0.2	100
20	28	4	±0.3	±0.2	50
25	33	4	±0.4	±0.2	50
30	40	5	±0.4	±0.3	10

Made-to-order These are made-to-order products. Please contact us for details.

- Size: Also possible to custom-make with other sizes than in the above size table.
- Wall thicknesses up to 5mm can be manufactured.

Color silicone rubber tube

RoHS directive（RoHS2）



Features

- These tubes are brightly colored red, blue, green, and yellow.
- Various shades from translucent to opaque are possible.
- Colors other than those shown in the photo are also possible.
- Please contact us.

■Size table (This is an example of the sizes that can be manufactured)

ID (mm)	OD (mm)	Wall thickness (mm)	Tolerance (mm)		Standard length (m)
			ID	Wall thickness	
1	3	1	±0.1	±0.1	100
2	4	1	±0.1	±0.1	100
3	5	1	±0.1	±0.1	100
4	6	1	±0.1	±0.1	100
5	7	1	±0.15	±0.1	100

ID (mm)	OD (mm)	Wall thickness (mm)	Tolerance (mm)		Standard length (m)
			ID	Wall thickness	
6	8	1	±0.15	±0.1	100
7	10	1.5	±0.2	±0.2	100
8	11	1.5	±0.2	±0.2	100
9	12	1.5	±0.2	±0.2	100
10	13	1.5	±0.2	±0.2	100

Made-to-order These are made-to-order products. Please contact us for details.

●Size: Also possible to custom-make with other sizes than in the above size table.

Highly transparent silicone rubber tube〈SR1560〉

RoHS directive（RoHS2）

Features

- This tube has better transparency than common products. The photo shows that the transparency is superior to that of general-purpose one.

（The material properties are listed on page 22.）

The photo shows general-purpose silicone tube SR1554 on the left, on the right is high transparency one SR1560.

■Size table (This is an example of the sizes that can be manufactured.)

ID (mm)	OD (mm)	Wall thickness (mm)	Tolerance (mm)		Standard length (m)
			ID	Wall thickness	
1	3	1	±0.1	±0.1	100
2	4	1	±0.1	±0.1	100
3	5	1	±0.1	±0.1	100
4	6	1	±0.1	±0.1	100
5	7	1	±0.15	±0.1	100
6	8	1	±0.15	±0.1	100

ID (mm)	OD (mm)	Wall thickness (mm)	Tolerance (mm)		Standard length (m)
			ID	OD	
7	9	1	±0.2	±0.1	100
8	10	1	±0.2	±0.1	100
9	12	1.5	±0.2	±0.2	100
10	13	1.5	±0.2	±0.2	100
12	15	1.5	±0.3	±0.2	100
15	20	2.5	±0.3	±0.2	50

Made-to-order These are made-to-order products. Please contact us for details.

●Size: Also possible to custom-make with other sizes than in the above size table.

Silicone rubber round cord 〈SR151〉

RoHS directive（RoHS2）

Features

- Round cord with easy-to-use hardness.
  （The material properties are listed on page 22.）
- A wide variety of sizes (see table below) are available in stock.

■Size table This is an example of the sizes that can be manufactured.

Diameter (mm)	Tolerance (mm)	Standard length (m)
2	±0.1	100
3	±0.1	100
4	±0.1	100
5	±0.15	100
6	±0.15	100
7	±0.2	100

Diameter (mm)	Tolerance (mm)	Standard length (m)
8	±0.2	100
9	±0.2	100
10	±0.2	50・100
12	±0.3	50・100
15	±0.3	50
16	±0.3	30

Diameter (mm)	Tolerance (mm)	Standard length (m)
1 8	±0.3	30
20	±0.3	30
25	±0.4	20
30	±0.4	20

Made-to-order The sizes shown in ☐ are made-to-order.

- Size: Also possible to custom-make with other sizes than in the above size table.
- Material: In addition to SR151, others such as SR141, 151, 161, etc. are also available.

Note: Materials other than SR151 are made-to-order products. Please contact us for details.

Silicone rubber square cord 〈SR151〉

RoHS directive（RoHS2）

Features

- Square cord with easy-to-use hardness.
  （The material properties are listed on page 22.）

■Size table This is an example of the sizes that can be manufactured.

□ (mm)	Tolerance (mm)	Standard length (m)
3	±0.25	100
4	±0.25	100
5	±0.3	100
6	±0.3	100
8	±0.35	100

□ (mm)	Tolerance (mm)	Standard length (m)
10	±0.35	50
12	±0.45	50
15	±0.45	30
20	±0.45	20

Made-to-order These are made-to-order products. Please contact us for details.

- Size: Also possible to custom-make with other sizes than in the above size table. Please contact us.
- Different hardness [40/70] is also available. Please contact us.

Silicone rubber made-to-order shape cord〈SR141,151,161,171〉

RoHS directive（RoHS2）

Features

- These are made-to-order shape cords for packing , sealing material applications, etc.
- Products with hardnesses of 40 to 70 are available, and materials can be selected according to the application.
- Manufactured based on customer's drawings.

（The material properties are listed on page 22.）

Made-to-order These are made-to-order products.
Please contact us for details.

Flame retardant silicone rubber〈SR1102,1158〉

RoHS directive（RoHS2）

The white one in the photo above is SR1102 and the gray black one is SR1158.

Made-to-order These are made-to-order products.
Please contact us for details.

Note) These types of products are subject to size restrictions. Please contact us for details.

Features

- Silicone rubber having flame retardancy.
- Manufactured based on customer’s drawings.

（The material properties are listed on page 22.）

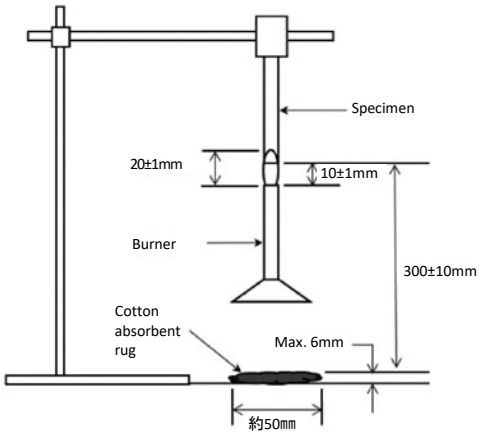
Frame retardancy by grade

Grade	Hardness (type A durometer)	Flame retardancy
SR1102	59	Equivalent to UL94 V-0 at test piece wall thickness 1mm
SR1158	60	Equivalent to UL94 V-0 at test piece wall thickness 1mm

* Flame retardancy tests (UL94V method: 2013) were conducted on samples made with extrusion molding.
* The test values are for reference only and not standard ones. Subject to change without notice.

■ UL94 standard (Vertical flame retardancy test method and criteria)

Criteria	Flame retardant classification		
	V-0	V-1	V-2
Respective afterflame time for each specimen (t1 and t2)	≦10s	≦30s	≦30s
Total afterflame time for a set of 5 specimens for each conditioning tf	≦50s	≦250s	≦250s
Total of afterflame time and residual dust time after second flame contact of each specimen (t2+t3)	≦30s	≦60s	≦60s
Afterflame and residual dust reaching the holding clamp	No	No	No
Molten drippings or flaming falling objects that ignite cotton absorbent rug	No	No	Yes



tf : Total afterflame time (s)
t1 : First afterflame time of specimen (s)
t2 : Second afterflame time of specimen (s)
t3 : Residual dust time (s)

Afterflame: Flame that connects after the ignition source is removed
Afterflame time: Length of time that an afterflame lasts under specified test conditions
Residual dust: Red-hot combustion that persists after the ignition source is removed and flaming combustion is over

Conductive silicone rubber 〈SR1402〉

RoHS directive（RoHS2）

Features

- Silicone rubber with conductivity.
- Suitable for electromagnetic shielding and anti-static packing, etc.
- Manufactured based on customer's drawings.

(The material properties are listed on page 22.)

Made-to-order This is a made-to-order product. Please contact us.

Note) This type of product is subject to size restrictions. Please contact us for details.

Material properties

Grade	Hardness (type A durometer)	Volume resistivity (Ω・cm)
SR1402	69	15

*The test values are for reference only and not standard ones. Subject to change without notice.

Antistatic silicone rubber 〈SR2160〉

RoHS directive（RoHS2）

The left photo is an antistatic silicone rubber tube, which is less susceptible to static electricity when measured with an electrostatic tester.

Features

- Silicone rubber with antistatic properties while maintaining the characteristics of silicone rubber.
- Coloring is easy because of no carbon.
- Retains insulating properties as general silicone rubber.
- Manufactured based on customer's drawings. (The material properties are listed on page 22.)

Made-to-order This is a made-to-order product. Please contact us.

Note) This type of product is subject to size restrictions. Please contact us for details.

Comparison of antistatic properties

	Grade	Hardness (type A durometer)	Volume resistivity (Ω・cm)	Half-life (10kV)
Antistatic	**SR2160**	60	1.9×10^{13}	4秒
General purpose	**SR1554**	54	5.7×10^{15}	1800秒以上

Note) SR1554 is a general-purpose extrusion material. It is listed for comparison.

*The test values are for reference only and not standard ones. Subject to change without notice.

Silicone rubber sponge
(round, square made-to-order shape cord)

RoHS directive（RoHS2）

Features

- ◆ Products with sponge hardness of 10 to 30 are available.
- ◆ Possible to make round, square and made-to-order shape cords.
- ◆ Manufactured based on customer's drawings.

(The material properties are listed on page 22.)

Note) This type of product is subject to size restrictions.
Please contact us for details.

Hardness by Grade

Grade	Hardness (type E durometer)	Color phase
SR210	10	Red
SR215	15	Red
SR225	21	Red
SH25	25	Red

● Colors other than red are also possible. Please contact us.

*The test values are for reference only and not standard ones. Subject to change without notice.

Round cord〈SR225〉

■This is an example of the sizes that can be manufactured.

Diameter (mm)	Tolerance (mm)	Standard length (m)
7	+1.0 −0.5	100
8	+1.0 −0.5	100
9	+1.0 −0.5	100
10	+1.0 −0.5	100
12	+2.0 −1.0	50
15	+2.0 −1.0	50
16	+2.0 −1.0	30
18	+2.0 −1.0	30
20	+2.0 −1.0	30

Made-to-order This is a made-to-order product.
Please contact us.

● Size: Also possible to custom-make with other sizes than in the above size table. Please contact us.

Square cord〈SR225〉

■This is an example of the sizes that can be manufactured.

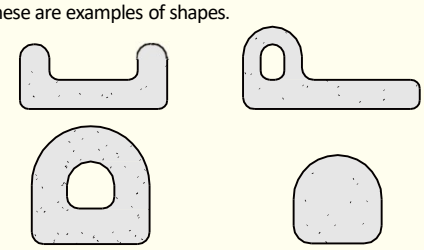
□ (mm)	Tolerance (mm)	Standard length (m)
5	+1.0 −0.5	100
6	+1.0 −0.5	100
8	+1.0 −0.5	100
10	+1.0 −0.5	100
12	+2.0 −1.0	50
15	+2.0 −1.0	50
20	+2.0 −1.0	50

Made-to-order This is a made-to-order product.
Please contact us.

● Size: Also possible to custom-make with other sizes than in the above size table. Please contact us.

Made-to-order shape cord

Made-to-order These are examples of shapes.



Fluoro rubber tube 〈FR27〉

RoHS directive（RoHS2）

Features

- Tubes with high chemical resistance.
- Available in stock in a wide range of sizes (see the size table below).

(The material properties are listed on page 23.)

■Size table

ID (mm)	OD (mm)	Wall thickness (mm)	Tolerance (mm) ID	Tolerance (mm) Wall thickness	Std. length (m)
1	3	1.0	±0.1	±0.15	100
2	4	1.0	±0.1	±0.15	100
3	5	1.0	±0.15	±0.15	100
4	6	1.0	±0.15	±0.15	100
5	7	1.0	±0.2	±0.15	100
6	8	1.0	±0.2	±0.15	100
6	9	1.5	±0.2	±0.2	50

ID (mm)	OD (mm)	Wall thickness (mm)	Tolerance (mm) ID	Tolerance (mm) Wall thickness	Std. length (m)
7	10	1.5	±0.25	±0.2	50
8	11	1.5	±0.25	±0.2	50
9	12	1.5	±0.25	±0.2	50
9	13	2.0	±0.25	±0.25	50
10	13.5	1.75	±0.25	±0.25	30
10	14	2.0	±0.25	±0.25	30
12	16	2.0	±0.4	±0.25	30

Made-to-order The sizes shown in ☐ are made-to-order.

•Size: Also possible to custom-make with other sizes than in the above size table. Please contact us.

Transparent fluoro rubber tube 〈Tiger Flon〉

RoHS directive（RoHS2）

Features

- These transparent tubes change the preconception that fluoro rubber is black.
- Transparency allows for a clear view of the fluid flow inside the tube.
- Chemical resistance is superior to that of conventional fluoro rubber tubing.
- Excellent safety with almost no elution by solvents and chemicals.

(The material properties are listed on page 23.)

■Size table

ID (mm)	OD (mm)	Wall thickness (mm)	Tolerance (mm) ID	Tolerance (mm) Wall thickness	Std. length (m)
1	3	1.0	±0.1	±0.1	50
1	4	1.5	±0.1	±0.1	50
2	4	1.0	±0.1	±0.1	50
3	5	1.0	±0.1	±0.1	50
4	6	1.0	±0.1	±0.1	50

ID (mm)	OD (mm)	Wall thickness (mm)	Tolerance (mm) ID	Tolerance (mm) Wall thickness	Std. length (m)
5	7	1.0	±0.2	±0.1	50
6	8	1.0	±0.2	±0.1	50
7	9	1.0	±0.2	±0.1	50
8	10	1.0	±0.2	±0.1	50

Made-to-order These are made-to-order products. Please contact us for details.

•Size: Also possible to custom-make with other sizes than in the above size table. Please contact us for details.

Fluoro rubber extruded products〈FR27〉
(Round cord, square cord, made-to-order shape cord)

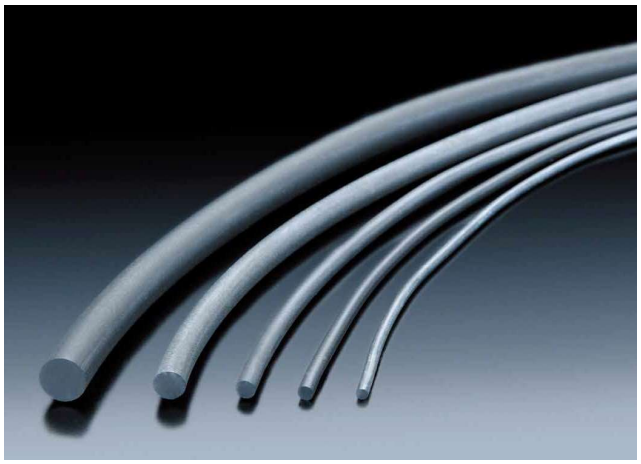
RoHS directive（RoHS2）

Features

- Extruded products with high chemical resistance. (FR27)
- Available in stock in a wide range of sizes for round cords (see the size table below)
- Square cords can be manufactured from □3mm to □24mm. All sizes are made-to-order.
- Made-to-order shape cords are possible based on customer's drawings. Please contact us for details.

(The material properties are listed on page 23.)

Round cord



■Size table (Example of the sizes that can be manufactured)

Diameter (mm)	Tolerance (mm)	Standard length (m)
3	±0.15	100
4	±0.15	100
5	±0.20	100
6	±0.20	100
7	±0.25	100
8	±0.25	100
9	±0.25	50
10	±0.25	50
12	±0.40	50
15	±0.40	30
20	±0.40	20

Made-to-order The sizes shown in □ are made-to-order.

• Size: Also possible to custom-make with other sizes than in the above size table. Please contact us.

Square cord

■ Size table (Example of the sizes that can be manufactured)

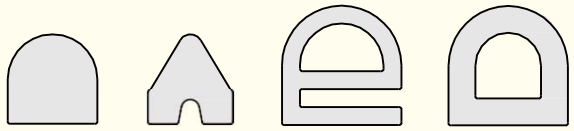
□ (mm)	Tolerance (mm)	Standard length (m)
3	±0.4	100
4	±0.4	100
5	±0.5	100
6	±0.6	50
7	±0.6	50
8	±0.6	50
9	±0.6	50
10	±0.6	50
12	±0.8	40
15	±0.8	30
20	±0.8	20

Made-to-order These are made-to-order products. Please contact us for details.

• Size: Also possible to custom-make with other sizes than in the above size table. Please contact us.

Made-to-order shape cord

Made-to-order These are examples of shapes.



Fluoro rubber sponge〈FR235〉
(Round cord, square cord, made-to-order shape cord)

RoHS directive（RoHS2）

Features

- Made of fluoro sponge rubber that resolves the disadvantage that fluoro rubber is too hard and difficult to use.
- Excels in chemical resistance, solvent resistance, and oil resistance.
- Round cords can be manufactured from ϕ5mm to ϕ20mm, square cords from □3mm to □24mm. All sizes are made-to-order.
- Shapes other than a regular square are also possible upon special order.
- Made-to-order shape cords are possible based on customer's drawings. Please contact us for details.

(The material properties are listed on page 23.)

Round cord

■ Size table (Example of the sizes that can be manufactured)

Diameter (mm)	Tolerance (mm)	Standard length (m)
5	+1.0 −0.5	50
6	+1.0 −0.5	50
8	+1.0 −0.5	50
10	+1.5 −0.5	50
15	+1.5 −0.5	30
20	+2.0 −0.5	30

Made-to-order These are made-to-order products. Please contact us for details.

● Size: Also possible to custom-make with other sizes than in the above size table. Please contact us.

Square cord

■ Size table (Example of the sizes that can be manufactured)

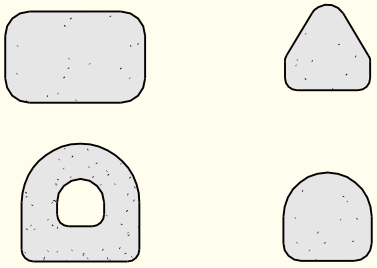
□ (mm)	Tolerance (mm)	Standard length (m)
9	+1.0 −0.5	50
10	+1.5 −0.5	50
12	+1.5 −0.5	50
15	+1.5 −0.5	30
20	+2.0 −0.5	30

Made-to-order These are made-to-order products. Please contact us for details.

● Size: Also possible to custom-make with other sizes than in the above size table. Please contact us.

Made-to-order shape cord

Made-to-order These are examples of shapes.



Laboratory Tube 〈MediL$_{TM}$ P642 I〉

RoHS directive（RoHS2）

●We can also manufacture items not listed in the size table. Please contact us for details.

●The material properties are listed on page 24.

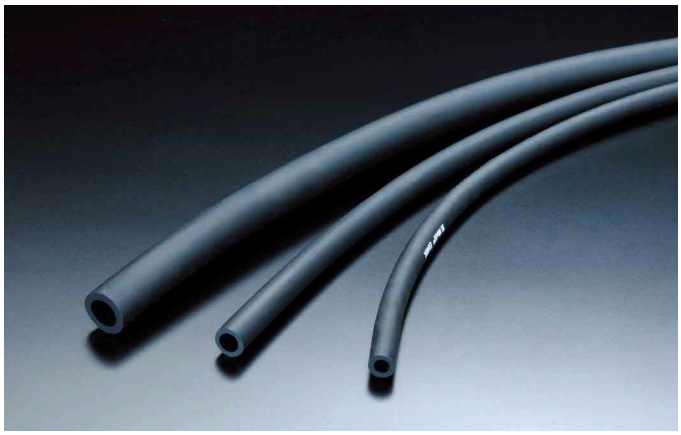
Features

- Olefin elastomer tubes provide outstanding roller pump durability. They can be expected to last approximately 4 to 10 times longer than silicone tubes.
- Excel in chemical resistance and suitable for science and chemistry.
- The size table is listed on page 20.

Made-to-order These are made-to-order products. Please contact us for details.

Industrial tube 〈MediL$_{TM}$ E640K〉

RoHS directive（RoHS2）



●We can also manufacture items not listed in the size table. Please contact us for details.

● The material properties are listed on page 24.

Features

- Olefin elastomer tubes provide outstanding roller pump durability. They can be expected to last approximately 4 to 10 times longer than silicone tubes.
- Excel in chemical resistance and suitable for general industrial uses.
- These tubes are also most suitable as an alternative to conventional rubber tubes such as EPDM and natural rubber.
- The size table is listed on page 20.

Made-to-order These are made-to-order products. Please contact us for details.

MediL$_{TM}$ is the trade name for our elastomer products.

Laboratory soft PVC tube 〈MediL$_{TM}$ V580C〉

RoHS directive（RoHS2）

●We can also manufacture items not listed in the size table.
Please contact us for details.

●The material properties are listed on page 24.

Features

◆PVC elastomer tubes with good chemical resistance and high transparency.

◆These product have less impact on the environment as DOP is not used as a plasticizer.

◆Excels in mechanical strength and durability.

◆The size table is listed on page 20.

Made-to-order These are made-to-order products.
Please contact us for details.

BM (Biomass) Series Environmental impact reduction/soft PVC tube 〈MediL$_{TM}$ V580C・BM〉

RoHS directive（RoHS2）

45
バイオマス
No.210433

● We can also manufacture items not listed in the size table.
Please contact us for details.

● The material properties are listed on page 24.

Features

◆ Some materials of biological origin are used as biomass.

◆ The biomass degree (proportion of biomass material in the product weight) is 45%.

◆ These tubes are a highly transparent made of soft PVC and have the equivalent physical properties to MediL tube VC580C.

◆ The size table is listed on page 20.

Made-to-order These are made-to-order products.
Please contact us for details.

Chemical resistant・Roller pump tube〈MediL™T740C〉

RoHS directive（RoHS2）

● We can also manufacture items not listed in the size table. Please contact us for details.

● The material properties are listed on page 24.

特 長

- ◆ Olefin elastomer tube with transparency comparable to soft PVC, making it easy to check the fluid.
- ◆ Resistant to flex fatigue and can be expected to last longer for roller pumps than equivalent olefin-based elastomer tubes.
- ◆ Excels in chemical resistance and suitable for science and chemistry.
- ◆ Harmful gases are hardly emitted during combustion and are resulting in mostly carbon dioxide and water.
- ◆ The size table is listed on page 20.

Made-to-order

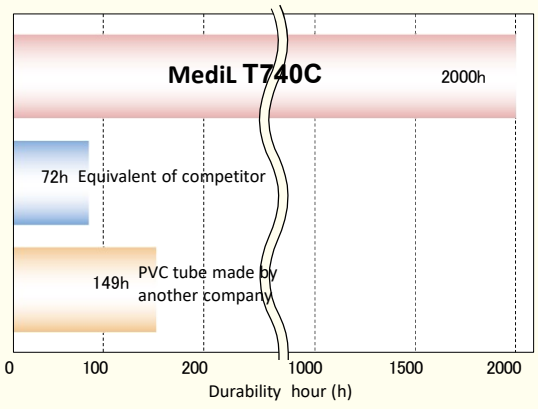
These are made-to-order products.
Please contact us for details.

Tubing durability data in roller pumps

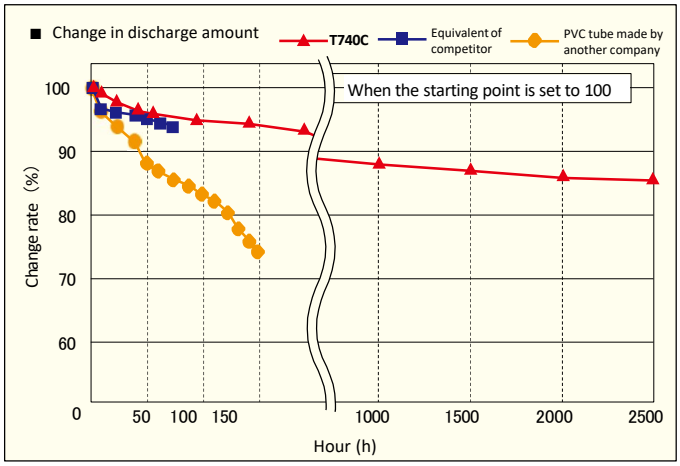
In-house tests have confirmed a durability time approximately 10 times longer than that of soft PVC.

Tube durability time in roller pumps varies depending on pump, fluid type and temperature.
Additionally, the following durability times are not standard values. Please check compatibility in advance.

■ Comparison of the tube durability time



■ Change in discharge amount



Possible to endure (methyl ethyl ketone) for a short time. T740C and soft PVC tubes were immersed in MEK for a short time and pulled out. No significant change was observed in T740C, but the soft PVC one swelled and turned cloudy white.

MediL™ is the trade name for our elastomer products.

Laboratory 〈P642 Ⅰ〉 ●Std. length:5m

I.D. (mm)	O.D. (mm)	Wall thick. (mm)	Tolerance (mm)	
			I.D.	Wall thick.
1	3	1	±0.1	±0.1
2	4	1	±0.1	±0.1
3	5	1	±0.1	±0.1
4	6	1	±0.1	±0.1
4	7	1.5	±0.1	±0.2
4	8	2	±0.1	±0.2
4.9	10	2.55	±0.15	±0.2
6	10	2	±0.15	±0.2
7	10	1.5	±0.2	±0.2
8	12	2	±0.2	±0.2
10	14	2	±0.2	±0.2

Made-to-order These are made-to-order products.
Please contact us for details.

Industrial 〈E640K〉 ●Std.length:15m

I.D. (mm)	O.D. (mm)	Wall thick. (mm)	Tolerance (mm)	
			I.D.	Wall thick.
3.2〈1/8〉	6.4〈1/4〉	1.6	±0.1	±0.2
4.8〈3/16〉	7.9〈5/16〉	1.6	±0.15	±0.2
6.4〈1/4〉	9.5〈3/8〉	1.6	±0.2	±0.2
6.4〈1/4〉	11.1〈7/16〉	2.4	±0.2	±0.2
9.5〈3/8〉	14.3〈9/16〉	2.4	±0.2	±0.2
19.1〈3/4〉	25.4〈1〉	3.2	±0.4	±0.2

※The measurements are converted from inches to mm.
The figures in 〈 〉 are in inches.

Made-to-order These are made-to-order products.
Please contact us for details.

Laboratory soft PVC 〈V580C〉 ●Std.length:15m

I.D. (mm)	O.D. (mm)	Wall thick. (mm)	Tolerance (mm)	
			I.D.	Wall thick.
1	3	1	±0.1	±0.2
2	4	1	±0.1	±0.2
3	5	1	±0.15	±0.2
4	6	1	±0.15	±0.2
5	7	1	±0.2	±0.2
5	8	1.5	±0.2	±0.25
6	8	1	±0.2	±0.2
6	9	1.5	±0.2	±0.25
7	10	1.5	±0.25	±0.25
8	11	1.5	±0.25	±0.25

Made-to-order These are made-to-order products.
Please contact us for details.

BM Series (Biomass) Environmental impact reduction/soft PVC 〈V580C-BM〉 ●Std.length:10m

I.D. (mm)	O.D. (mm)	Wall thick. (mm)	Tolerance (mm)	
			I.D.	Wall thick.
1	3	1	±0.1	±0.2
2	4	1	±0.1	±0.2
3	5	1	±0.15	±0.2
4	6	1	±0.15	±0.2
5	7	1	±0.2	±0.2
5	8	1.5	±0.2	±0.25
6	8	1	±0.2	±0.2
6	9	1.5	±0.2	±0.25
7	10	1.5	±0.25	±0.25
8	11	1.5	±0.25	±0.25

Made-to-order These are made-to-order products.
Please contact us for details.

Chemical resistant・Roller pump tube 〈T740C〉 ●Std.length:20m

I.D. (mm)	O.D. (mm)	Wall thick. (mm)	Tolerance (mm)	
			I.D.	Wall thick.
1	3	1	±0.1	±0.15
2	4	1	±0.1	±0.15
3	5	1	±0.15	±0.2
4	6	1	±0.15	±0.2
5	7	1	±0.2	±0.25
5	9	2	±0.2	±0.3
6	8	1	±0.2	±0.25
6	9	1.5	±0.2	±0.3
7	10	1.5	±0.25	±0.35
8	11	1.5	±0.25	±0.4
9	12	1.5	±0.3	±0.4

Made-to-order These are made-to-order products.
Please contact us for details.

Silicone rubber

The main chain is linked by siloxane bonds, which have a high bond energy, making it highly stable. This provides excellent heat resistance, electrical insulation, and chemical stability. Furthermore, due to its weak intermolecular forces, it exhibits high elasticity, excellent water repellency, and mold releasability, resulting in unique interfacial characteristics.
As it does not utilize plasticizers or other liquids for hardness adjustment, nor aging inhibitors, it is a safe material with minimal leaching.

Heat resistance

It maintains most of its properties at 150°C and can be used for extended periods. However, durability can vary significantly depending on usage conditions, so thorough verification is essential.

Cold resistance

It can withstand use down to -60°C.
However, durability can vary significantly depending on usage conditions, so thorough verification is essential.

Ozone and weather resistance

Compared to general organic rubbers, it exhibits superior stability against oxygen, ozone, and ultraviolet radiation, resulting in excellent weather resistance.
No signs of degradation, such as cracking, softening, or adhesion, have been observed in outdoor exposure tests conducted over the past 10 years. (*Outdoor exposure test results may vary depending on conditions.)

Flame retardancy

While it is not easily ignited when exposed to flame, it will continue to burn once ignited. However, flame-retardant materials (SR1102, 1158) are also available on our product portfolios, with flame retardants added to enhance their flame-retardant properties.

Steam resistance

It exhibits minimal degradation when exposed to water vapor under normal pressure. However, contact with pressurized steam above 150°C will accelerate hydrolysis. While some improvements can be achieved through compounding selection, verification under usage conditions is necessary.

Silicone rubber material properties list

Item \ Properties		Hardness (Type A Durometer)	Tensile strength at break		Elongation at break (%)	Tear resistance		Compression set (%) (150°C×24 hrs)	Color	Page	Applicable items	
			MPa	kgf/cm²		KN/m	kgf/cm				Food hygiene test compliant	RoHS directive (RoHS2)
General Purpose	**SR1554**	54	11.8	120.4	530	25.8	26.3	18	Translucent	**07**	o	o
Medium hardness	**SR1563**	59	9.1	92.8	630	28.5	29.1	15	Translucent	**–**	o	o
High hardness	**SR1573**	70	9.8	100.0	560	31.4	32.0	16	Translucent	**–**	o	o
Low hardness	**SR141**	40	10.5	107.1	600	24.5	25.0	37	Translucent	**11**	o	o
Medium hardness	**SR151**	53	10.8	110.2	480	25.5	26.0	29	Translucent	**10·11**	o	o
Medium hardness	**SR161**	58	9.2	93.8	420	27.0	27.5	30	Translucent	**11**	o	o
High hardness	**SR171**	70	8.5	86.7	420	20.6	21.0	33	Translucent	**11**	o	o
High tearing	**SR1050**	49	10.3	105.1	600	33.0	33.7	–	Pale yellow	**–**		o
Roller pump	**SR1055**	55	9.9	100.5	635	27.7	28.3	15	Translucent	**8**	o	o
Flame retardant	**SR1102**	59	8.2	83.6	292	21.0	21.4	–	White	**11**		o
	SR1158	60	10.0	102.0	220	14.5	14.8	29	Gray	**11**		o
Steam proof	**SR1260**	70	9.6	97.9	316	23.2	23.7	29	Pale yellow	**–**		o
Heat resistant	**SR1351**	48	8.5	86.7	480	21.6	22.0	–	Brown	**–**		o
Conductive	**SR1402**	68	5.4	55.0	210	15.0	15.3	–	Black	**12**		o
High transparent	**SR1560**	59	9.8	100.0	450	24.5	25.0	18	Transparent	**9**		o
Anti static	**SR2160**	60	9.0	91.8	500	16.0	16.3	–	Translucent	**12**		o

JIS K6250

*1 SR1554, SR1563, SR1573, SR1055, and SR1560 are tube-specific grades.

*2 Please note that the test values are for reference only and are not guaranteed ones. They may be subject to change without notice.

Silicone sponge rubber material properties list

Item \ Properties	Hardness (Type E Durometer)	Tensile strength at break		Elongation at break (%)	Tear resistance		Compression set (%) (150°C×24hrs)	Color	Page	Applicable items	
		MPa	kgf/cm²		KN/m	kgf/cm				Food hygiene test compliant	RoHS directive (RoHS2)
SR210	10	0.3	3.0	150	–	–	53	Red	**13**		o
SR215	15	0.5	5.0	140	–	–	55	Red	**13**		o
SR225	21	1.1	11.2	358	–	–	55	Red	**13**	o	o
SH25	25	1.5	15.3	343	–	–	39	Red	**13**	o	o

JIS K6250

*1 Sponge hardness is measured using Type E durometer.

*2 Please note that the test values are for reference only and are not guaranteed ones. They may be subject to change without notice.

Fluoro rubber, Fluoro sponge rubber

Fluoro rubber is a high-performance rubber that utilizes the unique properties of fluorine atoms in the polymer side chains. It surpasses silicone rubber in heat resistance, offering excellent oil resistance and chemical resistance. Among organic rubbers, it exhibits the best weather resistance. Additionally, its low gas permeability leads to excellent barrier properties.

Heat resistance

It can withstand long-term use at 200℃ in air, and even short-term use at 300℃. However, strength significantly decreases at high temperatures, so verification under usage conditions is necessary.

Cold resistance

It has a high temperature dependency and poor cold resistance, with a practical usage temperature limit of -5℃. However, there can be variations among material grades, so verification according to the usage conditions is required.

Ozone and weather resistance

It exhibits the best weather resistance among organic rubbers. Even after 1000 hours of exposure to 100 ppm ozone, no cracking occurs. It is also highly resistant to high-pressure oxygen.

Flame retardancy

Due to the presence of fluorine atoms in its molecules, it is one of the least flammable materials among organic rubbers.

Fluoro rubber and fluoro sponge rubber material properties list

Item \ Properties		Hardness (Type A Durometer)	Tensile strength at break		Elongation at break (%)	Tear resistance		Compression set (%) (150℃×24 hrs)	Color	Page	Applicable items	
			MPa	kgf/cm²		KN/m	kgf/cm				Food hygiene test compliant	RoHS directive (RoHS2)
Solid	**FR27**	71	12.1	123.4	490	27.5	28.1	53	Black	**14・15**		○
	FR57	76	12.7	129.5	300	27.5	28.1	17	Black	**–**		○
Sponge	**FR235**	33※1	1.8	18.4	320	–	–	87	Black	**16**	○	○

JIS K6250

*1 Sponge hardness is measured using Type E durometer.

*2 Please note that the test values are for reference only and are not guaranteed ones. They may be subject to change without notice.

Transparent fluoro rubber

It is the most suitable for applications where chemical and heat resistance are required, alongside transparency for visibility. Additionally, as it is crosslinked without the use of crosslinking agents such as organic peroxides, it has minimal leaching of any substances.

Transparent fluoro rubber material properties list

Item \ Properties	Hardness (Type A Durometer)	Tensile strength at break		Elongation at break (%)	Tear resistance		Compression set (%) (150℃×24 hrs)	Color	Page	Applicable items	
		MPa	kgf/cm²		KN/m	kgf/cm				Food hygiene test compliant	RoHS directive (RoHS2)
Tiger Flon	67	19.5	199.0	510	28.5	29.1	11	Trans-parent	**14**	○	○

JIS K6250

*Please note that the test values are for reference only and are not guaranteed ones. They may be subject to change without notice.

For laboratory For industry

〈P642I〉 〈E640K〉

The material is an olefin-based elastomer, characterized by its high elasticity and low permanent set, making it the most suitable for tubes used in roller pumps. It can also withstand repeated sterilization in an autoclave. Furthermore, compared to general olefin-based elastomers, it exhibits superior heat and oil resistance, making it a versatile material with applications ranging from general use to replacing crosslinked rubber.

Soft PVC for laboratory

〈V580C〉

The material is soft PVC, which is highly transparent and is an environmentally friendly material of a DOP-free plasticizer. The tubes are resistant to many inorganic chemicals used in laboratories and similar settings, making them suitable for use with roller pumps.

BM Series (Biomass) Environmental impact reduction/soft PVC

〈V580C-BM〉

The material is made of soft PVC resin with a partial use of bio-based materials. It has a bio-based content of 45% and exhibits similar properties to V580C.

Chemical resistant･Roller pump

〈T740C〉

The material is an olefin-based elastomer, which excels in transparency, high elasticity, and excellent abrasion resistance, making it suitable for use in roller pumps. Furthermore, it is a safe material with minimal leaching due to the absence of plasticizers.

MediL™ tube material properties list

Item \ Properties	Hardness (Type A Durometer)	Tensile strength at break		Elongation at break (%)	Tear resistance		Compression set (%)	Color	Page	Applicable items	
		MPa	kgf/cm²		KN/m	kgf/cm				Food hygiene test compliant	RoHS directive (RoHS2)
P642 I	63	6.2	63.2	524	27.8	28.4	36※1	Pale yellow	**17**	○ ※3、※4	○
E640K	59	7.2	73.4	505	27.3	27.8	36※1	Black	**17**		○
V580C	56	15.6	159.1	392	42.0	42.8	–	Transparent	**18**		○
V580C-BM	56	15.9	162.2	435	45.3	46.2	–	Transparent	**18**		○
T740C	85	18.0	183.6	957	60.7	61.9	72※2	Transparent	**19**	○ ※3、※4	○

JIS K6250

※1 Compression set is measured under the following conditions: 100°C for 168 hours.
※2 Compression set is measured under the following conditions: 70°C for 22 hours.
※3 Excluding n-heptane.
※4 A positive list system was introduced on June 1, 2020, for food utensils and containers, allowing only substances that have been evaluated for safety for food use. While P642 I and T740C comply with the Food Sanitation Law (Ministry of Health and Welfare Notification No. 370) that was in effect before the introduction of the above system, they are not currently included on the positive list as of October 1, 2023. Therefore, they fall under the transitional measures, allowing for their continued use in food applications during the transitional period. Please contact us for information about the handling of these materials after the transitional period. Food Sanitation Law Compliance refers to either being compliant with the Positive List or falling within the transitional period. The transitional period refers to a 5-year period (until May 2025) where utensils and containers that were already in circulation before the implementation of the system can continue to be circulated, provided they can be verified as being similar to those that were in circulation before the implementation.
※5 Please note that the test values are for reference only and are not guaranteed ones. They may be subject to change without notice.

Technical data② 《Other properties》

Gas permeability

Silicone rubber has a very high gas permeability compared to other organic rubbers and plastics. Fluorine rubber, on the other hand, belongs to the category of rubbers with very low permeability and is often used for seals in high vacuum applications. In both cases, the permeability coefficient tends to increase significantly with rising temperature.

●Approximate order of gas permeability for common rubbers and plastics :

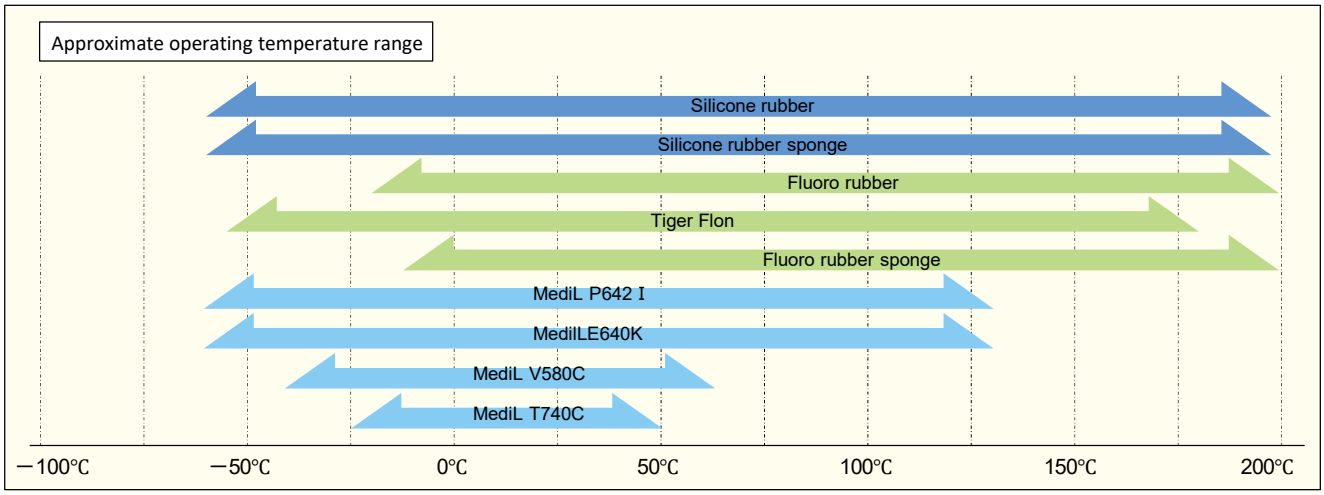
Butyl < Fluorine rubber < Tiger Flon < T740C < Silicone rubber(from lower permeability to higher permeability)

(Unit : 1×10^{-9}cc・cm/cm^2・sec・cmHg)

Item / Gas	Silicone rubber	Fluoro rubber		Elastomer
	SR1554	FR27	Tiger Flon	T740C
Hydrogen	550	4.6	–	–
Helium	300	30.0	26.0	–
Nitrogen	250	0.9	1.2	–
Oxygen	600	1.8	2.1	7.8
Argon	500	–	–	–
Xenon	1,710	–	–	–
Ammonia	5,000	–	–	–
Steam	30,000	–	–	–
Carbon dioxide	3,200	1.7	1.7	–
Methane	800	–	–	–

Guideline for operating temperatures

The heat resistance and embrittlement temperature data shown on page 5 are graphed for visualization. When using the product, please confirm the data by conducting tests, etc., taking into consideration the conditions of use.



Chemical resistance

Sort	Item / Chemical	Silicone rubber	Fluoro rubber		Elastomer			
		SR1554	FR27	Tiger Flon	P642 Ⅰ	E640K	V580C	T740C
Acid	Sulfurous acid（5%）	○	×	◎	△	△	◎	○
	Hydrochloric acid（10%）	○	○	◎	◎	○	◎	○
	Hydrochloric acid（36%）	×	△	○	×	○	△	△
	Hydrogen peroxide water（30%）	◎	×	◎	△	○	○	○
	Formic acid（25%）	△	×	△	◎	◎	◎	△
	Chromic Acid（10%）	×	◎	◎	×	◎	×	○
	Acetic acid（10%）	○	△	×	○	◎	◎	×
	Nitric acid（10%）	△	○	△	○	△	○	△
	Nitric acid（60%）	×	○	△	×	△	×	×
	Sulfuric acid（10%）	△	◎	◎	◎	×	△	△
	Sulfuric acid（98%）	×	△	◎	×	×	×	△
	Oleum	×	◎	◎	×	×	×	×
	Phosphoric acid（75%）	△	◎	◎	○	◎	◎	○
Alkali	Ammonia water（30%）	◎	△	△	◎	○	×	◎
	Sodium hypochlorite（5%）	○	◎	◎	○	○	◎	○
	Calcium hydroxide	△	△	◎	×	×	×	×
	Sodium hydroxide（30%）	△	×	◎	◎	◎	◎	△
Organic solvent	Acetaldehyde	○	×	×	△	△	×	○
	Acetone	△	×	×	△	△	×	◎
	Aniline	△	○	◎	○	○	×	△
	Dichlorobenzene	×	◎	○	△	×	×	×
	Xylene	×	◎	△	×	×	×	×
	Cresol	△	○	○	×	×	×	×
	Ethyl acetate	×	×	×	×	×	×	×
	Carbon tetrachloride	×	◎	○	×	×	×	×
	Cyclohexane	×	◎	○	×	×	×	×
	Diethyl ether	△	×	○	×	×	×	×
	Dibutyl phthalate	○	○	◎	×	×	×	◎
	Toluene	×	×	△	×	×	×	×
	Triethanolamine	○	△	×	○	○	△	△
	Butane Gas	×	◎	◎	◎	◎	◎	○
	Propane Gas	×	○	×	◎	◎	◎	◎
	Benzene	△	△	△	×	×	×	×
	Methyl alcohol	◎	×	◎	○	○	×	◎
Oils and others	Linseed oil	○	○	◎	△	△	△	△
	ASTM No.3	×	◎	◎	×	×	△	×
	Gasoline	×	○	◎	×	×	×	×
	Silicone oil	○	◎	◎	○	△	○	◎
	Kerosine petroleum	△	◎	◎	×	×	×	×
	Bromine	×	○	○	△	×	△	×

(◎ : Hardly affected
○ : Slightly affected but considered to affect use
△ : Not recommended as some degree of impact
× : Unsuitable for use as severely damaged)

※The above chemical resistance data is a general indication of chemical resistance based on swelling rate and other factors and does not guarantee chemical resistance. It is essential to conduct tests considering your specific usage conditions and confirm suitability before using the materials.

Pressure resistance

● Approximate Recommended Operating Pressure at Room Temperature (23°C):

（Unit：MPa）

I.D. (mm)	O.D. (mm)	Silicone rubber	Fluoro rubber		Elastomer			
		SR1554	FR27	Tiger Flon	P642 Ⅰ	E640K	V580C	T740C
1	3	0.08	0.28	0.27	–	–	–	0.25
2	4	0.06	0.27	0.24	0.16	–	0.40	0.20
3	5	0.05	0.24	0.19	0.16	–	0.34	0.17
3.2	6.4	–	–	–	–	0.25	0.42	–
4	6	0.05	0.20	0.14	0.14	–	0.28	0.14
4.8	7.9	–	–	–	–	0.19	–	–
4.9	10	–	–	–	0.23	–	–	–
5	7	0.04	0.16	0.11	–	–	0.23	0.14
6	8	0.04	0.14	0.09	–	–	–	0.12
6.4	9.5	–	–	–	–	0.14	–	–
7	10	0.05	0.14	–	0.10	–	–	0.18
8	11	0.05	0.12	–	–	–	0.20	0.17
9	12	0.04	0.10	–	–	–	–	0.16
9.5	14.3	–	–	–	–	0.13	–	–
10	14	0.05	0.12	–	0.10	–	–	–
12	16	0.04	0.10	–	–	–	–	–
15	20	0.04	–	–	–	–	–	–
18	24	0.04	–	–	–	–	–	–

Note: For sizes not listed in the table above, please contact us for information.

Note: Please consider these values in the table as guidelines and use them for reference only.

Minimum bending radius

●Approximate Minimum Bending Radius at Room Temperature (23°C) (The minimum radius at which the tube can be bent slowly without buckling):

（Unit：mm）

I.D. (mm)	O.D. (mm)	Silicone rubber	Fluoro rubber		Elastomer			
		SR1554	FR27	Tiger Flon	P642 Ⅰ	E640K	V580C	T740C
1	3	3	3	3	4	–	6	2
2	4	9	8	8	8	–	–	7
3	5	13	13	12	12	–	9	13
3.2	6.4	–	–	–	–	12	–	–
4	6	20	20	19	22	–	13	19
4.8	7.9	–	–	–	–	18	–	–
4.9	10	–	–	–	22	–	–	–
5	7	29	25	25	–	–	24	25
6	8	32	31	33	–	–	40	29
6.4	9.5	–	–	–	–	31	–	–
7	10	35	35	–	36	–	28	33
8	11	43	41	–	–	–	30	38
8	12	–	–	–	39	–	–	–
9	12	51	47	–	–	–	–	45
9.5	14.3	–	–	–	–	50	–	–
10	14	50	53	–	55	–	–	–
12	16	71	66	–	–	–	–	–
15	20	80	–	–	–	–	–	–
18	24	110	–	–	–	–	–	–

Note: For sizes not listed in the table above, please contact us for information.

Note: Please consider these values in the table as guidelines and use them for reference only.

TIGERS POLYMER CORPORATION

● The contents of this catalog are subject to change without prior notice for improvement purposes. ● This catalog is current as of November 1, 2023.

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