ESP

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Head Office / Wadayama Plant / Santo Plant

● The content of this catalog is subject to change without notice due to product improvements, etc.
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ESP Series Product Catalog

ESP

- Silicone rubber sponge sheets
- Fluoro rubber sponge sheets

Sunpolymer Corporation

Microcellular silicone rubber sponge sheet

These closed-cell sponge sheets are resistant to heat of 200°C.

Features

- Highly resistant to heat and weather
- Compliant with food sanitation standards
- Excellent sealing performance thanks to uniform closed microcells
- Also suitable for thin applications (e.g. 1 mm thick)

Product specifications

Basic product dimensions : 20mm ×1m ×1m
Thickness : 1 mm or more
(sliced as requested by the customer)

	Product number (color)	Si-100 Red and black	Si-200 Red,black,and white	Si-300 Red,black,and white	Test condition
Physical properties	Apparent density (g/cm³)	0.28	0.39	0.50	JIS-K7222
	Tensile strength (MPa)	0.7	1.1	1.6	JIS-K6251
	Elongation (%)	413	400	350	
	Tear resistance (N/mm)	2.4	4.2	5.2	JIS-K6252
	Hardness*1 (type E) Skin side	10	20	30	JIS-K6253
	Hardness*1 (type E) Sliced side	7	15	25	
	25% compressive load (kPa)	34	46	50	JIS-K6767
	50% compressive load (kPa)	73	121	160	
	25% compression set (%)	23	20	10	JIS-K6767 (150℃×22H)
Heat resistance	Tensile strength change rate (%)	−29	−7	−9	JIS-K6257 (180℃×72H)
	Elongation change rate (%)	+6	+13	+5	
	Hardness change (point)	+1	+3	+3	
Other	Ozone resistance	No abnormality	No abnormality	No abnormality	JIS-K6259 (50pphm 40℃×24H)
	Food sanitation standards	Compliant	Compliant	Compliant	Public notice No.370 issued by the Japanese Ministry of Health, Labour and Welfare
	Volume resistivity (Ω·m)	1.2×10^{13}	5.8×10^{12}	1.2×10^{12}	JIS-K6271 (500V)
	Thermal conductivity (W/m·K)	0.054	0.069	0.083	JIS-A1412-2

*1 In JIS-K6253:2006, the measurement method was changed (measurement conducted three seconds later). However, the measurement values in the above table are based on the conventional measurement method (measurement conducted within one second) which is still widely used.

(The values in the table are for reference and do not represent the standard values.)
Unless specified otherwise, the values in other tables in this catalog are based on the test conditions in the above table.

Thick silicone rubber sponge sheet

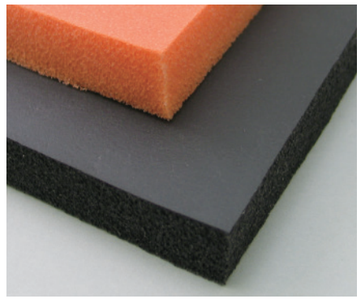
The free foaming sponge sheets are available up to 30 mm in thickness.

Features

- Highly resistant to heat and weather
- Compliant with food sanitation standards
- Superb permanent compression set (due to cells larger than microcells)

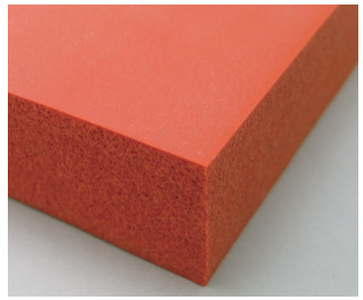
Product specifications

Basic product dimensions: 30mm × 0.5m × 1m
Thickness: 2 mm or more (sliced as requested by the customer)



▲ Si-001F

▲ Si-100F



▲ Si-250F

	Product number (color)	Si-001F Red and black	Si-100F Red	Si-250F Red	Test condition
Physical properties	Apparent density (g/cm³)	0.17	0.29	0.42	JIS-K7222
	Tensile strength (MPa)	0.3	0.4	0.5	JIS-K6251
	Elongation (%)	330	202	150	
	Tear resistance (N/mm)	1.3	1.5	2.0	JIS-K6252
	Hardness*1 (type E) Skin side	5	10	25	JIS-K6253
	Hardness*1 (type E) Sliced side	3	8	23	
	25% compressive load (kPa)	—	40	80	JIS-K6767
	50% compressive load (kPa)	40	130	230	
	25% compression set (%)	4	2	2	JIS-K6767 (150℃×22H)
Heat resistance	Tensile strength change rate (%)	−13	+7	−7	JIS-K6257 (180℃×72H)
	Elongation change rate (%)	−3	−4	−3	
	Hardness change (point)	±0	+1	±0	
Other	Ozone resistance	No abnormality	No abnormality	No abnormality	JIS-K6259 (50pphm 40℃×24H)
	Food sanitation standards	Compliant	Compliant	Compliant	Public notice No.370 issued by the Japanese Ministry of Health, Labour and Welfare
	Volume resistivity (Ω·m)	2.2×10^{14}	9.4×10^{13}	1.9×10^{13}	JIS-K6271 (500V)
	Thermal conductivity (W/m·K)	0.049	0.050	0.079	JIS-A1412-2

(The values in the table are for reference and do not represent the standard values.)

Silicone-modified rubber sponge sheet

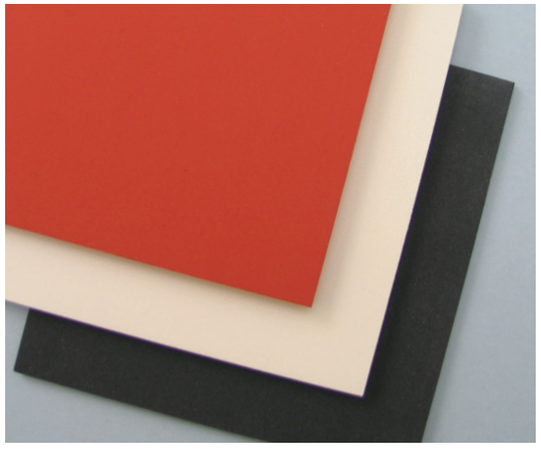
These sponge sheets are low-cost and heat-resistant (150°C).

Features

- Equivalent in performance to silicone rubber sponge sheets (except for heat resistance of 150°C) and low-cost
- Also suitable for thin applications (e.g. 1 mm thick)

Product specifications

Basic product dimensions : 20mm ×1m ×1m
Thickness : 1 mm or more
(sliced as requested by the customer)



	Product number (color)		SE-200 Red,black,and white	SE-300 Red,black,and white	Test condition
Physical properties	Apparent density (g/cm³)		0.33	0.37	JIS-K7222
	Tensile strength (MPa)		1.8	1.3	JIS-K6251
	Elongation (%)		450	400	
	Tear resistance (N/mm)		3.6	5.5	JIS-K6252
	Hardness*1 (type E)	Skin side	22	33	JIS-K6253
		Sliced side	12	24	
	25% compressive load (kPa)		45	60	JIS-K6767
	50% compressive load (kPa)		144	160	
	25% compression set (%)		20	15	JIS-K6767 (70℃×22H)
Heat resistance	Tensile strength change rate (%)		−8	+22	JIS-K6257 (120℃×72H)
	Elongation change rate (%)		−6	+6	
	Hardness change (point)		+8	+5	
Other	Ozone resistance		No abnormality	No abnormality	JIS-K6259 (50pphm 40℃×24H)
	Volume resistivity (Ω·m)		2.3×10^{14}	3.1×10^{14}	JIS-K6271 (500V)
	Thermal conductivity (W/m·K)		0.078	0.082	JIS-A1412-2

(The values in the table are for reference and do not represent the standard values.)

Fluoro rubber sponge sheet

These top-grade sponge sheets are characterized by excellent chemical stability.

Features

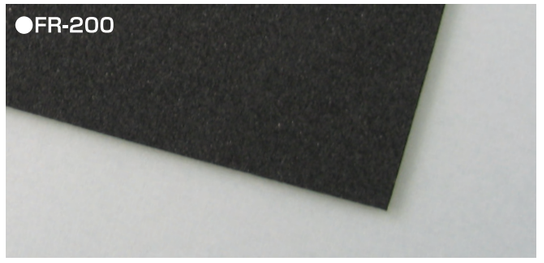
- Heat-resistant (200°C) and highly resistant to oils and acids
- Highly resistant to weather and ozone, and good for long-term use
- Compliant with food sanitation standards

Product specifications

Basic product dimensions
FR−200 : 10mm×1m×1m
FR−350 : 10mm×0.5m×1m

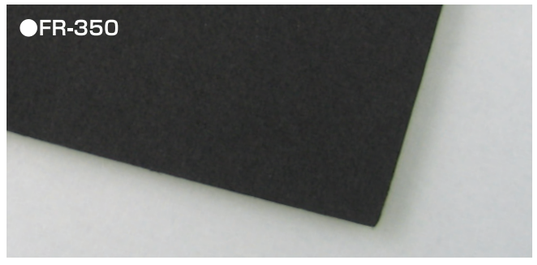
Thickness : 1 mm or more
(sliced as requested by the customer)

●FR-200



▲ Available up to 1m×1m

●FR-350



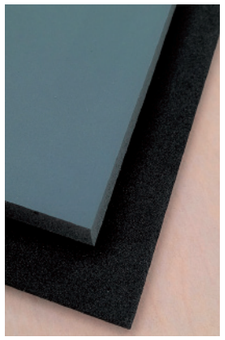
▲ Available up to 0.5m×1m

	Product number (color)		FR-200 Black	FR-350 Black	Test condition
Physical properties	Apparent density (g/cm³)		0.28	0.40	JIS-K7222
	Tensile strength (MPa)		1.8	1.6	JIS-K6251
	Elongation (%)		225	175	
	Tear resistance (N/mm)		4.5	3.0	JIS-K6252
	Hardness*1 (type E)	Skin side	21	36	JIS-K6253
		Sliced side	16	32	
	25% compressive load (kPa)		37	65	JIS-K6767
	50% compressive load (kPa)		103	153	
	25% compression set (%)		22	25	JIS-K6767 (150℃×22H)
Heat resistance	Tensile strength change rate (%)		+4	+2	JIS-K6257 (200℃×72H)
	Elongation change rate (%)		−18	−31	
	Hardness change (point)		+3	+6	
Other	Ozone resistance		No abnormality	No abnormality	JIS-K6259 (50pphm 40℃×24H)
	Food sanitation standards		Compliant	Compliant	Public notice No.370 issued by the Japanese Ministry of Health, Labour and Welfare
	Volume resistivity (Ω·m)		3.9×10^{9}	3.0×10^{9}	JIS-K6271 (500V)
	Thermal conductivity (W/m·K)		0.046	0.058	JIS-A1412-2

(The values in the table are for reference and do not represent the standard values.)

Flame-retardant silicone rubber sponge sheet

The two types of silicone rubber sponge sheets meet the UL94V-0 flame retardance requirements.



(Top: Si-820, bottom: SE-800)

Features

- Si-820 (resistant to heat of 200°C) complies with the UL requirements. (Si-820 is not a UL-certified product.)
- SE-800 is a low-cost UL-certified product (resistant to heat of 150°C).

Product specifications

Basic product dimensions : 20mm ×1m ×1m

Thickness : 1 mm or more
(sliced as requested by the customer)

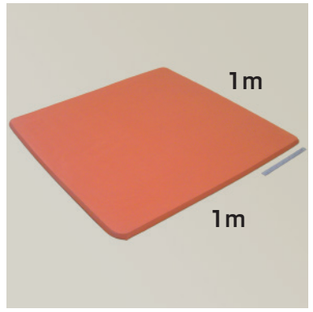
Product number (color)		Si-820 (Gray)	SE-800 (Black)
Physical properties	Apparent density (g/cm³)	0.39	0.30
	Tensile strength (MPa)	0.6	0.4
	Elongation (%)	280	150
	Tear resistance (N/mm)	2.2	1.1
	Hardness (skin side) (type E)*1	21	20
Heat resistance	Tensile strength change rate (%)	±0	−12
	Elongation change rate (%)	±0	+33
	Hardness change (point)	±0	+1
	Test condition	180℃×72H	120℃×72H
Ozone resistance		No abnormality	
Flame retardance		Compliant with V-0	Certified with V-0
Volume resistivity (Ω·m)		3.5×10^{13}	1.0×10^{14}
Thermal conductivity (W/m·K)		0.073	0.126

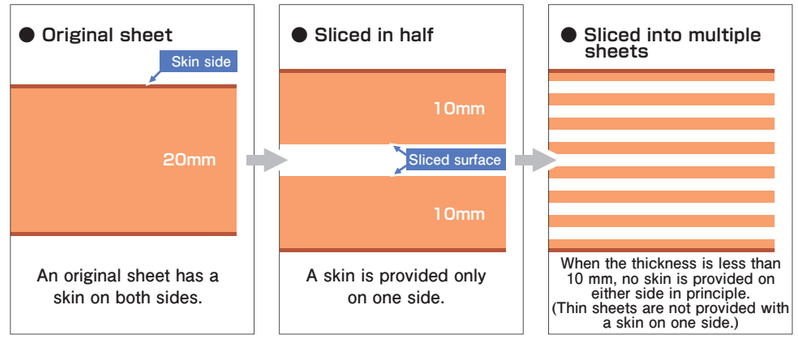
(The values in the table are for reference and do not represent the standard values.)

Original sheets, slicing, and secondary processing

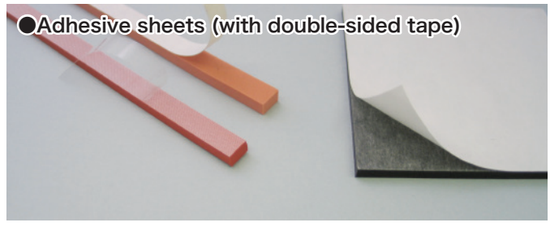
Slicing (conceptual image) (in the case of an original sheet of 20 mm thickness)

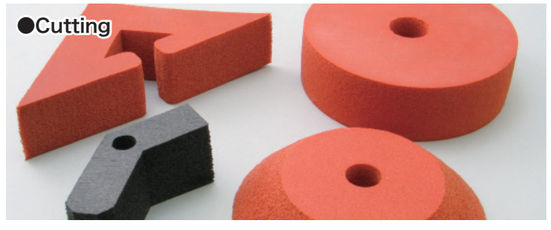
Conceptual image of an original sheet (1m×1m)





Processed sheets Images





Compliance with environmental regulations

- All the ESP series products comply with the amended RoHS Directive that bans the use of six substances (Cd, Pb, Hg, Cr^{6+}, PBBs, and PBDEs) with four phthalates (DEHP, BBP, DBP, and DIBP) added.
- We can submit the analysis data (X-ray fluorescence analysis) of six substances subject to the RoHS Directive as evidence for all of our products. We issue non-use certificates for the four phthalates.

  (Note) RoHS Directive: Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment.