

## Shin-Etsu Silicone

# Rubber Compounds

## Performance Test Results

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# 1. Silicone rubber: general properties

Classification		For general purpose									
Grade		KE-931-U	KE-941-U	KE-951-U	KE-961-U	KE-971-U	KE-981-U	KE-961T-U	KE-971T-U	X-30-3491-U	
Appearance		Milky white translucent			Grayish white			Milky white translucent		Grayish white	
Density 23°C	g/cm <sup>3</sup>	1.07	1.11	1.14	1.22	1.30	1.42	1.17	1.20	1.29	
Williams plasticity (10 min after remix)		160	190	240	280	360	420	280	340	290	
Curing agent	Curing agent name	C-8	C-8	C-8	C-8	C-8	C-8	C-8A	C-8	C-8A	
	Standard addition quantity*1	2.0	2.0	2.0	2.0	2.0	2.0	0.5	2.0	0.3	
Linear shrinkage*2		%	4.0	3.9	3.9	3.4	3.0	2.7	3.6	3.4	—
Physical strength	Hardness Durometer A	31	43	52	63	71	84	62	71	69	
	Tensile strength	MPa	4.7	6.5	8.2	7.3	7.5	8.8	9.7	8.8	7.0
	Elongation at break	%	480	365	325	320	220	100	310	260	170
	Tear strength crescent piece	kN/m	15*3	15*3	23*3	20*3	20*3	8	25*3	25*3	7
Compression set 180°C/22 h		%	15	11*4	11*4	11*4	9*4	12*4	—	11	12*4
Dielectric breakdown strength	kV	Normal state	—	23	24	25	25	24	—	—	—
		Submerged	—	21	20	25	24	23	—	—	—
Volume resistivity	TΩ·m	Normal state	—	30	8	6	3	4	—	—	—
		Submerged	—	40	5	4	3	3	—	—	—

(Not specified values)

Classification		Non post curing					For thick section molding				
Grade		KE-742-U*5	KE-752-U*5	KE-762-U*5	KE-772-U*5	KE-782-U*5	KE-850-U	KE-870-U	KE-880-U	KE-890-U	
Appearance		Light yellow	Grayish white				Milky white translucent	Grayish white			
Density 23°C	g/cm <sup>3</sup>	1.10	1.30	1.36	1.40	1.43	1.16	1.35	1.45	1.55	
Williams plasticity (10 min after remix)		180	200	240	270	330	220	350	450	550	
Curing agent	Curing agent name	C-4	C-4	C-4	C-4	C-4	C-4	C-4	C-4	C-8	
	Standard addition quantity*1	4.0	2.8	2.7	2.7	2.7	4.0	4.0	4.0	1.5	
Linear shrinkage*2		%	3.6	3.0	2.7	2.6	2.5	3.9	2.9	2.7	—
Physical strength	Hardness Durometer A	45	53	60	71	79	56	72	80	87	
	Tensile strength	MPa	4.4	6.0	6.7	7.5	8.5	7.6	8.3	8.5	6.0
	Elongation at break	%	300	250	250	200	160	300	140	100	80
	Tear strength crescent piece	kN/m	8	9	11	13	14	9	11	7	—
Compression set 180°C/22 h		%	12	12	12	16	18	9*4	5	7*4	18
Dielectric breakdown strength	kV	Normal state	26	29	26	26	29	23	23	25	—
		Submerged	27	30	25	26	29	23	23	25	—
Volume resistivity	TΩ·m	Normal state	100	20	10	100	20	10	5	2	—
		Submerged	90	10	10	70	10	8	3	2	—

Measurement: in accordance with JIS K 6249 Test pieces: 165°C/10 min (press cure), 200°C/4 h (post cure)

(Not specified values)

\*1 Standard addition quantity is the quantity of curing agent added to 100 parts compound.

\*2 Linear shrinkage values differ according to the curing agent used.

\*3 Angle piece

\*4 Measured values at 150°C/22 h.

\*5 The data below linear shrinkage is based on measurements on a product by compression molding at 170°C/10 min (with no post cure).

[Unit conversion] tensile strength: 10 kgf/cm<sup>2</sup> = 0.98 MPa; tear strength: 1 kgf/cm = 0.98 kN/m; volume resistivity: 10<sup>14</sup> Ω·cm = 1 TΩ·cm.

Classification		For general extrusion molding										For tubing			
Grade		KE-541-U*3	KE-551-U*3	KE-561-U*3	KE-571-U*3	KE-581-U*3	KE-153-U	KE-174-U	KE-1551-U*3	KE-1571-U*3					
Appearance		Milky white translucent										Milky white translucent			
Density 23°C g/cm <sup>3</sup>		1.10	1.14	1.17	1.22	1.24	1.16	1.21	1.16	1.19					
Williams plasticity (10 min after remix)		150	200	250	360	430	255	370	270	315					
Curing agent	Curing agent name	C-23	C-25A/B	C-23	C-25A/B	C-23	C-25A/B	C-23	C-25A/B	C-23	C-25A/B	C-153A/R-153A/ CAT-PL-2*4		C-23	C-23
	Standard addition quantity*1	1.0	0.5/2.0	1.0	0.5/2.0	1.0	0.5/2.0	1.0	0.5/2.0	1.3	0.5/2.0			0.8	0.7
Linear shrinkage*2 %		—	—	—	—	—	—	—	—	—	—	—	—	3.3	—
Physical strength	Hardness Durometer A	40	40	50	50	63	62	70	68	79	77	53	71	56	74
	Tensile strength MPa	8.0	8.2	10.5	9.8	11.5	11.5	11.0	11.0	10.5	10.5	10.0	8.1	10.5	9.5
	Elongation at break %	550	690	530	590	450	470	430	450	310	430	650	520	530	370
	Tear strength crescent piece kN/m	10	22	13	26	15	24	19	26	13	23	36	37	16	23
Compression set 180°C/22 h		12*5	9*6	8*5	9*6	11*5	9*6	13*5	9*6	14*5	9*6	—	—	—	35*6
Dielectric breakdown strength kV	Normal state	—	—	26	—	25	—	26	—	29	—	26	28	28	25
	Submerged	—	—	24	—	—	—	27	—	27	—	25	28	26	—
Volume resistivity TΩ·m	Normal state	—	—	10	—	1	—	600	—	50	—	900	650	600	600
	Submerged	—	—	5	—	—	—	700	—	20	—	700	370	600	—

(Not specified values)

Classification		High strength		Low hardness, high elongation			Flame resistant					
Grade		KE-555-U	KE-575-U	KE-520-U	KE-530B-2-U	KE-540B-2-U	KE-5620W-U	KE-5620BL-U	KE-5612G-U	KE-5634-U		
Appearance		Light yellow		Milky white translucent			White	Black	Charcoal	Translucent		
Density 23°C g/cm <sup>3</sup>		1.17	1.21	1.06	1.13	1.13	1.40	1.38	1.47	1.20		
Williams plasticity (10 min after remix)		310	320	145	170	175	240	230	310	330		
Curing agent	Curing agent name	C-8	C-8	C-8	X-93-1538	C-15	X-93-1609*7/C-3		C-3	C-25A/B		
	Standard addition quantity*1	2.0	2.0	2.0	0.6	1.5	0.1/1.3		1.3	1.0/2.0		
Linear shrinkage*2 %		4.0	4.0	4.5	3.8	4.1	3.1	3.2	2.7	3.4		
Physical strength	Hardness Durometer A	53	70	23	35	39	59	57	59	70		
	Tensile strength MPa	11.0	9.4	5.0	9.7	9.7	6.5	7.0	7.2	7.7		
	Elongation at break %	650	550	770	880	700	410	430	310	370		
	Tear strength crescent piece kN/m	35	41	10	34	17	12	11	12	14		
Compression set 180°C/22 h		32	18	22	20*6	9*6	21	27	15	20		
Dielectric breakdown strength kV	Normal state	27	27	—	—	—	27	28	29	29		
	Submerged	22	24	—	—	—	29	28	—	—		
Volume resistivity TΩ·m	Normal state	100	200	—	—	—	50	80	110	300		
	Submerged	80	100	—	—	—	30	10	10	—		

Measurement: in accordance with JIS K 6249 Test pieces: 165°C/10 min (press cure), 200°C/4 h (post cure)

(Not specified values)

\*1 Standard addition quantity is the quantity of curing agent added to 100 parts compound.

\*2 Linear shrinkage values differ according to the curing agent used.

\*3 Test pieces: 120°C/10 min (press cure), 200°C/4 h (post cure)

\*4 For addition quantities, refer to Standard Addition Quantity of curing agents on p. 9.

\*5 Measured values at 100°C/22 h

\*6 Measured values at 150°C/22 h

\*7 X-93-1609 is a flame retardant.

[Unit conversion] tensile strength: 10 kgf/cm<sup>2</sup> = 0.98 MPa; tear strength: 1 kgf/cm = 0.98 kN/m; volume resistivity: 10<sup>14</sup> Ω·cm = 1 TΩ·cm.

## Silicone rubber: General properties (cont.)

Classification		Heat resistant		Hermetic heat resistance	Steam resistant			Electrically conductive			For heat conductive	
Grade		KE-552-U*3	KE-582-U*4	KE-552B-U*5	KE-7511-U	KE-7611-U	KE-7711-U	KE-3601SB-U	KE-3711-U	KE-3801M-U	KE-6801-U*3	
Appearance		Light brown		Light yellow	Light yellow			Black			Dark blue	
Density 23°C	g/cm <sup>3</sup>	1.16	1.25	1.17	1.14	1.15	1.21	1.17	1.14	1.20	1.90	
Williams plasticity (10 min after remix)		270	470	280	220	220	230	450	480	630	500	
Curing agent	Curing agent name	C-23	C-23	C-23	C-15	C-8A	C-8A	C-8A	C-8A	HC-101/CAT-PL-2	C-23	
	Standard addition quantity*1	1.0	1.0	1.0	1.3	0.6	0.6	1.0	1.0	2.7/0.1	0.8	
Linear shrinkage*2		2.7	3.3	2.4	3.8	3.9	3.9	4.2	—	—	—	
Physical strength	Hardness Durometer A	52	80	52	55	61	72	62	66	73	85	
	Tensile strength MPa	10.0	7.0	9.8	9.5	9.1	8.8	7.0	6.5	5.3	4.0	
	Elongation at break %	550	250	550	410	330	300	290	170	190	110	
	Tear strength crescent piece kN/m	15	20	14	12	11	15	10	—	15*6	—	
Compression set 180°C/22 h		18*7	23	24*7	9	9	10	—	12	18*7	—	
Dielectric breakdown strength	kV	Normal state	27	25	28	—	—	—	—	—	26	
		Submerged	26	24	23	—	—	—	—	—	25	
Volume resistivity	TΩ·m	Normal state	900	900	500	—	—	—	0.05*8	0.05*8	0.03*8	30
		Submerged	800	600	50	—	—	—	—	—	—	2

(Not specified values)

Classification		For industrial rollers		For rubber rollers		Voltage resistant		For oil bleed			For super low temperature	
Grade		KE-765-U	KE-785-U	KE-7008-U	KE-7005-U	KE-655-U	KE-675-U	KE-503-U	KE-5042-U	KE-505-U	KE-136Y-U*2	
Appearance		Light yellow	Grayish white	Light yellow		Grayish white		White			Grayish white	Light yellow
Density 23°C	g/cm <sup>3</sup>	1.17	1.58	1.30	1.09	1.22	1.29	1.10	1.14	1.19	1.16	
Williams plasticity (10 min after remix)		270	370	135	150	300	310	170	185	210	220	
Curing agent	Curing agent name	C-8	C-8	C-3	C-3	C-8A	C-8A	C-8	C-8	C-8	C-23	
	Standard addition quantity*1	2.0	1.5	3.0	3.0	0.7	0.7	2.0	2.0	2.0	0.7	
Linear shrinkage*2		3.7	2.4	—	—	3.8	3.1	4.0	3.6	3.4	3.6	
Physical strength	Hardness Durometer A	63	83	29	47	60	70	32	43	48	52	
	Tensile strength MPa	10.0	8.5	3.8	5.2	10.5	8.5	6.5	7.4	7.3	10.2	
	Elongation at break %	340	110	450	240	400	300	650	500	330	620	
	Tear strength crescent piece kN/m	—	—	5	6	28	23*6	18	22	19	32	
Compression set 180°C/22 h		8	11	13	6	15*7	10*7	15	10	17*9	16*10	
Dielectric breakdown strength	kV	Normal state	27	26	—	—	28	28	24	25	23	29
		Submerged	25	26	—	—	—	—	—	—	—	27
Volume resistivity	TΩ·m	Normal state	10	10	—	—	50	10	50	50	8	200
		Submerged	10	10	—	—	—	—	—	—	—	90

Measurement: in accordance with JIS K 6249 Test piece: 165°C/10 min (press cure), 200°C/4 h (post cure)

(Not specified values)

\*1 Standard addition quantity is the quantity of curing agent added to 100 parts compound.

\*2 Linear shrinkage values differ according to the curing agent used.

\*3 Test pieces: 120°C/10 min (press cure), 200°C/4 h (post cure)

\*4 Test pieces: 120°C/10 min (press cure), 150°C/1 h + 250°C/24 h (post cure)

\*5 Test pieces: 120°C/10 min (press cure), 150°C/1 h (post cure)

\*6 Angle piece \*7 Measured values at 150°C/22 h \*8 Ω·m \*9 Measured values at 150°C/70 h \*10 Measured values at 105°C/70 h

[Unit conversion] tensile strength: 10 kgf/cm<sup>2</sup> = 0.98 MPa; tear strength: 1 kgf/cm = 0.98 kN/m; volume resistivity: 10<sup>14</sup> Ω·cm = 1 TΩ·cm.

## Silicone rubber: other properties

Classification			For general purpose						
Grade			KE-941-U	KE-951-U	KE-961-U	KE-971-U	KE-981-U	KE-971T-U	X-30-3491-U
Heat resistance	Rate of change (RC) at 220°C/96 h	Hardness Point	-4	-1	-1	+3	0	—	—
		Tensile strength %	-20	-10	-10	+2	-5	—	—
		Elongation at break %	-8	-22	-30	-35	-13	—	—
Oil resistance	RC at 150°C/72 h IRM 903 Oil	Hardness Point	—	-15	-15	-15	—	-19	—
		Tensile strength %	—	-25	-15	-15	—	-6	—
		Elongation at break %	—	-30	-20	-10	—	-16	—
		Volume change %	—	+30	+30	+26	—	+28	—
	RC at 175°C/70 h ASTM Oil No.1	Hardness Point	—	—	—	-3	—	—	-6
		Tensile strength %	—	—	—	+14	—	—	-4
		Elongation at break %	—	—	—	-20	—	—	+10
Volume change %	—	—	—	+6	—	—	+9		
Flame resistance		UL94	HB	HB	HB	HB	HB	HB	—
Low temperature characteristics		T10 Gehman test °C	—	-46	—	-47	—	—	—

(Not specified values)

Classification			For general extrusion molding			Voltage resistant		For oil bleed		
Grade			KE-551-U*5	KE-561-U*5	KE-571-U*5	KE-655-U	KE-675-U	KE-503-U	KE-5042-U	KE-505-U
Heat resistance	Rate of change (RC) at 220°C/96 h	Hardness Point	+4	+6	+8	+5*1	+2*1	0*2	+3*2	-4*2
		Tensile strength %	-19	-27	-28	-25*1	-4*1	-5	-12*2	-10*2
		Elongation at break %	-40	-41	-56	-30*1	-27*1	-15	-23*2	+8*2
Oil resistance	RC at 150°C/72 h IRM 903 Oil	Hardness Point	—	—	—	-20	-20	-10	—	—
		Tensile strength %	—	—	—	-40	-15	-45	—	—
		Elongation at break %	—	—	—	-40	-15	-50	—	—
		Volume change %	—	—	—	+55	+40	+55	—	—

(Not specified values)

Classification			Flame resistant				Heat resistant		Hermetic heat resistance
Grade			KE-5620W-U	KE-5620BL-U	KE-5612G-U	KE-5634-U	KE-552-U*3	KE-582-U*3	KE-552B-U*3
Heat resistance	Rate of change (RC) at 220°C/96 h	Hardness Point	+4	+3	+2	—	+15*4	+8*4	+5
		Tensile strength %	+10	+13	-30	—	-48*4	-35	-10
		Elongation at break %	-28	-28	-20	—	-59*4	-60	-30
Flame resistance		UL94	V-0	V-0	V-0	V-1	—	—	—

Measurement: in accordance with JIS K 6249 Test pieces: 165°C/10 min (press cure), 200°C/4 h (post cure)

(Not specified values)

Classification			Non post curing					Steam resistant		
Grade			KE-742-U*6	KE-752-U*6	KE-762-U*6	KE-772-U*6	KE-782-U*6	KE-7511-U	KE-7611-U	KE-7711-U
Heat resistance	Rate of change (RC) at 220°C/96 h	Hardness Point	+2	+2	+3	+4	—	+2*2	+3	+2*2
		Tensile strength %	+5	0	-20	-5	-10	-15	-10	-8*2
		Elongation at break %	-10	-10	-15	-15	-15	-10	-15	-11*2

Measurement: in accordance with JIS K 6249 Test pieces: 165°C/10 min (press cure), 200°C/4 h (post cure)

(Not specified values)

\*1 Measured values at 200°C/72 h \*2 Measured values at 230°C/72 h \*3 Test pieces: 120°C/10 min (press cure), 200°C/4 h (post cure)

\*4 Measured values at 300°C/72 h \*5 Relevant data is for addition cure (C-25A/B=0.5/2.0)

\*6 Data for the product in question was measured based on a pressure-cure product cured at 170°C/10 min (with no post cure).

## Fluorosilicone rubber

Fluorosilicone rubber is highly resistant to high and low temperatures and solvents, and has excellent workability. In IRM 903, a standard oil, there is less than 5% swelling (150°C/70 h). Fluorosilicone rubber also has excellent resistance to silicone fluid. Shin-Etsu's fluorosilicone rubber products include the FE-201-U Series for general molding (hardness: 25-80), and the FE-301-U Series of high strength rubbers (hardness: 40-80). We also produce FE-451-U, a copolymer

type that exhibits oil resistance midway between that of dimethyl silicone rubber and fluorosilicone rubber. This copolymer material has oil resistance while also having superior cold resistance, and maintains a greater degree of rubber elasticity at low temperatures than typical silicone rubbers.

Applications : Rubber parts including diaphragms, check valves, and connectors, specifically in applications requiring oil and solvent resistance.

### General properties

Grade		FE-251-U	FE-261-U	FE-271-U	FE-351-U	FE-361-U	FE-451-U*2
Appearance		Light yellow	Light yellow	Grayish white	Light yellow	Light yellow	Light yellow
Density 23°C g/cm <sup>3</sup>		1.41	1.42	1.50	1.44	1.46	1.23
Prescribed curing agent	Curing agent name	C-8A	C-8A	C-8A	C-8A	C-8A	C-8A
	Standard addition quantity	0.8	0.8	0.8	0.8	0.8	0.8
Normal state data	Hardness Durometer A	54	63	73	49	62	50
	Elongation at break %	430	400	300	520	520	300
	Tensile strength MPa	9.8	9.8	9.0	13.3	12.7	6.4
	100% modulus MPa	1.9	2.7	5.3	0.98	1.2	1.8
	200% modulus MPa	4.4	5.8	6.6	2.5	2.7	3.7
	Tear strength Crescent kN/m	15	16	16	38	45	10
	Linear shrinkage %	3.5	3.5	3.3	3.3	3.2	3.8
	Rebound resiliency %	43	43	34	24	21	74
Compression set*1 %	8	8	9	17	14	6	
Heat resistance 200°C/72 h	Hardness (points change)	+2	+3	+3	+5	+5	+2
	Elongation at break (rate of change) %	-7	-5	-16	±0	-2	-7
	Tear strength (rate of change) %	-16	-12	-17	-7	-8	-7
IRM 903 oil immersion 150°C/70 h	Hardness (points change)	-5	-5	-5	±0	±0	-11
	Elongation at break (rate of change) %	-15	-5	-10	±0	+1	-18
	Tensile strength (rate of change) %	-20	-10	-10	-2	±0	-19
	Volume change %	+4	+4	+4	+3	+3	+14
Fuel C 25°C/72 h	Hardness (points change)	-9	-9	-10	-12	-15	—
	Elongation at break (rate of change) %	-44	-45	-23	-33	-14	—
	Tensile strength (rate of change) %	-48	-40	-17	-46	-27	—
	Volume change %	+24	+23	+21	+23	+22	+140
Remarks	For fuel diaphragms and check valves			High tear strength		Copolymer	

Measurement: based on JIS K 6249 Test pieces: 165°C/10 min (press cure), 200°C/4 h (post cure)

(Not specified values)

\*1 Measured values at 180°C/22 h \*2 FE-451-U is produced in response to orders received.

## SEP Rubber (silicone-modified EPDM)

SEP rubber is produced by modifying ethylene propylene rubber (EPDM) with silicone. This improves EPDM's properties of heat resistance and weather resistance, and low temperature characteristics. These performance characteristics lie between those of EPDM and silicone rubber, but SEP rubber has the additional favorable properties of chlorine resistance and sponge foaming characteristics. In high temperature conditions over 100°C, SEP rubber has higher mechanical strength, in particular tear strength, than EPDM, and is comparable to

high-strength silicone rubber. In terms of resistance to steam, hot water, acids and alkalis, SEP rubber is more durable than silicone rubbers. SEP rubbers are available in several grades: general grade (SEP-1711-U, SEP-1411-U), heat-resistant grade (SEP-1721-U, SEP-1421-U, SEP-855B-U), extrusion grade (SEP-1731-U), flame-resistant grade (SEP-363-U), and solar grade (SEP-1631-U).

Applications : Rubber parts for high-temperature applications requiring high strength, including plug boots and anode caps.

### General properties

Grade		SEP-1711-U*2	SEP-1721-U*3	SEP-1731-U	SEP-855B-U	SEP-363-U	SEP-1631-U
Appearance		Yellow	Light yellow	Gray	Light yellow	Black	Light yellow
Density 23°C g/cm <sup>3</sup>		1.11	1.15	1.21	1.15	1.40	1.02
Prescribed curing agent	Curing agent name	C-11	C-11	C-12/SEP-BM	C-11	C-11	C-11
	Standard addition quantity	2.0	2.0	4.0/0.2	2.0	1.5	2.0
Mooney viscosity ML 1+4 100°C		75	66	50	55	50	42
Normal state data	Hardness Durometer A	70	72	70	56	70	68
	Elongation at break %	600	550	600	750	400	800
	Tensile strength MPa	17.0	11.0	14.0	13.0	4.8	15.3
	Tear strength Crescent kN/m	35	30	30	31*4	25	36
	Rebound resiliency %	50	50	51	60	50	49
	Compression set*1 %	40	45	28	45	28	40
	Linear shrinkage %	2.5	2.7	—	—	—	—
	Flame resistance	—	—	—	—	1.6mm UL94 V-0	—
Remarks		For general molding Sulfur cure possible	For general molding Heat-resistant grade	For extrusion General grade	For general molding Heat-resistant grade	Flame resistant Halogen-free	Solar grade Extrusion possible

Measurement: based on JIS K 6249 Test pieces: 170°C/10 min (press cure), 150°C/2 h (post cure)

(Not specified values)

\*1 Measured values at 150°C/22 h \*2 SEP-1711-U is available in a hardness 40 variation, SEP-1411-U.

\*3 SEP-1721-U is available in a hardness 40 variation, SEP-1421-U. \*4 Angle

● We also offer a range of trial products in grades other than those listed above.

## Curing agents

Shin-Etsu's silicone rubber compounds typically do not include a curing agent. These are called "U-types," and expressed such as KE-951-U. With U-type products, choose

a suitable curing agent (from C-1A to C-25A/B) in accordance with the curing method. We also offer curing agents other than those listed here. Please contact Shin-Etsu for details.

### Types

	Applications	Appearance	Main vulcanizing ingredient
C-1A	General molding, thin sections	White paste	Benzoyl peroxide Approx. 50% content
C-3	General molding, steam curing, flame resistant	White putty	Dicumyl peroxide Approx. 20% content
C-4	General molding	Light gray paste	Ditertiary butyl peroxide Approx. 20% content
C-8 C-8A C-8B	General molding, thick sections	Light gray paste (C-8) Translucent paste (C-8A, C-8B)	2.5 dimethyl-2.5 bis (tertiarybutylperoxy) hexane Approx. 25% content (C-8), approx. 80% content (C-8A), approx. 40% content (C-8B)
C-10	Vulcanization of addition-cure high-strength rubbers	Brown paste	Contains metallic salt
C-15	General molding, for transparent products	Translucent paste	2.5 dimethyl-2.5 bis (tertiarybutylperoxy) hexane Approx. 12.5% content
C-16	General molding, for transparent products	Transparent liquid	Tertiarybutylcumylperoxide Approx. 50% content
C-23	Hot Air Vulcanization (HAV)	White paste	Paramethylbenzoylperoxide Approx. 50% content
C-25A/B	Vulcanization of addition-cure rubbers	Transparent paste (C-25A) Translucent paste (C-25B)	Contains metal complex (C-25A) Contains cross-linker (C-25B)

### Suitability by application

Grade	Application					Curing method			
	Thin sections	Thick sections	Sponge*	Carbon compound products	Low compression set	HAV	CV	Mold	Coating
C-1A	●		●				●	●	●
C-3		●	●	●	●		●	●	
C-4		●			●			●	
C-8 C-8A C-8B	●	●		●	●		●	●	
C-10		●	●	●	●	●		●	
C-15	●	●		●	●			●	
C-16	●	●			●		●	●	
C-23			●			●	●	●	●
C-25A/B		●	●	●	●	●		●	

\* Use sponge curing agents as a combination of C-1A with C-3, or C-23 with C-3.



Standard addition quantity

Grade	C-1A*1	C-3	C-4*2	C-8*3	C-8A	C-23*1	
KE-931-U	0.75	3.2	4.0	2.0	0.5	1.8*	
KE-941-U							
KE-951-U							
KE-961-U	0.6	2.3	3.5		0.4	1.4*	
KE-971-U	0.55	1.9	3.0			1.3*	
KE-981-U	0.5	1.6	4.0		0.5	1.2*	
KE-961T-U	0.65	2.5				1.5	
KE-971T-U	0.6	2.3	3.5		0.3	1.4	
X-30-3491-U							
KE-742-U	0.85	3.5	4.0		2.0	0.5	1.7*
KE-752-U	0.8	3.2	2.8	1.5*			
KE-762-U	0.7	2.8	2.7	0.4		1.3*	
KE-772-U	0.6	2.6				1.2*	
KE-782-U			1.5	1.2*			
KE-850-U	0.75	2.8	4.0	2.0		0.5	1.4*
KE-870-U	0.65	1.9				0.4	1.2*
KE-880-U	0.6	1.6		1.5		0.6	1.1
KE-890-U	—	3.0				—	
KE-541-U	0.8	3.0	4.0	2.0		0.6	1.0
KE-551-U							
KE-561-U							
KE-571-U	0.6	3.0	4.0	2.0	0.6	1.3	
KE-581-U							
KE-153-U	C-153A/R-153A/CAT-PL-2=2.5/0.25/0.03						
KE-174-U	C-153A/R-153A/CAT-PL-2=2.5/0.25/0.03						
KE-1551-U	0.8	3.2	4.0	2.0	0.5	1.3	
KE-1571-U	0.7	2.0	3.0		0.4	1.2	
KE-555-U	0.8	2.5	—	2.0	0.5	1.3	
KE-575-U					0.4		

Grade	C-1A*1	C-3	C-4*2	C-8*3	C-8A	C-23*1
KE-520-U	0.8	3.5	4.0	2.0	0.5	1.8*
KE-530B-2-U	0.7	3.4				1.5*
KE-540B-U	0.8	3.2				1.3
KE-5620W-U	—	1.3	—	—	—	—
KE-5620BL-U	—		—	—	—	—
KE-5612G-U	1.0		1.5	1.5	0.5	0.5*
KE-5634-U	C-25A/B=1.0/2.0					
KE-552-U	0.8	3.4	4.0	2.0	0.5	1.3
KE-582-U		2.5	3.0		0.4	1.2
KE-552B-U		3.4	4.0		0.5	1.0
KE-7511-U	—	—	3.0	—	0.6	—
KE-7611-U			—			
KE-7711-U			—			
KE-3601SB-U	—	5.0	5.0	4.0	1.0	—
KE-3711-U		—	—	—		
KE-3801M-U		—	—	—		
KE-6801-U	0.5	2.0	3.0	2.0	0.4	0.8*
KE-765-U	0.7	2.8	3.0	2.0	0.5	1.3*
KE-785-U	0.6	2.6		1.5	0.4	1.2*
KE-7008-U	—	3.0	—	2.0	0.6	—
KE-7005-U						
KE-655-U	—	3.0	4.0	2.0	0.7	—
KE-675-U						
KE-503-U	—	3.0	4.0	2.0	0.6	—
KE-5042-U						
KE-505-U						
KE-136Y-U	0.75	3.0	—	2.0	0.5	0.7

Standard addition quantity is the quantity of curing agent added to 100 parts compound.

★ Note: Please contact Shin-Etsu separately for information regarding Hot Air Vulcanization (HAV).

\*1 In summer (June-September), add curing agents at 0.2-0.4 parts greater than the standard addition quantity;  
in winter (December-March), add at 0.1-0.3 parts less than the standard addition quantity.

\*2 C-4 is volatile, so the rubber compound should be used soon after mixing.

\*3 C-8 has qualities nearly identical to C-4, but has the advantage of lower volatility than C-4.

## Standard conditions for compression molding

Grade	Thickness of molded item (mm)		Less than 1	1 - 5	5 - 10	10 - 25	25 - 50
	Press conditions						
C-1A* <sup>1</sup> C-23	Temperature	°C	120 - 125				
	Time	min	10	10 - 15	15 - 30	30 - 60	60 - 120
	Pressure	MPa	2.9 - 4.9				
C-3	Temperature	°C	155 - 160				
	Time	min	10	10 - 15	15 - 30	30 - 60	60 - 120
	Pressure	MPa	2.9 - 4.9				
C-4 C-15 C-8 C-16 C-8A C-8B	Temperature	°C	165 - 170				
	Time	min	10	10 - 15	15 - 30	30 - 60	60 - 120
	Pressure	MPa	2.9 - 5.9				
C-10 C-25A/B* <sup>2</sup>	Temperature	°C	150 - 170				
	Time	min	10 - 20			20 - 60	60 - 120
	Pressure	MPa	2.9 - 5.9				

\*1 Curing may be uneven in molded items thicker than 5 mm. Shin-Etsu recommends C-3, C-8, or C-8A for molding items over 5 mm thick.

\*2 Molding possible at temperatures as low as 120°C-150°C.

## Primers

By applying the primer in advance, better adhesion will be obtained.

Grade	Features	Appearance	Ingredient (%)	Solvent	Drying conditions	Adherend
Primers No.4	For general molding	Colorless and transparent	20	n-Heptane	23°C / 15 - 20 min	Metal Plastic
Primers No.18B	Heat and oil resistant	Reddish brown	25	Toluene n-Hexane	23°C / 15 - 20 min →100 - 150°C / 10 - 20 min	Metal

● We offer other primers in addition to those listed above. Contact our Sales Department for details.

## Coloring agents

Grade	Color	Coloring ingredient (%) (ingredient name)
KE-Color BR	Reddish brown	50 (iron oxide)
KE-Color W	White	50 (titanium oxide)
KE-Color MB	Blue	50 (lapis)
KE-Color BL	Black	50 (iron oxide, carbon)
KE-Color SB	Sky blue	50 (cobalt blue)
X-93-941	Yellow	50 (titanium oxide, organic pigment)
X-93-942	Red	50 (organic pigment)

## Application examples by industry

Industry	Application examples	Desired properties	Typical grade
Home appliances	anode caps, wedges	electrical insulation, heat resistance, flame resistance	KE-5612G-U
	defrosters	heat resistance, cold resistance, electrical insulation	KE-552B-U/KE-136Y-U KE-582-U
	hot airbrushes	heat resistance, weather resistance, color tone	KE-941-U/KE-951-U
	microwave oven window gaskets microwave oven turnbelts	heat resistance, low compression set	KE-951-U
Electric wiring	lead wires of motors and electric appliances heater wires of rice cookers defroster wires of refrigerators ignition wires	electrical insulation, heat resistance, cold resistance, thermal conductivity, extrusion workability, flame resistance, high pressure-resistance	KE-552B-U KE-5620W-U
Office equipment	keypads of mobile communications devices, etc.	electrical conductivity (some)*1, electrical insulation, flex fatigue resistance, low temperature-dependence	KE-951-U KE-3711-U
	EMI gaskets	electrical conductivity, flame resistance, thermal conductivity	KE-3801M-U/KE-3711-U
	photocopy machine (PPC) rollers	heat resistance, releasability, low compression set	KE-870-U
	FAX platen rollers		KE-7008-U
	printer platen rollers		KE-971-U
Machinery	low-frequency therapy equipment	electrical conductivity	KE-7005-U/KE-7008-U
	lost wax casting	heat resistance, workability, releasability	(KE-661-U)*2
	solar hoses	chlorine water resistance, weather resistance	KE-655-U/KE-675-U SEP-1631-U
	hot stamp rollers	heat resistance, low compression set	KE-765-U/KE-785-U
	vibration-damping rubbers	low rebound resilience	(KE-5560-U)*2
Automotive	diaphragms, o-rings	oil resistance, heat resistance, cold resistance, flex fatigue resistance	FE-251-U/FE-271-U
	plug boots	oil resistance, heat resistance	KE-675-U/KE-655-U
	waterproof connectors	heat resistance, oil bleed, oil resistance	KE-503-U/KE-505-U
	radiator hoses	heat and cold resistance, low compression set, hot water resistance, anti-LLC (Long Life Coolant) resistance	SEP-1741-U
	turbocharger hoses intercooler hoses	heat resistance, oil resistance, flex fatigue resistance	KE-675-U/KE-552B-U KE-655-U
Food	pressure cooker gaskets rice cooker and electric kettle gaskets electronic rice cooker gaskets	steam resistance, safety, chlorine water resistance, low compression set	*2
	milkers	transparency, high strength, safety, pleasant texture against the skin, high-class	
	baby nipples	transparency, safety	
	lunch box gaskets	safety, low compression set	
Leisure	swimming goggles, snorkel mouthpieces, goggle bands	transparency, high strength, high-class, safety, pleasant texture against the skin	KE-153-U

\*1 Electrically conductive products such as KE-3711-U

\*2 For information about these products, please contact one of the Sales Departments listed on the back cover.

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