

Chlorinated polyethylene
「ELASLEN™」

SHOWA
DENKO

The background of the right side of the slide features several overlapping circles in different shades of blue, creating a modern, abstract design.

About us



昭和電工株式会社

Company Name

Showa Denko K.K.

Head office

13-9, Shiba Daimon 1-Chome, Minato-ku,
Tokyo 105-8518 Japan

Type of Industry

Diversified Chemical Company

Founded

June 1939

Capital

140,564 million yen (US\$ 1,278 million)

Employees

Consolidated: 10,634
Parent: 3,347

Sales

992.1 billion yen (US\$ 9 billion)
Unconsolidated: 576.8 billion yen (US\$ 5.2 billion)

Business sectors

Petrochemical, chemicals, inorganics,
aluminum, electronics and others(building materials etc.)

Global Locations

- Head office: Tokyo (Japan)
- Plant Location: Kawasaki City (Japan)
- Sales Offices: Munich (Germany), New York (USA), Singapore (Singapore)
Shanghai (China), Seoul (Korea)



Product name Elaslen™

Chemical name Chlorinated Polyethylene

HS code number 3901.90.10

Start of Sales October 1968

Production Capacity 3,000MT/Y

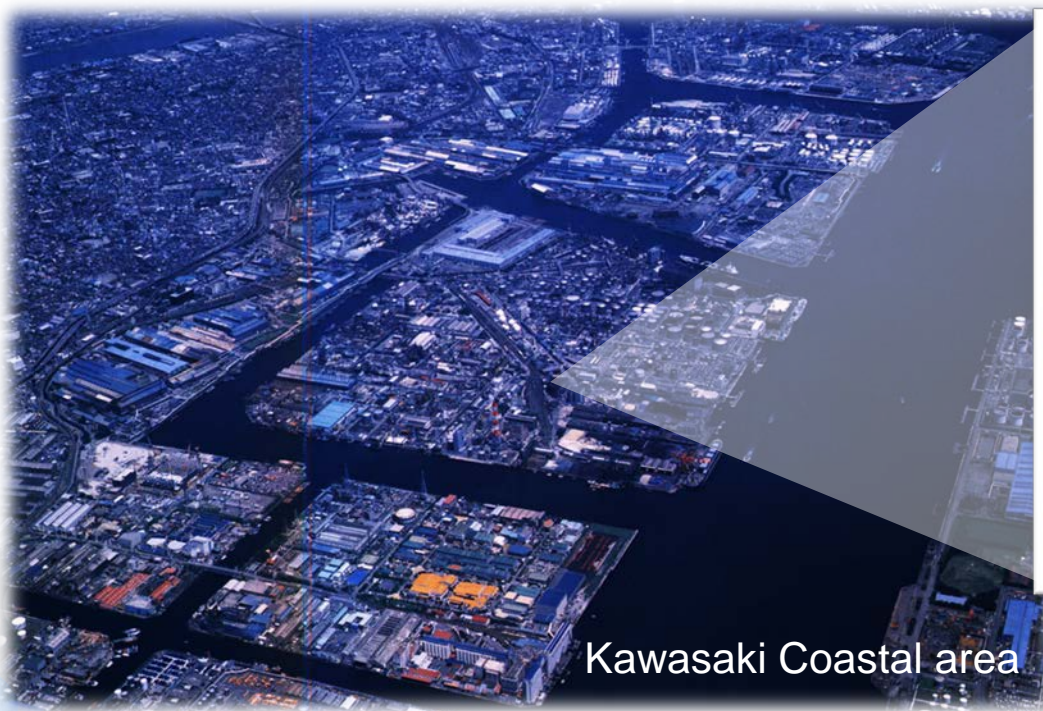
Quality Control Program ISO 9001

Environmental Control Program ISO 14001



What is ELASLEN™ ?

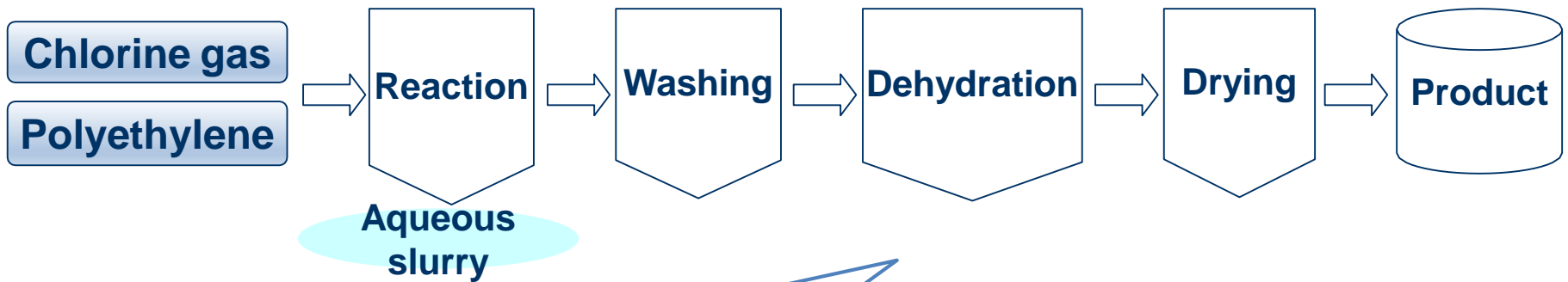
- ◆ Product name of **Chlorinated Polyethylene** made by Showa Denko
- ◆ Thermoplastic polymer chlorinating HDPE (high density polyethylene)
- ◆ Advantage: Flexibility, Weatherability, Heat aging resistance
Flame retardancy and Chemical resistance



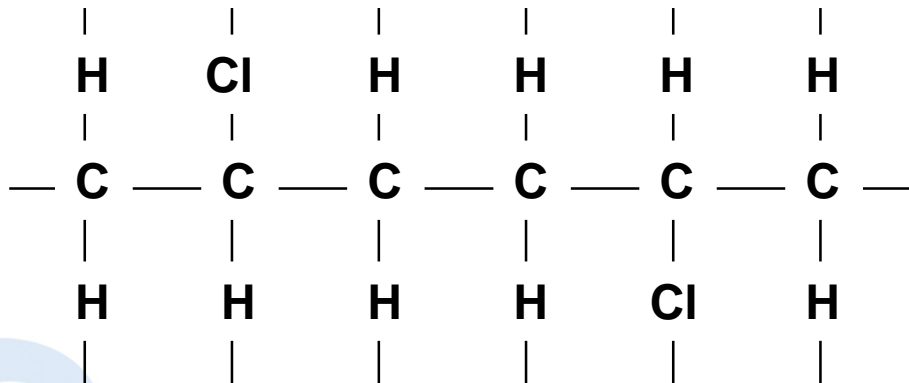
Kawasaki Coastal area



Production Process



*Hydrogen is displaced by Chlorine at random



Appearance

- powder

Package

- 20kg paper bag

FCL

- 14.4MT (0.9MT/pallet)

Applications

as Modifier

- Soft & Rigid PVC
- FR-ABS
- FR-PE (Wire & Cable)

Rubber

- Wire & Cable Jacket
- Hose & Boots for Automotive
- Rubber for Construction
- Magnetic rubber

TPE

- FR-TPE












Applicable grades for each application

Field	Major Effect	Applicable Grades	Application
Rigid PVC	Impact resistance Processability	301A 351AYS	Modified Pipe Window Profiles
Soft PVC	Low temperature characteristics	301A 401AY	Cable jacket Insulating tape
FR ABS	Flame retardancy Elimination of flame droplets	252B, 303BS 302NAC	FR ABS for UL94 V-0 grades
FR-PE (Wire & Cable)	Flame retardancy	402B 404B	Cable jacket
Rubber	Chemical resistance Filler acceptance	301A, 401AY 351AYS 302NA	Magnetic rubber Automotive hose OA rollers

A Wide Variety of Elaslen™ Grades

Three key factors determine Elaslen™ characters

- You can choose suitable grade by balancing those aspects

	Flame retardancy	Chemical resistance	Mechanical strength	Heat aging resistance
Chlorine Content ~variation from 23% to 45%~				
Molecular Weight ~diversity from very low to extremely high~	—			
Crystallinity ~contrast amorphous to high crystallinity~	—	—		

*↗ : higher, better or improved

↘ : decreased or reduced

Superiority of CPE

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- ✓ CPE has well balanced properties
- ✓ CPE can compensate other polymers' weaknesses by blending

Item	CPE	CR	EPDM	PVC (flexible)	XLPE (cross-linked PE)	Q (Silicon rubber)
Flexibility	Good	Excellent	Excellent	Good	Poor	Excellent
Flame Retardancy	Excellent	Good	Poor	Good	Poor	Excellent
Oil Resistance	Excellent	Good	Poor	Good	Poor	Good
Ozone Resistance	Excellent	Fair	Good	Excellent	Excellent	Excellent
Weather Resistance	Excellent	Fair	Good	Poor	Excellent	Excellent
Heat Resistance	Good	Fair	Excellent	Fair	Excellent	Excellent
Electrical Insulation	Good	Fair	Excellent	Fair	Excellent	Excellent
Strength	Good	Excellent	Good	Good	Good	Poor
Coloring	Excellent	Poor	Fair	Good	Excellent	Excellent
Cost	Good	Good	Good	Excellent	Good	Poor

Grade List of ELASLEN™ - Non Crystallinity-

Non Crystallinity

Items	Unit	Test Method	301MA	301AS	351AYS	401AY	302NAC	402NA	303A	353AY
Chlorine content	%	SDK method	32	31	35	40	28	40	31	35
Crystallinity	J/g	SDK method	<2	<2	<2	<2	<2	<2	<2	<2
Specific Gravity	-	JIS K7112	1.12	1.12	1.16	1.20	1.11	1.20	1.12	1.16
Melt Flow Rate(*)	g/10min	JIS K7210	0.1	1.7	1.8	1.6	12	8	120	65
Mooney Viscosity	ML1+4(121°C)	JIS K6300	-	85	90	105	45	65	20	20
Tensile Strength	Mpa	JIS K6251	11.8	11.1	10.5	9.9	9.8	6.9	6.9	5.2
Elongation	%	JIS K6251	900	950	1000	800	1100	700	800	1200
100% Modulus	Mpa	JIS K6251	1.0	1.0	0.9	0.9	1.1	0.9	1.5	0.8
Brittle Temp	°C	JIS K6261	<-70	<-70	<-70	<-70	<-70	-55	<-70	<-70
Hardness	JIS-A	JIS K6253	60	58	56	58	58	58	60	50
Volume Resistivity	Ω-cm	ASTM D257	2×10 ¹⁵	3×10 ¹⁵	2×10 ¹⁵	1×10 ¹⁵	3×10 ¹⁵	1×10 ¹⁵	3×10 ¹⁵	2×10 ¹⁵

(*)Measured at 180°C under the load of 21.6kgf.

Application M: Most suitable A: Applicable	Cable Jacket			A	M		M		A
	Rigid PVC Modifier	A	M	M	A				A
	Flexible PVC Modifier			A	M		A		
	TPE								
	FR ABS Modifier							A	A
	Rubber	M	A		A	M	A	M	M
	Magnetic Rubber	A	M	M		A	A		

Grade List of ELASLEN™ - Semi Crystallinity-

Semi Crystallinity

Specialty

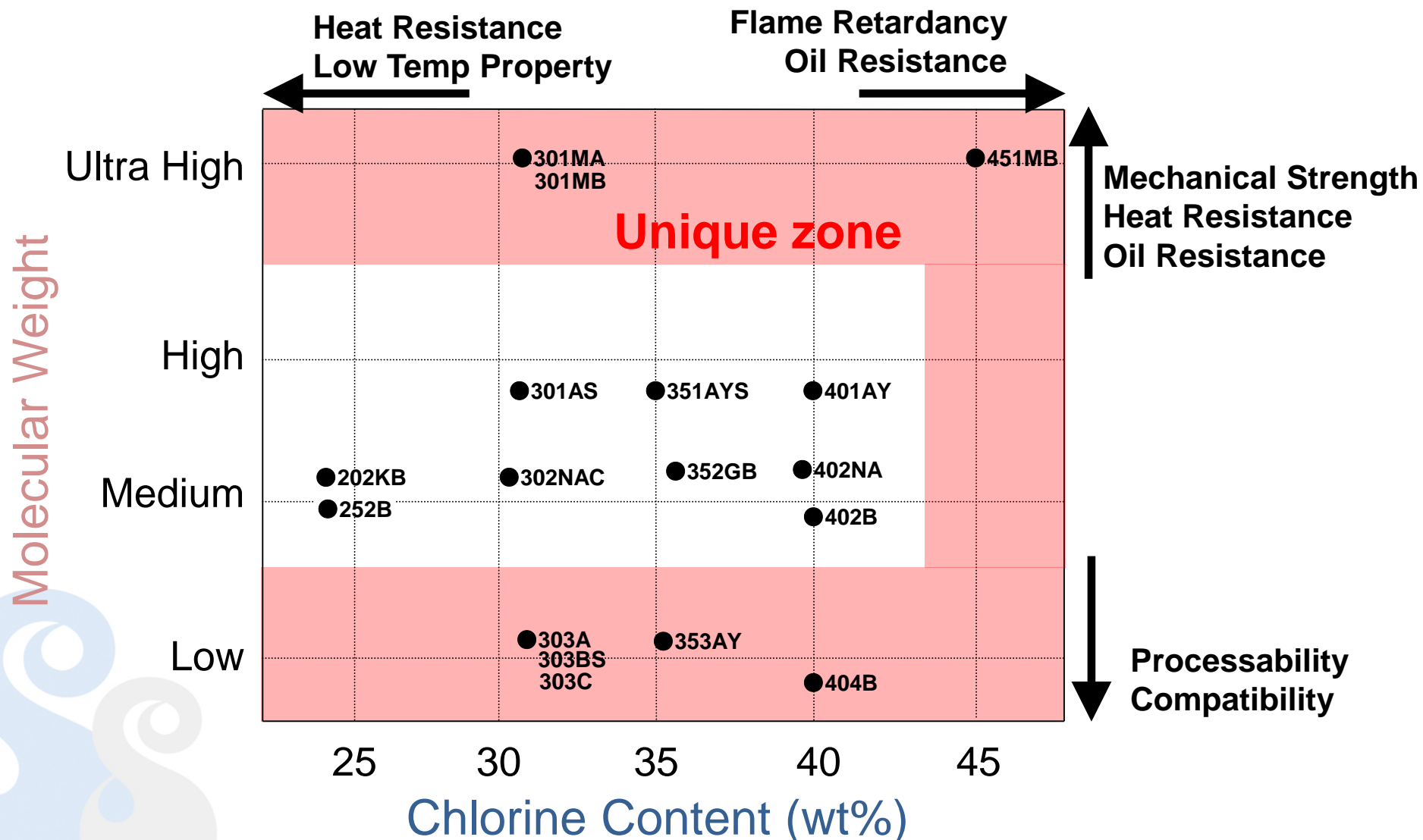
Items	Unit	Test Method	252B	303BS	303C	301MB	352GB	404B	451MB	202KB	402B
Chlorine content	%	SDK method	23	32	31	30	35	40	45	23	40
Crystallinty	J/g	SDK method	20	50	84	20	20	29	7	23	10
Specific Gravity	-	JIS K7112	1.07	1.12	1.15	1.14	1.18	1.20	1.27	1.07	1.21
Melt Flow Rate(*)	g/10min	JIS K7210	3	25	20	0.1	0.8	25	0.1	8	1.2
Mooney Viscosity	ML1+4(121°C)	JIS K6300	-	-	-	-	-	-	-	-	-
Tensile Strength	Mpa	JIS K6251	14.0	11.1	13.0	15.0	12.7	16.7	25.0	11.0	15.0
Elongation	%	JIS K6251	850	800	380	420	400	550	300	710	500
100% Modulas	Mpa	JIS K6251	3.1	2.9	10.0	3.9	2.5	2.5	9.0	3.8	2.5
Brittle Temp	°C	JIS K6261	-60	-60	3	-60	-60	-55	-30	-60	-55
Hardness	JIS-A	JIS K6253	82	78	95	76	76	80	82	82	65
Volume Resistivity	Ω-cm	ASTM D257	4×10 ¹⁶	4×10 ¹⁵	7×10 ¹⁶	4×10 ¹⁵	3×10 ¹⁶	1×10 ¹⁶	2×10 ¹⁵	5×10 ¹⁵	1×10 ¹⁶

(*)Measured at 180°C under the load of 21.6kgf.

Application M: Most suitable A: Applicable	Cable Jacket	M	A	M		A	M		M	M
	Rigid PVC Modifier		A				A			
	Flexible PVC Modifier	A			A	M		A	A	A
	TPE	A	A	A	M	M	A	M	A	A
	FR ABS Modifier	M	M						M	
	Rubber									
	Magnetic Rubber									

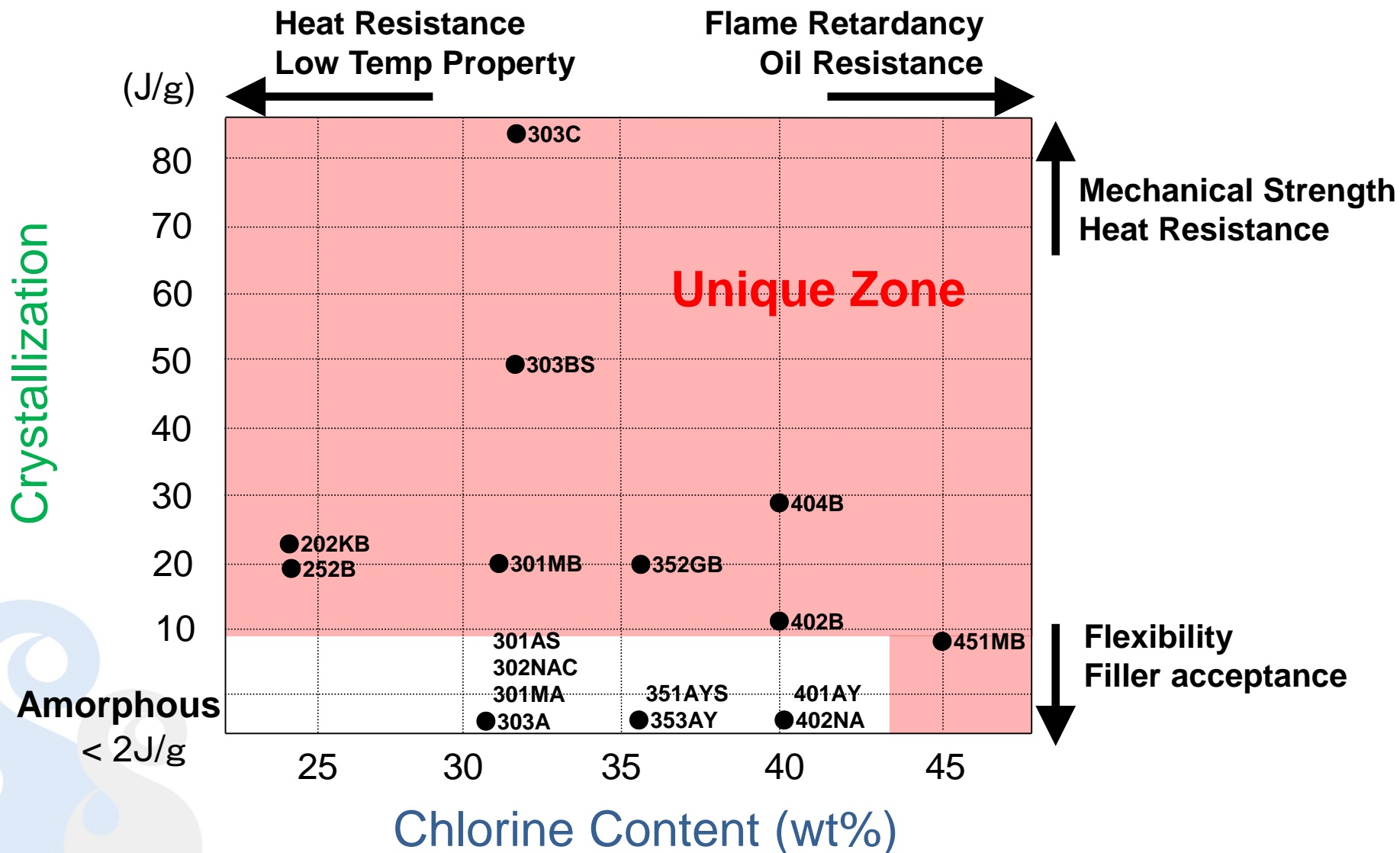
Grade Map -1

Chlorine content vs Molecular Weight



Grade Map -2

Chlorine content vs Crystallization



*The information provided herein is believed to be reliable but no representations, guarantees or warranties of any kinds are made as to its accuracy, suitability for particular applications or the results to be obtained therefrom.

Contact

Elastomer Group
Organic Industrial Chemicals Department

TEL : +81-44-520-1347

Inquiry form from our website is also available
<http://www.sdk.co.jp/english/products/104/108/13520.html>