

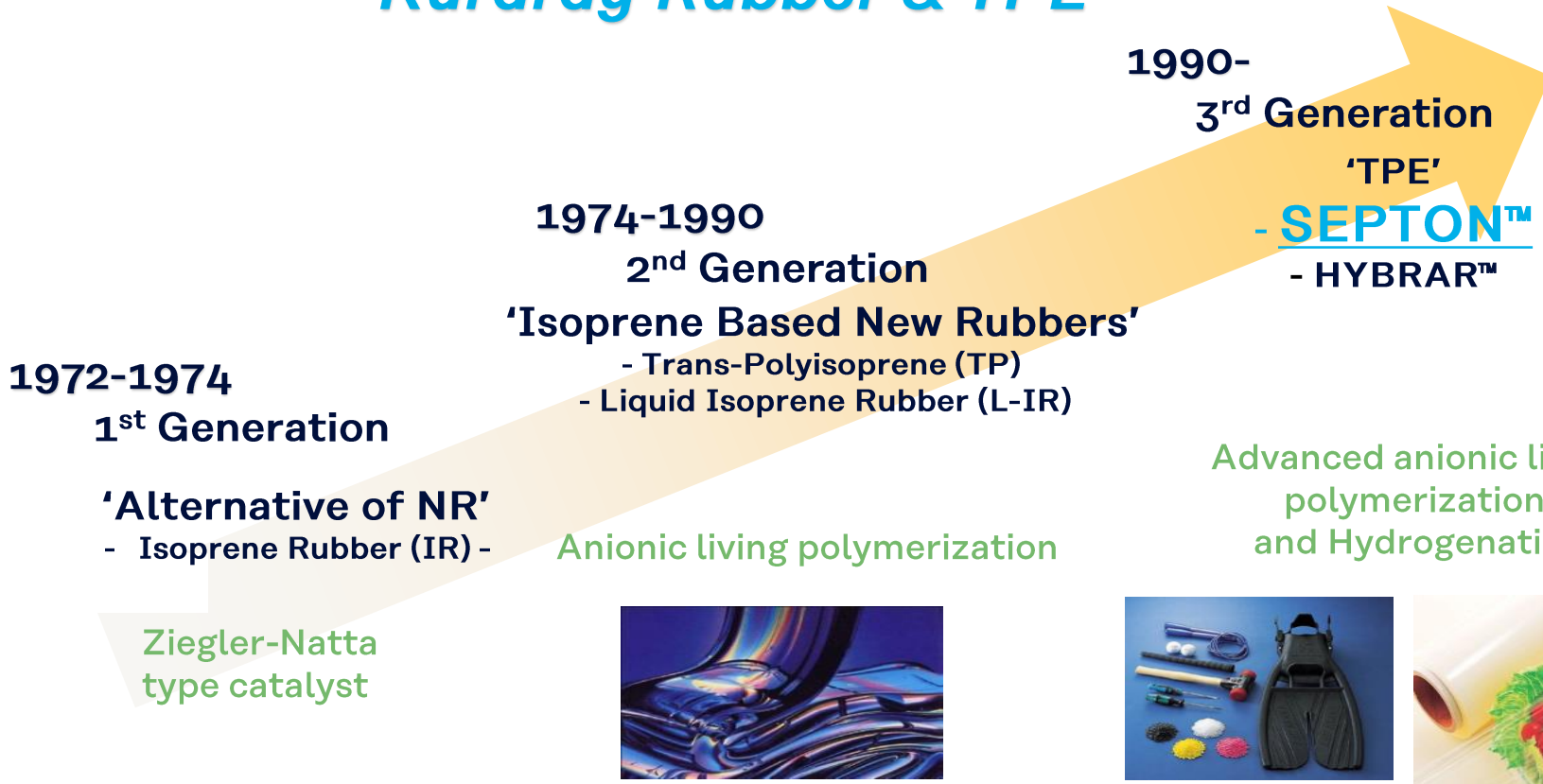
Introduction of SEPTON™ J-series

Elastomer R&D Dept.
Elastomer Division

kuraray **Septon™**

Kuraray Elastomer History

Achievement of continuous innovation of Kuraray Rubber & TPE



Now
SEPTON™
Q/V/J/BIO-series

Unique synthetic technologies

Polymer alloy /
Compounding technologies
Process development



Introduction to SEPTON™ J3341

SEPTON™ J3341, the typical grade of SEPTON™ J-series, is a newly designed polymer which is suitable for soft gel compounds.

SEPTON™ J3341 based gel compounds have advanced features compared with those of SEPTON™ 4055.

- Lower melt viscosity
- Lower rebound resilience
- Lower hardness

Advantages

- Better processability
- Better damping property
- Better softness

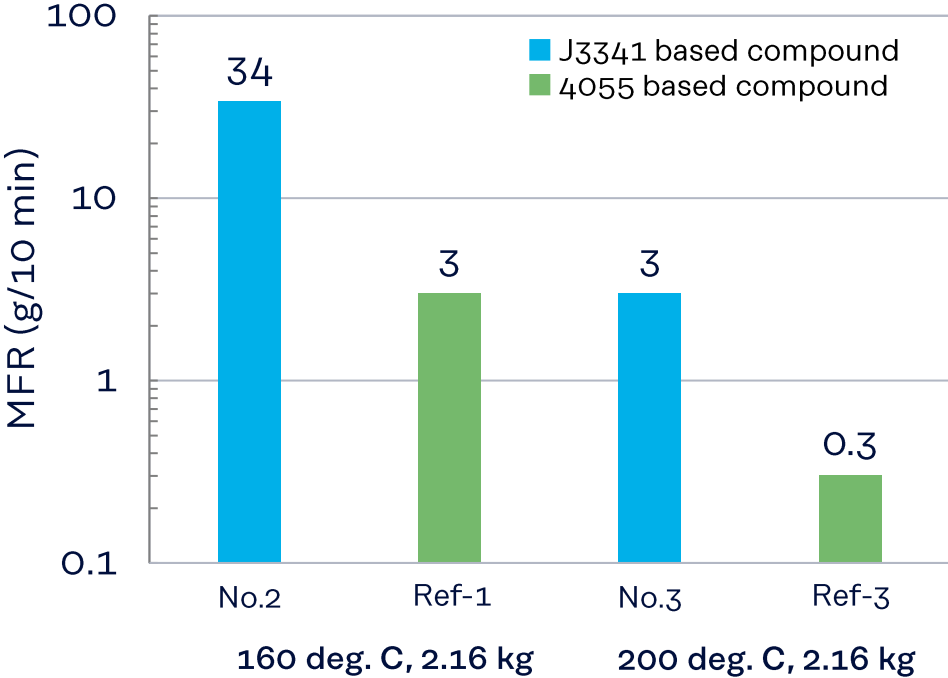
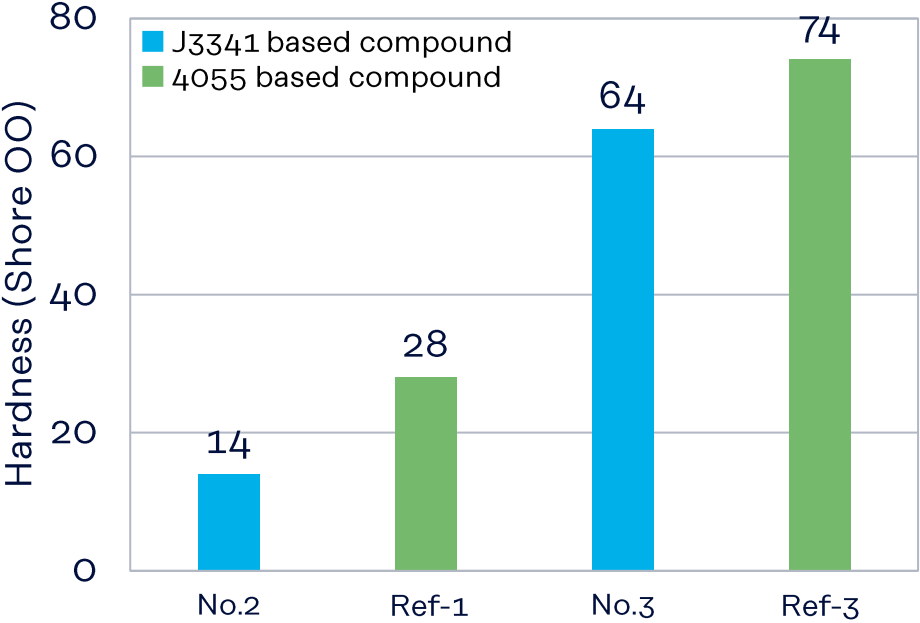
Typical Properties of SEPTON™ J3341

Grade		SEPTON™ J3341	SEPTON™ 4055
Type		Block Polymer	Block Polymer
Styrene Content	wt%	40	30
Specific Gravity	-	0.93	0.91
MFR (230 deg. C, 2.16 kg)	g/10 min	No Flow	No Flow
Solution viscosity 5 wt% (in Toluene at 30 deg. C)	mPa·s	25	90
Physical Form		Crumbs	Crumbs

Hardness and MFR (In the same formulation)

<Formulation> No.2 : J3341 / Paraffin Oil (100/400)
 (by wt) No.3 : J3341 / Paraffin Oil / PP (100/200/15)

Ref-1 : 4055 / Paraffin Oil (100/400)
 Ref-3 : 4055 / Paraffin Oil / PP (100/200/15)

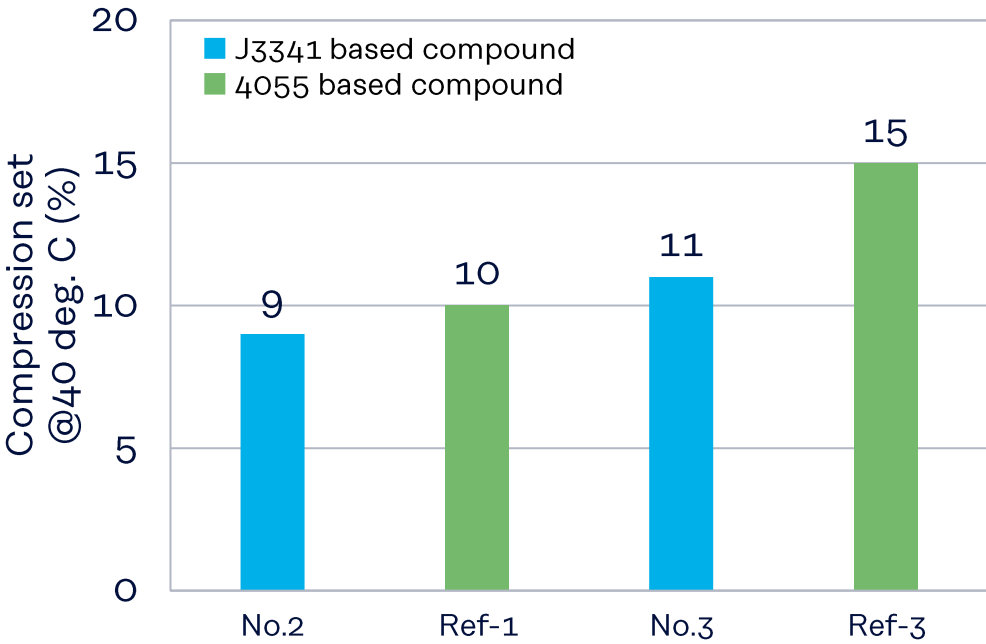
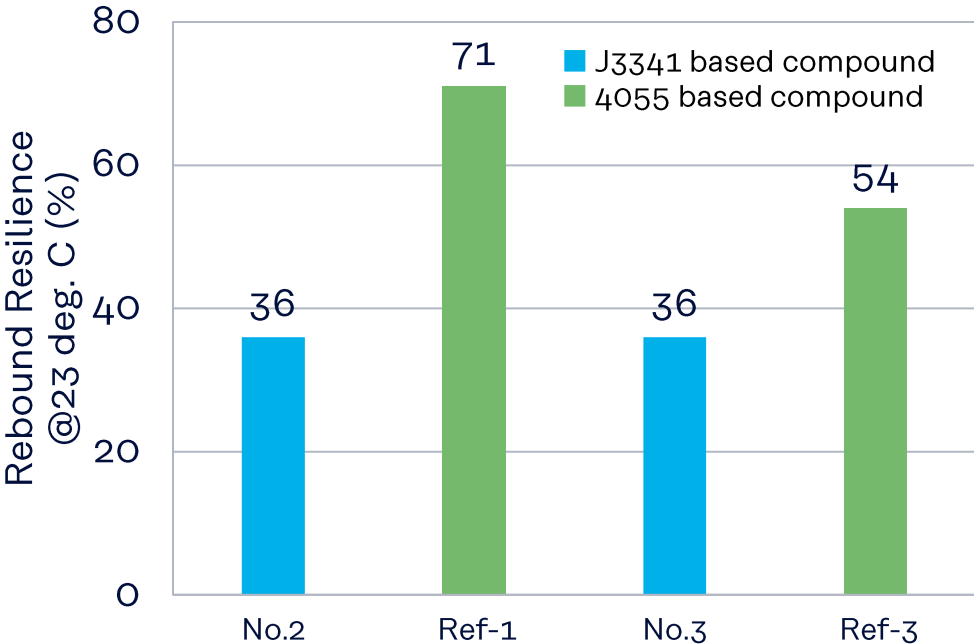


J3341 based compounds show lower hardness and higher MFR than 4055 based compounds.

Rebound Resilience and Compression Set (In the same formulation)

<Formulation> No.2 : J3341 / Paraffin Oil (100/400)
 (by wt) No.3 : J3341 / Paraffin Oil / PP (100/200/15)

Ref-1 : 4055 / Paraffin Oil (100/400)
 Ref-3 : 4055 / Paraffin Oil / PP (100/200/15)

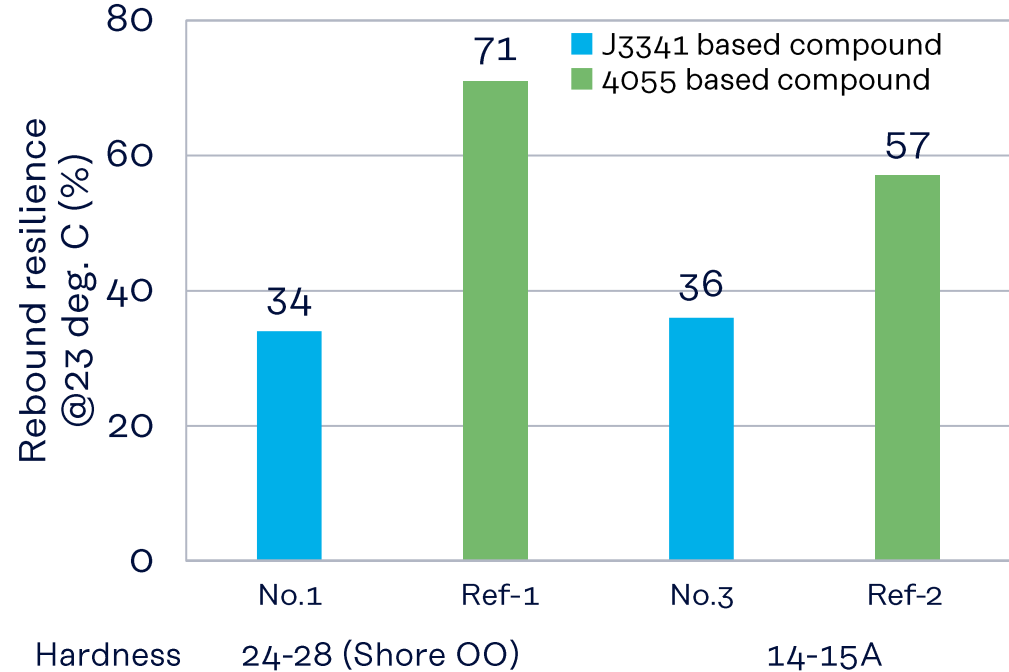
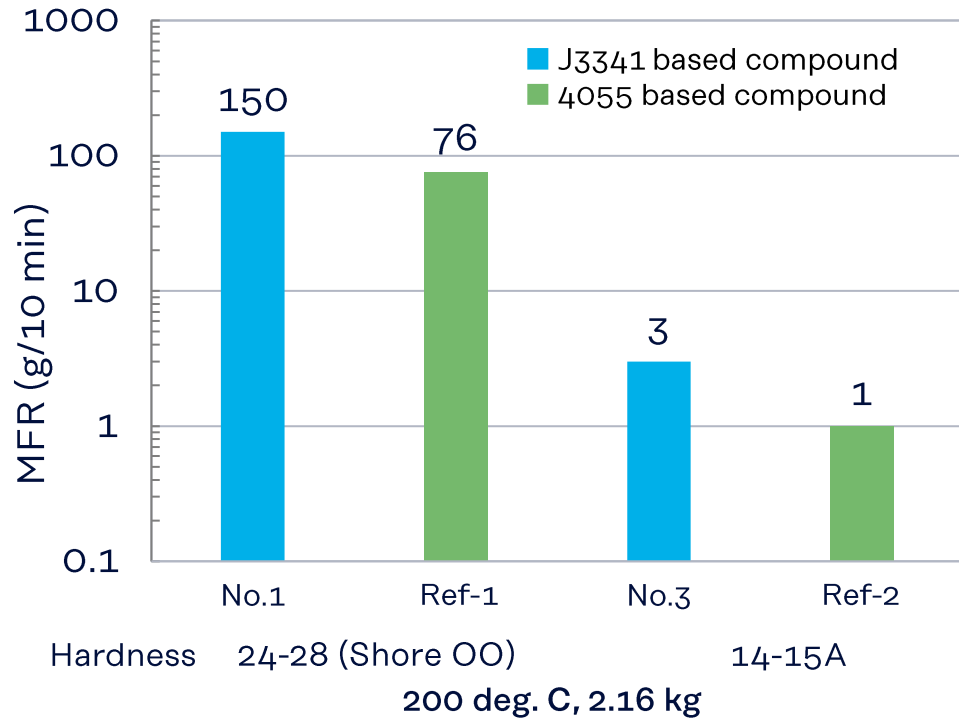


J3341 based compounds show lower rebound resilience and improved compression set at 40 deg.C than 4055 based compounds.

MFR and Rebound Resilience (In the same hardness)

<Formulation> No.1 : J3341 / Paraffin Oil (100/300)
 (by wt) No.3 : J3341 / Paraffin Oil / PP (100/200/15)

Ref-1 : 4055 / Paraffin Oil (100/400)
 Ref-2 : 4055 / Paraffin Oil / PP (100/250/15)



In the same hardness, J3341 based compounds show higher MFR and lower rebound resilience than 4055 based compounds.

(The formulation of J3341 compound is different from 4055 compound to achieve same hardness.)

Recommended Pre-blend Condition

100L High speed mixer



Photo A



J3341 powder

Photo B



J3341/Paraffin oil (100/400)
(after pre-blend)

Pre-blend condition

Step 1. Crumbling up J3341 crumbs

1000 rpm x 1 min. (Photo A)

Step 2. Adding Paraffin oil

450 rpm x 4 min.

1000 rpm x 9 min. > 60 deg. C (Photo B)

Step 3. Adding PP and additives

450 rpm x 1 min.

Good oil absorption is achieved by raising the temperature over 60 deg. C at step 2 of pre-blend condition.

Formulations of J3341 Based Compounds (1)

		No.1	No.2	Ref-1
J3341	phr	100	100	
4055	phr			100
Paraffin oil (31 mm ² /s at 40 deg. C)	phr	300	400	400
Antioxidant*	wt%	0.1	0.1	0.1

*Irganox[®] 1010 (BASF SE)

Typical Properties of J3341 Based Compounds (1)

		No.1	No.2	Ref-1	Method
Hardness					
Type C		12	8	15	JIS K7312
Shore OO		24	14	28	ASTM D2240
Tensile Properties					JIS K6251
Tensile Strength	MPa	2	1.6	>1.7*	500 mm/min
Elongation	%	1,300	1,300	>1,500*	
Compression Stress					ISO 7743
20% strain	MPa	0.13	0.1	0.17	10 mm/min
Compression set					ISO 815
40 deg. C, 22 h	%	9	9	10	
70 deg. C, 22 h	%	52	59	51	
100 deg. C, 22 h	%	100	107	99	

*not break

Typical Properties of J3341 Based Compounds (1)

		No.1	No.2	Ref-1	Method
Rebound Resilience					Kuraray method
23 deg. C	%	34	36	71	(ISO 8307 as reference)
Melt Viscosity					B type
200 deg. C	Pa · s	394	78	no data	
210 deg. C	Pa · s	164	no data	642	
MFR					ISO 1133
160 deg. C, 2.16 kg	g/10 min	5	34	3	
200 deg. C, 2.16 kg	g/10 min	150	no data	76	

Formulations of J3341 Based Compounds (2)

		No.3	Ref-2	Ref-3
J3341	phr	100		
4055	phr		100	100
Paraffin oil (31 mm ² /s at 40 deg. C)	phr	200	250	200
Homo-PP (MFR = 15 g/10 min)	wt%	15	15	15
Antioxidant*		0.1	0.1	0.1

*Irganox[®] 1010 (BASF SE)

Typical Properties of J3341 Based Compounds (2)

		No.3	Ref-2	Ref-3	Method
Hardness					
Type A		14	15	21	JIS K7312
Type C		43	45	54	
Shore OO		64	67	74	ASTM D2240
Tensile Properties					ISO 37
Tensile Strength	MPa	3.3	5.7	5.3	500 mm/min
Elongation	%	830	1100	1100	

Typical Properties of J3341 Based Compounds (2)

		No.3	Ref-2	Ref-3	Method
Compression Stress					ISO 7743
20% strain	MPa	0.61	0.78	1.1	10 mm/min
Compression set					ISO 815
40 deg.C, 22 h	%	11	15	15	
70 deg.C, 22 h	%	28	27	27	
100 deg.C, 22 h	%	61	55	52	
Rebound resilience					Kuraray method
23 deg. C	%	36	57	54	(ISO 8307 as reference)
MFR					ISO 1133
200 deg. C, 2.16 kg	g/10 min	3	1	0.3	
200 deg. C, 5 kg	g/10 min	80	40	8	

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