Kuraray Liquid Rubber

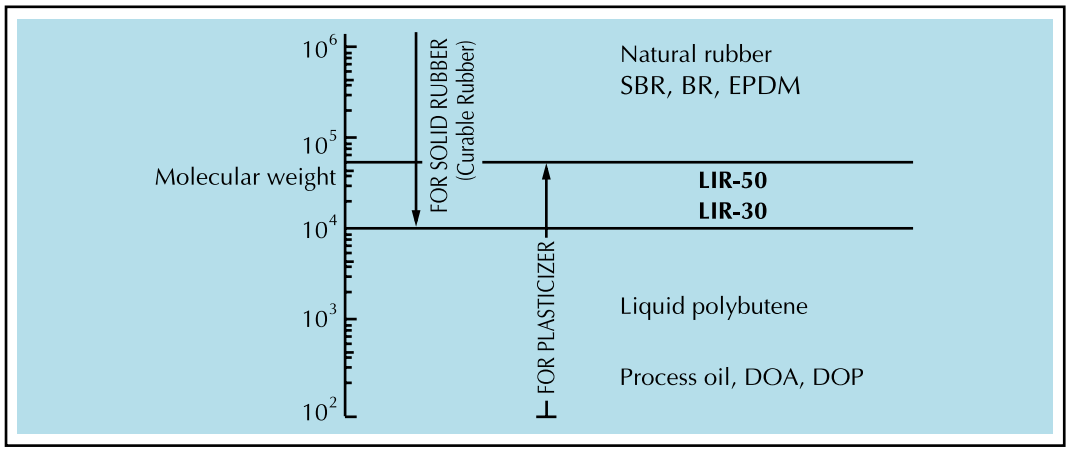
kuraray

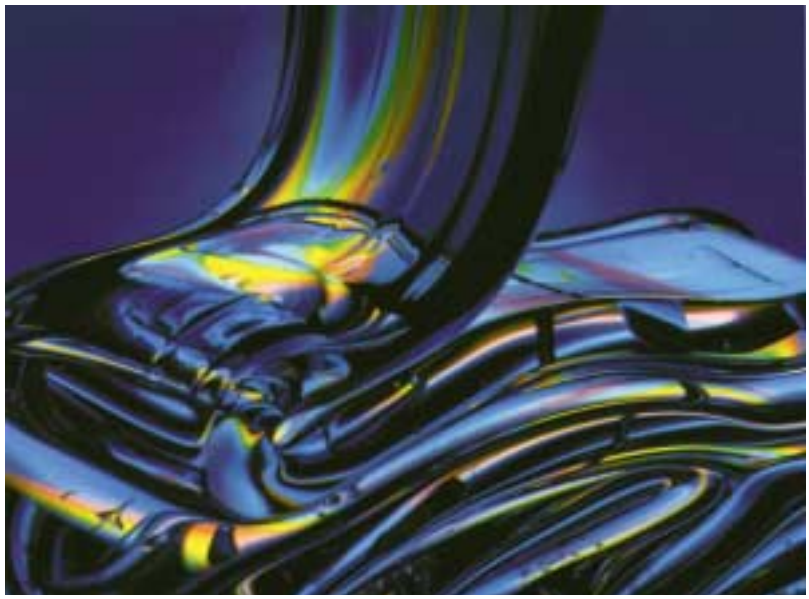
Kuraray
Liquid
Rubber

Liquid Isoprene Rubber (“LIR”)
Liquid Butadiene Rubber (“LBR”)

- LIR/LBR is a viscous liquid rubber based on isoprene and /or butadiene, which was originally synthesized by Kuraray Co., Ltd.
- LIR/LBR is colorless, transparent and almost completely odorless.
- LIR/LBR has a function as a “Reactive plasticizer.”
  In terms of function as a “Plasticizer”, LIR/LBR is the rubber with the highest molecular weight among materials which have the plasticizing function.
  In terms of function as a “Reactive”, it is “vulcanizable”.
  LIR/LBR is co-vulcanizable and /or co-crosslinkable with solid rubber such as NR, SBR, BR and EPDM using sulfur or peroxide.
- Some LIR/LBR grades are crosslinkable by reaction of its functional groups and are crosslinkable by UV irradiation.

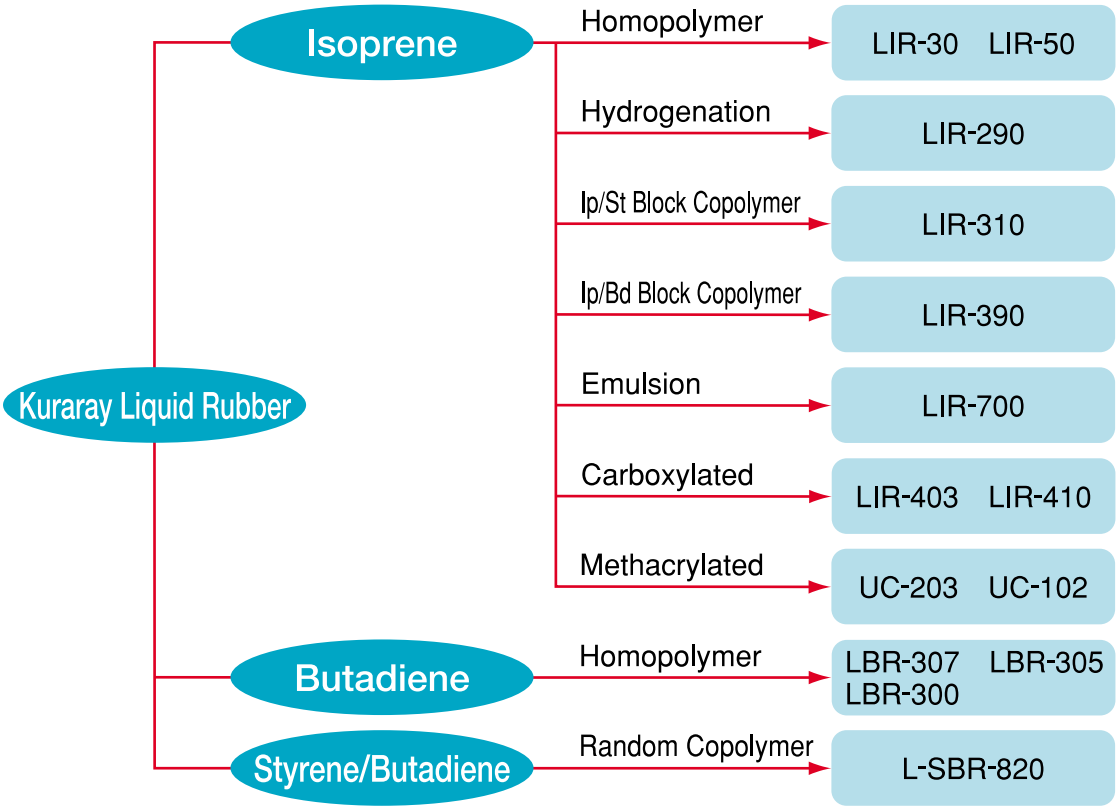
“Molecular weight of rubbers and plasticizers”





Kuraray Liquid Rubber

Grades of "LIR/LBR"

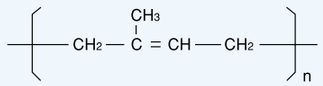
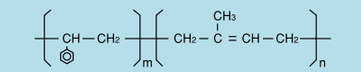
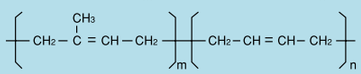
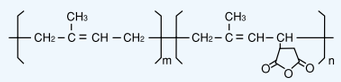
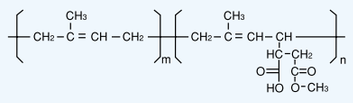
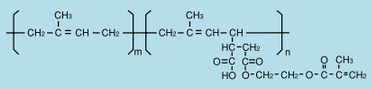
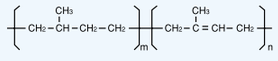
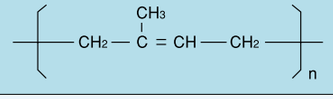
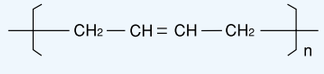
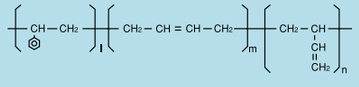


Applications of "LIR/LBR"

When functioning as a "Reactive plasticizer" and as "Crosslinkable", LIR/LBR can be applied to the following applications.

Rubber goods	**Tire, Roll, Belt, Hose, Foot wear**
Adhesives	**Solution, Hot melt, Crosslink, Latex**
Sealants	**Automobile**
Others	**Printing Plate, Coating, Lubricants, Binders**

Typical properties of “LIR/LBR”

Category	Type	Grade	Structure	Number of functionality in a molecule	Molecular Weight	Melt Viscosity (Pa·s at 38℃)	Specific Gravity(g/cc)	Glass Transition Temp. (℃)	Features	Main applications
LIR (Isoprene)	**Homopolymer**	LIR-30		—	28,000	70	0.91	−63	•Good compatibility with diene Rubbers. •Well-balanced adhesive properties.	•Reactive plasticizer (NR, IR,SBR, BR) -Tire, Roll- •Pressure sensitive adhesives •Sealants (Automobile)
		LIR-50		—	54,000	500	0.91	−63		
	Block Copolymer	LIR-310		—	32,000	1,400	0.92	−63	•Good compatibility with SIS. •Superior in Softness.	•Hot melt adhesives (SIS, SBS, EVA) •Sealants (Automobile)
		LIR-390		—	48,000	400	0.88	−95	•Superior in heat resistance.	
	Carboxylated	LIR-403		3	34,000	200	0.92	−60	•Crosslinkable by metal compounds, epoxy compounds, isocyanate compounds, amine compounds. •Good adhesion with metals and fibers.	•Modifier of adhesion between rubber and metal, fabric.-Belts, Hose, Footwear- •Pressure sensitive adhesives •Sealants (Automobile)
		LIR-410		10	30,000	430	0.92	−59		
	UV cure	UC-102		2	17,000	30	0.90	−60	•Reactive at low temperature. •Crosslinkable by UV.	•Pressure sensitive adhesives (UV Crosslinkable)
		UC-203		3	35,000	190	0.90	−60		
	Hydrogenated	LIR-290		—	31,000	1,500	0.86	−59	•Good compatibility with EPDM, SEPS and SEBS. •Superior in heat and weather resistance.	•Reactive plasticizer (EPDM) •Hot melt adhesives (SEBS, SEPS)
	Latex	LIR-700		—	28,000	75 (Solid cont. =60wt%)	—	−63	•Good compatibility with NR latex.	•Reactive plasticizer (NR latex, SBR latex) •Adhesive
LBR (Butadiene)	**Homopolymer**	LBR-307		—	8,000	1.5	0.89	−95	•Good compatibility with BR and SBS.	•Sealants (Automobile) •Reactive plasticizer •Pressure sensitive adhesives
		LBR-305		—	26,000	40	0.90	−95		
		LBR-300		—	44,000	225	0.90	−95		
L-SBR (St/Bd)	**Random Copolymer**	L-SBR-820		—	8,500	350	0.95	−14	•Good compatibility with S-SBR and E-SBR.	•Tire

Compound of "LIR/LBR"

LIR-50 for Rubber Compounds

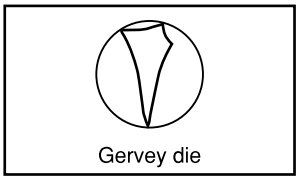
Features: Improvement of processability.

Formulation	1	2	3
NR (RSS #3)	70	66	66
SBR 1502	30	30	30
LIR-50	—	4	—
Process oil [1]	—	—	4
CB (FEF)	50	50	50
ZnO No.1	5	5	5
Stearic Acid	2	2	2
Sulfur	2.2	2.2	2.2
Accelerator CBS [2]	1.2	1.2	1.2
Antioxydant IPPD [3]	1	1	1

[1] JSO Aroma 790 (Snn oil)
[2] Noccellor CZ-G (Ohuchi Shinko)
[3] Nocrac 810-NA (Ohuchi Shinko)

[Mixing]
①BR Bunbury Mixer : 6min
②8 inch Roll : 10min

[Garvey die test by extruder]
(Condition)
・Cylinder temp. : 90℃
・Die temp. : 90℃
・Screw rotation speed : 20rpm


Gervey die

	Extruded Sample	ASTM D 2230*	
		EDGE	SURFACE
Formulation 1		6	B
Formulation 2		10	A
Formulation 3		6	B

*) EDGE : 10 (excellent) ⟷ 1 (poor)
SURFACE : A (excellent) ⟷ E (poor)

[Surface (×50)]


Formulation 1 (SURFACE : B)


Formulation 2 (SURFACE : A)


Formulation 3 (SURFACE : B)

Safety data

Grade name	Regulatory Status		
	—	USA	EU
	CAS No.	TSCA[1)]	EINECS[2)]
LIR-30	9003-31-0	○	○
LIR-50	9003-31-0	○	○
LIR-310	25038-32-8	○	○
LIR-390	25102-52-7	○	○
LIR-403	841251-34-1	○	○
LIR-410	128000-08-8	○	○
UC-203	848245-48-7	○	○
UC-102	848245-48-7	○	○

Grade name	Regulatory Status		
	—	USA	EU
	CAS No.	TSCA[1)]	EINECS[2)]
LIR-290	151789-04-7	○	○
LIR-700	9003-31-0	○	○
LBR-307	9003-17-2	○	○
LBR-305	9003-17-2	○	○
LBR-300	9003-17-2	○	○
L-SBR-820	9003-55-8	○	○

1) : "Toxic Substances Control Act"
2) : "European Inventory of Existing Commercial Chemical Substances"

When using LIR/LBR, please confirm related law and regulations, and examine its safety and suitability for the application.

For medical and health care applications, please contact your LIR/LBR representative for specific recommendations.

LIR/LBR should not be used in any devices or materials intended for implantation in the human body.

Packaging

Available in both cans and film pouches. Film pouches are preferred when dealing with a viscous polymer.

* Packaging could vary by grades, please confirm the details with your LIR/LBR representative.

Can style

Drum 150kg, 165kg
5 gallon can 15kg

Pouch

Weight of one pack	Number of Pouches in one carton	Weight of one carton
2kg	8 Pouches	16kg
3kg	5 Pouches	15kg
4kg	4 Pouches	16kg
5kg	3 Pouches	15kg

Polyethylene film / melting point:110℃

Pouch

Carton box

All data presented herein is based on actual measurements perfomed by Kuraray Co., Ltd.
All information contained herein is presented in good faith and without warrant.
KURARAY CO., LTD. ACCEPTS NO LIABILITY FOR DAMAGE OR LOSS RESULTING FROM THE USE OR MISUSE OF THIS INFORMATION.

KURARAY CO., LTD. : Ote Center Bldg, 1-1-3, Otemachi, Chiyoda-ku, Tokyo 100-8115, Japan
PHONE: +81-3-6701-1613, FACSIMILE: +81-3-6701-1645
KURARAY AMERICA, INC. :11414 Choate Road, Pasadena, TX 77507, U.S.A.
PHONE: +1-281-909-5850, FACSIMILE: +1-281-909-5851
KURARAY EUROPE GMBH : Building F821, Hoechst Industrial Park, D-65926, Frankfurt am Main, Germany
PHONE: +49-69-305-35850, FACSIMILE: +49-69-305-35650

PRINTED WITH SOY INK
This is printed with eco-friendly vegetable soy ink.

1st Ed. 2007. 9 E
2nd Ed. 2009. 5 E