Kuraray Liquid Rubber

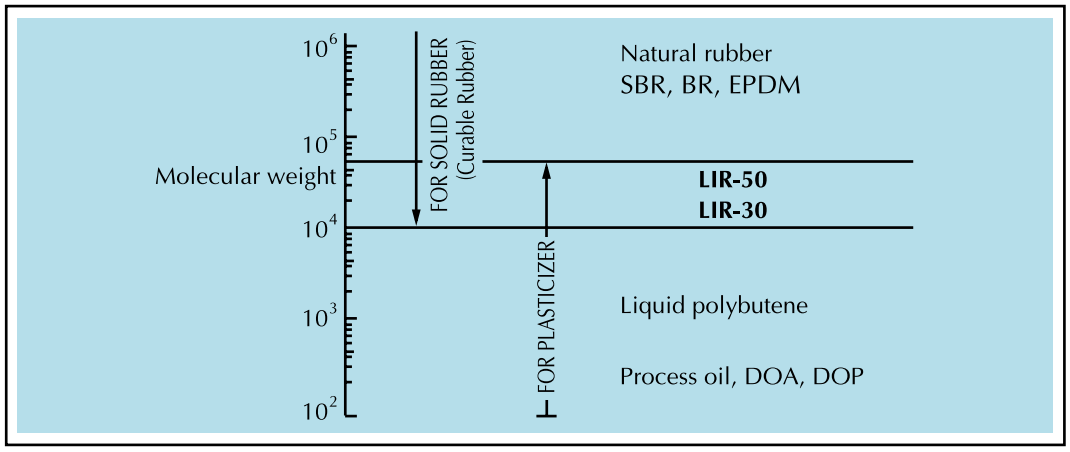
kuraray

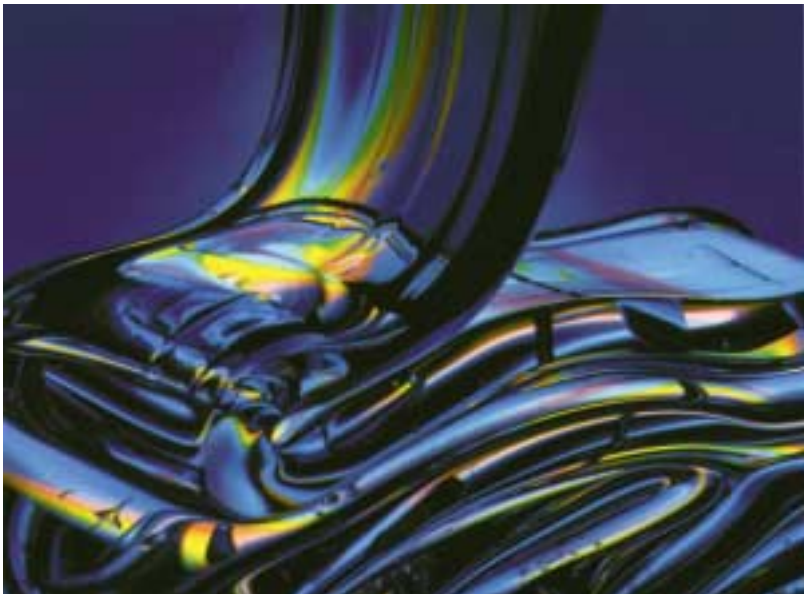
Kuraray
Liquid
Rubber

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 is functional 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 its function as a "Reactive Plasticizer", it is "vulcanizable".
  LIR/LBR is co-vulcanizable and /or co-crosslinkable with solid rubber such as NR, SBR, BR and EPDM by using sulfur or peroxide.
- Some LIR/LBR grades are crosslinkable by reaction of functional groups and are crosslinkable by UV irradiation.

"Molecular weight of rubbers and plasticizers"





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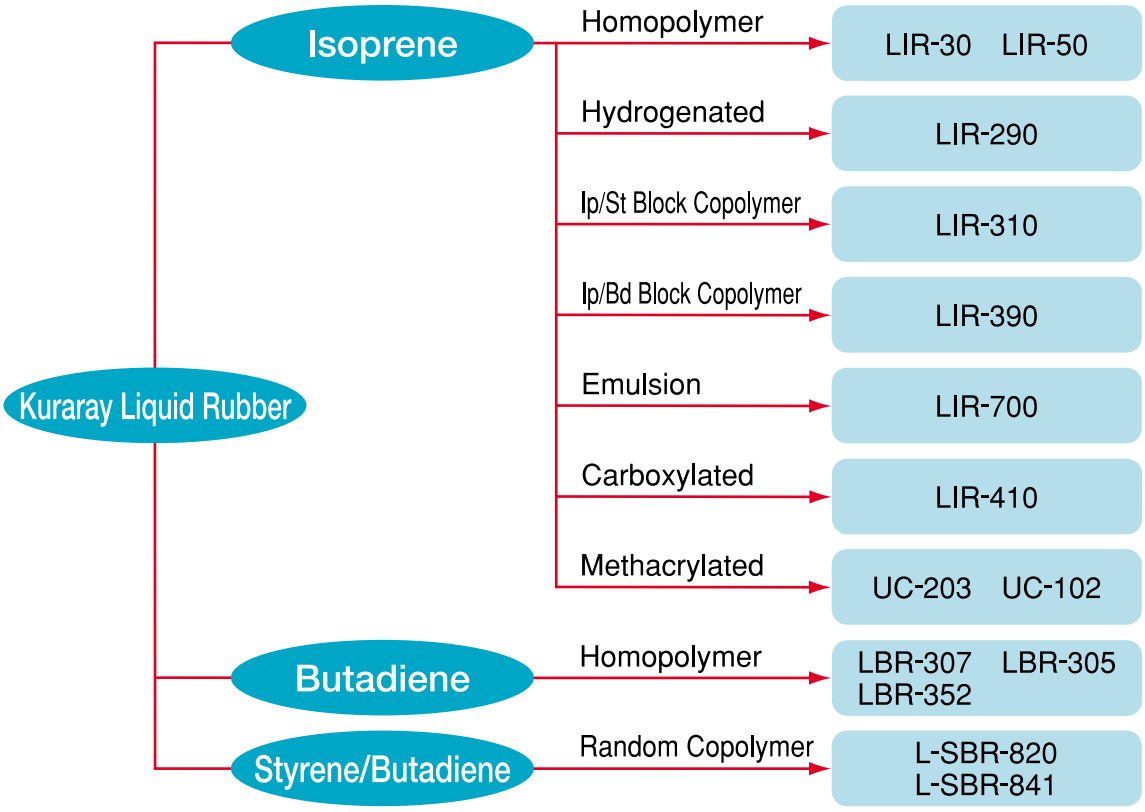
Grades of "LIR/LBR"

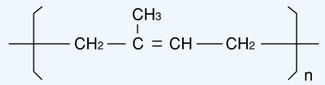
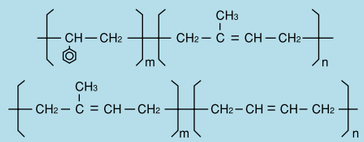
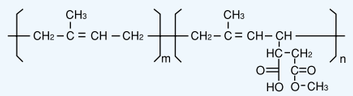
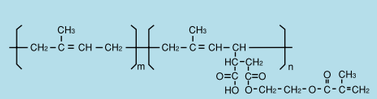
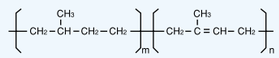
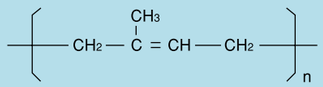
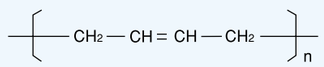
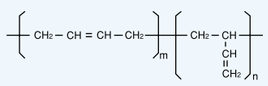
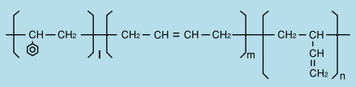


Applications of "LIR/LBR"

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

Rubber goods	**Tire, Roll, Belt, Hose, footwear**
Adhesives	**Solution, Hot melt, Crosslinkable, Latex**
Sealants	**Automotive**
Others	**Printing Plate, Coating, Lubricants, Binders**

Typical properties of “LIR/LBR”

Category	Type	Grade	Structure	Number of functional groups per molecule	Molecular Weight	Melt Viscosity (Pa·s at 38℃)	Specific Gravity(g/cc)	Glass Transition Temp. (℃)	Features	Main applications
LIR (Isoprene)	**Homopolymer**	LIR-30 LIR-50		— —	28,000 54,000	70 500	0.91 0.91	−63 −63	•Good compatibility with diene Rubbers. •Well-balanced adhesive properties.	•Reactive plasticizer (NR, IR,SBR, BR) -Tire, Roll- •Pressure sensitive adhesives •Sealants (Automotive)
	Block Copolymer	LIR-310 LIR-390		— —	32,000 48,000	1,400 400	0.92 0.88	−63 −95	•Good compatibility with SIS. •Superior in Softness. •Superior in heat resistance.	•Hot melt adhesives (SIS, SBS, EVA) •Sealants (Automotive)
	Carboxylated	LIR-410		10	30,000	430	0.92	−59	•Crosslinkable by metal compounds, epoxy compounds, isocyanate compounds, amine compounds. •Good adhesion to metals and fibers.	•Modifier of adhesion between rubber and metal, fabric.-Belts, Hose, Footwear- •Pressure sensitive adhesives •Sealants (Automotive)
	UV Curable	UC-102 UC-203		2 3	17,000 35,000	30 190	0.90 0.90	−60 −60	•Reactive at low temperature. •Crosslinkable by UV.	•Pressure sensitive adhesives (UV Crosslinkable)
	Hydrogenated	LIR-290		—	31,000	1,200	0.86	−59	•Good compatibility with EPDM, SEPS and SEBS. •Superior in heat and weather resistance. •Iodine value=40g/100g	•Reactive plasticizer (EPDM) •Hot melt adhesives (SEBS, SEPS)
	Latex	LIR-700		—	28,000	7.5(at 25℃) (Solid cont. =60wt%)	—	−63	•Good compatibility with NR latex.	•Reactive plasticizer (NR latex, SBR latex) •Adhesive
LBR (Butadiene)	**Homopolymer**	LBR-307 LBR-305		— —	8,000 26,000	1.5 40	0.89 0.90	−95 −95	•Good compatibility with BR and SBS.	•Sealants (Automotive) •Reactive plasticizer •Pressure sensitive adhesives
		LBR-352		—	9,000	6	0.89	−60		
L-SBR (St/Bd)	**Random Copolymer**	L-SBR-820 L-SBR-841		— —	8,500 10,000	350 100(at 60℃)	0.95 0.96	−14 −6	•Good compatibility with S-SBR and E-SBR.	•Tire

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Compounds 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
Process oil [1]	—	4	—
LIR-50	—	—	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
Antioxidant IPPD [3]	1	1	1

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

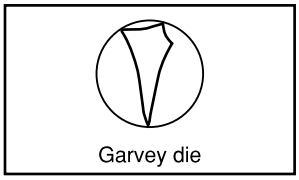
[Mixing]

①BR Banbury Mixer : 6min
②8 inch Roll : 10min

[Garvey die extrusion test]

(Test Conditions)

- Cylinder temp. : 90℃
- Die temp. : 90℃
- Screw rotation speed : 20rpm


Garvey die

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

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

[Surface (×50)]


Formulation 1 (SURFACE : B)


Formulation 2 (SURFACE : B)


Formulation 3 (SURFACE : A)

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Safety data

Grade name	Regulatory Status						
	—	USA	EU	China	Taiwan	Canada	Australia
	CAS NO.	TSCA	REACH	IECSC	ECN	DSL	AICS
LIR-30	9003-31-0	×	＊1	×	×	×	×
LIR-50	9003-31-0	×	＊1	×	×	×	×
LIR-310	25038-32-8	×	＊1	×	×	×	×
LIR-390	25102-52-7	×	＊1	×	×	×	×
LIR-410	128000-08-8	×	＊2	×	×	×＊4	—
UC-203	848245-48-7	×	＊2	×	×	×＊4	—
UC-102	848245-48-7	×	＊2	×	×	×＊4	—
LIR-290	151789-04-7	×	＊1	×	×	×＊4	—
LIR-700	9003-31-0	×	＊3	×	×	×	×
LBR-307	9003-17-2	×	＊1	×	×	×	×
LBR-305	9003-17-2	×	＊1	×	×	×	×
LBR-352	9003-17-2	×	＊1	×	×	×	×
L-SBR-820	9003-55-8	×	＊1	×	×	×	×
L-SBR-841	9003-55-8	×	＊1	×	×	×	×

X: Listed —: Not Listed
＊1: Monomer registered.
＊2: Monomer Preregistered.
＊3: Monomer registered, additives not registered.
＊4: Listed in NDSL

TSCA: Toxic Substances Control Act
REACH: Registration, Evaluation, Authorization and Restriction of Chemicals
IECSC: Inventory of Existing Chemical Substances in China.
ECN: Guidance for Existing Chemical Substance Nomination
DSL(NDSL): Domestic Substances List (Non-Domestic Substances List)
AICS: Australian Inventory of Chemical Substances

When using LIR/LBR, please confirm applicability under the appropriate laws 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

Classification	Grade Name	Standard Packaging I		Standard Packaging II		Standard Packaging III	
Commercial	LIR-30	Drum	165kg	Can	15kg	Pouch	2kg
	LIR-50	Drum	150kg	Can	15kg	Pouch	2kg
	LIR-310	Drum	135kg	—	—	—	—
	LIR-390	Drum	150kg	Can	15kg	—	—
	LIR-410	Drum	165kg	Can	15kg	Pouch	2kg
	LIR-290	Drum	150kg	—	—	—	—
	LIR-700	Drum	150kg	Can	15kg	—	—
	LBR-305	Drum	165kg	Can	15kg	—	—
	LBR-307	Drum	150kg	Container	800kg	—	—
	LBR-352	Drum	165kg	—	—	—	—
	UC-102	Drum	150kg	Can	15kg	—	—
	UC-203	Drum	150kg	Can	15kg	—	—
	L-SBR-820	Drum	150kg	—	—	—	—
	L-SBR-841	Drum	150kg	—	—	—	—

These packaging styles are standard options, and other choices may also be available.
Please confirm the availability with your LIR/LBR sales representative.


Drum


CAN


Pouch


Carton box

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