■ Latex for Paper Coating (styrene-butadiene copolymer)

ZEON markets coated paper such as art paper, light-weight coated paper and lightly coated paper; coated paper board, such as coated white cardboard and coated Manila cardboard; data recording paper such as pressure-sensitive paper and thermal paper; other painted papers, such as modified styrene-butadiene latex; and organic pigments. We develop diverse latices utilizing new technologies in response to the various needs of the market.

Product name	Composition	Total solids (%)	pH	Viscosity (mPa•s)	Average particle diameter (nm)	Characteristics	Applications
Nipol LX407AS Series	Modified SB	48	5-6	30-150	100-140	Sole binder. Alkali-thickening latex with excellent water resistance. Non-casein mix ensures sufficient water retention and viscosity.	Coated paper board.
Nipol LX407F Series	Modified SB	50	8-10	50-250	80-150	Desirable for sheet offset due to surface strength (specifically formulated to avoid dry pick). Suitable for bi-toko web offset. Low Tg product is used for gravure.	Coated paper for sheet offset and gravure printing, and coated paper board.
Nipol LX407G Series	Modified SB	50	8-10	50-250	80-150	Excellent blister resistance and wet strength. Wide range of applications from art paper to bi-toko paper.	Coated paper for web offset.
Nipol LX407H Series	Modified SB	50	8-9	50-250	90-120	Outstanding fluidity and stability by combining highly concentrated coating color.Suitable for a high-speed blade coater.	Coated paper for sheet offset.
Nipol LX407K Series	Modified SB	50	8-9	60-200	120-150	Amphoteric latices. Exhibits affinity with kaolin as it changes from anion to cation at isoelectric point. Controls migration during drying process for even	Coated paper for sheet offset, and special

						coating. Excellent wet strength and ink receptivity.	coating paper.
Nipol LX407S Series	Modified SB	48	6-7	30-200	100-160	Excellent color development and surface strength as a binder for pressure-sensitive paper.	Pressure-sensitive paper and special coating paper.

Note Modified SB: carboxyl styrene-butadiene copolymer.

■ Latex of styrene-butadiene copolymer (SB latex)

For Tire cords

Product name	Composition	Total solids (%)	pH	Viscosity (mPa•s)	Surface tension (mN/m)	Average particle diameter (nm)	Tg (°C)	Characteristics
Nipol 2518FS	VP	40.5	11.0	30	50	80	-44	Fiber and rubber adhesion for RFL. Excellent adhesiveness with nylon chords.
Nipol 5218GL	VP	40.5	11.0	25	45	200	-44	Fiber and rubber adhesion for RFL. Excellent adhesiveness with nylon chords and excellent initial adhesiveness with polyester chords. Good adhesiveness with aramid chords.
Nipol LX603	Modified VP	36.0	9.0	35	40	120	-31	Fiber and rubber adhesion for RFL. Excellent initial adhesiveness when used together with polyester chords and excellent heat-resisting adhesiveness. May become unstable when mixed with 5218FS, 5218GL, LX110, LX112.
Nipol LX110	SBR	40.5	11.5	55	60	80	-47	RFL type with high adhesive strength. Soluble with VP latex. These are frequently used together.

Nipol LX112	SBR	40.5	11.0	30	60	80	-47	Same as the above. Slightly lower viscosity than LX110. Used with VP latex.

Notes 1. VP: styrene-butadiene vinylpyridine copolymer

2. Modified VP: carboxyl styrene-butadiene vinylpyridine copolymer

3. SBR: low styrene-butadiene copolymer

For Carpets

Product name	Composition	Total solids (%)	pH	Viscosity (mPa•s)	Surface tension (mN/m)	Average particle diameter (nm)	Tg (°C)	Characteristics
Nipol LX430	Modified SB medium styrene (hard type)	49.0	7.0	130	50	150	12	Slightly hard carboxyl SB latex. Excellent stability, filler dispersion and adhesiveness. Easy processing due to low bubbling.
Nipol LX433C	Modified SB medium styrene (hard type)	50.0	9.0	90	45	100	50	Hard carboxyl SB latex. Excellent reinforcement effect, filler dispersion and combination stability. Blend with other soft Nipol latices to adjust toughness.
Nipol LX435	Modified SB medium styrene	50.0	8.5	120	38	120	-14	Medium-hard type. Great adhesive strength even at high filling rate. Well suited for floss processing
Nipol 9570A	SBR	70.0	11.0	400	33	300	-47	High concentration.Well suited for foam carpets.
Nipol 5207H	SB high styrene	52.0	10.0	20	35	250	58	High styrene-butadiene latex. Blend with 9570A to adjust toughness.

Notes 1. SB: styrene-butadiene copolymer

2. Modified SB: SB such as modified carboxyl

For Non-woven fabrics and fiber

Product name	Composition	Total solids (%)	pH	Viscosity (mPa•s)	Surface tension (mN/m)	Average particle diameter (nm)	Tg (°C)	Characteristics	Applications
Nipol LX415M	Modified SB medium styrene (hard type)	43.0	8.0	55	40	110	27	Hard, self-crosslinking type with low formaldehyde. High waterproofing property, and dry cleaning and light resistance.	Non-woven fabrics for wooden floor cushions, and wrapping materials (pulp non-woven fabrics).
Nipol LX432M	Modified SB medium styrene (soft type)	41.0	8.0	60	40	130	-55	Soft, self-crosslinking type with low formaldehyde. Excellent waterproofing properties, and dry cleaning, heat, and light resistance.	Non-woven fabrics (wooden floor cushions, glass fibers).
Nipol LX433C	Modified SB medium styrene (hard type)	50.0	9.0	90	45	100	50	Hard type. Effectively reinforces other SB latices.	Filters as impregnated non-woven fabrics, and synthetic leathers.
Nipol 5270X5	Modified SB medium styrene	41.0	6.5	20	40	100	-18	Standard modified carboxyl.	Glass fibers and fiber treatment such as impregnated polishing fabrics.
Nipol 5270H	SB	52.0	10.0	20	35	250	58	High concentration with	Non-woven

	high styrene							improved stability.	fabrics(synthetic leather), and fiber treatment such as shoe materials.
Nipol LX303A	PST	50.0	7.2	25	45	160	100	Polystyrene latex. Does not produce a film at normal temperatures. Used to reinforce other latices.	Fabric treatment such as shoe materials.

Note PST: Polystyrene

For Cement and asphalt

Product name	Composition	Total solids (%)	pH	Viscosity (mPa•s)	Surface tension (mN/m)	Average particle diameter (nm)	Tg (°C)	Characteristics	Applications
Nipol LX206	Modified SB medium styrene (hard type)	45.5	11.0	20	35	200	-15	Excellent chemical stability and good miscibility with cement.	Mixed with cement mortar (deck covering).
Nipol LX438C	Modified SB medium styrene (hard type)	45.0	7.0	350	50	150	1	Good miscibility with cement and adhesive strength.	Mixed with cement mortar (waterproofing use).
Nipol LX119	SBR	50.0	10.0	180	35	50	-48	Goog mutual solubility with asphalt.	Mixed with asphalt.
Nipol 9570A	SBR	70.0	11.0	400	33	300	-47	Goog mutual solubility and spray effect with asphalt.	Mixed with asphalt.

For Special paper and paper processing (internal and impregnated)

Product name	Composition	Total solids (%)	pH	Viscosity (mPa•s)	Surface tension (mN/m)	Average particle diameter (nm)	Tg (°C)	Characteristics	Applications
Nipol LX110	SBR	40.5	11.5	55	60	80	-47	Used as special internal paper.	Gaskets.
Nipol 2570H	SB high styrene	52.0	10.0	20	35	250	58	High concentration with improved stability.	Shoe materials (impregnated), and battery separators.
Nipol 5270X5	Modified SB	41.0	6.5	20	40	100	-18	Used for special papers such as impregnated paper and paper processing.	Impregnated paper.
Nipol LX416	Modified SB high styrene	48.0	8.0	45	50	110	50	Used to reinforce other latices. Good mechanical and spray stability.	Impregnated paper such as shoe materials.
Nipol LX430	Modified SB medium styrene (hard type)	49.0	7.0	130	50	150	12	Excellent adhesive strength and stability. Low bubbling. Available for various purposes.	Special papers used as battery separators and in paper processing (impregnated).
Nipol LX432M	Modified SB medium styrene (soft type)	41.0	8.0	60	40	130	-55	Soft, self-crosslinking type with low formaldehyde. Excellent waterproofing properties, and dry cleaning, heat, and light resistance.	Paper processing (impregnated), and special paper.

For Adhesives

Product name	Composition	Total solids (%)	pH	Viscosity (mPa•s)	Surface tension (mN/m)	Average particle diameter (nm)	Tg (°C)	Characteristics	Applications
Nipol 9570A	SBR	70.0	11.0	400	33	300	-47	High concentration. Used as an adhesive.	Album paste, cement block adhesives, and can seal compounds.
Nipol LX112	SBR	40.5	11.0	30	60	80	-47	Excellent adhesive strength.	Adhesive and medical tapes.
Nipol LX426	Modified SB medium styrene (soft type)	50.0	8.5	100	40	120	-39	Excellent adhesiveness and extremely low odor.	Cataplasms, plaster materials, film treatment, and tape primer of paper adhesives.
Nipol LX430	Modified SB	49.0	7.0	130	50	150	12	Excellent adhesive strength and stability. Low bubbling.	Adhesives for wood.
Nipol LX432M	Modified SB medium styrene (soft type)	41.0	8.0	60	40	130	-55	Soft, self-crosslinking with low formaldehyde. Excellent waterproofing properties, and dry cleaning, heat, and light resistance.	Adhesives. Masking tape primers.

■ Latex for ABS resin

Product name	Type	Total solids (%)	pH	Viscosity (mPa•s)	Surface tension (mN/m)	Average particle diameter (nm)	Gel content (%)	Characteristics
Nipol LX111A2	PB	54.0	11.5	70	40	300	73	Sharp distribution of particle diameter. General-purpose type. Suitable for transparent uses.
Nipol LX111HG	PB	54.0	11.0	150	35	240	80	Middle to small particle diameter of polybutadiene latex for high gloss.
Nipol LX111NF	PB	55.0	11.5	35	38	350	86	General-purpose polybutadiene latex of hard gel and high gel types.
Nipol LX111K	PB	55.0	11.5	40	38	350	80	General-purpose polybutadiene latex of hard gel and high gel types.
Nipol 9570A	SBR	70.0	11.0	400	33	300	60	Wide distribution of large particle diameter. Loose gel type. Suitable for high impact use.

Notes 1. PB: polybutadiene

2. Sodium alginate method is applied for calculating the average particle diameter of this table.(For other tables, electron microscopy is applied.)

■ Latex of acrylonitrile butadiene copolymer (NBR latex)

Nipol NBR latices are available in medium nitrile, medium-high nitrile, and high nitrile, according to the relative concentration of acrylonitrile. We also have modified types, such as modified carboxyl, and non-modified types. Major applications are detailed in tables 4-2 to 4-5, while table 4-6 lists other typical uses, and are useful references for selecting a specific latex.

For Paper processing and fiber treatment(impregnated and internal)

Product name	Type	Total solids (%)	pH	Viscosity (mPa•s)	Surface tension (mN/m)	Average particle diameter (nm)	Tg (°C)	Characteristics	Applications
Nipol 5161	NBR	40.5	10.5	25	40	50	-11	High nitrile. Good adhesiveness to paper, fabrics, wood and natural leather. Cure film is very flexible and elastic. Excellent oilproofing properties and heat resistance.	Basic paper for tapes (impregnated).
Nipol 1562	NBR	41.0	10.0	35	43	50	-21	Medium-high nitrile. Soft type of 5161.	Basic paper for tapes, clutch sheets, belts, and hoses.
Nipol 1571H	Modified NBR	40.0	8.3	15	28	120	-8	High nitrile. Standard modified carboxyl. Good infiltration, adhesive strength and low discoloration with paper, fabrics, and wood. Good oilproof properties and solvent resistance.	Paper packing, polishing fabrics, gaskets, and battery separators.
Nipol 5171C	Modified NBR	45.0	8.5	25	40	120	-10	High nitrile. Further improved on 5171 by creating low bubbling, higher concentration, and more stable.	Gaskets (internal).
Nipol 5171CL	Modified NBR	38.0	8.0	12	29	100	-11	High nitrile.Less Cl- from 5171 type. Low rusting with iron. Good blend stability with phenol.	Polishing fabrics and paper (impregnated), and clutch boards.

Nipol LX517A	Modified NBR	40.0	8.0	12	42	120	−16	Medium-high nitrile. More flexible with less bubbling than 5171 type.	Gaskets and clutch sheets.
Nipol 5177	NBR	38.0	10.0	20	45	40	26	Special nitrile. Good oilproof properties and adhesiveness, even though medium nitrile. Hard type used to reinforce other NBR latices.	Shoe materials (impregnated).
Nipol LX511	Modified NBR	46.0	8.0	20	30	170	−19	Medium-high nitrile.	Polishing fabrics and gaskets.
Nipol LX513	NBR	45.0	10.0	35	34	140	−31	Medium-high nitrile. Capable of gelatinization by heat. More flexible than LX511.	Gaskets.

Foam rubber

Product name	Type	Total solids (%)	pH	Viscosity (mPa•s)	Surface tension (mN/m)	Average particle diameter (nm)	Tg (°C)	Characteristics	Applications
Nipol LX531	NBR	64.0	11.0	250	34	300	−15	Medium nitrile. High oilproof, high concentration, and easily gelatinized. Wet gel is elastic and strong.	Cosmetic puffs.
Nipol LX531B	NBR	66.0	11.0	300	34	300	−12	Medium-high nitrile. Enhanced oilproofing compared to LX531 type and stronger gel. Desirable for foam rubber.	Cosmetic puffs.

Note NBR: acrylonitrile butadiene copolymer

For Gloves

Product name	Composition	Total solids (%)	pH	Viscosity (mPa•s)	Surface tension (mN/m)	Average particle diameter (nm)	Tg (°C)	Characteristics
Nipol LX550	Modified NBR	45.0	8.5	250	35	110	-27	Soft type for supported glove applications. High viscosity can influence fabric penetration.
Nipol LX550L	Modified NBR	45.0	8.3	60	35	110	-27	Low modulus and excellent durability used for thin disposable glove applications.
Nipol LX551	Modified NBR	45.0	8.5	85	31	120	-14	High chemical resistance used for supported glove applications.
Nipol LX552	Modified NBR	45.0	8.0	30	28	110	-12	High chemical resistance used for both thin and heavy mill unsupported glove applications.

For Non-woven fabrics

Product name	Composition	Total solids (%)	pH	Viscosity (mPa•s)	Surface tension (mN/m)	Average particle diameter (nm)	Tg (°C)	Characteristics	Applications
Nipol LX511A	Modified NBR	46.0	8.0	20	30	170	-19	Medium-high nitrile. Easy crosslinking using zinc oxide. Film is soft and elastic. Excellent oil and solvent resistance. Sharply heat-gelatinized by organo polysiloxane copolymer. More elastic than 5171.	Synthetic leather. Thick non-woven fabric binders, base of non-woven fabric binders for artificial leather.

For Carpets

Product name	Composition	Total solids (%)	pH	Viscosity (mPa•s)	Surface tension (mN/m)	Average particle diameter (nm)	Tg (°C)	Characteristics	Applications
Nipol 5171C	Modified NBR	45.0	8.5	25	40	120	-10	High nitrile. Further improved on 5171 type by creating lower bubbling, higher concentration, and better stability.	Floor mats.

■ Acrylate latex

Acrylate type latices are copolymerized alkylester acrylic acid and alkylester metacrylic acid, which are based on pure acrylic. These latices can be copolymerized with functional groups such as carbonic acid and monomers such as acrylonitrile and styrene. Major applications are detailed in tables 5-2 to 5-4, while table 5-5 lists other typical uses, and are useful references for selecting a specific latex.

For Non-Woven Fabrics

Product name	Type	Total solids (%)	pH	Viscosity (mPa•s)	Surface tension (mN/m)	Tg (°C)	Characteristics	Applications
Nipol LX811H	Self-crosslinking type	50.0	6.5	170	35	1	Standard type. Excellent resistance to discoloration from light and age.	Countercloth (spray).
Nipol LX814	Self-crosslinking type	46.0	6.0	30	35	25	Hard and similar type to LX811H.	Clothing.
Nipol LX851C	Self-crosslinking type	45.0	6.5	20	27	15	Medium-hard. Excellent resistance to discoloration from light and age. Extremely low formaldehyde.	Interlining cloth materials (impregnated), resin cotton, clothing (spray), and automobile

								ceiling materials.
Nipol LX851E	Self-crosslinking type	45.0	6.0	40	30	15		Oil filters and non-woven fabrics for civil engineering.
Nipol LX851F	Self-crosslinking type	45.0	7.0	60	30	15		Resin cotton, filters and cotton wool.
Nipol LX852	Self-crosslinking type	45.0	6.5	80	30	-6	Soft type. Excellent adhesiveness, resistant to discoloration from light and age. Extremely low formaldehyde. LX852 is included in the Japan Sanitary Material Industrial Association's list.	Rough blankets, clothing materials (impregnated), wet tissues, sanitation materials and filters.
Nipol LX854E	Self-crosslinking type	45.0	6.5	25	27	-10	Stronger self-crosslinking than LX852. Low formaldehyde.	Non-woven fabrics for wood floor cusions, resin cottons, and clothing.
Nipol LX855EX1	Self-crosslinking type	45.0	6.5	20	28	36	Harder than LX851 with good resistance to washing and dry cleaning. Extremely low formaldehyde.	Wet tisues, food tray mats, and ventilation filters.
Nipol LX857X2	Self-crosslinking type	45.0	6.5	30	28	43	Harder than LX855EX1. Low formaldehyde. Good resistance to discoloration from light.	Food tray mats, air conditioning filters, and non-woven fabrics for engineering.

Nipol LX874	Self-crosslinking type	45.0	6.5	20	26	-31	Extremely soft with good waterproofing properties and dry cleaning resistance.	Spiral spring supporting sheets of automobile seats, filters, clothing materials, clothing and automobile ceiling materials.

For Paper processing (impregnated and internal)

Product name	Type	Total solids (%)	pH	Viscosity (mPa•s)	Surface tension (mN/m)	Tg (°C)	Characteristics	Applications
Nipol LX814	Self-crosslinking type	46.0	6.0	30	35	25	Hard type.	Polishing paper (filler material) and special paper.
Nipol LX816	Self-crosslinking type	42.0	2.0	30	35	-10	Non-ionic, but can be stabilized with a small amount of coagulant.	Special paper (internal).
Nipol LX844B	Self-crosslinking type	40.0	7.5	70	55	32	Hard type. Good waterproofing properties and resistant to white discoloration from water.	Air filters (impregnated).
Nipol LX852	Self-crosslinking type	45.0	6.5	80	30	-6	Soft type.	Filters (internal) and clutch sheets.
Nipol LX857X2	Self-crosslinking type	45.0	6.5	30	26	43	Harder than LX855.	Paper knives (impregnated).
Nipol LX874	Self-crosslinking type	45.0	6.5	20	26	-31	Extremely soft type. Good	Paper

							waterproofing properties and dry cleaning resistance.	processing (filters), and tape paper (impregnated).

For Fiber treatment

Product name	Type	Total solids (%)	pH	Viscosity (mPa•s)	Surface tension (mN/m)	Tg (°C)	Characteristics	Applications
Nipol LX851C	Self-crosslinking type	45.0	6.5	20	27	15	Medium-hard type. Excellent washing resistance.	Fabric labels (care instruction labels).
Nipol LX851F	Self-crosslinking type	45.0	7.0	60	30	15	Medium-hard type.	Canvases (impregnated).
Nipol LX852	Self-crosslinking type	45.0	6.5	80	30	-6	Soft type.	Glass fibers (internal).
Nipol LX854E	Self-crosslinking type	45.0	6.5	25	27	-10	Soft type.	Fabric labels (care instruction labels), and canvases (impregnated).
Nipol LX855EX1	Self-crosslinking type	45.0	6.5	20	28	36	Harder than LX851 with good resistance to washing and dry cleaning.	Glass fibers.
Nipol LX874	Self-crosslinking type	45.0	6.5	20	26	-31	Extremely soft.	Fire hoses (impregnated).

For Painting materials

Product name	Composition	Total solids (%)	pH	Viscosity (mPa•s)	Surface tension (mN/m)	Tg (°C)	Characteristics	Applications
Nipol LX820A	Reaction type	55.0	7.5	3,000	36	−43	Good miscibility with pigments and especially good spreading at low temperature.	Multi-layered elastic paints.
Nipol LX821	Reaction type	55.0	8.3	700	44	−13	Good miscibility with pigments and good spreading at low temperature. Low temperature-dependance.	Multi-layered elastic paints.

■ Soap-free latex

1. Colloid characteristics

(1)Low thixo property, displays flow properties similar to Newtonian flow(solvent-like movement).

(2) Good miscibility with water solvents, such as alcohol.

(3) Good miscibility with various synthetic resins.

(4) Good fluidity for coating, enable a consistant coating without causing craters on the surface of various materials.

(5) Good mechanical stability.

2. Polymer characteristics

(1) Good film composition.

(2) Can form a film with high Tg at relatively low temperatures .

(3) Good blocking resistance(low viscosity).

(4) Good balance between impairing strength and impairing elasticity of unvulcanized polymer film.

(5) Close adherence and adhesiveness to a variety of materials.

(6) Dramatically improves the size of impregnated paper.

(7) Good solvent resistance of latex-coated paper.

(8) Latex-coated paper is decomposable.

(9) Low particle dissolution with less bleeding.

Product name	Polymer composition	Characteristics	Total solids (%)	pH	Viscosity (mPa•s)	Surface tension (mN/m)	Specific gravity	Average particle diameter (nm)	Tg (°C)
Nipol SX1105	Styrene-butadiene copolymer	Fluidity, miscibility with alcohol, film composition, close adherence, rubber-like elasticity, flexibility.	45.0	7.0	250	42	1.02	100	0
Nipol SX1503	Acrylonitrile butadiene copolymer	Fluidity, miscibility with alcohol, film composition, close adherence, rubber-like elasticity, flexibility, solvent resistance.	42.0	7.0	180	44	1.00	50	-20
Nipol SX1706	Ester acrylic acid copolymer	Fluidity, miscibility with alcohol, film composition, close adherence, weather resistance, transparency, decomposibility.	48.0	7.4	220	41	1.08	100	0

■

Latex for pavements (SBR latex)

Product name	Characteristics	Total solids (%)	pH	Viscosity (mPa•s)	Specific gravity	Average particle diameter (nm)
Nipol Roadstar	1.More aggregate gripping strength and adhesive strength (less aggregate spreading) 2.More flow resistance (less waving and grooving) 3. Excellent impact resistance (crack prevention) 4. Excellent friction resistance (less friction in vehicles and chains) 5. Excellent age resistance (longer operating life) 6.Excellent waterproofing properties (peeling prevention) 7.Less brittleness caused by low temperatures(crack	50.0	10.0	130	0.98	50

	prevention) 8.Greater elasticity (improve traveling stability)					
Nipol Roadace	Dramatically improved flow resistance for wave and groove resistance, in addition to Roadstar's characteristics.	50.0	11.0	50	0.98	150
Nipol Elastace	Improved friction resistance, in addition to Roadace's characteristics (wave and groove resistance).	50.0	10.5	150	0.98	50