Solution–Styrene Butadiene Rubber (S-SBR)

In recent years, the increased interest in environmental sustainability and safe mobility drove a technological challenge to progressively and remarkably improve tyres performance in terms of minimal energy dissipation, enhanced road grip and highest wear resistance. Adoption of SSBR in appropriately developed tyre formulations is the key to success. Based on Versalis technology, LVE is one of the few manufacturers producing SSBR in both batch and continuous process: Europrene® K Sol R grades are successfully used in compounds for 'green' tyres, while Sol B grades are broadly used in adhesives, bitumen and ABS modification.

Solution polymerized styrene-butadiene rubber is obtained by the anionic polymerization of styrene and butadiene initiated by lithium alkyls in hydrocarbon solvent, the distribution of styrene units in the polymer chain results in either Block or Random Co-Polymers.
Block and Random S-SBRs impart very different properties to the polymer and are used in different applications. Block S-SBRs have a lower styrene content than Random S-SBRs and are more suitable for calendaring and extrusion processes. They are also used for bitumen modification and for the production of adhesive and High Impact Polystyrene (HIPS) and ABS resins. Random S-SBRs provide a versatile support for tailor-made product operating through the styrene content and microstructure of butadiene units allowing good performance in terms of processability, rolling resistance, grip and abrasion and becoming the first preference in the tyre sector.

Partial Block S-SBR

GRADE NAME	Process	Bound Styrene %wt	Block Styrene %wt	Mooney Viscosity ML(1+4) @100°C	Solution Viscosity cPs (5% in styrene @ 25°C)	Main Application
EUROPRENE K SOL B 1205	Batch	25	18	53	10	Calendared and extruded articles, cables, flooring, shoe soles, medium glossy HIPS
AGON K SOL C283	Continuous	11	8		32	Impact improver of ABS and Polystyrene giving a gloss surface.

Random Dry S-SBR

GRADE NAME	Process	Bound Styrene %wt	Vinyl Content(*) %wt	Mooney Viscosity ML(1+4) @100°C	Extension Oil Content (TDAE, phr)	Main Application
EUROPRENE K SOL R 72613	Batch	21	65	65	-	Silica - based compounds for high performance tyre treads; high quality technical rubber goods.

(*) Referred to butadiene portion

Random Oil Extended S-SBR

GRADE NAME	Process	Bound Styrene %wt	Vinyl Content(*) %wt	Mooney Viscosity ML(1+4) @100°C	Extension Oil Content (TDAE, phr)	Main Application
EUROPRENE K SOL R 72614	Batch	25	64	55	37.5	Silica-based compound for low rolling resistance and winter treads
EUROPRENE K SOL R 74618T	Batch	35	58	61	37.5	Tyre tread compounds for HP/UHP tyre.
AGON K SOL R 73521T	Batch	35	58	83	25	Tyre tread compounds for HP/UHP tyre.
EUROPRENE K SOL R C2564T	Continuous	25	64	50	37.5	Low rolling resistance tyre treads with improved wet grip; technical rubber goods.
EUROPRENE K SOL R C2565T	Continuous	25	64	65	37.5	Silica-based compounds for low rolling resistance tyre treads with improved wet grip
EUROPRENE K SOL R C3458T	Continuous	34	56	71 (@120°C)	37.5	Tread compounds for HP/UHP tyres. Extremely suitable for high filler loading
EUROPRENE K SOL R C3555T	Continuous	35	51	75	37.5	Tread compounds for HP/UHP tyres. Extremely suitable for high filler loading
EUROPRENE K SOL R C3737T	Continuous	37	38	75	37.5	Tyre tread compounds for HP/UHP tyres. It shows improved grip and handling performances.

(*) Referred to butadiene portion

Functionalized Random S-SBR

GRADE NAME	Process	Bound Styrene %wt	Vinyl Content(*) %wt	Mooney Viscosity ML(1+4) @100°C	Extension Oil Content (TDAE, phr)	Main Application
EUROPRENE K SOL R 72616	Batch	21	63	68	-	Silica - based compounds for premium low rolling resistance summer, all seasons and winter tyre treads.

(*) Referred to butadiene portion