



# RIDE WITH US TO SUCCESS

Styrenic solutions for two-wheelers



Driving Success. Together.



## OPTIMIZING EFFICIENCY, MAXIMIZING AESTHETICS

**S**tyrolution is the world's number one supplier of automotive styrenics – with a focus on styrene specialties. We are therefore able to offer unique, cutting-edge solutions for two-wheelers that not only improve durability and fuel efficiency, but also enhance the look and feel of all surfaces: Novodur®, Luran® S and Terblend® N

## PARTNERING FOR GROWTH

**W**e partner with you to create customized and affordable solutions, adapted exactly to your specific requirements. We go the extra mile to understand you better as we continuously improve our product development and after-sales support, thereby delivering higher uptime and also addressing issues related to processing, painting and electroplating. With in-depth knowledge of two-wheeler parts processing, CAE simulations and regulatory compliance, our technical service experts are able to help you achieve your project objectives on-time, every time.

## BUILT-IN FUTURE PERFORMANCE

The advantages of partnering with Styrolution are manifold:

- ▶ Global manufacturer with local production and technical teams
- ▶ Consistent material performance under extreme conditions
- ▶ Freedom in design to produce complex geometries
- ▶ Project management support for large automotive projects
- ▶ Design support for part and injection molding tools
- ▶ Ease of recyclability and compatibility with a large number of other materials
- ▶ Possibility of reduction of wall thickness through application of thin wall technique
- ▶ Special heat resistance grades with a vicat softening point of up to 112 °C to meet stringent heat requirements
- ▶ Good adhesion and support action for in-mold decoration (IMD) employing textiles and film

## STYRENICS PROPERTIES THAT OUTPERFORM

Some of the reasons styrenics from Styrolution are the polymer of choice for motorbikes and scooters:

**EXCELLENT PAINTABILITY** LOW MATERIAL DENSITY  
**OUTSTANDING AESTHETICS**  
**EASE OF RECYCLABILITY**  
**HIGH DIMENSIONAL STABILITY** **GOOD IMPACT RESISTANCE**  
**EASY PROCESSING** AMORPHOUS STRUCTURE **CHEMICAL RESISTANCE**  
**HIGH RESISTANCE TO THERMAL VARIATION** **GOOD MECHANICAL STRENGTH**  
**GOOD WEATHERABILITY** LOW TENDENCY TO CREEP & WARP  
**HIGH RIGIDITY**  
**EASE OF ASSEMBLY - WELDING, SNAP FITTING, SCREWING**

# MAJOR AREAS OF APPLICATION

The Styrolution products Novodur, Luran S and Terblend N are used in a variety of two-wheeler applications.

## TYPICAL MOTORBIKE APPLICATIONS



APPLICATION TAG	APPLICATION	NOVODUR	LURAN S	TERBLEND N
1	MIRROR HOUSING	✓	✓	
2	SPEEDOMETER HOUSING	✓		
3	FRONT VISOR	✓		
4	HEAD LAMP MASK	✓		
5	HEAD LAMP HOUSING	✓		
6	HEAD LAMP COWLING	✓		
7	BLINKER HOUSING	✓	✓	
8	FRONT FENDER	✓		✓
9	TANK SPOILER	✓		✓
10	ENGINE COVER	✓	✓	✓
11	SIDE COVER	✓		✓
12	LOGO & EMBLEM	✓		
13	SEAT COWLING	✓		
14	TAIL LAMP HOUSING	✓	✓	
15	NUMBER PLATE	✓		

## TYPICAL SCOOTER APPLICATIONS



APPLICATION TAG	APPLICATION	NOVODUR	LURAN S	TERBLEND N
1	MIRROR HOUSING	✓	✓	
2	SPEEDO CASE	✓		
3	FRONT / REAR HANDLE COVER	✓	✓	✓
4	GLOVE BOX COMPARTMENT	✓		
5	HEAD LAMP MASK	✓	✓	
6	NOSE COVER	✓	✓	
7	HEAD LAMP HOUSING	✓		✓
8	BLINKER HOUSING	✓	✓	
9	FRONT MUDGUARD	✓		✓
10	FOOT BOARD	✓		
11	LOWER FAIRING LH & RH	✓		
12	SPARK PLUG COVER	✓		
13	SIDE COVER	✓		
14	LOGO & EMBLEM	✓		
15	TAIL LAMP HOUSING	✓		
16	REAR COVER	✓		
17	REAR MUDGUARD			

## STYRENIC SPECIALTY APPLICATIONS

Styrenic specialties from Styrolution are ideal for affordable high aesthetics, thanks to a low overall system cost, e.g. by saving painting costs with pre-colored high quality surfaces with excellent weatherability. Here are some examples:

### > SPEEDOMETER HOUSING



MADE WITH LURAN S, FEATURING:

- > Excellent weather resistance
- > Excellent color retention
- > Good chemical resistance

### > FRONT FENDER



MADE WITH TERBLEND N, FEATURING:

- > Excellent impact resistance even at subzero temperatures
- > Excellent chemical resistance
- > Good acoustic properties

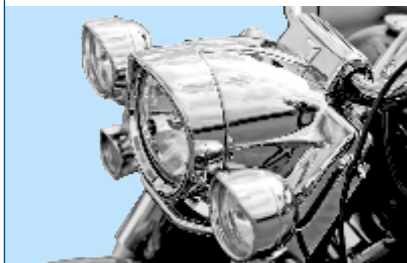
### > FRONT VISOR



MADE WITH LURAN S, FEATURING:

- > Excellent weather resistance
- > Excellent color retention
- > Good mechanical strength

### > HEAD LAMP BEZEL, BLINKER BEZEL LOGO & EMBLEM



MADE WITH NOVODUR (GALVANO ABS), FEATURING:

- > High adhesion strength
- > Excellent surface appearance
- > Good mechanical strength

### > SPEEDO CASE



MADE WITH LURAN S, FEATURING:

- > Excellent weather resistance
- > Excellent color retention
- > Good mechanical strength

### > TAIL LAMP HOUSING



MADE WITH NOVODUR HIGH HEAT ABS, FEATURING:

- > Excellent thermal stability
- > Excellent metallization
- > Good mechanical strength

## STYROLUTION PRODUCTS FOR TWO WHEELERS AT A GLANCE

### NOVODUR (ABS & HIGH HEAT ABS)

Novodur grades are specialty acrylonitrile butadiene styrene (ABS) copolymers characterized by easy processability, highly aesthetic colorful surfaces and excellent paintability as well as good impact strength. They also exhibit high adhesion strength required for electroplating as well as good mechanical strength and chemical resistance.

Galvano ABS (electroplatable ABS) Styrolution offers specific ABS grades designed for electroplating. They offer an optimum adhesion strength to the metal layer after "etching", as well as the required high surface quality.

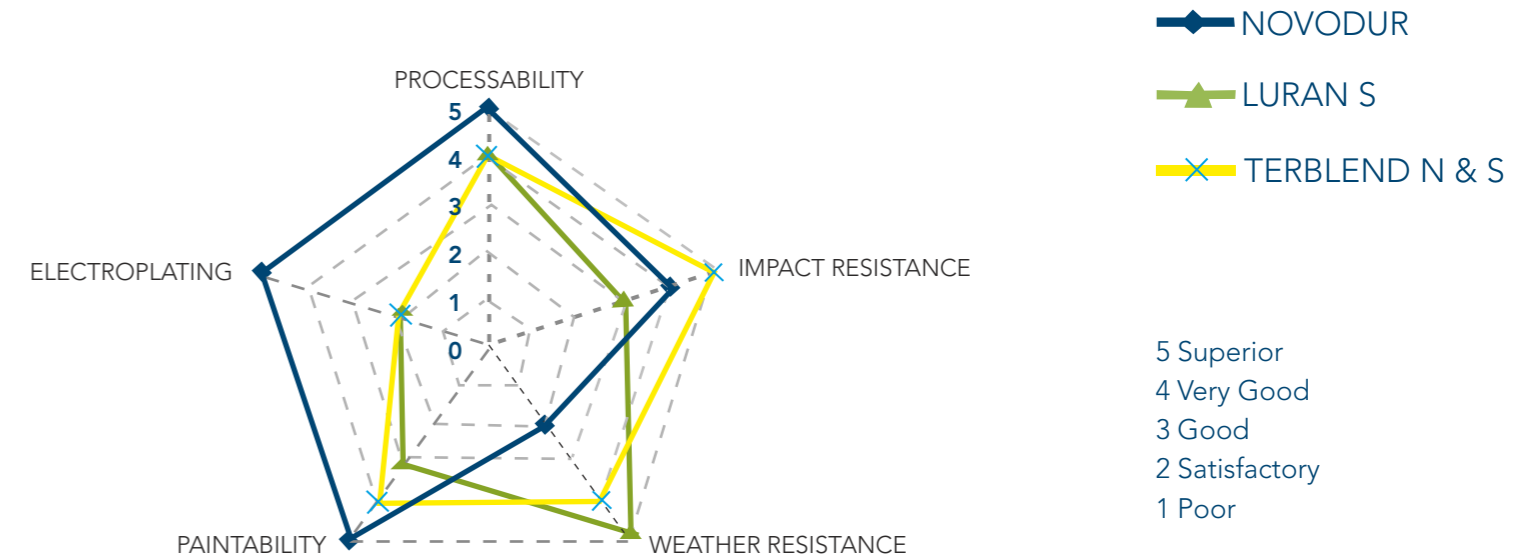
### LURAN S (ASA)

Luran S grades are acrylonitrile styrene acrylate copolymer (ASA) that are impact-modified with acrylic ester rubber, characterized by their resistance to weathering, their high aging stability and good resistance to chemicals.

### TERBLEND N (ABS+PA) / TERBLEND S (ASA+PA)

Terblend N grades are blends based on ABS and polyamide (PA) that reduce the disadvantages of PA, like shrinkage and inadequate low-temperature impact strength. They are characterized by high-quality surface finish and a pleasant feel, extraordinary impact strength at subzero temperatures, ease of processing, outstanding chemical resistance, good dimensional stability under heat, and high quality acoustic dampening. Terblend S grades are blends based on ASA and polyamide that gives very high impact strength, easy flow, pronounced color fastness, especially suitable for unpainted high UV – exposed automotive parts.

## KEY CHARACTERISTICS IN COMPARISON



For more information please also refer to <http://www.styrolution.com/Products.html>

## TYPICAL VALUES FOR UNCOLORED PRODUCTS AT 23°C

	TEST STANDARD	UNIT	TERLURAN GP22	TERLURAN GP35	NOVODUR 970	NOVODUR P2MC	NOVODUR HH106	NOVODUR HH112	LURAN S 778 T	LURAN S 777K	TERBLEND NM-21EF
<b>&gt; PROPERTIES</b>											
POLYMER ABBREVIATION	-	-	ABS	ABS	ABS	ABS	ABS	ABS	ASA	ASA	ASA/PA
DENSITY	ISO 1183	g/cm <sup>3</sup>	1.04	1.04	1.04	1.03	1.05	1.05	1.07	1.07	1.07
MOISTURE ABSORPTION EQUILIBRIUM 23 °C/50% R.H.	ISO 62	%	0.22	0.24	-	-	0.25	0.25	0.35	0.35	1.3
<b>&gt; PROCESSING</b>											
MELT VOLUME FLOW RATE (220°C/10KG)	ISO 1133	cm <sup>3</sup> /10 min	19	34	22	25	7	6	5	15	60 (240/10)
MOLD SHRINKAGE	ISO 294-4	%	0.4 - 0.7	0.4 - 0.7	0.4 - 0.6	0.4 - 0.7	0.4 - 0.7	0.4 - 0.7	0.4 - 0.7	0.4 - 0.7	0.8
<b>&gt; MECHANICAL PROPERTIES</b>											
CHARPY NOTCHED IMPACT STRENGTH, 23°C	ISO 180/A	KJ/m <sup>2</sup>	22	19	22	24	17	12	15	17	70
TENSILE STRENGTH AT YIELD	ISO 527	Mpa	45	44	41	40	51	58	54	48	45
TENSILE MODULUS	ISO 527	Mpa	2300	2300	2250	2200	2400	2700	2500	2300	2100
FLEXURAL STRENGTH	ISO 178	Mpa	65	65	67	62	72	81	80	70	65
FLEXURAL MODULUS	ISO 178	Mpa	-	-	2200	2100	2400	2700	-	-	2000
<b>&gt; THERMAL PROPERTIES</b>											
HEAT DEFLECTION TEMP (HDT ANNEALED, 1.8 MPA)	ISO 75	°C	94	92	90	94	106	109	103	97	63
VICAT SOFTENING TEMP (VST, B/50N)	ISO 306	°C	96	95	98	95	106	112	104	97	110

## STYROLUTION AT A GLANCE

Styrolution is the leading, global styrenics supplier with focus on styrene monomer, polystyrene, ABS Standard and styrenic specialties. With a rich heritage and a unique business model, Styrolution helps its customers succeed by offering the best possible solution, designed to give them a competitive edge in their markets.



**3,200**  
EMPLOYEES



**10**  
COUNTRIES



**17**  
PRODUCTION SITES



**6**  
R&D  
CENTERS

**No 1**  
GLOBAL  
LEADER  
in styrenics

**80+**  
YEARS  
of experience  
in styrenics

**2,000+** APPLICATIONS ACROSS **SEVEN** INDUSTRIES



AUTOMOTIVE



ELECTRONICS



HOUSEHOLD



CONSTRUCTION



HEALTHCARE



PACKAGING



TOYS, SPORTS  
& LEISURE

**1000+**  
ACTIVE  
PATENTS



**1,500+**  
PRODUCTS



**4,000+**  
CUSTOMERS



**5.8 BILLION**  
EUROS IN  
REVENUE  
IN 2013



STYROLUTION SERVES THE AUTOMOTIVE INDUSTRY AROUND THE WORLD WITH THE LARGEST PORTFOLIO OF STYRENICS SPECIALTIES, FUELED BY INNOVATION.

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## PLEASE NOTE

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