

SOLUTION DATA SHEET

New ESTANE® EV TPU for Electric Vehicle Charging System Cables



Markets	Electric vehicle (EV) charging system and transportation cables
Polymer	ESTANE® EV thermoplastic polyurethane (TPU)
Key Benefits	<ul style="list-style-type: none"> • Non-Halogenated Flame retardancy • Sustainable alternative • Low toxicity and low volatiles • Easy processability • Very good aesthetics • Low or no odor

Europe has seen the largest growth in EVs. Lubrizol Engineered Polymers has developed in recent years, a portfolio of polymer solutions that are halogen-free flame retardant TPUs for all types of wire and cable. These materials are commercialized as the ESTANE® ZHF series (for zero halogens flame retardants), and it has been expanded with several new grades to cater for the different needs of wire and cable customers.

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With the growth of EV and the focus on finding more sustainable alternatives, Lubrizol's scientists and application experts have worked jointly to release, in a short time, a range of material solutions specifically for EV charging system cables.



Our actual portfolio of four grades is based on differentiated, non-halogenated flame retardant (NHFR) technology with low toxicity/smoke and showing an advantage in conductivity ($<35 \mu\text{S}/\text{mm}$). We have used materials that are easy to process like conventional TPUs, none of our grades use dangerous substances and they contain either a low number of volatiles or none at all. Our grades are compliant with the following standards: IEC 62893 and EN 50620.

The above-mentioned ESTANE grades: ESTANE EV 90AT2 TPU, ESTANE EV 88AT2 TPU, ESTANE ZHF 58202 and ESTANE ZHF 58370 are plasticizer-free and low odor. All of these aspects are appreciated beyond the International Standards.

Moreover, cables are no longer 'all-black'. Sometimes, cables are required in fancy light or pastel colors and when used outdoors, there could be the formation of blooming/white plate on the surface. ESTANE polymers for EVs have taken this into account and provide a durable, long-lasting effect even on such cables, no blooming or whitening.

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Physical property	Unit	ESTANE® ZHF 58202 NAT 02	ESTANE® EV 90AT2 NAT 01	ESTANE® EV 88AT2 NAT 01	ESTANE® ZHF 58370 NAT 01
Feature		Differentiated Halogen-free FR	Halogen- free FR	Halogen free FR	Differentiated Halogen-free FR
Hardness	Shore A	89	90	89	86
Specific Gravity	g/cm ³	1.23	1.19	1.18	1.20
Tensile at break	MPa	28	29	34	31
Elongation at break	%	632	523	529	653
Abrasion resistance	mm ³	65	46	45	91
Oxygen Index	%	25	22	22	23
Vertical Burn test	Rating	V-2 @ 1.9 mm	V-2 @ 1.9 mm	V-2 @ 1.9 mm	V-2 @ 1.9 mm
pH value		8.1	8.5	8.9	7.3
Gas conductivity	μS/mm	<35	<40	<35	<10
IEC 60332-1-2	/	PASS	PASS	PASS	PASS*
IEC62893/EN50620 compliance		IEC62893/ EN50620	EN50620	IEC62893/ EN50620	IEC62893/ EN50620

*Dependent on cable construction

Table 1: Overview of new halogen-free, flame retardant grades for EV charging cables

Lubrizol’s ESTANE ZHF TPU portfolio for EVs is backed by many years’ experience in the development of durable and high-performing polymers and has been designed factoring in the latest trends for safer and regulatory-compliant materials.

For more information, please visit our web site: www.lubrizol.com/Engineered-Polymers

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