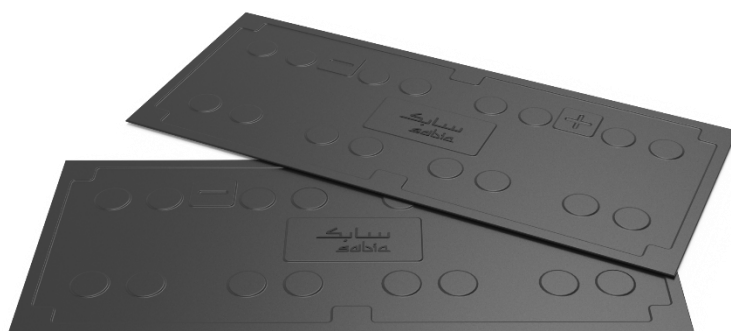


NORYL™ RESINS: INNOVATIVE MATERIAL SOLUTIONS TO SAFEGUARD BATTERY SAFETY

Highest CTI Level, Ultra-thin Wall FR, Better EV Battery Modules Protection

Transitioning from standard, 400-volt EV batteries to higher voltages offers the potential to shorten charging times, extend range and improve energy management within the vehicle. However, designing higher-voltage batteries requires the invention of breakthrough materials, such as the new NORYL resin for insulation films.

The CTI PLC, which indicates the maximum voltage a material can withstand without developing tracking, is used to evaluate electrical insulators under exposure to conditions of stress, humidity and contamination. NORYL NHP8000VT3 resin achieved the highest CTI performance level category of 0 in testing by an UL certified lab, indicating it can withstand 600 volts and greater. PC, the other incumbent battery insulation material, typically cannot achieve CTI PLC0.



Value Propositions:

- Enabling complex design without secondary processing compared to PP.
- Better mechanical strength and impact @0.25mm vs. PP
- FR V0@0.25mm
- Lower specific gravity and better thin wall FR vs. PC, NORYL NHP8000VT3 resin features up to 40 percent weight reduction



NORYL™ Resin Grade	Properties	V0/CTI	HDT (0.45 MPa)	MFR 300°C/5kg
NHP8000VT3	Extrusion grade, CTI0, thermal compression	0.25mm V0, CTI PLC0	150°C	12g/10min
NHP8010T3	Extrusion grade, non CTI0, thermal compression	0.25mm V0	149°C	15g/10min
NHP7020T3	High flow, injection molding grade, non CTI0	0.3mm V0	144°C	40g/10min



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