CHEMISTRY THAT MATTERS™

OPTIMIZE THE DESIGN AND PERFORMANCE OF POWER ELECTRONIC COMPONENTS

Discover specialty FR thermoplastics meeting insulation safety requirements for CTI



BROADEN DESIGN SPACE WITH CTI MATERIAL SOLUTIONS FROM SABIC

The **Comparative Tracking Index** (CTI) is a crucial parameter in assessing the electrical insulation properties of plastics. It measures a material´s resistance to electrical tracking. Plastics with high CTI values are considered as better insulators.



Polymers with high CTI performance can exhibit enhanced resistance to the formation of conductive paths under electrical stress.

This is particularly important in applications where electrical components are exposed to harsh environments or contaminants and high voltage currents.

Plastics with superior CTI values can help to provide

- A reliable barrier against electrical tracking
- A reduced risk of short circuits and electrical failures
- A robust compliance to electrical safety standards
- A broader design space in high voltage applications
- New application spaces for innovative compounds

POTENTIAL APPLICATION SPACE



PHOTOVOLTAICS



TELECOMMUNICATIONS



GREEN HYDROGEN



AUTOMOTIVE EV



RAIL



WIND ENERGY



AEROSPACE



ELECTRICAL & ELECTRONICS

The ongoing miniaturization and complexity in the electronics industry is leading to constantly increasing requirements in terms of thinner wall designs, power density, fire safety regulations for increased flame retardancy (FR) and thermal properties.

SABIC's ULTEM™ resins, NORYL™ resins, and LNP™ Copolymers and Compounds can offer a broad range of material choices fulfilling the stringent insulation safety requirements for comparative tracking index (CTI) material solutions as defined by EE industries.



INDUSTRY CHALLENGES

- Electrical insulation
- Heat & mechanical resistance
- Property retention over lifetime
- Weight & cost out, design freedom
- Sustainability, nonintentional added PFAS

MATERIAL REQUIREMENTS

- High CTI acc. to UL746 & IEC60112
- High heat resistance, RTI ≥150°C
- Stable elec. properties over temp.
- Thin wall design (good flow)
- FR performance acc. to UL746

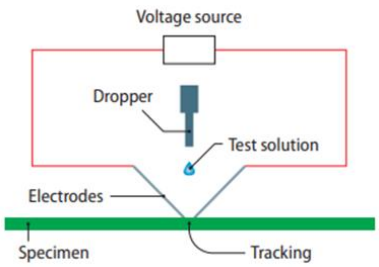
METHODOLOGY FOR CTI TEST

- IEC 60112 ((UL 746)
- Test 5 samples at each voltage
- Start testing at 300V
- Pass when no tracking at > 50 drops
- When pass, go up in steps of 25V
- Voltage on yellow card

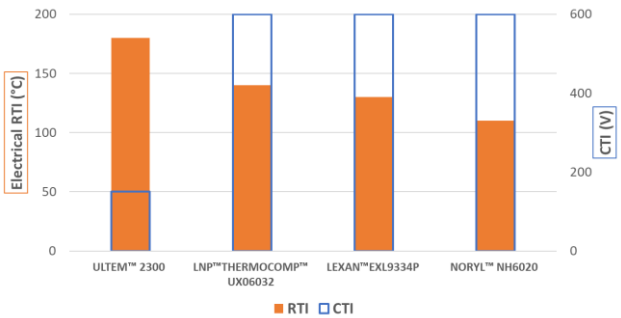
MATERIALS FEATURES

- High CTI class with high RTI
- Good resistance to variety of chemicals
- Portfolio set up to serve different needs
- Consistent electrical properties during life
- Mechanical & dimensional stability options
- Choices for inherent & halogen free FR

Experimental set up for CTI test



Portfolio for CTI material solutions



GRADE	MATERIAL	UL 94		CTI UL 746A	RTI UL 746B	ADDITIONAL FEATURES
		Flame Class	Min. Thk. mm	CTI (V)	RTI elec. (°C)	
ULTEM™ (HU) 2300	PEI GF30	5VA V-0	1.2 0.25	150	180	High heat & resilient, low CTE, inherent flame retardance, healthcare management of change policy
LNP™ THERMOCOMP™ UX06032	PPA GF30	V-0	0.41	600	140	Thin wall, halogen-free flame retardant, heat stabilized, high stiffness
VALOX™ FR ENH4560	PBT GF30	5VA V-0	1.5 0.8	600	140	Thin wall non-chlorinated/ brominated flame retardant with excellent chemical resistance
NORYL™ GTX4610	PPE/PA GF10	5VA V-0	2.0 1.5	425	140	Halogen-free flame retardant, F1 for outdoor use, excellent chemical & high heat resistance and flow
LEXAN™ EXL9334P	PC Copolymer unfilled	5VA V-0	3 1.2	600	130	Halogenated flame retardant, F1 for outdoor us, low temperature ductility (-60°C), solar connectors
NORYL™ NH6020	PPE/PS Unfilled	5VA V-0	2.5 0.75	600	110	Thin wall, halogen-free flame retardant, F1 for outdoor usage, IEC 60335 compliant
NORYL™ NHP8000VT3	PPE/PS unfilled	V-0	0.25	600	110[2]	Ultra thin wall, halogen-free flame retardant & high CTI performance, capable for extrusion & insulation film

CONTACT INFORMATION

SABIC SPECIALTIES BUSINESS

AMERICAS
E: Specialties.Americas@sabic-hpp.com
T: +1 800 845 0600

ASIA PACIFIC
E: Specialties.Asia@sabic-hpp.com
T: +86 400 833 1033

EUROPE
E: Specialties.EMEA@sabic-hpp.com
T: +36 1 288 3040

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