

CHEMISTRY THAT MATTERS™



GET MORE RESISTANCE TO HARSH CHEMICALS

LNPT™ ELCREST™ CXL COPOLYMERS

Helping to extend the service life of components in
mobility, infrastructure, industrial and electronics



ABOUT SABIC SPECIALTIES

SABIC's Specialties business offers more than just materials. We stay ahead of the game by developing new products to keep up with the latest regulatory, scientific and consumer trends. And we're always looking for new ways to add value to your experience.

SABIC invites you to work with us in a personal and collaborative way. We are well equipped to support your product development team with expertise in materials, design, application development, processing and testing.

Contact us today to learn more.

Email us at Specialties@sabic-hpp.com

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Look for our
sustainability
icon



Frequent exposure to strong chemicals can impact the aesthetics and service life of traditional plastic components. LNP™ ELCRES™ CXL PC copolymers are highly resistant to many types of aggressive chemicals.

Chemicals pose an increasing risk to plastics used in mobility, infrastructure, industrial and consumer electronics applications. Concerns about cleanliness have persisted following the COVID-19 pandemic, leading consumers to continually disinfect surfaces that they touch.

The popularity of wearable electronics and the constant use of smartphones expose electronic devices to chemicals used in lotions, insect repellent, hand sanitizer and sunscreen. Additionally, the growing adoption of electric vehicles means more drivers are handling – and disinfecting – public electric vehicle (EV) charging infrastructure.

Exposure to strong chemicals on a more-frequent basis can mean problems for parts made with traditional plastics:

- Changes in color and gloss level
- Softening of the material
- Crazing (surface-level defects)
- Environmental stress cracking

These effects can shorten the life of the part, cause customer dissatisfaction and increase plastic waste in the environment.

LNP™ ELCREST™ CXL COPOLYMERS FOR IMPROVED CHEMICAL RESISTANCE

To help manufacturers find solutions to increased chemical exposure, SABIC developed a new portfolio of polycarbonate (PC) copolymer resins.

LNP ELCREST CXL copolymer resins are highly resistant to many types of aggressive chemicals found in the mobility, infrastructure, industrial and electronics sectors.

- Mobility chemicals could include motor oil, gasoline, antifreeze, transmission fluid and washing chemicals.
- For industrial applications, typical chemical exposures include tar remover, IPA, turpentine, and caustic soda
- Consumer electronics and EV charging stations are often in contact with hand creams, cosmetics, sunscreen, insect repellent and hand sanitizer.

In addition to chemical resistance, LNP ELCREST CXL copolymers portfolio contains grades that provide:

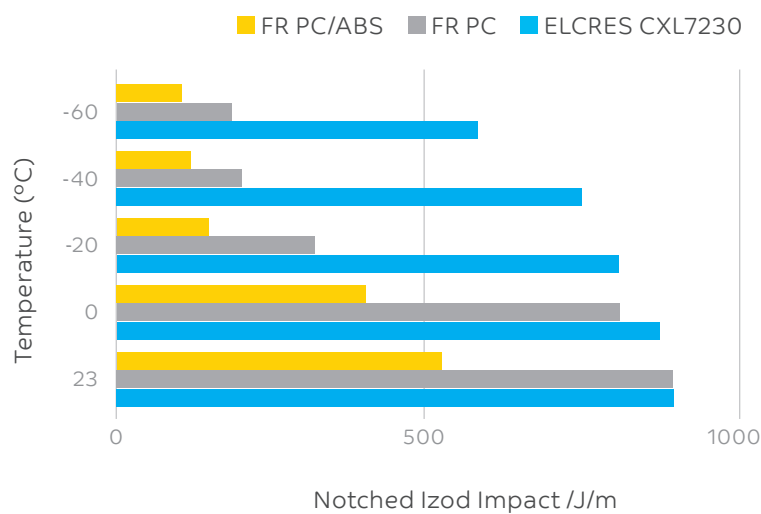
- Non-brominated/non-chlorinated flame retardance at thin gauges
- Excellent low-temperature impact and ductility (down to -60°C)
- High flow for easy processing and fast throughput
- Good colorability to meet aesthetic requirements

A PATH TOWARD CARBON NEUTRALITY

To help provide a path toward carbon neutrality, SABIC offers ISCC PLUS certified bio-renewable versions of the new materials, supplied under the LNP ELCRIN™ CXL brand. These grades are new additions to the company's TRUCIRCLE™ program, which are products and services that aim to help companies around the world meet their sustainability goals.



Figure 1. Low temperature impact resistance



LNP ELCREST CXL7230 copolymer offers better impact resistance at lower temperatures vs FR PC and FR PC/ABS. ELCRES CXL7230 copolymer offers 100% ductility down to -60 °C.

WHY CHOOSE LNP ELCRES CXL COPOLYMERS?

Although they are amorphous, LNP ELCRES CXL copolymer resins can deliver good chemical resistance. Thanks to a chemically modified polymer backbone, they surpass the resistance of traditional amorphous like polycarbonate (PC), and acrylonitrile-butadiene-styrene (ABS) resins/blends.

See Figure 2 for data on how different materials, including a representative LNP ELCRES CXL grade, withstand common consumer and industrial chemicals. Similarly, Figure 3 shows compatibility of these materials with common automotive chemicals.

Figure 2. Chemical resistance data: Industrial and consumer chemicals

SABIC ESC Method: per ASTM D543 Strain level: 1% strain Exposure condition: 23°C Application: Saturation method		Exposure days	Banana Boat™ sunscreen	Fantastik™ cleaner	OFF DEET™ lotion	Sebum	Hydrogen peroxide 30%	Oleic Acid
PRODUCT			$\sigma_y \epsilon_b$	$\sigma_y \epsilon_b$	$\sigma_y \epsilon_b$	$\sigma_y \epsilon_b$	$\sigma_y \epsilon_b$	$\sigma_y \epsilon_b$
FR PC/ABS	5	■ ■	■ ■	■ ■	■ ■	■ ■	▲ ■	—
FR PC	5	■ ■	■ ■	■ ■	● ■	● ■	● ■	—
EXL9330 PC COPOLYMER	5	■ ■	■ ■	■ ■	● ▲	● ▲	—	—
CXL7230 PC COPOLYMER	5	▲ ■	● ●	● ■	● ●	● ●	—	—
TRANSPARENT PC	5	■ ■	▲ ■	● ▲	● ■	—	● ▲	—
TRANSPARENT EXL1414T PC COPOLYMER	5	■ ■	■ ■	● ●	● ■	—	● ■	—
TRANSPARENT CXL1313T PC COPOLYMER	5	● ●	● ■	● ●	● ▲	—	● ●	—

SABIC's ESC method evaluates retention of tensile properties versus control for up to five days. This information should be viewed as a screening test. End users are responsible for determining the suitability of these products for their application requirements.

Compatibility criteria color rating	Tensile stress at yield retention σ_y (%)	Tensile elongation at break retention ϵ_b (%)
Compatible	> 90	80 – 139
Marginal	80 – 89	65 – 79
Not compatible	< 79	< 64 or > 140

Figure 3. Chemical resistance data: Automotive chemicals and fluids

SABIC ESC Method: per ASTM D543						
Exposure: 48 hrs						
Strain level: 0% strain						
Application according LV214						
Aging temperature 50°C						
PRODUCT	$\sigma_y \epsilon_b$	$\sigma_y \epsilon_b$	$\sigma_y \epsilon_b$	$\sigma_y \epsilon_b$	$\sigma_y \epsilon_b$	$\sigma_y \epsilon_b$
FR PC	● ▲	● ●	● ■	● ●	● ●	● ▲
CXL7230 PC COPOLYMER	● ●	● ●	● ●	● ●	● ●	● ●

HOW CAN YOUR APPLICATIONS BENEFIT?

Applications requiring a high level of durability, such as electronic device housings, EV charging infrastructure, EV and E-bike battery housings and electrical enclosures, can benefit from the exceptional chemical resistance of LNP ELCRES CXL copolymer resins.

Advantages include:

- Retaining performance properties and aesthetics
- Extending useful life
- Maintaining value
- Protecting brand reputation
- Avoiding replacement cost and waste due to premature failure





WHICH LNP™ ELCRES™ CXL COPOLYMER GRADE IS RIGHT FOR YOU?

SABIC experts can help you choose the appropriate product for your needs from the portfolio shown in Figure 4.

Figure 4. LNP ELCRES CXL PC Copolymer Portfolio

		MFR 300C/1.2KGf		DUCTILITY	UL 94 RATING	FEATURES
LNP ELCRES CXL Portfolio	Transparent	CXL1313T	6	-30d	UL94 HB @ 0.75mm for all colors	Thin wall transparency
	Opaque	CXL1434	10	-60d	UL94 HB @ 0.75mm for all colors	UV stabilized
		CXL9730E	4**	-60d	UL94 V0 @ 1.5mm in black	extrusion grade non-Br/Cl FR
		CXL9030	6	-60d	UL94 V0 @ 1.5mm for all colors	UV stabilized non-Br/Cl FR
		CXL7230	13	-60d	UL94 V0 @ 1 mm for all colors	f1 non-Br/Cl FR
	Filled	CXL1521F4	33***	23d	UL94 HB @ 0.6mm for all colors	High modulus with 20% GF

**MFR, 300°C/2.16 kgf

*** MFR, 260°C/5.0 kgf

Contact us to request additional chemical resistance exposure data and to discuss your application requirements.

We're here to help.

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