CHEMISTRY THAT MATTERS™

LNP™ EXL COPOLYMER RESINS FOR HEALTHCARE

SABIC'S SPECIALTIES BUSINESS

LNP™ EXL COPOLYMER RESINS HEALTHCARE PORTFOLIO

Applications in the healthcare industry have unique and demanding requirements. Thermoplastic material selection for medical devices and equipment housings will continue to be very important to help keep vital equipment in service for longer periods of time, reduce system costs, and support improved patient safety.

OEMs can collaborate with material suppliers early within the design process to identify the appropriate solutions to meet performance requirements.

DESIGNERS AND ENGINEERS SEEK MATERIAL SOLUTIONS THAT FEATURE:

- Superior impact and excellent processability
- Chemical resistance to healthcare chemicals
- Excellent property retention in high humidity environment
- Healthcare management of change policy
- Compliant with certain FDA and EU Food Contact regulations
- Steam autoclave sterilization capability up to 121°C and good impact retention
- EtO and Gamma/e-beam sterilizable
- Clear/transparent Broad color space
- Biocompatibility (ISO 10993 or USP Class VI)
- Laser weldable in light colors

POTENTIAL HEALTHCARE APPLICATIONS:

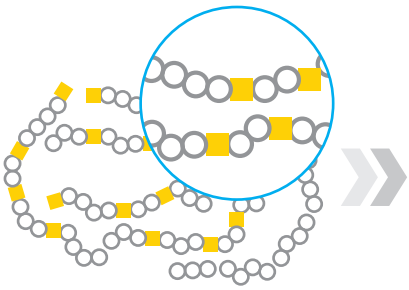
Enclosures/ housings

Respiratory masks

Insulin pens

Fluid & drug delivery devices

LNP™ EXL RESIN IS A COPOLYMER OF POLYCARBONATE AND SILOXANE



POLYCARBONATE

Heat Stability
Modulus

+

SILOXANE

Low temperature
Impact strength
Excellent release
Improved weatherability

The EXL copolymer structure combines the best of PC and siloxane properties, resulting in a significant improvement vs. standard PC and PC blends. The siloxane forms a chemical link in the PC backbone to provide outstanding low temperature impact performance. Since silicone is relatively unaffected by heat or humidity under typical aging conditions, the materials retain their properties longer than standard PC.

The improved toughness of EXL copolymer resin addresses cracking or ductility limitations that can occur with standard PC or PC/ABS blends. EXL resin can offer enhanced performance when using snap fit or metal insert designs and allow for lower draft angles and lower levels of molded-in stresses, as compared to standard PC.

POTENTIAL BENEFITS OF LNP™ EXL COPOLYMER RESINS:

- **Impact:** Outstanding balance of ductility (up to -30°C) and viscosity
- **Weatherability:** Excellent retention of mechanical properties in outdoor exposure
- **Aging:** Improved retention of properties vs. other PC resins
- **Flame Retardance:** FR grades can be used in many applications that require compliance with certain sustainability or environmental standards
- **Knit line Strength:** A significant improvement over PC/ABS materials
- **Chemical Resistance:** Improved chemical resistance to some chemicals compared to standard PC resins

HEALTHCARE PORTFOLIO

LNP™ EXL resin HPX Healthcare Portfolio				
	Autoclave + EtO sterilization	10 MFR	HPX4 HPX4EU*	V-2 @ 2.5mm
			HPX4R HPX4REU*	Release, V-2 @ 2.5mm
		35 MFR	HPX8R HPX8REU*	High flow and Release, HB @ 1.5mm
	Autoclave + EtO + Gamma & E-beam sterilization	35 MFR	HPXS8R	High Flow, Gamma and E-beam HB @ 1.5mm

* Grades ending with EU: Europe Source

PROCESSING EXL RESINS

Extensive studies at SABIC's Polymer Processing Development Center (PPDC) have found that, compared to a standard PC resin of the same melt flow, EXL resin exhibits lower effective viscosity at comparable shear rates that can contribute to a reduction in injection pressure (see Figure 1).

Since the silicone component of the copolymer is bound to the resin, there is little tool deposit during molding. Additionally, the use of specific release additives, which can result in tool deposit, can be eliminated. Due to inherent release properties, part ejection pressures (see Figure 2) are lower. Depending on tool design, EXL resin compared to PC resin, may provide reduced cycle times.

EXL resins exhibit versatility in flow and impact performance. Spiral flow studies have confirmed a significant improvement in flow length. When compared to standard PC resins in the range of 10 to 17 MFR, EXL resins provide multiple opportunities to offer increased toughness and flow (see Figure 3).

Figure 1:
Effective viscosity @ 315°C melt / 82°C mold

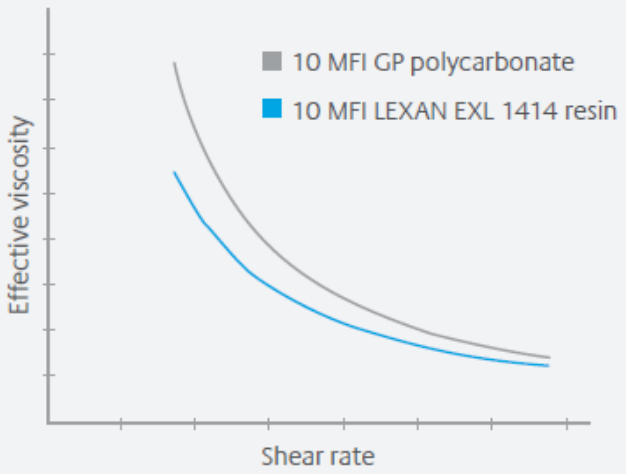


Figure 2:
Part ejection pressure

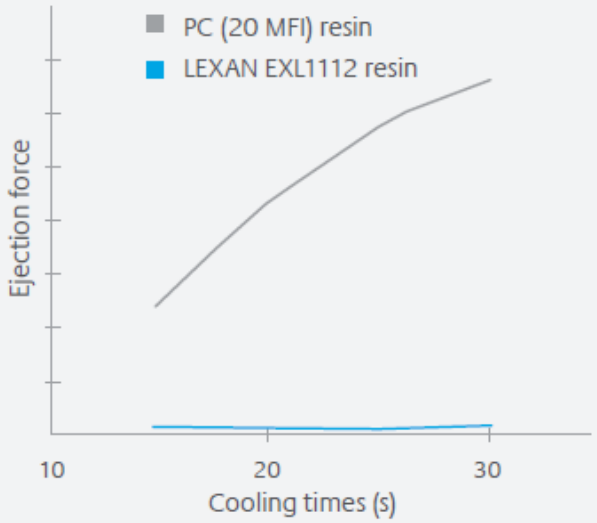
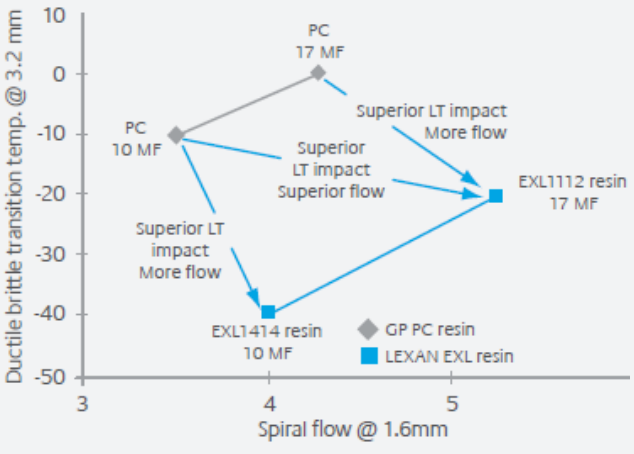


Figure 3:
Flow and ductility benefits



POTENTIAL PROCESSING BENEFITS USING LNP™ EXL COPOLYMER RESINS (depending on tool design):

- Lower injection pressures
- Lower ejection pressures
- Higher flow
- Improved ductility/toughness
- Shorter production cycle time
- Lower draft angles

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SCAN TO CONNECT WITH US ON LINKEDIN