

CHEMISTRY THAT MATTERS™



LNPT™ EXL COPOLYMER RESINS FOR HEALTHCARE

SABIC'S SPECIALTIES BUSINESS



LNPT™ 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



Steam autoclave sterilization capability up to 121°C and good impact retention



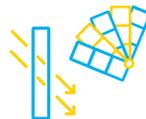
Chemical resistance to healthcare chemicals



EtO and Gamma/e-beam sterilizable



Excellent property retention in high humidity environment



Clear/transparent
Broad color space



Healthcare management of change policy



Biocompatibility (ISO 10993 or USP Class VI)



Compliant with certain FDA and EU Food Contact regulations



Laser weldable in light colors

POTENTIAL HEALTHCARE APPLICATIONS:



Enclosures/
housings



Respiratory
masks

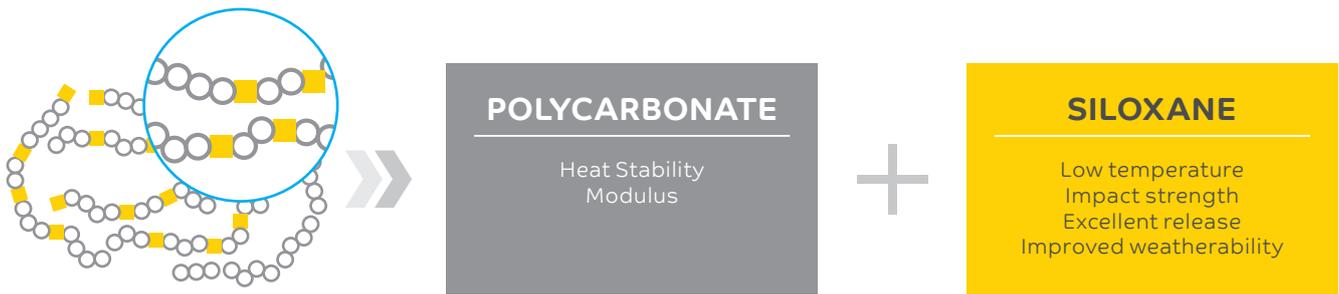


Insulin
pens



Fluid & drug
delivery devices

LNPTM EXL RESIN IS A COPOLYMER OF POLYCARBONATE AND SILOXANE



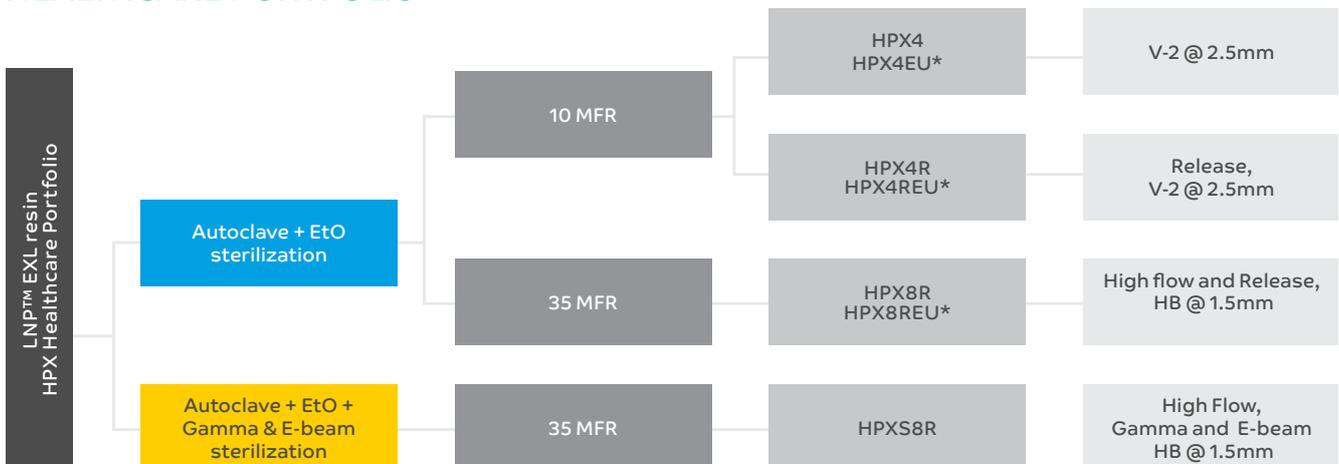
The EXL copolymer structure combines the best of PC and siloxane properties, resulting in a significant improvement vs. standard PC and PC blends. The siloxane forms a chemical link in the PC backbone to provide outstanding low temperature impact performance. Since silicone is relatively unaffected by 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 LNPTM 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



* 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

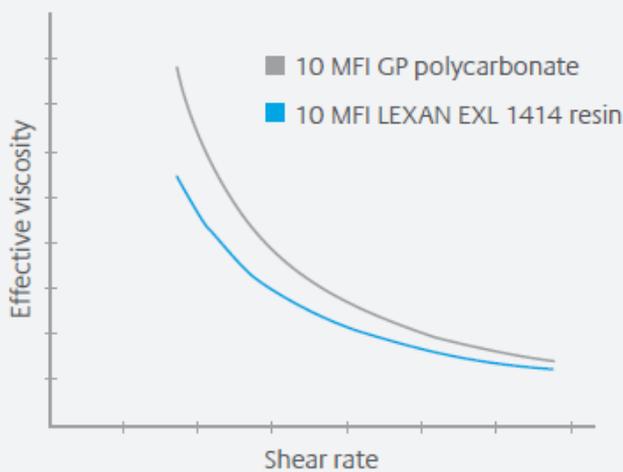


Figure 2:
Part ejection pressure

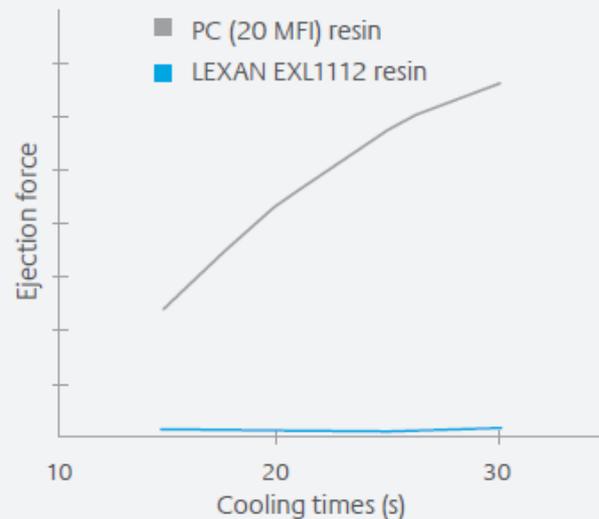
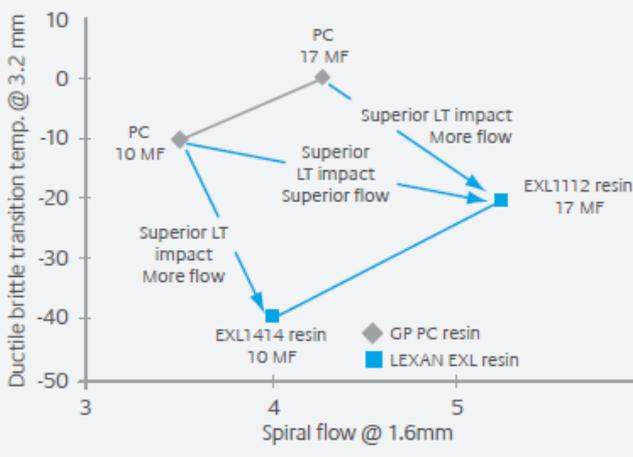


Figure 3:
Flow and ductility benefits



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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