



By your side  
for a healthier world™



## Molding the Future of Drug Pharmaceutical Packaging & Delivery

### Daikyo Crystal Zenith® High-Quality Polymer Syringe Systems Designed to Maintain Purity, Integrity and Efficacy of Biopharmaceuticals

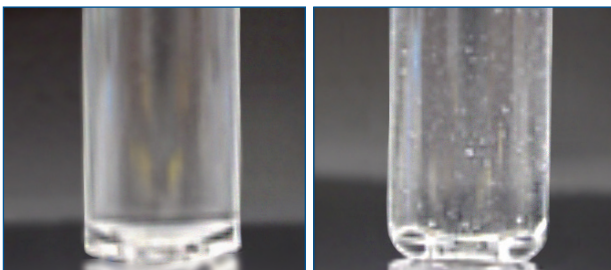
Daikyo Crystal Zenith®, an engineered cyclic olefin polymer containment and delivery system, was designed as a high-performance alternative to glass. It is designed to protect drug safety, purity and efficacy from development through commercialization – silicone oil free, with FluroTec® elastomers and approved in global markets.

#### The Insert Needle Syringe system offers:

- Reduced protein aggregation and stability risks
- Suitable for high-viscosity products
- Consistent functional performance without silicone oil
- Improved flange strength and breakage resistance
- Tight dimensional tolerances
- Compatibility with auto-injectors
- Multiple needle options and sizes
- Sterile and validated to help meet compliance requirements
- Direct introduction into aseptic and barrier isolator filling lines
- Eliminate fill-finish interventions due to glass breakage



#### Silicone Oil Free, Crystal Zenith Syringes Minimize Aggregation



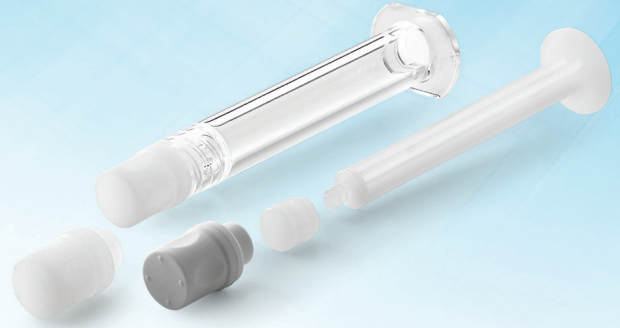
CZ Syringe | No Silicone Oil

Glass Syringe | Siliconized

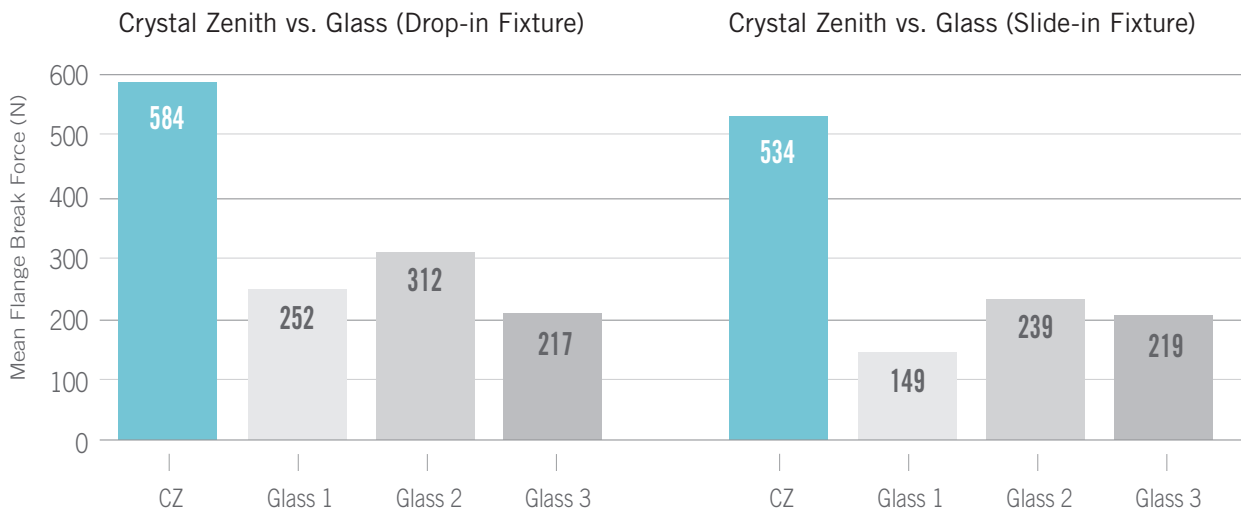
Characterization of Protein Aggregation & Adsorption on Prefillable Syringe Surfaces; Reza Esfandiari, Sangeeta B. Joshi and C. Russell Middaugh, University of Kansas; and Vinod Vilivalam, West Pharmaceutical Services, Inc.; 2008

### Luer Lock Syringe System offers:

- Improved drug stability and shelf life
- Suitable for high-viscosity products
- Consistent functional performance without silicone oil
- Improved flange strength and breakage resistance
- Tight dimensional tolerances
- Multiple barrel sizes and fill volume capacity
- Sterile and validated to help meet compliance requirements
- Direct introduction into aseptic and barrier isolator filling lines
- Eliminate fill-finish interventions due to glass breakage



### Crystal Zenith's Superior Syringe Flange Strength Tested



Crystal Zenith barrels consistently outperformed glass in drop-in and slide-in mechanical force tests comparing 1 mL Crystal Zenith barrels to 1 mL glass barrels from three glass suppliers.

Contact West today to learn more about how Crystal Zenith can help you move your molecule to market with the worry of unexpected interactions, breakage or storage concerns.

For more information visit [www.westpharma.com](http://www.westpharma.com)

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