Formerra™

Product Selection Guide

FORMERRA HEALTHCARE SOLUTIONS

Drug Delivery Devices

Formerra.com

Drug Delivery Devices

Healthcare professionals and patients use drug delivery devices every day to administer IV therapy, inhalations and injections. Performance and reliability is paramount, as these devices are becoming more complex pushing device developers to create new delivery methods geared towards ease of self-dosing and patient regimen adherence.

Formerra can help you solve your toughest application challenges by providing a specialized approach to the latest material technologies. With a dedication to sustainable solutions, technical and logistics expertise and innovative design engineering capabilities, we can help you deliver safe and reliable, industry-leading products to patients, caregivers, and medical professionals alike.

Our Suppliers

In addition to maintaining an effective manufacturing and supply chain operation, you're faced with designing products that must meet strict regulatory and quality assurance standards. At Formerra, we help you achieve these goals with our comprehensive portfolio of leading suppliers, on-time delivery and a host of services focused on helping you succeed.

AmSty

AVIENT

Celanese
The chemistry inside innovation™

covestro

Delrin®

DOW

EASTMAN

GEON
Performance Solutions

INEOS
Olefins & Polymers USA

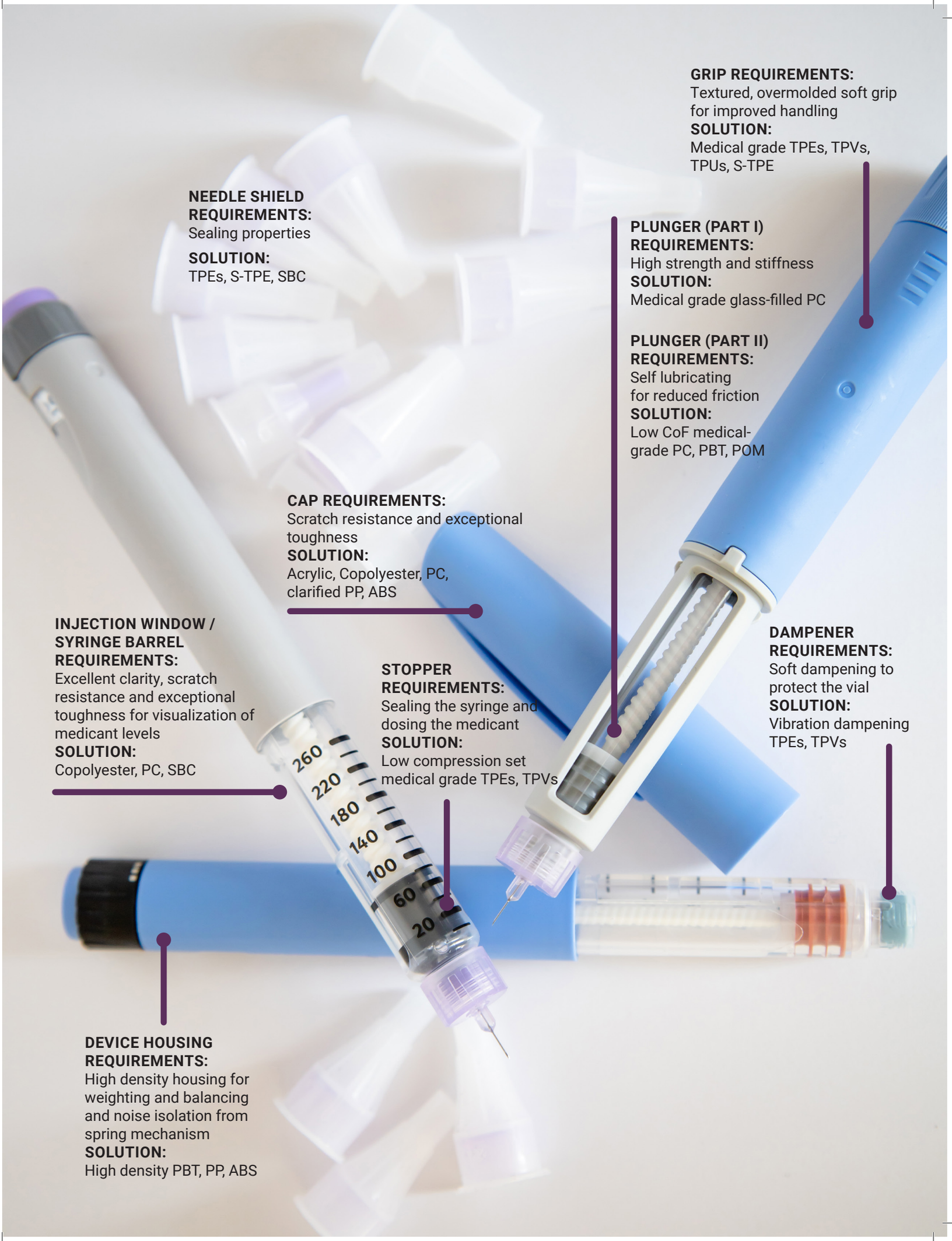
INEOS
STYROLUTION

INVISTA™
POLYPROPYLENE

LYB LyondellBasell

Pinnacle Polymers

TRINSEO



GRIP REQUIREMENTS:
Textured, overmolded soft grip for improved handling
SOLUTION:
Medical grade TPEs, TPVs, TPUs, S-TPE

NEEDLE SHIELD REQUIREMENTS:
Sealing properties
SOLUTION:
TPEs, S-TPE, SBC

PLUNGER (PART I) REQUIREMENTS:
High strength and stiffness
SOLUTION:
Medical grade glass-filled PC

PLUNGER (PART II) REQUIREMENTS:
Self lubricating for reduced friction
SOLUTION:
Low CoF medical-grade PC, PBT, POM

CAP REQUIREMENTS:
Scratch resistance and exceptional toughness
SOLUTION:
Acrylic, Copolyester, PC, clarified PP, ABS

INJECTION WINDOW / SYRINGE BARREL REQUIREMENTS:
Excellent clarity, scratch resistance and exceptional toughness for visualization of medicant levels
SOLUTION:
Copolyester, PC, SBC

STOPPER REQUIREMENTS:
Sealing the syringe and dosing the medicant
SOLUTION:
Low compression set medical grade TPEs, TPVs

DAMPENER REQUIREMENTS:
Soft dampening to protect the vial
SOLUTION:
Vibration dampening TPEs, TPVs

DEVICE HOUSING REQUIREMENTS:
High density housing for weighting and balancing and noise isolation from spring mechanism
SOLUTION:
High density PBT, PP, ABS

Rigid Components
IV Therapy, Inhalation & Injection

Applications include:

- IV y-sites
- Drip chambers
- Syringe bodies
- Valves
- Luers
- Spikes
- Caps
- Plungers
- Gears
- Actuators
- Housings

Rigid Component Solution Needs:

- Materials compliant with ISO 10993 & USP Class VI, if required
- Devices resistant to cracking with exposure to lipids, drugs &/or hand oils
- Components that retain mechanical & aesthetic integrity after sterilization
- Components that exhibit long-lasting bond strength
- High quality resins with proven performance in drug delivery devices

High-Performance Polymers		
Liquid Crystal Polymer (LCP)	Celanese Vectra® MT® (LCP)	Medical devices requiring high stiffness, high aspect ratio features. Capable of thin wall molding and appropriate for direct tissue contact
Polyphenylene Sulfide (PPS)	Celanese Fortron® MT® (PPS)	High-temperature thermoplastic material that offers an excellent combination of thermal, mechanical and chemical resistance properties
Copolyester, PBT & PC/PET Blends		
Copolyester	Eastman Tritan™ (Copolyester)	High chemical resistance to oncology drugs and carrier solvents, lipids, and disinfectants; clarity; no color shift after gamma/e-beam sterilization; free of BPA, BPS, halogens; high bond strength to tubing
Polybutylene Terephthalate (PBT)	Celanese Crastin® (PBT)	Excellent surface appearance; good printability; low extractables and volatiles; excellent gamma sterilization performance; good chemical resistance; alternative to nylon for low moisture uptake and dimensional stability; low wear/low friction
Non-FR PC/Polyester	Covestro Makroblend® (Non-FR PC/Polyester)	Opaque; high strength; excellent toughness; chemical resistance; skin contact biocompatibility
PC & PMMA		
Polycarbonate (PC)	Covestro Apec® (HH PC)	High-heat transparent, strong co-polycarbonate; suitable for autoclave sterilization; good hydrolysis resistance; biocompatible
	Covestro Makrolon® (PC)	Transparent and opaque; excellent impact resistance; low friction, glass-filled and lipid resistant options; sterilizable by gamma, EtO, e-beam and steam; biocompatible per ISO 10993-1 and USP Class VI
	Trinseo CALIBRE™ & CALIBRE™ MEGARAD™ (PC)	Transparent and opaque; lipid and gamma resistant options; sterilizable by gamma, e-beam, and EtO; animal-derivative free and ISO 10993 tested
PolyMethyl Methacrylate (PMMA)	Trinseo Plexiglas® SG Acrylics (PMMA)	Water-white clarity, transparency, BPA free and ease of processing; excellent resistance to lipids and plasticizers, withstands sterilization to disinfectants such as bleach and alcohols; select grades are formulated for gamma sterilization recovery and chemical resistance; ISO 10993 and USP Class VI tested
PA (Nylon), Rigid TPU & Rigid PVC & PVC Blends		
Polyamide (Nylon, PA)	Celanese Zytel® (PA66)	Good toughness; chemical resistance and colorability; excellent stiffness and strength; acceptable EtO, gamma, e-beam, and autoclave sterilization
	Celanese Zytel® (PA612)	Good toughness and colorability; acceptable EtO and autoclave sterilization (limited gamma/e-beam sterilization performance); improved dimensional stability; chemical resistance; reduced aqueous extractables versus PA66
Rigid Thermoplastic Polyurethane (TPU)	Covestro Texin® (TPU)	Biocompatible; excellent chemical resistance; bondable to polar substrates like PC; sterilizable by gamma, EtO, e-beam and dry heat; rigid 65 to 80 Shore D grades
Rigid Polyvinyl Chloride (PVC)	GEON Performance Solutions Resilience™ HC (PVC)	Excellent chemical resistance; physical integrity after chemical/cleaner exposure; inherently flame retardant; color branding available; excellent solvent bonding to PVC tubing
Rigid Polyvinyl Chloride/ABS (PVC/ABS)	GEON Performance Solutions Geon® HTX™ (PVC/ABS)	High temperature resistance; excellent chemical resistance; physical integrity after chemical/cleaner exposure; inherently flame retardant; color branding available; excellent solvent bonding to PVC tubing

Rigid Components
IV Therapy, Inhalation & Injection

Applications include:

- IV y-sites
- Drip chambers
- Syringe bodies
- Valves
- Luers
- Spikes
- Caps
- Plungers
- Gears
- Actuators
- Housings

Rigid Component Solution Needs:

- Materials compliant with ISO 10993 & USP Class VI, if required
- Devices resistant to cracking with exposure to lipids, drugs &/or hand oils
- Components that retain mechanical & aesthetic integrity after sterilization
- Components that exhibit long-lasting bond strength
- High quality resins with proven performance in drug delivery devices

Styrenics & PC/ABS Blends

Styrenics	Trinseo MAGNUM™ (ABS)	Opaque; custom colors; excellent impact and flow; low residuals; ISO 10993 tested
	INEOS Styrolution NAS® (SMMA)	Sparkling clarity; color neutrality; good rigidity; easy processing; no pre-drying needed; excellent alcohol resistance
	INEOS Styrolution Zylar® & Clearblend® (MBS)	Exceptional toughness; excellent clarity; low specific gravity; no pre-drying needed; excellent thermal stability; superior chemical resistance
	INEOS Styrolution Styrolux® and K-Resin® (SBC)	Rigid; heat resistant; outstanding transparency; good overall chemical resistance; superior processing; good scratch resistance
	INEOS Styrolution Styrolux® (SBC)	Good transparency and excellent toughness; easy and versatile processing; great for adding toughness to styrenic polymer blends
	INEOS Styrolution Terlux® HD (MABS)	Good clarity; good heat and overall chemical resistance; good impact strength; good solvent bonding to PVC; outstanding surface quality
	INEOS Styrolution Novodur® HD (ABS)	Opaque appearance; outstanding chemical resistance; high impact strength; excellent balance of properties; ease of processability; bondable
Polycarbonate/ABS (PC/ABS)	Covestro Bayblend® (PC/ABS)	Opaque; excellent mechanical and thermal properties; toughness; rigidity; dimensional stability; easy processing; sterilizable by gamma, e-beam and EtO; biocompatible per ISO 10993-1 and USP Class VI
	Trinseo EMERGE™ (PC/ABS)	Opaque; high toughness; high flow; easy processing; sterilizable by gamma, e-beam, and EtO; ISO 10993 tested

POM (Acetal), PP & PE

Polyoxymethylene (Acetal, POM)	Delrin Delrin® (POM)	Excellent low wear/low friction; excellent surface appearance; good chemical resistance; alternative to nylon for low moisture uptake and dimensional stability; acceptable for EtO and autoclave sterilization (not recommended for gamma/e-beam sterilization)
Polypropylene (PP) & Polyethylene (PE)	INVISTA™ (PP)	Good strength and stiffness; easy processing; sterilizable grades available
	Pinnacle™ (PP)	
	Dow™ HEALTH+ Polymers™ (PE)	
	Lyondellbasell™ (PP) & (PE)	

Flexible Components
IV Therapy, Inhalation & Injection

Applications include:
- O-rings
- Plunger seals
- Gaskets
- Spring seals
- Soft-touch overmolds

Flexible Component Solution Needs:
- Materials compliant with ISO 10993 & USP Class VI, if required
- Optimum sealing force & compression set for gaskets & valves
- Comfortable, easy to hold & operate devices
- Flow control

TPE, TPC-ET, TPU, TPV & Flexible PVC		
Thermoplastic Elastomers (TPE)	Avient Versaflex™ HC Series (TPE)	Proven healthcare solutions with hardness ranges 23–90 Shore A; autoclave, radiation and EtO sterilizable; good ambient and elevated compression set properties
	Avient Versaflex™ HC Overmolding Series (TPE)	Proven healthcare solutions with hardness ranges 42–65 Shore A; autoclave, radiation and EtO sterilizable; bondable to PC, ABS, PVC, COPE, PP, HIPS and others
Thermoplastic Polyester Elastomers (TPC-ET)	Celanese Hytrel® (TPC-ET)	BPA-free; excellent flex fatigue and toughness; low temperature flexibility; good chemical resistance
Thermoplastic Polyurethane (TPU)	Avient NEU™ Specialty Engineered Materials (TPU)	Biocompatible; various durometer ranges; autoclave, radiation and EtO sterilizable
	Covestro Texin® (TPU)	Biocompatible; soft touch; sterilizable; good chemical and abrasion resistance and toughness; excellent bonding to polar substrates like PC; 70 to 95 Shore A grades
Thermoplastic Vulcanizate (TPV)	Avient Versalloy™ (TPV)	Proven healthcare solutions with hardness ranges 45–90 Shore A; autoclave, radiation and EtO sterilizable; natural and colorable; smooth texture; bonds to PP
	Celanese Santoprene™ (TPV)	Durable sealing performance; elastic recovery; excellent chemical resistance; compliance with medical standards
Flexible Polyvinyl Chloride (PVC)	GEON Performance Solutions Geon™ Flexible PVC	Engineered exclusively for the healthcare market; transparent and opaque colors; radiopaque grades available; durometer range from 55A to 40D; gamma and EtO sterilizable
Thermoset Silicone Elastomers		
Thermoset Silicone Elastomers/Liquid Silicone Rubber (LSR)	DuPont™ Liveo™ Silicone Elastomers	Biocompatible; non-irritating and non-sensitization; sterilizable; made without plasticizers, phthalates or latex
SBC		
Styrene Butadiene Copolymer (SBC)	INEOS Styrolution Styroflex® (SBC)	Rubber-like mechanics; outstanding resilience; toughness and transparency; extremely high elasticity; excellent bonding to other polymers

When it comes to administering life-saving drugs, your devices need to properly perform every time. With the right polymers, your devices will not only resist cracking, but can also bring greater comfort to both the patient and physician.

- IV y-Site
- Luers
- Needleless Valves
- Stopcocks & Connectors
- Drip Chambers
- Syringes
- Inhalers
- Injector Pens

Formerra

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2024-12-SGUIDE-DRUG-DELIVERY-DEVICES