Formerra™

Product Selection Guide

FORMERRA HEALTHCARE SOLUTIONS

Patient Monitoring

Medical Wearables

The pandemic created a very different world for a lot of us, and this is more evident than ever in healthcare. An acceleration in the adoption of technology has rapidly expanded through the Internet of Medical Things. Because of this, selecting the best FDA-approved materials for skin contact, robustness, and chemical resistance is critically important while ensuring comfort, secure fit, and device accuracy through design optimization.

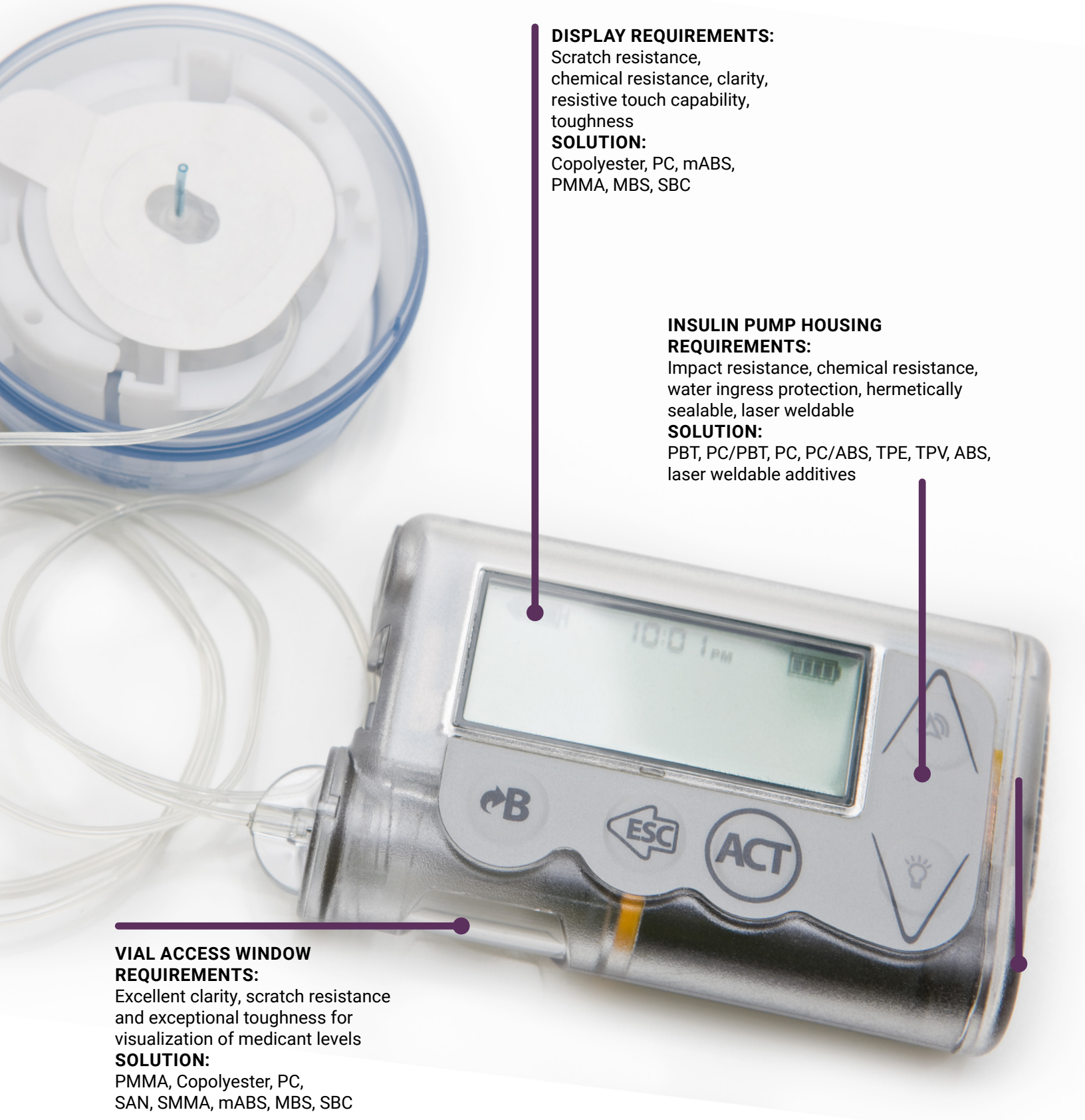
Formerra can help you solve your toughest application challenges by providing a specialized approach to the latest material technologies. With a dedication to sustainable solutions, technical and logistics expertise and innovative design engineering capabilities, we can help you deliver safe and reliable,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


SKIN ADHESIVE REQUIREMENTS:
Comfort and releasability, durability, moisture resistant, ability to be repositioned
SOLUTION:
Multi-layer customizable SSA or PSA adhesives
INFUSION SET CONNECTOR REQUIREMENTS:
Chemical resistance, clarity, dimensional stability, good bondability
SOLUTION:
Copolyester, PMMA, MBS, mABS
RESEVOIR CAP REQUIREMENTS:
Water ingress protection, tetherable, UV protection, ergonomical
SOLUTION:
Two-shot TP/TPE, PC, PP, TPV
TUBING REQUIREMENTS:
Kink resistance, chemical resistance, translucent, tear strength
SOLUTION:
SBC, S-TPE, TPE, cross-linkable elastomer
DEVICE HOUSING REQUIREMENTS:
Chemical resistance, impact resistance
SOLUTION:
PBT, PC/PET, PC/PBT, PA



DISPLAY REQUIREMENTS:
Scratch resistance, chemical resistance, clarity, resistive touch capability, toughness
SOLUTION:
Copolyester, PC, mABS, PMMA, MBS, SBC

INSULIN PUMP HOUSING REQUIREMENTS:
Impact resistance, chemical resistance, water ingress protection, hermetically sealable, laser weldable
SOLUTION:
PBT, PC/PBT, PC, PC/ABS, TPE, TPV, ABS, laser weldable additives

VIAL ACCESS WINDOW REQUIREMENTS:
Excellent clarity, scratch resistance and exceptional toughness for visualization of medicant levels
SOLUTION:
PMMA, Copolyester, PC, SAN, SMMA, mABS, MBS, SBC

Rigid Components
Diagnostic & Monitoring

Applications include:

- Housings
- Covers
- Clips
- Lenses
- Buttons
- Dials
- Battery panels
- Connectors
- Fasteners

Rigid Component Solution Needs:

- Materials compliant with ISO 10993 & USP Class VI, if required
- UL approved resins to meet flammability requirements, if required
- Materials that do not cause skin irritation or sensitization
- High degree of stiffness, strength and toughness to meet durability requirements
- Excellent chemical resistance to disinfectants & household cleaners, drug solutions, hand oils, lotions, sunscreen, etc.
- Broad spectrum of color & surface appearance options

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)	Durability, reliability, and toughness; impact resistance; chemical resistance to disinfectants and hand sanitizers, drug carrier solvents and lipids found in the body, or enteral feeding solutions; color retention for opaque and excellent clarity with no color shift for clear parts; no black specks; free of BPA, BPS, antimony, and halogens; high bond strength to tubing; no annealing required
Polybutylene Terephthalate (PBT)	Celanese Crastin® (PBT)	Excellent surface appearance; good printabilty; 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 (Crastin® SC164 and SC193)
	Celanese Crastin® & Rynite® (FR-PBT)	30% glass reinforced; UL94 V-0; good-excellent mold flow and electrical properties; high strength, stiffness, dimensional stability and heat resistance (Crastin® CE15330 and Rynite® FR530)
Polycarbonate/Polyester (PC/PET)	Covestro Makroblend® (FR- & Non-FR- PC/PET)	Opaque; high strength; excellent toughness; chemical resistance; skin contact biocompatibility
	Trinseo EMERGE™ (FR- & Non-FR PC/PET)	Chemical resistance to hospital disinfectants; UL94 V-0 and HB options; ISO 10993 tested
PC & PMMA		
Polycarbonate (PC)	Covestro Apec® (HH-PC)	High heat transparent, strong co-polycarbonate; suitable for autoclave sterilization; good hydrolysis resistance and biocompatible
	Covestro Makrolon® (PC)	Transparent and opaque; excellent impact resistance; sterilizable by gamma, EtO, e-beam and steam; biocompatible per ISO 10993-1 and USP Class VI ; low friction options
	Trinseo EMERGE™ & CALIBRE™ (PC)	Ignition resistant; transparent and opaque options; UL94 V-0, V-2, and HB options; glass-filled also available
PolyMethyl Methacrylate (PMMA)	Trinseo Plexiglas® 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, Rigid TPU & Rigid PVC		
Polyamide (Nylon, PA)	Celanese Zytel® (PA66)	Good toughness, chemical resistance and colorability; excellent stiffness and strength; acceptable EtO, gamma, e-beam and autoclave sterilization (Zytel® SC310 and Zytel® FGFE5171)
	Celanese Zytel® (PA612)	Good toughness and colorability; acceptable EtO and autoclave sterilization (limited gamma/e-beam sterilization performance); improved dimensional stability, chemical resistance, and reduced aqueous extractables versus PA66 (Zytel® SC315)
PA, Rigid TPU & Rigid PVC		
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; maintains physical integrity and color after frequent cleaner and/or disinfectant wipe down; inherently flame retardant to UL94 5VA; high impact toughness; USP Class VI

Rigid Components
Diagnostic & Monitoring

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Rigid Component Solution Needs:

- Materials compliant with ISO 10993 & USP Class VI, if required
- UL approved resins to meet flammability requirements, if required
- Materials that do not cause skin irritation or sensitization
- High degree of stiffness, strength and toughness to meet durability requirements
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- Broad spectrum of color & surface appearance options

Styrenics & PC/ABS Blends

Styrenics	Trinseo MAGNUM™ (ABS) & STYRON™ (PS)	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 Lustran® (SAN)	Rigid; heat resistant; outstanding transparency; good overall chemical resistance; superior processing; good scratch resistance
	INEOS Styrolution Styrolux® and K-Resin® (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 Lustran® & Novodur® HD (ABS)	Opaque appearance; outstanding chemical resistance; high impact strength; excellent balance of properties; ease of processability; bondable
	INEOS Styrolution NAS® (SMMA)	Extreme clarity, excellent flow properties, virtually no molded-in stress, high chemical resistance to alcohol, color neutrality
Polycarbonate/ABS (PC/ABS)	Covestro Bayblend® (PC/ABS)	Excellent mechanical and thermal properties; toughness, rigidity & dimensional stability; opaque; biocompatible per ISO 10993-1 and USP Class VI; flame retardant options available
	Trinseo EMERGE™ (FR- & Non-FR PC/ABS)	Ignition resistant; opaque; high flow; easy processing; UL94 V-0 and HB options; ISO 10993 tested

POM (Acetal), PP & PE

Polyoxymethylene POM (Acetal)	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
Diagnostic & Monitoring

Applications include:
- O-rings
- Gaskets
- Bumpers
- Soft touch grips/handles
- Keypads/Displays
- Diaphragms
- Seals

Flexible Component Solution Needs:
- Flexible & comfortable against the body
- Water-tight seals
- Durable buttons or user interface
- Chemically resistant materials

TPE, TPC-ET, TPU, TPV & Flexible PVC		
Thermoplastic Elastomers (TPE)	Avient Versaflex™ HC Overmolding Series (TPE)	Proven healthcare solutions with hardness ranges 42–65 Shore A; autoclave, radiation and EtO sterilizable; bondable to many substrates; customizable haptics
Thermoplastic Polyester Elastomers (TPC-ET)	Celanese Hytrel® (TPC-ET)	BPA-free; excellent flex fatigue and toughness; low temperature flexibility; good chemical resistance; grades ranging from 30–82 Shore D durometer
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 (fPVC)	GEON Performance Solutions Geon™ Flexible PVC	Engineered exclusively for the healthcare market; transparent and opaque colors; radiopaque grades available; durometer ranges from 55A to 40D; gamma and EtO sterilizable
Thermoset Elastomers, Thermoset Adhesives & Thermoplastic Adhesives		
Thermoset Elastomers	DuPont™ Liveo™ Liquid Silicone Rubber (LSR)	Biocompatible; non-irritating and non-sensitization; sterilizable; made without plasticizers, phthalates or latex; used in Liquid Injection Molding (LIM) process
	DuPont™ Liveo™ High Consistency Rubber (HCR)	Biocompatible; non-irritating and non-sensitization; sterilizable; made without plasticizers, phthalates or latex; used in extrusion or compression molding process
Thermoset Adhesive	DuPont™ Liveo™ Soft Skin Adhesive	Skin friendly; repositionable; solventless two-part system; non-irritation and non-sensitization; used for device attachment to the skin
Thermoplastics Adhesive	DuPont™ Liveo™ Silicone Pressure Sensitive Adhesive (PSA)	Skin friendly; one-part solvent silicone adhesive; high adhesion; used for device attachment to the skin
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

Your medical wearables and handheld devices need to be durable and properly perform every time. With the right polymers, your devices will not only look great, but they will resist cracking and bring greater comfort to both the patient and the physician.

- Ambulatory Pumps
- Mobile EKG Heart Monitors
- Smart Sensor Patches
- Mobility Analysis Wearables
- Vital Signs Monitors
- Sleep Tracking Wearables
- Blood Pressure Monitors
- Pain Management Wearables
- Wearable Defibrillators
- Glucose Sensors, Monitoring & Insulin Dispensing
- Smart Clothing

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