Formerra™

High-Performance Polymers
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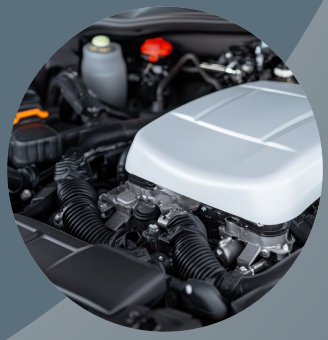

Discover the Power of High-Performance Polymers

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In an era defined by rapid technological advancement, the need for materials that can endure and perform in extreme conditions is more critical than ever. Enter high-performance polymers—innovative materials at the cutting edge of modern industry solutions. Precisely engineered to tackle some of the toughest challenges, these polymers offer unmatched advantages that drive innovation and elevate design and manufacturing processes.

BASF We create chemistry

Celanese

DUPONT

EVONIK Leading Beyond Chemistry

KINGFA

SYENSQO

Why High-Performance Polymers Matter

These materials are not merely alternatives—they are game-changers that redefine how design and manufacturing challenges are approached. Their unique properties offer unparalleled advantages including:

- **Abrasion Resistance:** Capable of withstanding wear from friction, rubbing, or scraping.
- **Chemical Resistance:** Perfect for harsh chemical environments, protecting against corrosion and degradation.
- **Dimensional Stability:** Maintains shape and precise measurements even in challenging conditions during manufacturing and use.
- **Electrical and Insulating Properties:** Essential for providing reliable insulation in electronics and electrical industries.
- **Flame Retardant:** Slows down ignition and combustion processes.
- **Heat Resistance:** Suitable for applications where extreme temperatures are a concern, ensuring longevity and stability.
- **Impact Resistance:** Can endure significant pressure or instantaneous force.
- **High Barrier Properties:** Blocks light, gas, odors, flavors, water vapor, and moisture effectively.
- **Hydrolysis Resistance:** Withstands prolonged exposure to moisture and high temperatures.
- **Mechanical Stress Handling:** Maintains integrity under high impact and pressure.
- **Moisture Performance:** Offers superior resistance to moisture, ideal for wet or humid conditions.
- **Sterilization Compatibility:** Withstands rigorous sterilization processes without compromising quality, crucial for medical and food industries.
- **Supports Thin Wall Designs:** Provides structural integrity and precision for intricate designs with thin walls.
- **UV Resistance:** Resists deterioration from UV radiation.

How Formerra Can Help

Formerra partners with the world's top suppliers to deliver a comprehensive portfolio of high-performance materials. Our technical support team stands ready to assist with material selection, processing optimization, and quality and regulatory guidance. From concept to distribution, we act as an extension of your team, ensuring you find the perfect solution to meet your needs.

Material	Supplier	Trade Name	Properties	Application Examples
LCP	Celanese	Vectra® Zenite® CoolPoly®	🏆 Very high flow for thin walled parts 🏆 Low warpage & dimensional stability 🏆 Tunable dielectric constant (Dk) & dissipation factor (Df) • Electrically & thermally conductive options available • Flame resistance • Hydrolysis resistant • Medical & FDA grades available • Metal & ceramic replacement • Platable	**Consumer:** Cookware coatings, food containers, metal & ceramic replacements **Electrical & Electronics:** Connector housings, electronic support structures, lighting components **Healthcare:** Catheter braiding, surgical instruments, trays, drug delivery systems **Mobility & Aerospace:** Aircraft interiors, RF antennas, metal & ceramic replacements in automotive parts, LED housings, & electrical isolation
PA PACM 12	EVONIK Leading Beyond Chemistry	TROGAMID®	🏆 High transparency 🏆 High gloss 🏆 High heat resistance • Abrasion resistance & scratch resistance • Chemical resistance • Dimensional stability • High mechanical strength & impact • UV resistance	**Consumer:** Home appliances, goggles, eyeglasses, food & drinkware **Electrical & Electronics:** Switch gears, housings, & battery seals **Mobility:** Relays, switches
PA1010 / PA610	EVONIK Leading Beyond Chemistry	VESTAMID® Terra	🏆 Up to 100% based on bio-renewables (sustainable material) 🏆 Bridges gap between ambient & high temperature applications • Chemical resistance • FDA options available • High dimensional stability • High mechanical strength • High translucency (contact clarity) • UV resistance	**Consumer:** Spun fibers, textiles, non-woven gowns, zippers, toothbrush bristles **Packaging:** Film
PA12 / PEBA	EVONIK Leading Beyond Chemistry	VESTAMID® E	🏆 High elasticity & good resilience 🏆 Low density 🏆 Excellent low-temperature impact strength • Chemical resistance • Free from volatile or leaching plasticizers • Good mechanical properties • High rebound resilience in flexible foam • Low water absorption	**Consumer:** Sports equipment, shoe soles, decorative film **Industrial:** Air hose, tubing
PA12	EVONIK Leading Beyond Chemistry	VESTAMID® L	🏆 Low water absorption resulting in high dimensional stability with variation in atmospheric humidity & high electrical insulation 🏆 Low coefficient of friction compared with steel, PBT, POM, & other materials • Chemical resistance • Easy processing • Excellent abrasion resistance • Excellent resistance to fatigue caused by frequent load change • High impact resistance • Noise & vibration damping properties	**Industrial:** Crude oil pipelines, cable insulation, precision injection-molded parts for machinery like impellers & control-valve housings **Mobility:** Fuel lines, brake lines, cooling lines
	EVONIK Leading Beyond Chemistry	VESTAMID® NRG	🏆 Low water absorption resulting in high dimensional stability with variation in atmospheric humidity & high electrical insulation 🏆 Low coefficient of friction compared with steel, PBT, POM, & other materials • Easy processing • Excellent abrasion resistance • Excellent resistance to fatigue caused by frequent load change • High impact resistance • Noise & vibration damping properties • Outstanding resistance to mechanical load, fatigue fractures & chemicals such as crude oil or gas	**Industrial:** Industrial pipes in the oil & gas industry, interior & exterior of onshore & offshore industrial tubing

🏆 **Key properties most often used for product selection.**

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Material	Supplier	Trade Name	Properties	Application Examples
PA612	Celanese	Zytel® LCPA	🏆 Higher heat deflection temperature than PA12 🏆 Higher tensile & flexural strength than PA12 🏆 More cost effective than PA12 • Excellent dimensional stability under changing ambient humidity • Excellent resistance to greases, oils, fuels, hydraulic fluids, water, alkalis, & salt solutions • Excellent resistance to stress cracking, even when subjected to chemical attack & when used to encapsulate metal parts • Low sliding friction coefficient & high abrasion resistance even under dry conditions	**Consumer:** Appliances **Electrical & Electronics:** Switches, insulators **Industrial:** Gears, fluid lines, cooling lines, fuel lines, tubes, hoses **Mobility:** Fluid lines, cooling lines, fuel lines, engine covers, door handles, interior consoles
	EVONIK	VESTAMID® D	🏆 Higher heat deflection temperature than PA12 🏆 Higher tensile & flexural strength than PA12 🏆 More cost effective than PA12 • Excellent dimensional stability under changing ambient humidity • Excellent resistance to greases, oils, fuels, hydraulic fluids, water, alkalis, & salt solutions • Excellent resistance to stress cracking, even when subjected to chemical attack & when used to encapsulate metal parts • Low sliding friction coefficient & high abrasion resistance even under dry conditions	**Consumer:** FDA applications, toothbrush bristles **Electrical & Electronics:** Low warp housings **Industrial:** Hose, tubing
PEEK	EVONIK	VESTAKEEP®	🏆 High service temperatures 🏆 Inherent flame resistance 🏆 Superior chemical resistance • Dimensional stability • Electrically insulative • High abrasion resistance • Impact strength • Mechanical strength	**Mobility & Aerospace:** Aircraft interior, exterior or structural components, tubing, cables, automotive bearings & gears
Polysolfone PESU	BASF We create chemistry	Ultrason® E	🏆 Transparency 🏆 High service temperatures 🏆 Sterilizable - autoclave/steam, ethylene oxide (ETO), gamma radiation, peroxide • Chemical resistance • Glass, metal, thermoset, & ceramic replacement • Hydrolysis resistance • Grades with regulatory approvals available upon request • Reliable dielectric properties • Superior impact strength	**Healthcare:** Membranes, filtration media, dialysis membranes, housings, surgical trays, control panels, anesthesia masks, heart valve sizers, baby bottles, food trays, specialty caps **Industrial:** Pump housings, beverage & drinking water processing, NSF-approved applications
	KINGFA	Visulfon™ C	🏆 Transparency 🏆 High service temperatures 🏆 Sterilizable - autoclave/steam, ethylene oxide (ETO), gamma radiation, peroxide • Chemical resistance • Glass, metal, thermoset, & ceramic replacement • Hydrolysis resistance • Grades with regulatory approvals available upon request • Reliable dielectric properties • Superior impact strength	**Consumer:** Fire helmet components & visors, face shields, & specialty glasses **Electrical & Electronics:** Connectors, insulators **Healthcare:** Membranes, filtration media, dialysis membranes, housings, medical trays, control panels, anesthesia masks, baby bottles, food trays, specialty caps **Industrial:** Beverage & drinking water processing, NSF approved applications, & pump housings **Mobility & Aerospace:** Bezels, headlamps, valves, pistons, hydraulic components, battery caps, ignition components, aircraft interior parts
PPE/PPO	EVONIK	VESTORAN®	🏆 Chemical resistance 🏆 Dimensional stability 🏆 Excellent impact strength • High heat deflection temperature under load • High strength • Low water absorption • Rigidity	**Mobility:** Automotive applications

🏆 **Key properties most often used for product selection.**

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Material	Supplier	Trade Name	Properties	Application Examples
Polysolfone PPSU	BASF We create chemistry	Ultrason® P	🏆 Transparency 🏆 High service temperatures 🏆 Sterilizable - autoclave/steam, ethylene oxide (ETO), gamma radiation, peroxide (high number of cycles) • Chemical resistance (better than PSU) • Glass, metal, thermoset, & ceramic replacement • Hydrolysis resistance • Grades with regulatory approvals available upon request • Reliable dielectric properties • Superior impact strength (better than PSU & PESU)	**Healthcare:** Surgical handles, dental trays & guards, medical trays, retractors, clamps, membranes, specialty tubing & connectors, food storage, specialty pans, microwave cookware, conveyors & handling equipment
	KINGFA	Visulfon™ B	🏆 Transparency 🏆 High service temperatures 🏆 Sterilizable - autoclave/steam, ethylene oxide (ETO), gamma radiation, peroxide (high number of cycles) • Chemical resistance (better than PSU) • Glass, metal, thermoset, & ceramic replacement • Hydrolysis resistance • Grades with regulatory approvals available upon request • Reliable dielectric properties • Superior impact strength (better than PSU & PESU)	**Consumer:** Plumbing, faucet cartridges, eyeglass frames, fire helmet **Electrical & Electronics:** Connectors, coil bodies, printed circuit boards, semiconductor packaging **Healthcare:** Surgical handles, medical trays, retractors, clamps, membranes, specialty tubing & connectors, food storage, specialty pans, microwave cookware, conveyors & handling equipment, bottling equipment **Industrial:** Valve spools, flanges, fittings, tubes, pump cases, specialty windows & lenses **Mobility & Aerospace:** Bezels, headlamps, valves, pistons, hydraulic components, battery caps, ignition components, aircraft interior parts, engine components, headlights
Polysolfone PSU	BASF We create chemistry	Ultrason® S	🏆 Transparency 🏆 High service temperatures 🏆 Sterilizable - autoclave/steam, ethylene oxide (ETO), gamma radiation, peroxide • Chemical resistance • Glass, metal, thermoset, & ceramic replacement • Hydrolysis resistance • Grades with regulatory approvals available upon request • Reliable dielectric properties • Superior impact strength	**Healthcare:** Surgical handles, dental trays & guards, medical trays, retractors, clamps, membranes, specialty tubing & connectors, food storage, specialty pans, microwave cookware, conveyors & handling equipment
	KINGFA	Visulfon™ A	🏆 Transparency 🏆 High service temperatures 🏆 Sterilizable - autoclave/steam, ethylene oxide (ETO), gamma radiation, peroxide • Chemical resistance • Glass, metal, thermoset, & ceramic replacement • Hydrolysis resistance • Grades with regulatory approvals available upon request • Reliable dielectric properties • Superior impact strength	**Consumer:** Plumbing, faucet cartridges **Electrical & Electronics:** Connectors, coil bodies, lamp sockets, antenna sockets **Healthcare:** Surgical handles, medical trays, retractors, clamps, membranes, specialty tubing & connectors, food storage, specialty pans, microwave cookware, conveyors & handling equipment **Industrial:** Valve spools, flanges, fittings, tubes, pump cases, specialty windows & lenses **Mobility & Aerospace:** Bezels, headlamps, valves, pistons, hydraulic components, battery caps, ignition components, aircraft interior parts
PPS	Celanese	Fortron® CoolPoly®	🏆 High service temperatures (up to 240°C) 🏆 Chemical resistance at elevated temperatures 🏆 Excellent creep resistance even at elevated temperatures • Electrically & thermally conductive options available • Flame resistance • Low water absorption • Medical & FDA grades available • Metal & ceramic replacement	**Consumer:** Appliance handles, switches, grills **Electrical & Electronics:** Electrical components, insulators, coil forms, switch components **Healthcare:** Medical device gears & levers **Mobility & Aerospace:** Conditioner hose clamps, drive system components, cooling system components
PVDF	SYENSQO	Solef®	🏆 Excellent abrasion resistance 🏆 Superior chemical resistance to a wide range of aggressive chemicals 🏆 Inherent flame & smoke resistance • Easy processing & secondary operations • High electrochemical stability for battery systems • Low permeation to gases & liquids • UV resistance	**Electrical & Electronics:** Li-ion batteries, semiconductors **Healthcare:** N95 masks **Industrial:** Oil & gas, plumbing, wire & cable, tubing, piping for drinking water

🏆 **Key properties most often used for product selection.**

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Material	Supplier	Trade Name	Properties	Application Examples
Silicone Adhesives	DUPONT	Liveo™	Biocompatibility Non-sensitizing Breathability & wear performance • Good moisture transmission rate • Sterilizable – ethylene oxide (ETO)	**Healthcare:** Wearables, prosthetics, ostomy, & transdermal patches
Silicone Elastomers	DUPONT	Liveo™	Biocompatibility Non-sensitizing Breathability & wear performance • Good moisture transmission rate • Sterilizable – ethylene oxide (ETO)	**Healthcare:** Wearables, prosthetics, ostomy, & transdermal patches
Silicone Fluids	DUPONT	Liveo™	Biocompatibility Low surface tension – superior lubrication Water repellency – hydrophobicity • Sterilizable – autoclave/steam, dry heat, ethylene oxide (ETO), gamma radiation	**Healthcare:** Lubrication of glass, metal, plastic & rubber components including syringes, vials, stoppers & catheters; mold release for coating medical parts & de-nesting of medical packaging
Silicone Masterbatches	DUPONT	MULTIBASE™ (Siloxane)	High slip performance at low loadings Improves scratch & mar resistance at low loadings Increases throughput & reduces energy demand during production • Pellet form for easy handling • Prevents gel formation • Prevents die build-up • High compatibility with multiple polymers • Maintains base resin mechanical properties	**Consumer, electrical & electronics, industrial, mobility, & packaging:** Processing aid & polymer modifier added at processing machine hopper or during compounding
Silicone TPV	DUPONT	TPSiV™	Unique soft touch & silky feel (Shore A 50 to 75) Safe for skin contact Abrasion resistance • Chemical resistance • Outstanding colorability • Recyclable & reusable in manufacturing processes • Stain resistance • UV resistance	**Consumer:** Wearables, earbuds, phone cases **Healthcare:** Wearables **Industrial:** Water piping, tubing **Mobility:** Interior components
UHMWPE	Celanese	GUR® Hostalloy	Imparts low coefficient of friction, enhanced abrasion resistance, texture, & other surface modifications into coatings & compounds Typically compression molded, ram extruded, or gel spun Chemical resistance to acids, alkalis & corrosive gases • Exceptionally high impact strength • FDA compliant • Injection molding grades available • Metal replacement • Stress resistant under pressure or repeated loadings	**Consumer:** Breathable membranes for outdoor garments & outdoor paints **Industrial:** Lithium-ion batteries, ultra capacitors, fuel cells, air-coalescing & liquid filters **Mobility & Aerospace:** Lubricious surfaces, battery separators, pumps, valves

Key properties most often used for product selection.

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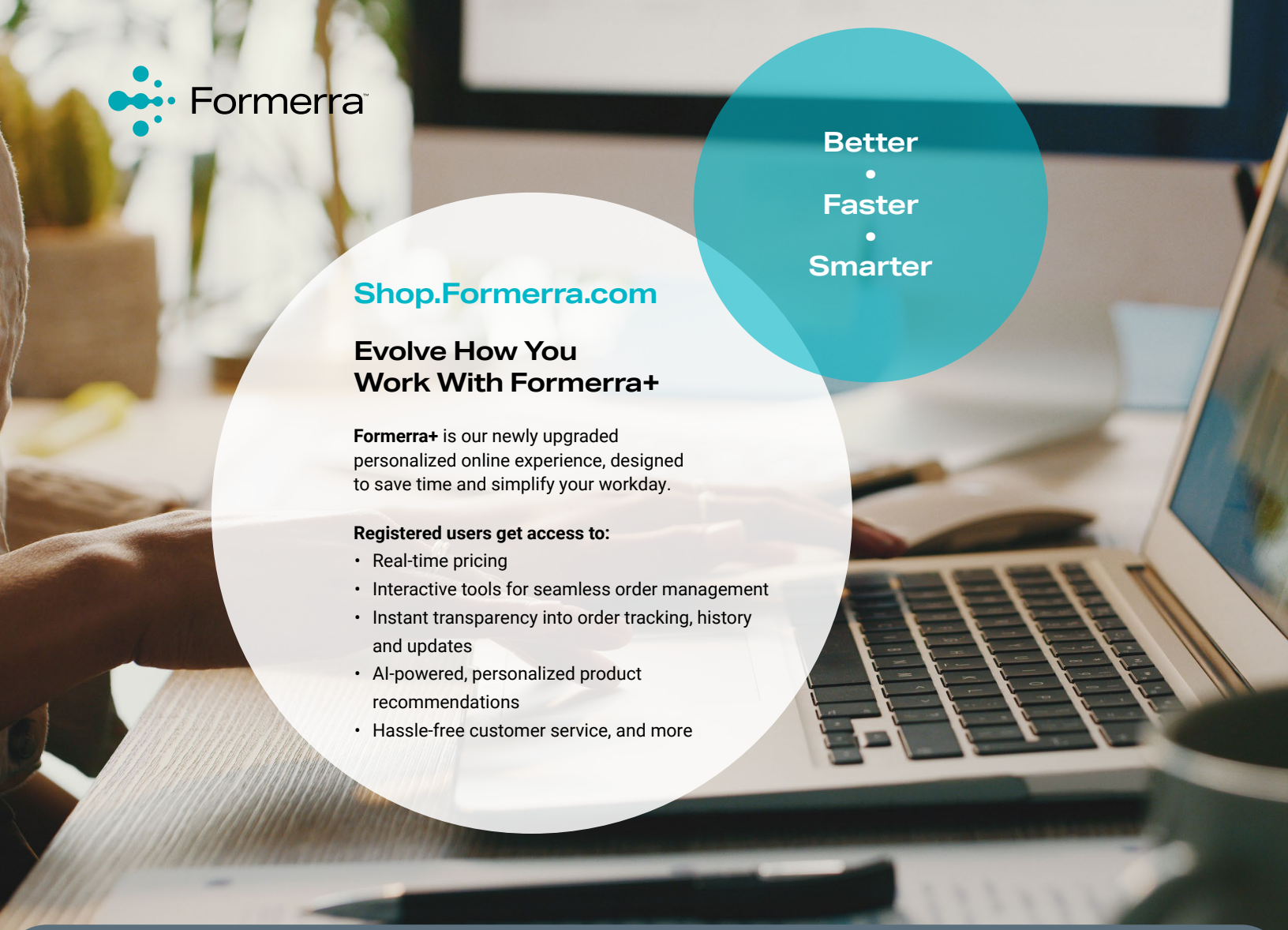

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