

**SPECIALTY
ENGINEERED
MATERIALS FOR
HEALTHCARE**





Careful consideration must be given to materials used for medical devices and their impact on patient safety. In addition, the right material selection matters for meeting evolving industry needs. We're dedicated to providing innovative, specialized polymer solutions for demanding healthcare applications. Our high-performance materials are engineered to give you design freedom, regulatory compliance confidence, and excellent performance. We understand the challenges you face and are ready to help you bring your next-generation designs to life.



AVIENT'S NO SURPRISES PLEDGESM

At Avient, we are committed to helping you grow your business with safe and environmentally sound solutions. This commitment is exemplified by our No Surprises PledgeSM which we make to all customers and markets, across the globe.

- You can be confident that, in formulating and manufacturing our materials, we use sustainable practices to provide long-term product viability and sound environmental stewardship.
- You can expect that the materials we produce contain only ingredients that conform to accepted legal and regulatory compliance guidelines.
- You can trust that Avient materials meet the rigorous quality and safety management standards required across the globe.
- You can be certain that Avient meets or exceeds the material safety data reporting requirements of your country or region.
- When you choose Avient, you can be confident our products will help you meet or exceed today's stringent compliance standards.



THERMOPLASTIC ELASTOMERS FOR HEALTHCARE

GENERAL CHARACTERISTICS COMPARING TPE, RUBBER, SILICONE, AND PVC

We offer a broad range of TPEs solutions that are specially formulated to meet demanding healthcare device and application challenges. Common applications include medical device overmolds, medical and biopharma tubing, and gaskets and stoppers.

CHARACTERISTICS	TPE	THERMOSET RUBBER	LIM* SILICONE	PVC
Compression Set	Good	Excellent	Excellent	Fair
Heat Resistance	Good	Excellent	Excellent	Fair
UV/Ozone Resistance	Good	Good	Good	Good
Chemical Resistance	Good	Excellent	Excellent	Good
Barrier Properties	Excellent	Good	Excellent	Excellent
# of Manufacturing Steps	Excellent	Good	Good	Excellent
Supply Chain Availability	Excellent	Excellent	Fair	Excellent
Colorability	Excellent	Good	Good	Excellent
Total Costs	\$\$	\$\$\$	\$\$\$\$	\$

VERSAFLEX™ CL AND DYNAFLEX™ TPES OVERMOLDING FOR ERGONOMICS

- Adds good tactile surface with soft-touch feel
- Available in a variety of color effects and textures
- Improves grip, cushion, and comfort
- Enhances functional performance like sealing properties, vibration damping, oxygen barrier, and scratch and abrasion resistance
- Reduces assembly costs, good processability
- Offers excellent adhesion to a wide range of substrates

Applications:

- Glucometers
- Medical tools overmolds
- Injector pens
- Analysis devices



PP OVERMOLDING	HARDNESS	REGULATORY	STERILIZATION	CHARACTERISTICS
Dynaflex™ G2706	28A	USP Class VI, ISO 10993, Food contact	EtO	Soft translucent grade, grippy feel
Dynaflex™ G2711	43A	USP Class VI, ISO 10993, Food contact	EtO	Highly colorable solution, grippy feel, low compression set
Versaflex™ CL2242 & CL2250	42A/ 50A	USP Class VI, ISO 10993, US Food contact	EtO	Clear boilable grades; ABS, PC bondable
Versaflex™ G2705 N	60A	USP Class VI, ISO 10993, Food contact	EtO/Steam	High resilience, low compression set
Versaflex™ HC3810	20A-90A	USP Class VI, ISO 10993	EtO	General purpose, unfilled
ABS, PC OVERMOLDING	HARDNESS	REGULATORY	STERILIZATION	CHARACTERISTICS
Versaflex™ OM1040	40A	USP Class VI, ISO 10993	EtO	Translucent
Versaflex™ OM3060	60A	USP Class VI, ISO 10993	EtO	Clear

VERSALLOY™ HC & VERSAFLEX™ HC TPEs

SEALING & RESEALING

- Rubbery feel and soft touch
- No coring, good puncture, and resealability in static stoppers
- Meets low coefficient of friction requirements in dynamic seals
- Low extractables
- Suitable to overmold onto polyolefins

Applications:

- Sealing and resealing septum
- Seals and sanitary gaskets
- Syringe plungers and tips



MATERIAL DESCRIPTION	HARDNESS	REGULATORY	STERILIZATION	CHARACTERISTICS
Versalloy™ HC 9210-45N	45A	USP Class VI	EtO	Good processability, smooth surface aesthetics
Versalloy™ HC 9210-55N	55A	USP Class VI	EtO	Good processability, smooth surface aesthetics
Versalloy™ HC 9210-70N	70A	USP Class VI	EtO	Good processability, smooth surface aesthetics
Versalloy™ HC 9220-43N	43A	USP Class VI, ISO 10993-4/5	EtO	Extrusion grade, high temperature resistance
Versaflex™ HC 2110-35N	34A	FDA, USP Class VI, ISO 10993	Autoclave EtO radiation	Resealing, elevated comp set
Versaflex™ HC 2110-57B	57A	FDA, USP Class VI, ISO 10993	Autoclave EtO radiation	Low stiction

VERSAFLEX™ CL AND DYNAFLEX™ TPES HIGH CLARITY GRADES WITHOUT PLASTICIZERS

- Water clear grades formulated without phthalate plasticizers
- Meets medical regulatory USP Class VI and ISO 10993-4,5
- Food contact and FDA compliant
- Autoclave and radiation stable
- Low extractable
- High clarity (Haze <5 ASTM D1003)
- Suitable for extrusion or blown film, could be considered for injection molding

Applications:

- Peristaltic/infusion pump tubing
- IV tubing
- Biopharmaceutical tubing
- CPAP tubing



MATERIAL DESCRIPTION	HARDNESS	REGULATORY	STERILIZATION	CHARACTERISTICS
Versaflex™ HC MT222 & 224 & 226	65A/ 75A/ 84A	USP Class VI, ISO 10993, Food contact	Radiation	High clarity, without plasticizers, oil free
Versaflex™ HC MT555	54A	USP Class VI, ISO 10993, Food contact	Autoclave	High service temperature, autoclavable
Versaflex™ HC BT218	67A	USP Class VI, ISO 10993-4, -5, and -11	EtO Radiation	Suitable for biopharma tubing, weldable, kink resistant, low extractables

ENGINEERED POLYMER FORMULATIONS FOR HEALTHCARE

TRILLIANT™ HC THERMOPLASTICS

The family of Trilliant™ HC high-performance thermoplastics is formulated to meet the growing challenges of medical devices and equipment. These customizable materials include chemically resistant polymers to prevent device cracking, electrically conductive materials for consistent measuring, and high-density formulations to replace lead.

COMPETITIVE MATERIAL COMPARISON

PROPERTY	TRILLIANT™ HC8920	FR PC/ABS		FR PC/PET		FR COPE
		COMPETITOR A	COMPETITOR B	COMPETITOR A	COMPETITOR B	TRILLIANT™ HC2020
Density (g/cm ³)	1.20	1.19	1.19	1.28	N/A	1.29
Mold Shrinkage (%)	0.7 to 1.1	0.4 to 0.6	0.4 to 0.6	0.6 to 0.8	1.2 to 1.8	0.5 to 0.7
Yield Strength (MPa)	45	60	65	58	42	42
Elongation: Yield, Break (%)	10, 40	4.0, >50	4.1, 100	4.5, 100	4, 70	6, 70
Tensile Modulus (MPa)	2200	2700	2600	2350	1820	1820
Flexural Strength (MPa)	80	90	104	86	68	68
Flexural Modulus (MPa)	2500	2700	2500	2300	1980	1590
HDT: 0.45, 1.8 (MPa)	110, 80	90, 80	100, 89	123, 100	123, 64	100, 70
UL-94 Rating @ 3.0 mm	5VA	V-0	5VA	V-0	HB	V-0
UL-94 Rating @ 1.5 mm	V-0	V-0	5VB	V-0	HB	V-0
UL-94 Rating @ 0.75 mm	V-1	V-2	V-0	None	None	V-2

TRILLIANT™ HC THERMOPLASTICS

- Chemically resistant replacement for FR PC/ABS, FR PC/PET & FR COPE, providing UL 94 Yellow Card V-0 flame rating at 1.5 mm, V-1 at 0.75 mm thicknesses for a broad color spectrum
- Outperforms PC/ABS, PC/PET and COPE in resistance to common disinfectants
- Retains tensile strength after 72-hour exposure to common hospital disinfectants, and shows better long-term chemical resistance as compared to PC blends and COPE
- Exhibits good impact and temperature resistance
- Available in natural grades, standard medical colors, or custom pre-colored products

Applications:

- Medical device housings
- MRI, X-ray, CT scanner components
- Surgical instruments such as staplers, dissectors, scissors
- Auto-injector pen



MATERIAL DESCRIPTION	BASE RESIN
Trilliant™ HC2020	Copolyester
Trilliant™ HC8910/8920	Polyketone/ABS blend
Trilliant™ HC2120	Tritan
Trilliant™ HC3120	PC
Trilliant™ HC5210	PP
Trilliant™ HC6010	PA6
Trilliant™ HC6610	PA66
Trilliant™ GRV-NP-110-W	PA12

TRILLIANT™ HC ELECTRICALLY CONDUCTIVE FORMULATIONS

- Consistent conductivity ensures repeatable part performance and minimizes failures related to inconsistent electrical conductivity
- High flow and easy processing facilitate filling of thin wall parts and multiple cavity tools, which enable faster cycle times and lower per-unit part costs
- Superior durability reduces breakage and resultant scrap related costs
- Less tendency to flash results in improved appearance and less fluid retention in or on the tip, thus driving greater accuracy and less potential for cross-contamination
- High strength produces parts with greater stiffness and warp resistance, again minimizing scrap-related costs

Applications:

- Conductive pipette tips



TEST TEMS	SPECIFIC GRAVITY	MELT FLOW RATE (230OC, 2.16KG)	TENSILE STRENGTH	FLEXURAL STRENGTH	FLEXURAL MODULUS	IMPACT STRENGTH NOTCHED, IZOD	SURFACE RESISTIVITY
Method	ASTM D-792	ASTM D-1238	ASTM D-638	ASTM D-790	ASTM D-790	ASTM D-256	ASTM D-257
Unit	--	g/10min	MPa	MPa	MPa	J/m	Ohms/sq.
ST5200-8030 ESD BK001	1	5	27	52	1980	42	E3
ST5200-8035 ESD BK001	1	20	22	37	1460	150	E3





**The need to innovate is virtually endless.
Contact Avient to tap into our material science expertise
and comprehensive product development support services
to help you bring your ideas to market faster.**

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