



COMPOUNDS FOR SURGICAL ROBOTIC SYSTEMS

RTP COMPANY HEALTHCARE PORTFOLIO

FEATURES

- Specially designed for surgical robotic systems, including moving parts, monitors, single or reusable instruments, and staplers
- Provide strength, color, flame retardance, and chemical resistance
- Withstand high heat sterilization

BENEFITS

- Resistance to damage caused by harsh chemical cleaners
- UV V-0 Non-halogen flame resistance
- Sterilization capability including autoclave
- Biocompatible colors and certified resin solutions

THERMOPLASTIC TECHNOLOGIES FOR SURGICAL ROBOTS

Surgical robots and the tools associated with them are a fast growing segment in the Medical Market. For over 35 years, RTP Company engineers have been providing the medical industry with solutions that solve this market's unique challenges. Our compounds can provide mechanical performance, durability, and wear resistance while at the same time meeting demands for reusable sterilization, chemical resistance, aesthetics, and cost reduction. Most materials can come with some level of biocompatibility support and formulation change control to ensure that required specifications are met. RTP Company is a global company, providing you with colored, high volume engineered, or specially compounded solutions to fit your needs, anywhere in the world.



MONITORS

The monitors used for surgical robotics are comprised of several components, including the housing, screen bezels, base, and various arms to hold tools. We formulate a number of thermoplastic materials that provide substantial benefits to surgical robotic monitors, including UV protection, resistance to damage caused by harsh hospital cleaners, and UL HB and V-0 flame resistance.



FIGURE 1: A SELECTION OF THERMOPLASTIC COMPOUNDS

Product	Description	Key Characteristics	Benefits	Typical Applications
RTP 2000 HC	Unique polyester alloy formulated for superior resistance to damage caused by hospital cleaners	<ul style="list-style-type: none"> • Same shrinkage as PC/ABS • Available in UL 94 V-0 flame retardant version • Colorable 	<ul style="list-style-type: none"> • Resists damage caused by harsh cleaning chemicals • Maintains structural integrity 	<ul style="list-style-type: none"> • Monitor housing • Star base • Screen bezels • Tool Arms
PC/ABS Compounds	Alloy material formulated for good melt flow and impact	<ul style="list-style-type: none"> • Available in UL 94 V-0 • Colorable • UV stable 	<ul style="list-style-type: none"> • Meets UL 94 requirements • Provides dimensional stability • Impact resistant 	<ul style="list-style-type: none"> • Monitor housing • Screen bezels • Cosmetic parts
Flame Retardant Compounds	PC, ABS, PP formulated for flame retardance and other properties	<ul style="list-style-type: none"> • Available in V-2, V-0 • UV stable • Colorable • Good impact resistance 	<ul style="list-style-type: none"> • Meets UL 94 requirements • Impact resistant 	<ul style="list-style-type: none"> • Monitors • Keyboards • Control covers
Pre-Colored Compounds	PPSU, PSU available with Biocompatibility statements	<ul style="list-style-type: none"> • 12 standard colors or custom colored • ISO 10993-1 biocompatibility tested for Parts 5, 10, and 11 	<ul style="list-style-type: none"> • Withstand autoclave and high heat • Small lots available • Fixed formulation service available 	<ul style="list-style-type: none"> • Reusable and disposable devices • Medical packaging



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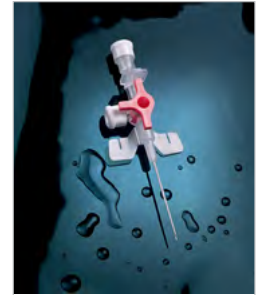
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INSTRUMENTS

Reusable instruments, such as cannula, trocar housing, grasper tips, and endo ports must incorporate thermoplastics that can withstand sterilization techniques; Figure 2 shows a number of compounds and their ability to hold up well under various sterilization processes. Single-use tools, such as surgical forceps, shears, tweezers, and tool housings that do not require sterilization can therefore be made with more cost-effective materials, such as Glass Filled Polycarbonate (PC).

FIGURE 2: THERMOPLASTIC MATERIALS AND STERILIZATION*

Material	Steam	EtO	Gamma	Plasma	Chemical
PPSU (Radel®)	VG > 1,000 cycles	VG	VG	VG	VG
PEEK	VG > 1,000 cycles	VG	VG	VG	VG
PPS	VG Repeated times	VG	VG	VG	VG
PEI (Ultem®)	G 100 cycles	VG	G	G	G
PC	F 10 cycles	VG	G	G	P
PP	G 100 cycles	G	G**	G	VG
POM	F 50 cycles	VG	P	G	G



LEGEND

VG = Very Good
G = Good
F = Fair
P = Poor

* The suitability of a specific RTP Company compound for a particular sterilization method must be evaluated by the equipment manufacturer
** Requires stabilization

Radel® is a registered trademark of the Solvay Company. Ultem® is a registered trademark of the GE Company.

STAPLERS

Reinforced thermoplastic materials are ideal for medical staplers, as they meet the dimensional stability, strength, and rigidity specifications of these tools (Figure 3). Depending on the base polymer selection, they can also meet demanding sterilization requirements.

FIGURE 3: THERMOPLASTIC COMPOUNDS FOR STAPLERS

Product	Description	Key Characteristics	Benefits	Typical Applications
Very Long Fiber Compounds	PP, PC	<ul style="list-style-type: none"> Impact resistance High tensile strength Colorable 	<ul style="list-style-type: none"> High rigidity Lower cost Part-to-part consistency 	<ul style="list-style-type: none"> Connectors
Glass Reinforced Compounds	PPSU, PEEK	<ul style="list-style-type: none"> High heat resistance High strength 	<ul style="list-style-type: none"> Autoclavable Colorable Consistent performance 	<ul style="list-style-type: none"> Stapler tips Clamps
Non-Reinforced Compounds	PC	<ul style="list-style-type: none"> Aesthetics Good melt flow 	<ul style="list-style-type: none"> Colorable Impact resistant 	<ul style="list-style-type: none"> Stapler housings Modules



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