



Biomedical Plastics



PROFESSIONAL PLASTICS

The Global Leader in High Performance Plastics

Company Overview

Established in 1984, Professional Plastics has been a privately-held distributor of high-performance engineering plastic shapes with an annual turnover exceeding \$ 100 million dollars. The company operates 15 locations throughout North America and Asia, and employs sales representatives worldwide.

Professional Plastics is focused on providing our customers with the widest variety of products from the most respected manufacturers in the world. We focus on quality, consistency and reliability in order to provide our customers with a steady supply standards. Material traceability is extremely important to the biomedical industry so Professional Plastics works with ISO 9001 suppliers and also meets Mil-I-45208 for their internal quality control procedures.

Today, Professional Plastics is the USA's largest distributor of high- performance engineering plastic shapes and we have built a reputation for customer service, customer value, and superior quality.

Professional Plastics offers a wide variety of medical grade plastic materials that meet FDA and USP Class VI requirements. Our high-purity materials have been used in applications from Medical Wands to Sterilization Trays and Endoscopic Probes & Devices. The majority of these products perform well even after virtually unlimited autoclaving cycles. We can assist you with application profiles, medical certifications, as well as lot & batch traceability.

Professional Plastics works with the largest and most respected manufacturers in the world to provide our customers with quality, consistency and peace of mind.



Our medical-grade plastics are manufactured with state of the art machinery and technologies to meet the high quality demands of our customers. Our products are subjected to numerous quality tests in all phases of production, including 100% ultrasonic testing – every inch of every rod. We manufacture a complete line of engineering and high-performance plastics in rods and sheets for applications including surgical instruments and devices, orthopedic sizing trials, imaging and monitoring components, surgical trays and caddies, diagnostic and analytical equipment, pharmaceutical manufacturing and biotechnology equipment. As a member of The Röchling Group, we are a leading global plastics manufacturer with a workforce of more than 6000 employees with 54 locations in 20 countries. That's why Röchling ranks among the top international leaders in the field of plastics processing.



Saint-Gobain Performance Plastics is an industry leader in advanced-technology polymer products for the most demanding industrial applications. From advanced bearing & seal materials such as Rulon® & Meldin® to Fluoropolymer & Tubing products such as Tygon® Chemfluor®, Versilic®, Pharmed®, Santoprene®, Tygothane®. St Gobain provides engineering solutions to hundreds of industries worldwide. Founded in 1665', Saint Gobain is one of the oldest companies in the world. Today, Saint Gobain is one of the largest companies in the world with an annual turnover exceeding US\$ 60 billion dollars. Their commitment to quality has helped Saint Gobain develop a reputation as a trusted supplier for critical applications including medical, semiconductor and aerospace companies worldwide.



Quadrant Life Science Grades (LSG) are designed specifically for the Medical, Pharmaceutical and Biotechnology markets. They save OEMs the time and costs associated with biocompatibility testing and regulatory approvals. These products will replace existing solutions made of stainless steel, Titanium and glass or ceramics through a combination of properties like weight reduction, resistance to commonly used sterilization methods, X-ray transparency, design flexibility, anti-static performance and resistance to high energetic radiation. The LSG portfolio includes plastics which comply with FDA, ISO 10993 and USP guidelines for biocompatibility testing of materials. Quadrant provides OEMs with the assurance of full traceability for its comprehensive LSG product portfolio. In line with its ISO 9001:2000 certified Quality Assurance System, Quadrant EPP thoroughly monitors and controls the entire manufacturing process of its Life Science Grades.



Requirements for Medical Technology

ISO 13485 Certified Plastic Materials

Professional Plastics offers a full-range of medical grade plastic stock shapes that meet the highest standards and changing requirements of the Life Science industry and medical device market.

Many of our products are certified to ISO 10993 and are produced by manufacturers that meet 13485:2003, the Medical Device Standard that represents the requirements for a comprehensive management system for the design and manufacturing of medical devices. As a supplier of stock shapes of Rods, Sheets, and Tubes our supply chain quality procedures include key elements such as resin and process validation, product inspection, lot and batch traceability (Device History Record), risk management analysis, corrective and preventive actions and customer feedback.

Our customers can be assured that our medical-grade products meet their expectations and comply with regulatory requirements. We offer full lot and batch traceability, detailed certification documents and raw material certificates of compliance upon request.

We offer a complete line of engineering and high-performance plastics in rods, sheets, and tubes for applications including surgical instruments and devices, orthopedic sizing trials, imaging and monitoring components, surgical trays and caddies, diagnostic and analytical equipment, pharmaceutical manufacturing and biotechnology equipment. With medical-grade (MG) materials, a product range is at your disposal that has been specifically developed with medical technology in mind.

Biocompatibility

With the raw materials deployed, we utilize plastics and additives that have already been in use in medical-technical applications for many years now. The raw materials are FDA-compliant, meet ISO 10993 for Cytotoxicity and can be tested for other parts of the certification put forth by the ISO standard.

Chemical resistance

Medical-grade materials possess good chemical resistance to various conventional disinfectants and cleansers.

Sterilization performance

A great number of our medical-grade plastic materials are very easily sterilizable by means of hot steam, ethylene oxide (ETO), plasma and gamma rays and STERRAD NX.

Traceability

We offers complete lot and batch traceability for **medical-grade** materials – from semi-finished products right up to the raw materials.

FDA compatibility

The majority of our high-performance materials meet FDA requirements.

Many colors of our MG products have also been tested in regards to these guidelines.

Hydrolysis resistance

The excellent hydrolysis resistance of our MG products is indispensable for sterilizability with hot steam.

Physiological harmlessness ISO 10993

Biological evaluation of Medical Devices per ISO 10993

ISO 10993 includes a series of tests for evaluating the biocompatibility of a medical device prior to a clinical trial. Compliance to ISO 10993-5 (tests for in vitro cytotoxicity) is typically the most requested for applications requiring our high-performanceplastics.

The majority of our products have either been tested and approved by an independent lab to ISO 10993-5 or are produced with raw materials that are certified for approval.

USP Class VI

Biological tests per USP Class VI

USP tests are used to determine the biological reactivity of plastic materials. Most of our products are either USP VI (systemic and intracutaneous toxicity) certified or compliant.

Biocompatibility

Within the scope of selecting the suitable material for a medical-technical application, not only the technical requirements have to be considered, but often it is necessary to ensure the material is compatible with the human organism. The biological assessment of a product is invariably requisite, if there is direct contact of the material or product with the patient.

The extent of such tests depends particularly on the experience already gained for this material in the particular application concerned, and the precise intended use of the medical product (in particular the nature and duration of the physical contact).

The chief basic regulations for biological testing and assessment of materials are ISO 10993 and testing as per United States Pharmacopeia Class VI (USP Class VI for short). Despite the fact that the clearly more comprehensive ISO 10993 was originally meant to supersede testing as per USP Class VI, USP testing is very frequently referred to today to assess plastics.

There are various test results for bio-compatibility according to ISO 10993 and USP Class VI available for the **medical-grade** materials.

Ultrasonic Testing (UT)

Our suppliers perform ultrasonic testing on all medical-grade products to ensure that there are no cracks or voids. We can also perform 100% full lot UT testing.

Material selection

High Performance plastics are generally defined by their ability to maintain their physical properties under thermal, chemical or electrical stress, while operating at elevated temperatures above 300° F. These materials typically feature high strength and stiffness as well as outstanding chemical resistance and electrical properties.

Engineering plastics are among the most common and useful thermoplastics and typically exhibit good mechanical properties. These materials generally have one or two main attributes that best fit the needs of the application and should be taken into consideration when deciding on a specific plastic.

Amorphous thermoplastics are mostly transparent or translucent due to their polymer structure. Their mechanical properties remain almost unchanged over a wide temperature range, frequently right up to their continuous operating temperature. They are susceptible to stress cracking and this should be taken into account when machining them. Amorphous plastics include PPSU, PEI, PSU, PC and PPO.

Partially crystalline thermoplastics are a result of the molecular arrangement, usually being opaque. The mechanical properties (strength, toughness and hardness) of this group depend to a great extent on the degree of crystallinity. They feature great resistance to the formation of stress cracks and very good chemical resistance. Partially crystalline plastics include Acetal, PP and PEEK.



Sustason PPSU MG
(Radel® R5500)

Sustason PPSU MG offers incredible toughness in applications that receive repeated sterilization. With a high heat deflection temperature of 420° F it can absorb tremendous impact without cracking or breaking.

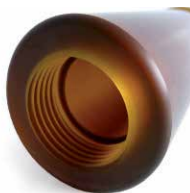
PRODUCT FEATURES:

Excellent thermal stability
High impact resistance
Resistance to repeated autoclaving
Resistance to hydrolysis

CERTIFICATIONS:

ASTM D6394
FDA compliant
USP Class VI, ISO 10993 compliant

Products	Sizes
Sheets	3/8" - 2" x 24" x 48"
Rods	1/4" - 6" diameter



SustaPEI MG
(Ultem® HU1000)

SustaPEI MG (Ultem®) is an amorphous transparent polyetherimide plastic that offers outstanding high heat resistance (up to 356° F), high strength and a broad chemical resistance.

PRODUCT FEATURES:

Strength and modulus at elevated temperatures
Inherent flame resistance
Gamma radiation resistance
Excellent resistance to steam sterilization

CERTIFICATIONS:

ASTM D5205
Meets FDA 210 CFR 177.1595 USP Class VI,
ISO 10993 compliant

Products	Sizes
Sheets	1/4" - 4" x 24" x 48"
Rods	1/4" - 6" diameter



SustaPEEK MG

The superior physical properties of SustaPEEK MG, including chemical resistance and high temperature stability is the reason that it is increasingly replacing metals and other lower grade plastics in the medical industry.

PRODUCT FEATURES:

Continuous use temperature of 480°F
Outstanding dimensional stability
High chemical resistance
Excellent resistance to sterilization

CERTIFICATIONS:

ASTM D6262
FDA compliant
USP Class VI & ISO 10993-5 certified

Products	Sizes
Sheets	1/4" - 4 x 24" x 48"
Rods	1/4" - 6" diameter



Sustason PSU MG
(Polysulfone)

Sustason PSU MG is a semi-transparent amorphous thermoplastic with an amber tint. Due to its inherent resistance to hot water and steam, it is regularly used in medical applications where repeated sterilization is required.

PRODUCT FEATURES:

Continuous use temperature of 300°F
Long-term resistance to steam sterilization
Resistant to hydrolysis
Strength and dimensional stability

CERTIFICATIONS:

ASTM D6394
FDA compliant
USP Class VI, ISO 10993 compliant

Products	Sizes
Sheets	3/8" - 2" x 24" x 48"
Rods	3/8" - 6" diameter



**Sustarin®
C MG
Acetal
(Celcon® M25)**

Sustarin® C MG is easy to machine to close tolerances and is very dimensionally stable. The material has excellent wear properties and low coefficient of friction.

PRODUCT FEATURES:

- Excellent dimensional stability
- Easy to machine to close tolerances
- porosity free
- Available in multiple colors

CERTIFICATIONS:

- ASTM D6100
- FDA21 CFR 177.2470
- USP Class VI & ISO 10993-5 compliant

Products	Sizes
Sheets	1/4" - 4" x 24" x 48"
Rods	1/4" - 8" diameter



**Sustanat
PC MG
(Polycarbonate)**

Sustanat PC is ideally suited for applications that demand high impact strength. It is an amorphous, transparent product that exhibits good electrical and mechanical properties along with excellent dimensional stability.

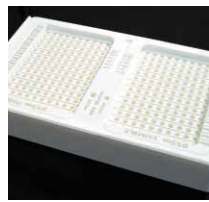
PRODUCT FEATURES:

- Continuous use temperature of 250° F
- Easy to machine to close tolerances
- High impact strength
- Good electrical insulation

CERTIFICATIONS:

- ASTM D6096 PC 0111
- ASTM D3935 PC 0111
- Natural meets FDA 21 CFR 177.1582
- USP Class VI compliant

Products	Sizes
Sheets	1/4" - 4" x 24" x 48"
Rods	3/8" - 8" diameter



**Polystone®
P MG
(Polypropylene®)**

Polystone® P MG is a compression molded polypropylene that is manufactured by a unique heat stabilization process. This product is easily machined and is specifically designed for surgical trays and caddies.

PRODUCT FEATURES:

- Excellent dimensional stability
- Resistant to steam autoclaving
- Laser markable
- Low moisture absorption

CERTIFICATIONS:

- USP Class VI certified
- FDA compliant

Products	Sizes
Sheets	1/4" - 4 x 24" x 48"
Rods	1/4" - 6" diameter



**Susta PPO
MG (Noryl®)**

SustaPPO is excellent for medical device applications due to its machineability, excellent impact properties and resistance to repeated autoclaving cycles.

PRODUCT FEATURES:

- Resistance to acids and bases
- Thermal and electrical resistance
- Excellent hydrolytic stability
- Balance of strength, stiffness & dimension stability

CERTIFICATIONS:

- ASTM D4349
- FDA compliant
- ISO 10993 compliant

Products	Sizes
Sheets	3/8" - 2" x 24" x 48"
Rods	3/8" - 6" diameter

General notes

All the information contained in this product range has been researched to the best of our knowledge. Nonetheless, errors cannot be completely precluded. For this reason, the information contained in the present product range does not involve any kind of obligation or warranty. Accordingly, we therefore do not undertake any responsibility nor any resultant or any other liability, arising in any manner from utilisation of this information. No responsibility is undertaken either for the completeness of the products, processes, properties, etc. covered. Data concerning weights are purely computed values, ensuing from the density and the mean value of the tolerance dimensions.

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Application of materials of Röchling not intended for implants

The materials described in this product range are not suitable for application as medical implants. Furthermore, they should not be put to use in medical technical fields, necessitating direct, long-term contact of the material with the patient.

Sterilization and multiple use of medical products

For classification of the sterilization resistance of our materials, various criteria were referred to, such as change to the mechanical properties, change in weight or loss in transparency (amorphous materials). For these reasons, this assessment only represents recommendations and not definite commitment for the suitability of a material for a specific reprocessing procedure. Should the medical product be re-used, it is incumbent upon the manufacturer of the product to determine the suitability and the number of possible reprocessing cycles for a process.

OLEFIN-BASED

Polypropylene Proteus® O&P Grade



Orthopedic polypropylene sheets are used for orthotic & prosthesis devices. Because people come in all different shapes and sizes, orthotic

and prosthetic devices must be custom fit — and that's where Proteus® O&P Grade comes in. Proteus® O&P Grade maintains the rigidity and durability required by the orthotics and prosthetics industry, while exhibiting top thermoforming performance.

Proteus® O&P Grade is a “natural” color and available in 48” x 96” sheets with gauge sizes ranging from 1/16” to 1/4”.



FORMING GRADE

Meldin® 7001 Polyimide (Unfilled)

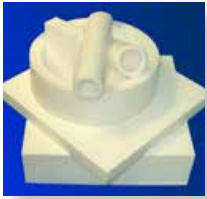


Meldin® 7001 Unfilled Polyimide offers superior mechanical properties, wear-resistance & chemical resistance. Meldin

is ideal for electrical and thermal insulating applications, as well as, for parts where high PV (pressure velocity) performance is required. More ductile than ceramics, and lighter weight than metals, Meldin® 7001 excels in high-speed, non-lubricated rotational parts including surgical and dental instruments such as pneumatic hand pieces and battery powered bone drills. Meldin® performs well over a wide temperature range while maintaining excellent creep resistance.

FLOUROPOLYMER MATERIALS

Teflon® - PTFE-Virgin Grade



Teflon® - PTFE Virgin Grade Rods & Sheets - exhibit astonishing chemical resistance and ultra high-purity. Self-lubricating and

with a low friction coefficient, Teflon PTFE is ideally suited for the manufacture of high-temperature seals, insulators and bearings used in semiconductor, aerospace & chemical processing industries.

Kel-F® - PCTFE



Kel-F® - PCTFE is a fluorocarbon-based polymer and is commonly abbreviated PCTFE. PCTFE offers the unique combination of

physical and mechanical properties, nonflammability, chemical resistance, near zero moisture absorption, and excellent electrical properties. These characteristics cannot be found in any other thermoplastic fluoropolymer with a useful temperature range of -400°F to +400°F. PCTFE also has extremely low outgassing, making it well suited for use in aerospace and flight applications.

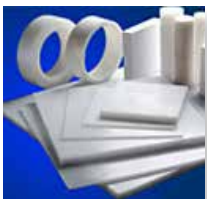
FEP



FEP is a relatively soft thermoplastic with lower tensile strength, wear resistance, and creep resistance than many other engineering

plastics. However, it is chemically inert and has a low dielectric constant over a wide frequency range. FEP possesses a very high degree of stress crack resistance, a low coefficient of friction, exceptional dielectric properties, heat resistance, retention of properties after service at 400°F (204°C) with useful properties at -454°F (-270°C), and meets FDA 21CFR.177.1550. FEP has high transparency (with good transmittance of UltraViolet and visible wavelengths.)

PFA



PFA offers similar properties to FEP, but is considered more of a premium resin. PFA is preferred when extended service is required

in hostile environments involving chemical, thermal, and mechanical stress. PFA offers high melt strength, stability at high processing temperatures, excellent crack and stress resistance, a low coefficient of friction, and more than 10 times the Flex life of FEP. It has high resistance to creep and retention of properties after service at 500°F (260°C), with useful properties at -320°F (95°C). PFA also meets FDA 21CFR.177.1550.

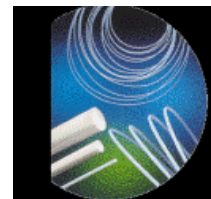
Halar® - ECTFE



Halar ECTFE is a partially fluorinated semi-crystalline polymer offering a unique combination of mechanical properties, thermal

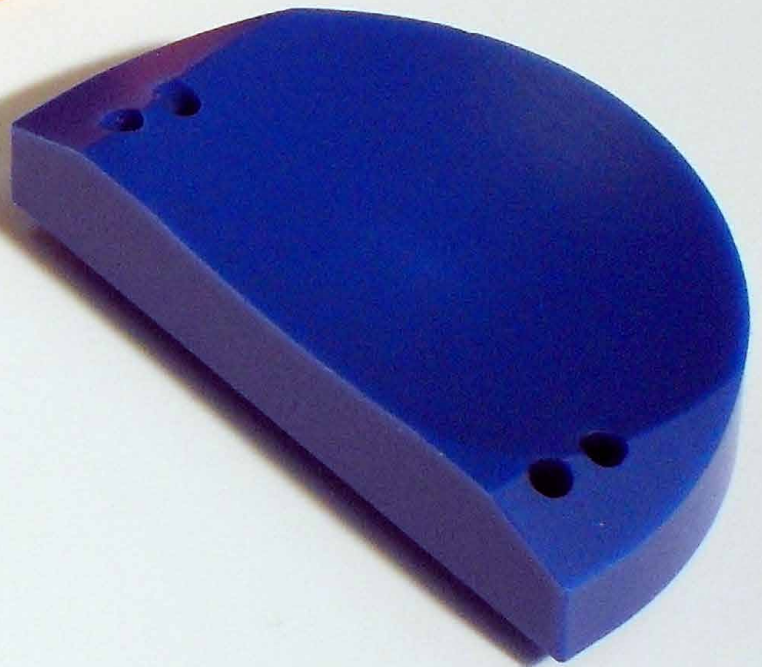
and chemical resistance with an outstanding ease of processability. Halar ECTFE, a copolymer of ethylene and chlorotrifluoroethylene, can bring advantages to the end user when compared to other fluoropolymers. It is a very versatile polymer, available in all forms to meet processing needs. Halar offers excellent resistance to abrasion, harsh chemicals, and permeation.

Tefzel® - ETFE



Tefzel® ETFE provides both corrosion resistance and mechanical strength over a wide temperature range. The

fluoroplastic family offers plastics with high chemical resistance, low and high temperature capability, resistance to weathering, low friction, electrical and thermal insulation. High purity, Excellent chemical resistance, good permeability resistance & excellent abrasion resistance over a temperature range of -300°F to +300°F (-185°C to +150°C).



KYDEX®

THERMOPLASTIC SHEET

**EXCELS IN
HIGH-PERFORMANCE
MEDICAL APPLICATIONS.**



Medical Equipment Housings, Mobile Carts, Work Surfaces, Hospital Bed Footboards and Headboards, Orthotics and Prosthetics, Tables and Trays, Ceiling Panels, Protective Wall Coverings, Work Stations

KYDEX® sheet is offered in an expanded range of high performance grades that meet the demanding requirements of medical applications.

KYDEX sheet provides the physical, chemical and aesthetic properties needed to improve the durability, cleanability, and appearance of medical products.

In addition to thermoforming, KYDEX sheet is suitable for laminating, fabricating, machining, and membrane pressing, making it the ideal material from which to create a broad variety of flat and three-dimensional medical components.

- Extreme chemical resistance: withstands harsh cleansers with no staining, fading, cracking or crazing
- Carries a UL Std. 94V-0 & 5V fire rating
- Extreme formability, hot tear strength and the ability to maintain uniform wall thickness
- Outstanding impact resistance, modulus of elasticity, tensile strength, hardness and heat deflection temperature
- Thicknesses from 0.71mm - 12.70mm (.028" - .500"),
- 8 surface textures, 3000 custom colours, realistic woodgrains, metallics & custom patterns
- Low minimum quantities

KYDEX® Thermoplastic Sheet Grades For Medical Applications

Below is a partial listing of KYDEX sheet rated for medical applications. For a comprehensive listing please visit www.kydex.com or contact a Kleerdex representative.

	<i>Izod Impact Resistance</i> at 22.8° C (73°F) [ASTM D-256]	<i>Modulus of Elasticity</i> [ASTM D-790]	<i>Tensile Strength</i> [ASTM D-638]	<i>Rockwell Hardness</i> (R Scale) [ASTM D-785]	<i>Heat Deflection Temp</i> @ 1.82MPa (264 psi) (annealed) [ASTM D-648]	<i>Thicknesses</i>	<i>UL Std 94 V-0 & 5V</i> Fire Rating
KYDEX® T Cost competitive with fire retardant ABS/PVC (FR-ABS) formulations but exhibits significantly higher impact strength and extensibility. Integral solid colours.	801 J/m (15 ft-lbs/in)	2,480 MPa (360,000 psi)	42 MPa (6100 psi)	94	75.6° C (168° F)	0.70mm (0.028") to 12.70mm (0.500")	●
KYDEX® 100 Integral solid colours.	961 J/m (18 ft-lbs/in)	2,310 MPa (335,000 psi)	42 MPa (6100 psi)	94	78.3° C (173° F)	0.70mm (0.028") to 12.70mm (0.500")	●
KYDEX® 110 Integral metallic colours.	128 J/m (2.4 ft-lbs/in)	2,450 MPa (356,000 psi)	45 MPa (6500 psi)	94	73.9° C (165° F)	0.70mm (0.028") to 9.60mm (0.375")	●
KYDEX® 130 Decorative granite-look sheet. It is Underwriter's Laboratories, Inc® recognized Std 94 V-0, 5V in all thicknesses and UL classified Class I/A for non-wall-covering building product applications.	187 J/m (3.5 ft-lbs/in)	2,372 MPa (344,000 psi)	41 MPa (6000 psi)	101	76.7° C (170° F)	0.70mm (0.028") to 9.60mm (0.375")	●
KYDEX® 510 Weatherable and decorative sheet. Acrylic cap protects the surface providing excellent weatherability for outdoor use.	801 J/m (15 ft-lbs/in)	2,480 MPa (360,000 psi)	42 MPa (6100 psi)	94	75.6° C (168° F)	1.00mm (0.040") to 9.60mm (0.375")	●
KYDEX® V Recycled grade that is cost competitive with other grades of thermoplastic sheet while offering improved performance. Available only in Black (52114).	427 J/m (8 ft-lbs/in)	2,068 MPa (335,000 psi)	42 MPa (6100 psi)	88	78° C (173° F)	0.70mm (0.028") to 9.60mm (0.375")	●
KYDEX® XD Membrane Press Grade Extreme Durability, superior impact 3D laminate with integral colours.	48.58 N-m 430 in-lbf Gardner Drop Dart (25.40mm [1.0"] MDF)	2,480 MPa (360,000 psi)	42 MPa (6100 psi)	94	75.6° C (168° F)	0.76mm (0.030") only	●
KYDEX® WG Membrane Press Grade Decorative Wood Grain 3D laminate with integral colours.	35.06 N-m 310 in-lbf Gardner Drop Dart (25.40mm [1.0"] MDF)	3,367 MPa (489,000 psi)	50 MPa (7200 psi)	114	75.1° C (167° F)	0.76mm (0.030") only	●



Material Properties and Applications

Material			Specific Gravity	Tensile Strength	Tensile Modulus	Tensile Elongation	Flexural Strength	Flexural Modulus
Trade Name	Common Name		D792	D638 PSI	D638 PSI	D638 %	D790 PSI	D790 PSI
PPSU	SUSTASON PPSU MG	Radel R	1.29	11,000	390,000	30	15,500	350,000
POM C	SUSTARIN® C MG	Acetal Copolymer	1.41	9,500	400,000	40	12,000	400,000
PEEK	SUSTAPEEK MG	PEEK	1.32	16,000	500,000	20	25,000	600,000
PEI	SUSTAPEI MG	Ultem	1.27	16,700	480,000	80	20,000	500,000
PSU	SUSTASON PSU MG	Polysulfone	1.24	10,200	360,000	30	15,400	390,000
PPO	SUSTAPPO MG	Noryl	1.08	9,400	350,000	30	13,400	360,000
PC	SUSTANAT PC MG	Polycarbonate	1.20	10,000	320,000	75	13,000	340,000
PP	Polystone® P MG	Polypropylene	0.91	4,700	232,000	—	—	180,000

Material			Rockwell Hardness	Izod Impact Notched	Heat Deflection Temp. @ 66 psi	Heat Deflection Temp. @ 264 psi	Continuous Use	Volume Resistivity
Trade Name	Common Name		D785 R	D256 ft. lb/in	D648 °F	D648 °F	°F	D257 ohm-cm
PPSU	SUSTASON PPSU MG	Radel R	R120	13	417	420	320	10 ¹⁶
POM C	SUSTARIN® C MG	Acetal Copolymer	R120	1.2	320	225	180	10 ¹⁶
PEEK	SUSTAPEEK MG	PEEK	R126	1.2	360	320	480	10 ¹⁵
PEI	SUSTAPEI MG	Ultem	R123	0.6	405	395	340	10 ¹⁶
PSU	SUSTASON PSU MG	Polysulfone	R125	1.3	359	345	300	5.0 x 10 ¹⁶
PPO	SUSTAPPO MG	Noryl	R119	3.5	289	260	220	10 ¹⁷
PC	SUSTANAT PC MG	Polycarbonate	R126	10	295	280	250	>10 ¹³
PP	Polystone® P MG	Polypropylene	—	1.9	221	149	180	—

Applications for medical technology

Today, finished products machined from our plastics are used in a host of medical devices and instruments. For applications requiring proven biocompatibility we offer a variety of **medical-grade** materials as well a comprehensive offering of standard plastics for applications that do not come into direct contact with patients.

Surgical instruments and supplies

- ☛ handles and grips for instrumentation
- ☛ sizing trials for knee and hip replacement
- ☛ fixation devices
- ☛ endoscopic housings and eyepieces
- ☛ sterilization trays and caddies

Diagnostic

- ☛ parts for X-ray and MRI devices
- ☛ components for supports and biopsy units

Therapeutic systems

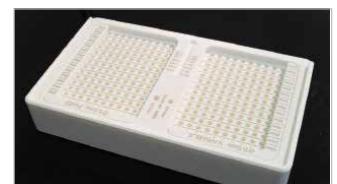
- ☛ blocks and housings for dialysis machines
- ☛ pistons and valves for anesthetic equipment
- ☛ supports and adaptors for respiratory units

Dental

- ☛ grips and handles for dental instruments
- ☛ components for treatment and therapy units

Pharmaceutical and biotechnology

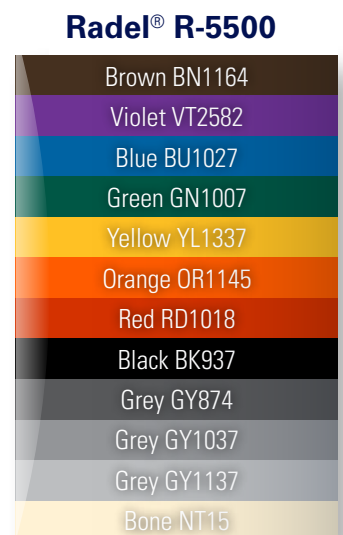
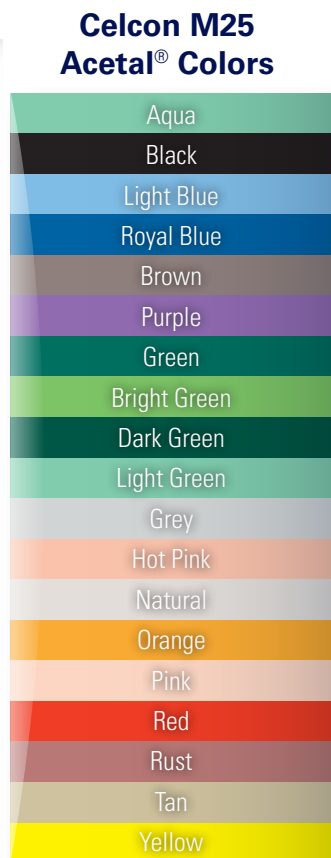
- ☛ components for sample changers
- ☛ valve housings and nozzles for fluid distribution
- ☛ spectrometer parts for chromatography systems
- ☛ wear parts for pill and tablet production



Medical Grade Plastic Tubing

Product	Description	Specifications
Polyimide Microbore Tubing	Ultra-smooth, chemically inert tubing for Cardiovascular Catheters, Urological Retrieval Devices, Electrical Applications, Fiberoptics, Intravascular Drug Delivery, Balloon Angioplasty, and Stent Delivery	USP Class VI
Tygon® 3350 Sanitary Silicone Tubing	For high-purity applications and repeated sterilization	ISO 10993, USP Class IV, FDA
Tygon® 3355-L Tubing	High-performance platinum-cured extended life silicone tubing	USP Class IV & FDA
Tygon® S-50-HL Medical/Surgical Tubing	Developed for use in cardiac surgery, Ideal for contact with blood	USP Class VI
Tygon® S-54-HL Microbore Tubing	Micro-diameter sizes fit needle guages 30 to 17	USP Class IV & FDA
PTFE Teflon® Tubing – Convoluted	Can also provide this convoluted tubing in FEP, MFA, PFA, ETFE, PVDF, or PEEK™	FDA Approved
PEEK Capillary Tubing	Corrosion resistant and resistant to high pressures	USP Class IV & FDA
PharMed® BPT Tubing	Outlasts silicone in peristaltic pumps by 30x	ISO 10993, USP Class IV, FDA
PharmaPure® Tubing	Low Spallation Pump Tubing	USP Class IV & FDA
Chemflour® FEP Tubing	Chemically inert from -454°F to 400°F	USP Class IV & FDA
Chemflour® PFA Tubing	Chemical resistance and heat resistance to 500°F	USP Class IV & FDA
Chemflour® PTFE Tubing	Smooth, non-porous, dimensionally stable tubing made out of polytetrafluoroethylene resin	FDA Approved
Chemflour® PVDF Pipe	Manufactured from Kynar® 740	USP Class IV & FDA
Versilic® SPX-50 High-Strength Silicone Tubing	Reliable, durable & resilient silicone tubing	USP Class IV & FDA
Versilic® SPX-70 I.B. Tubing	High Strength braided silicone tubing	USP Class IV & FDA
Sani-Tech® STHT™-R	Platinum-cured braid-reinforced silicone hose is an ultra-flexible, high-purity hose	USP Class VI & FDA
Tygpure™ Monobarb Sanitary Fittings	Quick and secure sanitary tubing attachments in a variety of low-pressure biopharmaceutical and laboratory applications	USP Class VI & FDA

Available Colors for Medical Grade Plastic Shapes





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