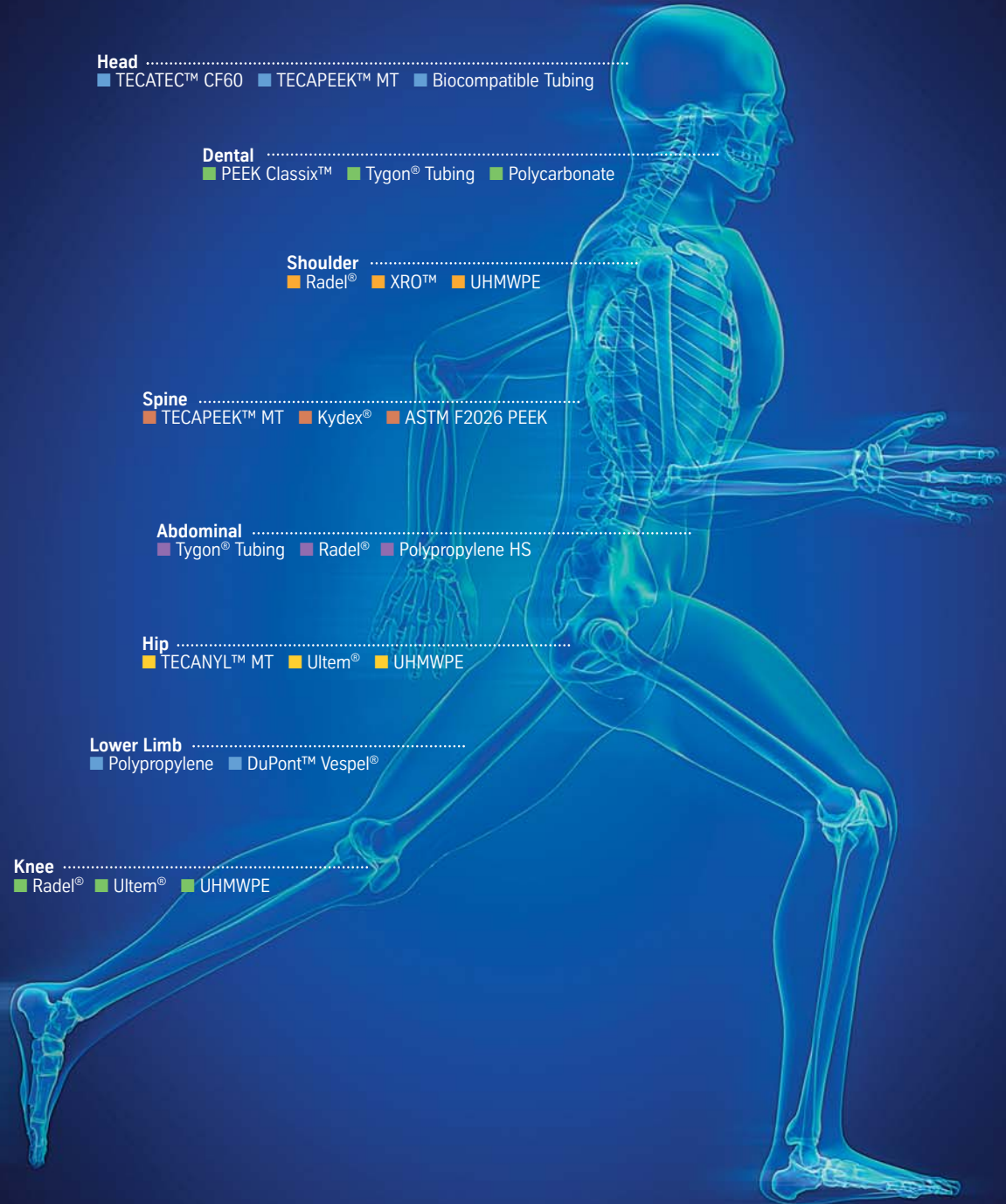


Materials for Medical Applications



ThyssenKrupp Materials NA
AIN Plastics Medical Technologies Group



ThyssenKrupp

The AIN Advantage for Medical Materials

Today's life science and healthcare markets are expanding rapidly and changing constantly. That's why medical device manufacturers and medical outsourcing companies need quality materials and fast dependable delivery from a forward-thinking supplier who can combine expert product knowledge with innovative supply chain solutions.

For more than 30 years, the AIN Plastics division of ThyssenKrupp Materials NA, has offered customers quality products, competitive pricing, and an unsurpassed level of service by supplying industrial and medical grade plastic shapes from the world's leading manufacturers including: Ensinger, Quadrant EPP, Westlake Plastics, DuPont, Bayer Corporation, St. Gobain Performance Plastics, and many other industry leaders.

The AIN Plastics Medical Technologies Group combines decades of proven expertise in engineering plastics with ThyssenKrupp's long standing reputation as a leading supplier of nonferrous metals, specialty alloys, and stainless steel products. The Medical Technologies Group is a complete integrated source in your supply base that provides the inventory management expertise and value-added processing services you need to compete in today's global medical marketplace.

ThyssenKrupp Materials NA has been steadily expanding its portfolio of products and services beyond materials procurement and processing. In recent years, we have established ourselves as an industry leader in production process support for the manufacturing industry. From warehousing, third party logistics, transportation, blanking, kitting, and sequencing, to complete supply-chain management solutions, we can develop a customized production support program which will work for you.

Not all materials are compliant; let the experts at **AIN Plastics Medical Technologies Group** assist you in finding the correct material for every specification and requirement.

- Full line of medical grade materials with full regulatory compliance
 - ISO 10993
 - USP Class VI
 - FDA Compliant
 - ASTM F2026
 - ASTM F-648
 - ISO 5834 (1&2)
- Complete material lot and batch traceability on all biocompatible and medical grade products.
- Certificates of conformance accompany every order and include lot and batch traceability.
- Comprehensive technical support is available at the local and national levels.
- Extensive inventory of medical grade plastic shapes in many colors, diameters, sheet sizes, and types.

Materials For Medical Devices, Instruments & Appliances

Plastic Shapes

ISO 10993

Description	Primary Trade Name
Acetal Copolymer (Celcon® M25)	TECAFORM™ MT
Radel® R 5500 (PPSU)	TECASON™ P
Radel® R5500 w/ BaSO4 filler	TECASON™ P XRO™
Noryl® HNA055 (PPE)	TECANYL™ MT
Noryl® 30% Carbon Fiber	TECANYL™ MT CF30
Noryl® w/ BaSO4 filler	TECANYL™ MT XRO
ULTEM® (PEI)	TECAPEI™ MT
PEEK	TECAPEEK™ MT
PEEK Classix™ BC1	TECAPEEK™ Classix™
PEEK 30% Carbon Fiber	TECAPEEK™ XP98
PAEK 60% Carbon Woven	TECATEC™ CF60
Polycarbonate	Zelux® GS

NOTE: Biocompatibility test results are subject to change due to resin modifications and substitutions. Please contact AIN Plastics at (877) 770-6337 to confirm classification levels before product use.

ASTM F-648 & ISO 5834

Description	Grade
Medical Grade UHMWPE	GUR® 1020 (Type 1)
Medical Grade UHMWPE	GUR® 1050 (Type 2)

NOTE: Special terms and conditions apply to the sale of permanently implantable materials.

USP VI

Description	Trade Name
Polypropylene (Heat Stabilized)	TECAPRO™ MT, Propylux® HS
Polyvinylidene Fluoride (PVDF)	Kynar®
Polysulfone (PSU 1000)	Udel®
Polyphenylsulfone (PPSU)	Radel®, Ultrason®
Polyetherimide (PEI)	Ultem® 1000F
Polycarbonate GS	Zelux® GS

FDA Only

Description	Trade Name
Copolymer Acetal	Acetron® GP
Homopolymer Acetal	Delrin®
PET	Ertalyte® PET-P
PET (internally lubricated)	Ertalyte® TX
PTFE (mica filled)	Flourosint® 207
Polycarbonate	Lexan®, Makrolon®
Nylon Cast — Type 6	Nylatron® MC 907
Nylon Extruded — Type 6/6	Nylon 101
UHMWPE	Tivar® 1000
PEEK	Ketron® PEEK

ASTM F2026

Description
PEEK Implant Grade

NOTE: Special terms and conditions apply to the sale of permanently implantable materials.

Plastic Tubing

Description	Trade Name	Specifications
Medical / Surgical Tubing	Tygon® S-50-HL	ISO 10993, USP Class VI, FDA
High Purity Tubing	Tygon® 2275	ISO 10993, USP Class VI, FDA
Sanitary Silicone Tubing	Tygon® 3350	ISO 10993, USP Class VI, FDA
Medical Peristaltic Pump Tubing	Pharmed®	ISO 10993, USP Class VI, FDA
Microbore Tubing	Tygon® S-54-HL	USP Class VI

Stainless Steel

Type	Specifications
17-4 Accumax® Precision	ASTM A564, AMS 5643, ASTM A484
17-4 Cond. A	ASTM A564
17-4 H 900	ASTM A564
17-4 HRAP Cond. A	ASTM A564, AMS 5643, AMS 2303, ASTM A484
303 MAXX®	ASTM A276, ASTM A479, ASTM A582, AMS 5640
316/316L MAXX®	ASTM A276, ASTM A314, ASTM A473, ASTM A479, AMS 5648
440C	ASTM A276, AMS 5630
455 Custom Solution	ASTM A564-04, Grade XM-16, AMS 5617 Rev. J

Radio Opaque Plastic materials allow for clear visibility of orthopedic sizing trials and other instrument devices and components on fluoroscopy and x-ray machines. This accommodates many of the new challenges created by minimally invasive and image guided surgery. Radio opaque plastics also provide a safety feature for locating plastic components during surgery.

- TECASON™ P MT XRO™ (Radel®)
- TECAPEI™ XRO™ (Ultem®)
- TECANYL™ MT XRO™ (Noryl® HNA055)

Semi-finished rods have been tested to meet the requirements of ISO 10993 for external devices intended for less than 24 hour contact with tissue, bone, and dentine.

High Strength Radiolucent materials are available in carbon fiber reinforced as well as unfilled grades. These products are characterized by high strength, extreme resistance to hydrolysis, and consistent resistance to ionizing radiation. All conventional sterilization methods are very compatible and the products are supported with biocompatibility testing to ISO 10993 for contact up to 24 hours.

- TECANYL™ MT CF30 (30% Reinforced Mod PPE)
- TECAPEEK™ MT CF30 (30% Reinforced PEEK)
- TECATEC™ CF60 (60% Reinforced PAEK)

PAEK resins are excellent for repeated steam sterilization cycles and carbon fiber provides metal like dimensional stability and stiffness making it an ideal material for external fixation devices, targeting guides, retractor blades, and structural components.

Antimicrobial Additives provide an additional safety and performance factor in medical devices. The antimicrobial effect is achieved by a gradual release of silver ions that create several advantages such as reduced formulation of bacteria and reduction of accumulated odor and biofilm on material surfaces. They also reduce bacterial contamination during downtime to increase cleanliness.

- TECAFORM™ AH MT SAN (Copolymer Acetal)
- TECAPRO™ MT SAN (H.S. Polypropylene)
- (Other SAN materials available as custom run)

SAN antimicrobial additive is non-toxic and conforms to FDA requirements. The homogeneous distribution of active SAN on the material surface is continuously renewed by cleaning and minor abrasion to constantly renew the antimicrobial effect.



Materials For Life Science Applications

Plastic Tubing

Product	Type	Description	Specifications
PharmaPure™ Tubing		Low Spallation Pump Tubing	USP Class IV & FDA
Tygon® HPT Tubing		Biopharmaceutical Tubing - Animal Free	USP Class IV, EP 3.2.9 & FDA
PharMed™ Tubing		Outlasts silicone in peristaltic pumps by 30 x	ISO 10993, USP Class IV, FDA
Versilic™ High Strength Tubing	SPX-50	Reliable, durable & resilient silicone tubing	USP Class IV & FDA
Versilic™ Pressure Tubing	SPX-70 I.B.	High Strength braided silicone tubing	USP Class IV & FDA
Tygon® Sanitary Silicone	3350	For high-purity applications and repeated sterilization	ISO 10993, USP Class IV, FDA
Tygon® Sanitary Pressure Tubing	3370 I.B.	Braided silicone tubing for high-purity applications	USP Class IV & FDA
Tygon® Microbore Tubing	S-54-HL	Micro-diameter sizes fit needle gauges 30 to 17	USP Class IV & FDA
Tygon® High Purity Tubing	2275	Provides an uncompromising fluid path	ISO 10993, USP Class IV, FDA
Tygon® High Purity Pressure Tubing	2275 I.B.	Tough braid reinforced for elevated working pressures	USP Class IV & FDA
Tygon® Long Flex Life Pump Tubing	LFL	Longest flex life of any clear Tygon® 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® PVDF Tubing		Abrasion resistance, high purity & mechanical strength	USP Class IV & FDA
Chemflour® PVDF Pipe		Manufactured from Kynar® 740	USP Class IV & FDA
Acutech PEEK Capillary Tubing		Corrosion resistant and resistant to high pressures	USP Class IV & FDA

Engineering Plastics For Pharmaceutical Processing & Packaging

- Applications for tablet production such as strong wear resistant manifolds
- Wear parts for processing equipment such as star wheels and self lubricated bearings
- Ultem® and Polysulfone tooling plugs for in-line thermoforming of pharmaceutical packaging
- Sliding surfaces such as material chutes and wear strips on packaging conveyers
- Anti-static plastics are used to control dust build up and to control surface contamination
- High purity aseptic seals for pumps and seats for valves are machined from USP Class IV materials
- Filled PTFE products with antimicrobial additives are used for sanitary seals and gaskets

Engineering Plastics For Biotechnology & Laboratory Equipment

- Polycarbonate for optics and lenses in electro-optical microscopes and optical systems
- Seals, stoppers and closures produced from natural, butyl and silicone rubber formulations
- PEEK is highly corrosion resistant and is ideal for applications in high pressure liquid chromatography (HPLC)
- PTFE, PFA and FEP are simply the most "universally inert" materials available in lab wear products
- Kydex® sheet is a great choice for impact resistant housings and equipment covers
- Fabricated thermoplastic trays used in the fermentation of microorganisms to produce antibiotics

DuPont™ Vespel® Bearings are used in powered surgical instruments such as pneumatic handpieces and battery powered bone drills. Spin-dles and impellers are light weight, durable, and require no external lubrication.

- Vespel® SP-21 (15% Graphite Filled)
- Vespel® SP-22 (40% Graphite Filled)
- Vespel® SP-211 (15% Graphite & 10% PTFE)
- Vespel® SCP- 50094 (15% Graphite Filled)
- Vespel® SCP- 5050 (50% Graphite Filled)

Vespel® bearings perform well without lubrication under conditions that destroy other plastics and cause severe wear in most metals. Vespel® can accommodate higher pressures and velocities and excel over a wide range of temperatures while maintaining outstanding creep resistance.

Kydex® Specialty Thermoplastic Sheet combines reliable performance and regulatory compliance with an extensive array of color and texture combinations. Kydex® resists exposure to lipids present in body fats and to gamma radiation.

- Kydex® 100 High Impact Fire-Rated Sheet
- Kydex® T High Impact Fire-Rated Sheet
- Kydex® 130 Decorative Granite-Look Sheet
- Kydex® 510 Weatherable & Decorative Sheet
- Kydex® 115 Clean Room Ceiling Panels
- Kydex® 160 Class I/A Clean Room Wall Covering

Kydex® sheet is extruded of non-porous, proprietary thermoplastic and is able to withstand repeated removal/cleaning/re-installation cycles. Applications include medical equipment housings, mobile carts, hospital beds, and orthotic and prosthetic devices.

Tygon® High Purity Tubing is ideal for handling sensitive fluids such as pharmaceutical or biological solutions. There is virtually no absorption of key fluid constituents into the tubing material or fluid absorption into the tubing walls.

- Documented biocompatibility to ISO 10993
- Meets USP Class IV, FDA and NSF
- Plasticizer-free (virtually no extractables)
- Environmentally friendly (safe to incinerate)

Frequently, incineration is used to dispose of contaminated materials. While many tubings release hazardous byproducts when burned, this tubing only releases carbon dioxide and water when properly incinerated for safe disposal.

Materials For Medical Applications

Head

- TECATEC™ CF60 used for external fixation devices
- Biocompatible tubing for respiratory equipment
- TECAPEEK MT™ for ocular funnel in an endoscope

Dental

- PEEK Classix™ for temporary implants and healing caps
- Tygon® Tubing for suction and pump applications
- Clear Gamma Stabilized Polycarbonate for equipment housings

Shoulder

- Radel® is ideal for rotator cuff sizing trials
- XRO™ materials for X-Ray and fluoroscopic opaque applications
- Polypropylene HS, ideal for surgical caddy or trays

Spine

- TECAPEEK™ MT as pre-setup option for PEEK-OPTIMA® in spinal cages
- Modified Polyethylene and Kydex® for immobilization devices
- ASTM F2026 PEEK for spinal cages

Abdominal

- Tygon® Long Flex Life Pump Tubing for dialysis equipment
- Tygon® Surgical Tubing with higher sterilization resistance
- Ergonomic Radel® Pistol Grip for suture cutter

Hip

- TECANYL™ MT for hip arthroplasty sizing trials
- Ultem® handles for femoral shaft surgical rasps
- Radel® for hand fitting shaped grip on striking instrument
- UHMW PE GUR® 1020 and GUR® 1050 for total joint replacement prostheses

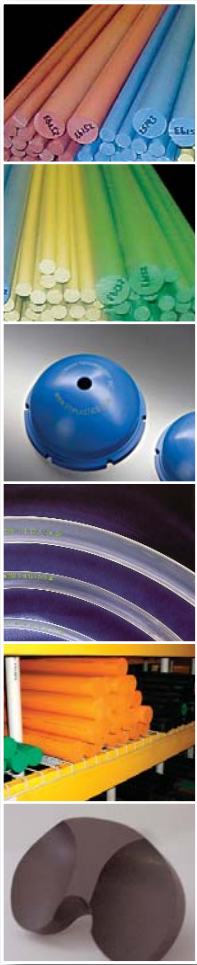
Lower Limb

- Copolymer Polypropylene for custom orthopaedic braces
- DuPont™ Vespel® non-lubricated bearing for light weight surgical drills
- Stress relieved polypropylene for ankle foot orthosis

Knee

- Celcon® Acetal for sizing trials used during knee arthroplasty
- Ultem® handles for orthopedic surgical instruments
- Radel® plate for extramedullary tibia alignment guide
- Medical Grade UHMWPE for tibial components

Typical Colors For Common Medical Shapes



Acetal Colors	Ultem® Colors	Radel® Colors	TECANYL MT® Colors
Aqua	Black	Black	Green
Black	Blue 1000F	Blue	Yellow
Light Blue	Dk Blue 1000F	Brown	Brown
Royal Blue	Lt Blue 1000F	Grey	Grey
Brown	Brown 1000F	Smoke Gray	Blue
Purple	Grey 1000F	Green	Black
Green	Dk Green 1000F	Bright Green	White
Bright Green	Lt Green 1000F	Grey	
Dark Green	Lavendar 1000F	Orange	
Light Green	Purple 1000F	Purple	
Grey	Natural 1000	Red	
Hot Pink	Rust 1000F	Rust	
Natural	Red 1000F	Yellow	
Orange	Tan 1000F	Natural (amber)	
Pink	Lt Yellow 1000F	Natural (bone)	
Red	Yellow 1000F		
Rust	White 1100F		
Tan			
Yellow			

NOTE: We can not guarantee that the colors shown here are true representations of the extruded shape. Please contact AIN Plastics at (877) 770-6337 to confirm the actual color per the manufacturer's specification.

One number to call for the best names in plastics...



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