Ensinger

Plastics used in medical technology

Stock shapes

Agenda

Industry overview

Product portfolio

Additional information

Application examples

Industry overview
Applications

Ensinger

Plastics are used in following applications for medical technology:

→ Surgical instruments, amongst others minimal invasive surgery

→ Sterilisation trays

→ Dental

→ Clinical diagnosis systems

→ Orthesis

→ Orthopaedics (test implants)

Industry overview
Advantages

Ensinger

What can plastics offer for the medical technology?

→ Realisation of more and more smaller surface structures

→ Miniaturisation of prefabricated parts

→ Advanced functionality

→ Easier handling by lighter weight

→ Economic production and processing possibilities

→ Design flexibility (colour & shape)

Plastics offer a high potential to the medical technology industry
especially by the substitution of metal.

Industry overview

Requirements in medical technology

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Resistance
- Sterilisation resistance
- Chemical resistance
- Resistance against hydrolysis
- Thermal resistance
- Radiation resistance

Physiology
- Biocompatibility acc. to USP 23 Class VI/ ISO 10993
- FDA Drug (DMF) / Device Master File (MAF) listing
- FDA compliance
- FDA compliant pigments

Mechanics
- Strength and stiffness at high temperatures
- Low tendency to creep
- High precision

Plastics used in medical technology

Tribology
- Low friction
- Abrasion resistance
- Good dry-running porperties against metal

Electrics
- Dielectric loss factor
- High impact strength
- Good creep resistance
- Conductivity resp. insulation

Others
- Barrier properties
- Production precision
- Low moisture absorption
- Low thermal expansion

Agenda

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Application examples

Ensinger portfolio for MT materials

Ensinger

Basis portfolio for medical and pharmaceutical applications:

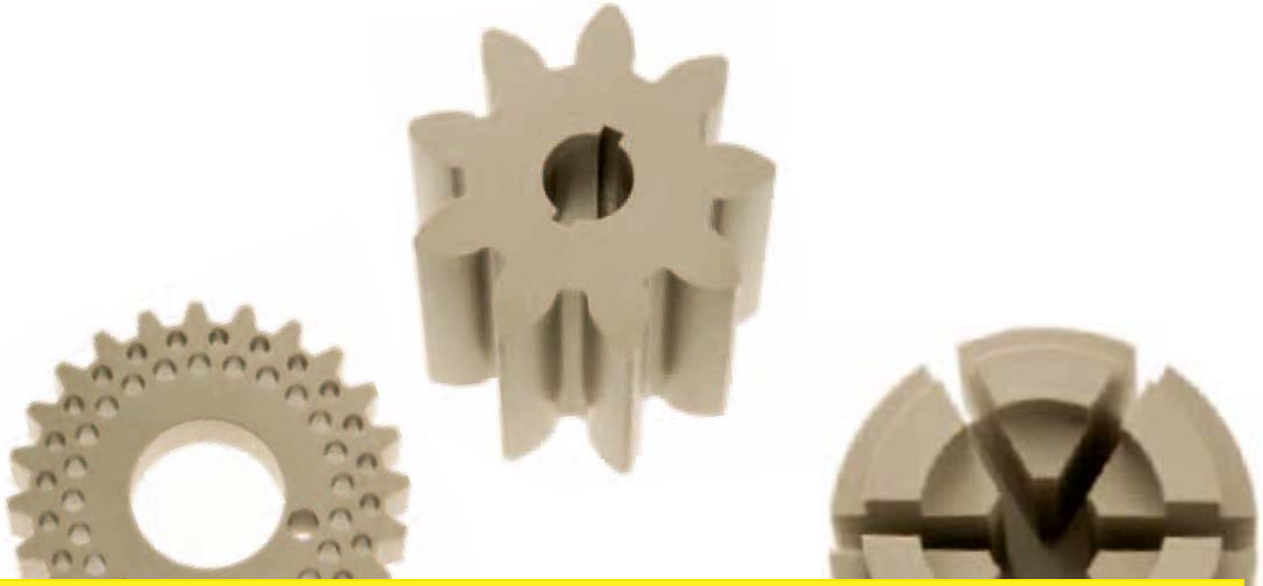
- TECAPEEK MT
- TECAPEI MT
- TECAPEEK CLASSIX™
- TECANYL MT
- TECAPEEK CF30 MT
- TECAFORM AH MT
- TECATRON MT
- TECAPRO MT
- TECASON P MT
- TECANAT MT

Special materials:

- TECATEC
- XRO materials
- SAN materials

- Resistance / Traceability / Packaging
- Application examples

Ensinger



Polyetheretherketone

TECAPEEK MT

Fields of application for PEEK materials

Ensinger

Equipment	Analysis	Instruments	„Delivery systems“	Long-term implants
→ Pumps → Housings → Motors → Sterilization equipment	→ Chromatography components → Chemicals-contact → Biohazard handling	→ Laparoscopy → Handles → Surgical tools → Endoscopy	→ Stents → Contact with medicines → Contact with blood (dialysis) → Temporary implants in the field of dentistry	→ Orthopaedics → Dental medicine → Neurology → Pharmacy
TECAPEEK FDA conformity, not suitable for direct contact with blood or tissue		TECAPEEK MT ISO 10993 tested, contact: short periods (≤24 hrs.)	TECAPEEK CLASSIX™ USP VI conformity, batch-by-batch testing to ISO 10993-5 on raw materials and stock shapes Contact: Long-term (≤ 30 days) with scope to increase to 180 days (via Invibio®)	PEEK-OPTIMA® For long-term implants, sale only through Invibio®

Increasing risk and responsibility for suppliers

victrex
MADE WITH VICTREX PEEK POLYMER

TECAPEEK MT
Property profile

Ensinger

→ Very good chemical resistance

→ Excellent level of resistance to customary methods of sterilization

→ Good radiation resistance

→ High stress cracking resistance

→ Good dimensional stability and easy machining properties

→ Excellent tribological properties

→ Good electrical insulation even under high voltages (does not apply to TECAPEEK black)

→ Suitable for direct contact with blood and tissue of up to 24 hours

TECAPEEK MT
Colour portfolio

Ensinger

Following colours are available for **TECAPEEK MT**:

black	blue	yellow	bright red
green	ivory	natural	

The colour fields are only for comparison.
A color fidelity cannot be guaranteed.

Dimensions and further information of our MT-materials can be found in the stock shapes catalogue

Ensinger

Polyetheretherketone

TECAPEEK CLASSIX™

TECAPEEK CLASSIX™
Property profile

Ensinger

→ Extremely hydrolysis resistance, even at high temperatures

→ Repeated sterilization capability using conventional methods

→ Outstanding chemical resistance

→ Particularly successful combinatino of strength, rigidity, toughness and hardness

→ Excellent abrasion resistance and impact strength

→ Standard colour cream white, further colours on request

→ Also available as X-ray opaque XRO modification

→ Suitable for direct contact with blood and tissue of up to 30 days, respectively 180 days

TECAPEEK CLASSIX™
Colour portfolio

Following colours are available for **TECAPEEK CLASSIX™**:

creme white

black

XRO white

Dental healing cap
TECAPEEK CLASSIX™

Dimensions and further information of our MT-materials can be found in the stock shapes catalogue

The colour fields are only for comparison.
A color fidelity cannot be guaranteed.

Ensinger

Polyetheretherketone

TECAPEEK CF30 MT

TECAPEEK CF30 MT
Property profile

Ensinger

→ Very high rigidity and creep strength

→ Excellent thermal dimensional stability

→ Excellent chemical resistance

→ Extremely wear resistant

→ Excellent dimensional stability

→ Physiological harmlessness

→ Good sterilization capability

→ Suitable for direct contact with blood and tissue of up to 24 hours

TECAPEEK CF30 MT
Colour portfolio

Following colours are available for **TECAPEEK CF30 MT**:

black

Dimensions and further information of our MT-materials can be found in the stock shapes catalogue

The colour fields are only for comparison.
A color fidelity cannot be guaranteed.

Ensinger

Polyphenylensulfide

TECATRON MT

TECATRON MT
Property profile

Ensinger

→ Very good chemical resistance

→ Good radiation resistance

→ Very good thermal and mechanical properties

→ Long-term service temperature up to 230 °C

→ Extreme hardness and rigidity

→ High dimensional stability and low creep tendency

→ Suitable for direct contact with blood and tissue of up to 24 hours

Polyphenylsulfone

TECASON P MT

TECASON P MT

Property profile

Ensinger

- → Resistant to cleaning agents and disinfectants, hydrolysis and steam
- → Heat stabilization results in improved resistance to sterilization and low warping tendency
- → Minimal moisture absorption
- → Good sliding properties
- → Easy to machine
- → Also available as X-ray opaque XRO material
- → Suitable for direct contact with blood and tissue of up to 24 hours

TECASON P MT
Colour portfolio

Ensinger

Following colours are available for **TECASON P MT**:

black	blue	yellow	red	green	grey	brown	sky blue
rust red	ivory	bright yellow	deep orange	raspberry red	blue lilac	light green	

Dimensions and further information of our MT-materials can be found in the stock shapes catalogue

The colour fields are only for comparison.
A color fidelity cannot be guaranteed.

Ensinger

Polyetherimid

TECAPEI MT

TECAPEI MT
Property profile

Ensinger

→ Excellent sterilization resistance

→ Permeable to high-frequency electromagnetic waves

→ Good thermal and mechanical properties

→ Long-term service temperature up to 170 °C

→ Good dimensional stability

→ Available in a variety of colours

→ Suitable for direct contact with blood and tissue of up to 24 hours

TECAPEI MT
Colour portfolio

Following colours are available for **TECAPEI MT**:

black

blue

green

brown

grey

natural

The colour fields are only for comparison.
A color fidelity cannot be guaranteed.

Dimensions and further information of our MT-materials can be found in the stock shapes catalogue

Ensinger

Polyphenylenether

TECANYL MT

TECANYL MT

Property profile

Ensinger

- → High level of resistance to repeated gamma radiation, steam and ethylene oxide sterilization, compatible with morpholine
- → Low density for lighter-weight parts
- → Good chemical resistance
- → High impact strength
- → Available in a variety of colours
- → Also available as X-ray opaque XRO material
- → Suitable for direct contact with blood and tissue of up to 24 hours

TECANYL MT
Colour portfolio

Following colours are available for **TECANYL MT**:

black

blue

green

brown

yellow

grey

The colour fields are only for comparison.
A color fidelity cannot be guaranteed.

Dimensions and further information of our MT-materials can be found in the stock shapes catalogue

Ensinger

Polyacetal Copolymer

TECAFORM AH MT

TECAFORM AH MT
Property profile

Ensinger

→ Good chemical resistance

→ Good electrical insulation (does not apply to TECAFORM AH MT black)

→ Very good sliding and abrasion properties

→ Rigid, strong and hard

→ Easy to machine

→ Available in a variety of colours

→ Suitable for direct contact with blood and tissue of up to 24 hours

TECAFORM AH MT
Colour portfolio

Ensinger

Following colours are available for **TECAFORM AH MT**:

black	blue	yellow	red
green	grey	brown	

The colour fields are only for comparison.
A color fidelity cannot be guaranteed.

Dimensions and further information of our MT-materials can be found in the stock shapes catalogue

Ensinger

Polypropylene, stabilized

TECAPRO MT

TECAPRO MT
Property profile

Ensinger

- → Resistant to cleaning agents and disinfectants, hydrolysis and steam
- → Heat stabilization results in improved resistance to sterilization and low warping tendency
- → Minimal moisture absorption
- → Good sliding properties
- → Easy to machine
- → Suitable for direct contact with blood and tissue of up to 24 hours

TECAPRO MT
Colour portfolio

Following colours are available for **TECAPRO MT**:

Dimensions and further information of our MT-materials can be found in the stock shapes catalogue

The colour fields are only for comparison.
A color fidelity cannot be guaranteed.

Ensinger

Polycarbonate

TECANAT MT

TECANAT MT
Property profile

Ensinger

→ High toughness

→ Good transparency

→ High heat distortion temperature (130°C)

→ Good dimensional stability

→ Very good electrical insulation

→ Suitable for direct contact with blood and tissue of up to 24 hours

Ensinger

Special material

Thermoplastic Composites:

TECATEC PEEK CW50

TECATEC PEKK CW60

TECATEC
Property profile

Ensinger

- → Outstanding strength
- → Excellent thermal dimensional stability
- → Good dimensional stability
- → Low water absorption
- → Corrosion resistance
- → Excellent chemical resistance
- → Excellent resistance to hot steam autoclaving
- → Physiologically harmless
- → Suitable for direct contact with blood and tissue of up to 24 hours

Target arm
TECATEC PEEK CW50
Courtesy Stryker Trauma GmbH

TECATEC

Thermoplastic Composites based on PAEK

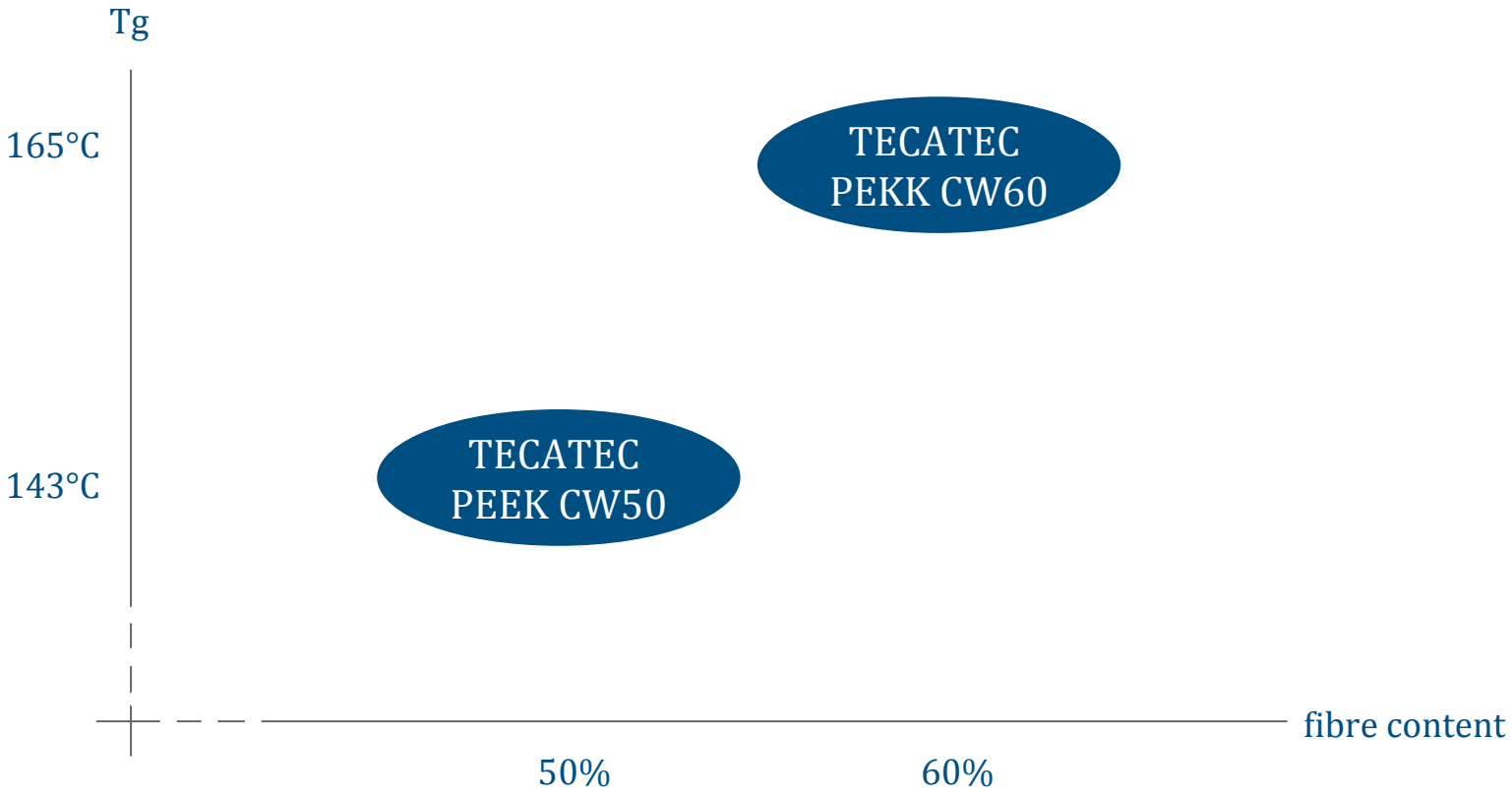
TECATEC PEEK CW50	**TECATEC PEKK CW60**
→ Consists of 50% carbon fibre (3K)	→ Consists of 60 % carbon fibre (3K)
→ Matrix: PEEK	→ Matrix: PEKK
→ Fibre type: T300	→ Fibre type: T300
→Fabric: 0° / 90° (orthotrop)	→Fabric: 0 ° / 90 ° (orthotrop)
→ Matrix content: 50% (weight percent)	→ Matrix content: 40 % (weight percent)

TECATEC

Property comparison

Property	Unit	Orien-tation	Norm	TECATEC PEKK CW60	Norm	TECATEC PEEK CW50
Tensile strength	[MPa]	warp	DIN ISO 527-4	585	DIN ISO 527-4	491
Tensile strength	[MPa]	fill	DIN ISO 527-4	626	DIN ISO 527-4	511
Modulus of elasticity (tensile test)	[GPa]	warp	DIN ISO 527-4	55.3	DIN ISO 527-4	53.2
Modulus of elasticity (tensile test)	[GPa]	fill	DIN ISO 527-4	54.3	DIN ISO 527-4	50.4
Compression strength	[MPa]	warp	D6641	574	DIN EN ISO 604	455
Compression strength	[MPa]	fill	D6641	663	DIN EN ISO 604	433
Flexural strength	[MPa]	warp	DIN ISO 178	964	DIN ISO 178	813
Flexural strength	[MPa]	fill	DIN ISO 178	882	DIN ISO 178	738
Modulus of elasticity (flexural test)	[GPa]	warp	DIN ISO 178	50,9	DIN ISO 178	48.9
Modulus of elasticity (flexural test)	[GPa]	fill	DIN ISO 178	45.3	DIN ISO 178	47.1
Thermal expansion (CLTE)	[10^{-5}*K^{-1}]	warp	ISO 11359	0.5	ISO 11359	0.5
Thermal expansion (CLTE)	[10^{-5}*K^{-1}]	fill	ISO 11359	0.5	ISO 11359	0.5
Water absorption	[%]	-	48h / 80°C	0.23	48h / 80°C	0.15
Service temperature (long-term)	[°C]	-	-	260	-	260
Glass transition temperature (Tg)	[°C]	-	ISO 3146	165	ISO 3146	143
Density	[g/cm³]	-	ISO 1183	1.61	ISO 1183	1.48
Biocompatibility	-	-	ISO 10993-5	yes	ISO 10993-5	yes

TECATEC
Differences of the products



TECATEC
Dimensions

→ All production are make-to-order on customer request

→ Samples are available on request

→ Dimensions are between 10 – 50mm, larger thicknesses on request

Ensinger

Specials materials

X-ray opaque XRO materials

X-ray opaque XRO materials

Ensinger

- → With its X-ray opaque XRO materials, Ensinger meets the challenging demands of minimally invasive and image-controlled surgery.
- → A contrast medium added to the standard product line permits clear visibility of components under fluoroscopy and X-ray radiation.
- → It provides the surgeon with a precise picture of his or her instruments or of orthopaedic test implants during image-controlled procedures.
- → Following materials are currently available as standard X-ray opaque material:
  - → TECAPEEK CLASSIX™ XRO20 (PEEK)
  - → TECASON P MT XRO (PPSU)
  - → TECANYL MT XRO (PPE)

Our X-ray opaque XRO plastics allow a precise view of instruments or orthopaedic test implants during imagecontrolled surgical procedures.

X-ray opaque XRO materials
Property profile

Ensinger

→ X-ray impermeable

→ Raw material and colour additives are biocompatible

→ Resistant to cleaning agents, disinfectants and different solvents

→ Resistant to repeated steam autoclaving

→ High level of resistance to gamma radiation

→ Good hydrolysis resistance

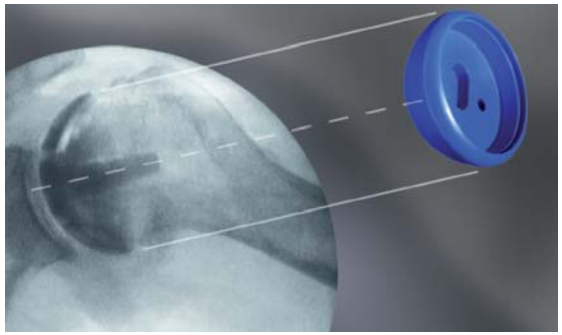
→ Excellent dimensional stability, very hard and rigid

→ High thermal stability and outstanding mechanical characteristics

→ High impact strength and notched impact strength

→ Low water absorption

→ Very good electrical insulation



Ensinger

Specials materials

Antimicrobical SAN materials

Antimicrobical SAN materials

Ensinger

- → SAN materials from Ensinger offer additional safety through their antimicrobial effect
- → This effect is based on the continuous release of biocides to the surface of the plastic component
- → This supplements the necessary mechanical and chemical cleaning steps by an additional safety stage
- → The following materials are currently equipped with antimicrobial properties as standard:
  - → TECAFORM AH SAN (POM-C)
  - → TECAPRO SAN (PP)
  - → TECADUR PBT SAN (PBT)

The antimicrobial effect of our SAN materials is designed to supplement mechanical and chemical cleaning processes in medical technology by an additional safety stage.

Antimicrobical SAN materials
Property profile

Ensinger

- → Higher degree of material purity
  - → Due to reduced bacterial contamination during downtimes
  - → Decreased formation of biological films on the material surface
  - → Decreased formation of bacteria accumulation in critical machine geometries (corners, hollows etc.)
- → Even distribution of the active substance over the material surface
- → Cleaning or low surface abrasion results continuous renewal of antimicrobial effect
- → Harmless to humans as the active substance is neither toxic nor does it migrate; no degradation into toxic substances takes place
- → No thermal damage to the active substance takes place in the temperature range of normal applications

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MT portfolio

Resistance

Traceability

Packaging

Sterilization resistance

Ensinger

	TECAPEEK MT (PEEK)	TECATRON MT (PPS)	TECASON P MT (PPSU)	TECAPEI MT (PEI)	TECANYL MT (PPE)	TECAFORM AH MT (POM-C)	TECAPRO MT (PP)	TECANAT (PC)
Acids - weak	+	+	+	+	+	+	+	(+)
Acids - strong	(+)	+	(+)	(+)		(+)	(+)	-
Alkalis - weak	+	+	+	-	+	+	+	-
Alkalis - strong	+	+		-		-	+	-
Solvents - alcohol	+	+	+	+		+	+	(+)
Solvents - ester	+	+				(+)	(+)	-
Solvents - ether	+	+				(+)	(+)	-
Ketone	+	+	-	-		(+)	(+)	-
Water - cold	+	+	+	+	+	+	+	+
Water - hot	+	+	+	+	+	+	+	(+)

+ = resistant
(+) = limited resistance
- = not resistant

Chemical resistance

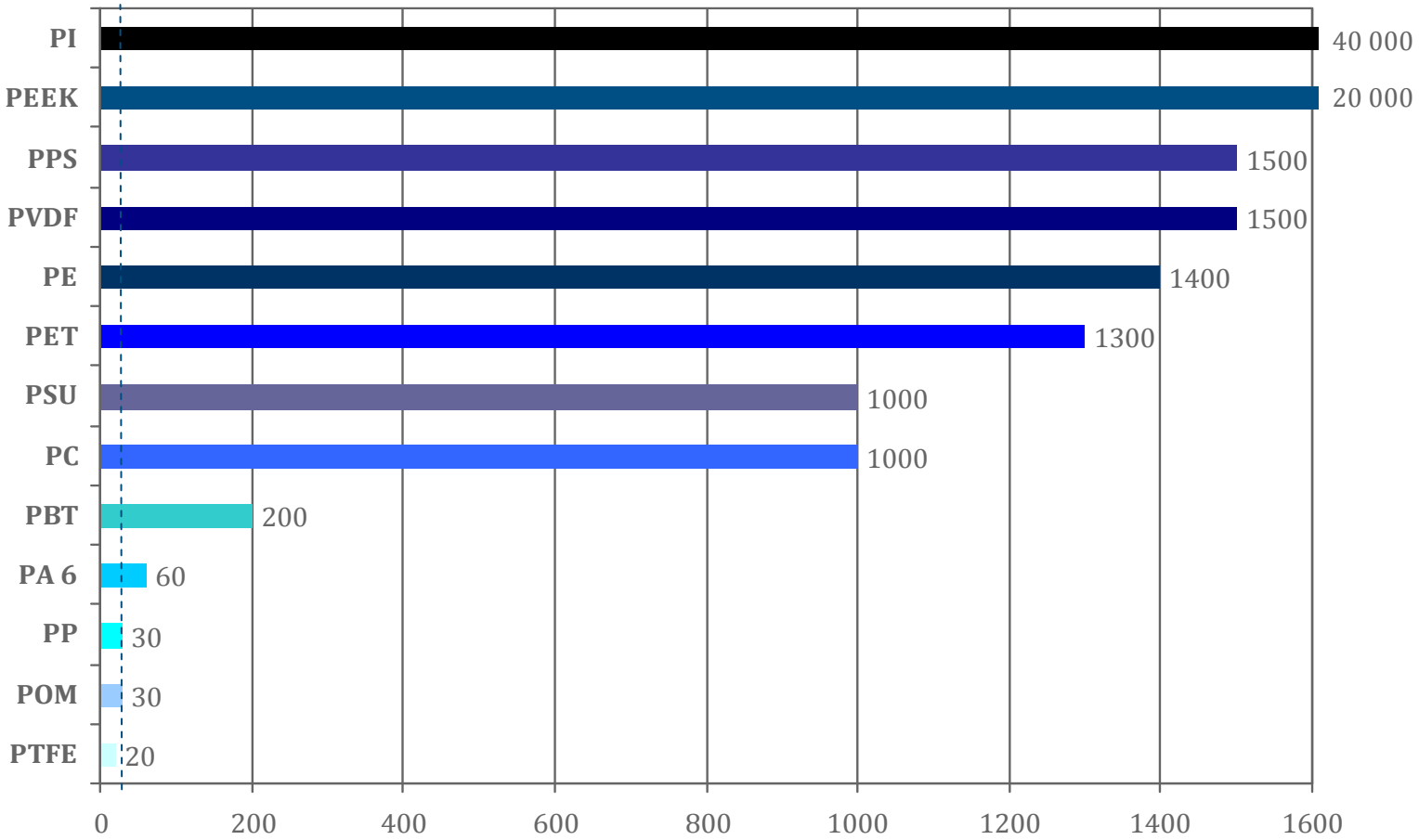
Ensinger

	TECAPEEK CLASSIX™ (PEEK)	TECAPEEK MT, CF30 MT (PEEK)	TECATRON MT (PPS)	TECASON P MT, P VF (PPSU)	TECAPEI MT (PEI)	TECANYL MT (PPE)	TECAFORM AH MT (POM-C)	TECA PRO MT (PP)	TECAFLON PTFE (PTFE)	TECASON E (PES)	TECASON S (PSU)	TECAFLON PVDF (PVDF)	TECANAT (PC)	TECAPET (PET)
Steam (134 °C)	++	++	++	+	+	+	(+)	(+)	++	+	+	+	-	-
Hot air (appr. 180 °C)	++	++	++	+	+	-	-	-	++	+	(+)	-	-	-
Plasma	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Formaldehyde	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Ethylene oxide	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Gamma radiation	++	++	++	+	+	+	-	-	-	+	+	+	+	+

++ = very resistant (practically no or very low change of weight)
+ = resistant (low change of weight possible)
(+) = limited resistance (short contact with medium weight change possible)
- = no resistance (weight changes > 5%, strong decline in mechanical properties)

Resistance against γ-radiation

Ensinger



Traceability

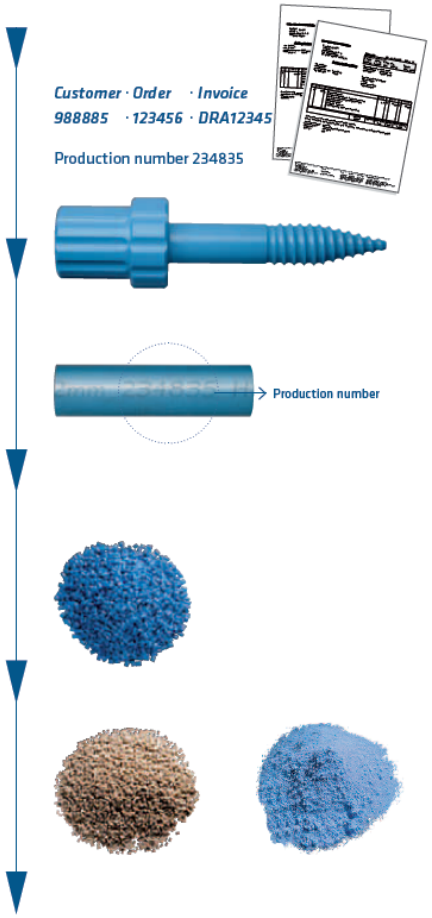
Ensinger

1 *Invoice / delivery note*
The order and invoice number is shown on the invoice / delivery note, for semi-finished products the batch number is also shown on the delivery note. This allows goods to be traced back using these numbers. A certificate to ISO 10204 is issued on an order-specific basis.

2 *Semi-finished products*
The production and manufacturing number is located on the semi-finished product. Starting with the production or manufacturing number data from the production process can be traced (production data, production protocol, control cards).

3 *Compounds*
The lot number of the compound can be determined from the production / manufacturing number of the semi-finished product.

4 *Raw materials*
The lot number of the compound is traceable back to the formulation and so to the delivered raw material batch, the relevant raw material specification and the safety data sheet.



Ensinger secures foolproof traceability from the delivery note to the raw material

Packaging of MT products

Ensinger

→ The packaging for medical products is an important aspect to protect the product from corrosion, contamination and damage. The product should be protected from high air humidity, dust and dirt, extremes of temperature and direct sunlight during transportation and storage at Ensinger or on the customer's premises.

→ Depending on the customer‘s requirements this is provided by using film or sleeve packaging. They can be adapted flexibly to the product, to some extent even shrunk or used in multiple layers.

→ The product can be cleaned or washed and sterilised as required.

Product nomenclature from competition for MT-products

Ensinger

Ensinger

MT = medical technology

→ Grades for direct contact with blood and tissue

→ Tested in general acc. to ISO 10993-4, -5, -18 and -1 on stock shapes

→ e.g. TECAPEEK® MT, TECASON® P MT, TECAFORM® AH MT

Röchling

MG = medical grade

→ Grades for direct contact with blood and tissue

→ Tested in general acc. to USP Class VI and ISO 10993-5 on stock shapes

→ e.g. SUSTAPEEK MG, SUSTASON PPSU MG, Polystone® P MG

Quadrant

LSG = life science grade

→ Grades for direct contact with blood and tissue

→ Tested in general acc. to ISO 10993-4, -5, -10, -11 on stock shapes

→ e.g. ACTRON® LSG, KETRON® PEEK LSG, PC LSG natural

➔ Grades from all 3 supplier are on the same quality level/quality class

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Ensinger

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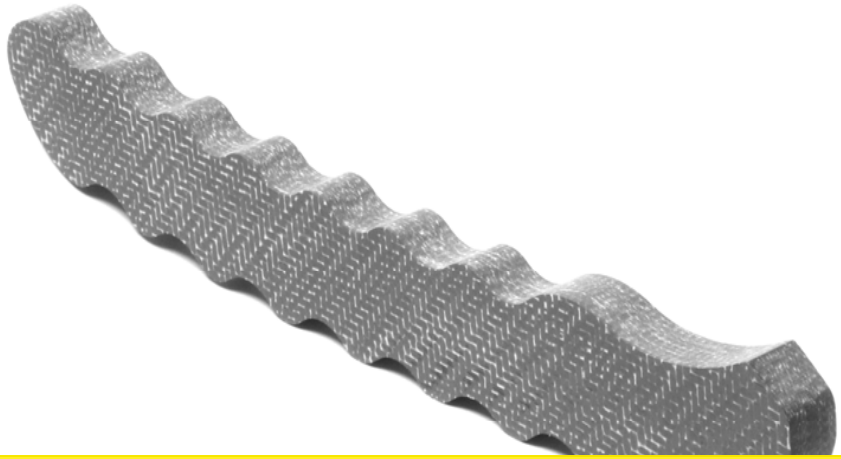


Application examples

Products for medical applications

Medical application examples
Couch for dental-centre

Ensinger

Market segment

→ Medical industry

Material

→ TECARIM (PA Cast + Elastomer)

Requirement profile

→ Low warpage

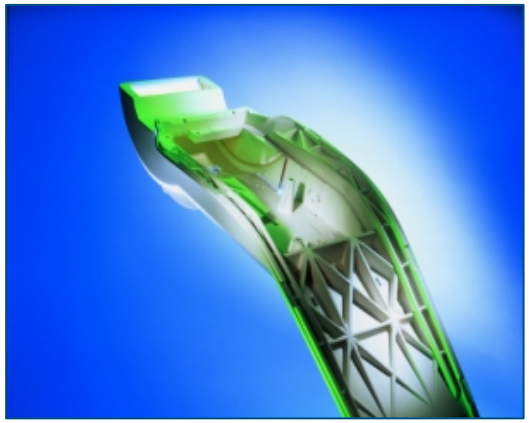
→ Good chemical resistance to detergents and disinfectants

→ High production precision

→ Integration of hollow areas through a core technology

Functional description

→ Forming substructure for special ergonomic couches for the dental sector



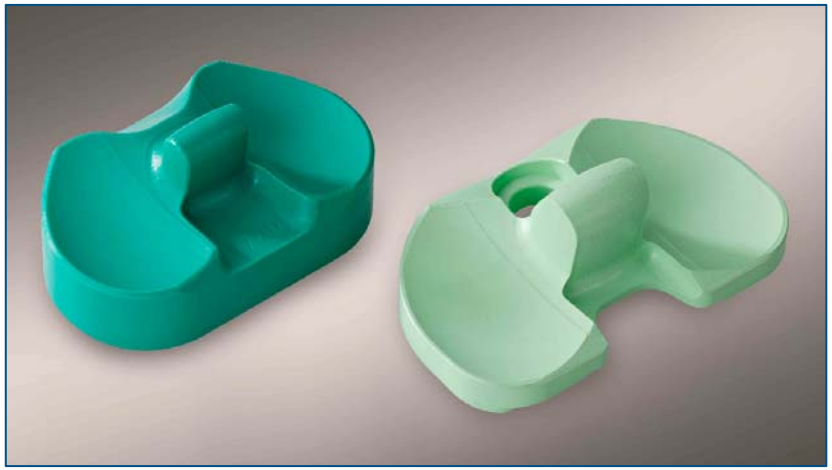
Medical application examples
Kneecap test implantation

Market segment

→ Medical industry

Material

→ TECAFORM AH MT coloured (POM-C + colour)



Requirement profile

→ Good dimension stability

→ High stiffness

→ Good resistance to sterilization/autoclaving

→ Compliance: FDA, biocompatibility

→ Easy machinability

→ High production precision

Functional description

→ Test implantation parts, for the determination of the size of the real knee cap implantation

→ Colour gives information on the sizes

Medical application examples
Adaption part for implants

Ensinger

Market segment

→ Medical industry

Material

→ TECAFORM AH MT coloured (POM-C + colour)

Requirement profile

→ Compliance: FDA, biocompatibility

→ Easily machined

→ High production precision

→ Sterilization resistant

→ Good chemical resistance

Functional description

→ Adaptation parts for the examination of sizes and fittings of hip joints

→ Colour relates to size

Medical application examples
Transportation gear

Ensinger

Market segment

→ Medical industry

Material

→ TECAPEEK MT black (PEEK + colour)

Requirements profile

→ Sterilization resistant, autoclavable

→ Good toughness

→ Good stiffness

→ Good wear resistance

→ Good dimensional stability

→ Compliance: FDA, biocompatibility

Functional description

→ Transportation gear with long lifetime and very low reduction of mechanical properties over several hundreds sterilization cycles

Medical application examples
Dental healing hood

Market segment

→ Medical industry

Material

→ TECAPEEK Classix (PEEK)

Requirement profile

→ Sterilization resistant, autoclavable

→ Good toughness

→ Good stiffness

→ Good wear resistance

→ Good dimensional stability

→ Compliance: FDA, biocompatibility

→ Valid for short-time implants

Functional description

→ Dental healing hoods suitable for implants in the mouth for up to 30 days

Medical application examples
PercuTwist-Dilator for tracheostomy (Rüsch GmbH)

Market segment

→ Medical industry

Material

→ TECAPEEK MT blue (PEEK + colour)

Requirement profile

→ Physiologicaly harmless with direct contact to the human organism

→ Good chemical resistance to desinfectants

→ Good electrical insulation

→ Good sterilization resistance for all established processes

→ High precision for sharp-edged and absolute durr-free screw thread

Functional description

→ Medical device for easier breathing with a tracheotomy

Medical application examples
Capillary carousel for a PCR-analysis

Ensinger

Market segment

→ Medical industry

Material

→ TECAPEEK MT black (PEEK + colour)

Requirement profile

→ Low thermal expansion with fast changes of temperature

→ Good chemical resistance to disinfectants and detergents

→ High precision when machining

→ Intensive pigmentation (deep black) allows very accurate measurements

Functional description

→ Precise adaption of the measurement capillaries for optoelectrical analysis (lowest systematic measurement error)

Medical application examples
Components for dental instruments

Ensinger

Market segment

→ Medical industry

Material

→ TECAPEEK MT black (PEEK + colour)

Requirement profile

→ Good sterilization resistant

→ Good chemical resistance to disinfectants and detergents

→ High precision when machining

→ High mechanical resistance

Functional description

→ Case components for dental instruments with lowest weight and highest number of sterilization cycles compared to alternative materials

Medical application examples
Orthesis

Market segment

→ Medical industry

Material

→ TECAPEEK (PEEK)

Requirement profile

→ High flexibility

→ Good stiffness, strength

→ Easily formed

→ Low weight

→ ”Warm“ feeling in skin contact

Functional description

→ Orthosis for the support of the leg muscles

→ Lower weight and ”warmer“ than metal

Medical application examples
Handle for MIC-Instruments

Ensinger

Market segment

→ Medical industry

Material

→ TECATRON (PPS)

→ Also out of TECAPEEK MT (PEEK)

Requirement profile

→ Good sterilization resistant

→ Good chemical resistance to disinfectants and detergents

→ High precision at machining

→ High mechanical strength

→ Low weight

Functional description

→ Ergonomically formed handles for medical instruments for a better handling and the avoidance of symptoms of fatigue

Medical application examples
Block for respirators

Ensinger

Market segment

→ Medical industry

Material

→ TECATRON (PPS)

Requirement profil

→ Good sterilization resistant

→ Good chemical resistance to disinfectants and detergents

→ High precision at machining

→ High mechanical strength

Functional description

→ Case block for the adaption of mechanical forces
(lowest elongation and leakage)

Medical application examples
Filter segment

Ensinger

Market segment

→ Mechanical engineering, medical industry

Material

→ TECASON S (PSU)

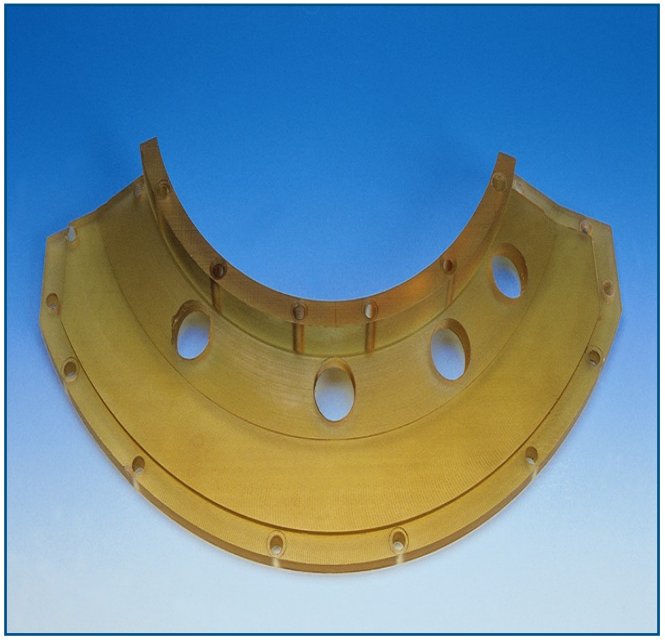
Requirement profile

→ X-ray transparent

→ Good dimensional stability

→ High transparency

→ FDA compliant



Functional description

→ Segment of a base frame for the filtering of substances in the food and pharmaceutical industry

Medical application examples
Control plate for dialysis-systems

Ensinger

Market segment

→ Medical industry

Material

→ TECASON E (PES)

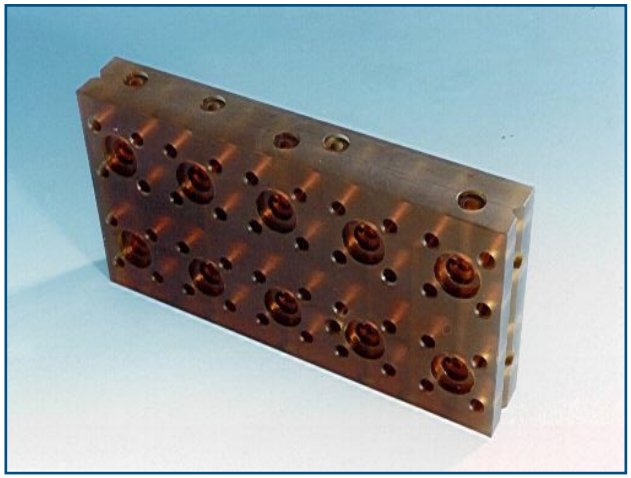
Requirement profile

→ Good sterilization resistant

→ Free of burrs surface

→ FDA-conformity grades available

→ Translucent



Functional description

→ Dialysis block for the distribution and control of the media flow

Medical application examples
Sterilisation container

Ensinger

Market segment

→ Medical industry

Material

→ TECASON P VF (PPSU + vacuum mouldable)

Requirement profile

→ Vacuum mouldable

→ Good sterilization resistant

→ High strength

→ Compliance: FDA, biocompatibility

→ Low weight

Funktional description

→ Sterilization container for the storage and sterilization of medical instruments and parts

Medical application examples
Spreader (Valves)

Market segment

→ Medical industry

Material

→ TECATEC

Requirement profile

→ X-ray transparent

→ Good dimensional stability

→ Good physiology

→ High mechanical strength

Functional description

→ For the opening of the body at surgical intervention

Medical application examples
External fixings

Ensinger

Market segment

→ Medical industry

Material

→ TECATEC

Requirement profile

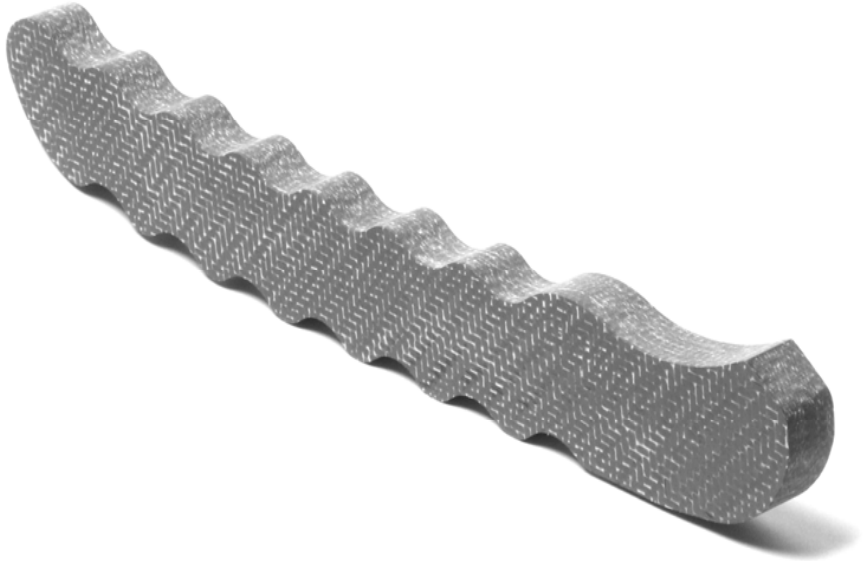
→ X-ray transparent

→ Good dimensional stability

→ Good physiology

→ High mechanical strength

→ Low weight



Functional description

→ External fixings of fractures of the human body. Due to the low weight and warmness comfortable to wear

→ Material is X-ray transparent and has not to be removed during X-ray examination

Medical application examples
Target arms

Target arm
TECATEC PEEK CW50
Courtesy Stryker Trauma GmbH

Market segment

→ Medical industry

Material

→ TECATEC

Requirement profile

→ X-ray transparent

→ Good dimensional stability

→ Good physiology

→ High mechanical strength

Functional description

→ Target arm, to place parts and screws at exact positions at human bones

→ Material is X-ray transparent and has not to be removed during X-ray examination

Medical application examples
Dosing stamp

Market segment

→ Chemical-, pharmaceutical industry

Material

→ TECAFLON PTFE (PTFE)

Requirement profile

→ Excellent chemical resistance

→ Low friction coefficient

→ No stick-slip-effect

→ FDA compliance

Functional description

→ Stamp for the dosing of viscous aggressive chemical media

Medical application examples
Multiplier

Ensinger

Market segment

→ Medical technology

Material

→ TECANAT MT (PC)

Requirement profile

→ High purity

→ Good toughness

→ Dimensionally accurate

Functional description

→ Multiplier for the distribution of media and control of media flow

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Thank you very much for your attention

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