

Reliability and precision - our suture materials

# ABSORBABLE

Surgical sutures

Convincing  
down to the  
smallest detail



**SERAG  
WIESSNER**





## High-tech and hand-crafted

Decades of experience and state-of-the-art production technology

Reliability and precision

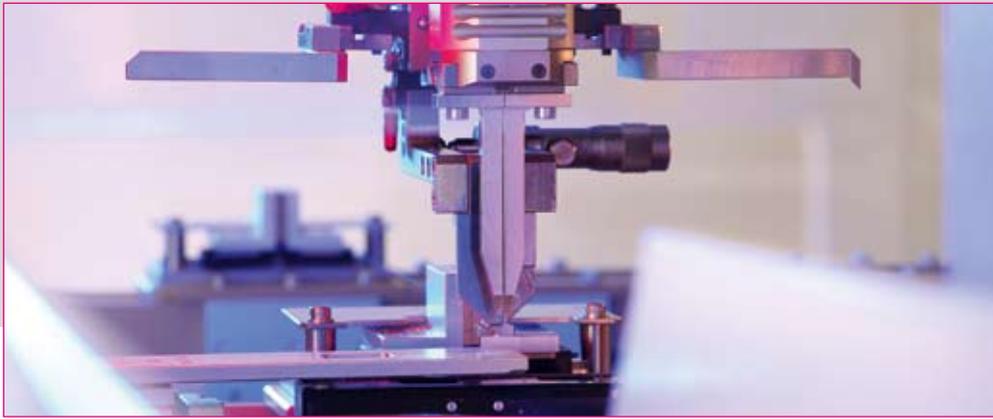
Wide range of top-quality suture materials

As the oldest German manufacturer of surgical suture material, SERAG-WIESSNER uniquely combines decades of experience with the latest medical know-how. It is nearly 150 years since the company began manufacturing sterile catgut.

The manufacture of surgical suture material is characterised by the contrast between state-of-the-art production technology and a large number of manual production processes. At SERAG-WIESSNER, we manufacture and sterilise needle-suture combinations in our cleanrooms using computer-controlled automated equipment. At the same time, many of the production steps require the sensitive and reliable manual skills of our highly experienced workers. To ensure consistently high quality, we maintain a certified quality management system in accordance with

the international standards DIN EN ISO 13485.





## Raw materials

Suture material can be classified according to whether it is of natural or synthetic origin.

Natural suture materials include silk.

The other group consists of synthetically produced polymers such as threads made of polyamides, polyolefins and polyester. Absorbable polymers made from polyglycolic acids also belong in this group.

## Absorbability

An important characteristic for classifying sutures is whether or not they are absorbable. Absorbability is the desired and deliberate dissolution of the thread in human or animal tissues. There are both absorbable and non-absorbable materials, although it has to be remembered that even non-absorbable sutures such as silk and polyamide may disintegrate in the tissues after a long period of time.

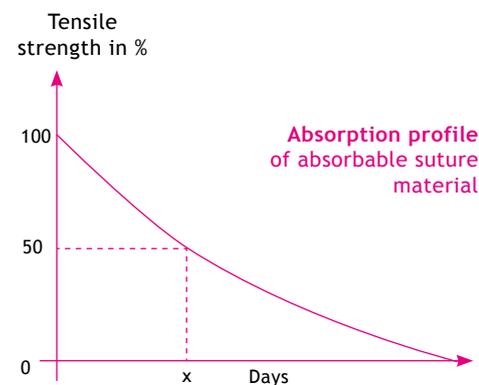
Absorbable synthetic polymers are broken down by hydrolysis. The established criterion for distinguishing absorbable sutures is the half-life of the material. This is the time taken for the tensile strength of the thread to be reduced to half of its original value. Another criterion is the absorption time, which is the interval required for the complete macroscopic dissolution of the thread in the tissues. However, the half-life and the absorption time are also affected by many factors such as suture size, type of tissue, presence of infection in the wound and, last but not least, the patient's general condition. For this reason, data given on these values are always approximate.

In addition we offer a wide range of non-absorbable suture materials. Please ask for our brochure on these products.

## Absorbability

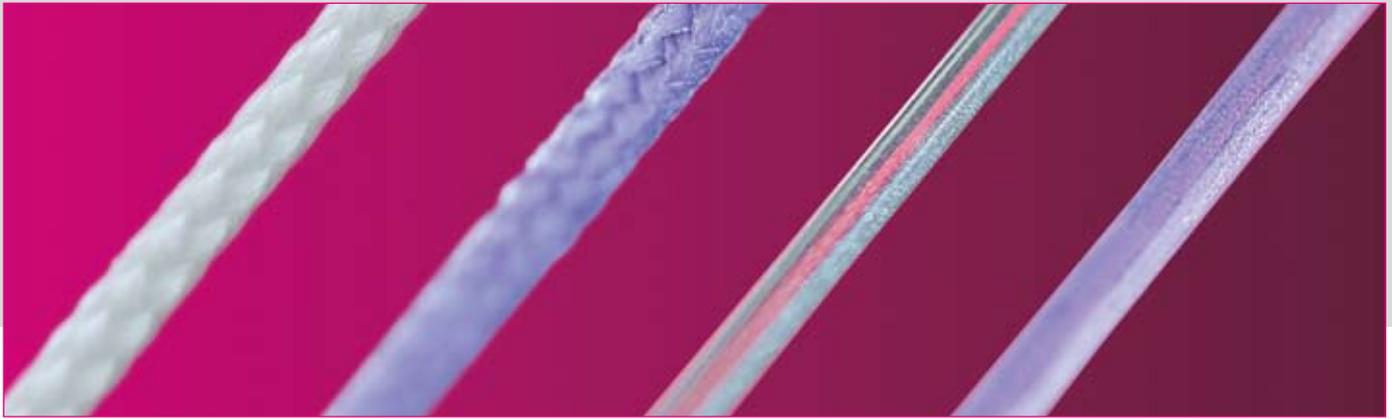
The most important half-lives and absorption times

Material	Half-life (days)	Absorption time (days)
SERAPID®	approx. 5-8	approx. 30-42
SERAFIT®	approx. 15-20	approx. 60-90
SERAFAST®	approx. 8-13	approx. 90-120
SERASYNTH®	approx. 28-42	approx. 180-210



X = half-life  
The period of time required for the tensile strength to fall to 50% of its original value.

Absorption time  
Time until the thread is completely absorbed



## Thread structure



Monofilament

Coated,  
braided  
multifilament

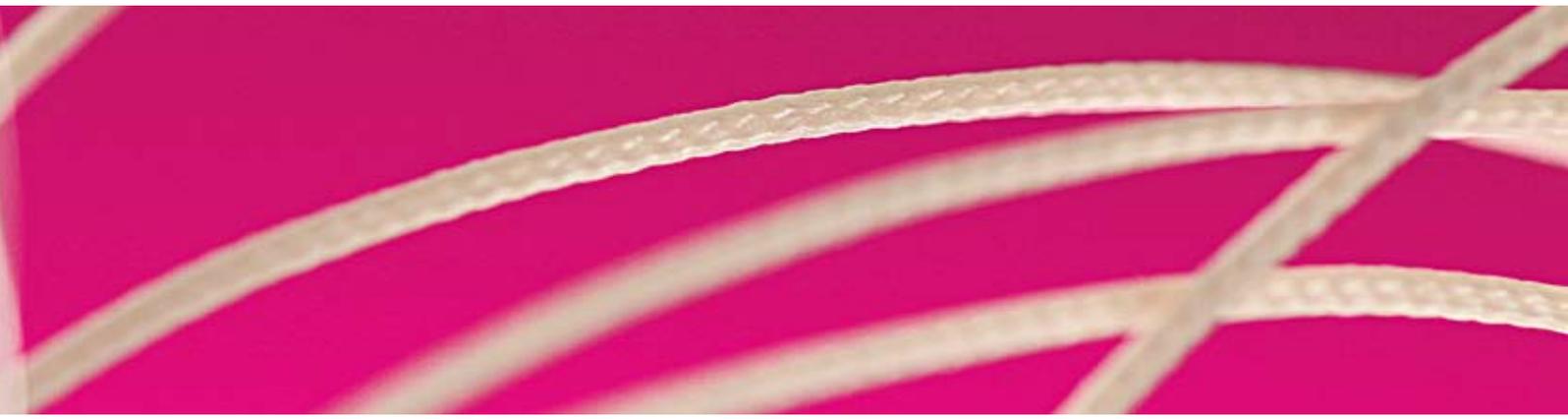
### Monofilament sutures

Monofilament threads of synthetic materials are obtained by a special melt spinning process. The molten synthetic is thereby extruded through very fine spinning nozzles or spinnerets under high pressure. Monofilament sutures are preferably used in smaller sizes, since the wiriness, which is found in all monofilament threads, causes the handling to become progressively more difficult as the thread increases in thickness. In particular, it is less easy to knot. Monofilament sutures are relatively sensitive to external damage, e.g. when grasping the thread with instruments. The smooth closed surface, as well as the completely closed interior, prevents any capillary action in the monofilament fibres. At the same time, they slide the most smoothly through the tissues.

### Multifilament sutures

Multifilament or polyfilament threads are made up of many thin individual filaments. These can be twisted or braided. The diameter of all twisted threads varies greatly and their surface tends to be rough. The longitudinal direction of the individual fibres results in relatively high capillarity. The individual filaments in a braided suture lie more or less transversely to its longitudinal axis, which means that braided sutures have less capillary action than twisted threads. Multifilament sutures have a rough surface that affects their passage through the tissues. On the other hand, they have considerably better knot-holding security.

Multifilament sutures are usually coated. This coating makes the irregular surface of the thread smooth, so that it passes through the tissues more easily.



Knot holding remains secure and the sutures are less stiff than monofilament sutures. In addition, the coating reduces capillarity.

### Suture sizes

Besides the raw materials and thread structure, the suture size significantly contributes to determining the tensile strength and knotting properties of a surgical suture. Suture sizes are therefore strictly regulated. Within the jurisdiction of the European Pharmacopoeia (EP), the decimal system is used. The diameter is metric and gives the suture size in 0.1 mm. Although the EP system is more rational, the United States Pharmacopoeia (USP) classification is more often used in practice.

### Suture classification

EP (metric)	USP	Ø in mm
0.01	12-0	0.001-0.004
0.05	-	0.005-0.009
0.1	11-0	0.010-0.019
0.2	10-0	0.020-0.029
0.3	9-0	0.030-0.039
0.4	8-0	0.040-0.049
0.5	7-0	0.050-0.069
0.7	6-0	0.070-0.099
1	5-0	0.100-0.149
1.5	4-0	0.150-0.199
2	3-0	0.200-0.249
2.5	-	0.250-0.299
3	2-0	0.300-0.349
3.5	0	0.350-0.399
4	1	0.400-0.499
5	2	0.500-0.599
6	3+4	0.600-0.699
7	5	0.700-0.799
8	6	0.800-0.899
9	7	0.900-0.999
10	8	1.000-1.099
-	9	1.200-1.199
-	10	1.200-1.299

## Suture sizes and classification



## Atraumatic needles

Atraumatic suture material is understood to mean needle-suture combinations in which the thread is firmly attached (swaged) to the needle, thus minimising tissue trauma. We offer a wide range of atraumatic needles for these needle-suture combinations. They are made of 300 series stainless steel, which has a high resistance to bending, excellent penetrating qualities, and exceptional breaking strength (ductility) - all qualities that allow the surgeon to work easily and safely. The designation of our atraumatic needles uses a combination of letters and numbers as recommended by the Technical Committee of the Association of Surgical Suture Manufacturers.



● Round-bodied needle, with standard point



⊕ Round-bodied needle, with trocar point



▼ Reverse cutting needle



▽ Reverse cutting needle with special point



SERAPID® has an optimal pliable braided structure and is characterised in particular by its short absorption time and high knot tensile strength.

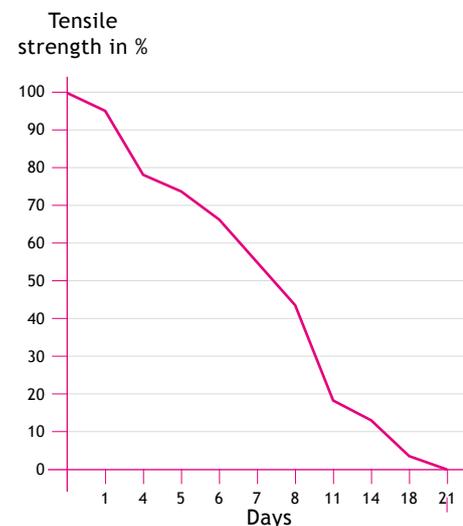
<b>Material</b>	 POLYGLYCOLIC ACID
<b>Symbol</b>	 undyed, multifilament (braided), coated
<b>Size</b>	USP 6/0 to 2 EP 0,7 to 5
<b>Absorption profile</b>	50% tensile strength after 5-7 days 0% after 42 days
<b>Available combinations</b>	Unneeded: Multipacks Needed: DS, DSS, FRX, GR, GS, HR, HRT, HRX, HS, KS, Single sutures / multipacks
<b>Uses</b>	ENT / gynaecology / paediatric surgery / oral and maxillofacial surgery / plastic surgery / urology

SERAPID®

High knot tensile strength

Easy to tie

Optimal passage through the tissues



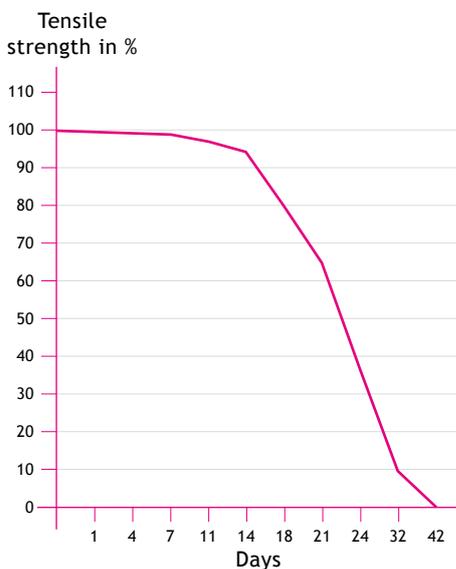
Absorption profile of undyed SERAPID® EP 2, USP 3-0

## SERAFIT®

Good knot security

Extremely pliable

Minimum sawing effect



Absorption profile of violet SERAFIT®  
EP 2, USP 3-0

SERAFIT® is a braided absorbable suture, which is extremely pliable and allows a smooth passage of the thread through the tissue during suture placement with minimum sawing effect. It can be tied reliably, even in areas containing a good deal of blood or tissue secretions, and ensures knot security.

SERAFIT® is available in a special form with patented suture stiffening for use in minimally invasive surgery (MIS).

### Material

PGA POLYGLYCOLIC ACID

### Symbol

 violet, multifilament (braided), coated or  
 undyed, multifilament (braided), coated

### Size

USP 8/0 to 5 (undyed: 6/0 to 2)

EP 0,4 to 7 (undyed: 0,7 to 5)

### Absorption profile

50% tensile strength 15-20 days

0% after 60-90 days

### Available combinations

Unneeded: Single sutures / multipacks / cassette packs

Needed: DR, DRN, DS, DSL, DSS, FRX, GR, GS, HR, HRT, HRX, HS, KS, LR, VSP, Single sutures / multipacks  
Large range of special MIS combinations

### Uses

Ligatures / dermatology / gastroenterology / gynaecology / MIS / oral and maxillofacial surgery / ophthalmology / urology



SERAFAST® is the right choice for indications with short wound healing time, when it is of benefit to make use of the advantages that monofilament sutures provide.

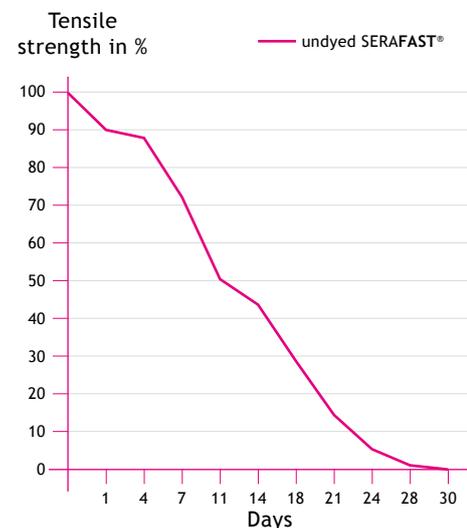
Material	 POLYGLYCOLIC ACID CAPROLACTONE
Symbol	 undyed, monofilament or  violet, monofilament
Size	USP 5/0 to 2/0 EP 1 to 3
Absorption profile	50% tensile strength after 8-13 days 0% after 90-120 days
Available combinations	Unneeded: Multipacks Needed: DS, DSS, HR, GR, GS, Single sutures
Uses	Ligatures / dermatology / plastic surgery / urology / gynaecology / skin closure

## SERAFAST®

Superior ease of handling

Passes extremely smoothly through the tissues

Optimal absorption profile



Absorption profile of undyed SERAFAST® EP 2, USP 3-0



## SERASYNTH®

Passes extremely smoothly through the tissues

High linear and knot tensile strength

Very pliable handling

Reliable absorption profile

SERASYNTH® adds another monofilament thread to our range of absorbable synthetic suture material.

SERASYNTH® is used for adapting soft tissues or as a ligature where long-term absorbable sutures are indicated.

**Material**  POLYDIOXANONE

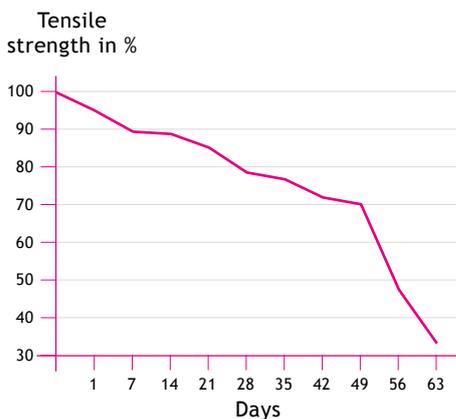
**Symbol**  violet, monofilament

**Size** USP 7/0 to 2  
EP 0,5 to 5

**Absorption profile** 50% tensile strength after 28-42 days  
0% after 180-210 days

**Available combinations** Unneeded: Single sutures / multipacks  
Needed: DR, DS, DSS, GR, GS, HR, HRT, HRX, HS  
Single sutures / multipacks  
special MIS combinations

**Uses** Ligatures / dermatology / vascular surgery / orthopaedics / plastic surgery / urology / MIS



Absorption profile of violet SERASYNTH® EP 2, USP 3-0





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