Reliability and precision – our suture materials

ABSORBABLE

Surgical sutures

Convincing
down to the
smallest detaill

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.

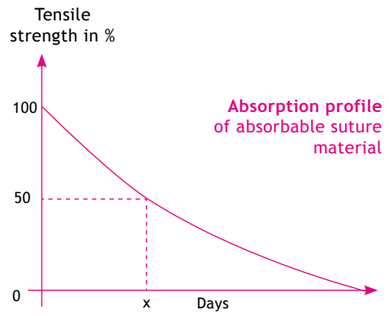
Absorbable synthetic polymers are broken down by hydrolysis. The established criterion for distinguishing absorbable sutures is the half-life of the material. This is the time taken for the tensile strength of the thread to be reduced to half of its original value. Another criterion is the absorption 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

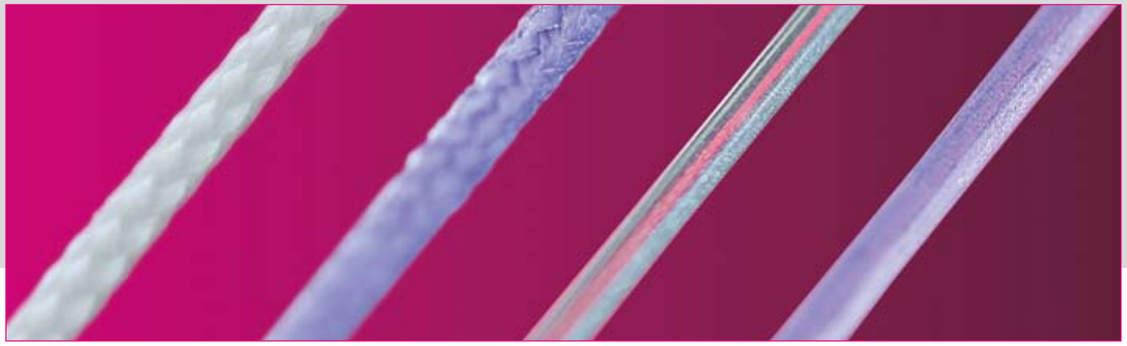
Material	Half-life (days)	Absorption time (days)
SERAPID®	approx. 5-8	approx. 30-42
SERAFIT®	approx.15-20	approx. 60-90
SERAFAST®	approx. 8-13	approx. 90-120
SERASYNTH®	approx.28-42	approx. 180-210



Absorption profile of absorbable suture material

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

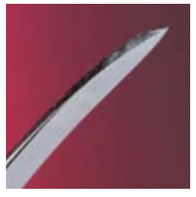
Atraumatic needles

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

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

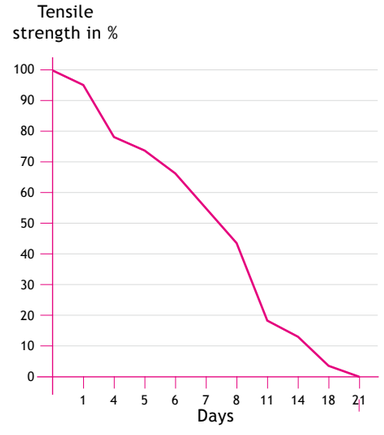
Material	PGA POLYGLYCOLIC ACID
Symbol	undyed, multifilament (braided), coated
Size	USP 6/0 to 2 EP 0,7 to 5
Absorption profile	50% tensile strength after 5-7 days 0% after 42 days
Available combinations	Unneedled: Multipacks Needled: DS, DSS, FRX, GR, GS, HR, HRT, HRX, HS, KS, Single sutures / multipacks
Uses	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 SERA**PID**®
EP 2, USP 3-0

SERAFIT®

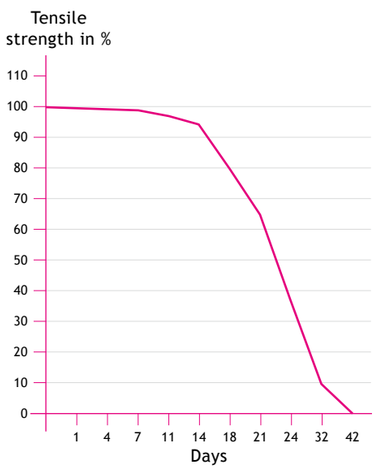
Good knot security

Extremely pliable

Minimum sawing effect

SERA**FIT**® 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	Unneedled: Single sutures / multipacks / cassette packs Needled: 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



Absorption profile of violet SERA**FIT**®
EP 2, USP 3-0

SERAFAST®

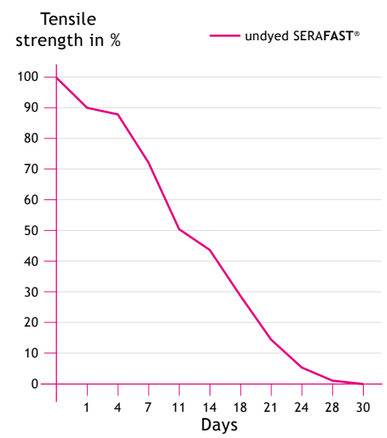
Superior ease of handling

Passes extremely smoothly through the tissues

Optimal absorption profile

SERA**FAST**® 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	PGACL 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	Unneedled: Multipacks Needled: DS, DSS, HR, GR, GS, Single sutures
Uses	Ligatures / dermatology / plastic surgery / urology / gynaecology / skin closure



Absorption profile of undyed SERA**FAST**®
EP 2, USP 3-0

SERASYNTH®

Passes extremely smoothly through the tissues

High linear and knot tensile strength

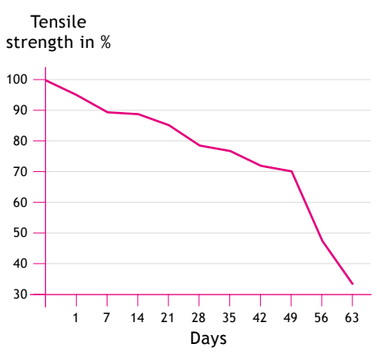
Very pliable handling

Reliable absorption profile

SERA**SYNTH**® adds another monofilament thread to our range of absorbable synthetic suture material.

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

Material	PDO POLYDIOXANONE
Symbol	violet, monofilament
Size	USP 7/0 to 2 EP 0,5 to 5
Absorptionl profile	50% tensile strength after 28-42 days 0% after 180-210 days
Available combinations	Unneedled: Single sutures / multipacks Needled: 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 SERA**SYNTH**®
EP 2, USP 3-0

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