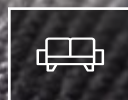
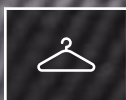


TECH-X
PERFORMANCE THREADS





QUALITY THROUGH EXPERTISE

THE COMPANY

Since 1854, AMANN has been one of the leading global producers in the field of high-quality sewing and embroidery threads. Its technical expertise, reliability and flexibility in production and service makes AMANN a strong partner worldwide. In close cooperation with its customers, AMANN develops sewing and embroidery threads, as well as smart yarns for tomorrow's market requirements.

More than 2.500 motivated employees in more than 100 countries worldwide make AMANN's success possible. AMANN Group exclusively produces at its own production sites. The company headquarters are located in Bönningheim, Germany.

CERTIFICATION & SAFETY

At AMANN, customer expectations regarding performance, reliability and technical expertise, as well as the quality and environmental compatibility of the products are an obligation and a motivation at the same time. Continuous compliance with the high-quality standards at AMANN Group is ascertained by the certification for quality management according to DIN EN ISO 9001.

ENVIRONMENTAL MANAGEMENT

AMANN's resource-friendly approach and its strive to keep the environmental impact as low as possible is documented by the certification in accordance with the DIN EN ISO 14001 environmental management system.

QUALITY COMMITMENT

The fulfilment of the process-oriented quality commitment for a safe production environment is proven by the certification under the strict IATF 16949 standards.

PRODUCT CERTIFICATIONS

The compliance with REACH guarantees that AMANN's products are not harmful. Moreover, they are certified according to STANDARD 100 by OEKO-TEX®, and a large number of the products are even certified to the stricter criteria of appendix 6.

AMANN products Saba, Sabatex, Sabaflex, Isacord, Serafil, N-tech and N-tech CS have been examined concerning the industrial wash resistance according to DIN EN ISO 15797, and have received the PRO-Label certification according to DIN EN ISO 30023.

The AMANN aramide thread N-tech CS is certified according to the high safety requirements of UL (Underwriters Laboratories). Silver-tech features the Cytotoxicity certificate by Hohenstein Laboratories. Consequently, there is no cell damaging effect in the Cytotoxicity Test according to DIN EN ISO 10993-5.

INNOVATION LAB



THINKING SOLUTIONS

AMANN INNOVATION LAB

AMANN Innovation Lab is the innovation pool at AMANN. Our textile think-tank develops intelligent products, individual solutions and innovative concepts for textile issues, not only for sewing and embroidery threads but also for textile surfaces. The spectrum includes conductive threads and yarns, hybrid threads for composites, sensor yarns, threads with indicator function as well as a multitude of functional yarns and technical threads. The AMANN Innovation Lab develops different smart yarns that offer technical solutions for the following fields:



CONDUCTIVE

The topic conductivity is becoming increasingly important for many industries. Due to its properties, a conductive smart yarn offers itself for a variety of different applications such as conductance of electricity or data transfer.



SENSORY

Smart yarns with sensor technology transfer information and have a variety of different applications. These so-called sensor yarns are thread-like textile constructions that measure e. g. humidity.



COMPOSITES

The COMPHIL finish, specially developed by AMANN for composites, offers optimised sewing performance without adhesion-inhibiting properties towards the composite matrix. Thus, it is optimally synchronised with the further processes (for example resin infusion) and end use applications.

We will be glad to support you with your individual project – please contact us via innovation-lab@amann.com



TECHTEX

SPECIAL SEWING THREADS FOR TECHNICAL APPLICATIONS

All over the world technical textiles are gaining more relevance. They provide high-tech solutions, replacing more traditional materials and can be bonded with other materials for new combinations. Whether our threads are required for textile construction, the industrial or apparel sector – technical textiles are always high-tech, innovative products with special physical, chemical and application-technical characteristics. Their development is shaped by demanding requirement profiles, and for security-related applications by norms, specifications and directives. Their functionality must also be reflected in the seams.

The seam is an essential feature within technical textiles. It provides a flexible and secure connection for the manufacture of complex two or three dimensional products. Embroidery technology is also utilised for technical textiles, for example in the production of fibre composite materials (composites and textile heating systems).

Whether sewn, embroidered or woven, sewing threads inserted into the textile material must maintain or fulfil the function and the sometimes very demanding requirements of the entire product. For this, special sewing threads are frequently required. AMANN's technically oriented product range offers such solutions, among others for protective clothing, outdoor textiles, filters, smart textiles, composites, lifting and restraint systems and many more.

AMANN is a specialist in these fields and our extensive range of Tech-X Performance Threads offers the perfect solution for every complex requirement.

AMANN SEWING TECHNOLOGY CENTER

Excellent technical sewing and embroidery consulting is one of AMANN's big strengths. For this purpose, AMANN has created a state-of-the-art sewing-technical lab with its new Sewing Technology Center (STC).

Among others, the services of the AMANN Sewing Technology Center comprise the following:

- Technical sewing and embroidery consulting worldwide
- Individual customer workshops, technical seminars and lectures
- Sewing tests and analyses
- Calculation of sewing thread requirement and recommendations for increase in productivity
- Technical elaborations for specific topics
- Processing tests

The AMANN STC team has decades-long, application-oriented know-how and enables customers to receive the best possible consulting and support.



PROTECTIVE CLOTHING

AMANN PRODUCTS FOR PROTECTIVE CLOTHING:

- N-tech
- N-tech CS
- K-tech
- Kc-tech
- A-tech CS
- Nc-tech

SPECIAL SEWING THREADS FOR PROTECTIVE CLOTHING AND OTHER HEAT-PROTECTIVE APPLICATIONS

Flame and heat protection is required in the most varied applications. The challenge is protecting the wearer and environment from life threatening situations involving fire and heat. The manufacturing of heat protective clothing is tightly controlled by norms, regulations and partly by individual product specifications. In general, those norms and specifications do not actually specify the sewing thread to be used. The test parameters refer to the complete item of clothing; the threads are examined as a whole. The seams have to fulfil the same requirements in the test as the garment fabric. This means that in the limited flame spread test method the seams are exposed to the flame as well.

All AMANN aramids products have been examined according to the DIN EN ISO 15025 test standard. So, they can fulfill the requirements of DIN EN ISO 11.611, DIN EN ISO 11.612, DIN EN ISO 14.116 and DIN EN 469. Moreover, the products A-tech CS, N-tech, N-tech CS, Nc-tech, K-tech are certified according to the strict safety requirements of UL. They fulfill the safety standards NFPA 1951, NFPA 1971, NFPA 1975, NFPA 1977, NFPA 2112, ASTM F1506, CSGB 155.22 and CGSB 155.20

When the seams are on the inside and therefore protected from direct heat transmission or an open flame source, AMANN threads from our standard product range such as Saba or Rasant can be used. Generally speaking, the manufacturing of heat protective textiles does not necessarily have to involve special sewing threads. Should specified test standards allow the application of conventional sewing threads, then for the sake of economy and a more varied choice of colours, this may be an option. The manufacturing of heat protective textiles usually requires the application of special sewing threads to fulfil temperature resistance requirements. For this purpose, sewing threads made from meta or para-aramids are proven products. They neither burn nor melt and carbonise or decompose only after a long exposure to high temperatures. After clearing the fire source, they are self-extinguishing. Aramide sewing threads thus constitute an essential part of the many specifications and regulations for the production of heat protective clothing for the military, police, fire brigade and many other profession sectors. They enable raw material uniformity of sewing thread and sewn material. Therefore, the entire garment fulfils the function profile.



APPLICATION FIELDS:

- Fire prevention and heat protection (e.g. fire brigade)
- Blast furnace and smelters
- Motor racing
- Bullet-proof vests (e.g. police)
- and much more

N-tech
N-tech CS

NOMEX® DUPONT™ META-ARAMIDE,
SCHAPPE SPUN (N-TECH)

NOMEX® DUPONT™ META-ARAMIDE,
CUT STAPLE SPUN (N-TECH CS)


- high-performance meta-aramide special sewing and embroidery thread
- for flame-retardant and heat-protective applications
- self-extinguishing and non-melting
- permanent temperature resistance up to approx. 200°C
- decomposition temperature at approx. 370°C
- burning behaviour tested according to DIN EN ISO 15025
- certification according to the strict safety requirements of UL

N-tech

Ticket no.	Tex no.	Needle size		Make-up	No. of colours
		Nm	No.		
40	75	100-120	16-19	3.000 m Co	14
70	40	80-100	12-16	10x1.000 m XW 5.000 m Co	21

N-tech CS

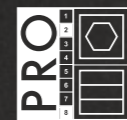
Ticket no.	Tex no.	Needle size		Make-up	No. of colours
		Nm	No.		
70	40	80-100	12-16	10x1.000 m XW 5.000 m Co	21
120 (80/2)	25	70-90	10-14	5.000 m Co	21

Co =  XW = 

Main application:

- Protective clothing: heat-protective clothing, racing clothing, work boots
- Filtration: hot-gas filtration
- Other: flame-retardant textiles (e.g. airplane seats, curtains)


Further applications:



KEVLAR® DUPONT™ PARA-ARAMIDE,
SCHAPPE SPUN

- para-aramide special sewing thread for applications with high requirements on cut, flame and heat protection
- permanent temperature resistance up to approx. 170°C
- decomposition temperature at approx. 425°C
- burning behaviour tested according to DIN EN ISO 15025
- certification according to the strict safety requirements of UL

Ticket no.	Tex no.	Needle size		Make-up	No. of colours
		Nm	No.		
35	80	120-140	19-22	3.000 m Co	1
50	60	110-130	18-21	3.000 m Co	1
75	40	100-120	16-19	5.000 m Co	1

Co = 


Main application:

- Protective clothing: heat-protective clothing (e.g. protective gloves), bullet-proof vests (e.g. police), cut protection (e.g. lumbermen's trousers)

KEVLAR® DUPONT™ PARA-ARAMIDE
CONTINUOUS FILAMENT, BONDED

- extremely high-performing para-aramide special sewing thread for technical textiles requiring cut and heat protection
- self-extinguishing and non-melting
- permanent temperature resistance up to approx. 170°C
- decomposition temperature at approx. 425°C
- burning behaviour tested according to DIN EN ISO 15025

Ticket no.	Tex no.	Needle size		Make-up	No. of colours
		Nm	No.		
22	135	130-150	21-23	ca. 500 g/ 3.000 m FS	1

FS/KS = 

Main application:

- Protective clothing: heat-protective clothing (e.g. safety shoes), bullet-proof vests (e.g. police)
- Filtration
- Composites
- Other: airbags and tyres


K-tech

Kc-tech

NEWSTAR® YANTAI META-ARAMIDE, CUT STAPLE SPUN

- meta-aramide special sewing & embroidery thread for flame-retardant and heat-protective applications
- self-extinguishing and non-melting
- the powerful alternative to Nomex®
- permanent temperature resistance up to approx. 200°C
- decomposition temperature at approx. 370°C
- burning behaviour tested according to DIN EN ISO 15025
- certification according to the strict safety requirements of UL

Ticket no.	Tex no.	Needle size Nm	Needle size No.	Make-up	No. of colours
40	75	100-120	16-19	3.000 m Co	14
70	40	80-100	12-16	5.000 m Co	14

Co = 

Main application:

- Protective clothing: heat-protective clothing (e. g. protective gloves), racing clothing
- Filtration: hot-gas filtration
- Other: flame-retardant textiles (e. g. airplane seats, curtains)


Further applications:



NOMEX® DUPONT™ META-ARAMIDE CONTINUOUS FILAMENT

- meta-aramide special sewing thread for highest requirements in flame-retardant and heat-protective applications
- self-extinguishing, non-melting, robust and extremely durable
- permanent temperature resistance up to approx. 200°C
- decomposition temperature at approx. 370°C
- burning behaviour tested according to DIN EN ISO 15025

Ticket no.	Tex no.	Needle size Nm	Needle size No.	Make-up	No. of colours
20	140	120-140	19-22	1.000 m FS	6
34	95	120-130	19-21	1.500 m FS	6
40	70	110-130	18-21	2.000 m FS	6
60	45	100-120	16-19	3.000 m FS	6

FS/KS = 

Main application:

- Protective clothing: heat-protective clothing (e. g. protective gloves), heavy-duty safety shoes, racing clothing
- Other: flame-retardant textiles (e. g. airplane seats)



OUTDOOR TEXTILES

AMANN PRODUCTS FOR OUTDOOR TEXTILES:

- Gore® Tenara®
- Serabond

SPECIAL SEWING THREADS FOR OUTDOOR APPLICATIONS

Sun, wind and rain put outdoor textiles under a lot of environmental stress, which is often underestimated. The different climatic influences – UV rays, moisture, acid rain or airborne substances as well as ozone, nitrogen oxide or dirt – show that there is a need for products with technical characteristics that remain unchanged after many years of being exposed to these factors.

Gore® Tenara® and Serabond offer excellent UV light and weather-proofing characteristics as well as a high-tech performance profile against abrasion and tensile stress. Even long exposure to sunlight and mechanical stress do not reduce seam quality. The breaking strength and the visual aspect and colour of the seam remain constant under the hardest environmental conditions.

Conventional sewing threads can only partly fulfil these requirements. They, and particularly the WR-finish (water-repellent), can be applied for outdoor textiles.

15 YEARS WARRANTY

Gore® Tenara® sewing threads will be delivered free from defects in material and workmanship and will not be damaged by exposure to sunlight, weather or water. W. L. Gore & Associates GmbH makes this warranty for a period of 15 years to all products that are stitched with Gore® Tenara® sewing threads.

WEATHERING TEST ACCORDING TO ISO 4892-1 AND 4892-2

The results by Hohenstein Laboratories confirm: Serabond performs excellently in the weathering test.

- Examination according to DIN EN ISO 12402-7 contains artificial weathering according to ISO 4892-1 and ISO 4892-2
- Simulation of the influences of various weather conditions (insolation, rain, fog), as well as simulation of daytime and nighttime
- Test duration: approx. 300 h, test objects: all relevant sizes (10-40)
- Test criteria: maximum tensile force, loop strength, colour fastness




APPLICATION FIELDS:

- Sails
- Tents
- Awnings
- Boat covers
- Tarpaulins
- and many more

ePTFE (EXPANDED POLYTETRAFLUORETHYLENE) TAPE

- special sewing thread with excellent UV and weather protection with 15 years warranty
- designed for high speed sewing
- also available in transparent colour
- will not fade, stain or discolour
- resistant to UV radiation in sunlight, mould, mildew, acid rain, cleaning solutions, salt water and industrial pollutants

Ticket no.	Tex no.	Needle size		Make-up	No. of colours
		Nm	No.		
HTR	270	110-140	18-22	1.050 m FS	11
TR	150	100-120	16-19	1.750 m FS	12
LTR	110	90-110	14-18	2.100 m FS	1

FS/KS = 

Main application:

- Outdoor textiles: sails, tents, awnings, boat covers, tarpaulins
- Other: artificial turf, bouncy castles


Further applications:



POLYESTER CONTINUOUS FILAMENT, BONDED

- high-performance bonded special sewing thread for outdoor applications
- extremely durable
- resistant to untwisting and therefore suited for multidirectional sewing
- outstanding UV resistance due to special dyestuffs
- weathering test according to ISO 4892-1 and ISO 4892-2

Ticket no.	Tex no.	Needle size		Make-up	No. of colours
		Nm	No.		
6	500	240-260	27-28	1.700 m FS	1
9	350	210-240	26-27	1.700 m FS	12
10	270	190-220	25-26	1.400 m FS	2
12	240	180-200	24-25	1.800 m FS	12
15	210	170-190	24-25	2.400 m FS	12
18	150	150-170	23-24	2.600 m FS	12
20	135	130-150	21-23	1.600 m FS 3.200 m FS	34 on request
25	105	120-140	19-22	3.000 m FS	12
30	90	110-130	18-21	2.300 m FS	34
40	70	90-120	14-19	4.600 m FS	16
60	45	80-100	12-16	5.000 m FS	16

FS/KS = 

Main application:

- Outdoor textiles: sails, tents, awnings, boat covers, tarpaulins

Further applications:



FILTRATION

SPECIAL SEWING THREADS FOR FILTRATION

Technical textiles can be exposed to very different chemical influences. Therefore, seams also have to be resistant to those influences and must keep their characteristics over a long induction period. The seams have to fulfil the same requirements as the fabric it is being processed with. Ideally, the thread and fabric raw material is uniform.

Industrial filtration is a typical application example. Textile filters have to fulfil the most varied and extreme chemical resistance requirements depending on the method and on the filtrate (wet or dry filtration, hot-gas or liquid-gas filtration).


AMANN PRODUCTS FOR FILTRATION:

- PP-tech
- D-tech
- Zyex®

PEEK (POLYETHERETHERKETONE) CONTINUOUS FILAMENT

- Special sewing thread for the most extreme requirements in terms of chemical resistance
- excellent resistance to bases and acids
- extremely durable under mechanical wear
- permanent temperature resistance up to approx. 250°C
- melting point at approx. 330°C

Ticket no.	Tex no.	Needle size Nm	Needle size No.	Make-up	No. of colours
24	125	120-140	19-22	3.000 m FS	1

FS/KS = 

Main application:

- Filtration: solid-liquid separation
- Protective clothing: chemical-protective clothing




D-tech

DOLANIT® DOLAN POLYACRYLIC, CUT STAPLE SPUN

- Dolanit® special sewing thread for filtration applications
- high resistance to bases and acids
- permanent temperature resistance up to approx. 125°C

Ticket no.	Tex no.	Needle size Nm	Needle size No.	Make-up	No. of colours
30	105	110-130	18-21	3.000 m Co	1

Co = 

Main application:

- Filtration: dedusting




PP-tech

POLYPROPYLENE CONTINUOUS FILAMENT

- special sewing thread for the filter industry
- high resistance to chemicals

Ticket no.	Tex no.	Needle size Nm	Needle size No.	Make-up	No. of colours
40	85	120-140	19-22	3.250 m FS	1

FS/KS = 

Main application:

- Filtration: wet filtration, solid-liquid filtration



SMART TEXTILES

SPECIAL SEWING THREADS FOR ELECTRICALLY CONDUCTIVE TEXTILES AND TEXTILES TO DIVERT STATIC ELECTRICITY

Sewing and embroidering can create conductive structures in textiles, which can be applied in the textile industry as well as in electrical engineering and in microsystems technology.

Electrostatic charging can be a result of technical processes and technological motion sequences (e.g. friction of machine parts) and significantly compromise security. There is a danger that if the electrostatic charges are high, spontaneous discharging occurs and leads to disturbances in systems or electrical devices/components. In explosive environments this can present an ignition source.

The work environment in the pharmaceutical, semi-conductor and electronics industry, in artificial materials processing, in coating and painting facilities and in bio-technology institutes often require protective clothing to prevent static electricity sparks. The manufacturing of these clothes, also referred to as ESD (Electric Static Discharge) clothing, is precisely specified being a part of PPE.

AMANN PRODUCTS FOR SMART TEXTILES:

- Silver-tech/Silver-tech⁺
- C-tech
- I-tech

SILVER COATED POLYAMIDE/ POLYESTER HYBRID THREAD (SILVER-TECH)


- special sewing and embroidery thread with a silver coating
- for conductive seams and surfaces
- textile electrodes as sensors and actuators
- for seam positions that require antimicrobial characteristics
- no cell damaging effect in the Cytotoxicity Test according to DIN EN ISO 10993-5

Ticket no.	Tex no.	Needle size Nm	No.	Make-up	Electric resistance
30	96	120-130	19-21	500 m FS	< 85 Ω/m
50	62	90-100	14-16	1.500 m FS	< 150 Ω/m
120	28	75-90	11-14	2.500 m FS	< 530 Ω/m

SILVER COATED POLYAMIDE CONTINUOUS FILAMENT (SILVER-TECH⁺)

- special sewing and embroidery thread with a silver coating
- for conductive seams and surfaces
- maximum conductivity
- fully conductive surface
- textile electrodes as sensors and actuators
- for seam positions that require antimicrobial characteristics

Ticket no.	Tex no.	Needle size Nm	No.	Make-up	Electric resistance
100	33	75-90	11-14	2.000 m KS	< 200 Ω/m
150	22	70-75	10-11	2.500 m KS	< 300 Ω/m

FS/KS = 

Main application:

- Smart textiles
- Medtech


Further applications:



BELLTRON[®] B31/POLYESTER HYBRID THREAD

- special sewing thread with a carbon component for dispersion and decaying of electrical or static charges, for example clean room garments or protective clothing

Ticket no.	Tex no.	Needle size Nm	No.	Make-up	No. of colours
80	35	80-100	12-16	4.000 m FS	1

FS/KS = 

Main application:


- clean room garments and protective clothing, e.g. for the fields of microelectronics or pharmacy



BEKINOX[®] STAINLESS STEEL- POLYESTER/POLYAMIDE HYBRID THREAD

- special sewing thread with an inox component for dispersion and conduction of electrical or static charges

Ticket no.	Tex no.	Needle size Nm	No.	Make-up	No. of colours
20	125	110-130	18-21	2.000 m FS	1

FS/KS = 

Main application:

- Protective clothing: safety shoes
- Filtration



COMPOSITES

SPECIAL SEWING THREADS FOR COMPOSITES

Composite materials such as carbon and glass fibre fabrics set the trend for the mobility and energy supply of tomorrow. These lightweight and extremely durable materials are used in the automotive, aircraft and shipbuilding industries, in trains and space technology as well as in wind turbines, for example.

A special embroidery process – and our specially developed threads – are required to ensure that the advantages of lightweight components are fully exploited.


AMANN PRODUCTS FOR COMPOSITES:

- Serafil Comphil
- Onyx Comphil

POLYESTER CONTINUOUS FILAMENT WITH SPECIAL FINISH

- thread with finish that is specially developed for composites
- optimised sewing/embroidery performance without adhesion-inhibiting properties towards composite matrix
- for fixing carbon or fibreglass rovings by TFP embroidery method (Tailored Fibre Placement)

Ticket no.	△ Embroidery ticket	Tex no.	Needle size	Make-up	Colour no.
300 (200/2)	75	10	Nm 60-70	15.000 m KS	1000 (raw)
60	25	45	Nm 80-110	5.000 m FS	7822 (orange)


FS/KS = 

Main application:
• Composites

POLYAMIDE 6.6 CONTINUOUS FILAMENT WITH SPECIAL FINISH

- thread with finish that is specially developed for composites
- optimised sewing/embroidery performance without adhesion-inhibiting properties towards composite matrix
- for fixing carbon or fibreglass rovings by TFP embroidery method (Tailored Fibre Placement)

Ticket no.	△ Embroidery ticket	Tex no.	Needle size	Make-up	Colour no.
60	25	45	Nm 90-110	5.000 m FS	7822 (orange)

FS/KS = 

Main application:
• Composites



FURTHER SPECIAL SEWING THREADS

FURTHER SPECIAL TECHNICAL SEWING THREADS

Thread follows function. According to this principle, AMANN's product range offers other special sewing threads. Whether for the growing market of fibre composite materials, for the manufacturing of sails, for lifting and restraint systems, or special protective clothing: AMANN offers customised sewing threads, which are aligned with ever new requirement profiles of technical textiles.


AMANN PRODUCTS FOR FURTHER APPLICATIONS:

- Xtreme-tech with Dyneema®

DYNEEMA® BY DSM, HPPE (HIGH PERFORMANCE POLYETHYLENE) CONTINUOUS FILAMENT, BONDED

- high-tenacity special sewing thread made from Dyneema®
- maximum strength at minimum weight: 15 times stronger than steel
- high resistance to UV-light, chemicals and water
- extremely abrasion-resistant
- maximum strength can be reached in combination with fabric made from Dyneema®

Ticket no.	Tex no.	Needle size		Make-up	No. of colours
		Nm	No.		
20	150	160	23	1.500 m FS	7
40	65	110-130	18-21	3.000 m FS	7

FS/KS = 

Main application:



- Lifting and restraint systems: climbing equipment, fixation of freight containers
- Protective clothing: safety shoes, safety gloves
- Other: hand gliders, fishing nets



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Our management systems are certified according to:

