

Dyneema Purity® SGX fiber

A proprietary medical grade ultra high molecular weight polyethylene fiber used to improve implant performance

Dyneema Purity® SGX fiber is 15 times stronger than steel, 40% stronger than aramids on a weight-by-weight basis and 3 times stronger than polyester on a volume basis. It also offers high pliability and low elongation. This innovative UHMWPE technology, specifically designed for use in humans, has the potential to aid in therapeutic repairs that last longer, create stronger mechanical performance and increase comfort—contributing to improved quality of life for patients.

A growing list of applications

With a long and proven track record, this material has found its way to millions of patients in a broad range of medical devices used in the body temporarily or permanently. From demanding suture designs to the most delicate procedures within joints, the SGX grade of Dyneema Purity® fiber has the high strength, flexibility and abrasion resistance needed to help improve patient outcomes.

Sutures made with this fiber can withstand the enormous stresses put on the material during arthroscopic procedures by knot-pushing devices. This strength helps to reduce the breakage commonly seen during rotator cuff repair surgery when polyester sutures are used.

Small size is big news

Because of its exceptional strength, Dyneema Purity® fiber allows for substantial reduction in the size of medical implants (particularly knot volume) and tissue capsule, common causes of patient discomfort. This improvement in the balance between strength and volume also allows the development of lower profile, stronger devices, supporting the trend toward minimally invasive surgery.

Summary of Product Benefits

- High tensile strength 35 cN/dtex (3Gpa) and high modulus 1300cn/dtex (125GPa).
- High pliability and softness
- Lower profile with equivalent strength
- Proven biocompatibility
- Non-hemolytic
- Cut resistant
- Low friction coefficient

Dyneema Purity® fiber is easy on the body

Compared with other materials widely used in the manufacture of medical devices, Dyneema Purity® SGX fiber is extremely soft, with a typical coefficient of friction (COF) of < 0.10. This remarkable softness combined with chemical inertness reduces the invasive nature of implantable devices, lowering tissue inflammation and

irritation. This can increase patient compliance and comfort as well as accelerating recovery.

Dyneema Purity® SGX fiber also has excellent fatigue and abrasion resistance, and is non-hemolytic. It has been successfully tested according to ISO 10993 for genotoxicity, cytotoxicity, sensitization/irritation, and mutagenicity.

Current Applications

High strength orthopedic sutures	For soft tissue repair demanding strength yet low profile to help fast and reliable repair and patient comfort
Small joint sutures	For repairing small joints – including extremities, elbows and ankles – plus craniofacial procedures
Arthroscopy	For reduced-profile devices that maintain the strength and functionality of larger devices
Shoulder/rotator	For unparalleled strength and stability in the most innovative sports medicine devices, with low profiles to keep suture knots small
Knee/ACL	For optimizing critical connections with less trauma to ligament and bone, including better graft fixation to the femur; for stronger meniscal replacement
General Surgery	For use in various implantable textile structures like meshes where low profile, strength and softness are important requirements

Typical mechanical performance characteristics

Tensile strength 35 cN/dtex (3GPa) and modulus 1300cN/dtex (125GPa).

Tensile strength and modulus depend on grade and yarn size. Please contact DSM for more details.

To watch videos and animations and also read white papers on Dyneema Purity® fiber, please visit www.dyneemapurity.com.

Material Master Files available at the FDA and Notified Body.

Dyneema Purity® fiber is produced according to ISO 13485.

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