

AntiStat



Perlon[®] – The Filament Company

Perlon[®] – The Filament Company – is an innovative, global group of companies specialized in the manufacture of synthetic filaments. Perlon[®] generates annual sales of about 135 million euros, employs more than 850 people and has a production capacity of over 20,000 tons. We operate from locations in Germany, in the USA and in China.

Through our technical expertise and strength in innovation we develop premium quality products for our customers. The comprehensive product portfolio is based on a variety of raw materials. In line with the intended application, these are modified and processed into high quality, application-specific filaments. The consistent high quality of our products sets worldwide benchmarks.

AntiStat works before it sparks

As a manufacturer of monofilaments marketed under the brand name QualiFil[®], Perlon[®] has developed a polyester-based monofilament with antistatic properties: AntiStat.

AntiStat is designed for the manufacture of process and conveying belts in various branches of industry, e.g. for the production of nonwovens, particle board or pellets. It can be interwoven or alternatively used in the manufacture of spiral sieve screens. Process or conveying belts with AntiStat dissipate electrical charges – for more stable processes and lower risk of explosion in accordance with the ATEX directive (explosive atmospheres).

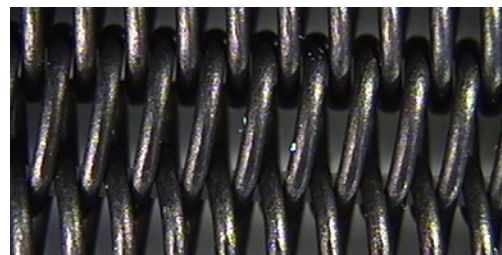


Fig. 1: Spiral cloth from 100% AntiStat

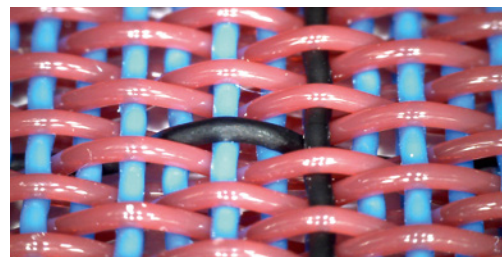


Fig. 2: PET-based fabric with AntiStat in warp and weft directions

AntiStat can also be used as a semi-conductive material for screening high voltage cables.

Characteristics of AntiStat

AntiStat is a bicomponent monofilament with a concentric core-sheath structure. The core consists of polyester and the sheath is formed by a polyester-based polymer filled with carbon black (see Fig. 3). The two polymers are co-extruded to ensure an excellent core-shell adhesion (see Fig. 4) and to prevent the release of carbon black particles during the belt manufacturing process and most importantly in the end application. The electrostatic conductivity outperforms other polyester-based monofilaments available on the market: with a volume resistivity $\leq 250 \text{ Ohms x cm}$, AntiStat belongs to the electrostatic conductive materials.

AntiStat is available in four different shrinkage levels as well as a diameter range of 0.30 to 2.50 mm. AntiStat can be woven or spiralsised (see Fig. 5).

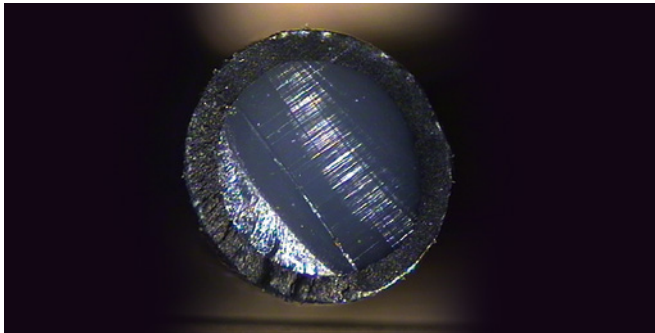


Fig. 3: Cross section of an AntiStat monofilament

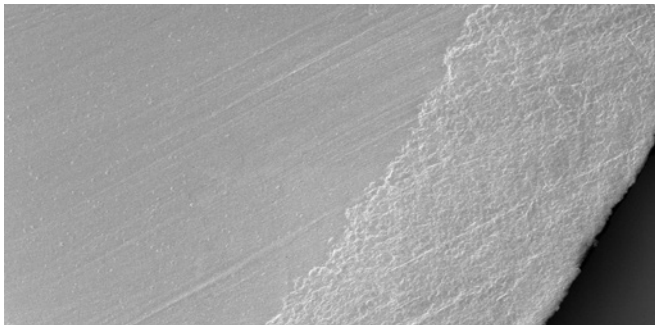


Fig. 4: Core-shell transition zone



Fig. 5: Spiral made from AntiStat

Characteristics of process belts manufactured with AntiStat

Process belts usually contain conductive as well as standard polyester threads in warp and weft directions: the polyester monofilament contributes to the dimensional stability and strength of the structure while the AntiStat is used in various diameters to achieve the required electrostatic dissipation property. The contact resistance of a structure containing AntiStat is between 4×10^4 and $6 \times 10^{10} \text{ Ohm}$ depending on the structure and the diameter of the AntiStat used. This fulfils the requirements for electrostatic conductive or energy absorbing systems as well as the ATEX directives.

AntiStat thus offers a valuable alternative to polyamide-based, electrostatic dissipating monofilaments. On the one hand it better resists the high temperatures during fixing and on the other, due to its hydrophobic properties it is easier to work in any environment. Because the thermomechanical characteristics of AntiStat equate to those of our QualiFil[®] polyester monofilaments, the belts or spiral sieves manufactured with AntiStat have a very uniform structure in addition to a smooth, even surface (see Fig. 6a) in comparison to competitive materials (see Fig. 6b).

This reduces the risk of marking and improves the abrasion resistance to static machine parts.

Difference



Fig. 6a: Even surface of a sieve with AntiStat –
Product side: AntiStat and PET at the same level;
machine side: AntiStat offers a flat and stable float



Fig. 6b: Uneven surface of a sieve with competitive material –
Product side: antistatic PA & PET at different levels;
machine side: the antistatic monofilament has an arched float

Fabrics with AntiStat are also more convincing in the so-called MIE abrasion tester than competitive sieves. In this test, strips of fabric are rolled back and forth between two metallic rollers. Here, the test demonstrated in one and the same fabric that AntiStat monofilaments (see Fig. 7b) emitted significantly less carbon black particles than the competition antistatic monofilaments (see Fig. 7a). Thus the use of AntiStat also reduces the risk of contaminating the manufactured product.

High mechanical resistance LH type and hydrolysis resistant LC type

AntiStat LH has been specifically developed for mechanically demanding applications. AntiStat LH withstands high pressure showers operating at 200 bar while the standard type shows significant damages after 20 minutes exposure. Therefore the AntiStat LH type is highly recommended for spunbond forming fabrics which usually undergo periodic cleaning process at high pressure.

The hydrolysis resistant AntiStat LC has been developed for dryer fabrics (e.g. for particle boards or pellets) operating at high temperatures in damp environments. It has a residual strength under extreme hydrolytic conditions (145 °C / 32 h / 4.2 bars) of over 60 %.

Fig. 7: Fabrics after comparative MIE abrasion stress
(Mecanique Industrielle d'Enghien)

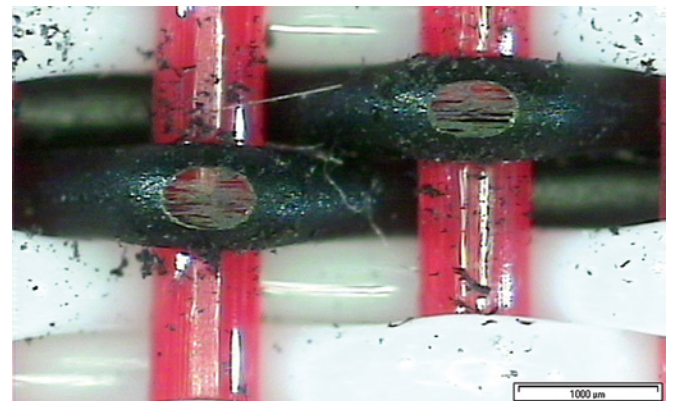


Fig. 7a: Fabric with polyamide-based antistatic monofilament

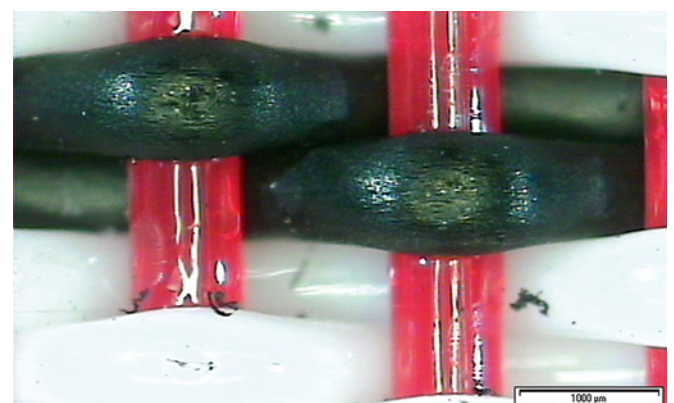


Fig. 7b: The same fabric with polyester-based AntiStat

Brand related products: 7** LC, LH, LS

This product information has been compiled to the best of our knowledge and with the greatest of care. We cannot, however, assume any liability for the accuracy, integrity or timeliness of its content. The technical parameters and the behaviour of the monofilament can vary depending on diameter and production technique.