

AntiStat



A brilliant flash of inspiration: 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).

Perlon[®] – The Filament Company

We are the world's leading manufacturer of synthetic filaments. We develop customer-oriented products of excellent quality through technical expertise and innovation.

Perlon[®] – The Filament Company – stems from the merger of PerlonNextrusion and Hahl-Pedex. Perlon[®] generates annual sales of about 125 million euros, employs more than 750 people and has a production capacity of over 20,000 tons. We operate from seven locations in Germany, in the USA, in China as well as in Korea.

Our portfolio incorporates an extremely diverse range of products for almost any industrial application. We are constantly creating new solutions for unique products – developed today for the markets of tomorrow.



Fig. 1: Spiral cloth from 100% AntiStat

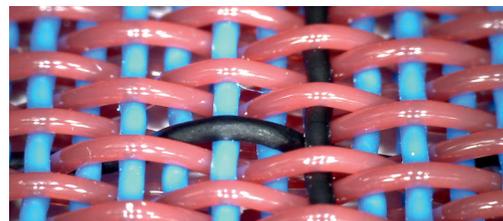


Fig. 2: PET-based fabric with AntiStat in warp and weft directions

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-shell structure. The core consists of polyester and the outer layer forms a polyester-based polymer filled with carbon black (see Fig. 3). The two polymer systems which form the core and the shell are co-extruded in one single step. This ensures a very good core-shell bond (see Fig. 4) and prevents the release of carbon black particles during the manufacturing process and above all in the end application. The electrostatic conductivity outperforms other polyester-based monofilaments available on the market: with a resistance range of 35 to 150 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 0.20 mm to 2.50 mm. AntiStat can be woven or spiralised (see Fig. 5).

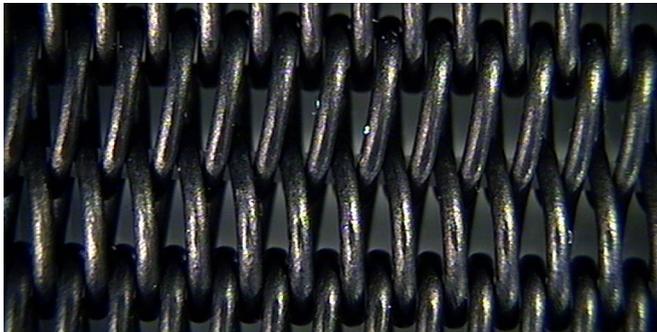


Fig. 3: Cross section of an AntiStat monofilament

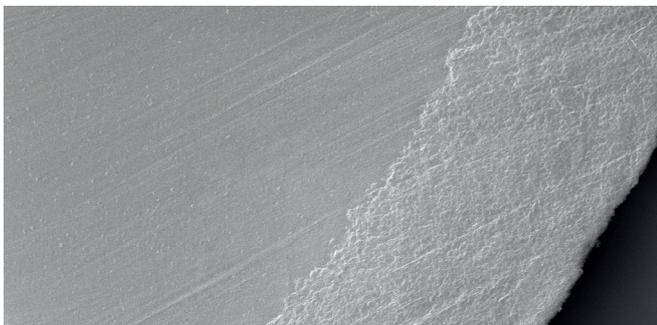


Fig. 4: Core-shell transition zone



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 6×10^{10} 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

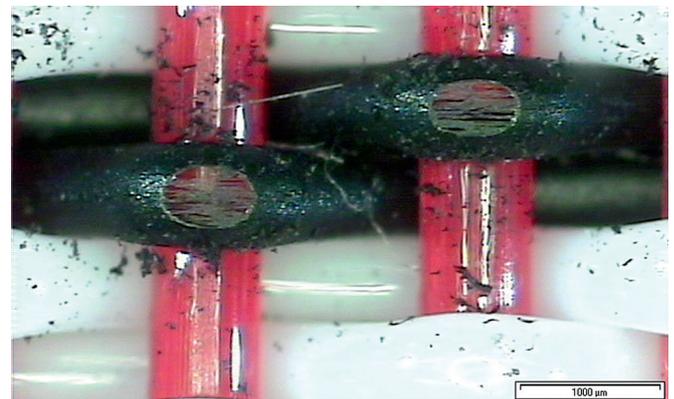
Fabrics with AntiStat are also more convincing in the so-called MIE abrasion tester than competitive sieves. In this test, strips of fabric are rolled back and forth between two metallic rollers. Here, the test demonstrated in one and the same fabric that AntiStat monofilaments (see Fig. 7b) emitted 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

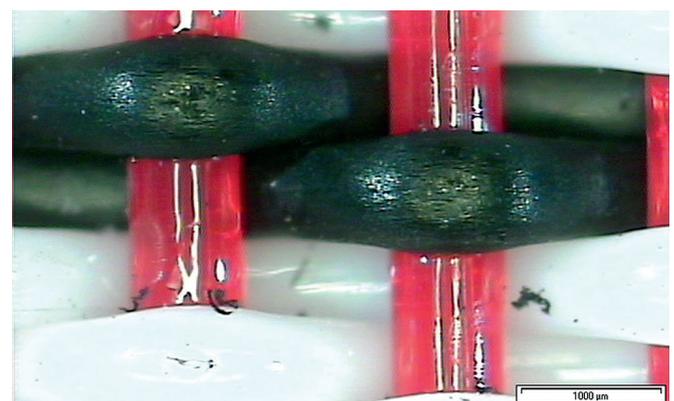
During the spunbond process diverse contaminations can occur whereby cleaning by means of high pressure jets at up to 200 bar becomes necessary. Because AntiStat LH has been specially developed for mechanically demanding applications it resists the utilisation of high pressure jets up to 200 bar. After 10 minutes there is no sign of damage whatever and even after 20 minutes only marginal mechanical damage is visible.

The hydrolysis resistant AntiStat LC has been developed for use in industrial filter designs at high temperatures in damp environments. Its residual strength under extreme hydrolytic conditions (145°C / 32 h / 4.2 bar) is over 60%.

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



7a: Fabric with polyamide-based antistatic monofilament



7b: The same fabric with polyester-based AntiStat

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 correctness, completeness or currentness of the contents. Depending on diameter and production technique the technical parameters and the behaviour of the monofilament can vary.