SPECIAL TYPES OF MONOFLAMENTS

FLAME RETARDANT

POLYESTER MONOFILAMENT PET F.R. FLAME-RETERDANT- VO VERIFIED according to the American rule UL94

This monofilament has an optimal behaviour to the flame. The standart PET is classified as HB (Horizontal Burning), meaning that the article made of PET, when in horizontal position, produces flame and it maintains it vigorous. The article made of PET V0, when in vertical position, therefore in disadvantageous condition, does not produce flame.

Other intermediate degrees, such as V1-V2-V3-V4, can be realized. The progressive numeration is pejorative in relation to its fire-proof property. This monothread has been conceived for the electrical field, but new applications are rewarding the characteristic of this material: its fire-proof property, without any release of halogen gases (toxic gases). New families of technical fabrics have been developed, others are in the study in important centers of research with the aim to safeguard the security of the public places, transport means, meeting place. The range of the diameters in which we can supply the PET f.r. is comprised from 0,10 to 0,80mm (coloured monofilament can be produced starting from the diameter 0,20mm upwards).

PBT F.R. MONOFILAMENT PET - FLAME-RETERDANT- VO VERIFIED according to the American rule UL94

Such material belongs to the family of polyesters, has an higher fire-proof capability than polyester flame retardant and finds employment above all in the electrical field, like covering of electric cables. It has a minimal halogen content. The current production is from the diameter 0,23 to 0,254 mm in dull, black and grey but other diameters and colors can be realized on request.
REINFORCED HOSES

FIL.VA developed a specific production of monofilament during these years i.e:

**Polyamide 6 monofilament**
- Working temperature in continuous: 90° C.
- Melting temperature: 220° C.
- Softening temperature: 220° C.
- Available diameters from 1,00 mm up to 4,30 mm.
- Low shrinkage value: It is around 0% at 150° C. For 5 minutes at 4 physical atmospheres (it is also available with higher shrinkage data. Value to be confirmed).
- Very low diameter tolerance range. The Requested minimum diameter value is respected.
- Very good compatibility with vulcanized rubber: this guarantees a perfect cohesion between the two products.

**Polyester monofilament**
- Working temperature in short time: 220° C.
- Working temperature in continuous: 100/120° C.
- Melting temperature: 256°C.
- Softening temperature: 236°C.
- Available diameters from 0,65 mm up to 3,00 mm.
- This monofilament is available with standard shrinkage from 5% up to 15%.
- Its characteristics is the high resilience: the ability of returning to the original position.
BICOMPONENT SHEATH/CORE MONOFILAMENT

Fil.Va has developed his own technology for the production of bicomponent filament of various composition.

The bicomponent monofilament can guarantee a cost-saving on the one hand and the development of new applications on the other hand. A cost-saving because it allows the realisation of monofilaments composed by a combination of low-cost polymers, but with excellent technical characteristics, combined with high-cost technical polymers with remarkable chemical resistances.

In this range of monofilaments we find **(monofilaments sheath/core):**

- PA6/PA11
- PA6/PA11
- PA6/PA6.12

Produceable diameters: from 0,18 mm up to 0,60 mm

These monofilaments have been realised for the filtration market (filter press) of water and mud. The advantages of these bicomponent monofilaments composed to the standard monofilament realised in tecnopolymer are:

- lower cost due to the use of PA6 internally.
- higher mechanical characteristics, due to the use of PA6 internally.

All this guaranteeing the same chemical/physical behaviour of the final product, due to the fact that the external part is 100% tecnopolymer.

**New applications** because the sheath/core technology allows to realise monofilaments with the two portion with different melting points.

Monofilaments with this composition have been realised as follows:

<table>
<thead>
<tr>
<th>CORE</th>
<th>SHEATH</th>
</tr>
</thead>
<tbody>
<tr>
<td>PA6/PA low melt</td>
<td>220°C</td>
</tr>
<tr>
<td>Elastomeric PET: high melt/low melt</td>
<td>212°C</td>
</tr>
<tr>
<td>Pet/Copet</td>
<td>259°C</td>
</tr>
<tr>
<td>PP/PE</td>
<td>160°C</td>
</tr>
</tbody>
</table>

Produceable diameters: from 0,25 mm up to 0,50 mm. These monofilaments are used for the construction of clothes welded in the exact contact between weft and warp in order to give a very high stability to the cloth. The cloth can be realised with these monofilaments at 100% or with variable percentages depending on the requests.

**Applications:** Interior decoration market, transport, conveyor belt and forming clothes. Other combinations can be discussed and realised with the customers depending on their needs.
NEW DEVELOPMENT BIODEGRADABLE MONOFILAMENT “FILTON”

Fil.Va is a specialized manufacturer of high quality monofilaments out of Polyester, Polyamide, PP, PBT, PVDF, Polyester Elastomeric also in the flame retardant grade.

Introducing you the company we underline you that FIL.VA is selling monofilaments all over the world in several sectors for example technical textile, geotextiles, upholstery, home textiles, braided sleeves, sewing thread, fabrics reinforcements, fabrics for filtration, technical tapes, curtain ribbons, 3-D fabrics and many others more.

We are interested in drawing your attention on their new development consisting in a biodegradable FILTON monofilament arn based on PLA polymer.

The most important feature of FILTON is its biodegradability and therefore an excellent environmental impact because fabrics or other items produced with PLA undergo to a selfdegradation through a complex hydrolisis mechanizm, catalysed by temperature, microorganisms, bacteria, humidity which jointly attack and destroy the PLA polymer chains. The end result of the biodegradation process is carbon dioxide, water and some humus. The degradation process is temperature and humidity dependent. PLA is compostable at industrial composting facilities.

FILTON MONOFILAMENTS PROPERTIES

- **Density:** the spesific gravity is 1,25 gr/cm³
- **Thermal properties:** PLA is stiff at room temperature
- **Glass transition temperature (tg):** 55-65 °C
- **Melting temperature (tm):** 160-170 °C
- **Moisture regain:** 0,4-0,6 %
- PLA has a higher LOI (limiting oxygen index) compared to most of the important polymers and this means that it is more difficult to ignite.

STANDART FILTON MONOFILAMENTS MECHANICAL PROPERTIES

- **Tensile strength:** 36-38 cN/dtex
- **Elongation at break:** 40-45 %
- **Shrinkage in boiling water x 3’:** 2,7-3,2 %
FILSTER (PET MONOFILAMENT)

AVAILABLE ALSO IN THE FLAME TYPE (V0)

This monofilament type is widely used for technical applications thanks to its particular characteristics of low or even no humidity absorption that gives to it a very good dimensional stability, resistance to low and high temperatures and a good resistance to abrasion.

FILSTER HT (high tenacity polyester monofilament)

This monofilament has a % 40 higher tenacity than our standart polyester monofilament.

MAIN CHEMICAL AND PHYSICAL CHARACTERISTICS

- **Density** 1,38 g/cc
- **Melting temperature** 255°C – 260°C
- **Softening temperature** 240°C
- **Self-extinguishability Class** (Ref. UL 94) HB horizontal burning

FILSTER ELAST (Elastomeric Polyester Monofilament)

It has characteristics of a very high elastic elongation with a none inelastic residual.

It is available in several elasticity grades and also in the V0 type.
FILYLON FILPRO (POLYAMID – POLIPROPYLENE)

POLYAMID MONOFILAMENT

This kind of monofilament is appreciated for its very good workability. It shows perfect characteristics of mechanical resistance, abrasion resistance and an excellent dyeing.

MAIN CHEMICAL AND PHYSICAL CHARACTERISTICS

- Density: 1,14 g/cc
- Melting temperature: 213°C – 220°C
- Softening temperature: 180°C - 190°C
- Self-extinguishability Class: (Ref. UL 94) V2

PA6 MONOFILAMENT

PA6.6 MONOFILAMENT

Further to the characteristics stated for the Polyamide 6, the Polyamide 6.6 allows the use at higher temperatures, without modifying the mechanical characteristics.

It guarantees resilience and has a better dimensional stability than Polyamide 6.

MAIN CHEMICAL AND PHYSICAL CHARACTERISTICS

- Density: 1,14 g/cc
- Melting temperature: 258°C – 262°C
- Softening temperature: 235°C
- Self-extinguishability Class: (Ref. UL 94) V2

POLIPROPYLENE MONOFILAMENT

This monofilament is particularly suitable for all filtration fabrics due to its excellent resistance to the acids.

Among the main characteristics there is its extreme hydro repellency.

Thanks to its capacity to resist to organic substances, it is largely used for the production of biomedical fabrics.

MAIN CHEMICAL AND PHYSICAL CHARACTERISTICS

- Density: 0,91 g/cc
- Melting temperature: 160°C – 170°C
- Softening temperature: 145°C
- Self-extinguishability Class: (Ref. UL 94) HB horizontal burning