

# High Performance Resins



## Perlon<sup>®</sup> – The Filament Company

Perlon<sup>®</sup> – The Filament Company – is an innovative, global group of companies specialized in the manufacture of synthetic filaments. Perlon<sup>®</sup> 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.

Within the Perlon<sup>®</sup> QualiFil product range, we offer a wide array of monofilament produced from different polymers for use in the Paper Machine Clothing (PMC) and Advanced Technical Textiles (ATT) fields. Different polymer types can be used depending on the area of application. As to which polymer is the right one for your application, depends on the profile requirements of the end product. We are happy to offer advice.

Polyetheretherketone (PEEK) belongs to the polycondensates family and is an extrudable polymer. It is a high temperature raw material with a very high thermal resistance, PEEK is self-extinguishing and melts. Moreover PEEK has a very good chemical resistance and is resistant to hydrolysis. In comparison to other polymers, PEEK is more UV resistant. PEEK has inherently a brown coloration.

Polyphenylene sulphide (PPS) is also an extrudable polymer. PPS demonstrates excellent chemical resistance and comes a close 2nd to PVDF in terms of its oxidation resistance. PPS has very good insulating properties. PPS is self-extinguishing but will melt. The high temperature resistance is a further important criteria in choosing PPS. PPS demonstrates no abrasion resistance but displays excellent hydrolysis resistance.

Polyvinylidene fluoride (PVDF) is a semi crystalline raw material which is resistant to different forms of fuel, oil and solvents. PVDF is best used in applications for which self-extinguishing and high insulating properties and a good chemical and UV resistance are vital. PVDF is a highly purified raw material and can therefore also be used in drinking water applications. Its translucence is another reason to choose PVDF.

|  | Polyether(ether)ketone  | Polyphenylene sulphide   | Polyvinylidene fluoride  |
|--|---|--|--|
| Abbreviation                                   | PEEK  | PPS  | PVDF   |
| Density [g/cm <sup>3</sup> ]                   | 1,30  | 1,34   | 1,75 – 1,78  |
| Continuous working temperature [°C]            | -50 bis 250   | -40 bis 180  | -100 bis 150   |
| Short term working temperature [°C]            | 290   | 235  | 180  |
| Glass transition temperature [°C]              | 150   | 85 – 95  | -40  |
| Crystallisation temperature [°C]               | 340   | 285  | 170 – 180  |
| Moisture absorption [%] (24h, ASTM D570)       | < 0,10  | 0,02   | 0,03 – 0,06  |
| Resistance to acids (20°C)                     | Resistant to weak and strong acids. Resistant to weak organic acids. Partial resistance to strong organic acids, not resistant to oxidising acids.          | Resistant to weak acids. Partial resistance to strong acids and not resistant to oxidising acids.  | Resistant to weak and strong acids. Partial resistance to oxidising acids.   |
| Resistance to alkaline solutions (20°C)        | Resistant to weak and strong alkaline   | Resistant to weak and strong alkaline  | Resistant to weak and strong alkaline except amino acids.  |
| Resistance to organic solvents                 | Resistant to alcohol, acetones and hot water. Resistant to alcohol and saturated aliphatic hydrocarbons.  | Resistant to alcohol and saturated aliphatic hydrocarbons. Partial resistance to aromatic hydrocarbons, fats and oils.                       | Resistant to aliphatic, aromatic and chlorinated hydrocarbons. Not resistant to hot acetones, amino acids and strong polar, organic substances. Resistant to alcohols. |
| Flammability                                   | Self-extinguishing. Inflammable.  | PPS is flame retardant. The self-extinguishing flame burns brightly and smells of rotten eggs.   | Self extinguishing.  |
| LOI Value                                      | 35  | > 40   | 44   |
| Mechanical properties/ special characteristics | Excellent mechanical properties. High stiffness. High abrasion resistance. Not resistant to UV. Insulating, hydrolysis resistant, physiologically harmless. | Not resistant to UV and weathering, cannot be supplied coloured, addition of additives for increased flexibility and to prevent brittleness. | High mechanical and tensile strength, very good chemical resistance, will not decay, resistant to UV light, food approved, transparent.                                |

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