



PolySciTech Division of

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PolymBlend® Technical Data Sheet

PolymBlend® is a **polymer blend** which has been formulated with an optimum mixture of **two high molecular weight statistic copolymers** to produce materials with properties difficult to achieve with conventional polymers.

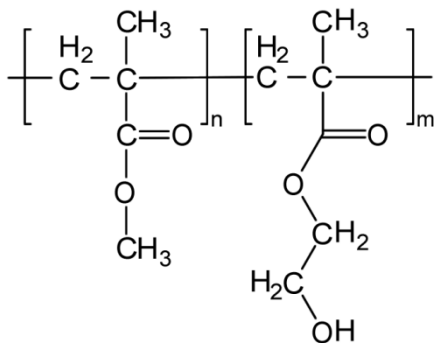
PolymBlend® has been thoroughly optimized for the production of nonwoven membranes by electrospinning with different percentages of OH groups in their structure and excellent mechanical and physicochemical properties.

In addition, PolymBlend® can be used for the formulation and preparation of polymeric films using other techniques (spin coating, knife coating, curtain coating, etc.) as well as for the preparation of thin coatings, porous membranes, etc.

Due to PolymBlend® being based on two copolymers that can be mixed together in all proportions, the chemical and mechanical properties of the resulting materials can be easily modulated.

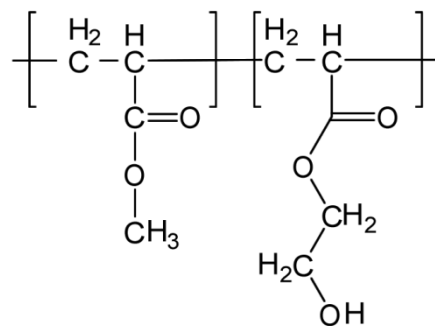
Chemical Composition

PolymBlend® is composed by a mixture of two high molecular weight statistic copolymers:



Copolymer A

Methyl methacrylate-co-hydroxyethyl methacrylate
(average M_w 200 kDa, PDI < 2.5)



Copolymer B

Methyl acrylate-co-hydroxyethyl acrylate
(average M_w 2,000 kDa, PDI < 1.5)

The percentage of the hydroxylated monomers in the polymer blend depends on the ratio in which the two copolymers are mixed. The following equation shows a simple way to calculate this percentage:

$$\% \text{ OH - monomers} = \frac{2.6 \cdot A + 2.1 \cdot B}{5.2 \cdot A + 6 \cdot B}$$

where *A* is the mass of copolymer A and *B* is the mass of copolymer B; both in the same units.

The recommended ratio for processing by electrospinning is 1:1, which corresponds to 41% of hydroxylated monomers.

Characteristics

PolymBlend®:

Miscible with a wide range of polymers and copolymers.

Soluble, up to 14% w/w, in DMF, DMSO, dioxane, NMP, and solvents with similar polarities; copolymer A is soluble up to 30% w/w and copolymer B is soluble up to 10% w/w.

Resistant to acids and bases in a wide pH range (4.0 to 11.5)

Both copolymers are amorphous with a degradation temperature of 200 °C for copolymer A, 250 °C for copolymer B and 220 °C for the 1:1 polymer blend.

Materials obtained with PolymBlend® by electrospinning:

Mechanical properties: high resistance to abrasion, high tensile strength, high bursting resistance, adequate flexibility and elasticity, easy handling and temperature resistance (up to 100 °C).

Chemical properties: high resistance to acids and bases (pH between 4 and 11.5 up to 24 hours), to hydrophobic organic solvents (toluene, hexane, heptane, vegetable and mineral oils, etc.), and to hydroalcoholic mixtures (up to 30% v/v).

Polarity: the obtained materials are hydrophobic, but they can be easily transformed into hydrophilic ones (Q=2; Q is defined as mass of absorbed water per mass of material) by a thermal wetting protocol. Once wetted, the capillarity and permeability to water of the materials remain irreversible.

Storage and Stability

Stable at RT.

This product is for research use only and it is not intended for use in humans or for in vitro diagnostic use.

PolymBlend® is a registered trademark of Nanomateriales y Polimeros S.L.
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