Therapeutic Apheresis

**plasma Flux PSu**

the filter with the Fresenius Plasmasulfone Membrane for plasmapheresis
Advances in therapeutic apheresis made over the last 30 years have coincided with the developments and improvements of membrane filtration techniques. Therapeutic apheresis today is not just the simple substitution of the patient’s plasma; additionally, the therapy involves the removal of pathological factors such as auto-antibodies, immune-complexes or toxins from the blood of the patient by filtration or adsorption.

**plasmaFlux PSu** filters from Fresenius Medical Care enable the elimination of a wide range of substances due to sieving coefficient of 1 for molecules with a molecular weight of up to two million dalton.

**Diseases treated by therapeutic apheresis**

Due to a better understanding of the basic diseases and the improved technical know how, therapeutic apheresis is today a standard therapy for people suffering from the following diseases [1, 2]:

**Critical care setting**

- Acute inflammatory demyelinating polyneuropathy/Guillain-Barré syndrome
- Myasthenia gravis
- Goodpasture’s disease
- Thrombotic thrombocytopenic purpura/haemolytic uremic syndrome
- Acute pancreatitis due to chylomicronemia syndrome

**Ambulatory care setting**

- Systemic lupus erythematosus (SLE)
- Familial hypercholesterolaemia (FHC)
- Refsum’s disease
- Microangiopathic thrombocytopenia (TTP/cHUS)
- Pemphigus vulgaris

**New therapeutic approaches**

- Sudden hearing loss
- Age-related macular degeneration
- Ischemic diabetic foot syndrome

**plasmaFlux PSu** filters contain the new Polysulfone based Fresenius Plasmasulfone membrane (Figure 1) which facilitates the continuous separation of plasma. Its development has been based upon the extended experience of plasmapheresis procedures as well as of Polysulfone membranes in clinical practice. A high performance and biocompatibility of the primary partition filter are fundamental prerequisites for the efficient treatment of different diseases by therapeutic apheresis.

Fresenius Plasmasulfone membranes minimise the activation of the patient’s immune system during blood-membrane interaction. The Fresenius Plasma-sulfone membrane thus offers the acknowledged biocompatibility profile of all Fresenius Polysulfone® membranes.

Figure 1: Scanning electron micrograph of the new Fresenius Plasmasulfone membrane

Figure 2: Flow chart of plasmapheresis therapy with the multiFiltrate (acute dialysis machine from Fresenius Medical Care)
**Fresenius Plasmasulfone – a new approach**

- **High Filtration Performance – at low Transmembrane Pressure**

  The increased hydraulic permeability as well as the high effective surface area of the new Fresenius Plasmasulfone membrane ensure high filtration performance even at low transmembrane pressures for the entire duration of the treatment.

  The excellent flow conditions within the *plasmaFlux* filters contribute to the efficient, rapid and safe exchange of plasma.

- **High sieving coefficients**

  For substances with high molecular weights. An efficient removal of pathological factors within the filtered plasma can only be achieved if the sieving coefficient of the toxins and immune complexes (having a molecular weight of up to two million dalton) approaches 1 (Fig 4).

  ![Figure 4: Sieving coefficients of membranes for dialysis and plasmapheresis](image)

- **INLINE steam sterilisation**

  Ensures no sterilisation residues and is thereby eliminating potential side effects of other sterilising agents. Moreover, the reduced requirement of saline for the rinsing procedures is associated with considerable time-saving benefits.

<table>
<thead>
<tr>
<th>Performance / technical data</th>
<th>plasmaFlux PSu 1S</th>
<th>plasmaFlux PSu 2S</th>
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<tbody>
<tr>
<td>Membrane material</td>
<td>Fresenius Plasmasulfone</td>
<td>Fresenius Plasmasulfone</td>
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<tr>
<td>Inner lumen/Wall thickness (µm)</td>
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<td>340/70</td>
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<td>Effective surface (m²)</td>
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<tr>
<td>Sieving coefficient for molecules up to $2 \times 10^6$</td>
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<td>~ 1</td>
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<td>Max. TMP (mm Hg)</td>
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<td>Maximum filtrate flow</td>
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Literature
