LUVITEC® for Membrane Applications.

Optimize your products with the various and unique properties of polyvinylpyrrolidones.
**Introduction**

Ongoing developments in separation processes, membrane devices and especially, raw materials are key drivers for substantive growth in this innovative field of technology. Demanding process conditions and the need for high separation selectivity and process efficiency, have led to the widespread use of the high performance polymer membranes based on thermoplastic polymers like polysulfone (PSU), polyethersulfone (PESU), polyphenylsulfone (PPSU) and polyvinylidene fluoride (PVDF) in combination with LUVITEC®, a polyvinylpyrrolidone (PVP) from BASF. These polymer membranes are manufactured as hollow fibers or as flat sheets (see page 4) by using phase inversion technology.

LUVITEC® cover a broad range of molecular weight products. Different kinds of membrane applications are possible due to LUVITEC®’s unique and various functions and properties.

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**Products**

- LUVITEC® K 17, K 30, K 80, K 85, K 90, K90 HM - Powder
- LUVITEC® VA 64 - Powder
LUVITEC® – Value Added Products.

Applications

The scope of advanced, cost efficient membrane filtration processes is constantly expanding.

Application fields include:
- biomedical applications (e.g. dialysis – artificial kidney, enzyme and protein separation)
- water purification (e.g. drinking water purification)
- waste treatment (e.g. waste water treatment)
- food processing (e.g. beer and wine filtration, clarification of juice, concentration of milk)
- manufacturing process separations (e.g. purification of chemicals, gas separation)

Properties

Polyvinylpyrrolidone (PVP) is widely employed in the membrane manufacturing process to control the pore structure and to enhance hydrophilic properties of the membrane surface. BASF offers a broad range of PVP products under the brand name LUVITEC® in order to meet specific viscosity and molecular weight requirements.

LUVITEC®, when combined with e.g. PVDF, PSU, PESU and PPSU, yields membranes having:
- excellent chemical and temperature stability
- higher porosity and permeability
- better control of pore size and pore distribution
- highly interconnected pores
- improved hydrophilic properties of the surface with good biocompatibility and less fouling

Thus superior separation performance will be achieved compared to systems without LUVITEC® as additive. An additional modification of the membrane is possible by crosslinking the PVP by means of temperature, UV-radiation, γ-radiation, peroxide or E-beam.

BASF is able to offer LUVITEC® (PVP), Ultrason® (PSU, PESU and PPSU) and many of the commonly employed solvents, like Dimethylacetamide (DMAc), N-Methylpyrrolidone (NMP), 2-Pyrrolidinone (2-Py), Dimethylformamide (DMF), γ-Butyrolactone (GBL).
Polyvinylpyrrolidones (PVP) for Membrane Applications

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<tbody>
<tr>
<td>pH value*</td>
<td>3.0 – 7.0</td>
<td>3.0 – 7.0</td>
<td>5.0 – 8.0</td>
<td>5.0 – 9.0</td>
<td>5.0 – 9.0</td>
<td>5.0 – 9.0</td>
<td>3.8 – 6.0</td>
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<td>Solids content in %*</td>
<td>≥ 95</td>
<td>≥ 95</td>
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<tr>
<td>Mw in kPa (GPC)*</td>
<td>9</td>
<td>50</td>
<td>850</td>
<td>1100</td>
<td>1400</td>
<td>1800</td>
<td>65</td>
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* all data are approx. values. It does not necessarily form part of the product specification.
A detailed product specification is available from our local BASF representative.

Examples for Polymer Membrane Production: Hollow Fiber Membrane and Flat Membrane

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