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# GENEFLOC
## Range

**Flocculants for Pretreatment in Reverse Osmosis, Nanofiltration, and Ultrafiltration Plants**

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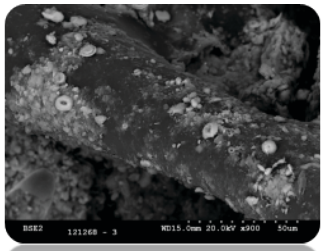
## Floculants for pretreatment in RO/NF/UF plants

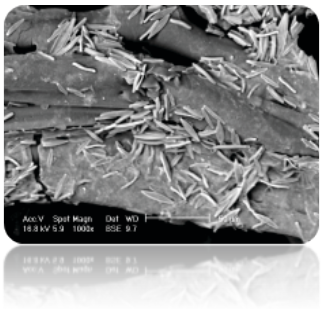
**GENEFLOC GPF** | **GENEFLOC PWF** | **GENEFLOC ABF**

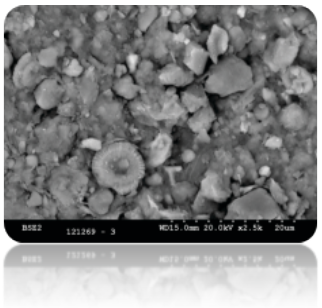
To minimize fouling formation on reverse osmosis membranes, it is essential to optimize the pretreatment process and keep the SDI (Silt Density Index) values as low as possible.

This pretreatment is usually based on filtration mechanisms featuring a range of different characteristics. In many cases, the effectiveness of filtration (especially sand filtration) is limited by the size of the particles present in the water to be treated (colloidal matter, organic matter, etc.).

One of the best solutions to remove colloidal matter from water is to cluster the colloids into larger particles that can be removed more easily by filtration using cationic flocculants.







Microphotographs of material retained in the fibers that make up the cartridge filters

Genesys has a range of flocculants with proven effectiveness in optimizing pre-osmosis filtration and reducing SDI.

Measurement of SDI index

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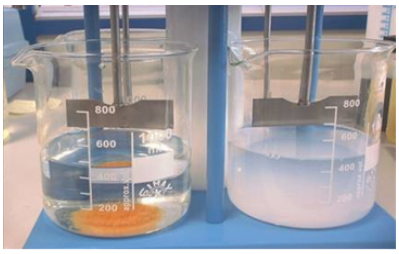
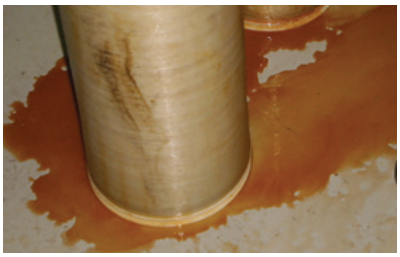
The Genefloc flocculants are effective against several substances in suspension. Plus, as these solutions are water-based , they are quickly diluted in water and can thus be efficiently administered a short distance from the filter.

The selection of the best flocculant for each type of water often requires a jar test or in situ testing.

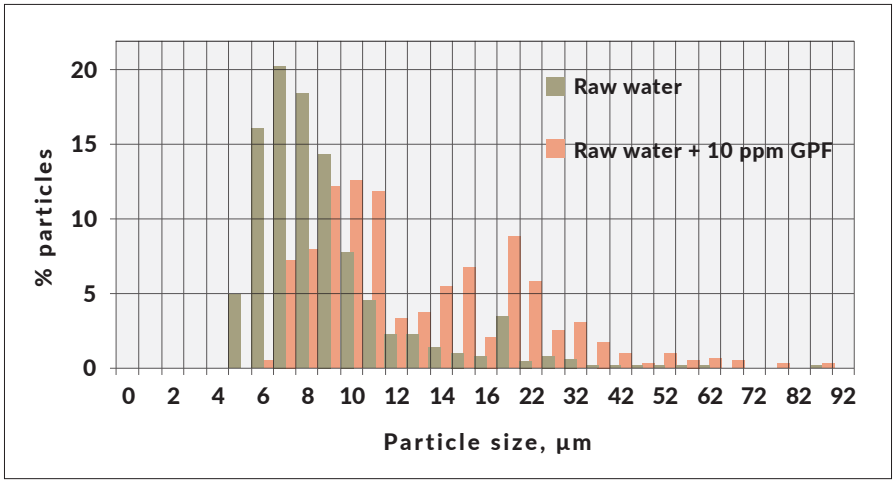




Iron or aluminum-based inorganic coagulants can also be dosed before the sand filters, but they require a significant amount of time (several minutes) to efficiently develop flocs. As such, if they are added immediately before the sand filters, they often form flocs behind the filters, which causes the formation of fouling on the membranes.

The Genefloc products eliminate the need to use inorganic iron or aluminum coagulants, which can lead to fouling formation on the membrane surfaces.

Particle distribution curves of a sample with and without flocculant – particle agglomeration for enhanced particle retention during the filtration process




**The appropriate flocculant dosage can be estimated by conducting a jar test, but dosage optimization should be performed based on in situ SDI measurements.**

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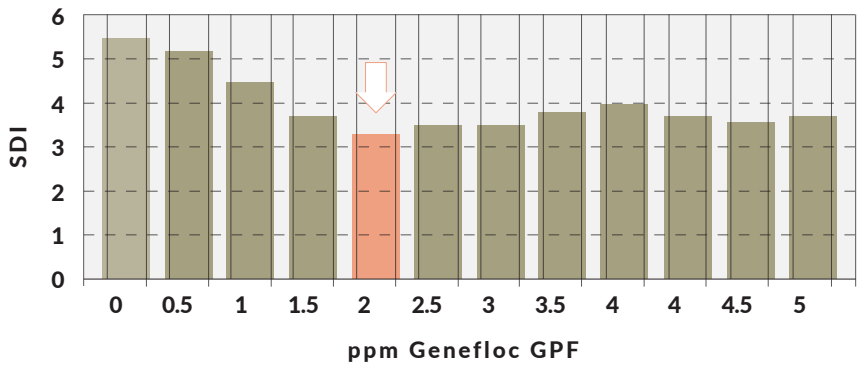
# Flocculant Dosage Optimization

The prescribed procedure for selecting the appropriate product dosage is outlined as follows:

1. Dispense 0.0 ppm of flocculant – wait 15 minutes – measure the SDI.
2. Dispense 1.0 ppm of flocculant – wait 15 minutes – measure the SDI.
3. Dispense 2.0 ppm of flocculant – wait 15 minutes – measure the SDI.
4. Dispense 3.0 ppm of flocculant – wait 15 minutes – measure the SDI.
5. Dispense 4.0 ppm of flocculant – wait 15 minutes – measure the SDI.

**The minimum SDI value corresponds to the optimal flocculant dose.**

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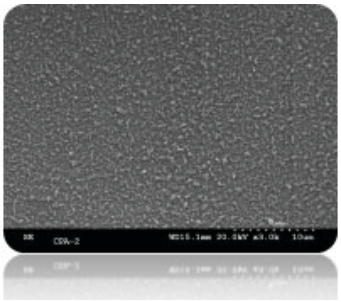
## Membrane Compatibility

**The accidental overdosing of Genefloc products or leaks due to variability in the quality of the feed water do not cause membrane fouling.**

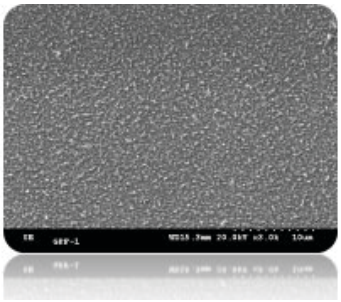
Genesys flocculants are not only effective in improving pretreatment based on filtration processes, but they are also perfectly compatible with polyamide membranes (1).

Experience in real plants and several laboratory tests have shown that there is no reaction between polyamide membranes and Genesys cationic flocculants (2).

The Genefloc series of flocculants has been approved by prominent membrane manufacturers.



Membrane microphotography of RO



RO membrane microphotography after a week-long exposure to a solution of 1 g/l of flocculant

(1) "*The safe use of a cationic flocculant with RO membranes.*"
Desalination and Water Treatment, 6 (2009) 144-151.

(2) "*Suitability of cationic flocculants for RO membranes performance improvement.*"
Desalination and Water Treatment, (2014) 1-15.

Both publications are available on the website:
**www.genesysro.com**

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## Characteristics

The table below presents the most relevant product specifications for the Genefloc line, as well as an application guide that provides important details for the proper use of these products.

| | GENEFLOC GPF | GENEFLOC PWF | GENEFLOC ABF |
|---|---|---|---|
| **Application** | Improves the efficiency of surface, ground, and process water filtration processes with medium-high SDI values. | Improves the efficiency of surface, well, and process water filtration processes with medium-high SDI values. **Suitable for use in drinking water systems**. This product complies with the requirements set out in the UNE-EN 1408:1998 standard,<br>*Chemicals used for treatment of water intended for human consumption.* | Improves the efficiency of filtration, effectively reduces SDI, and **prevents the formation of algae and bacteria.** |
| **Safety and Use*** | Aqueous solution of polyamine | Aqueous solution of a cationic homopolymer | Aqueous solution of a cationic homopolymer |
| **Classification** | CPL: Not classified<br>UN: Not dangerous | CPL: Not classified<br>UN: Not dangerous | CPL : Irritant<br>UN : Corrosive |
| **Compatibility** | Carbon steel and commonly used construction materials. Compatible with polyamide membranes. | Slightly corrosive against carbon steels, so the recommended materials for storage tanks include stainless steel, fiberglass, polyethylene, and polypropylene. | Compatible with polyamide membranes |
| **Packaging and expiration** | Available in 25 kg, 200 kg, and 1,000 kg containers.<br>Maximum storage period of two years.<br>Viscous liquid at low temperatures. | Available in 25 kg and 200 kg containers.<br>Maximum storage period of two years.<br>Viscous liquid at low temperatures. | Available 25 kg, 200 kg, and 1000 kg containers.<br>Maximum storage period of one year.<br>Viscous liquid at low temperatures. |

*Safety data sheets available on request.

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## Application Guide

| | GENEFLOC GPF | GENEFLOC PWF | GENEFLOC ABF |
|---|---|---|---|
| **Point of dosage** | This product should be dosed continuously into the feed water in a well stirred area to ensure proper blending.<br><br>A minimum contact time should be allowed before filtration to increase the flocculation efficiency. | This product should be dosed continuously into the feed water in a well stirred area to ensure proper blending.<br><br>A minimum contact time should be allowed before filtration to increase the flocculation efficiency. | This product should be dosed continuously into the feed water in a well stirred area.<br><br>Dosing is typically placed before the sand filters. |
| **Typical dosage** | **Between 1 to 4 mg/l**<br><br>This product can be diluted as it is miscible in water at any proportion. | **Between 2 to 5 mg/l**<br><br>This product can be diluted as it is miscible in water at any proportion. | **Between 2 to 10 mg/l**<br><br>This product can be diluted as it is miscible in water at any proportion. |

### Characteristics

| | | | |
|---|---|---|---|
| **Appearance** | Colourless liquid | Pale liquid | Colourless liquid |
| **pH (supply)** | 5,0 - 7,0 | 5,5 - 7,5 | 4,0 - 5,0 |
| **Density** | 1,03 - 1,05 g/cm$^3$ | 1,02 - 1,04 g/cm$^3$ | 1,00 - 1,10 g/cm$^3$ |
| **Freezing point** | < -2 °C | 2 °C | 2 °C |

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