



# Alfa Laval MBR membranes

## Naturally efficient wastewater treatment for municipal and industrial applications

### Introduction

With Alfa Laval MBR membranes, you get trouble-free MBR wastewater treatment at a low operating cost. Based on Alfa Laval LowResist™ technology, they combine minimal cleaning and maintenance needs with low energy consumption and excellent effluent quality.

### Applications

Alfa Laval MBR membranes are used around the world in MBR wastewater treatment plants for all forms of wastewater treatment. Some of these applications are:

- Municipal
- Food & beverage including wineries, breweries, dairies, starch, snacks
- Pharmaceutical production
- Chemical production
- Petrochemical processing
- Slaughterhouses
- MBR package plants for municipal and industrial applications

### Benefits

The updated version of our MBR membrane module features a number of improvements that increase efficiency, cut energy consumption and reduce maintenance costs even further. Based on tried-and-tested technology that is used in hundreds of installations over the past 10 years, our new MBR membrane module guarantees reliable operation at the lowest possible total cost of ownership.

Every detail of our unique hollow sheet membranes has been specifically designed for the conditions in a wastewater plant. The result is reliable operation and low total lifecycle costs with minimal input needed from your personnel.

Alfa Laval's MBR membrane modules combine our unique LowResist™, S Aerator™ and QuickSwap™ technologies, delivering a range of benefits for both municipal and industrial MBR processes.

### LowResist™ — minimizes fouling and energy consumption

Alfa Laval's unique LowResist™ design ensures an ultra-low transmembrane pressure (TMP) under operation. Many of our references operate under pressure from gravity alone. The ultra-low TMP results in Alfa Laval MBR membranes requiring



much less cleaning and maintenance than other MBRs on the market as the fouling is mainly surface fouling, which is easily removed, while pore fouling is minimised.

The key to the LowResist™ technology is a design that integrates a high permeability microfiltration membrane with a MBR module construction that limits pressure loss at all stages of permeate production. In the updated model, we have further improved the LowResist™ technology to reduce TMP even further. The new membranes have open sides, allowing water to flow freely into the permeate boxes. This leads to more even pressure distribution over the membrane, which improves capacity and reduces cleaning needs.

### S Aerator™ — minimizes air consumption and ensures performance

Our updated MBR model features the S Aerator™ aeration system. This new, improved system, which is unique to Alfa Laval, minimizes air consumption.

Alfa Laval's new S Aerator™ uses a single-line design, combined with a flush-line.

The design means you can reliably turn the air on and off during operation, allowing you to run your membrane modules with alternating aeration. This alternating scouring reduces energy consumption for air scouring by up to 40% compared to traditional operation – all without impacting the rate of fouling or efficiency of the membrane filtration.

#### **QuickSwap™ — easy membrane replacement**

Alfa Laval's unique QuickSwap™ means that each pack can be separated individually, minimizing the lifting height required above the membrane module. This means that Alfa Laval's MBR membrane modules are especially suitable for indoor or subterranean installations where extra lifting height means more capital cost.

Membranes are easily replaced thanks to the QuickSwap™ technology. With all of the membranes in a module mounted in packs, an entire pack can be replaced in one operation,

instead of having to replace each membrane element individually.

#### **Membranes made for wastewater applications**

The membranes are the key part of a MBR wastewater treatment plant. We develop and manufacture all membranes used in our MBR modules ourselves to ensure the highest quality and best durability. The membranes are made of chlorine resistant PVDF and have been specifically optimized for use in wastewater applications.

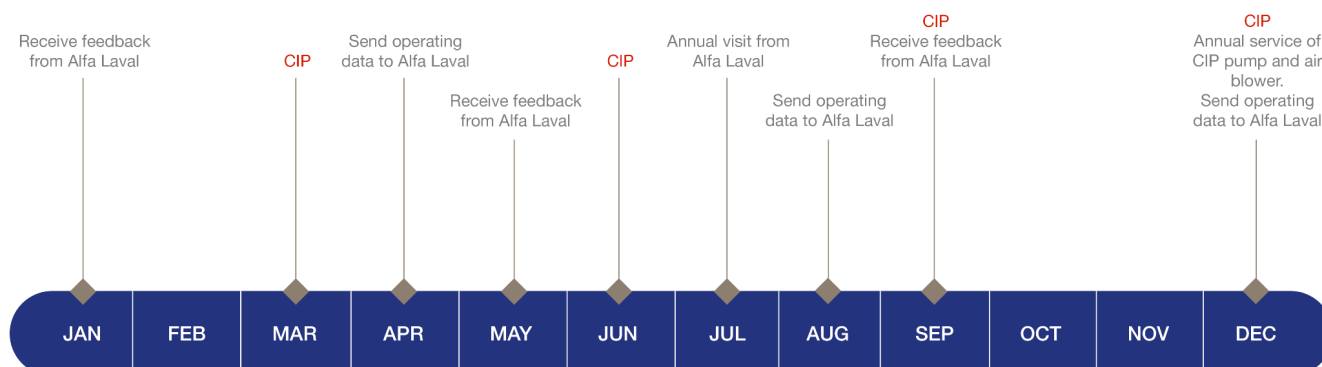
The membranes provide an absolute barrier to bacteria, microplastics and several other pollutants, and the treated water is guaranteed to contain less than 3 mg suspended solids per litre – ideal feed water for subsequent NF or RO treatment and recycling.

Alfa Laval MBR membranes come in a range of sizes, from the MFM 080 to the MFM 320, ensuring that there is always an Alfa Laval MBR membrane module that can fit your wastewater treatment plant.



## MBR membranes with minimal maintenance requirements

Alfa Laval's MBR membrane modules have the lowest maintenance requirements on the market, both in terms of cleaning and equipment service. A typical year in the life of an Alfa Laval MBR membrane with an Alfa Laval Performance Agreement is illustrated below.



## From MBR design calculations to continuous optimization

We are happy to support you at every step of the process, from the initial design stage throughout the entire lifetime of your plant. With over 250 references worldwide, we have the experienced team to help you reach your wastewater treatment goals. Entering a Performance Agreement with Alfa Laval gives you full peace of mind and guaranteed performance. Alfa Laval's team of MBR experts ensures that you get the best operating experience, based on Alfa Laval's strong knowledge. With Alfa Laval as your service partner, help is always close at hand. We have service personnel in close to 100 countries, ready to assist you in your local language. And our efficient logistics chain makes sure you get any required spare parts as quickly as possible.

## Alfa Laval MBR Membrane technical details

Alfa Laval MBR membrane modules are available in the following standard sizes:

### Standard sizes

| Module designation:             | MFM 080    | MFM 120    | MFM 160   | MFM 200   | MFM 240   | MFM 320   |
|---------------------------------|------------|------------|-----------|-----------|-----------|-----------|
| <b>Membrane area:</b>           |            |            |           |           |           |           |
| m <sup>2</sup>                  | 129        | 193        | 257       | 322       | 386       | 515       |
| ft <sup>2</sup>                 | 1,389      | 2,077      | 2,766     | 3,466     | 4,155     | 5,544     |
| <b>Water depth requirement:</b> |            |            |           |           |           |           |
| By gravity (m/inch)             | 2.4 / 94.4 | 2.8 / 110  | 3.2 / 126 | 3.7 / 146 | 4.1 / 162 | 5.0 / 197 |
| By pump (m/inch)                | 1.75 / 69  | 2.4 / 94.5 | 2.8 / 110 | 3.2 / 126 | 3.6 / 142 | 4.4 / 173 |

### Standard sizes L

| Module designation:             | MFM 080-L  | MFM 120-L  | MFM 160-L | MFM 200-L | MFM 240-L | MFM 320-L |
|---------------------------------|------------|------------|-----------|-----------|-----------|-----------|
| <b>Membrane area:</b>           |            |            |           |           |           |           |
| m <sup>2</sup>                  | 147        | 220        | 294       | 367       | 440       | 587       |
| ft <sup>2</sup>                 | 1,582      | 2,368      | 3,165     | 3,950     | 4,736     | 6,318     |
| <b>Water depth requirement:</b> |            |            |           |           |           |           |
| By gravity (mm/inch)            | 2.4 / 94.5 | 2.8 / 110  | 3.2 / 126 | 3.7 / 146 | 4.1 / 161 | 5.0 / 197 |
| By pump (mm/inch)               | 1.8 / 70.9 | 2.4 / 94.5 | 2.8 / 110 | 3.2 / 126 | 3.6 / 142 | 4.4 / 173 |

## MBR membrane module and operating data

|                              |                                       |
|------------------------------|---------------------------------------|
| Membrane type                | MFP1 / MFP2                           |
| Membrane pore size           | 0.1 / 0.2 µm                          |
| Typical TMP during operation | 0.01 — 0.084 bar / 0.15 — 1.16 psig   |
| Typical net flux range       | 10 — 30 LMH / 6 — 18 GFD <sup>1</sup> |
| Maximum temperature          | 50°C / 122° F                         |
| pH range                     | 1 — 11                                |

<sup>1</sup> Depending on actual wastewater conditions and composition

## MBR membrane module materials data

|                                    |                                |
|------------------------------------|--------------------------------|
| Module frame                       | AISI 316 stainless steel       |
| Permeate and aerator piping        | AISI 316 stainless steel       |
| Membrane element and spacer        | Polypropylene (PP)             |
| Membrane                           | Polyvinylidene fluoride (PVDF) |
| Aerator type                       | Coarse bubble diffuser         |
| Aerator material                   | AISI 316 stainless steel       |
| Connection at air inlet and outlet | DN 50 / 2 inch BSP/NPT         |
| Connection at permeate outlet      | OD 75 mm / OD 3"               |

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