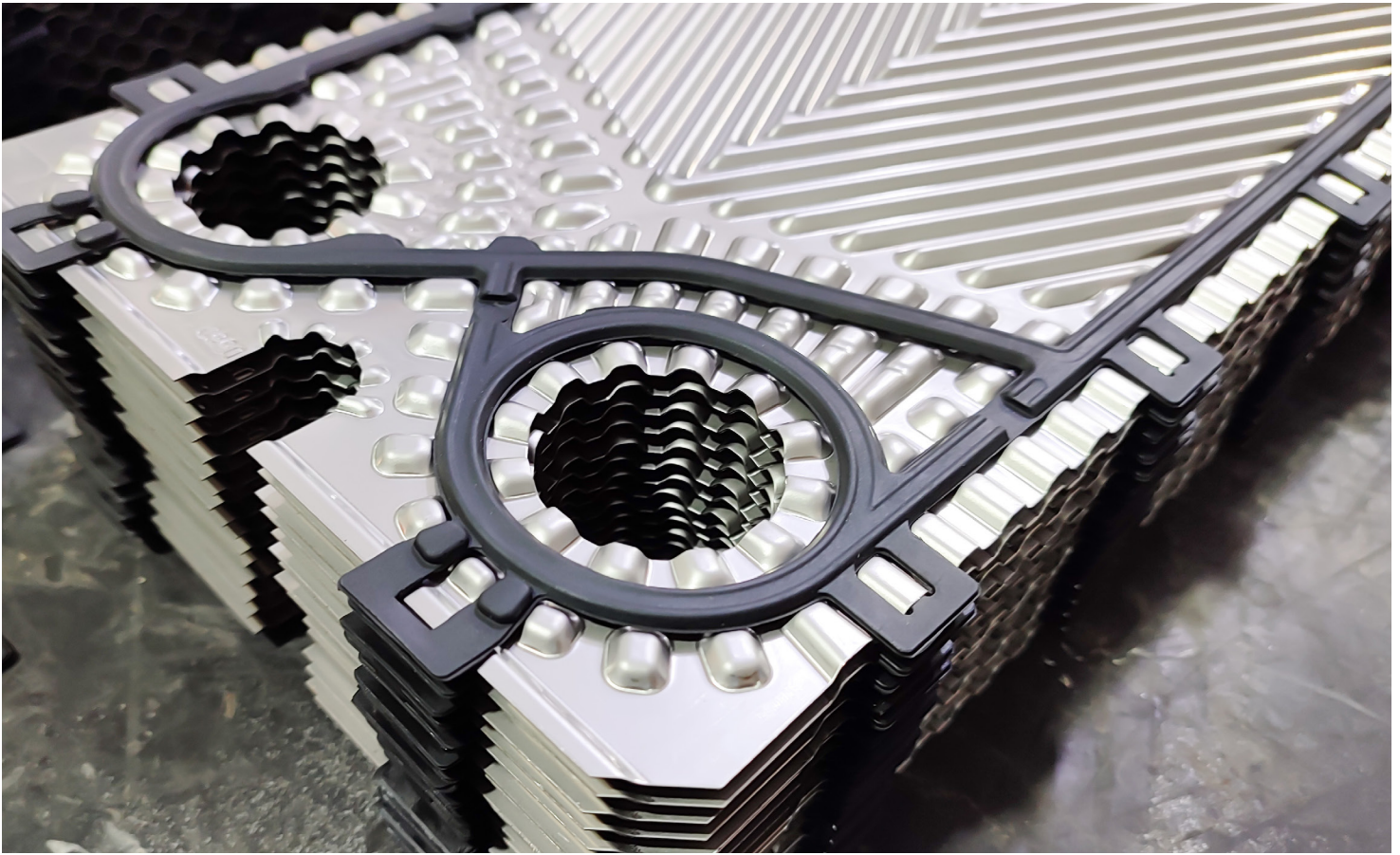


# Maintenance Manager Handbook



Your guide to getting more out  
of your plate heat exchangers.



# No matter the brand, avoid surprises with the right plate heat exchanger service partner.

If you're a plant or facility maintenance manager, your job encompasses much more than planning and scheduling maintenance. In today's economic environment, you might be challenged to do more with less as workloads continue to increase. Or you might be dealing with labour and resource shortages, pressures to cut costs or a requirement to find energy savings.

While scheduled maintenance is accounted for in the annual budget, unplanned downtime—when something unexpectedly breaks or stops functioning properly—can be costly.

It's estimated that unplanned downtime costs industrial manufacturers about \$50 billion each year, while reducing productive capacity by five to 20 percent. Aside from costs related to labour and overtime, there are also indirect costs such as lost production.

These days there's an increased focus on preventive maintenance rather than a reactive, run-to-fail approach. Facility maintenance managers are tasked with finding the right balance between spending enough to prevent breakdowns and spending too much of the budget. Finding that sweet spot can bring costs under control

and improve the return on investment of equipment and assets.

Regular maintenance of your plate heat exchangers, for example, can ensure your equipment is operating at optimal levels—and the cost of regular maintenance is often significantly less than the cost of emergency maintenance, downtime and/or lost production during an unscheduled shutdown. Working with a service partner ensures preventive maintenance is done regularly and only when it's actually needed.

As your service partner, Alfa Laval looks at the benefits of preventive maintenance for plate heat exchangers, how you can maintain peak performance to realize those benefits and how to deal with multiple brands from multiple suppliers that need to be serviced.



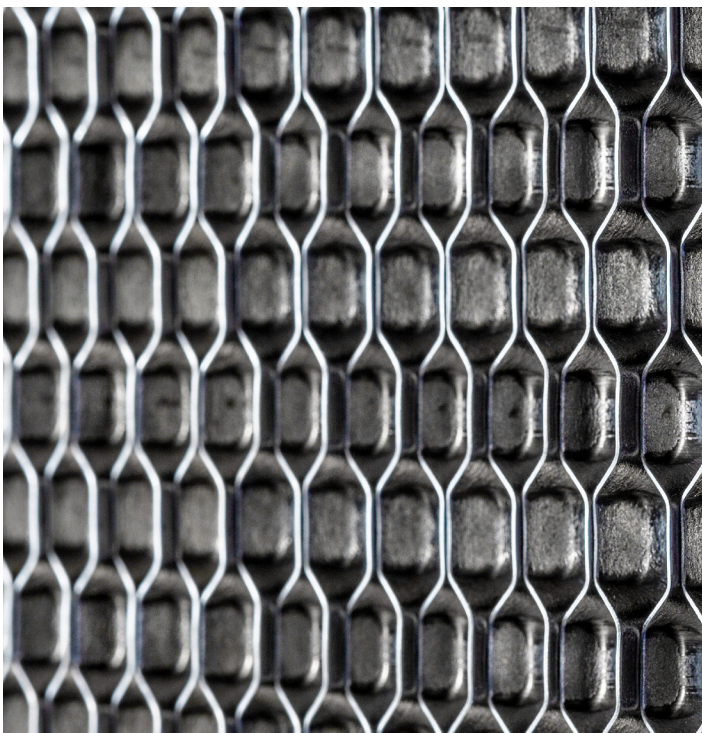
# Benefits of preventative maintenance

A gasketed plate heat exchanger is a stationary piece of equipment without any moving parts, but it still requires routine maintenance to optimize performance—just like any other critical piece of process equipment in your production facility.

Two common maintenance issues with heat exchangers are gaskets that have reached beyond their optimal lifetime (which can cause external leakage) and deposits such as scaling and fouling (which can lower heat transfer efficiency and eventually clog the channels). A poorly functioning heat exchanger could affect process quality, energy costs and sustainability. In addition, failure could lead to costly downtime and production losses. With regular and proactive maintenance, your heat exchangers can be kept in optimal condition, which in turn will lower your maintenance costs and extend the lifetime of your equipment. By saving energy, you can lower your operating costs and your carbon footprint.

## Regularly cleaning your plate heat exchangers helps to:

- Keep your process equipment in optimal condition
- Minimize planned and unplanned downtime
- Maintain optimal performance of your plate heat exchanger
- Minimize energy consumption to reduce your carbon footprint



# Maintaining peak performance

To realize these benefits, it's important to have and follow a regular maintenance schedule. Cleaning, reconditioning and/or repairing your heat exchangers will ensure less downtime and disruption to your operations. Regular maintenance can also bring your equipment back to its original performance, ensuring that it's as reliable as the original manufacturer's specifications.

## Your maintenance schedule should include:



### Cleaning-In-Place (CIP)

Systems and cleaning agents are specially designed and formulated to remove deposit build-up from heat exchangers. To ensure the safe removal of unwanted contaminants from equipment surfaces, use non-toxic cleaning agents with a low environmental impact that have been thoroughly tested to safeguard gasket and heat exchange materials.



### Reconditioning

Refers to services performed to the plates inside the gasketed plate heat exchanger, which involves removing the gaskets and scaling with specialized tools and chemicals. This prevents corrosion and creates an ideal surface for re-gasketing without having to handle chemicals or waste. Reconditioning ensures your equipment continues to deliver high efficiency and optimal performance.



### Repair

Refers to services performed to the plate heat exchanger frame, which could include inspection, refurbishment and replacement of connection linings, bolts or other frame parts, as well as plates and gaskets.

# Time for maintenance?

All heat exchangers lose performance over time and full reconditioning is necessary at a certain point. Even if your heat exchanger allows for Cleaning-in-Place, it's still recommended to send your units for reconditioning on a regular basis to reset their status to an 'as-good-as-new' condition.



## How do you know if your heat exchangers need servicing? Look for these signs:

- A decrease in performance
- External or internal leakages
- Disturbances in the process
- Need for increased capacity
- High energy consumption
- Unexplainable deviations from temperature or operation requirements



## You should also consider reconditioning your plate heat exchangers:

- When high thermal performance is vital to the process
- For the highest level of reliability to prolong the heat exchanger lifetime
- To restore performance should fouling, corrosion or leakage occurs

As a best practice, organizations often conduct a planned plant shutdown to inspect, repair and replace their equipment where needed. As part of this shutdown, heat exchangers should be inspected and reconditioned.

Waiting for visible signs of disrepair before servicing your heat exchanger could result in decreased efficiency, increased energy losses and even unplanned shutdowns. On the other hand, if you clean your heat exchangers too often, you could end up increasing downtime and lowering productivity, so it's important to find the right balance.

A professional performance audit can help to evaluate the condition of your heat exchangers and whether they're performing to design specifications. It can also help to identify areas where performance can be improved and predict optimal cleaning intervals. For example, if you're using intermediate cleaning services, it's possible to prolong the intervals between cleaning and reconditioning.



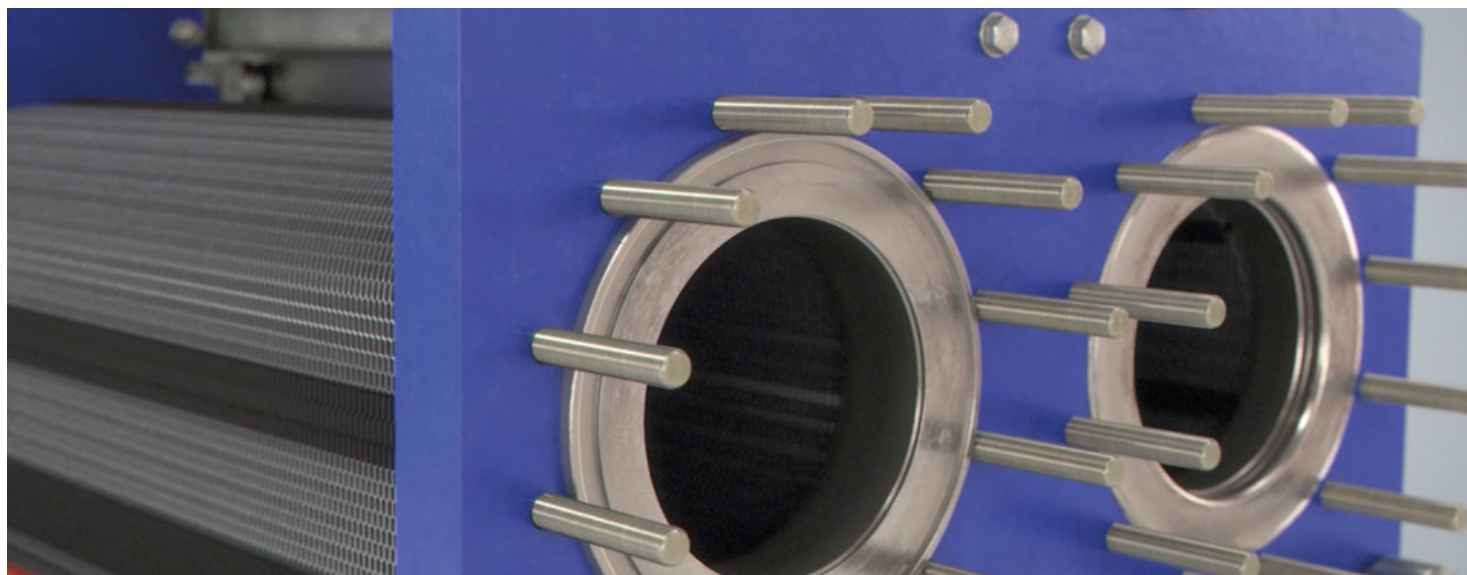


# Multi-suppliers can mean multi-problems

Many plants use multiple heat exchangers from multiple suppliers. This means you'll require different replacement parts—some of which may have a long lead time to procure—and you'll need to contract multiple suppliers for servicing. If you have custom equipment, this can become even more challenging.

While most heat exchanger manufacturers can service their own brand, they may not have the expertise or replacement parts to service other brands. That may lead you to source parts from less qualified suppliers, or even to take a 'do-it-yourself' approach. While this may solve an immediate problem, it could lead to bigger problems down the road—especially if you're using lower-quality replacement parts.

Without the right knowledge across brands, small defects could be missed, and reconditioning with the wrong tools or parts could seriously damage your heat exchangers. For example, chemical cleaning requires the right concentration, temperature and cleaning time; otherwise, the plates and gaskets could be damaged. That's why it's important to find a trusted service partner that can handle all of your needs.



## One partner to service them all

Having one partner that can service any brand and serve as a one-stop shop for reconditioning makes it easier, safer and often more cost-effective to service your heat exchangers. For example, while Alfa Laval produces a wide range of branded heat exchangers, we can also service any brand, including AGC, API Schmidt-Bretten, Bell & Gossett, Funke, Hisaka, ITT, Kapp, Kelvion, LHE, Reheat, Sondex, SPX, Swep, Tranter, WCR and Xylem.

We've been developing plate heat exchanger technology for 90 years, so we've gained a wealth of experience along the way. Today, we have an expansive portfolio of products and replacement parts, and we can recondition all brands of heat exchangers—and, in many cases, improve the performance of non-Alfa Laval heat exchangers by replacing original components with Alfa Laval components and reconditioning processes.

You can also take advantage of our proprietary [GPredict tool](#), which provides precise calculations based on your specific equipment and relevant application details, including temperature, gasket material, whether you use glued or non-glued gaskets and how often you open your unit in the course of annual operation. With GPredict, you'll know well in advance when it's time for regasketing. We can also work with you to integrate our services into a [Service Agreement](#) for predictable and worry-free operations.

# Get a head start with Alfa Laval All-Brands Service

Heat exchanger maintenance intervals vary widely, depending on factors such as media, temperature and pressure. That's why it's important to assess the performance of your gasketed plate heat exchanger to come up with an optimal cleaning and reconditioning schedule.

## Making the switch

With decades of experience, industry-leading technologies and a knowledgeable team of experts, we can serve as a trusted advisor and one-stop shop for servicing all brands of gasketed plate heat exchangers. Our extensive process and application experience comes from working with major companies, contractors, licensors and research institutes around the globe—ensuring you'll get the most out of your heat exchangers throughout their lifetime.

With a local network of plate heat exchanger service centres in Canada, more than 20 factory-trained field technicians, service representatives and authorized service partners, as well as a centrally located distribution centre, Alfa Laval has your parts and service needs covered. We provide local service and support 24 hours a day, 7 days a week, 365 days a year for our complete range of Alfa Laval products.

Our dedicated service network supports you with parts and expertise, wherever you are, whenever you need it. By ensuring greater uptime, availability and optimization of your heat exchangers, we help bring you peace of mind and maximize your return on investment.

To speak to one of our heat exchanger experts or schedule a [Condition Audit](#) or a [Performance Audit](#).

Contact Us

### Here's a glimpse into the process that we take at Alfa Laval:



#### Visual condition assessment

An assessment provides a quick overview of the state of your gasketed plate heat exchangers. You'll gain insights into the condition of your equipment and its detailed mechanical condition, need of repair and predicted remaining gasket lifetime. Using a thermal imaging camera, we're able to evaluate thermal performance and make recommendations based on our findings and analysis to maintain your heat exchangers in top operating condition.



#### Pre-cleaning inspection

Upon arrival at one of our service centres, your heat exchanger plates will be examined for major corrosion, erosion and deformities. Our technicians will then determine whether the plates should be reconditioned or replaced.



#### Gasket removal

We use an efficient, yet gentle, method to remove the gaskets using liquid nitrogen, which completely removes the gasket while leaving the groove intact, preventing plate damage. This contrasts with some field methods of removing gaskets, such as the use of propane torches or rotating wire brushes, which can severely harm the plates.



#### Chemical cleaning

Chemical tanks that are heated and agitated provide a superior plate cleaning process compared to water blasting and/or hand scrubbing with SS brushes typically used in the field. Plates are immersed in specially formulated chemical baths, where the concentration and temperature are carefully regulated for the gentle removal of deposits.



#### Crack and deformity detection

Each plate is sprayed with dye and then carefully inspected under ultraviolet light to find even the smallest defects, including cracks and pinholes. This is critical to ensure the regasketed plates are reusable, yet this process is rarely done in the field.



#### Regasketing

Our gaskets are bonded to the plates using a two-part epoxy glue, placed in a curing skid and baked in the oven for three to five hours under compression. This epoxy is far superior to the rubber-based contact cement used in field regasketing.



#### Final inspection

A final inspection ensures the gaskets are properly positioned on the plates and arranged in the proper plate pack in order to minimize field installation time. As part of this process, you'll receive a detailed heat exchanger service report, including the procedure documentation and recommendations based on your results.