



## Cutting-edge solutions

Cleaning, heating and cooling of service fluids in the metalworking industry



# Keep your operation at the cutting edge

Not everyone in the metalworking industry is aware of two important facts.

Firstly, correct temperature control and efficient cleaning of service fluids can have a huge impact on plant profitability.

Secondly, when it comes to service fluids for metalworking, Alfa Laval has extensive process know-how that will save you money.

Efficient service fluid management pays! Clean water-based and oil-based service fluids by high-speed centrifugal separation and use heat exchangers to maintain correct fluid temperatures. As well as significant environmental benefits, you will get maximum uptime, lower operating costs, higher end-product quality and long service life for your tools and fluids.

Alfa Laval has the cutting-edge solutions you need for service fluid cleaning, heating and cooling at all processing stations throughout your plant.

*Stay at the cutting edge!*









# Our cutting-edge solutions will cut your costs

Your metalworking operation may not include every process mentioned below. But all your processes involve water-based or oil-based service fluids. Their operating temperatures must be precisely controlled and they must be

cleaned efficiently. And that is where we come in.

Combining our extensive know-how in the metalworking field with our core technologies, high-speed centrifugal separation and heat transfer technology,

we have developed cutting-edge solutions that enable you to clean, heat and cool your service fluids efficiently, cutting your operating costs and increasing your profit margin.



## RAW MATERIAL

Raw material enters the process as sheets, coils, bars, rods, etc.



## MACHINING 1

**Typical processes:** Cutting, forming, pressing, drawing

**Service fluids:** Water-based coolants, straight/neat oil, pressing/rolling oil/emulsion, etc.

**Customer reference:** Speedline Italy. Alloy wheel manufacturing plant

**Requirement:** Cleaning of water-based coolant, two tanks 20 m<sup>3</sup> and 24 m<sup>3</sup>, respectively

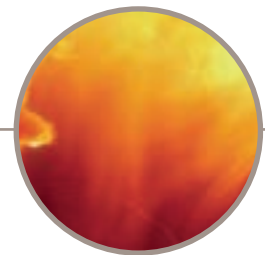
**Alfa Laval solution:** High-speed separation cleaning modules

**Situation prior to installation:**

- Tramp oil in coolant
- Accumulation of small particles

**Situation following installation:**

- Tramp oil level reduced
- Particles down to 2 µm removed
- Higher productivity
- Improved working environment



## HEAT TREATMENT

**Typical processes:** Quenching

**Service fluid:** Oil, process water

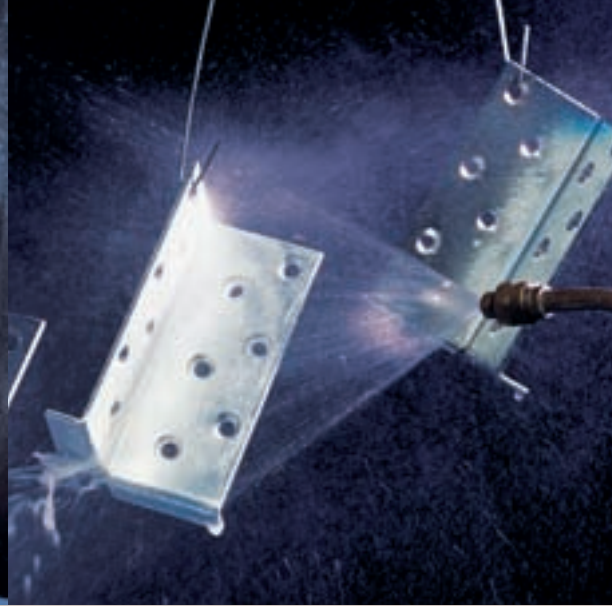
**Customer reference:** GKN, Italy. Design and production of driveline components

**Requirement:** Safe, efficient quenching of steel components during production

**Alfa Laval solution:** M6MD double-wall plate heat exchanger, with seal material AISI 316/NBR

**Situation following installation:**

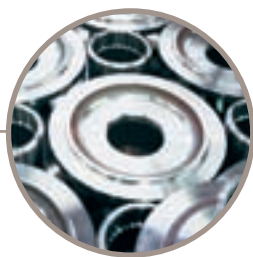
- Double wall and efficient seals ensure no leakage between water side and quench oil side, thus no risk of steam explosion
- High-turbulence plate pattern eliminates potential clogging due to steel flakes or particles forming a suspension with the quench oil



# and increase quality at every stage

## Alfa Laval supplies solutions for:

- Anodizing
- Chromium plating
- Compressor oil
- Coolants
- Copper plating
- Cutting oil
- Degreasing
- Honing oil
- Hydraulic oil
- Lapping oil
- Lubrication oil
- Nickel plating
- Paint waste
- Passivating
- Phosphatising
- Pickling
- Process water
- Quench oil
- Rolling oil
- Sintering oil
- Test bed oil
- Wash liquid
- Zinc plating etc.



### MACHINING 2

**Typical processes:** Cutting, grinding, honing, milling, drilling

**Service fluids:** Water-based coolants, straight/heat oil, etc.

**Customer reference:** Ford, France. Transmission plant

**Requirement:** Cleaning of water-based coolant, two tanks 150 m<sup>3</sup> and 110 m<sup>3</sup>, respectively  
**Alfa Laval solution:** High-speed separation cleaning modules

**Situation prior to installation:**

- 4-5% tramp oil in coolant
- Tramp oil reduced to <0.3%
- Particles down to 2 µm removed
- Lower tool wear
- Longer life-time of coolant
- Higher product quality
- Short payback time



### WASHING/DEGREASING

**Typical processes:** Washing and degreasing before surface treatment or painting

**Service fluids:** Water-based wash liquids

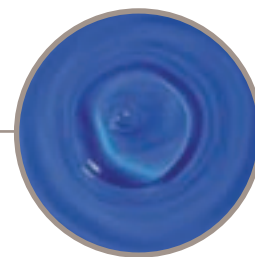
**Customer reference:** Francaise de Mecanique, France. Engine manufacturing plant

**Requirement:** Cleaning of wash liquid, 165 m<sup>3</sup>  
**Alfa Laval solution:** High-speed separation cleaning module

**Situation prior to installation:**

- 1% free oil in wash liquid and coolant
- Free oil reduced to 0.3%
- Particles >5 µm removed
- Payback time 24 months

**Situation following installation:**



### SURFACE TREATMENT AND PAINTING

**Typical processes:** Painting, metal plating, anodising, phosphatising

**Service fluids:** Water curtain, chemical treatment, electrolytic bath, etc.

**Customer reference:** Surface coating of motor vehicles and other products in Austria, Belgium, Brazil, Germany, Portugal and Spain.

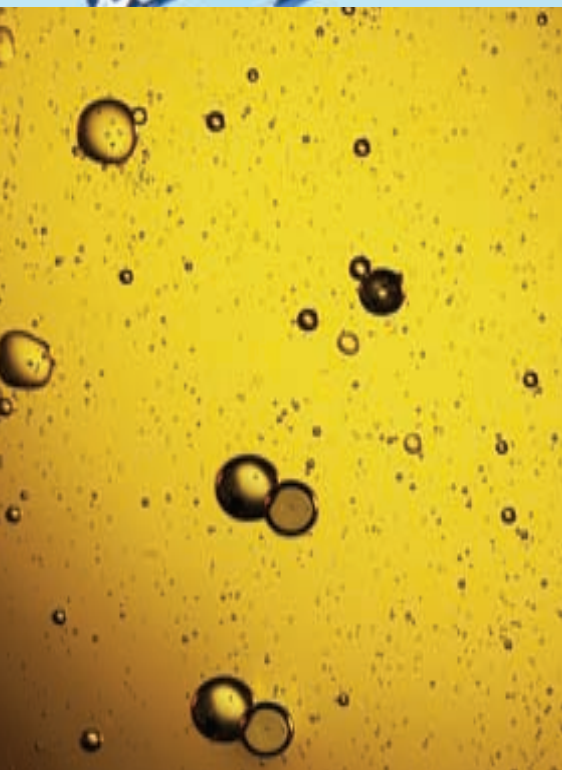
**Requirement:** Cleaning of paint waste  
**Alfa Laval solution:** Decanters

**Situation prior to installation:**

- Heavy waste disposal costs
- Time-consuming cleaning of painting booths
- Water can be recirculated
- Paint waste disposal costs dramatically reduced
- Fast payback on investment

**Situation following installation:**





## Choose the right technology for

Whatever the metalworking process, whatever the service fluid, water-based or oil-based, accurate temperature control and efficient cleaning are essential to ensure end-product quality. Efficient cleaning of service fluids will reduce your operating costs as well. Alfa Laval has the cutting-edge solutions you need – state-of-the-art heat exchangers for heating and cooling, high-speed centrifugal separation systems and decanters for cleaning service fluids.

### Heating and cooling of service fluids

Alfa Laval offers a complete range of heat transfer solutions, comprising gasketed, copper brazed, welded and fusion-bonded plate heat exchangers, and spiral heat exchangers, for accurate process temperature control in the metalworking industry. Plate heat exchangers offer major advantages over more traditional technology.

#### **Accurate temperature control for sensitive processes**

An Alfa Laval plate heat exchanger offers up to five times greater heat transfer efficiency than a comparable shell-and-tube unit.

The patented plates in an Alfa Laval plate heat exchanger are the result of decades of ongoing R&D in the fields of thermal dynamics and heat transfer technology. The special plate pattern creates a high level of turbulence which, in combination with the low

hold-up volume, ensures high heat transfer values. This, in turn, gives you the accurate temperature control you need for sensitive processes.

#### **Space saving and energy efficient**

With its compact design, an Alfa Laval plate heat exchanger requires 20-50% less space in your metalworking plant than a comparable shell-and-tube installation. Since it requires up to 80% less cooling media, you use smaller pumps and consume less energy.

#### **Low maintenance requirements**

The patented design of Alfa Laval plate heat exchangers effectively reduces fouling. When cleaning is needed, gasketed plate heat exchangers can easily be opened, giving access to the plate surfaces. All types of Alfa Laval plate heat exchangers can be cleaned using our specially designed Cleaning-in-Place equipment.



# heating, cooling and cleaning of service fluids

## Cleaning of service fluids

How do you clean your service fluids? Skimmers, filters, lamella separators, coalescers? Perhaps you use ultra filtration – all these methods have their disadvantages. They are either inefficient or they generate high operating costs. Cleaning by high-speed centrifugal separation, using separators or decanters, is not only highly efficient, it will reduce your operating costs as well!

### Less tool wear, improved end-product quality

Since cleaning by centrifugal separation is highly efficient, removing water, abrasive metal fines and other particles as small as 2  $\mu\text{m}$ , your machine tools give much longer service before wearing out. This means considerably lower tool replacement costs. Reduced tool wear also results in more precise machining and, fewer rejects.

### Increased uptime in your plant

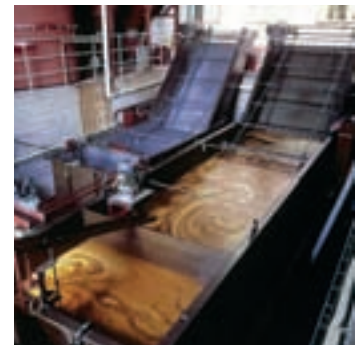
Clean service fluids mean longer production runs without tool changes. Also, fewer breakdowns due to solid particles clogging pumps and other equipment. Since Alfa Laval separators are normally installed in a bypass system, other benefits include more efficient utilisation of machine tools and fewer stops for tank cleaning.

### It benefits your workforce and the environment

Efficient cleaning and recycling of coolants, wash liquids and oils with an Alfa Laval cleaning system inhibits growth of micro-organisms in the service fluids. This ensures cleaner, healthier working conditions in your plant. It also reduces the impact of plant operation on the external environment.

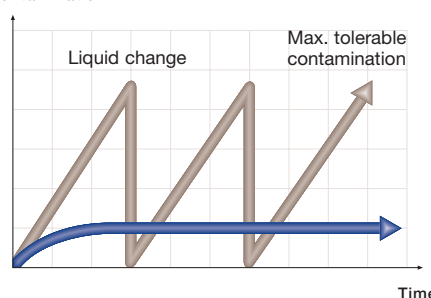
### Fast payback

In a nutshell, having clean service fluids all the time means lower purchasing and disposal costs for fluids, more production uptime, and reduced wear and corrosion on the equipment served. The payback time for an Alfa Laval separation system is therefore surprisingly short, often less than one year.



Tramp oil floating on the surface of coolant.

Contamination



■ Without cleaning  
■ Continuous separator cleaning





# State-of-the-art heating, cooling and cleaning



Plate Heat Exchanger, PHE

## Heat exchangers

Alfa Laval heat exchangers come in a variety of materials, sizes and capacities, from the smallest brazed unit to the largest gasketed and welded units, or the new AlfaNova plate heat exchanger. Whatever your application, Alfa Laval has the right heat exchanger for your specific heating needs.



Brazed Heat Exchanger, BHE



AlfaNova

### Plate Heat Exchangers, PHE

In terms of capacity, Alfa Laval gasketed plate heat exchangers, PHEs, take over where the compact brazed heat exchanger ranges stop. Easy to clean and requiring very little maintenance, Alfa Laval PHEs can be supplied with corrosion-resistant titanium plates for use with aggressive media.

*Suitable for most duties*

### AlfaNova

AlfaNova is a new type of plate heat exchanger constructed of 100% stainless steel using AlfaFusion, a unique bonding technology that provides high temperature resistance (up to 550°C) and an exceptional level of hygiene. Copper-free, AlfaNova offers unmatched corrosion resistance. Risk of corrosion caused by elevated levels of chloride and sulphate in the cooling water is eliminated.

*Suitable for applications with high demands on cleanliness, that use ammonia, or where copper or nickel contamination is unacceptable.*



Spiral Heat Exchanger, SHE

### Brazed Heat Exchangers, BHE

Alfa Laval brazed heat exchangers are designed to handle pressures from full vacuum to 30 bar and temperatures from -160°C to +400°C.

*Suitable for most duties*

### Air Heat Exchangers, AHE

The AlfaBlue series is a wide range of heavy-duty dry coolers for cooling of various process liquids. Dry coolers are fitted with copper or stainless steel tubes, aluminum fins and axial fans. With a wide range of sound pressure alternatives, these units are particularly suited to demanding, noise sensitive environments. AlfaBlue dry coolers are available for both horizontal and vertical air flow, either in single or dual coil execution.

*Suitable for closed circuit cooling when there is limited cooling water supply.*



Air Heat Exchanger, AHE

### Spiral Heat Exchangers, SHE

Spiral heat exchangers are highly effective in handling sludge, liquids with solids or fibres in suspension, including slurries, and a wide range of viscous fluids.

*Suitable for duties with dirty fluids*





# solutions from the technology leader



AlfaPure Cleaning Modules



Emmie and Alfie Mobile Separation System



Decanter

## Centrifugal cleaning modules and systems

Alfa Laval centrifugal separation systems come in a wide range of sizes and capacities. Small separation systems that can be integrated into your production line, compact, trolley mounted separators that can be wheeled around your plant, large module-mounted separation systems – whatever you need, we have it.

### AlfaPure Cleaning Modules

AlfaPure is a range of advanced mobile modules for cleaning water or oil-based fluids. Each module is a complete system that includes a separator and utility equipment. Innovative designs ensure highest separation efficiency. The equipment is easy to operate with minimum space and service requirements.

*Applications: Cleaning of coolants, wash liquid, straight/neat oil, hydraulic/quench/lubrication/compressor/test bed oil, or oily water.*

### Alfie 500 Mobile Separation System

Alfie 500 is a complete, compact mobile system, including separator, feed pump and control system. Alfie 500 separates tramp oil from the coolant as well as metal fines and solid particles down to 1  $\mu\text{m}$ . Alfie 200 is designed for permanent mounting on the coolant tank.

*Applications: Cleaning of water-based coolants.*

### Emmie Mobile Separation System

A fully mobile, plug-and-play cleaning system for oils, Emmie removes nearly 99% of all particles in the 2  $\mu\text{m}$ –5  $\mu\text{m}$  range. The system also removes virtually all water, without removing the additives.

*Applications: Cleaning of hydraulic oil, lubrication oil, compressor oil, test bed oil, diesel fuel.*

### Decaners

An efficient solution for dewatering sludge from, for example, painting lines. Decaners reduce waste to a minimum and the water can be re-circulated. Decaners are also suitable for removing sludge from service fluids, prior to cleaning in centrifugal separators, and for various duties in surface treatment applications.

*Applications: Dewatering of paint waste; removal of sludge from liquids in surface treatment and waste coolants/oils.*

### Alfa Laval Parts & Service

- More than 70 service centres worldwide
- Regional spare parts distribution network
- Global inventory management and fast delivery of standard parts
- Wide network of distributors and service partners

**Alfa Laval in brief**

Alfa Laval is a leading global provider of specialized products and engineered solutions.

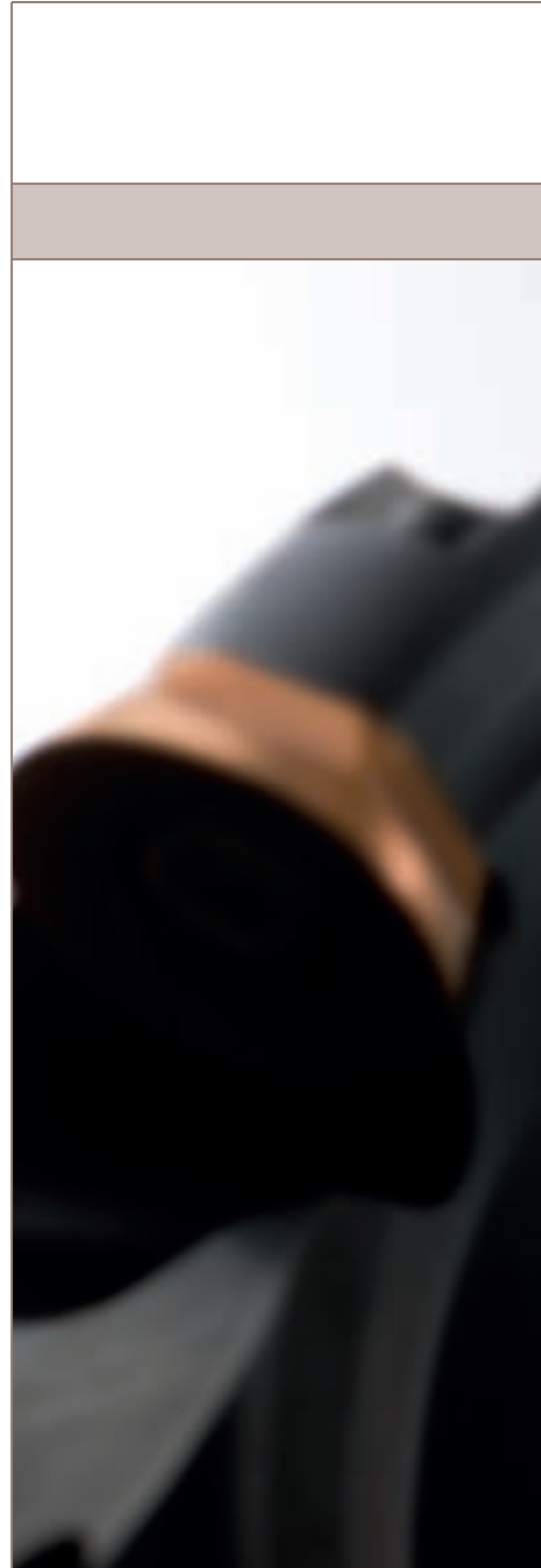
Our equipment, systems and services are dedicated to helping customers to optimize the performance of their processes. Time and time again. We help our customers to heat, cool, separate and transport products such as oil, water, chemicals, beverages, foodstuffs, starch and pharmaceuticals.

Our worldwide organization works closely with customers in almost 100 countries to help them stay ahead.

**How to contact Alfa Laval**

Up-to-date Alfa Laval contact details for all countries are always available on our website at [www.alfalaval.com](http://www.alfalaval.com)

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