

# MAHLE

Industrial Filtration

## CLEAN AIR TO BREATHE DEEPLY

MAHLE LGA SERIES

OIL MIST SEPARATION



# FOR CLEAN AIR AND PERFORMANCE

# SEPARATING OIL

## Applications of the LGA oil mist separators

- Machinery and plant construction, machine tools, precision machines
- Drive technology
- Automotive
- Energy and power plant technology

## We eliminate oil mist

Cooling lubricants (oil or emulsions) are used under high pressure during industrial machining and forming operations—in modern machine tools, for example. As a result, more oil mist and emulsions are released into the air. To ensure that the aerosol level of the maximum workplace concentration (MAK) value is not exceeded, the cooling lubricant mist must be reliably and continually extracted from the work area of the machines and cleaned. Conventional systems frequently struggle with this task.

## Preventing “thick air” and damage

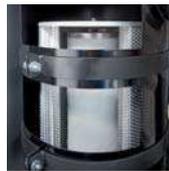
High aerosol concentrations in production may be harmful to the employees' health and result in absences and discomfort. Similarly, damage may be incurred to electronic devices, precision machinery, ventilation systems, and the building structure.

## Promoting a productive working environment: MAHLE LGA series

MAHLE oil mist separator units efficiently protect the employees, resources, and production locations from cooling lubricant mists, thereby contributing to increased productivity. With their highly efficient coalescer principle, they achieve separation rates for non-water-soluble cooling lubricants and cooling lubricant emulsions far below the legally stipulated air quality limit values. The units run reliably and have economical maintenance intervals as well as service lives of up to 2 years, even at very high untreated raw-gas loads. Upgrade your systems to meet future requirements and incorporate modern MAHLE filtration technology in your planning right from the start, to ensure up-to-date occupational health and safety, effective protection of the environment, and greater productivity.



# MORE EFFICIENTLY



**Low-maintenance coalescer filter element with optional prefilter for highly efficient oil mist separation**



**Digital monitoring of the operating parameters**



**Preset control electronics with frequency controller for optimum operating state**



**Energy-efficient and low-noise radial fan for a long service life**



**Integrated silencer for low noise emissions in the installation area**



**For attachment to, installation on, or fitting in the machine tool**



# CLEAN AIR WITH COALESCER FILTER TECHNOLOGY

## **Separation rate over 99% and service life of up to 2 years**

Due to their efficient coalescer filter technology, MAHLE LGA series oil mist separator units achieve fractional collection efficiency rates of

- 99% for particulate diameters of 0.5  $\mu\text{m}$  and
- 100% for particulate diameters greater than 0.7  $\mu\text{m}$ .

Considering their performance and proven service lives of up to two years in multishift operations, the virtually maintenance-free units pay off quickly not only for the working environment and the employees' health, but also for the business operation.

## **Coalescer filter principle for higher performance**

The efficient separation principle of the LGA series is based on coalescence. The oil mist is extracted from the machining area of the machine tool. In the process, cooling lubricant mists build up on the fiber fleece. The microscopically small oil droplets collect in the fiber glass structure—they "coalesce" to form larger droplets or an oil film. These larger droplets are carried by the air stream to the surface of the filter element and are dissipated downward to the housing bottom in a drainage fleece due to gravity. This drainage effect continuously cleans the filter element and allows for an extremely long service life. The cleaned air stream is drawn off with a high-pressure fan and exhausted upward through a silencer. This technology eliminates all worries about critical values such as the "maximum workplace concentration" (MAK value) and "Technical Instructions on Air Quality Control" (TA Luft).

# LOGY

## Closed circuit for oil recirculation – clean and cost-efficient

The filtered oil collects at the bottom of the housing. When a level of 500 mm has been reached, a membrane valve opens and the cooling lubricant is recirculated to the reservoir of the machine tool. A clean and economical process that saves valuable lubricant and costs.

## Ideal for high raw-gas loads

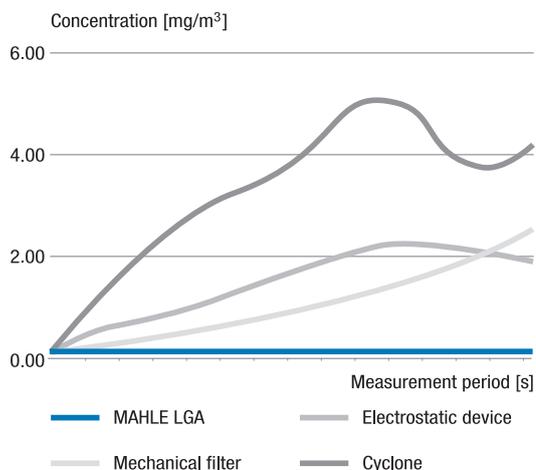
The LGA series proves its superiority at high raw-gas loads of up to 3,000 mg/h and in oil applications (non-water-soluble coolants). Conventional technology – e.g., cyclones or electrostatic filters – typically struggles with this task and require enormous cleaning and maintenance requirements.

## Prefilter system optimizes retention and service life

A prefilter element can be integrated in the coalescer filter (LGA series FUW) to achieve even better filtration performance and a longer service life.

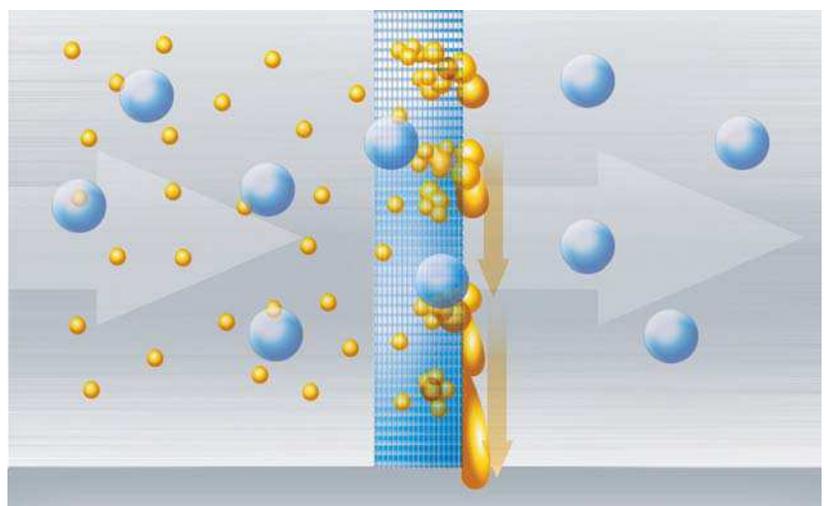
## Fast, easy replacement of filter elements

The coalescer filters of the LGA series are virtually maintenance-free. The filter elements are fast and easy to replace – ensuring maximum availability.



*Low emissions values substantiate the consistently high retention efficiency of the MAHLE LGA series (in comparison with conventional separators).*

## Coalescer filter principle



*Higher performance, longer service life, and lower maintenance costs thanks to the coalescer filter principle: the oil mist “coalesces” into larger droplets, which are efficiently separated.*

# THREE UNITS FOR EVERY OCCASION JUST THE RIGHT

## **Complete LGA series for every application**

Available in three sizes and different versions, FU (regulation of the constant extraction capacity using frequency control) and FUW (like FU, however with prefilter for aqueous emulsions), the LGA series covers a broad application spectrum with different throughputs ranging up to 3,600 m<sup>3</sup>/h. The optimum nominal operating flow rates are respectively 600, 1,200, and 2,400 m<sup>3</sup>/h.

## **Frequency-controlled regulation for consistent extraction capacity and energy efficiency**

MAHLE's FU and FUW oil mist separator units are driven by a frequency-controlled motor. The frequency-controlled regulator with digital

display ensures energy-efficient operation and a constant volume flow. A flow sensor supplies the actual value and a frequency converter is used to achieve a constant volume flow. If the volume flow falls below the setpoint, the unit outputs an electrical signal. Maintenance procedures can then be implemented in a timely manner based on the evaluation of this signal.

## **Simple assembly and integration**

All connections of the LGA oil mist separators are ready for installation in the existing system – without complex welding and conversion steps. The modular design of the series also allows the direct installation of the main components on and in machining centers.



LGA 600 FUW



LGA 1200 FUW



LGA 2400 FUW

# SOLUTION

## **LGA 600 FUW: The convenience system**

For attachment to and installation on machine tools. Compact and virtually maintenance-free. Equipped with flow sensor and frequency converter for constant volume flow. Optional prefilter system for optimized service life.

- Volume flow: max. 1,440 m<sup>3</sup>/h
- Operating volume flow: 600 m<sup>3</sup>/h
- Dimensions (LxWxH): 930x555x875 mm
- Sound level (at 1 m distance): < 69 dB (A)

## **LGA 1200 FUW: Convenience and higher performance**

For attachment to and installation on machine tools. Compact and virtually maintenance-free. Equipped with flow sensor and frequency converter for constant volume flow. Optional prefilter system for optimized service life.

- Volume flow: max. 2,150 m<sup>3</sup>/h
- Operating volume flow: 1,200 m<sup>3</sup>/h
- Dimensions (LxWxH): 1,155x640x1,040 mm
- Sound level (at 1 m distance): < 72 dB (A)

## **LGA 2400 FUW: Central or stand-alone solution – with booster function**

The central stationary unit is located next to several machine tools. Virtually maintenance-free, with high-pressure fan, and (optional) booster operation for short-term, fast extraction during workpiece changeovers. Equipped with flow sensor and frequency converter for constant volume flow. Optional prefilter system for optimized service life.

- Volume flow: max. 3,650 m<sup>3</sup>/h
- Operating volume flow: 2,400 m<sup>3</sup>/h
- Dimensions (LxWxH): 1,600x1,175x1,850 mm
- Sound level (at 1 m distance): < 79 dB (A)

## **Base unit can be integrated in machine tool**

The principle of the coalescer filter consists in filter element – fan – frequency controller – system monitoring for optimized extraction efficiency. If the unit cannot be added due to limited space, it is possible to integrate the base system/frame in the machine tool – depending on the space conditions. Customized solutions are part of the MAHLE range of services. Talk to us.

## **Consulting, service, and modern metrology**

We are your one-stop source for the optimal solution to your requirements. Benefit from our global systems expertise – from consulting, to condition monitoring of your production using state-of-the-art metrology (scattered light photometers or isokinetic sampling system), to on-site service. This will ensure high availability and reliability of your production systems.



*Coalescer filter*



*Prefilter*

# MAHLE

*Industrial Filtration*

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