

# The importance of oil and water separators for air compressors

Air compression systems play a key role in many industrial production cycles. While they are highly beneficial to the manufacturing industry, poorly maintained air compressors can be damaged by the build-up of contaminants during production activities. An oil-water separator will effectively optimise the compressed air system while maintaining compliance with environmental industrial waste disposal regulations.

What is an oil-water separator?

An oil-water separator is a device used to eliminate waste oil generated during industrial production activities. Sometimes referred to as a condensate separator, this device helps to separate oil and other lubricants from the condensate that forms during industrial-scale air compression. This enables operators to discharge oil-free water, allowing them to comply with municipal wastewater treatment regulations.

How does the oil-water separator work?

An air compressor oil and water separator is very simple to set up, requiring only a single manifold connection between it and the source of condensate. The water produced during air compression activities is usually collected in the following components

Aftercooler

Air drying system

Receiving tank

Air filter

Condensate collector

Once the water has been introduced into the separator from the different sources, the filtration process can begin.

Components of an oil and water separator

The main components of an industrial oil and water separation unit are.

Connection channels

Cyclone decompression chamber

Filter cartridges

Activated carbon system

Outlet drainage unit

Oil and water separation processes for air compressors

Oil-water separators for industrial air compression systems usually combine adsorption and absorption processes to remove oil from the waste water. The main steps of the filtration process are outlined below.

Condensate is conveyed through channels connecting the air compressor and separator to the cyclone decompression chamber, where any accompanying air is discharged. This provides power to the oil-water mixture and makes the filtration process more efficient.

The liquid mixture is allowed to drain by gravity onto a filter cartridge made of polypropylene fibres. This constitutes the suction phase of the separation, as most of the oil is retained in the fibres of the filter.

The largely oil-free water is then exposed to the activated carbon material, which eliminates any residual oil by adsorption. Activated carbon filters are made up of micro-pores with oleophilic walls that retain the oil and lubricants that pass through them.

Once the water has left the carbon filter, it can be safely discharged or reused in the appropriate process.

#### Benefits of oil and water separation systems for air compressors

From a legal, environmental and economic point of view, there are many benefits to the treatment of condensate generated in industrial production activities. The following outlines the main benefits of using oil and water separators in air compression systems.

#### Compliance with environmental protection regulations

Oil and waste water can have a significant negative impact on the environment, with soil and water contamination being the main issues. The use of efficient oil and water filtration systems enables air compressor operators to prevent environmental pollution. This also enables them to comply with environmental protection regulations in the regions where their industry is located.

#### Recycling of oil and water

From an economic point of view, resource conservation and reuse can save companies high operating costs. Recycling water and oil from production activities can reduce energy and utility bills.

For example, oil generated by the food materials processing industry can be reused as a raw material for biofuels and tyre manufacturing. In addition, recycled waste water can be used to cool and clean industrial systems.

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