

Atlas Copco | First in oil-free air technology



# Customers prefer oil-free

*Sustainable Productivity*

**Atlas Copco**

Your customers, your patients, plant managers, safety inspectors, electronic experts, car owners... **they all choose oil-free.**



## And you?



Oil-free compressed air is used in all kinds of industries where air quality is important for the end-product and the production process.

These applications include food and beverage processing, pharmaceutical manufacturing and packaging, chemical and petrochemical processing, semiconductor and electronics manufacturing, the medical sector, automotive paint spraying, textile manufacturing and many more.

For the past sixty years, Atlas Copco has been pioneering the development of oil-free air technology, resulting in a range of oil-free air compressors designed specifically for applications that can make no compromise when it comes to clean, 100% oil-free air.

By maintaining and strengthening its world-leading position through continuous research and development, Atlas Copco was able to achieve a new milestone in setting the standard for air purity: it was the first manufacturer to be awarded ISO 8573-1, ed3. 2012, Class 0, for oil content.



### Why Class 0?

Industries such as pharmaceuticals, food and beverages, electronics and textiles need technology that excludes any risk of contamination, and the severe consequences that can follow: spoiled or unsafe products, production downtime, or costly product recalls and legal issues, which can damage their brand and reputation.

They therefore look to ISO 8573-1 (2010) certification, which establishes a comprehensive classification and measurement methodology in which Class 0 represents the best possible air quality. This is what brings them back to Atlas Copco time after time, because your customers deserve the best.

Class	Concentration total oil (aerosol, liquid, vapour) mg/m <sup>3</sup>
<b>0</b>	<b>As specified by the equipment user or supplier and more stringent than Class 1</b>
1	≤ 0.01
2	≤ 0.1
3	≤ 1
4	≤ 5

## Why would you choose oil-free?

### Atlas Copco Class 0 = Zero oil

Atlas Copco asked the TÜV to type-test its range of oil-free air compressors. They were submitted to the most rigorous testing methodologies available. All possible oil forms were measured across a wide range of temperatures and pressures.

**The TÜV found no traces of oil in the output air stream. Atlas Copco has thereby become the first compressor manufacturer to receive certification for the industry standard of air purity: ISO 8573-1 ed 3 Class 0 for oil content.**

### ISO 8573-1 (2010) Class 0 eliminates your risk

Only oil-free air compressors deliver 100% oil-free air. We developed our oil-free air compressors especially for applications demanding the highest levels of purity. Whether your activities are in pharmaceutical production, food processing, critical electronics or in a similarly exacting industry, zero oil means zero risk.

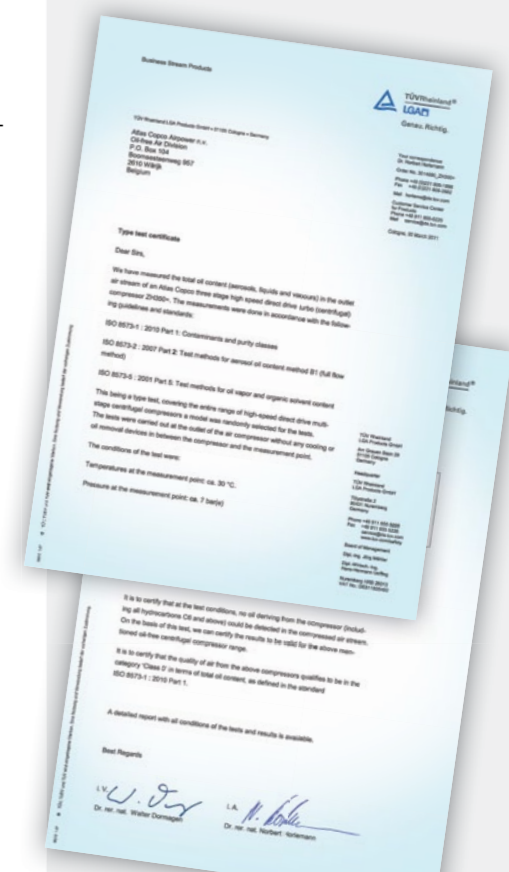
Zero risk of contamination. Zero risk of damaged or unsafe products, or of losses due to operational downtime. Above all, zero oil means zero risk of ruining your hard-earned reputation.

### Go for the best standard: ISO 8573-1 (2010) Class 0.

Our compressors offer reliability and efficiency, reducing downtime and increasing yield. So even industries that are not as heavily reliant on 100% clean air appreciate and seek out the value that this technology can add to their business.

### What is the TÜV?

The Technische ÜberwachungsVerein (Technical Monitoring Association) is an independent, international organization specializing in evaluating the safety and quality of products. The TÜV is recognized worldwide for its independence, neutrality, professional expertise and strict standards.





# ISO 8573-1 Class 0 oil-free, tested without compromise

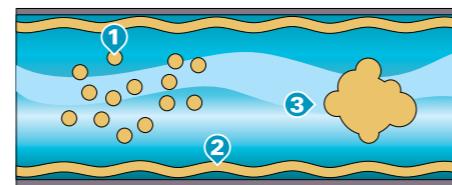
## What are the main differences between the first ISO 8573-1, ed 1, 1991 and the later versions?

The 1991 edition of the ISO 8573-1 standard established five classes of air purity, 1-5, with Class 1 being the purest. However on oil content, only oil aerosols and liquids were taken into consideration. Below 35°C (95°F), vapors could be ignored.

Later, higher levels of air purity were considered necessary for critical applications such as pharmaceuticals, food processing and the manufacture of critical electronic components.

So in 2001 the standard was revised. A higher Class of air purity was added: ISO 8573-1 class 0. In addition, measurements now cover all three forms of oil contamination – aerosols, vapour and liquid – providing a true picture of air quality.

The 2010 edition of the standard confirmed the oil classification introduced in 2001. We at Atlas Copco have made a point of staying abreast of these developments and have acquired the certification according to this latest standard.



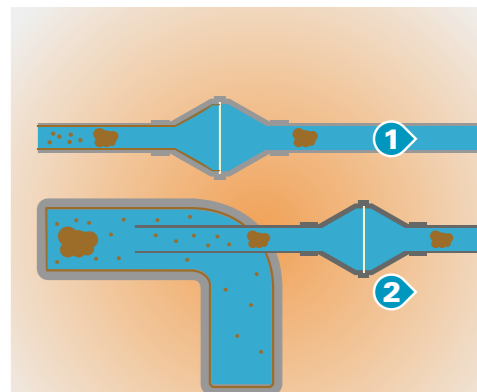
- 1 **Aerosols** - Minute droplets of oil suspended in the air stream
- 2 **Wall flow** - Oil in liquid form, which creeps along the pipe wall
- 3 **Vapors or oil mist** - Vaporised oil in a cloud form

## Even with the most comprehensive test method, no traces of oil were found

Both methods are acceptable for aerosol and liquid measurement according to ISO 8573 Part 2.

**The B2 method** samples only the center of the air flow. Oil aerosols are registered but oil that sticks to the pipe wall (wall flow) is not detected. Most air compressor manufacturers still prefer this less stringent method.

**The B1 method** examines the entire air flow to measure both aerosols and wall flow. This comprehensive test method was used on the Atlas Copco oil-free air compressors. Even so, no traces of oil were found in the output air stream.



- 1 **Full flow testing method (B1)**
- 2 **Partial flow testing method (B2)**



## What are the tests required to qualify for ISO 8573-1 Class 0?

The Part 2 test measures aerosols and liquids. Testing can be done through partial flow (B2) or full flow (B1) methods (see next page). The Part 5 test measures vapors only.

Both parts are necessary to obtain ISO 8573 Class 0 certification. This means that all three forms of oil contamination – aerosol, vapor and liquid – have to be measured.



# Choose risk-free, Choose oil-free.

## Can oil-injected compressors(\*) with oil removal filters deliver oil-free air?

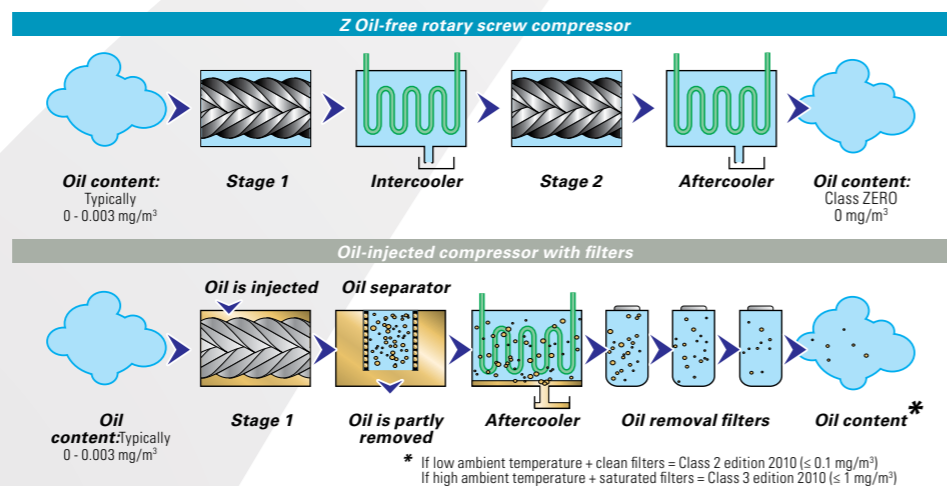
This solution is often referred to as "technically oil-free air". However, even under optimum conditions and with several stages of oil removal, the air quality with regard to oil is suspect.

With oil-injected compressors there will always be a risk of contamination and the possibility of severe consequences for the business.

With Atlas Copco's oil-free air compressors, you're choosing for zero risks, as oil-free air is 100% guaranteed oil-free.

(\*) Oil-injected compressors are sometimes called lubricated, coolant cooled or contact cooled compressors.

**Caution** : Oils designated as "Food Grade Oils" are considered by some users as edible oils and hence completely safe. In reality, contamination with these oils can have a serious health impact on consumers.



## What about oil contamination in ambient air?

Ambient air has very small traces of oil coming from vehicles and industrial sources. However, in contaminated areas, oil content does not normally exceed 0.003 mg/m<sup>3</sup>.

This is borne out by tests conducted by the TÜV near a factory with heavy machining activity (including turning, milling, grinding and drilling). Heavy vehicular traffic and a garbage incinerator were in the vicinity.

Aspirated by an oil-free air compressor, this extremely low level of atmospheric oil is washed away by the condensate in the intercooler and aftercooler, resulting in pure oil-free air for your process.

## When ambient temperature rises, oil-filtering drops out.

One aspect influencing the efficiency and purity of air systems is temperature. When using oil-injected compressors with oil removal filters, oil carryover through filter media increases exponentially according to the temperature at the filtration interface.

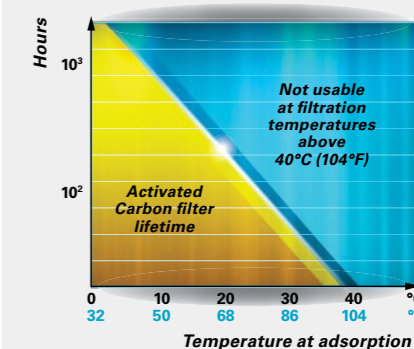
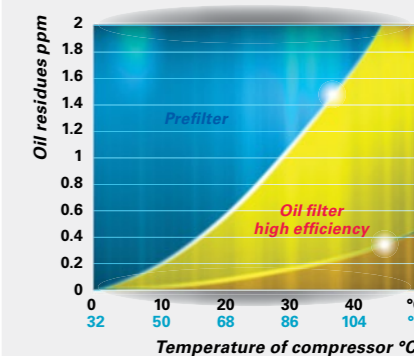
Filter performance is often specified at 20°C (68°F). If the ambient temperature in the compressor room increases to 30°C (86°F), the compressor outlet temperature could be 40°C (104°F) with the oil carryover 20 times the specified value. Such temperatures are not unusual even in colder countries, where the compressor room temperature is substantially higher than that outside.

Temperatures also cause an increase in the vapor content of the air, which can carry through to the end product. Moreover, high temperatures shorten the lifetime of activated carbon filters. An increase in temperature from 20°C (68°F) to 40°C (104°F) can cut filter lifetime from 1000 hours to about 50 hours, which means that the filter needs to be changed with every three days of operation. Even worse, the activated carbon filter does not warn the user when it is saturated. It will simply allow oil to pass on to processes.

For Atlas Copco's oil-free air compressors, air quality is independent of temperature. This was demonstrated by the TÜV test which showed no traces of oil at temperatures of 20°C (68°F), 40°C (104°F) and 50°C (122°F).

## Customers prefer environmental-friendly

With Atlas Copco's oil-free air technology, leaks and energy waste are minimized. Also, the need for condensate treatment is eliminated. The amount of lubricating oil required is a fraction of the quantity in oil-injected compressors. This means you can safeguard the environment and better comply with international regulations.



## Investors adore oil-free

Aren't oil-free air compressors more expensive? Not if you look at total cost of ownership. Atlas Copco oil-free air technology reduces expenditures in four ways: by avoiding expensive filter replacements, cutting maintenance costs and costs of treating oily condensate, and avoiding the costs of extra energy needed to combat pressure drop in filters.

These costs, although not apparent at the time of purchase, are very high and contribute substantially to the total cost of ownership.

Moreover, as Atlas Copco's oil-free air compressors eliminate the risk of a contaminated end-product, production downtime and damaged reputation, Class 0 compressors are well worth the investment.



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