



**First in**  **il-free**  
**air technology**



The only air compressors TÜV-certified as "oil-free" (ISO 8573-1 CLASS 0)



# ISO 8573-1 CLASS 0:

Oil-free air is used in all kinds of industries where air quality is paramount for the end-product and the production process. These applications include food and beverages, powder and bulk handling, aeration, air separation, electronics, pharmaceuticals, cosmetics, automotive painting, and textiles.

Atlas Copco has, over the past **sixty** years, pioneered the development of oil-free air technology, resulting in a range of oil-free air screw compressors to suit applications that cannot compromise when it comes to 100% oil-free, clean air.

Having retained and strengthened its world leadership through continuous research and development, Atlas Copco has achieved a new milestone, setting the standard for air purity as the first manufacturer to be awarded ISO 8573-1 CLASS 0 certification.

## Why a new class?

The ISO 8573-1 compressed air standard was revised in 2001 to address the needs of critical applications where air purity is essential.

Industries such as pharmaceuticals, food and beverages, electronics and textiles must exclude any risk of contamination and the severe consequences that could follow, such as spoiled or unsafe products, production downtime and damage to brand and reputation.

The revision established a more comprehensive measuring methodology. And to the existing purity classes 1 through 5, a new and more stringent class was added: ISO 8573-1 CLASS 0.

## Atlas Copco goes even further: CLASS 0 = zero oil

Atlas Copco asked the TÜV to type-test the Z range of oil-free screw 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 a new industry standard of air purity: ISO 8573-1 CLASS 0.**

CLASS	Concentration total oil (aerosol, liquid, vapour) mg/m <sup>3</sup>
0	As specified by the equipment user or supplier and more stringent than class 1
1	≤ 0,01
2	≤ 0,1
3	≤ 1
4	≤ 5

## ISO 8573-1 CLASS 0 eliminates your risk

Only oil-free compressors deliver oil-free air.

We developed our oil-free screw 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.

**Move up to a new, risk-free standard: ISO 8573-1 CLASS 0.**

**a new industry standard**



# ISO 8573-1 CL

# any

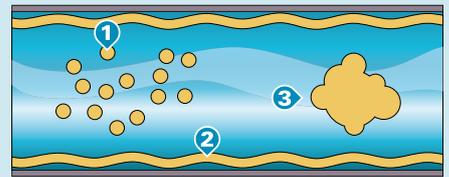
## What are the main differences between the old ISO 8573-1 standard and the latest version?

The ISO 8573-1 1991 edition of the standard established five air purity classes, 1-5, with Class 1 the purest. However, only oil aerosols and liquids were considered. Below 35 °C, vapors could be ignored.

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

of critical electronic components.

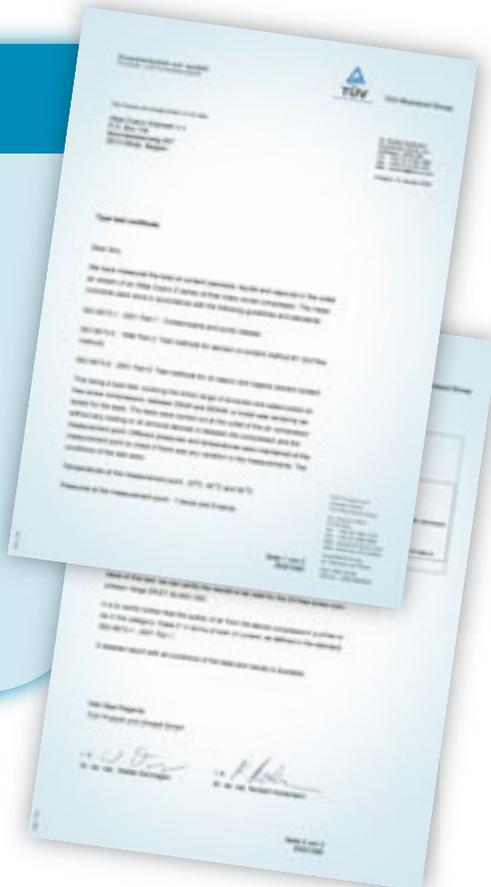
Therefore, the standard was revised in 2001. A higher class of air purity was added: ISO 8573-1 CLASS 0. In addition, measurements now include all three forms of oil contamination – aerosols, vapor and liquid – providing a true picture of air quality.



- 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

## What is the TÜV?

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



## 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 below). 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.



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# ASS O questi O ns ?



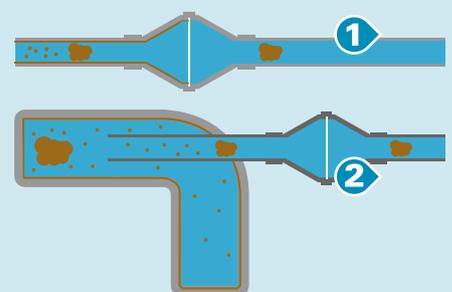
## What is the essential difference between partial flow (B2) and full flow (B1) testing methods?

Both methods are acceptable for aerosol and liquid measurement according to ISO 8573-1 Part 2.

The B2 method targets 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 Z range of oil-free screw compressors. Even so, no traces of oil were found in the output air stream.

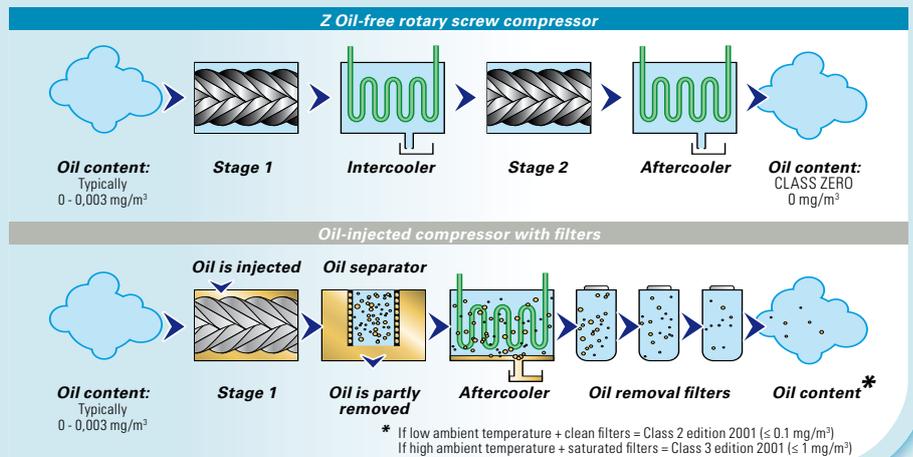


- 1 Full flow testing method (B1)
- 2 Partial flow testing method (B2)

## 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.



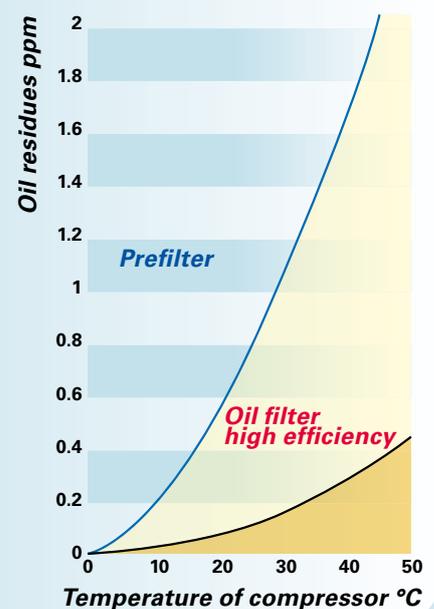
## What is the impact of ambient temperature?

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. If the ambient temperature in the compressor room increases to 30°C, the compressor outlet temperature could be 40°C 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 to 40°C can cut filter lifetime by up to 90%. 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 screw compressors, air quality is independent of temperature.



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

## Aren't oil-free compressors more expensive?

Not if you look at total cost of ownership. Atlas Copco oil-free 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.

## What about the environment?

With Atlas Copco's oil-free technology, leaks and energy waste are minimized. Also, the need for condensate treatment is eliminated. This means you can safeguard the environment and better comply with international regulations.

[www.classzero.com](http://www.classzero.com)

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