



First in



oil-free air technology

The ISO 8573-1 CLASS 0 Story
For internal use only



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



Atlas Copco

The ISO 8573-1 CLASS 0 standard

A great sales story

We are pleased to announce a major global marketing and communications campaign to promote sales of the Atlas Copco oil-free screw compressor range. It is based on a new ISO air quality standard, Class Zero, and the fact that Atlas Copco is the first manufacturer to achieve it. This puts us in an excellent position to take ownership of this oil-free standard as a world leader and industry innovator. Don't miss out on this unique and exciting opportunity.

CLASS	Concentration total oil (aerosol, liquid, vapour) mg/m ³
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

Our customers depend on 100% oil-free air

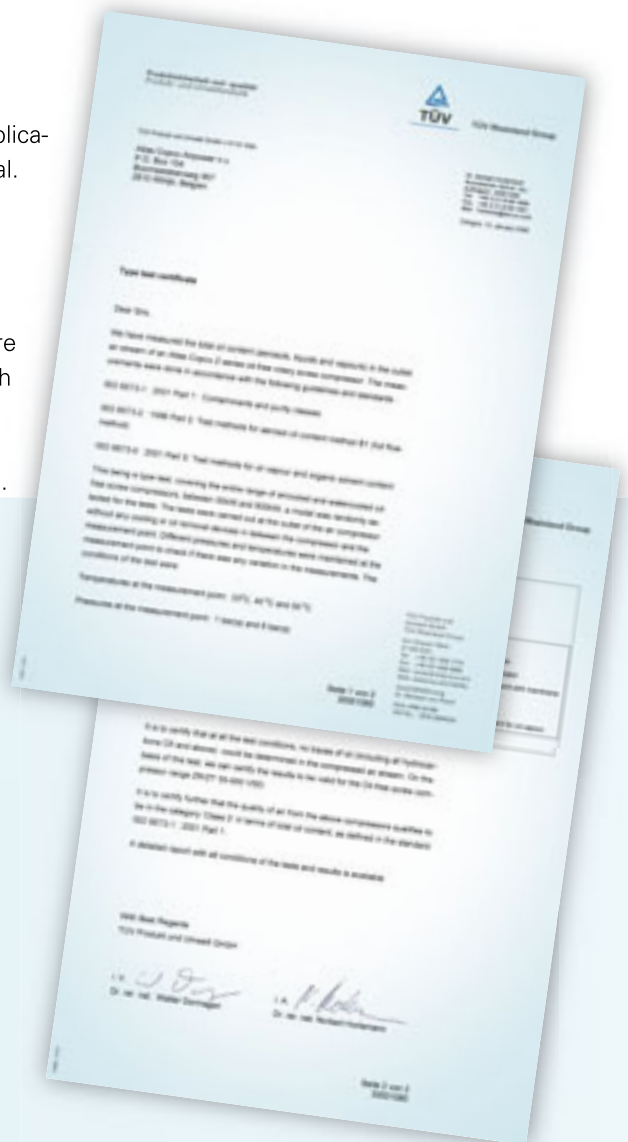
Oil-free air is used in all kinds of industries where air quality is paramount for the end-product and the production process. These applications include food and beverages, powder and bulk handling, aeration, air separation, electronics, pharmaceuticals, cosmetics, automotive painting, textiles and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

Atlas Copco pioneered the development of oil-free air screw technology. Now we have achieved a new milestone, setting the standard for air purity as the first manufacturer to be awarded ISO 8573-1 CLASS 0 certification.

A new class of air quality: Class Zero

The ISO 8573-1 compressed air standard was revised in 2001 to address the needs of critical applications where air purity is essential. These industries – among them pharmaceuticals, food and beverages, electronics and textiles – must exclude any risk of contamination. Otherwise severe consequences 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.



What some competitors claim

Competitors claim that their oil-injected compressors with oil removal filters deliver cleaner air than oil-free screw models. This is based on an assumption that ambient air already contains oil. This oil is removed by the filters of oil-injected machines, delivering what they call 'technically oil-free air', while an oil-free compressor does not remove the ambient oil contamination.

Atlas Copco commissioned the independent TÜV laboratory to test this claim. Ambient air in a typical industrial zone was examined for oil content. Nearby were heavy machining activity, vehicular traffic and an incinerator. Analysis of the ambient air revealed an oil content of 0.003 mg/m³, so low that it was at the very limit of determination. Result? This claim of the competition was proved completely untrue.

Class Zero eliminates customers' risks

Only oil-free compressors deliver oil-free air

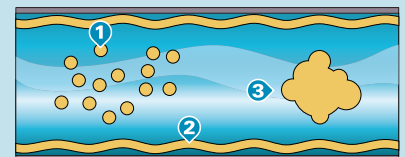
Atlas Copco oil-free screw compressors are especially for applications demanding the highest levels of purity, including pharmaceutical production, food processing, critical electronics or a similarly exacting industry. For these customers, zero oil means zero risk.

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 our customers' hard-earned reputations.

Atlas Copco goes even further: here's proof

Atlas Copco asked the highly respected TÜV laboratory to type-test the Z range of oil-free screw compressors using the most rigorous testing methodologies available. All possible oil forms were measured across a wide range of temperatures and pressures.

The result? The TÜV could determine no traces of oil in the output air stream. Atlas Copco thereby became the first compressor manufacturer to receive certification for a new industry standard of air purity for its Z range of oil-free screw compressors: ISO 8573-1 CLASS 0.



- 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



ISO 8573-1 CLASS 0

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Answers to your questions – and those of your customers – about Class Zero and Atlas Copco oil-free air compressors.

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. In 2001, to address the needs of critical applications, 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.

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 tests are required to qualify for ISO 8573-1 CLASS 0?

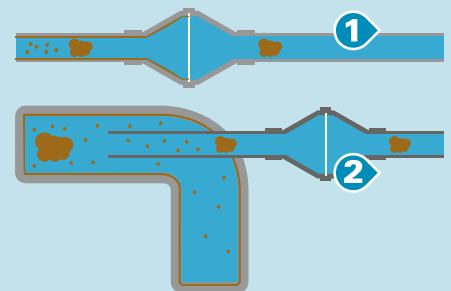
Part 2 test measures aerosols and liquids. Testing can be done through partial flow (B2) or full flow (B1) methods (see below). Part 5 test measures vapors only. Both parts are necessary to obtain ISO 8573 CLASS 0 certification. This means all three sources of oil contamination – aerosol, vapor and liquid – are measured.

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. Our customers can safeguard the environment and better comply with international regulations.

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

The B2 method targets only the center of the air flow. Oil aerosols are registered but oil sticking to the pipe wall (wall flow) is not. Most air compressor manufacturers prefer this less stringent method. The B1 method examines the entire air flow to measure both aerosols and wall flow. This 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.



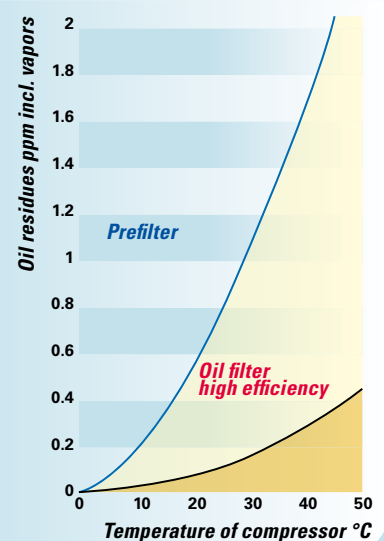
- 1 Full flow testing method (B1)
- 2 Partial flow testing method (B2)

questions ?

What is the impact of ambient temperature?

One aspect influencing the filter efficiency and purity of air 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, some of 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.



Can oil-injected compressors with 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 about oil contamination in ambient air?

Ambient air has very small traces of oil from vehicles and industrial sources. However, in contaminated areas, oil content does not normally exceed 0.003 mg/m³. This was confirmed in tests conducted by the TÜV near a factory with heavy machining activity and in proximity to heavy vehicular traffic and a garbage incinerator. 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 the customers' process.

Aren't oil-free compressors more expensive?

Not if you look at total cost of ownership. Atlas Copco's oil-free technology reduces costs by avoiding expensive filter replacements, reducing oil costs, cutting maintenance costs and costs of treating oily condensate, and avoid the costs of extra energy to combat pressure drop in filters. These costs contribute substantially to the total cost of ownership. Furthermore, Atlas Copco's oil-free air compressors eliminate costs related to the risk of contaminated end-products, production downtime and damaged reputation.

Communications Marketing &

We strongly believe that our Class Zero certification is a major marketing tool that will significantly increase sales in our oil-free screw compressor range. That's why it is being supported by a global marketing and communications campaign. It is designed to give Atlas Copco ownership over this oil-free standard, and strengthen our position as a world leader and industry innovator.

The campaign focusses on industries and applications where oil-free air is an absolute must. These

applications are reflected in the media that will be targeted, as well as in the type of visuals used: food, beverages, chemicals, pharmaceuticals, automotive, textiles, and electronics.

The campaign is strong and consistent globally, but also provides local flexibility in selecting the appropriate industry segments and messages for your market.

Creative approach

The central element in the campaign is a zero symbol. It is used as a "seal" on all campaign materials, promotional items, packaging, machines, etc. The

seal combines the zero symbol with an Atlas Copco blue checkmark, showing that our compressors meet the Class Zero standard.



Advertising



In the advertising campaign, the zero symbol is integrated into strong slogans going with industry-specific visuals.

The campaign will run in targeted industry magazines worldwide from

June 2006 onwards. Advertisements are available in double-page, single-page and half-page formats. Special magazine inserts will be placed in a number of industry magazines.

The objective is to quickly generate

awareness of the existence of the ISO 8573-1 Class Zero standard in the market, along with the fact that Atlas Copco is the first manufacturer to be awarded Class Zero certification.

How to order these materials?

"Global Business Portal" is Atlas Copco's business intranet. There, all the adds, brochures and promotional materials can be found. All these materials will be available in different languages. For more information, feel free to contact the Oil-free Air Communications team!

AIF.Communications@be.atlascopco.com

Press relations

To support the advertising campaign, a PR campaign will ensure there is considerable editorial coverage on the subject. We believe this is a great story journalists will want to write about. These articles will provide more detail on the subject and make our messages more credible.



Website

Our message includes a lot of technical detail. For that reason the campaign is supported by a dedicated website: www.classzero.com. It contains information on the ISO 8573-1 standard, the tests and the results. The site will be a useful tool to answer all questions customers could have. Check it out!

Sales support

For each Customer Center a package of sales support items will be available:

- 1 press release
- 2 leaflet explaining Class Zero, with technical background and Q&A
- 3 mailing piece for adapting to specific industry segments
- 4 Z-compressor product range brochure (related to Class Zero)
- 5 posters
- 6 giveaways and promotional items
- 7 internet banners
- 8 screensaver
- 9 trade show package (panels, decorations, etc.)

Through this campaign Atlas Copco has made major efforts to communicate this message and promote the oil-free screw compressor range internationally. We hope that local marketing & sales will build further on this initiative, using the support materials to generate more awareness about our unique oil-free compressor proposition. We are confident our combined efforts will increase sales significantly.



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