



ETV Verification Statement

Technology Type	Electrostatic separator for oil mist	
Application	Removal rate for oil mist	
Technology Name	Simas (LTA) Oil Mist Filter AC 3002	
Company	Simas Filters A/S	
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WEB site	www.simas.dk	
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Verification and tests of the Simas (LTA) Oil Mist Filter AC 3002, manufactured by LTA Lufttechnik GmbH in Germany, was conducted and performed by the DANETV Verification Centre FORCE Technology.

DANETV was established by four independent Danish research and technology organizations and supported by the Danish Agency for Science, Technology and Innovation under the Danish Ministry of Science, Technology and Innovation, to provide environmental technology verification for vendors of air emission and energy efficient technologies. Information and DANETV documents are available at www.etv-danmark.com.

The verification centre evaluates the performance of the Simas (LTA) Oil Mist Filter AC 3002 electrostatic precipitator used primarily to remove oil mist from ventilation air from metal cutting machinery. This verification statement summarizes the test results for the Simas (LTA) Oil Mist Filter AC 3002.

Verification and test description

The test was based on the requirements from the test design set in the Verification Protocol, September 2009. The protocol introduces the technology to be verified and with the identification of the application and performance parameters, the Test Plan, September 2009 were elaborated inclusive measurement methods and scope.

In order to determine the filters capability to remove oil mist from ventilation air, the concentrations of oil aerosol were measured at the filter inlet and outlet, and the relative removal rate calculated. The standardized method to determine the concentration of oil aerosol is the Danish Standard Reference Method (SRM) for mineral oil mist (MEL 14). The protocol also includes requirements for quality management and quality assurance.

Verified technology description

The technology product to be verified is applying the electrostatic precipitation technology for removal of oil mist from ventilation air from metal cutting machines. The removal of oil mist is based upon electrostatic attraction. By using an electro filter the electrical forces are used to separate the aerosols from the ventilation air

The set-up for the verification test consists of the Simas (LTA) Oil Mist Filter AC 3002 electrostatic separator. It is developed to remove cooling lubricant oil mist from metal cutting machinery. The oil mist is ventilated from the working centre by the integrated fan in the oil mist filter.

The filtration process is divided into 3 main filtration steps:

1. Pre filter: Consist of several layers of metal filters. As the oil mist passes through the pre filter the major part of the largest oil droplets and eventually solid particles is captured.
2. Electrostatic filter: Consist of an Ionisator and a Collector. The oil mist droplets (aerosols) are charged positively by the high voltage field in the Ionisator. The charged particles are attracted to the Collector, which is negative charged. This process enables an efficient removal of aerosols.
3. Polish filter: The final polish filter makes sure, that no aerosols are left after the filtration process.

Figures 1 and 2 show the filtration principle and the Simas (LTA) Oil Mist Filter AC 3002.

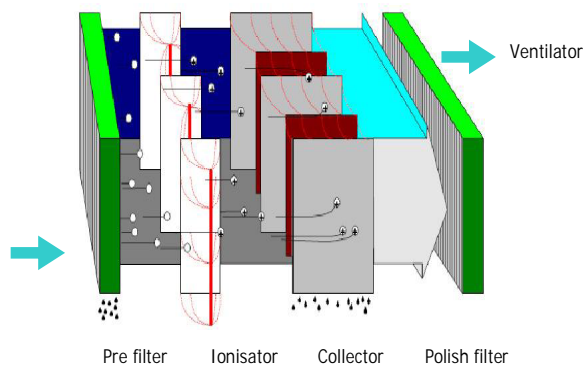


Figure 1.
Filtration principle.



Figure 2.
Simas (LTA) Oil Mist Filter AC 3002.

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Verification of performance

Verification and tests of the Simas (LTA) Oil Mist Filter AC 3002, manufactured by LTA Lufttechnik GmbH in Germany, was performed from the 12.10.2009 to the 26.10.2009 at FORCE Technology, Park Allé 345, DK-2605, Brøndby, Denmark.

The test design is described in the following, and the test results are summarized in Table 1.

Test design

The oil mist separator is tested in a set up which is imitating the set up of a metal cutting machine equipped with an oil mist separator. Instead of a metal cutting machine an oil mist generator will be used.

The oil mist separator, which has a built-in fan, is connected to the oil mist generator, by the use of 200 mm ducts (Tradename Spiro) long enough to achieve proper sampling points and a uniform distribution of the oil mist in the constant air flow.

Test results

The overall results of the test, concerning the removal rate for oil mist removed from the air is shown in Table 1. Each of the concentrations is the average of three one hour successive samples. Table 2 shows main results from previous test made by ILK Dresden in 2008 and . Figure 3 and 4 show the aerosol particle size distribution

Table 1. Main test results for removal rate at the beginning of the test and after 240 days of operation.

Date	Inlet concentration mg/m ³	Outlet concentration mg/m ³	Removal rate RR
14/10/2009	86.7	4.8	94.5 %
26/10/2009	109	4.1	96.3 %

Table 2. Main results from the ILK Dresden test in 2008.

Sample no.:		1	3	4	5	Average
Inlet concentration	mg/m ³	63.8	77.2	61.9	67.6	67.63
Outlet concentration	mg/m ³	0.14	0.14	0.14	0.14	0.14
Removal rate	%	99.78	99.82	99.77	99.79	99.79

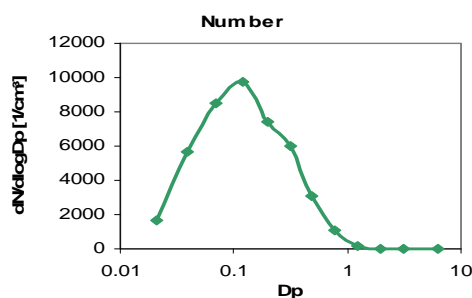


Figure 3.

Inlet aerosol particle size distribution (FORCE test 2009).

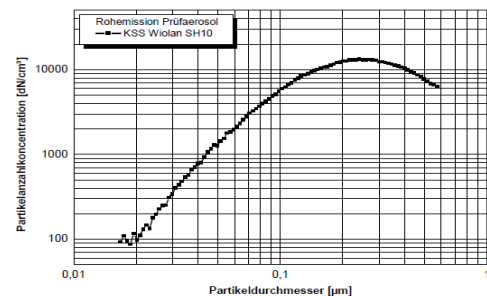


Figure 4.

Aerosol particle size distribution (ILK Dresden test 2008.)

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The Air Emission and Energy Efficient Technology Verification Centre quality assurance officer has reviewed the test results and the quality control data and has concluded that the data quality objectives given in the verification protocol and test/QA plan have been attained.

This verification statement addresses the following qualities of the electrostatic separator for oil mist: The ability to remove oil mist from a standardised oil aerosol, and to keep the same removal rate for a period comparable to one month of normal industrial operation.

In accordance with the verification protocol, this verification statement is applicable to the Simas (LTA) Oil Mist Filter AC 3002 manufactured between the signature date of the verification and 3 years hereafter.

Signed by	25/5 -10	Signed by	25/5 -10
Annemette Geertinger	Date	Marianne Kyed Ørbæk	Date
Deputy Manager		Project Manager	
DANETV Steering Committee member		DANETV Verification Centre Project Manager	

FORCE Technology - Air Emission and Energy Efficient Technology Verification Centre

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