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**TÜV RHEINLAND
ENERGIE UND UMWELT GMBH**

Evaluation of the air purity class for total oil
after an Atlas Copco DD+ PD+ QDT filter train

TÜV-Report No.: 931/21229599/01

Köln, 14.08.2015

Die auszugsweise Vervielfältigung des Berichtes bedarf der schriftlichen Genehmigung.

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Client: Atlas Copco Airpower n.v.
P.O. Box 104
Boomsesteenweg 957
2610 Wilrijk
Belgium

Date of order: June 06th, 2015

Client Order No.: 20452524

TÜV Order No.: 931/2129599

TÜV-Client No.: 354769

Date of Test: July 8th, 2015

Participants during the test: Ken Goris (Atlas Copco Airpower n.v.)
Dr. rer. nat. Norbert Horlemann
(TÜV Rheinland Energie und Umwelt GmbH)

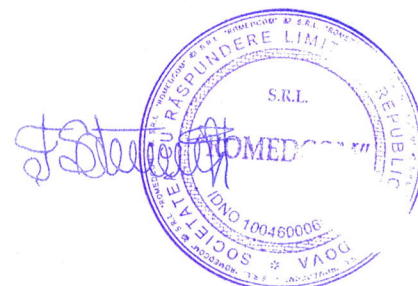
Carried out by: Jo Wouters (Atlas Copco Airpower n.v.)

Witnessed by: Dr. rer. nat. Norbert Horlemann
(TÜV Rheinland Energie und Umwelt GmbH)

Analysis carried out by: Atlas Copco Airpower n.v.

Assessment by: Dr. rer. nat. Norbert Horlemann
(TÜV Rheinland Energie und Umwelt GmbH)

Purpose of Assessment: ISO 8573-1 – 2010: Compressed air - Part 1: Contami-
nants and purity classes
ISO 8573-5 – 2001: Compressed air - Part 5: Test methods
for oil vapour and organic solvent content



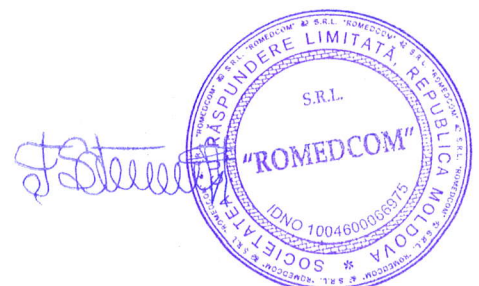
TÜV Rheinland Energie und Umwelt GmbH
Gefahrstoffe

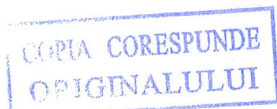
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1. INTRODUCTION

TÜV Rheinland Energie und Umwelt GmbH were approached by Atlas Copco Airpower n.v. – Medical Gas Solutions Division to assess and witness determination of the air purity class for total oil after an Atlas Copco DD+ PD+ QDT filter train using test-rigs which are located at Atlas Copco's facility Boomsesteenweg 957; 2610 Wilrijk; Belgium.

The standards, according to which the tests were to be carried out, were:

ISO 8753-1, 2010: Compressed air Part 1: Contaminants and purity classes

ISO 12500-1, 2007: Filters for compressed air – test methods – Part 1: Oil aerosols

ISO 8573-2, 2007: Compressed air Part 2: Test methods for oil aerosol content

ISO 8573-5, 2001: Compressed air Part 5: Test methods for oil vapour and organic solvent content

2. OBJECTIVE

To determine the air purity class for total oil after an Atlas Copco DD+ PD+ QDT filter train, the residual oil aerosol content after a DD+ PD+ filter train and the residual oil vapour content after a QDT filter are combined. Both tests are witnessed by TÜV, and the test conditions, sample measurements, and test results can be consulted in test reports No. 3047714 dated 21st May 2012 and No. 931/21229599_03 dated 14th August 2015.

The measurements are done according to the following standards.

ISO 8753-1, 2010: Compressed air Part 1: Contaminants and purity classes

ISO 12500-1, 2007: Filters for compressed air – test methods – Part 1: Oil aerosols

ISO 8573-2, 2007: Compressed air Part 2: Test methods for oil aerosol content

ISO 8573-5, 2001: Compressed air Part 5: Test methods for oil vapour and organic solvent content



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3. TEST RESULTS

Atlas Copco's DD+ PD+ filter train, tested according to ISO 12500-1:2007 & ISO 8573-2:2007, has a residual oil aerosol content of $< 0.001 \text{ mg/m}^3$ (0.07 mg/m^3 (DD+) $\times 0.008 \text{ mg/m}^3$ (PD+)). Atlas Copco's QDT, tested according to ISO 8573-5:2001 has maximum residual oil vapour content (VOC $C_6 - C_{16}$ as defined in ISO 16000-6) of 0.003 mg/m^3 . Therefore, the total oil content after DD+ PD+ QDT is in any case below 0.01 mg/m^3 , which is the maximal allowed total oil content for class 1, according to ISO 8573-1:2010. The type tests are representative for the full range of Atlas Copco DD+ PD+ QDT filters.

4. CONCLUSION

Atlas Copco complies with the test method requirements for ISO 12500-1:2007, ISO 8573-2:2007, and ISO 8573-5:2001. The air purity class for total oil after an Atlas Copco DD+ PD+ QDT filter train is class 1, according to ISO 8573-1:2010.

The Expert:



Dr. rer. nat. Norbert Horlemann

The Responsible Specialist:



Dr. rer. nat. Walter Dormagen

Köln, 14.08.2015

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