	OLIFAN PTFE OXYGENE	Nanteuil le Haudouin, le 15 mars 2018

ATTESTATION

Nous soussignés, certifions que le produit ***OLIFAN PTFE OXYGENE*** peut être utilisé au contact d'oxygène gazeux jusqu'à 60°C et 40 bars :

- Rapport d'essai du BAM n° II-1514/2008 E

GEB SAS Laboratoire Recherche & Développement

GEB SAS – CS 62062 – Tremblay en France
95972 Roissy Charles de Gaulle Cédex - France
Tél. (33) 01 48 17 99 99 - Fax (33) 01 48 17 98 00
N°SIREN : 500 674 056

BAM
Bundesanstalt für Materialforschung und -prüfung

Report
on Testing a Thread Seal Tape for Reactivity with Oxygen

Reference Number II-1514/2008 E

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1 Application

Customer
GEB LABORATOIRE
1, allée des Coquelicots
60440 NANTEUIL LE HAUDOUIN
FRANKREICH

Order Date June 9, 2008

Reference Purchase Order No. 2008060051

Receipt of Order June 11, 2008

Test Samples Thread Seal Tape Olifan PTFE oxygène for use in piping, valves and fittings, and components for gaseous oxygen service at temperatures up to 60 °C.
BAM-Order No. II.1/49 319

Receipt of Samples June 10, 2008

Test Date July 14, 2008

Test Location BAM - Working Group "Safe Handling of Oxygen"; building no. 41, room no. 120

Test Procedure According to
DIN EN 1797: 2002-02
„Cryogenic Vessels - Gas/Material Compatibility"
Annex of pamphlet M 034-1 (BGI 617-1)
„Liste der nichtmetallischen Materialien die von der Bundesanstalt für Materialforschung und –prüfung (BAM) zum Einsatz in Anlageteilen für Sauerstoff als geeignet befunden worden sind.",
to pamphlet M 034 „Sauerstoff" (BGI 617)
Berufsgenossenschaft der chemischen Industrie
Edition: October 2007;
according chapter 3.17 „Gleitmittel und Dichtwerkstoffe"
to rule BGR 500 „Betreiben von Arbeitsmitteln" part 2,
chapter 2.32 „Betreiben von Sauerstoffanlagen",
Edition: April 2008.

All pressures of the report are excess pressures.
This test report consists of page 1 to 3 and annex 1.

This test report may only be published in full and without any additions. A revocable permission in writing has to be obtained from BAM for any amended reproduction of this certificate or the publication of any excerpts. The test results refer exclusively to the tested materials.
In case a German version of the test report is available, exclusively the German version is binding.

TEST REPORT

2 Documents and Test Samples

The following documents and samples were submitted to BAM:

1 test application
1 Safety Data Sheet
1 Material Data Sheet
4 Coils of Thread Seal Tape Olifan PTFE oxygène
Width 19 mm; thickness 0,1 mm; length 30 m
colour: white

3 Test Methods and Results

A determination of the autogenous ignition temperature (AIT) was not necessary as thread seal tape Olifan PTFE oxygène is not for use at temperatures greater than 60 °C.

3.1 Ignition Sensitivity to Gaseous Oxygen Impacts

The test method is described in annex 1.

Results:

Sample Temperature t_a [°C]	Oxygen Pressure p_a [bar]	Oxygen Pressure p_e [bar]	Reaction on Impact
60	1	40	no reaction*)
60	1	40	no reaction*)
60	1	50	ignition on 4. impact

*) within a series of five consecutive impacts

In two separate tests, each consisting of a series of five consecutive impacts, no reactions with oxygen could be observed at an oxygen pressure p_e of 40 bar.

4 Evaluation

On basis of the results of the impact testing, there are no objections with regard to technical safety to use the thread seal tape Olifan PTFE oxygène in valves and fittings or other components for gaseous oxygen service at:

Maximum Temperature	Maximum oxygen pressure
up to 60 °C	up to 40 bar

This report does not cover the use of the material for liquid oxygen service. For this application, a particular test for reactivity with liquid oxygen needs to be carried out.

5 Comments

The test results refer exclusively to the tested material.

Products that have been tested by us, and which are on the market, shall be marked according to our evaluation in the BAM test report. A label on a product saying that a BAM test has been performed and (or) citing our reference number, only, is not tolerable. The use of the product and its safe operating conditions must also be given.

It shall be clear that the product may only be used for gaseous oxygen service. The maximum safe oxygen pressure of the product and its maximum use temperature as well as other restrictions in use shall be given.

Federal Institute for Materials Research and Testing (BAM)
12200 Berlin, July 22, 2008

Division II.1
"Gases, Gas Plants"

Dr. Chr. Binder
Head of Working Group

Working Group
"Safe Handling of Oxygen"

Dipl.-Ing. P. Hartwig
Engineer in Charge

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Annex 1

Testing for Ignition Sensitivity to Gaseous Oxygen Impacts

Approximately 0.2 g to 0.5 g of the pasty or divided solid sample is placed into a heatable steel tube, 15 cm^3 in volume. In case of liquids to be tested, ceramic fibre, soaked with the sample, is used. The sample tube is connected by a 750 mm long pipe (internal diameter 14 mm) and a pneumatically operated quick opening valve to a high-pressure oxygen accumulator.

A heater allows to set the sample tube to the test temperature t_a. After the tube and pipe are at test pressure p_a, the quick opening valve is opened and preheated oxygen of 60 °C and of pressure p_e flows abruptly into the pipe and tube. In this way, the oxygen in the tube and in the pipe is almost adiabatically compressed from pressure p_a to p_e and heated. If there is a reaction of the sample with oxygen, indicated by a steep temperature rise in the tube, further tests with a new sample are performed at a lower pressure ratio p_e/p_a. If, however, no reaction of the sample with oxygen can be detected after a waiting period of 30 seconds, the tube is de-pressurized and the test is repeated (up to four times) until a reaction takes place. This means, each test series consists of a maximum of five single tests with the same material under the same conditions. If no reaction can be observed, even after the fifth single test of a test series, testing is continued with new samples at greater pressure ratios p_e/p_a, until finally that pressure ratio is determined, at which no reaction can be observed within a test series of five single tests. If the repetition of that test series with a new sample shows the same result, the test can be finished or continued at a different test temperature t_a.