

**BAM****Bundesanstalt für
Materialforschung
und -prüfung**Unter den Eichen 87
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Report

on Testing a Sealing Material for Reactivity with Oxygen

BAM reference II-1155/2003
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1 Application

Customer DONIT TESNIT d.d.
Cesta komandanta Staneta 38
1215 Medvode
Slovenija

Order date March 12, 2003

Reference -

Receipt of order March 14, 2003

Test samples Testing the gasket BAGL 3000 for flanged connections in oxygen plants and equipment for reactivity with gaseous oxygen
BAM Order No. II.1/46 838

Receipt of samples March 14, 2003

Test date May 7, 2003 – June 2, 2003

Test location BAM-Laboratory II.13; building no. 41, room no. 073

Test procedure according to Regulation BGV B 7 „Oxygen“ of the „Berufsgenossenschaft der chemischen Industrie“. Test methods according to the annex of the pamphlet „Liste der nichtmetallischen Materialien die von der Bundesanstalt für Materialforschung und -prüfung (BAM) zum Einsatz in Anlageteilen für Sauerstoff als geeignet befunden worden sind.“(Edition: 31. August 2002) of BGV B 7.

TESTREPORT

This test report consists of page 1 to 3 and annex 1 to 3.

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In case a German version of the test report is available, exclusively the German version is binding.



2 Documents and Test Samples

The following documents and samples were submitted:

- 1 Application for testing,
- 1 data sheet on BAGL 3000,
- 1 product information on BAGL 3000 and
- 15 disks of BAGL 3000 (thickness: ca. 2 mm; diameter: 140 mm), color: one side turquoising and one side blue, printed with „TESNIT BAGL 3000 EKO“

3 Test Methods and Results

3.1 Autogenous Ignition Temperature (AIT)

The test method is described in annex 1.

Results:

In five tests with an oxygen pressure of $p_a = 84$ bar, an AIT of 160 °C was determined with a standard deviation of ± 5 °C. The oxygen pressure p_o at ignition is approximately 123 bar.

3.2 Artificial Aging

The test method is described in annex 2.

3.2.1 Aging at 120 bar Oxygen Pressure and 110 °C

Results:

During the aging test, the material reacted with oxygen in a fierce way. This reaction produced heat in such an extent, that it caused the sample to melt. The color of the aged sample was whitish and it had lost approximately 20,7 % in mass.

3.2.2 Aging at 120 bar Oxygen Pressure and 85 °C

Results:

After aging of BAGL 3000 at 120 bar oxygen pressure and 85 °C, the material was somewhat brittle and the color insignificantly lighter. The sample gained 5,2 % in mass.

The AIT of the aged sample at 118 bar oxygen pressure was 143 °C with a standard deviation of ± 4 °C. The test showed that the AIT of the aged sample was lower than the AIT of the non-aged sample.

3.3 Flange Test

The test method is described in annex 3.

Results:

Due to the aging behavior of the material, the samples were tested at 120 bar oxygen pressure and 60 °C. Only those parts of the gasket burn that projected into the pipe; the fire is neither transmitted to the steel nor does the gasket burn between the flanges. The flange remained gas-tight. Thereupon, the test was repeated four times at 120 bar and 60 °C. The same result was obtained as before.

4 Evaluation

The tests have shown that the autogenous ignition temperature of the material is (160 ± 5) °C at an oxygen pressures of 123 bar.

At a temperature of 85 °C and an oxygen pressure of 120 bar, the material proved to be sufficient aging resistant.

On basis of the test results, regarding technical safety, the flat gasket BAGL 3000 may be used in flange connections made of copper, copper alloys or steel at oxygen pressures up to 120 bar and temperatures up to 60 °C. This applies to flat faced flanges, male and female flanges, and flanges with tongue and groove.

This report does not cover the use of the gasket for liquid oxygen service. A particular test for reactivity with liquid oxygen needs to be carried out to evaluate the compatibility of the gasket with liquid oxygen.

5 Comments


This report expires at once, if the composition of the tested material is changed. This report expires on June 30, 2013, at the latest. A prolongation beyond this date is possible, if the manufacturer confirms in writing that the material has not changed since this evaluation.

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 3, 2003**

**Subdivision II.1
“Gases, Gas Plants”**


Dr. Chr. Binder
Head of Laboratory

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“Equipment for Gases, Oxygen”**


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