BAM
Bundesanstalt für Materialforschung und -prüfung

Translation of a Report

on Testing an Adhesive for Reactivity with Oxygen

Reference Number II-2747/2002 II E

Copy 1. Copy of 2 Copies

1 Application

Customer WEICON GmbH & Co. KG
Postfach 84 60
48045 Münster

Order Date July 2, 2002

Receipt of Order July 5, 2002

Test Samples Adhesive and sealant WEICONLOCK AN 306-48 for use as a thread sealant in valves and fittings or other components for gaseous oxygen service at temperatures up to 60 °C.
BAM-Order No. II.1/46 363

Receipt of Samples July 4, 2002

Test Date July 23, 2002 to July 24, 2002

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

Test Procedure According to 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.",
(Edition: August, 31 2001) to safety rule B7 „Oxygen" of „Berufsgenossenschaft der chemischen Industrie"

TEST REPORT

All pressures of the report are excess pressures.
This test report consists of page 1 to 4 and annex 1.

2 Documents and Test Samples

The following documents and samples were submitted to BAM:

1 Test Application and
2 Bottles á 50 ml WEICONLOCK AN 306-48, liquid
Colour: Green, Transparent

3 Test Methods and Results

The adhesive WEICONLOCK AN 306-48 has been tested in uncured and in cured condition.

3.1 Autogenous Ignition Temperature (AIT)

A determination of the autogenous ignition temperature (AIT) was not necessary as the adhesive is not for use at temperatures greater than 60 °C.

3.2 Ignition Sensitivity to Gaseous Oxygen Impacts

The test method is described in annex 1.

3.2.1 Uncured Liquid Adhesive

Results:

Sample Temperature t_a [°C]	Oxygen Pressure p_a [bar]	Oxygen Pressure p_e [bar]	Reaction on Impact
60	1	40	ignition on 1. impact
60	1	30	no reaction*)
60	1	30	no reaction*)

*) within a series of five consecutive impacts

3.2.2 Cured Adhesive

Results:

Sample Temperature t_a [°C]	Oxygen Pressure p_a [bar]	Oxygen Pressure p_e [bar]	Reaction on Impact
60	1	40	ignition on 1. impact
60	1	30	ignition on 4. impact
60	1	25	no reaction*)
60	1	25	ignition on 2. impact
60	1	20	no reaction*)
60	1	20	no reaction*)

*) within a series of five consecutive impacts

4 Evaluation

On basis of the test results, there are no objections with regard to technical safety to use the adhesive WEICONLOCK AN 306-48 in valves and fittings or other components for gaseous oxygen service at:

Maximum Temperature	Maximum Oxygen Pressure
up to 60 °C	up to 20 bar

This evaluation does not cover the use of adhesive WEICONLOCK AN 306-48 for liquid oxygen service. For this case, a particular test for reactivity with liquid oxygen needs to be carried out.

5 Comments

This report expires at once, if the composition of the tested material is changed. This report expires on August 31, 2012, 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.

BAM Federal Institute for Materials Research and Testing
12200 Berlin, November 18, 2009

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

Copies:
1. Copy: WEICON GmbH & Co. KG
2. Copy: BAM-Working Group "Safe Handling of Oxygen"

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.