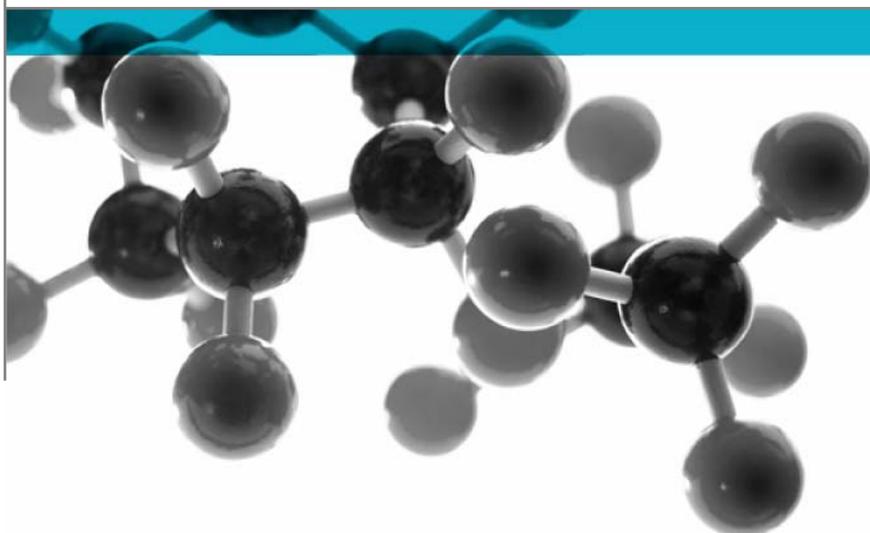


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BS EN ISO 4589-2: 1999



Determination of Burning Behaviour By Oxygen Index

A Report To: Hermann Otto GmbH

Document Reference: 312424

Date: 17th August 2012

Issue No.: 1

Page 1

Testing
Advising
Assuring



Executive Summary

Objective To determine the oxygen index of the following product when tested in accordance with BS EN ISO 4589-2: 1999

Generic Description	Product reference	Thickness	Density
Flame resistant silicone sealant	"OTTOSEAL S 51"	4.13mm*	1.34g/cm ³
*Determined by Exova Warringtonfire			
Please see page 5 of this test report for the full description of the product tested			

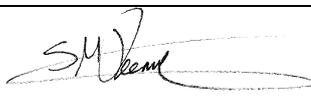
Test Sponsor Hermann Otto GmbH, OTTO-CHEMIE, Krankenhausstraße 14, D-83413 Fridolfing, Germany

Test Results: **When tested in accordance with the procedure specified in BS EN ISO 4589 - 2: 1999 the material shows an oxygen index of 28.2%**

Date of Test 8th August 2012

Signatories


 Responsible Officer
 T. Mort *
 Senior Technical Officer


 Authorised
 S. Deeming *
 Operations Manager

* For and on behalf of **Exova Warringtonfire**.

Report Issued: 17th August 2012

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Test Details

Purpose of test	<p>To assess the performance of a material when it is tested in accordance with BS EN ISO 4589 - 2: 1999 "Plastics - Determination of burning behaviour by oxygen index".</p> <p>The test was performed in accordance with the procedure specified in BS EN ISO 4589-2:1999 - Plastics - Determination of burning behaviour by oxygen index, and this report should be read in conjunction with that BS EN ISO Standard.</p>
Scope of test	<p>BS EN ISO 4589 – 2: 1999 specifies test methods for determining the minimum concentration of oxygen, in a mixture with nitrogen that will support combustion of small vertical test specimens under specified test conditions. The results are defined as oxygen index values.</p>
Instruction to test	<p>The test was conducted on the 8th August 2012 at the request of Hermann Otto GmbH, the sponsor of the test.</p>
Provision of test specimens	<p>The specimens were supplied by the sponsor of the test. Exova Warringtonfire was not involved in any selection or sampling procedure.</p>
Conditioning of specimens	<p>The specimens were received on the 14th October 2011.</p> <p>Prior to test the specimens were conditioned to equilibrium with air at $23 \pm 2^{\circ}\text{C}$ and a relative humidity of 50 ± 5 per cent for at least 88 hours.</p>
Method of testing	<p>Specimens measuring nominally 100mm long by 9.87mm wide by 4.13mm thick were used. The thickness of the specimens used conforms with the requirements specified in Table 2 of the standard for test specimen Form III for sheet materials 'as received'. The specimens were tested in accordance with the test procedure specified in Clause 8 of the Standard using the Stanton Redcroft Limiting Oxygen Index apparatus.</p>
Ignition procedure	<p>Ignition procedure A - top surface ignition, was used to initiate burning on the top surface of the upper end of the specimen.</p>

Description of Test Specimens

The description of the specimens given below has been prepared from information provided by the sponsor of the test. All values quoted are nominal, unless tolerances are given.

General description	Flame resistant silicone sealant
Trade name	"OTTOSEAL S 51"
Detailed description	One component silicone sealant based on a modified amine system
Name of manufacturer	Hermann Otto GmbH
Density	1.34g/cm ³ (stated by sponsor) 2.06g/cm ³ (determined by Exova Warringtonfire)
Thickness	4.13mm (determined by Exova Warringtonfire)
Colour	"White"
Flame retardant details	See Note 1 below
Brief description of manufacturing process	See Note 1 below

Note 1. The sponsor of the test was unwilling to provide this information.

Test Results

Applicability of test results

The test results relate only to the behaviour of the specimens under the particular conditions of this test, they should not be used to infer the fire hazards of the material in other forms or under other fire conditions.

The test results relate only to the specimens of the product in the form in which they were tested. Small differences in the composition or thickness of the product may significantly affect the performance during the test and may therefore invalidate the test results. Care should be taken to ensure that any product which is supplied or used is fully represented by the specimens which were tested.

In accordance with Sections 8 and 9 of the Standard, the results obtained are given in appendix A.

Conclusion

When tested in accordance with the procedure specified in BS EN ISO 4589 - 2: 1999 the material shows an oxygen index of 28.2%

Validity

The specification and interpretation of fire test methods is the subject of ongoing development and refinement. Changes in associated legislation may also occur. For these reasons it is recommended that the relevance of test reports over five years old should be considered by the user. The laboratory that issued the report will be able to offer, on behalf of the legal owner, a review of the procedures adopted for a particular test to ensure that they are consistent with current practices, and if required may endorse the test report.

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Appendix A

MATERIAL TESTED

Part 1 - Preliminary oxygen concentration

Oxygen Concentration (%)	32.0	29.0	27.0	28.0
Burning Period (s)	>180	>180	28.5	52.5
Length Burnt (mm)	45	30	2	8
Response ('X' or 'O')	X	X	O	O

Part 2 - Determination of the oxygen index value

N _T series measurements											
N _L series measurements (8.5.1 - 8.5.2)						(8.6.2)					
						C _f					
Oxygen Concentration (%)	28.0	28.2	28.4			28.4	28.2	28.0	28.2	28.0	
Burning Period (s)	97.0	47.5	>180			>180	>180	33.5	>180	82.0	
Length Burnt (mm)	10	6	25			25	22	3	20	13	
Response ("X" or "O")	O	O	X			X	X	O	X	O	
Column (2,3,4 or 5)	3					Row (1 to 16)					11
k value from table 4	0.94										

Hence k = 0.94

Oxygen index value OI = C_F + kd
 d is oxygen concentration increment

$$OI = 28.0 + (0.94 \times 0.2)$$

Oxygen index value = 28.2 (to one decimal place for reporting)

= 28.19 (to two decimal places, for calculation of and verification of *d* as required in Part 3)

Standard Deviation = 0.15 Therefore, the test result is valid.

Revision History

Issue No :	Issue Date:
Revised By:	Approved By:
Reason for Revision:	

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