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WATER REGULATIONS ADVISORY SCHEME (WRAS).

**TESTING OF NON-METALLIC MATERIALS FOR USE WITH DRINKING WATER (BS 6920 : 2000)**

**AUDIT TEST REPORT**

Product : Loctite 277 (Anaerobic Adhesive 5220)  
 Report Reference : M 103383  
 Page 1 of 5 Pages.

Henkel Loctite Adhesives  
 Watchmead  
 Welwyn Garden City  
 Herts  
 AL7 1JB

Report Date : 14<sup>th</sup> July 2004

**Executive Summary - samples of this product have been tested to the Audit Test requirements of the Water Regulations Advisory Scheme (WRAS)/BS 6920:2000 for use with Hot and Cold Water.**

***A copy of this report should be submitted to the Water Regulations Advisory Scheme (WRAS) for further advice concerning this product.***

***Conformity with the Audit Test requirements of the WRAS will be confirmed by the Scheme.***

**NOTES.**

1. The results given in this report relate only to the items tested, and not necessarily to the bulk from which they were taken.
2. This test work was undertaken in the UKAS accredited Spencer House laboratory of Thames Water Utilities Ltd., UKAS registration number 0677, unless otherwise stated.
3. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.
4. This test report shall not be reproduced, except in full, without our prior written approval.



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**TESTING OF NON-METALLIC MATERIALS FOR USE WITH DRINKING WATER.  
WATER REGULATIONS ADVISORY SCHEME TESTS OF EFFECT ON WATER  
QUALITY (BS 6920:2000).**

**0. INTRODUCTION.**

The samples of the product referred to in this report have been tested in accordance with the methods of the Water Regulations Advisory Scheme (WRAS) Tests of Effect on Water Quality/BS 6920-2:2000 "Suitability of non-metallic products for use in contact with water intended for human consumption with regard to their effect on the quality of the water : Methods of Test". **The testing undertaken is in accordance with the Water Regulations Advisory Scheme (WRAS) letter ref CR/JC dated 6<sup>th</sup> April 2004.**

**1. TEST SAMPLES.**

|   |                                       |  |
|---|---------------------------------------|--|
| General composition of product                                    | Anaerobic Adhesive                    |  |
| Trade name/designation  | Loctite 277 (Anaerobic Adhesive 5220) |  |
| Material manufacturer   | Henkel Loctite Adhesives              |  |
| Date of manufacture/production                                    | September 2003                        |  |
| Production batch numbers  | 3JP 414B                              |  |
| Samples prepared by   | WQC Staff                             |  |
| Submitting organisation   | Henkel Loctite Adhesives              |  |
| Date of receipt of test samples                                   | 26 <sup>th</sup> April 2004           |  |
| Method of packaging   | Product Container                     |  |
| Condition on receipt  | Satisfactory                          |  |
| Laboratory storage before test                                    | Ambient temperature (21±4)°C          |  |
| Description of  | test article                          | Anaerobic adhesive was applied to male threads of a brass coupling before assembly and cured for 7 days at 25°C. |
| Appearance of a test article                                      | colour<br>surface finish<br>opacity   | Red<br>Glossy<br>Translucent   |
| Surface area of one article (mm <sup>2</sup> )                    | n/a                                   |  |
| Number of articles to give a surface area of 15000mm <sup>2</sup> | n/a                                   |  |
| Calibration mark of the test vessel/container in litres           | 1                                     |  |
| Extraction temperature used for tests 2 & 6                       | (85±2)°C                              |  |

## 2. ODOUR & FLAVOUR OF WATER TEST

Temperature of extraction : (85±2)°C

Date test started : 11.05.04.

The extracts from the samples were compared with the procedural blank test waters by a panel of 3 testers. The following results were obtained for the test extracts.

| Extract         | Test water    | Test    | Descriptors                | Threshold dilutions |
|-----------------|---------------|---------|----------------------------|---------------------|
| <b>Sample 1</b> | Chlorine free | Odour   | Chemical/Chemical/Chemical |                     |
|                 |               | Flavour | –                          | --                  |
|                 | Chlorinated   | Odour   | --                         |                     |
|                 |               | Flavour | –                          | --                  |
| Final           | Chlorine free | Odour   | None                       |                     |
|                 |               | Flavour | None                       | <1                  |
|                 | Chlorinated   | Odour   | None                       |                     |
|                 |               | Flavour | None                       | <1                  |

**COMMENT.** On the basis of these results the samples of this product have been found **to conform** with the requirements of BS 6920-1 : Clause 4 when extracted at 85°C.

## 4. GROWTH OF AQUATIC MICROORGANISMS.

Temperature of test : (30±2)°C.

Date test started : 11.05.04.

| Container   | Mean Dissolved Oxygen Difference (MDOD) in mg/L |
|---|---|
| <b>Test product (weeks 5 to 7)</b>                                    | <b>0.8</b>                                      |
| Negative reference (glass) (weeks 5 to 7)                             | 0.1   |
| Positive reference (wax) (weeks 5 to 7)                               | 7.4   |
| Special positive reference  | n/a   |
| Negative control - Mean dissolved oxygen concentration (weeks 5 to 7) | 7.8   |

**COMMENT.** On the basis of these results the sample of this product has been found **to conform** with the requirements of BS 6920-1 : Clause 6.

At the end of this test the test pieces showed no changes in colour and appearance.

## 6. EXTRACTION OF METALS.

Temperature of extraction : (85±2)°C

Date test started : 11.05.04.

The results obtained for the first extract are given below -

| Element              | Unit               | MAC  | Reporting limit | Sample 1      | Sample 2     | Brass Coupling Blank | Reagent blank |
|----------------------|--------------------|------|-----------------|---------------|--------------|----------------------|---------------|
| Aluminium            | Al $\mu\text{g/L}$ | 200  | 15.0            | 16.0          | <15.0        | <15.0                | <15.0         |
| Antimony             | Sb $\mu\text{g/L}$ | 10   | 0.5             | <0.5          | <0.5         | <0.5                 | <0.5          |
| Arsenic              | As $\mu\text{g/L}$ | 50   | 0.8             | <0.8          | <0.8         | <0.8                 | <0.8          |
| Barium               | Ba $\mu\text{g/L}$ | 1000 | 4.0             | <4.0          | <4.0         | <4.0                 | <4.0          |
| Cadmium              | Cd $\mu\text{g/L}$ | 5    | 0.5             | <0.5          | <0.5         | <0.5                 | <0.5          |
| Chromium             | Cr $\mu\text{g/L}$ | 50   | 5.0             | <5.0          | <5.0         | <5.0                 | <5.0          |
| Iron                 | Fe $\mu\text{g/L}$ | 200  | 12.0            | <12.0         | <12.0        | <12.0                | <12.0         |
| Lead<br>Total Effect | Pb $\mu\text{g/L}$ | 50   | 0.5             | 126.3<br>40.2 | 70.7<br><0.5 | 86.1                 | <0.5          |
| Manganese            | Mn $\mu\text{g/L}$ | 50   | 3.0             | <3.0          | <3.0         | <3.0                 | <3.0          |
| Mercury              | Hg $\mu\text{g/L}$ | 1    | 0.05            | <0.05         | <0.05        | <0.05                | <0.05         |
| Nickel               | Ni $\mu\text{g/L}$ | 50   | 2.0             | <2.0          | <2.0         | <2.0                 | <2.0          |
| Selenium             | Se $\mu\text{g/L}$ | 10   | 0.5             | <0.5          | <0.5         | <0.5                 | <0.5          |
| Silver               | Ag $\mu\text{g/L}$ | 10   | 1.0             | <1.0          | <1.0         | <1.0                 | <1.0          |

### **Extract Analytical.**

The analysis of the extracts for these metals was undertaken in the Millharbour Laboratories of Thames Water, UKAS registration number 1258.

*Mercury, arsenic, selenium, antimony, silver and lead* - inductively coupled plasma mass spectrometry [method code 407].

*Aluminium, barium, cadmium, chromium, iron, manganese, and nickel* - inductively coupled plasma optical emission spectrometry [method code 385].

*Analytical Control Data* - these two techniques are in continuous use for analysis of drinking water metals; all of these techniques are fully validated to the requirements of "A Manual on Analytical Quality Control for the Water Industry" (NS 30) and the requirements laid down by the Drinking Water Inspectorate. Each technique has a comprehensive AQC protocol including control solutions and spike recovery testing with each batch of samples for analysis; full details available upon request.

**COMMENT.** On the basis of these results the samples of this product have been found **to conform** with the requirements of BS 6920-1 : Clause 8 when extracted at 85°C.

**CONCLUSIONS.**

**The samples of this product have been tested in accordance with the Audit Test requirements of the Water Regulations Advisory Scheme (WRAS) for use with hot (up to 85°C) and cold water.**

***A copy of this report should be submitted to the Water Regulations Advisory Scheme (WRAS) for further advice concerning this product.***

NOTE : materials and products intended for use by a public water supply company in the preparation or conveyance of water may need to satisfy more comprehensive toxicological requirements as set specified by the Drinking Water Inspectorate. These additional requirements are necessary to ensure legal compliance with Regulation 25 of the Water Supply (Water Quality) Regulations 1989.

**NO OTHER PRODUCTS WERE UNDERTAKEN ON THIS PRODUCT.****NOTES -**

1. The results specified in this report relate to the samples submitted for evaluation and not necessarily to the bulk from which they were taken. Any changes in the nature or source of ingredients and the process of manufacture or application could affect the suitability of the product for use in contact with drinking water.
2. We would draw to your attention that reports issued by the accredited test laboratories do not of themselves constitute approval by the Water Regulations Advisory Scheme (WRAS) or the test laboratory. Only a letter from the Scheme, citing a Directory Reference Number, can be regarded as indicating approval.

**Note for the Water Regulations Advisory Scheme (WRAS) :** The 1<sup>st</sup> extract in the Odour & Flavour of Water Test foamed when shaken.



Caroline Stokell  
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