

DESIGN, DEVELOPMENT AND TESTING

Approval Nos. MOD IINY01 CAA A1/462/55  
DOE Supervisory Scheme for Fire Test Laboratories

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Our ref

Your ref

Date 22nd October 1981

For the attention of Mr. C. Watson

REPORT NO. D70817/3

TOXICITY TESTS ON ONDULINE PANELS

SUMMARY

In order to determine any toxic effect sustained by water collected after catchment by Onduline panels, tests were carried out immersing 0.2 metre square samples in approximately 7 litres water, both at 25°C for 144 hours and at 55°C for 129 hours. A control test was carried out by storing water under similar conditions without Onduline immersed in it. There was no detectable change in taste due to the Onduline immersion and no toxic materials were detected in the water in which the Onduline had been immersed. However, the tar acid content could cause taint problems if the water were chlorinated.

1. INTRODUCTION

This test was authorised by your letter of 22nd April 1981.

2. MATERIALS EXAMINED

The black Onduline sheets used in this test were supplied by you.

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3. EXPERIMENTAL

Seven and a half litres of distilled water were placed in each of four glass containers with lids. Into each of two of these were immersed four pieces of Onduline sheeting, 225mm square, with the edges roughly saw-cut. Two containers, one without Onduline sheets and one with Onduline sheets, were then conditioned at 25°C for 144 hours, while the other two were placed in an oven at 55°C for 129 hours. The containers without Onduline in were used for control purposes.

After the specified time, samples of the immersed water were taken and submitted for analytical examination. The Analyst's Report is given below.

Sample A was a mixture of the two control water samples.

4. RESULTS

	Milligrammes per litre			World Health Organisation standard maximum values
	A	B	C	
Tar Acids	None	0.059	3.8	--
Detergent	None	0.18	0.54	0.20
Lead (Pb)	0.009	0.008	0.010	0.05
Copper (Cu)	0.027	0.011	0.008	1.50
Iron (Fe) ,	0.026	0.048	0.073	0.10
Zinc (Zn)	0.009	0.094	0.099	5.0
Tin (Sn)	0.076	<0.009	0.028	--

The pH value of the original water was 8.1 and that of both treated waters 8.3

Taste

The treated waters could not be distinguished from the original by taste but were distinguishable by colour, and in the case of the "warm" water, by the presence of a sediment and suspended matter.

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### Detergent

The treated waters gave reactions for anionic detergent equivalent to the amounts shown. Both waters frothed when shaken, the "warmer" sample having a more persistent foam.

### Fluorescence

The control sample had no fluorescence under ultraviolet light but the "cool" sample did fluoresce and the "warm" sample fluoresced strongly.

### Metals

All the results for metallic constituents are below the maximum admissible concentrations laid down in the EEC\* directive on the quality of water for human consumption (except that no limit is proposed for tin. The tin content of these waters was less than 1/3000th of that recommended as a maximum level in food). The water with samples immersed at 25°C was also within the levels recommended by the World Health Organisation but the water with samples immersed at 55°C contained too much lead.

### Other Constituents

The two treated waters were also characterised by having absorbed a definite trace of soluble chloride. It is probable that other similarly distinguishing differences could be found.

\* EEC Directive on Potable water supplies. Official Journal of the European Communities L229 Vol. 23, 30 August 1980.

## 5. COMMENTS

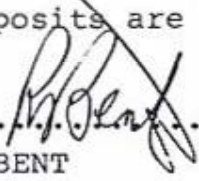
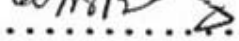
It should be borne in mind that there may have been more concentration of the dissolved substances by evaporation of the warm sample during the initial tests.

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In order to define the water as potable, certain bacteriological tests must be performed. However, we cannot envisage that Onduline will pose any problems in this respect.

The one aspect of the tests which gives concern is the tar acid content. While these are not poisonous, they do, however, give a distinct taint to water when it is chlorinated. We understand that removal of these tar acids cannot be achieved by normal water purification techniques. However, it should be borne in mind that the tar acid concentration could quickly reduce after surface deposits are washed off.

REPORTED BY .....  ..... AUTHORIZED BY .....  .....  
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Head of Chemical Technology Divisional Manager

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