



Technical Service

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Technical Service Report No. B/15/0532

**Evaluating the Antibacterial Activity of Tikkurila AB
Argentum 20 Paint**

19 May 2015

Client:

Tikkurila Oy
Kuninkaalantie 1
FI-01301 Vantaa
Finland

Testing Laboratory:

Thor Specialities (UK) Limited
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Please note that, unless otherwise stated, the conclusions and any recommendations either made or implied, are based on information drawn from examination of the samples identified in this report only. Since these may be influenced by, for example, infection level variations in raw materials, stored component solutions and manufacturing equipment, it is recommended that some appropriate monitoring of microbiological properties be carried out.

1. Objectives

- 1.1 To investigate the anti-bacterial activity of Tikkurila AB Argentum 20 paint when tested according to the ISO 22196: 2011 – Measurement of antibacterial activity on plastic and other non-porous surfaces.

2. Conclusions

The results detailed in Tables 1 and 2 indicate that:

- 2.1 When tested against *Escherichia coli* (ATCC 8739) a value of antibacterial activity of greater than 2.64 was achieved when compared to the reference paint.
- 2.2 When tested against *Staphylococcus aureus* (ATCC 6538P) a value of antibacterial activity of greater than 3 was achieved when compared to the reference paint.

3. Samples

Samples labelled as detailed below were received at the laboratory on 25/03/2015 and testing commenced on 23/04/2015:

Each test specimen was cut to a 50mm x 50mm size :
Tikkurila AB Argentum 20 paint on black scrub panels (P121-10N) to a wet thickness of 300 µm
0-Reference on black scrub panels (P121-10N) to a wet thickness of 300 µm
Laboratory Blank. LDPE to a thickness of 100 µm

4. Test Methods

ISO 22196:2011 Plastics – Measurement of antibacterial activity on plastic and other non-porous surfaces

**Table 1 ISO 22196:2011 Plastics - Measurement of antibacterial activity on plastics and other non-porous surfaces
Escherichia coli – ATCC 8739**

Sample	Value	Number of viable bacteria per cm ² of film			Average log	Value of Antimicrobial Activity
		Rep 1	Rep 2	Rep 3		
Tikkurila AB Argentum 20 Paint (300 µm wet thickness)	A _t	<10	<10	<10	<1	>2.64
0-reference (300 µm wet thickness)	U _t	7.0 x 10 ³	2.5 x 10 ³	5.0 x 10 ³	3.64	-
0-reference (300 µm wet thickness)	U _o	2.3 x 10 ⁴	2.2 x 10 ⁴	2.3 x 10 ⁴	4.36	-
Laboratory Blank	U _o	1.4 x 10 ⁴	1.6 x 10 ⁴	1.5 x 10 ⁴	4.18	-
Laboratory Blank	U _t	2.5 x 10 ⁵	2.9 x 10 ⁵	2.3 x 10 ⁵	5.41	-

Inoculum = 3.75 x 10⁵

U_o = cfu of bacteria immediately after inoculation of untreated test piece

U_t = cfu of bacteria on untreated test piece after 24 hrs at 37°C

A_t = cfu of bacteria on antimicrobial test piece after 24 hrs at 37°C

Value of Antimicrobial activity = Average Log U_t – Average Log A_t

**Table 2 ISO 22196:2011 Plastics - Measurement of antibacterial activity on plastics and other non-porous surfaces
Staphylococcus aureus – ATCC 6538P**

Sample	Value	Number of viable bacteria per cm ² of film			Average log	Value of Antimicrobial Activity
		Rep 1	Rep 2	Rep 3		
Tikkurila AB Argentum 20 Paint (300 µm wet thickness)	A _t	<10	<10	<10	<1	>3
0-reference (300 µm wet thickness)	U _t	9.0 x 10 ³	1.1 x 10 ⁴	1.0 x 10 ⁴	4.00	-
0-reference (300 µm wet thickness)	U _o	6.0 x 10 ³	7.0 x 10 ³	5.0 x 10 ³	3.77	-
Laboratory Blank	U _o	6.5 x 10 ³	6.4 x 10 ³	6.6 x 10 ³	3.81	-
Laboratory Blank	U _t	1.3 x 10 ⁶	2.0 x 10 ⁵	3.0 x 10 ⁵	5.63	-

Inoculum = 2.63 x 10⁵

U_o = cfu of bacteria immediately after inoculation of untreated test piece

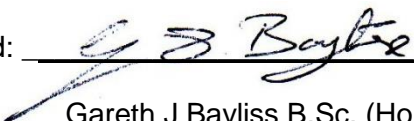
U_t = cfu of bacteria on untreated test piece after 24 hrs at 37°C

A_t = cfu of bacteria on antimicrobial test piece after 24 hrs at 37°C


Value of Antimicrobial activity = Average Log U_t – Average Log A_t

Report Review

The work detailed in this report has been carried out according to the Thor Specialities (UK) Limited Standard Methods of Test. All results have been checked by the responsible person and reviewed by the Laboratory Manager.

Signed: 
Gareth J Bayliss B.Sc. (Hons)
Microbiologist

Date: 20.05.15

Signed: 
Pamela Pratt
Laboratory Manager

Date: 20.05.15

Appendix – Test Methods

ISO 22196:2011 Measurement of antibacterial activity on plastics and other non-porous surfaces

Triplicate 50mm x 50mm of the test material were placed into individual petri dishes. Each sample was inoculated with 0.4ml of a specified test micro-organism and 40mm x 40mm sterile plastic membranes were placed on top. After incubation at 37°C for 24 hours, when the samples and filters were then removed and a viable count was carried out to determine the number of micro-organisms remaining. Based on the control sample, an average log reduction was calculated.

Effectiveness of the Antibacterial Agent

The value of the antibacterial activity can be used to characterise the effectiveness of an antibacterial agent. The antibacterial activity values used to define the effectiveness shall be agreed upon by all interested parties.

Conditions of Test Effectiveness

1. The variation in immediate counts on the untreated test pieces was found to be ≤ 0.2 .
2. The average of the number of viable cells immediately after addition to the untreated test piece for both bacteria fell within the requirement of 6.2×10^3 cells/cm² to 2.5×10^4 cells/cm².
3. The number of viable cells of bacteria recovered from the untreated test pieces after 24 hours exceeded the minimum requirement of 6.2×10^1 cells/cm².