

# Certificate

**Antibacterial Activity / HD-974784-Z**

**UNILIN Division Panels**

**Ingelmunstersteenweg 229 | 8780 Oostrozebeke | Belgium**

**Sample:**

- 1 UNILIN EVOLA – Melamine Faced Chipboard**
- 2 UNILIN EVOLA – HPL (High Pressure Laminate)**
- 3 UNILIN EVOLA – Fibromax Compact MR Black LF+**

According to the report no. 24.8.3.0097, issued on 24 October 2024 we confirm that the above mentioned items were tested at the Hohenstein Laboratories GmbH & Co. KG according to ISO 22196:2011-08 “Plastics – Measurement of antibacterial activity on plastic surfaces”. The items show antibacterial activity. The tests were carried out with the test strains *Staphylococcus aureus* ATCC 6538P and *Escherichia coli* ATCC 8739.

The certificate is valid until 30 November 2026.



Dr. Timo Hammer  
Chief Executive Officer

REPORT: Determination of the Antibacterial Activity of Treated Articles using  
ISO 22196 (*Escherichia coli* and *Staphylococcus aureus*)

CLIENT: Unilin BV Division Panels  
Ooigemstraat 3  
8710 Wielsbeke  
BELGIË

STUDY NO: IMSL2025/01/024.1A

PO REF: 2001984815

REFERENCE: T-2025-035

DATED: 07<sup>th</sup> March 2025

Study Determination of the Antibacterial Activity of Treated Articles using ISO 22196  
(*Escherichia coli* and *Staphylococcus aureus*)

Number IMSL2025/01/024.1A


Client: Unilin BV Division Panels  
Ooigemstraat 3  
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The above study was conducted in the laboratories of Industrial Microbiological Services Ltd at Pale Lane Hartley Wintney, Hants, RG27 8DH, UK. This report represents a true and accurate account of the results obtained.

Start Date 05<sup>th</sup> March 2025

Report Issued 07<sup>th</sup> March 2025

Supervisor Richard Webb  
Laboratory Manager



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Operator David Iredale  
Microbiologist



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## 1 Introduction

This report summarises a study performed to assess the antibacterial performance of Melamine Faced Wooden samples against *Escherichia coli* and *Staphylococcus aureus* using the method described in ISO 22196: 2011.

## 2 Test Materials

Samples of Melamine Faced Wooden samples were supplied by Unilin (Lab samples 02/2025). A sample of unfortified Polypropylene was supplied by IMSL to act as a reference material. All samples were held in the dark at  $20\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$  prior to testing.

The topside of the samples were tested. The backside was marked with a cross.

## 3 Methods

Antibacterial activity was determined using the method described in ISO 22196: 2011 (Ref 1).

### 3.1 Determination of Antibacterial Activity

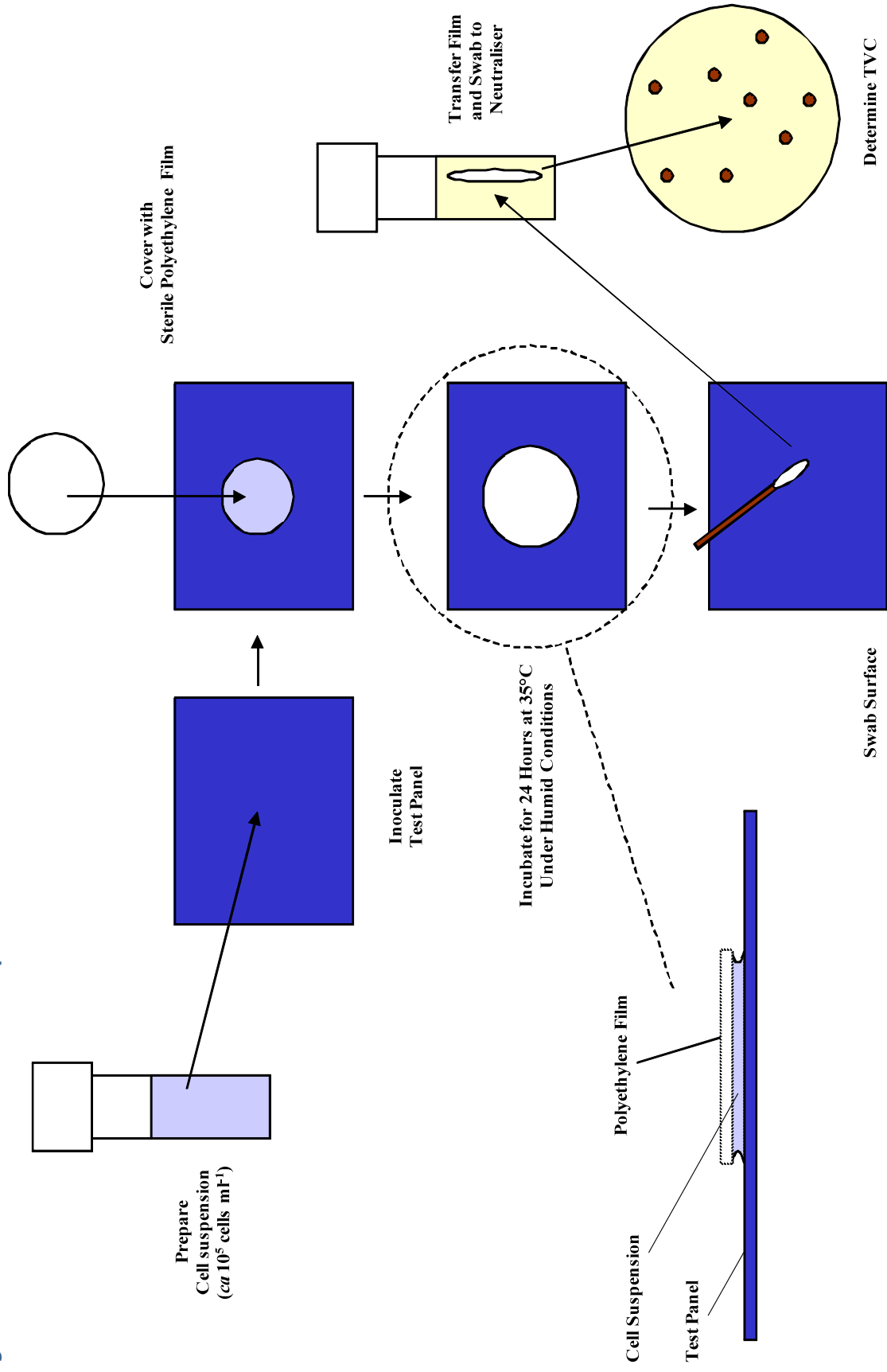
An aliquot (225  $\mu\text{L}$ ) of a log phase cell suspension of either *Escherichia coli* ( $4.9 \times 10^5$  cells  $\text{mL}^{-1}$ ; ATCC 8739) or *Staphylococcus aureus* ( $5.3 \times 10^5$  cells  $\text{mL}^{-1}$ ; ATCC 6538p) prepared using the method described in ISO 22196 : 2011 were held in intimate contact with each of 3 replicates of the test surfaces supplied using a 30 x 30 mm polyethylene film with a thickness of 0.06 mm (cut from a sterile Stomacher bag) for 24 hours at  $35\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ .

The size of the surviving population was determined using the method described in ISO 22196 : 2011. The viable cells in the suspension were enumerated by spiral dilution on to Trypcase Soya Agar (TSA) and by the pour plate method described in ISO 22196. These plates were then incubated at  $35\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$  for 24 hours and then the colonies present were counted.

An additional 3 replicate unfortified surfaces were also inoculated in the manner described above but were then analysed immediately for the size of microbial population present to provide 0-time control data. The method is described schematically in Figure 1 below.

All data were converted to colony forming units (CFU)  $\text{cm}^{-2}$  and then transformed ( $\text{Log}_{10}$ ) to provide a data set that conformed to a Gaussian distribution. Potential outliers were tested using Dixon's *Q*-test ( $P = 0.05$ ).

Figure 1: ISO 22196 : 2011 - Schematic Representation



#### 4 Results / Discussion

The results are shown in Tables 1 - 2 and Figure 2 below. The statistical analysis of the data is shown in Tables 3 - 4 (ANOVA) and Figures 3 - 4 (Confidence Intervals) below.

**Table 1: Activity Against *Escherichia coli*  
(Geometric Mean of Replicates as Colony Forming Units cm-2)**

Sample	Contact Time		Reduction from Initial	
	0 hours	24 hours <sup>‡</sup>	Log <sub>10</sub>	%
IMSL Polypropylene	1.5 x 10 <sup>4</sup>	2.9 x 10 <sup>5</sup>	-	-
MFF DP U827 Taupe	1.5 x 10 <sup>4</sup>	≤ 1.0	≥ 4.2	≥ 99.99
HPL CPL U828 Fresco	1.5 x 10 <sup>4</sup>	3.0 x 10 <sup>1</sup>	2.7	99.80

‡ The theoretical limit of detection is 1 CFU cm

It can be seen from the results above that the population of *Escherichia coli* exposed to the Polypropylene increased in size by 1.3 orders of magnitude over the 24 hour contact interval compared to the initial population. This is considered a normal response for this organism on an inert surface under the conditions imposed by ISO 22196.

In contrast, the population of *Escherichia coli* exposed to the sample of HPL CPL U828 Fresco declined by 2.7 orders of magnitude over the 24 hour contact compared to the initial population.

The population of *Escherichia coli* exposed to the sample of MFF DP U827 Taupe declined by ≥ 4.2 orders of magnitude to below the limit of detection over the 24 hour contact compared to the initial population.

**Table 2: Activity Against *Staphylococcus aureus*  
(Geometric Mean of Replicates as Colony Forming Units cm<sup>-2</sup>)**

Sample	Contact Time		Reduction from Initial	
	0 hours	24 hours <sup>‡</sup>	Log <sub>10</sub>	%
IMSL Polypropylene	1.9 x 10 <sup>4</sup>	2.9 x 10 <sup>5</sup>	-	-
MFF DP U827 Taupe	1.9 x 10 <sup>4</sup>	≤ 1.0	≥ 4.3	≥ 99.99
HPL CPL U828 Fresco	1.9 x 10 <sup>4</sup>	≤ 1.0	≥ 4.3	≥ 99.99

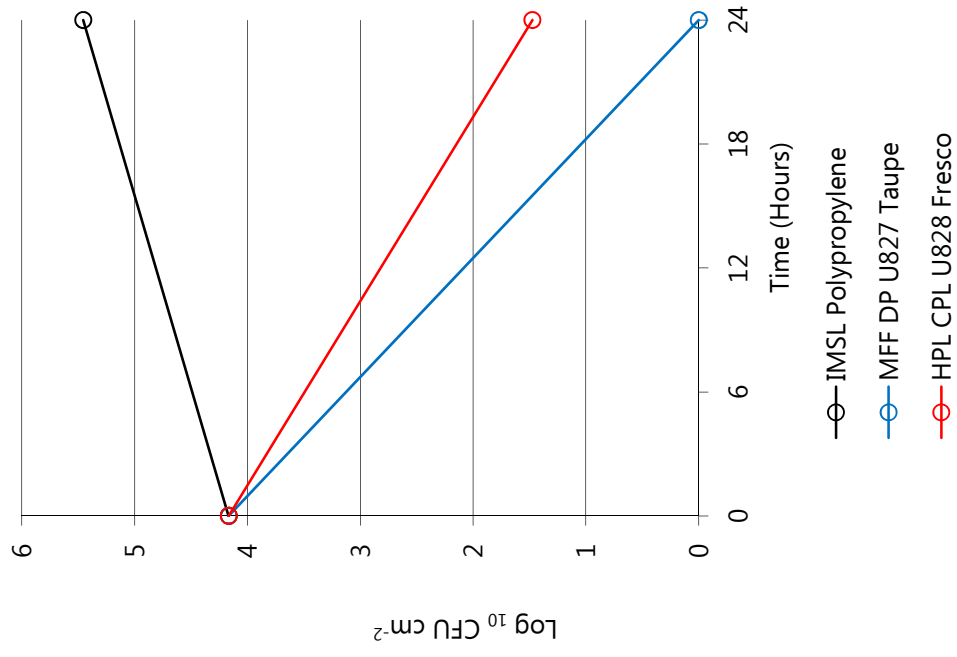
‡ The theoretical limit of detection is 1 CFU cm

It can be seen from the results above that the population of *Staphylococcus aureus* exposed to the Polypropylene remained at a constant order of magnitude over the 24 hour contact interval compared to the initial population. This is considered a normal response for this organism on an inert surface under the conditions imposed by ISO 22196.

In contrast, the population of *Staphylococcus aureus* exposed to the samples of MFF DP U827 Taupe and HPL CPL U828 Fresco both declined by ≥ 4.3 orders of magnitude to below the limit of detection over the 24 hour contact compared to the initial population.

Figure 2: Results as Log<sub>10</sub> CFU cm<sup>-2</sup>

*Escherichia coli*



*Staphylococcus aureus*

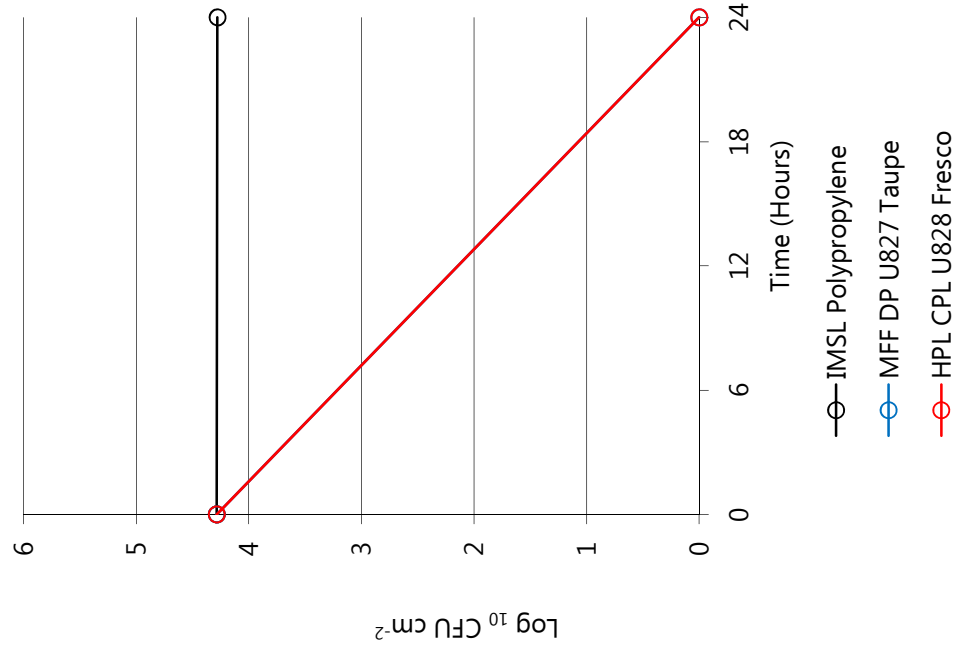


Figure 3: Confidence Intervals of the Data - *Escherichia coli*

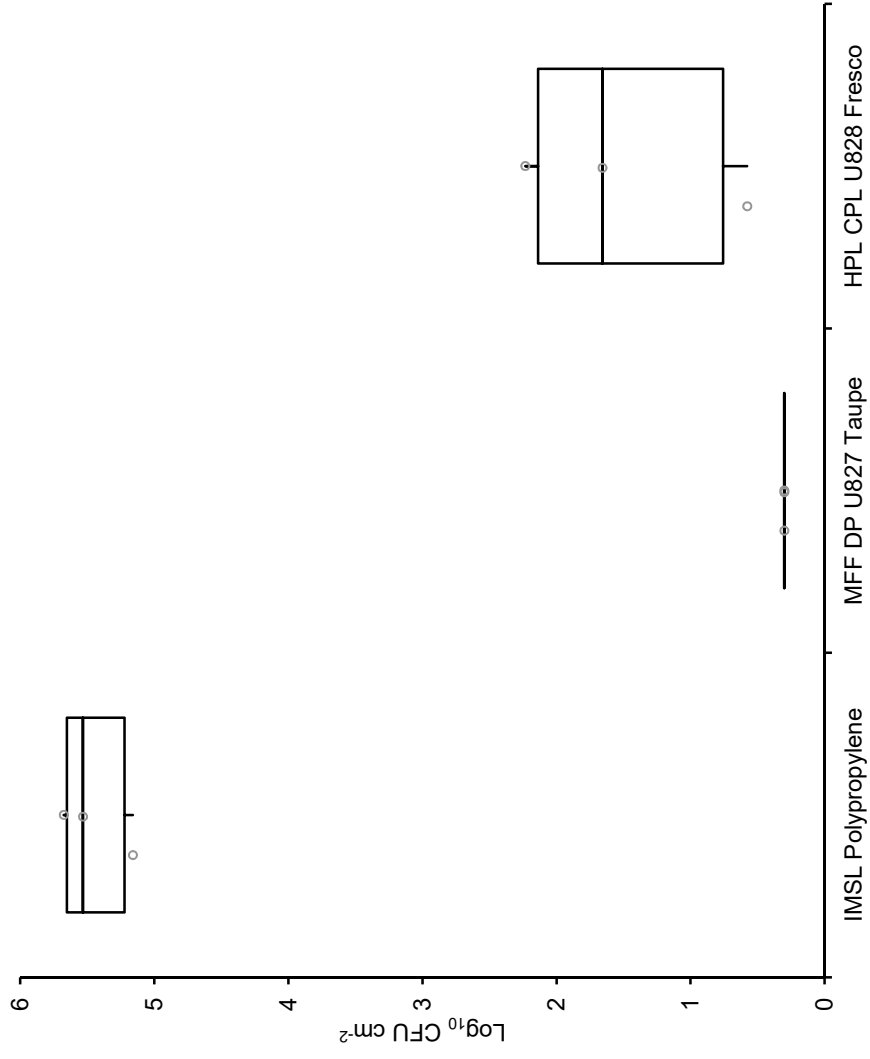
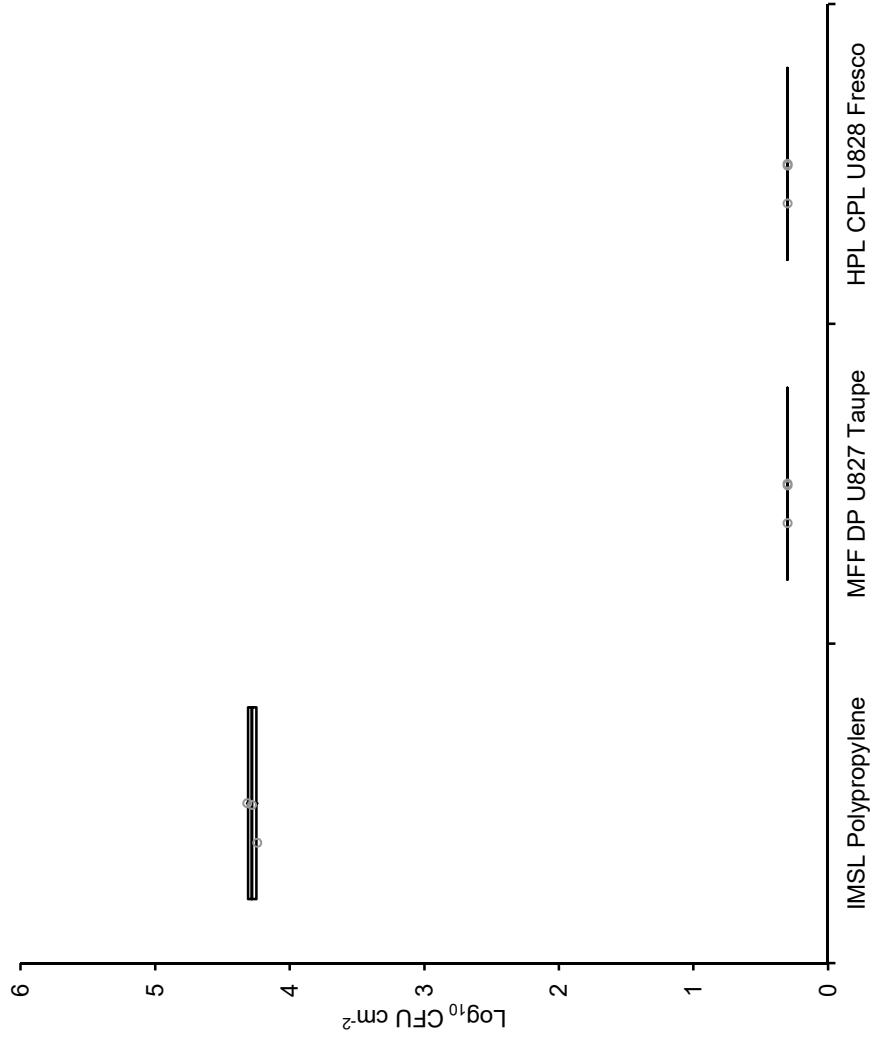


Figure 4: Confidence Intervals of the Data - *Staphylococcus aureus*



## **5 Raw Data**

The raw data for this study will be held in file IMSL2025/01/024.1 in the Archive of IMSL at Pale Lane, Hartley Wintney, Hants, RG27 8DH, UK for 12 years from the date of this report unless other specific instructions are given.

## **6 References**

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

## 7 Exclusion of Liability

The contents of this report are subject to the standard terms and conditions of IMSL as displayed on the reverse of the invoice. Specific attention is drawn to Section 10 restated below.

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  - (ii) the interpretation of the Report and / or the application of the results as stated and / or the accuracy of any advices based thereon
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