



# **Antibacterial Test Report for Melatone**

**Melatone Ltd.**

**692-10 GOJAN-DONG, NAMDONG-KU,  
INCHEON, KOREA**

**WWW.MELATONE.CO.KR**

**PHONE: 82-32-811-8620**

**FAX: 82-32-811-8625**

---

---

## 1 Testing

IFAM tested two coating systems according to JIS Z 2801-2012 (ISO 22196-2011).

In consultation with the customer, the following test organisms were used for all the experiments. Table 1 lists the test organisms and their international reference numbers.

**Table 1: Test organisms**

---

<b>Organisms</b>	<b>Sample Number</b>
<b>Escherichia coli</b>	ATCC 8739, DSMZ 1576
<b>Staphylococcus aureus</b>	ATCC 6538P, DSMZ 346
<b>Salmonella choleraesius (Salmonella enterica)</b>	subsp. enterica Serovar Typhimurium (Syn. <i>Salmonella choleraesuis</i> ) DSMZ 5569
<b>Pseudomonas aeruginosa</b>	DSMZ 1253

---

---

## 2 Coating systems

The test parameters prescribed by the standard are shown in Table 2.

**Table 2: Test parameters according to JIS Z 2801 (ISO 22196)**

Parameter	Description
Reference	50 x 50 x 2 mm, Glass
Samples	50 x 50 x 0.15 mm, Coating
Film	40 x 40 x 0.05 mm PE-Foil (16 cm <sup>2</sup> )
Suspension medium	400 µL 1/500 nutrient broth (NB)
Temperature and contact time	36°C, 24 h
Flush medium / neutralization	9.6 mL SCDLP broth
Kultivierugsmedium	Hefeextrakt-Pepton-Agar (HEA)
Evaluation process	Verdünnungsreihe, Plattengussverfahren (ISO 6222)

Except for slightly elevated viable cell counts per cm<sup>2</sup> ( $U_0$ ) for *Escherichia coli* ( $2.75 \times 10^4$ ) and *Salmonella enterica* ( $3.25 \times 10^4$ ), the test and validation parameters corresponded to the values set down in the standard.

The slightly elevated values had no influence on the test result because even for these test organisms there was complete reduction of the viable cell counts down to the detection limit.

---

---

**Table 3: Test results for antimicrobial activity (log-Reduction, R)**

Organism	Reference		Sample 1		Sample 2	
	$U_0$	$U_t$	$A_t$	$R>^*$	$A_t$	$R>^*$
Escherichia coli	4.44	5.99	-0.20	<b>6.15</b>	-0.19	<b>6.18</b>
Salmonella enterica	4.51	5.52	-0.19	<b>5.72</b>	-0.22	<b>5.74</b>
Staphylococcus aureus	4.38	4.19	-0.17	<b>4.36</b>	-0.24	<b>4.43</b>
Pseudomonas aeruginosa	4.29	6.46	-0.25	<b>6.71</b>	-0.23	<b>6.79</b>

\*  $R = (U_t - U_0) - (A_t - U_0)$

### 3 Conclusions

Tests according to ISO 22196 show that sample 1 and sample 2 coatings had **very high antimicrobial activity** ( $R > 3$ ) for all the bacteria that were tested.

After 24 h contact time on the two coatings, more than 99.99% of the original bacteria were no longer detectable (namely the concentration was below the statistical detection limit of 10 cells per 400  $\mu$ L suspension medium).

---