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Determination of efficacy of JUPOL Antimicrob against fungi

TEST REPORT: Efficacy of JUPOL Antimicrob

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1. CLIENT

JUB d.o.o., Dol pri Ljubljani 28, SI - 1262 Dol pri Ljubljani

2. OBJECTIVE OF TESTING

Determination of efficacy of **JUPOL Anticrob** against fungi relevant for wall growth as specified in standard **EN 15457**

3. PRODUCT PRESENTATION

JUPOL Antimicrob is an interior wall paint used for decorative and antimicrobial protection of walls and ceilings in residential buildings, schools, nursery schools, hospitals, hotels, residences for elderly and other buildings where high hygiene is demanded. The product is a chemical compound characterized by low content of hazardous substances. It has been verified that the product does not contain dangerous and vaporous organic substances and heavy metals. Certified low emission of substances into a place during use is also characteristic of the product.

Classification in compliance with the Act on Biocides Products (Regulation EU/528/2012): protection agent in the building industry (PT10).

JUPOL Antimicrob contains biocidal actives:

- 2,5 g/kg benzyl-C12-16-alkyldimetthylammonium chloride (CAS 68424-85-1)

4. TEST SAMPLES

We tested biocidal paint JUPOL Antimicrob by preparing paint films in three different manners:

- Freshly prepared paint applied
- Artificially aged paint applied (28 days at 45 °C)
- Paint film treated with 200 cycles wet scrub resistance assay in accordance to ISO 11998

5. TEST METHOD

Specimen was tested for resistance against mold growth on dry film of tested paints as listed in section 3 in accordance to standard EN 15457.

5.1: Test organisms used:

- *Aureobasidium pullulans* (DSM 2404)
- *Alternaria alternata* (DSM 12634)
- *Aspergylus versicolor* (DSM1943)
- *Stachybotris chartarum* (DSMZ 2144)

5.2: Test procedure:

- Paint samples applied on filter paper without any biocidal effect by brush in two layers with 1 day drying between 1st and 2nd layer.
- Paint films were stored in standard conditions for 14 days before tests were performed.
- In tests 5x5 cm samples were used.
- Samples were inoculated with 0,2 mL spore suspension of fungi listed in section 4.1 with concentration 10^6-10^7 spores/mL.
- Inoculated samples were incubated at 24 (±1) °C
- Substrate used in test: Malt Agar
- Samples were evaluated after 7, 14 and 21 days of incubation after inoculation.

5.3: Criteria for evaluation of mold growth on paint specimens:

0 – no fungal growth on the surface of specimen
1 – less than 10 % of specimen surface overgrown
2 – 10 – 30 % of specimen surface overgrown
3 – 30 – 50 % of specimen surface overgrown
4 – 50 – 100 % of specimen surface overgrown

6. RESULTS

6.1. JUPOL Antimicrob; Freshly prepared paint applied:

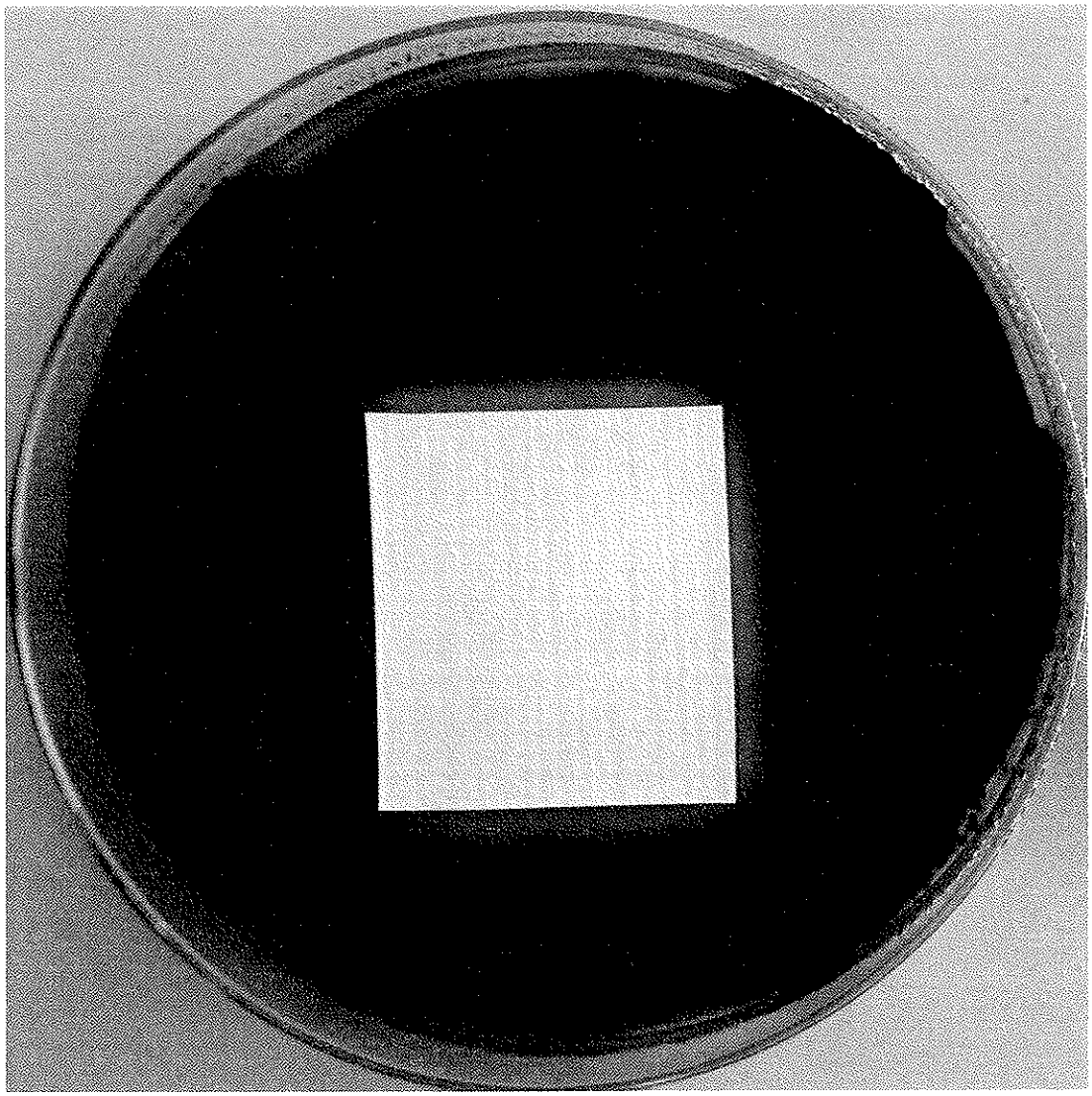

Fig. 1: No fungal growth (0) over the JUPOL Antimicrob observed at 21st day. Inhibition cone is notable.

6.2. JUPOL Antimicrob; Artificially aged paint applied (28 days at 45 °C):

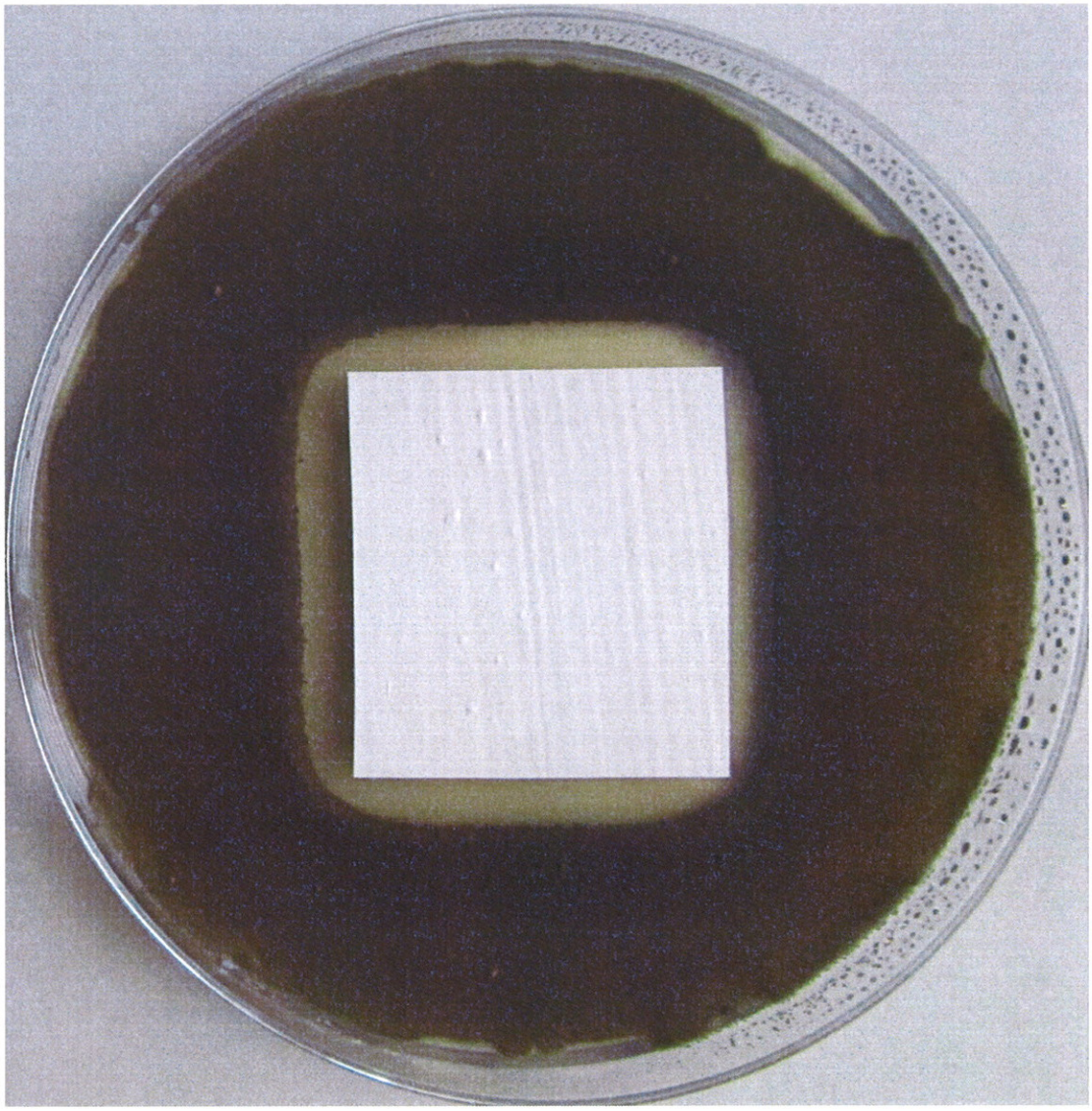

Fig. 2: No fungal growth (0) over the JUPOL Antimicrob observed at 21st day. Inhibition cone is notable and similar to sample without artificial ageing prior to application.

6.3. JUPOL Antimicrob; Paint film treated with 200 cycles wet scrub resistance assay in accordance to ISO 11998:

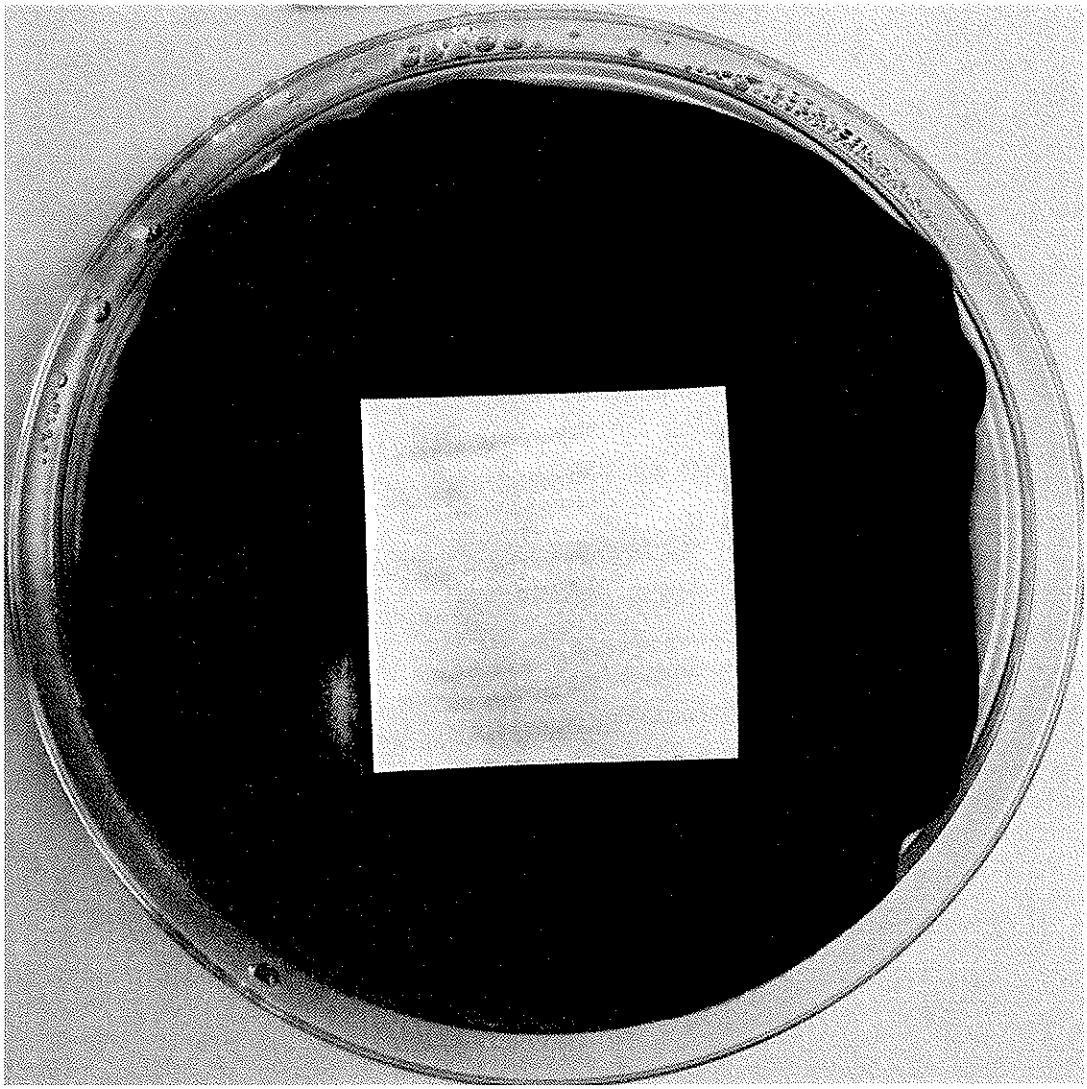

Fig. 3: No fungal growth (0) over the JUPOL Antimicrob observed at 21st day. Inhibition cone is reduced but still notable after wet scrub simulation. Surface appearance has a bit dirty look due to changed surface roughness after wet scrub treatment and consequential dirt pick up resistance reduction.

7. CONCLUSION

Results of the test show efficiency sufficient efficiency of JUPOL Antimicrob, against fungi in accordance to EN 15457. Efficiency is stable also after acelerated aging of liqiud paint, which indicates, that storage stability of the product is not chalanged in therms of antifungal activity. As the active component is benzalconium chloride, it also partially migrates into surrounding area resulting in inhibition cones arround specimens of JUPOL Antimicrob. In practice such migration of active component is expected to have biocidal effect not only on fungal cells indirect contact with JUPOL Antimicrobe surface, but also against fungal cells with indirec contact, like by dust, aerosols, dirt pick up and other manners. Additionally efficiency of JUPOL Antimicrob paint film retains strong activity against fungus also after 200 cycles of wet scrub test in accordance to ISO 11998. It is seen that inhibition cone is reduced after this treatment, partially due to film thickness reduction and partially due to some leeching effect of the active substance during wet scrub test.

According to our findings we suggest restorative painting of JUPOL Antimicrob paint film with fresh layers of the paint if paint film structure is visibly demaged or every 5 years or sooner if paint surface is cleaned very freequently.

Dol pri Ljubljani, February 5th, 2021

Dr. Janez Orehek