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Antibacterial & Antifungal Coatings

AVERT-ALL

Product Function

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Test Certification

Outline Method Statements

www.norigin-sci.com

Continuously Active Antibacterial & Antifungal Coatings

AVERT-ALL Topcoat

PRODUCT FUNCTION

Continuously active antibacterial and antifungal top-coat

Formulated for use in:

- Healthcare
- Areas with high public transit intensities such as rail and mass transit stations, airports, shopping centres, sports stadiums and public entertainment venues.
- Buildings with higher levels of communal occupation such as offices, apartment buildings, schools and universities, military facilities and prisons.

Please refer to Product Selection Guide for further information.

AVERT-ALL is a premium quality water-based coating containing finely dispersed P.T.F.E. having resistance to a wide range of disinfectants and chemicals including formaldehyde, hydrochloric acid (10%), sulphuric acid (10%), nitric acid (10%), formic acid (10%), caustic soda (10%), and benzyl alcohol as well as water and steam.

Ancillary Technical Data Sheets

Technical Datasheets are available for the following ancillary products:

norigin Primer
norigin Basecoat

TECHNICAL SPECIFICATIONS

norigin AVERT-ALL Topcoat

Density:
Application Temperature:
Maximum Relative Humidity:
Volume Solids:
VOC:
Typical Dry Coat Thickness:
Typical Coverage:
Flash Point:
Contains biocide:

Contains nanoparticles:
Micro-porous:
Colour range:

Testing & Approvals

ISO 221961¹:
ASTM G21²:
EEC Food Safety Regulation:
ASTM D2794 Impact Resistance:

ASTM D2486 Abrasion resistance:

ISO 1519 Bend Test:

ISO 2819:2017 Shot Peening Test:

BS 476 part 7- Spread of Flame:
BS 476 part 6- Combustion:

ISO 22196¹

ISO 22196:2021 'Measurement of antibacterial activity on plastics and other non-porous surfaces'

ASTM G21²

ASTM G21:2021 'Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi

Technical

1.08 – 1.18
8 – 30C⁰
85%
ca 35%
<42.2g/litre
ca 40µm per coat
8 – 10m² per litre
N/A Water borne
Yes. US EPA Approved
Yes. EU BPR Approved
No
Yes
Standard colour:
White Available to
RAL & BS4800

Fully tested
Fully tested
93/43 EEC compliant
Surface free from
cracks & delamination
Coating intact after
8,000 abrasion cycles
Coating intact.
No crazing
No blistering. Free
from cracks and
delamination
Class 1
Class 0

Product Function

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UNDERSTANDING TESTING

The efficacy of any antibacterial or antifungal coating can only be assessed by independent laboratory testing. Unsupported claims should be viewed with caution and **The Cynical Specifier's Guide** has been produced to equip a specifier engaged in selecting coatings and finishes with a firm grasp of not only the most threatening pathogens, but also have the knowledge to view coating manufacturer's claims with that cynical eye.

Dry and wet antimicrobial testing are two different methods used to assess the effectiveness of antimicrobial agents or materials in inhibiting or killing microorganisms.

Dry Testing

In dry antimicrobial testing, the antimicrobial agent or material is applied in a dry or solid form to a surface, such as a coating on a medical device or a fabric. The effectiveness is evaluated without the presence of excess moisture or liquid. Dry testing typically evaluates the antimicrobial activity under dry conditions, which may not accurately represent scenarios where moisture is present. It may be suitable for materials or surfaces that are not exposed to liquids.

Wet Testing

Wet antimicrobial testing involves assessing the antimicrobial properties of a substance in the presence of moisture or a liquid medium. This can simulate real-world conditions where microorganisms often come into contact with liquids like water or bodily fluids. Wet testing is designed to mimic situations where antimicrobial materials are exposed to moisture.

It's essential to select the testing method that best simulates the real-world environment to ensure accurate and reliable results. In that real world coatings are exposed to a wide range of differing environments where humidity, condensation and other liquids are a constant.

Two wet test standards are used by **norigin**.

ISO 22196:2021 'Measurement of antibacterial activity on plastics and other non-porous surfaces' is the current international benchmark for testing the efficacy of continuously active antibacterial coatings.

ASTM G21:2021 'Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi' is used to determine the resistance of continuously active antifungal coatings. This test is most appropriate for use when the fungi in question are spore-forming.

ISO 22196 Scope Limitations

One of the limitations of ISO 22196 is that only two bacterial pathogens are required to be tested: gram-positive MRSA and gram-negative E. coli. The problem with this approach is that some antibacterial coating manufacturers then make the assumption that a coating that shows efficacy against MRSA and E. coli will be equally effective against the whole range of dangerous bacterial pathogens. More a leap of faith than rational science.

norigin Scientific tests a wide range of the most dangerous bacterial pathogens including those that present antibiotic resistance.

Testing Non-spore Forming Fungi

To be tested using ASTM G21, fungi need to be spore forming so that they grow/creep over the sample surface. Candida, a yeast, will not do this, but does form countable colonies which make it more suited to ISO 22196 testing. Similarly, Cryptococcus neoformans forms distinct mucoidal colonies on agar. As the colonies are separate, they can be counted, and quantitative methods are generally better for reproducibility and accuracy therefore ISO 22196 is regarded as more appropriate.

INDEPENDENT LABORATORY TEST RESULTS

AVERT-ALL Antibacterial & Antifungal

norigin's products have been tested by independent laboratories to show their proven efficacy against the most dangerous antibiotic and antifungal resistant pathogens.

A synopsis of the results of this testing programme is shown in the attached Table.

These test results are shown for AVERT-ALL which is a combined Antibacterial & Antifungal Coating product.

Copies of individual test certification are available upon request or via download from our website www.norigin-sci.com.

AVERT-ALL TEST RESULTS							
TEST STANDARD	PATHOGEN TYPE	REP. TYPE	PATHOGEN	REDUCTION		TOTAL ELIMINATION*	
				24 HOURS	HOURS	MINUTES	
ISO 22196	BACTERIA		Drug-resistant Streptococcus pneumoniae	≥99.81%	24	3	
			Clostridioides difficile	≥99.44%	24	8	
			Vancomycin-resistant Enterococcus faecium (VRE)	≥99.90%	24	1	
			Methicillin-resistant Staphylococcus aureus MRSA	≥99.87%	24	2	
			Escherichia coli (E. coli)	≥99.89%	24	2	
			Multidrug-resistant Pseudomonas aeruginosa	≥99.89%	24	1	
			Drug-resistant Campylobacter jejuni	99.82%	24	17	
			Klebsiella pneumoniae	≥99.06%	24	14	
			Carbapenem-resistant Acinetobacter (CRAB)	≥99.88%	24	2	
			ESBL-producing Enterobacterales	≥99.17%	24	12	
			Drug-resistant nontyphoidal Salmonella	≥99.89%	24	1	
			Carbapenem-resistant Enterobacterales (CRE)	≥99.44%	24	8	
	FUNGI	NON - SPORE FORMING	Candida albicans	≥99.87%	24	2	
			Candida auris	99.78%	24	3	
			Cryptococcus neoformans	99.03%	24	14	
			Candida glabrata	99.20%	24	11	
			Candida tropicalis	99.74%	24	4	
			Candida parapsilosis	≥99.72%	24	4	

*by extrapolation

ASTM G21	FUNGI	SPORE FORMING	Aspergillus brasiliensis	0	Growth Rating After 28 Days
			Penicillium chrysogenum	1	

ASTM G21 GROWTH RATING	0 = NO GROWTH
	1 = TRACE GROWTH (≤ 10% COVERAGE)
	2 = LIGHT GROWTH (> 10% ≤ 30% COVERAGE)
	3 = MODERATE GROWTH (> 30% ≤ 60% COVERAGE)
	4 = HEAVY GROWTH (>60% COVERAGE)

Method Statements

AVERT

OUTLINE METHOD STATEMENT AVERT COATING SERIES

AVERT-ALL, AVERT-AB and AVERT-AF

1. Preparation

All surfaces prepared to client's requirements in regard to smoothness and finish, in accordance with NBS M60 standard specification. Surface defects removed and faulty substrate repaired and made good (preparation by others).

Why use norigin Basecoat?

norigin's Basecoat is a material which, when applied over a primer, establishes a tough, resistant barrier against moisture and forms a perfect base for paint to adhere to. It creates a smooth, neutral base generally improving the colour consistency of subsequent topcoats.

norigin's Basecoat also incorporates the same biocides that are used in **norigin's** AVERT and DETER Topcoats. Allied with highly packed extenders this extra layer offers added antimicrobial protection in the event that Topcoats are damaged through impact or abrasion.

The use of **norigin's** Basecoat is **optional** but is particularly encouraged where the substrate is highly porous and materials such as plaster and plasterboard are employed.

2. Application of AVERT Surface Systems

2.1 Health & Safety & Protection

Caution signs placed where obligatory and dust sheets laid out where required. Masking tape applied where necessary. Minor surface defects (max. 5%) are made good. For areas beyond natural reach, the use of Industrial Approved Platforms and/or Ladders are implemented where applicable.

2.2 Apply norigin Primer

Surfaces should be sealed or primed using the **norigin** Primer and left to dry. 2-4 hours.

2.3 Apply norigin Basecoat

The **norigin** Basecoat may be applied by roller, brush or airless spray, providing a smooth matt and even-coloured finish. One or two coats may be required. Overcoating interval 4-6 hours. Hard dry in 6-8 hours.

2.4 Apply AVERT-ALL, AVERT-AB or AVERT-AF Topcoat

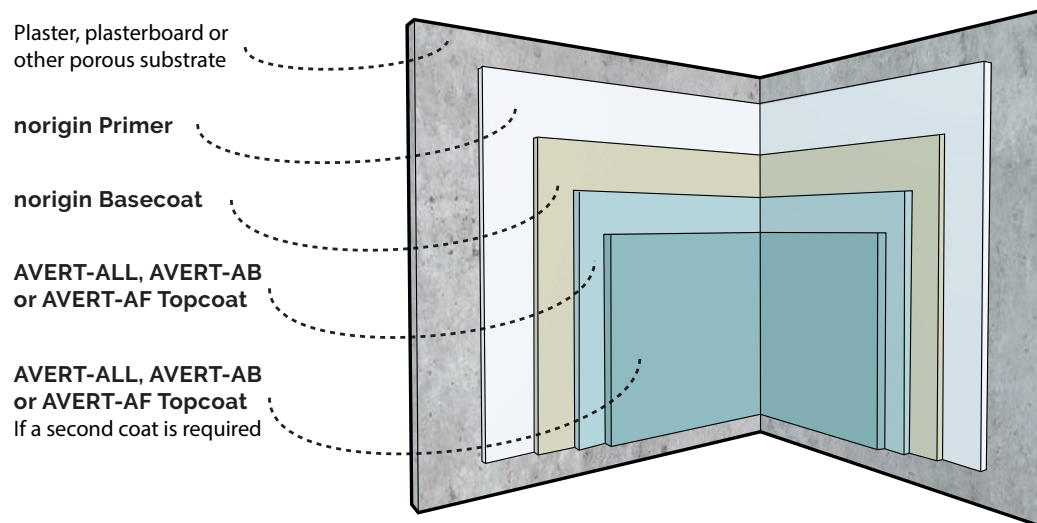
When the applied **norigin** Basecoat is hard dry, the first coat of the selected AVERT Topcoat may be applied by roller, brush or spray and left to dry. 2-4 hours. Once touch dry, the second coat of AVERT Topcoat may be applied by the same method as the prior coat and left to dry. Dust free in 4-6 hours. Hard dry in 6-8 hours. Full properties 5-7 days.



Continuously Active Antibacterial & Antifungal Coatings

Application on general and porous surfaces

- The following application instructions apply to AVERT-ALL, AVERT-AB and AVERT-AF products.
- Seal the surface with a single coat of **norigin** Primer. If the substrate is highly absorbent a second coat of primer may be required.
- When the **norigin** Primer is dry, apply a single coat of **norigin** Basecoat.
- When the **norigin** Basecoat is dry, apply a single coat of AVERT- ALL, AVERT-AB or AVERT-AF Topcoat.
- If required, a second coat of AVERT Topcoat may be applied when the first coat of AVERT has fully dried.



Product	Coverage (m ² /Ltr)	Drying Time (Hrs) (20o C - 60% RH)				Pack Sizes (Ltr)	Recommended Coat Thickness	
		Overcoating	Surface Dry	Hard Dry	Full Properties (Days)		Wet Film (µm)	Dry Film (µm)
norigin Primer ¹	5 - 10	2 - 4	4			25	120 - 130	30 - 40
norigin Basecoat	8 - 10	4 - 6	6			5 & 20	120 - 140	60 - 80
AVERT Topcoat	8 - 10	4 - 6	6 - 8	10 - 12	5 - 7	5 & 20	60 - 80	40 - 60

¹norigin Primer Coverage depends upon the absorbency of the substrate

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Continuously Active
Antibacterial and Antifungal
Wall & Ceiling Coatings