



Environmental Claim Validation Procedure (ECVP)

**Environmental Claim Validation Procedure
(ECVP) for Measuring Microbial Resistance
From Various Sources Using Static
Environmental Chambers**

UL ECVP 2824



ECVP for Measuring Microbial Resistance From Various Sources Using Static Environmental Chambers

Environmental Claim Validation Procedure (ECVP) for Measuring Microbial Resistance From Various Sources Using Static Environmental Chambers, UL ECVP 2824

Edition 2.0, dated December 29, 2023

Summary of Topics

This is the Second Edition of the Environmental Claim Validation Procedure (ECVP) for Measuring Microbial Resistance From Various Sources Using Static Environmental Chambers, UL ECVP 2824, dated 12/29/2023.

Subject to these terms and conditions and those in any other agreements between you and UL LLC., or its affiliates (collectively, "UL Solutions"), you are hereby granted a limited, non-exclusive, non-transferable license to use the Environmental Claim Validation Procedure (ECVP) solely for your internal, non-commercial business purposes. The ECVP is not being sold, and other than the limited license granted herein UL Solutions retains all rights, title and interest (including exclusive ownership) in the ECVP and all copyright therein. UL Solutions reserves the right to regain possession of the ECVP from you at any time. When no longer needed, you agree to destroy the ECVP (if in hardcopy form) or delete and purge the ECVP from your files (if in electronic form). No part of the ECVP may be reproduced, modified, stored in a retrieval system, or transmitted in any form by any means, whether electronic, mechanical photocopying, recording, or otherwise without prior written permission of UL Solutions. You further agree not to create any derivative works from the ECVP or remove or alter any copyright or other proprietary notices in the ECVP. The limited license to use the document shall automatically terminate upon your breach of any of the terms and conditions herein or any other agreement between you and UL Solutions.

UL Solutions provides this ECVP "as is" without warranty of any kind, either expressed or implied, including but not limited to, the implied warranties of merchantability or fitness for any purpose.

In no event will UL Solutions be liable for any special, incidental, consequential, indirect or similar damages, including loss of profits, lost savings, loss of data, or any other damages arising out of the use of or the inability to use this ECVP, even if UL Solutions has been advised of the possibility of such damage. In no event shall UL Solutions' liability for any damage ever exceed the price paid for the license to use this ECVP, regardless of the form of the claim.

Users of the electronic versions of UL Solutions' Environmental Claim Validation Procedure agree to defend, indemnify, and hold UL Solutions' and each of their respective trustees, officers, employees, agents and representatives harmless from and against any loss, expense, liability, damage, claim, or judgment (including reasonable attorney's fees) resulting from any error or deviation introduced while purchaser is storing an electronic ECVP on the purchaser's computer system.



ECVP for Measuring Microbial Resistance From Various Sources Using Static Environmental Chambers

Publisher:

UL LLC

Tracking of versions:

Version	Comments	History
1.0	Release	03/29/2013
2.0	All references from GREENGUARD taken out	12/29/2023

© UL LLC



Content

1.0	SCOPE	6
2.0	GENERAL	6
2.1	Objectives.....	6
2.2	Use	7
3.0	UNITS OF MEASUREMENT	7
4.0	UNDATED REFERENCES	7
5.0	GLOSSARY	7
6.0	PRODUCT SAMPLE COLLECTION, PACKAGING, SHIPMENT, AND DOCUMENTATION ...	9
6.1	Purpose	9
6.2	Personnel	9
6.3	Representative Sample	9
6.4	Sample Preservation	9
6.5	Location of Sampling	9
6.6	Sample Age	10
6.7	Sample Collection Procedures	10
6.8	Packaging and Shipment of Samples	10
6.9	Chain of Custody Documentation	11
6.10	Receipt of Samples by Laboratory	12
6.11	Rejection of Samples by Laboratory	12
6.12	Storage of Samples by Laboratory Prior To and Following Testing	12
7.0	LABORATORY SAMPLE PREPARATION AND ANALYSES	13
7.1	Test Specimen Preparation and Apparatus	13
7.2	Inoculum Preparation and Adjustment of the Concentration	15
7.3	Inoculation of Test and Control Specimen, Harvesting and Dilution Plating	15
7.4	Calculations	16
7.5	Quality Assurance / Quality Control	16
7.6	Microbial Resistance Testing Equipment and Facilities	17
8.0	MOLD GROWTH RATES AND PRODUCT RATINGS	17
8.1	Mold Resistance Rating System	17
9.0	LABORATORY TEST REPORT REQUIREMENTS	18
9.1	Report of the Test Results	18

Appendix A – External References

Appendix B – References and Documents

Appendix C – Terminology – Acronyms and Abbreviations

Appendix D – Symbols

Preface

The following test method incorporates the best-learned practices following ASTM D6329 for using a known mold inoculum for challenging and evaluating building products for their resistance to fungal colonization (mold growth) as support for an Environmental Claim Validation. Examples of materials that can be evaluated are paints and coatings, adhesives and sealants, wallboard, insulation, flooring, ceilings, window components, and many other dry and wet materials. Elements of the test method include sample handling and shipment, sample preparation, product inoculation, environmental chamber exposure, analytical measurement techniques, and mold amplification levels. The quantification of fungal increase provides the basis for a numeric scale rating a material from supporting mold growth (susceptible) to resisting mold growth (resistant).

The assessment relies upon a challenge using a widely occurring biodeteriogenic mold and conditions favorable for the growth of mold. This combination of challenge conditions permits an accelerated test of the ability of a material to resist mold growth. The assessment of mold growth relies upon established mold quantification procedures and yields an objective value of the degree of mold amplification that developed during the challenge. The configuration of the challenge was developed according to ASTM Standard D 6329, "Standard Guide for Developing Methodology for Evaluating the Ability of Indoor Materials to support Microbial Growth Using Static Environmental Chambers."

This document will be updated as new test protocols and standards become available.

Introduction

1.0 SCOPE

1.1 Building materials exposed to environmental conditions and/or with poor maintenance can lead to mold growth. Some materials, especially those that are porous and/or hygroscopic, are more likely than others to support microbial growth. As a result, these materials can become potential indoor sources of bio-contaminants including mold. Common materials susceptible to mold growth include porous materials and those with cellulose substrates. These may include gypsum wallboard, ceiling tile, insulation, textiles, wallcoverings, floor coverings, upholstered furniture, and office panels. In some cases, materials may be treated with anti-microbial agents as a preventive step. The ability of these materials to support or to resist mold growth is often not well documented. A testing protocol has been established to determine how susceptible or resistant a product may be to mold growth. Based on ASTM Standard D6329, this test is designed specifically to address indoor air quality (IAQ) issues. It involves the study of molds most likely to contaminate products and, consequently, contribute to poor indoor air quality. Materials are inoculated with mold and placed in static environmental chambers with elevated humidity conditions. Mold growth is measured over time, and the results will indicate if a product is likely to support mold growth under these pre-defined environmental conditions. This test evaluates the IAQ performance of a product can be used to rank products as to their ability to resist mold growth.

1.2 This test method establishes the procedures for product sample collection, microbial resistance testing and analysis, and reporting.

1.3 This test method is an application of ASTM Standard D6329, "Standard Guide for Developing Methodology for Evaluating the Ability of Indoor Materials to support Microbial Growth Using Static Environmental Chambers."

1.4 The methodology provides a standard means of reproducibly and accurately testing building material under realistic, yet highly controlled, environment conditions.

1.5 The methodology with standardized measurement and analysis provides consistent testing of materials within a product group and across product groups.

1.6 This methodology is applicable for newly manufactured products before they are used in construction. Products taken from inventory or from within buildings can also be studied but these may be soiled or precontaminated. Resultant data may not be considered representative of newly manufactured products.

1.7 This test method is applicable to newly manufactured products and may not serve as a predictor of mold resistance based on long term usage of product, with exposure to soil and varying environmental conditions.

1.8 While this test method categorizes a new building material's resistance to mold growth, it does not assess the human risk involved with use of the materials as an end user.

1.9 This test method does not purport to address safety concerns, if any, associated with the use of this test method. It is the responsibility of the user of this protocol to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

1.10 This test method can be expanded to evaluate environmental insults such as soiling, or use additional or alternate mold types, upon agreement by the involved parties.

2.0 GENERAL

2.1 Objectives

2.1.1 Measure resistance to mold growth of building materials, furnishings and finishes.

ECVP for Measuring Microbial Resistance From Various Sources Using Static Environmental Chambers

2.1.2 Application of ASTM Standard D6329 for quantitatively measuring the resistance to mold growth of building materials, furnishings, and finishes.

2.1.3 Measurements of mold growth resistance that can be used to rank products.

2.1.4 Provide material mold resistance data to manufacturers for assistance in product development.

2.1.5 Provide mold resistance material rating to assist specifiers and users in selecting proper materials for building use.

2.1.6 Provide mold resistance material rating for building moisture management programs and certifications.

2.2 Use

2.2.1 Provide measurements of mold growth with spiked (inoculated) mold on defined materials.

2.2.2 Provide quantitative and objective measurements of colony-forming-units (cfu) as the metric of growth.

3.0 UNITS OF MEASUREMENT

3.1 For the purposes of this procedure, values shall be reported in accordance with the requirements of the individual criterion. If the manufacturer's choice of units deviates, that change shall be documented and justified as to the reason and relevance for that change.

4.0 UNDATED REFERENCES

4.1 Any undated reference to a code or standard appearing in the requirements of this procedure shall be interpreted as referring to the latest edition of that code or standard.

5.0 GLOSSARY

5.1 Amplification - The act or result of increasing the quantity of microorganisms.

5.2 Absolute Humidity (H) - A measure of the amount of water vapor in the air; expressed as grams of water per grams of air.

5.3 Accuracy - The degree of conformity of a value generated by a specific procedure to the assumed or accepted true value; includes both precision and bias.

5.4 Chain-of-Custody (COC) - A document providing written evidence of the transfer of a product sample, air sample, or another document from one organization to another organization or from one individual to another individual within the same organization. The document is signed and dated by each party involved in the transfer.

5.5 Concentration - The number of colony forming units or spores per unit of air or water volume expressed at standardized conditions for temperature and humidity (i.e., 298K, 101.3 kPa or as cfu/ml)

5.6 Colony - Macroscopically visible growth.

5.7 Colony Forming Unit - The measure of culturable fungal units, such as spores, clumps of spores or portions of hyphae.

5.8 Coupon - A representative sample of material used for testing, cut to the required size for MRT analysis.

5.9 Inoculation - The act of introducing a microorganism (inoculum) onto the test material.

5.10 Inoculum - Viable test microorganism introduced onto a material by implanting a measured amount onto the surface or substrate.