

1 **IICRC S520 Standard for Professional Mold Remediation**

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3 **Second Limited Public Review: Substantive Changes (January 2024)**

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5 Draft shows Proposed Changes to Current Standard

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7 **Note to Reviewers:** *These changes are indicated in the text by underlining (for additions) and strikethrough*
8 *(for deletions). Only these changes to the current standard are open for review and comment at this time.*
9 *Additional material is provided for context only and is not open for comment except as it relates to the*
10 *proposed changes.*

11
12 **A.2 Purpose**

13
14 Any deviation should be specified in writing with full disclosure to the client of the deviation, the rationale, and
15 reference to the LCCC section.

16
17 **B Definitions**

18
19 **Cleaning:** The process of removing unwanted substances from an environment or material.

20
21 **Condition 1** (normal fungal ecology): an indoor environment that, may have settled or airborne mold spores or
22 fragments, or traces of actual mold growth and constituents, that are reflective of a ~~normal fungal ecology for a~~
23 ~~similar~~ clean and dry indoor environment.

24
25 **Condition 3** (actual mold growth): an indoor environment contaminated with the presence of mold growth that
26 is active ~~or~~ dormant, dead, non-viable, visible or hidden.

27
28 **Decontamination:** the process of removing contaminants that have accumulated on personnel and equipment.

29
30 Decontamination protects workers from mold and other substances that may contaminate and eventually
31 permeate the protective clothing, respiratory protection, tools, vehicles, and other equipment used on site; it
32 protects site personnel by minimizing the transfer of contaminated materials into clean areas; and it protects
33 the non-work spaces by limiting release of contaminants from the remediation area.

34
35 All personnel, clothing, equipment, and materials leaving the contaminated area of a site (generally referred to
36 as the Remediation Zone) ~~must be~~ should be decontaminated to remove contaminants that may have adhered
37 to them.

38
39 **Encapsulant (Carpet Cleaning):** a component of an aqueous detergent that dries to a crystalline structure or
40 forms a brittle film that binds soils and prevents additional soils from adhering to the cleaned substrate. Some
41 crystalline types may be removed quickly through routine vacuuming and foot traffic while the film forming types
42 may be more durable. Encapsulants can vary in structure and composition depending on the desired effect and
43 application.

44
45 **Encapsulant (Restoration):** a coating or sealant formulated to be applied over an existing contaminant in a
46 building that will provide a permanent barrier between the coated substance and the living
47 environment. Encapsulants are commonly used in the abatement of asbestos-containing materials and lead-
48 based paints as an abatement method because of the relatively lower cost and lesser generation of airborne
49 contaminants and hazardous waste versus removal. In mold remediation work, no coatings or chemicals
50 should be used to overcoat contaminants instead of source removal by cleaning. Mold contamination
51 (Condition 2 and 3) should be removed, and should not be encapsulated in lieu of cleaning. Fungicidal coatings
52 and Mold-resistant coatings are used after mold removal to lockdown residual contaminants, as well as deter
53 future mold growth. cp. "fungicidal coatings, mold- resistant coatings, encasement".

55 **Encapsulation** - the process of applying an encapsulant.

56
57 **Fungicidal coatings:** EPA-registered antimicrobial sealants designed to deliver antimicrobial activity on pre-
58 cleaned surfaces, while also providing long-term inhibition of fungal growth on treated surfaces. Fungicidal
59 coatings kill, at the time of application, residual mold and mildew present after pre-cleaning or the use of a
60 disinfectant sanitizer. Fungicidal Coatings should not be used as encapsulants over mold growth (Condition
61 3). Fungicidal Coatings are paint-like in application method and appearance. cp. “fungicide, mold-resistant
62 coatings”.

63
64 **HEPA:** an acronym for “High Efficiency Particulate Air,” which describes an air filter that removes 99.97% of
65 particles at 0.3 microns in diameter. **HEPA:** see HEPA filter.

66
67 **HEPA filter:** High Efficiency Particulate Air filter; an air filter that removes a minimum of 99.97% at 0.3 micron
68 (0.3 μm) size particles. that pass through the filter. Particles of this size are called the Most Penetrating Particle
69 Size (MPPS), which represents the worst-case particle capture efficiency.

- 70 ▪ Particles both larger and smaller than 0.3 microns will be captured at efficiencies better than
71 99.97% efficiency; capture efficiency of smaller and larger particles have been shown to exceed
72 99.99%. Thus, HEPA filter media is sufficiently effective for removing those particles commonly
73 referred to as 'fine' or 'ultra-fine' by the mold industry, this includes mold spores and fragments.
- 74 ▪ For respirator filters in the USA, NIOSH designates a HEPA filter as filter class "100".
- 75 ▪ Micron, Micrometer (syn.); one-millionth of a meter; also written variously as 10^{-6} m, 0.000001
76 meter, or 1/1,000,000th of a meter.
- 77 ▪ HEPA filters capture particles through three interrelated and simultaneously occurring processes,
78 interception, impaction, and diffusion.

79
80 **HEPA vacuum:** a vacuum cleaner which has been designed with a High Efficiency Particulate Air (HEPA) filter
81 as the last filtration stage (See HEPA). ~~A HEPA filter is a filter that is capable of capturing particulates of 0.3~~
82 ~~microns with 99.97% efficiency. The vacuum cleaner must be HEPA vacuum is~~ designed so that all the air
83 drawn into the machine is expelled through the HEPA filter with none of the air leaking past it. ~~HEPA vacuums~~
84 ~~must be operated and maintained in accordance with the manufacturer's instructions.~~

85
86 **Mold-resistant coatings:** coatings and sealants that contain EPA-registered antimicrobials intended to inhibit
87 mold growth on or in the coating film. Mold-resistant coatings should not be used as encapsulants over mold
88 growth (Condition 3), but are intended for use after mold removal. Mold-Resistant Coatings are for fungistatic
89 inhibition only, do not claim to kill or disinfect microbial growth, and are paint-like in application method and
90 appearance. cp. “fungicidal coatings”.

91
92 **Normal fungal ecology (Condition 1):** ~~see 'Condition 1' definition, an indoor environment that may have~~
93 ~~settled spores, fungal fragments, or traces of actual growth whose identity, location, and quantity are reflective~~
94 ~~of a normal fungal ecology for a similar clean and dry indoor environment.~~

95
96 **Porosity:**

- 97 ▪ **non-porous:** materials that do not absorb or adsorb moisture ~~or those that have been surface treated~~
98 ~~and do not easily support fungal growth~~ (e.g., finished wood, glass, metal, plastic); For the purposes of
99 this Standard, non-porous surfaces are considered cleanable for both Condition 2 and Condition 3.
- 100 ▪ **porous:** materials that easily absorb or adsorb moisture and, ~~if organic, can easily support fungal~~
101 ~~growth~~ (e.g., drywall, carpet, clothing and other textiles, padded or upholstered items, leather,
102 taxidermy, paper goods, many types of fine art). Porous surfaces are generally not cleanable for
103 Condition 3 but may be cleanable for Condition 2.
- 104 ▪ **semi-porous:** materials that absorb or adsorb moisture slowly and, ~~if organic, can support fungal~~
105 ~~growth~~. Semi-porous surfaces may or not be sufficiently cleanable and must be determined on a case-
106 by-case basis.

108 **Preliminary determination:** an initial set of conclusions drawn by the restorer from the collection, analysis,
109 and summary of information obtained during an initial inspection to identify areas of moisture intrusion and
110 actual or potential mold growth and the need for assistance from other specialized experts.

111
112 **Preserve (verb):** to stabilize and accept items that are irreplaceable items that but cannot be returned to
113 Condition 1 maintained in a state where further mold damage will not occur to that item.

114 115 **1.1 Provide for the Safety and Health of Workers and Occupants**

116
117 ~~Employers should perform a~~ A hazard assessment shall be performed to determine the hazards present, and
118 implement adequate engineering controls and safe work practices.

119 120 **1.2.1 Assessment**

121
122 When a preliminary determination indicates that mold contamination exists or is likely to exist, if confirmation of
123 Condition is ~~required~~ requested, an assessment should be performed prior to starting remediation. ~~An IEP may~~
124 ~~be used for this purpose.~~

125 126 **1.4 Contamination Removal**

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128 Attempts to kill, encapsulate, or inhibit mold instead of proper source removal generally are not adequate. The
129 Standard emphasizes source removal by physical methods, therefore utilizing spray, fog, foam, gas, or other
130 remediation approaches, as a stand-alone process, is a deviation from this standard of care.

131 132 **2 ~~Equipment, Tools, and Materials (ETM)~~ Mold Cleaners, Antimicrobial Chemicals, and Coatings** 133 **as Remediation Tools**

134 135 **2.1.2 Chemicals (Antimicrobials, Stain Removers, Cleaning Products) – Limitations of Use**

136
137 ~~Antimicrobials, stain removers, and cleaning solutions~~ No liquid product (antimicrobials, stain-removers , and
138 cleaning solutions) should be used as an alternative to ~~cleaning procedures that result in~~ the physical removal
139 of mold contamination.

140 141 **2.1.3 Cleaner, Stain-Remover and Antimicrobial Application Considerations**

142
143 Remediators shall follow label directions carefully and explicitly for efficacy, safety, and compliance with
144 regulations. Improper use of cleaners, chemicals, and coatings of all types can have unintended consequences
145 (i.e., misuse can harm humans, pets, wildlife and property). If an application of a pesticide is not listed on the
146 container label it is illegal to use for that application (i.e., electrostatic spray application) per the EPA enforced
147 Federal Insecticide, Fungicide, and Rodenticide Act.

148
149 To prevent or reduce misuse, remediators should:

- 150
- 151 ▪ understand and be able to explain the purpose and efficacy of applying antimicrobial products to kill
 - 152 microorganisms; and
 - 153 ~~▪ provide label, SDS, and other information for each chemical product or antimicrobial device to the client;~~
 - 154 and
 - 155 ▪ document details of use for all chemical and coatings products utilized in remediation.
- 156

157 To inform the stakeholders in advance of product use, it is recommended that the label, SDS and other
158 information for each chemical product or antimicrobial device is provided to the client.

159
160 Disinfectants and sanitizers selected for mold remediation should be properly registered by the AHJs as
161 fungicides. The remediator should not state that a disinfectant, sanitizer, or fungicide has any ongoing or future

162 antimicrobial efficacy beyond use in the present moment unless specifically claimed to do so on an EPA
163 registered product label.

164 **3 Building and Material Science**

166
167 ~~Remediators should~~ It is recommended that remediators understand building systems and related physical laws
168 in order to remediate a contaminated building and return it to its intended function.

169 **7.2.1 Health Complaints**

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171
172 If occupants' express health concerns or have medical questions during the inspection process, remediators should
173 instruct them to seek advice from qualified health-care professionals, ~~public health authorities, or IEPs.~~ Remediators
174 should not give advice, education, or warnings on subjects outside their areas of expertise. ~~Occupant health~~
175 ~~complaints or concerns should be referred to an IEP or other specialized expert with knowledge of mold-related~~
176 ~~health.~~

177 **9.1.1 Inspection/Monitoring Tools**

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179
180 Maintaining air pressure differentials and containment integrity should be monitored and managed regularly (e.g.,
181 manometer, containment poly direction, indicator smoke) ~~by using a combination of a manometer and indicator~~
182 ~~smoke.~~

183 **9.1.7 Ozone Gas and ~~Vapor Phase Biocides~~ Other Antimicrobial Devices**

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185
186 Ozone and biocides intended for use and delivery as a gas or vapor should not be used to attempt to kill mold as
187 part of the remediation process and should not be used as a substitute for source removal. This includes utilizing
188 a variety of chemicals and technology as a stand-alone remediation process; including hydroxyl radical generators,
189 UV lights, photo catalytic oxidation, fogging of enzymes, diffusion of essential oils, or other techniques employed as
190 an alternative to physical removal of the fungal material. Antimicrobial devices shall be registered by the responsible
191 AHJ.

192 **9.2.1 Isolation/Critical Barriers and Source Containments**

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194
195 Air supply and returns, building openings and fixtures in the remediation area should be sealed with critical barriers.
196 Exposed polyethylene should be rated fire retardant and should not interfere with the operation of the HVAC system.
197 If necessary, it is recommended a specialized expert (e.g., HVAC contractor) be engaged.

198 **9.3.3 Containment Set-up**

199
200
201 Remediators should:
202 ▪ use 6mil flame retardant polyethylene, when using polyethylene;

203 **9.3.5 Containment Maintenance**

204
205
206 Remediators should:
207 ▪ maintain a minimum of 4 Air Changes per Hour (ACH) with the air being drawn from the entry across
208 the work area to the furthest point before exhausting directly outside if possible;

209 **11.1 Inspection and Evaluation for Restorability**

210
211
212 The restorability of contents is dependent upon the following factors:

- 213
214 ▪ condition of the contents;
215 ▪ basic material composition of the contents;

- 216 ▪ complexity of the item's construction, particularly for internal voids where contamination could be trapped
217 and difficult to remove;
218 ▪ cost of remediation;
219 ▪ financial value or cost of replacement; and
220 ▪ other types of value (e.g., sentimental, legal, artistic, cultural, historical).

221 222 **11.2 Removing Contents from Affected Areas**

223
224 Contaminated or potentially contaminated contents should be appropriately packaged or decontaminated, when
225 moved into or through uncontaminated areas (Condition 1) to prevent the spread of contaminants into unaffected
226 areas and the exposure of workers or occupants to contaminants. Before removing potentially contaminated contents
227 from a contaminated area to an uncontaminated ~~a cleaner~~ area or to another location, the remediator or other
228 qualified professional should:

- 229
230 ▪ inspect all contents prior to inventory and ~~separate affected from~~ protect unaffected contents where practical;
231 ▪ document the condition of the contents, including actual or perceived value of one or more of the “other
232 types of value” mentioned above;
233 ▪ photo-document the placement and condition of contents; and
234 ▪ ensure that clients agree and authorize disposal of contaminated contents in writing before disposal.

235 236 **11.3.5 Cleaning Condition 2 or Condition 3 Contamination from Contents**

237
238 When cleaning contents with Condition 2 or 3 contamination, the remediator should evaluate factors related to the
239 item when determining the viability of remediation, including but not limited to:

- 240
241 ▪ extent and depth of contamination;
242 ▪ complexity of the item's construction, particularly for internal voids where contamination could be trapped
243 and difficult to remove;
244 ▪ material composition (e.g., density, tightness of fabric weave, texture, fragility);
245 ▪ assembly (e.g., stability, access to contaminated surfaces);
246 ▪ malodors (i.e., persistence of odors); and
247 ▪ cost of restoration (Refer to section 11.4 *High Value and Irreplaceable Items*).

248 249 **12 Post Remediation Verification**

250
251 At a minimum, remediation completion criteria ~~should will include~~ verify return to Condition 1; and, remaining
252 materials are dry, the work area is free of visible dirt, dust, debris, malodors, and visible mold growth.

253
254 Any changes should be agreed upon by the IEP and remediation contractor.

255 256 **References**

257 5. ~~American College of Occupational and Environmental Medicine (ACOEM), *Evidence-Based*~~
258 ~~*Statement—Adverse Human Health Effects Associated with Molds in The Indoor Environment,*~~
259 ~~(2002).~~

260
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262 indoor microbial contaminants. J Air Waste Manag Assoc. 2008 May;58(5):647-56. doi: 10.3155/1047-
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