



NE — AIHA

**Strengthening Scopes
in Mitigation of Environmental
Hazards in Buildings**

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Fiberlock Technologies, Inc.

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Fiberlock- Introduction



- Andover, MA based manufacturer of specialty coatings and chemicals since 1984
- Reputation:
 - Quality, Knowledge, and Science.
 - Excellent, Flexible, Highly Personalized Customer Service.
- We recognize the value and role of the consulting professional
- The right product for the right application

Fiberlock Technologies, Inc.

- 66 products available for environmental hazards in the living environment
- Solutions for
 - Microbial Contamination/Indoor Air Quality
 - Specialty cleaning/disinfecting
 - H1N1, MRSA
 - Asbestos (encapsulation & removal)
 - Lead-based paint (encapsulation & removal)
 - Catastrophe & Water/smoke/fire damage restoration
- Kontrol Kube
 - Portable containment/anteroom for airborne particulate in medical construction/renovation &/or Bioterror/Pandemic

...the obligatory
disclaimer...

If you come away from this
presentation with a better
feel for questions to ask,
we accomplished
something today.



Chemical confusion?

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- Chemicals are difficult to intuitively evaluate
 - Can't see, smell, feel efficacy
 - No obstacles to outlandish, bizarre claims
- Environmental hazards in buildings can generate powerful emotions and interests
- Regulatory requirements of minimum performance, accurate labeling/marketing help, but...
 - Slow introduction for new hazards
 - Waning understanding for old hazards

Scope Pitfalls



- Common fear of product choice responsibility
 - None of us can be experts in everything
 - Coatings and chemicals can be arcane
 - Everyday pressure to multitask, produce quickly
 - Perception of protection in vague specifications
 - Move choice to contractor, building owner
- And yet, product choice can be crucial
 - Wrong product, incorrect use can result in unintended consequences, increased cost and the pain to the client of trial and error

Scope Solutions



- Cultivate paper and personal gurus
- Paper:
 - Incorporate and reference regulations and industry standards
 - Utilize third-party, non-manufacturer based approval lists and databases
 - When applicable, require performance testing from independent and certified testing laboratories to demonstrate compliance
- Personal:
 - We can't know everything, but we can know who to call
 - Manufacturers: reputation, institutional memory, references

Encapsulation (Asbestos, Lead)

- Barrier coating
- Applied over an undesirable substance to prevent release into / contact with living environment
- Abatement \neq Removal
- Abatement $=$ Removal, Enclosure *or* Encapsulation with approved materials



Abatement is permanently lead-safe, asbestos-safe, etc.

Interim Control is temporary risk reduction – i.e., applying ordinary paint.

ASTM E-1795



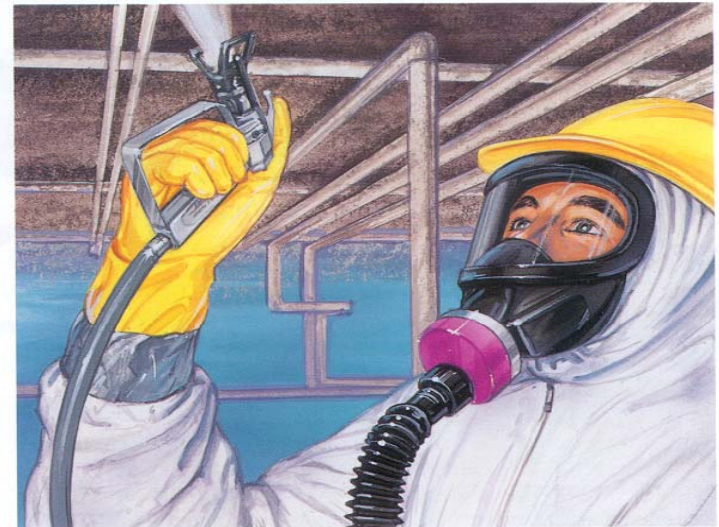
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- Performance Protocol for lead-based paint encapsulants
 - The performance standard for all LBP encapsulants
 - Must pass to be considered an abatement method
 - Otherwise just paint
 - Determines minimum film thickness = application rate
 - Referenced in HUD Guidelines and EPA regulations, and (implicit or explicit) in regulations of all 50 states
- Utilize state approval lists based on E-1795, list minimum dry film thickness
 - Some also indicate required 20-year warranty
 - Most stringent: MA, CT, OH, NY
 - Coming soon: NH (N.B.-anti-ingestant required!)

Encapsulating Fireproofing

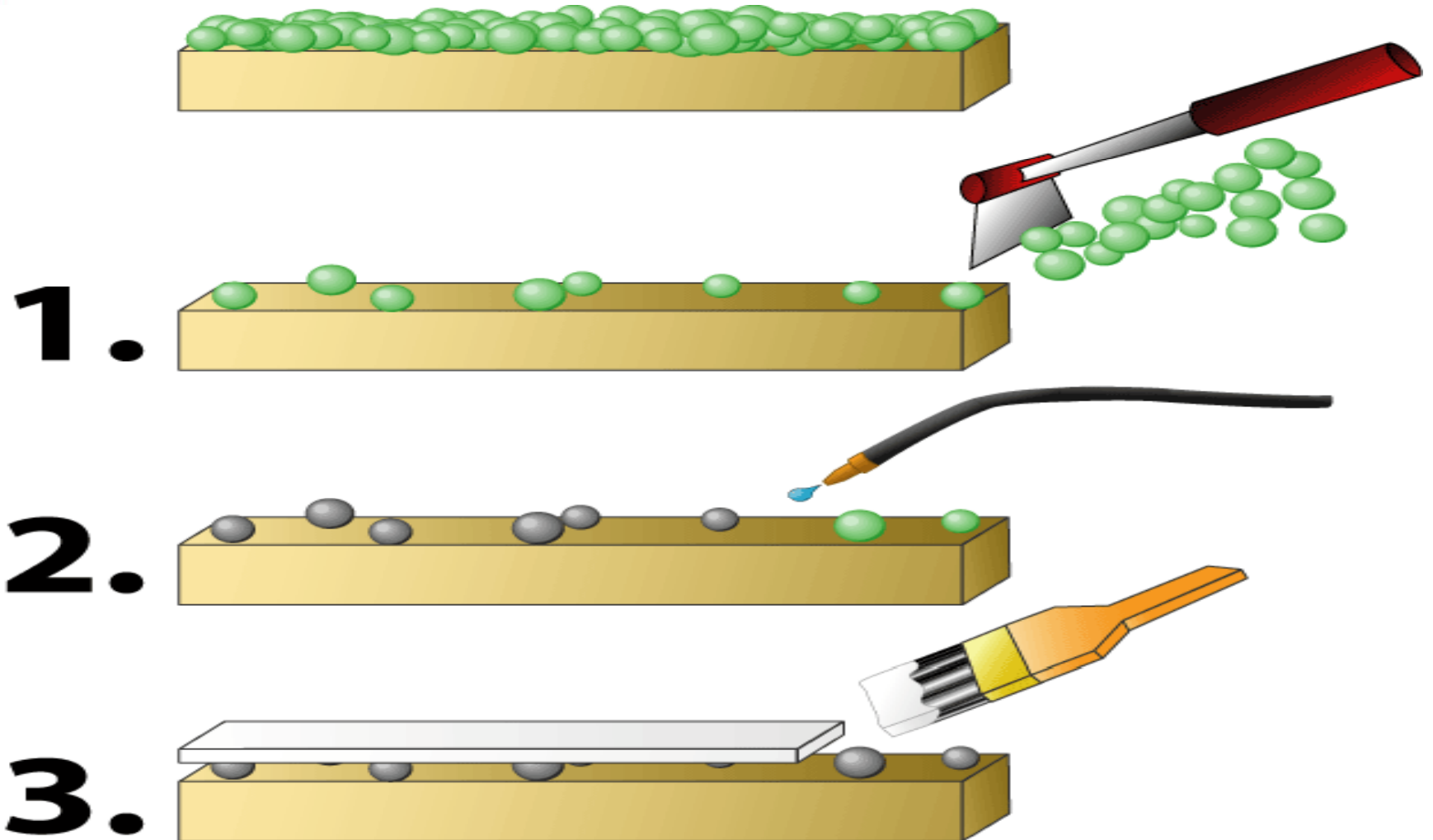
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- ‘Penetrating’ encapsulant
 - Binds up fibrous material
- Bridging encapsulant
 - Seals outer surface
- EPA/Battelle Labs testing (1981)
 - Determined which products are ‘satisfactory’
 - 17 products found to be acceptable; 5 available and still used today
- Less expensive and time consuming than removal



Clean, Kill, Coat

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Mold Remediation Process

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Fix water intrusion!

Dry & Dehumidify

Remove unsalvageable material

Clean infested surfaces

Disinfect and sanitize

Dry surfaces

Prime surfaces if necessary

Apply mold resistant coating

Allow coating to dry, then rebuild

Clean

Kill

Coat

Myth: It doesn't matter what we use to kill mold

- Antimicrobials are designed to kill and/or control microbial growth
- Any product with 'antimicrobial' claims on its label must be registered with EPA for sale and/or use in US
 - Must also be registered with each state
 - Must display 'EPA Registration Number' on label
- Illegal to use an antimicrobial product 'in a manner inconsistent with its labeling'
 - Federal offense
 - A trap/tripwire if the worst happens - litigation

Sanitizers vs. Disinfectants



- **Disinfectants**
 - Generally registered for hard, non-porous surfaces
 - Kill infectious microbes, not necessarily their spores
- **Sanitizers**
 - Registered to control or reduce the number of microbes to a safe level
 - Can be registered for use on certain types of porous materials
- Most products are limited to only hard, non-porous surfaces.
- ***Heavily damaged, infested porous materials should always be removed/replaced whenever possible***

“Black Water”

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- Only a few antimicrobials have sewer backup and river flooding EPA-registrations, commonly referred to as:
 - “Black Water”
 - Seawater
 - Ground water
 - Rivers & streams
 - Sewage
 - Water stagnant for multiple days
 - Clean Water is Black Water within 7 days
 - Now referred to as Condition 1, 2, or 3 water

Soil Load / “Clinical Relevance”

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- When demonstrating efficacy, antimicrobials are tested in the presence of an organic soil load
 - EPA minimum of 5% soil load
 - Some manufacturers aim for “greenish” marketing and label safety claims by testing with no soil load
 - There are manufacturers that proactively choose to test to higher soil loads
- A “real world” situation is more closely replicated in the laboratory, where contamination does not self-dilute down to 5%.
- US EPA does not require such extreme testing, but it is a way to identify efficacy in actual field conditions.

Websites for Antimicrobials

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- Need some Verification?
 - EPA
 - <http://oaspub.epa.gov/pestlabl/ppls.home>
 - PPIS CERIS (Purdue)
 - <http://ppis.ceris.purdue.edu/htbin/ppismenu.com>
 - Links to state databases
- What about subregistered labels: New York
 - <http://magritte.psur.cornell.edu/pims>

IICRC S520

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- One of the most recent Mold Standards
 - Revision a 4 year, 8 month effort
 - ANSI accredited
- A document for remediators
 - State of the art / State of the practice
 - Many improvements; many concerns addressed – but still by no means perfect
 - Extensive CIH and remediator participation in revision



Where to look in S520

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- **Post-Remediation Materials, Considerations And Alternative Methodologies**
 - Added to end of E-T-M Chapter to cover a variety of techniques
 - Section includes chemicals, as well as dry heat, UV, ozone, gas/vapor-phase biocides
- **Structural Remediation**
- **HVAC**
- **Contents**



Coatings and Sealants: Efficacy

- ASTM G-21 Mold resistance
 - ‘0’ rating = best score
 - 21 day exposure
- ASTM D-3273 Mold resistance
 - ‘10’ rating = best score
 - 35 day exposure
- ASTM D-1653 Permeability
 - 2-5 perms indicates breathable for <15% M.C.
 - Sometimes a vapor barrier (<1 perm) is a benefit
- ASTM E-84 Flame Spread/Smoke Development – Class “I” (formerly Class “A”)
- HVAC Sealants – also NFPA 90A/90B
 - ASTM tests C-411 and E-84
 - C-411: Exposure to superheated air
 - E-84: Burn Testing: Flame Spread, Smoke Developed

Unless a coating is a registered product, there are no minimum performance testing requirements. Use products from proactive manufacturers that test at independent laboratories, and make the complete testing report public!



THANK YOU!!!

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Overflow

The following slides contain information for which there is not likely to be sufficient time for presentation, but the information was developed in researching this presentation, and it may be helpful.

S520 – More to know

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- Standard vs. Reference Guide
 - and we follow which?
 - “The Standard summarizes most of the...important procedures..., while the Reference Guide restatesthose procedures and....provides additional background. ...the two sections complement one another and *should always be considered in tandem.*”



Mold Remediation Process

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ShockWave – Specific Microbial Registrations

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- While most products offer only a general claim of efficacy against viruses, germs, bacteria and fungi, ShockWave offers an extraordinary range of specific EPA-registered performance against over 130 microorganisms commonly involved with water damage and mold remediation

Partial Microorganism List

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Isolates From AIDS Patients

Aspergillus niger
Candida Albicans
Cryptococcus neoformans
Pseudomonas aeruginosa
Staphylococcus aureus
Streptococcus pneumoniae

Gram Positive Clinical Isolates

Enterococcus faecalis
Micrococcus luteus
Staphylococcus aureus
Staphylococcus aureus
(Toxic Shock)
Staphylococcus epidermidis
Staphylococcus
saprophyticus
Streptococcus haemolyticus

Gram Negative Clinical

Isolates Acinetobacter
calcoaceticus var. anitratus
Acinetobacter calcoaceticus
var. Iwoffii
Bordetella bronchiseptica
Brevundimonas dimunita
Burkholderia cepacia
Enterobacter agglomerans
Enterobacter cloacae
Enterobacter gergoviae
Enterobacter liquefaciens
Escherichia coli (Urinary)
Escherichia coli (Wound)

Flavobacterium
meningosepticum
Hafnia alvei
Klebsiella oxytoca
Klebsiella pneumoniae
Morganella morganii
Proteus mirabilis
Proteus vulgaris
Pseudomonas
aeruginosa
Pseudomonas
fluorescens
Pseudomonas
pseudomallei
Pseudomonas putida

Partial Microorganism List

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Pseudomonas stutzeri
Serratia marcescens
Sphingomonas
paucimobilis

Other Bacteria

Actinobacillus
pleuropneumoniae
Actinomyces pyogenes
Bacillus cerus
Brevibacterium
ammoniagenes
Bordetella bronchiseptica
Burkholderia picketti
Campylobacter jejuni
Chryseomonas luteola
Corynebacterium
ammoniagenes

Corynebacterium
pseudotuberculosis
Enterobacter aerogenes
Escherichia coli
Escherichia coli strain
0157:H7
Escherichia coli culneris
Legionella pneumophila
Listeria monocytogenes
Neisseria gonorrhoeae
Pasteurella haemolytica
Pseudomonas aeruginosa
Rhodococcus equi
Salmonella cholerausuis
Salmonella schottmuelleri

Salmonella typhi
Shigella dysenteriae
Staphylococcus auricularis
Staphylococcus capitis
Staphylococcus hominis
Staphylococcus simulans
Stenotrophomonas
maltophilia
Streptococcus equi var.
equi
Streptococcus equi var.
zooepidermicus
Streptococcus pyogenes
Streptococcus salivarius
Treponema pallidum (ATCC
#27087)

Partial Microorganism List

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Pathogenic Fungi

Trichophyton mentagrophytes

Environmental Fungi

Aspergillus candidus

Aspergillus niger

Penicillium chermesinum

Penicillium oxalicum

Penicillium spinulosum

Ulocladium sp.

Non-Human Viruses

Avian Influenza/

Turkey/ Wisconsin Virus

Canine Herpesvirus

Duck Hepatitis B Virus

Equine Herpesvirus

Equine Influenza

Feline Calicivirus

Feline Infect. Peritonitis

Infectious Bovine

Rhinotracheitis (IBR)

Newcastle Disease Virus

Porcine Parvovirus

Pseudorabies Virus

Transmissible

Gastroenteritis

T1 bacteriophage

T4 bacteriophage

Antibiotic Resistant

Gram Negative Rods

Pseudomonas aeruginosa
(resistant)

Escherichia coli (Sulfa,

Klebsilla pneumoniae

type 1 (Cephalothin,

Ampicillin, Sulfa and

Tetracycline resistant)

Morganella morganii

(Penicillin and

tetracycline resistant)

Enterobacter

agglomerans (Ampicillin

and Sulfanilimide

resistant)

Tetracycline, Ampicillin

and Penicillin resistant)

Klebsiella oxytoca

Partial Microorganism List

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Antibiotic Resistant Gram Positive Rods

Enterococcus faecalis
(Vancomycin Resistant-
VRE)

Enterococcus faecium
(Vancomycin Resistant-
VRE)

Staphylococcus aureus
(Methicillin-MRSA,
Penicillin G, Ampicillin,
Cefaeolin, Cefatoxime,
Chloramphenicol,
Ciprofloxacin,
Clindimycin,
Erythromycin, Ozacillin,
Rifampin and
Tetracycline Resistant)

Staphylococcus epiderimdis
(Drug Resistant)

Human Viruses

Adenovirus type 2

Cytomegalovirus

Echovirus II (30 minute
contact time)

HBV (Hepatitis B Virus)

Herpes Simplex type 1
Virus

Herpes Simplex type
Virus

HIV-1 (AIDS Virus)

Measles Virus

Poliovirus type 1 (Chat
strain)

Vaccinia Virus

Influenza A/Brazil Virus

Influenza A/Victoria
(H3N2) Virus

Influenza A2-Asian
Virus

Influenza B Virus (Allen
Strain)

Influenza C Virus
(Taylor Strain)

Parainfluenza type 1

M.R.S.A. The “superbug”!

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- MRSA – Periodic HOT media story (New? vs. News?)
 - Community Acquired Infection
 - Hospitals
 - Schools
 - Athletics-Athletic Surfaces / Health Clubs
 - Opportunity for professional cleaning/remediation
 - EPA-registered disinfectants with specific MRSA kill claim (including products with VRSA/VISA)
 - Also EPA-registered for other pathogens?:
 - YES → Hepatitis, HIV, Norovirus, Enterococcus, Coronavirus, Rotavirus, Streptococcus...

SW Use Dilution

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- Labels and MSDS for mixed solution of ShockWave concentrate are available
 - Use solution is stable for 64 days!!!
 - Authorized by EPA
 - EPA Label Review Manual, Chapter 18
 - “Although the agency does not require labels on secondary containers, it will allow registrants to provide labels to users for secondary containers that are used to apply or temporarily store enduse pesticides as long as the labels that accompany the secondary container are ‘not inconsistent’ with the EPA approved label...”