Spec It Right: Know Your Durable Coated Fabrics – Reduce Failures and Advance Understanding using the Durable Coated Fabric Programming & Selection Guide for Healthcare

AAHID Education Session

November 12, 2020
11am-1pm EST
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American Academy of Healthcare Interior Designers
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Important Notes!

• This session will feature a live Q&A with the speakers. Submit your questions by clicking the Q&A box at the bottom of your screen, and they will be answered at the end of the session.

• Questions related to technical issues can also be entered in the Q&A box, and they will be answered immediately by our producers.

• This session is being broadcast over Zoom Webinar. For best performance, it is recommended that you close any other applications on your computer that could prevent you from getting the most out of this session.

• You can find specifics regarding CEU accreditation for this session in the Attendee Resources tab on the home page of HCD Virtual.
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Jane Rohde, AIA, FIIDA, ASID, ACHA, CHID, LEED AP, BD+C, GGA-EB. Principal JSR Associates Inc
**Learning Objectives:**

#1. Demonstrate knowledge of durable coated fabric construction, performance characteristics, field reporting, challenges of cleaning and disinfecting processes and procedures.

#2. Recognize the challenges and benefits of conducting real-world, third party lab tests and field studies to evaluate the impact of environmental contaminates, cleaning chemicals, and methods on 24/7 heavy duty durable coated fabrics.

#3. Provide background and demonstration of the “Durable Coated Fabric Programming and Selection Guide for Healthcare” to evaluate, prioritize, and inform selection of durable coated fabrics appropriate to your projects.

#4. Evaluate multiple attributes when specifying durable coated fabrics to improve successful outcomes.
#1. Demonstrate knowledge of durable coated fabric construction, performance characteristics, field reporting, challenges of cleaning and disinfecting processes and procedures.
Jargon Alert!

Upholstery materials are all called "fabrics"
...they are either durable coated fabrics
or woven textile fabrics

Fabric memo samples have a label that provides information about material composition and testing,
Designers call this a "Memo Tag"
Manufacturers call this a "Sample Ticket"

These terms can be used interchangeably
What are durable coated fabrics?

Coated Fabrics
represent a family of fully coated textiles that can be considered “non-porous”.

Coated Fabrics
Are NOT a textile with a coating applied to the yarn.

Choices are:
PVC – Polyvinyl chloride (vinyl)
PU – Polyurethane (PU)

Silicone – relatively new to the Coated Fabrics market

Thermoplastic Elastomers – very new, used in roofing products for years
Construction Basics

PVC Cross Section
- Clear Protective top-finish critical to durability
- Skin-coat – 0.006” – 0.008”
- Foam Layer – 0.020” – 0.040”
- Textile Backing

Polyurethane Cross-Section
- ~ .002” Skincoat* Critical to Durability
- Adhesive coating
- Textile/PU Base

*Best: Polycarbonate – High resistance to hydrolysis
Good: Polyether – Good resistance to hydrolysis
Fair: Polyester – Low resistance to hydrolysis

Thermoplastic Elastomers
- .020” – 0.25” Single ply Coating
- Textile Backing

Silicone Coating
- .010” – 0.12” Single ply Coating
- Textile Backing

Slide content courtesy of Ronnie Bell, Technical Manager OMNOVA 2018
Are you experiencing this?

Soiling?
Staining?

Cracks?
Puddling?

Delamination?
Fading from Sunlight and Ultraviolet Light Exposure?
Do you have a room like this?

Cost to Reupholster? > $700,000

Were you told, “this is only happening at your hospital”.
What happened?

...furniture cleaned in real-world healthcare environments are not being cleaned as recommended by manufacturers.

The result? ... premature upholstery failure, disgusted patients, & frustrated staff.
February of 2017, in an airport shuttle to attend Design Connections, several healthcare designers, in-house and consultants, expressed their frustration with persistent coated fabric failures. We shared our stories, experiences and photos.

Continuing the discussion with fellow AAHID-CHID, and other industry partners, we realized...

We were ALL having the same problems!
We decided to work together to try to do something about it!
Healthcare interior designers and architects

Fabric manufacturers/distributors

Trade Associations

Environmental Services representatives

Furniture manufacturers/distributors

DCF TASK GROUP
The **Durable Coated Fabrics (DCF)** Task Group was born...

Comprised of volunteers & peers representing:
- Healthcare interior designers and architects
- Fabric manufacturers/distributors
- Furniture manufacturers/distributors
- Trade Associations
- Environmental Services representatives

Since 2017 in meetings & monthly conference calls we’ve discussed issues of **performance & durability**, polled the industry for information on current practices, supported durability field testing, shared information, and advanced collaborative collegial dialogue within our industry.

Since 2019 DCF has affiliated with AAHID

Updates are posted on the AAHID LinkedIn page to continue the dialog. *We need each others help!*
In 2018 AAHID & DCF surveyed 150+ Healthcare Designers, asking...

When evaluating an upholstery material for your healthcare environments, what are your main issues?

...the response was overwhelming...

#1 Performance & Durability 38%

#2 Cleanability 24%
#3 Aesthetics 18%
#4 Warranty 11%
#5 Cost 6%
#6 Sustainable (Green) 3%
Data gathering, with the help of AAHID, the DCF task group gathers information to better understand the magnitude of product failures within acute care, outpatient care, and long-term care failures, including associated costs, and potential solutions.

Cleaning and Disinfection Survey; to collect data on cleaning/disinfection products & procedures being used, from Environmental Services, Facility Management, and Designers:
https://www.surveymonkey.com/r/J6W3PDX

Healthcare Durable Coated Fabrics Upholstery Failures Survey; to provide data regarding actual problems and failures of various types of durable coated fabrics used in healthcare across the U.S.
https://www.surveymonkey.com/r/HKBW67B

Healthcare Furniture Failures Survey; to provide data on the challenges of various furniture items used in healthcare across the U.S.
https://www.surveymonkey.com/r/7NSKHD5
https://www.surveymonkey.com/r/7MGW896
Our conclusion?

Industry standard fabric tests do not reflect real world healthcare conditions!

Manufacturer recommended cleaning & disinfecting procedures are not happening.

...and then along came SARS-CoV-2/COVID-19....
On March 9th I received this email from Southwest Airlines (emphasis mine)

Aircraft Cleaning: We spend between 6-7 hours cleaning each aircraft every night, and, as of March 4, 2020, we have enhanced our overnight cleaning procedures. Typically, we use an EPA approved, hospital-grade disinfectant in the lavatories and an interior cleaner in the cabin. Now, we are expanding the use of the hospital-grade disinfectant throughout the aircraft, and it will be used in the cabin, on elements in the flight deck, and in the lavatory. This goes beyond the standard CDC guidelines.

Anyone care to guess what’s going to happen to **surface materials** which were **not** specified for environments, ...which are now routinely cleaned with **high risk healthcare** cleaners and disinfectants?
We live in a Covid-19 world now highest risk healthcare cleaners, & disinfectants, are being used extensively in non-healthcare industries;

Transportation, Hospitality, Education, & Workplace

How soon before they are all experiencing accelerated upholstery and surface material failures?

It’s probably already begun....
These materials were not specified for this kind of cleaning, so *when* they fail, these designers/owners may also hear

“*you didn’t clean them according to our recommendations*”

and

“*we’ll provide you with more of the same material*”

Our new reality is that we all need to plan for expensive upholstery replacements!
The primary responsibility of a **Professional Healthcare Interior Designer** is to safeguard the health, safety, and welfare of our patients, visitors and staff.

We cannot be compelled to specify a product that we do not consider to be the best selection for our projects.

We talk to each other.
We trust each other.
We share **real world** information and expertise.

This comes with the responsibility to always speak the **truth** to the best of our ability.
#1. Demonstrate knowledge of durable coated fabric construction, performance characteristics, field reporting, challenges of cleaning and disinfecting processes and procedures.
Cleaning & Disinfection Paradigms and Innovative Technologies

Presented by:
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CleanHealth Environmental
Risk Management Training Solutions

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How does COVID-19 Spread?

- Person-to-person
  - Between people who are in close contact with one another (within about 6 feet)
  - Via respiratory droplets produced when an infected person coughs or sneezes.
- Contact with infected surfaces or objects
- Through feces
- Airborne

“This virus has many routes of transmission, which can partially explain its strong transmission and fast transmission speed.”

- China CDC
# Organisms Outside Human Body

<table>
<thead>
<tr>
<th>Microbe</th>
<th>Survival time outside human body</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Clostridium difficile</em> (spores)</td>
<td>5 months</td>
</tr>
<tr>
<td><em>Acinetobacter</em> spp.</td>
<td>3 days to 5 months</td>
</tr>
<tr>
<td><em>Enterococcus</em> spp. including VRE</td>
<td>5 days – 4 months</td>
</tr>
<tr>
<td><em>Pseudomonas aeruginosa</em></td>
<td>6 hours – 16 months</td>
</tr>
<tr>
<td><em>Klebsiella</em> spp.</td>
<td>2 hours to &gt; 30 months</td>
</tr>
<tr>
<td><em>Staphylococcus aureus</em>, inc. MRSA</td>
<td>7 days – 7 months</td>
</tr>
<tr>
<td>Norovirus (and feline calicivirus)</td>
<td>8 hours to &gt; 2 weeks(^1)</td>
</tr>
<tr>
<td>SARS Coronavirus</td>
<td>72 hours to &gt;28 days(^2)</td>
</tr>
<tr>
<td>Influenza</td>
<td>Hours to several days(^3)</td>
</tr>
</tbody>
</table>

Adapted from Kramer et al. *BMC Infect Dis* 2006;6:130.

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SARS-CoV-2 (COVID-19) compared to SARS-CoV-1

<table>
<thead>
<tr>
<th>Media</th>
<th>SARS-CoV-1</th>
<th>SARS-CoV-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerosols</td>
<td>3 hours</td>
<td>3 hours</td>
</tr>
<tr>
<td>Plastic</td>
<td>72 hours</td>
<td>72 hours</td>
</tr>
<tr>
<td>Stainless Steel</td>
<td>48 hours</td>
<td>48 hours</td>
</tr>
<tr>
<td>Cardboard</td>
<td>8 hours</td>
<td>24 hours</td>
</tr>
<tr>
<td>Copper</td>
<td>8 hours</td>
<td>4 hours</td>
</tr>
</tbody>
</table>

Virus Structures

- **Non-enveloped virus**
  - Hardy, resistant to many active ingredients
  - Picornoviridae (Polio, Enterovirus, Hepatitis A, Rhino)
  - Parvovirus
  - Calicivirus, Norovirus
  - Adenovirus
  - Rotavirus

- **Enveloped virus**
  - Easier to kill; less hardy
  - Coronavirus
  - Hepatitis C
  - Paramyxoviridae (Parainfluenza, RSV, Measles, Mumps)
  - Herpesviridae (Herpes, CMV)
  - Vaccinia
  - Hepatitis B
  - Influenza
  - HIV-1
# Resistance of pathogens to disinfectants

<table>
<thead>
<tr>
<th>Pathogens</th>
<th>Example</th>
<th>Low-level Disinfection</th>
<th>Intermediate-level Disinfection</th>
<th>High-level Disinfection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prions</td>
<td>Mad Cow Disease</td>
<td></td>
<td></td>
<td>Peracetic acid / hydrogen peroxide blends</td>
</tr>
<tr>
<td>Bacterial Spores</td>
<td>Clostridium difficile</td>
<td></td>
<td>underside of orange bar</td>
<td>Bleach and Hydrogen peroxide</td>
</tr>
<tr>
<td>Mycobacteria</td>
<td>Tuberculosis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nonlipid or small viruses</td>
<td>Norovirus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fungi</td>
<td>Athletes foot</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vegetative bacteria</td>
<td>MRSA, VRE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lipid or medium viruses</td>
<td>HIV, SARS-CoV-2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Certified Healthcare Environmental Services Technician

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Cleaning Agents Commonly Used in Healthcare

**Bleach**: sodium hypochlorite - intermediate level disinfectant

**Hydrogen Peroxide**: Can be either a low or intermediate level disinfectant

**Alcohol**: Isopropyl and ethyl alcohol at 55-70%, usually used in combination with quaternary ammonium salts or as 70% isopropyl alcohol

**Quaternary Ammonium (Quats)**: low level disinfectants that will kill most bacteria, viruses and fungi.
How to Clean and Disinfect

Surfaces

- Cleaned with detergent or soap and water prior to disinfection
- For disinfection:
  - EPA-registered household disinfectants
  - Additionally, diluted household bleach solutions (at least 1000ppm sodium hypochlorite) can be used if appropriate for the surface.
<table>
<thead>
<tr>
<th>Cleaning</th>
<th>Sanitizing</th>
<th>Disinfecting</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The removal of material like dust, soil,</td>
<td>• Carry a general claim of germ control, but</td>
<td>• The inactivation of pathogens.</td>
</tr>
<tr>
<td>blood and body fluid</td>
<td>generally not organism specific</td>
<td>• Usually involves chemicals, heat or UV.</td>
</tr>
<tr>
<td>• Physically removes rather than kills</td>
<td>• There are two basic kinds of sanitizers, food</td>
<td>• Sterilization destroys microbial life including</td>
</tr>
<tr>
<td>microorganisms. Accomplished with</td>
<td>contact and non-food contact sanitizers.</td>
<td>bacteria, viruses, spores and fungi</td>
</tr>
<tr>
<td>water, detergents, and mechanical action</td>
<td>• food contact surfaces 99.999% (a 5-log</td>
<td>• Most common disinfectants used as quaternary</td>
</tr>
<tr>
<td>• Always essential prior to disinfection or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>sterilization</td>
<td>reduction)</td>
<td>ammonium compound products, hydrogen-based</td>
</tr>
<tr>
<td>• A surface that has not been cleaned</td>
<td></td>
<td></td>
</tr>
<tr>
<td>effectively cannot be properly disinfect</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ed or sterilized.</td>
<td>• nonfood contact a reduction of 99.9% (3 logs)</td>
<td>products, and sodium hypochlorite (bleach)</td>
</tr>
<tr>
<td></td>
<td>within 30 seconds.</td>
<td></td>
</tr>
</tbody>
</table>
Soft Surface “Disinfection”

- Soft surface claims are limited by the EPA, to “sanitizer” versus “disinfectant” claims.
- The EPA Performance Standard for non-food contact sanitizers requires a reduction of at least 99.9% (a 3-log reduction).
- The disinfectant standard requires a higher level of reduction, 99.9999% reduction/kill (a 6-log reduction).

*3 log reduction means the number of germs is 1000 times smaller. 4 log reduction means the number of germs is 10,000 times smaller.*
List N: Disinfectants for Use Against SARS-CoV-2

https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2

- List N includes products that meet EPA’s criteria for use against SARS-CoV-2
- When purchasing a product, check EPA registration number
- Note: Inclusion on this list does not constitute an endorsement by EPA.
How Disinfectants Work

To Work Properly, Disinfectants Need:

➢ Proper Concentration
➢ Dwell Time
➢ Kill Claims
➢ PROPER APPLICATION PROCESS!
Accidental mix of bleach and acid kills Buffalo Wild Wings employee

Incidents like this, which create chlorine gas, occur more than 2,000 times per year in the US.

CDC: Some Americans are misusing cleaning products — including drinking them — in effort to kill coronavirus

To try to kill the novel coronavirus, some Americans are unadvisedly using disinfectants and cleaners, including washing food with bleach, using the products on bare skin, and inhaling and ingesting them, federal health officials reported Friday.

Health experts caution explicitly against using cleaning products in these ways.

The findings come from an online survey of 500 adults conducted by the Centers for Disease Control and Prevention in May. Thirty-nine percent had misused the cleaning products, and one quarter reported "an adverse health effect that they believed was a result" of the products.

Poison control sees spike in calls for cleaner, disinfectant accidents amid COVID-19 pandemic

Calls related to cleaner and disinfectant exposure are up 20% compared with calls last year.

Calls to poison control centers regarding exposure to household cleaners and disinfectants have spiked amid the COVID-19 pandemic, according to a new report.

The report authors found that, from January to March this year, poison control centers received 45,550 calls related to cleaner and disinfectant exposure. That’s up 20% compared with calls over the same period in 2019, according to the report, from the Centers for Disease Control and Prevention.
Application Methods/Considerations

- Electrostatic Sprayers
- Vapor Systems
- Spray Bottles
- Traditional Wiping
High Touch Surfaces

• Surfaces with regular hand-contact are called high touch surfaces.

• These surfaces should be cleaned and disinfected daily to reduce the spread of infection.
Ultraviolet Germicidal Irradiation

- Short wavelength ultraviolet C (UVC) light destroys microorganism’s DNA
- $\lambda = 255 \text{ nm} – 280 \text{ nm}$ for LED
- $\lambda = 230 \text{ nm} – 250 \text{ nm}$ for mercury
Continuous Disinfection Technologies
Replacing traditional materials (e.g., plastic, stainless steel) with materials with antimicrobial properties or treating surfaces with coatings is a potential solution to this problem.

Candidate antimicrobial surfaces and coatings supported by data from nonclinical settings include:

- Copper
- Silver
- Surfaces sprayed with surfacine or organosilane
American will be the first airline to use a coating said to kill coronavirus for up to seven days

Chemical experts question EPA’s approval of coronavirus disinfectant

The cleanser could be harmful and might not be necessary
High-Intensity Narrow-Spectrum (HINS) Light

- 405 nm, sometimes referred to as “Near UV,” although not in the UV spectrum.
- Conforms to international safety guidelines for clinical use in occupied rooms.
- Provides continuous disinfection of air and exposed surfaces in occupied spaces.
Bipolar / Needlepoint Ionization

- Air cleaners using reactive ions and/or reactive oxygen species (ROS) have become prevalent during the COVID-19 pandemic.
- Systems can be modified to create mixtures of reactive oxygen species (ROS), ozone, hydroxyl radicals and superoxide anions.
- Systems may emit ozone, some at high levels. Manufacturers are likely to have ozone generation test data.
Photocatalytic Oxidation (PCO)

- Consists of a pure or doped metal oxide semiconductor material
- Activated by a UV light source
- Some units claim disinfection from gaseous hydrogen peroxide
- Possible by-products formed by incomplete oxidizing.
- Used in localized UV air purifiers and HVAC systems
Thank you!

“Let me guess...it’s contagious!”
#2. Recognize the challenges and benefits of conducting real-world, third party lab tests and field studies to evaluate the impact of environmental contaminates, cleaning chemicals, and methods on 24/7 heavy duty durable coated fabrics.
Case Study – University Health System

New 1.2 million SF state-of-the-art Cancer Hospital opened in 2014

Project Goals for Furniture and Finishes:
• Create a safe environment for patients, guests and staff
• Sophisticated esthetic
• LEED Gold / reduce use of PVC – based products
  
  *Design Consultant chose to replace 90% of PVC with Polyurethane coated fabrics and finishes.*

• Reduce first cost
• Increased durability
• Ease of housekeeping and maintenance
Unintended Consequences

Rapid degradation of polyurethane (PU) coated fabrics and finishes:

• At 8 months in Emergency Department waiting and exam rooms

• Within 2 years:
  • Surgery waiting areas, infusion rooms
  • all 24/7 patient care areas, including task chairs/stools

• Within 3 years:
  • all areas, Gummy texture and peeling of task chair/stools
  • all clinic waiting areas, and PU top coat failure on printed vinyl, revealing white base coating
  • peeling of PU wood finishes
  • peeling and degradation of PU arm caps
Public and Patient Area Failures

**Issues:**
- Cleaning & Chemicals
- “no rinse” protocol
- UV light treatment
- Heat
- Oils
- Sweat
- 24/7 use
- Rubbing/abrasion
- Polyurethane-based materials
Clinical and Office Support Areas Failures

Issues:
- Heat
- Oils
- Sweat
- 24/7 use
- Rubbing/abrasion points
- Polyurethane-based materials

These surfaces are not scheduled to be routinely cleaned by EVS
Extent of Failures

Quantity of Failures from the Cancer Hospital, (Original items):

1,053  Inpatient sleep settees, overnight sleep chairs, & patient recliners
540  Large scale lounge seating units
923  Infusion Recliners & exam /infusion room guest seating
130  (ED only) modular & exam room seating
1,623  Upholstered Task chairs & stools

4,269 + additional failures in administrative and research buildings in 2020

Note that we had ordered large quantities of furniture with these same polyurethane fabrics and finishes between 2013 and 2018 to replace public and patient care furniture in waiting areas throughout the university hospital campus and all off-campus buildings and clinics.
Why is this so important?

1. Epidemiology (EPI) Concerns

- EVS staff is unable to properly clean and disinfectant the surfaces due to damage & vulnerable subsurface of material exposed.
- Hospital Acquired Infections, (HAI) risks associated with the exposed sub-surfaces, cushion cores, soft backings, and raw wood:

  **SARS-CoV-2**
  Multidrug resistant organisms (e.g. MRSA, VRE)
  Clostridium difficile
  Acinetobacter
  Pseudomonas
  Klebsiella

2. Contaminated Furniture has to be pulled out of service - sent to hard trash

3. Financial impact - unforeseen cost of replacement furniture  
   – *capital & operational budget diversions est. $9 Million over 5+ years*
What’s the plan?

**Discover the sources of failures** - collaborate with Chemical Engineering Department to understand chemical formula and construction of materials, generate hypothesis for lab tests

**Assess the impact** to the hospital’s business model – *operational vs. capital $*

**Define new criteria and expand the conversation** - engage Facilities, EVS, EPI, Safety, Compliance, Supply Chain, Center for Innovation, Hospital Leadership

- SARS-CoV-2 = ALL spaces have the same high risk of failure
- Reduce cost – first and life-cycle considerations, *plan for accelerated failures in non-clinical and administrative buildings*
- Increased durability to resist cleaning methods and environmental contaminants
- Create new tests & performance criteria for upholstery and finishes specifications
- Create safer environments for all users
Goal – Create New fabric performance tests that reflect the current state of disinfecting chemicals/methods, and environmental contaminates within the acute care hospital setting to more accurately predict fabric performance:
Disinfectant & Accelerated UV Exposure Tests, Combined Together
Stain Resistance Test – New Staining Agents and Cleaning Chemicals

Ten upholstery fabrics types currently marketed for “healthcare” tested:

- Vinyl with Brand A topcoat
- Vinyl with UV and acrylic topcoat
- Vinyl with Brand B topcoat
- Polyurethane
- Thermoplastic Elastomer
- Polycarbonate with Brand C topcoat
- Silicone, no top coat
- Silicone with Brand C topcoat
- 100% nylon matrix
- Treated Leather
Disinfectant & Accelerated UV Exposure Test

**Disinfectants and Cleaners** — after saturation and drying, chemicals are left on samples going into Xenon-Arc chamber to test for light-fastness and degradation

- 10% bleach solution
- Oxivir TB: Hydrogen Peroxide (0.5%)
- Oxycide: Hydrogen Peroxide + Peroxyacetic Acid
- Quaternary - Virex II 256
- JF2 Glance: Non-ammoniated
- JF3 Stride Citrus Neutral cleaner
- Hand Sanitizer - 70% Isopropanol
Disinfectant & Accelerated UV Exposure Test - Process

**Disinfectant Application**

**80 Degree Drying Cabinet**

**Xenon Arc Cabinet**

**Evaluate Samples**
Disinfectant & Accelerated UV Exposure Test

Rating for fabrics for both tests:

4. **Excellent**: No effect to the integrity or appearance of the material

3. **Good**: Slight discoloration. Damage determined to not affect the material performance and aesthetically mildly objectionable.

2. **Poor**: Moderate effect. Softening, stiffening and/or swelling are present and permanent.

1. **Severe effect**: Discoloration, cracking and/or delamination clearly visible or objectionable aesthetics.
## Disinfectant & Accelerated UV Exposure Test - Results

<table>
<thead>
<tr>
<th>Disinfectant</th>
<th>Fabric 1 Vinyl w/Brand A Topcoat</th>
<th>Fabric 2 Vinyl w/UV &amp; Acrylic Topcoat</th>
<th>Fabric 3 Thermoplastic Elastomer</th>
<th>Fabric 4 Silicone, no topcoat</th>
<th>Fabric 5 Polyurethane</th>
<th>Fabric 6 Treated Leather</th>
<th>Fabric 7 Vinyl w/Brand B Topcoat</th>
<th>Fabric 8 100% Nylon Matrix</th>
<th>Fabric 9 Polycarbonate w/Brand C Topcoat</th>
<th>Fabric 10 Silicone w/Brand C Topcoat</th>
</tr>
</thead>
<tbody>
<tr>
<td>A In house Bleach</td>
<td>Rating: 3.0</td>
<td>Rating: 3.0</td>
<td>Rating: 1.7</td>
<td>Rating: 3.3</td>
<td>Rating: 1.0</td>
<td>Rating: 2.0</td>
<td>Rating: 1.3</td>
<td>Rating: 1.0</td>
<td>Rating: 2.0</td>
<td>Rating: 4.0</td>
</tr>
<tr>
<td>B Oxivir TB: Hydrogen Peroxide (0.5%)</td>
<td>Rating: 2.0</td>
<td>Rating: 3.0</td>
<td>Rating: 2.0</td>
<td>Rating: 3.0</td>
<td>Rating: 1.0</td>
<td>Rating: 2.7</td>
<td>Rating: 3.0</td>
<td>Rating: 1.3</td>
<td>Rating: 2.0</td>
<td>Rating: 3.0</td>
</tr>
<tr>
<td>C Oxydide: Hydrogen Peroxide + Peroxyacetic Acid</td>
<td>Rating: 2.0</td>
<td>Rating: 3.0</td>
<td>Rating: 2.0</td>
<td>Rating: 3.0</td>
<td>Rating: 1.3</td>
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<td>Rating: 2.0</td>
<td>Rating: 3.0</td>
</tr>
<tr>
<td>D Quaternary: Virex II 256</td>
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### Ratings

- **4** Excellent
- **3** Good
- **2** Poor
- **1** Severe Effect

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The Ohio State University
Wexner Medical Center

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Disinfectant & Accelerated UV Exposure Test

Takeaways:

• **Prolonged exposure to UV light matters with ALL disinfectant residue. What is the impact of different UVC light technologies?**
• **UV additive** appears to be very helpful in preventing damage
• **Topcoats & performance treatments/base cloth combinations matter** – polycarbonate vs. silicone with the same branded performance treatment/top coat had different results
• **50% of fabrics** rated for healthcare appear vulnerable to alcohol-based hand sanitizer and “non-oxidizing” cleaning chemicals
• **Acrylic topcoat**, not usually considered for healthcare, appears to perform very well with disinfecting chemicals, even alcohol-based hand sanitizers
Stain Resistance Test – New Staining Agents

Commonly used environmental contaminates in healthcare and public areas tested:

**Patient Transferrable Stains**
1. Super Lustrous Lipstick- Love That Red (already on standard test)
2. Baby Oil (already on standard test)
3. Daily Moisture Dry Skin Moisturizer
4. Acetone Nail Polish Remover
5. Non-Acetone Polish Remover
6. Broad-Spectrum Sunscreen SPF 50 (Oxybenzone 5%, Avobenzone 3%, Octocrylene 4%, Homosalate 10%, Octisalate 5%)
7. Skin Sunscreen Lotion with Broad Spectrum SPF 60+ (Zinc oxide 4.7%, Titanium dioxide 4.9%)
8. Jamaican black castor oil strengthen restore leave-in conditioner

**Synthetic Body Fluids and Clinical Reagents**
1. Stomach Acid – Carolina Biological Supply Company: Gastric Juice, Artificial, Laboratory Grade
2. Human Sweat – Pickering AATCC TM15 Sweat pH 4.3
3. Urine – Carolina Biological Supply Company: Simulated Urine, Normal (already on standard test)
4. Viscot Mini Surgical Fine Tip Marker
Stain Resistance Test – Cleaning Chemicals

Application of staining agent with *extended dwell time of 48 hours*

Cleaning of staining/contaminate agents *with hospital disinfectants in lieu of soap & water:*

- Oxivir TB wipes Hydrogen Peroxide (0.5%)
- Clorox Bleach Germicidal Wipes
- Virex II 256
Stain Resistance Test – Process

APPLICATION OF STAIN, 48 HR DWELL TIME

AFTER CLEANING, EVALUATE
## Stain Resistance Test – Results

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S= Stain Present
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S = Stain Present
Evaluating using: + (present) or - (not present)

4 Excellent 3 Good 2 Poor 1 Severe Effect
## Stain Resistance Test – Results

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S= Stain Present  
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### Grades:
- **4**: Excellent  
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- **2**: Poor  
- **1**: Severe Effect
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S = Stain Present
 EVALUATED USING: + (present) or - (not present)

4 Excellent  3 Good  2 Poor  1 Severe Effect

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<td>5 (Bleach)</td>
<td>S: -</td>
<td>S: -</td>
<td>S: -</td>
<td>S: +</td>
<td>S: -</td>
<td>S: -</td>
<td>S: -</td>
<td>S: -</td>
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<tr>
<td>Stain</td>
<td>6 (Virex)</td>
<td>S: -</td>
<td>S: -</td>
<td>S: -</td>
<td>S: +</td>
<td>S: -</td>
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</table>

S: Stain Present
Evaluated using: + (present) or - (not present)

1 Severe Effect 2 Poor 3 Good 4 Excellent

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## Stain Resistance Test – Results

<table>
<thead>
<tr>
<th>Stain</th>
<th>Replicate (Cleaning Agent)</th>
<th>Fabric 1 Vinyl w/ Brand A Topcoat</th>
<th>Fabric 2 Vinyl with UV &amp; Acrylic Topcoat</th>
<th>Fabric 3 Thermoplastic Elastomer</th>
<th>Fabric 4 Silicone, no topcoat</th>
<th>Fabric 5 Polyurethane</th>
<th>Fabric 6 Treated Leather</th>
<th>Fabric 7 Vinyl w/ Brand B Topcoat</th>
<th>Fabric 8 100% Nylon Matrix</th>
<th>Fabric 9 Polycarbonate w/ Brand C Topcoat</th>
<th>Fabric 10 Silicone w/Brand C Topcoat</th>
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</thead>
<tbody>
<tr>
<td>1 (Oxivir)</td>
<td></td>
<td>S: +</td>
<td>S: +</td>
<td>S: +</td>
<td>S: -</td>
<td>S: +</td>
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<tr>
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<td>4 (Oxivir)</td>
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<td>S: +</td>
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<td>S: +</td>
<td>S: +</td>
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<tr>
<td>5 (Bleach)</td>
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<td>S: +</td>
<td>S: +</td>
<td>S: +</td>
<td>S: +</td>
<td>S: +</td>
<td>S: +</td>
<td>S: +</td>
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</table>

S = Stain Present  
Evaluated using: + (present) or - (not present)
# Stain Resistance Test – Results Take-Aways

<table>
<thead>
<tr>
<th>Patient Transferrable Stains</th>
<th>Scores:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Super Lustrous Lipstick- Love That Red</td>
<td>100% fabrics stains present – no 4s</td>
</tr>
<tr>
<td>Baby Oil</td>
<td>75% of fabrics stains present, all at 2 or 3, few 4s</td>
</tr>
<tr>
<td>Daily Moisture Dry Skin Moisturizer</td>
<td>60% of fabrics stains present; all at 2 or 3, few 4s</td>
</tr>
<tr>
<td>Acetone Nail Polish Remover</td>
<td>30% fabrics types stains present; 3 or 4</td>
</tr>
<tr>
<td>Non-Acetone Polish Remover</td>
<td>30% fabric types stains present; 2, 3, 4</td>
</tr>
<tr>
<td>Broad-Spectrum Sunscreen SPF 50 (Oxybenzone 5%, Avobenzone 3%, Octocrylene 4%, Homosalate 10%, Ocitisulate 5%)</td>
<td>100% fabrics stains present – no 4s; all fabric types scored 1-2, very few 3s</td>
</tr>
<tr>
<td>Skin Sunscreen Lotion with Broad Spectrum SPF 60+(Zinc oxide 4.7%, Titanium dioxide 4.9%)</td>
<td>100% fabrics stains present – no 4s; 1 fabric type scored 1, most scored 2</td>
</tr>
<tr>
<td>Jamaican black castor oil strengthen restore leave-in conditioner</td>
<td>100% fabrics stains present – no 4s</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Synthetic Body Fluids and Clinical Reagents</th>
<th>Scores:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stomach Acid</td>
<td>40% fabrics stains present, all at 3 &amp; 4</td>
</tr>
<tr>
<td>Human Sweat</td>
<td>0% fabric stains present, though 50% scored 3 on degradation &amp; appearance</td>
</tr>
<tr>
<td>Urine</td>
<td>0% fabric stains present, though 50% scored 3 on degradation &amp; appearance</td>
</tr>
<tr>
<td>Viscot Mini Surgical Fine Tip Marker</td>
<td>100% fabrics stains present; no 4s, many 1,2s</td>
</tr>
</tbody>
</table>
Moving Forward

• There is no “silver bullet” fabric for healthcare – yet!
• Modify industry standardized tests to update expectations of performance – adjust to changes in disinfectants and CDC requirements, and UV light technologies
• COVID-19 response = ONE LEVEL OF RISK for selection of materials
• Prioritize component-based furniture over unitized to easily replace components that are forecasted to degrade over time
• Adjust life-cycle replacement expectations with Owner/end-user
• Manufacturers have opportunity for innovative & collaborative product development to create durable fabrics and finishes
• Start testing other vulnerable and failing finishes
#3. Provide background and a demonstration of the “Durable Coated Fabric Programming and Selection Guide for Healthcare” to evaluate, prioritize, and inform selection of durable coated fabrics appropriate to your projects.

Barbara Dellinger, MA, FIIDA, CHID, CID, EDAC, NCIDQ
Director
Design & Research,
Adventist Healthcare
Shady Grove Medical Center Field Study Recap:
Evergreen Lounge: ICU/CVIR Family waiting

**Initial Goals:**
1. Assess performance of various coated fabrics
2. Test for cleanliness, lack of bioburden, once a week

- Reupholster seating units, 2-seater and 3–seater in the following durable-coated fabrics:
  - Silicone
  - Polyurethane/Polycarbonate
  - Vinyl
  - TPE

.............*Before* photo
Criteria for selection of original 18 durable coated fabrics:

1. Manufacturer/distributor recommended as Heavy-duty, 24/7, Healthcare use
2. Aesthetics/color – avoid “patchwork quilt look”
3. Ability to withstand SGMC’s cleaning products & process

Making the case for the importance of Evidence-Based Design and evaluating return on investments (ROI)

Research objective: to determine results for
- HAI’s related to fabric
- ROI’s for failures

............... After photo
Using a Luminometer to quantify effectiveness of cleaning
Provided by SureTrend/Maryland Health Connections to measure for bioburden (ATP)

Scoring: 25-50 = Passing
11 = Excellent
2725 = Fail
Results:

Goal 1: Durability

15 of 18 – Excellent
3 of 18 – Good (stretching on humid days)

Goal 2: Cleanliness
Testing halted due to Environmental Services inability to comply with daily, consistent cleaning as recommended by fabric manufacturers, and challenges with the testing device.
<table>
<thead>
<tr>
<th>#</th>
<th>Code</th>
<th>Durable Coated Fabric Type</th>
<th>Splitting</th>
<th>Cracking/Peeling of coating from backing</th>
<th>Crocking</th>
<th>Softened or Gummy</th>
<th>Stretching</th>
<th>Ink Transfer</th>
<th>Comments</th>
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<tbody>
<tr>
<td>1</td>
<td>S1</td>
<td>Silicone 1</td>
<td></td>
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<td></td>
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<tr>
<td>2</td>
<td>S2</td>
<td>Silicone 2</td>
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<td>3</td>
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<td>Silicone 3</td>
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<td>4</td>
<td>T1</td>
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<tr>
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<td>Triple Seat</td>
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<td>8</td>
<td>V1</td>
<td>Vinyl 1</td>
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<td>V2</td>
<td>Vinyl 1</td>
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<td>11</td>
<td>V4</td>
<td>Vinyl 1</td>
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<td>V5</td>
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<td>13</td>
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<td>14</td>
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<td>16</td>
<td>P3</td>
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<td>Double Seats</td>
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</table>

Seats, backs and sides cleaned with Echolab A-456 II, from 1/10/2019 to 1/10/2019. Cleaning was supposed to be done daily (7 days/week), in reality it was done 3-5 times a week.
Further case studies being developed...
Example: AHC – Case Study – SGMC Unit 2D

Within 3 months of directive from new nurse manager to use Bleach wipes on ALL chairs every day, this damage occurred. Chairs had been in use (with no damage) for over 4 years. Other chairs are still in use with no damage.

Cost for new chairs: 
$370 \times 17 = $6,290
Unplanned Results:

- Continued to compare information for the 18 DCFs
- What testing data were manufacturers/distributors using to determine that their recommended fabric was “suitable for healthcare”
- We found many inconsistencies, and the more we looked, the more inconclusive the data was!
**Why?**

*because there were no requirements for testing minimum performance*

- Inconsistent definitions of Heavy duty/approved for 24/7 healthcare use
- Inconsistent names of tests; CFFA, ASTM, AATCC
- Inconsistent vocabulary between disciplines
- Sustainable attributes often supersede durability and performance
- Sales reps don’t have answers – Tech depts. say some info is proprietary
- Technical people advise designers to ask for the data reports, which have more info but are inconsistent and incomplete
- Memo Tag/Sample Ticket information is limited by space, & wording is inconsistent between manufacturers.
- Jargon proliferates, an example is …“for healing”
- If a fabric fails a test, that information likely will not be provided
Something had to be done!

• Costs of failures continue to rise and may be in the hundreds of millions of dollars
• Linda’s Ohio State University study, finding that current testing was unrealistic, created their own testing to replicate real world conditions
• New products coming out with unrealistic claims

...and we still did not have answers
Next steps were....

• Develop list of tests that were noted on the fabric Memo Tag/Sample Ticket
• Work with each durable coated fabric manufacturer/distributor to obtain complete list of fabric test results
• Gather, compare & analyze fabric test results

....this seemed so logical
Where do we find test information about about upholstery fabrics?

**Conclusion:**
- Multiple similar but not the same tests
- Minimal test information
- Few names
- Wide variance

There was no standard list of tests which were most important to healthcare designers.
Summary of our review of Fabric Test Results:

Memo Tag/Sample Ticket
- Provides only basic product information
- Quantity of tests varies between 0 – 7 (most list 0 - 2)
- Most reference “Wyzenbeek” but do not use official CFFA or ASTM test names
- Test names are inconsistent and confusing;
  - CFFA-16 is Tear Strength, but AATCC 16H is Colorfastness
  - ASTM D-751-06: is it “Break Strength” or “Seam Slippage”?

Manufacturer Website Information
- Testing info is limited and inconsistent between manufacturers
- One had tested for 12+ staining agents, with results
- Many provide results of cleaning product tests

Manufacturer/Distributor representative may provide additional information
- Several more test results were provided when the summary chart was sent
  - Between 8–12 tests listed (but most not on website)
- Some sent test results not listed on Memo tag or on Website

Unanswered questions remain
- How many tests did the fabric product fail?
- Which tests are most important? …and who decides?
- How much do the tests cost?
Evergreen Field Test: Assessment of Tests

**Findings:**
- Minimal test information
- Few names
- Wide variance
- Multiple similar but not the same tests

**Conclusion:**
There was no standard list of the tests that were most important to healthcare designers.
Lessons Learned:

I thought that the field test results were the most important part, but it turns out that test results, and data-gathering, are only the first step.

It’s the path you travel while gathering the data that may lead to new discoveries.
Field Tests and New Operational Paradigms require.....
The Durable Coated Fabric Task Group collaboration resulted in the...

Durable Coated Fabric Programming & Selection Guide for Healthcare
Durable Coated Fabric Programming & Selection Guide for Healthcare

Part 1
Programming Questions

I. End-User or Client - Questions (care providers, infection preventionists, environmental services, industrial hygienist, quality assurance, etc.)

II. Durable Coated Fabric Manufacturer/Distributor - Questions

III. Upholstered Furniture Manufacturer/Dealer - Questions

The Durable Coated Fabric programming questions and a summary Checklist for tracking the answers from each of the above stakeholders include the following categories:

A. Performance / Durability and Budget
B. Cleaning and Disinfecting
C. Sustainable Attributes
D. Upholstered Furniture Design

Part 2 Chemical Fabrics and Film Association: CFFA-Healthcare-201

The CFFA-Healthcare-201 has been reprinted with permission of the Chemical Fabrics and Film Association (CFFA).

The Durable Coated Fabrics (DCF) Task Group is recommending that interior designers and specifiers request DCF distributors and manufacturers to utilize CFFA-Healthcare-201 to test their products. This provides a basis for informed decision making.

Part 2 CFFA-Healthcare-201

The CFFA-Healthcare-201 has been reprinted with permission of the Chemical Fabrics and Film Association.
### Fabric Review Checklist


<table>
<thead>
<tr>
<th>Proposed Manufacturer/Distributor:</th>
<th>Composition:</th>
<th>Project:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coated Fabric: Pattern Name &amp; Number:</td>
<td>Backing:</td>
<td>Reviewer:</td>
</tr>
<tr>
<td>Fabric Color Name/Number:</td>
<td>Cost:</td>
<td>Date:</td>
</tr>
<tr>
<td>Form Item Furniture Mfr. &amp; Model:</td>
<td>Mfr. Fabric Grade:</td>
<td></td>
</tr>
</tbody>
</table>

**Data Collections Information sources are:** Memo Tag/Sample Ticket, product literature, website, manufacturer and/or distributor representatives.

**Scoring:** a positive/preferred value gets a “1”, a negative/not preferred/unknown value gets a “0”. Using this checklist to evaluate the proposed coated fabric(s) for a project will result in scores which reflect the likelihood of a positive outcome.

**Part 1: Programming Questions**

(Questions shown for simplicity. Refer to Guide Part 1 for complete question and context)

<table>
<thead>
<tr>
<th>Ref. # Description</th>
<th>Value</th>
<th>Score</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>I.A.1.a</strong></td>
<td>What is the expected product service life?</td>
<td>36 years = 1, 0-4 years = 0</td>
<td>Not Deeply Embossed = 1, Deeply Embossed = 0</td>
</tr>
<tr>
<td><strong>I.A.1.b</strong></td>
<td>Does the fabric have deeply embossed texture?</td>
<td>Tested = 1, Not tested = 0</td>
<td></td>
</tr>
<tr>
<td><strong>I.B.1</strong></td>
<td>Have cleaning &amp; disinfecting chemicals used in your facility been successfully tested on this fabric?</td>
<td>Assayed = 1, Not Assayed = 0</td>
<td></td>
</tr>
<tr>
<td><strong>I.B.1.a.i</strong></td>
<td>Are cleaning &amp; disinfecting chemicals being rinsed off/water?</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>I.B.3.b</strong></td>
<td>In what projects with similar conditions, has the coated fabric met durability expectations?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Part 1 Programming: II. Durable Coated Fabric Distributor/Manufacturer - Questions**

| II.A.1 | Does proposed coated fabric comply with CFDA-Healthcare-201 Standard? | Comply = 1, Does Not Comply = 0 |
| II.A.2 | Has topcoat material proven durable in similar applications? | Durable = 1, Not durable = 0 |
| II.A.3 | Has backing material proven durable in similar applications? | Durable = 1, Not durable = 0 |
| II.A.4 | Has proposed fabric been used successfully in similar locations? |
| II.B.2 | Does the DCF manufacturer/distributor provide a list of approved cleaning/disinfecting chemicals? | List provided = 1, List not provided = 0 |
| II.B.3 | Has fabric been tested for ultraviolet light, hydrogen peroxide, or other additional disinfection procedures? | Tested = 1, Not tested = 0 |
| II.B.5 | Does manufacturer recommend rinsing with water after cleaning and disinfecting the DCF? |

**Part 1 Programming: III. Upholstered Furniture Manufacturer and Furniture Dealers - Questions**

| III.A.1 | Has the fabric had any failures related to furniture upholstering techniques, i.e., seams, welts, corners, backing color, or needle holes? | No Failures = 1, Failures = 0 |
| III.A.3 | Has the fabric been approved by the manufacturer for use on the specified furniture? | Approved = 1, Not approved = 0 |
| III.B.1 | Has the coated fabric manufacturers’ recommended cleaning/disinfecting protocols damaged other parts of the furniture? | Not damaged = 1, Damaged = 0 |
| III.D.1 | Can undesirable attributes; corners, welts, sharp corners, etc. be eliminated to improve the product? | Componentized = 1, Not componentized = 0 |
| III.D.2 | Is furniture item componentized for full replaceable repairs? |

**Part 1 Subtotal:** 0

**Part 2: CFDA-Healthcare-201 (Recommended Minimum Performance Standards)**

<table>
<thead>
<tr>
<th>CFDA</th>
<th>CFDA-Healthcare-201 compliance confirmation</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFDA Subtotal</td>
<td>0</td>
</tr>
</tbody>
</table>

**TOTAL Parts 1 & 2:** 0 (Maximum Score = 27 Points)
Currently we are in a transition period;

**CFFA-Healthcare-201**
- available since August 2020
- not yet adopted as an industry standard
- not yet reflected in fabric information
Industry wide adoption of

CFFA-Healthcare-201

will guide comparison of durable coated fabrics based on standard testing for performance, durability, cleaning, and disinfecting.
So where are we now? What can we do during the transition time?

- Designers and Specifiers have asked for clarity and transparency with testing.
- CFFA has clarified; and developed **CFFA-Healthcare-201**.
- Designers can learn more about the various tests and test names, understand the issues that the DCF manufacturers face.
- Coordinate with durable coated fabrics manufacturers/distributors AND furniture manufacturers. **Listen to their concerns**.
- Durable coated fabrics manufacturers/distributors can be transparent, do more testing, share test results, gear up for complying with **CFFA-Healthcare-201**.
- Furniture Manufacturers can work with durable coated fabrics manufacturers/distributors to get **CFFA-Healthcare-201** test results, and review with designers issues they have discovered related to furniture design (seams, welts, curves, needle size, etc.)
What can we do as healthcare interior designers?

- Complete the Programing Guide Checklist
- Be sure your coated fabric complies with CFFA-Healthcare-201
#4. Evaluate multiple attributes when specifying durable coated fabrics to improve successful outcomes.

Thank you, Teri, Shari, Linda, & Barbara!

Jane Rohde, AIA, FIIDA, ASID, ACHA, CHID, LEED AP, BD+C, GGA-EB.
Principal JSR Associates Inc
When all performance characteristics are not evaluated, DCF failures were the result.

When Single Attribute approach is used, what are the risks?

What does Multiple Attribute mean?

When product life cycle is not evaluated from the beginning, what are the potential consequences?

What are additional examples that have created unintended consequences, such as premature product failure that impacts human health?
Owner’s Project Requirements (OPR)
Balancing Criteria

- Single Attribute Selection – not a comprehensive evaluation – can create unintended consequences
- Evaluation of all components – required to meet project requirements
- There are some trade-offs – realizing that some will take precedent over others
- Product Service Life to be identified and tied to Use Phase – based upon performance through maintenance, durability, etc.
- COVID-19 – cleaning, sanitizing, and disinfection for human health and safety are front and center
Outpatient Healthcare Project Example

- **Gypsum Board**: Lower GWP*
- **Acoustical Tile**: Higher GWP*
- Is that when the design decision is made?
- What are the other considerations?
  - Acoustic Comfort
  - Usability of Space
  - Existing Conditions
  - HIPAA Privacy

Move beyond a single attribute comparison!

*Tally Tool Comparison*
Owner Project Requirements (OPR)

Project Type: Healthcare Setting Urban Hospital

Building Service Life: Exterior: 50 years
Building Service Life: Systems: 20 years – 2 ½ Cycle Renovations based on System Service Life
Building Service Life: Interior: 12 years – 4+ Cycle Renovations based on Product Service Life

Outcome: Mitigate Infection Risk
Outcome: Reduce Readmission Rates
Outcome: Improved Discharge Planning Process
Outcome: Maximize Reimbursement Rates
Outcome: Improve HCAHPS Scores
Outcome: Care Staff Retention
Outcome: Staff Satisfaction
Urban Hospital – site constraints dictates orientation and location of building

LEED® v4.1 Silver Certification
Fitwel® Two Stars Certified

Operational cost savings is key to the Client
Environmental: Energy and Water Savings
Material Selection: Building Service Life, Environmental Footprint, and IEQ
Health & Wellness: Thermal, Acoustic, and Lighting Comfort and Quality, Healthy Nutritional Focus, Water Availability and Water Quality
Product Example #1

OPR: Building Service Life: 12 years
OPR: Reduce / Mitigate Spread of Infection
OPR: Improve HCAHPS Scores

Upholstery Materials

Green Building Rating System: Material Selection
The Notorious Chair Graveyard
Complexity of Product Failure

- Evaluation of material selection based upon single attribute
- Perception of “sustainability” or “material health”
- Appropriate product for the appropriate application
- Performance requirements – cleaning and disinfection
- Real world conditions – kill time, staff time, FTEs, environmental services training and education
Result of Collaboration of All Stakeholders

- Toolkit Development
- Process and Programming Guide
- Questions: DCF distributors / manufacturers / clients / furniture manufacturers
- CFFA–Healthcare-201 for minimum performance standards
- Comply with CFFA-Healthcare-201
- Opportunity for replication of toolkit for other interior product families
- Resource development that now impacts ALL spaces – as a result of COVID-19
- www.durablecoatedfabrics.com
Balance is Necessary to Avoid Unintended Consequences
Product Example #2

OPR: Building Service Life: 20+ years anticipated
OPR: Mitigate Infection Risk
OPR: Improve HCAHPS Scores
OPR: Reduce Readmission Rates
OPR: Maximize Reimbursement Rates

Low-Flow Toilets

Green Building Rating System: Water Use Reduction
Health & Wellness Rating System: Water Quality
The recent U.S. National Academies of Science (NAS) study that highlights the importance of designing a plumbing system to minimize the risk of Legionella bacteria.

Photo provided by Cypress Garden.
Hotels, Schools, Offices, Apartments, & Government Buildings

- Water Management Plan for all Building Types
- ASHRAE 188 – evaluation of Legionella
- Evaluation of COVID-19 and resulting Cleaning, Sanitizing, and Disinfection Requirements
- Flushing is a vector for transmission
Product Example #3

OPR: Building Service Life: 50+ years anticipated
OPR: Outcome: Mitigate Infection Risk
OPR: Outcome: Care Staff Retention
OPR: Outcome: Staff Satisfaction

Plumbing Infrastructure

Health & Wellness Rating System: Access to Water & Water Quality
Los Angeles Department of Water and Power determined corroded cast-iron pipe was overwhelmingly to blame for water pipe breaks!
National Research Council of Canada – iron pipe break rates: 100 km (62.41 miles) of water distribution pipe!
Replacing infrastructure – but also evaluation of Water Quality – along with flow, quantity, and use – all attributes!
Building Service Life: 100+ years
Independent Study: American Water Works Association and Plastics Pipe Institute
Summary: Select products in context

1. Understand Sustainable Attributes that are Supported by Performance Testing in context with the Application, Building Type, and Care Population
2. Balance all the considerations with Owner Project Requirements & Design Firm Recommendations
3. Recognize “real life” challenges and address them from the beginning in the development of the OPR and Functional Program
4. Collaboratively discuss the interconnectivity of innovation, research, science, solutions, and proven track records

- Think of product life cycle as an approach to investment with a return instead of first cost solution
- Consider decisions that impact all stakeholders needs – including product service life, health, safety, and wellbeing
- Specify a product for the appropriate setting and do not select based on a single attribute or “redlist” approach
Next Steps:

.... share this information with non-Healthcare designers...

See this new resource that provides highlights for decision-making.

New Information about Specifying and Cleaning Durable Coated Fabrics
www.durablecoatedfabrics.com/resources
durablecoatedfabrics@gmail.com
AAHID will post info on their website and LinkedIn page as it becomes available.

Encourage all Interior designers to discuss this with your peers, clients, etc.

We don’t have all the answers yet, but we do have partners to help find the solutions!
Help us to Collect Data!

Cleaning and Disinfection Survey
https://www.surveymonkey.com/r/J6W3PDX

Healthcare Durable Coated Fabrics Upholstery Failures Survey
https://www.surveymonkey.com/r/HKBM67B

Healthcare Furniture Failures Survey
https://www.surveymonkey.com/r/7NSKHD5
https://www.surveymonkey.com/r/7MGW896
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Q & A