UL UVC Testing

UV Lights
The wavelength of UV radiation ranges from 210 to 328 nm (2100 to 3280 A) at 2-6 mw/cm2. 200-280 nm is typically considered to be the UVC range. (The maximum bactericidal effect of Ultraviolet light occurs at 254 nm. Cycle time exposures are determined by the lamp manufacturer, and lamps should not be used in the presence of humans).

The Centers for Disease Control (CDC) recognizes that UVC light, wavelength 200-280 nm, has a germicidal effect on microorganisms and its use has widespread commercial acceptance as a method to disinfect bacteria, viruses, mold and spores1 . Peak germicidal effectiveness occurs at 254 nm by damaging the DNA of microorganisms and rendering them unable to replicate. Typically germicidal low-pressure mercury vapor lamps have a peak output of 254 nm and are commonly used in commercial portable disinfection systems.

Studies applied UVC doses of 12,000 uWs/cm2 to 36,000 uWs/cm2 achieved in times ranging from 15 to 50 minutes to achieve Log 2-4 kill rates of MRSA, VRE, and Clostridium difficle. C. difficle is recognized as a primary pathogen causing healthcare associated infections and is among the most difficult to disinfect9 . Killing C. difficle may be considered a benchmark for effective disinfection. One time UVC exposure to kill C. difficle is in the order of 0.8 kJ/m2 [10] . This is at the high end of reported UVC disinfection doses; therefore this dose should be sufficient to kill nearly all pathogens at a Log4 kill rate. Seven years has been proposed for the life statement for the Healthcare Furniture Cleaning Guideline (BIFMA H1-201X). Weekly exposure for 7 years gives a total germicidal dose of 291 kJ/m2 . Therefore, a total exposure of 291 kJ/m2 using a germicidal lamp operating at 254 nm output is suggested.

UV Test procedure
Apply a UVC light source to achieve 291 kJ/m2 (+/- 15 kJ/m2) radiation within 12 to 24 hours. GE G36T5 UVC lamp applies 500 uW/cm2 irradiation at 16 inches to achieve this dose in 16 hours. Any similar UVC germicidal light source is satisfactory.

Measure the light intensity after a warm up period sufficient to achieve stable irradiation. Determine the exposure time necessary to achieve 291 kJ/m2 . Sper Scientific UVC Light Meter, Model 850010, or similar is satisfactory to measure irradiation.

Establish initial L*a*b* readings if color values are used. For wood surfaces identify the location so that subsequent readings may be made in the same location. Disregard if only visual assessment is used. Uniform color surfaces may be measured in exposed and unexposed areas after the exposure, if desired.

Cover approximately 1/2 the sample with aluminum foil or other mask across the grain for wood surfaces. Sample size of 100 mm x 200 mm (4 in. x 8 in.) is suggested.

Up to four samples may be tested at once by placing the unmasked ends of the four samples together in a 200 mm x 200 mm (8 in. x 8 in.) sample area centered under the lamp. Placing the samples within this area minimizes the irradiation variation to +/- 5%. Expose the sample in UVC light until 291 kJ/m2 (+/- 15 kJ/m2) is achieved.

Establish final L*a*b* readings as appropriate. For visual assessment position the conditioned sample on a table and view it at an eye- to-sample distance of approximately 750-900 mm (30-36 in.) and at an angle of approximately 45-75 degrees from the horizontal plane. The sample shall be rotated in the horizontal plane and viewed from all directions. Direct sunlight or other angle light sources, which can accentuate or minimize the effects, shall be avoided.

The light resistance shall be reported as one of the following: a. No effect—no change in color or surface gloss. b. Slight effect—a change in color or surface gloss visible only at certain angles and directions. c. Moderate effect—a change in color or surface gloss visible at all angles and directions but does not notably alter the original condition of the specimen. d. Severe effect—a change in color or surface gloss, which markedly alters the original condition of the specimen.

Acceptance Level The test surface shall show no more than a slight effect by visual assessment. The test surface shall show a delta E of 2.0 or less.

Solid surface work surfaces

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Solid surface work surfaces	Pass	Fail
Deep Mink	●	
Concrete	●	
Cameo White	●	
Modern White	●	

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Powder coats

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Powder coats	Pass	Fail
Deep Mink	●	
Soft Bronze (SBRZ)	●	
Oiled Bronze (H1P)	●	
Goldenrod (GLDN)	●	
Onyx (BKO)	●	
Warm Grey (H1F)	●	
Bone White (BWT)	●	
Gold (SGLD)	●	
Onyx (BKO)	●	
Luster Grey (MSL)	●	

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HPL laminate

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HPL laminate	Pass	Fail
Cognac (MGP)	●	
Mocha (CMP)	●	
Molasses (QEP)	●	
Sienna (CHP)	●	
Burnished (BUP)	●	
Desert (DSP)	●	
Kodiak (KDP)	●	
Port (VMP)	●	
Root (NWP)	●	
Toffee (MEP)	●	
Blonde (BEP)	●	
Honey (HNP)	●	
Ochre (TMP)	●	
Linen (COP)	●	
Burnished (BUP)	●	
Pecan (PCP)	●	
Quarry (QRP)	●	
Steel (STP)	●	
Black (BLP)	●	
Frosty White(FWP)	●	
Grey (GRP)	●	
Pure White (RWP)	●	
Slate Grey (SGP)	●	
Natural Champagne (NGP)	●	
Natural Steamwash (NHP)	●	

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3DL laminate

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3DL laminate	Pass	Fail
Cognac (VM3)	●	
Mocha (MC3)	●	
Molasses (QE3)	●	
Sienna (LC3)	●	
Burnished (BU3)	●	
Desert (DS3)	●	
Kodiak (KD3)	●	
Root (NW3)	●	
Toffee (EN3)	●	
Blonde (BE3)	●	
Honey (MH3)	●	
Ochre (LM3)	●	
Linen (CO3)	●	
Pecan (PC3)	●	
Steel (ST3)	●	
Black (BL3)	●	
Frosty White (FW3)	●	
Grey (GR3)	●	
Pure White (RW3)	●	
Natural Champagne (NG3)	●	
Natural Steamwash (NH3)	●	

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Genus Elastomer

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Genus elastomer	Pass	Fail
Pitch		●
Snow		●
Storm		●

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Maren plastic

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Maren plastic	Pass	Fail
Black	●	
White	●	

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Arm caps: Genus, Revel, Sladr, Zonal

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Arm caps: Genus, Revel, Sladr, Zonal	Pass	Fail
Carbon Graphite	●	

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Polyurethane arm caps

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Polyurethane arm caps	Pass	Fail
Black (curved)	●	
Taupe (curved)	●	
Grey (curved)	●	
Folkstone Grey (curved)		●
Black	●	
Taupe	●	
Grey	●	
Folkstone Grey		●

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Harpin shell

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Harpin shell	Pass	Fail
Black	●	
Grey	●	
White	●	

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Quickstacker seat

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Quickstacker seat	Pass	Fail
Black	●	
White	●	
Battleship	●	
Dark Grey	●	

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Genus stacker plastic

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Genus stacker plastic	Pass	Fail
Pitch	●	
Snow	●	
Storm	●	

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Flexxy mesh

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Flexxy mesh	Pass	Fail
Black	●	
Grey	●	

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