MARMOLEUM® COMPOSITION SHEET (MCS) TECHNICAL DATA

1. PRODUCT NAME / MANUFACTURER

1.1 Product:

Marmoleum® Composition Sheet (MCS) linoleum sheet resilient floor covering

1.2 Manufacturer:

Forbo Flooring Systems
Humboldt Industrial Park
Hazleton, PA 18202
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1.3 Product Description:

Construction: MCS is a homogeneous floor covering made from natural ingredients including linseed oil, rosin binders, wood flour, limestone and dry pigments which are mixed and then calendared onto a natural jute backing.

Topshield2™ is a high performance finish. Its double UV cured double layer technology delivers extraordinary performance and clear and vibrant colors that remain over time. Topshield2™ creates a 'ready to use' Marmoleum® that requires no initial maintenance or polymer application. The surface can be repaired or refreshed in cases of accidents or after years of intensive use.

1.4 Physical Characteristics: (dimensions are approximate)

Gauge----------0.080" (2.0 mm)
Backing----------Jute
Width----------79" (2 meters)
Length----------105' (32 meters)
Roll Size----------77 yards^2 (64 meters^2)

2. PRODUCT PERFORMANCE AND TECHNICAL DATA

2.1 Reference Specification:

Meets or exceeds all technical requirements as set forth in ASTM F 2034 Standard Specification for Linoleum Sheet Flooring

Type I

2.2 Environmental:

3. Platinum certified in accordance with SMaRT© Sustainable Products Standard, led by the Institute for Market Transformation to Sustainability (MTS).
4. 100% USDA Certified BioBased Product.
5. Compliant with CHPS 01350 requirements for VOC emissions and indoor air quality.
6. Contributes to the following LEED® credits:
   Materials & Resources
   Credit 4: Recycled Content (46.5% Pre-Consumer)
   Credit 6: Rapidly Renewable Materials (33%)
   Indoor Environmental Quality
   Credit 4.3: Low-Emitting Materials (www.chps.net)
   Credit 4.1: Low-Emitting Materials (Adhesive complies with SCAQMD Rule #1168)

6.1 Static Load Limit:

850 pounds per square inch when tested in accordance with ASTM F 970-00, Standard Test Method for Static Load Limit.

2.4 Slip Resistance:

Meets or exceeds the industry recommendation of >0.5 for flat surfaces when tested in accordance with ASTM D 2047, Standard Test Method for Static Coefficient of Friction.

2.5 Castor Resistance:

Suitable for office chairs with castors when tested in accordance with EN 425, Castor Chair Test.

2.6 Impact Sound Reduction:

≤ 4db when tested in accordance with ISO 717-2, Impact Sound Insulation Test.

2.7 Resistance to Bacteria:

Provides a self-sanitizing quality in the form of a bactericidal effect. Independent testing has shown that a sterile zone around the material inhibits the growth of organisms such as staphylococcus aureus, Clostridium difficile, and Klebsiella pneumonia (CRE).

2.8 Anti-Static Properties:

Naturally anti-static. This property makes cleaning easier because dirt and dust does not cling to the surface as it may with other materials.

2.9 Fire Testing:

Class 1 when tested in accordance with ASTM E 648/NFPA 253, Standard Test Method for Critical Radiant Flux.

Meets 450 or less when tested in accordance with ASTM E 662/ NFPA 258, Standard Test Method for Smoke Density.

2.10 Cigarette Resistance:

Resists cigarette burns. Burning cigarettes will leave only a brown mark, which can be rubbed out using steel wool or a scouring pad.

2.11 Chemical Resistance: (Exposure Time: One Hour)*

Diluted Acids – Sulfuric, Nitric, Hydrochloric, Acetic, Lactic, Citric----------No Effect
Sodium Hydroxide (5%)----------Softening
Ammonia (5%), Acetone---------- Possible Softening
Soda Solution, Soap Solution (Slightly Alkaline)----------No Effect
Gasoline, White Spirit, Paraffin, Benzene, Toluene, Methyl Alcohol, Methyl Ethyl Ketone, Ethyl Acetate, Ether, Mineral Oil, Vegetable Oil, Animal Fat ----------No Effect
Blood, Urine, Excrement ---------- No Effect
Lipstick----------No Effect
Formaldehyde, Hydrogen Peroxide 3% ----------No Effect
Hot Chili Paste, Shoe Polish, Iodine, Betadine---------- Staining
Silver Nitrate---------- Staining/Possible Softening
Bitumen, Salt Water ----------No Effect
Methylene Blue----------Staining

Tested in accordance with ASTM F 925, Standard Test Method Resistance to Chemicals of Resilient Flooring.

*Marmoleum® is NOT resistant to prolonged exposure to high alkalis.

7. INSTALLATION

3.1 Site Conditions:

The installation should not begin until the work of all other trades has been completed, especially overhead trades. Areas to receive flooring should be clean, fully enclosed and weathertight with the permanent HVAC must be fully operational, controlled and set at a minimum of 68° F (20° C) for a minimum of seven days prior to, during, and seven days after the installation. The flooring material (including adhesive and welding rod) should be conditioned in the same manner for a minimum of 48 hours prior to the installation. Areas to receive flooring shall be adequately lighted to allow for proper inspection of the substrate, installation and seaming of the flooring, and for final inspection.

3.2 Substrates:

Floors shall be sound, smooth, flat, permanently dry, clean, and free of all foreign materials including, but not limited to, dust, paint, grease, oils, solvents, curing and hardening compounds, sealers, asphalt and old adhesive residue. Wood floors should be double construction with a minimum total thickness of 1". Wood floors must be rigid, free from movement and have at least 18" of well-ventilated air space below. Forbo floor coverings should not be installed over wooden subfloors built on sleepers over on or below grade concrete floors without first making sure that adequate precautions have been taken to ensure the structural integrity of the system, and to prevent moisture migration from the concrete slab. Concrete substrates should be prepared in accordance with the latest version of ASTM F 710, Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring. Concrete shall have a minimum compressive strength of 3,000 psi. Patch and repair minor cracks and other imperfections using only the highest quality patching and leveling compounds in strict accordance to the manufacturer's recommendations for their use and application. Floor covering should not be installed over expansion joints. Suitable expansion joint covers should be used. It is essential that moisture tests be conducted on all concrete floors regardless of the age or grade level. Conduct calcium chloride tests in accordance with the latest version of ASTM F 1869, Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride. Measure the internal relative humidity of the concrete slab in accordance with the latest version of ASTM F 2170, Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes. One test of each type should be conducted for every 1,000 square feet of flooring (minimum of 3). The tests should be conducted around the perimeter of the room, at columns, and anywhere moisture may be evident. Concrete moisture vapor emissions must not exceed 8.0 lbs. per 1,000 square feet in 24 hours when using Forbo L 885 adhesive or Forbo Sustain 885m adhesive or 10.0 lbs. per 1,000 square feet in 24 hours when using Forbo Sustain 1195 adhesive. Concrete internal relative humidity must not exceed 85% when using Forbo L 885 adhesive or Forbo Sustain 885m adhesive or 95% when using Forbo Sustain 1195 adhesive. A diagram of the area showing the location and results of each test should be submitted to the Architect, General Contractor or End User. If the test results exceed these limitations, the installation must not proceed until the problem has been corrected.

Note: Moisture tests indicate conditions at the time of the test only. The absence of an acceptable vapor retarder under the slab, changes in the environment, or other circumstances beyond Forbo's control, may lead to adverse changes in the moisture condition of the concrete. Forbo's warranty shall not be extended to cover damage or failures caused by moisture conditions in excess of specified limits that occur after the time of initial testing or installation.

3.3 Adhesive:

Use Forbo L 885, Forbo Sustain 885m or Forbo Sustain 1195 adhesive.
Use a 1/16" x 1/16" x 1/16" square notch trowel.
Spread Rate: Approximately 125 square feet/gallon.

3.4 Heat Welding (OPTIONAL):

Heat welding is not necessary for all installations, however it is optional. For seamless, hygienic watertight installation requirements, use Forbo Marmoweld welding rod.
Welding rod dimensions: 4 mm; 165 linear feet per spool.

3.5 Flash Coving (OPTIONAL):

Flash cove up walls to the desired height. Use Forbo L 885 adhesive or Forbo Sustain 885m adhesive.

3.6 Installation Guidelines:

Refer to Forbo Flooring's Installation Guide for complete installation guidelines.

8. AVAILABILITY AND COST

Available through authorized Forbo Flooring suppliers throughout North America. Contact Forbo Flooring or an authorized supplier for cost information.

9. WARRANTY

Limited 5-year warranty. For complete details, contact Forbo Flooring.

10. CARE AND CLEANING

After installation is completed, allow a minimum of 5 days for the adhesive to properly bond and cure before conducting wet cleaning procedures. See Forbo Flooring's Floor Care Guide for additional information.

11. SUPPORT SERVICES

Submittal samples for verification and approval are available upon request from Forbo Flooring. Samples shall be submitted in compliance with the requirements of the Contract Documents. Please fax all sample requests to +570 450 0229 or visit our website at www.forboflooringna.com. Accepted and approved samples shall constitute the standard materials that represent materials installed in the project.

For current installation and floor care guidelines, guide specifications, and other technical information, visit our website at www.forboflooringna.com.