

Specifier Note: This Specification has been created to assist in preparing a Project or Master Specification. In accordance with Construction Specifications Institute (CSI)'s MasterFormat®, this Specification can be used with most Master Specifications following simple editing.

Specifier Note: **The enclosed requirements are intended for indoors installations over concrete** (or in some cases wood). If the provisions described herein are adopted for installations outdoors or over asphalt, Mondo's Warranty will be null and void and the Specifier will be held liable.

Specifier Note: This Specification describes the resilient flooring to be installed. The number and title of the section may be changed, if the Specifier deems necessary, but in any circumstance it will belong to the general CSI Section 09 65 00: Resilient Flooring.

SECTION 09 65 16.33
Rubber Sheet Flooring
and/or
SECTION 096519.33
Rubber Tile Flooring

1 PART 1 - GENERAL

1.1 SUMMARY

1.1.1 Products Supplied

- A. Resilient Flooring
- B. Accessories required for installation, maintenance and repair.

1.1.2 Related requirements

Specifier Notes: The following CSI sections serve as a guide to what is essential information needed to determine the acceptability of the site conditions required for the installation of resilient flooring. The Specifier may choose to include other sections he/she deems necessary.

- A. Section 02 25 00 - Existing Material Assessment
- B. Section 03 05 00 - Common Work Results for Concrete
- C. Section 06 05 00 - Common Work Results for Wood, Plastics and Composites
- D. Section 07 05 00 - Common Work Results for Thermal and Moisture Protection
- E. Section 07 10 00 - Dampproofing and Waterproofing

1.2 REFERENCES

1.2.1 Committee for Health-Related Evaluation of Building Products (AgBB)

- A. German evaluation of Volatile Organic Compounds (VOC and SVOS) in building products.

1.2.2 ASTM International (ASTM)

- A. ASTM D412: Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension.
- B. ASTM D2047: Standard Test Method for Static Coefficient of Friction of Polish-Coated Floor Surfaces as measured by the James Machine.
- C. ASTM D2240: Standard Test Method for Rubber Property (Durometer Hardness).
- D. ASTM D3389: Standard Test Method for Coated Fabrics Abrasion Resistance (Rotary Platform Abrader).
- E. ASTM E648: Standard Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.
- F. ASTM E662: Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials.
- G. ASTM E1643: Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.
- H. ASTM E1745: Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.
- I. ASTM F386: Standard Test Method for Thickness of Resilient Flooring Materials Having Flat Surfaces.
- J. ASTM F710: Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
- K. ASTM F925: Standard Test Method for Resistance to Chemicals of Resilient Flooring.
- L. ASTM F970: Standard Test Method for Static Load Limit.
- M. ASTM F1344: Standard Specification for Rubber Floor Tile.
- N. ASTM F1514: Standard Test method for Measuring Heat Stability of Resilient Flooring by Color Change.
- O. ASTM F1515: Standard Test Method for Measuring Light Stability of Resilient Flooring by Color Change.
- P. ASTM F1859: Standard Specification for Rubber Sheet Floor Covering Without Backing.
- Q. ASTM F1869: Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
- R. ASTM F2055: Standard Test Method for Size and Squareness of Resilient Floor Tile by Dial Gage Method.
- S. ASTM F2170: Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.
- T. ASTM F2199: Standard Test Method for Determining Dimensional Stability of Resilient Floor Tile after Exposure to Heat.

1.2.3 The Blue Angel

- A. RAL-UZ 120: Elastic Floor Coverings. German standard for eco-labeling. Blue Angel products meet a list of criteria considering environmental and health-related aspects.

1.2.4 State of California (CA)

- A. Section 01350: Standard Method for the Testing and Evaluation of Volatile Organic Compound Emissions from Indoor Sources Using Environmental Chambers.

1.2.5 Building Foundation Information RTS

- A. Finnish emission classification of building materials, fixture and furniture without padding or textile coverings used in ordinary work spaces and residences with respect to good indoor air quality. M1 stands for low emissions.

1.2.6 Good Environmental Choice Australia Ltd. (GECA)

- A. GECA 25-2001v2: Floor Coverings Standard. Seeks to identify and improve environmental impacts of floor covering products throughout their life cycle. Is recognized by the Green Building Council of Australia (GBCA) at Level A: products certified to this standard can earn 100% of available points for Green Star building projects.

1.2.7 GREENGUARD Environmental Institute (GEI)

- A. GREENGUARD Certification: Compliant with stringent emission levels for over 360 VOCs, plus a limit on the total of all chemical emissions combined (TVOC).
- B. GREENGUARD Gold: Compliant with safety factors to account for sensitive individuals (such as children and the elderly) and ensures that a product is acceptable for use in environments such as schools and healthcare facilities.

1.2.8 International Organization for Standardization (ISO)

- A. ISO 9001: Quality management systems – Requirements.
- B. ISO 10140-3: Acoustics. Laboratory measurement of sound insulation of building elements - Part 3: Measurement of impact sound insulation.
- C. ISO 14001: Environmental management systems – Requirements with guidance for use.
- D. ISO 16000-9: Indoor air - Part 9: Determination of the emission of volatile organic compounds from building products and furnishing - Emission test chamber method.

1.3 SUBMITTALS

Specifier Note: The following are typical submittals. The Specifier may choose to include other submittals he/she deems necessary.

1.3.1 Action Submittals

- A. Provide current printed data sheets for all Products Supplied
- B. Provide samples, 6 inches x 6 inches, for verification of such characteristics as color, texture and finish for each specified resilient flooring product.
- C. If heat welding of seams is specified, provide samples of welding thread for verification of each color selected.
- D. As necessary, provide shop drawings prepared for project illustrating layouts, details, dimensions and other data.

1.3.2 Informational Submittals

- A. Provide Manufacturer's current printed base surface preparation guidelines.
- B. Provide Manufacturer's current printed installation guidelines for Products Supplied.

1.3.3 Closeout Submittals

- A. Provide Manufacturer's current printed maintenance guidelines for resilient flooring.
- B. Provide Manufacturer's current printed standard warranty for resilient flooring.

1.3.4 Maintenance Material Submittals

- A. Provide extra stock materials from original dye lots, for use in facility operations and maintenance (approximately 2% of the total floor surface for each color, surface texture and format of Manufactured Product).

1.4 QUALITY ASSURANCE

- A. Manufacturer must be certified ISO 9001 and ISO 14001.
- B. Manufactured Product must have undergone a vulcanization process; factory lamination should not be accepted as equivalent.
- C. In accordance with ASTM E648, the Manufactured Product must have a critical radiant flux $\geq 0.45\text{W/cm}^2$ (Class 1).
- D. In accordance with ASTM E662, the Manufactured Product must have an optical density of smoke ≤ 450 .
- E. Manufacturer must have a minimum of fifteen (15) years of experience in the manufacturing of prefabricated resilient flooring.
- F. Installer must have performed installations of the same scale in the last three (3) years.
- G. Installer to be recognized and approved by the Manufacturer.

Specifier Note: Specify mock-up dimensions as instructed by Owner or Architect.

- H. Installation of mock-up is highly recommended and must be deemed acceptable by Owner and Architect. Mock-up is to be installed following the same procedures and utilizing the same specified materials that will be used for the actual project.

- Mock-up size: [XXin x XXin (XXcm x XXcm)].

1.5 DELIVERY, STORAGE AND HANDLING

- A. Products Supplied must be delivered in Manufacturer's original, unopened and undamaged packaging with identification labels intact.
- B. Products Supplied must be protected from exposure to harmful weather conditions and must be safely stored on a clean, dry, flat surface. Store rolls of resilient flooring upright; store tiles of resilient flooring on a flat surface, carefully protecting corners and edges.
- C. Climate controlled storage is recommended. Storage temperature must not be below 55°F (13°C) and must not exceed 100°F (38°C).
- D. Avoid storing Manufactured Product for extended periods of time or additional material trimming may be required.
- E. Products Supplied need not suffer damage during handling (i.e. dents/scratches, edge chipping, excessive warping, etc.).

1.6 SITE CONDITIONS

- A. The General Contractor or Construction Manager shall be responsible for ensuring all site conditions meet the requirements of the Manufacturer, as referenced herein at sections 3.2 and 3.3.
- B. Concrete slabs, on or below grade, must be installed over a permanent effective vapor retarder, respecting current versions of the standard practice ASTM E1643 and the standard specification ASTM E1745. The vapor retarder must be placed directly underneath the concrete slab, above the granular fill, as per Manufacturer's instructions. The vapor retarder must have a perm rating of 0.1 or less and must have a minimum thickness of 10 mil (0.010 in).
- C. No sealers or curing compounds are applied to or mixed into the concrete (refer to Section 03 05 00 – Common Work Results for Concrete of Division 3).
- D. Installation of the resilient flooring to be carried out no sooner than the specified curing time of concrete (normal density concrete curing time is approximately 28 days for development of design strength). Refer to current version of ASTM F710.
- E. Concrete surface must be free of all contaminants that can inhibit bond (paint, wax, dust, oil or grease, sealer, curing compound, solvent, asphalt, old adhesive residues, etc.). All contaminants must be removed from the surface via mechanical abatement. Use of abatement chemicals is not recommended.
- F. Concrete to have smooth, dense finish, and be highly compacted with a tolerance of 1/8th of an inch in a 10-foot radius (3.2 mm in a 3.05 m radius). Floor Flatness (FF) and Floor Levelness (FL) numbers are not recognized.
- G. Moisture and alkalinity tests must be performed on all concrete substrates, under in-service conditions. It is recommended to turn on the HVAC unit prior to performing moisture testing, in order to ensure stable testing conditions and accurate results. The concrete's surface pH should be between 7 and 10. Relative humidity of the concrete slab must not exceed 85%, in accordance with ASTM F2170 (in situ probes). Moisture vapor emissions from the concrete slab must not exceed the tolerance of the adhesive specified, in accordance with ASTM F1869 (anhydrous calcium chloride).
- H. If installing over wood subfloors, ensure exterior grade plywood with at least one good side, such as: APA (Engineered Wood Association) Exterior grade plywood (A-A Exterior, A-B Exterior or A-C Exterior) and CANPLY (Canadian Plywood Association) Exterior certified plywood (Canada: Grade G2S A-A or G1S A-C. USA: G2S A-A, A-B, B-B, or G1S A-C, B-C). There must be proper underfloor ventilation, plywood must be dry and should have a moisture content ranging between 6 and 12%, when measured with a quality wood moisture meter (electronic hygrometer).
- I. Room and concrete temperature must be maintained within the recommended range of 65°F to 86°F (18°C to 30°C), 48 hours prior to installation, during the installation, and 48 hours after the installation. Recommended ambient humidity control level is between 35 to 55%.
- J. Installation of resilient flooring will not commence until the building is enclosed and all other trades have completed their work. It is the General Contractor or Construction Manager's responsibility to maintain a secure and clean working area before, during and after the installation of the resilient flooring.

1.7 WARRANTY

- A. The resilient flooring is warranted to be free from manufacturing defects for a period of one (1) year from the date of shipment from the Manufacturer.
- B. The resilient flooring is warranted against excessive wear under normal usage for a period of ten (10) years from the date of shipment from the Manufacturer.

2 PART 2 – PRODUCT

2.1 MANUFACTURED PRODUCTS

2.1.1 Manufacturer

- A. MONDO S.p.A.: Artigo S.p.A., 17014 Cairo Montenotte (SV), Loc. Carpeneto – Italy.

2.1.2 Description

Specifier Note: Specify required color and format.

- A. Harmoni is prefabricated resilient rubber flooring, calendered and vulcanized with a base of natural and synthetic rubbers, stabilizing agents and pigmentation, as manufactured by Mondo S.p.A. or approved equal.
- B. Health-Conscious Production: Harmoni is manufactured without BPA (bisphenol A), formaldehyde, halogen, heavy metal, isocyanate, phthalate and PVC (polyvinyl chloride). This product is also manufactured using a source of green energy (solar power).
- C. Thickness: 0.118" (3mm).
- D. Colors: Provided in standard, solid background colors with randomly dispersed colored chips throughout the wear layer's entire depth.
- E. Surface Texture: Smooth.
- F. Finish: Factory applied low-gloss finish, cured by ultraviolet (UV) processing.
- G. Vulcanized, dual durometer construction. The shore hardness of the top layer (wear layer) will be greater than that of the bottom layer (backing); shore hardness of layers to be recommended by the Manufacturer and to respect limits specified.
- H. Formats: Available in sheets that are 6'2" (1.90m) wide and 32'9" (10m) long [min. 19'8" (6m)/max. 59' (18m)]; available in tiles that are 24" x 24" (61cm x 61cm).

2.1.3 Performance

- A. Manufactured Product tested following standard specifications ASTM F1344 (rubber tile flooring) and ASTM F1859 (rubber sheets flooring).
- B. Performance of the Manufactured Product to conform to the following criteria:

Performance Criterion	Test Method	Requirement	Result*
Indoor Air Quality	AgBB	-	Compliant
Modulus at 10% Elongation	ASTM D412	≥300 psi	>495 psi
Coefficient of Friction	ASTM D2047	≥0.50	≥0.80
Hardness Shore A	ASTM D2240	≥85	95 ±5
Abrasion Resistance (H18 wheels/1000g/1000 cycles)	ASTM D3389	≤1.0 g	0.15 g
Critical Radiant Flux	ASTM E648	≥0.45 W/cm2	>0.45 W/cm2 (Class 1)
Optical Density of Smoke	ASTM E662	≤450	<450
Impact Sound Transmission Reduction	ASTM E2179	-	≥14 dB (ΔIIC)
Antimicrobial Activity	ASTM2180	-	Significant Reduction
Thickness	ASTM F386	±0.15 mm	3 mm (±0.1 mm)
Wear Layer Thickness	ASTM F410	≥1mm	>1mm
Resistance to Chemicals	ASTM F925	-	Compliant
Static Load Limit (Tested at 250psi)	ASTM F970	≤0.005 in	0.001 in
Static Load Limit (Tested at 800psi)	ASTM F970	-	0.003 in
Heat Resistance	ASTM F1514	ΔE ≤8.0	Compliant
Light Resistance	ASTM F1515	ΔE ≤8.0	Compliant
Tile Size	ASTM F2055	±0.45 mm	Compliant
Tile Squareness	ASTM F2055	≤0.254 mm	Compliant
Dimensional Stability of Tiles	ASTM F2199	≤0.15%	Compliant
Resistance to Fungi	ASTM G21	-	No Growth
Indoor Air Quality	CA 01350	-	Compliant
GECA Ecolabel Certification	GECA 25-2001v2	-	Yes
Greenguard Certification	Greenguard	-	Yes
Greenguard Gold	Greenguard	-	Yes
Emission Class for Building Materials	ISO 16000-9	-	M1 Classification
The Blue Angel Environmental Label	RAL-UZ 120	-	Yes

**Values From Manufacturing Controls; Manufacturer reserves the right to modify Manufactured Product design and/or performance characteristics at any time without notice.*

2.1.4 Materials

- A. Provide HARMONI prefabricated resilient flooring manufactured by Artigo S.p.A. or approved equal.
- B. Provide resilient flooring as specified in section 2.1.2 Description.

2.2 ACCESSORIES

Specifier Note: Accessories should be specified in accordance with the project requirements.

- A. Provide adhesive certified by Manufacturer: Mondo MP 965 (acrylic), Mondo PU 105 (polyurethane) or Mondo EP 55 (epoxy). For suitability, recommendations and use please refer to Manufacturer's current printed adhesive guidelines.
- B. Patching or leveling compound to be supplied or recommended/approved by Manufacturer.
- C. If heatwelding of seams is specified, welding thread to be supplied or recommended/approved by Manufacturer.

3 PART 3 – EXECUTION

3.1 INSTALLERS

- A. Refer to section 1.4 of this document for information on installers.

3.2 EXAMINATION

Specifier Note: The following must be ensured prior to installation of resilient flooring.

- A. Ensure that concrete slabs, on or below grade, are installed over a permanent effective vapor retarder, respecting current versions of the standard practice ASTM E1643 and the standard specification ASTM E1745. The vapor retarder must be placed directly underneath the concrete slab, above the granular fill, as per Manufacturer's instructions. The vapor retarder must have a perm rating of 0.1 or less and must have a minimum thickness of 10 mil (0.010 in).
- B. Installation of the resilient flooring to be carried out no sooner than the specified curing time of concrete (normal density concrete curing time is approximately 28 days for development of design strength). Refer to current version of ASTM F710.
- C. Ensure that no concrete sealers or curing compounds have been applied to or mixed into the concrete (refer to Section 03 05 00 – Common Work Results for Concrete of Division 3).
- D. Ensure that concrete surface is free of any contaminant that could inhibit bond (paint, wax, dust, oil or grease, sealer, curing compound, solvent, asphalt, old adhesive residues, etc.). All contaminants must be removed from the surface via mechanical abatement. Use of abatement chemicals is not recommended.
- E. Confirm concrete has smooth, dense finish, and is highly compacted with a tolerance of 1/8th of an inch in a 10-foot radius (3.2 mm in a 3.05 m radius). Floor Flatness (FF) and Floor Levelness (FL) numbers are not recognized.
- F. Moisture and alkalinity tests must be performed on all concrete substrates, under in-service conditions. It is recommended to turn on the HVAC unit prior to performing moisture testing, in order to ensure stable testing conditions and accurate results. The concrete's surface pH should be between 7 and 10. Relative humidity of the concrete slab must not exceed 85%, in accordance with ASTM F2170 (in situ probes). Moisture vapor emissions from the concrete slab must not exceed the tolerance of the adhesive specified, in accordance with ASTM F1869 (anhydrous calcium chloride).
- G. If installing over wood subfloors, ensure exterior grade plywood with at least one good side, such as: APA (Engineered Wood Association) Exterior grade plywood (A-A Exterior, A-B Exterior or A-C Exterior) and CANPLY (Canadian Plywood Association). Exterior certified plywood (Canada: Grade G2S A-A or G1S A-C. USA: G2S A-A, A-B, B-B, or G1S A-C, B-C). There must be proper underfloor ventilation, plywood must be dry and should have a moisture content ranging between 6 and 12%, when measured with a quality wood moisture meter (electronic hygrometer).

- H. Ensure room and concrete temperature are maintained within the recommended range of 65°F to 86°F (18°C to 30°C), 48 hours prior to installation, during the installation, and 48 hours after the installation. Recommended ambient humidity control level is between 35 to 55%.
- I. Installation of resilient flooring will not commence until the building is enclosed and all other trades have completed their work. Ensure a secure and clean working area before, during and after the installation of the resilient flooring.

3.3 PREPARATION

Specifier Note: The surface of the concrete is to be prepared according to Manufacturer's current printed guidelines; it is recommended that the Specifier review said guidelines. A copy of the base surface preparation guidelines can be obtained from the Technical Department at Mondo America, Inc. The guidelines are considered common practice for the preparation and verification of base surfaces that will receive resilient athletic flooring, and as such should not be omitted or altered in any case.

- A. Prepare concrete subfloor in accordance with Manufacturer's current printed guidelines.

3.4 INSTALLATION

Specifier Note: Select appropriate installation guidelines for resilient flooring format required for the project. Products Supplied are to be installed following their current printed guidelines; it is recommended that the Specifier review said guidelines. Copies of all installation guidelines for Products Supplied can be obtained from the Technical Department at Mondo America, Inc. Installation procedures may be altered to accommodate special project needs, as deemed necessary by the Specifier and after he/she has consulted the Technical Department at Mondo America, Inc. to ensure suitability.

- A. Install rolls of resilient flooring following Manufacturer's current printed guidelines.
- B. Install tiles of resilient flooring following Manufacturer's current printed guidelines.
- C. Install all accessories following Manufacturer's current printed guidelines.

3.5 REPAIR

- A. Refer to section 1.3.4 for extra stock materials.
- B. Repair material must come from the same original dye lot as the Manufactured Product initially installed.
- C. Repairs are to be performed by qualified installers/technicians only.

3.6 CLEANING

- A. Always wait at least a minimum of 72 hours after the resilient flooring has been completely installed before performing initial maintenance.
- B. Always maintain the resilient flooring following Manufacturer's current printed guidelines.

3.7 PROTECTION

- A. As needed, protect resilient flooring with 1/8" Masonite during and after the installation, prior to acceptance by the Owner.