

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 indoor 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 athletic 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 66

Resilient Athletic Flooring

1 PART 1 – GENERAL

1.1 SUMMARY

1.1.1 Products Supplied

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

1.1.2 Related Requirements

Specifier Note: 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 athletic 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 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 F1514: Standard Test method for Measuring Heat Stability of Resilient Flooring by Color Change.
- M. ASTM F1515: Standard Test Method for Measuring Light Stability of Resilient Flooring by Color Change.
- N. ASTM F1869: Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
- O. ASTM F2170: Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.

1.2.2 State of California (CA)

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

1.2.3 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.

1.2.4 International Organization for Standardization (ISO)

- A. ISO 9001: Quality Management Systems - Requirements.

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 and surface texture of each specified resilient athletic flooring product.
- C. 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 subfloor 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 athletic flooring.
- B. Provide Manufacturer's current printed standard warranty for resilient athletic 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.
- 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 athletic 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 athletic flooring upright; store tiles of resilient athletic 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 subfloors, 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 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 (0.010in).
- C. No concrete sealers or curing compounds are applied or mixed with the subfloors (refer to Section 03 05 00 – Common Work Results for Concrete of Division 3).
- D. Installation of the resilient athletic flooring to be carried out no sooner than the specified curing time of concrete subfloor (normal density concrete curing time is approximately 28 days for development of design strength). Refer to current version of ASTM F710.
- E. The subfloor surface must be free of any paint, wax, oil, grease, sealer, curing compound, solvent or any other contaminants that may inhibit bond. 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 1/8" in a 10ft radius (3.2mm in 3.05m 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. Maintain a stable room and subfloor temperature 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 athletic 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 athletic flooring.

1.7 WARRANTY

- A. The resilient athletic 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 athletic flooring is warranted against excessive wear under normal usage for a period of ten (10) years from the date of shipment from the Manufacturer.
- C. Refer to current copy of Manufactured Product's Limited Warranty for all terms and conditions.

2 PART 2 – PRODUCTS

2.1 MANUFACTURED PRODUCT

2.1.1 Manufacturer

- A. Mondo S.p.A.: Piazzale E. Stroppiana, 1, 12051 Alba, Fraz. Gallo - Italia.

2.1.2 Description

Specifier Note: Specify required color and format.

- A. MondoArmor is prefabricated resilient rubber athletic 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. MondoArmor is phthalate-free, halogen-free, heavy metal-free, formaldehyde-free, isocyanate-free and BPA-free.
- C. Thickness: 0.236" (6mm).
- D. Colors: Provided in standard, solid background colors with random colored flecks dispersed throughout material.
- E. Surface Texture: Sealskin.
- F. Manufactured in two layers which are vulcanized together. The shore hardness of the top layer will be greater than that of the bottom layer; shore hardness of layers to be recommended by the Manufacturer and the limits specified.
- G. Formats: Available in sheets that are 6'1" (1.86m) wide and 39'4" (12m) long [min. 19'8" (6m)/max. 55'9" (17m)]; available in tiles that are 36" x 36" (91.4 cm x 91.4 cm).

2.1.3 Performance

- A. Performance of the Manufactured Product to conform to the following criteria:

Performance Criterion	Test Method	Requirement	Result
Elongation at Break	ASTM D412	-	≥300%
Tensile Strength	ASTM D412	-	>100psi
Static Coefficient of Friction	ASTM D2047	≥0.50	>0.80
Hardness (Shore A)	ASTM D2240	-	80 (±5)
Abrasion Resistance (H18 wheel, 1000g, 1000 cycles)	ASTM D3389	<1.0	<0.45g
Critical Radiant Flux	ASTM E648	≥0.45	≥0.45 W/cm ² (Class 1)
Optical Density of Smoke	ASTM E662	<450	<450
Thickness	ASTM F386	-	6mm (±0.2mm)
Resistance to Chemicals	ASTM F925	-	Compliant
Heat Stability	ASTM F1514	ΔE ≤8.0	Compliant
Light Stability	ASTM F1515	ΔE ≤8.0	Compliant
Indoor Air Quality	CA 01350	-	Compliant
Greenguard Certification	Greenguard	-	Yes
Greenguard Gold	Greenguard	-	Yes

2.1.4 Limitations

- A. MondoArmor resilient athletic flooring with a thickness of 6mm is NOT recommend for use in areas subject to surface impacts, such as designated "free weight" sections in fitness facilities. For use in such areas, minimum thickness of flooring must be 10mm.

2.1.5 Materials

- A. Provide MondoArmor resilient athletic flooring manufactured by Mondo S.p.A. or approved equal.
- B. Provide resilient athletic 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 PU 105 (polyurethane). For suitability, recommendations and use please refer to Manufacturer's current printed adhesive guidelines. In some cases, Mondo EP 55 (epoxy) adhesive may be used in areas that have not been specified to receive Everlay, and that will not be subject to surface impacts (such as falling free weights) or heavier dynamic loads (such as bleachers).
- B. Patching or leveling compound 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 athletic flooring.

- A. Ensure that concrete subfloors, 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 (0.010in).
- B. Installation of the resilient athletic flooring to be carried out no sooner than the specified curing time of concrete subfloor (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. Subfloor surface must be free of any paint, wax, oil, grease, sealer, curing compound, solvent or any other contaminants that may inhibit bond. 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 1/8" in a 10ft radius (3.2mm in 3.05m 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. Maintain a stable room and subfloor temperature 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 athletic 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 athletic flooring.

3.3 PREPARATION

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

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

3.4 INSTALLATION

Specifier Note: Select appropriate installation guidelines for resilient athletic 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 athletic flooring following Manufacturer's current printed guidelines.
- B. Install tiles of resilient athletic 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 athletic flooring has been completely installed before performing initial maintenance.
- B. Always maintain the resilient athletic flooring following Manufacturer's current printed guidelines.

3.7 PROTECTION

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