

*Specifier Note:* This Specification has been created to assist in preparing a Project or Master Specification. It follows guidelines established by Construction Specifications Institute (CSI) and can be used with most Master Specifications with 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 athletic surfacing 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. Adhesive and accessories required for installation, maintenance and repair.

##### 1.1.2 Related Requirements

*Specifier Note:* the following CSI sections of the project manual are a guide to what is the essential information needed to determine the acceptability of the site conditions and details of the installation of MONDO products. 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 American Society for Testing & Materials (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 F410: Standard Test Method for Wear Layer Thickness of Resilient Floor Coverings by Optical Measurement.
- K. ASTM F710: Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
- L. ASTM F925: Standard Test Method for Resistance to Chemicals of Resilient Flooring.
- M. ASTM F970: Standard Test Method for Static Load Limit.
- N. ASTM F1344: Standard Specification for Rubber Floor Tile (sections 7.1-7.6, 8.4-8.6).
- O. ASTM F1514: Standard Test Method for Measuring Heat Stability of Resilient Flooring by Color Change.
- P. ASTM F1515: Standard Test Method for Measuring Light Stability of Resilient Flooring by Color Change.
- 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.

#### **1.2.2 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.

#### **1.2.3 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: Requirements for Quality Management Systems.

#### **1.2.5 European Committee for Standardization (CEN)**

- A. EN 1372: Test method for adhesives for floor and wall coverings - Peel test

#### **1.2.6 Color Measurement Committee (CMC)**

- A. CMC 2:1: Color difference acceptability.

#### **1.2.7 American National Standards Institute (ANSI)**

- A. ANSI B101.3: Test method for measuring wet dynamic coefficient of friction of common hard-surface floor materials

### 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 Manufacturer's current printed data sheets on specified products (surfacing product, adhesives, accessories, etc.).
- B. Provide samples, 6 inches x 6 inches, for verification of such characteristics as color, texture and finish for 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 current subfloor preparation guidelines, as published by the Manufacturer.
- B. Provide current installation guidelines, as published by the Manufacturer.

#### 1.3.3 Closeout Submittals

- A. Provide current maintenance guidelines, as published by the Manufacturer.
- B. Provide current standard warranty, as published by the Manufacturer.

#### 1.3.4 Maintenance Material Submittals

- A. Provide extra stock materials for use in facility operation and maintenance. Provide amount of approximately 2% of the total floor surface, of each type, color and dye lot.

### 1.4 QUALITY ASSURANCE

- A. Manufacturer must be certified ISO 9001.
- B. Manufacturer must have a minimum of fifteen (15) years of experience in the manufacturing of prefabricated resilient athletic flooring.
- C. Installer must have performed installations of the same scale in the last three (3) years.
- D. Installer to be recognized and approved by the resilient athletic flooring Manufacturer.

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

- E. 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: [XX" x XX" (XX cm x XX cm)].

### 1.5 DELIVERY, STORAGE AND HANDLING

- A. Materials must be delivered in Manufacturer's original, unopened and undamaged containers with identification labels intact.
- B. Store sheet goods upright on a clean, dry, flat surface protected from all possible damage and from exposure to harmful weather conditions. Store tiles on a clean, dry, flat surface, carefully protecting corners and edges from all possible damage and from exposure to harmful weather conditions.
- C. Recommended environmental condition for storage is a minimum of 55°F (13°C).
- D. Avoid storing materials for extended periods of time or additional material trimming may be required.
- E. Material need not suffer damage during handling (i.e. 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 resilient athletic flooring 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, as per current versions of ASTM E1643 and 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 mils.
- 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 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.
- F. Smooth, dense finish, highly compacted with a tolerance of 1/8" in a 10 ft radius (3.2 mm in 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 the tolerance of the adhesive specified, 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. Provide current standard warranty, as published by the Manufacturer.
- B. The resilient athletic flooring is warranted to be free from manufacturing defects for a period of three (3) years from the date of sale from the Manufacturer.

## 2 PART 2 – PRODUCT

### 2.1 MANUFACTURED PRODUCTS

#### 2.1.1 Manufacturer

- A. MONDO Luxembourg S.A.: Z.I. Foetz - Rue de l'Industrie, L-3895 Foetz, Luxembourg.

#### 2.1.2 Description

Specifier Note: specify format and color of product used in project.

- B. RAMFLEX NF 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 Luxembourg S.A. or approved equal.
- C. Thickness: 0.394" (10mm).
- D. Colors: provided in standard, solid background colors with random marbleization throughout wear layer except black that is offered in solid color.
- E. Texture: hammered.
- 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. Material available in sheets: 6' (1.83m) wide and 29'6" (9m) long [min. 19'8" (6m)/max. 36'1" (11m)]; material available in tiles: 36" x 36" (913.5mm x 913.5mm).

#### 2.1.3 Performance

- A. Performance of the prefabricated resilient athletic flooring to conform to the following criteria:

Performance Criteria	Test Method	Result
Thickness	ASTM F386	10mm ± 0.2
Thickness of top layer	ASTM F410	2.2 (-2/+0.3)mm
Tile size	ASTM F1344	913.5± 0.50mm
Tile squareness	ASTM F2055	≤0.254mm
Tile straightness	ASTM F2055	≤0.254mm
Hardness top layer Shore A	ASTM D2240	75 ± 5
Hardness bottom layer Shore A	ASTM D2240	65 ± 5
Coefficient of Friction	ASTM D2047	≥0.90
Tensile Strength	ASTM D412	≥600psi
Elongation at Break	ASTM D412	≥200%
Abrasion Resistance (H18 wheel, 1000g, 1000 cycles)	ASTM D3389	≤0.5g loss
Critical Radiant Flux	ASTM E648	≥0.45 W/cm <sup>2</sup> , Class 1
Optical Density of Smoke-Flaming	ASTM E662	≤431
Optical Density of Smoke-Flaming	ASTM E662	≤480

Static Load Limit	ASTM F970	≤0.005in
Dimensional Stability	ASTM F2199	
Length		0.15%
Width		0.03%
Chemical Resistance	ASTM F925	Compliant
Color Match	CMC 2:1 (BYK)	≤3 (≤2,5) ΔE
Resistance to Heat	ASTM F1514	≤8.0 ΔE
Color Light Stability	ASTM F1515	≤8.0 ΔE
Indoor Air Quality	CA 01350	Compliant
GREENGUARD Certification	Greenguard	Yes
GREENGUARD Gold	Greenguard	Yes

#### 2.1.4 Materials

- A. Provide RAMFLEX resilient athletic flooring manufactured by MONDO Luxembourg S.A. or approved equal.
- B. Provide resilient athletic flooring as specified in section 2.1.2 Description.

#### 2.2 ACCESSORY PRODUCTS

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

- A. Provide adhesive certified by resilient athletic flooring Manufacturer: MONDO PU 105 polyurethane adhesive. For suitability, recommendations and use please refer to adhesive instruction manual provided by Manufacturer. 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 (falling free weights) or heavier dynamic loads (bleachers).
- B. Patching or leveling compound to be supplied or recommended/approved by resilient athletic flooring 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, as per current versions of ASTM E1643 and 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 mils.

- B. Installation 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.
- E. Smooth, dense finish, highly compacted with a tolerance of 1/8" in a 10 ft radius (3.2 mm in 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 the tolerance of the adhesive specified, 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.

### 3.3 PREPARATION

*Specifier Note: Subfloors are to be prepared according to resilient athletic flooring Manufacturer's written instructions; it is recommended that the Specifier review all recommendations. A copy of the current Subfloor Preparation Guide can be obtained from the Technical Department at Mondo America, Inc. The following are considered common practice subfloor preparations to 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 Subfloor Preparation Guide.

### 3.4 INSTALLATION

*Specifier Note: Resilient athletic flooring to be installed according to Manufacturer's written instructions; it is recommended that the Specifier review all recommendations. A copy of the current Installation procedures can be obtained from the Technical Department at Mondo America, Inc. The following procedures may be altered to accommodate special project cases, as deemed necessary by the Specifier and after he/she has consulted the Technical Department at Mondo America, Inc. to ensure suitability.*

- A. Install resilient sheet goods in accordance with Manufacturer's current printed Installation Manual.
- B. Install resilient tiles in accordance with Manufacturer's current printed Installation Manual.

### 3.5 REPAIR

- A. Refer to section 1.3.4 for extra stock materials.
- B. Repair material must be from the same dye lot as material supplied for initial installation.
- 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 resilient athletic flooring according to Manufacturer's current maintenance instructions for specified product.

### **3.7 PROTECTION**

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