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 over 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, line marking (if specified), 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 E492: Standard Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine.

F. ASTM E648: Standard Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.
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 Measuring Recovery Properties of Floor Coverings after Static Loading.
M. ASTM F1514: Standard Test method for Measuring Heat Stability of Resilient Flooring by Color Change.
N. ASTM F1515: Standard Test Method for Measuring Light Stability of Resilient Flooring by Color Change.
O. ASTM F1869: Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
P. 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. Technical and warranty information is available for download at www.mondoworldwide.com or may be obtained from the Technical Department at Mondo America, Inc. (United States 1-800-361-3747 • Canada 1-800-663-8138).

1.3.1 Action Submittals

A. Provide a copy of Original Equipment Manufacturer (OEM)'s ISO 9001 certificate.
B. Provide current printed data sheets for all Products Supplied.
C. Provide samples (6 inches x 6 inches), for verification of such characteristics as color and surface texture, for each Manufactured Product specified.
D. If line painting has been specified, provide samples of available paint colors for selection and approval.

E. As necessary, provide shop drawings prepared for the project that illustrate layouts, details, dimensions and other pertinent data.

1.3.2 Informational Submittals

A. Provide Manufacturer's current printed substrate 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 Manufactured Product.
B. Provide Manufacturer's current printed standard warranty for Manufactured Product.

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 specified).

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 rubber flooring.
C. Manufactured Product must have undergone a vulcanization process; factory lamination should not be accepted as equivalent.
D. Surfacing Contractor to be recognized and approved by the Manufacturer.
E. Surfacing Contractor shall be fully acquainted with the existing facility and utilities and shall fully understand the difficulties and restrictions attending the execution of the work under contract. Surfacing Contractor to advise the Owner of any restrictions or anticipated difficulty, in writing and before submitting bids.
F. Installer must be approved by the Surfacing Contractor and must have performed installations of the same scale in the last three (3) years.
G. If line marking has been specified, the Line Marker shall be approved by the Surfacing Contractor. Painting must be done by professionals with proper experience and qualifications to effectively perform the work; Line Marker to have painted a minimum of ten (10) rubber surfaces in North America.

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

H. A mock-up installation is highly recommended; always follow the same procedures and use the same materials that have been specified for the actual project. The Owner or Architect will be responsible for deeming the mock-up acceptable.

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

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.
C. Climate controlled storage is recommended. Storage temperature must not be below 40°F (4°C) and must not exceed 100°F (38°C). Materials must be delivered to site a minimum of 24 hours before work is scheduled to begin so that they may acclimate.
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 delivery, storage and handling (i.e. dents/scratches, excessive compression or warping, chipped edges, 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. Refer to current version of ASTM F710 for additional information.
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 athletic flooring to be carried out no sooner than the specified curing time of the concrete (normal density concrete curing time is approximately 28 days for development of design strength, having a minimum 3500 psi or 25 MPa in compressive strength).
E. Substrate 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 must have a smooth finish, proper density and be highly compacted with a tolerance of 1/8th of an inch in a 10-foot 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 the current version of ASTM F2170 (in situ probes). Moisture vapor emissions from the concrete slab must not exceed the tolerance of the adhesive specified, in accordance with the current version of ASTM F1869 (anhydrous calcium chloride).
H. Maintain stable room and substrate temperatures prior to moisture testing and flooring installation, during the flooring installation, as well as a minimum of 48 hours after the flooring has been completely installed. Recommended ambient temperature range is between 65°F and 86°F (18°C and 30°C) and recommended ambient humidity range is between 35% and 55%.
I. If installing over wood substrates, 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).
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 that is 30 days from shipment from the Manufacturer, per the terms and conditions of the Manufacturer's written Limited Warranty.
B. For standard applications, the resilient athletic flooring is warranted against excessive wear under normal usage for a period of ten (10) years from the date that is 30 days from shipment from the Manufacturer, per the terms and conditions of the Manufacturer's written Limited Warranty.
C. Refer to current copy of Manufacturer's written Limited Warranty for all terms and conditions, which shall be obtained directly from Manufacturer. In no event shall any warranties provided by any third parties (including distributors, insurance and/or private label providers) be considered a valid.

2 PART 2 – PRODUCTS

2.1 MANUFACTURED PRODUCT

2.1.1 Manufacturer

A. Mondo Luxembourg S.A.: Z.I. Foetz - Rue de l'Industrie, L-3895 Foetz, Luxembourg.
Distributed by : **RFS SPORTS** 375 Columbia Memorial Pkwy, Kemah, TX 77565
Contact : Michelle Music 512-755-9497 michelle@teamrfs.com

2.1.2 Description

Specifier Note: Specify required color(s).

A. Advance Vulcanized is prefabricated resilient 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.
B. Triple durometer construction, vulcanized into a single prefabricated sheet for optimal performance and durability. The Shore hardness of the top layer (wear layer) will be greater than that of the other layers; Shore hardness of layers to be recommended by the Manufacturer and to respect limits specified.
C. Health-Conscious Production: Advance Vulcanized is free from red listed ingredients (LBC Red List) and is manufactured without bisphenol A (BPA), formaldehyde, halogens, heavy metals, isocyanates, phthalates and polyvinyl chloride (PVC).
D. Thickness: 0.394'' (10 mm).
E. Colors: Provided in standard, solid background colors with random marbleization throughout the wear layer's entire depth.
F. Surface Texture: Smooth, matte.
G. Format: Available in sheets that are 6'1" (1.86 m) wide and 42'7" (13 m) long [min. 19'8" (6 m)/max. 49'2" (15 m)].

2.1.3 Performance

Specifier Note: Results may vary slightly between production runs, due to manufacturing tolerances and testing methods/equipment used by laboratories during analysis. However, Manufactured Product must always meet the minimum requirements listed.

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

Performance Criterion	Test Method	Requirement	Result*
Elongation at Break	ASTM D412	≥100%	≥100%
Tensile Strength	ASTM D412	≥300 psi	≥350 psi
Static Coefficient of Friction (leather heel)	ASTM D2047	≥0.50 (dry)	≥0.80 (dry)
Hardness of Top Layer (Shore A)	ASTM D2240	78 ± 5	82
Hardness of Bottom Layer (Shore A)	ASTM D2240	50 ± 8	53
Abrasion Resistance (H18 wheel, 1000 g, 1000 cycles)	ASTM D3389	≤1.0 g	≤0.4 g
Impact Insulation Class	ASTM E492	-	≈60 dB (IIC)
Critical Radiant Flux	ASTM E648	≥0.22 W/cm^2 (Class 2)	≥0.45 W/cm^2 (Class 1)
Thickness	ASTM F386	10 mm (±0.2 mm) 0.394" (±0.008")	Compliant
Resistance to Chemicals	ASTM F925	≤Slight Change	Compliant **
Static Loading (tested at 250psi)	ASTM F970	≤0.009 in	0.006 in
Heat Resistance	ASTM F1514	ΔE ≤8.0	Compliant
Light Resistance	ASTM F1515	ΔE ≤8.0	Compliant
Indoor Air Quality (IAQ) Certifications			
CA Section 01350	CA: V1.1-2010	-	Compliant
Greenguard Gold	Greenguard	-	Compliant
Greenguard Certification	Greenguard	-	Compliant

*Results obtained from manufacturing controls can vary between production lots and do not constitute representations or warranties as to any particular production lot. Mondo reserves the right to modify product design and/or specifications at any time without notice.

**For complete list of chemicals tested, concentration and contact time, please communicate with Mondo's Technical Department.

2.1.4 Materials

A. Provide Advance Vulcanized rubber flooring manufactured by Mondo Luxembourg S.A. or approved equal.
B. Provide Manufactured Product 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) adhesive is recommended for installations over concrete and wood. For suitability, recommendations and use, please refer to Manufacturer's current printed adhesive data sheets. In some cases, Mondo EP 55 (epoxy) may be used in areas that have not been specified for use of Mondo Everlay products, and that will not be subject to surface impacts or heavier dynamic loads (bleachers, equipment, etc.). For acceptable installations over Mondo Everlay products (where surface impacts and heavier dynamic loads are not a concern), please consult Mondo's Technical Department for current adhesive recommendations.

B. Portland cement based patching or leveling compound to be supplied or recommended/approved by Manufacturer.
C. If line painting has been specified, line paint 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 resilient athletic flooring installation.

A. Prior to resilient athletic flooring installation, ensure substrate is ready to receive resilient flooring and has been prepared according to Manufacturer's current substrate surface preparation guidelines. Refer to current version of ASTM F710 for additional information.
B. 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).
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. Installation of the resilient athletic flooring to be carried out no sooner than the specified curing time of the concrete (normal density concrete curing time is approximately 28 days for development of design strength, having a minimum 3500 psi or 25 MPa in compressive strength).
E. 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.
F. Confirm concrete has a smooth finish, proper density and is highly compacted with a tolerance of $1/8^{th}$ 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 the tolerance of the adhesive specified, in accordance with the current version of ASTM F2170 (in situ probes). Moisture vapor emissions from the concrete slab must not exceed the tolerance of the adhesive specified, in accordance with the current version of ASTM F1869 (anhydrous calcium chloride).
H. Ensure room and substrate temperatures are maintained prior to moisture testing and flooring installation, during the flooring installation, as well as a minimum of 48 hours after the flooring has been completely installed. Recommended ambient temperature range is between 65°F and 86°F (18°C and 30°C) and recommended ambient humidity range is between 35% and 55%.
I. If installing over wood substrates, 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).

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 ensure that a secure and clean working area is maintained before, during and after the installation of the resilient athletic flooring.

3.3 PREPARATION

Specifier Note: The surface of the concrete (or wood when specified) is to be prepared according to Manufacturer's current printed guidelines; it is recommended that the Specifier review said guidelines. A copy of the substrate surface preparation guidelines can be obtained from the Technical Department at Mondo America, Inc. (United States 1-800-361-3747 • Canada 1-800-663-8138). The guidelines are considered common practice for the preparation and verification of substrates that will be receiving resilient athletic flooring, and as such should not be omitted or altered in any case.

A. Prepare substrate surface in accordance with Manufacturer's current printed guidelines.

3.4 INSTALLATION

Specifier Note: 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. (United States 1-800-361-3747 • Canada 1-800-663-8138). 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 sheets of resilient athletic flooring following Manufacturer's current printed guidelines.
B. Install all accessories following Manufacturer's current printed guidelines.
C. If line painting has been specified, Line Marker to paint all lines following Manufacturer's current printed guidelines, respecting the drawing(s) and the Master Specification.

3.5 REPAIR

A. Refer to section 1.3.4 for extra stock materials. Repair material must come from the same original dye lot as the Manufactured Product initially installed.
B. Repairs are to be performed by Surfacing Contractor's 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. Always maintain the resilient athletic flooring following Manufacturer's current printed guidelines.
B. For surfaces having received newly painted lines, wait a minimum of 30 days after the application of the paint to ensure its proper curing before going over the surface with a scrubber/scrubbing the lines.

3.7 PROTECTION

A. As needed, protect resilient athletic flooring with 1/8" Masonite during and after the installation, prior to its acceptance by the Owner.
B. Preserve the integrity of the installation and protect against direct sunlight/UV exposure; always ensure that windows and glass doors have inherent UV protection and/or are fitted with blinds/UV film.