

*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 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 09 65 19.33**  
**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 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 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 German Committee for Health-Related Evaluation of Building Products (AgBB)**

- A. AgBB. Evaluation of volatile organic compounds (VOC) and semi-volatile organic compounds (SVOC) from 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 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.
- 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 F1859: Standard Specification for Rubber Sheet Floor Covering Without Backing.
- R. ASTM F1869: Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
- S. ASTM F2055: Standard Test Method for Size and Squareness of Resilient Floor Tile by Dial Gage Method.
- T. ASTM F2170: Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.
- U. ASTM F2199: Standard Test Method for Determining Dimensional Stability of Resilient Floor Tile after Exposure to Heat.
- V. ASTM G21: Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.

**1.2.3 The Blue Angel**

- A. Blue Angel. RAL-UZ 120: Elastic Floor Coverings. German environmental label. Products with the Blue Angel ecolabel meet a list of criteria considering environmental and health-related aspects.

**1.2.4 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.

**1.2.5 Grenelle Environment Forum**

- A. Decree № 2011-321. French decree on labeling requirement for construction materials, wall and floor coverings, and paint and varnishes, as it pertains to their emissions of volatile pollutants.

**1.2.6 Good Environmental Choice Australia Ltd. (GECA)**

- A. GECA 25-2011v2: Floor Coverings. GECA-certified products are better for the environment, have a lower impact on human health and are ethically made. The GECA ecolabel 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.

#### **1.2.9 Building Foundation Information RTS**

- A. M1. 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.

### **1.3 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](http://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 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 Manufactured Product.
- C. If the heatwelding of seams (sheets) has been specified, provide samples of welding thread for color match verifications with each specified Manufactured Product.
- 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 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).

**1.4 QUALITY ASSURANCE**

- A. Manufacturer must be certified ISO 9001 and ISO 14001.
- 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. In accordance with ASTM E648, the Manufactured Product must have a critical radiant flux  $\geq 0.45$  W/cm<sup>2</sup> (Class 1).
- E. In accordance with ASTM E662, the Manufactured Product must have an optical density of smoke  $\leq 450$ .
- F. Surfacing Contractor to be recognized and approved by the Manufacturer.
- G. 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.
- H. Installer must be approved by the Surfacing Contractor and must have performed installations of the same scale in the last three (3) years.

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

- I. 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 (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 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.
- 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 the concrete (normal density concrete curing time is approximately 28 days for development of design strength, having a minimum 3500 psi/25 MPa in compressive strength). Refer to current version of ASTM F710 for additional information.
- 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 1/8<sup>th</sup> 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 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, beginning 30 days 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, beginning 30 days 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.: Artigo S.p.A., 17014 Cairo Montenotte (SV), Loc. Carpeneto – Italia.

**2.1.2 Description**

*Specifier Note: Specify required color(s) and format(s).*

- A. Kayar is prefabricated resilient rubber flooring, calendered and vulcanized with a base of synthetic rubber, stabilizing agents and pigmentation, as manufactured by Mondo S.p.A. or approved equal.
- B. Health-Conscious Production: Kayar 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), in addition to being manufactured from 100% renewable electric energy sources: water, wind and solar.
- C. Thickness: 0.118” (3 mm).
- D. Colors: Provided in standard, solid background colors with randomly dispersed natural coconut husk fibers 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” (1.90 m) wide and 32’9” (10 m) long [min. 19’8” (6 m)/max. 59’ (18 m)]; available in tiles that are 24” x 24” (61 cm x 61 cm).

**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. Manufactured Product tested following standard specifications ASTM F1344 (rubber tile flooring) and ASTM F1859 (rubber sheets flooring without backing).
- B. Performance of the Manufactured Product to conform to the following criteria:

Performance Criterion	Test Method	Requirement	Result*
Modulus at 10% Elongation	ASTM D412	≥300 psi	455.64 psi
Static Coefficient of Friction (neolite heel)	ASTM D2047	≥0.50 (dry)	≥0.80 (dry)
Durometer Hardness (Shore A)	ASTM D2240	≥85	95
Abrasion Resistance (H18 wheel, 1000g, 1000 cycles)	ASTM D3389	≤1.0 g	0.22 g

Performance Criterion	Test Method	Requirement	Result*
Critical Radiant Flux	ASTM E648	≥0.45 W/cm <sup>2</sup>	≥0.45 W/cm <sup>2</sup> (Class 1)
Optical Density of Smoke	ASTM E662	≤450	≤450
Thickness	ASTM F386	3 mm (±0.15 mm) 0.118" (±0.006")	Compliant
Wear Layer Thickness	ASTM F410	≥1 mm	Compliant
Resistance to Chemicals	ASTM F925	≤Slight Change	Compliant **
Static Loading (Tested at 250psi)	ASTM F970	≤0.005 in	0.001 in
Static Loading (Tested at 800psi)	ASTM F970	-	0.004 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
Impact Sound Insulation	ISO 10140-3	-	≈11 dB (ΔL <sub>w</sub> )
Indoor Air Quality: CA Section 01350	CA: V1.1-2010	-	Compliant
Indoor Air Quality: Greenguard Gold	Greenguard	-	Compliant
Indoor Air Quality: Greenguard Certification	Greenguard	-	Compliant
Indoor Air Quality: AgBB	ISO 16000-9	-	Compliant
Indoor Air Quality: Decree № 2011-321	ISO 16000-9	-	Compliant
Indoor Air Quality: M1	ISO 16000-9	-	Compliant
Environmental Label: GECA	GECA 25-2011v2	-	Compliant
Environmental Label: The Blue Angel	RAL-UZ 120	-	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 Kayar resilient rubber flooring manufactured by Mondo 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 1000 (acrylic), Mondo PU 105 (polyurethane) or Mondo EP 55 (epoxy). For suitability, recommendations and use, please refer to Manufacturer's current printed adhesive data sheets.
- B. Portland cement based patching or leveling compound to be supplied or recommended/approved by Manufacturer.
- C. If the heatwelding of seams (sheets) has been 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 resilient flooring installation.*

- 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. 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).
- C. Installation of the resilient 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/25 MPa in compressive strength). Refer to current version of ASTM F710 for additional information.
- 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 a smooth finish, proper density and is highly compacted with a tolerance of 1/8<sup>th</sup> 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 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).
- G. 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%.
- H. 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).
- I. 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 ensure that a secure and clean working area is maintained before, during and after the installation of the resilient 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 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: 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. (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 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. 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 flooring has been completely installed before performing initial maintenance. 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 its acceptance by the Owner.
- B. Preserve the integrity of the installation and protect against direct sunlight/UV exposure; always ensure windows and glass doors are fitted with blinds or UV film.