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

SECTION 09 65 16 and/or 09 65 19
Resilient Sheet Flooring and/or Resilient Tile Flooring

1 PART 1 – GENERAL

1.1 SUMMARY

1.1.1 Products Supplied

A. Resilient (rubber) commercial flooring.
B. Adhesive and accessories required for installation, maintenance and repair.

1.1.2 Related Requirements

Specifier Note: These 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 and related 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 German Committee for Health-Related Evaluation of Building Products (AgBB)

A. AgBB: Evaluation of Emissions of Volatile Organic Compounds (VOC and SVOC) from Building Products.

1.2.2 American Society for Testing & Materials (ASTM)

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 F710: Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
L. ASTM F1344: Standard Specification for Rubber Floor Tile (sections 7.1-7.6, 8.4-8.6).
O. ASTM F1859: Standard Specification for Rubber Sheet Floor Covering without Backing (sections 7.1-7.6, 8.4-8.6).
P. ASTM F1869: Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.

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 Building Research Establishment (BRE)
A. Environmental profiles for construction products using Life Cycle Assessment (LCA) method developed by BRE Global.

1.2.5 State of California (CA)

1.2.6 German Institute for Standardization (DIN)
A. DIN 51130: Testing of floor coverings - Determination of the anti-slip property.

1.2.7 European Committee for Standardization (CEN)
A. EN 423: Resilient floor coverings. Determination of resistance to staining.
C. EN 433: Resilient floor coverings. Determination of residual indentation after static loading.
D. EN 434: Resilient floor coverings. Determination of dimensional stability and curling after exposure to heat.
E. EN 435: Resilient floor coverings. Determination of flexibility.
F. EN 1081: Resilient floor coverings. Determination of electrical resistance.
G. EN 1815: Resilient and textile floor coverings. Assessment of static electrical propensity.
H. EN 1817: Resilient floor coverings. Specification for homogeneous and heterogeneous smooth rubber floor coverings.
I. EN 13501-1: Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests.

1.2.8 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.

1.2.9 International Organization for Standardization (ISO)
A. ISO 105-B02: Textiles - Tests for colour fastness. Part B02: Colour fastness to artificial light: Xenon arc fading lamp test.
B. ISO 4649: Determination of abrasion resistance using a rotating cylindrical drum device.
C. ISO 7619: Determination of indentation hardness - Part 1: Durometer method (Shore hardness).

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 (flooring, 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 flooring product.
C. If heat welding of seams for sheet goods has been specified, provide samples of welding rod for verification of color.
D. 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.
C. If heat welding of seams for sheet goods has been specified, provide current heat welding instructions, 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 and ISO 14001.
B. Manufacturer must have a minimum of fifteen (15) years of experience in the manufacturing of prefabricated resilient commercial 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 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 rubber sheet goods upright on a clean, dry, flat surface protected from all possible damage and from exposure to harmful weather conditions. Store rubber 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. 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 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 preformed 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 flooring will not commence unless all other trades in the building are completed. 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. Provide Manufacturer’s current standard warranty.

B. 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.

C. The resilient flooring is warranted against excessive wear under normal usage for a period of five (5) years from the date installation.

2 PART 2 – PRODUCT

2.1 MANUFACTURED PRODUCTS

2.1.1 Manufacturer


2.1.2 Description

Specifier Note: Specify format and color of product used in project.
A. GRANITO is prefabricated resilient rubber commercial flooring, calendered and vulcanized with a base of synthetic rubbers, stabilizing agents and pigmentation, as manufactured by Artigo S.p.A. or approved equal.

B. Thicknesses: 0.079'' (2mm).

C. Manufactured in a single layer. Shore hardness to be recommended by the Manufacturer and to respect limits specified.

D. Colors: Provided in standard, solid background colors with randomly dispersed colored chips throughout its surface.

E. Surface texture: Smooth.

F. Finish: Factory applied low-gloss finish, cured by ultraviolet (UV) processing.

G. Material available in sheets: 6'2" (1.90m) wide and 45'9" (14m) long. Material also available in tiles: 24" x 24" (61cm x 61cm).

2.1.3 Performance

A. Product tested in accordance to ASTM F1859 for rubber sheet floor and ASTM F1344 for rubber floor tile.

B. Product tested in accordance to EN 1817 for smooth rubber floor coverings.

C. Performance of the resilient flooring to conform to the following criteria:

<table>
<thead>
<tr>
<th>Performance Criteria</th>
<th>Test Method</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>VOC Emissions</td>
<td>AgBB</td>
<td>Compliant</td>
</tr>
<tr>
<td>Modulus at 10% Elongation</td>
<td>ASTM D412</td>
<td>≥ 300 psi</td>
</tr>
<tr>
<td>Coefficient of Friction</td>
<td>ASTM D2047</td>
<td>≥0.60</td>
</tr>
<tr>
<td>Hardness Shore A</td>
<td>ASTM D2240</td>
<td>≥85</td>
</tr>
<tr>
<td>Taber Abrasion (H18 wheel, 1000g, 1000 cycles)</td>
<td>ASTM D3389</td>
<td>&lt;0.4g loss</td>
</tr>
<tr>
<td>Critical Radiant Flux</td>
<td>ASTM E648</td>
<td>≥0.45 W/cm², Class 1</td>
</tr>
<tr>
<td>Optical Density of Smoke</td>
<td>ASTM E662</td>
<td>&lt;450</td>
</tr>
<tr>
<td>Chemical Resistance</td>
<td>ASTM F925</td>
<td>Compliant</td>
</tr>
<tr>
<td>Static Loading</td>
<td>ASTM F970</td>
<td>&lt;0.005 in. (tested at 800lbs)</td>
</tr>
<tr>
<td>Resistance to Heat</td>
<td>ASTM F1514</td>
<td>Compliant</td>
</tr>
<tr>
<td>Color Light Stability</td>
<td>ASTM F1515</td>
<td>Compliant</td>
</tr>
<tr>
<td>Fungal Resistance Test</td>
<td>ASTM G21</td>
<td>No growth</td>
</tr>
<tr>
<td>Indoor Air Quality</td>
<td>CA 01350</td>
<td>Compliant</td>
</tr>
<tr>
<td>Anti-Slip Characteristics</td>
<td>DIN 51130</td>
<td>≥6 (R9)</td>
</tr>
<tr>
<td>Thermal Resistance</td>
<td>DIN 52612</td>
<td>0.012 m² K/W</td>
</tr>
<tr>
<td>Effects of Stains</td>
<td>EN 423</td>
<td>Resistant (based on concentrations)</td>
</tr>
<tr>
<td>Effect of Castor Chairs</td>
<td>EN 425</td>
<td>Suitable with wheels type W.</td>
</tr>
<tr>
<td>Residual Indentation (after static loading)</td>
<td>EN 433</td>
<td>0.05mm</td>
</tr>
<tr>
<td>Dimensional Stability</td>
<td>EN 434</td>
<td>±0.30%</td>
</tr>
<tr>
<td>Flexibility (Method A)</td>
<td>EN 435</td>
<td>No fissuring</td>
</tr>
<tr>
<td>Electrical Resistance</td>
<td>EN 1081</td>
<td>&gt;10¹⁰ ohm</td>
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<tr>
<td>Electrostatic Charge</td>
<td>EN 1815</td>
<td>≤2 kV (antistatic)</td>
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<tr>
<td>Fire Classification</td>
<td>EN 13501-1</td>
<td>Class B₉ –s1</td>
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<tr>
<td>Dynamic Coefficient of Friction</td>
<td>EN 13893</td>
<td>≥0.30 (DS)</td>
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<tr>
<td>Colour Fastness to Artificial Light (Method 3)</td>
<td>ISO 105-B02</td>
<td>≥6 degree blue scale</td>
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<tr>
<td>Abrasion Resistance (Method A)</td>
<td>ISO 4649</td>
<td>150mm³</td>
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<tr>
<td>Hardness (Shore A)</td>
<td>ISO 7619</td>
<td>88 ± 5</td>
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<tr>
<td>Impact Sound Insulation</td>
<td>ISO 10140-3</td>
<td>~6db</td>
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</tbody>
</table>
### Performance Criteria

<table>
<thead>
<tr>
<th>Performance Criteria</th>
<th>Test Method</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environment and Health, Blue Angel</td>
<td>RAL-UZ 120</td>
<td>Certified</td>
</tr>
<tr>
<td>Environmental Assessment BRE</td>
<td>SD028</td>
<td>Certified</td>
</tr>
<tr>
<td>GREENGUARD</td>
<td>Certification</td>
<td>Yes</td>
</tr>
<tr>
<td>GREENGUARD</td>
<td>Gold</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### 2.1.4 Materials

A. Provide GRANITO prefabricated resilient rubber commercial flooring, as manufactured by Artigo S.p.A. or approved equal.
B. Provide resilient flooring as specified in section 2.1.2 Description.

### 2.2 ACCESSORY PRODUCTS

*Specifier Note:* Specify adhesive suitable for application and intended use, as well as all accessories required for project.

A. Provide adhesive certified by the Manufacturer: MP 965 acrylic adhesive, PU 105 polyurethane adhesive or EP 55 epoxy adhesive. Refer to instruction manual of adhesives provided by resilient flooring Manufacturer for suitability.
B. Patching or leveling compound to be supplied and/or recommended/approved by resilient flooring Manufacturer.
C. Heat welding rod to be supplied and/or recommended/approved by the resilient flooring Manufacturer, if heat welding of seams has been specified for the project.

### 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 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 flooring will not commence unless all other trades in the building are completed.

3.3 PREPARATION

Specifier Note: Subfloors are to be prepared according to resilient 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 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 flooring products are to be installed according to resilient flooring Manufacturer’s written instructions; it is recommended that the Specifier review all recommendations. A copy of the current Commercial 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. If heat welding of seams for sheet goods has been specified, weld seams in accordance with Manufacturer’s current heat welding instructions.
C. 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. Initial cleaning should not be performed until a minimum of 72 hours after the complete installation of the resilient flooring.
B. Maintain resilient flooring according to Manufacturer’s current maintenance instructions for specified product.

3.7 **PROTECTION**

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