

Specifier Note: This Product Specification has been created to assist in preparing a Project or Master Specification. In accordance with Construction Specifications Institute (CSI)'s MasterFormat®, this Product Specification can be used with most Master Specification, following simple editing.

Specifier Note: The enclosed requirements are intended for outdoor installations over concrete. If the provisions described herein are adopted for indoor installations or for outdoor installations over other type(s) of substrate(s), Mondo's Warranty will be null and void and the Specifier will be held liable. Product specifications for indoor applications or outdoor applications over asphalt may be obtained from the Technical Department at Mondo America, Inc. (United States 1-800-361-3747 • Canada 1-800-663-8138).

Specifier Note: This Product Specification describes the Synthetic Resilient 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 32 18 00: Athletic and Recreational Surfacing.

SECTION 32 18 16 SYNTHETIC RESILIENT SURFACING

PART 1 GENERAL

1.01 SUMMARY

1. This section covers all labor and materials required to install prefabricated Synthetic Resilient Surfacing.
2. Full knowledge and understanding of all drawings, specifications, general provisions of the bidding documents and related foundation and utilities work is required of the Surfacing Contractor.
3. The General Contractor is responsible for the installation, if any, of the subbase works, drainage systems and concrete base works, designed by others, to corrected levels and as is detailed in project drawing(s) and Master Specification.
4. The General Contractor is responsible for the purchase and installation, or reinstallation, of any inground sports equipment, as is required.
5. The General Contractor is responsible for ensuring the subbase, base and/or existing surface to receive Synthetic Resilient Surfacing, as well as all inground sports equipment, meet the specifications of the various manufacturers and rules of the sport(s) when applicable.
6. The General Contractor is responsible for delivering a concrete base that has received a topical moisture mitigation treatment, applied by approved professionals, prior to the installation of Synthetic Resilient Surfacing. The only acceptable and proven compatible topical moisture reduction barrier is Aquafin Vaportight Coat SG2.
7. The Surfacing Contractor is responsible for the purchase and installation of Synthetic Resilient Surfacing, as is detailed in project drawing(s) and Master Specification.
8. If line marking is specified, the Line Marker is responsible for all line markings, as is detailed in project drawing(s) and Master Specification, respecting rules and requirements for the intended sport(s) when applicable.

A. Products Supplied and Installed by the Surfacing Contractor:

1. Prefabricated Synthetic Resilient Surfacing.
2. Accessories required for installation, line marking (if specified), maintenance and repair.

B. Related Requirements:

Specifier Note: These divisions and sections serve as a guide to what is essential information needed to determine the acceptability of the site conditions required for the installation of Synthetic Resilient Surfacing. The Specifier may choose to include other sections he/she deems necessary.

1. Division 02 00 00 – Existing Conditions
2. Section 03 05 00 – Common Work Results for Concrete
3. Section 07 05 00 – Common Work Results for Thermal and Moisture Protection

4. Section 07 10 00 – Dampproofing and Waterproofing
5. Section 11 66 00 – Athletic Equipment
6. Division 31 00 00 – Earthwork
7. Division 32 00 00 – Exterior Improvements
8. Section 32 10 00 – Bases, Ballasts, and Paving
9. Division 33 00 00 – Utilities

1.02 REFERENCES

A. Association:

1. International Association of Athletics Federations (IAAF).

B. ASTM International (ASTM):

1. ASTM D412: Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension.
2. ASTM D2240: Standard Test Method for Rubber Property (Durometer Hardness).
3. ASTM D3389: Standard Test Method for Coated Fabrics Abrasion Resistance (Rotary Platform Abrader).
4. ASTM D4944: Standard Test Method for Field Determination of Water (Moisture) Content of Soil by the Calcium Carbide Gas Pressure Tester.
5. 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.
6. ASTM E1745: Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.
7. ASTM F387: Standard Test Method for Measuring Thickness of Resilient Floor Covering With Foam Layer.
8. ASTM F710: Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
9. ASTM F925: Standard Test Method for Resistance to Chemicals of Resilient Flooring.
10. ASTM F1514: Standard Test Method for Measuring Heat Stability of Resilient Flooring by Color Change.
11. ASTM F2157: Standard Specification for Synthetic Surfaced Running Tracks.

C. European Committee for Standardization (CEN):

1. EN 12230: Surfaces for sports areas. Determination of tensile properties of synthetic sports surfaces.
2. EN 13036-4: Road and airfield surface characteristics. Test methods - Part 4: Method for measurement of slip/skid resistance of a surface: The pendulum test.
3. EN 14808: Surfaces for sports areas. Determination of shock absorption.
4. EN 14809: Surfaces for sports areas. Determination of vertical deformation.
5. EN 14810: Surfaces for sports areas. Determination of spike resistance.

D. International Organization for Standardization (ISO):

1. ISO 9001: Quality Management Systems - Requirements.
2. ISO 14001: Environmental management systems – Requirements with guidance for use.

1.03 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).*

A. Action Submittals:

1. The Surfacing Contractor to provide current printed technical data sheets for all Products Supplied.

2. Provide three (3) samples, 6 inches by 6 inches in size, for verification of such characteristics as color, texture and finish for each Manufactured Product. Separate samples are required for each color that will be installed. Samples must be representative of Manufactured Product specified, and must be submitted and approved by the Owner. During installation, samples can be used for quality comparison with the installed product.
3. If line marking is specified and upon request, the Surfacing Contractor/Line Marker is responsible for submitting samples of available paint colors to the Owner for selection and approval.
4. Surfacing Contractor to provide current printed copies of outdoor concrete base surface preparation guidelines, installation guidelines for the Manufactured Product and all Products Supplied, and painting guidelines for the Manufactured Product (if specified), respecting any requirements of the sport(s) when applicable. The Surfacing Contractor must advise the Owner, in writing, of any known or anticipated restrictions.
5. As necessary, General Contractor to provide shop drawings prepared for the project that illustrate layouts, details, dimensions and other pertinent data useful to Surfacing Contractor and/or Line Marker.

B. Informational Submittals:

1. Surfacing Contractor to provide a sample copy of the Manufacturer's current printed Limited Material Warranty for the Manufactured Product specified.

C. Closeout Submittals:

1. If line marking has been specified, it is to the discretion of the Owner to request that the Surfacing Contractor/Line Marker submit to the Owner a certification of accuracy submitted by a registered Engineer or Surveyor, upon completion of all line markings. The Engineer or Surveyor shall certify the actual line markings on the Synthetic Resilient Surfacing, not line marking drawing(s) or computation(s). The document shall state that the line markings and layout meets the requirements of project drawing(s) and the Master Specification.
2. Surfacing Contractor to provide Owner with his/her official registered and numbered Manufacturer's Limited Material Warranty certificate for the Manufactured Product installed.
3. Surfacing Contractor to provide Owner the current printed copy of the Manufacturer's outdoor maintenance guidelines for the Manufactured Product.
4. Surfacing Contractor to provide Owner the current printed copy of the Manufacturer's bulletin Spike Recommendations for Super X and Mondotrack (Bulletin 11-001).

D. Maintenance Materials Submittals:

1. It is highly recommended to purchase extra stock material from the original dye lot used, for the purpose of facility operations and maintenance (approximately 2% of the total floor surface for each color of Manufactured Product specified), for optimal results.

1.04 QUALITY ASSURANCE

A. Surfacing Contractor, Installer and Line Marker Qualifications:

1. 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 is responsible for immediately advising the Owner, in writing, of any restrictions or anticipated difficulty.
2. Surfacing Contractor must be recognized and approved by Manufacturer.
3. Installer must be approved by Surfacing Contractor and must have performed same scale installations in the last three (3) years.
4. Surfacing Contractor is required to use approved technicians for the installation. Local laborers may be hired for non-technical work only.
5. Surfacing Contractor must ensure that a designated Project Manager/Superintendent be on site every day to supervise the installation of Synthetic Resilient Surfacing. Substitutions of Project Manager/Superintendent shall not be permitted.

6. Surfacing Contractor to have successfully completed a minimum of ten (10) multipurpose/track and field facilities in North America, utilized the same or similar Manufactured Product as specified. Upon Owner request, Surfacing Contractor to provide a list of ten (10) completed Synthetic Resilient Surfacing reference projects.
7. If line marking is 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 twenty (20) rubber multipurpose/track and field facilities in North America; all line markings shall be spray applied under the direction of the qualified Line Marker.
8. Bond tests/mock-ups are highly recommended. When requested by Owner, specify materials needed for mock-up installation based on area size requested by Owner; always follow the same procedures and use the same materials that have been specified for the actual project. The Owner will be responsible for deeming the mock-up acceptable.
9. All machinery and materials used must be only those approved by the Owner and Manufacturer.

B. Manufacturer Qualifications:

1. Manufacturer must be certified ISO 9001 and ISO 14001. Upon Owner request, Surfacing Contractor to provide copies of the ISO 9001 and ISO 14001 certifications from the Manufacturer's plant where the Synthetic Resilient Surfacing product was produced.
2. Manufacturer must have a minimum of twenty (20) years of experience in the manufacturing of prefabricated Synthetic Resilient Surfacing.
3. Manufactured Product must have undergone a vulcanization process; factory lamination is not accepted as equivalent.

C. Slopes & Tolerances:

1. The maximum lateral inclination permitted for the outdoor athletic area across the full width of the area shall not exceed 1:50 (2%), and the minimum lateral inclination shall be no less than 0.6%.
2. The maximum overall downward inclination permitted in the inner direction for the athletic area, measured over the full length of any straight distance, shall not exceed 1:1000 (0.1%).
3. Depressions cannot exceed 3 mm under a 1 m straight edge or 6 mm under a 4 m straight edge.
4. These requirements are assumed to reflect the status quo of the existing area configuration; should any areas proves to be noncompliant, remedial works will be subject to repair by the General Contractor or other, this work is not the responsibility of the Surfacing Contractor.

1.05 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 Synthetic Resilient Surfacing 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).
- 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.).

1.06 SITE CONDITIONS

- A. The General Contractor shall be responsible for ensuring required drainage and base works. The General Contractor will provide a technician on-site during sub-contract installations through the completion of the contract. The surfacing areas must drain properly and be free of bumps and/or depressions.
- B. The General Contractor shall be responsible for ensuring all site conditions meet the requirements of the Manufacturer, as referenced herein at sections 3.02 and 3.03.
- C. Concrete slabs on grade (and below grade), must always be installed over a permanent effective vapor retarder, respecting current versions of the standard practice ASTM E1643 and 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).
- D. 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).
- E. Installation of Synthetic Resilient Surfacing 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 in compressive strength). Refer to current version of ASTM F710 for additional information.
- F. Concrete 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.
- G. 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. Differences in elevation across an expansion joint shall not exceed 1/32 inch.
- H. Application of a topical moisture reduction barrier is required for all outdoor concrete, in order to protect from moisture vapor emissions and moisture infiltration from natural and/or artificial causes. The only acceptable and proven compatible topical moisture reduction barrier is Aquafin Vaportight Coat SG2, applied at a rate of 160 square feet per 2.1 gal. kit. Install according to the manufacturer's instructions.
- I. Moisture vapor emission content of the concrete slab and surface pH must not exceed the tolerance of the adhesive used, when tested according to ASTM D4944 (Calcium Carbide Gas Pressure Tester). Maximum moisture content of concrete, using this specified method, must not exceed 2.5%. The concrete's surface pH should be between 7 and 10.
- J. Installation of the Products Supplied shall not take place until the completion of adjacent or concurrent construction operations which generate dust, airborne abrasives, or any other by-product that, in the opinion of the Owner or Manufacturer, would be harmful to the Manufactured Product.
- K. General Contractor is responsible for maintaining a secure and clean working area, before, during, and after the installation of Synthetic Resilient Surfacing.

1.07 WARRANTY

- A. The Manufactured Product is warranted to be free from manufacturing defects for a period of one (1) year from the date that is within 90 days from shipment from the Manufacturer, per the terms and conditions of the Manufacturer's written Limited Material Warranty.

- B. The Manufactured Product is warranted against excessive wear under normal usage for a period of ten (10) years from the date that is within 90 days from shipment from the Manufacturer, per the terms and conditions of the Manufacturer's written Limited Material Warranty.
- C. Refer to current copy of Manufacturer's written Limited Material 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.

PART 2 PRODUCTS

2.01 MANUFACTURED PRODUCT

A. Manufacturer:

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

B. Description:

***Specifier Note:** Specify color(s) and width(s) required. Manufactured Product width and length to minimize joints in all areas; when possible side joints to be located under line markings (if line marking has been specified).*

1. Super X 720 is prefabricated rubber track surfacing with a honeycomb (elongated hexagon-shaped) design and engineered shock absorption layer for superior biomechanical properties and athlete comfort, calendered and vulcanized with a particular closed cell structure, based on special isoprenic rubbers, mineral fillers, stabilizing agents and pigmentation, with a system of differential elasticity between top surface and base, as manufactured by Mondo S.p.A.
2. 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.
3. Thickness: 0.413 in. (10.5 mm).
4. Colors: Provided in standard, solid background colors. Consult available colors for outdoor applications.
5. Surface Texture: Matte Super X 720 embossing. Non-directional, irregular tessellation patterns with interconnected surface channels. Directional patterns shall be deemed unacceptable.
6. Format: Sheets available in widths from 4' (1.22 m) to 5'3" (1.60 m) and 49'2" (15 m) long [min. 19'8" (6 m)/max. 52'5" (16 m)].

C. Performance:

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

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

Performance Criteria	Test Methods	Requirements	Results*
Elongation at Break	ASTM D412	≥100%	≥190%
Tensile Strength	ASTM D412	≥75 psi	≥110 psi
Hardness, Shore A (Wear Layer)	ASTM D2240	55 ±5	50
Hardness, Shore A (Backing)	ASTM D2240	35 ±5	30
Abrasion Resistance (H18 wheel, 500g, 1000 cycles)	ASTM D3389	≤2.0 g	≤1.2 g
Critical Radiant Flux	ASTM E648	≥0.1 W/cm ²	Compliant

Performance Criteria	Test Methods	Requirements	Results*
Thickness	ASTM F387	10.5 mm (±0.3 mm)	13.5 mm (±0.3 mm)
Chemical Resistance	ASTM F925	≤ Slight Change	Compliant**
Heat Stability	ASTM F1514	≤8.0 ΔE	Compliant
Synthetic Surfaced Running Tracks	ASTM F2157	Class A	Class A
Elongation at Break	EN 12230	≥40%	≥115%
Tensile Strength	EN 12230	≥0.4 MPa	≥0.75 MPa
Slip/Skid Resistance (Dry)	EN 13036-4	80-110	83
Slip/Skid Resistance (Wet)	EN 13036-4 (IAAF)	≥47	61
Shock Absorption	EN 14808 (IAAF)	35-50%	39%
Vertical Deformation	EN 14809 (IAAF)	0.6-2.5 mm	Compliant
Spike Resistance	EN 14810	ΔTr% ≤20	Compliant
Spike Resistance	EN 14810	ΔEb% ≤20	Compliant
Track and Runway Testing Specifications	IAAF	Compliant	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 the complete list of chemicals tested, concentrations and contact time, please communicate with Mondo's Technical Department.

D. Limitations:

1. Athletic footwear with spikes is permitted onto Super X 720, provided that use and spike specifications always respect Manufacturer's current guidelines, as outlined in the bulletin Spike Recommendations for Super X and Mondotrack (Bulletin 11-001).

E. Materials:

1. Provide Super X 720, as manufactured by Mondo S.p.A.
2. Provide Synthetic Resilient Surfacing, as specified in section 2.01 B. Description.

2.02 ACCESSORIES

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

1. Provide adhesive certified by Manufacturer: Mondo PU 100 or EPU 200 polyurethane adhesive (color-coordinated adhesive available for seaming). For suitability, recommendations and use, please refer to Manufacturer's current printed adhesive guidelines.
2. Any substrate surface patching or levelling compound(s) to be recommended/approved by Manufacturer.
3. If line marking has been specified, all painting products are to be recommended/approved by Manufacturer.

PART 3 EXECUTION

3.01 INSTALLERS

- A. Refer to section 1.04 of this document for information on installers.

3.02 EXAMINATION

- A. Surfacing Contractor to review bidding documents and specifications, verify suitability of installation by General Contractor's sub-contractors, the concrete base and any in-ground equipment.
- B. Prior to installation, Surfacing Contractor to verify that the surfacing areas drain properly and are free of bumps and/or depressions.

- C. Prior to installation, Surfacing Contractor to obtain confirmation that the concrete base works have been installed per specification. Confirm that the concrete is free of all contaminants that can inhibit bond (paint, wax, dust, oil or grease, sealer, curing compound, solvent, asphalt, old adhesive residues, etc.). Any contaminated area having been corrected should receive a bond test to confirm effectiveness of the removal.
- D. Confirm acceptable moisture levels and effectiveness of the topical moisture mitigation treatment applied, prior to gluing down Synthetic Resilient Surfacing.
- E. General Contractor to confirm completion of adjacent or concurrent construction operations, prior to installation of Synthetic Resilient Surfacing.
- F. General Contractor is responsible for maintaining a secure and clean working area before, during and after the installation of the Synthetic Resilient Surfacing.

3.03 PREPARATION

Specifier Note: The outdoor concrete base is to be prepared according to Manufacturer's current printed guidelines; it is recommended that the Specifier review said guidelines. A copy of the outdoor concrete base 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 concrete surfaces that will receive Synthetic Resilient Surfacing, and as such should not be omitted or altered in any case.

A. General Contractor:

- 1. General Contractor is responsible for the installation, if any, of the subbase works, drainage systems and concrete base works, designed by others, to corrected levels, as is detailed in project drawing(s) and Master Specification.
- 2. Prepare concrete base in accordance with Manufacturer's current printed guidelines.

B. Surfacing Contractor:

- 1. Surfacing Contractor is required to have a Technical Representative verify the suitability of the installed concrete substrate, prior to the installation of Synthetic Resilient Surfacing.

3.04 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. Weather and Climate:

- 1. If in the opinion of the Surfacing Contractor, Manufacturer or Owner, weather and climatic conditions are having or will have an adverse effect on the installation, work shall be delayed until the adverse condition has passed.

B. General Contractor:

- 1. If any, General Contractor is to purchase and install or adjust all existing fixtures and structures, and all existing inground sports equipment. Refer to CSI Section 11 66 00 – Athletic Equipment. It shall be the General Contractor's responsibility to see that each item is supplied and installed and/or adjusted per their manufacturer's specifications, respecting specified rules of the sport(s) when applicable. Any item where Synthetic Resilient

Surfacing must be installed up to or on top of must be installed prior to the installation of the Synthetic Resilient Surfacing.

C. Surfacing Contractor:

1. Surfacing Contractor to sufficiently clean down all areas to be surfaced and protect all areas not to receive Synthetic Resilient Surfacing.
2. Surfacing Contractor to install sheets of Synthetic Resilient Surfacing following Manufacturer's current printed guidelines.
3. Surfacing Contractor to install all Accessories following Manufacturer's current printed guidelines.
4. Surfacing Contractor must provide a technical representative on-site for any technical services during the installation of the Synthetic Resilient Surfacing.

D. Line Marker (When Line Marking is Specified):

1. Line Marker to paint all line markings following Manufacturer's current printed guidelines.
2. All line markings shall be spray applied.
3. Line Marker to paint all line markings following specified requirements for the sport(s) when applicable, respecting project drawing(s) and Master Specification requirements.

3.05 REPAIR

- A. Refer to section 1.03, point D.-1, 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.

3.06 CLEANING

- A. It is highly recommended to wait at least 6 months before performing the initial wash of the outdoor Synthetic Resilient Surfacing. This allows the natural paraffins to migrate to the surface of the product. In any case, the initial wash should not occur before a minimum of 72 hours after the material has been fully installed, and a minimum of 30 days when the surface has received newly painted lines so that the paint has time to properly cure.
- B. Always maintain the Synthetic Resilient Surfacing following Manufacturer's current printed guidelines.

3.07 PROTECTION

- A. As needed, protect desired areas of the Synthetic Resilient Surfacing with 1/8" Masonite during and after the installation, prior to acceptance by the Owner.

END OF SECTION