



# *Action Ultimate Combination*<sup>TM</sup> High Performance Resilient Floor System

## SPORTS FLOOR SPECIFICATIONS

**PART 1 - GENERAL****1.01 DESCRIPTION**

A mixed elastic combination maple and urethane floor system featuring Actions' premium maple flooring in combination with Actions' high performance Herculan synthetic floor system consisting of granular rubber mat, two-component urethane, and pigmented two-component waterborne color coat. All supported by a subfloor system featuring Action AirTech II Natural Rubber AirThrust pads.

**A. Related Sections: Cast-in-Place Concrete**

1. The general contractor shall provide a level slab, steel troweled to a tolerance of 1/8" (3mm) in a 10'0" (3m) radius and subject to the approval of the wood floor contractor. High spots shall be ground down and low spots shall be filled with an approved leveling compound by the general contractor to the tolerance specified above.
2. MFMA does not acknowledge the use of FF/FL numbers to measure levelness/flatness tolerances in gymnasium concrete slabs.
3. Concrete shall not use river gravel or pea gravel and have an average of 3500 psi. compressive strength after 28 days. Concrete must be cured for 60 days before installation can begin.
4. The concrete slab shall be depressed: 2-1/8" (54mm) for 25/32" (20mm) flooring.

**B. Related Sections: Membrane Waterproofing**

1. Concrete slabs on or below grade shall be adequately waterproofed beneath the slab and at the perimeter walls and on earth side of below grade walls by general contractor using suitable type membrane.

**C. Related Sections: Thresholds****D. Related Sections: Game Standard Inserts****1.02 REFERENCES**

- A. MFMA – Maple Flooring Manufactures Association
- B. MFMA PUR – MFMA Performance Uniformity Rating
- C. DIN 18032-2 - Performance Standard
- D. ASTM F2772 - Athletic Performance of Indoor Sport Systems
- E. EN 14904 – European Committee of Standardization for Indoor Sports Surfaces
- F. FIBA – International Basketball Federation
- G. FSC – Forest Stewardship Council
- H. FloorScore – Certified product by CDPH 01350

**1.03 QUALITY ASSURANCE****A. Manufacturer Qualifications**

1. Basis of design shall be Ultimate Combination as provided by Action Floor Systems, LLC. All system component parts must be supplied by Action Floor Systems, LLC.
2. Manufacturer shall be a MFMA Mill Member in good standing, an established firm experienced in the field, and have been in business a minimum of ten (10) years; Action Floor Systems, LLC or an approved equal.
3. Floor system manufacturer shall be solvent with no bankruptcy proceedings the previous seven (7) years.
4. Carbon Evaluation must be inclusive and based on all corporate facilities; offices and mills.
5. Floor system manufacturer and flooring shall be independently verified by the guidelines of the ISO 14064-1:2006 World Resource Institutes Greenhouse Gas Protocol, Scope 1, 2 and 3.
6. Floor system manufacturer and flooring shall be independently verified by the guidelines of the ISO 14040:2006 and ISO 14044:2006 Life Cycle Assessment (LCA), confirming a

negative carbon footprint.

7. Floor system manufacturer and flooring shall be registered in the Collaborative for High Performance Schools (CHPS) Product Database.
  8. Flooring system shall be independently verified to meet or exceed the SCORES criteria for environmental design and athletic performance: Sustainable Construction of Renewable Engineered Surfaces.
  9. Floor system manufacturer must provide a Life Cycle Assessment and an Environmental Product Declaration (EPD) in accordance with the Product Category Rule Version 2.2014.
  10. FloorScore – Indoor Air Quality Certified to SCS-EC10.3-2014 v3.0 Conforms to the CDPH/EHLB Standard Method v1.1-2010 (California Section 01350), effective January 1, 2012, for the school classroom and private office parameters when modeled as Flooring. Registration # SCS-FS-04375.
  11. Accredited “Ecospecifier” product for achievement of Green Building Rating Tool Credits.
- B. Floor Contractor/Installer requirements
1. The flooring contractor must be approved by Action Floor Systems, LLC.

### 1.03 WORKING CONDITIONS

- A. Synthetic materials specified herein shall not be installed until all masonry, painting, plaster, tile, marble and terrazzo work is completed, and overhead mechanical trades, and painters have finished in the synthetic floor area. The building must be reasonably dry; all openings must be closed in; permanent heating and air conditioning installed and working before, during, and after installation.
- B. The general contractor / owner shall provide an area where the stored materials can be maintained at a minimum of 65 degrees and under 80% relative humidity. Ideal installation and storage conditions are the same as those that will prevail when the building is occupied.
- C. Others will provide a concrete sub floor to the flooring contractor finished, steel troweled, and level to 1/8” in any ten-foot radius. High spots shall be ground level and low spots filled with an approved leveling compound. No concrete curing or hardening agents shall be applied to the concrete sub floor. The concrete shall be clean, flat, dry, and free from dirt, dust, oil, grease, paint, alkali, and concrete curing agents, hardening and parting compounds, old adhesive residue, or other foreign materials.
- D. Flooring installation shall not begin until all sub-contract work that would cause damage, dirt, dust, or interruption of normal installation. The installation area shall be closed to all traffic and activity for a period to be set by the flooring contractor.
- E. ENVIRONMENTAL LIMITATIONS
1. Comply with requirements of athletic flooring material suppliers.
  2. Adhere to all MSDS requirements for materials. Protect all persons from exposure to hazardous materials.
  3. LEED - Leadership in Energy and Environmental Design, Comply with EQ 4.1 and EQ 4.2 principals. Utilize high postindustrial recycled content resilient base mat.
- F. Protect the work during and after the installation process, until acceptance by the owner or agents.

### 1.04 WARRANTY

- A. Action Floor Systems, LLC. warrants the material it ships to be free from defects in materials and workmanship for a period of one year and the flooring installer warrants the installation of the flooring to be free of defects in materials and workmanship for a period of one year. The exclusive remedy under this warranty shall be replacement of defective material supplied by Action Floor Systems, LLC. or correction of defective installation by the flooring installer.
- All implied warranties of merchantability or fitness for intended use are limited to the period of this warranty. This warranty excludes consequential damages.

- B. This warranty does not cover damage caused by fire, winds, floods, chemicals, or other abuse, or by failure of other contractors to adhere to specifications, or neglect of reasonable precaution to provide adequate ventilation during hot and humid weather. This warranty also excludes damage due to excessive dryness or excessive moisture from humidity, spillage, migration through the slab or wall or any other source. This warranty also excludes damage to floors due to ordinary wear and tear, faulty construction of the building, (other than the flooring installation), separation of the concrete slab underlying the floor, settlement of the walls, or use of water on the floor.
- C. During the warranty period, the floor cannot be coated without the permission of the floor contractor.

## PART 2 - PRODUCTS

### 2.01 MATERIALS

- A. All polyurethane components shall be supplied by Action Floor Systems, LLC.
- B. HERCULAN BASE MAT ADHESIVE (UN 700), two-component polyurethane, shall bond rubber base mat to concrete, asphalt, or wood. It shall be applied at a rate of approximately .2/lbs / cubic foot minimum.
- C. HERCULAN BASE MAT
  - 4. Base mat shall be prefabricated rubber mat made of all recycled rubber granules bound with MDI polyurethane and a constant thickness. The base mat shall have a density of 45-lbs. / cubic foot minimum.
  - 5. Standard base mat thickness shall be 7mm.
- D. HERCULAN SCRATCH COAT (EG 120), two-component, thixotropic polyurethane compound applied at a rate of 0.18 lbs. / cubic foot.
- E. HERCULAN TROWEL COAT (SX 500) two-component, pigmented, self-leveling polyurethane compound applied monolithically over the base mat to a 2mm thickness. Color to be manufacturer's standard color.
- F. HERCULAN WEAR COAT (PU 150 W) two-component polyurethane applied at a rate of 0.03lbs. / square foot. Colors to be selected from manufacturer's standard color chart.
- G. Game line paint shall be HERCULAN two-component polyurethane.
- H. Optional base (specify or delete). Vinyl wall base; 4" high, select from standard colors.
- I. Tested per EN and DIN. No single point best results are acceptable.
- J. Technical Information Technical Information

Force Reduction	(EN 14808)	58%
Ball Rebound	(EN 12235, DIN 18032)	>90%
Vertical Deformation	(EN 14904)	2.3mm
Surface Hardness	(DIN 53505, ASTM D-2240)	Shore A=80 +/-
Impact Resistance	(EN 1517-1999, DIN 18032)	11Nm
Tensile Strength	(EN ISO 527-1, DIN 53455)	8 MPa
Elongation at Break	(EN ISO 527-1, DIN 53455)	150-160%
Tear Strength	(DIN 53515)	25 N/mm
Resistance to Rolling Load (1,500N)	EN 1517	<0.5mm
Resistance to Indentation	EN 1516	<0.5mm
Friction	EN 13036-4	80-110
Flammability	(DIN 51960)	Class 1 (not flammable)
- K. VOC Emission Requirements, grams per liter

1. Adhesive	0	Grams per Liter
2. Sealer	0	Grams per Liter
3. Polyurethane	0	Grams per Liter
4. Color Coating Urethane Paint	28	Grams per Liter
5. Line Paint	28	Grams per Liter

L. Floor Score: Measured Concentration of Total Volatile Organic Compounds (TVOC): Less than/equal to 0.5 mg/m<sup>3</sup> (in compliance with CDPH/EHLB Standard Method v1.1-2010).

M. Flooring

1. Flooring shall be Northern Hard Maple standard strip flooring, 25/32" x 2-1/4" (20mm x 57mm) or 1-1/2" (38mm), TGEM, MFMA grade marked & stamped as manufactured by Action Floor Systems, LLC.
2. Grades available are Select (MFMA 1<sup>st</sup>), Standard (MFMA 2<sup>nd</sup>&Btr), Character (MFMA 3<sup>rd</sup>&Btr), and Natural (MFMA 3<sup>rd</sup>).
3. Long Length Strip Flooring by Action Floor Systems, LLC (optional).
4. FSC Certified lumber (optional).
5. Expansion Ridge Technology (ERT) 1/64" milled expansion spacer (optional).
6. Factory Sand and Seal Long Length Strip Flooring (optional).

N. Subfloor

1. Vapor barrier shall be 6-mil polyethylene.
2. The pads shall be ProFlex (60 durometer) 3/4" (19mm) conical natural rubber pads, or AirFlex (48 durometer) 3/4" (19mm) conical natural rubber pads.
3. Panels shall be 15/32" x 4' x 8' (12mm x 1.2M x 2.4m) HPS, exposure 1, rated sheathing, minimum APA span rating of 32/16.

O. Fasteners

1. Subfloor fasteners shall be 1" (25mm) coated staples.
2. Flooring fasteners shall be 2" (50mm) cleats, or 15-gauge coated staples.

P. Wall Base

1. Wall base shall be 3" x 4" (76mm x 102mm) vented cove base with pre-molded outside corners (specify black or brown), as supplied by Action Floor Systems, LLC.

Q. Protective Floor Cover (optional)

1. Action AirRide cover system with patented air blower system. System includes Phthalate-free, seamless 10'-0" wide, 20.5 ounce vinyl covers and A-frame rack.

## PART 3 – EXECUTION

### 3.01 INSPECTION

- A. Inspect concrete slab for proper tolerance and dryness reporting any discrepancies in writing to the general contractor.
- B. All work to put the concrete slab in acceptable condition shall be the responsibility of the general contractor.
- C. Slab shall be broom cleaned by the general contractor.

### 3.02 INSTALLATION

- A. Cover concrete slab with polyethylene lapping edges 6" (150mm) and seal with adhesive or 2" (50mm) duct tape.
- B. AirThrust pads shall be attached to the underside of the first layer of sheathing 12" (300mm) on center as specified by the manufacturer.
- C. Place the first layer of sheathing diagonal or perpendicular to the intended direction of the finish flooring. Allow a minimum 1/4" (6mm) between panels at sides and edges, and a 2" (50mm) expansion void at walls and vertical obstructions.
- D. Install solid blocking at doorways, bleacher stack areas or under portable goals as needed.
- E. Fasten the second layer of sheathing without pads at a 45-degree angle or at right angles to the first layer. The sheathing sheets must be nailed or stapled together with 1" (25mm) fasteners starting from the center of the sheet working outward. No joint in the second layer of sheathing shall coincide with a joint in the first layer. Allow 1/4" (6mm) between panels at sides and edges, and a 2" (50mm) expansion void at walls and vertical obstructions on both layers of sheathing.



- F. At Areas where Herculan is to be installed lay 11/32" (10mm) sheathing underlayment perpendicular to the long dimension of the room. Apply construction adhesive in a box "x" pattern to the bottom of the sheathing underlayment. The underlayment sheets must be nailed or stapled to the subfloor with 1-1/4" (32mm) fasteners starting from the center of the sheet working outward. At perimeter of sheet, fasten approximately 2" (50mm) from edge of sheets 4" (102mm) across and 6" (300mm) on centers. Allow 1/4" (6mm) between panels at sides and ends and a 2" (50mm) expansion void at walls and vertical obstructions. No joint in the sheathing underlayment shall coincide with a joint in the previous layers.

### **Herculan**

- A. Cover concrete slab with poly lapping edges 6" (150mm) and sealing edges.
- B. AirTech pads shall be attached to the underside of the first layer of plywood, 12" o.c. (300mm) 32 pads per 4' x 8' (1.2m x 2.4m) sheet.
- C. Place the first layer of sheathing (with the pads attached) at a 45-degree angle to the long wall of the facility. Lay the second layer of sheathing at the opposite 45-degree angle (90 degrees to the first layer). Apply construction adhesive in a box "x" pattern on the plywood, sheets must be nailed or stapled together with 1" fasteners starting from the center of the sheet working outward. At perimeter of sheet, fasten approximately 2" (50mm) from edge of sheets 4" (102mm) across and 6" o on centers (300mm). Allow 1/4" (6mm) between panels at sides and ends and a 2" (50mm) expansion void at walls and vertical obstructions. No joint in the second layer of sheathing shall coincide with a joint in the first layer.
- D. Surface shall be clean and free of sealers, dirt, oil, paint, and any material that, in the opinion of the flooring installer, will adversely affect the HERCULAN material bonding to the surface or the overall installation (refer to 1.03 Working Conditions).
- E. Mix the two-component polyurethane adhesive and apply directly to the concrete sub floor at the specified rate with the specified notched trowel.
- F. Immediately unroll pre-relaxed mat into freshly applied adhesive.
- G. Roll base mat with heavy flat roller.
- H. Thoroughly mix two-component scratch coat. Apply two coats of scratch coat to rubber base mat with a flat steel trowel. Allow each coat to cure before proceeding to the next application. After second coat has cured, inspect base mat for ridges and voids. Sand sown ridges, and fill voids as needed.
- I. Thoroughly mix two-component trowel coat. Apply mixed material using recommended notched trowel, or notched squeegee to a thickness of 2mm. Materials must be applied continuously to create a seamless surface. Allow topcoat to cure before proceeding to next step. Repair any imperfections in the finished surface. Clean floor with a vacuum, broom, or dry dust mop. Tack clean prior to proceeding.
- J. Thoroughly mix two-component polyurethane wear coat. Apply wear coat material with a high solvent resistant paint roller at the specified rate, or by airless spray application. Allow wear coat to cure before applying game lines.
- K. Using the highest quality masking tape, tape the floor. Thoroughly mix the two-component game line paint, and paint between the tape. Remove all tape prior to the paint curing.
- L. If wall base is specified, install vinyl base to walls by using the proper cement.

### **Maple**

- A. Machine nail strip flooring approximately 10"-12" (300mm) o.c.. End joints must be properly driven up. Provide adequate expansion at regular intervals across the floor during installation as dictated by the average humidity conditions of the area according to the recommendations of the local Action Floor Systems, LLC. flooring contractor. Allow 2" (50mm) expansion voids at perimeter and all vertical obstructions.

### **3.03 FLOOR SANDING**

- A. Use coarse, medium and fine grade sandpaper.

- B. After sanding, buff entire floor using 100-grit screen or equal grit sandpaper, with a heavy-duty buffing machine.
- C. Vacuum or tack floor before first coat of finish.
- D. Floor shall present a smooth surface without drum stop marks, gouges, streaks or shiners.

#### 3.04 FINISHING

- A. Inspect entire area of floor to ensure that the surface is acceptable for finishing, completely free from sanding dust and perfectly clean.
- B. Apply seal and finish per manufacturer's instructions.
- C. Buff and vacuum or tack between each coat after it dries.

#### 3.05 BASE INSTALLATION

- A. Affix rubber base to wall with recommended adhesive or screws. Miter all corners carefully. Use pre-molded outside corners. Install aluminum thresholds as required, anchoring firmly in concrete floor beyond limits of wood flooring.

#### 3.06 CLEAN UP

- A. Clean up all unused materials and debris and remove.

#### 3.04 MAINTENANCE

- A. New floor initial maintenance.
  - 1. IMPORTANT Allow new floor or newly recoated floor to cure at least 96 hours.
  - 2. Sweep floor thoroughly. Do not use sweeping compounds.
  - 3. Mix Action Floor Systems, LLC approved cleaner with clean water to achieve desired water-to-cleaner ratio.
  - 4. Using a new mop, damp mop the entire floor with cleaner/water mix.
  - 5. Allow solution to dry on floor prior to use.
- B. Upon completion of floor installation, the owners, attendants or individuals in charge and responsible for the upkeep of the building are to see that all care maintenance are followed in accordance with Action Floor Systems, LLC guidelines. Failure to follow care and maintenance guidelines may void warranty.

IT IS THE POLICY OF ACTION FLOOR SYSTEMS, LLC. TO CONTINUALLY UPDATE AND IMPROVE OUR PRODUCT LINES. THEREFORE, WE RESERVE THE RIGHT TO CHANGE, MODIFY OR DISCONTINUE SYSTEMS, SPECIFICATIONS AND ACCESSORIES OF ALL PRODUCTS AT ANY TIME WITHOUT ANY NOTICE OR OBLIGATION TO ANY PURCHASERS.