**Section 03540: Cementitious Underlayment**

Note to Architect: The following are specifications for AccuLevel™ G40 covering a typical installation. For special conditions and other types of applications please consult with your local AccuCrete® representative.

**Part 1: General**

 **1.1 Scope**

1. Specify to meet project requirements. The conditions of the contract (General Supplementary, and other conditions) and the General Requirements (Sections of Division 1) govern the provisions of this section.
2. Work includes self-leveling underlayment for interior finish but is not limited to
3. AccuLevel™ G40
4. Division 3 Concrete Topping
5. Division 9 Sound Control, patching and leveling underlayments
6. References
7. ASTM C472 Test method for Physical Testing of Gypsum, Gypsum Plaster and Gypsum Concrete
8. ASTM F2419 Standard Practice for Installation of Thick Poured Gypsum Concrete Underlayments and Preparation of the Surface to Receive Resilient Flooring
9. ASTM C33 Standard Specification for Concrete Aggregates
10. ASTM F1869 Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor using Anhydrous Calcium Chloride
11. ASTM E492 Standard Test Method for laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine
12. ASTM E90 Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements

**1.2 Qualifications**

1. All materials, unless otherwise indicated, shall be manufactured by Arcosa Specialty Materials, and shall be installed in accordance with its current printed procedures by an AccuCrete Authorized licensed applicator.
	1. **Delivery / Storage**
2. All materials shall be delivered in their original unopened packages and stored in an enclosed shelter providing protection from damage and exposure to the elements. Avoid ambient temperature below 40 degrees F. Do not allow bags to get wet. Products shall not be used beyond shelf life. Damaged or deteriorated materials shall be removed from the project.

**1.4 Conditions**

1. Prior to the application, the building envelope must be enclosed (all windows, doors, roofing, and other openings). AccuCrete® Prime can be poured after drywall or when needed prior to drywall installation. Consult your licensed AccuCrete® contractor for details.
2. The interior of the building must be enclosed, protected from sun and wind. Ambient and substrate temperatures must be maintained at a minimum temperature of 50 degrees F for 24 hours prior to the start of the installation and maintained during the installation for a period of seventy-two (72) hours after the installation of AccuCrete® Prime. Provide continuous ventilation and heat to remove excess moisture after installation until underlayment is dry. The absence of condensation on windows will confirm adequate ventilation.

**Part 2: Products**

**2.1 Products**

1. Cementitious Underlayment: AccuLevel™ G40, 3500 to 5000 psi compressive strength per ASTM C472 M, depending upon mix design, sand gradation, water content and slump size. Recommended thickness 3/8 inch to 1-1/2 inches in a single lift. Minimum 3/8-inch depth on all wood substrates. Can be poured 1” over the top of metal deck fluting. When used with hydroponic heating systems, AccuLevel™ G40 must be poured to a thickness of ¾” above the top of the tubing or 1” above the top of the flutes, whichever is greater. Ready for light trade traffic within hours, and normal trade traffic within 24 hours. Approved for use the hydronic heating systems for radiant heat over wood or galvanized steel deck construction. Approved for wood or steel deck. Water per bag 3 to 4.25 US gallon per 80 lb. bag. Dry density average 125 lb./cubic foot. ASTM-E84- Flame Spread :0, Fuel Contribution:0, Smoke Density:0, AccuLevel™ G40 is Greenguard Gold Certified.
2. Primer: AccuCrete® Primer 8818 or manufacturer-approved primer over wood and concrete substrates. The number of coats will vary depending on primer and application.
3. Sand: Clean, washed plaster masonry or concrete sand as per ASTM C33 and the AccuCrete® Applicator Manual
4. Water: Potable water, free of contaminants.
5. Sealer: Manufacturer-approved floor sealer.
6. AccuQuiet® D18 Ultra Low compression Sound Mat 3/16” Thickness. AccuQuiet® D25 Ultra Low Compression Sound Mat ¼” Thickness. AccuQuiet® DX38 Ultra Low Compression Sound Mat 3/8” Thickness. All AccuQuiet® Sound Mats are 80% post-industrial recycled content and Greenguard Gold certified.

**2.2 Manufacturer**

1. Arcosa Specialty Materials, 1550 Double Drive, Norman, OK 73069, 800-624-5963

**2.3 Substitutions**

1. Require Approval

**Part 3: Execution**

**3.1 Preparation**

1. Subfloor should be structurally sound, properly fastened, and dry. Subfloor must be clean and free of all dust, mud, oil, grease, and any other contaminants prior to pouring the underlayment. All cracks or voids must be filled.
2. Wood substrate: Limit design of subfloor and framing to minimum L/360 for live and dead loads. Wood panels must be securely attached to the floor joists with approved fasteners and properly spaced. Wood should be APA rated and T&G or back blocked at joints. Other wood products such as particle board are not satisfactory as a subfloor.
3. Concrete substrate: Concrete must be structurally sound, dry, and free of surface contamination and must meet the live and dead load deflection standards of L/360. If the concrete is new verify it has been properly cured for at least 28 days and is dry. In 24 hours prior to underlayment installation. The substrate should be thoroughly sealed with AccuCrete® Primer 8818 or an approved primer/sealer. In all cases where vapor emissions might be an issue, a test of the pressure must be conducted per ASTM E-1869. This test must show a minimum vapor emission rate of 5 lbs./1000 sq. ft./24 hours.
4. Steel deck: Minimum 22- gauge galvanized steel deck with minimum flute depth of 9/16”. Deflection floor limits L/360. More restrictive deflection limits may be required by floor goods manufacturer. Refer to UL Fire Resistive Directory for a full description of minimum criteria for specific fire rated design.
5. AccuLevel™ G40, typically does not require mechanical profiling of substrates over clean, well bonded, structurally sound substrates for pedestrian traffic areas. Ground in dirt, old loose flooring adhesive, and carpet backing, must be mechanically profiled. When high dynamic and point loads are anticipated, the substate must be profiled to a minimum ICRI CSP 3 to enhance bond to substrate, and a 3500-psi minimum compressive strength is required.
6. AccuLevel™ G40 should not be used to bridge moving cracks or expansion joints. All joints must be honored through to the surface.
7. AccuLevel™ G40 is not a wear surface and are not intended for use as a structural element. Products are for interior use only and should not be used in areas where extended or repetitive exposure to moisture is anticipated unless protected by a waterproofing system.
8. Before, during and after installation of AccuLevel™ G40, the general contractor shall be responsible for ensuring the building shall be ventilated and heated to a Minimum of 50 degrees F (10 degrees C) until subfloor and ambient temperatures have stabilized. Temperature during and after installation shall be maintained until material has completely cured.
9. Once AccuLevel™ G40 is fully dry and passed a dryness test, the application of a surface sealer is recommended prior to the installation of all glue down or thin set finished flooring. Test AccuLevel™ G40 for dryness prior to the installation of floor goods using a Delmhorst G-79 Moisture Meter. A reading of 5 or below on the B range is considered acceptable for the installation of floor goods. All instructions or recommendations by the finished floor goods manufacturer supersede this recommendation.
10. When used in conjunction with hydroponic heating systems, pour AccuLevel™ G40 to a minimum thickness of ¾” above the top of the hydroponic tubing.
11. Wear a NIOSH approved dust mask and provide ventilation when mixing product.

**3.2 Mixing**

1. Add 3.0 to 4.25 gallons of water to one 80 lb. bag of AccuLevel™G40 following recommendations outlined in the applicator manual. Sand not to exceed 1.4 cu. ft. per bag, meeting AccuCrete® minimum gradation criteria

**3.3 Application**

1. In most cases, shotblasting or profiling is not required. Brush broom and clean substrate as needed. Prime all subfloors prior to the installation of AccuLevel™G40. Use AccuCrete® Primer 8818 or an approved primer at the recommended application rate. Over wood substrates or in cases where a bond is not anticipated, reinforcing lath is recommended.
2. When applications require a sound mat, rolls are loose laid on the subfloor, seams tightly joined and sealed. The perimeter of rooms, adjoining walls, all fixable objects, and mechanical penetrations must be isolated with perimeter isolation strip. Refer to AccuQuiet product literature or AccuCrete Applicator manual for details
3. AccuQuiet D18 3/16” thick. AccuCrete Thickness Compressive Strength Recommendations:
4. Residential/Multifamily Construction 0.75” using a 2000 psi mix design.
5. Light Commercial; 1” using a 3000-psi mix design
6. AccuQuiet D25 ¼” thick. AccuCrete Thickness Compressive Strength Recommendations:
7. Residential/Multifamily Construction: ¾” using a 2000 psi mix design
8. Light Commercial: 1” using a 3000-psi mix design
9. AccuQuiet DX38 3/8” thick. AccuCrete Thickness Compressive Strength Recommendations:
10. Residential/Multifamily Construction: 1” using a 2000 psi mix design
11. Light Commercial: 1’using a 3000-psi mix design
12. Pour AccuLevel™G40 over properly prepared substrate, while spreading and finishing to a smooth surface. AccuLevel G40 recommended thickness 3/8” to 1-1/2” in a single lift depending upon mix design, sand gradation, and water.
13. Except for authorized joints, spread product in a continuous, monolithic application, taking caution to not pour any wet slurry against any material that has already achieved an initial set.

D. General contractor shall provide continuous ventilation and adequate heat as indicated in section 3.1.E above, to rapidly remove excess moisture from the area of the installation, until the underlayment is dry.

E. Curing and drying time depends on thickness, humidity and ventilation conditions. At a thickness of ½”, AccuLevel™ G40 can be covered with flooring in 3 days. At a thickness of 1-1/2 inches, AccuLevel™ G40 can normally be covered with tile in 7-10 days and non- porous floor coverings in 15-20 days. Thinner applications can be covered quickly, and thicker application require extended drying time. Conditions such as high humidity, cool temperatures, or poor ventilation will prolong drying time.

**3.4 Field Quality Control**

1. Cube samples must be taken on each job as a record of the strength of the pour. A minimum of one set of three cubes should be taken for each pour and at least one set of three cubes per 10,000 square feet that is poured per ASTM F2419. The cubes are formed from molds made from non-rusting or non-corroding material. Cubes are tested in accordance with ASTM C472M.
2. Slump Test. AccuLevel™ G40 should be tested for slump at the beginning of each installation. Slump tests should be conducted periodically during the installation to confirm the required slump is maintained. Slump test apparatus using a 2-inch by 4-inch cylinder. Slump tests on wood will vary from plexiglass. The acceptable patty should be 9.5 to 10.5 inches with a target of 10 inches on plexiglass. The acceptable patty shall be 8.5 to 9.5 inches with a target of 9 inches on wood.

**3.4 Preparation for installation of a glued down floor covering.**

1. After installation protect floor with plywood for heavy traffic areas and heavy-duty non-staining floor protection paper for all other areas.
2. After the underlayment has dried, spray or roll on an approved sealer prior to the in applications where the floor goods Installation of manufacturer requires a special adhesive or installation system, the floor goods Floor Goods manufacturers’ recommendations will supersede all others.
3. Any damaged areas of the underlayment must be repaired prior to the installation of the sealer. Oil based sweeping compounds are prohibited. Use only AccuCrete® approved sealer and recommended by the manufacturer. Sealer to be applied by the finished flooring contractor.
4. Fasteners in underlayment must be designed for use with concrete/masonry.
5. Underlayment must be dry prior to installing finished floor. Follow flooring manufacturer recommendations regarding moisture levels and vapor retarders prior to installing finished floor.
6. Allow for adequate curing or setting time prior to allowing traffic on finished floor.