



EVALUATION GUIDELINE FOR AIR-CONDITIONING EQUIPMENT PADS

EG100

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PREFACE

Evaluation reports issued by ICC Evaluation Service, Inc. (ICC-ES), are based upon performance features of the International family of codes and other widely adopted code families, including the Uniform Codes, the BOCA National Codes, and the SBCCI Standard Codes. Section 104.11 of the *International Building Code*[®] reads as follows:

The provisions of this code are not intended to prevent the installation of any materials or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. An alternative material, design or method of construction shall be approved where the building official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety.

Similar provisions are contained in the Uniform Codes, the National Codes, and the Standard Codes.

This document has been issued to provide all interested parties with guidelines for demonstrating compliance with performance features of the applicable code(s) referenced in the document. The guideline has been approved by the ICC-ES Evaluation Committee, and is effective on the date shown above. All reports issued or reissued on or after the effective date must comply with this guideline, while reports issued prior to this date may be in compliance with this guideline or with the previous edition. If the guideline is an updated version from the previous edition, a solid vertical line (|) in the margin within the guideline indicates a technical change, addition, or deletion from the previous edition. A deletion indicator (→) is provided in the margin where a paragraph has been deleted if the deletion involved a technical change. This guideline may be further revised as the need dictates.

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EVALUATION GUIDELINE FOR AIR-CONDITIONING EQUIPMENT PADS

1.0 INTRODUCTION

1.1 Purpose: The purpose of this evaluation guideline is to establish requirements for composite and molded plastic equipment pads to be recognized in an ICC Evaluation Service, Inc. (ICC-ES), evaluation report under the 2003 *International Mechanical Code*® (IMC), the 2003 *International Residential Code*® (IRC), the 1997 *Standard Mechanical Code*® (SMC), the 1997 *Standard Swimming Pool Code*® (SSPC) and the 1997 ICBO *Uniform Mechanical Code* (ICBO UMC). The equipment pads are used as outdoor foundations and supports between mechanical equipment and prepared soil grade as required in IMC Section 304.8, IRC Section M1305.1.4.1, SMC Sections 304.5 and 304.7, SSPC Sections 305.2 and 405, and UMC Section 1105.2.1.

1.2 Scope: The composite and molded plastic equipment pads are alternatives to concrete. Three types of equipment pad are included within the scope of this guideline, as described in Sections 1.2.1, 1.2.2 and 1.2.3.

1.2.1 Composite Equipment Pad: The composite equipment pad is composed of an expanded polystyrene (EPS) foam meeting the requirements of ASTM C 578-95, Type I, II, VIII or IX. The foam is molded on five sides with a composite coating made up of cementitious materials and polypropylene fibers. The product comes in various sizes to accommodate the various sizes of air-conditioning units available in the marketplace. The product shall be a minimum of 3 inches (76 mm) thick to satisfy ground clearance requirements of the applicable code.

1.2.2 Plastic Equipment Pad: The plastic equipment pad is a one-piece pad, injection-molded from high-density Type III or IV polyethylene complying with ASTM D 1248 or polypropylene complying with ASTM D 4101, with a minimum top thickness of 0.25 inch (6.4 mm), a nominal support rib wall thickness of at least 0.4 inch (10 mm), and uniform, full-depth ribs spaced at a nominal 3.75 inches (95 mm) (maximum) in each direction. Available in various sizes to accommodate various sizes of air-conditioning units available in the marketplace, the product shall be a minimum of 3 inches (76 mm) thick to satisfy ground clearance requirements of the applicable code.

1.2.3 Recycled Plastic and Rubber Equipment Pad: The recycled plastic and rubber equipment pad is a one-piece pad, injection-molded from a mix of recycled plastic and rubber materials. The minimum thickness of the top of the pad is 0.35 inch (9.4 mm), and the nominal support rib wall thickness is at least 0.4 inch (10 mm). Full-depth cross-ribs and/or support ribs shall be placed on the bottom side of the pad to provide adequate support for the top surface of the pad and stability for the pad overall. The pad shall be a minimum of 3 inches (76 mm) thick to satisfy ground clearance requirements in the applicable code.

1.3 Reference Standards:

1.3.1 2003 *International Mechanical Code*® (IMC), International Code Council.

1.3.2 2003 *International Residential Code*® (IRC), International Code Council.

1.3.3 1997 *Standard Mechanical Code*® (SMC).

1.3.4 1997 *Standard Swimming Pool Code*® (SSPC).

1.3.5 1997 ICBO *Uniform Mechanical Code* (ICBO UMC).

1.3.6 ASTM C 578-95, Specification for Rigid, Cellular Polystyrene Thermal Insulation, ASTM International.

1.3.7 ASTM D 1248-84 (1989), Specification for Polyethylene Plastics Molding and Extrusion Materials, ASTM International.

1.3.8 ASTM D 4101-96a, Specification for Polypropylene Plastic Injection and Extrusion Materials, ASTM International.

1.3.9 ASTM C 67-97, Sampling and Testing Brick and Structural Clay Tile, ASTM International.

1.3.10 ASTM C 393-94, Flexural Properties of Flat Sandwich Constructions, ASTM International.

1.3.11 ASTM D 2299, Recommended Practice for Determining Relative Stain Resistance of Plastics (discontinued 1992).

1.3.12 ASTM D 790-86, Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials, ASTM International.

1.3.13 ASTM D 256-99, Determining the Pendulum Impact Resistance of Notched Specimens of Plastics, ASTM International.

1.3.14 ASTM D 570-81, Water Absorption of Plastics, ASTM International.

1.3.15 ASTM D 1499-92a, Practice for Operating Light- and Water-Exposure Apparatus (Carbon-Arc Type) for Exposure of Plastics, ASTM International.

1.3.16 ASTM D 2565-92a, Practice for Operating Xenon Arc-Type Light-Exposure Apparatus With and Without Water for Exposure of Plastics, ASTM International.

1.3.17 ASTM D 746-95, Brittleness Temperature of Plastics and Elastomers by Impact, ASTM International.

1.3.18 ASTM D 792-91, Density and Specific Gravity (Relative Density) of Plastics by Displacement, ASTM International.

1.3.19 ASTM D 579-95, Specification for Greige Woven Glass Fabrics, ASTM International.

1.3.20 ASTM D 3282-93, Classification of Soils and Soil-aggregate Mixtures for Highway Construction Purposes, ASTM International.

1.3.21 ASTM D 1557-91, Laboratory Compaction Characteristics of Soil Using Modified Effort, ASTM International.

1.3.22 ASTM D 1929-91a, Ignition Properties of Plastics, ASTM International.

1.3.23 ASTM E 1354-94, Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter, ASTM International.

2.0 BASIC INFORMATION

2.1 General: The following information shall be submitted:

2.1.1 Product Description: Complete information concerning material specifications, thickness, size and the manufacturing process.

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2.1.2 Installation Instructions: Installation details and limitations.

2.1.3 Packaging and Identification: A description of the method of packaging and field identification of the panel. Identification provisions shall include the evaluation report number.

2.2 Testing Laboratories: Testing laboratories shall comply with Section 2.0 of the ICC-ES Acceptance Criteria for Test Reports (AC85) and Section 4.2 of the ICC-ES Rules of Procedure for Evaluation Reports.

2.3 Test Reports: Test reports shall comply with AC85.

2.4 Product Sampling: Sampling of the equipment pads for tests under this criteria shall comply with Section 3.2 of AC85.

3.0 TEST AND PERFORMANCE REQUIREMENTS

3.1 Composite Equipment Pads:

3.1.1 Performance Objectives: The composite equipment pad shall satisfy the following requirements through testing in accordance with Section 4.1:

3.1.1.1 Support the anticipated equipment loads without damage.

3.1.1.2 Transfer the equipment load to the ground without exceeding the permitted soil-bearing pressure.

3.1.1.3 After the initial set, the surface of the equipment pad shall not continue to creep under the long-term loading.

3.1.1.4 The protective coating shall stay intact to prevent EPS exposure.

3.1.1.5 The cementitious surface may be indented after impact, but shall not otherwise be damaged.

3.2 Plastic Equipment Pads: The plastic equipment pad shall satisfy the following requirements through testing in accordance with Section 4.2:

3.2.1 Support the anticipated equipment loads without damage.

3.2.2 Transfer the equipment load to the ground without exceeding the permitted soil-bearing pressure.

3.2.3 The exposed surface shall be resistant to ultraviolet light.

3.3 Recycled Rubber and Plastic Equipment Pad: The recycled-rubber-and-plastic equipment pad shall satisfy the following requirements through testing in accordance with Section 4.3:

3.3.1 Support the anticipated equipment loads without damage to pad or equipment, and without excessive surface deflection, under normal air-conditioning unit weight and compressor/cooling fan vibration, and under exterior exposures.

3.3.2 Transfer the equipment load to the ground without exceeding the permitted soil-bearing pressure.

3.3.3 The exposed surface shall be resistant to ultraviolet light.

4.0 TEST METHODS

4.1 Composite Equipment Pads:

4.1.1 Foam Plastic: The foam plastic shall comply with ASTM C 578-01 and with the ICC-ES Interim Criteria for Foam Plastic Insulation (AC12). Each EPS type manufactured by the applicant shall be tested unless the product passes all the tests with the lowest density foam plastic.

4.1.2 Concentrated Load and Creep Test:

4.1.2.1 Test Procedures: The concentrated load test will be required to justify long-term creep. The loading will be based on an equipment foot that imparts concentrated loads to the equipment pad. The equivalent diameter of the equipment feet shall be 2 inches (51 mm). A maximum 500-pound (2225 N) design load shall be supported by the pad. Assuming the equipment has four feet, the concentrated test load shall be 125 pounds (556 N) per equipment foot at four random locations on the equipment pad surface.

4.1.2.2 The 125-pound (556 N) concentrated test load is applied to a 2-inch-diameter (51 mm) disk. The set is then measured, the load released and the rebound measured. The procedure is repeated four times. The results shall indicate no continuous indentation, and the deformation after rebound shall be within 0.01 inch (0.25 mm) of initial reading.

4.1.2.3 The load is increased to two times the concentrated test load [250 pounds (1113 N)] and the deformation again measured. The overload is removed and the rebound measured. The deformation after the rebound shall be within 0.01 inch (0.25 mm) of the initial reading.

4.1.2.4 If procedures in Section 4.1.2.3 are successful, the 125-pound (556 N) load is applied to the four locations on the pad surface for 7 days, with the pad surface temperature maintained at 140°F ± 5°F (60°C + 3°C).

4.1.2.5 The deformation shall not exceed 0.01 inch (0.25 mm) during this period.

4.1.2.6 After completion of the test described in Section 4.1.2.4, the load shall be increased 5 times to 625 pounds (2781 N) and held for 30 seconds.

4.1.2.7 Conditions of Acceptance:

4.1.2.7.1 No ongoing movement under the 625-pound (2781 N) load.

4.1.2.7.2 EPS foam cannot be exposed. Pad deformation is permitted. Cracking and spalling are unacceptable.

4.1.3 Engineering Analysis: Based on successful completion of the concentrated load test, bearing pressures shall be calculated to justify load transfer between equipment, equipment pad and the soil.

4.1.4 Durability Test:

4.1.4.1 Test Procedures: A 24-inch-by-24-inch (610 mm by 610 mm) test pad shall be selected and a line drawn from the midpoint of one edge to the midpoint of the opposite edge.

4.1.4.1.1 A 2-inch-diameter (51 mm) steel ball shall be dropped 10 times from a height of 36 inches (914 mm) on one side of the established line on the equipment pad surface. Slight indentations of the surface are permitted as long as the surface does not crack and the EPS foam is not exposed. The extent of indentation shall be examined with a 5-power magnifying glass and reported.

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4.1.4.1.2 After the ball drops, the pad is cut along the marked line and the impacted half is subjected to 25 cycles of freezing and thawing in accordance with Section 8 of ASTM C 67. The 20-hour freezing portion of each cycle shall occur with the specimen submerged in $\frac{1}{2}$ inch (12.7 mm) of water, with the coated surface in contact with the water. After the freezing portion, the sample is removed from the cold box and thawed in water maintained at $75^{\circ}\text{F} \pm 4^{\circ}\text{F}$ ($24^{\circ}\text{C} \pm 2^{\circ}\text{C}$). The undamaged half is stored in a controlled atmosphere until the freezing and thawing cycles are completed.

4.1.4.2 Conditions of Acceptance:

4.1.4.2.1 After completion of the freeze-thaw cycle, the sample shall be examined for additional cracks or crazing, using a 5-power magnification glass. No exposure of EPS core is permitted.

4.1.4.2.2 Both the aged and the conditioned samples shall be placed on a test frame with supports spaced 20 inches (508 mm) apart, and shall be tested for flexural loads in accordance with ASTM C 393. The sample is placed on the supports so that the cementitious surface is in tension. The flexural strength of the aged sample shall be within 90 percent that of the conditioned sample.

4.1.5 Vibration Test:

4.1.5.1 Test Procedures: To evaluate vibration resistance, the equipment pad is subjected to an operating compressor motor and cooling fan. A steel plate, weighing a minimum of 500 pounds (2225 N), shall be supported on four 2-inch-diameter (51 mm) foot pads simulating actual conditions. The compressor motor and fan shall be placed on a rubber damping pad and mounted on a wood base. The wood base is placed on the steel platform and clamped in place. The initial set of the foot is then measured and the assembly placed on the composite equipment pad. The compressor equipment is operated for 8 hours per day for 10 days for a total of 80 hours. See Figure 1 for details.

4.1.5.2 Conditions of Acceptance: The set of the foot on the surface shall be measured and compared to the original reading. The maximum deformation is 0.007 inch (0.18 mm).

4.1.6 Chemical Resistance Test:

4.1.6.1 Test Procedure: Testing is in accordance with ASTM D 2299. The equipment pad surface is evaluated for resistance to the following liquids, using three specimens for each liquid:

4.1.6.1.1 R22 or R134a.

4.1.6.1.2 Compressor oil.

4.1.6.1.3 Salt solution, 20 percent by volume.

4.1.6.1.4 Synthetic canine urine.

4.1.6.2 Conditions of Acceptance: After testing, the exposed surface is investigated to determine the extent of surface change. Crazing, softening, delamination or spalling shall constitute failure.

4.2 Plastic Equipment Pad:

4.2.1 Plastic: The plastic shall comply with ASTM D 1248, Type III or IV, or with ASTM D 4101.

4.2.2 Exposure to Soil Environment:

4.2.2.1 General: The following tests are necessary to evaluate the plastic qualities in resisting mechanical degradation when exposed to soil environment:

4.2.2.1.1 Flexural strength tests conducted in accordance with ASTM D 790, Section 12.5.

4.2.2.1.2 Izod impact tests conducted in accordance with ASTM D 256, Method A.

4.2.2.1.3 Water absorption tests conducted in accordance with ASTM D 570.

4.2.2.2 Test Specimen Conditioning: Test specimens shall be injection-molded in accordance with the applicable ASTM specification, or cut from test samples. Each set shall consist of at least five specimens conditioned in accordance with the following:

4.2.2.2.1 The control set shall be maintained at room temperature of $73^{\circ}\text{F} \pm 5^{\circ}\text{F}$ ($23^{\circ}\text{C} \pm 2^{\circ}\text{C}$).

4.2.2.2.2 The acid-exposed set of specimens shall be immersed for 21 days in $73^{\circ}\text{F} \pm 5^{\circ}\text{F}$ ($23^{\circ}\text{C} \pm 2^{\circ}\text{C}$) sulfuric acid solution having a concentration of pH3.

4.2.2.2.3 The alkaline-exposed set of specimens shall be immersed for 21 days in $73^{\circ}\text{F} \pm 5^{\circ}\text{F}$ ($23^{\circ}\text{C} \pm 2^{\circ}\text{C}$) sodium hydroxide solution having a concentration of pH12.

4.2.2.2.4 The immersed set of specimens shall be immersed for 21 days in $73^{\circ}\text{F} \pm 5^{\circ}\text{F}$ ($23^{\circ}\text{C} \pm 2^{\circ}\text{C}$) deionized water.

4.2.2.2.5 The weathered set of specimens shall be subjected to one of the following weatherometer exposures with water cycles:

4.2.2.2.5.1 Minimum 2,000 hours in accordance with ASTM D 1499, using Type DH or EH apparatus.

4.2.2.2.5.2 Minimum 2,900 hours of weatherometer exposure in accordance with ASTM D 2565, using Type BH apparatus and borosilicate inner and outer filters.

4.2.2.3 Conditions of Acceptance:

4.2.2.3.1 Specimens conditioned as described in Sections 4.2.2.2.2 through 4.2.2.2.5 shall exhibit a minimum of 90 percent of the flexural strength and impact resistance of control specimens described in Section 4.2.2.2.1.

4.2.2.3.2 Percentage weight change between the control specimens described in Section 4.2.2.2.1, and the immersed specimens described in Section 4.2.2.2.4, shall not exceed 1 percent.

4.2.3 Low-temperature Brittleness:

4.2.3.1 Procedure: Ten specimens shall be tested in accordance with ASTM D 746.

4.2.3.2 Conditions of Acceptance: The minimum temperature at which 50 percent of the specimens break shall be reported. This minimum temperature will be reported in the evaluation report.

4.2.4 Density:

4.2.4.1 Procedure: Five specimens shall be tested in accordance with ASTM D 792.

4.2.4.2 Conditions of Acceptance: The density shall be equal to or greater than 0.941 gram per cubic centimeter for high-density polyethylene and 0.900 gram per cubic centimeter for polypropylene.

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4.2.5 Stiffness:

4.2.5.1 Procedure: Five specimens shall be tested for flexural modulus of elasticity in accordance with Section 12.11 of ASTM D 790.

4.2.5.2 Conditions of Acceptance: The specimens shall exhibit a minimum average flexural modulus of 155,000 psi (1069 MPa) for the high-density polyethylene, and 140,000 psi (965 N) for the polypropylene.

4.2.6 Creep:

4.2.6.1 General: Creep effects shall be determined by the following test method:

1. After the allowable concentrated load from Section 4.2.7 has been determined, that load shall be applied to a minimum of four points on the plastic pad. The concentrated load shall be on the pad surface and located at the geometric center between the four stiffening ribs. At least two load points shall be located between the first interior stiffening ribs and the perimeter ribs.

2. After the concentrated load points have been selected, the allowable concentrated load shall be applied to each point on a 2-inch-diameter (51 mm) disk. When the loading is completed, the pad surface temperature shall be raised to 140°F ± 5°F (60°C ± 3°C) and held for 7 days.

3. Measurements shall be taken initially, after applying the allowable concentrated load, after 7 days at 140°F (60°C), and after load removal.

4.2.6.2 Conditions of Acceptance: The deformation, after removal of the concentrated load at 140°F (60°C), shall recover to within 0.06 inch (15 mm) of the initial reading.

4.2.7 Concentrated Load Test:

4.2.7.1 Procedure: A concentrated load, applied on a 2-inch-diameter (51 mm) disk, shall be applied between the reinforcing ribs on five specimens. The rate of loading shall be 600 pounds (2670 N) per minute.

4.2.7.2 Conditions of Acceptance: The allowable concentrated load shall be limited to the lesser of the following and shall be within the elastic range of the product:

1. Peak load divided by a safety factor of 4.
2. Load at maximum deformation limited to 0.10 inch (2.5 mm).

4.2.8 Uniform Load Test on Plastic Pad:

4.2.8.1 Procedure: Three specimens of the smallest plastic pad shall be selected and placed on a uniform compacted bed of sand 6 inches (152 mm) in depth. The pad shall be leveled and the initial elevation of the pad surface recorded. The pad shall be loaded uniformly with 1.25 times the design load, and the level of the pad surface recorded. Design loads shall not exceed loads that create a net soil-bearing pressure of 1,000 psf (47.88 kPa). The load shall remain on the pad for seven days. After the seven-day period, the final elevation of the pad surface shall be recorded.

4.2.8.2 Conditions of Acceptance: The maximum settlement of the pad after the seven days of loading shall not exceed $\frac{1}{8}$ inch (3.2 mm) from the initial loaded condition.

4.3 Recycled Plastic and Rubber Equipment Pad:

4.3.1 Exposure to Soil Environment:

4.3.1.1 General: The following tests are necessary to evaluate the material for resistance to mechanical degradation when exposed to a soil environment:

4.3.1.1.1 Flexural strength tests conducted in accordance with ASTM D 790, Section 12.5.

4.3.1.1.2 Izod impact tests conducted in accordance with ASTM D 256, Method A.

4.3.1.1.3 Water absorption tests conducted in accordance with ASTM D 579.

4.3.1.2 Test Specimen Conditioning: Test specimens shall be injection-molded in accordance with the applicable ASTM specification, or cut from test samples. Each set shall consist of at least five specimens conditioned in accordance with the following:

4.3.1.2.1 The control set shall be maintained at a room temperature of 73°F ± 5°F (23°C ± 2°C).

4.3.1.2.2 The acid-exposed set of specimens shall, for 21 days, be immersed in 73°F ± 5°F (23°C ± 2°C) sulfuric acid solution having a concentration of pH3.

4.3.1.2.3 The alkaline-exposed set of specimens shall, for 21 days, be immersed in 73°F ± 5°F (23°C ± 2°C) sodium hydroxide solution having a concentration of pH12.

4.3.1.2.4 The immersed set of specimens shall, for 21 days, be immersed in 73°F ± 5°F (23°C ± 2°C) deionized water.

4.3.1.2.5 The weathered set of specimens shall be subjected to one of the following weatherometer exposures with water cycles:

4.3.1.2.5.1 Minimum 2,000 hours in accordance with ASTM D 1499, using Type DH or EH apparatus.

4.3.1.2.5.2 Minimum 2,900 hours of weatherometer exposure in accordance with ASTM D 2565, using Type BH apparatus and borosilicate inner and outer filters.

4.3.1.3 Conditions of Acceptance:

4.3.1.3.1 Specimens conditioned as described in Sections 4.3.1.2.2 through 4.3.1.2.4 (acid, alkaline, and deionized water tests) shall exhibit a minimum of 90 percent of the flexural strength and impact resistance of control specimens conditioned as described in Section 4.3.1.2.1.

4.3.1.3.2 Percentage weight change between the control specimens described in Section 4.3.1.2.1 and the immersed specimens described in Section 4.3.1.2.4 shall not exceed 1 percent.

4.3.2 Low-temperature Brittleness:

4.3.2.1 Procedure: Ten specimens shall be tested in accordance with ASTM D 746.

4.3.2.2 Conditions of Acceptance: The minimum temperature at which 50 percent of the specimens break shall be reported. This minimum temperature will be reported in the evaluation report.

4.3.3 Density:

4.3.3.1 Procedure: Five specimens shall be tested in accordance with ASTM D 792.

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4.3.3.2 Conditions of Acceptance: The density shall be equal to or greater than 0.900 gram per cubic centimeter.

4.3.4 Stiffness:

4.3.4.1 Procedure: Five specimens shall be tested for flexural modulus of elasticity in accordance with Section 12.11 of ASTM D 790 for what would be expected to be a low flexural value, based on recycled material types and proportions expected. The same is to be done for a high flexural value. The intent of this test is to establish a possible range of flexural modulus due to the use of recycled material. See Section 4.3.12.

4.3.4.2 Condition of Acceptance: The specimens shall exhibit a minimum average flexural modulus of 30,000 psi (207 MPa) for the recycled plastic and rubber mixture.

4.3.5 Allowable Concentrated Load Test:

4.3.5.1 Procedure: A single concentrated load, applied on a 2-inch-diameter (51 mm) disk, shall be applied between reinforcing ribs. Five specimens shall be tested at the worst-case location for both the largest and smallest pad manufactured. The uniform rate of loading shall be 600 pounds (2670 N) per minute.

4.3.5.2 Conditions of Acceptance: The allowable concentrated load shall be limited to the lesser of the following but under no circumstances shall be less than 100 pounds (45 kg) per corner-support foot (assume the air-conditioning unit has a minimum of four corner-support feet):

1. Peak load in elastic range of material divided by a safety factor of 4.
2. Load at maximum deformation limited to 0.125 inch (3.2 mm).

4.3.6 Creep:

4.3.6.1 General: Creep effects shall be determined by the following test method:

4.3.6.1.1 After the allowable concentrated load has been determined in accordance with Section 4.3.5, that load shall be simultaneously applied to four points on the pad. The loads shall be on the pad surface and shall be placed at locations selected from the concentrated load tests to simulate an air-conditioning unit load condition.

4.3.6.1.2 After the concentrated load points have been selected, the allowable concentrated load shall be applied on a 2-inch-diameter (51 mm) disk to each point. When the loading is completed, the pad surface shall be raised to a temperature of 140°F ± 5°F (60°C ± 3°C) and kept at that temperature and load for 7 days.

4.3.6.1.3 Deflection measurements shall be taken at load locations before any loads are placed on the pad, after applying the allowable concentrated loads, every 24 hours during the 7 days at 140°F (60°C), and every 30 minutes for 4 hours after load removal (or until full rebound is reached).

4.3.6.2 Condition of Acceptance: The deformation, after removal of the concentrated load at 140°F (60°C), shall recover to within 0.06 inch (1.5 mm) of the initial reading within 4 hours of full load removal.

4.3.7 Settlement Test of Equipment Pad:

4.3.7.1 Procedure: Three specimens of the smallest and largest pads shall be selected and placed on a uniform

compacted bed of soil 6 inches (152 mm) deep. The soil should conform with ASTM D 3282, Group A2, to simulate top soil used in construction. The soil should be compacted to a minimum of 90 percent of standard Proctor density in accordance with ASTM D 1557. The pad shall be leveled on the soil and the initial elevation of the pad surface recorded. Space between pads being tested should be such that the bearing stress will not affect the soil of adjacent pads being tested. The pad shall be fourpoint loaded with 1.25 times the anticipated maximum air-conditioning unit load for that particular pad size, but under no circumstances shall have less than 1,250 psf (60 kPa) contact pressure between soil and ribs. The maximum anticipated load for pad size will be stated. The elevation of the pad surface should be recorded by a minimum of two settlement measurement devices near a load point. The load shall remain on the pad for seven days. Elevations of the pad surface shall be recorded before loads are placed on the pad, immediately after the full load is placed on the pad, and after the seven-day period. The height of the top of the pad above the surrounding soil shall be measured at these same times.

4.3.7.2 Condition of Acceptance: The maximum average settlement of the pads after the seven days of loading shall not exceed the initially loaded condition by more than 1/8 inch (3.2 mm).

4.3.8 Ignition Temperature Test:

4.3.8.1 Procedure: A specimen shall be tested in accordance with ASTM D 1929; both self-ignition temperature and flash-ignition temperature shall be determined.

4.3.8.2 Conditions of Acceptance: The lowest self-ignition and flash-ignition temperatures shall be reported in the evaluation report.

4.3.9 Heat and Visible Smoke Release Rate Test:

4.3.9.1 Procedure: Three specimens shall be tested in accordance with ASTM E 1354.

4.3.9.2 Condition of Acceptance: The ignition time, heat release rate, and smoke obscuration (the average specific extinction area) shall be recorded. These values shall be reported in the evaluation report. The ignition time shall be greater than 80 seconds, the heat release rate shall be less than 350 kW/m², and smoke obscuration shall be less than 760 m²/kg.

4.3.10 Vibration Test:

4.3.10.1 Procedure: The equipment pad is subjected to the load imposition of an operating compressor motor and cooling fan. A steel plate, weighing a minimum of 500 pounds (2225 N), shall be supported on four 2-inch-diameter (51 mm) foot pads, simulating actual conditions. The compressor motor and fan shall be placed on a rubber damping pad and mounted on a wood base. The wood base shall be placed on the steel platform and clamped in place (see Figure 1). The initial set of the foot shall then be measured and the assembly shall be placed on the equipment pad. The compressor equipment shall be operated for 8 hours per day for 10 days, for a total of 80 hours.

4.3.10.2 Conditions of Acceptance: The final set of the foot on the surface shall be measured and compared to the original reading. The maximum deformation shall be 0.01 inch (0.254 mm).

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4.3.11 Ignition Test:

4.3.11.1 Purpose: The purpose of the ignition test is to evaluate the effects of incidental flame impingement on the plastic pad.

4.3.11.2 Procedure: Five test specimens, each approximately 12 inches (305 mm) square, shall be cut from a representative rubber pad. The ignition test shall be conducted under a draft-free laboratory hood having provisions for removal of products of combustion immediately after each test is conducted. The test specimen shall be mounted under the hood in a vertical position. The burner of a propane torch shall be adjusted to provide a blue flame, the visible portion of which is 1 inch (25.4 mm) long. The torch shall be positioned in such a manner that the flame is inclined upward at a 45-degree angle to the specimen, which is in a vertical plane, with the tip of the blue portion of the flame touching the center of the specimen. After 30 seconds, the torch shall be moved at least 18 inches (457 mm) away from the test specimen, and the stopwatch shall be started, to time the burning period. When no evidence of flame or progressive glow is seen, the time shall be recorded. One minute from the time of removal of the flame, the flame shall be applied to the same location on the specimen for an additional 30 seconds, after which the torch shall be removed and the burning period recorded.

4.3.11.3 Conditions of Acceptance: All five specimens shall cease to burn (if ignited) within 30 seconds of removal of the flame. If any one of the specimens fails the test, five additional specimens shall be tested, and all five specimens shall pass.

4.3.12 Quality Control Tests:

4.3.12.1 Quality control tests shall be conducted during the production of the pads in conformance with procedures set forth in the in-house quality control manual. The quality control tests shall be as follows:

1. One flexural test in accordance with ASTM D 790 shall be performed for every 1,000 pads produced, and one concentrated load test in accordance with Section 3.3.5 of this report shall be performed for every 3,000 pads produced.
2. The test samples shall be randomly taken from the injection-molded products.

3. Percentages and types of material used shall be recorded for each day of production. If different material sources, percentages, or types of materials are introduced into any production run, tests noted above shall be performed and documented in accordance with procedures set forth in the in-house quality control manual.

4.3.12.2 Conditions of Acceptance: The determined flexural modulus and flexural strength shall not be less than 95 percent of the lowest control sample values reported in the initial qualification test report. The allowable concentrated load shall not be less than 95 percent of the value reported in the qualification test report.

5.0 QUALITY CONTROL

5.1 A quality control manual complying with the ICC-ES Acceptance Criteria for Quality Control Manuals (AC10) shall be submitted.

5.2 Third-party follow-up inspections are not required under this evaluation guideline.

6.0 EVALUATION REPORT RECOGNITION

Products complying with this guideline can be recognized as foundation pads for air-conditioning equipment. The composite equipment pad shall be recognized for a load based on soil-bearing stress and/or stress created by a skid-mounted perimeter frame. The allowable concentrated load for all designs shall be limited to 125 pounds (556 N) per equipment foot. The plastic equipment pad shall be recognized for a load based on soil-bearing stress and/or stress created by a skid-mounted perimeter frame. The allowable concentrated load for all designs shall be limited to the values determined in Section 4.2.7. The recycled-plastic-and-rubber equipment pad shall be recognized for a load based on soil-bearing stress and/or stress created by a skid-mounted perimeter frame. The allowable concentrated load for all designs shall be limited to the values determined in Section 4.3.5. The evaluation report shall note that equipment anchorage to the pads and the pads' resistance to horizontal loads are beyond the scope of the evaluation report. A condition of use shall be included in the evaluation report that the equipment pad shall not be installed within 5 feet of the property line. ■

EVALUATION GUIDELINE FOR AIR-CONDITIONING EQUIPMENT PADS

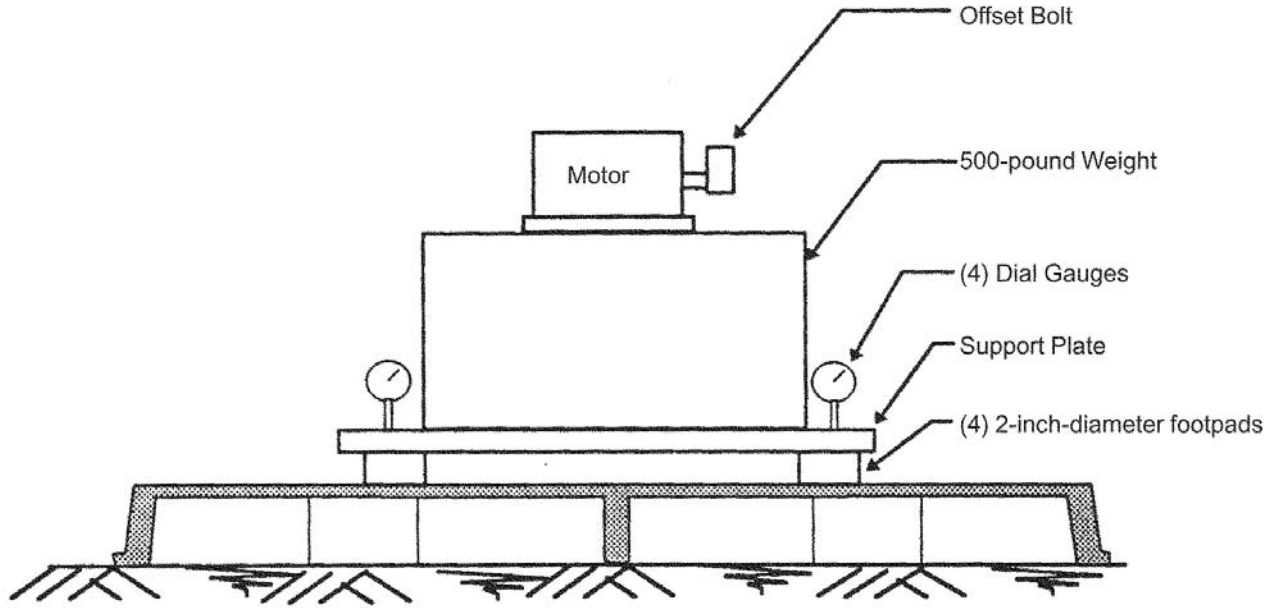


FIGURE 1—VIBRATION TEST SETUP