



Celcore[®] Incorporated

Factory Mutual Approvals

Noncombustible Rated Roof Decks: A noncombustible rating indicates the structural roof deck will not burn or contribute fuel to a fire while preventing the passage of heat through the deck for an extended period of time. These are cementitious decks such as concrete, fiber reinforced cement and gypsum, having a minimum deck thickness of 2 inches (51 mm), having a flat rigid top surface for good adhesion of insulation, and having good fire resistive properties. They can be used with any combination of insulation, felt vapor retarder, hot asphalt adhesive and roof covering without the need for fire protection for the deck.

Class 1 Rated Roof Decks: A Class 1 roof deck rating applies to those assemblies which burn slowly when subjected to an interior building fire and when their fuel contribution rate is reduced to acceptable limits by selecting a proper combination of materials. The structural deck may be steel, fire retardant-treated wood, structural cement fiber, some gypsum and lightweight concrete.

An insulated roof deck system, if not properly designed, may produce a rapidly spreading fire on the underside of the deck, due to possible vapors from combustibles, and be extremely susceptible to wind damage. Application of insulations to the deck must be conducted with extreme care to establish a strong, permanent bond. The deck must provide a rigid plane surface to support insulation and preserve the roofing system under anticipated concentrated live loads.

Noncombustible Constructions: Require 1) a minimum 2 in. (51 mm) thickness of lightweight concrete directly above the top of the corrugations of the steel-forming, unless otherwise noted, or 2) a minimum 1/8 in. (3 mm) thickness of lightweight concrete above a structural concrete deck or a structural concrete deck with existing BUR cover in place, unless otherwise noted.

Insulation boards may be placed in the wet concrete, followed by additional concrete which must be placed before the bottom layer sets up. Unless otherwise noted, a minimum 2 in. (51 mm) thickness of lightweight concrete is required above any rigid insulation board.

Class 1 Fire Rated Constructions: Requires a minimum 1/8 in. (3 mm) thickness of lightweight concrete applied above the top of the corrugations of the steel form deck, unless otherwise noted. Insulation boards may then be placed in the wet concrete, followed by additional concrete which must be placed before the bottom layer sets up. A minimum 2 in. (51 mm) thickness of lightweight concrete is required above any rigid insulation boards, unless otherwise noted.

For all applications, a roof covering is applied over the lightweight insulating concrete in accordance with listed Approvals.

Celcore Inc 775 US Hwy 70 W Black Mountain NC 28711

Trade Name:	Celcore Cellular Concrete
Composition:	Mixture of Type I portland cement, Celcore Foaming Agent and water
Cast Density:	Min 36 lb/ft ³ (577 kg/m ³) or Min 42 lb/ft ³ (673 kg/m ³)
Dry Density:	Min 26 lb/ft ³ (417 kg/m ³) and min 200 psi (1.38 MPa) compressive strength or Min 29 lb/ft ³ (465 kg/m ³) and min 300 psi (2.1 MPa) compressive strength
Insulation:	Max 12 in. (305 mm) thick Apache Holey board polystyrene insulation.



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Roof Covers: Asphaltic BUR, Modified Bitumen and Single Ply
Deck: Celcore Cellular Concrete

Construction #1: Steel Form Deck Construction — A slurry coat of Celcore Cellular Concrete, min 36 lb/ft³ (577 kg/m³) wet cast density, is placed on the deck filling the corrugations plus min 1/8 in. (3 mm) thick above the top flange immediately followed by a single layer of min 1 in. (25 mm) thick Apache, Carpenter or Cellofoam Holey Board Polystyrene Insulation. The following day, min 2 in. (51 mm) thick Celcore Cellular Concrete, min 36 lb/ft³ (577 kg/m³) wet cast density, is placed. After setting to support foot traffic, Celcore PVA Curing Compound is applied at a nominal rate of 300 ft²/gal (7.2 m²/L). After curing several days, a roof covering is applied as described in Constructions #4, #4a, #4b, #4c, #5, #5a, #5b, #5c and #5d.

Construction #2: Structural Concrete Deck, New or Recover Construction — New Structural concrete deck is covered with an asphaltic vapor retarder (optional). Min 1/8 in. (3 mm) thick slurry coat of Celcore Cellular Concrete, min 36 lb/ft³ (577 kg/m³) wet cast density, is placed on the deck, asphaltic vapor retarder or existing asphaltic BUR roof followed by a single layer of min 1 in. (25 mm) thick Apache, Carpenter or Cellofoam Holey Board Polystyrene Insulation. The remainder of the Celcore Cellular Concrete system is constructed as described in Construction #1 above. After curing several days, a roof covering is applied as described in Constructions #6, #6a, #6b, #6c, #7, #7a, #7b or #7c.

Construction #3: Structural Concrete Deck, New or Recover Construction. Min 2 in. (51 mm) thick Celcore Cellular Concrete, min 36 lb/ft³ (577 kg/m³) wet cast density, is placed on the substrates described in Construction #2 followed by Celcore PVA Curing Compound applied as in Construction #1. After curing several days a roof covering is applied as described in Constructions #6, #6a, #6b, #6c, #7, #7a, #7b or #7c.

Construction #4: Steel Form Deck, New Construction. Min 0.029 in. (0.74 mm) thick, 1.5 in. deep Wheeling Corrugating Company BW galvanized deck is secured to min 0.25 in. (6.4 mm) thick structural supports with ITW Buildex ICH Traxx/5 screws placed at each bottom rib [6 in. (152 mm) o.c.] with structural supports spaced at max 4 ft (1.2 m) o.c. Celcore Cellular Concrete, min 36 lb/ft³ (577 kg/m³) wet cast density is placed as described in Construction #1. Min 0.048 in. (1.2 mm) thick Sarnafil G410 Felt Back roof cover is then adhered with Sarnacol 2121 Adhesive squeegee [1/4×1/4 in. (6.4×6.4 mm) notches] applied at a nominal rate of 2.25 gal/sq (0.92 L/m²) or with Sarnacol 2170 Adhesive roller applied as a primer at a rate of 0.8 to 1.0 gal/sq (0.33 to 0.41 L/m²) and allowed to dry followed by a second coat of Sarnacol 2170 roller applied at the same rate. The roof cover is immediately rolled into the wet adhesive and rolled with a weighted roller and the seams sealed with a min 1.5 in. (38 mm) wide heat weld. Meets Class 1-180.

Construction #4a: Steel Form Deck, New Construction. Steel form deck per Construction #4 is secured to structural supports spaced at a max of 5 ft (1.5 m) o.c. as described in Construction #4. Celcore Cellular Concrete, min 36 lb/ft³ (577 kg/m³) wet cast density, is then placed as described in Construction #1 followed by Sarnafil G410 applied as described in Construction #4. Meets Class 1-150.

Construction #4b: Steel Form Deck, New Construction. Steel form deck per Construction #4 is secured to structural supports spaced at max 6 ft (1.9 m) o.c. as described in Constructions #4 or #4 with the addition of two deck side lap fasteners evenly spaced between supports. Celcore Cellular Concrete, min 36 lb/ft³ (577 kg/m³) wet cast density, is then placed as described in Construction #1 utilizing a min 2.5 in. (64 mm) thick top coat of Celcore Cellular Concrete followed by Sarnafil S327 adhered as in Construction #4. Meets Class 1-120.

Construction #4c: Steel Form Deck, New Construction. Steel form deck per Construction #4 is secured to structural supports spaced at max 5 ft (1.5 m) o.c. with min 5/8 in. (16 mm) dia. puddle welds or with 1/2 in. (13 mm) dia. puddle welds and washers placed at every corrugation and at each support where sides lap or as described in Constructions #4 and #4a. Celcore Cellular Concrete, min 36 lb/ft³ (577 kg/m³) wet cast density, is then placed as described in Construction #1 followed by Sarnafil S327 adhered as in Construction #4 or by Flex Membrane Flex FB White Tripolymer adhered as in Constructions #6a or #6b or a GAFGLAS #75 Base Sheet, GAFGLAS #80 Ultima Base Sheet or GAFGLAS STRATAVENT Nailable Base Sheet or a Celotex Hydro-Stop Vapor Barrier/Venting Base Sheet or a Johns Manville PermaPly R, DynaBase, Ventsulation Base Sheet or a Tremco BURmastic Composite Ply Base Sheet, max 39.37 in. (1000 mm) wide, secured to the deck with Olympic CR Base Felt Fasteners and Discs or ITW Buildex Lite Weight Concrete Fasteners and Discs or GAF GAFTITE Base Sheet Fasteners and Plates spaced at max 7 in. (178 mm) o.c. through min 3 in. (76 mm) wide laps and at max 7 in. (178 mm) o.c. in two rows in the field of the sheet. The lap fasteners are in-line perpendicular to the laps. The fastener rows in the field of the sheet are evenly spaced between side laps with the fasteners in these rows offset 3.5 in. (89



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mm) from lap fasteners. A min 3 ply glass felt asphaltic BUR or min 3 ply asphalt adhered modified bitumen roof covering is then applied. Meets Class 1-90.

Construction #4d: Steel Form Deck, New Construction. Steel form deck per Construction #4 is secured to structural supports as described in Constructions #4, #4a, #4b or #4c above. Celcore Cellular Concrete, min 36 lb/ft³ (577 kg/m³) wet cast density, is then placed as described in Construction #1. After curing several days, GAFGLAS #80 Premium Base Sheet or GAFGLAS STRATAVENT Nailable Base Sheet or a Celotex Hydro-Stop Vapor Barrier/Venting Base Sheet, max 39.37 in. (1000 mm) wide is secured to the deck with Olympic CR Base Felt Fasteners and Discs or ITW Buildex Lite Weight Concrete Fasteners and Discs or GAF GAFTITE Base Sheet Fasteners and Plates spaced at max 7 in. (178 mm) o.c. through min 3 in. (76 mm) wide laps and at max 7 in. (178 mm) o.c. in two rows in the field of the sheet. The lap fasteners are in-line perpendicular to the laps. The fastener rows in the field of the sheet are evenly spaced between side laps with the fasteners in these rows offset 3.5 in. (89 mm) from lap fasteners. AC Foam-II, Pyrox or Multi-Max FA is placed with all joints staggered and adhered with hot asphalt applied at a nominal rate of 20-25 lb/sq (1.0-1.2 kg/m²) in single or multiple layers — See insulation listings. An Approved Seaman single-ply roof cover is applied per roof cover listings. Meets Class 1-90.

Construction #4e: Steel form deck and Celcore Cellular Concrete, same as Construction #4c. Danosa Glasdan R-36, Esterdan R-36-4, Basedan II; Garland HPR Tribase, HPR Glasbase; Hickman Performance Ply, Multi Ply Glas; J. Manville Dynalastic 180S, Glasbase, Permaply-28, Glas Ply Premier, Glas Ply IV, Glasbase Plus; Soprema Glass Base, Sopra IV, Sopra VI; Tamko Versa Base, Glass Base, Base-N-Ply max 39.37 in. (1000 mm) wide, secured to the deck with Olympic CR Base Felt Fasteners and Discs spaced at max 7 in. (178 mm) o.c. through min 3 in. (76 mm) wide laps and at max 7 in. (178 mm) o.c. in two rows in the field of the sheet. The lap fasteners are in-line perpendicular to the laps. The fastener rows in the field of the sheet are evenly spaced between side laps with the fasteners in these rows offset 3.5 in. (89 mm) from lap fasteners. A min three-ply glass felt asphaltic BUR or min three-ply asphalt adhered modified bitumen roof covering is then applied. Meets Class 1-90.

Construction #5: Steel Form Deck, New Construction. Min 0.0179 in. (0.45 mm) thick Tensiform S-75 form deck or min 0.0205 in. (0.52 mm) thick Tensiform 75 form deck by Wheeling Corrugating Company is secured to the structural supports with Approved deck fasteners or with 1/2 in. (13 mm) dia. puddle welds and washers placed at every other corrugation [7.5 in. (191 mm) o.c.] and at each support where sides lap. Structural supports are spaced at max of 5 ft (1.5 m) o.c. Celcore Cellular Concrete, min 36 lb/ft³ (577 kg/m³) wet cast density, is then placed as described in Construction #1 and covered with a roof covering installed as described in Constructions #5a, #5b #5c or #5d below. Meets Class 1-60.

Construction #5a: Celotex Vapor Bar Base Sheet, min 4 in. (102 mm) wide laps or Johns Manville PermaPly No. 28 Base Sheet, min 3 in. (76 mm) wide laps, both max 36 in. (914 mm) wide is secured to the deck with ES Products FM-90 Base Ply Fasteners or with Olympic C-R Base Felt Fasteners and Discs spaced max 8 in. (203 mm) o.c. through the laps and at max 16 in. (406 mm) o.c. staggered in two rows in the field of the sheet. The base sheet is covered with a min 3 ply glass felt BUR or a min 3 ply asphalt adhered modified bitumen roof covering. Meets Class 1-60.

Construction #5b: Soprema Sopra G Base Sheet, 36.37 in. (1000 mm) wide is secured to the deck with either ES Products FM-90 Base Ply Fasteners or with Olympic C-R Base Felt Fasteners and Discs spaced max 6 in. (152 mm) o.c. through min 4 in. (102 mm) wide laps and at max 12 in. (305 mm) o.c. staggered in two rows in the field of the sheet. The base sheet is covered with min 3 ply glass felt BUR or min 2 ply asphalt adhered modified bitumen roof cover. Meets Class 1-60.

Construction #5c: GAF GAFGLAS #75 Base Sheet or US Intec Ultra Base, 39.37 in. (1000 mm) wide with min 2 in. (51 mm) wide laps is secured to the deck with ES Products FM-90 Base Ply Fasteners or with Olympic C-R Base Felt Fasteners and Discs spaced at max 8 in. (203 mm) o.c. through the laps and max 8 in. (203 mm) o.c. in two rows in the field of the sheet. The lap fasteners are in-line perpendicular to the laps. The fastener rows in the field of the sheet are evenly spaced between side laps with the fasteners in these rows offset 4 in. (102 mm) from lap fasteners. The base sheet is then covered with a min 3 ply glass felt BUR or a min of 1 ply of an asphalt or torch adhered modified bitumen roof cover. Meets Class 1-60.

Construction #5d: Sarnafil G410 is applied as described in Construction #4 or Flex Membrane Flex FB White Tripolymer applied as in Constructions #6a or #6b. Meets Class 1-60.

Construction #5e: Danosa Glasdan R-36, Esterdan R-36-4, Basedan II; Garland HPR Tribase, HPR Glasbase; Hickman Performance Ply, Multi Ply Glas; J. Manville Dynalastic 180S, Dynabase, Glasbase, Permaply-28, Glas Ply Premier, Glas Ply IV, Glasbase Plus; Soprema Glass Base, Sopra IV, Sopra VI; Tamko Versa Base, Glass Base, Base-N-Ply, max 39.37 in. (1000 mm) wide with min 2 in. (51 mm) wide laps is secured to the deck with Olympic C-R Base Felt Fasteners and Discs spaced at max 8 in. (203 mm) o.c. through the laps and max 8 in. (203 mm) o.c.



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in two rows in the field of the sheet. The lap fasteners are in-line perpendicular to the laps. The fastener rows in the field of the sheet are evenly spaced between side laps with the fasteners in these rows offset 4 in. (102 mm) from lap fasteners. The base sheet is then covered with a min three-ply glass felt BUR or a min of one-ply of an asphalt or torch adhered modified bitumen roof cover. Meets Class 1-60.

Construction #6: Structural Concrete Deck, New Construction. Celcore Cellular Concrete, min 36 lb/ft³ (577 kg/m³) wet cast density, is placed as described in Constructions #2 or #3 for new construction. Sarnafil G410 is then applied as described in Construction #4. Meets Class 1-270.

Construction #6a: Structural Concrete Deck, New Construction. Celcore Cellular Concrete, min 36 lb/ft³ (577 kg/m³) wet cast density, is placed as described in Constructions #2 or #3 for new construction. The deck is primed with Monsey Asphalt Primer applied at a rate of 200 ft² /gal (4.8 m²/L). After drying overnight, min 0.045 in. (1.1 mm) thick Flex Membrane Flex FB White Tripolymer felt backed roof cover is adhered with hot asphalt. The roof cover is then rolled with a weighted roller and the seams sealed with a min 2 in. (38 mm) wide heat weld or with Tetrahydrofuran. Meets Class 1-270.

Construction #6b: Structural Concrete Deck, New Construction. Celcore Cellular Concrete, min 36 lb/ft³ (577 kg/m³) wet cast density, is placed as described in Constructions #2 or #3 for new construction. The deck is primed with Monsey Asphalt Primer applied at a rate of 200 ft² /gal (4.8 m²/L). After drying overnight, min 0.045 in. (1.1 mm) thick Flex Membrane Flex FB White Tripolymer felt backed roof cover is adhered with Flex Rubber Emulsion Adhesive applied at a rate of 60 ft²/gal (1.4 m²/L). The roof cover is then rolled with a weighted roller and the seams sealed with a min 2 in. (38 mm) wide heat weld or with Tetrahydrofuran. Meets Class 1-210.

Construction #6c: Structural Concrete Deck, New Construction. Celcore Cellular Concrete, min 36 lb/ft³ (577 kg/m³) wet cast density, is placed as described in Constructions #2 or #3 for new construction followed by a glass felt or modified bitumen roof cover as described in Construction #4c. Meets Class 1-90.

Construction #6d: Structural Concrete Deck, New Construction. Celcore Cellular Concrete, min 36 lb/ft³ (577 kg/m³) wet cast density, is placed as described in Constructions #2 or #3 for new construction followed by a glass felt or modified bitumen roof cover as described in Construction #5a, #5b or #5c. Meets Class 1-60.

Construction #7: Structural Concrete Deck, Recover Construction. Celcore Cellular Concrete, min 36 lb/ft³ (577 kg/m³) wet cast density, is placed as described in Constructions #2 or #3 for recover construction. Sarnafil G410 is then applied as described in Construction #4 or Flex Membrane Flex FB White Tripolymer felt backed roof cover is then applied as in Construction #6a. Meets wind uplift rating of the existing roof, max Class 1-270.

Construction #7a: Structural Concrete Deck, Recover Construction. Celcore Cellular Concrete, min 36 lb/ft³ (577 kg/m³) wet cast density, is placed as described in Constructions #2 or #3 for recover construction. Flex Membrane Flex FB White Tripolymer felt backed roof cover is then applied as in Construction #6b. Meets wind uplift rating of the existing roof, max Class 1-210.

Construction #7b: Structural Concrete Deck, Recover Construction. Celcore Cellular Concrete, min 36 lb/ft³ (577 kg/m³) wet cast density, is as described in Constructions #2 or #3 for recover construction followed by a glass felt or modified bitumen built up roof covering as described in Construction #4c. Meets wind uplift rating of the existing roof, max Class 1-90.

Construction #7c: Structural Concrete Deck, Recover Construction. Celcore Cellular Concrete, min 36 lb/ft³ (577 kg/m³) wet cast density, is as described in Constructions #2 or #3 for recover construction followed by a glass felt or modified bitumen roof cover as described in Construction #5a, #5b, #5c. Meets the wind uplift rating of the existing roof, max Class 1-60.

Construction #8: Steel Form Deck, New Construction. Min 0.029 in. (0.74 mm) thick, 1.5 in. deep Marlyn Steel Decks or Wheeling Corrugating Company Type B Wide Rib galvanized deck is secured to the structural supports spaced at max 5 ft (1.5 m) o.c. with 1/2 in. (13 mm) diameter puddle welds and washers placed at every corrugation and at each support where sides lap or as described in Constructions #4. Celcore Cellular Concrete, min 42 pcf (673 kg/m³) wet cast density, is then placed as described in Construction #1. A base sheet with roof cover is then secured as described in Construction #4c. Meets Class 1-150.

Construction #8a: Steel Form Deck, New Construction. Steel form deck per Construction #8 is secured to structural supports as described in Constructions #4d or #8. Celcore Cellular Concrete, min 42 lb/ft³ (673 kg/m³) wet cast density, is then placed as described in Construction #1. Base sheet, insulation and roof cover are applied as described in Construction #4d. Meets Class 1-90.

Construction #9: Structural Concrete Deck, New Construction. Celcore Cellular Concrete, min 42 pcf (673 kg/m³), is placed as described in Construction #2 or #3 for new construction. A roof cover is applied per Construction #8. Meets Class 1-150.



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Construction #10: Structural Concrete Deck, Recover Construction. Celcore Cellular Concrete, min 42 pcf (673 kg/m^3), is placed as described in Construction #2 or #3 for recover construction. A roof cover is applied per Construction #8. Meets the wind uplift rating of the existing roof, max Class 1-150.

Construction #11: Structural Concrete Deck-Celcore Cellular Concrete applied to a min thickness of 3 in. (76 mm) with a min wet density of 42 pcf (673 kg/m^3) is placed on the structural concrete deck followed by Celcore PVA Curing Compound applied at a nominal rate of $300 \text{ ft}^2/\text{gal}$ ($7.2 \text{ m}^2/\text{L}$). After the Celcore has dried for several days, the Celcore Cellular Concrete is covered with Johns Manville Corporation UltraGard PVC Plus 50 or UltraGard PVC Plus 60 roof cover which is fully adhered with UltraGard PVC Solvent Adhesive applied to the surface of the Celcore and the fleece back surface of the roof cover at a rate of 2 gal/sq (0.8 L/m^2) per surface. The adhesive is allowed to dry 5-20 min. before mating the two surfaces by rolling the roof cover into the adhesive and rolling with a weighted roller. The outer 2 in. (51 mm) portion of the 3 in. (76 mm) wide end lap and the 3 in. (76 mm) wide side lap is sealed by heat welding. A bead of UltraGard PVC Sealant is applied along the edge of all laps. Meets Class 1-270.

Construction #11a: Structural Concrete Deck-Celcore Cellular Concrete applied to a min thickness of 3 in. (76 mm) with a min wet density of 42 pcf (673 kg/m^3) is placed on the structural concrete deck followed by Celcore PVA Curing Compound applied at a nominal rate of $300 \text{ ft}^2/\text{gal}$ ($7.2 \text{ m}^2/\text{L}$). After the Celcore is dried overnight, the Celcore is covered with Johns Manville Corporation UltraGard PVC Plus 50 or UltraGard PVC Plus 60 roof cover which is fully adhered with UltraGard PVC Latex Adhesive. The adhesive is applied to the surface of the Celcore with a notched squeegee at a rate 3 gal/sq (1.2 L/m^2). Prior to any film formation on the adhesive, the roof cover is rolled into the adhesive and rolled with a weighted roller. The outer 2 in. (51 mm) portion of the 3 in. (76 mm) wide end lap and the 3 in. (76 mm) wide side lap is sealed by heat welding. A bead of UltraGard PVC Sealant is applied along the edge of all laps. Meets Class 1-270.