

FACTORY MUTUAL WIND UPLIFT APPROVAL LISTINGS

The following products have been evaluated and shown to meet the minimum requirements for Factory Mutual Research Approval recognition:

LIGHTWEIGHT INSULATING CONCRETE ROOF DECKS

Lightweight insulating concrete decks are poured in place as a slurry over approved corrugated steel-form or structural concrete deck. The corrugated steel-form deck is fastened as indicated in the Approval listing. Approved lightweight concrete is a mixture of Portland cement and water with various aggregate and/or preformed foam and an air-entraining agent. The lightweight concrete shall be installed by a licenses applicator. Reinforcing mesh of galvanized steel-welded wire mesh is recommended in seismic areas. A brief description of some of the construction methods are listed below.

Construction #1: Steel Form Deck Construction. A slurry of Mearlcrete with a min 35 pcf (466 kg/m³) wet density is placed on the steel deck filling the corrugations plus a min of 18 in. (3 mm) thickness above the top flange, immediately followed by a min 1 in. (26 mm) thick Apache Holey Board or Mearl Corrugated EPS Board Polystyrene Insulation. The Deck is a United Steel deck Type B which is galvanized (G60) steel form deck, 24 ga. (0.025 in., 0.63 mm) thick, 1.5 in. (40 mm) deep. A min 2 in. (50 mm) Mearlcrete with a min 35 pcf (466 kg/m³) wet density is immediately placed over the Polystyrene Insulation. Within 36 to 72 hours (when walkable), a roof covering is then applied as described below.

Construction #1a: The steel deck is welded with standard 38 in. (10 mm) welding washes at every corrugation, average 6 in. (152 mm) o.c., into purlins positioned at a max of 5 ft (1.5 m) o.c. Steel deck overlaps are secured with two #10 steel self-tapping screws evenly spaced between purlins. The Approved* base sheets are mechanically fastened with ES Products FM 90 Base Ply Fasteners or Olympic CR Base Felt Fasteners or ITW Buildex Lite Weight Concrete Fastener and Plates at 712 in. (191 mm) o.c. in the 3 in. wide lap. In addition, fasteners are applied at 10 in. o.c. in two rows evenly divided and staggered in the field. An Approved min 3 ply organic or glass felt BUR or **Modified Bitumen Roof System is then constructed with hot asphalt or ***Approved single ply roof cover is fully adhered to surface of Mearlcrete. Meets a Class 1-60.

Construction #1b: New structural concrete deck is covered with an asphaltic vapor retarder. An alternate method is to simply wet the newconcrete surface with water just prior to applying the slurry coat, in both cases EPS is optional. When EPS is used, the remainder of the Mearlcrete system is constructed above the deck. When EPS is not utilized then the min thickness of Mearlcrete is 2 in. A roof cover is applied as in Construction #1a above.

Construction #2: New structural concrete deck is covered with an asphaltic vapor retarder. An alternate method is to simply wet the new concrete surface with water just prior to applying the slurry coat, in both cases EPS is optional. When EPS is used, the remainder of the Mearlcrete system is constructed above the deck. When EPS is not utilized then the min thickness of Mearlcrete is 2 in. An Approved single ply is fully adhered to the surface of Mearlcrete. Meets Class 1-90.

Construction #3: Recover. An existing structural concrete deck covered with asphaltic BUR roof cover has the option of EPS in the slurry coat. When EPS is used, the remainder of the Mearlcrete system is constructed above the deck. When EPS is not utilized then the min thickness of Mearlcrete is 2 in. A roof cover is applied as in Construction #1a above. The recover wind classification is determined by the classification of the existing roof system.

*The Approved base sheets include the following: Glas Base, Dynabase, Vensulation, Glasply Premier, Perma Ply-R or IV or No. 28 or No. 80 or Perma Cap, Vapor Bar, Hydrostop, Gafglas Ply 4, Gafglas #75, Stratavent, Black Armor Glass Fiber, Black Armor Vented Base, Black Armor Fiber Felt, Black Armor Premium Glass Fiber Felt and GS Products Base Sheets.

**Modified Bitumen Roof System include the following: Johns Manville, GAF, GS and Tamko.

***The fully adhered single ply membrane manufacturers Approved include the following: Sarnafil G410/G410L felt backed, Flex Membrane Tripolymer FB felt backed and Johns Manville UltraGard Plus 50 or UltraGard Plus 60 fleece backed. All are PVC based membranes.

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Construction #4: Steel Form Deck Construction. The deck is a United Steel Deck (vented) Type BV galvanized (G60) steel form deck, min 22 ga. (0.029 in. [0.75 mm]) thick, 1.5 in. (40 mm) deep, and 36 in. (914 mm) wide. The steel deck is welded with standard 38 in. (10 mm) welding washers at every corrugation, average 6 in. (152 mm) o.c. into purlins positioned at a max of 5 ft (1.5 m) o.c. Steel deck overlaps are secured with two #10 steel self-tapping screws evenly spaced between purlins. A slurry coat of Mearlcrete cast with a wet density of 40 pcf (642 kg/m³) is placed on the form deck filling the corrugations plus a min of 18 in. (3 mm) thickness above the top flange, immediately followed by an optional min 1 in. (26 mm) to 12 in. (305 mm) thick Approved Apache Corrugated Holey Board or Mearl Corrugated EPS Polystyrene Insulation. A min of 2 in. (50 mm) thick Mearlcrete cast with a wet density of 40 pcf (648 kg/m³) is placed over the Polystyrene Insulation. Unless otherwise noted, the 2 in thick top coat is to be applied immediately over the polystyrene insulation, if present. Within 36 to 72 hours, an Approved base sheet is mechanically fastened as described below. The base sheet is covered with a roof covering consisting of either a FM Approved min 3-ply organic or glass felt BUR or a min two-ply modified bitumen roof system that is Approved for use over the described base sheets (unless otherwise specified below). The modified bitumen manufacturers are GS Roofing Products Company, U.S. Intec, Malarkey Roofing Company, Johns Manville Corporation, The Garland Company, Soprema, Inc., GAF Materials Corporation, WP Hickman Systems, Inc. Tamko Roofing Products, Inc. or Celotex Corporation. As an alternate, the Mearlcrete deck is covered with a single-ply roof covering consisting of either Sarnafil G410/G410L Felt Backed, Flex Membrane Tripolymer FB felt backed. All are PVC based membranes and are Approved for fully adhered applications with their latex adhesive. See the manufacturer's listing for application details.

Note: The steel roof deck is washed with a mild vinegar solution. Precautions must be taken to avoid damage to building components that may be affected by acidity, a means of neutralization of the acid must be present.

Construction #4a: A base sheet of GAFGLAS #75, Garland HPR Glasbase, HPR Premium Glasbase or HPR Tribase, Johns Manville Glasbase, Glasbase Plus, PermaPly No. 28, or Dynabase, Soprema Sopra-G or Modified Sopra-G, WP Hickman Multi Ply Glass or Performance Ply, Tamko Vapor Chan, Glass Base, Base N Ply or Versa Base is mechanically fastened with ES Products FM-90 Base Ply Fasteners or Olympic CR Base Felt Fasteners at 7 in. (178 mm) o.c. in the 4 in. (102 mm) wide lap and in two rows spaced equally between the overlaps and staggered in the field of the sheet. A Hyload Hybase SAM intermediate ply is self-adhered to the base sheet and a Hyload SAM cap is self-adhered to the intermediate ply. Meets Class 1-60.

Construction #4b: A base sheet of Performance Roof Systems Derbibase is mechanically fastened with ITW Buildex LiteWeight Concrete Fasteners at 7 in. (178 mm) o.c. in the 4 in. (102 mm) wide lap and in two rows evenly divided and staggered in the field of the sheet. Tamko 39.37 in. (1 m) wide base sheet fastened at 6 in. (152 mm) o.c. in the 4 in. (102 mm) wide lap and in two rows evenly divided and staggered in the field at 6 in. (152 mm) o.c. The base sheet is covered with a Performance Roof System roof cover Approved for use with the base sheet. Meets Class 1-75.

Construction #4c: A base sheet of GS Glasbase, GS Flex-I-Glas Base, GS All Weather/Empire Base, GAFGLAS #75, Stratavent Eliminator Venting Base Sheet (Nailable), Garland HPR Glasbase, Garland HPR Premium Glasbase, Malarkey #501, Johns Manville Glasbase, Glasbase Plus, Ventsulation, or Dynabase, Soprema Modified Sopra-G, Sopra-G, or Sopraglass 100, Celotex Hydrostop, US Intec Permavent, Bondable Base, Ultrabase, or Flex Base 30, or Tamko, Glass Base or Base N Ply, base sheet is mechanically fastened with Simplex Base Lok fasteners spaced 9 in. (229 mm) o.c. in the 4 in. (102 mm) wide lap and in two rows spaced equally between the overlaps and staggered in the field of the sheet. Tamko 39.37 in. (1 m) wide base sheet fastened at 8 in. (203 mm) o.c. in the 4 in. (102 mm) wide lap and in two rows evenly divided and staggered in the field at 8 in. (203 mm) o.c. A FM Approved min 3-ply organic or glass felt BUR or min 2-ply modified bitumen roof system is applied. Meets Class 1-90.

Construction #4d: A base sheet of Tamko Vapor Chan or Firestone APP 80 Glass Base, MB Base Sheet, APP 160, SBS Base Sheet, SBS Premium Base Sheet, SBS Smooth, SBS Poly Base is mechanically fastened with ES Products FM-90 Base Ply Fasteners or Olympic CR Base Felt Fasteners at 7 in. (178 mm) o.c. in the 4 in. (102 mm) wide lap and in two rows spaced equally between the overlaps and staggered in the field of the sheet. Tamko 39.37 in. (1 m) wide base sheet fastened at 6 in. (152 mm) o.c. in the 4 in. (102 mm) wide lap and in two rows evenly divided and staggered in the field at 6 in. (152 mm) o.c. A FM Approved hot asphalt applied min 3-ply organic or glass felt BUR or min 2-ply modified bitumen roof system is applied. Meets Class 1-90.

Construction #4e: An Approved single-ply roof cover is adhered to the top surface of Mearlcrete. Meets Class 1-90.

Construction #4f: A base sheet of SOPREMA Sopraglass 100, GAFGLAS #75, Stratavent Eliminator Venting Base Sheet (Nailable), Johns Manville Glasbase, Glasbase Plus, or Dynabase, Celotex Hydrostop, US Intec Permavent or Bondable Base is mechanically fastened with Simplex Base Lok fasteners spaced 9 in. (229 mm) o.c. in the 4 in. (102 mm) wide lap and 12 in. (305 mm) o.c. in two rows spaced equally between the overlaps and staggered in the field of the sheet. A FM Approved min 3-ply organic or glass felt BUR or min 2-ply modified bitumen roof system is applied. Meets Class 1-105.

Construction #4g: A base sheet of Soprema Sopra-G or Modified Sopra-G, GAFGLAS #75, Johns Manville Glasbase, Glasbase Plus, PermaPly No. 28, or Dynabase, WP Hickman Multi-Ply Glass or Performance Ply, Garland HPR Glasbase, HPR Premium Glasbase or HPR Tribase, Tamko Glass Base, Base N Ply, or Versa Base or Firestone APP 80 Glass Base, MB Base Sheet, APP 160, SBS Base Sheet, SBS Premium Base Sheet, SBS Smooth, SBS Poly Base is mechanically fastened with ES Products FM-90 Base Ply Fasteners or Olympic CR Base Felt Fasteners at 7 in. (178 mm) o.c. in the 4 in. (102 mm) wide lap and in two rows spaced equally between the overlaps and staggered in the field of the sheet. Tamko 39.37 in. (1 m) wide base sheet fastened at 6 in. (152 mm) o.c. in the 4 in. (102 mm) wide lap and in two rows evenly divided and staggered in the field at 6 in. (152 mm) o.c. A FM Approved min 3-ply organic or glass felt BUR or min 2-ply modified bitumen roof system is applied. Meets Class 1-105.

Construction #4h: The min 2 in. (50 mm) thick cap of Mearlcrete is covered with Soprema Soprafix base membrane, which is mechanically fastened with Soprema Tri-Fixx Fasteners spaced 10 in. (254 mm) o.c. for Class 1-75 or spaced 9 in. (228 mm) o.c. for Class 1-90 located in the 5 in. (127 mm) wide heat welded seam. An Approved Soprema torch applied or self-adhered roof cover is applied to the base membrane. Meets Class 1-75/1-90 per base membrane attachment.



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Construction #4i: The min 2 in. (50 mm) thick cap of Mearlcrete is covered with a roof cover of Polyglass Xtraflex G mechanically fastened through the Mearlcrete into the steel deck with Dekfast #15 HS and Dekfast 2.5 in. Seam Plates spaced 12 in. (305 mm) o.c. located in the 6 in. (152 mm) wide heat welded seam. Meets Class 1-120.

Construction #4j: The Mearlcrete slurry and polystyrene insulation are allowed to sit for minimum 24-hours prior to application of the Mearlcrete cap. The min 2 in. (50 mm) thick cap of Mearlcrete is covered with GAFGLAS #75 mechanically fastened with ITW Buildex LiteWeight Concrete Fasteners spaced 7 in. (178 mm) o.c. in the 4 in. (102 mm) wide laps and in two rows spaced equally between the overlaps and staggered in the field of the sheet. The base sheet is primed with ASTM D 41 primer, and allowed to dry. A Hyload Hybase SAM intermediate ply is self-adhered to the primed base sheet and a Hyload SAM cap is self-adhered to the intermediate ply. Meets Class 1-75.

Construction #4k: The Mearlcrete slurry and polystyrene insulation are allowed to sit for minimum 24-hours prior to application of the Mearlcrete cap. The min 2 in. (50 mm) thick cap of Mearlcrete is covered with Hyload HyBase mechanically fastened with ITW Buildex LiteWeight Concrete Fasteners spaced 7 in. (178 mm) o.c. in the 4 in. (102 mm) wide laps and in two rows spaced equally between the overlaps and staggered in the field of the sheet. The base sheet is primed with ASTM D 41 primer, and allowed to dry. A Hyload HyBase SAM intermediate ply is self-adhered to the primed base sheet and a Hyload SAM cap is self-adhered to the intermediate ply. Meets Class 1-90.

Construction #4l: The Mearlcrete slurry and polystyrene insulation are allowed to sit for minimum 24-hours prior to application of the Mearlcrete cap. The min 2 in. (50 mm) thick cap of Mearlcrete is covered with GAFGLAS #75 is mechanically fastened with ITW Buildex Lite Weight Concrete Fasteners spaced 7 in. (178 mm) o.c. in the 4 in. (102 mm) wide laps and in two rows spaced equally between the overlaps and staggered in the field of the sheet. An approved Polyglass one or two ply modified bitumen roof system is applied to the base sheet. Meets Class 1-90.

Construction #4m: The Mearlcrete slurry and polystyrene insulation are allowed to sit for minimum 24-hours prior to application of the Mearlcrete cap. The min 2 in. (50 mm) thick cap of Mearlcrete is covered with Soprema Soprafix mechanically fastened with Soprema Tri-Fixx Fasteners spaced 8 in. (203 mm) o.c. in the 5 in. (127 mm) wide side laps and 8 in. (203 mm) o.c. in one center row. The side laps are heat fused and the center row is stripped-in with a 6 in. (152 mm) wide strip of Soprafix membrane. An Approved Soprema torch applied or self-adhered roof cover is applied to the base membrane. Meets Class 1-150.

Construction #4n: A base sheet of Firestone APP 80 Glass Base, MB Base Sheet, APP 160, SBS Base Sheet, SBS Premium Base Sheet, SBS Smooth, SBS Poly Base is mechanically fastened with ES Products FM-90 Base Ply Fasteners or Olympic CR Base Felt Fasteners at 7 in. (178 mm) o.c. in the 4 in. (102 mm) wide lap and in two rows spaced equally between the overlaps and staggered in the field of the sheet. The base sheet is covered with 2 plies of Firestone Type IV Ply Felt, each fully adhered with hot asphalt. Firestone APP 180 FR Cap sheet is torched applied. Meets Class 1-90.

Construction #5: New structural concrete deck is either covered with an asphaltic vapor retarder or simply wet the concrete surface with water just prior to applying the Mearlcrete slurry coat at a 40 pcf (648 kg/m³) wet density. The slurry coat is immediately followed by an optional min 1 in. (26 mm) to 12 in. (305 mm) thick Approved Apache Corrugated Holey Board or Mearl Corrugated EPS Polystyrene Insulation. When the polystyrene insulation is used, the 2 in. (50 mm) thick cap of Mearlcrete is cast with a min 40 pcf (648 kg/m³) wet density over the insulation. Unless otherwise noted, the 2 in thick top coat is to be applied immediately over the polystyrene insulation, if present. When the polystyrene insulation is not utilized, then the min 2 in. (50 mm) thick cap of Mearlcrete, cast with a min 40 pcf (648 kg/m³) wet density, is placed directly to the concrete deck. Within 36 to 72 hours, a roof cover is installed as noted in Construction #4, and as described further below.

Construction #5a: The Mearlcrete is covered with a mechanically attached base sheet and roof cover as noted in Constructions #4a through #4g. Meets Classifications noted in respective construction listings.

Construction #5b: The Mearlcrete is covered with fully adhered Sarnafil G410/G410L Felt Backed roof cover, adhered with Sarnacol 2121 latex adhesive which is squeegee applied at a rate of 2.25 gal/sq (0.92 L/m²). Meets Class 1-540.

Construction #6: Concrete Deck Construction – structural concrete deck is either covered with an asphaltic vapor retarder or simply wet the concrete surface with water just prior to applying the Mearlcrete slurry coat at a 40 pcf (642 kg/m³) wet density. The slurry coat is immediately followed by an optional min 1 in. (26 mm) to 12 in. (305 mm) thick Approved Apache Corrugated Holey Board or Mearl Corrugated EPS Polystyrene Insulation. When the polystyrene insulation is used, the 2 in. (50 mm) thick cap of Mearlcrete is cast with a min 40 pcf (642 kg/m³) wet density over the insulation. Unless otherwise noted, the 2 in thick top coat is to be applied immediately over the polystyrene insulation, if present. When the polystyrene insulation is not utilized, then the min 2 in. (50 mm) thick cap of Mearlcrete, cast with a min 40 pcf (642 kg/m³) wet density, is placed directly to the concrete deck. Within 36 to 72 hours, a base sheet and roof cover is installed as noted in Construction #4h through #4m above or is installed as follows:

Construction #6a: The min 2 in. (50 mm) thick cap of Mearlcrete is covered with Soprema Soprafix mechanically fastened with Soprema Tri-Fixx Fasteners spaced 8 in. (203 mm) o.c. in the 5 in. (127 mm) wide side laps and 8 in. (203 mm) o.c. in one center row. The side laps are heat fused and the center row is stripped-in with a 6 in. (152 mm) wide strip of Soprafix membrane. An Approved Soprema torch applied or self-adhered roof cover is applied to the base membrane. Meets Class 1-150.

