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BITEC INC  
MR D ALLEN  
NO 2 INDUSTRIAL PARK DR  
PO BOX 497  
MORRILTON AR 72110



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## TGDY.R18135 Prepared Roofing Accessories

**BITEC INC**  
2 INDUSTRIAL PARK DR  
PO BOX 497  
MORRILTON, AR 72110 USA

R18135

**Asphalt underlayment accessories**, “Bitec UDL-40 Shingle and Tile Underlayment”, “IMPERFLEX USA”. A modified asphalt saturated and coated glass mat for use in the installation of Class A or C asphalt glass fiber mat or Class C asphalt organic felt shingles.

**Asphalt underlayment accessory**, “ULM-80”. A modified asphalt saturated and coated glass mat for use in the installation of roof tiles.

**UNDERWRITERS LABORATORIES INC.**

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# TGFU.R13231

## Roofing Systems

**BITEC INC**  
INDUSTRIAL PARK DR  
PO BOX 497  
MORRILTON, AR 72110 USA

R181352

### ASPHALT FELT SYSTEMS WITH HOT ROOFING ASPHALT Class A

**1. Deck:** NC

**Incline:** 3

**Base Sheet:** “Beta Base” I or II (Type G2), mechanically fastened or hot mopped.

**Insulation:** (Optional): Perlite, glass fiber, polyisocyanurate, urethane or phenolic, any thickness, mechanically fastened or hot mopped.

**Ply Sheet:** One or more plies “Beta Base” I or II (Type G2).

**Surfacing:** Gravel, crushed stone or crushed slag, in a flood coat of hot roofing asphalt.

### SINGLE PLY MEMBRANE SYSTEMS

The following alternate constructions are applicable for roofing systems listed below:

A. “Type FA-2T, FS-2H, FS-25”, “Beta Base I” or “Beta Base II” may be used wherever Type G2 base sheet are specified.

B. Vapor barriers or ply sheets are optional under roof insulation.

C. Type G3 cap sheet may be used in lieu of Type G2 base sheet.

D. “EGM-2H” may be used in lieu of “SFM-3.5H” membrane in noncombustible deck roof systems.

E. “Compabase PS-2H” or “Compaflash BFS-2H” may be used in noncombustible deck roof systems where perlite or woodfiber board is utilized as a barrier board. In uninsulated systems over noncombustible roof decks, these products may be installed directly on the deck.

F. Two plies Type G1 may be used in lieu of Type G2 base sheet in noncombustible deck roof systems.

G. Partek Insulations Inc., 3/4 in. min thick “Paroc Baseboard” or “Paroc Capboard” insulations are suitable alternates to any of the insulation products Listed in a given insulated system. Systems intended for application over noncombustible roof decks may be applied over combustible roof decks when 3/4 in. min thick “Paroc Capboard” with the insulation joints are staggered a min of 6 in. from the plywood deck joints. “Paroc Baseboard” and “Paroc Capboard”, may be hot mopped in place or mechanically fastened.

H. Systems which utilize “APS-4T”, “APM-4T”, “APM-4.5T” or “ISA-4T” modified bitumen membrane products which are restricted to inclines not exceeding 1 in. may use any of the following coatings applied at 1-1/2 gal/sq:

1. APOC, Subsidiary of Gardner Asphalt Products, “APOC 212”.
2. Henry, “Henry 520”.
3. Karnak, “Karnak No. 97”.
4. Monsey Products “Pro-Grade Aluminum Roof Coating”.

I. Any of the following Classified roofing systems may be installed over combustible or noncombustible roof decks or any existing roof system when min 1/4 in. thick G-P Gypsum Dens-Deck® or min 1/2 in. thick gypsum board is installed. When these materials are installed over new combustible roof decks, the butt joints are to be staggered a min of 6 in. from deck joints.

J. Unless otherwise indicated, “SPM-4H” and “SPM-4H/250” are acceptable alternates to “SFM-3H”, “SFM-3.5H”, “SPM-4T” and “SPM-4.5T” in noncombustible roof deck assemblies.

K. Unless otherwise indicated, “Mineral Design MDA” may be used as an alternate to “APM-4T”. Unless otherwise indicated, Mineral Design MDS” may be used as an alternate to “SPM-4H”.

L. Unless otherwise indicated, “BETA VENT” may be used in lieu of “EGM-2H”, Type G1 ply sheet or Type G2 base sheet.

M. In any of the following Classifications, additional layers of base/ply sheets may be used above and beyond the number of plies specified in the individual Classifications.

N. “IMPERFLEX USA” may be used in lieu of “FS-2H” in any of the following classification.

### CLASS A - BALLASTED

**1. Deck: NC                      Incline: 3**

**Insulation (Optional):** Polyisocyanurate, urethane, perlite/polyisocyanurate composite, perlite/urethane composite glass fiber, wood fiber or perlite, any thickness.

**Base Sheet:** One or more plies Type G2, hot mopped or mechanically fastened.

**Membrane:** “APS-4T”, “APM-4T”, “APM-4.5T”, “ISA-4T” or “SPM-4.5T” (modified bitumen), heat fused; or “SPS-3H”, “SPM-3.5H”, “SFM-3H”, “SFM-3.5H”, “SFM-3H-FR”, hot mopped “SFM-3.5H-FR”, “SFM-4H”, “SFM-4H-FR” or “SFM-4.5H-FR”, (modified bitumen) or “IMPERFLEX MSA”, self adhered.

**Surfacing:** Gravel. As an option, gravel can be applied loosely, but incline cannot exceed 2 in.

**2. Deck: C-15/32                      Incline: 1/2**

**Insulation (Optional):** Polyisocyanurate, urethane, phenolic, phenolic/perlite composite, perlite/polyisocyanurate composite, perlite/urethane composite, glass fiber or perlite, 1-1/2 in. min thickness.

**Base Sheet:** One or more plies Type G2, hot mopped or mechanically fastened.

**Membrane:** “APS-4T”, “APM-4T”, “APM-4.5T”, “ISA-4T” or “SPM-4.5T” (modified bitumen), heat fused; or “SPS-3H”, “SPM-3.5H”, “SFM-3H”, “SFM-3.5H”, “SFM-3H-FR”, hot mopped “SFM-3.5H-FR”, “SFM-4H”, “SFM-4H-FR” or “SFM-4.5H-FR”, (modified bitumen) or “IMPERFLEX MSA”, self adhered.

**Surfacing:** Gravel embedded in hot mopping asphalt. As an option, gravel can be applied loosely.

### CLASS A - FULLY ADHERED

**1. Deck: NC                      Incline: 1-1/2**

**Insulation:** Perlite, glass fiber, polyisocyanurate, urethane, phenolic, phenolic/perlite composite, perlite/polyisocyanurate composite, perlite/urethane composite or wood fiber, any thickness.

**Base Sheet:** One or more plies Type G2, mechanically fastened or hot mopped.

**Membrane:** “APM-4T”, “APM-4.5T”, “APS-4T” or “ISA-4T”, heat fused in place.

**Surfacing:** Karnak Chemical Corp. “Karnak #97 Fibrated Aluminum Asphalt Coating” or “Karnak #97 Asbestos Free Aluminum Roof Coating” 1-1/2 gal/sq.

**2. Deck:** NC

**Incline:** 3/4

**Insulation:** Perlite, glass fiber, polyisocyanurate, polyisocyanurate/perlite composite, urethane, phenolic, phenolic/perlite composite, perlite/urethane composite or wood fiber, 4-1/2 in. max.

**Base Sheet:** One or more plies Type G2, mechanically fastened or hot mopped.

**Membrane:** "IMPERFLEX MSA", self adhered; "SFM-3H", "SFM-3.5H", "SFM-4H", "SPM-3.5H" or "SPS-3H" adhered with hot roofing asphalt.

**Surfacing:** Karnak Chemical Corp. "Karnak #97 Fibrated Aluminum Asphalt Coating", "Karnak #97 Asbestos Free Aluminum Roof Coating", Grundy "al MB Aluminum Roof Coating", 1-1/2 gal/sq.

**3. Deck:** NC

**Incline:** 3/4

**Insulation:** Perlite, glass fiber, polyisocyanurate, urethane, phenolic, phenolic/perlite composite, polyisocyanurate/perlite composite, perlite/urethane composite or wood fiber, any thickness.

**Base Sheet:** One or more plies Type G2, mechanically fastened or hot mopped.

**Membrane:** "SPM-4.5T", heat fused in place.

**Surfacing:** Karnak Chemical "Karnak #97 Fibrated Aluminum Asphalt Coating", "Karnak #97 Asbestos Free Aluminum Roof Coating", Grundy "al MB Aluminum Roof Coating", 1 1/2 gal/sq.

**4. Deck:** NC

**Incline:** 1/2

**Ply or Base Sheet:** Two plies Type G2 base sheet.

**Membrane:** "APS-4T" "APM-4.5T", "ISA-4T" or "SPM-4.5T", heat fused.

**Surfacing:** Karnak Chemical "Karnak #97 Fibrated Aluminum Asphalt Coating," 1 - 2 gal/sq, "Karnak #97 Asbestos Free Aluminum Roof Coating" or Grundy "al MB Aluminum Roof Coating" at 1-2 gal/sq or "MAC 200" at 1-1/2 gal/sq.

**5. Deck:** NC

**Incline:** 1/2

**Ply or Base Sheet:** Three plies Type G2.

**Membrane:** "IMPERFLEX MSA", self adhered; "SPM-3.5H", "SPS-3H", "SFM-3H", "SFM-3.5H" or "SFM-4H", adhered with hot roofing asphalt.

**Surfacing:** Karnak Chemical Corp. "Karnak #97 Fibrated Aluminum Asphalt Coating" or "Karnak #97 Asbestos Free Aluminum Roof Coating", 1 - 2 gal/sq or Grundy "al MB Aluminum Roof Coating" at 1-2 gal/sq.

**6. Deck:** NC

**Incline:** 1

**Insulation:** Polyisocyanurate, urethane, Perlite/polyisocyanurate composite, perlite/urethane composite, phenolic, phenolic/perlite composite glass fiber, wood fiber or perlite, any thickness

**Base Sheet:** One or more plies Type G2, hot mopped or mechanically fastened.

**Membrane:** "APS-4T", "APM-4T", "APM-4.5T" or "ISA-4T" (modified bitumen), heat fused.

**Surfacing:** Karnak Chemical Corp. "Karnak #97 Fibrated Aluminum Asphalt Roof Coating", "Karnak #97 Asbestos Free Aluminum Roof Coatings", Grundy "al MB Aluminum Roof Coating", 1-2 gal/sq.

**7. Deck: NC**

**Incline: 3/4**

**Insulation:** Polyisocyanurate, phenolic, perlite/phenolic composite, urethane, perlite/polyisocyanurate composite, perlite/urethane composite, glass fiber, wood fiber or perlite, any thickness.

**Base Sheet:** One or more plies Type G2, hot mopped or mechanically fastened.

**Membrane:** “IMPERFLEX MSA”, self adhered; “SPS-3H”, “SPM-3.5H”, “SFM-3H”, “SFM-3.5H” or “SFM-4H” (modified bitumen), hot mopped or “SPM-4.5T”, (modified bitumen), heat welded.

**Surfacing:** Karnak Chemical Corp. “Karnak No. 97 Fibrated Aluminum Asphalt Roof Coating”, “Karnak #97 Asbestos Free Aluminum Roof Coating” or Grundy “al MB Aluminum Roof Coating”, 1-2 gal/sq.

**8. Deck: C-15/32**

**Incline: 1/2**

**Insulation (Optional):** Glass fiber, perlite, perlite/urethane composite, polyisocyanurate, urethane, phenolic, phenolic/perlite composite, perlite/urethane composite, polyisocyanurate/perlite composite, any thickness, mechanically fastened or hot mopped.

**Base Sheet:** Three plies Type G2, mechanically fastened or hot mopped.

**Membrane:** “APS-4T”, “APM-4T”, “APM-4.5T”, “ISA-4T” or “SPM-4.5T” (modified bitumen), heat fused.

**Surfacing:** Karnak Chemical Corp. “Karnak No. 97 Fibrated Aluminum Asphalt Roof Coating”, 1-2 gal/sq. or gravel. As an option, gravel may be loose laid.

**9. Deck: C-15/32**

**Incline: 1/4**

**Insulation:** Two or more layers (staggered joints) polyisocyanurate, urethane, perlite/polyisocyanurate composite, phenolic, perlite/phenolic composite, perlite/urethane composite, glass fiber or perlite, 3 in. min. thickness.

**Base Sheet:** One or more plies Type G2, hot mopped or mechanically fastened.

**Membrane:** “IMPERFLEX MSA”, self adhered “APM-4T”, “APM-4.5T”, “APS-4T”, “ISA-4T” or “SPM-4.5T”, heat fused or “SFM-3H”, “SFM-3.5H”, “SFM-4H”, “SPM-3.5H”, “SPS-3H”, hot mopped.

**Surfacing:** Karnak Chemical Corp. “Karnak #97 Fibrated Aluminum Asphalt Roof Coating”, “Karnak #97 Asbestos Free Aluminum Roof Coating”, 1-2 gal/sq. or Grundy “al MB Aluminum Roof Coating” at 1-2 gal/sq.

**10. Deck: NC**

**Incline: 1**

**Insulation:** Cellular concrete, gypsum concrete, vermiculite concrete, perlite concrete or structural concrete.

**Base Sheet:** One or more plies Type G2, mechanically fastened.

**Membrane:** “APM-4T”, “APM-4.5T”, “APS-4T” or “ISA-4T” (modified bitumen), heat fused.

**Surfacing:** Karnak Chemical Corp. “Karnak No. 97 Fibrated Aluminum Asphalt Roof Coating”, “Karnak #97 Asbestos Free Aluminum Roof Coating”, 1-2 gal/sq. or Grundy “al MB Aluminum Roof Coating” at 1-2 gal/sq.

**11. Deck: NC**

**Incline: 1**

**Insulation (Optional):** Perlite, glass fiber, polyurethane, isocyanurate, combination isocyanurate/perlite, phenolic, perlite/phenolic composite, polyurethane/perlite or wood fiber, any thickness.

**Base Sheet:** One or more plies Type G2, mechanically fastened or hot mopped.

**Membrane:** “APM-4.5T”, “APM-4T”, “APS-4T”, “ISA-4T” or “SPM-4.5T” (modified bitumen), heat fused or “IMPERFLEX MSA” self adhered, “SFM-3H”, “SFM-3.5H”, “SFM-4H”, “SPS-3H” or “SPM 3.5H”, (modified bitumen), hot mopped.

**Surfacing:** Grundy “al MB Aluminum Roof Coating” at 1-2 gal/sq.

**12. Deck: NC**

**Incline: 3/4**

**Insulation:** Polyisocyanurate, urethane, perlite/isocyanurate composite, glass fiber, phenolic, perlite/phenolic composite, perlite/urethane composite, perlite or wood fiber, any thickness or EPS, any thickness covered with min. 1/2 in. thick wood fiber or min. 3/4 in. thick perlite.

**Base Sheet:** One or more plies Type G2, hot mopped or mechanically fastened.

**Membrane:** “SFM-3H-FR”, “SFM-3.5H-FR”, “SFM-4H-FR” or “SFM-4.5H-FR” (modified bitumen), hot mopped.

**13. Deck: C-15/32**

**Incline: 1/4**

**Insulation:** Polyisocyanurate, urethane, perlite/isocyanurate composite, glass fiber, phenolic, perlite/phenolic composite, perlite 1-1/2 in. minimum or wood fiber, 3/4 in. min.

**Base Sheet:** One or more layers Type G2, hot mopped or mechanically fastened.

**Membrane:** “SFM-3.5H-FR”, “SFM-4H-FR” or “SFM-4.5H-FR” (modified bitumen), hot mopped.

**14. Deck: NC**

**Incline: 3/4**

**Insulation (Optional):** Polyisocyanurate, urethane, perlite/isocyanurate composite, glass fiber, phenolic, perlite/phenolic composite, perlite or wood fiber, any thickness.

**Base Sheet:** One ply Type G1 or G2, mechanically fastened or hot mopped.

**Ply Sheet (Optional):** One or more plies Type G1 or G2, mechanically attached or hot mopped.

**Membrane:** “SFM-3H-FR”, “SFM-3.5H-FR”, “SFM-4H-FR” or “SFM-4.5H-FR”, hot mopped.

**15. Deck: C-15/32**

**Incline: 3/4**

**Insulation:** Polyisocyanurate, urethane, perlite/isocyanurate composite, glass fiber, phenolic, perlite/phenolic composite, perlite/urethane composite, perlite, 1-1/2 in. min or wood fiber, 3/4 in. min, offset 6 in. from joints in plywood.

**Base Sheet:** Type G2, mechanically attached or hot mopped.

**Ply Sheet (Optional):** One or more plies Type G1 or G2, mechanically attached or hot mopped.

**Membrane:** SFM-3.5H-FR, SFM-4H-FR or SFM-4.5H-FR, hot mopped.

**16. Deleted.**

**17. Deck: NC**

**Incline: 1/2**

**Insulation (Optional):** Glass fiber, perlite, perlite/urethane composite, 4 in. max, mechanically fastened or hot mopped.

**Base Sheet:** Three plies Type G2, mechanically fastened or hot mopped.

**Membrane:** "IMPERFLEX MSA", self adhered "SFM-3H", "SFM-3.5H", "SFM-4H", "SPM-3.5H" or "SPS-3H" (modified bitumen), hot mopped.

**Surfacing:** Karnak Chemical Corp. "Karnak No. 97 Fibrated Aluminum Asphalt Roof Coating" at 1-2 gal/sq., "Karnak #97 Asbestos Free Aluminum Roof Coating" 1-1/2 gal/sq. or gravel. As an option, gravel may be loose laid.

**18. Deleted.**

**19. Deck: C 15/32**

**Incline: 1**

**Insulation (Optional):** Any UL Classified insulation, any thickness.

**Barrier Board:** Regular gypsum wallboard 1/2" nom, joints in wallboard off set 6" with joints in deck (may be placed above or below insulation).

**Base Sheet:** Type G2, hot mopped or mechanically attached.

**Membrane:** APM-4T, APM-4.5T, APS-4T, "ISA-4T" or SPM-4.5T, heat fused.

**Surfacing:** Karnak Chemical Corp #97, "Karnak #97 Asbestos Free Aluminum Roof Coating" or MAC-200 at 1-2 gal/sq.

**20. Deck: NC**

**Incline: 1/2**

**Insulation:** Polyisocyanurate, wood fiber, any thickness.

**Base Sheet:** One ply Type G2 mechanically attached or hot applied.

**Membrane:** Two plies "ELASTO PE 3 P/P" (Same as SPS-3H except it is heat welded).

**Insulation:** Expanded polystyrene, any thickness.

**Fabric:** Polypropylene (non-UL Classified)

**Surface:** Pre-cast concrete pavers, min 1-1/2 in thickness.

**21. Deck: C-15/32**

**Incline: 1**

**Insulation (Optional):** Any UL Classified, any thickness.

**Barrier Board:** Gypsum wallboard, 1/2 in. min, butt joints staggered a min fo 6 in. from plywood deck joints.

**Base Sheet:** 1 ply Type G2, hot mopped.

**Membrane:** "SFM-3.5H-FR", hot mopped.

**22. Deck: NC**

**Incline: 1**

**Insulation:** (Optional) Polyisocyanurate, urethane, glass fiber phenolic, perlite/polyisocyanurate composite, perlite/urethane composite, perlite/phenolic composite, 1 in. min; perlite or woodfiber 3/4 in. min, mechanically fastened or mopped in place.

**Base Sheet:** 1 ply Type G2, mechanically fastened or mopped in place.

**Membrane:** "ISA-4T", "APS-4T", "APM-4T" or "APM-4.5T", heat welded.

**Surfacing:** Karnak Corp. "Karnak No. 97" or Henry Co. "Henry #520" or APOC, Subsidiary of Gardner Asphalt Corp. "APOC 212" or Monsey Products Co. "Pro-Grade Aluminum Roof Coating", applied at 1-1/2 gal/sq.

**23. Deck: NC**

**Incline: 1/4**

**Base Sheet:** 1 ply Type G2, mechanically fastened or mopped in place.

**Membrane:** "APM-4T" or "APM-4.5T", heat welded.

**24. Deck: NC**

**Incline: 1**

**Insulation (Optional):** Any thickness, one or more layers UL Classified perlite, wood fiber, glass fiber, polyisocyanurate, polyisocyanurate/composite, EPS/wood fiber, EPS/perlite, EPS/composite or Partek Insulation Inc. "PAROC" roof insulation.

**Base Sheet:** One or more layers "Fields Glass" or other UL Classified Type G1 or G2.

**Membrane:** One or more layers "APM-4T", "APM-4.5T", "APS-4T", "ISA-4T" (modified bitumen), heat fused.

**Surfacing:** Fields Corp. "F530 Heat Shield Aluminum Coating" or "F630 Heat Shield Fibered Aluminum Coating", 1-1/2 gal/sq.

**25. Deck: NC**

**Incline: 1**

**Insulation (Optional):** Perlite, glass fiber or wood fiber, 3/4 in. max, mechanically fastened.

**Base Sheet:** 1 or more plies Type G2, mechanically fastened.

**Membrane:** 1 ply "APM-4T" or "APM-4.5T", heat welded.

**26. Deck: NC**

**Incline: 1/2**

**Insulation (Optional):** Perlite, glass fiber or wood fiber, 3/4 in. max.

**Base Sheet:** 1 or more plies Type G1 hot mopped or Type G2, mechanically fastened or hot mopped in place.

**Membrane:** 1 ply "SFM-3H", "SFM-3.5H", "SFM-4H", "SPM-3.5H", "SPM-4H", "SPM-4H/250", hot mopped in place or "SPM-4T" or "SPM-4.5T", heat fused or "IMPERFLEX MSA" self adhered.

**27. Deck: C-15/32**

**Incline: 1/2**

**Insulation:** Polyisocyanurate, 1 in. min.

**Slip Sheet:** Two or more layers "CompaShield FBS", mechanically attached.

**Membrane:** One ply "SFM-3.5-H", "SFM-3.5H-FR", "SFM-4H-FR" or "SPM-4.5H-FR", hot mopped.

**28. Deck: C-15/32**

**Incline: 1/2**

**Insulation (Optional):** Pearlite, 3/4 in. max.

**Slip Sheet:** Two or more layers "CompaShield FBS", mechanically attached or hot mopped.

**Membrane:** "SFM-3.5-H", "SFM-3.5H-FR", "SFM-4H-FR", "SPM-4.5H-FR", "SPM-3.5H", "SPM-4H" or "SPM-4H/250", hot mopped; "SPM-4.5T", heat fused.

**CLASS B - FULLY ADHERED**

**1. Deck: C-15/32**

**Incline: 1/2**

**Insulation:** Two or more layers (staggered joints) polyisocyanurate, urethane, perlite/polyisocyanurate composite, perlite/urethane composite, glass fiber, phenolic, perlite/phenolic composite or perlite, 3 in. min. thickness.

**Base Sheet:** One or more plies Type G2, hot mopped or mechanically fastened.

**Membrane:** "APM-4T", "APM-4.5T", "APS-4T", "ISA-4T" or "SPM-4.5T", heat fused or "IMPERFLEX MSA", self adhered "SFM-3H", "SFM-3.5H", "SFM-4H", "SPM-3.5H", "SPS-3H" (modified bitumen), hot mopped.

**Surfacing:** Karnak Chemical Corp. "Karnak No. 97 Fibrated Aluminum Asphalt Roof Coating", "Karnak #97 Asbestos Free Aluminum Roof Coating", 1-2 gal/sq. or Grundy "al MB Aluminum Roof Coating" at 1-2 gal/sq.

**2. Deck: C-15/32      Incline: 1/2**

**Base Sheet:** Two plies Type G2, mechanically fastened or hot mopped.

**Membrane:** “SFM-3H”, “SFM-3.5H”, “SPM-3.5H”, “SFM-4H”, “SPS-3H”, hot mopped or “IMPERFLEX MSA”, self adhered or “APM-4T”, “APM-4.5T”, “APS-4T”, “ISA-4T”, “SPM-4.5T”, heat fused.

**Surfacing:** Karnak Chemical Corp. “Karnak No. 97 Fibrated Aluminum Asphalt Roof Coating”, 1-2 gal/sq.

**3. Deck: C-15/32      Incline: 1/2**

**Base Sheet:** Two plies Type G2, hot mopped or mechanically fastened.

**Membrane:** “SFM-3.5H-FR”, “SFM-4H-FR” or “SFM-4.5H-FR”, hot mopped in place.

**4. Deck: C-15/32      Incline: 1/2**

**Insulation:** (Optional) Polyisocyanurate, urethane, glass fiber phenolic, perlite/polyisocyanurate composite, perlite/urethane composite, perlite/phenolic composite, 1 in. min; perlite, 3/4 in. min or wood fiber 1 in. min, mechanically fastened or mopped in place.

**Base Sheet:** 1 ply Type G2, mechanically fastened or mopped in place.

**Membrane:** “APM-4T” or “APM-4.5T”, heat welded.

**Surfacing:** Karnak Corp. “Karnak No. 97”, Henry Co. “Henry #520”, APOC, Subsidiary of Gardner Asphalt Corp. “APOC 212” or Monsey Products Co. “Pro-Grade Aluminum Roof Coating”, applied at 1-1/2 gal/sq.

**5. Deck: C-15/32      Incline: 1/4**

**Base Sheet:** 1 ply Type G2, mechanically fastened or mopped in place.

**Membrane:** “APM-4T” or “APM-4.5T”, heat welded.

**6. Deck: C-15/32      Incline: 1/2**

**Base Sheet:** One or more plies Type G2, hot mopped or mechanically fastened.

**Membrane:** “SFM-3H-FR”, “SFM-3.5H-FR”, “SFM-4H-FR” or “SFM-4.5H-FR”, hot mopped in place.

**7. Deck: C-15/32      Incline: 1/2**

**Insulation (Optional):** Any thickness, one or more layers UL Classified perlite, glass fiber, polyisocyanurate, polyisocyanurate/composite or Partek Insulation Inc. “PAROC” roof insulation.

**Base Sheet:** One or more layers UL Classified Type G2.

**Membrane:** One or more layers “APM-4T”, “APM-4.5T”, “APS-4T”, “ISA-4T” (modified bitumen), heat fused.

**Surfacing:** Fields Corp. “F530 Heat Shield Aluminum Coating” or “F630 Heat Shield Fibered Aluminum Coating”, 1-1/2 gal/sq.

## CLASS C

**1. Deck: C-15/32      Incline: 1-1/2**

**Base Sheet:** One or more plies Type G2, hot mopped or mechanically fastened.

**Insulation (Optional):** Polyisocyanurate, urethane, perlite/polyisocyanurate composite, phenolic, perlite/phenolic composite, perlite/urethane composite, glass fiber or perlite, any thickness.

**Membrane:** “APS-4T”, “APM-4T”, “APM-4.5T” or “ISA-4T” (modified bitumen), heat fused,

**2. Deck: C-15/32      Incline: No Limitation**

**Insulation (Optional):** Polyisocyanurate, urethane, perlite/isocyanurate composite, glass fiber, perlite, phenolic, perlite/urethane composite, perlite/phenolic composite, or wood fiber, any thickness, offset 6 in. from joints in plywood.

**Base Sheet:** Type G2, mechanically attached or hot mopped.

**Ply Sheet (Optional):** One or more plies Type G1 or G2, mechanically attached or hot mopped.

**Membrane:** "SPM-3.5H-FR", hot mopped.

**3. Deck: NC      Incline: No Limitation**

**Insulation:** Polyisocyanurate, phenolic, perlite/phenolic composite, urethane, perlite/isocyanurate composite, perlite/urethane composite, glass fiber, perlite or wood fiber, any thickness.

**Base Sheet:** Type G2, mechanically fastened.

**Ply Sheet:** "FS-2H-FR", hot mopped.

**Membrane:** "SPM-3.5H-FR", hot mopped.

**4. Deck: NC      Incline: 1/2**

**Insulation:** Polyisocyanurate, urethane, perlite/urethane composite, phenolic, perlite/phenolic composite, isocyanurate composite, wood fiber, glass fiber, perlite, any thickness, mechanically attached.

**Base Sheet:** Type G2, hot mopped or mechanically attached.

**Membrane:** "IMPERFLEX MSA", self adhered "SPS-3H", "SPM-3.5H", "SFM-3.5H", "SFM4-H" or "SPM-4H", hot mopped.

**5. Deck: C-15/32      Incline: Unlimited**

**Underlayment:** One ply Type G2 "Beta Base", mechanically fastened.

**Membrane:** One ply "Mineral Design MDA" heat fused or "Mineral Design MDS" hot mopped.

**MAINTENANCE AND REPAIR SYSTEMS  
CLASS A**

**1. Deck: C-15/32      Incline: 3**

**Existing Roofing System:** Class A BUR smooth surface or gravel surface with all gravel maintained at original coverage rate covered with:

**Insulation (Optional):** One layer wood fiber, perlite or glass fiber, 1/2 in.

**Base Sheet (Optional):** Type G1 or G2, hot mopped or mechanically fastened.

**Membrane:** "APS-4T", "APM-4T", "APM-4.5T", "ISA-4T" or "SPM-4.5T" (modified bitumen), heat fused; or "IMPERFLEX MSA", self adhered; "SPS-3H", "SPM-3.5H", "SFM-3H", "SFM-3.5H" or "SFM-4H" (modified bitumen), hot mopped.

**Surfacing:** Gravel. As an option, gravel can be applied loosely, but incline cannot exceed 2 in.

**2. Deck: NC                      Incline: 1/2**

**Existing Roofing System:** Class A, B or C BUR Smooth Surface or gravel surface (gravel may be removed) covered with: Membrane: “APS-4T”, “APM-4T”, “APM-4.5T”, “ISA-4T” or “SPM-4.5T” (modified bitumen), heat fused; or “IMPERFLEX MSA”, self adhered; “SPS-3H”, “SFM-3H”, “SFM-3.5H” or “SFM-4H” (modified bitumen), hot mopped.

**Surfacing:** Karnak Chemical Corp. “Karnak No. 97 Fibrated Aluminum Asphalt Roof Coating”, “Karnak No. 97 Asbestos Free Aluminum Roof Coatings”, 1-2 gal/sq. or gravel. As an option gravel can be applied loosely.

**3. Deck: C-15/32                      Incline: 1/2**

**Existing Roofing System:** Class A BUR Smooth Surface or glass fiber ply sheet, gravel surfaced BUR (gravel may be removed) covered with: Insulation (Optional): Glass fiber, perlite, wood fiber, polyisocyanurate, recovery board, perlite/polyisocyanurate composite, 1/2 in. min.

**Membrane:** “APM-4T”, “APM-4.5T”, “APS-4T”, “ISA-4T” or “SPM-4.5T” (modified bitumen), heat fused; or “IMPERFLEX MSA”, self adhered; “SFM-3H”, “SFM-3.5H”, “SFM-4H”, “SPM-3.5H” or “SPS-3H” (modified bitumen), hot mopped.

**Surfacing:** Karnak Chemical Corp. “Karnak No. 97 Fibrated Aluminum Asphalt Roof Coating”, 1-2 gal/sq, Grundy “al MB Aluminum Roof Coating” at 1-2 gal/sq. or gravel. As an option, gravel can be applied loosely.

**4. Deck: NC                      Incline: 1/2**

**Existing Roofing System:** Class A B or C BUR smooth Surface or gravel surface (gravel may be removed) covered with: Membrane: “APM-4T”, “APM-4.5T”, “APS-4T”, “ISA-4T” or “SPM-4.5T” (modified bitumen), heat fused; or “IMPERFLEX MSA”, self adhered “SFM-3H”, “SFM-3.5H”, “SFM-4H”, “SPM-3.5H” or “SPS-3H” (modified bitumen), hot mopped.

**Surfacing:** Grundy “al MB Aluminum Roof Coating” at 1-2 gal/sq.

**5. Deck: NC                      Incline: 1/2**

**Existing Roof System:** Class A, B or C BUR, gravel partially removed, coated with an aluminum coating and covered with:

**Base Sheet:** Type G3.

**Membrane:** “APS-4T” or “ISA-4T”, heat fused.

**Surfacing:** Karnak Chemical Corp. “Karnak #97 Fibrated Aluminum Asphalt Coating” or Grundy “al MB Aluminum Roof Coating” at 1-2 gal/sq.

**6. Deck: Structural Cement Fiber Unit                      Incline: 1/2**

**Existing Roof System:** Class A, B or C BUR, gravel surfaced, covered with:

**Insulation:** EPS, any thickness, covered with 1/2 in. wood fiber or 3/4 in. perlite.

**Base Sheet:** Type G2, hot mopped or mechanically fastened.

**Membrane:** “APM-4T”, “APM-4.5T”, “APS-4T”, “ISA-4T” or “SPM-4.5T” (modified bitumen) heat fused, “IMPERFLEX MSA”, self adhered; “SFM-3.H”, “SFM-4H” or “SPM-3.5H” (modified bitumen), hot mopped.

**Surfacing:** Karnak Chemical #97 Fibrated Aluminum Coating at 1-2 gal/sq.

**7. Deck: Structural Cement Fiber Unit      Incline: 3/4**

**Existing Roof System:** Class A, B or C BUR, gravel surfaced, covered with:

**Insulation:** EPS, any thickness, covered with 1/2 in. wood fiber or 3/4 in. perlite.

**Base Sheet:** Type G2, hot mopped or mechanically attached.

**Membrane:** "SFM-3H-FR," "SFM-3.5H-FR," "SFM-4H-FR" or "SFM-4.5H-FR" (modified bitumen), hot mopped.

**8. Deck: NC                                      Incline: 1/2**

**Existing Roof System:** Class A, B or C BUR, smooth or gravel surfaced (gravel may be removed) covered with:

**Insulation:** EPS, any thickness, covered with 1 in. wood fiber or 3/4 in. perlite.

**Base Sheet:** Type G2, hot mopped or mechanically fastened.

**Membrane:** "APM-4T," "APM-4.5T," "APS-4T", "ISA-4T" or "SPM-4.5T" (modified bitumen) heat fused, "IMPERFLEX MSA", self adhered "SFM-3.H," "SPM-3.5H" or "SFM-4H" (modified bitumen), hot mopped.

**Surfacing:** Karnak Chemical #97 Fibrated Aluminum Coating at 1-2 gal/sq.

**CLASS B**

**1. Deck: C-15/32                              Incline: 1/2**

**Existing Roofing System:** Class A or B BUR smooth or gravel surface (gravel may be removed) covered with: Base Sheet (Optional): Type G2, hot mopped or mechanically fastened.

**Membrane:** "APM-4T", "APM-4.5T", "APS-4T", "ISA-4T" or "SPM-4.5T" (modified bitumen), heat fused; or "IMPERFLEX MSA", self adhered; "SFM-3H", "SFM-3.5H", "SFM-4H", "SPM-3.5H" or "SPS-3H" (modified bitumen), hot mopped.

**Surfacing:** Karnak Chemical Corp. "Karnak No. 97 Fibrated Aluminum Asphalt Roof Coating", 1-2 gal/sq, Grundy "al MB Aluminum Roof Coating" at 1-2 gal/sq. or gravel. As an option, gravel can be applied loosely.

**CLASS C**

**1. Deck: C-15/32                              Incline: 1/2**

**Existing Roofing System:** Class A, B or C smooth or gravel surface (gravel may be removed) covered with:

**Base Sheet:** Type G2, hot mopped or mechanically fastened.

**Membrane:** "SPM-4.5T" (modified bitumen), heat fused.

# CHCI.R13231

## Roofing Membranes

**BITEC INC**  
R18135  
2 INDUSTRIAL PARK DR  
PO BOX 497  
MORRILTON, AR 72110 USA

Modified Bitumen Membrane Systems-For method of attachment refer to the manufacturer's Classification in the Roofing Material and Systems Directory-Roofing Systems (TGfU):

For use in Design Nos:

P213	P242	P411	P710	P729	P811	P904	P922
P215	P244	P501	P711	P730	P812	P905	P923
P216	P245	P503	P714	P731	P813	P906	P924
P224	P246	P505	P717	P732	P814	P907	P925
P225	P250	P507	P718	P734	P815	P908	P926
P227	P251	P508	P719	P735	P816	P909	P927
P229	P253	P509	P720	P736	P818	P910	P928
P231	P255	P510	P722	P737	P819	P912	P929
P235	P257	P511	P723	P738	P820	P913	
P237	P259	P512	P724	P739	P823	P915	
P238	P405	P513	P725	P801	P824	P916	
P239	P406	P514	P726	P803	P827	P919	
P240	P407	P701	P727	P805	P902	P920	
P241	P410	P708	P728	P810	P903	P921	

# TGIK.R13231

## Roofing Systems, Uplift Resistance

BITEC INC  
2 INDUSTRIAL PARK DR  
PO BOX 497  
MORRILTON, AR 72110 USA

R13231

### SINGLE PLY MEMBRANE SYSTEMS

#### 1. Uplift Resistance: 120 psf.

**Deck:** Min 15/32 in. APA rated sheathing, 32/16.

**Base Sheet:** One ply Type G2 “Glasbase” mechanically attached to deck with steel cap-nails. Cap 1 in. diam, 0.032 in. thick with annular ring shanked nail 0.120 in. diam, 1-1/2 in. long. Nails spaced 7-1/2 in. OC along 4 in. side lap and 12 in. OC in two interior rows located 11 in. from exposed edges of side laps.

**Membrane:** “APM-4T”, “APM-4.5T”, “APS-4T”, “SPM-4.5T” or “Mineral Design MDA”, heat fused. “SFM-3.5H”, “SFM-3.5H-FR”, “SFM-4H-FR”, “SPM-3.5H” or “Mineral Design MDS”, hot mopped.

#### 2. Uplift Resistance: 105 psf.

**Deck:** Min 15/32 in. APA rated sheathing, 32/16 or nom 2 in. by 6 in. wood planking.

**Insulation:** Any polyisocyanurate, perlite or wood fiber, any thickness.

**Base Sheet:** One ply Type G2 “Glasbase” mechanically attached to deck with annular ring shanked nails 0.148 in. diam used with a separate 3 in. diam, 0.021 in. thick formed disc. Nails spaced 7-1/2 in. OC along 4 in. side lap and 12 in. OC in two interior rows located 11 in. from exposed edges of side laps. Nails to penetrate plywood min 1/2 in. and wood planking min 1 in.

**Membrane:** “APM-4T”, “APM-4.5T”, “APS-4T”, “SPM-4.5T” or “Mineral Design MDA”, heat fused SFM-3.5H”, “SFM-3.5H-FR”, “SFM-4H-FR”, “SPM-3.5H” or “Mineral Design MDS”, hot mopped.

As an alternate for fastening to plywood, No. 12-12.5, No. 3 phillip drive, trusshead or 1/4 in. hex-washer-head coated steel screws may be used with the same pressure plate and spacing as for nails. Screws to penetrate plywood min 1/2 in. As an alternate for fastening to wood planking, No. 14-10, No. 3 phillips drive, trusshead or 1/4 in. hex-washer-head coated steel screws may be used with the same pressure plate and spacing as for nails. Screws to penetrate planking min 1 in.



333 Pfingsten Road  
Northbrook, Illinois 60062-2096  
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FAX No. (708) 272-8129  
MCI Mail No. 254-3343  
Cable ULINC NORTHBROOK, IL  
Telex No: 6502543343

January 23, 1992

BITEC Inc.  
P.O. Box 497  
Morrilton, AR 72110

Our Reference: R13231

This is in response to our phone conversation on January 15, 1992 regarding the use of your UL Classified APP or SBS modified bitumen roofing membranes in systems which utilize multiple layers of same.

As discussed, based on fire test data on file, using more than one layer of any of your modified bitumen membranes in any of your currently UL Classified roofing systems is acceptable assuming existing incline restrictions and system constructions are observed.

Should any questions arise on the above, please feel free to contact us.

Regards,

Reviewed by:

MARIANE HAPNER  
Engineering Assistant  
Engineering Services

KENNETH RHODES  
Assistant Managing Engineer  
Engineering

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Telex No: 6502543343

January 23, 1992

BITEC Inc.  
P.O. Box 497  
No. 2 Industrial Park Drive  
Morrilton, AR 72110

Our Reference: File R13231

This is to supplement our phone conversation on January 21st regarding the use of an inverted G3 cap sheet in lieu of two plies of a G2 base sheet.

It is our judgement that substituting a G3 cap sheet for two layers of G2 base sheet would not affect the fire performance of the roofing system.

Regards,

A handwritten signature in cursive script that reads 'Mariane Hapner'.

MARIANE HAPNER  
Engineering Assistant  
Engineering Services - Dept. 411

Reviewed by:

A handwritten signature in cursive script that reads 'Kenneth Rhodes'.

KENNETH RHODES  
Assistant Managing Engineer  
Engineering Services - Dept. 411

MA1/mh

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Telex No: 6502543343

January 19, 1995



Bitec, Inc.  
#2 Industrial Park Drive  
Morrilton, AR 72110

Our Reference: Filr R13231

This is in response to our phone conversation today, January 20, 1995 concerning UL's position on the use of gypsum wallboard in roofing systems Classified in accordance with ANSI/UL790.

As discussed, 1/2 in. thick gypsum wallboard may be incorporated in currently Classified noncombustible deck roofing systems to allow their use over combustible substrates as well. The only restriction is that the gypsum wallboard must be placed over any polystyrene insulation; otherwise the wallboard may be placed anywhere within an assembly.

If any questions arise on the above, please contact the writer.

Very truly yours,

ROGER ANDERSON (X43283)  
Engineering Associate  
Engineering Services, Dept 411

Reviewed by:

DOUGLAS C. MILLER (X43262)  
Engineering Team Leader  
Engineering Services, Dept 411

RA:sr

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June 12, 1997

BITEC Inc.  
P.O. Box 497  
Morrilton, AR 72110



Our Reference: R13231

Subject: Length of Nails Used to Fasten Base Sheet to  
Plywood Deck for Uplift Purposes

This letter is in answer to your request that the length of the nails utilized in System 1 under our TGIK category, Roofing Systems Uplift Resistance, be changed from 1-5/8 in. to 1-1/2 in.

We have examined your request and determined that the 1-1/2 in. length will not jeopardize the uplift resistance qualities of Roof System No. 1. We will revise System No. 1 and are enclosing the revised system for your information.

Please call if you have any questions regarding this.

Very truly yours,

Reviewed by:

GREG REZEK (Ext. 42793)  
Senior Engineering Associate  
Engineering Services, Dept 411

JAMES HATCHER (Ext. 42688)  
Staff Engineer  
Engineering Services, Dept 411

GR: per  
S:/fpsave/R13231.jun  
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