ACFoam®
Polyiso Roof Insulation

The following information has been compiled in accordance with the Construction Specifications Institute (CSI) *MasterFormat* to enhance Atlas **ACFoam® Polyiso Roof Insulation** project specifications.

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SECTION 07 22 00
ROOF AND DECK INSULATION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Flat Polyiso Roof Insulation
   1. Faced with non-asphaltic, fiber-reinforced cellulosic organic felt facers on both major surfaces of the core foam (GRF).
      a. ACFoam®-II
   2. Faced with inorganic coated polymer-bonded glass fiber mat facer on both major surfaces of the core foam (CGF).
      a. ACFoam®-III
      b. ACFoam® Recover Board
      c. ACFoam®-HD CoverBoard
   3. Faced with aluminum foil on both major surfaces of the core foam.
      a. ACFoam® Supreme
   4. Faced with oriented strand board or waferboard on one major surface of the core foam and GRF or CGF facer on the other major surface of the core foam.
      a. ACFoam® Nail Base
      b. ACFoam® CrossVent®

B. Tapered Polyiso Roof Insulation
   1. Faced with non-asphaltic, fiber-reinforced cellulosic organic felt facers on both major surfaces of the core foam (GRF).
      a. Tapered ACFoam®-II
      b. Gemini™ TES Tapered Edge Strip
      c. Gemini™ CKT Pre-Cut Cricket
      d. Gemini™ DST Drain Set
      e. Gemini™ MTR Pre-Cut Miter
   2. Faced with inorganic coated polymer-bonded glass fiber mat facer on both major surfaces of the core foam (CGF).
      a. Tapered ACFoam®-III

   b. Gemini™ TES Tapered Edge Strip
   c. Gemini™ CKT Pre-Cut Cricket
   d. Gemini™ DST Drain Set
   e. Gemini™ MTR Pre-Cut Miter

C. Accessories
   1. Atlas Nailable Insulation Fasteners

1.2 RELATED SECTIONS

A. 07 26 00 Vapor Retarders
B. 07 27 00 Air Barriers
C. 07 31 00 Shingles and Shakes
D. 07 32 00 Roof Tiles
E. 07 33 00 Natural Roof Coverings
F. 07 41 00 Roof Panels
G. 07 51 00 Built-Up Bituminous Roofing
H. 07 52 00 Modified Bituminous Membrane Roofing
I. 07 53 00 Elastomeric Membrane Roofing
J. 07 54 00 Thermoplastic Membrane Roofing
K. 07 55 00 Protected Membrane Roofing
L. 07 56 00 Fluid-Applied Roofing
M. 07 57 00 Coated Foamed Roofing
N. 07 58 00 Roll Roofing

1.3 REFERENCES

A. ASTM C1289: Standard Specification for Faced Rigid Cellular Polyisocyanurate Insulation Board.
B. ASTM D312: Standard Specification for Asphalt Used in Roofing.
C. ASTM E108: Standard Test Methods for Fire Tests or Roof Coverings.
D. ASTM E119: Standard Test Methods for Fire Tests of Building Construction and Materials.
E. FM 4450: Approval Standard – Class I Insulated Steel Roof Decks
F. FM 4470: Approval Standard – Class I Roof Covers.
G. LTTR: Long Term Thermal Resistance predicated by CAN/ULC-S770-09.
H. UL 263: Fire Tests of Building Construction and Materials.
I. UL 790: Standard Test Methods for Fire Tests of Roof Coverings.
J. UL 1256: Fire Test Methods for Fire Tests of Roof Coverings.
K. ASTM E2114: Standard Terminology for Sustainability Relative to the Performance of Buildings.
L. ASTM E2129: Standard Practice for Data Collection for Sustainability Assessment of Building Products.

1.4 DEFINITIONS

A. LTTR (Long Term Thermal Resistance): Defined as using techniques from ASTM C1303 or CAN/ULC-S770-09, the predicated R-Value that has been shown to be equivalent to the average performance of a permeably faced foam insulation product over 15 years. LTTR applies to ALL foam insulation products with blowing agents other than air, such as Polyiso, extruded polystyrene and polyurethane. The new method is based on consensus standards in the US and Canada.

1.5 SUBMITTALS

A. Submit under provisions of Section 01 30 00 and 01 60 00.
B. Product Data:
   1. Manufacturer's Specifications.
   2. Installation instructions for insulation board and fasteners.
   3. Product Data as per ASTM E2129: Standard Practice for Data Collection for Sustainability Assessment of Building Products.
C. Samples:
   1. Submit minimum 6 inch by 6 inch (152 millimeters by 152 millimeters) of each board type required.
   2. Submit samples of each fastener type required.
D. Shop Drawings:
   1. Roof plan showing layout of boards and fastening patterns.
E. Certificates:
   1. System Manufacturer's or Insulation Manufacturer's Certification that the insulation meets Zero ODP (Ozone Depletion Potential) and Zero GWP (Global Warming Potential) specification requirements.
F. Thermal Warranty:
   1. Submit sample warranty indicating conditions and limitations.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing Products specified in this section with minimum twenty five years documented experience.
B. Installer Qualifications: Company specializing in the installation of products specified in this section with minimum 5 years documented experience in installing products of the same type and scope as specified.
C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
   1. Finish areas designated by Architect.
   2. Do not proceed with remaining work until workmanship is approved by Architect.
   3. Refinish mock-up area as required to produce acceptable work.
D. Pre-installation Meeting: Conduct pre-installation meeting to verify project requirements, substrate conditions and insulation manufacturer's installation instructions.

1.7 DELIVERY, STORAGE AND HANDLING

A. Comply with general requirements specified in sections 01 65 00 and 01 66 00.
B. Deliver product in packages labeled with material name, thermal value and product code.
C. When stored outdoors or on the jobsite, the insulation should be stacked on pallets at least three inches above ground level and completely covered with a waterproof covering such as a tarpaulin. The temporary factory-applied packaging should be slit or removed to prevent accumulation of condensation. Insulation which has become wet or damaged should be removed and replaced with solid, dry insulation.

1.8 SEQUENCING

A. Ensure that information required for installation of products in this section is furnished to affected trades in time to prevent interruption of construction progress.
B. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.
C. Coordinate installation with roof membrane manufacturer's installation instructions.

1.9 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Atlas Roofing Corporation
   1. Address: 2000 Riveredge Parkway Suite 800 Atlanta, GA 30328
   2. Phone: 800-388-6134
   3. Fax: 770-952-3170
   4. Web: www.atlasroofing.com
B. Substitutions: Not Permitted.
C. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00.

2.2 MATERIALS

A. **ACFoam®-II GRF Roof Insulation**: Flat closed-cell polyisocyanurate (polyiso) foam core integrally bonded to non-asphaltic, fiber-reinforced organic felt facers.
   1. Compliance:
      a. ASTM C1289, Type II, Class 1, Grade 2 (20 pounds per square inch) or Grade 3 (25 pounds per square inch).
      b. CAN/ULC-S704 Type 2, Class 3 or Type 3, Class 3.
      c. CCMC No. 12464-L.
      d. UL Certified for Canada- Insulated Roof Deck Assemblies Construction No. C38 and 52. Meet CAN/ULC-S126, CAN/ULC-S101 and CAN/ULC-S107.
      e. UL Standard 1256 Classification: Construction No. 120, 123 & 292.
      f. UL Standard 790 (ASTM E108): Roofing Systems Classification.
      g. UL Standard 263 (ASTM E119): Fire Resistance Classification.
      h. UL Standard 1897: Uplift Resistance.
      i. FM Standard 4450 & 4470 Approved: Refer to FM Approvals® RoofNav for Specific Systems Details.
      j. IBC Chapter 26 & National Building Code: Sections on Foam Insulation.
      k. California State Insulation Quality Standards.
      l. Title 25 Foam Flammability Criteria (T 1231).
      m. Miami-Dade County Product Control Approved.
      n. State of Florida Product Approval: FL17989.
      o. Dimensional Stability (ASTM D2126): less than 2 percent.
      p. Compressive Strength (ASTM D1621): 20 pounds per square inch (140 kPa) or 25 pounds per square inch (172 kPa).
      q. Water Absorption (ASTM C209): less than 1.5 percent.

r. Water Absorption (ASTM D2842): less than 3.5 percent.
s. Water Vapor Transmission (ASTM E96): less than 1.5 perm (85.5ng/(Pa•s•m^2))
t. Product Density (ASTM D1622): Nominal 2.0 pounds per cubic foot (32.04 kg/m^3).
u. Flame Spread (ASTM E84 10 minimum): 40-60.
v. Smoke Development (ASTM E84 10 minimum): 50-170.
w. Tensile Strength (ASTM D1623): greater than 730 pounds per square foot (35 kPa).
x. Service Temperature: -100°F to +250°F.
y. Panel Area:
   1) 4 feet x 8 feet (1220 millimeters x 2440 millimeters)
   2) 4 feet x 4 feet (1220 millimeters x 1220 millimeters)
z. Panel Thickness:
   1) 1.0 inch (25.4 millimeters): LTTR - 5.7
   2) 1.5 inch (38.1 millimeters): LTTR - 8.6
   3) 2.0 inch (50.8 millimeters): LTTR - 11.4
   4) 2.5 inch (63.5 millimeters): LTTR - 14.4
   5) 3.0 inch (76.2 millimeters): LTTR - 17.4
   6) 3.5 inch (88.9 millimeters): LTTR - 20.5
   7) 4.0 inch (101.6 millimeters): LTTR - 23.6

B. **Tapered ACFoam®-II GRF Roof Insulation:** Tapered closed-cell polyisocyanurate (polyiso) foam core integrally bonded to non-asphaltic, fiber-reinforced organic felt facers.
1. Compliance:
   a. ASTM C1289, Type II, Class 1, Grade 2 (20 pounds per square inch) or Grade 3 (25 pounds per square inch).
   b. CAN/ULC-S704 Type 2, Class 3 or Type 3, Class 3.
   c. CCMC No. 12464-L.
   d. UL Certified for Canada- Insulated Roof Deck Assemblies Construction No. C38 and 52. Meet CAN/ULC-S126, CAN/ULC-S101 and CAN/ULC-S107.
   e. UL Standard 1256 Classification: Construction No. 120, 123 & 292.
   f. UL Standard 790 (ASTM E108): Roofing Systems Classification.
   g. UL Standard 263 (ASTM E119): Fire Resistance Classification.
   h. UL Standard 1897: Uplift Resistance.
   i. FM Standard 4450 & 4470 Approved: Refer to FM Approvals® RoofNav for Specific Systems Details.
   j. IBC Chapter 26 & National Building Code: Sections on Foam Insulation.
   k. California State Insulation Quality Standards.
   l. Title 25 Foam Flammability Criteria (T 1231).
   m. Miami-Dade County Product Control Approved.
   n. State of Florida Product Approval: FL17989.
   o. Dimensional Stability (ASTM D2126): less than 2 percent.
   p. Compressive Strength (ASTM D1621): 20 pounds per square inch (140 kPa) or 25 pounds per square inch (172 kPa).
   q. Water Absorption (ASTM C209): less than 1.5 percent.
   r. Water Absorption (ASTM D2842): less than 3.5 percent.
   s. Water Vapor Transmission (ASTM E96): less than 1.5 perm (85.5ng/(Pa•s•m^2))
   t. Product Density (ASTM D1622): Nominal 2.0 pounds per cubic foot (32.04 kg/m^3).

u. Flame Spread (ASTM E84 10 minimum): 40-60.
v. Smoke Development (ASTM E84 10 minimum): 50-170.
w. Tensile Strength (ASTM D1623): greater than 730 pounds per square foot (35 kPa).
x. Service Temperature: -100°F to +250°F.
y. Panel Area:
    1) 4 feet x 4 feet (1220 millimeters x 1220 millimeters)
z. Panel Thickness:
    1) AA
        i. Slope: 1/8 inch per foot
        ii. Minimum Thickness: 0.5 inch (12 millimeters)
        iii. Maximum Thickness: 1.0 inch (25.4 millimeters)
        iv. Average Thickness: 0.75 inch (19 millimeters)
        v. Average LTTR Value: 4.3
    2) A
        i. Slope: 1/8 inch per foot
        ii. Minimum Thickness: 1.0 inch (25.4 millimeters)
        iii. Maximum Thickness: 1.5 inch (38.1 millimeters)
        iv. Average Thickness: 1.25 inch (31.8 millimeters)
        v. Average LTTR Value: 7.1
    3) B
        i. Slope: 1/8 inch per foot
        ii. Minimum Thickness: 1.5 inch (38.1 millimeters)
        iii. Maximum Thickness: 2.0 inch (50.8 millimeters)
        iv. Average Thickness: 1.75 inch (44.5 millimeters)
        v. Average LTTR Value: 10.0
    4) C
        i. Slope: 1/8 inch per foot
        ii. Minimum Thickness: 2.0 inch (50.8 millimeters)
        iii. Maximum Thickness: 2.5 inch (63.5 millimeters)
        iv. Average Thickness: 2.25 inch (57.2 millimeters)
        v. Average LTTR Value 12.9
    5) X
        i. Slope: ¼ inch per foot
        ii. Minimum Thickness: 0.5 inch (12 millimeters)
        iii. Maximum Thickness: 1.5 inch (38.1 millimeters)
        iv. Average Thickness: 1.0 inch (25.4 millimeters)
        v. Average LTTR value: 5.7
    6) Y
        i. Slope: ¼ inch per foot
        ii. Minimum Thickness: 1.5 inch (38.1 millimeters)
        iii. Maximum Thickness: 2.5 inch (63.5 millimeters)
        iv. Average Thickness: 2.0 inch (50.8 millimeters)
        v. Average LTTR value: 11.4
    7) Q
        i. Slope: ½ inch per foot
        ii. Minimum Thickness: 0.5 inch (12 millimeters)
        iii. Maximum Thickness: 2.5 inch (63.5 millimeters)
        iv. Average Thickness: 1.5 inch (38.1 millimeters)
        v. Average LTTR Value: 8.6

C. **ACFoam®-III CGF Roof Insulation**: Flat closed-cell polyisocyanurate (polyiso) foam core integrally bonded to inorganic coated glass facers.
   1. Compliance:
      a. ASTM C1289, Type II, Class 2, Grade 2 (20 pounds per square inch) or Grade 3 (25 pounds per square inch).
      b. CAN/ULC-S704 Type 2, Class 3 or Type 3, Class 3.
      c. CCMC No. 12423-L.
      d. UL Certified for Canada- Insulated Roof Deck Assemblies Construction No. C38 and 52. Meet CAN/ULC-S126, CAN/ULC-S101 and CAN/ULC-S107.
      e. UL Standard 1256 Classification: Construction No. 120, 123 & 292.
      f. UL Standard 790 (ASTM E108): Roofing Systems Classification.
      g. UL Standard 263 (ASTM E119): Fire Resistance Classification.
      h. UL Standard 1897: Uplift Resistance.
      i. FM Standard 4450 & 4470 Approved: Refer to FM Approvals® RoofNav for Specific Systems Details.
      j. IBC Chapter 26 & National Building Code: Sections on Foam Insulation.
      k. California State Insulation Quality Standards.
      l. Title 25 Foam Flammability Criteria (T 1231).
      m. Miami-Dade County Product Control Approved.
      n. State of Florida Product Approval: FL17989.
      o. Dimensional Stability (ASTM D2126): less than 2 percent.
      p. Compressive Strength (ASTM D1621): 20 pounds per square inch (140 kPa) or 25 pounds per square inch (172 kPa).
      q. Water Absorption (ASTM C209): less than 1.5 percent.
      r. Water Absorption (ASTM D2842): less than 3.5 percent.
      s. Water Vapor Transmission (ASTM E96): less than 4.0 perm (228.8ng/(Pa•s•m^2))
      t. Product Density (ASTM D1622): Nominal 2.0 pounds per cubic foot (32.04 kg/m^3).
      u. Flame Spread (ASTM E84 10 minimum): 40-60.
      v. Smoke Development (ASTM E84 10 minimum): 50-170.
      w. Tensile Strength (ASTM D1623): greater than 730 pounds per square foot (35 kPa).
      x. Service Temperature: -100°F to +250°F.
      y. Panel Area:
         1) 4 feet x 8 feet (1220 millimeters x 2440 millimeters)
         2) 4 feet x 4 feet (1220 millimeters x 1220 millimeters)
      z. Panel Thickness:
         1) 1.0 inch (25.4 millimeters): LTTR - 5.7
         2) 1.5 inch (38.1 millimeters): LTTR - 8.6
         3) 2.0 inch (50.8 millimeters): LTTR - 11.4
         4) 2.5 inch (63.5 millimeters): LTTR - 14.4
         5) 3.0 inch (76.2 millimeters): LTTR - 17.4
         6) 3.5 inch (88.9 millimeters): LTTR - 20.5
         7) 4.0 inch (101.6 millimeters): LTTR - 23.6

D. **Tapered ACFoam®-III CGF Roof Insulation:** Tapered closed-cell polyisocyanurate (polyiso) foam core integrally bonded to inorganic coated glass facers.
   1. Compliance:
      a. ASTM C1289, Type II, Class 2, Grade 2 (20 pounds per square inch) or Grade 3 (25 pounds per square inch).
      b. CAN/ULC-S704 Type 2, Class 3 or Type 3, Class 3.

c. CCMC No. 12423-L.
d. UL Certified for Canada- Insulated Roof Deck Assemblies Construction No. C38 and 52. Meet CAN/ULC-S126, CAN/ULC-S101 and CAN/ULC-S107.
e. UL Standard 1256 Classification: Construction No. 120, 123 & 292.
f. UL Standard 790 (ASTM E108): Roofing Systems Classification.
g. UL Standard 263 (ASTM E119): Fire Resistance Classification.
h. UL Standard 1897: Uplift Resistance.
i. FM Standard 4450 & 4470 Approved: Refer to FM Approvals® RoofNav for Specific Systems Details.
j. IBC Chapter 26 & National Building Code: Sections on Foam Insulation.
k. California State Insulation Quality Standards.
l. Title 25 Foam Flammability Criteria (T 1231).
m. Miami-Dade County Product Control Approved.
n. State of Florida Product Approval: FL17989.
o. Dimensional Stability (ASTM D2126): less than 2 percent.
p. Compressive Strength (ASTM D1621): 20 pounds per square inch (140 kPa) or 25 pounds per square inch (172 kPa).
q. Water Absorption (ASTM C209): less than 1.5 percent.
r. Water Absorption (ASTM D2842): less than 3.5 percent.
s. Water Vapor Transmission (ASTM E96): less than 4.0 perm (228.8ng/(Pa•s•m^2))
t. Product Density (ASTM D1622): Nominal 2.0 pounds per cubic foot (32.04 kg/m^3).
u. Flame Spread (ASTM E84 10 minimum): 40-60.
v. Smoke Development (ASTM E84 10 minimum): 50-170.
w. Tensile Strength (ASTM D1623): greater than 730 pounds per square foot (35 kPa).
x. Service Temperature: -100°F to +250°F.
y. Panel Area:
    1) 4 feet x 4 feet (1220 millimeters x 1220 millimeters)
z. Panel Thickness:
    1) AA
        i. Slope: 1/8 inch per foot
        ii. Minimum Thickness: 0.5 inch (12 millimeters)
        iii. Maximum Thickness: 1.0 inch (25.4 millimeters)
        iv. Average Thickness: 0.75 inch (19 millimeters)
        v. Average LTTR Value: 4.3
    2) A
        i. Slope: 1/8 inch per foot
        ii. Minimum Thickness: 1.0 inch (25.4 millimeters)
        iii. Maximum Thickness: 1.5 inch (38.1 millimeters)
        iv. Average Thickness: 1.25 inch (31.8 millimeters)
        v. Average LTTR Value: 7.1
    3) B
        i. Slope: 1/8 inch per foot
        ii. Minimum Thickness: 1.5 inch (38.1 millimeters)
        iii. Maximum Thickness: 2.0 inch (50.8 millimeters)
        iv. Average Thickness: 1.75 inch (44.5 millimeters)
        v. Average LTTR Value: 10.0
    4) C
        i. Slope: 1/8 inch per foot

ii. Minimum Thickness: 2.0 inch (50.8 millimeters)
iii. Maximum Thickness: 2.5 inch (63.5 millimeters)
iv. Average Thickness: 2.25 inch (57.2 millimeters)
v. Average LTTR Value 12.9

5) X
i. Slope: ¼ inch per foot
ii. Minimum Thickness: 0.5 inch (12 millimeters)
iii. Maximum Thickness: 1.5 inch (38.1 millimeters)
iv. Average Thickness: 1.0 inch (25.4 millimeters)
v. Average LTTR value: 5.7

6) Y
i. Slope: ¼ inch per foot
ii. Minimum Thickness: 1.5 inch (38.1 millimeters)
iii. Maximum Thickness: 2.5 inch (63.5 millimeters)
iv. Average Thickness: 2.0 inch (50.8 millimeters)
v. Average LTTR value: 11.4

7) Q
i. Slope: ½ inch per foot
ii. Minimum Thickness: 0.5 inch (12 millimeters)
iii. Maximum Thickness: 2.5 inch (63.5 millimeters)
iv. Average Thickness: 1.5 inch (38.1 millimeters)
v. Average LTTR Value: 8.6

E. **ACFoam® - HD CoverBoard:** Flat closed-cell polyisocyanurate (polyiso) foam core integrally bonded to ACFoam®-III inorganic coated glass facers.
1. Compliance:
a. ASTM C1289, Type II, Class 4, Grade 1 (80 psi (551 kPa) minimum, up to 110 psi (758 kPa) compressive strength).
b. UL Certified for Canada
c. UL Standard 1256 Classification: Construction No. 120, 123 & 292.
d. UL Standard 790 (ASTM E108): Roofing Systems Classification.
e. UL Standard 263 (ASTM E119): Fire Resistance Classification.
f. FM Standard 4450 & 4470 Approved: Refer to FM Approvals® RoofNav for Specific Systems Details.
g. ASTM D6329: Resistant to Mold growth as Validated by the GREENGUARD Environmental Institute.
h. UL Class B Over Combustible Decks with UL Classified Membranes.
i. IBC Chapter 26 & National Building Code: Sections on Foam Insulation.
j. Dimensional Stability (ASTM D2126): less than 0.5 percent.
k. Compressive Strength (ASTM D1621): Grade 1.
l. Water Absorption (ASTM C209): less than 3.0 percent.
m. Water Vapor Transmission (ASTM E96): less than 1.5 perm ($85.5 ng/(Pa \cdot s \cdot m^2)$)
n. Flame Spread (ASTM E84 10 minimum): 40-60.
o. Smoke Development (ASTM E84 10 minimum): 50-170.
p. Tensile Strength (ASTM D1623): greater than 2000 pounds per square foot (95 kPa).
q. Service Temperature: -100°F to +250°F.
r. Panel Area:
1) 4 feet x 8 feet (1220 millimeters x 2440 millimeters)
2) 4 feet x 4 feet (1220 millimeters x 1220 millimeters)
s. Panel Thickness:

1) 0.5 inch (12 millimeters): LTTR – 2.5

F. **ACFoam® Supreme Foil Faced Roof Insulation**: Flat closed-cell polyisocyanurate (polyiso) foam core integrally bonded to reflective tri-laminate foil facers.
   1. Compliance:
      a. ASTM C1289, Type I, Class 1, Grade 2 (20 pounds per square inch) or Grade 3 (25 pounds per square inch).
      b. CAN/ULC-S704 Type 2, Class 1 or Type 3, Class 1.
      c. CCMC No. 12422-R.
      d. UL Standard 790 (ASTM E108): Roofing Systems Classification.
      e. FM Standard 4450 & 4470 Approved: Refer to FM Approvals® RoofNav for Specific Systems Details.
      f. IBC Chapter 26 & National Building Code: Sections on Foam Insulation.
      g. California State Insulation Quality Standards.
      h. Title 25 Foam Flammability Criteria (T 1231).
      i. Miami-Dade County Product Control Approved.
      j. State of Florida Product Approval: FL17989.
      k. Dimensional Stability (ASTM D2126): less than 2 percent.
      l. Compressive Strength (ASTM D1621): 20 pounds per square inch (140 kPa) or 25 pounds per square inch (172 kPa).
      m. Water Absorption (ASTM C209): less than 0.5 percent.
      n. Water Absorption (ASTM D2842): less than 3.5 percent.
      o. Water Vapor Transmission (ASTM E96): less than 0.3 perm (17.2 ng/(Pa•s•m^2))
      p. Product Density (ASTM D1622): Nominal 2.0 pounds per cubic foot (32.04 kg/m^3).
      q. Flame Spread (ASTM E84 10 minimum): 40-60.
      r. Smoke Development (ASTM E84 10 minimum): 50-170.
      s. Tensile Strength (ASTM D1623): greater than 730 pounds per square foot (35 kPa).
      t. Service Temperature: -100°F to +250°F.
      u. Panel Area:
         1) 4 feet x 8 feet (1220 millimeters x 2440 millimeters)
         2) 4 feet x 4 feet (1220 millimeters x 1220 millimeters)
      v. Panel Thickness:
         1) 1.0 inch (25.4 millimeters): LTTR - 5.7
         2) 1.5 inch (38.1 millimeters): LTTR - 8.6
         3) 2.0 inch (50.8 millimeters): LTTR - 11.4
         4) 2.5 inch (63.5 millimeters): LTTR - 14.4
         5) 3.0 inch (76.2 millimeters): LTTR - 17.4
         6) 3.5 inch (88.9 millimeters): LTTR - 20.5
         7) 4.0 inch (101.6 millimeters): LTTR - 23.6

G. **ACFoam® Recover Board Roof Insulation:** Flat closed-cell polyisocyanurate (polyiso) foam core integrally bonded to inorganic coated glass facers.
   1. Compliance:
      a. ASTM C1289, Type II, Class 2, Grade 2 (20 pounds per square inch) or Grade 3 (25 pounds per square inch).
      b. CAN/ULC-S704 Type 2, Class 3 or Type 3, Class 3.
      c. CCMC No. 12423-L.
      d. UL Certified for Canada- Insulated Roof Deck Assemblies Construction No. C38 and 52. Meet CAN/ULC-S126, CAN/ULC-S101 and CAN/ULC-S107.
      e. UL Standard 790 (ASTM E108): Roofing Systems Classification.

f. FM Standard 4450 & 4470 Approved: Refer to FM Approvals® RoofNav for Specific Systems Details.
g. IBC Chapter 26 & National Building Code: Sections on Foam Insulation.
h. California State Insulation Quality Standards.
i. Title 25 Foam Flammability Criteria (T 1231).
j. Miami-Dade County Product Control Approved.
k. State of Florida Product Approval: FL17989.
l. Dimensional Stability (ASTM D2126): less than 2 percent.
m. Compressive Strength (ASTM D1621): 20 pounds per square inch (140 kPa) or 25 pounds per square inch (172 kPa).
n. Water Absorption (ASTM C209): less than 1.5 percent.
o. Water Absorption (ASTM D2842): less than 3.5 percent.
p. Water Vapor Transmission (ASTM E96): less than 4.0 perm (228.8ng/(Pa•s•m^2))
q. Product Density (ASTM D1622): Nominal 2.0 pounds per cubic foot (32.04 kg/m^3).
r. Flame Spread (ASTM E84 10 minimum): 40-60.
s. Smoke Development (ASTM E84 10 minimum): 50-170.
t. Tensile Strength (ASTM D1623): greater than 730 pounds per square foot (35 kPa).
u. Service Temperature: -100°F to +250°F.
v. Panel Area:
    1) 4 feet x 8 feet (1220 millimeters x 2440 millimeters)
    2) 4 feet x 4 feet (1220 millimeters x 1220 millimeters)
w. Panel Thickness:
    1) 0.5 inch (12 millimeters): LTTR - 2.9
    2) 0.75 inch (19 millimeters): LTTR - 4.3
    3) 1.0 inch (25.4 millimeters): LTTR - 5.7

H. **ACFoam® Nail Base Nailable Roof Insulation:** Thermally efficient non-structural composite insulation. Consisting of closed-cell ACFoam®-II or ACFoam®-III polyisocyanurate (polyiso) roof insulation board bonded to Oriented Strand Board (OSB) or CDX Plywood on the top face.
1. Compliance:
    a. ASTM C1289, Type V.
    b. UL Standard 1256 Classification: Construction No. 120, 123 & 458.
    c. UL Standard 790 (ASTM E108): For use with Class A, B or C Shingles, Metal or Tile Roof Coverings.
    d. UL Standard 263 (ASTM E119): Fire Resistance Classification.
    e. FM Standard 4450 & 4470 Approved (1-90, 1-105): Approved for Class 1 Insulated Roof Deck Construction. Refer to FM Approvals® RoofNav for Specific Systems Details.
    f. IBC Chapter 26 & National Building Code: Sections on Foam Insulation.
    g. California State Insulation Quality Standards.
    h. Title 25 Foam Flammability Criteria (T 1231).
    i. Miami-Dade County Product Control Approved.
    j. State of Florida Product Approval: FL17989.
    k. APA/TECO Rated OSB Nailing Surface.
    l. United States Voluntary Product Standard: PS 2 Compliant.
    m. Dimensional Stability (ASTM D2126): less than 2 percent.
    n. Compressive Strength (ASTM D1621): 20 pounds per square inch (140 kPa) or 25 pounds per square inch (172 kPa).

o. Water Absorption (ASTM C209): less than 1.5 percent.
p. Water Absorption (ASTM D2842): less than 3.5 percent.
q. Water Vapor Transmission (ASTM E96): less than 1.0 perm (57.5ng/(Pa•s•m^2))
r. Product Density (ASTM D1622): Nominal 2.0 pounds per cubic foot (32.04 kg/m^3).
s. Flame Spread (ASTM E84 10 minimum): 40-60.
t. Smoke Development (ASTM E84 10 minimum): 50-170.
u. Tensile Strength (ASTM D1623): greater than 730 pounds per square foot (35 kPa).
v. Service Temperature: -100°F to +250°F.
w. Panel Area:
    1) 4 feet x 8 feet (1220 millimeters x 2440 millimeters)
x. Composite Panel Thickness: Composite calculations include polyiso layer and 7/16 inch OSB (R-0.55).
    1) 1.5 inch (38.1 millimeters): LTTR - 6.3
    2) 2.0 inch (50.8 millimeters): LTTR - 9.1
    3) 2.5 inch (63.5 millimeters): LTTR - 12.0
    4) 3.0 inch (76.2 millimeters): LTTR - 15.0
    5) 3.5 inch (88.9 millimeters): LTTR - 18.0
    6) 4.0 inch (101.6 millimeters): LTTR - 21.1
    7) 4.5 inch (114.3 millimeters): LTTR - 24.2
y. Wood Layer Compatibility:
    1) OSB
        i. 7/16 inch (11 millimeters): R - 0.55
            a. Available Certifications: FSC, Fire-Treated & Preservative-Treated
        ii. 5/8 inch (16 millimeters): R - 0.78
            a. Available Certifications: FSC, Fire-Treated & Preservative-Treated
        iii. 3/4 inch (19 millimeters): R - 0.94
            a. Available certifications: FSC, Fire-Treated & Preservative-Treated
    2) CDX
        i. 5/8 inch (16 millimeters): R - 0.78
            a. Available Certifications: FSC, Fire-Treated & Preservative-Treated
        ii. 3/4 inch (19 millimeters): R - 0.94
            a. Available Certifications: FSC, Fire-Treated & Preservative-Treated

l. **ACFoam® CrossVent® Nailable Cross Ventilated Roof Insulation:** Thermally efficient cross ventilated non-structural composite insulation. Consisting of closed-cell **ACFoam®-II** or **ACFoam®-III** polyisocyanurate (polyiso) roof insulation board and Oriented Strand Board (OSB) or CDX Plywood separated with and bonded to 5 individual Expanded Polystyrene vent spacer strips.
    1. Compliance:
        a. ASTM C1289, Type V.
        b. UL Standard 1256 Classification: Construction No. 120, 123 & 458.
        c. UL Standard 790 (ASTM E108): For use with Class A, B or C Shingles, Metal or Tile Roof Coverings.
        d. UL Standard 263 (ASTM E119): Fire Resistance Classification.
        e. FM Standard 4450 & 4470 Approved (1-90, 1-105): Approved for Class 1 Insulated Roof Deck Construction. Refer to FM Approvals® RoofNav for Specific Systems Details.
        f. IBC Chapter 26 & National Building Code: Sections on Foam Insulation.
        g. California State Insulation Quality Standards.

h. Title 25 Foam Flammability Criteria (T 1231).
i. Miami-Dade County Product Control Approved.
j. State of Florida Product Approval: FL17989.
k. APA/TECO Rated OSB Nailing Surface.
l. Federal Housing Administration (FHA) Minimum Property & Asphalt Roofing Manufacturers Association (ARMA) Insulated Deck Requirements.
m. Dimensional Stability (ASTM D2126): less than 2 percent.
n. Compressive Strength (ASTM D1621): 20 pounds per square inch (140 kPa) or 25 pounds per square inch (172 kPa).
o. Water Absorption (ASTM C209): less than 1.0 percent.
p. Water Absorption (ASTM D2842): less than 3.5 percent.
q. Water Vapor Transmission (ASTM E96): less than 1.0 perm ($57.5 ng/(Pa \cdot s \cdot m^2)$)
r. Product Density (ASTM D1622): Nominal 2.0 pounds per cubic foot (32.04 kg/m^3).
s. Flame Spread (ASTM E84 10 minimum): 40-60.
t. Smoke Development (ASTM E84 10 minimum): 50-170.
u. Tensile Strength (ASTM D1623): greater than 730 pounds per square foot (35 kPa).
v. Service Temperature: -100°F to +250°F.
w. Panel Area:
    1) 4 feet x 8 feet (1220 millimeters x 2440 millimeters)
x. 1.0 inch Air Space Composite Panel Thickness: Composite calculations include polyiso layer, 1.0 inch EPS vent spacer strip and 7/16 inch OSB.
    1) 2.5 inch (63.5 millimeters): LTTR - 5.7
    2) 3.0 inch (76.2 millimeters): LTTR - 8.6
    3) 3.5 inch (88.9 millimeters): LTTR - 11.4
    4) 4.0 inch (101.6 millimeters): LTTR - 14.4
    5) 4.5 inch (114.3 millimeters): LTTR - 17.4
    6) 5.0 inch (127 millimeters): LTTR - 20.5
    7) 5.5 inch (139.7 millimeters): LTTR - 23.6
y. 1.5 inch Air Space Composite Panel Thickness: Composite calculations include polyiso layer, 1.5 inch EPS vent spacer strip and 7/16 inch OSB.
    1) 3.0 inch (76.2 millimeters): LTTR - 5.7
    2) 3.5 inch (88.9 millimeters): LTTR - 8.6
    3) 4.0 inch (101.6 millimeters): LTTR - 11.4
    4) 4.5 inch (114.3 millimeters): LTTR - 14.4
    5) 5.0 inch (127 millimeters): LTTR - 17.4
    6) 5.5 inch (139.7 millimeters): LTTR - 20.5
    7) 6.0 inch (152.4 millimeters): LTTR - 23.6
z. 2.0 inch Air Space Composite Panel Thickness: Composite calculations include polyiso layer, 2.0 inch EPS vent spacer strip and 7/16 inch OSB.
    1) 3.5 inch (88.9 millimeters): LTTR - 5.7
    2) 4.0 inch (101.6 millimeters): LTTR - 8.6
    3) 4.5 inch (114.3 millimeters): LTTR - 11.4
    4) 5.0 inch (127 millimeters): LTTR - 14.4
    5) 5.5 inch (139.7 millimeters): LTTR - 17.4
    6) 6.0 inch (152.4 millimeters): LTTR - 20.5
    7) 6.5 inch (165 millimeters): LTTR - 23.6
aa. Vent Strip Compatibility:
    1) 1.0 inch (25.4 millimeters) x 4.0 inch (101.6 millimeters)

i. NFA = 9.5 square inch per linear foot.
ii. Compressive: 6000 pounds per square foot compressive resistance
iii. Moisture, Mold and Rot Resistant
iv. Continuous fastening support for projects which require an excess of 30 fasteners.

2) 1.5 inch (38.1 millimeters) x 4.0 inch (101.6 millimeters)
i. NFA = 14.25 square in per linear foot.
ii. Compressive: 6000 pounds per square foot compressive resistance
iii. Moisture, Mold and Rot Resistant
iv. Continuous fastening support for projects which require an excess of 30 fasteners.

3) 2.0 inch (50.8 millimeters) x 4.0 inch (101.6 millimeters)
i. NFA = 19.0 square in per linear foot.
ii. Compressive: 6000 pounds per square foot compressive resistance
iii. Moisture, Mold and Rot Resistant
iv. Continuous fastening support for projects which require an excess of 30 fasteners.

bb. Wood Layer Compatibility:

1) OSB
i. 7/16 inch (11 millimeters): R - 0.55
a. Available Certifications: FSC, Fire-Treated & Preservative-Treated
ii. 5/8 inch (16 millimeters): R - 0.78
a. Available Certifications: FSC, Fire-Treated & Preservative-Treated
iii. 3/4 inch (19 millimeters): R - 0.94
a. Available certifications: FSC, Fire-Treated & Preservative-Treated

2) CDX
i. 5/8 inch (16 millimeters): R - 0.78
a. Available Certifications: FSC, Fire-Treated & Preservative-Treated
ii. 3/4 inch (19 millimeters): R - 0.94
a. Available Certifications: FSC, Fire-Treated & Preservative-Treated

J. **Gemini™ CKT Pre-Cut Cricket:** Pre-cut tapered polyisocyanurate (polyiso) roof insulation fabricated of factory cut and hinged triangular shaped

K. **Tapered ACFoam®-II** or **Tapered ACFoam®-III** and flat **ACFoam®-II** or **ACFoam®-III**.

1. Compliance:
a. **ACFoam®-II** faced product: Tapered or Flat closed-cell polyisocyanurate (polyiso) foam core integrally bonded to non-asphaltic, fiber-reinforced organic felt facers.
1) ASTM C1289, Type II, Class 1, Grade 2 (20 pounds per square inch) or Grade 3 (25 pounds per square inch).
2) CAN/ULC-S704 Type 2, Class 3 or Type 3, Class 3.
3) CCMC No. 12464-L.
4) UL Certified for Canada- Insulated Roof Deck Assemblies Construction No. C38 and 52. Meet CAN/ULC-S126, CAN/ULC-S101 and CAN/ULC-S107.
5) UL Standard 1256 Classification: Construction No. 120, 123 & 292.
6) UL Standard 790 (ASTM E108): Roofing Systems Classification.
7) UL Standard 263 (ASTM E119): Fire Resistance Classification.
8) UL Standard 1897: Uplift Resistance.
9) FM Standard 4450 & 4470 Approved: Refer to FM Approvals® RoofNav for Specific Systems Details.

10) IBC Chapter 26 & National Building Code: Sections on Foam Insulation.
11) California State Insulation Quality Standards.
12) Title 25 Foam Flammability Criteria (T 1231).
13) Miami-Dade County Product Control Approved.
14) State of Florida Product Approval: FL17989.
15) Dimensional Stability (ASTM D2126): less than 2 percent.
16) Compressive Strength (ASTM D1621): 20 pounds per square inch (140 kPa) or 25 pounds per square inch (172 kPa).
17) Water Absorption (ASTM C209): less than 1.5 percent.
18) Water Absorption (ASTM D2842): less than 3.5 percent.
19) Water Vapor Transmission (ASTM E96): less than 1.5 perm (85.5ng/(Pa•s•m^2))
20) Product Density (ASTM D1622): Nominal 2.0 pounds per cubic foot (32.04 kg/m^3).
21) Flame Spread (ASTM E84 10 minimum): 40-60.
22) Smoke Development (ASTM E84 10 minimum): 50-170.
23) Tensile Strength (ASTM D1623): greater than 730 pounds per square foot (35 kPa).
24) Service Temperature: -100°F to +250°F.

b. **ACFoam®-III** faced product: Tapered or Flat closed-cell polyisocyanurate (polyiso) foam core integrally bonded to inorganic coated glass facers.
   1) ASTM C1289, Type II, Class 2, Grade 2 (20 pounds per square inch) or Grade 3 (25 pounds per square inch).
   2) CAN/ULC-S704 Type 2, Class 3 or Type 3, Class 3.
   3) CCMC No. 12423-L.
   4) UL Certified for Canada- Insulated Roof Deck Assemblies Construction No. C38 and 52. Meet CAN/ULC-S126, CAN/ULC-S101 and CAN/ULC-S107.
   5) UL Standard 1256 Classification: Construction No. 120, 123 & 292.
   6) UL Standard 790 (ASTM E108): Roofing Systems Classification.
   7) UL Standard 263 (ASTM E119): Fire Resistance Classification.
   8) UL Standard 1897: Uplift Resistance.
   9) FM Standard 4450 & 4470 Approved: Refer to FM Approvals® RoofNav for Specific Systems Details.
   10) IBC Chapter 26 & National Building Code: Sections on Foam Insulation.
   11) California State Insulation Quality Standards.
   12) Title 25 Foam Flammability Criteria (T 1231).
   13) Miami-Dade County Product Control Approved.
   14) State of Florida Product Approval: FL17989.
   15) Dimensional Stability (ASTM D2126): less than 2 percent.
   16) Compressive Strength (ASTM D1621): 20 pounds per square inch (140 kPa) or 25 pounds per square inch (172 kPa).
   17) Water Absorption (ASTM C209): less than 1.5 percent.
   18) Water Absorption (ASTM D2842): less than 3.5 percent.
   19) Water Vapor Transmission (ASTM E96): less than 4.0 perm (228.8ng/(Pa•s•m^2))
   20) Product Density (ASTM D1622): Nominal 2.0 pounds per cubic foot (32.04 kg/m^3).
   21) Flame Spread (ASTM E84 10 minimum): 40-60.
   22) Smoke Development (ASTM E84 10 minimum): 50-170.

23) Tensile Strength (ASTM D1623): greater than 730 pounds per square foot (35 kPa).
24) Service Temperature: -100°F to +250°F.

c. Triangular Panel Area: Applies to Flat and Tapered Gemini™ Pre-Cut Cricket Panels.
   1) Length: 4 feet (1220 millimeters)
   2) Width: 12ft (3660 millimeters)
d. Tapered Panel Thickness:
   1) X
      i. Slope: ¼ inch per foot
      ii. Minimum Thickness: 0.5 inch (12 millimeters)
      iii. Maximum Thickness: 1.5 inch (38.1 millimeters)
      iv. Average Thickness: 1.0 inch (25.4 millimeters)
      v. Average LTTR value: 5.7
   2) Y
      i. Slope: ¼ inch per foot
      ii. Minimum Thickness: 1.5 inch (38.1 millimeters)
      iii. Maximum Thickness: 2.5 inch (63.5 millimeters)
      iv. Average Thickness: 2.0 inch (50.8 millimeters)
      v. Average LTTR value: 11.4
   3) Q
      i. Slope: ½ inch per foot
      ii. Minimum Thickness: 0.5 inch (12 millimeters)
      iii. Maximum Thickness: 2.5 inch (63.5 millimeters)
      iv. Average Thickness: 1.5 inch (38.1 millimeters)
      v. Average LTTR Value: 8.6
e. Flat Panel Thickness:
   1) 2.0 inch (50.8 millimeters): R - 11.4

L. **Gemini™ DST Drain Set**: Pre-cut or fabricated **Tapered ACFoam®-II** or **Tapered ACFoam®-III** polyisocyanurate (polyiso) roof insulation drainage sump. Designed to provide consistent and positive roof slope from the panel perimeter inward toward the panel center.
   a. **ACFoam®-II** faced product: Tapered closed-cell polyisocyanurate (polyiso) foam core integrally bonded to non-asphaltic, fiber-reinforced organic felt facers.
      1) ASTM C1289, Type II, Class 1, Grade 2 (20 pounds per square inch) or Grade 3 (25 pounds per square inch).
      2) CAN/ULC-S704 Type 2, Class 3 or Type 3, Class 3.
      3) CCMC No. 12464-L.
      4) UL Certified for Canada- Insulated Roof Deck Assemblies Construction No. C38 and 52. Meet CAN/ULC-S126, CAN/ULC-S101 and CAN/ULC-S107.
      5) UL Standard 1256 Classification: Construction No. 120, 123 & 292.
      6) UL Standard 790 (ASTM E108): Roofing Systems Classification.
      7) UL Standard 263 (ASTM E119): Fire Resistance Classification.
      8) UL Standard 1897: Uplift Resistance.
      9) FM Standard 4450 & 4470 Approved: Refer to FM Approvals® RoofNav for Specific Systems Details.
      10) IBC Chapter 26 & National Building Code: Sections on Foam Insulation.
      11) California State Insulation Quality Standards.
      12) Title 25 Foam Flammability Criteria (T 1231).

13) Miami-Dade County Product Control Approved.
14) State of Florida Product Approval: FL17989.
15) Dimensional Stability (ASTM D2126): less than 2 percent.
16) Compressive Strength (ASTM D1621): 20 pounds per square inch (140 kPa) or 25 pounds per square inch (172 kPa).
17) Water Absorption (ASTM C209): less than 1.5 percent.
18) Water Absorption (ASTM D2842): less than 3.5 percent.
19) Water Vapor Transmission (ASTM E96): less than 1.5 perm (85.5ng/(Pa•s•m^2))
20) Product Density (ASTM D1622): Nominal 2.0 pounds per cubic foot (32.04 kg/m^3).
21) Flame Spread (ASTM E84 10 minimum): 40-60.
22) Smoke Development (ASTM E84 10 minimum): 50-170.
23) Tensile Strength (ASTM D1623): greater than 730 pounds per square foot (35 kPa).
24) Service Temperature: -100°F to +250°F.

b. **ACFoam®-III** faced product: Tapered closed-cell polyisocyanurate (polyiso) foam core integrally bonded to inorganic coated glass facers.
   1) ASTM C1289, Type II, Class 2, Grade 2 (20 pounds per square inch) or Grade 3 (25 pounds per square inch).
   2) CAN/ULC-S704 Type 2, Class 3 or Type 3, Class 3.
   3) CCMC No. 12423-L.
   4) UL Certified for Canada- Insulated Roof Deck Assemblies Construction No. C38 and 52. Meet CAN/ULC-S126, CAN/ULC-S101 and CAN/ULC-S107.
   5) UL Standard 1256 Classification: Construction No. 120, 123 & 292.
   6) UL Standard 790 (ASTM E108): Roofing Systems Classification.
   7) UL Standard 263 (ASTM E119): Fire Resistance Classification.
   8) UL Standard 1897: Uplift Resistance.
   9) FM Standard 4450 & 4470 Approved: Refer to FM Approvals® RoofNav for Specific Systems Details.
   10) IBC Chapter 26 & National Building Code: Sections on Foam Insulation.
   11) California State Insulation Quality Standards.
   12) Title 25 Foam Flammability Criteria (T 1231).
   13) Miami-Dade County Product Control Approved.
   14) State of Florida Product Approval: FL17989.
   15) Dimensional Stability (ASTM D2126): less than 2 percent.
   16) Compressive Strength (ASTM D1621): 20 pounds per square inch (140 kPa) or 25 pounds per square inch (172 kPa).
   17) Water Absorption (ASTM C209): less than 1.5 percent.
   18) Water Absorption (ASTM D2842): less than 3.5 percent.
   19) Water Vapor Transmission (ASTM E96): less than 4.0 perm (228.8ng/(Pa•s•m^2))
   20) Product Density (ASTM D1622): Nominal 2.0 pounds per cubic foot (32.04 kg/m^3).
   21) Flame Spread (ASTM E84 10 minimum): 40-60.
   22) Smoke Development (ASTM E84 10 minimum): 50-170.
   23) Tensile Strength (ASTM D1623): greater than 730 pounds per square foot (35 kPa).
   24) Service Temperature: -100°F to +250°F.

c. Panel Area:

1) 4 feet x 4 feet (1220 millimeters x 1220 millimeters)

d. Panel Thickness:
   1) DS1.5
      i. Slope: 1/2 inch per foot
      ii. Minimum Thickness: 0.5 inch (12 millimeters)
      iii. Maximum Thickness: 1.5 inch (25.4 millimeters)
      iv. Average Thickness: 1.0 inch (19 millimeters)
      v. Average LTTR Value: 5.7

M. **Gemini™ MTR Pre-Cut Miter**: Pre-cut tapered polyisocyanurate (polyiso) roof insulation hip or valley fabricated of factory cut **Tapered ACFoam®-II** or **Tapered ACFoam®-III**.
   1. Compliance:
      a. **ACFoam®-II** faced product: Tapered or Flat closed-cell polyisocyanurate (polyiso) foam core integrally bonded to non-asphaltic, fiber-reinforced organic felt facers.
         1) ASTM C1289, Type II, Class 1, Grade 2 (20 pounds per square inch) or Grade 3 (25 pounds per square inch).
         2) CAN/ULC-S704 Type 2, Class 3 or Type 3, Class 3.
         3) CCMC No. 12464-L.
         4) UL Certified for Canada- Insulated Roof Deck Assemblies Construction No. C38 and 52. Meet CAN/ULC-S126, CAN/ULC-S101 and CAN/ULC-S107.
         5) UL Standard 1256 Classification: Construction No. 120, 123 & 292.
         6) UL Standard 790 (ASTM E108): Roofing Systems Classification.
         7) UL Standard 263 (ASTM E119): Fire Resistance Classification.
         8) UL Standard 1897: Uplift Resistance.
         9) FM Standard 4450 & 4470 Approved: Refer to FM Approvals® RoofNav for Specific Systems Details.
         10) IBC Chapter 26 & National Building Code: Sections on Foam Insulation.
         11) California State Insulation Quality Standards.
         12) Title 25 Foam Flammability Criteria (T 1231).
         13) Miami-Dade County Product Control Approved.
         14) State of Florida Product Approval: FL17989.
         15) Dimensional Stability (ASTM D2126): less than 2 percent.
         16) Compressive Strength (ASTM D1621): 20 pounds per square inch (140 kPa) or 25 pounds per square inch (172 kPa).
         17) Water Absorption (ASTM C209): less than 1.5 percent.
         18) Water Absorption (ASTM D2842): less than 3.5 percent.
         19) Water Vapor Transmission (ASTM E96): less than 1.5 perm (85.5ng/(Pa•s•m^2))
         20) Product Density (ASTM D1622): Nominal 2.0 pounds per cubic foot (32.04 kg/m^3).
         21) Flame Spread (ASTM E84 10 minimum): 40-60.
         22) Smoke Development (ASTM E84 10 minimum): 50-170.
         23) Tensile Strength (ASTM D1623): greater than 730 pounds per square foot (35 kPa).
         24) Service Temperature: -100°F to +250°F.
      b. **ACFoam®-III** faced product: Tapered or Flat closed-cell polyisocyanurate (polyiso) foam core integrally bonded to inorganic coated glass facers.
         1) ASTM C1289, Type II, Class 2, Grade 2 (20 pounds per square inch) or Grade 3 (25 pounds per square inch).

2) CAN/ULC-S704 Type 2, Class 3 or Type 3, Class 3.
3) CCMC No. 12423-L.
4) UL Certified for Canada- Insulated Roof Deck Assemblies Construction No. C38 and 52. Meet CAN/ULC-S126, CAN/ULC-S101 and CAN/ULC-S107.
5) UL Standard 1256 Classification: Construction No. 120, 123 & 292.
6) UL Standard 790 (ASTM E108): Roofing Systems Classification.
7) UL Standard 263 (ASTM E119): Fire Resistance Classification.
8) UL Standard 1897: Uplift Resistance.
9) FM Standard 4450 & 4470 Approved: Refer to FM Approvals® RoofNav for Specific Systems Details.
10) IBC Chapter 26 & National Building Code: Sections on Foam Insulation.
11) California State Insulation Quality Standards.
12) Title 25 Foam Flammability Criteria (T 1231).
13) Miami-Dade County Product Control Approved.
14) State of Florida Product Approval: FL17989.
15) Dimensional Stability (ASTM D2126): less than 2 percent.
16) Compressive Strength (ASTM D1621): 20 pounds per square inch (140 kPa) or 25 pounds per square inch (172 kPa).
17) Water Absorption (ASTM C209): less than 1.5 percent.
18) Water Absorption (ASTM D2842): less than 3.5 percent.
19) Water Vapor Transmission (ASTM E96): less than 4.0 perm (228.8ng/(Pa•s•m^2))
20) Product Density (ASTM D1622): Nominal 2.0 pounds per cubic foot (32.04 kg/m^3).
21) Flame Spread (ASTM E84 10 minimum): 40-60.
22) Smoke Development (ASTM E84 10 minimum): 50-170.
23) Tensile Strength (ASTM D1623): greater than 730 pounds per square foot (35 kPa).
24) Service Temperature: -100°F to +250°F.

c. Panel Area:
   1) 4 feet (1220 millimeters) x 4 feet (1220 millimeters)
d. Tapered Panel Thickness:
   1) AA
      i. Slope: 1/8 inch per foot
      ii. Minimum Thickness: 0.5 inch (12 millimeters)
      iii. Maximum Thickness: 1.0 inch (25.4 millimeters)
      iv. Average Thickness: 0.75 inch (19 millimeters)
      v. Average LTTR Value: 4.3
   2) A
      i. Slope: 1/8 inch per foot
      ii. Minimum Thickness: 1.0 inch (25.4 millimeters)
      iii. Maximum Thickness: 1.5 inch (38.1 millimeters)
      iv. Average Thickness: 1.25 inch (31.8 millimeters)
      v. Average LTTR Value: 7.1
   3) B
      i. Slope: 1/8 inch per foot
      ii. Minimum Thickness: 1.5 inch (38.1 millimeters)
      iii. Maximum Thickness: 2.0 inch (50.8 millimeters)
      iv. Average Thickness: 1.75 inch (44.5 millimeters)
      v. Average LTTR Value: 10.0

4) C
   i. Slope: 1/8 inch per foot
   ii. Minimum Thickness: 2.0 inch (50.8 millimeters)
   iii. Maximum Thickness: 2.5 inch (63.5 millimeters)
   iv. Average Thickness: 2.25 inch (57.2 millimeters)
   v. Average LTTR Value 12.9
5) X
   i. Slope: ¼ inch per foot
   ii. Minimum Thickness: 0.5 inch (12 millimeters)
   iii. Maximum Thickness: 1.5 inch (38.1 millimeters)
   iv. Average Thickness: 1.0 inch (25.4 millimeters)
   v. Average LTTR value: 5.7
6) Y
   i. Slope: ¼ inch per foot
   ii. Minimum Thickness: 1.5 inch (38.1 millimeters)
   iii. Maximum Thickness: 2.5 inch (63.5 millimeters)
   iv. Average Thickness: 2.0 inch (50.8 millimeters)
   v. Average LTTR value: 11.4
7) Q
   i. Slope: ½ inch per foot
   ii. Minimum Thickness: 0.5 inch (12 millimeters)
   iii. Maximum Thickness: 2.5 inch (63.5 millimeters)
   iv. Average Thickness: 1.5 inch (38.1 millimeters)
   v. Average LTTR Value: 8.6

N. **Gemini™ TES Tapered Edge Strip**: Pre-cut tapered polyisocyanurate (polyiso) roof insulation edge strip fabricated of factory cut **Tapered ACFoam®-II** or **Tapered ACFoam®-III**.
   1. Compliance:
      a. **ACFoam®-II** faced product: Tapered or Flat closed-cell polyisocyanurate (polyiso) foam core integrally bonded to non-asphaltic, fiber-reinforced organic felt facers.
         1) ASTM C1289, Type II, Class 1, Grade 2 (20 pounds per square inch) or Grade 3 (25 pounds per square inch).
         2) CAN/ULC-S704 Type 2, Class 3 or Type 3, Class 3.
         3) CCMC No. 12464-L.
         4) UL Certified for Canada- Insulated Roof Deck Assemblies Construction No. C38 and 52. Meet CAN/ULC-S126, CAN/ULC-S101 and CAN/ULC-S107.
         5) UL Standard 1256 Classification: Construction No. 120, 123 & 292.
         6) UL Standard 790 (ASTM E108): Roofing Systems Classification.
         7) UL Standard 263 (ASTM E119): Fire Resistance Classification.
         8) UL Standard 1897: Uplift Resistance.
         9) FM Standard 4450 & 4470 Approved: Refer to FM Approvals® RoofNav for Specific Systems Details.
         10) IBC Chapter 26 & National Building Code: Sections on Foam Insulation.
         11) California State Insulation Quality Standards.
         12) Title 25 Foam Flammability Criteria (T 1231).
         13) Miami-Dade County Product Control Approved.
         14) State of Florida Product Approval: FL17989.
         15) Dimensional Stability (ASTM D2126): less than 2 percent.

16) Compressive Strength (ASTM D1621): 20 pounds per square inch (140 kPa) or 25 pounds per square inch (172 kPa).
17) Water Absorption (ASTM C209): less than 1.5 percent.
18) Water Absorption (ASTM D2842): less than 3.5 percent.
19) Water Vapor Transmission (ASTM E96): less than 1.5 perm (85.5ng/(Pa•s•m^2))
20) Product Density (ASTM D1622): Nominal 2.0 pounds per cubic foot (32.04 kg/m^3).
21) Flame Spread (ASTM E84 10 minimum): 40-60.
22) Smoke Development (ASTM E84 10 minimum): 50-170.
23) Tensile Strength (ASTM D1623): greater than 730 pounds per square foot (35 kPa).
24) Service Temperature: -100°F to +250°F.

b. **ACFoam®-III** faced product: Tapered or Flat closed-cell polyisocyanurate (polyiso) foam core integrally bonded to inorganic coated glass facers.
1) ASTM C1289, Type II, Class 2, Grade 2 (20 pounds per square inch) or Grade 3 (25 pounds per square inch).
2) CAN/ULC-S704 Type 2, Class 3 or Type 3, Class 3.
3) CCMC No. 12423-L.
4) UL Certified for Canada- Insulated Roof Deck Assemblies Construction No. C38 and 52. Meet CAN/ULC-S126, CAN/ULC-S101 and CAN/ULC-S107.
5) UL Standard 1256 Classification: Construction No. 120, 123 & 292.
6) UL Standard 790 (ASTM E108): Roofing Systems Classification.
7) UL Standard 263 (ASTM E119): Fire Resistance Classification.
8) UL Standard 1897: Uplift Resistance.
9) FM Standard 4450 & 4470 Approved: Refer to FM Approvals® RoofNav for Specific Systems Details.
10) IBC Chapter 26 & National Building Code: Sections on Foam Insulation.
11) California State Insulation Quality Standards.
12) Title 25 Foam Flammability Criteria (T 1231).
13) Miami-Dade County Product Control Approved.
14) State of Florida Product Approval: FL17989.
15) Dimensional Stability (ASTM D2126): less than 2 percent.
16) Compressive Strength (ASTM D1621): 20 pounds per square inch (140 kPa) or 25 pounds per square inch (172 kPa).
17) Water Absorption (ASTM C209): less than 1.5 percent.
18) Water Absorption (ASTM D2842): less than 3.5 percent.
19) Water Vapor Transmission (ASTM E96): less than 4.0 perm (228.8ng/(Pa•s•m^2))
20) Product Density (ASTM D1622): Nominal 2.0 pounds per cubic foot (32.04 kg/m^3).
21) Flame Spread (ASTM E84 10 minimum): 40-60.
22) Smoke Development (ASTM E84 10 minimum): 50-170.
23) Tensile Strength (ASTM D1623): greater than 730 pounds per square foot (35 kPa).
24) Service Temperature: -100°F to +250°F.

c. **1.5 inch Gemini™ TES** Tapered Edge Strip: TES1.5
1) Facer Availability: ACFoam®-II
2) Slope: 1.5 inch (38.1 millimeters) per foot
3) Minimum Thickness: 0.0 inch (0.0 millimeters)

4) Maximum thickness: 1.5 inch (38.1 millimeters)
5) Width: 12.0 inch (305 millimeters)
6) Length: 8.0’ (2440 millimeters)

d. **2.0 inch GEMINI™ TES** Tapered Edge Strip: TES2.0
1) Facer Availability: ACFoam®-II or ACFoam®-III
2) Slope: 1.0 inch (25.4 millimeters) per foot
3) Minimum Thickness: 0.0 inch (0.0 millimeters)
4) Maximum thickness: 2.0 inch (50.8 millimeters)
5) Width: 24.0 inch (610 millimeters)
6) Length: 8.0’ (2440 millimeters)

2.3 ACCESSORIES

A. **Atlas Nail Base Fastener**: Engineered fastener **for ACFoam® Nail Base** and **ACFoam® CrossVent®** Nailable insulation to an approved substrate. Required for proper attachment of all ACFoam® Nailable insulation products.
1. Material: Case hardened and Tempered Carbon Steel
2. Head Style/Drive: Pancake Head with T-30 Internal Drive
3. Head Diameter: 0.635 inch
4. Shank Diameter: 0.190 inch
5. Thread Length: 2.750 inch
6. Point: #2 (0.135 inch diameter) Drill Point
7. Coating: Epoxy E-Coat (Black)
8. Overall Length:
a. 3.0 inch (76 millimeters)
b. 3.5 inch (89 millimeters)
c. 4.0 inch (102 millimeters)
d. 4.5 inch (114 millimeters)
e. 5.0 inch (127 millimeters)
f. 5.5 inch (140 millimeters)
g. 6.0 inch (152 millimeters)
h. 6.5 inch (165 millimeters)
i. 7.0 inch (178 millimeters)
j. 7.5 inch (191 millimeters)
k. 8.0 inch (203 millimeters)
l. 8.5 inch (216 millimeters)
m. 9.0 inch (229 millimeters)
n. 10.0 inch (254 millimeters)
o. 11.0 inch (279 millimeters)
p. 12.0 inch (305 millimeters)
q. 13.0 inch (330 millimeters)
r. 14.0 inch (356 millimeters)
s. 15.0 inch (381 millimeters)
t. 16.0 inch (406 millimeters)
u. 17.0 inch (457 millimeters)

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine roof deck for suitability to receive insulation.

B. Verify that substrate is dry, clean and free of foreign material that will damage insulation or impede installation.
C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
D. Verify that roof drains, scuppers, roof curbs, nailers, equipment supports, vents and other roof accessories are secured properly and installed in conformance with Contract Documents.
E. Verify that deck is structurally sound to support installers, materials and equipment without damaging or deforming work.
    1. Start of installation indicates installer accepts conditions of existing deck surfaces.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.
B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
C. Verify the manufacturer's roof edge details for accuracy to fit the assembly

3.3 INSTALLATION

A. Install in accordance with manufacturer's installation instructions.
B. Install specified insulation using approved mechanical fasteners, hot asphalt or adhesives in accordance with manufacturer's latest written instructions and as required by governing codes and Owner's insurance carrier.
C. Install with end joints staggered to avoid having insulation joints coinciding with joints in deck. In multi-layer installations, stagger joints in top and bottom layers.

3.4 PROTECTION

A. Remove trash and construction debris from insulation surface prior to application of roofing membrane.
B. Do not leave installed insulation exposed to weather. Cover and waterproof completed roof system immediately after installation.
    1. Temporarily seal exposed insulation edges at the end of each day.
    2. Remove and replace installed insulation that has become wet or damaged with new insulation.
C. Protect installed insulation and roof cover from traffic by use of protective covering materials during and after installation.

END OF SECTION