# 2 PLY TPO HYBRID BONDED TO INSULATION

## Assembly Identification

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<th>Substrate</th>
<th>Number of Plies</th>
<th>Cap Sheet Thickness</th>
<th>Membrane Type</th>
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<td>I = Insulated</td>
<td>2</td>
<td>T = TPO</td>
<td>T = Thermoplastic</td>
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### Type of Base Sheet
- C = SBS Composite
- F = SBS Fiberglass
- P = SBS Polyester
- G = BUR Fiber Glass

### Cap Sheet
- TPO FB 150™ - (Hot Asphalt)
- TPO FB 175™ - (Hot Asphalt)

### Base Ply (SBS Polymer):
- DynaBase™
- DynaBase™ PR
- DynaFast™ 180 S
- DynaFast™ 250 S
- DynaLastic™ 180 S
- DynaLastic™ 250 S

### Approved Cover Boards:
- (If Applicable)
  - 1/2" RetroFit™ Board
  - Fesco Board
  - Fesco Board HD
  - Tapered Fesco Board
  - JM DensDeck Prime™ Roof Board
  - RetroPlus™ Roof Board

### Approved Thermal Barrier:
- (If Applicable)
  - JM SECUROCK®
  - Gypsum-Fiber Roof Board
  - Glass-Mat Roof Board
  - JM DEXCELL®
  - FA Glass-Mat Roof Board
  - Glass-Mat Roof Board
  - JM DensDeck™ Roof Board
  - JM DensDeck Prime Roof Board

### Approved Base Sheets:
- (If Applicable) Over Nailable Deck
  - DynaBase™
  - DynaBase™ PR
  - DynaBase™ XT
  - DynaFast™ 180 S
  - DynaLast™ 180 S
  - DynaLast™ 250 S
  - GlasBase™ Plus
  - GlasPly™ Premier
  - GlasPly™ Flexible
  - PermaPly™ 28
  - Ventsulation™ Felt

### Approved JM Insulations:
- DuraFoam™
- ENRGY 3™
- AGF
- CGF
- FR
- 20 PSI
- 25 PSI
- Tapered
- Invinsa Foam™

### Approved Vapor Barrier:
- (If Applicable)
  - DynaBase™
  - DynaBase™ PR
  - GlasPly™ IV
  - GlasPly™ Premier
  - 6 or 10 mil poly with taped seams

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For JM Guarantee Requirements Contact JM Technical Services at (800) 922-5922 Option 3 or Refer to the JM Peak Advantage Charges and Requirements-Multi Ply document.
General
This specification is for use over any approved structural deck that provides a suitable surface to receive the roof. This specification can also be used in certain re-roofing applications. Properly prepared concrete decks require priming prior to application of hot asphalt.

This specification is also for use over JM insulations or other rigid insulations which are not nailable and which offer a suitable surface to receive the roof. Specific written approval is required for any roof insulation not manufactured or supplied by JM.

Note:
Consider all general instructions contained in the current JM Thermoplastic Membrane with Redundant Bituminous Ply Systems Installation Guide and the JM SBS Application Guide as part of this specification.

Design
Consider local conditions and characteristics when designing, specifying, and installing any roofing system. Information from the Single Ply Roofing Industry (SPRI), Asphalt Roofing Manufacturers Association (ARMA), FM Global® and local building codes can provide guidelines for the designer.

Design and installation of the deck and/or roof substrate must result in the roof draining freely to outlets numerous and so located as to remove water substantially within 48 hours of a rain event.

Membrane Substrate
The surface on which the built-Up, SBS modified bitumen or thermoplastic fleece backed membrane is to be applied should be an approved structural substrate. The surface must be clean, smooth, flat and dry. Built-Up roofing and SBS modified bitumen should not be applied directly to foam plastic insulations.

Flashings and Components
Refer to the JM TPO Hybrid Details and the JM Thermoplastic Membrane with Redundant Bituminous Ply Systems Installation Guide on the JM website.

Deck Preparation
Before roofing work is started, the deck should be carefully inspected by the roofing contractor, the deck contractor, and the owners representative to determine that it will be able to receive the roofing system by some method which will hold the system securely, either by adhesion, ballast, or mechanical fasteners. Refer to the JM Deck and the JM Thermoplastic Membrane with Redundant Bituminous Ply Systems Installation Guide for further information.

Vapor Barrier Application
All surfaces receiving vapor barrier must be clean and free from oil, grease, rust, scale, loose paint and dirt. The substrate may need to be cleaned according to JM Application Instructions, and any required primers installed. An adhesion test may need to be performed to determine if the substrate is adequate. Vapor Barrier attachment methods include Hot Asphalt, Cold Adhesive, Heat Welded, and Self Adhered. Refer to the JM Vapor Barrier SA Installation Guide, the Vapor Barrier Data Sheets, and the Vapor Retarder section in SBS Roofing Systems for further information.

Thermal Barrier Application
Apply the units of approved JM thermal barrier products with long joints continuous. End joints should be staggered so that they are offset at least 12" (305 mm) from the end joints in adjacent rows. Thermal barriers provide a fire resistive layer in the roof assembly directly above the deck.

Base Sheet Application
The bituminous base sheets for these systems are either mechanically fastened or adhesively applied. Refer to the "BM" Fastening Patterns section in SBS System Application Tools for Base Sheet fastening patterns and further information.

Insulation Application
Roof Insulation plays a key role in energy efficiency shown in codes and standards that have mandated increasing higher minimum R-values for all U.S. climate zones. Local codes dictate the required R-values for commercial and industrial projects and the local jurisdiction should be consulted for this information.

A minimum offset of 6" (152 mm) is recommended from the previous layer of insulation. Loose laid insulations should be positioned with the long side of the boards running perpendicular to the SBS sheet orientation and continuous. End joints should be staggered at least 12" (305 mm) from the end joint in adjacent rows. A minimum offset of 6" (152 mm) is recommended from plywood joints. Refer to the Insulation Installation Instructions document for further information.

Appropriate JM Insulation Adhesives Include:
- JM One Step Foamable Adhesive
- JM Roofing System Urethane Adhesive (RSUA)
- JM Two-Part Urethane Insulation Adhesive (UIA)
- JM Green Two-Part Urethane Insulation Adhesive (GUA)
- Hot Asphalt
- JRIS P23 Adhesive
- JRIS P43 Adhesive
- JRIS P33 Adhesive
- JRIS P43 Adhesive

Refer to JM drawing UA-12 INS for Adhesive Bead Patterns.

When using a low rise urethane adhesive product for insulation boards, all surfaces must be clean, dry, smooth, compatible and free of dirt, debris, oil/grease and gravel. Apply JM urethane adhesive directly to the substrate and allow it to rise and build body before placing board stock into the adhesive. Board stock attachment requires the board stock to be walked in to ensure positive contact between the board stock, adhesive and substrate. When using JM One-Step Foamable Adhesive, insulation boards must be set into the adhesive immediately and walked in due to the rapid curing time of the adhesive. Refer to the specific JM product data sheets of JM insulation adhesives listed above for coverage rates and specific application information.

When adhering insulation boards using hot asphalt, board size must be no greater than 4' x 4' (1.22 m x 1.22 m). If installing over an existing layer of insulation or in multiple layers, all joints must be offset a minimum of 6" (152 mm) between layers. Porous substrates may require greater amounts of asphalt. Concrete decks must be primed with Asphalt Primer prior to application of hot asphalt. Refer to the Insulation Installation Instructions document for further information.

Appropriate JM Insulation Fasteners Include:
- All Purpose Fasteners
- Ultrafast Fasteners and Plates
- Structural Concrete Deck Fasteners and Plates
- Polymer Auger Fasteners

Install JM insulation Fasteners and Plates at an appropriate rate determined by building code, specification, and/or JM Guarantee requirements. Refer to the JM Minimum Insulation Fastening Requirements-Adhered Membrane bulletin for further information.

Cover Board Application
Cover boards may be installed using asphalt, mechanical fasteners, or adhesives. A minimum offset of 6" (152 mm) is recommended from previous layers of insulation. No board widths less than 6" (152 mm) are allowed. Refer to the Invinsa Roof Board Codes and Application Brochure for further information. Refer to the JM Cover Boards Selectors Guide for JM Cover Boards product information. Refer to section Insulation Application above for Cover Board Securement Information including Adhered and Fastened methods of attachment.

Asphalt Application
JM BUR. SBS modified bitumen and thermoplastic fleece back products are designed to be installed with hot asphalt. Permitted: coal tar pitch and coal tar asphalt are not permitted.

JM requires the use of approved asphalt within systems which require a JM Peak Advantage Guarantee. Asphalt should meet the requirements of ASTM D 312. JM guarantees require the use of approved asphalt. The slope of the roof as well as the climate governs the grade of asphalt to be used.

JM endorses the guidelines established by the NRCA and ARMA for heating asphalt for proper applications. Asphalt should be applied at the Equiviscous Temperature (EVT) +/- 25°F (+/- 4°C).

Modified Bitumen Sheet Application - Hot Asphalt
On roof decks with slopes upslope to 1/2" per foot (41 mm/m), the roof felts may be installed either perpendicular or parallel to the roof incline. Install each felt so that it is firmly and uniformly set, without voids into the hot asphalt just before the felt at the proper nominal recommended rates. All sheet edges should be well sealed.

SBS and BUR Applications: Starting with one of the base plies listed, install a full width ply into a full moping of hot asphalt, the remaining plies are to be applied full width in the same manner, with 3" (76 mm) side laps and 4" (102 mm) end laps over the preceding plies.

Note:
Sheets with polyester reinforcement must be allowed to relax in an unrolled position prior to installation. Allow the membrane to relax for at least 15 minutes when the temperature is above 60°F (16°C), or 30 minutes when the temperature is below 60°F (16°C) prior to installation.

Thermoplastic Membrane with Redundant Bituminous Systems Over Non-Nailable Decks
These specifications are for use over any type of deck which is not nailable and which offers a suitable surface to receive the roof. Concrete decks require coating with JM Asphalt Primer prior to the application of hot asphalt. Pre-cast concrete panels also require a layer of approved roof insulation prior to installing a roof membrane. The thermoplastic fleece backed membrane must be firmly and uniformly placed into a full moping of hot asphalt without voids. Asphalt must not be applied to the seigeage edge of the thermoplastic fleece backed membrane to allow a minimum of 1 1/2" (38 mm) weld. Before installation, unroll the JM TPO Fleece Backed membrane and allow it to relax. The laps of JM TPO Fleece Backed membrane must be hot air welded. Clean all surfaces to be welded. All laps must be a minimum of 1 1/2" (38 mm) in width.

Steep Slope Requirements
Special procedures are required on inclines over 1/2" per foot (41 mm/m). Refer to the SBS Application Guide for further information.

Re-Roofing
A large percentage of all commercial and industrial roofing pertains to re-roofing of existing buildings. Refer to the JM Re-Roofing document for inspection, testing, components and other valuable information pertaining to re-roofing projects.

JM Guarantee Requirements
JM Peak Advantage® Guarantees are available up to a 25 year term with approved components and assembly make-up. Refer to the JM Peak Advantage Charges and Requirements-Bituminous Systems document for additional guarantee information.

Refer to the JM Peak Advantage Guarantee Information document for additional guarantee information and guidelines.

Refer to the JM Peak Advantage Guarantee Specimen document to see a JM Peak Advantage Guarantee sample.

All guaranteed installations must follow the guidelines for the requested guarantee as outlined in the SBS Modified Bitumen Specifications document. Not all JM specifications are eligible for all JM Peak Advantage Guarantees or enhanced coverage. Please contact JM Guarantee Services at (800) 922-5922 Option 3 for specific requirements.

All projects requiring a guarantee from JM must be applied for a minimum 14 days in advance of job start.

Refer to the Preventative Maintenance Brochure for roof and building maintenance guidelines.