APP and SBS Asphalt Roofing Systems

Guide for Applicators and Designers

July 2025

NOTE: The contents of this guide are considered accurate at the time of posting. All information contained within should be validated for accuracy as it relates to specific project conditions or requirements. Specific codes, uplifts or other factors may result in changes to the information contained within this document. Validate all specific conditions with a Regional Technical Coordinator prior to its use.

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Table 1: Asphalt Membrane Offering

SBS Membrane Offering				
Membrane	Compound	Surface	Reinforcement	Thickness
SBS Cap	SBS	Granule	Polyester with Glass Strands	0.15" (3.81 mm)
SBS FR	Fire Retardant SBS	Granule	Polyester with Glass Strands	0.15" (3.81 mm)
SBS FR Torch	Fire Retardant SBS	Granule	Polyester with Glass Strands	0.16" (4.06 mm)
SBS Smooth	SBS	Smooth	Polyester with Glass Strands	0.14" (3.55 mm)
SBS Premium FR	Fire Retardant SBS	Granule	Polyester with Glass Strands	0.16" (4.06 mm)
SBS Premium FR Torch	Fire Retardant SBS	Granule	Polyester with Glass Strands	0.16" (4.06 mm)
SBS Base	SBS	Smooth	Glass Fiber Mat	0.09" (2.29 mm)
SBS Glass Torch Base	SBS	Smooth	Glass Fiber Mat	0.12" (3.04 mm)
SBS Glass Torch Base 1.5	SBS	Smooth	Glass Fiber Mat	0.09" (2.28 mm)
SBS Poly Torch Base	SBS	Smooth	Polyester with Glass Strands	0.12" (3.04 mm)
APP				
APP 160	APP	Smooth	Polyester with Glass Strands	0.15" (3.81 mm)
APP 160 Cool	APP	Smooth	Polyester with Glass Strands	0.15" (3.81 mm)
APP 180	APP	Granule	Polyester with Glass Strands	0.17" (4.32 mm)
APP 180 Cool	APP	Granule	Polyester with Glass Strands	0.17" (4.32 mm)

Table 2: Evaluated GenFlex Membranes

Evaluated GenFlex Membranes					
Type	PDS	Product	Material Standard		
			Reference	Type	Grade
APP BASE/PLY SHEETS	401	APP 160	ASTM D6222	I	S
	402	APP 160 COOL	ASTM D6222	I	S
APP, GRANULED CAP	406	APP 180	ASTM D6222	I	G
	407	APP 180 COOL	ASTM D6222	I	G
SBS, SMOOTH-SURFACE MEMBRANES	501	SBS Base	ASTM D6163	I	S
	505	SBS Glass Torch Base	ASTM D6163	I	S
	527	SBS Glass Torch Base 1.5	ASTM D6163	I	S
	509	SBS Smooth	ASTM D6164	I	S
	504	SBS Poly Torch Base	ASTM D6164	I	S
	506	SBS Cap	ASTM D6164	I	G
	507	SBS FR Cap	ASTM D6164	I	G
	512	SBS Premium FR	ASTM D6164	II	G
	513	SBS Premium FR Torch	ASTM D6164	II	G
	508	SBS FR Torch	ASTM D6164	I	G

INTRODUCTION

This section is intended to serve as the preface to the Design Guides for GenFlex roofing systems. Additional technical information is available at www.GenFlex.com.

GenFlex is pleased to offer job-specific technical assistance for our roofing contractors and for the design community. Contact GenFlex Technical Services at (800) 443-4272 to discuss the technical needs of your project, including meeting specification requirements, application techniques, codes, warranty eligibility of systems, and any other technical questions.

Purpose of this Guide to General Design Criteria

The information contained in this guide is intended to assist GenFlex Licensed Contractors in meeting the requirements necessary to obtain a warranty from GenFlex.

Architects, engineers, roof consultants, and other specifiers may also use this information in their design of warranty-eligible GenFlex roofing systems. GenFlex does not engage in roof design.

General Considerations – All GenFlex Roofing Systems

1. Design
   - Always consult a design professional, architect, engineer, roof consultant, etc., before making any design decisions.
   - GenFlex does not practice architecture or engineering.
2. Structural Loads
   - Concentrated loads from rooftop equipment may cause deformation of insulation/underlayment and damage to the membrane if proper protection is not provided. Sleepers are recommended to protect the roofing system.
   - The building must be able to support the loads created by the staging, installation, and in-place service of the roofing system.
   - It is the responsibility of the design professional to determine loads and load capacities.
3. Projects with Extreme Design Considerations
   Contact GenFlex prior to bid to ensure that GenFlex minimum warranty requirements are met whenever any of the following are present:
   - Buildings with positive air pressure, canopies, and/or any building where the total wall openings exceed 10% of the total wall area on which the openings are located (airport hangars, warehouses, etc.).
   - Cold storage buildings and freezer facilities.
   - Buildings where mold or fungi are present.
   - Projects over 250' (76.2 m) in height.
4. Projects Requiring Enhancements or Specific Components
   Contact GenFlex prior to bid, should any of the following be required:
   - Projects with extended wind speeds greater than 55 mph (88.5 km/h).
   - Projects that require coverage for leaks caused by incidental cuts and punctures.
5. Projects with Potential for Chemical Incompatibility
   - Petroleum-based products, incompatible chemicals, animal fats/greases/oils, and other products can be harmful to roofing membranes and accessories and should not come into direct contact with roofing materials.
   - Contact GenFlex prior to bid to determine the potential effects of chemical reaction should any substances be present which may be harmful to the roofing system, and to determine if additional protection of the roofing membrane may be needed.
6. Coordination with Other Trades
   - Work and traffic by other construction trades can cause roofing membrane damage, insulation crushing or displacement, and accessory/flashing failure. Coordination between various trades is essential to avoid unnecessary rooftop traffic over completed sections of the roof and to prevent subsequent damage to the roofing system.
   - Protect the roofing system from damage during construction.

Building Codes & Approvals

1. It is the responsibility of the specifier to review all applicable building codes to determine their impact on the specified GenFlex roofing system. To locate code-compliant GenFlex roofing systems, consult the GenFlex Guides and Codes section on the GenFlex website, or contact GenFlex Technical Services at (800) 443-4272 to discuss.
2. Authorities Having Jurisdiction
   Local building codes and building owner insurance requirements directly impact the design of a roofing system. The Authorities Having Jurisdiction (AHJ) – local, state, or regional building code authorities – should be consulted prior to designing the roofing system. Where building code or insurance requirements differ from those of GenFlex, GenFlex requirements should be followed as the minimum acceptable for warranty purposes.
3. FM Global/FM Approvals
   - Where FM Global wind uplift and/or fire ratings (such as “1A-90”) are specified as Performance Requirements, it is important to first determine if the building is insured by FM Global, or if the requirements have instead been chosen by the specifier. If the building is insured by FM Global, it is recommended that you contact the local FM Engineer prior to specifying or bidding a project, to understand any job-specific requirements which may be imposed by FM Global on the project.
   - GenFlex roofing materials carry the FM seal, and hundreds of FM Approvals-rated GenFlex roofing systems may be found in FM RoofNav.

4. UL/Underwriters Laboratories
    - Where UL fire resistance codes (such as “Class A”) are specified, it is important to determine whether the deck is classified as Combustible [C] or Non-Combustible [NC]. Next, determine the rating – A, B, or C – that is required. Last, locate rated roofing systems that comply with the specified code.
    - GenFlex asphalt roofing systems that have been tested and rated by UL for fire resistance may be found in the UL website, listing number TGFU.R9516.

Drainage

1. Drainage and slope are design considerations and should be evaluated by the specifier in accordance with all applicable building codes and industry standards.
2. The National Roofing Contractors Association (NRCA) recommends that a roofing assembly be designed to drain any ponding water within 48 hours of a rain event.
3. It is recommended that a minimum roof slope of ¼:12 (2.1%) be obtained to facilitate proper drainage and maximize long-term performance of the roof system. This minimum slope is required for certain warranties and codes.
4. Good roofing practice dictates proper drainage to prevent possible excessive live loads and, in the event of a roof leak, to minimize potential interior damage to the roofing assembly and to the interior of the building.
5. Slope may be achieved by tapering the structure or using tapered GenFlex ISO / GenFlex GL or GenFlex CG ISO; an adequate number of roof drains should also be specified and properly located to allow for positive drainage.
6. Tapered insulation formed into edges, saddles or crickets is recommended to alleviate incidental areas of ponding water.
7. GenFlex is not responsible for the performance of the drainage or slope of an installed roofing system. The presence of ponding water does not void the warranty.

Vapor Retarders and Air Barriers

1. The need for a vapor retarder or air barrier is the decision of a design professional.

   Buildings with high moisture content, vapor drive or other conditions that could drive moisture into the roofing system are often specified with vapor and/or air barriers as part of the roofing system.
2. GenFlex Vapor Shield Membrane may be used whenever a vapor barrier is specified in a GenFlex roofing system.
3. Construction Generated Moisture (CGM)
    - CGM typically occurs due to increased moisture created during construction by several possible sources. The heating of interior spaces during construction in cold weather, enclosing the space above concrete foundations and floors before the concrete has sufficiently dried, and many other means, including perimeter tilt-up panels, the heating and air-conditioning return air system, immediate occupancy of the building, etc., all may have significant contributions to the amount of moisture within the building’s initial air content. Perhaps the most common cause, however, is a concrete foundation and/or floors. While the moisture present within new concrete will likely dissipate over time, its initial content enhances the potential for condensation water drips when the building is heated during its initial cold weather cycle.
    - A design professional should review the potential initial moisture content of the building’s interior when preparing the roof specification and recommend specific design enhancements.
    - The following are design enhancements that may be applied to help mitigate CGM in the roof system:
        - Multiple layers of staggered insulation joints.
        - The presence of a vapor barrier such as GenFlex Vapor Shield Vapor Barrier Membrane within the roofing assembly.
        - Enhancing the R-value of the installed insulation to reposition the dew point to a level within the roof assembly to where condensation will not be allowed to form.
    - Specifying a fully adhered roof assembly.

Warranty

Pre-Warranty Issuance Requirements include:

- Submit an Electronic Pre-Installation Notice (P.I.N.) along with an approved roof drawing, 14 days prior to project start and receive an acknowledgement from GenFlex of acceptance or necessary enhancements to meet GenFlex requirements to receive a warranty.
- The GenFlex roof system must be installed by a current licensed GenFlex applicator.
- Upon inspection and acceptance of the installed roof system by a GenFlex Technical Representative, the warranty will be issued and dated based on the completion date of the roof installation reported by the roofing contractor.
- GenFlex inspections are to confirm the installation details for the roofing system for compliance with GenFlex documents of record for warranty requirements. The inspection is not intended as an inspection for the benefit of the building owner or the design professional with respect to contract, building codes or compliance with specifications other than GenFlex.

The following warranties include the GenFlex brand materials and the workmanship of the licensed GenFlex applicator when the system is installed according to GenFlex technical specifications.

1. GenFlex System Warranty
   - 5 – 20 years for qualifying systems
   - Includes labor and materials to repair warranted leaks.
   - Non-prorated with No Dollar Limit (NDL)
   - Includes all GenFlex-branded products used in the roofing system. Excludes non-GenFlex branded products and any materials not provided by GenFlex. Use of non-GenFlex branded products may prevent warranty issuance.
2. Extended Warranty Coverage
   - A GenFlex System Warranty is eligible for the following extended coverage. Contact GenFlex Technical Services for limitations.
   - **Increased Wind Speed** [72 – 100 mph (115.87 – 160.93 km/h), depending on system criteria]
     - GenFlex MB Cold Adhesive – Maximum 80 (128.75 km/h) mph based on approved assembly
     - Torch Applied or Hot Asphalt Attached – Up to 100 (160.93 km/h) mph based on approved assembly
   - **Cut and Puncture Protection (CPP)** warranty coverage is not available for GenFlex Asphalt systems.
   - **Hail** warranty coverage is not available for GenFlex Asphalt Systems
3. GenFlex Membrane Limited Warranty
   - 10 – 20 years
   - Provides replacement membrane for leaks caused by manufacturing defects or premature weathering
   - Limited to owner's original cost of the membrane
4. Other GenFlex Warranties
   - 35-Year Paint Finish Warranty for all GenFlex branded factory-formed edge metal systems

Quality Assurance

1. Materials
   Only GenFlex branded products may be used exclusively in warranted GenFlex roofing systems. The performance or integrity of products by others is not included in the Warranty.
2. Technical Deviations
   Any deviation from GenFlex technical specifications, warranty criteria, or detail drawings must be approved by GenFlex Technical Services.
3. Inspection
   Completed installations will be inspected by a GenFlex Technical Services Representative to verify that the roofing system has been installed per current GenFlex technical standards. This inspection is solely for the determination of warranty eligibility by GenFlex.

ROOF DECKS & SUBSTRATE REQUIREMENTS

General

1. The GenFlex roof system depends on a suitable substrate to perform its intended function of weatherproofing the building.
2. Structural roof decks should be designed and constructed to provide sufficient strength to support the anticipated dead and live loads. These include the loads anticipated from construction traffic and rooftop equipment that cannot be moved or shut down as well as ice and snow accumulation on the roof surface.
3. The suitability of a deck for roofing activities (such as structural) is the responsibility of the building owner or their design professional. It is the roofing contractor's responsibility to ensure that the substrate is acceptable for the GenFlex roof system to be warranted. The substrate to which the GenFlex roof system is installed must:
   - Be structurally sound.
   - Be dry, smooth, flat, and clean.
   - Be free of sharp fins or foreign materials that could damage the membrane.
   - Meet the minimum requirements for the system.
   - Deteriorated decks should be repaired or replaced. All holes, deformations, depressions, etc. must be reinforced and/or smoothed prior to the roof application.
4. The deck should provide a minimum of ¼:12 (2.1%) slope to drain.
5. Phenolic insulation must be removed prior to reroofing.
6. Sprayed-In-Place Polyurethane Foam (PUF) roof systems require a COMPLETE TEAROFF of the foam system prior to reroofing.

Classification

1. Structural decks can be classified as nailable or non-nailable for purposes of mechanically attaching or nailing insulation and base sheets. Nailable decks include wood, gypsum, and lightweight insulating concrete. These decks are soft enough so that the above-deck components can be secured with fasteners. Cementitious wood fiber and poured or precast structural concrete decks have been referred to as non-nailable.
2. Structural decks can be classified as combustible or non-combustible for purposes of fire ratings and code requirements.

Table 3: Structural Deck Classification

Structural Deck Classification		
Deck Type	**Nailability Classification**	**Combustibility Classification**
Steel, Structural Concrete, Cementitious Wood Fiber	Non-Nailable	Non-Combustible
Wood	Nailable	Combustible
Gypsum, Lightweight Insulating Concrete	Nailable	Non-Combustible

Steel Decks

1. GenFlex requires that the steel deck be a minimum 22-gauge.
2. FM Approved steel decks are currently available in 22-, 20-, and 18-gauge sheets with 1½" (38 mm) deep corrugations. The corrugations (ribs) are cold rolled in the sheets. The deck has a 6" (152 mm) module, that is, the ribs are 6" (152 mm) on center. All fastening approvals and recommendations are based on this profile. Fasteners must engage the top flange of the deck. Another common configuration is 3" (76 mm) deep deck, which usually has an 8" (203 mm) module.
3. When mechanically attaching insulation, steel decks are required to have minimum fastener pullout strength of 300 lbf (1.3 kN) per fastener.
4. When adhering insulation or a vapor barrier to a new steel deck, be certain that all processing oils have been removed from the deck.
5. The GenFlex roofing plies may not be adhered directly to a steel deck. They must be adhered to an acceptable insulation or cover board.
   - GenFlex Vapor Shield Vapor Barrier Membrane may be adhered directly to a steel deck. All substrates must be primed with Vapor Shield Primer (primer is not required when adhering Vapor Shield Vapor Barrier Membrane to a steel deck).
6. The edges of insulation boards running parallel with the steel deck are required to be supported by the top flange of the deck. The board should have a minimum 1½" (38 mm) bearing on the steel deck flange. Cantilevering insulation boards over deck flutes can fracture insulation boards, reducing the support for the membrane, and making it susceptible to puncture.

Table 4: Acceptable Fasteners for Steel Decks

Acceptable Fasteners for Steel Decks	
Insulation	**Deck Penetration**
#12 Fastener	¾" (19 mm) through deck #12 fasteners are approved for warranty purposes. If uplift validation is required HD fasteners may be required.
Pre-Assembled #12 Screw and Plate	
#14 Fastener	
Pre-Assembled #14 Screw and Plate	
#15 WH Fastener	
Pre-Assembled #15 Screw and Plate	
#16 MAX	
Membrane	
#14 Fasteners and Plates	¾" (19 mm) through deck
#15 and #16 Fasteners and Plates	1" (25 mm) through deck

Acceptable Insulation Adhesives for Use Direct to Steel Decks	
One Step Quick Dual™ ISO Bond	**NOTE:** ▪ The deck must be clean, free of all processing oils and other contamination. ▪ Bead spacing should be spaced to ensure top flute adhesion is made. ▪ Use only 4' x 4' (1.2 m x 1.2 m) insulation boards with adhesives. ▪ Factory Mutual (FM) does not recognize adhesion of insulation direct to steel deck.

Structural Concrete Decks

1. To avoid blister formation, roof substrates must be clean, dry, and free of debris. Residual asphalt from prior roof installations must be cleaned and scraped smooth.
2. GenFlex requires that the structural concrete deck have a minimum strength of 2500 psi (17,236 kPa).
3. New concrete decks must cure for a minimum of 28 days, irrespective of the dryness of the deck.
4. Concrete may contain latent amounts of moisture that may affect the insulation and the roof system. To help protect the components, GenFlex Vapor Shield Vapor Barrier Membrane, or other vapor retardant material should be installed in accordance with GenFlex requirements. The installation of a vapor retarder should be considered regardless of the type of attachment of the insulation and the membrane system.
5. GenFlex does not determine acceptable moisture levels within a deck.
6. Verify with the building owner or their design professional about the suitability of mechanical fastening into pre-stressed and post-tensioned structural concrete.
7. When mechanically attaching insulation, structural concrete roof decks require minimum fastener pullout of 300 lbf (1.3 kN) per fastener.
8. When adhering or heat welding approved insulation or membrane to a structural concrete substrate, the concrete must be primed with an ASTM D-41 asphalt primer. The primer is applied per ASTM D-41 manufacturers recommended coverage rate and allowed to fully dry prior to the application of insulation or roof membrane.
9. The GenFlex roofing plies may be adhered directly to a primed, poured-in-place structural concrete deck using hot asphalt, GenFlex Multi-Purpose MB Cold Adhesive, or by heat welding. The concrete must be finished to provide a substrate that is structurally sound, smooth, flat, clean, dry, and free of sharp fins or foreign materials that could damage the material.
10. Concrete additives can have a negative impact on the adhesion of asphaltic membranes and insulation products. The concrete supplier/installer should certify that any additives in the mix will not render the deck unsuitable for roofing application. GenFlex does not accept surface-applied curing compounds for warranted systems.
11. GenFlex does not accept for warranty any concrete substrates that have been sealed with chemical sealers or silicon surface treatments.
12. The application of GenFlex roofing plies to a structural concrete plank deck, such as a pre-cast concrete deck, may not be an acceptable application. Should the deck not require grouted joints, precautions must be taken to prevent bitumen from dripping into the building. Pre-cast concrete panels may not always be a suitable substrate to receive insulation due to the potential for irregularities, even if the joints are grouted. It may sometimes be necessary to consider pouring a leveling layer of structural concrete over the panels prior to roofing.

Table 5: Base Sheet and Insulation Attachment for Structural Concrete Roof Decks

Base Sheet and Insulation Attachment for Structural Concrete Roof Decks		
Acceptable Fasteners	**Acceptable Insulation Adhesives**	**Acceptable Base Sheet Adhesives**
#14 Fastener[1]	One Step Adhesive	Multi-Purpose MB Cold Adhesive
#15 WH Fastener[1]	Quick Dual Adhesive	Hot Asphalt[3, 4]
CD-10 Concrete Fastener[2]	ISO Bond Adhesive	
	Hot Asphalt[3, 4]	

NOTE:
1. Penetrate 1" (25 mm) min. into the structural concrete deck
2. Penetrate 1¼" (32 mm) min. into the structural concrete deck
3. Not for use with APP membranes
4. Do not use hot asphalt to adhere membrane to GenFlex GL ISO, GenFlex ISO, GenFlex CG ISO, GenFlex Coated Glass ISO or GenFlex HD ISO

Wood Decks – Plywood, OSB, and Wood Plank

1. Minimum thicknesses:
   - Plywood and/or OSB must have a minimum thickness of ½" (13 mm).
   - Wood planks must have a minimum thickness of 1" (25 mm).
2. When mechanically attaching insulation, wood decks are required to have a fastener pullout of 300 lbf (1.3 kN) per fastener.
3. When nailing a base sheet, wood decks are required to have a fastener pullout of 40 lbf (178 N) for cap nails per fastener.
4. GenFlex roofing plies may not be adhered directly to a wood substrate. They must be adhered to an acceptable insulation, cover board, or mechanically attached base sheet. If the membrane is to be attached to a nailed base sheet with Multi-Purpose MB Cold Adhesive or adhesion asphalt, a layer of sheathing paper is required under the nailed base to help prevent adhesive or asphalt from dripping into the building.

Table 6: Insulation Attachment for Plywood, OSB. And Wood Plank Decks

Insulation Attachment for Plywood, OSB. And Wood Plank Decks	
Acceptable Fasteners[1]	**Acceptable Insulation Adhesives**
#12 Fastener	One Step Adhesive
#14 Fastener	Quick Dual Adhesive
#15 WH Fastener	ISO Bond Adhesive
[1]Penetrate 1" (25 mm) min. into or through deck	

Cementitious Wood Fiber Decks

1. GenFlex requires that cementitious wood fiber decks have a minimum thickness of 2" (51 mm).
2. When mechanically attaching insulation, cementitious wood fiber decks are required to have fastener pullout of 300 lbf (1.3 kN) for each fastener.
3. GenFlex roofing plies may not be adhered directly to a cementitious wood fiber deck. They must be adhered to an acceptable insulation, cover board or a mechanically attached base sheet.

Table 7: Base Sheet and Insulation Attachment for Cementitious Wood Fiber Decks

Base Sheet and Insulation Attachment for Cementitious Wood Fiber Decks	
Acceptable Fasteners	**Acceptable Insulation Adhesives**
GenFast GypTec Fastener (Penetrate 2" (51 mm) min. into deck)	GenFlex ISO Bond, One Step, Quick Dual

Gypsum Decks

1. GenFlex requires that the gypsum roof deck have a minimum thickness of 2" (51 mm).
2. When attaching insulation to a gypsum roof deck, a fastener pullout value of 300 lbf (1.3 kN) per GenFlex Polymer Fastener is required.
3. When mechanically attaching a base sheet to a gypsum roof deck, a fastener pullout value of 40 lbf (178 N) is required for each 1.2" (30.48 mm) or 1.7" (43.18 mm) LWC Base Ply Fastener.
4. GenFlex roofing plies may not be adhered directly to a gypsum deck. The roofing plies must be adhered to an acceptable insulation, cover board, or a mechanically attached base sheet.

Table 8: Base Sheet and Insulation Attachment for Gypsum Decks

Base Sheet and Insulation Attachment for Gypsum Decks		
Acceptable Insulation Fasteners	**Acceptable Base Sheet Fasteners**	**Acceptable Insulation Adhesives**
GenFast GypTec Fastener[1]	1.2" (30.18 mm) LWC Base-Ply Fastener 1.7" (43.18 mm) LWC Base-Ply Fastener	ISO Bond, Quick Dual, and One Step Adhesive
[1]Penetrate 2" (51 mm) min. into deck. Pre-drilling is required.		

Lightweight Insulating Concrete Roof Decks

1. GenFlex requires that the lightweight insulating concrete have a minimum thickness of 2" (51 mm).
2. When mechanically attaching insulation through lightweight insulating concrete into a structural deck, a fastener pullout value of 300 lbf (1.3 kN) per fastener is required.
3. When mechanically attaching a base sheet to lightweight insulating concrete using 1.2" (30.48 mm) or 1.7" (43.18 mm) LWC Base Ply Fasteners, a fastener pullout of 40 lbf (178 N) per fastener is required.
4. A vapor retarder is required under new systems with insulation.
5. GenFlex roofing plies may not be adhered directly to a lightweight insulating concrete roof deck. The roofing plies must be adhered to an acceptable insulation, cover board, or mechanically attached base sheet.

Table 9: Base Sheet and Insulation Attachment for Lightweight Insulating Concrete (LWC) Decks

Base Sheet / Insulation Attachment for Lightweight Insulating Concrete (LWC) Decks			
Into Steel Pan	**Into Structural Concrete Deck**	**Base Sheet to LWIC**	**Insulation Adhesives**
#15 WH Fastener[1]	#15 WH Fastener[2]	1.2" (30 mm) LWC Base-Ply Fastener 1.7" (43.18 mm) LWC Base-Ply Fastener	One Step
	Concrete Fastener[3]		ISO Bond
			Quick Dual
NOTE: 1. Penetrate ¾" (19 mm) min. into steel pan 2. Penetrate 1" (25 mm) min. into the structural concrete deck 3. Penetrate 1¼" (32 mm) min. into structural concrete deck			

TEMPORARY ROOFS

General

1. If the installation of the GenFlex roof system is required during unsuitable weather, before completion of wood blocking, curbs, or penetrations, or prior to the erection of walls, a temporary roof may be necessary. A temporary roof is not a roof system and as such cannot be relied upon to be completely weather-resistant. Temporary roofs may not perform well under submerged/ponding conditions.
2. The base ply for the GenFlex roof system is not to be considered a temporary roof as the base ply is an integral component of the roof system.
3. If a temporary roof is needed to meet construction requirements, GenFlex recommends installing a modified asphalt base sheet in an appropriate adhesive over an approved substrate. GenFlex Vapor Shield Vapor Barrier Membrane may also be used as a temporary roof for up to 90 days. This temporary roof can serve to protect the interior of the building during the early stages of construction. It may then be removed or repaired, if necessary, and can be left as a vapor retarder prior to the installation of the finished GenFlex roofing system.
4. If roof insulation is installed under the temporary roof, the insulation shall be inspected for wet or damaged areas, so that such areas may be removed and replaced prior to installation of the GenFlex roof system.
5. When a temporary roof is specified as a vapor retarder, precaution shall be exercised in protecting the temporary roof from other construction trades. Damage to the temporary roof may impair its effectiveness as a vapor retarder. If the vapor retarder is installed as a temporary roof during construction, the vapor retarder shall be examined, and if necessary, repaired to ensure watertight integrity prior to installation of the remainder of the roof system.
6. The determination of the necessity and location for a vapor retarder or an air barrier are project-specific requirements, which are the responsibility of the building owner or their design professional. The proper assessment of the building, the need for, and the proper design of, an air barrier and vapor retarder are critical to the long-term operation of the roofing system.

Phased Construction

1. Phased Construction refers to the installation of roof plies over separate time intervals (e.g., 2 or more days).
   - A final surfacing such as a flood coat and gravel application or a roof coating is not considered a phase and may be delayed in its application.
   - A cap sheet is integral to the roofing system and should not be delayed in its application.
   - GenFlex does not recommend phased construction. Phased construction results in unprotected roof sections, which can allow moisture into the roofing plies or trap moisture, dust, or debris between the plies of the roof system. These application defects may increase the incidence of blistering in the GenFlex roof system.
   - Modified Bitumen base sheets may not be exposed for more than 60 days. Base sheets left exposed for more than 48 hours must be primed with ASTM D-41 primer prior to the completion of the roof assembly. In all cases, base sheets to receive a cap sheet or covering ply must be clean, dry, and free of debris.
2. A better option than phased construction is the installation of a temporary roof, as described above. This allows for the delayed installation of the roof system until more suitable weather, or until other trades can complete their projects. A temporary roof can be designed and installed in the same way as a vapor retarder and becomes a vapor retarder in the final construction.

VAPOR RETARDERS

General

1. The determination of the necessity and location for a vapor retarder is a project-specific requirement and is the responsibility of the building owner or their design professional. The proper assessment of the building, the need for and the proper design of a vapor retarder are critical to the long-term operation of the roofing system.
   - A vapor retarder is a building envelope element that limits diffusion of moisture into an assembly. Diffusion is water vapor migration in a material. Its rate depends on two factors:
     1. Water vapor pressure difference across the roof assembly.
     2. Resistance of materials along the migration path.
2. The main property requirement of a vapor retarder is low water vapor permeance – the time of water vapor transmission through a unit area of flat materials or construction induced by a unit vapor pressure difference between two specified surfaces, under specified temperature and humidity conditions.
3. A vapor retarder may be necessary when high interior humidity is of concern. High interior relative humidity is present in natatoriums, gyms, laundry facilities, paper mills, and bottling plants. In these cases, vapor drive may form a dew point under the roof membrane or in the insulation.
   - In these types of environments, the vapor drive can be substantial, and the potential exists for moisture accumulation within the roof assembly if an effective vapor retarder is not included in the roof assembly. This movement is reversed in some air-conditioned buildings in humid summer conditions.

4. Vapor retarders are installed to prevent several types of roof assembly failures:
    - Wet insulation becomes a conductor of heat rather than an insulator and reduces insulation R-value.
    - Moisture promotes the deterioration of the roof membrane, insulation, structural deck, and associated building components.
    - Moisture promotes delamination of roof components by freeze/thaw cycling, eventually causing blisters and delamination when vapor pressure results from solar heating.
5. The following is a partial list of situations which can influence the need for a vapor retarder:
    - Building usage as related to vapor drive.
    - External temperature in relation to internal temperature.
    - The humidity of the interior and/or exterior air.
    - Building code requirements.
    - Construction generated moisture, particularly during winter construction.
6. A vapor retarder's effectiveness generally depends upon the following factors:
    - The vapor retarder's perm (permeance) rating which should be as close to zero as possible.
    - The location of the vapor retarder within the system.
    - The integrity of the vapor retarder's seals at perimeters and penetrations.
    - The integrity of the vapor retarder's membrane after other tradespeople finish their projects.

Examples of Common Vapor Retarder Applications

1. GenFlex Vapor Shield Vapor Barrier Membrane self-adhered over a properly prepared and primed deck. Refer to Vapor Shield application instructions for specific application requirements.
2. APP Sheets
    - An adhered GenFlex APP base sheet set in GenFlex Multi-Purpose MB Cold Adhesive or heat fused over an acceptable mechanically attached barrier board.
3. An adhered GenFlex APP base sheet set in GenFlex Multi-Purpose MB Cold Adhesive or heat fused over a properly prepared and primed structural concrete deck.
4. SBS Sheets
    - An adhered GenFlex SBS base sheet set in ASTM D 312 adhesion asphalt, GenFlex Multi-Purpose MB Cold Adhesive, or heat fused over an acceptable mechanically attached barrier board.
    - Adhered GenFlex SBS base sheet set in ASTM D 312 adhesion asphalt, GenFlex Multi-Purpose MB Cold Adhesive, or heat fused over a properly prepared and primed structural concrete deck.

Considerations and Cautions

1. Construction roof traffic shall be restricted to prevent damage to the vapor retarder. In the event damage does occur, repair the vapor retarder damage with the same roof components and quantities as specified for the vapor retarder installation.
2. The roof system designer is responsible for the design requirements of the roof deck, vapor retarder, and rigid insulation along with the roof system. This is especially important when specifying roof systems over high humidity buildings. A professional architect or engineer should determine the need for a vapor retarder, as well as the type, placement, and location of the vapor retarder. The inclusion of an air barrier or vapor retarder may affect the UL or FM Approvals rating including the attachment of the GenFlex roof system.
    - It is the roof system designer’s responsibility to:
    - Ensure that the methods of attachment of the roof system to the vapor retarder selected are approved by GenFlex and compatible with the roof system.
    - Ensure that the approved vapor retarder will extend continuously and evenly throughout the roof plane to provide a complete seal against the intrusion of moist air from the building interior. Integration of the wall and roof air retarder systems is essential.
    - Take the appropriate steps necessary to deal with the effect of construction-generated moisture on a new roofing system, particularly during winter, when temporary propane heat may be required.
3. GenFlex does not review or calculate dew point analyses and therefore does not accept responsibility for damage due to recurrence rate or location of the dew point. Although not all projects require a vapor retarder, a design review should be considered for all projects.
4. Contact one of the following agencies for help in determining the need for a vapor retarder.
    - National Roofing Contractors Association (NRCA)
    - U.S. Army Corps of Engineering Cold Regions Research and Engineering Laboratory (CRREL)
    - American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)
    - Oak Ridge National Laboratory (ORNL)

AIR BARRIERS

General

While some GenFlex roof systems may require an air barrier to receive a warranty, a professional architect or engineer must determine the need for an air barrier, as well as the type, placement, and location of the air barrier.

1. Air barriers are a component of building envelope systems that control the movement of air into and out of buildings.
2. An air barrier may consist of a single material or of two or more materials which, when installed as a system, make up an air impermeable, structurally adequate barrier.
3. Air barrier systems are generally comprised of building components and materials that have an air permeability not exceeding 0.004 cfm/ft² (0.02 L/s•m²) under a pressure differential of 0.3" (7.62 mm) of water (1.57 psf, 75 Pa) when tested in accordance with ASTM E 2178.
4. No single component or material has the capability to provide a complete air barrier system for a building, therefore air barrier systems include many components and materials that interface with each other. GenFlex recommends that the individual manufacturers of these products provide written certification that their products will function as needed when used together.
5. If the air barrier is to perform its intended role, it must meet several requirements:
    - Continuity: The assembly must be linked together to ensure that there is no break in the air tightness of the envelope.
    - Structural Integrity: The air barrier must be capable of resisting the imposed load or must be supported by one that can. It must be capable of resisting the strongest wind load acting as either a pressure or suction without rupturing or breaking away from its support. The air barrier and its support must be sufficiently rigid to resist displacement.
    - Air Impermeability: A major requirement of an air barrier is that it offers a high resistance to airflow.
    - Durability: Durability depends largely on how a material reacts to a specific environment such as moisture, temperature, ultra-violet radiation, and to the presence of other materials (incompatibility).

COMMON ROOF SYSTEM ACCESSORIES

Cant Strips

1. Cant strips are a means by which the angle between deck to wall and other types of transitions are reduced so that the roof membrane and flashings can conform better to the adhesion surface.
2. Cant Strips are required at all angle changes greater than 45°.
3. Acceptable Cant Strip materials
    - Wood or preservative-treated wood
    - Wood fiber
    - Perlite
    - Concrete (primed with ASTM D-41 primer)
4. Depending on the cant strip material, cant strips may be set in adhesion asphalt, GenFlex Multi-Purpose MB Flashing Cement, or mechanically attached with acceptable fasteners and plates.
5. Caution: Cant strip materials may be combustible. Proper precautions must be taken to prevent exposure of combustible cant materials to the open flame of a roofing torch or other sources of ignition.

Wood Nailers

1. For new construction projects, wood nailers must be kiln-dried (Southern Pine, Douglas Fir) structural grade #2 or better.
2. Make GenFlex specifications and details available when others will install nailers. Work that compromises the integrity of the system may jeopardize the warranty.
3. For re-cover projects and new construction projects where a poured-in-place deck will be used, wood nailers must be pressure treated for rot resistance. Asphaltic or creosote-treated lumber is not acceptable. Lumber treated with other wood preservatives such as Pentachlorophenol, Copper naphthenate or Copper-8-quinolinolate will adversely affect the membrane when in direct contact and are, therefore, unacceptable.
4. Treatments for lumber may be highly corrosive to fasteners. Contact the fastener manufacturer for their recommendations on fasteners if attaching nailers that have been treated with corrosive materials.
5. Chemical treating for fire resistance or other purposes (other than pressure treating for rot resistance, e.g., CCA, ACZA, CBA, ACQ or other copper treatments) may affect the performance of the GenFlex membrane and accessories. Contact GenFlex Technical Services at (800) 443-4272 when using chemically treated lumber that will encounter the membrane.

6. GenFlex requires wood nailers at the following locations:
    - All roof edges.
    - Metal penetration pockets.
    - Sheet metal flanges.
    - Refer to GenFlex details for other location requirements.
    - The wood nailer may be omitted when metal flanges are less than 12" (305 mm) on a side or when metal flanges are placed and secured directly to the deck.
7. The building owner of their design professional must specify a wood nailer attachment system that will resist a minimum force of 200 lbf (890 N) in any direction. GenFlex fasteners are required for all roofing applications. For further clarification, please refer to Factory Mutual Los prevention Data Sheet 1-49.

Expansion Joints

1. The determination of the necessity and location for expansion joints is a project specific requirement, which is the responsibility of the building owner or their design professional Typical consideration for selection criteria may be one or more of the following:
    - Where additions are connected to existing buildings
    - Where additions are connected to existing buildings.
    - At junctions where interior heating conditions change, such as a heated space abutting an unheated space.
    - Where movement between vertical walls and the roof deck is anticipated.
    - Roof areas greater than 200' (61 m) in any direction.
2. Coordination and sequencing of expansion joint closure systems and their continuity, compatibility and function of seal is the responsibility of the design team.
3. Expansion joints must not restrict the flow of water.

Area Dividers and Control Joints

1. Area dividers or control joints are raised, double wood members attached to a properly flashed wood base plate that is anchored to the roof deck.
2. Large open expanses can create large thermal stresses. Area dividers can help minimize this by dividing the roof system into smaller sections. The determination of the necessity and location for area dividers is a project specific requirement, which is the responsibility of the building owner or their design professional.
3. The areas of the roof should be rectangular and uniformly spaced where possible.
4. Roof area dividers are recommended for the following conditions:
5. Roof areas greater than 200' (61 m) in any direction.
6. Roofs with H, L, E, T, and U shapes should be subdivided by area dividers into rectangular areas that can be roofed one area at a time.

Walkway Pads

1. Walkways help protect the membrane from damage due to necessary rooftop service traffic.
2. Walkways may consist of an additional layer of GenFlex modified bitumen cap sheet adhered in cold adhesive, hot asphalt, or heat welded, as is appropriate for the membrane being used.
    - Do not use black granule surfaced products when installing walkways in cold adhesive.
    - Do not heat seal the edges of walkways installed in cold adhesive.
3. Walkway runs must not be longer than 10' (3 m) so as not to interfere with roof drainage.
4. Walkway systems must be installed on roofs:
    - Subjected to traffic more frequently than once per month.
    - At all access points (ladders, hatches, doorways, etc.) to the roof.
    - Around all serviceable rooftop units.
1. If protection of the insulation system is required, additional measures must be specified (e.g., concrete pavers, prefabricated walkways).
2. The owner is responsible for maintaining walkways.

MATERIALS

Caution

The information in this Guide is not intended to be comprehensive. Refer to the Product Data Sheet (PDS) and Safety Data Sheet (SDS) for each product for critical information. These may be found at www.GenFlex.com or by calling GenFlex Technical Services at (800) 443-4272.

Insulation

1. Only GenFlex insulation can be included in the warranty.
2. Insulation must provide a suitable substrate for the proposed roof system in addition to its function as insulation for the building.
3. Insulation may be installed by various methods including fasteners and approved adhesives. It is acceptable to combine fastener and approved adhesive attachment methods in multi-layer applications.
4. Where overall insulation thickness is 2" (51 mm) or greater, GenFlex recommends installing the insulation in two (2) or more layers with staggered joints.
5. Insulation may be installed in one (1) or multiple layer applications for the warranty. If installed in multiple layers, the joints of each succeeding and adjoining layer must be staggered from the joints of previous layers by a minimum of 6" (152 mm) in each direction.
6. Gaps of ¼" (6 mm) or greater between insulation boards must be filled in.
7. Refer to specific GenFlex Product Data Sheets (PDS) for installation requirements.
8. Insulation thickness requirements may vary for code compliance. Contact local code and/or insurance officials before contacting GenFlex Technical Services.
9. When installing Nailbase / NB ISO or HD ISO Composite, install the polyiso side down to the deck.
10. The following is a chart showing the types and minimum thickness of GenFlex insulation/cover boards acceptable for use as a direct contact substrate for GenFlex roof systems when applying a fully adhered base sheet. Other approved insulations may be allowed below the immediate substrate insulation.

Table 10: Insulation / Cover Board Attachment Options by Deck

Insulation / Cover Board Attachment Options by Deck

Deck to Which Insulation will be Attached	Mechanical Attachment	One Step	ISO Bond	Quick Dual	Asphalt Attachment
Steel	✓	✓	✓	✓	
Structural Concrete	✓	✓	✓	✓	✓
Plywood or OSB	✓	✓	✓	✓	
Wood Plank	✓	✓	✓	✓	
Poured or Pre-Cast Gypsum	✓	✓	✓	✓	
Cementitious Wood Fiber	✓	✓	✓	✓	
Lightweight Insulating Concrete Decks	✓	✓	✓	✓	
Existing Roof with Phenolic Insulation	Complete tear-off required. When phenolic insulation is removed, a visual inspection of the deck components is required; all deteriorated components must be replaced.				

Table 11: Insulation / Cover Board Attachment to Insulation Options by Insulation Type

Insulation/Cover Board Attachment to Insulation Options by Insulation Type

Base Layer of Insulation to Which Insulation / Cover Board Will Be Adhered	Insulation / Cover Board to Insulation Attachment Method			
	Quick Dual	One Step	ISO Bond	Hot Asphalt
ISO / GL ISO	✓	✓	✓	✓*
Coated Glass Facer / CG ISO	✓	✓	✓	✓*
HD ISO	✓	✓	✓	✓*
STRUCTODEK HD Wood Fiberboard	✓	✓	✓	✓
DensDeck	N/A	N/A	N/A	N/A
DensDeck Prime	✓	✓	✓	✓
DensDeck StormX Prime	✓	✓	✓	✓
Securock Gypsum-Fiber	✓	✓	✓	✓
Securock UltraLight Glass-Mat	N/A	N/A	N/A	N/A
Securock Cement	✓	✓	✓	✓
Securock UltraLight Coated Glass-Mat	✓	✓	✓	✓
DEXcell FA Glass Mat	✓	✓	✓	✓
DEXcell Cement Board	✓	✓	✓	✓
DEXcell FA VSH Glass Mat	✓	✓	✓	✓
Perlite Insulation	N/A	N/A	N/A	✓
Asphalt Base Sheet	✓	✓ with primer	✓ with primer	✓
Vapor Shield Vapor Barrier Membrane	✓	✓	✓	N/A

NOTE:

- GenFlex recommends mechanically attaching a Cover board over existing insulation. The responsibility of identifying and removing damaged or wet insulation is that of the contractor.

*** Board to board attachment acceptable but membrane to board securement with hot asphalt not approved.**

✓ = Acceptable N/A = Not Applicable

Base Sheet and Smooth Plies

General

- Depending on the substrate, base sheets may be attached with fasteners, Multi-Purpose MB Cold Adhesive, adhesion asphalt (not permitted for APP), or heat fusing. Refer to the membrane's Product Data Sheet (PDS) to ensure the specific membrane is appropriate for the intended installation method.
- GenFlex modified bitumen systems must be installed so that all laps shed water.
- Side laps must be 3" (76 mm) and end laps must be 6" (152 mm).
- Base sheets, base plies, or ply sheets must not be glaze coated when used as a substrate for any base or cap sheet.
- When adhesion asphalt is used as the method of attachment for SBS sheets, GenFlex requires that only GenFlex SEBS Mopping Asphalt or ASTM D 312 Type IV asphalt be used:
  - In all 20-year SBS systems
  - Where the slope exceeds ½"/ft (4.2%).
- All sheets must be unrolled and allowed to "relax" for at least 30 minutes prior to installation.

Table 12: Base Sheet Attachment Options by Deck

Base Sheet Attachment Options by Deck

	Prepared Substrate to Which the Base Sheet will be Attached	Mechanically Attached	Heat Welded	Multi-Purpose MB Cold Adhesive	Adhesion Asphalt[1]
Deck	Steel	Insulation or cover board is required.			
	Structural Concrete (primed if applicable)	✓	✓	✓	✓
	Plywood or OSB	✓			
	Wood Planking	✓			
	Poured or Pre-Cast Gypsum	✓			
	Cementitious Wood Fiber	✓			
	Lightweight Insulating Concrete	✓			
Recover	Asphalt Base Sheet, Smooth/Uncoated		✓	✓	✓
	Asphalt Base Sheet, Granules	New Insulation or cover board is required			✓
	Asphalt Base Sheet, Gravel Surface				✓
	Coal Tar Pitch				New Insulation or cover board is required
	Existing Single-Ply Systems				
New Insulation	GenFlex GL ISO / GenFlex ISO	May fasten through insulation		✓	
	GenFlex CG ISO / GenFlex Coated Glass ISO			✓	
	NailBase Composite Board			✓	✓
	STRUCTODECK HD with Primed Red Coating			✓	✓
	DensDeck Prime		✓	✓	✓[2]
	SECUROCK Gypsum-Fiber Board		✓	✓	✓[2]
	SECUROCK UltraLight Coated Glass-Mat		N/A	✓	N/A
	ISOGARD HD			✓	
	DEXcell Glass Mat				
	DEXcell FA Glass Mat		✓	✓	✓[2]
	DEXcell Cement Board		✓	✓	✓[2]
	DEXcell FA VSH Glass Mat		✓	✓	✓[2]

[1] Hot asphalt is not for use with APP membranes

[2] DensDeck, SECUROCK and DEXcell to be applied in hot asphalt must be completely dry. The max asphalt temperature must not exceed 450 °F (232 °C).

Cap Sheets

General

- GenFlex cap sheets have a granular surface for enhanced protection from UV degradation, rooftop traffic, etc.
- Cap sheets may be attached with Multi-Purpose MB Cold Adhesive, adhesion asphalt (not permitted for APP), or heat fusing. Refer to the membrane's Product Data Sheet (PDS) to ensure the specific membrane is appropriate for the intended installation method.
- GenFlex modified bitumen systems must be installed so that all laps shed water.
- Side laps must be 3" (76 mm) and end laps must be 6" (152 mm).
- When adhesion asphalt is used as the method of attachment for SBS sheets, GenFlex requires that only GenFlex SEBS Mopping Asphalt or ASTM D 312 Type IV asphalt be used:
  - In all 20-year SBS systems
  - Where the slope exceeds ½" (4.2%)
- All sheets must be unrolled and allowed to "relax" for at least 30 minutes prior to installation.

HOT ASPHALT ATTACHMENT OF INSULATION AND ROOFING PLIES

DISCLAIMER:

Applicators are directed to handle and process adhesion asphalt in accordance with the requirements of this guide to protect the aging properties of the adhesion asphalt. Adhesion asphalt must provide continuous coverage between GenFlex products. Please refer to the National Roofing Contractors Association (NRCA) and Asphalt Roofing Manufacturers Association (ARMA) guidelines for adhesion asphalt type requirements, handling, and use. Follow all OSHA and other applicable safety regulations.

Cautions and Guidelines

1. The information in this Guide is not intended to be comprehensive. Refer to the Product Data Sheet (PDS) and Safety Data Sheet (SDS) for each product for critical information. These may be found at www.GenFlex.com or by calling GenFlex Technical Services at (800) 443-4272.
2. Ensure that all health and safety measures are followed when installing hot asphalt to protect the installers as well as occupants of the building and passers nearby. Ensure compliance with OSHA, building codes, and contractor/jobsite/misc. safety regulations when using hot asphalt.
3. Use only ASTM D 312 Type III or IV adhesion asphalt or GenFlex SEBS Asphalt, as appropriate for project conditions.
4. Asphalt primer must meet the requirements of ASTM D-41. Structural concrete decks must always be primed with ASTM D-41 primer; refer to ASTM D-41 primer manufacturers recommended coverage rate.
5. Adhesion asphalt must be properly applied in accordance with NRCA and ARMA requirements and the requirements of this guide for the following:
   - Between layers of GenFlex insulation designated for adhesion with hot asphalt.
   - GenFlex SBS products designed for asphalt attachment.
6. Adhesion asphalt must provide continuous inter-ply coverage.
7. Adhesion asphalt must NEVER be heated above the flash point.
8. Asphalt properties may change when stored at high temperatures for long periods of time. Asphalt may become softer or may experience what is known as "fallback." Fallback is the degradation of the asphalt to the point that its physical properties (e.g., softening point) deteriorate which could then cause roof slippage. To reduce the chances for fallback, the following recommendations should be implemented:
   - Decrease the kettle temperature as much as possible, while maintaining the minimum application temperature.
   - Use material as quickly as possible, thus reducing exposure time.
   - Insulate all lines and equipment used to transport asphalt.

Insulation and Cover Boards

1. The proposed insulation or cover board must be compatible with the roof substrate, the proposed bitumen, and the requirements of the GenFlex roof system.
2. GenFlex SEBS Mopping Asphalt or ASTM D-312 Type III or Type IV must be utilized.
3. GF ISO / GL ISO insulation boards, when applied using hot asphalt, require approximately 30 lb (14 kg) of asphalt per 100 ft² (9.3 m²) nominal application rate. A guideline for asphalt application temperature to install insulation board is the asphalt EVT less 25 to 30 °F (14 to 17 °C).
4. Porous and irregular substrates generally require additional quantities of asphalt to assure positive adhesion of the insulation boards.
5. When using adhesion asphalt for insulation attachment:
   - The insulation must be no larger than 4' x 4' (1.2 m x 1.2 m).
   - All insulation joints must be staggered from adjoining and adjacent boards and adjacent layers.
   - Follow all health and safety measures when installing adhesion asphalt to protect the installers and occupants of the building.
   - Refer to slope restrictions.

6. Take special care when installing DensDeck products in hot asphalt:
   - Georgia-Pacific Gypsum specifies max asphalt application temperatures of 425 – 450 °F (218 – 232 °C). Application temperatures above these temperatures may adversely affect roof system performance.
   - DensDeck Prime may be flood mopped to a substrate followed by a flood mopped application of membrane (encapsulated) using these guidelines:
     - DensDeck Prime Roof Boards and substrate must be dry.
     - Asphalt used to install DensDeck Prime should be allowed to cool after installation of the DensDeck and prior to mopping base sheet to top of DensDeck boards.
     - Allow base ply to cool before mopping additional plies or cap sheet to limit the amount of direct heat that is applied to boards.
7. Do not use hot asphalt to adhere membrane to HD ISO, Coated Glass Facer / CG ISO or GF ISO / GL ISO Insulation.
8. Expanded or extruded polystyrene insulation (EPS or XPS) must not be attached with hot asphalt.

Table 13: Approved Substrates for Hot Asphalt Attachment of Insulation

Approved Substrates for Hot Asphalt Attachment of Insulation	
Approved base sheets that have been mechanically attached in accordance with GenFlex requirements. Approved base sheets that have been adhered in accordance with GenFlex requirements.	
Compatible Insulations	GF ISO / GL ISO
Compatible Cover Boards	DensDeck Prime (see guidelines for encapsulating DensDeck Prime in hot asphalt above)
	SECUROCK Gypsum-Fiber Board, Securock Cement Board
	DEXcell: FA Glass Mat, Cement Board and FA VSH Glass Mat
	STRUCTODEK HD with Primed Red Coating
Structural concrete deck that has been primed with ASTM D-41 primer	
Existing properly prepared asphalt membrane roof systems	Uncoated smooth BUR or Mod Bit
	Granule surfaced modified asphalt roof systems
	Gravel surface built-up roof systems

Roof Membranes

1. Never use hot asphalt to adhere APP products.
2. SBS base sheets, or ply sheets must not be glaze coated when used as a substrate for any APP base or cap sheet.
3. Do not mop a roof membrane directly to polyiso.

MECHANICAL ATTACHMENT OF INSULATION AND ROOFING PLIES

Pullout Tests

1. Substrates for membrane and/or insulation are required to provide sufficient pullout resistance for the fasteners and the roof system.

Table 14: Minimum Fastener Pullout

Fastener	Minimum Fastener Pullout
Insulation Mechanically Attached to Deck	300 lbf (1.3 kN)
Base Sheet Mechanically Attached to Deck	300 lbf (1.3 kN)
Base Sheet Nailed to Deck	40 lbf (178 N)
Contact GenFlex Technical Services at (800) 443-4272 if the structural deck does not meet the minimum fastener pullout requirements.	

2. Due to the variety of physical conditions that can affect pullout resistance, GenFlex recommends that on-site tests be conducted by an independent testing laboratory or the fastener manufacturer's representative, to determine actual pullout values. The following deck types are those which are most likely to not provide sufficient pullout resistance:
   - Steel decks thinner than 22 gauge (0.76 mm).
   - Concrete less than 2,500 psi (20,684 kPa).
   - Plywood or OSB less than 7/16" (11 mm) thickness.
   - Wood plank less than 1" (25 mm) thickness.
   - Poured or pre-cast gypsum, cementitious wood fiber and lightweight insulating concrete decks.
   - Existing masonry or brick.
   - Any other substrate that does not have a published pullout capacity greater than the minimum required for the applicable roof system.

3. The sections of the substrate where integrity is most in question should be used for testing. Test areas should include corners, drain areas, and perimeters. The recommended minimum number of pullout tests is as follows:
   - Less Than 10,000 ft² (930 m²): 6 pullout tests
   - 10,000 ft² – 50,000 ft² (930 m² – 4,645 m²): 10 pullout tests
   - 50,000 ft² – 100,000 ft² (4,645 m² – 9,290 m²): 20 pullout tests
   - Over 100,000 ft² (9,290 m²): 1 test per 5,000 ft² (465 m²)
4. When new construction or other conditions prevent preliminary on-site pullout tests, the fastener manufacturer should supply estimated pullout values for design and bid purposes. On-site verification of the pullout capacity must be confirmed prior to system installation. (Consider requesting a unit price for potential increased fastening requirement).

Fasteners: General

1. Refer to the Product Data Sheet (PDS) that references the specific fastener being used and for the deck penetration requirements of that fastener. All fasteners must be suitable for the existing deck type.
2. Roof systems rely on the attachment of the components to the deck substrate to perform as required. Wind creates uplift forces on the roof, making the overall holding power of the fasteners critical. GenFlex recommends that the use of any fastener be investigated should there be concerns about the structural integrity of the deck. Some of the items to be considered include:
   - How the fastener(s) might affect the deck.
   - The capability of the deck to hold the fasteners and roof system in place in a wind related event.
   - In existing construction, the structural integrity of the deck may have weakened over time, thus the choice of fastener and roof attachment methods should be considered in determining the best solution to the given deck and situation.
3. For retrofit roof systems, GenFlex #15 WH Fasteners must be used for 15-year or greater GenFlex System Warranty when mechanically fastening insulation using fasteners and plates.
4. For new and replacement roofing, GenFlex #15 WH Fasteners must be used for a 20-year or GenFlex System Warranty when mechanically fastening insulation using fasteners and plates.
5. Cap Nails
   - Cap nails must be FM Approved and have 1" (25 mm) diameter steel heads. Shank must be a minimum of 11-gauge (2.3 mm) annular ring or spiral.
   - Cap nails may only be used to attach base sheets to wood decks where a base sheet must be mechanically fastened prior to the installation of the roof assembly for up to 15-year warranties.
   - GenFlex insulation plates and fasteners may be used in lieu of cap nails.

Table 15: Allowable Fastener and Substrate Configurations

Allowable Fastener and Substrate Configurations

Fastener	Acceptable for 20-yr Warranty	Steel Decks	Structural Concrete Decks	Plywood or OSB Decks	Cementitious Wood Fiber Decks	Gypsum Decks	Lightweight	
							Steel Pan	Concrete
#14 Fastener	✓	✓		✓				
#12 Fastener[1]	✓	✓		✓				
#15 WH Fastener	✓	✓	✓	✓			✓	✓
CD-10 Concrete Fastener	✓		✓					✓
GypTec Fastener	✓				✓	✓		
#16 Fastener	✓	✓						
LWC Base Ply Fastener	✓					✓	✓	✓
	For the attachment of base sheets only.							
Nail Driver				✓				
	For the attachment of base sheets only. Insulation may not be attached with nails of any kind.							

[1]The #12 Fastener is limited to a 20-year warranty when used on a steel or wood deck.

Table 16: Acceptable Fasteners

Acceptable Fasteners					
GenFlex Fastener		Roofing Insulation (Insulation Plate Required)	Base Sheet (Insulation Plate Required)	Termination Bar	Other Accessories
PDS#	Fastener	See the specific fastener PDS for specific application data.			
1027	#14 Fastener	✓	✓	✓	✓
1028	#15 WH Fastener	✓	✓	✓	✓
1005	CD-10 Concrete Fastener	✓	✓	✓	✓
		Do not use with polymer batten strips.			
1006	GypTec Fastener	✓	✓		
		Special battens/plates are required (see PDS 1102, 1107, 1204, 1207).			
		✓	✓		
		Insulation to steel and wood roof decks with AccuTrac installation equipment.			
1012	LWC Base-Ply Fastener		✓		
		For the attachment of base sheets only			
1026	#12 Fastener	✓			

Insulation Fastening Requirements

1. General
   - Mechanically fastened Insulation must be fastened with appropriate GenFlex fasteners and insulation plates.
   - Insulation must be installed in accordance with the fastening rate and pattern for the applicable system.
   - Fastening rates and patterns may vary for code compliance. Contact GenFlex Technical Services at (800) 443-4272 for specific FM Approvals and code compliance requirements.
2. Multiple Layers of Insulation
   - Where overall insulation thickness is 2" (51 mm) or greater, GenFlex recommends installing the insulation in two (2) or more layers with staggered joints.
   - Insulation may be installed in one (1) or multiple layer applications for the GenFlex warranty. If installed in multiple layers, the joints of each succeeding and adjoining layer must be staggered from the joints of previous layers by a minimum of 6" (152 mm) in each direction.
   - When a composite of two (2) insulation layers is installed, the fastening pattern required is dependent on the top board type and thickness. A common fastener may be used to simultaneously fasten all layers to the structural deck.
   - Tapered insulation less than the 1" (25 mm) minimum thickness must be fastened at a rate of one (1) fastener and plate per 2 ft² (185,806 mm²) = 16 fasteners and plates per 4' x 8' (1.2 x 2.4 m) board. If possible, install the tapered insulation first, covered by the flat stock.
   - It is acceptable to combine fastener and approved adhesive attachment methods in multi-layer applications.

Table 17: Insulation Mechanical Attachment Options

Structural Deck	#12	#14	#15	#16	GypTec	Concrete Fastener	Min. Penetration of Fastener into or Through Deck
Steel	✓	✓	✓	✓			¾" (19 mm)
Structural Concrete			✓	✓		✓	#15 - 1" (25 mm) Concrete Fastener-1¼" (32 mm)
Plywood or OSB	✓	✓	✓	✓			1" (25 mm)
Wood Plank		✓	✓	✓			1" (25 mm)
Gypsum					✓		1½" (38 mm)
Cementitious Wood Fiber						✓	1½" (38 mm)
Lightweight concrete over steel deck			✓	✓			¾" (19 mm) through steel pan
Lightweight concrete over concrete deck			✓	✓			1.2" (30 mm) into structural concrete deck

3. Minimum number of fasteners and plates per insulation board

   See GenFlex Insulation Attachment Patterns for the required patterns for the proper placement of approved fasteners and plates for insulation on GenFlex roof systems. These fastening patterns apply to flat or tapered insulations. The most common fastener density and pattern requirements are shown. For non-standard fastener densities, contact GenFlex Technical Services at (800) 443-4272.

Table 18: Minimum Number of Fasteners and Plates per Insulation Board

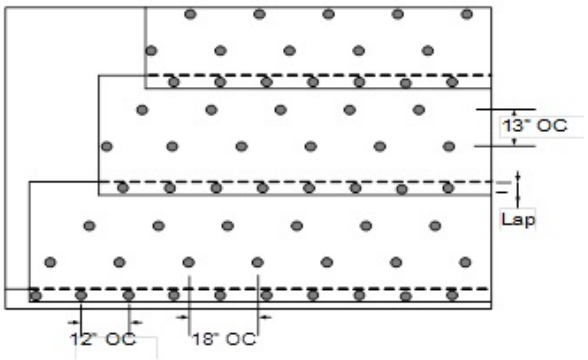
Minimum Number of Fasteners and Plates per Insulation Board			
Insulation Type and Thickness		**Min. Penetration of Fastener into or Through Deck**	
		4' x 4' (1.2 x 1.2 m)	4' x 8' (1.2 x 2.4 m)
GF ISO / GL ISO, Coated Glass Facer / CG ISO, Nailbase / NB ISO, HD ISO Composite	0.5" – 1.4" (13 – 35 mm)	8	16
	1.5" – 1.9" (38 – 48 mm)	6	12
	≥ 2" (≥ 51 mm)	4	8
HD ISO Cover Board	0.5" (13 mm)	6	12[1]
STRUCTODEK HD Fiberboard (max 20-year)	.5"	8	16
Securock Gypsum-Fiber	¼"	5	10
	½"	4	8
	⅝"	4	8
Securock Cement Board	½"	4	8
	⅝"	4	8
Securock UltraLight Coated Glass-Mat*	¼"	5	10
	½"	4	8
	⅝"	4	8
DensDeck Prime	¼"	6	12
	½"	4	8
	⅝"	4	8
DensDeck StormX Prime	⅝"	4	8
DEXcell Cement Board	7/16"	5	10
	⅝"	4	8
DEXcell FA Glass Mat	¼"	6	12
	1½"	4	8
	⅝"	4	8
DEXcell FA VSH Glass Mat	⅝"	4	8
NOTE: ¼" = 6 mm; ½" = 13 mm; ⅝" = 16 mm; 1" = 25 mm; 1.4" = 35.6 mm; 1.5" = 38 mm; 1.9" = 48.2 mm; 2" = 51 mm			
*Securock UltraLight Coated Glass-Mat for use in Cold-Applied adhesive applications only!			
[1]FM GLOBAL 1-90 FASTENING PATTERN FOR ISOGARD HD For more information, see GenFlex PDS Sheet 950 Insulation Attachment Patterns			

4. Base Sheet Fastening Requirements: the base sheet must be fastened with appropriate GenFlex fasteners or GenFlex fasteners and insulation plates and installed in accordance with the fastening rate and pattern for the applicable system.
5. Fastening rates and patterns may vary for code compliance. Contact the local code or insurance officials before contacting GenFlex Technical Services at (800) 443-4272.
6. Base sheets can mechanically attach through insulation to deck where appropriate. Adhere to GenFlex base sheet seam and lap width requirements.

GenFlex Fasteners and Plates or Concrete Fasteners

Two (2) rows staggered at 18" (457 mm) on center, each approximately 13" (330 mm) in from edge of sheet and inside laps at 12" (305 mm) on center.

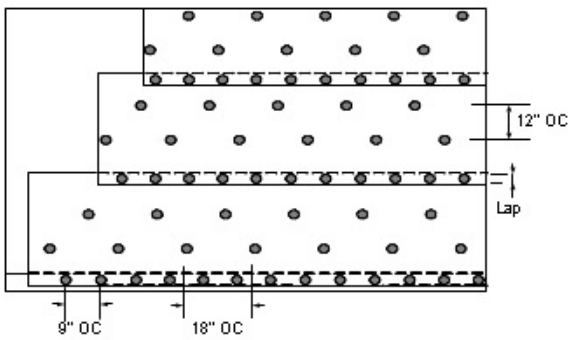
Contact GenFlex Technical Services at (800) 443-4272 when the deck system will not provide a min. of 300 lbf (1.3 N) of pullout resistance per fastener.



Cap Nails or GenFlex LWC Base Ply Fasteners

Two (2) rows staggered at 18" (457 mm) on center, each approximately 12" (305 mm) in from edge of sheet and inside laps at 9" (229 mm) on center. Attachment pattern, plate/head size, and frequency may be different to meet code requirements.

Contact GenFlex Technical Services at (800) 443-4272 when the deck system will not provide a minimum of 40 lbf (178 N) of pullout resistance per fastener.



ADHESIVE ATTACHMENT OF INSULATION AND ROOFING PLIES

Insulation Adhesion Requirements

1. Insulation Adhesion Requirements
   - The insulation must be no larger than 4' x 4' (1.2 x 1.2 m).
   - Stagger all insulation joints from adjoining and adjacent boards and adjacent layers.
   - Adhesion pull tests may be required.
     - Prepare an area large enough to allow a 4' x 4' (1.2 x 1.2 m) insulation board to be laid in place. Follow the appropriate GenFlex PDS guidelines for surface preparation and list of acceptable substrates.
     - Apply the adhesive to the deck per required application rates and methods. Allow the adhesive a minimum of 60 minutes to cure.
     - After the adhesive has been allowed to cure, pull up on the adhered board by placing a hand under the corner or end of the board in the same direction as the ribbons. Make sure that the board is lifted by hand. Using tools to scrape the board sometimes dis-bonds the adhesive from the deck. This will not show whether the adhesive is performing under uplift considerations.
     - Observe the insulation and deck. The desired result is a delamination of the surface or board facer with adhesive and facer residue remaining on the deck or the board breaks apart remaining adhered to the deck at the ribbons. If the board is lifted and the adhesive pulls/peels off the deck or decking is pulled up with the board, contact GenFlex Technical Services at (800) 443-4272.
2. GenFlex insulation adhesives must be applied in accordance with the installation instructions and Product Data Sheets (PDS).
3. Ensure that all safety measures are followed when installing insulation adhesives to protect the installer as well as the occupants of the building.
4. Existing decks containing residual asphalt must be cleaned and scraped as smooth as possible.
5. Existing decks shall be smooth, flat, clean, dry, free of sharp fins, or foreign materials.

Table 19: Allowable Adhesive Attachment of Insulation / Cover Board

Allowable Adhesive Attachment of Insulation / Cover Board				
To Deck	**One Step**	**ISO Bond**	**Quick Dual**	**Asphalt Attachment**
Steel	✓	✓	✓	
New Structural Concrete	✓	✓	✓	✓
Existing Structural Concrete	ATR	ATR	ATR	✓
Plywood, OSB, Wood Plank	✓	✓	✓	
Cementitious Wood Fiber	ATR	ATR	ATR	
Poured or Pre-Cast Gypsum	ATR	ATR	ATR	
Lightweight Insulating Concrete	✓	✓	✓	
To New Insulation or New Base Sheet				
GF ISO / GL ISO	✓	✓	✓	✓
Coated Glass Facer / CG ISO	✓	✓	✓	✓
HD ISO	✓	✓	✓	✓
Nailbase / NB ISO	✓	✓	✓	✓
STRUCTODEK HD w/ Primed Red Coating	✓	✓	✓	✓
DensDeck Prime	✓	✓	✓	✓

Table 19: Allowable Adhesive Attachment of Insulation / Cover Board Continued

Allowable Adhesive Attachment of Insulation / Cover Board				
To Deck	**One Step**	**ISO Bond**	**Quick Dual**	**Asphalt Attachment**
DensDeck StormX Prime	✓	✓	✓	✓
SECUROCK Gypsum-Fiber Board	✓	✓	✓	✓
SECUROCK Cement Board	✓	✓	✓	✓
SECUROCK UltraLight Coated Glass-Mat	✓	✓	✓	N/A
DEXcell FA Glass Mat	✓	✓	✓	✓
DEXcell Cement Board	✓	✓	✓	✓
DEXcell FA VSH Glass Mat	✓	✓	✓	✓
New Base Sheet	✓	✓	✓	✓
*ATR: Adhesion Test Required				

Base-Sheet, Inter-Ply, and Cap Sheet Adhesion Requirements

1. Application of sand-backed modified bitumen rolls in GenFlex Multi-Purpose MB Cold Adhesive
   - Unroll and relax all sheets for at least 30 minutes prior to installation.
   - Apply GenFlex Multi-Purpose Cold Adhesive to the substrate using a ¼" (6 mm) notched squeegee or airless sprayer at a rate of 1½ – 2½ gallons per 100 ft² (0.6 – 1.0 L/m²). The adhesive may be left open no more than 10 minutes prior to installing the sheet.
   - Broom the sheet into place.
   - Complete the side and end laps of the sheet by sealing with Multi-Purpose MB Cold Adhesive applied to both sides of the lap, or by heat fusing. Corners of the sheet should be cut at a 45° angle which will help them lay flat.
   - GenFlex requires that granules be applied to areas of adhesive bleed-out on the cap sheet as the installation progresses to protect exposed areas from UV exposure.
2. Three-ply systems installed with GenFlex Multi-Purpose MB Cold Adhesive must have the bottom two (2) plies exposed for 7 – 30 days at a minimum of 60 °F (16 °C) before the cap sheet is applied. This will allow the cold adhesive to cure properly.
3. This is the only time phasing is acceptable, and the second ply should be cleaned, inspected, and primed prior to the application of the cap sheet.
4. Attachment of base sheets with cold adhesives to expanded or extruded polystyrene insulation (XPS or EPS) is not acceptable.
5. Wood fiber insulation is not an acceptable substrate for use with Multi-Purpose MB Cold Adhesive, except for STRUCTODEK HD with Primed Red Coating high density fiberboard roof insulation and cover board.
6. Torch base and torch cap sheets, backed with polyethylene burn-off film, cannot be applied with cold adhesive.
7. Flashings must be installed in GenFlex Multi-Purpose MB Flashing Cement.
   - When applying flashings in GenFlex Multi-Purpose MB Flashing Cement, both the substrate and the back of the sheet must be coated with the flashing cement.

HEAT-FUSED ATTACHMENT OF ROOFING PLIES

Cautions Regarding Insulation

1. Attachment of base sheets by heat fusing to expanded or extruded polystyrene insulation is not acceptable.
2. No roofing membranes can be heat fused to polyiso insulation. An overlay must be used to separate the polyiso insulation from the heat-fused ply. Acceptable overlay sheets include:
   - A base sheet mechanically attached through the polyiso insulation into the deck.

General

1. Unroll and relax all sheets for at least 30 minutes prior to installation.
2. Corners of the sheet should be cut at a 45° angle which will help them lay fat.
3. Torch-apply the membrane to the approved substrate using CERTA (Certified Roofing Torch Applicator) techniques.
4. GenFlex requires that granules be applied to areas of adhesive bleed-out on the cap sheet as the installation progresses to protect exposed areas from UV exposure.
5. Do not walk on freshly torch-applied membrane until it has had time to cool, as this will leave foot impressions in the membrane.

Table 20: Approved Substrates for Heat-Fused Base Sheets

Approved Substrates for Heat-Fused Base Sheets
Structural Concrete (must be clean, dry, properly cured, and primed with ASTM D-41 primer) *
Existing Smooth Surface SBS or APP Modified Bitumen (must be clean, smooth, and primed with ASTM D-41 primer) *
DensDeck Prime, DensDeck StormX, SECUROCK Gypsum-Fiber Board, or Securock Cement Board
DEXCell: FA Glass Mat, Cement Board and FA VSH Glass Mat
NOTE: Apply per ASTM D-41 manufacturers recommended coverage rate

SELF-ADHERED MEMBRANES

Vapor Shield Membrane

1. GenFlex Vapor Shield Membrane is a vapor barrier which may be directly adhered to a variety of approved surfaces that have been primed with Vapor Shield Water Based Primer, or Vapor Shield Solvent Based Primer.
2. Vapor Shield Membrane must be rolled in with a 75 lb (34 kg) roller to ensure adhesion throughout the membrane and at all laps.
    - When installing directly to a fluted steel deck, install a piece of light-gauge sheet metal perpendicular to the flutes to ensure the Vapor Shield has a solid surface under the head lap for proper lap adhesion. Side laps MUST fall on the top of a deck flute to ensure proper lap adhesion.
3. Install GenFlex insulation to the clean and dry Vapor Shield Membrane after any necessary repairs have been made. Acceptable insulation adhesives include One Step Insulation Adhesive, ISO Bond Insulation Adhesive, and Quick Dual Insulation Adhesive. Hot asphalt is not acceptable.
4. Vapor Shield Membrane may be used as a temporary roof and exposed for up to 90 days. It must be inspected and repaired before insulation and/or roofing plies are installed to ensure its integrity as an effective vapor barrier.
5. Refer to PDS 604 for specific application requirements.

SPECIAL CONSIDERATIONS

Moisture in Existing Roof

1. The roofing contractor is responsible for ensuring that the substrate is suitable to receive a GenFlex roof system. All damaged and/or wet insulation or substrate must be removed and replaced prior to the application of the GenFlex roof system.
2. A moisture survey should be conducted to determine the moisture content of any existing roof system component. Any damaged and/or wet components of the existing system must be removed prior to the installation of the new GenFlex roofing system.
3. The best diagnostic technique for evaluating moisture in existing roofs is by taking and evaluating a series of roof cores.
    - Techniques such as infrared scans are available to evaluate the roof by non-invasive means. These techniques provide measurements of factors that can be associated with the presence of moisture. Results of these studies should be confirmed with roof cores.
4. Failure to remove any existing system components that could cause damage to the new GenFlex roofing system may void the warranty.

Drainage

1. GenFlex recommends a minimum ¼:12 (2.1%) slope to facilitate proper drainage and maximize long-term performance of the roof system. This is a requirement for certain warranties. Positive slope is always required.
2. Ponding water is defined as a condition existing on any area of the roof where water remains more than forty-eight (48) hours after precipitation.
3. Adequacy of drainage provisions, placement, sizing and/or number of drains required is the responsibility of the building owner or their design professional. Drainage conditions should meet the requirements of applicable codes as well as standard industry recommendations.
4. In reroofing or re-cover situations, analysis of the existing drainage conditions is the responsibility of the building owner and/or their design professional. Existing deck deflection or ponding water may necessitate the upgrade of drainage provisions including the relocation of existing drains, the addition of new drains, increased bar joist support, etc. GenFlex does not design roof drainage systems nor assume any liability for the adequacy (or lack thereof) of roof drainage systems or facilities.
5. Proper and adequate drainage of the roof surface is required to assure the long-term performance of the roofing system. Drains should be of sufficient number and size and located to provide satisfactory and rapid drainage of the entire roof surface (within 24 to 48 hours of precipitation). A minimum roof slope of ¼:12 (2.1%) is the industry standard.

6. Tapered GenFlex ISO / GL ISO provides an effective and economical solution where substrate slope will not permit efficient drainage. When properly installed, it can extend the life of the roof assembly by eliminating problems associated with ponded water. Tapered GenFlex ISO / GL ISO is available in slopes from 1/16:12 (.5%) to ½:12 (4.2%). Contact your GenFlex Sales Representative for assistance with a professionally designed tapered system layout.
7. The following are some of the reasons why proper roof drainage is important:
    - Standing water can result in deck deflection and possible structural damage.
    - Water on the roof can promote vegetation, fungi, and bacterial growth.
    - In the event of an opening in the roof membrane, standing water can significantly worsen the damage to the roof system, the building itself, and the interior contents.
    - It is required by many, if not all, building codes.
    - Proper drainage of the roof system prevents premature deterioration of the roof membrane and roof components.

Back-Nailing and Insulation Stops – Slopes Greater than ½:12 (4.2%)

1. General Guidelines
    - Reference Details BU-LS-02 and MB-LS-09 for appropriate application.
    - Back-nailing nailing strips are required on all roofs with slopes greater than ½:12 (4.2%).
    - Exceptions may be made for torch-applied systems only with slopes up to 1:12 (8.3%). This must be pre-approved by GenFlex Technical Services after a review of the roof configuration/system.
    - Insulation stops are recommended on all roofs with slopes greater than ½:12 (4.2%).
    - When the slope of the roof exceeds ½:12 (4.2%) and hot asphalt attachment is specified, GenFlex requires that only GenFlex SEBS Mopping Asphalt or ASTM D 312 Type IV (4) asphalt be used.
    - Roof slopes over 3:12 (25%) are generally not suitable for the application of asphaltic roof systems.
    - Insulation stops, and back-nailing nailing strips are not needed when system is applied directly to a wood deck or a similar nailable substrate. The cap sheet can be back-nailed directly to a wood deck or similar nailable substrates when back-nailing is required.
    - The building owner or design professional intending to specify back-nailing should consider geographic location, specific job conditions, accepted area application practices, and the type and grade of materials specified when creating an actual specification for a project.

Table 21: Back-Nailing Requirements for Sloped Roofs

Back-Nailing Requirements for Sloped Roofs		
Slope	**Back-Nailing**	**NOTE**
≤ ½:12 (4.2%)	None required	---
> ½:12 ≤ 2:12 (4.2% — 16.7%)	End laps of roll	Not to exceed 33′ (10 m)
> 2:12 ≤ 3:12 (16.7% — 25%)	Every 10' (3 m)	---
Refer to GenFlex detail MB-LS-9 for detailed back-nailing requirements.		

2. Installation
    - For roof slopes up to and including ½:12 (4.2%), the side laps can be installed parallel or perpendicular to the slope.
    - For roofs slopes greater than ½:12 (4.2%), the membrane must run parallel to the slope.
    - Back-nailing nailing strips and insulation stops shall be a minimum of 3½" (89 mm) wide and the same thickness as the roof insulation.
    - Back-nailing nailing strips and insulation stops must be attached to resist a force of 200 lbf (890 N) minimum.
    - Cap nails must have 1" (25 mm) diameter steel heads. Plastic heads are not allowed. The shank must be minimum 11 ga (2.3 mm) annular ring or spiral shank. Nails must be FM Approved.
    - End laps must extend a minimum of 6" (152 mm) beyond the edge of the fastener. For example, when fasteners and 3" (76 mm) plates are used (as shown below), each end lap must be a minimum of 9" (229 mm).
    - Non-nailable decks and nailable decks with insulation:
        - Cut the cap sheet to conform to nailer spacing.
        - Using capped nails or GenFlex fasteners and plates, nail the end lap into the wood nailer across the width of the sheet, with the first nail spaced ¾" (19 mm) from the leading edge of the sheet. The remaining nails are to be spaced approximately 3" (76 mm) on center.
        - The nails should be staggered across the width of the nailer.
        - When GenFlex fasteners and plates are used in lieu of cap nails, four (4) per end lap are required.
        - Contact GenFlex Technical Services at (800) 443-4272 for information regarding back-nailing requirements when utilizing approved insulation less than 1" (25 mm).

- Nailable decks with no insulation:
  - Using capped nails or GenFlex fasteners and plates, nail the end lap into the nailable deck across the width of the sheet, with the first nail spaced ¾"(19 mm) from the leading edge of the sheet. The remaining nails are to be spaced approximately 3" (76 mm) on center.
  - When GenFlex fasteners and plates are used in lieu of cap nails, four (4) per end lap are required.

Partial Tear-off and Re-cover Applications

1. Existing roof components are not included in the GenFlex warranty.
2. It is the responsibility of the building owner and/or their agents to verify that the existing roof system is sound and intact.
   - Confirm the structural integrity of the existing deck and specify repair or replacement as required.
3. When using fasteners, verify that the substrate has sufficient fastener pullout resistance to meet system requirements.
4. The effect of existing moisture on the performance of the new system may be significant depending upon the roofing components selected. Therefore, a moisture survey should be conducted to determine the presence of moisture in the existing roof system components. All components of the existing system that would be detrimental to the new GenFlex roof system must be removed and replaced prior to its installation.
5. Limitations in flashing heights may be encountered. Existing building features (e.g., door or window locations, weeps, or through-wall flashings) may not allow sufficient clearance to provide proper termination above the potential water level. Detailed consideration of this condition is critical to the integrity of the roofing system. Contact GenFlex Technical Services at (800) 443-4272 for assistance.
6. Partial tear-off is the removal of the existing membrane, installing a new layer of insulation over the existing in place insulation and a new membrane over the new insulation. Partial tear-offs are not eligible for a 20-year warranty.
   - New insulation or cover board is always required.
   - The existing insulation must be suitable for use as a component of the new roof system. The existing insulation must be:
     - Dry and free of trapped moisture.
     - Re-secured as necessary to meet GenFlex, local code, and/or other specified wind uplift requirements.
     - An acceptable substrate for the new insulation and the new membrane.
     - If existing insulation is to remain, all damaged or wet components must be replaced prior to installing the new roof system.
7. Re-cover is the installation of a new roof system over an existing roof system.
   - All damaged or wet components must be removed and replaced prior to installing the new roof system.
   - All re-cover or retrofit systems using adhesives for insulation attachment require a pull test to verify adhesion.
   - Loose gravel, if present, must be removed until the roof surface is smooth enough to provide a suitable substrate for the insulation. All loose gravel must be removed by vacuuming and/or power brooming. Spud any remaining gravel smooth to provide a level surface.
   - New insulation or a cover board is required except when installing an appropriate GenFlex roof membrane directly to an existing smooth surfaced BUR or Modified Bitumen roof. The warranty period for direct attachment to an approved existing roof is limited to 10 years. The existing smooth asphalt roof must not have been coated or re-saturated and must be primed with ASTM D-41 primer prior to the installation of a new asphalt or modified bitumen membrane.
     - Verify that the attachment of the existing roof system is acceptable. If existing insulation is not mechanically fastened, contains fasteners that may be corroded or loose, or the attachment may not be sufficient, re-attachment of the roof system is required prior to the installation of new insulation.
   - Coal Tar Pitch Built-Up Roofs
     - New, mechanically attached insulation or a cover board is required to isolate the new roof from the existing coal tar bitumen.
     - Flow of existing coal tar into the building may occur when new fasteners penetrate an existing coal tar pitch membrane
   - Sprayed-in-place polyurethane foam (PUF) roof systems require a COMPLETE TEAR-OFF of the PUF system.
   - Existing roofs over phenolic insulation require a COMPLETE TEAR OFF the entire roof system to the structural deck.
     - When Phenolic insulation is removed, a visual inspection of the deck condition and other components is required; all deteriorated components must be replaced, as necessary.
   - Existing Single-Ply Systems
     - A mechanically attached insulation or cover board is required.
     - Re-cover over all roof systems will require that all existing base tie-ins and flashings be removed prior to the installation of a new roof.

Table 22: Special Attachment Considerations for Partial Tear-Off and Re-cover Applications

Special Attachment Considerations for Partial Tear-Off and Re-cover Applications	
Deck	**Special Considerations**
Steel and Nailable Decks (Wood plank, plywood, OSB, gypsum, cementitious wood fiber, poured-in-place concrete)	If the existing system is not sound and intact mechanical attachment of the system may be necessary.
Non-Nailable Decks (Poured-in-place, precast, and post-tension concrete)	If the existing roof system is not sound and intact, additional securement may be necessary.

Table 23: Insulation / Cover Board Attachment Options by Re-cover / Retrofit

Insulation / Cover Board Attachment Options by Re-cover / Retrofit					
Substrate to Which Insulation / Cover Board will be Attached	**Mech. Attached**	**One Step**	**ISO Bond**	**Quick Dual**	**Hot Asphalt**
Existing, uncoated, smooth surface BUR or Modified Bitumen Roof	✓	✓	✓	✓	✓
Granule-Surfaced Modified Bitumen Roof	✓	✓	✓	✓	✓
Gravel-Surfaced BUR	✓	✓	✓	✓	✓
Coal Tar Pitch	✓	✓	✓	✓	N/A
Sprayed Urethane Roof (PUF)	Complete tear-off required				
Adhesive attachment may require an adhesive pull test. See the appropriate PDS					

FLASHINGS

Edge Metal Requirements

GenFlex metal must be used and installed per GenFlex details and standards for warranty inclusion. ES-1 certified metal and details are required for increased wind speed warranties over 80 mph. Contractors participating in the GenFlex ES-1 Metal Cleat Program may receive up to 90 mph coverage for qualifying products. To meet GenFlex technical specifications, all edge metal, metal copings and edge systems whether field fabricated, shop fabricated, or factory formed should be designed in compliance with the International Building Code (IBC) and be tested/installed in accordance with ANSI/SPRI/FM4435/ES-1 standard and requirements. Reference the table below and the Attachment and Supplemental Increased Wind Speed Guide for more available warranty terms and wind speed coverage options.

Table 24: GenFlex Edge Metal and Flashing Warranty Breakdown

GenFlex Edge Metal and Flashing Warranty Breakdown			
Material	**Edge Metal Warranty Term**	**Included in System Warranty**	NOTE
Non-GenFlex Metal	None	N/A	
Non-GenFlex Factory Formed	None	No	
GenFlex Metal (Flat/Coil)	Product Finish Warranty Up to 35 Years	No	Must be purchased from GenFlex.
GenFlex Metal – Field Fabricated	Max. 20 -Years, 55 mph	Yes	Installed per current NRCA, SMACNA or other appropriate details/guidelines.
GenFlex Metal – Field Fabricated	Max. 20 -Years, 80 mph	Yes	Installed per current GenFlex details/guidelines.

NOTE:
1. See warranty sample for specific coverage.
2. See appropriate edge metal tables below for warranty coverage based on specific engineered edge metal system offerings.

General

1. A flashing is a roofing element used to seal the roof system at areas where the roof covering is interrupted or terminated. For example, pipes, curbs, walls, etc. all have special components that, when correctly installed, will help prevent moisture entry into the roof system or building. Flashings divert the water to the membrane. The membrane then carries it to the roof drains. Typically, flashing intercepts water flowing down parapets, down walls of higher adjacent construction and down roof penetrations. There are four typical locations where a flashing is needed:
   - Terminations
   - Junctions
   - Projections
   - Joints
2. In any flashing detail, there are up to three different flashing components:
   - Base flashing
   - Counter-flashing
   - Cap flashing

3. Many factors affect the performance of the flashing system. Design drawings for several common applications are available from the www.GenFlex.com website.
4. Extended warranties may require special flashing applications.

UltraFlash Liquid Flashings

UltraFlash One-Part Liquid Flashing may be used on SBS, and APP roofing systems.

Base Flashing

An extension of the roofing membrane or a different material that is bonded to the roof to form a waterproof joint. It extends upward along the vertical surface to divert water onto the membrane. The base flashing should reach a higher level than that reached by water on the roof. In some situations, water may temporarily accumulate on the roof. This may occur during heavy rainfalls, where the drain size is inadequate, where local building regulations require controlled flow drains, or where ice and snow restrict drainage.

Counter-Flashing

Counter-flashing is used, in some situations, to carry water onto the base flashing and the membrane. This may be the case where a wall rises above a roof and masonry, or concrete wall cladding is carried down to the roof surface. It covers the vertical face of the base flashing. It provides protection for the base flashing and may serve to shed water. Where required, the counter-flashing is secured to the parapet or wall cladding. Counter-flashing may not be required where single-ply membranes are used for the base flashing. If not required, it should not be used, since it will cover defects and hinder maintenance.

Cap Flashing

Cap flashings are horizontal coverings for parapets and expansion joints. Cap flashing should be sloped toward the roof and secured to allow differential movement. Failure to provide for adequate flashing height at the design stage may result in serious problems that cannot be subsequently corrected.

Wall/Curb Flashing Materials and Requirements

1. Refer to the Detail Drawings at: www.GenFlex.com
2. All GenFlex modified membranes may be used in flashing assemblies, per warranty requirements.

Penetrations (Pipes, Conduits, Etc.)

> **!** Penetrations shall be placed to maintain a minimum distance away from obstructions (walls, curbs, etc.) to allow for proper installation of flashing details. Minimum 12" (305 mm) of clearance is required for penetrations when located near obstructions and/or details (base tie-in, flashing, etc.). Liquid flashing may be used as an alternative to standard flashings if the membrane and system application allows.

1. Rigid Penetrations
   - Whenever possible, all rigid penetrations should be flashed with UltraFlash One-Part Liquid Flashing. Alternatively, a penetration pocket may be installed, and flashed in accordance with GenFlex Details.
2. Penetration Pockets
   - Clusters of pipes may require the installation of a penetration pocket.
   - A minimum clearance of 1" (25 mm) between penetrations, pipes, conduits, etc., and on all sides of the penetration pocket, is required to assure adequate space for the application of Pourable Sealer around each penetration.
3. Flexible penetrations (electrical and braided cable, etc.) must be installed in a sheet metal gooseneck.

Curbs and Terminations

1. Where possible, provide a minimum design height of at least 8" (203 mm) for all flashing terminations (except penetration pockets).
2. Minimum flashing height must be 3" (76 mm) above the highest water level that could be reached during a deluging rain. Wherever a vertical termination height is 5" (127 mm) or less, contact GenFlex Technical Services at (800) 443-4272.
3. Do not flash over existing through-wall flashings, weep holes and overflow scuppers.
4. Terminations must be made directly to a sound, watertight, rigid, vertical substrate. For retrofit conditions, existing loose flashing materials must be removed, or overlaid with ⅝" (16 mm) exterior grade plywood. Terminations are not acceptable directly to gypsum or wooden substrates.

5. When using a surface-mounted termination, ensure a consistent seal at the wall interface. The surface above the termination must be waterproof.
6. Gypsum board, used as a substrate for flashings, must be moisture resistant exterior grade with laminated fiberglass facers, which is recommended for this application by the gypsum board manufacturer.
7. Stucco, cobblestone, textured masonry, corrugated metal panels or any uneven surface is not a suitable substrate to receive conventional flashing materials. Such surfaces must be prepared to provide an acceptable substrate by attaching minimum ⅝" (16 mm) exterior grade or pressure treated plywood. Attach as required for structural integrity.
8. UltraFlash Liquid Flashings may be used with textured masonry, corrugated metal panels and most uneven surfaces.

Sheet Metalwork

1. Coping, gravel stops, counter-flashings etc., must be supplied by GenFlex for warranty inclusion.
2. If GenFlex is not able to supply a given sheet metal product or design, it must be installed in accordance with current GenFlex details but will not be included as part of the warranty.
3. All sheet metalwork not supplied by GenFlex should be fabricated and installed in accordance with the recommendations of the Sheet Metal and Air Conditioning Contractors' National Association (SMACNA).
4. Some specific roofing details in GenFlex Technical Specifications may exceed SMACNA recommendations. For such details, the GenFlex requirements must be used.
5. All sheet metalwork not supplied by GenFlex should have a quality weather resistant coating that will not corrode or weather to the point of failure during the warranty period.
6. It is the owner's responsibility to maintain non-GenFlex sheet metal in a watertight condition.
7. Metalwork which is not in conformance with GenFlex specifications and details or that compromises the integrity of the system may jeopardize issuance of the warranty for the entire project. GenFlex does not warrant the performance of products which are not supplied by GenFlex.
8. Counter-flashings, copings, and other perimeter or penetration metalwork must be properly fastened and sealed by the roofing contractor or others.
9. Refer to ANSI/SPRI ES-1 for information on wind design and metal edge treatments.
10. Extended wind speed warranties require enhanced edge details. Contact GenFlex Technical Services at (800) 443-4272 for specific information
11. Make these specifications available to the sheet metal fabricator/contractor.

ROOF COATINGS

General

1. Coatings are considered a maintenance item. GenFlex recommends that coatings be adequately and regularly maintained.
2. Periodic maintenance and recoating may be required to maintain the Underwriters Laboratories, Factory Mutual or other ratings.
3. The use of aluminum roof coating prevents fully adhered attachment of a new membrane during retrofit. A new substrate may be mechanically attached to receive the retrofit membrane.
4. Proper preparation of the roof surface is important to assure the best possible adhesion of the roof coating.

WARRANTIES

General

1. Only GenFlex-supplied components are eligible to be covered as part of the GenFlex Warranty.
2. GenFlex does not warrant GenFlex roof system tie-ins to other roofing systems.
3. Warranted GenFlex roof systems are to be installed only on commercial, industrial, institutional, or multi-family commercial housing buildings in the United States and Canada.
    - Issuance of a warranty for projects outside the US and Canada must be submitted to the GenFlex Solutions Group for consideration prior to bidding.
    - Individual residential construction does not qualify for a GenFlex warranty.
4. Upon a GenFlex inspection and acceptance of the installed roof system, the requested warranty can be issued. A GenFlex inspection is not intended as an inspection for the benefit of the owner or design professional with respect to contract, building codes or compliance with specifications other than GenFlex.

5. Failure of a flashing terminated to an intermediate element (e.g., metal flashing, insulation, surface treatment, etc.), which itself could fail and admit moisture beneath the membrane is beyond the limits of the GenFlex warranty.
6. It is the building owner's responsibility to expose the membrane if warranty service is required when access is impaired. Such impairment includes, but is not limited to:
    - Design features, such as window washer systems, which require the installation of traffic surface units in excess of 80 lb (36 kg) per unit.
    - Any equipment, ornamentation, building service units and other rooftop surfacing materials that are not defined as part of the membrane assembly.
    - Intricately placed or multicolored ballast configurations.
    - Individual pavers utilized as ballast, which weigh more than 80 lb (36 kg) per unit, unless otherwise required by GenFlex for wind uplift resistance.
    - Interlocking paver systems that utilize mechanical clips, strapping, adhesive, etc.
    - Rooftop equipment that does not provide GenFlex with reasonable access to the membrane.
    - Ponded water, snow, ice, and other materials.

Table 25: Overview of GenFlex Warranty Requirements

Overview of GenFlex Warranty Requirements
(Please ask GenFlex Technical Services for specifics and additional components)

Years	Base Sheet	Cap Sheet	Flashing
10	• Any APP base Mechanically fastened, heat welded, or fully adhered in cold adhesive	• Any APP cap • Heat welded or fully adhered in cold adhesive	• Any APP cap, fully adhered, one ply, OR • UltraFlash One-Part Liquid Flashing
	• Any SBS base Mechanically fastened, heat welded, hot mopped, or fully adhered in cold adhesive	• Any SBS cap • Heat welded, hot mopped, or fully adhered in cold adhesive	• Any SBS cap, fully adhered, one ply, OR • UltraFlash One-Part Liquid Flashing
15	• Any APP base • Heat welded or fully adhered in cold adhesive	• Any APP cap • Heat welded or fully adhered in cold adhesive	• Any APP base and cap, fully adhered, 2 plies, OR • UltraFlash One-Part Liquid Flashing
	• Any SBS base • Heat welded, hot mopped, or fully adhered in cold adhesive	• Any SBS cap • Heat welded, hot mopped, or fully adhered in cold adhesive	• Any SBS base and cap, fully adhered, 2 plies, OR • UltraFlash One-Part Liquid Flashing
20	• Any APP Base • Heat welded or fully adhered in cold adhesive	• APP 180 series cap sheet • Heat welded or fully adhered in cold adhesive	• Equal-or-better APP base and cap sheets, fully adhered, 2 plies, OR • UltraFlash One-Part Liquid Flashing
	• Any SBS base • Heat welded, hot mopped, or fully adhered in cold adhesive	• Any SBS cap • Heat welded, hot mopped, or fully adhered in cold adhesive	• Equal-or-better SBS base and cap sheet, fully adhered, 2 plies, OR • UltraFlash One-Part Liquid Flashing
	Appropriate substrate and membrane combinations may allow for materials to be heat welded, hot mopped or fully adhered in cold adhesive.		

NOTE:
- All materials by GenFlex
- Never use hot asphalt in an APP system
- Except for 10-year warranties, a mechanically fastened base sheet must be followed by two (2) adhered plies (heat welded, hot mopped, or cold adhesive)

Table 26: GenFlex Warranty Summary

GenFlex Warranty Summary
(This chart is only a summary of the general warranty coverage. Please review each warranty for exact language.)

WARRANTY NAME	SPECIFICATION	ELIGIBLE CONTRACTOR	COVERAGE
Roofing System Limited Warranty 5-20 Years	GenFlex Asphalt specifications for the term requested	Licensed Applicator	Repair leaks in the roofing system caused by GenFlex-supplied materials or the workmanship used to install them. No dollar limit to GenFlex expenditures to honor the warranty.
Membrane Only Warranty 10-20 Years	GenFlex Asphalt specifications for the term requested	Licensed Applicator	Provide replacement membrane materials sufficient to replace any area of GenFlex Roofing Membrane ("Membrane") which leaks as a result of ordinary exposure to the elements or any manufacturing defect in the Membrane.

Other Considerations

Leak Detection – Wire Grid System

A leak detection grid system refers to a network of sensors or conductors arranged in a grid pattern, installed beneath a surface like a roof, designed to detect the presence of moisture or leaks by creating an electrical circuit when water contacts the grid, allowing for pinpoint location of the leak within the monitored area.

- Wire mesh provided by others for use in an electronic leak detection system (ELD) is allowed in warranted GenFlex membrane systems provided the mesh is placed beneath an acceptable cover board. The mesh may not come in direct contact with the GenFlex membrane to prevent compromising system uplift resistance or physical damage to the membrane.
- GenFlex assumes no liability for ELD products or services provided by others. Only GenFlex branded and GenFlex provided products are included within warranty coverage. Validation of uplift performance and fire ratings may not be possible when ELD systems are used.
- Low Voltage scanning platforms can be utilized in the following systems: TPO and modified bitumen.
  NOTE: Full compatibility shall be validated by the user with the ELD system provider.

Leak Detection – Conductive Primer

Conductive primer enables electronic leak detection (ELD) of conventional roofing assemblies by creating the required conductivity directly below the membrane.

- A conductive primer provided by others for use in an ELD is allowed in a warranted adhered single-ply GenFlex system. Warranted wind speeds for projects using a conductive primer are limited to 72 MPH unless performance can be validated via a tested assembly.
- GenFlex assumes no liability for ELD products or services provided by others. Only GenFlex branded and GenFlex provided products are included within warranty coverage.
- Conductive primer can be utilized in the following systems: TPO, EPDM and modified bitumen.
  NOTE: Full compatibility shall be validated by the user with the ELD system provider.