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4.01.1 Vapour Retarders — General

A. A vapour retarder installed on the roof deck beneath the roof insulation is a part of the roofing specification. The architect, engineer, or building owner must determine the need, design, use, and placement of a vapour retarder.

B. The use of a vapour retarder should be investigated if any of the following conditions exist:

1. Where a building component or assembly is subjected to differentials in temperature and water vapour pressure, the properties and position of the materials and components in those components or assemblies shall be such that they control vapour diffusion or permit venting to the exterior to minimize the accumulation of condensation in the building component or assembly; and/or
2. A project where construction components or assemblies may reasonably be expected to create uncontrolled water vapour diffusion that could impact the health and safety of the occupants and adversely affect the use of the building and/or the operation of the building in general.

C. Refer to the National Roofing Contractors Association's (NRCA) Roofing and Waterproofing Manual or the Canadian Roofing Contractors Association's (CRCA) Reference Manual for recommendations on vapour retarders or consult the current issue of the National Building Code (NBC) of Canada.

4.02.1 Vapour Retarders — Types

A. The following vapour retarders are acceptable to IKO:

1. ArmourGard kraft vapour retarder,
2. Two-ply asphalt and organic felt or glass felt built-up membranes,
3. Heat-applied SBS base sheets,
4. Adhesive or hot asphalt-applied SBS base sheets, and
5. Self-adhering sheets such as IKO's MVP (Modified Vapour Retarder) or MVP Sand.

NOTE: Contact the IKO Technical Services department for other options.

Although all of these products will perform as vapour retarders, different products may be selected based on project economics, roof design, compatibility with the roof membrane and/or insulation, or material availability. Note that the inclusion of a specific vapour retarder within a roof assembly may be integral to the performance criteria established through testing and, therefore, should not be substituted without consulting the IKO Technical Services department.

4.03.1 Vapour Retarders Installation — General

A. A vapour retarder is only effective in reducing the transmission of water vapour if properly installed and not damaged or punctured during installation.

B. The vapour retarder must be properly sealed at all laps. At all times, the vapour retarder shall be continuous regarding penetrations, joints, and other construction details requiring the continuity of the assembly.

C. The vapour retarder shall be located directly over the decking. In some instances, a thermal barrier is required to be placed upon the decking. In such cases, the placement of the vapour retarder can be located either above or below the thermal barrier, which shall be dictated by the design of the roof assembly and associated performance criteria. Furthermore, specific attachment of the vapour retarder layer may determine the ultimate level of wind uplift resistance of the overall roofing assembly. As such, surface preparation and attachment/adhesion of the vapour retarder may vary. Contact the IKO Technical Services department for further information on this subject.

D. On steel decks, endlaps spanning the female flutes may require support. Cut the appropriate pieces of rigid insulation and place them within the flute so that a level continuous surface supports the endlap. Other means of end lap support may be applied so long as the overall performance of the roof assembly is not compromised in doing so.

E. The vapour retarder shall begin at the low point of the roof. Chalk a line for the alignment of the vapour retarder. Begin the installation by unrolling and aligning the vapour retarder before attachment. Note: If a drain is the lowest point of the roof, ensure that the vapour retarder is centered over the drain. Where surface preparation is required, such as primers and adhesives, apply only as much material as can be covered that same day by the assembly.

F. Voids, fishmouths, and any other defect that would cause buckles or stress in the finished system must be removed and patched.

G. All punctures in the vapour retarder must be repaired before installing the roof insulation.

H. Surfaces intended to receive a vapour retarder must be smooth and dry and free from dust, dirt, grease, oil, or other foreign matter.

I. For concrete decks, gypsum boards, and cementitious panels, treat all surfaces with an appropriate surfacing agent as dictated by the kind of vapour retarder specified, and at the rate recommended by IKO and permit it to cure/dry before the application of the membrane.

J. On wood decks, the vapour retarder can be applied directly using self-adhered, adhesive applied, or mechanically attached membranes for securement, pending overall system performance criteria.

K. It is not recommended to apply liquid adhesives in full coats directly over wood decks where the risk of bleed-through to the interior is high. Tape the joints to prevent bleed through or use a mechanically attached sheet membrane to prevent this. Liquids can then be safely applied over the taped or fastened sheets.

L. It is recommended to mechanically fasten the first layer of a roofing assembly (typically the vapour retarder) over a wood deck as it can then be removed in the future without removing the wood decking. Assemblies adhered directly to wood decking may prohibit this from happening when re-roofing is necessary.

M. Ensure that the vapour retarder has sufficient material at all roof edges, penetrations, and curbs to affect a proper seal forming a continuous barrier throughout. The continuity of the whole building's air/vapour barrier system is beyond the scope of this manual. However, allowance should be made to ensure that the integrity of the whole building's air/vapour barrier system is achieved.

N. When asphalt is specified, only Type II or Type III roofing asphalt shall be used to attach the vapour retarder.

O. Insulation boards should be installed immediately over the vapour retarder to avoid damage to the vapour retarder during roof construction. Attach the insulation in accordance with the project specification or the manufacturer's recommendations.

P. Vapour barriers shall not be left exposed and must be covered the same day. However, during an emergency, the following techniques shall be applied. (This excludes the IKO AcrylicStick SA, which should not be left exposed):

1. All self-adhered membranes shall require the application of IKO S.A.M. Adhesive or IKO S.A.M. Adhesive LVC on all seams; and/or
2. Additional seaming such as buttering shall be required for SBS membranes intended to be left exposed.

4.04.1 Vapour Retarders — Installation Methods

A. Refer to Part 3 for deck preparation.

B. ArmourGard-A vapor retarder:

1. Attach a single ply of ArmourGard-A vapor retarder with vapour retardant adhesive at the rate of two hundred and fifty square feet per gallon (250 ft^2/gal) (0.16 L/m^2).
2. Apply successive plies in a shingle fashion and overlap previous layer side laps a minimum of two inches (2") (50 mm) on solid substrates or two to four inches (2" to 4") (50 mm to 100 mm) on steel decks depending on the profile of the steel deck. Endlaps should overlap a minimum of six inches (6") (150 mm). Stagger adjacent end laps a minimum of twenty-four inches (24") (610 mm).
3. On concrete or gypsum, ArmourGard-A vapor retarder may be applied with hot asphalt at the rate of thirteen pounds per one hundred square feet (13 lbs./100 ft^2) (.68 kg/m^2) in continuous ribbons two to three inches (2" to 3") (50 to 76 mm) wide at not more than six inches (6") (150 mm) on the center. IKO-approved adhesives may also be used. Contact the IKO Technical Services department for details.
4. Apply successive plies in a shingle fashion and overlap previous layer side laps a minimum of two inches (2") (50 mm). Stagger adjacent end laps a minimum of twenty-four inches (24") (610 mm).

C. Organic or glass ply sheet two-ply membranes:

1. Install the sheets in hot asphalt applied at the rate of twenty-five pounds per one hundred square feet (25 lbs./ 100 ft^2) (1.2 kg/m^2) plus or minus 20 percent (%).
2. For glass ply sheets, install a nineteen and five-eighths inches (19 5/8") (498 mm) and thirty-nine and three-eighths inches (39 3/8") (1 m) wide starter plies.
3. Install a second thirty-nine and three-eighths inches (39 3/8") (1 m) wide ply that laps the first thirty-nine and three-eighths inches (39 3/8") (1 m) ply by seventeen and five-eighths inch (17 5/8") (448 mm).
4. Lap successive plies twenty and eleven-sixteenths inches (20 11/16") (525 mm).
5. The ply sheet side and end laps shall be fully adhered.
6. The ply sheet must lay flat and be fully and uniformly bonded to the substrate. Fiberglass ply sheets must be broomed to prevent voids and ensure embedment.

7. To reduce the possibility of asphalt displacement due to “point loading,” foot and machine traffic shall be kept to a minimum on freshly applied components of the system. To permit the asphalt to harden, do not travel over the freshly laid membrane before the asphalt solidifies.
8. Discontinue applying asphalt over any substrate where the asphalt foams excessively.

D. Fire Stop Membrane: A self-adhesive fire stop membrane composed of a glass reinforcement and SBS modified bitumen. Fire stop membrane is a safety precaution and must be installed prior to the installation of any torch-applied vapour barriers at substrate cracks and voids, angle changes at curbs, parapets, penetrations or any locations subject to back drafts or entrance of flame from the torch, protecting combustible materials in the system.

E. Heat-applied base sheets installed as a vapour retarder:

1. Remove all the roll wrapping tape and labels before beginning base sheet installation. The base sheet must be unrolled, allowed to relax, and then re-rolled from either end toward the mid-point of the roll before installation.
2. Begin installation at the low point of the roof. Unroll and align the base sheet before attachment. Use chalk lines where necessary to ensure proper alignment. Note: If a drain is the lowest point of the roof, ensure that the base sheet is centered over the drain.
3. All metal and concrete surfaces that come into contact with heat-applied base sheets must first be primed with IKO Mod-Bit Primer in accordance with the manufacturer’s recommendations and be permitted to dry before applying the vapour retarder.
4. IKO requires that the torch operator be positioned in front of the roll and that a hook or cane type tool be used to pull the roll towards the installer instead of walking on the freshly heated membrane.
5. Beginning at the re-rolled portion of the base sheet, apply the flame evenly across the back of the roll and along the exposed side lap of the previously installed sheet.
6. Apply enough flame to melt the film on the back of the base sheet and the lap on the previously installed sheet. Base sheet installation is correct when a small bead of bitumen can be seen in front of the roll and at the side lap, producing a nominal one-quarter inch (1/4") (6 mm) bleed-out of bitumen.
7. All base sheet side laps shall be a minimum of three and one-half inches (3 1/2") (90 mm).
8. All base sheet end laps shall be a minimum of six inches (6") (150 mm).
9. In all cases, the side and end laps of the base sheet shall be staggered a minimum of twelve inches (12") (300 mm) and twenty-four inches (24") (610 mm), respectively, from each other and from the additional sheets’ side and end laps.
10. All end laps shall have a forty-five (45°) degree section removed from the bottom layer of the base sheet in the side lap forming a positive water stop. See Part 11, drawing MB-1 for details.

11. Re-roll the opposite half of the base sheet and repeat the above method to complete the installation of the full roll.

F. Adhesive-applied or hot-asphalt applied base sheets installed as a vapour retarder:

1. Remove all the roll wrapping tape and labels before beginning base sheet installation. The base sheet must be unrolled, allowed to relax, and then re-rolled from either end toward the mid-point of the roll before installation.
2. Begin installation at the low point of the roof. Unroll and align the base sheet before attachment. Use chalk lines where necessary to ensure proper alignment. Note: If a drain is the lowest point, start here with the edge of the base sheet bisecting the centerline of the drain.
3. All metal and concrete surfaces that come into contact with hot asphalt-applied base sheets must first be primed with IKO Standard Asphalt Primer in accordance with IKO's recommendations and be permitted to dry before applying the base sheet vapour retarder.
4. Install the base sheet in hot asphalt applied at the rate of twenty-five pounds per one hundred square feet (25 lbs./100 ft^2) (1.2 kg/m^2) plus or minus 20 percent (%). For adhesive-applied sheets, follow IKO's recommended application rate as referenced in Part 5 of this manual.
5. The base sheet side and end laps shall be fully adhered in hot asphalt or the specified adhesive. A nominal one-quarter inch (1/4") (6 mm) positive bead of asphalt or adhesive shall be present at all lap seams to indicate a fully sealed joint.
6. All base sheet side laps shall be a minimum of three and one-half inches (3 1/2") (90 mm).
7. All base sheet end laps shall be a minimum of six inches (6") (150 mm).
8. In all cases, the side and end laps of the base sheet shall be staggered a minimum of twelve inches (12") (300 mm) and twenty-four inches (24") (610 mm), respectively, from each other and from the additional sheets' side and end laps.
9. All end laps shall have a forty-five (45°) degree section removed to form a positive water stop. See Part 11, drawing MB-1 for details.
10. Re-roll the opposite half of the base sheet and repeat the above method to complete the installation of the full roll.
11. The base sheet must lay flat and be fully and integrally bonded to the substrate. Asphalt-applied base sheets must be broomed to prevent voids and ensure embedment. This action will release or force out trapped air from underneath, thereby, reducing the chances of blistering. Embedment of adhesive-applied sheets shall be ensured by rolling the sheet after installation with a 75 – 100 lbs. weighted roller. For cold process application of the base sheet vapour retarders, see Section 9.02.5.

12. To reduce the possibility of asphalt displacement due to “point loading,” foot and machine traffic shall be kept to a minimum on freshly applied sheets. Asphalt dispensing equipment must have balloon tires and positioned so as to minimize asphalt displacement. To permit hot asphalt time to harden, do not travel over the freshly laid membrane before the asphalt solidifies.
13. Discontinue applying asphalt over any substrate where the asphalt foams excessively.

G. Self-adhering vapour retarders:

1. Remove all the roll wrapping tape and labels before beginning the base sheet installation. The base sheet must be unrolled and aligned before installation. Do not remove the release film at this stage. Follow all application temperature guidelines as indicated on PDS.
2. Begin installation at the low point of the roof. Use chalk lines where necessary to ensure proper alignment. Note: If a drain is the lowest point, start here with the edge of the sheet bisecting the centerline of the drain.
3. All metal, wood, and concrete surfaces that come into contact with self-adhered vapour retarders must first be primed with IKO S.A.M. Adhesive or IKO S.A.M. Adhesive LVC in accordance with IKO’s recommendations and be permitted to dry before applying the vapour retarder. (This excludes IKO AcrylicStick SA, as it is a primerless vapour retarder membrane). This includes priming metal fasteners and plates.
4. For self-adhered vapour retarders on steel or plywood decks, prime them with IKO S.A.M. Adhesive and allow them to dry as per IKO’s recommendations. Note that priming is only required when the primary board layer above is not mechanically attached to the decking. (This excludes IKO AcrylicStick SA, as it is a primerless vapour retarder membrane).
5. Align vapour retarder sheets over male flutes on steel decks.
6. While aligned, remove the release film from the backside of the vapour retarder and press the vapour retarder into full contact with male flutes. Press areas in contact with the decking to ensure a full bond. The membrane shall be rolled after installation with a 75 – 100 lbs. roller to ensure adhesion.
7. Overlap sides by three inches 3” (75mm) minimum for all SBS based self-adhering vapour retarders. For the IKO AcrylicStick SA self-adhering vapour retarder membrane, overlap sides by two inches 2” (50 mm). End laps shall be six inches (6") (150 mm) minimum, and stagger endlaps from each other by a minimum of twenty-four inches (24") (610 mm). End laps spanning the female flutes may require support. Cut the appropriate pieces of insulation and place them within the flute so that a level continuous surface supports the endlap.
8. For self-adhered vapour retarders on all other suitable substrates, use a similar installation method as detailed above for steel decks.

End of Section