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REGARDING **SIGA MAJVEST® 500 SA – Canadian Building Code Review**

RDH Building Science Inc. (RDH) is pleased to provide this letter outlining the performance properties of SIGA Majvest® 500 SA as compared with the related prescriptive and functional requirements of Canadian building codes. SIGA Majvest® 500 SA is a self-adhered vapour permeable membrane comprised of one microporous functional layer laminated between two non-woven polypropylene layers and with a modified acrylic based adhesive. The membrane is blue with dark gray labelling on the exterior face with white interior facing. SIGA Majvest® 500 SA is intended to be used on the exterior side of sheathing prior to installing cladding systems.



SIGA's Majvest® 500 SA (left) is a vapour permeable self-adhering water-resistive barrier and air barrier membrane for both commercial and residential buildings, such as the multi-level wood frame building shown on the right.

Introduction

The primary focus of our engagement with SIGA is to perform a review of the current 2015 National Building Code of Canada (NBC) and the Ontario Building Code (OBC), consolidation period of January 1st, 2020, for requirements related to the prescriptive and functional use of SIGA Majvest® 500 SA as an air barrier material and as a water-resistive barrier (WRB) (i.e. sheathing membrane/house wrap).

Canadian building codes including the NBC and OBC refer to various *material specification standards* (e.g. CAN/ULC, CSA, ASTM etc.) as a set of minimum requirements for building materials to test against to demonstrate prescriptive compliance with the building code. These referenced material specification standards further reference additional *material testing standards* for individual material properties.

RDH has reviewed third-party material testing reports submitted by SIGA for compliance with the minimum requirements set by the building codes and referenced material specifications. This letter summarizes our review of the Canadian building codes (NBC and OBC) and lists both the referenced material specification standards and material testing standards and compares them to the third-party testing results. Third-party test reports may be available upon request from SIGA.

Canadian Building Code Requirements

SIGA Majvest® 500 SA may perform two primary control functions within exterior walls, if detailed and installed appropriately, to serve as a secondary plane of protection against water ingress (i.e. water resistive barrier) and as an air barrier material. Depending on the design of the wall, the use of the membrane may be isolated to one of these functions or may be used to provide both roles. For simplicity these two roles have been separated within this evaluation letter.

Air Barrier Material Requirements

The physical properties of SIGA Majvest® 500 SA as an air barrier material and as part of the air barrier assembly is compared with the prescriptive requirements of the NBC and OBC. It should be noted that the OBC substitutes Section 9.36 Energy Efficiency, as found in the NBC, with the Supplementary Standard SB-10 “Energy Efficiency Requirements” (amended 2016) and the Supplementary Standard SB-12 “Energy Efficiency for Housing” (amended 2016). However, requirements found in both SB-10 and SB-12 related to air barriers are equal or less stringent than those of the NBC. Therefore, the NBC will be used to define the requirements for SIGA Majvest® 500 SA. The NBC outlines the requirements of air barriers and air barrier assemblies in Article 5.4.1.2. Air Barrier System Properties, Articles 9.36.2.9 Airtightness and 9.36.2.10 Construction of Air Barrier Details. The building code articles specify the following requirements:

- Air barrier materials must comply with the CAN/ULC-S741, “Air Barrier Materials – Specification” material specification standard. Air barrier materials that comply with CAN/ULC-S741 may be used in all building types.
- Air barrier materials must have an air leakage permeance of less than 0.02 L/s·m² at 75 Pa in accordance with ASTM E2178, “Standard Test Method for Air Permeance of Building Materials”. The ASTM E2178 material test standard results may only be used in lieu of CAN/ULC-S741 when the air barrier material is used in buildings not classified under Part 9 (detached houses and small buildings). The accepted use may however depend on the local Authority Having Jurisdiction’s (AHJ) interpretation of the building code and references.
- Air barrier assemblies must comply with CAN/ULC-S742 “Standard for Air Barrier Assemblies – Specification” and achieve an assembly air leakage rate of less than 0.2 L/s·m² at 75 Pa (Type A4). CAN/ULC-S742 is required for air barrier assemblies used for Part 9 buildings, however ASTM E2357 material testing results may be used instead if the additional conditions outlined below are met.

- Air barrier assemblies must have an air leakage rate of less than 0.2 L/s·m² when tested in accordance with ASTM E2357 “Standard Test Method for Determining Air Leakage of Air Barrier Assemblies”. ASTM E2357 results may only be used if the air barrier is located behind the thermal control layer and the building is not subjected to high wind loads (less than 0.65 kPa for 1 in 50 hourly wind pressures). This applies to Part 9 buildings only.

To perform our technical evaluation, RDH has reviewed third-party testing reports provided by SIGA and compared the results against the minimum prescriptive requirements of the NBC. Table 1 summarizes the material property testing requirements and results.

TABLE 1 - AIR BARRIER MATERIAL PROPERTY REQUIREMENTS & RESULTS			
CAN/ULC-S741 "Standard for Air Barrier Materials – Specification"			NBC 2015 5.4.1.2. (1) (B) 9.36.2.10. (1)
MATERIAL PROPERTY	MATERIAL PROPERTY TEST	MINIMUM REQUIREMENTS	SIGA MAJVEST® 500 SA TESTING RESULTS
Water Vapour Permeance	ASTM E96/E96M – Desiccant Method	Measured	918 ng/(Pa · s · m ²) ¹ (16.1 US Perms)
Air Leakage @75 Pa Infiltration	ASTM E2178	<0.02 L/s · m ² @75 Pa	0.001 L/(s · m ²) ²
Air Leakage @75 Pa Exfiltration	ASTM E2178	<0.02 L/s · m ² @75 Pa	0.001 L/(s · m ²) ²
Air Leakage @ 75 Pa w/ Conditioning* Infiltration	ASTM E2178	<0.02 L/s · m ² @75 Pa and <0.001 L/s · m ² increase from control	0.001 L/(s · m ²) ²
Air Leakage @ 75 Pa w/ Conditioning* Exfiltration	ASTM E2178	<0.02 L/s · m ² @75 Pa and <0.001 L/s · m ² increase from control	0.001 L/(s · m ²) ²
CAN/ULC-S742 "Standard for Air Barrier Assemblies – Specification"			NBC 2015 9.36.2.9 (1) (B)
Air Barrier Assembly Air Leakage	ASTM E2357 w/ Cold Temp. Chamber (-20°C) and After Air Pressure Loading	A1: ≤ 0.05 L/s · m ² @ 75 Pa A2: ≤ 0.10 L/s · m ² @ 75 Pa A3: ≤ 0.15 L/s · m ² @ 75 Pa A4: ≤ 0.20 L/s · m ² @ 75 Pa† A5: ≤ 0.50 L/s · m ² @ 75 Pa	A1: 0.023 L/s · m ² ‡
Wind Pressure Loading	ASTM E2357	No Loss of Structural Integrity	Pass ³
Deflection	ASTM E2357	Measured	Measured ³
* See Appendix B for conditioning regime. † Type A4 is the minimum building code requirement. ‡ Result is the highest reported air leakage rate for all tests. The reported result of 0.023 L/(s·m ²) occurred for the penetrated wall assembly after wind-loading and during cold chamber testing. 1 - CTT Group Report # 5513-004S-1A-en dated November 29 th , 2019. 2 - UL/CLEB Laboratory Inc Report # AS-01161-A dated July 4 th , 2018. 3 - UL/CLEB Laboratory Inc. Report # AS-01161-D dated July 19 th , 2018.			

Based on RDH's review of the provided laboratory testing reports referenced above it is our opinion that SIGA Majvest® 500 SA meets the minimum prescriptive requirements outlined within the NBC and OBC for an air barrier material. It is our opinion, that when SIGA Majvest® 500 SA is used with SIGA accessory tapes (to detail fenestration and penetrations) and when installed according to the manufacturer's installation instructions meets minimum prescriptive requirements as an air barrier system. Refer to the SIGA system guidelines for detailing of fenestration and penetrations. The usage of SIGA Majvest® 500 SA in an air barrier assembly is subject to several conditions as stated within the usage and limitation section.

Sheathing Membrane Material Requirements

The NBC and OBC outline the requirements for sheathing membranes/water-resistive barriers (WRB) in Subsection 9.27.3. Second Plane of Protection, which specifies that sheathing membranes comply with the CAN/CGSB-51.32-M77, “Sheathing, Membrane, Breather Type” standard. In the professional opinion of RDH the current NBC reference standard CAN/CGSB-51.32-M77 is out of date. This is demonstrated by the standard’s withdrawal from service, which indicates the standard is not up-to-date technically or does not represent current materials used within the industry. It should be noted that several modern synthetic sheathing membranes do not comply with the standard. Additionally, the standard does not address self-adhered membranes. However, the standard provides a basis for sheathing membrane material properties as required by the Canadian building codes. These material properties and required minimum values can be found in Appendix A.

As CAN/CGSB-51.32-M77 is withdrawn and there are no up-to-date Canadian material specification standards for sheathing membranes, alternative specification standards are referenced to demonstrate an acceptable level of performance. The ASTM E2556/E2556M, “Standard Specification for Vapour Permeable Flexible Sheet Water-Resistive Barriers Intended for Mechanical Attachment” and the International Code Council’s Evaluation Services Acceptance Criteria 38, “Acceptance Criteria for Water-Resistive Barriers” (ICC-ES AC38) are therefore used as the primary reference material specification standards for this evaluation.

Both standards have similar requirements to CAN/CGSB-51.32-M77 and to the Canadian Construction Material Centre (CCMC) vapour permeable sheathing membrane evaluation criteria. The ICC-ES AC38 is the only specification standard with requirements for self-adhered membranes and is referenced to assess adhesion properties. More detail on the requirements for each specification standard can be found in Appendix A.

The material property requirements for ASTM E2556/E2556M and ICC-ES AC 38 as compared with SIGA’s third party testing are presented in Table 2.

TABLE 2 – SELF-ADHERED WRB MATERIAL PROPERTY REQUIREMENTS & RESULTS			
ASTM E2556/E2556M - “Standard Specification for Vapour Permeable Flexible Sheet Water-Resistive Barriers Intended for Mechanical Attachment”			
MATERIAL PROPERTY	MATERIAL PROPERTY TEST	MINIMUM REQUIREMENTS	SIGA MAJVEST® 500 SA TESTING RESULTS ¹
Tensile Strength	ASTM D882 (Tensile Properties of Thin Plastic Sheets)	≥3.5 N/mm (MD) ≥3.5 N/mm (CD)	6.95 N/mm (MD) 4.81 N/mm (CD)
Tensile Strength w/ Conditioning*	ASTM D882	≥3.5 N/mm (MD) ≥3.5 N/mm (CD)	4.95 N/mm (MD) 4.91 N/mm (CD)
Water Resistance Test	Water Resistance Ponding Test (exceeds 25.4mm water head)	No water shall penetrate in 120 minutes	Pass
Water Resistance Test w/ Conditioning*	Water Resistance Ponding Test	No water shall penetrate in 120 minutes	Pass
Water Vapour Permeance	ASTM E96/E96M (Dry Cup)	≥ 290 ng/(Pa · s · m ²) (5 US Perms)	918 ng/(Pa · s · m ²) (16.1 US Perms)
Water Vapour Permeance w/ Conditioning*	ASTM E96/E96M (Dry Cup)	N/A	955 ng/(Pa · s · m ²) (16.7 US Perms)
Pliability	ASTM E2556/E2556M A1.3 180° bend around 1.6mm mandrel @ 0°C	No cracking	Pass
ICC-ES AC308 - “Acceptance Criteria for Water-Resistive Barriers” ^{**}			
Peel Adhesion @ 23°C	ASTM D3330 - Method F (90° Peel) - Peel Adhesion of Pressure Sensitive Tape	≥ 0.26 N/mm	Majvest® 500 SA - Pass OSB - Pass Plywood - Pass Aluminum - Pass Vinyl - Pass Fiberglass mat-faced gypsum - Pass
Peel Adhesion w/ UV Exposure*	ASTM D3330 - Method F (90° Peel)	≥ 0.26 N/mm	Aluminum - Pass
Peel Adhesion w/ Elevated Temperature*	ASTM D3330 - Method F (90° Peel)	≥ 0.26 N/mm	Aluminum - Pass (Level 3)
Peel Adhesion w/ Thermal Cycling*	ASTM D3330 - Method F (90° Peel)	≥ 0.26 N/mm	Aluminum - Pass
Adhesion after Water Immersion (Control - No Immersion)	ASTM D3330 - Method F (90° Peel) as per AAMA-711 Sect 5.8	≥ 0.26 N/mm	Aluminum - Pass
Adhesion after Water Immersion*	ASTM D3330 - Method F (90° Peel) as per AAMA-711 Sect 5.8	≥ 0.26 N/mm	Aluminum - Pass
Resistance to Peeling from Itself	AAMA-711- Annex 2	Report Only	Peeling noted Exceeds recommended edge curl as defined by AAMA-711
* See Appendix B for conditioning procedures.			
** ICC-ES AC308 references AAMA-711 “Voluntary Specification for Self Adhering Flashing Used for Installation of Exterior Wall Fenestration Products” Sections 5.3,5.4,5.5,5.6,5.8, and 5.9 for defining adhesion requirements.			
1 - Various CTT Group Reports – Contact SIGA for more information.			

It should be noted that based on the material tests performed and the corresponding results, SIGA Majvest® 500 SA qualifies as a Type I membrane as defined by ASTM E2556/E2556M. Further explanation of ASTM E2556/2556M category classifications can be found in the Usage and Limitations Section.

As SIGA Majvest® 500 SA satisfies the physical property criteria set by ASTM E2556/E2556M (Type I), and the adhesion requirements set by ICC-ES AC38; it is in our opinion that SIGA Majvest® 500 SA meets the functional requirements of the NBC 2015 and OBC for use as a self-adhered sheathing membrane.

Usage and Limitations

RDH's evaluation of SIGA Majvest® 500 SA for use as an air barrier membrane and as a self-adhered sheathing membrane are applicable provided that the conditions and limitations set below are followed:

- The use and installation of SIGA Majvest® 500 SA should comply with all applicable building code requirements. SIGA Majvest® 500 SA should be stored, handled, and installed as directed by SIGA in their provided usage instructions. This includes all associated accessories including, but not limited to, sheathing tape, fasteners, sealants, and termination transitions.
 - Air barrier installation should be in accordance with Section 5.4.1 Air Barrier Systems (Part 3 buildings) or Section 9.36.2.9 Airtightness and 9.36.2.10 Construction of Air Barrier Details (Part 9 buildings).
 - Sheathing membrane installation requirements are outlined in Section 9.27.3 Second Plane of Protection (Part 9 buildings). For Part 3 buildings, design professionals will review provided standards against industry requirements.
- Substrates must be adequately prepared and in suitable condition as outlined in SIGA installation documentation. Refer to SIGA documentation for suitable substrates and any additional requirements for specific substrates or conditions. Contact a local SIGA representative for more direction on substrate suitability and material compatibility if not outlined in SIGA documentation.
- Limiting environmental exposure during construction is important to the performance of sheathing membranes as UV radiation can deteriorate many construction materials quickly. SIGA Majvest® 500 SA must be covered from environmental exposure as directed by SIGA.
- When SIGA Majvest® 500 SA material is used as part of an air barrier assembly it must be installed as per the manufacturer recommendations. Only components used as directed by the manufacturer are applicable to the qualification of SIGA Majvest® 500 SA use within an air barrier assembly. Project specific wind loading should be noted and guidance on air pressure limits may be checked with SIGA.
- As defined by ASTM E2556/E2556M, SIGA Majvest® 500 SA qualifies as a Type I WRB. There are two classifications, based on water resistance levels, in ASTM E2556/E2556M, Type I and Type II. Type II provides greater water resistance than Type I. The International Building Code (IBC) limits the usage of Type I membranes

behind stucco and plaster, indicating that two layers of Type I membranes must be used behind stucco or one layer of Type II be used provided a drainage space is provided. There are no qualifications for WRB membranes used behind stucco in the Canadian building codes. However, we do not recommend the use of SIGA Majvest® 500 SA directly behind stucco unless additional protection provisions are made and directly approved by SIGA. Please contact SIGA for additional information.

- When used as a water resistive barrier in a drained and vented wall system (i.e. rainscreen), SIGA Majvest® 500 SA should be installed with a minimum 10-mm air space between the membrane and the cladding.

For more information regarding the physical properties of SIGA Majvest® 500 SA and its installation, storage, accessories, and handling, please contact a local SIGA representative.

Disclaimer

The opinions claimed herein represent RDH Building Science Inc. and are strictly based on the results of third-party testing agencies, defined material specification criteria and Canadian building code prescriptive requirements. This report does not constitute an endorsement of SIGA or SIGA products by RDH. The functional performance requirements of the building codes are based on RDH's interpretations of the reference specification standards and our professional expertise in building enclosure engineering.

RDH cannot be held liable for circumstances arising due to the inadequacy of material specifications and standards.

RDH claims no responsibility for the results reported by the material testing facilities. Nor can RDH be held liable for misuse of the product or problems caused by poor installation, neglect or other person related factors associated with the use of SIGA Majvest® 500 SA.

Conclusion

RDH performed a review of the NBC and OBC for prescriptive and functional requirements as related to the use of SIGA Majvest® 500 SA as an air barrier material and as a self-adhered sheathing membrane/water resistive barrier. In the opinion of RDH, SIGA Majvest® 500 SA's physical properties, as tested by third party agencies, satisfies the performance requirements for both roles, provided the terms in the Usage and Limitations are heeded.

Yours truly,



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Appendix A

Specification Standards Requirement Summary

ASTM E2556/E2556M - Standard Specification for Vapour Permeable Flexible Sheet Water-Resistive Barriers Intended for Mechanical Attachment

The American Society for Testing and Materials (ASTM) is a leading standards organization that develop both material specifications and standardized testing procedures for a wide variety of materials and products.

ASTM E2556/E2556M - MATERIAL PROPERTY REQUIREMENTS		
MATERIAL PROPERTY	MATERIAL PROPERTY TEST	MINIMUM REQUIREMENTS
Tensile Strength (Unconditioned and Conditioned)	ASTM D828 – Tensile Properties of Paper and Paperboard ASTM D882 – Tensile Properties of Thin Plastic Sheets	≥ 3.5 N/mm (MD) ≥ 3.5 N/mm (CD)
	ASTM D5034 – Breaking Strength and Elongation of Textile Fabrics	≥ 7.0 N/mm (MD) ≥ 6.1 N/mm (CD)
Pliability	Bend around 1.6 mm mandrel @ 0°C	No cracking
Water Penetration Resistance (Unconditioned and Conditioned)	ASTM D779 – Water Vapour Resistance of Sheet Materials in Contact with Liquid Water by Dry Indicator Method	≥10 minutes w/ no water permeation (Type I) ≥60 minutes w/ no water permeation (Type II)
	CCMC 07102 – Water Ponding Test 25 mm of water head for 2 hours	No water leakage for 2-hour time period (Type I)
	AATCC-127 – Water Column Testing	No water leakage for 5-hours w/ 55cm water column head (Type II)
Water Vapour Transmission	ASTM E96/E96M – Test Method for Water Vapour Transmission of Materials	≥ 290 ng/(Pa · s · m ²) (5 US Perms)

Note: Where multiple material property tests are indicated for a material property only one of the property tests need to be satisfied.

International Code Council Evaluation Services – AC 38

The International Code Council’s Evaluation Service is a subsidiary of the International Code Council. This organization evaluates construction materials for code compliance with the model building codes (IBC and IRC) authored by the same organization. The ICC-ES Acceptance Criteria for Water-resistive Barriers (AC 38) evaluates water-resistive barriers or sheathing membranes. The specification includes additional optional material property tests however only relevant tests are shown here.

ICC-ES AC38 - MATERIAL PROPERTY REQUIREMENTS		
MATERIAL PROPERTY	MATERIAL PROPERTY TEST	MINIMUM REQUIREMENTS
Tensile Strength (Unconditioned and Conditioned)	ASTM D828 – Tensile Properties of Paper and Paperboard ASTM D882 – Tensile Properties of Thin Plastic Sheets	≥ 3.5 N/mm (MD) ≥ 3.5 N/mm (CD)
	ASTM D5034 – Breaking Strength and Elongation of Textile Fabrics	≥ 7.0 N/mm (MD) ≥ 6.1 N/mm (CD)
Pliability	Bend around 1.6 mm mandrel @ 0°C	No cracking
Water Penetration Resistance (Unconditioned and Conditioned)	ASTM D779 – Water Vapour Resistance of Sheet Materials in Contact with Liquid Water by Dry Indicator Method	≥10 minutes w/ no water permeation
	CCMC 07102 – Water Ponding Test (30.5 mm of water head for 2 hours)	No water leakage for 2-hour time-period
	AATCC-127 – Water Column Testing	No water leakage for five hours w/ 55cm water column head
Water Vapour Transmission	ASTM E96/E96M – Test Method for Water Vapour Transmission of Materials	≥35 grams/m ² per 24 hours
Adhesion Requirements	AAMA-711 “Voluntary Specification for Self Adhering Flashing Used for Installation of Exterior Wall Fenestration Products” Sections 5.3,5.4,5.5,5.6,5.8, and 5.9	See AAMA-711 Section 6.0 for minimum requirements

Note: Where multiple material property tests are indicated for a material property only one of the property tests need to be satisfied.

CAN/CGSB-51.32-M77 – “Sheathing, Membrane, Breather Type”

The Canadian General Standards Board (CGSB) is a federal government organization that provides standard developments and offers conformity assessment services for a wide variety of industries. It should be noted that this material specification standard is currently withdrawn from service.

CAN/CGSB-51.32-M77- MATERIAL PROPERTY REQUIREMENTS		
MATERIAL PROPERTY	MATERIAL PROPERTY TEST	MINIMUM REQUIREMENTS
Sheet Width	N/A	As specified to a tolerance of 6mm
Tensile Strength	ASTM D828 (Tensile Properties of Paper Materials)	≥ 3.5 N/mm (MD)
Pliability	90° bend around 15mm mandrel @ -10°C	No cracking
Water Vapour Permeance	ASTM E96/E96M (Desiccant Method)	≥ 170 ng/(Pa · s · m ²) (2.97 US Perms) and ≤ 1400 ng/(Pa · s · m ²) (24.5 US Perms)
Water Vapour Permeance w/ Conditioning*	ASTM E96/E96M (Desiccant Method)	< 2900 ng/(Pa · s · m ²) (50.7 US Perms)

Canadian Construction Material Centre (CCMC) Vapour Permeable Sheathing Membrane Evaluation.

CCMC is a branch of the National Research Council (NRC) of Canada that evaluates building materials. CCMC issues reports based on their judgement if materials meet minimum code compliance under the National Building Code. In conjunction with this service, CCMC has created several technical evaluation reports for common materials including vapour permeable sheathing membranes. The material testing standards used by CCMC are not included as the exact testing methodology for CCMC evaluations is propriety and unknown. However, the minimum requirements for each tested property are included in CCMC evaluation reports for individual products.

CCMC EVALUATION - MATERIAL PROPERTY REQUIREMENTS	
MATERIAL PROPERTY	MINIMUM REQUIREMENTS
Sheet Width	As specified to a tolerance of 6mm
Tensile Strength	≥ 3.5 N/mm
Tensile Strength w/ UV Exposure	>90% of original strength
Tensile Strength w/ UV Exposure and Heat Aging	>85% of original strength
Water Vapour Permeance	>170 ng/(Pa · s · m ²) (2.97 US Perms)
Water Vapour Permeance w/ UV Exposure and Heat Aging	>170 ng/(Pa · s · m ²) (2.97 US Perms)
Water Ponding	No water leakage for 2-hour time period
Water Ponding w/ UV Exposure and Heat Aged Samples	No water leakage for 2-hour time period

Appendix B

Conditioning Procedures

Conditioning Procedures

CAN/CGSB-51.32-M77 – “Sheathing, Membrane, Breather Type”

CAN/CGSB-51.32-M77 requires heating for 3 hours at $65\pm 2^{\circ}\text{C}$ then soaking in $23\pm 2^{\circ}\text{C}$ distilled water for 3 hours, followed by cold conditioning at $-10\pm 2^{\circ}\text{C}$ for 18 hours. Specimens are conditioned this way for 25 cycles.

ASTM E2556/E2556M – “Standard Specification for Vapor Permeable Flexible Sheet Water-Resistive Barriers Intended for Mechanical Attachment”

ASTM E2556/E2556M conditioning procedures require UV conditioning followed by exposure to 25 cycles of drying and wetting. The UV conditioning includes exposing samples to UV as per ASTM G-154 - Cycle 1 for a duration of 2 weeks (336 h). The wetting and drying cycles include oven drying samples at 49°C for 3 hours, followed by immersion in room temperature water ($23.8\pm 2.8^{\circ}\text{C}$) for 3 hours. Samples are then removed from water and air-dried for 18 hours at $23.8\pm 2.8^{\circ}\text{C}$.

ICC-ES AC38 – “Acceptance Criteria for Water-Resistive Barriers”

ICC-ES AC38 requires similar conditioning to ASTM E2556/E2556M. The only difference between the conditioning requirements is the specification for UV exposure. AC38 requires UV exposure be supplied by GE Type H275 RUV (275 W) or equivalent bulbs providing UV characteristics of $5.0 \text{ W/m}^2/\text{nm}$ irradiance at a wave length of 315 to 400nm at 1 meter. Samples shall be exposed for 210 hours (10 hours per day for 21 days) at a temperature between 57°C and 60°C . The wetting and drying cycles are the same as ASTM E2556/E2556M.

CCMC 07102 - “Technical Evaluation of Sheathing Membranes”

CCMC requires both UV exposure and heat aging. CCMC evaluation of permeable sheathing membranes is proprietary and the exact methodology for UV exposure and heat aging is unknown.

CAN/ULC-S741- “Standard for Air Barrier Materials – Specification”

CAN/ULC-S741 conditioning includes UV exposure followed by extended heat exposure. UV exposure includes 210 hours (10 hr for 21 days) of UV radiation according to ASTM G-154. Heat exposure includes placing the specimens in an air circulation oven for either 772 hours at $50\pm 2^{\circ}\text{C}$ for non-accessible air barrier material or 336 hours at $50\pm 2^{\circ}\text{C}$ for accessible air barrier materials.

Self-Adhered Flashing Membrane Conditioning Procedures (AAMA-711)

UV Exposure

The specimens are individually prepared and then exposed to UV radiation in accordance with ASTM G-154 Cycle I for 336 hours prior to peel adhesion tests.

Elevated Temperature Exposure

The specimens are individually prepared and then exposed to 80°C for seven consecutive days prior to repeated peel adhesion tests. This equates to Level 3 conditioning as defined in AAMA-711.

Thermal Cycling

The specimens are individually prepared and then exposed to 50°C for eight hours and then cooled at -40°C for 16 hours. This cycle is repeated ten times prior to repeated peel adhesion tests.

Water Immersion

The specimens are individually prepared, and half of the specimen length is tested in peel adhesion at standard temperatures. The remaining half length of the specimens are submerged in room temperature distilled water for seven days. Conditioned specimens are removed from water and blotted dry. Repeated peel adhesion testing occurred on remaining tape.