

**PART 1 - GENERAL**

**1.1 Section Includes**

- 1.1.1 Materials and installation methods required for installation of the primary air barrier material.

**1.2 References**

- 1.2.1 CAN/ULC-S705.1-98 (replaces CAN/CGSB-51.23-92): Standard for Thermal Insulation – Spray-Applied Rigid Polyurethane Foam, Medium Density, Material Specification
- 1.2.2 CAN/ULC-S705.2-98 (replaces CAN/CGSB-51.39-92): Standard for Thermal Insulation - Spray-Applied Rigid Polyurethane Foam, Medium Density, Installer’s Responsibilities-Specification
- 1.2.3 CCMC 12877-R – Evaluation of BASF WALLTITE as an air barrier material.

**1.3 Related Sections**

- 1.3.1 Masonry Wall construction - Section 04050
- 1.3.2 Insulation – Section 7213
- 1.3.3 Fire Stopping – Section xxxx
- 1.3.4 Roofing – Section 07500
- 1.3.5 Sealants – Section 07900
- 1.3.6 Door Frames – Section xxxx
- 1.3.7 Window Frames – Section xxxx
- 1.3.8 Gypsum Board – Section xxxx
- 1.3.9 Other – Section xxxxx

**1.4 Test Results**

- 1.4.1 Submit the following prior to commencing the work:
  - 1.4.1.1 Test reports verifying that qualities of insulation meet or exceed requirements of this specification, in accordance with Section 1400 – quality control
  - 1.4.1.2 Name of installer complete with proof (certification card) that installer is licensed or approved by the Quality and Training Program – Raising Performance To New Heights® by BASF and certified by Morrison Hershfield, to perform the installation of WALLTITE.

**1.5 Mock Ups**

- 1.5.1 Create samples that are in compliance with section 01340 (shop drawings, data sheets, and samples).
- 1.5.2 Create a sample of 5m<sup>2</sup> (54 sq.ft.) minimum, showing both inner and outer corners. This sample may be part of the completed structure.
- 1.5.3 Using the polyurethane foam insulation sample that was sprayed in place, make the necessary tests as per the Standard CAN/ULC-S705.2-98 and ensure results are in compliance. Enter the results in the daily report, under the Quality and Training Program – Raising Performance To New Heights from BASF Canada and certified by Morrison Hershfield.

**1.6 Protective Measures**

- 1.6.1 Ensure the work area is adequately ventilated, in compliance with requirements set out in section 01500 (temporary installations).
- 1.6.2 Ensure continuous and proper ventilation of the work area, through a fresh air intake and the extraction of foul air, during the course of the application process and for 24 hours thereafter.
- 1.6.3 When necessary, install temporary partitions in order to prevent any over spray outside of the work area from the sprayed on insulation material.
- 1.6.4 Ensure all structures are well protected, in accordance with the manufacturer's recommendations.
- 1.6.5 Protect all adjacent surfaces and equipment against any damage that may be caused by dispersion and over spray of insulation material beyond prescribed limits.
- 1.6.6 When cleaning equipment, it should be performed in areas designated for this purpose, and the contents of the empty containers neutralized according to the procedure established by the CAN/ULC-S705.2-98.

**1.7 Delivery, Storage & Handling**

- 1.7.1 All materials should be delivered and stored in their original packaging bearing the manufacturer's name, quantity, CCMC numbers, and other appropriate technical indicators or references. The production and expiry date must also appear on the containers as requested by the Standard CAN/ULC-S705.1-98.

**1.8 Quality Assurance**

- 1.8.1 Personnel licensed or approved by the Quality and Training Program – Raising Performance To New Heights by BASF and certified by Morrison Hershfield must apply the insulating material. These certified individuals must have their certification cards in their possession and available for presentation upon request. The certification cards must have the following: Level 1 (basic), Level 2 (Superior) or Foam Masters (Elite Level) for the polyurethane foam application.
- 1.8.2 A copy of the BASF Technical manual for the application of sprayed on polyurethane foam must be kept on site. In cases of transition membrane installation, a copy of the manufacturer's installation manual or guide is required.
- 1.8.3 Tests on the spray polyurethane must be conducted daily as per the Standard CAN/ULC-S705.2-98 and ensure results are in compliance. Enter the results in the daily report under the Quality and Training Program – Raising Performance To New Heights from BASF Canada and certified by Morrison Hershfield.
- 1.8.4 On request, submit a copy of all completed forms to the Consultant prior to making application for payment.
- 1.8.5 Allow access to the job site to any BASF representative and / or Morrison Hershfield for the purpose of technical assistance, verification of operator certification or for a review under the Quality and Training Program – Raising Performance To New Heights as requested in the specification.

**1.9 Environmental Requirements**

- 1.9.1 Apply insulating material only if the surface and ambient air temperatures are within the manufacturer's prescribed limits, i.e., -10°C to +40°C (+14°F to +104°F).
- 1.9.2 Comply with requirements regarding use, handling, storage, and disposal of chemical materials; and regarding labelling and provision of material safety data sheets acceptable to Labour Canada.

### 1.10 Surface Preparation

- 1.10.1 Surfaces must be clean and dry, as required by CAN/ULC-S705.2-98. The substrate must be free of all frost, dust, oil, grease, oxidization, or any other element that may affect adhesion of the system i.e. high moisture content.
- 1.10.2 Metallic surfaces should be checked to ensure no oxidization has occurred. Use of a primer is strongly recommended. Refer to the BASF Technical manual.
- 1.10.3 All transition membranes must be installed prior to application of the polyurethane foam. Transition membranes must be as listed in BASF technical manual. Contact BASF if other membranes are to be utilized. These membranes must be installed in accordance with the manufacturer's recommendations. Adhesion of the membranes material to the substrate must be sufficient to resist the stress applied by the polyurethane foam during the curing time. Refer to the BASF Technical manual.
- 1.10.4 All of the following stages must be completed prior to application of the WALLTITE insulating foam:
  - 1.10.4.1 Installation of masonry anchoring system
  - 1.10.4.2 Installation of wood blocking required at all openings
  - 1.10.4.3 Installation of any electrical or mechanical penetrations
  - 1.10.4.4 Air/vapour barrier transition membranes
  - 1.10.4.5 Sub-girt clip angles and sub-girt framing angle for exterior cladding
  - 1.10.4.6 Adjacent areas have been protected via drop sheets or polyethylene masking

### 1.11 Conditions of Use

- 1.11.1 Follow the manufacturer's written instructions when spraying the polyurethane foam (refer to BASF's technical data sheet and the Technical manual, WALLTITE application guide section).
- 1.11.2 The manufacturer's recommendations should be followed with regard to outside air temperature and substrate conditions –10°C to +40°C (+14°F to +104°F).

## **PART 2 - MATERIALS:**

2.1 Polyurethane Foam: a spray polyurethane foam listed under CAN/ULC-S705.1-98, with CCMC #12840-R for insulation and #12877-R for use as an air barrier material, according to CCMC technical guide: Air Barrier System for exterior walls of low-rise buildings, Master Format Section: 07272, with the following physical properties:

- Density (ASTM D-1622) minimum = 30.4 kg/m<sup>3</sup> (1.9 lb/ft.<sup>3</sup>)
- Compressive strength (ASTM D-1621), parallel to rise (10% compression) = 222 kPa (32 psi)
- Tensile strength (ASTM D-1623) = 337 kPa (49 psi)
- Open cell content (ASTM D-2856) = <1%
- Water absorption (ASTM D-2842) % by volume = 2.5%
- Dimensional stability (ASTM D-2126), % volume change after 28 days:
  - 20°C (-4°F) = 0.047%
  - +100°C (212°F) = 8.45%
  - +70°C (158°F) with relative humidity >90±3% = 7.64%
- Thermal resistance approved by the Standard CAN/ULC-S705.1-98
- Water vapour permeance (ASTM E-96), without the skins, core only = 125 ng/Pa.s.m<sup>2</sup>
- Flame spread classification (CAN/ULC-S102, including S127) = 375
- Smoke determined = 288
- VOC results during the curing period were below the detectable limit after 24 hrs

- Eco-efficiency analysis for the evaluation of the insulation / air barrier system
  - Polyurethane durability test of appendix D of the CCMC Technical Guide for Air Barrier Systems for Exterior Walls of Low-Rise Buildings, that specifies the two following limiting criteria:
    - Air permeance test after weathering and heat aging – Requirements: =110% of original value;
    - Thermal resistance after heat aging of weathered samples – Requirements: 90% retention from original value.
  - Product reference: WALLTITE by BASF – The Chemical Company
- 2.2 Primers: as recommended in the BASF Technical Manual, taking into account the type and condition of work surfaces.

**Specification Note: The following sections may be added IF required by local jurisdiction**

The following paragraph 2.3 and 2.4 may be used for reference only. We recommend that you have the information below checked for compliance with the Standards set out in the National Building Code applicable in your Province as well as those established by your local authorities. Paragraphs 2.5, 2.6, 2.7 and 2.8 are provided for informational purposes only and are without representation or warranty, expressed or implied. The warranty on these products should come from the manufacturers of these products.

- 2.3 Horizontal fire stopping: A preformed angle comprising at least 1.2 mm (18 ga) of steel core zinc coating, as stipulated in ASTM A 525 (galvanized steel G-90). Dimensions should be sufficient to allow the horizontal section to extend beyond the outside polyurethane foam surface in order that a 50% compressed mineral fibre fire stop can be installed in the remaining space.
- 2.4 Vertical fire stopping: A preformed angle comprising at least 0.38 mm (28 ga) of steel core zinc coating, as stipulated in ASTM A 525 (galvanized steel G-90). Dimensions should be sufficient to allow the section perpendicular to the substrate to extend beyond the outside polyurethane foam surface for the full depth of the cavity in order to close off the cavity. Sheet steel fire stop angles corners should be mechanically attached to the substrate at 200 mm (8 inches) OC.
- 2.5 Transition Membrane Self Adhering: SBS modified bitumen, self-adhering sheet membrane complete with a cross-laminated polyethylene film, and having the following physical properties:
- 2.5.1 Thickness: 1.0mm (40mils) min.
  - 2.5.2 Air Leakage (ASTM E283-91): 0.0003 L/s.m<sup>2</sup>@ 75 Pa
  - 2.5.3 Vapour Permeance (ASTM E96): 1.6 ng/Pa.s.m<sup>2</sup> (.03 Perms)
  - 2.5.4 Low Temperature Flexibility (CGSB 37-GP-56M): -30°C
  - 2.5.5 Elongation (ASTM D412-modified): 40MPa
- Acceptable material: Blueskin® SA as manufactured by Bakor or other material as accepted by BASF. Refer to the BASF Technical manual.
- 2.6 Through-wall flashing membrane (Self-Adhering): SBS modified bitumen, self-adhering sheet membrane complete with a cross-laminated polyethylene film, having the following physical properties:
- 2.6.1 Thickness: 1.0 mm (40 mils) min.
  - 2.6.2 Film Thickness: 0.225mm ( 9.0 mils)
  - 2.6.3 Elongation: 200% to ASTM D412;
  - 2.6.4 Tensile Strength (film): 34500 kPa (5000 psi) to ASTN D882
  - 2.6.5 Vapour permeance: 1.6 ng/Pa.m<sup>2</sup>.s (0.03 perms) to ASTM E96;
  - 2.6.6 Low temperature flexibility: -30°C to CGSB 37-GP-56M;
- Acceptable material: Blueskin TWF as manufactured by Bakor.

2.7 Through-wall flashing and damp proof coursing mastic: Synthetic asphalt/rubber base compound having the following characteristics:

2.7.1 Compatible with air/vapour barrier membrane, substrate and insulation materials,

- Acceptable material: Polybitume® – 570-05 Rubberized Mastic as manufactured by Bakor.

2.8 Primer for self-adhering membranes: Synthetic rubber based adhesive type, quick setting, having the following physical properties:

2.8.1 Colour: Blue;

2.8.2 Weight:  $\pm 0.8$  kg/l;

2.8.3 Solids by weight: 35%;

2.8.4 Drying time (initial set): 30 minutes;

- Acceptable material: Blueskin Primer as manufactured by Bakor.

### **PART 3 - EXECUTION**

- 3.1 All excessively wide joints should be covered or filled before applying the polyurethane foam.
- 3.2 Install transition membranes in all places recommended in section 3 of BASF's technical manual.
- 3.3 Install a bituminous polymer based caulking strip sealant i.e. BAKOR 570-05 at outside edge of the transition membrane installed horizontally on the concrete wall foundation. Refer to section 3, drawings # TD 3B, 3D, and 4B, in BASF's technical product documentation.
- 3.4 At all openings, install a compressible foam pressure gasket and than Compressible foam pressure gasket, in all openings TREMCO Dy Monic sealant. Refer to section 3, drawings # TD 3B, 3D, and 4B, in BASF's technical product documentation.
- 3.5 Polyurethane foam when used for insulation purpose, should be sprayed as per the Standard CAN/ULC-S705.2-98 with a tolerance of +6 / -0 mm (+1/4 / -0 inch) in relation to the specified thickness.
- 3.6 Avoid the formation of sub-layer air pockets when applying.
- 3.7 Avoid spraying the foam on any surfaces other than those indicated. Use drop sheets or masking tape to protect other surfaces.
- 3.8 Once the foam has hardened, remove all over spray from non-prescribed surfaces.
- 3.9 Do not allow polyurethane foam once applied, to be damaged during work by other trades.
- 3.9 Ensure the subsequent coverage of the applied insulating foam will be completed within the manufacturer's prescribed time frame (refer to BASF's technical data sheet or Technical manual).
- 3.10 Spray the polyurethane foam in overlapping layers, so as to obtain a smooth, uniform surface.
- 3.11 Do not spray polyurethane foam any closer than 75 mm (3" ) from chimneys, heating vents, steam pipes, recessed lighting fixtures, and other heat sources. Do not spray the interior of any exit openings or electrical junction boxes (refer to the BASF Technical manual).
- 3.12 In temperatures below +10°C (+50°F) use transition membranes specifically formulated for low temperature application with the proper primer. Adhesion tests must be conducted. Refer to the BASF Technical manual. If no proper adhesion, then secure the membranes mechanically. Refer to the membrane's manufacturer.
- 3.13 All mechanical fixtures should be covered with polyurethane foam in order to reduce thermal bridging.