

## Recommendations Regarding Built-Up Roofing Asphalt

*Revised February 2024*

Built-Up Roofing (BUR) membranes have been in use in North America for more than 100 years. BUR systems predominately consist of alternating layers of asphalt (bitumen) and fiberglass ply felts that create a very durable water-resistant membrane. The number of plies within a cross-section of the system will denote the type of system. “Three or four plies with a flood coat of asphalt and gravel” is a common phrase used to describe a BUR system.

Traditional Built-Up Roofing Asphalt (BURA) is manufactured via the oxidation of soft asphalt ‘fluxes’ to harder grades that meet various technical specifications. In the United States, BURA should meet the current version of ASTM D312, and in Canada, the current CSA A123.4 standard. The asphalt producer should provide certification of the asphalt provided upon request. ASTM D312 defines four types of roofing BURA (Types I, II, III, and IV), and CSA A123.4 defines three types (Types I, II, and III); considerations affecting the proper type of asphalt for a particular job include roof slope, environmental conditions, local roofing codes and practices, and the type of construction on which the roof membrane will be applied. Consult the roofing manufacturer and/or roof system specifier regarding proper asphalt type.

Temperature control is a critical objective on every hot asphalt roofing project. Excessive heating can cause degradation of the asphalt (particularly in hot asphalt tankers, where the asphalt can often be kept at elevated temperatures for longer duration), significantly increase worker exposure to fumes, and create kettle fire and explosion hazards. Asphalt should always be used at the lowest practicable temperature, given the specific application.

The proper temperature for BURA application is the equiviscous temperature (EVT), plus or minus 25°F (13°C). Studies have shown that the application of BURA at its EVT range typically yields the optimum mass of asphalt between the BUR plies. On a job, the EVT is measured in the mop cart, bucket, or mechanical spreader just prior to application to the substrate. ASTM D312 requires lot-specific EVT's for both mop and mechanical spreader application to be indicated on each carton/package of asphalt or bill of lading. Application temperature at the point of ply felt contact may also be impacted by ambient conditions but should not deviate from the EVT by more than 25°F (13°C). ASTM D312 specifies maximum EVT's for Type III and IV BURA to help prevent overheating.

ASTM D312 specifies a maximum kettle temperature of 550°F (288°C). Kettle temperatures should be kept as far below this maximum temperature as possible while maintaining a

temperature within the EVT range at the point of application. Some recommendations to help minimize heat loss between the kettle and the roof include the following:

- Minimize the distance between the kettle or tanker and the point of application on the roof.
- Use insulated kettles with capacities appropriate to the job and high pumping rates to deliver the hot material as quickly as possible.
- Insulate the hot pipe and use insulated rooftop containers (luggers, reservoirs on mechanical applicators, mop carts, buckets).
- Keep the lids of rooftop containers closed except when necessary to fill them.

The ASTM D312 maximum kettle temperature of 550°F (288°C) is critically linked to the minimum flashpoint of 575°F (302°C) specified in the standard. When using BURA reporting flashpoints below 575°F (302°C) (for example, under the CSA standard, asphalts may have flashpoints as low as 518°F (270°C)), the kettle temperature must remain at least 25°F (13°C) below the flashpoint at all times. Additionally, it is good practice to limit the heating and storage of asphalts at 500°F (260°C) or higher to less than 4 hours. All temperatures should be measured with properly maintained and calibrated devices once the asphalt and kettle have reached a steady state temperature and the asphalt has been skimmed if needed. If a thermocouple or thermometer is used, it should be inserted into the asphalt until a constant temperature is achieved. If an infrared gun is used, follow the equipment instructions for distance and point it at a freshly disrupted asphalt surface to get the best possible reading.

All practical measures to reduce worker exposure to asphalt fumes should be used on every BURA job. Some BURA asphalts are available as “low odor” products. In addition to good temperature management practices, as discussed above, a number of work practices, equipment controls, and innovative products are available. Information on these exposure control measures is available from ARMA.<sup>1</sup>

Follow manufacturer recommendations for storage of packaged and bulk asphalt. Prior to use, BURA packaged in traditional cardboard cartons should be stored in a way that protects them from weather, debris, and sunlight and that prevents cold flow of the asphalt from fallen cartons

---

<sup>1</sup> For more information on this topic, consult the ARMA & NRCA fact sheet, *Some Questions And Answers About Short-Term Non-Occupational Exposures To Asphalt Fumes Created During Roofing Jobs*.

or excessive material stacking. They should be stored in an upright position, single or double-stacked, and protected from moisture and adverse weather conditions that could degrade the packaging or product. In some markets, BURA is also available in a plastic-wrapped package, sometimes referred to as ‘melt packs,’ which may have different storage and handling requirements (confirm with the manufacturer/supplier). Application will be affected by surface and air temperature, wind conditions, as well as other environmental factors. For interplay mopping and flood coating, follow the directions of the roofing manufacturer.

BURA is also widely used in the application of modified bitumen (MB) membranes. The asphalt application temperatures may differ from traditional BUR installations – confirm with the MB membrane manufacturer for recommendations regarding hot asphalt use with MB roof systems. For additional information, see the ARMA Modified Bitumen Design Guide for Building Owners.

All of the foregoing discussions concerned traditional BURA manufactured by an oxidation process. BUR and MB systems can also use polymer-modified ‘rubberized’ asphalt as the hot asphalt component. A typical polymer used is SEBS (styrene ethylene butadiene styrene), and the SEBS BURA should conform to ASTM D6152. Storage, handling, heating, and use practices for SEBS-modified BURA will vary from conventional oxidized BURA. Consult and follow the asphalt supplier’s recommendations.

For additional information and guidance, contact ARMA or the asphalt supplier.

**WARNING:** Because it is dangerous to walk, climb, or work on a roof, ARMA recommends that only trained professionals engage in such activity. If you choose to do so, exercise extreme care, comply with all government safety regulations, and follow all safety work practices, precautions, and procedures, including but not limited to manufacturer’s instructions, labels, and warnings.

**DISCLAIMER OF LIABILITY:** This document was prepared by the Asphalt Roofing Manufacturers Association and is disseminated for informational purposes only. Nothing contained herein is intended to revoke or change the requirements or specifications of the individual roofing material manufacturers or local, state and federal building officials that have jurisdiction in your area. Any question, or inquiry, as to the requirements or specifications of a manufacturer, should be directed to the roofing manufacturer concerned. **THE USER IS RESPONSIBLE FOR ASSURING COMPLIANCE WITH ALL APPLICABLE LAWS AND REGULATIONS.**

Nothing contained herein shall be interpreted as a warranty by ARMA, either express or implied, including but not limited to the implied warranties of merchantability, fitness for a particular purpose or non-infringement. **IN NO EVENT SHALL ARMA BE LIABLE FOR ANY DAMAGES WHATSOEVER,** including special, indirect, consequential or incidental damages or damages for loss of profits, revenue, use or data, whether claimed in contract, tort or otherwise. Where exclusion of implied warranties is not allowed, ARMA’s liability shall be limited to the minimum scope and period permitted by law.