



technical bulletin

Asphalt Roofing Manufacturers Association

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Recommendations Regarding Built-Up Roofing Asphalt

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.

Built-Up Roofing Asphalt (BURA) is manufactured to meet various technical specifications. In the United States, BURA should meet the current version of ASTM D312, and in Canada, the current CSA 123.4 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); 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 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, 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. 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 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. ASTM D312 specifies maximum EVT's for Type III and IV BURA to help prevent overheating. In the case of modified bitumen systems applied using hot asphalt, consult manufacturer recommendations on proper application temperatures.

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 with 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
- For additional information and guidance, contact ARMA

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 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 exposures to asphalt fumes should be used on every BURA job. 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.¹

Follow manufacturer recommendations for storage of packaged and bulk asphalt. Prior to use, 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 or excessive material stacking. Asphalt kegs 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. 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.

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¹ 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*.