

## Low-Slope Asphalt Roofing Recycling

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### **What is low-slope asphalt roofing?**

Many commercial and industrial buildings in North America are covered with durable asphalt roofing membranes: either traditional multi-layer built-up roof assemblies (BUR) or modified bitumen roof membranes (MB), which are typically installed with two plies. Although low-slope asphalt roof membranes provide a very long service life, at some point they will need to be replaced. When removed, the asphalt and components can be recycled or re-purposed to avoid ending up in landfills.

### **What are the components of low-slope asphalt roofing materials?**

Built-up roofing is usually made with oxidized asphalt similar to the asphalt used to manufacture shingles. Modified bitumen roofing materials are manufactured using a softer grade of asphalt modified with a polymer. Both BUR and MB roofing systems generally contain more asphalt than asphalt shingles. Low-slope asphalt roofing materials are made using two primary types of reinforcements: fiberglass mat and/or polyester fabric.

### **What are the benefits of recycling low-slope asphalt roofing?**

The primary benefit of recycling low-slope asphalt roofing is that the material contains a relatively large percentage of asphalt, a high-value raw material. This recycled asphalt is particularly useful in road construction, where asphalt binder is a significant cost component. Aside from the economic benefit, some asphalt pavement specifications prescribe polymer modification as a way to enhance pavement durability and mitigate fracture and rutting issues. Building owners would benefit by avoiding roof removal disposal costs. Low-slope asphalt roof recycling can create jobs for recycling locations, reduce costs for paving or other uses, and allow building owners to make a positive environmental contribution.

### **What is the status of low-slope asphalt roofing recycling?**

Low-slope asphalt roofing recycling is currently not prevalent in North America but is more established in Europe. Initially, low-slope products there were recycled into roads, an excellent option given the high asphalt and moderate mineral content. Some European roofing manufacturers have developed other methods that provide product circularity, or the recycling of 'old' asphalt roofing into new MB roofing products.

### **What are the challenges to recycling or re-purposing low-slope asphalt roofing material?**

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Unlike asphalt shingles, BUR and MB roofing assemblies exist in a wide range of system configurations. Some are mechanically attached to the substrate, some are fully embedded in asphalt or otherwise solidly fused together, and various insulations and coverboards could be used beneath the membrane itself. An asphalt membrane is one contiguous material over possibly many hundreds of square feet.

In the roof replacement process, low-slope roof membranes are routinely separated during removal into manageable pieces; the entire roof is not removed in one huge sheet. Those pieces are disposed of in a dump truck or in dumpsters along with all the other roofing components such as fasteners and insulation. For the BUR and MB materials to be recycled, contractors would need to exercise care with material separation, with the high-value asphalt membrane pieces being sent to a separate disposal container.

Once received at the recycling facility, materials are typically collected in a staging pile prior to further processing. The large low-slope pieces may require a few size reduction steps to achieve the ‘finished’ particulate sizing needed for use in pavement or other end uses. The relative softness of the polymer-modified asphalt in MB waste roofing can require processing at lower temperatures or in smaller batches to avoid gumming up the size-reduction equipment. Processing MB pieces in conjunction with relatively harder asphalt shingles can also aid in process efficiency.

### **What other options might be available for recycling low-slope asphalt roofing besides its use in pavement?**

In addition to use in pavement, waste BUR and MB membranes have the potential to be used as:

- an ingredient in cold patch formulations designed for pothole repair,
- an additive in the manufacture of new roll roofing products,
- aggregate for the base layer in road construction, and
- a dust-suppression road covering for gravel/dirt utility roads.

### **How can professional roofing contractors and recyclers help in the recycling process?**

Recyclers could align themselves with roofing manufacturers and local commercial roofing contractors to determine the supply availability of low-slope asphalt roofing materials. Professional contractors can help by separating the asphalt roof components from other removed roof debris. Contractors could also promote the recycling option to building owners when discussing roof replacement, thus working together to make an informed decision regarding tear-off material diversion from landfills.



# TECHNICAL BULLETIN

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