




technical bulletin

**Asphalt Roofing
Manufacturers Association**

4041 Powder Mill Road, Suite 404
Calverton, Maryland 20705-3106
Tel: (301) 348-2002 • Fax: (301) 348-2020

The Effects of Greases, Oils, and Chemicals on Modified Bitumen Sheet Materials

Introduction

Roofing systems are intended to provide protection from natural elements such as rain, snow, hail and  sleet. Systems which are properly designed, installed and maintained should provide the user with satisfactory protection from these elements. Some roofing systems, especially those of factories, restaurants and fast food chains, require special care in design due to the presence of greases, oils, bacteria and/or other agents that tend to adversely affect the integrity of the roof membrane. Based upon the number and type of contaminants present, the specifier must select the type of roofing system that will best satisfy all performance requirements. This document is intended to aid the specifier by highlighting the effects various contaminants may have on polymer modified bitumen membranes.

Effects of Oils and Greases

Modified bitumen roofing membranes can be adversely affected by exposure to cooking oils (animal or vegetable) and greases. Membrane degradation typically occurs around exhaust vents, where the roofing membrane has repeated contact with these contaminants. The organic substances contained within the above contaminants typically weaken and eventually break down the polymer/bitumen structure, causing premature degradation of the roof.

Effects of Bacteria and Fungi

Cases of modified bitumen membrane decay, due to bacteria, have been reported by factories producing foods, such as potato pulp and dry milk. The deterioration, which usually starts as “mud cracking,” may ultimately lead to the total decay of the modified bitumen membrane and surface coating. The degree of degradation is dependent upon the type of microorganism, the temperature and other climatic conditions, and the composition of the bitumen. Fungus growth, which typically occurs in hot, humid regions, does not cause the same detrimental effects as bacterial attack and usually poses only aesthetic concerns.

Effects of Other Chemicals

Other chemicals, such as solvents, acids, bases and oxidizing agents, can cause varying degrees of harm to polymer modified bitumen roofing membranes. Non-polar solvents can temporarily swell and soften polymer modified bitumens, causing slumping and poor traffic resistance. They can also cause the polymer to separate from the asphalt. While polymer modified bitumens have excellent resistance to various inorganic acids and bases, some of these chemicals may attack and degrade glass and polyester mats, as well as fillers, such as talc and limestone. Organic acids, such as acetic acid, are also known to have detrimental effects. Strong oxidizing agents can attack both the polymer and the bitumen in a membrane. Additionally, when ponding water is present, inert, solid dusts can contribute to “mud cracking.” All of these effects may lead to premature failure of the roofing membrane. More detailed discussions on the effects of specific chemicals may be found in the reference documents.

Note: These recommendations were prepared by and have the approval of the Asphalt Roofing Manufacturers Association for informational purposes only. They are not 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.

Recommendations

- Wherever possible, reduce or eliminate exposure to contaminants.
- Determine the types and concentrations of contaminants which may be present on the roof. When reroofing, investigate what effects, if any, contaminants had on the existing roof before specifying and applying a new roofing system.
- Use commercially available traps and/or filters to prevent contaminants from being exhausted onto the roof.
- Establish a maintenance program to monitor the affected roof section and to properly maintain traps or filters.
- Provide positive drainage (i.e., at least 1/4" per foot roof slope) to prevent ponding in the affected area.
- If contaminant effects are minor, increasing the number of plies and/or adding resistant coatings may provide adequate protection.
- Investigate alternate venting designs which minimize or eliminate the contamination of the roofing membrane.

Applicable Reference Documents

Canadian Roofing Contractor, July 1991, pp. 10-13.

C. S. Barry and J. L. Jodoin, Roofer Magazine, February 1991, pp. 20-22.

H. M. Kalkanoglu, Roofer Magazine, February 1992, pp. 28-31.

R. W. Traxler in A. J. Hoiberg, Bituminous Materials: Asphalts, Tars, and Pitches, Vol. 1, 1979, pp. 323-346.

Shell Chemical Company, Kraton Thermoplastic Rubber, S.C.: 198-83, July 1983, pp. 4-5.

D. Fricklas, RSI Magazine, November 1990, p. 8.

R. B. Seymour and R. H. Steiner, Chemical Engineering, May 1954, pp. 232-242.

I. Rahimian and G. Zenke, Zum Verhalten Organischer Losemittel Gegenuber Bitumen, Bitumen, January 1986, pp. 2-8.

16th Biennial Materials of Construction Report, Chemical Engineering, No. 1954, pp. 172-234.
