



technical bulletin

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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, sleet, etc. Systems that are properly designed, installed and maintained should provide the user with satisfactory protection from these elements. Some roofing systems, especially those on factories, restaurants and fast food chains, require special care in design due to the presence of greases, oils, bacteria, and/or other agents on the roof surface that tend to adversely affect the integrity of the roof membrane. Depending 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 the 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 network, causing premature degradation of the roof.

Effects of Bacteria and Fungi

Factories producing foods such as potato pulp and dry milk have reported cases of modified bitumen membrane decay due to bacteria. Such deterioration, which usually starts as "mud cracking," may ultimately lead to the total decay of the modified bitumen membrane and any surface coating. The degree of degradation is dependent upon the type of microorganism, 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 polymers 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.

Recommendations

- Wherever possible, reduce or eliminate exposure to contaminants.
- Determine the types and concentrations of contaminants that may be present on the roof. When re-roofing, investigate what effects, if any, contaminants present 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 roof maintenance program to monitor 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, increase the number of plies and/or adding resistant coatings to provide adequate protection.
- Investigate alternate venting designs that minimize or eliminate contamination of the roofing membrane.

Applicable Reference Documents

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