



## Roof Top Effluence Management

Roof top effluents may come in many forms. Roof top effluents are generally in a liquid or particulate state though not necessarily. Gases can also be considered to be roof effluents. These substances may be benign or detrimental to the roof membrane. The effluent could be starch, wood or coal dust, which although unsightly, and possibly a health and safety hazard, is harmless to the roof membrane. It might be paint vapour or a solvent. It could so be a plasticizer, a material, a mineral, organic, animal fat, petroleum based grease or oil are the most common group of chemicals typically encountered.

The roof top effluents are carried onto the roof top with the exhaust air from the building through either up blast or down blast exhaust fans or by means of direct pipe exhaust. Roofing contractors often encounter roof top effluents during re-roofing or maintenance work. The intent of this bulletin is to suggest possible ways of preventing damage to roof from roof top effluents. When roofing contractors encounter roof top effluents, they have the opportunity of notifying the building owner of the hazard and suggesting some solutions. For a general compatibility list of common chemical compounds and roof membranes, refer to CRCA's series of bulletins on Chemical Resistance and Roof Membranes.

Roof top grease and oil deposits can cause expensive but avoidable damage to roof systems. Many roofing systems break down and deteriorate when exposed to grease. As grease accumulates on a built up roof for example, it dissolves the asphalt reducing it to a slippery gelatin like consistency and reduces the waterproofing integrity of the membrane. The result is a potential localized roof failure including wet insulation and possible roof deck damage in the extreme cases.

Grease has a similar effect on modified bitumen causing it to swell, wrinkle and blister to the point that it loses its original properties and characteristics. EPDM, PVC, Hypalon and most other single ply systems are also sensitive to grease resulting in swelling of the membrane and deterioration of seam adhesives and sealants. Simply put, grease destroys roof systems. Some roofing membranes are better than others at resisting grease, but all roofing systems are affected by the hazards of roof top grease in one way or another. The area of roof affected by grease needs to be constantly repaired or replaced. Naturally, such costs are NOT covered by any roof warranties and they become very expensive.

In addition to destroying roof systems, roof tip grease can pose a hazard to health and safety to the occupants, or be a fire or environmental hazard to the public at large.

- Roof top grease is very slippery. Anyone who walks on a greasy roof is exposed to severe risk of injury or death due to slippage when negotiating a latter or walking near the roof edge.
- Roof top grease is a fire waiting to happen. A kitchen fire which spreads to the roof through the exhaust system can ignite the grease on the roof. Other sources of ignition could be electrical failure of an overheating roof top mechanical unit bearing. Regardless of the cause, roof top fires involving grease can be devastating.
- Roof top grease can plug drains and sewers, causing excessive ponding on the roof or require the cleaning of drain systems, and could result in fines due to environmental violations.

- Improper disposal of effluents can contribute to environmental pollution either through giving off vapours or by flowing into public drainage and sewer systems e.g. one drop of oil can contaminate 1000 gallons of water.
- The accumulation of grease can create a breeding environment and medium for bacteria and fungi.

There are various systems in use today to control roof top grease and other effluents. They are specifically designed to fulfill one or more of the following functions:

- Keep grease off the primary roof membrane
- Confine the grease or effluent to a specific location on the roof
- Separate the grease or effluent from the rain water

These measures function well if they are properly and regularly maintained and serviced.

### **1. SPECIAL MEMBRANES**

The concept is to cover the area around the grease or effluent emitting location with a grease resistant membrane to reduce the damaging effects of roof top grease. This method is only effective if the protected area is cleaned regularly, which requires periodic maintenance schedule. If not maintenance is carried out, all this remedy achieves is to spread the problem over a bigger area, as the grease or effluent flows away from the source. This method is considered effective for localized spills and deposits of effluent.

### **2. SANDBOXES AND SIMILAR DEVICES**

Typically, these consist of wooden or metal frames, installed around the grease emitting device, which are filled with sand, rocks or some absorbent medium. These are high maintenance items and have a number of disadvantages which should be borne in mind when installing them.

- They add significant, sometimes excessive localized weight to the roof.
- They trap moisture under the unit, which can be damaging to the membrane.
- They require frequent maintenance, which includes unwanted foot traffic on the roof and hauling materials to and from the containment unit.
- If left un-maintained, they usually cause the grease and oil to spread even further onto the rest of the roof, as it overflows the sandbox frame.

### **3. CATCH PANS AND PICKLE BUCKETS**

These devices are generally placed under the exhaust spout of the exhaust fan, or in the area of expected fall out of grease and oil or effluents.

- Although the initial cost of these installations is low, as with the sandbox, if left un-maintained, they usually cause the grease and oil to spread even further onto the rest of the roof, as it overflows the frame. When full of water, the additional weight may even cause localized deflection.

- An additional drawback of this approach is that most fans leak grease and oil from gaskets, seams, welds and other joints. It is very difficult to build and detail a catch pan which can deal with such leakage.

#### **4. EFFLUENT CONTROL SYSTEMS**

This is the fourth alternative to roof top effluent containment. Briefly, it can be described as a system employing synthetic filter and absorption media. The type, density and position of these synthetic layers are dependent upon the type of effluent and its chemical make up. The method of preventing the egress of grease or effluents onto the roof membrane is achieved by the entrapment of these substances within the matrix of the synthetic media. Maintenance of these units involves the cleaning or rotation of the filter media. These units also have a number of disadvantages.

- The system needs specialized absorbent media for effluent entrapment
- The absorbing media need to be changed and maintained periodically

#### **MAINTENANCE**

The various methods for roof top effluent control discussed above will perform their intended function only if they are **properly and regularly maintained**. The maintenance aspect is generally the responsibility of the building owner. It is recommended that the various effluent containment devices be cleaned out on a semi-annual basis preferably coinciding with regularly scheduled roof maintenance inspection. Consideration should also be given to the disposal of the effluents. There is an ecological consideration especially in the case of corrosive substances. These should be disposed of in an approved manner conforming to federal and local regulations. If there is doubt as to the type of effluent and its origin, the building occupant should be consulted. It is also recommended that trained professional roofing contractors carry out any work or maintenance required on the roof.

#### **NOTE: SAFETY FIRST!**

The roof is an environment that can be dangerous to the untrained individual. When working on a roof, all safety precautions must be taken. Only professional roofers and trained personnel should be allowed access on a roof. Provincial Occupational Health and Safety Acts are very clear as to the precautions and training necessary for working on a roof.

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