

*Commentary*  
***Bathroom Exhaust Fans***  
**(ORSC – Section M1507)**

Since the adoption of the 2008 *Oregon Residential Specialty Code* (ORSC) I've been asked several questions concerning the new code language in Section M1507. The following commentary is intended to explain some of the more common terms used in this section, and provide a small glimpse of the intent behind the changes to Section M1507.

**Location:**

Mandating that all rooms with bathing facilities have an exhaust fan was first introduced in the 2005 ORSC. The 2008 ORSC continues this requirement with a few enhancements. As in the 2005 code, the 2008 code requires exhaust fans to be located in or near the shower, tub or spa area.

**Sone Levels:**

A sone is a measurement of sound in terms of comfortable hearing level for an average listener. It is surmised that if the sone level is low enough the occupants will use the fan more. The lower the sone value, the more comfortable the listening environment. Sones are not decibels or volume, but rather how sound is "sensed." One sone is the equivalent to a quiet refrigerator. The new requirements for sone ratings are found in Section M1507.3.1.

**Controls:**

The code now requires that intermittent fans be controlled by a dehumidistat, timer or similar means of automatic control. This requirement can be found in Section M1507.4. A light switch controlling both the fan and light is not considered an automatic means of control, and is no longer allowed in rooms containing a bathing fixture. It is speculated that the use of a 30 minute or 60 minute *spring-wound wall switch timer* will be the predominate means of controlling the typical bath fan system under the 2008 code. Some folks are confused by the language "...or similar means of automatic control." The intent was not to have the fan come-on automatically, but to *shut-off* automatically. When using a dehumidistat, the humidity percentage is set by the user, and when the humidity level reaches that set point the fan will turn on automatically and run until humidity levels drop below the set point. The same applies to a spring-wound timer, the intent is to have the user manually set the timer to shut-off several minutes after they have left the room. This new code language is not expected to cure all moisture related problems associated with a bathing facilities because it still requires participation from the occupants of the home, but it's a good start.

Although a minimum and/or maximum duration for the timers was not specified in the code, it is recommended that a *minimum* 30 minute or *maximum* 60 minute timer be used. The use of longer duration timers is not recommended since there is no need for the fan to run for hours after the user leaves the area. The 30 min./60 max. numbers were discussed during the code review process and this was the recommendation of the code change committee.



Timer



Dehumidistat

What's an example of “.....or similar means of automatic control”? One example might be a motion detector/sensor which turns on when it senses movement in the room and stays on for a period of time after movement has stopped. This method is frequently used successfully to activate lights in commercial bathrooms, and there's no reason it couldn't be used for residential bath fans too. The intent of this language was not to limit the activation of the fan to a timer or a dehumidistat, but to allow for some design flexibility and allow the use of new technologies.

### **Duct Types:**

It is recommended, where possible, to use rigid ducts for exhaust fans. They have less resistance to air flow and allow the fan to operate much more efficiently. If flexible duct is used, be sure the duct is as straight as possible. Larger diameter ducts will result in improved performance, smaller diameter ducts will cause the fan to run harder, greatly reducing the CFM performance of the fan and create excess noise. For best results, use galvanized sheet metal or PVC. Flexible aluminum duct is durable, easy to install and often used. However, the ridges in aluminum flexible duct increase static pressure and can reduce air flow and fan performance. This results in lower CFM's, higher noise levels and greater energy consumption. The degree to which performance is affected depends on the length of duct, number and degree of elbows. Sagging or weaving a fan duct will also increase static pressure and reduce a fans performance. When using a flexible aluminum duct, support the entire length of the duct with braces or hangers to keep it as straight as possible for the entire run. If the duct lies across the attic rafters, do not allow it to sag between each joist. Also, avoid weaving serpentine through trusses.

Although the code does not distinguish between a metal flex duct and plastic flex duct, the plastic ducts (similar to those used for in furnace supply ducts) have smoother interiors than the metal flex, and may be provided with insulation to help reduce condensation. If these ducts are stretched to their maximum (or close to their maximum) their resistance to air flow and efficiently is closer to a smooth duct than that of corrugated aluminum ducts, therefore, it is recommended that they be allowed to use the smooth duct category in Table M1507.4.

### **Intermittent or Continuous Service:**

Continuous ventilation provides today's airtight homes with a relatively constant and controlled lower level of ventilation. Intermittent ventilation is used to capture moisture and odors at their source, while continuous ventilation is used to remove accumulated indoor air pollutants through out the house as well as specific sources of moisture. Both intermittent and continuous ventilating fans should be located as near as possible to the source of moisture in bathrooms and kitchens.

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