RESIDENTIAL INFORMATION BULLETIN

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WATER VAPOUR TRANSMISSION AND PERMEANCE

IKO's roofing and waterproofing products are primarily designed to restrict the passage of liquid water. However, our products vary in their ability to limit the passage of water vapour (moisture in a gaseous form). The movement of water vapour is called **water vapour transmission**.

To reduce/control water vapour transmission in roofing systems, **vapour retarders**/barriers are used. Vapour retarders/barriers vary greatly in their ability to reduce water vapour movement. The rate at which water vapour moves through a material is called the **moisture transmission rate**. This rate is referred to as the material's **permeance** (commonly referred to by its perm rating). Permeance has the following unit of measurement: grains of water vapour per hour per square foot per inch of mercury vapour pressure differential (gr/ft²/hr/" Hg) [gram per millimeter mercury per second per meter square ($g/mmHg*s*m^2$)]. This value is dependent on a material's composition and thickness, and as such, should be used to compare various products. If a material has a perm rating of 1.0, we know that in 1 hour, when the vapour pressure difference between the cold side and the warm side of the material is equal to 1 inch of mercury (1" Hg), 1 grain of water vapour will pass through 1 square foot of the material (gr/ft²/hr/" Hg) (7000 grains of water is equal to 1 pound). The National Roofing Contractors Association (NRCA) classifies material with 0.5 perms or less as a vapour retarder, while the Ontario Building Code (OBC) classifies a Type 1 vapour retarder as materials with 0.26 perms or less and a Type 2 vapour retarder as materials with 0.78 perms or less.

Water vapour transmission is determined by the equation, **WVT (grains of water) = A x T x delta P x perms,** where A is area, T is time, delta P is difference in vapour pressure and perms is permeance. Water vapour transmission through a material is very much dependent upon the material's permeance - an increase in material permeance will increase the amount of water vapour moving through it.

IKO's least permeable membranes include GoldShield Ice & Water Protector, ArmourGard Ice & Water Protector and IKO MVP, all of which have a permeance of less than 0.5 perms (results based on ASTM E96 Procedure B). Conversely, IKO's asphalt saturated felts are considered very permeable, or "breathable", with permeance values such as 18 perms for AM No. 15 Asphalt Felt.

Depending on the roof/building design, the permeance rating, and subsequent water vapour transmission, may be very important when choosing a membrane material.

For additional information on any of IKO's products or application requirements, visit us on the web at www.iko.com, or contact us in Canada at 1-888-766-2468, or the United States at 1-888-456-7663.