

Calculation of Permeance for Water & Air Barrier Coatings Technical Bulletin

TB039

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	<i>Tested Thickness</i>	<i>Permeance</i>
Parex USA Weatherseal Spray & Roll-On	7 Dry Mils	12 Perms

By increasing the thickness of the coating, the permeance of the resulting application is calculated as follows:

Referenced Standard: ASHRAE Handbook of Fundamentals, Section 20.14 – 20.15, Equation (15)

From the Handbook, the total mass flow of vapor transmitted is inversely proportional to L, the length of flow path. For water and air barrier coatings, the flow path length is the thickness of the coating. Doubling the thickness therefore reduces to mass flow of vapor to one half.

Example: WeatherSeal Spray & Roll-On permeance

12 perms is by definition mass vapor flow of 12 grains / hour · foot squared · inch mercury.

For thickness 2L (14 Dry mils): 12 grains / hour·foot squared·inch mercury·2L = 6 perms

Calculation:

- The Handbook of Fundamentals gives the Resistance to Vapor flow as the reciprocal of permeance: $RV = 1 / u$.
- For one coat 7 dry mils thick that has a permeance of 12, the resistance to vapor flow is $1/12$, or 0.0833.
- By this method, the overall Resistance to Vapor flow is the sum of the resistances of the component parts, in this case two layers of coating, each 7 dry mils thick.
- The overall resistance to vapor flow for two coats is, therefore, $0.0833 \times 2 = 0.1666$.
- The overall permeance is the reciprocal of the overall resistance to vapor flow, which is $1/0.1666 = 6$.

By similar calculation:

- For dry film thickness of 12 mils instead of 7 mils: $L = 12/7$
- $0.0833 \times (12/7) = 0.1428$.
- The overall permeance is the reciprocal of the overall resistance to vapor flow, which is $1/0.1428 = 7$ perms

PAREXUSA
www.parexusa.com

Corporate Office

Parex USA, Inc.
4125 E. La Palma Ave., Suite 250
Anaheim, CA 92807
(866) 516-0061
Tech Support: (800) 226-2424

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