



SIP No. 2022

Subject: Water Vapor

Date: November 2007 (Revised January 2015)

Water vapor is not normally a problem in construction, but when it is allowed to condense, problems can develop. There are two issues that must be considered:

1. air infiltration
2. diffusion of water vapor

In a building envelope the primary cause of condensation within a wall or roof is due to air infiltration - warm, moist air meeting a cool surface. Stick buildings, which utilize fiberglass batts, rock wool or blown cellulose are at risk of having condensation occur because the structure has a tendency to leak air. Consequently, vapor retarders, such as polyethylene sheets, are used frequently in stick construction.

R-Control SIPs utilized and installed per R-Control details reduce building air infiltration to a very low level. Therefore, the potential for condensation due to air leakage in R-Control SIP buildings is greatly minimized.

Due to the air infiltration resistance properties of R-Control SIPs and its safe vapor diffusion profile, R-Control SIPs deny the opportunity for condensation to occur. Proper spline and plate application sealing using R-Control Low VOC Do-All-Ply and SIP Tape is required.

Vapor diffusion contribution to moisture problems needs to be understood and addressed when looking at a construction assembly. For condensation to occur, an air temperature must be reached at which water vapor in the air reaches saturation.

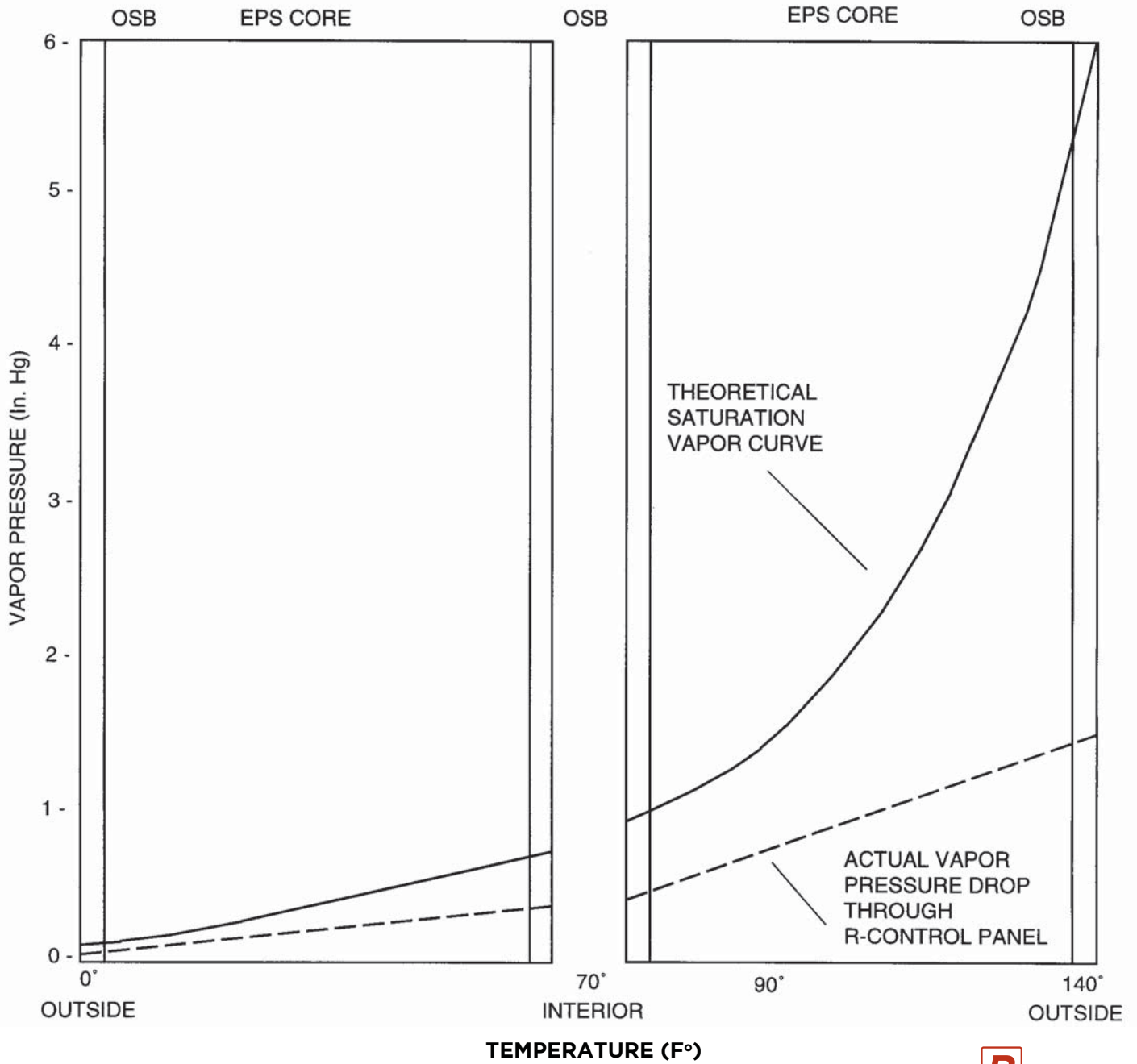
A vapor analysis of R-Control SIPs in both hot climates and cold climates determined that the vapor pressure curve typical for R-Control SIPs does not reach or exceed the saturation curve or dew point curve (See attached graph).

Structures housing swimming pools, refrigeration/freezer, or buildings humidified beyond 50% RH during the winter may require additional design considerations. These structures need to be reviewed on an individual basis as to whether a special vapor control design (including vapor retarders or other strategies) is required.



R-Control SIP Winter Conditions

R-Control SIP Summer Conditions



NOTE: Since vapor pressure through the R-Control SIP does not exceed saturation curve, condensation does not occur.



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