

# Implementation of Desiccant & Glass Conductivity Effects

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## Discussion:

- Two broad categories of products:
  - Loose bead desiccant known as molecular sieve (MS)
  - Desiccated matrix

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- Two schools of thought:
  1. One desiccant conductivity value is used for all desiccant materials.
  2. Separate conductivity values are required for molecular sieve (MS) and desiccated matrix.

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- Other considerations:
  1. The presence or lack of desiccant in an aluminum box spacer should be modeled. Hollow spacer legs will conduct differently than ones filled with desiccant. - 2 sides filled/2 hollow compared to 4 sides filled.
  2. there may be a difference in thermal performance between the horizontal and vertical legs of an IG unit.

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Type of Desiccant	Range of Desiccant Conductivity W/mC
Box Spacer desiccant (molecular sieve)	0.03 to 0.13  This range covers NFRC values and manufacturer supplied values
Desiccated matrix	0.23 to 0.29  This range covers manufacturer values submitted to NFRC

# Implementation of Desiccant & Glass Conductivity Effects Aluminum Box Spacer

Desiccant Material	Desiccant Conductivity W/mC	Spacer System $k_{\text{eff}}$ W/mC
Air Filled	0.034	7.19
SG (loose)	0.030	7.18
SG (bulk)	0.130	7.22
Molecular Sieve (MS)	0.100	7.21

# Implementation of Desiccant & Glass Conductivity Effects U-Channel Spacer

Desiccant Material	Desiccant $K_{\text{eff}}$	Spacer System $K_{\text{eff}}$
Air Filled	0.034	0.99
SG (loose)	0.030	0.99
SG (bulk)	0.130	1.00
Desiccated Matrix	0.285	1.02

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The results indicate:

1. Desiccant materials have no effect on the overall spacer system  $k_{\text{eff}}$  as compared to no desiccant for aluminum box spacers.
2. Desiccant and desiccated matrix materials have no effect on the overall spacer system  $k_{\text{eff}}$  as compared to no desiccant for U-channel spacers.
3. While this study did not directly address the difference in thermal performance between the horizontal and vertical legs of the spacer system, the range of conductivities studied and the results indicate that this difference may be small.

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## Recommendations:

1. Define a single conductivity value for a generic desiccant and use this value for all desiccant materials.

OR

2. Values for Silica Gel (loose fill and bulk) need to be re-defined as molecular sieve (MS) with a single conductivity value and define a conductivity value for desiccated matrix materials.