

Insulated Concrete Masonry Theoretical Maximum “R” Values

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Abstract*:

In keeping with well-known natural laws, the movement of heat, water, electricity, etc. is determined by the path of least resistance. Should an electrical network have parallel resistance paths where one resistance R_1 is extremely large in comparison to the other resistance R_2 then the current flow in the high resistance path will approach zero and virtually all current flows will pass through the low resistance path. Hence, a "shunt" is developed. This situation is replicated in a standard, commercially available ASTM C90 concrete masonry unit (CMU) with full depth webs when *all core spaces are filled with a totally nonconducting, superinsulating material with a thermal resistivity approaching infinity*. In this case, virtually all heat flow is through the webs and the rate of flow is determined by the thermal resistivity (r_c) of the concrete.

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