

Documents

Kosny, J., Asiz, A., Smith, I., Shrestha, S., Fallahi, A.

A review of high R-value wood framed and composite wood wall technologies using advanced insulation techniques
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Abstract

The main objective of this study is to identify advanced wall frame assemblies applicable for residential and small commercial buildings, that have or could reach R-values larger than RSI - 3.5 m² K/W (U-value lower from 0.29). An extensive literature review of existing and past practices is used as the main vehicle to analyze: framing and wall insulation methods, architectural details with focus on minimizing thermal bridges, structural adequacy aspects with respect to gravity and lateral loads, and ability to provide fire and sound breaks. In this paper a wide selection of advanced framing wall assemblies is discussed in details with main focus on construction methods, architectural details with minimized thermal bridges, and structural (strength) concerns. High performance wall technologies of consideration include: double walls, Larsen truss walls, optimum or advanced framing walls, walls using distance spacers (furring) and walls made of wood-based composites. Since wood framing for wall applications is mostly used in North America, Scandinavia, and Central Europe, this study is focused on research studies from these regions. In addition, field test studies are presented discussing an application of high R-value of new and retrofitted wall assemblies in actual test houses that have been constructed and being currently monitored. © 2014 Elsevier B.V.

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