

The Influence of Water on the Properties of Cellulose Fibre Insulation

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Abstract : Cellulose fibre insulation is an eco-friendly building material made from recycled paper fibres, treated with borates for fungal and fire resistance. It is comparable in terms of thermal and acoustic performance to mineral wool insulation and other insulation materials based on non-renewable resources. The main method of application consists in separating and blowing the fibres in attics or closed wall cavities. Another method, known as the "wet spray method" is gaining interest. With this method the fibres are projected with pulverized water, which stick to the wall cavities. The issue with the wet spray technique is that the water dosage could be difficult to control. A high water dosage implies not only a longer drying time, depending on ambient conditions, but also a change in the performance of the material itself. In our work we studied the thermal and mechanical properties of wet spray-cellulose insulation in order to understand how water dosage could affect these properties. The material was first characterized to study the chemical and physical properties of the fibres. Then representative samples of wet sprayed cellulose with varying applied water dosage were subject to thermal conductivity and compression testing in order to better understand how changes in the fibres induced by drying can affect these properties.

Keywords : cellulose fibre, recycled paper, moisture sorption, thermal insulation

Conference Title : ICCEBM 2016 : International Conference on Civil Engineering and Building Materials

Conference Location : Melbourne, Australia

Conference Dates : February 04-05, 2016