

New Gypsum Technologies to Reduce Carbon Footprint

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Innogyps Inc. is a service organization that promotes innovation and growth in the global gypsum industry. Our goal is to be the preferred catalyst for business development in the gypsum industry, using our expertise in gypsum technology and market intelligence to promote true growth for our client companies around the world.

The gypsum industry is a major energy consumer in North America, with gypsum board (drywall) production accounting for 74% of all gypsum use in North America. The energy consumption for the entire board production is 43.4 MJ/m² of board. There are four main stages of energy consumption during the production of gypsum board: acquiring and transporting the gypsum, paper production and transport, plaster and board production at the plant, and final board transport. The energy consumed in each stage, except for paper production and transport, is discussed, as well as new innovative methods for reducing energy demands and carbon footprint.

Innogyps Inc. has been actively researching and developing innovative methods for reducing the energy required to make gypsum board. The most prominent method, developed in conjunction with CasoFour Ltd., and Gypsum Technologies Ltd., is the patent pending NuGyp™ treatment of plaster. The NuGyp™ treatment system is already in full scale operation. This treatment process has proven to reduce the water required to mix with the plaster to form slurry. This reduction in water has shown to reduce the board drying energy by up to 40%. This reduction amounts to a savings of 7.2 MJ/m², or 16% of the total energy required.

Innogyps Inc. is also in the process of improving board performance and weight with the use of computed tomography (CT) scan images of nail pull tests. The nail pull test is often the first failing specification of reduced weight board samples, and many North American gypsum board producers have difficulty consistently meeting this specification. While decreasing board weight is not a new idea, using CT scanning is. The CT scan results of the nail pull tests display the failure mechanism, showing a relationship between the board core structure and the nail pull test result. A better understanding of the effect of core structure can lead to energy reductions by both producing lighter board, and reducing scrap board. Reducing the board weight by 50 lbs./msf would result in a reduction of 1.6% of total energy required. A reduction of 2% less scrap board results in a reduction of 1.8% of total energy required.

This paper also describes the carbon emissions associated with each stage, and the possible savings. Currently the North American gypsum board industry emits 9 260 000 tonnes of carbon dioxide per year. The amount of carbon emissions can also be presented as the amount of land required to neutralize the carbon emissions (in terms of global hectares). The carbon footprint of these emissions is roughly 8 times the size of Nova Scotia. The total savings presented are roughly equal to 1.2 times the size of Nova Scotia.

This paper also demonstrates how even small companies working in traditional industries can make a significant impact on reducing the carbon footprint of the products we use every day.

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