

SUMMARY OF FINDINGS

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Hemp Lime Bio-composite as a Building Material in Irish Construction.

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Abstract

The environmental impacts arising from the construction and use of buildings is of increasing concern to policy makers, legislatures and environmentalists, with an growing EU legislative focus on reducing such impacts and carbon emissions in particular. Hemp lime is a bio-composite material formed by the mixture of the woody core of the hemp plant, also known as ‘hurds’, or ‘shiv’ and a lime based binder. After setting, the composite forms a rigid lightweight material and has applications to a range of construction solutions. This report presents the findings of a desk based scoping study carried out under the EPA ‘STRIVE’ research funding programme to examine hemp lime as an innovative ecological building material and its potential application in the Irish context.

Key Words: Hemp Lime, Eco-Construction, Irish technical standards, Irish Application

Background

The objective of the study was to examine the application of hemp lime as a bio-composite material for construction application in the Irish context, and to assess in detail its known technical performance in relation to the principle standards and requirements within the Irish building regulations. Knowledge or data gaps in the assessment of performance in structure, fire, moisture, acoustic, energy and material / workmanship were identified and examined. A significant body of data was collated in the study to create the first significant collation of currently available literature and data on hemp lime bio-composite, with a number of summary and comparison tables, which should aid further investigation and research.

Key Points

- There is a growing body of international research on hemp lime, including Irish research, with significant demonstration projects undertaken, principally in the UK and France, and evidence of increasing application in Ireland.

- The predominant use of hemp lime to date has been as an insulating infill cast or sprayed in timber frame walls and also in roofs and floors. Hemp lime masonry blocks have also been developed, generally for non load-bearing situations and the material may also have potential to be utilised in cast in-situ work, and precast cladding solutions.
- Hemp has been successfully trialled in Ireland and is being grown only on a small scale, in part due to the absence of a hemp processing facility in the country, which is one of the main barriers for the development of a domestic hemp industry / market.
- A key environmental claim is the ability of the material to store carbon as hemp absorbs carbon dioxide in the atmosphere during growth and the lime binder reabsorbs carbon during setting. For example an LCA carried out in France highlighted the positive impact on greenhouse/gas mitigation due to the ability of a hemp lime wall to act as an overall carbon sink over a period of at least 100 years, resulting in a negative value for 'greenhouse effect'. However there is no definitive agreed calculation methodology for carbon capture and figures vary across different case studies.
- The report highlights the need for either Third Party Certification e.g. Agrément or equivalent for particular hemp lime proprietary products to facilitate mainstream take up in the Irish construction industry, and also discussed a specific code or standard for hemp lime as a material in construction
- The study also highlighted the need for on-going technical and material based research to support the development and mainstreaming of the material as well as research into economic, and market issues.
- The expansion of hemp growing and establishment of appropriately scaled processing industry in Ireland was highlighted in the report, as a prerequisite for a favourable context to develop hemp lime as construction material.

For Further Information

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The report 'Hemp Lime Bio-composite as a Building Material in Irish Construction by Patrick Daly et al' available on the Environmental Protection Agency SAFER website from <http://erc.epa.ie/safer/iso19115/display?isoID=202>.