



Case Study

Adnams Brewery, Reydon, Nr Southwold, Suffolk

Lime and hemp help warehouse save over 500 tonnes of CO₂

Introduction

A distribution centre for Adnams brewery in Southwold, Suffolk can probably lay claim to being Britain's greenest warehouse, thanks to a range of hemp and lime based products from Lime Technology.



Client:	Adnams Brewery
Project:	New brewery distribution centre
Architect:	Aukett Fitzroy Robinson
Product:	Sumatec® blocks, Tradical® Hemcrete®, and Limetec® hydraulic lime mortar, render and plaster
Completion date:	2006

Presented with a challenging brief to minimise environmental impact and create a building that will meet the needs of the Adnams business for years to come, architects Aukett Fitzroy Robinson needed to find the most sustainable method of construction to fit in with Adnams' corporate ethos of seeking to be a leader in corporate responsibility.

To help achieve this goal, Aukett Fitzroy Robinson turned to Lime Technology and specified Tradical® Hemcrete®, a building material that can help to reverse the damaging effects of greenhouse gases.

By using Tradical® Hemcrete®, over 150 tonnes of CO₂ have been locked up in the logistics centre's walls. In addition, creating walls within a conventional building of the same size would have generated around 400 tonnes of CO₂ emissions. By using Tradical® Hemcrete®, the Adnams distribution centre has therefore made a potential saving of over 500 tonnes of CO₂.

"The best value materials for low impact sustainable construction."

Limetec® is a registered trademark of Lime Technology

The Solution:

For Aukett Fitzroy Robinson, the solution to creating an ultra sustainable building lay in constructing the logistics centre using a revolutionary new masonry system developed by Lime Technology. The project marked the product's first commercial scale application in the UK.

The heart of the structure features a supporting steel frame with Lime Technology's Sumatec® unfired lime and earth blocks forming a diaphragm wall. In between this internal and external blockwork, Tradical® Hemcrete® was applied as an infill providing the building's necessary insulation.

Finally, Limetec®, Lime Technology's own brand of hydraulic lime mortar, plaster and render, was used for laying the hemp blocks as well as rendering the walls for long term durability and weather protection.

Carbon Sequestration

Tradical® Hemcrete® is a thermal hemp-lime walling solution that comprises a blend of hemp shiv and a lime based binder.

One hectare of hemp, which will grow in just 14 weeks, produces up to 10 tonnes of material, six of which is the woody core (shiv) that is used in Tradical® Hemcrete®.

The hemp can actually lock up copious amounts of CO₂ by capturing carbon from the atmosphere. Hemp, in common with all similar plants, captures CO₂ and releases oxygen during its rapid growth. The immediate and positive effect of this process is the sequestration of the principal greenhouse gas. By using hemp, Tradical® Hemcrete® can actually lock up harmful CO₂ emissions within wall construction. Finally, when the air-lime based binder in the product sets, even more carbon dioxide absorption occurs. In effect, the material becomes better than carbon neutral by locking up carbon, rather than emitting it.

Hemp has other attractions as an environmentally sound, commercial crop. For example, it doesn't need chemical spraying and it suppresses weeds and pests. When mixed with Tradical® to make walls, it provides high thermal and acoustic insulation and has excellent water vapour permeability.

Product Performance:

To achieve the building's unique combination of environmentally sensible elements, unfired Sumatec® blocks, each weighing about 19kg and made to size at 100 x 254 x 356mm, were produced by compressing a mixture of lime and earth. Once these were laid in place employing Limetec® hydraulic lime mortar, the diaphragm wall was then filled with Tradical® Hemcrete®.

As well as locking up CO₂ emissions, the wall design delivers high thermal and acoustic insulation, low density, excellent water vapour permeability, high flexural strength and high carbon capture.

Limetec®, Lime Technology's own brand of hydraulic lime mortar was used for the brickwork which forms the lower two metres of the building, as well as laying the lime-hemp blocks for the remainder of the structure, and a spray applied hydraulic lime render was then used to face the lime-hemp blocks in order to provide long term durability and weather protection. Internally Limetec® plaster completed the scheme.

Locked Up CO₂

Over 150 tonnes of CO₂ have been locked up in the logistics centre's walls, thanks to the Tradical® Hemcrete® infill. That's equivalent to 1.5 million miles of emissions from a Ford Escort or sixty times around the Earth! In addition, creating walls within a conventional building of the same size would have generated up to 600 tonnes of CO₂ emissions. By using Tradical® Hemcrete®, the Adnams distribution centre has therefore made a potential saving of up to 750 tonnes of CO₂.

"Testimony to the benefits of lime and hemp, proving they are commercially viable for large scale projects."

Completion:

As part of the project's further green credentials, the building also features a green sedum roof and wooden glulam roof support beams to provide a column-free interior and rooflights. Car parking areas will be made of reinforced grass; clerestory glazing will provide natural light to the interior; solar collectors will heat the site's water and rainwater harvesting and a foul water waste system, including septic tank and reed beds, will enable water to be cleaned and delivered to adjacent ponds.

Not only this, but the high insulating properties of the Tradical® Hemcrete® has enabled the 4400m² Adnams distribution centre to have the ability to naturally maintain an internal temperature at between 11 and 13 degrees centigrade. By negating the need for a mechanical cooling or heating system, it fulfills the building's vital criteria which will be used to store thousands of bottles of beer and wine.

With so many sustainable elements, the building received an "Excellent" rating under the BREEAM rating system (Building Research Establishment Environmental Assessment Method) on completion, and has proved that eco friendly building is able to meet the financial and operational requirements of one of the UK's most progressive brewers that has sustainable development at the heart of everything it does.

For more information please contact Lime Technology on:

T: 0845 603 1143

F: 0845 634 1560

E: info@limetechnology.co.uk

w: www.limetechnology.co.uk

Lime Technology Limited

Unit 126, Milton Park

Abingdon

Oxfordshire

OX14 4SA

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