



# NGS GreenSpec supporting CLP

Updated since AECB Annual  
Conference Friday 29<sup>th</sup> June 2007



# CarbonLite Programme in context

## Direction

European Directives

Energy Performance of  
Buildings Directive  
2002/91/EC

## UK Interpretation & Enabling

Building Acts

Sustainable & Secure  
Buildings Act 2004

## Primary Legislation cites

Building Regulations

Code for Practice

Standards BS EN ISO

## Secondary Interpretation

Approved Documents

Tried and tested  
generic solutions

BR AD E &  
L1A L1B L2A L2B

Robust Details

## Tertiary Application

Sector Guidance

Industry  
Best Practice

CIRIA  
Airtightness  
Testing

Sector Funded



Infrared  
Testing



# NGS GreenSpec: Policies & Strategies

# GreenSpec

Search

- HOME
- PRODUCTS
- MANUFACTURERS
- SPECIFICATIONS (available 2007)
- MATERIALS
- ENERGY
- CHECKLIST
- DESIGN
- IMAGE BANK
- REFURBISHMENT
- FORUMS
- SITE WASTE
- DURABILITY
- SUPPLIERS & INSTALLERS
- FABRICATORS
- RECLAMATION
- CRAFTSMEN
- POLICIES & STRATEGIES
- RESEARCH & PAPERS
- RESOURCES
- CPD
- HOW WE SELECT PRODUCTS
- CONTACT GREENSPEC
- REGISTER YOUR PRODUCT
- ECOBUILD: 'GREEN SHOOTS'

GreenSpec is the UK construction industry's definitive guide to 'green' building design, products, specification and construction. Inside GreenSpec you will find a wealth of information aimed at helping you to design more energy and resource efficient buildings, using materials and technologies that minimise damage to people and the environment.



## PRODUCTS



A directory of sustainable products available in the UK. Each product page comes with a description, brochure downloads and contact details.

## MATERIALS



A guide to sustainable materials, both traditional and new. Materials such as masonry, roofing and flooring are compared based on their environmental impacts.

## CHECKLIST



This CAWS menu-based checklist takes you through the construction process highlighting areas where sustainable construction best practice can be applied.



## SPECIFICATIONS



## ENERGY



## IMAGE BANK



HOW WE SELECT PRODUCTS

CONTACT GREENSPEC

REGISTER YOUR PRODUCT

### SPECIFICATIONS



NBS-compatible specs. GreenSpec specifications concentrate on Work Section areas supporting the sustainable agenda as well as dedicated product specs..

### ENERGY



Guides to designing with zero and low carbon energy technologies.

### IMAGE BANK



A collection of images of inspirational 'green' buildings ranging from the large commercial to the small domestic.



## sustainable.building.supplies

Suppliers of modern, high performance, sustainable building systems and products

### DESIGN



This section examines the techniques of sustainable construction through the combination of materials and renewable technologies.

### DURABILITY



The durability of materials influences whole life costs. Common component options are described by the criteria which are expected to determine durability in the UK.

### POLICY & STRATEGY



A collection of publications from the EU, UK government, local government and NGOs outlining climate change and sustainable construction policies and strategies.



  
Search

- HOME
- PRODUCTS
- MANUFACTURERS
- SPECIFICATIONS (available 2007)
- MATERIALS
- ENERGY
- CHECKLIST
- DESIGN
- IMAGE BANK
- REFURBISHMENT
- FORUMS
- SITE WASTE
- DURABILITY
- SUPPLIERS & INSTALLERS
- FABRICATORS
- RECLAMATION
- CRAFTSMEN
- POLICIES & STRATEGIES**
- RESEARCH & PAPERS
- RESOURCES
- CPD
- HOW WE SELECT PRODUCTS
- CONTACT GREENSPEC
- REGISTER YOUR PRODUCT

## Policies and Strategies

### 1 Energy & Climate Change

#### UK Government

Building A Greener Future: Towards Zero Carbon Development (pdf)	This publication is a consultation document seeking views on the Government's proposals to reduce the carbon footprint of new housing development. It sets out the Government's views on the importance of moving towards zero carbon in new housing. It explores the relationship between the planning system, Code for Sustainable Homes and Building Regulations in delivering our ambitions for zero carbon. And it proposes a timetable for revising the Building Regulations so as to reach zero carbon development in all new housing in England & Wales.' ( <i>Communities and Local Government, Dec 2006</i> )
Energy Review 2006 (pdf)	This work aims to put us in a position to meet the two major long-term challenges in UK energy policy: <ul style="list-style-type: none"><li>• we need to tackle climate change by reducing carbon dioxide emissions; and</li><li>• we need to deliver secure, clean energy at affordable prices, as we move to increasing dependence on imported energy' (<i>DTI July 2006</i>)</li></ul>
Climate Change Programme 2006 (pdf)	The new Climate Change Programme sets out our policies and priorities for action in the UK and internationally. Climate change is a global problem, so we will strive to secure global action on the scale needed to tackle it. But we will also take further action at home, to meet our commitments and demonstrate that climate change can be tackled without damaging our economy.' ( <i>DEFRA March 2006</i> )
Potential for Microgeneration (pdf)	'An independent report: Potential for Microgeneration Study and Analysis was commissioned by DTI in 2005. It provides information on the feasibility of the various technologies in the marketplace, and estimates market development out to 2050.' ( <i>DTI November 2005</i> )

#### NGOs

'A bright future' (pdf) Friends of the Earth's electricity sector model for	'The aim of this modelling exercise was to create realistic and transparent scenarios for future development of the energy sector...(it) has identified six possible outcomes that would help reduce emissions by large amounts and help achieve secure energy supplies' ( <i>FOE March 2006</i> )
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## NGOs

'A bright future' (pdf) Friends of the Earth's electricity sector model for 2030	'The aim of this modelling exercise was to create realistic and transparent scenarios for future development of the energy sector...(it) has identified six possible outcomes that would help reduce emissions by large amounts and help achieve secure energy supplies' ( <i>FOE March 2006</i> )
'Decentralising UK Energy'	'The World Alliance for Decentralised Energy (WADE) model compares traditional centralised energy systems to decentralised systems using local generation, under the same conditions of demand growth, fuel costs and so on.' ( <i>Greenpeace 2006</i> )

## Local Government

Planning and Climate Change (pdf)	'Planning Policy Statement 1 (PPS1): Delivering Sustainable Development sets out the overarching planning policies on the delivery of sustainable development through the planning system. This consultation seeks views and comments on a draft Planning Policy Statement' ( <i>Communities and Local Government, 2006.</i> )
'Planning Policy Statement 22'	<i>Planning Policy Statement 22: Renewable Energy (2004)</i> PPS 22 states that 'local planning authorities may include policies in local development documents that require a percentage of the energy to be used in new residential, commercial or industrial developments to come from on-site renewable energy developments.'
'Green light to clean power' The Mayor of London's Energy Strategy	'This Strategy sets out a coherent energy policy for London for the next ten years and beyond. It aims to minimise negative impacts on health and on the local and global environment, while still meeting the essential energy needs of all those living and working in London.' ( <i>Ken Livingstone 2004</i> )
'The Merton Rule' (doc)	'In October 2003 Merton became the first local authority in the UK to include a policy in its Unitary Development Plan that requires new non-residential developments to generate at least 10% of their energy needs from renewable energy equipment such a solar panels and wind turbines. '

## 2 Sustainable Construction

### Europe

'The Energy Performance of Buildings Directive'	Introduced in January 2006, the Directive is intended to lead to substantial increases in investments in energy efficiency measures within both domestic and non-domestic buildings. This briefing paper was written by Andrew Warren, Director of the Association for the Conservation of Energy. ( <i>CIBSE 2006</i> )
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## 2 Sustainable Construction

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### UK Government

'Code for Sustainable Homes'	'The Code for Sustainable Homes has been introduced to drive a step-change in sustainable home building practice. It is a standard for key elements of design and construction which affect the sustainability of a new home. It will become the single national standard for sustainable homes, used by home designers and builders as a guide to development, and by home-buyers to assist in their choice of home.' (Department for Communities and Local Government: December 2006)
'Code for Sustainable Homes - Technical Guide'	'This technical guidance manual sets out the requirements for the Code, and the process by which a Code assessment is reached' (Department for Communities and Local Government: March 2007)
'A cost review of the Code for Sustainable Homes'	<ul style="list-style-type: none"><li>• How compliance with Ecohomes Very Good is typically achieved and the performance of these homes in terms of water and energy efficiency</li><li>• The extra-over costs and impact on environmental performance of housing complying with the Code rather than EcoHomes</li></ul> Housing Corporation / English Partnerships, February 2007
'Sustainable Construction Strategy Report'	'In 2000, the Government published its first Strategy for Sustainable Construction Building A Better Quality of Life which presented a way forward for Government and industry. This current document considers what has been achieved over the past five years and summarises progress made on specific initiatives identified in the original Strategy. It aims to provide an effective framework to guide future government policies where they are relevant to construction and outlines where the Government wishes to see the industry going in its future development.' (DTI January 2006)
'Stock Take: Delivering improvements in existing housing'	Homes already built account for 99% of the total housing stock. This report assesses the level of savings in resources, energy, water and waste that can be achieved by implementing the full range of technical options in those homes. (Sustainable Development Commission, 2006)
'Review of Sustainability of Existing Buildings.'	The Energy Efficiency of Dwellings - Initial analysis (Department for Communities and Local Government, November 2006)
The Sustainable and Secure Buildings Act	The Act is a piece of enabling legislation and is not prescriptive. However, it does require building regulations (which are defined within the 1984 Buildings Act) to incorporate a number of fuel and power related obligations. The obligations relate to fuel and power usage, metering, building emissions and reporting on micro-generation facilities within housing stock.

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'Procuring the Future'	Sustainable Procurement National Action Plan: Recommendations from the Sustainable Procurement Task Force.

## Local Government

'Planning Policy Statement 1'	<i>Planning Policy Statement 1: Delivering Sustainable Development (2005)</i> . PPS 1 outlines the Government's objectives for the planning system. It states that 'regional planning authorities and local authorities should promote resource and energy efficient buildings; community heating schemes, the use of combined heat and power, small scale renewable and low carbon energy schemes in developments; the sustainable use of water resources; and the use of sustainable drainage systems in the management of run-off.'
'Sustainable Design and Construction' The London Plan SPG	This document sets out the Mayor of London's essential and preferred standards on a whole array of issues related to sustainable design and construction. Being the status of Supplementary Planning Guidance, the document does not set policy. 'However the SPG can be taken into account as a further material consideration so has weight as a supplement to the London Plan.'

## NGOs

'40% House'	'The Royal Commission on Environmental Pollution reported that the UK needs to achieve a 60% reduction in CO2 emissions by 2050 if we are to contribute to an avoidance of significant climate change. The domestic sector is crucial to the achievement of this target as it represents almost a third of the UK's energy. The 40% House project studies behavioural and technological changes in the search for how UK households can meet the 60% target.' ( <i>Environmental Change Institute 2005</i> )
'AECB Energy Standard(s)'	This document sets out the rationale for the proposed AECB energy standards for new buildings. It outlines what levels of energy efficiency and renewable energy use they would require. It explains what further work is needed before we can apply both standards to new buildings. ( <i>David Oliver, 2005</i> )
'A low-carbon roadmap to 2050'	'Using ZED standards gives us a once-in-a-lifetime opportunity to change the way the construction industry produces infrastructure and buildings, enabling a higher quality of life and a step-change reduction in environmental impact.' ( <i>BDA-ZEDfactory 2005</i> )

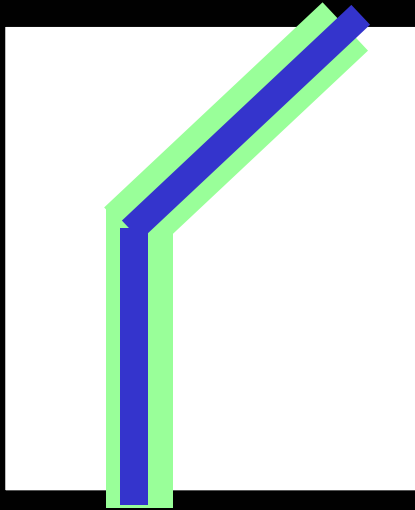


# CarbonLite Programme Application

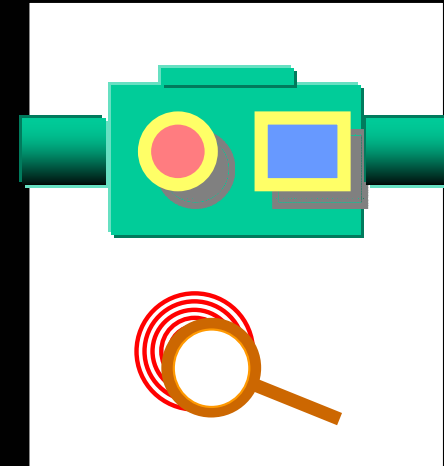


# Systems

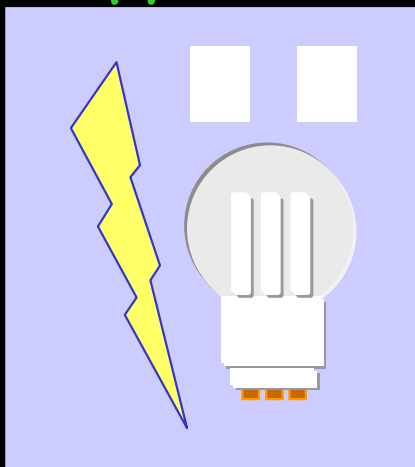
## Buildings Fabric Systems



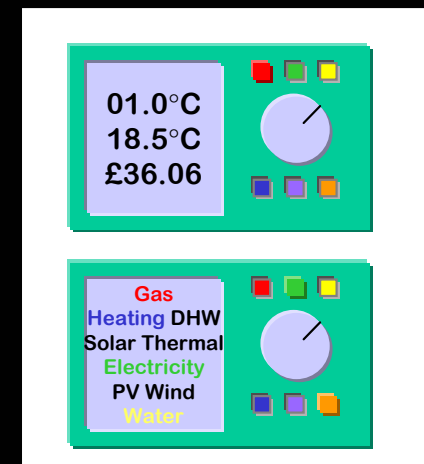
## Ventilation Heating & Cooking



## Electrical Power, Lighting & Appliances



## Controls Monitoring Metering

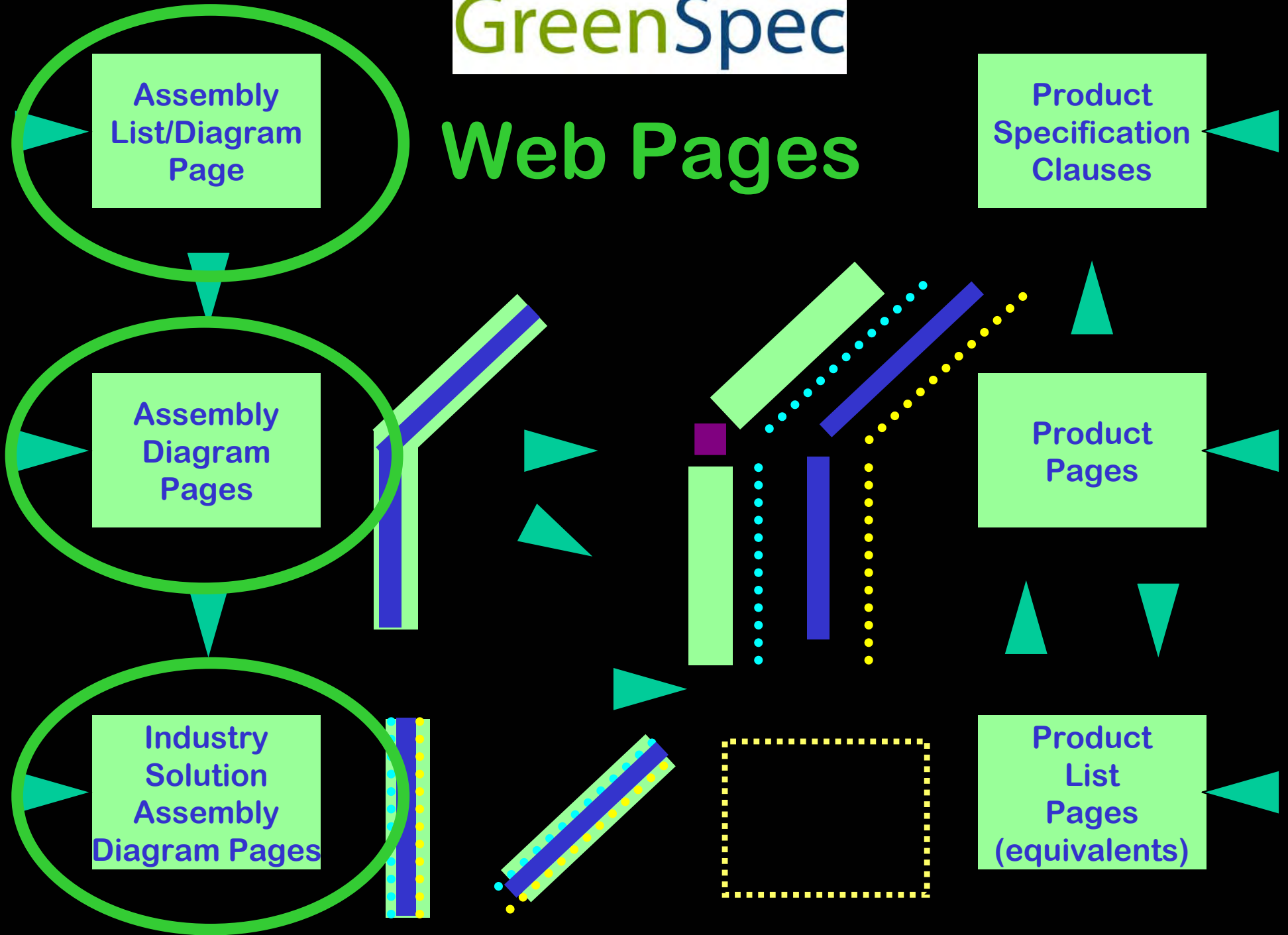




# NGS GreenSpec Assembly Pages

# GreenSpec

## Web Pages



# Assembly pages & List pages

- Do not exist yet
- Will be created to bring together materials and product pages which are know solutions when assembled together
- Examples:
- Tradis Insulated panel: Masonite Compound Section, Hunton Boards, Excel Insulation
- Wall, Roof, Ground floor
- Eaves detail, upper floor/external wall

## The Low-Carbon House: Contents

- Energy Standards: CSH Level 4 / CarbonLite Step 1
- Energy Standards: CSH Level 5/ Passivhaus / CarbonLite Step 2
- Energy Standards: CSH Level 6 / CarbonLite Step 3
- Siting and Orientation
- Direct Solar Gain
- Indirect Solar Gain: Thermal Walls
- Thermal Mass
- Construction details

### Low Carbon House:

- **Contents**
- Standards Level 4
- Standards Level 5
- Standards Level 6
- Siting & orientation
- Direct Solar Gain
- Thermal Walls
- Thermal Mass
- Construction details

[HOME](#)[PRODUCTS](#)[MANUFACTURERS](#)[SPECIFICATIONS \(available 2007\)](#)[MATERIALS](#)[ENERGY](#)[CHECKLIST](#)[THE LOW CARBON HOUSE](#)[DESIGN](#)[IMAGE BANK](#)[REFURBISHMENT](#)[FORUMS](#)[SITE WASTE](#)[DURABILITY](#)[SUPPLIERS & INSTALLERS](#)[FABRICATORS](#)[RECLAMATION](#)[CRAFTSMEN](#)[POLICIES & STRATEGIES](#)[RESEARCH & PAPERS](#)[RESOURCES](#)[CPD](#)[HOW WE SELECT PRODUCTS](#)[CONTACT GREENSPEC](#)[REGISTER YOUR PRODUCT](#)[LOW CARBON HOUSE CONTENTS](#)

- HOME
- PRODUCTS
- MANUFACTURERS
- SPECIFICATIONS (available 2007)
- MATERIALS
- ENERGY
- CHECKLIST
- THE LOW CARBON HOUSE**
- DESIGN
- IMAGE BANK
- REFURBISHMENT
- FORUMS
- SITE WASTE
- DURABILITY
- SUPPLIERS & INSTALLERS
- FABRICATORS
- RECLAMATION
- CRAFTSMEN
- POLICIES & STRATEGES
- RESEARCH & PAPERS
- RESOURCES
- CPD
- HOW WE SELECT PRODUCTS
- CONTACT GREENSPEC
- REGISTER YOUR PRODUCT
- LOW CARBON HOUSE CONTENTS**

## The Low-Carbon House: Construction Details: Contents and Introduction

### Contents

- Construction details: CSH Level 4 / Carbon Lite Step 1 (Silver)
- Construction details: CSH Level 5 / Carbon Lite Step 2/ Passivhaus
- Construction details: CSH Level 6 / Carbon Lite Step 3 (Gold)

### Introduction

In order to support 'early adopters' pioneering the draft standards, the AECB has produced this initial design guidance document. It concentrates on two of the areas where current UK practice most adversely affects building energy performance - thermal bridging and airtightness.

Although this guidance is written in the context of constructional examples based on Silver Standard U-values, part of the guidance is also relevant to projects where the building fabric is being designed to the Gold Standard. The key design and construction principles illustrated in this guide will be useful to all those who are attempting to design more thermally-efficient building envelopes.

Many of the examples used here have been used on "live" projects by various AECB members. They were adopted as part of a practical two day NVQ course run by the AECB for construction students, the details being built full-size in the college workshops by the students.

#### Low Carbon House:

- Contents
- Standards Level 4
- Standards Level 5
- Standards Level 6
- Siting & orientation
- Direct Solar Gain
- Thermal Walls
- Thermal Mass
- **Details: Introduction**
- Details: Level 4



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Please use these constructional examples to inform the detailed design of your own project's building fabric. Applying the principles of reduced thermal bridging and increased airtightness to all fabric elements - walls, floors, roof, etc - and key junctions between elements will significantly reduce your building's overall energy use and CO2 emissions.

It is intended that these details be treated as constructional examples only, to illustrate the application of good thermal design principles as required by the AECB Silver Standard. Do not treat them as "approved" or "accredited" details as they have not been through the necessary peer review process to gain this additional authority.

Considerable care has been taken when compiling the information in these documents and it is believed to be accurate, but it is provided without liability. It is hoped that you can utilise the constructional examples which are provided in your own work, but you must assess their suitability for use under your own particular circumstances.

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- HOME
- PRODUCTS
- MANUFACTURERS
- SPECIFICATIONS (available 2007)
- MATERIALS
- ENERGY
- CHECKLIST
- THE LOW CARBON HOUSE**
- DESIGN
- IMAGE BANK
- REFURBISHMENT
- FORUMS
- SITE WASTE
- DURABILITY
- SUPPLIERS & INSTALLERS
- FABRICATORS
- RECLAMATION
- CRAFTSMEN
- POLICIES & STRATEGIES
- RESEARCH & PAPERS
- RESOURCES
- CPD
- HOW WE SELECT PRODUCTS
- CONTACT GREENSPEC
- REGISTER YOUR PRODUCT
- LOW CARBON HOUSE CONTENTS**

## The Low-Carbon House: Construction Details: Contents and Introduction

### Contents

- Construction details: CSH Level 4 / Carbon Lite Step 1 (Silver)
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#### Low Carbon House:

- Contents
- Standards Level 4
- Standards Level 5
- Standards Level 6
- Siting & orientation
- Direct Solar Gain
- Thermal Walls
- Thermal Mass
- **Details: Introduction**
- Details: Level 4

HOME

PRODUCTS

MANUFACTURERS

SPECIFICATIONS (available 2007)

MATERIALS

ENERGY

CHECKLIST

**THE LOW CARBON HOUSE**

DESIGN

IMAGE BANK

REFURBISHMENT

FORUMS

SITE WASTE

DURABILITY

SUPPLIERS &amp; INSTALLERS

FABRICATORS

RECLAMATION

CRAFTSMEN

POLICIES &amp; STRATEGIES

RESEARCH &amp; PAPERS

RESOURCES

CPD

HOW WE SELECT PRODUCTS

CONTACT GREENSPEC

REGISTER YOUR PRODUCT

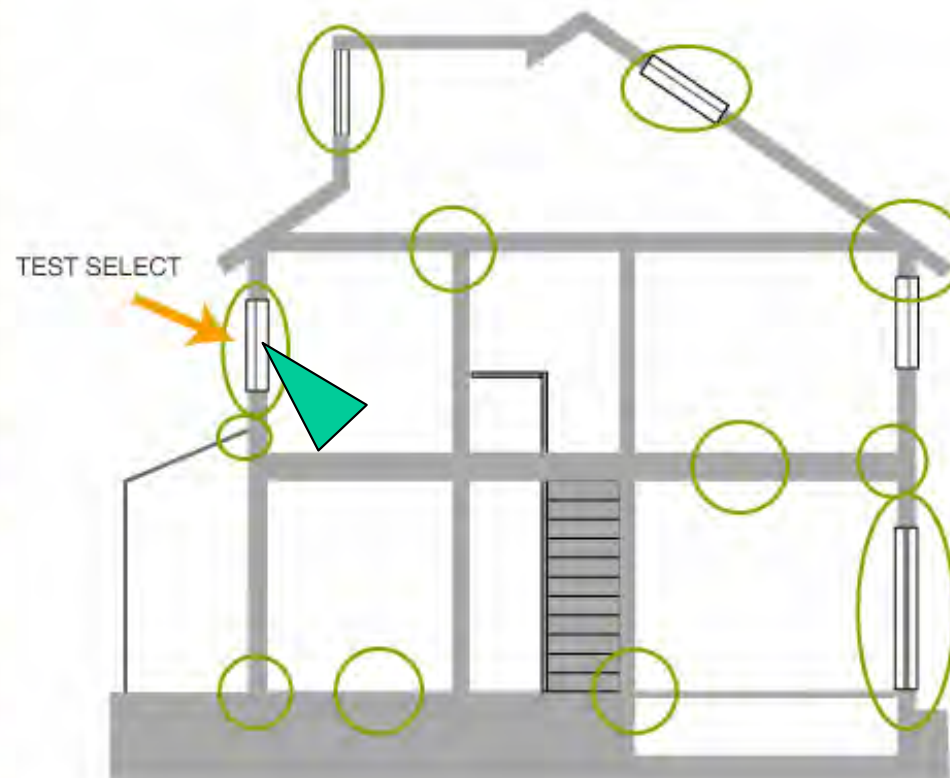
LOW CARBON HOUSE CONTENTS

# The Low-Carbon House: Construction Details: CSH Level 4 / Carbon Lite Step 1

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## Low Carbon House:

- Contents
- Standards Level 4
- Standards Level 5
- Standards Level 6
- Siting & orientation
- Direct Solar Gain
- Thermal Walls
- Thermal Mass
- Details: Introduction
- Details: Level 4



- HOME
- PRODUCTS
- MANUFACTURERS
- SPECIFICATIONS (available 2007)
- MATERIALS
- ENERGY
- CHECKLIST
- THE LOW CARBON HOUSE**
- DESIGN
- IMAGE BANK
- REFURBISHMENT
- FORUMS
- SITE WASTE
- DURABILITY
- SUPPLIERS & INSTALLERS
- FABRICATORS
- RECLAMATION
- CRAFTSMEN
- POLICIES & STRATEGES
- RESEARCH & PAPERS
- RESOURCES
- CPD
- HOW WE SELECT PRODUCTS
- CONTACT GREENSPEC
- REGISTER YOUR PRODUCT
- LOW CARBON HOUSE CONTENTS

## The Low-Carbon House: Construction Details: CSH Level 4 / Carbon Lite Step 1: Window Openings

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- Low Carbon House:
- Contents
  - Standards Level 4
  - Standards Level 5
  - Standards Level 6
  - Siting & orientation
  - Direct Solar Gain
  - Thermal Walls
  - Thermal Mass
  - Details: Introduction
  - **Details: Level 4**

### Masonry wall construction



Cavity wall  
(Test Select)



External insulation



Etc.

### Timber frame construction





Cavity wall  
(Test Select)



External insulation



Etc.

## Timber frame construction



Etc



Etc

### Disclaimer:

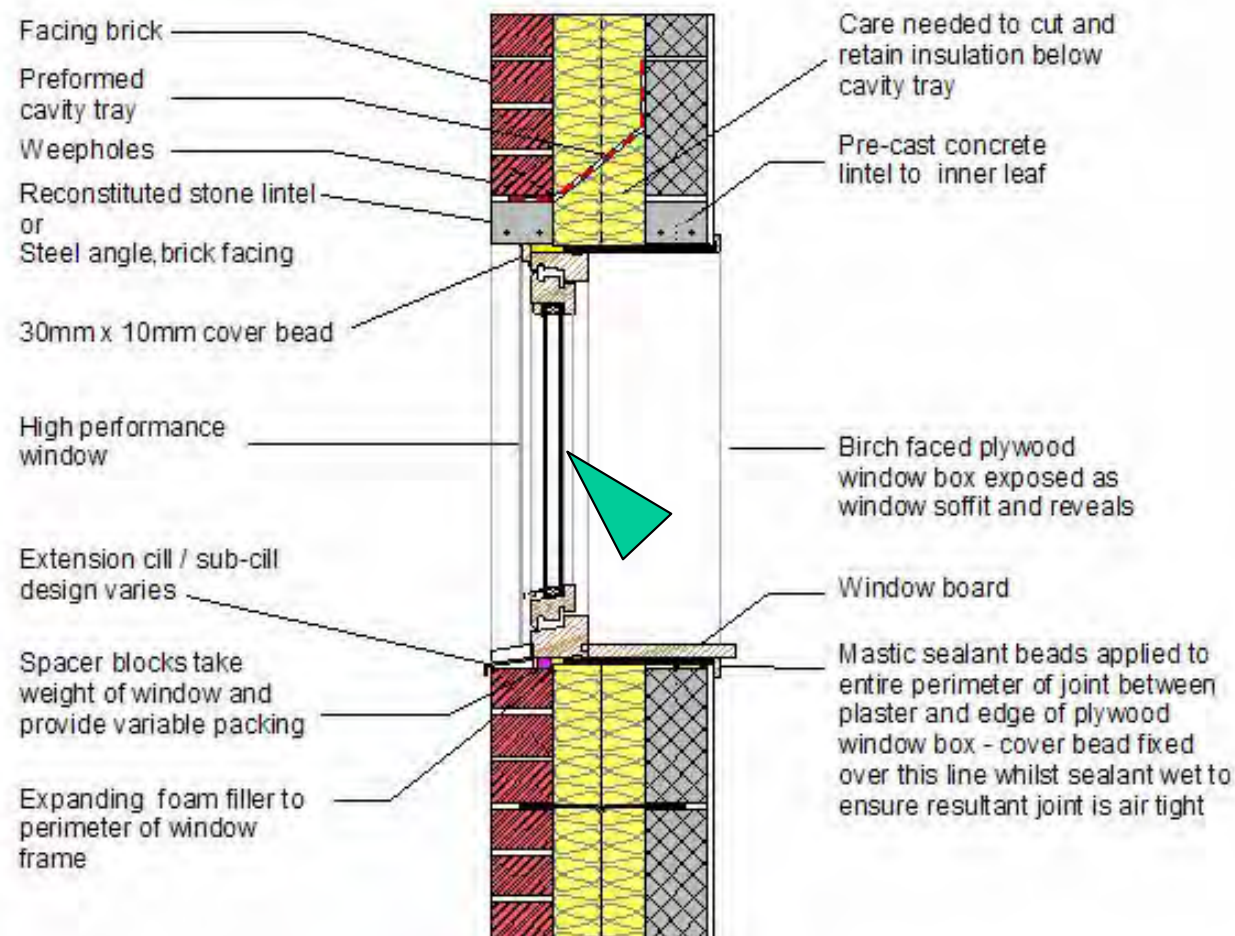
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# The Low-Carbon House: Construction Details: CSH Level 4 / Carbon Lite Step 1: Window Openings: Masonry: Cavity

## Low Carbon House:

- Contents
- Standards Level 4
- Standards Level 5
- Standards Level 6
- Siting & orientation
- Direct Solar Gain
- Thermal Walls
- Thermal Mass
- Details: Introduction
- Details: Level 4

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# GreenSpec




- HOME
- PRODUCTS**
- MANUFACTURERS
- SPECIFICATIONS (available 2007)
- MATERIALS
- ENERGY
- CHECKLIST
- DESIGN
- IMAGE BANK
- REFURBISHMENT
- FORUMS
- SITE WASTE
- DURABILITY
- SUPPLIERS & INSTALLERS
- FABRICATORS
- RECLAMATION
- CRAFTSMEN
- POLICIES & STRATEGIES
- RESEARCH & PAPERS
- RESOURCES
- CPD
- HOW WE SELECT PRODUCTS
- CONTACT GREENSPEC
- REGISTER YOUR PRODUCT
- PRODUCTS CONTENTS**
- L2 Complete construction entities
- L3 Structural and space division
- L4 Access, barrier and circulation

## L413 Windows

all types

Manufacturer	Product	Type			
Green Building Store	Ecoplus	high performance timber windows	✓	✓	
Green Building Store	Ecoclad	high performance timber / alu-clad windows	✓	✓	

### Key

-  product / equipment with climate change reduction potential
-  sustainable product
-  product with recycled content

HOME

PRODUCTS

MANUFACTURERS

SPECIFICATIONS (available 2007)

MATERIALS

ENERGY

CHECKLIST

DESIGN

IMAGE BANK

REFURBISHMENT

FORUMS

SITE WASTE

DURABILITY

SUPPLIERS & INSTALLERS

FABRICATORS

RECLAMATION

CRAFTSMEN

POLICIES & STRATEGIES

RESEARCH & PAPERS

RESOURCES

CPD

HOW WE SELECT PRODUCTS

CONTACT GREENSPEC

REGISTER YOUR PRODUCT

REGISTER YOUR PRODUCT

REGISTER YOUR PRODUCT

REGISTER YOUR PRODUCT

PRODUCTS CONTENTS

L2 Complete construction entities

L3 Structural and space division

L4 Access, barrier and circulation

## 'Ecoplus' windows

### High performance timber windows

- Manufactured from Forest Stewardship (FSC) 100% certified timber - available in European oak or redwood.
- Lamination and finger joint technology are utilised to minimise resource use and improve durability.
- Ultra-efficient double or triple glazing system with a centre pane U-value of 1.2 w/m<sup>2</sup>k or 0.5 w/m<sup>2</sup>k respectively.
- Warm edge spacers help maximise thermal efficiency and virtually eliminate cold edge condensation.
- Boron timber preservatives, considered the safest and most environmentally benign of all timber treatments.
- Durable and easy-to-maintain OS Color wood-finishes. Biocide-free and based on natural plant oils.
- Manufactured in the UK and designed in conjunction with the Timber Research and Development Association (TRADA).\*



Manufacturer's evidence rating:*	★
Material/s:	FSC timber, glass and aluminium
Environmental statement:	yes
BRE Ecopoints:	unrated
BRE Environmental profile:	unrated
Other environmental standards:	none
3rd party accreditation:	FSC certified
3rd party product endorsement:	none
Reusability / Recyclability:	reusable and glass is recyclable
% of post consumer waste:	unknown
Life expectancy	unknown
Substitute for or new	



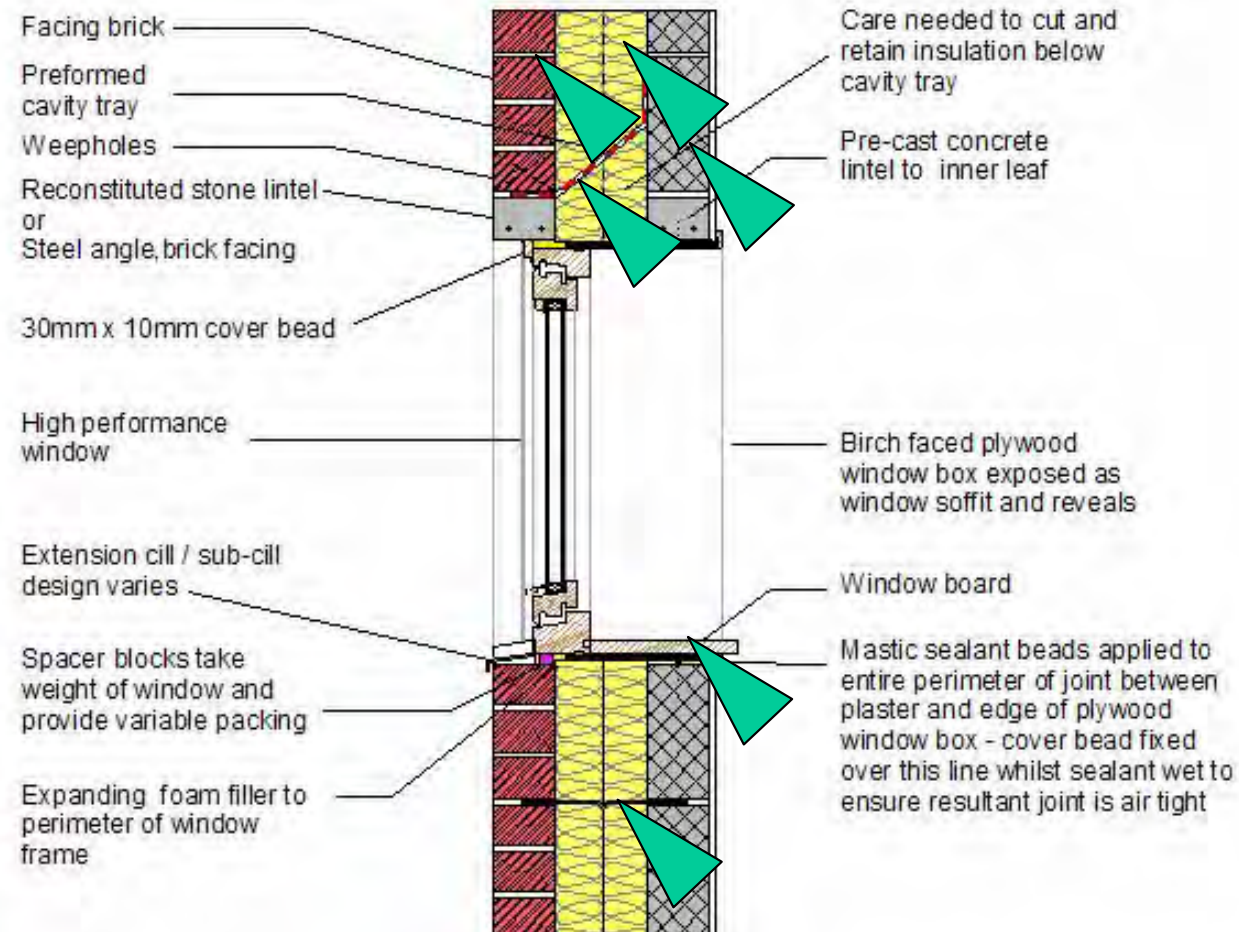
# NGS GreenSpec Many Products

# The Low-Carbon House: Construction Details: CSH Level 4 / Carbon Lite Step 1: Window Openings: Masonry: Cavity

## Low Carbon House:

- Contents
- Standards Level 4
- Standards Level 5
- Standards Level 6
- Siting & orientation
- Direct Solar Gain
- Thermal Walls
- Thermal Mass
- Details: Introduction
- Details: Level 4

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NGS GreenSpec  
Many Elements  
Many Assemblies

HOME

PRODUCTS

MANUFACTURERS

SPECIFICATIONS (available 2007)

MATERIALS

ENERGY

CHECKLIST

**THE LOW CARBON HOUSE**

DESIGN

IMAGE BANK

REFURBISHMENT

FORUMS

SITE WASTE

DURABILITY

SUPPLIERS &amp; INSTALLERS

FABRICATORS

RECLAMATION

CRAFTSMEN

POLICIES &amp; STRATEGIES

RESEARCH &amp; PAPERS

RESOURCES

CPD

HOW WE SELECT PRODUCTS

CONTACT GREENSPEC

REGISTER YOUR PRODUCT

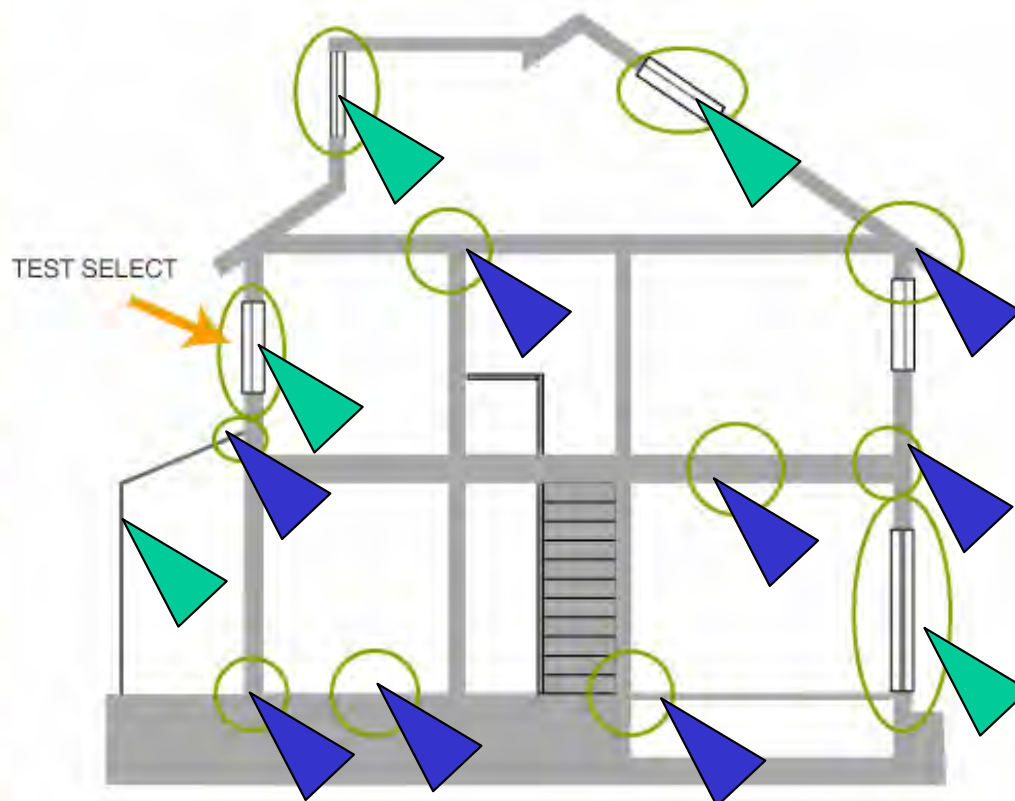
LOW CARBON HOUSE CONTENTS

# The Low-Carbon House: Construction Details: CSH Level 4 / Carbon Lite Step 1

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## Low Carbon House:

- Contents
- Standards Level 4
- Standards Level 5
- Standards Level 6
- Siting & orientation
- Direct Solar Gain
- Thermal Walls
- Thermal Mass
- Details: Introduction
- Details: Level 4



Inhabited  
Loft room  
Uninhabited  
Attic  
Unoccupied  
Green House  
Occupied  
Conservatory  
Un-insulated  
Internal garage



# GreenSpec


 

- HOME
- PRODUCTS**
- MANUFACTURERS
- SPECIFICATIONS (available 2007)
- MATERIALS
- ENERGY
- CHECKLIST
- DESIGN
- IMAGE BANK
- REFURBISHMENT
- FORUMS
- SITE WASTE
- DURABILITY
- SUPPLIERS & INSTALLERS
- FABRICATORS
- RECLAMATION
- CRAFTSMEN
- POLICIES & STRATEGIES
- RESEARCH & PAPERS
- RESOURCES
- CPD
- HOW WE SELECT PRODUCTS
- CONTACT GREENSPEC
- REGISTER YOUR PRODUCT


- PRODUCTS CONTENTS**
- L2 Complete construction entities
- L3 Structural and space division
- L4 Access, barrier and circulation

## L362 Fabricated components

### structural timber panels

Manufacturer	Product	Type	
KLH Massivholz	XLSolid	structural timber panels	
Finnorest Merk	LenoTec	structural timber panels	

#### Key

 product with recycled content





- HOME
- PRODUCTS**
- MANUFACTURERS
- SPECIFICATIONS (available 2007)
- MATERIALS
- ENERGY
- CHECKLIST
- DESIGN
- IMAGE BANK
- REFURBISHMENT
- FORUMS
- SITE WASTE
- DURABILITY
- SUPPLIERS & INSTALLERS
- FABRICATORS
- RECLAMATION
- CRAFTSMEN
- POLICIES & STRATEGIES
- RESEARCH & PAPERS
- RESOURCES
- CPD
- HOW WE SELECT PRODUCTS
- CONTACT GREENSPEC
- REGISTER YOUR PRODUCT
- PRODUCTS CONTENTS**
- L2 Complete construction entities
- L3 Structural and space division
- L4 Access, barrier and circulation

## L681 Thermal insulation

- external walls
- pitched roofs
- flat roofs
- intermediate and seperating floors
- ground floors
- internal walls / partitions
- services
- general applications

### external walls

Manufacturer	Product	Type			
CR	Flax100	flax slab	✓	✓	
Termex	Termex	loose cellulose for timber frame construction	✓	✓	✓
Homatherm	flexCL 040	cellulose slab for timber frame and partial-fill cavity walls	✓	✓	✓
Homatherm	woodFlex 040	woodfibre slab	✓	✓	
Vital	Vital 040	cellulose slab for timber frame and partial-fill cavity walls	✓	✓	
Excel	Warmcell 500	loose cellulose for wood frames	✓	✓	✓
Plant Fibre Technology	Isonat	hemp and cotton slab	✓	✓	
Second Nature	Thermafleece	wool rolls for timber frame construction	✓	✓	
Gutex	ThermoWall	wood-fibre board	✓	✓	
Pavatex	Pavatherm	wood-fibre board	✓	✓	
	Diffutherm	wood-fibre board, interlocking render carrier	✓	✓	
	Isolair	wood-fibre board, water resistant, for ventilated facades	✓	✓	







- HOME
- PRODUCTS**
- MANUFACTURERS
- SPECIFICATIONS (available 2007)
- MATERIALS
- ENERGY
- CHECKLIST
- DESIGN
- IMAGE BANK
- REFURBISHMENT
- FORUMS
- SITE WASTE
- DURABILITY
- SUPPLIERS & INSTALLERS
- FABRICATORS
- RECLAMATION
- CRAFTSMEN
- POLICIES & STRATEGIES
- RESEARCH & PAPERS
- RESOURCES
- CPD
- HOW WE SELECT PRODUCTS
- CONTACT GREENSPEC
- REGISTER YOUR PRODUCT
- PRODUCTS CONTENTS**
- L2 Complete construction entities
- L3 Structural and space division
- L4 Access, barrier and circulation

## Pavatex 'Pavatherm'

### Wood fibre board insulation

'Application: wall, floor and roof insulation  
 Pavatherm is a wooden fibreboard to DIN 68755 Part 1: Fibreboards for building constructions; Insulation material for thermal protection. The board does not contain any glue or wood preservatives. Pavatherm is effective in reducing the U value (thermal transmittance), in improving acoustic sound protection and summer heat protection (phase postponement). Pavatherm can be used in new and renovation buildings.

Application: wall, floor and roof insulation

Thermal Conductivity (K) = 0.040 W/m.K'



Manufacturer's evidence rating:*	★
Material/s:	wood fibre
Environmental statement:	none
BRE Ecopoints:	unrated
BRE Environmental profile:	unrated
Other environmental standards:	none
3rd party accreditation:	none
3rd party product endorsement:	none
Reusability / Recyclability:	recyclable & reusable
% of post consumer waste:	unknown
Life expectancy	life of building
Substitute for or new materials / method:	insulation from non-renewable sources
Editors' comments:	
Country/s of manufacture:	Germany



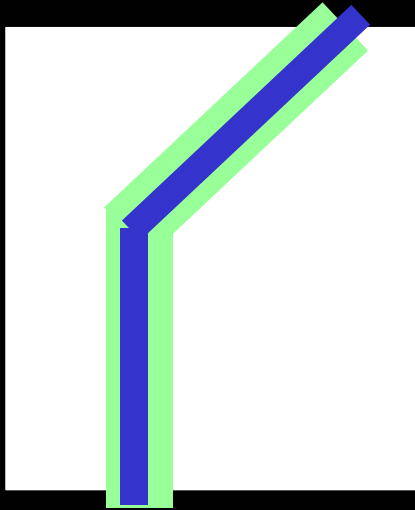
NGS GreenSpec  
Many Services



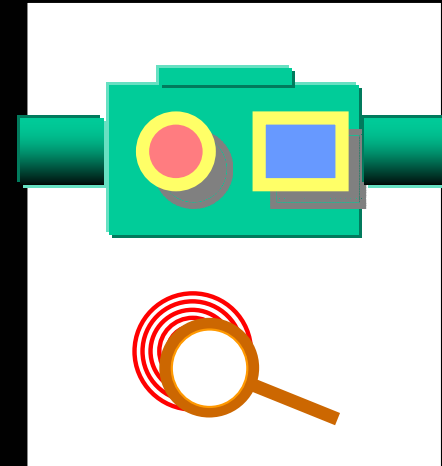
# Systems



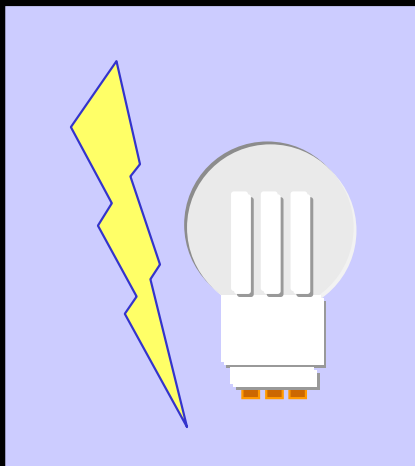
## Buildings Fabric Systems



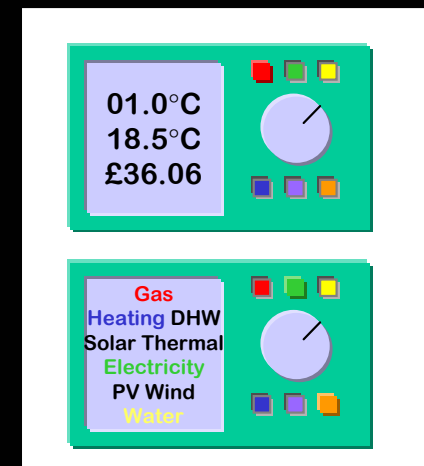
## Ventilation, Heating & Cooking



## Electrical Power, Lighting & Appliances



## Controls Monitoring Metering



- HOME
- PRODUCTS**
- MANUFACTURERS
- SPECIFICATIONS (available 2007)
- MATERIALS
- ENERGY
- CHECKLIST
- DESIGN
- IMAGE BANK
- REFURBISHMENT
- FORUMS
- SITE WASTE
- DURABILITY
- SUPPLIERS & INSTALLERS
- FABRICATORS
- RECLAMATION
- CRAFTSMEN
- POLICIES & STRATEGIES
- RESEARCH & PAPERS
- RESOURCES
- CPD
- HOW WE SELECT PRODUCTS
- CONTACT GREENSPEC
- REGISTER YOUR PRODUCT
- PRODUCTS CONTENTS**
- L2 Complete construction entities
- L3 Structural and space division
- L4 Access, barrier and circulation

## L752 Transformation & conservation of energy

### wood / biomass fuel boilers

Manufacturer	Product	Type	
Binder	'RRK' series boilers	biomass boilers for commercial, industrial and large residential	✓
	'PK' series boilers	wood pellet boiler for domestic use	✓

### wood fuel stoves

Manufacturer	Product	Type	
Tonwerk	Topolino	wood burning stove	✓
	T-ONE	wood burning stove	✓
	T-LOFT	wood burning stove	✓
Extraflame	'Extraflame' pellet stoves	wood pellet stove	✓

### hot water solar collectors

Manufacturer	Product	Type	
Energie Solaire	Azur	flat-plate collector	✓
	Solar Roof	integrated roof collector	✓
solarcentury	C21ft : Solar hot water roof tile	collector tile	✓
	Solar Hot Water Sunstation	flat-plate collector	✓
Thermomax	Thermomax	evacuated tube collector	✓
	Solamax	evacuated tube collector	✓
	Mazdon	evacuated tube collector	✓
Solar Twin	Solartwin	flat-plate collector	✓


 Search

- HOME
- PRODUCTS**
- MANUFACTURERS
- SPECIFICATIONS (available 2007)
- MATERIALS
- ENERGY
- CHECKLIST
- DESIGN
- IMAGE BANK
- REFURBISHMENT
- FORUMS
- SITE WASTE
- DURABILITY
- SUPPLIERS & INSTALLERS
- FABRICATORS
- RECLAMATION
- CRAFTSMEN
- POLICIES & STRATEGIES
- RESEARCH & PAPERS
- RESOURCES
- CPD
- HOW WE SELECT PRODUCTS
- CONTACT GREENSPEC
- REGISTER YOUR PRODUCT
- PRODUCTS CONTENTS**
- L2 Complete construction entities
- L3 Structural and space division
- L4 Access, barrier and circulation

## Binder 'RRK' series boilers

### Biomass boilers for commercial, industrial and large residential

The BINDER range of biomass boilers sets a bench-mark for convenience and comfort in handling:

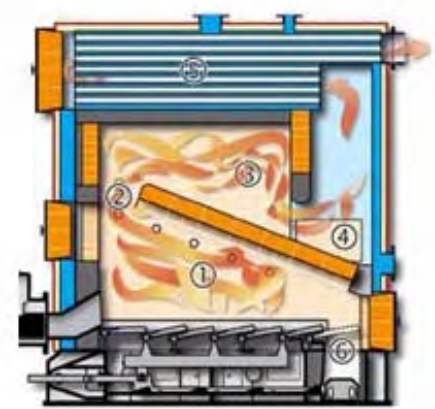
- automated de-ashing\*
  - automatic cleaning of the heat exchanger\*
  - computer based capacity and combustion control\* and accumulator tank management\*
- Start the boiler and have heat generated around the clock - with only bi-annual servicing for routine inspection and cleaning.

BINDER boilers achieve efficiency ratings of up to 92 percent\*.

- The CVP control package\* gives fully modulating capacity control from 25% to 100%.
- Speed-control\* on all fans minimises the electric power consumption.
- The Lambda O2 regulation improves efficiency and brings out the most of your fuel.
- High quality engineering with a minimum on maintenance required provides for high availability.

\*...dependent on plant size and system configuration'

Manufacturer's evidence rating:*	★
Material/s:	unknown
Environmental statement:	no
BRE Ecopoints:	unrated
BRE Environmental profile:	unrated
Other environmental standards:	none
3rd party accreditation:	EN303-5
3rd party product endorsement:	none
Reusability / Recyclability:	reusable



HOW WE SELECT PRODUCTS

CONTACT GREENSPEC

REGISTER YOUR PRODUCT

PRODUCTS CONTENTS

L2 Complete construction entities

L3 Structural and space division

L4 Access, barrier and circulation

L5 Coverings, claddings, linings


L6 General purpose fabric

L7 Services


L8 Fixtures and furnishing

Energie Solaire	AZUR	flat-plate collector	✓
	Solar Roof	integrated roof collector	✓
solarcentury	C21t : Solar hot water roof tile	collector tile	✓
	Solar Hot Water Sunstation	flat-plate collector	✓
Thermomax	Thermomax	evacuated tube collector	✓
	Solamax	evacuated tube collector	✓
	Mazdon	evacuated tube collector	✓
Solar Twin	Solartwin	flat-plate collector	✓


## heat pumps

Manufacturer	Product	Type	
Dimplex	Ground Source Heat Pump	domestic GSHP	✓
	Air to Water Heat Pump	domestic air to water heat pump	✓


## hot water management systems

Manufacturer	Product	Type	
Sandler	M2 solar thermal system	thermal hot water management system	✓
	014-2 thermal system	thermal hot water management system	✓

## energy management controls

Manufacturer	Product	Type	
Sandler	<a href="#">FW Thermal System</a>	renewable energy management controls	✓

### Key

 product / equipment with climate change reduction potential



# GreenSpec

 Search

- HOME
- PRODUCTS**
- MANUFACTURERS
- SPECIFICATIONS (available 2007)
- MATERIALS
- ENERGY
- CHECKLIST
- DESIGN
- IMAGE BANK
- REFURBISHMENT
- FORUMS
- SITE WASTE
- DURABILITY
- SUPPLIERS & INSTALLERS
- FABRICATORS
- RECLAMATION
- CRAFTSMEN
- POLICIES & STRATEGIES
- RESEARCH & PAPERS
- RESOURCES
- CPD
- HOW WE SELECT PRODUCTS
- CONTACT GREENSPEC
- REGISTER YOUR PRODUCT

- PRODUCTS CONTENTS**
- L2 Complete construction entities
- L3 Structural and space division
- L4 Access, barrier and circulation

## Sandler 'FW Thermal System'

### Renewable energy management contols

The Sandler FW system integrates conventional and renewable energy sources to manage your space heating and to provide instant domestic hot water. It prioritises the use of green energy. The FW modules are pretested making design and build simple and performance is guaranteed. The system is future proof.

Heat can be taken from solar thermal collectors, heat pumps, district heating and conventional boilers - priority is given to renewable sources. Both low and high temperature emitters are controlled as standard. The system optimises the charging of a thermal buffer which avoids the pollution and wear and tear of short cycling boilers. Energy monitoring and system diagnostics are available as options with a modem link.

For larger buildings, e.g. offices, schools, hotels and factories, the Sandler 020 is the system of choice.

The Sandler is a complete heating and hot water system. It optimises your heating system and buffer heat store allowing multiple heat sources to be combined. The controller prioritises renewable energy and reduces the effect of Climate Change Levy.

Domestic hot water is heated instantly and at constant temperature.

Flow rates of 20, 30 & 40 (l/min) are available as standard with higher ones to order. The system optimises energy use saving 10-16% in the production and distribution of DHW with existing boilers. By providing hot water safely at 50°C instead of 60°C as usual, the energy savings increase to 20-25%. To get the best out of the controller we recommend using the Sandler STB Buffer.'



Manufacturer's evidence rating:*	★
Material/s:	control equipment materials
Environmental statement:	no
BRE Essentials:	unrated

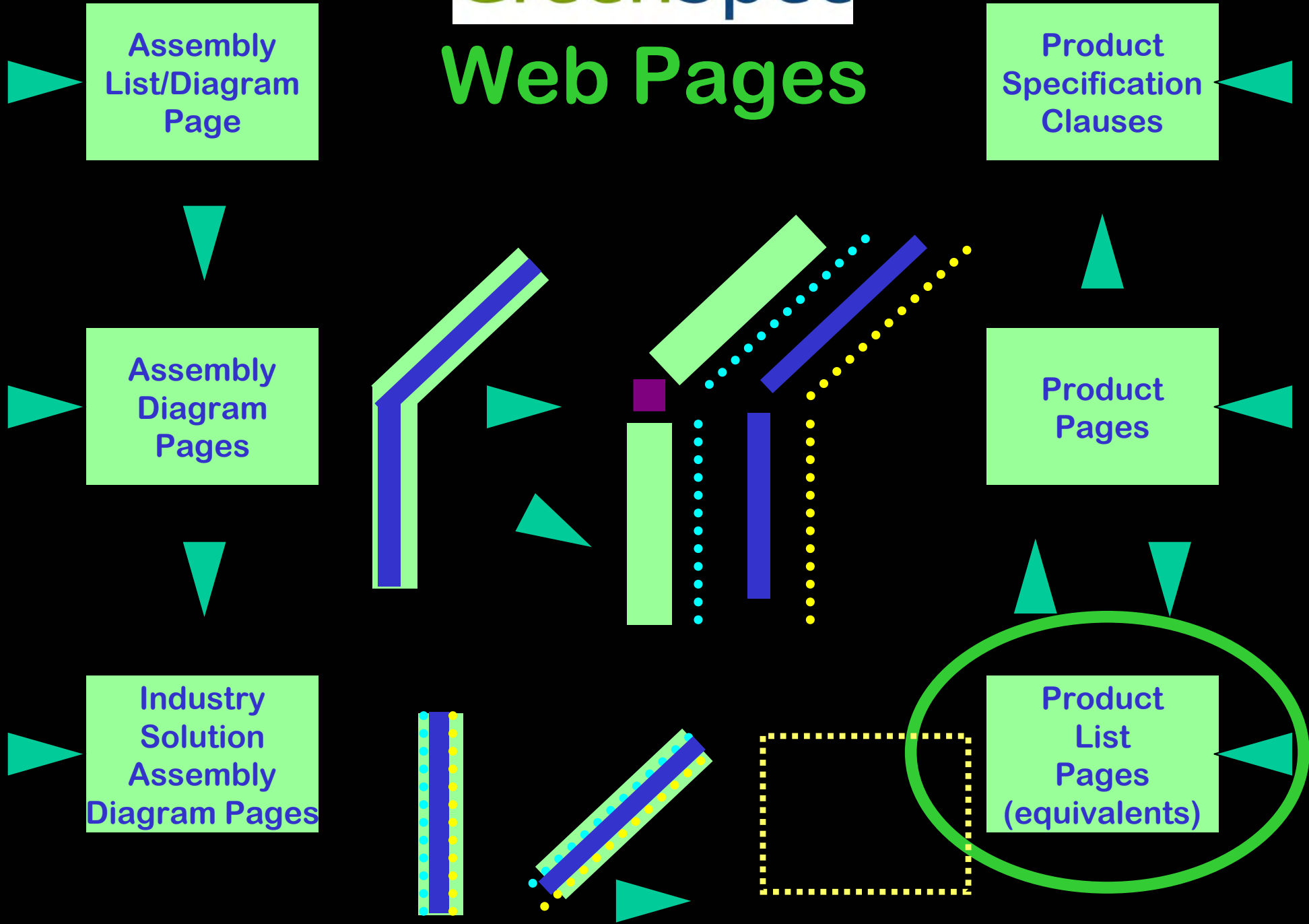


# NGS GreenSpec Product List Page

CLP endorsement added to lists of  
products

# GreenSpec

## Web Pages



# GreenSpec

 Search

- HOME
- PRODUCTS**
- MANUFACTURERS
- SPECIFICATIONS (available 2007)
- MATERIALS
- ENERGY
- CHECKLIST
- DESIGN
- IMAGE BANK
- REFURBISHMENT
- FORUM
- SITE WASTE
- DURABILITY
- SUPPLIERS & INSTALLERS
- FABRICATORS
- RECLAMATION
- CRAFTSMEN
- POLICIES & STRATEGIES
- RESEARCH & PAPERS
- RESOURCES
- CPD
- HOW WE SELECT PRODUCTS
- CONTACT GREENSPEC
- REGISTER YOUR PRODUCT
- PRODUCTS CONTENTS
- L2 Complete construction entities
- L3 Structural and space division

## L681 Thermal insulation

- external walls
- pitched roofs
- flat roofs
- intermediate and seperating floors
- ground floors
- internal walls / partitions
- services
- general applications

### external walls

Manufacturer	Product	Type				CLP
	Flax100	flax slab	✓	✓		✓
Termex	Termex	loose cellulose for timber frame construction	✓	✓	✓	
Homatherm	flexCL 040	cellulose slab for timber frame and partial-fill cavity walls	✓	✓	✓	✓
Homatherm	woodFlex 040	woodfibre slab	✓	✓		
Vital	Vital 040	cellulose slab for timber frame and partial-fill cavity walls	✓	✓		✓
Excel	<a href="#">Warmcell 500</a>	loose cellulose for wood frames	✓	✓	✓	✓
Plant Fibre Technology	Isonat	hemp and cotton slab	✓	✓		
Second Nature	Thermafleece	wool rolls for timber frame construction	✓	✓		✓
Gutex	ThermoWall	wood-fibre board	✓	✓		
Pavatex	Pavatherm	wood-fibre board	✓	✓		✓
	Diffutherm	wood-fibre board, interlocking render carrier	✓	✓		
		wood fibre board, moisture resistant for	✓	✓		





# GreenSpec

 Search

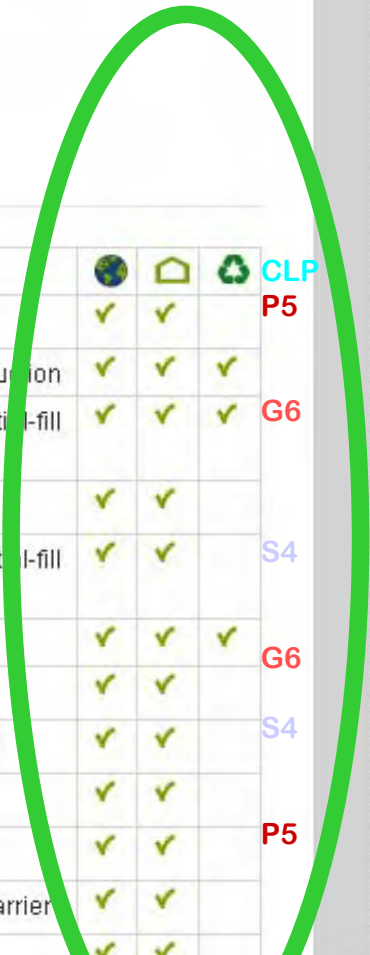
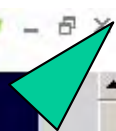
- HOME
- PRODUCTS**
- MANUFACTURERS
- SPECIFICATIONS (available 2007)
- MATERIALS
- ENERGY
- CHECKLIST
- DESIGN
- IMAGE BANK
- REFURBISHMENT
- FORUM
- SITE WASTE
- DURABILITY
- SUPPLIERS & INSTALLERS
- FABRICATORS
- RECLAMATION
- CRAFTSMEN
- POLICIES & STRATEGIES
- RESEARCH & PAPERS
- RESOURCES
- CPD
- HOW WE SELECT PRODUCTS
- CONTACT GREENSPEC
- REGISTER YOUR PRODUCT
- PRODUCTS CONTENTS
- L2 Complete construction entities
- L3 Structural and space division

## L681 Thermal insulation

- external walls
- pitched roofs
- flat roofs
- intermediate and seperating floors
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### external walls

Manufacturer	Product	Type				CLP
	Flax100	flax slab	✓	✓		P5
Termex	Termex	loose cellulose for timber frame construction	✓	✓	✓	
Homatherm	flexCL 040	cellulose slab for timber frame and partial-fill cavity walls	✓	✓	✓	G6
Homatherm	woodFlex 040	woodfibre slab	✓	✓		
Vital	Vital 040	cellulose slab for timber frame and partial-fill cavity walls	✓	✓		S4
Excel	<a href="#">Warmcell 500</a>	loose cellulose for wood frames	✓	✓	✓	G6
Plant Fibre Technology	Isonat	hemp and cotton slab	✓	✓		
Second Nature	Thermafleece	wool rolls for timber frame construction	✓	✓		S4
Gutex	ThermoWall	wood-fibre board	✓	✓		
Pavatex	Pavatherm	wood-fibre board	✓	✓		P5
	Diffutherm	wood-fibre board, interlocking render carrier	✓	✓		
		wood fibre board, moisture resistant for	✓	✓		

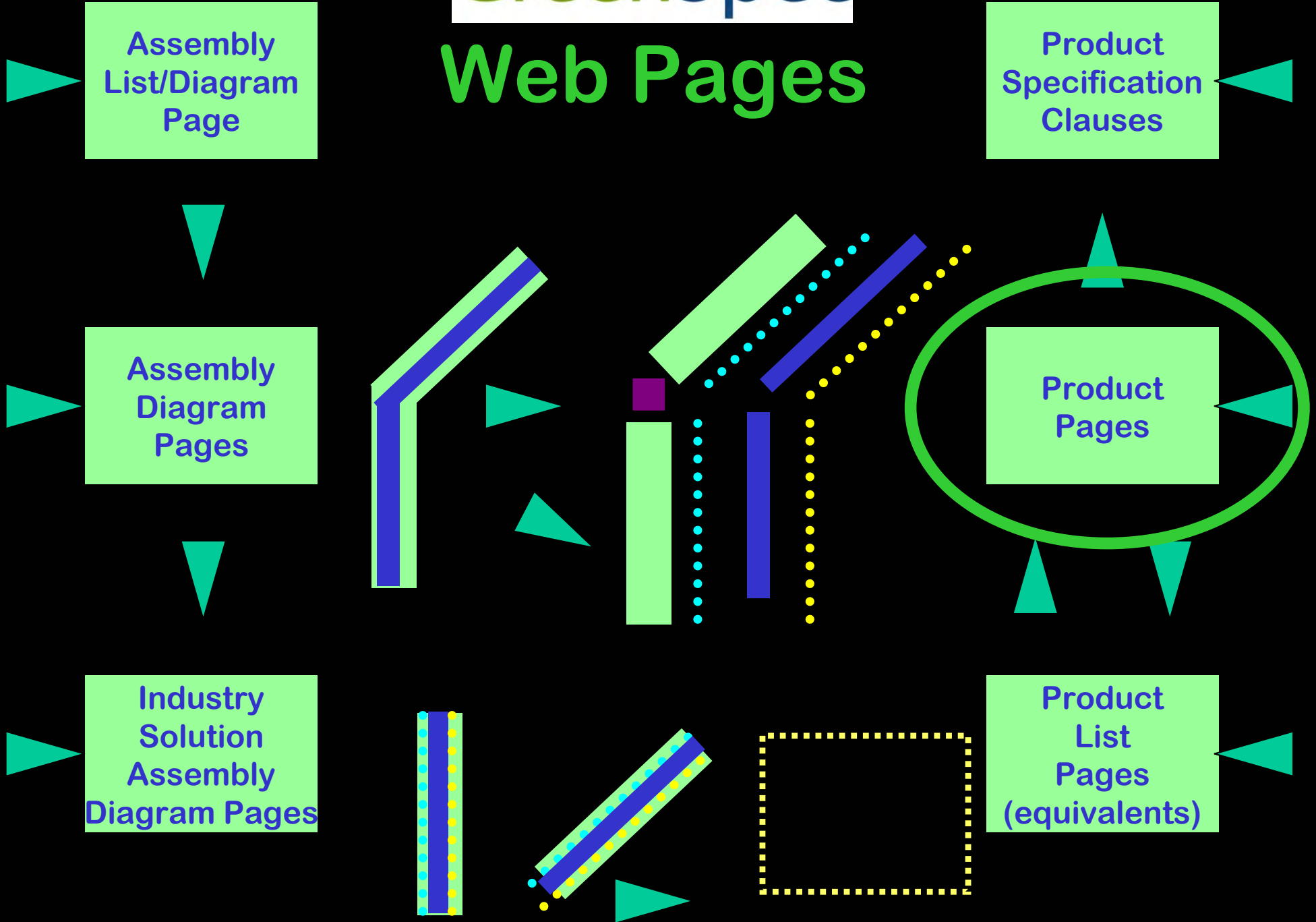




# NGS GreenSpec Product Pages

# GreenSpec

## Web Pages



# GreenSpec

 Search

- HOME
- PRODUCTS
- MANUFACTURERS
- SPECIFICATIONS (available 2007)
- MATERIALS
- ENERGY
- CHECKLIST
- DESIGN
- IMAGE BANK
- REFURBISHMENT
- FORUM
- SITE WASTE
- DURABILITY
- SUPPLIERS & INSTALLERS
- FABRICATORS
- RECLAMATION
- CRAFTSMEN
- POLICIES & STRATEGIES
- RESEARCH & PAPERS
- RESOURCES
- CPD
- HOW WE SELECT PRODUCTS
- CONTACT GREENSPEC
- REGISTER YOUR PRODUCT

GreenSpec is the UK construction industry's definitive guide to sustainable construction. Inside GreenSpec you will find a wealth of information aimed at helping you to design more energy and resource efficient buildings using materials and technologies that minimise damage to people and the environment.

## PRODUCTS



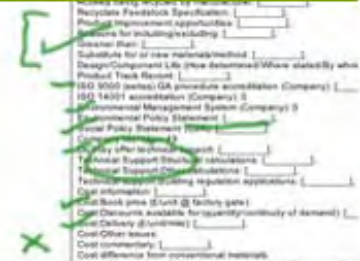
A directory of sustainable products available in the UK. Each product page comes with a description, brochure downloads and contact details.

## MATERIALS

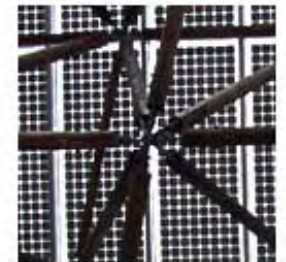


A guide to sustainable materials, both traditional and new. Materials such as masonry, roofing and flooring are compared based on their environmental impacts.

## CHECKLIST



This CAWS menu-based checklist takes you through the construction process highlighting areas where sustainable construction best practice can be applied.



**The GreenGrid Modular Green Roof System**  
for simplicity and flexibility in design and budget

www.greengridroofs.co.uk Tel: 01698 464620

**GREENGRID**  
The Natural Choice for Your Roof



## SPECIFICATIONS



## ENERGY



## IMAGE BANK





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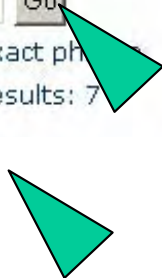
- HOME
- PRODUCTS
- MANUFACTURERS
- SPECIFICATIONS (available 2007)
- MATERIALS
- ENERGY
- CHECKLIST
- DESIGN
- IMAGE BANK
- REFURBISHMENT
- FORUM
- SITE WASTE
- DURABILITY
- SUPPLIERS & INSTALLERS
- FABRICATORS
- RECLAMATION
- CRAFTSMEN
- POLICIES & STRATEGIES
- RESEARCH & PAPERS
- RESOURCES
- CPD
- HOW WE SELECT PRODUCTS
- CONTACT GREENSPEC
- REGISTER YOUR PRODUCT

## Search results

Search:

all words  any words  exact ph

Displaying results: 1 - 7 Total results: 7



# GreenSpec

## Excel 'Warmcel 500'

### Cellulose thermal insulation for walls, roofs and floors

'Developed for EVT Technology applications, Warmcel 500 combines high levels of insulation with excellent breathability. Used for EVT walls, roofs and floors; timber frame walls and warm roofs, Warmcel 500 can be either TurboFill installed or damp spray installed.

With an impressive thermal conductivity value (k) of only 0.036 W/mK, Warmcel's 'in use' performance is further enhanced by its ability to create a high level of air-tightness to prevent thermal convection currents.'



<b>Manufacturer's evidence rating:</b>	☆☆☆
<b>Material/s:</b>	recycled newspaper with non-toxic additives
<b>Environmental statement:</b>	yes
<b>BRE Ecopoints:</b>	0.005
<b>BRE Environmental profile:</b>	A
<b>Other environmental standards:</b>	none
<b>3rd party accreditation:</b>	BBA cert 94/3027 for timber frame construction
<b>3rd party product endorsement:</b>	LPCB accredited CfSH Level 4, CLP Step 1: Silver
<b>Reusability / Recyclability:</b>	reusable as insulation
<b>% of post consumer waste:</b>	100% recycled newsprint
<b>Life expectancy</b>	lifetime of the building
<b>Substitute for or new materials / method:</b>	insulation from non-renewable sources
<b>Editors' comments:</b>	
<b>Country/s of manufacture:</b>	UK

Absolute Score  
Relative Rating

- HOME
- PRODUCTS**
- MANUFACTURERS
- SPECIFICATIONS (available 2007)
- MATERIALS
- ENERGY
- CHECKLIST
- DESIGN
- IMAGE BANK
- REFURBISHMENT
- FORUM
- SITE WASTE
- DURABILITY
- SUPPLIERS & INSTALLERS
- FABRICATORS
- RECLAMATION
- CRAFTSMEN
- POLICIES & STRATEGIES
- RESEARCH & PAPERS
- RESOURCES
- CPD
- HOW WE SELECT PRODUCTS
- CONTACT GREENSPEC
- REGISTER YOUR PRODUCT
- PRODUCTS CONTENTS
- L2 Complete construction entities
- L3 Structural and space division

Search

RESOURCES

CPD

HOW WE SELECT PRODUCTS

CONTACT GREENSPEC

REGISTER YOUR PRODUCT

PRODUCTS CONTENTS

L2 Complete construction entities

L3 Structural and space division

L4 Access, barrier and circulation

L5 Coverings, claddings, linings

L6 General purpose fabric

L7 Services

L8 Fixtures and furnishing

<b>Reusability / Recyclability:</b>	reusable as insulation
<b>% of post consumer waste:</b>	100% recycled newsprint
<b>Life expectancy</b>	lifetime of the building
<b>Substitute for or new materials / method:</b>	insulation from non-renewable sources
<b>Editors' comments:</b>	
<b>Country/s of manufacture:</b>	UK
<b>UK distribution location:</b>	Gwent
<b>Downloads:</b>	Product brochure
<b>Product specification clause:</b>	-
<b>Work sections:</b>	-
<b>Manufacturer:</b>	Excel Industries
<b>Address:</b>	Maerdy Industrial Estate, Rhymney, Gwent NP22 5PY
<b>Telephone:</b>	01685 845 200
<b>Email:</b>	sales@excelfibre.com
<b>Website:</b>	www.excelfibre.com
<b>Available direct:</b>	yes
<b>Suppliers:</b>	Direct from manufacturer
<b>Alternative products:</b>	Thermal insulation
<b>Further information:</b>	Insulation materials compared
<b>Information last updated:</b>	Monday 24th, July 2006

The product has been selected on the above average performance in the following areas:

- Abiotic depletion	- Acidification
✓ Global warming	- Eutrophication
- Ozone layer depletion	✓ Solid Waste



<b>Telephone:</b>	01685 845 200
<b>Email:</b>	sales@excelfibre.com
<b>Website:</b>	www.excelfibre.com
<b>Available direct:</b>	yes
<b>Supplier:</b>	Direct from manufacturer
<b>Alternative products:</b>	Thermal insulation
<b>Further information:</b>	Insulation materials compared
<b>Information last updated:</b>	Monday 24th, July 2006

The product has been selected on the above average performance in the following areas.

<input type="checkbox"/> Abiotic depletion	<input type="checkbox"/> Acidification
<input checked="" type="checkbox"/> Global warming	<input type="checkbox"/> Eutrophication
<input type="checkbox"/> Ozone layer depletion	<input checked="" type="checkbox"/> Solid Waste
<input type="checkbox"/> Human toxicity	<input type="checkbox"/> Radioactivity
<input type="checkbox"/> Fresh water aquatic ecotoxicity	<input type="checkbox"/> Minerals extraction
<input type="checkbox"/> Terrestrial exotoxicity	<input type="checkbox"/> Water extraction
<input type="checkbox"/> Photochemical oxidation	

\*Note:  
Manufacturer's evidence rating  
★ One star rating: The product has been included based on an assessment of the manufacturer's own product information.  
★★★ Three star rating: The product has been included on the basis of a third party, independent, Life Cycle Analysis (BRE Ecoprofile or similar).



# NGS GreenSpec Product Selection

How GreenSpec selects products for  
the website content



# GreenSpec

- HOME
- PRODUCTS
- MANUFACTURERS
- SPECIFICATIONS (available 2007)
- MATERIALS
- ENERGY
- CHECKLIST
- DESIGN
- IMAGE BANK
- REFURBISHMENT
- FORUM
- SITE WASTE
- DURABILITY
- SUPPLIERS & INSTALLERS
- FABRICATORS
- RECLAMATION
- CRAFTSMEN
- POLICIES & STRATEGIES
- RESEARCH & PAPERS
- RESOURCES
- CPD
- HOW WE SELECT PRODUCTS**
- CONTACT GREENSPEC
- REGISTER YOUR PRODUCT

## How products are selected for GreenSpec

### Green Product Definition

For the purposes of *GreenSpec*, a 'green' product / material is:

**A commercially available product / material (currently available in the UK) that embodies one or more positive environmental attributes or qualities that distinguish it from other products or materials in the same function category.**

### The selection process

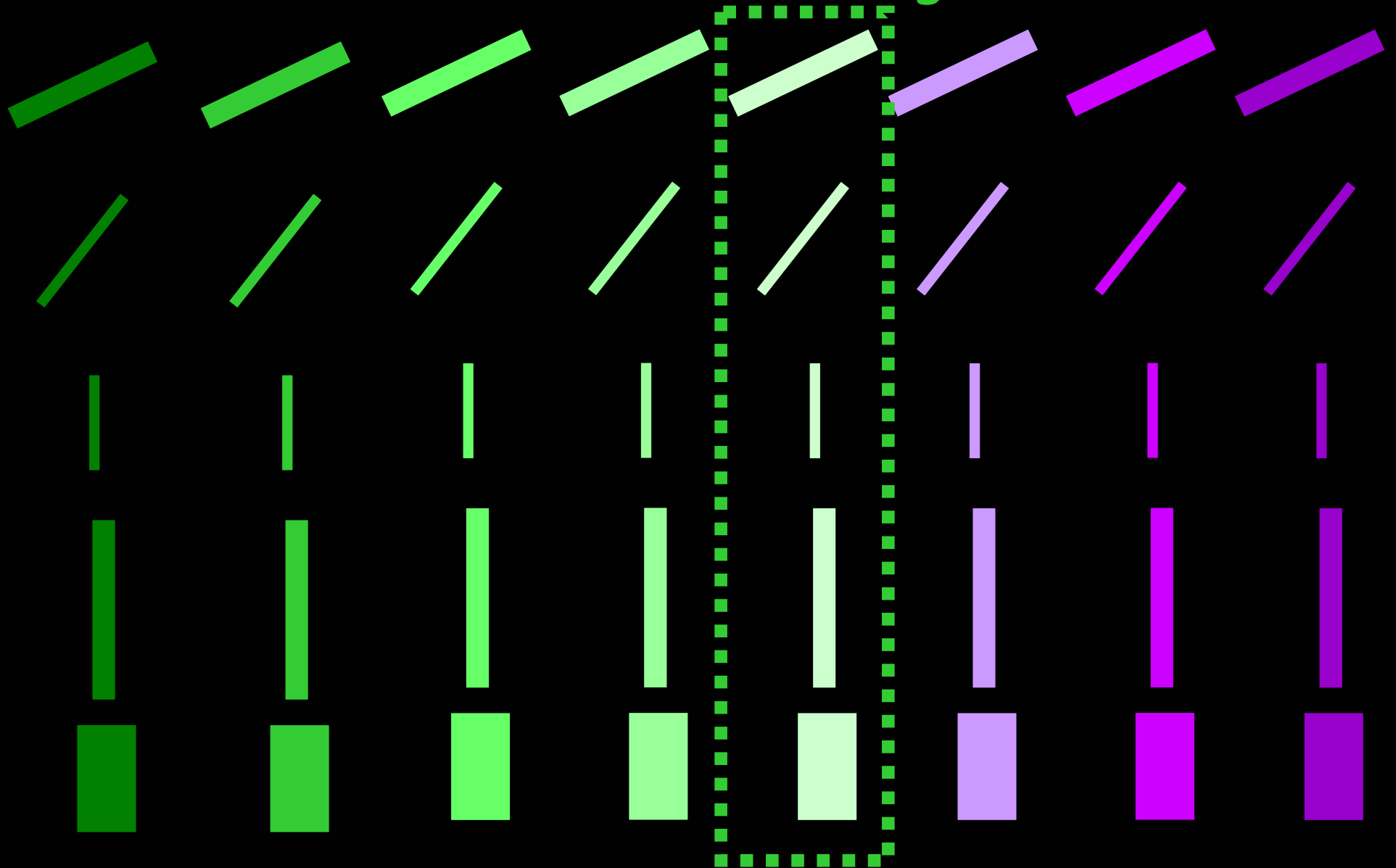


### 1 Submission of information

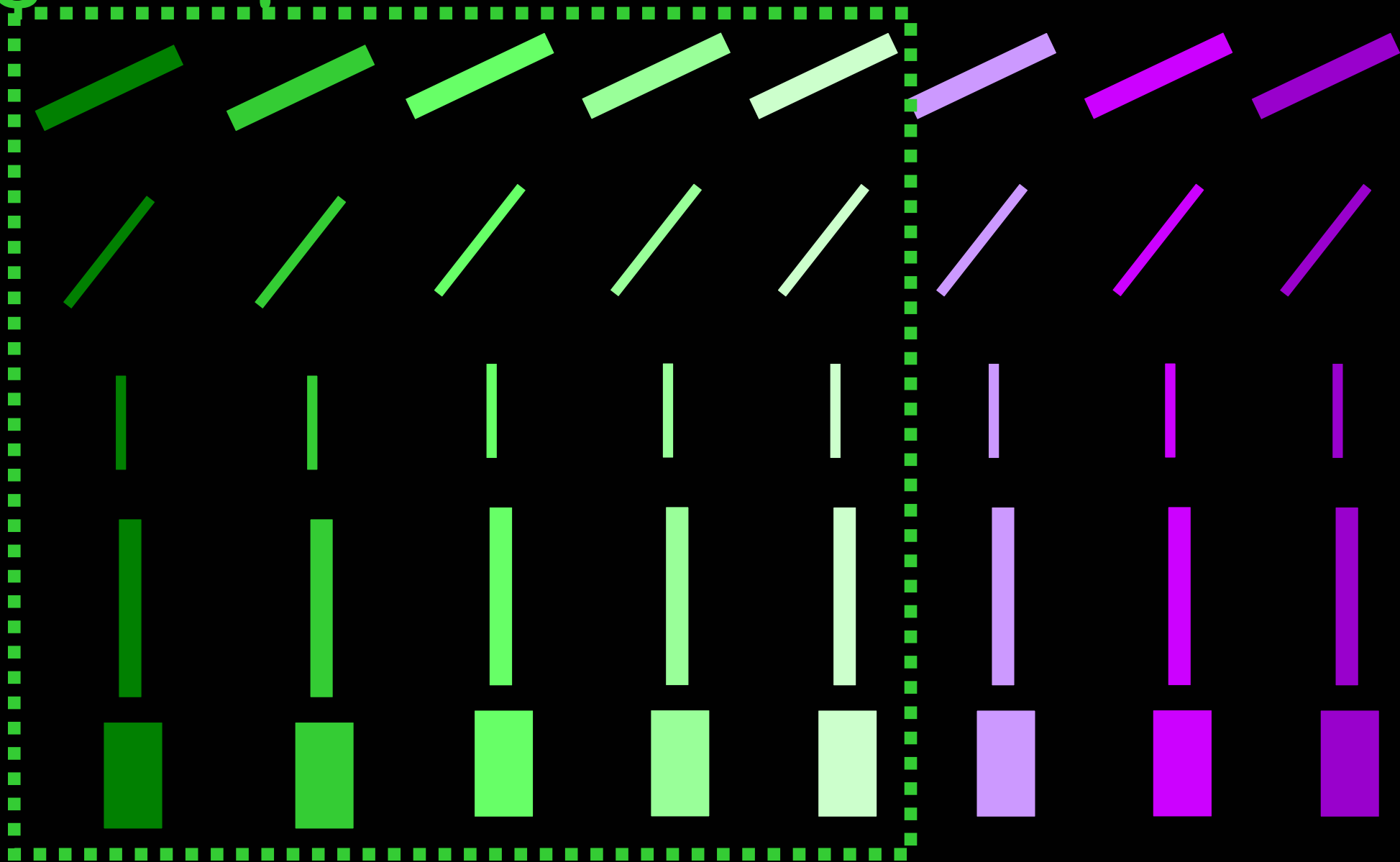
The submission by the manufacturer will comprise of one or more of the following documents:

- Manufacturer's literature including details of the manufacturing process and component material(s)
- Independent environmental certification (eg Eco Profiling or other LCA)
- Independent verification of manufacturer's claims
- Manufacturer's own support of claims
- Environmental Management Certification (ISO 14001 series) or other uncertified certification system
- Compliance with Construction Products Directive Essential Requirements and or EC Mark
- Compliance with British Standard(s)
- BBA Certification

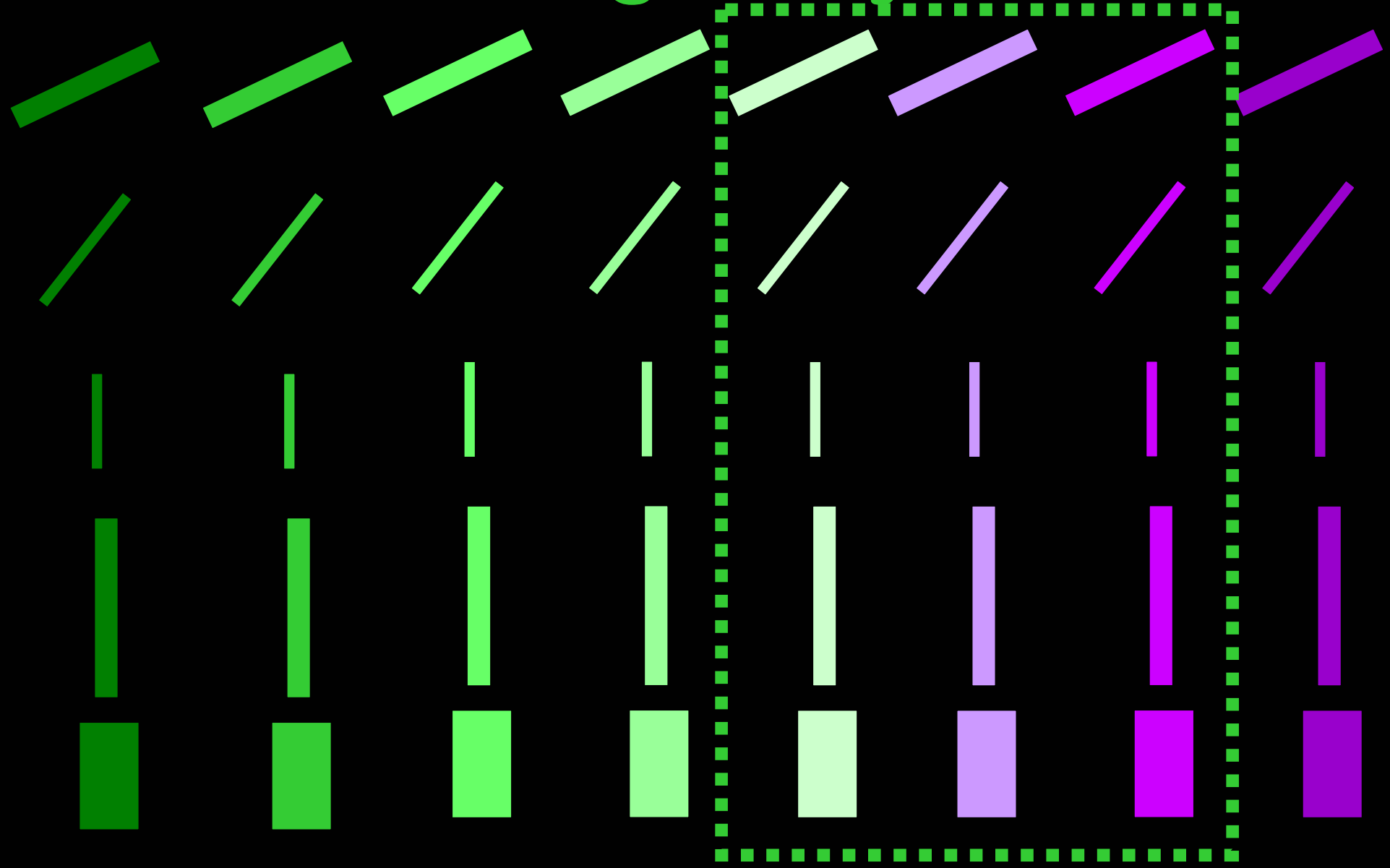
# GreenSpec compare environmental characteristics of many materials



GreenSpec includes dark & light green products but excludes violet

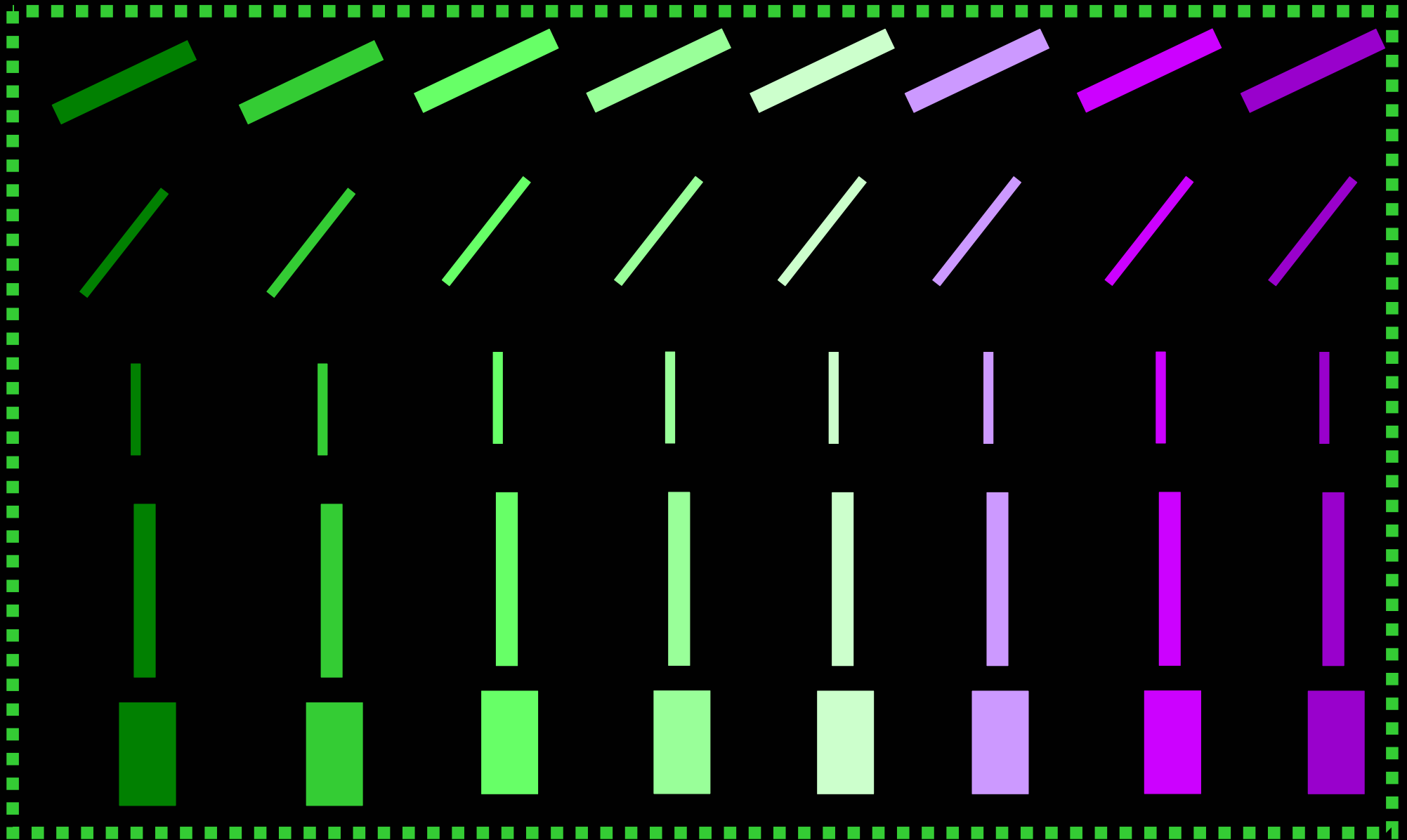


GreenSpec includes pale violet materials with high recycled content





AECB CLP includes dark green, light green & violet





# NGS GreenSpec Specification Clauses

Performance Generic & Prescriptive  
Specification clauses

CLP  
Performance  
Requirements



GreenSpec

Product  
Specification  
Clauses

# Project Specification

Client's Brief  
To  
Design Team

Project  
Specification

Prescriptive  
Specification

Design & Build  
Spec

Employer's  
Requirements



GBS A90  
Performance  
Specification

# NGS GreenSpec Performance Specification

A90 with CLP building Performance  
Specification clauses

# AECB

Carbon lite Programme

Principles:  
Insulation Airtightness Cold Bridge Avoidance

Performance Requirements:  
Buildings Elements/Assemblies Services

## GreenSpec

A90 Performance Specification  
Buildings Elements Services

A-Z Prescriptive Specification

Material & Component  
Generic Specifications

Manufacturer's  
Product Specifications

Government Funded Project Specs

Private Funded Project Specs

**GreenSpec**

[www.greenspec.co.uk](http://www.greenspec.co.uk)

**A90 Performance Specification**  
**Buildings Elements Services**

**A-Z Prescriptive Specification**  
**Buildings Elements Services**

**Material & Component**  
**Generic Specifications**

**Manufacturer's**  
**Product Specifications**

**Government Funded Project Specs**

**Private Funded Project Specs**

**Generic**  
**Specs**

**Level 6**  
**Gold**

**Generic**  
**Specs**

**Level 5**  
**Passivhaus**

**Generic**  
**Specs**

**Level 4**  
**Silver**

**Dedicated**  
**Products**  
**Specs**

**Dedicated**  
**Product**  
**Specs**

**Dedicated**  
**Product**  
**Specs**

CLP  
Performance  
Requirements



GreenSpec

Product  
Specification  
Clauses

# Project Specification

Client's Brief  
To  
Design Team

Project  
Specification

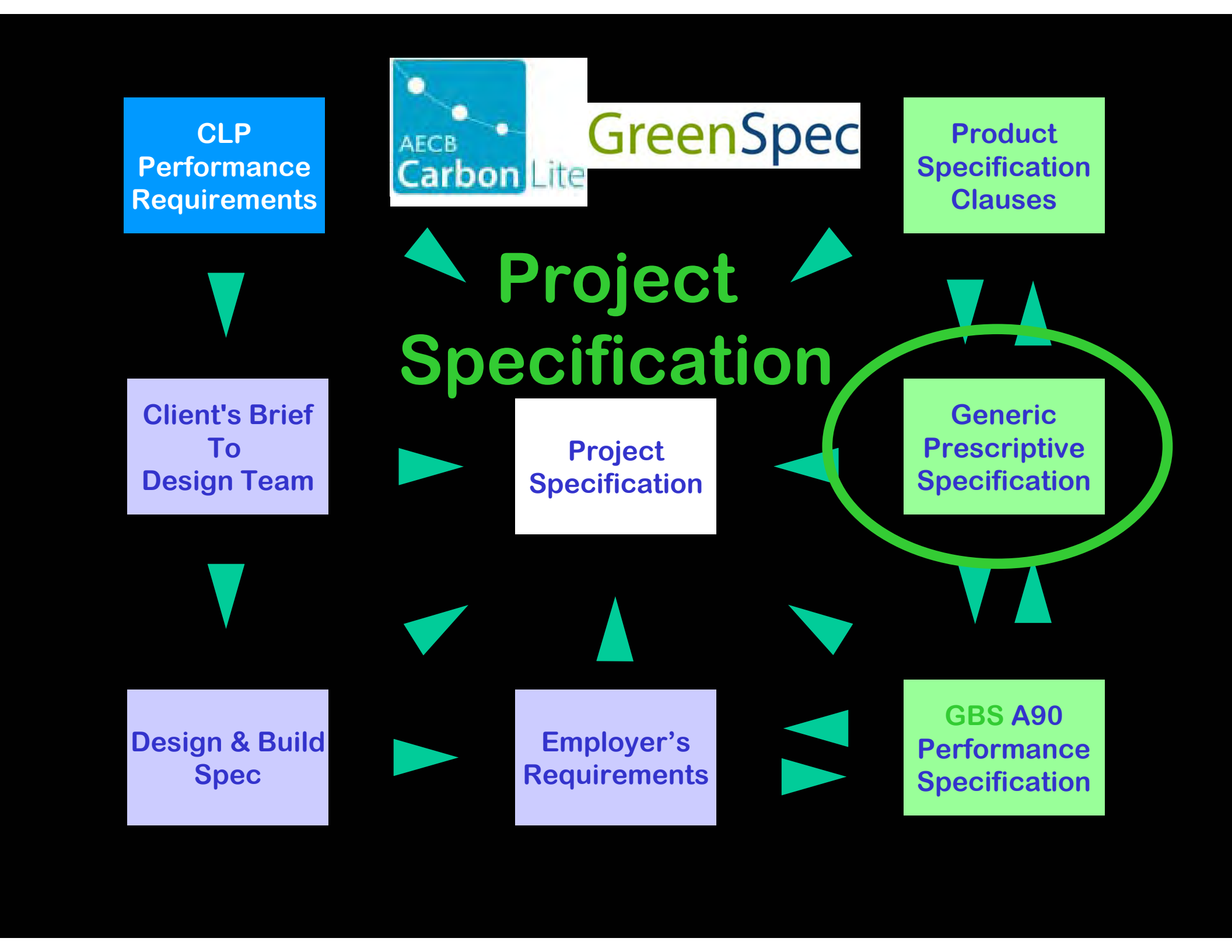


Generic  
Prescriptive  
Specification

Design & Build  
Spec

Employer's  
Requirements

GBS A90  
Performance  
Specification





# NBS Generic Specification Clauses

Materials or Product clauses without  
naming manufacturer and product

# Generic NBS Specification

## P10 Thermal Acoustic & Fire Proofing

### 110 ROCK MINERAL FIBRE

- Application: somewhere
- Manufacturing Standard: BS 1234
- BSI Kitemark: Required
- BBA Certificate: Required
- K value: 0.33 – 0.45
- Acoustic performance: 30-35 dB
- Density: 100-125 kg/m<sup>3</sup>
- Thickness: 50 - 300 mm.

- Manufacturer & Product Reference: **Contractors Choice**  
Submit proposals to CA for review

• OR

- Manufacturer: InsulMan
- Reference: ManMadeInsul
- Or equivalent (by virtue of NBS Preliminaries requirements)

Prone to substitution

Prone to surreptitious substitution

Prone to abuse by many parties:

Contractors, Buying department,

QS, Employer

CLP  
Performance  
Requirements



GreenSpec

Product  
Specification  
Clauses

# Project Specification

Client's Brief  
To  
Design Team

Project  
Specification

Prescriptive  
Specification

Design & Build  
Spec

Employer's  
Requirements

GBS A90  
Performance  
Specification





# NGS GreenSpec Specification Clauses

Dedicated product clauses

# Performance > Spec > Product



GreenSpec

Manufacturers

Performance Spec Prescriptive

Performance Requirement

Performance Requirement

Performance Requirement

Performance Requirement

A90 Perf. Spec.


P10 Insulation


Products  
Products  
Products  
Products  
Products  
Products  
Products

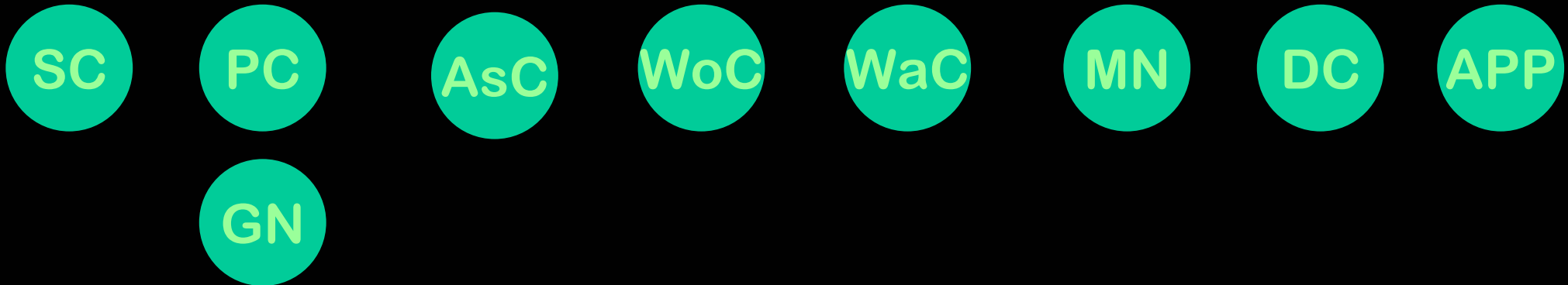
# Dedicated Prescriptive Green Building Specification

## P10 Thermal Acoustic & Fire Proofing

### 100 THERMAL INSULATION

- Performance Achieved:
- Test Evidence: Report 33/2006
- Manufacturing Standard(s): BS 1234
- Installation Code of Practice: CP 103
- 3<sup>rd</sup> Party Accreditations: \_\_\_\_\_
- BSI Kitemark: KM 1234
- BBA Certificate: 00/0001
- Manufacturer: Insumaker
- Product Reference: ManMadeInsul
- Contact Details: T F E W; Rep M
- K value: 0.4
- G value: 5
- Sy value: 2.3
- Density: 100 kg/m<sup>3</sup>
- Thermal mass: 66
- BRE GGtS rating: A
- BRE Environmental Profile: No
- EcoPoints: 1077
- EcoHomes, BREEAM: credits: 1
- 3<sup>rd</sup> Party Endorsements: AECB  
Carbon Lite Programme: Gold+
- Recycled content: 60% post consumer
- ZODP: Yes

# Specification clauses:



- Made up of many parts:
- Specification clause, Product Clause, Guidance Note, Assembly/Application clause, Workmanship clause, Waste clause, Maintenance Note, Demolition/Dismantling clause, Appendix,
- To be split down as NGS Green Building **Specification** progresses

## TYPE(S)-OF-LOAD-BEARING-TIMBER-BLOCK-WALLING¶

110 → MODULAR-LOADBEARING-COMMON-GLUED-TIMBER-BLOCK-WALLING-TO-  
[ ]:¶

Manufacturer: Steko-Switzerland,¶  
Reference: The Steko-Building-System,¶  
or equivalent and approved.¶  
UK-Agent: Ecological-Building-Centre:¶  
Construction-Resources-(Elink-Ltd): 16-Great-Guildford-Street, London, SE1-0HS.¶  
Telephone: 020-7450-2211, Fax: 020-7450-2212.¶  
Email: info@ecoconstruct.com¶  
Website: www.ecoconstruct.com¶

Bond: stretcher-half-lap,¶  
Joints: close-fit-dry-stacking,¶  
Surface-board-grade: Class-[C],¶  
Species: [Spruce-or-Fir],¶  
Timber: renewable-source-softwood-of-small-dimension,¶  
Timber-treatment: [See-G21/103],¶  
Moisture-content-at-time-of-construction: 20% +/- 2% maximum.¶  
Module-size: Vertical: 80-mm, Horizontal-(longitude-and-latitude): 160-mm.¶  
Module-block-size(s):¶

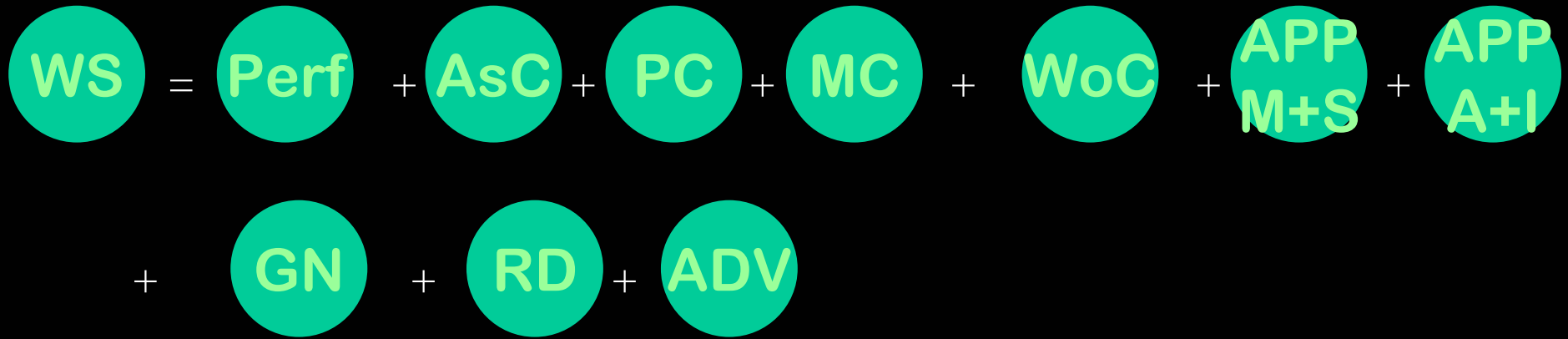
- Generally: [ ]¶
- 4-chamber-unit-160-mm-thick-x-240-mm-high-x-640-mm-long,¶
- 4-chamber-unit-160-mm-thick-x-320-mm-high-x-640-mm-long,¶
- Other Sizes: [ ]¶
- 3-chamber-unit-160-mm-thick-x-240-mm-high-x-480-mm-long,¶
- 2-chamber-unit-160-mm-thick-x-240-mm-high-x-320-mm-long,¶
- 1-chamber-unit-160-mm-thick-x-240-mm-high-x-160-mm-long,¶
- 3-chamber-unit-160-mm-thick-x-320-mm-high-x-480-mm-long,¶
- 2-chamber-unit-160-mm-thick-x-320-mm-high-x-320-mm-long,¶
- 1-chamber-unit-160-mm-thick-x-320-mm-high-x-160-mm-long,¶

Weight: [4-chamber-320-mm-high-unit: 6] kg.¶

Features:¶  
→ DPC-to-G21/185,¶  
→ Mortar-bed-to-G21/186,¶

Special-elements-of-system:¶  
→ Sill-Plate-to-G21/120,¶

# Specification work sections



- Specification work section: made up of many parts
- Performance Requirements: Trade or element specific (A90 Project)
- Assembly clauses, Products and Materials, Workmanship
- Appendix: Manufacturers and Suppliers,
- Appendix: Applicators and Installers
- Guidance Note, Reference Documents, Advisory Bodies, Documents and Websites
- To be split down as NGS Green Building Specification progresses



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

## W21-APP-M&S → APPENDIX-W21-PROJECTION-MANUFACTURERS-&SUPPLIERS

To be read with Preliminaries/General Conditions A10-A55 and Work section W21

### 209 → MATERIALS SUPPLIERS

Obtain materials of one type from only one source, unless specified or agreed otherwise in advance.

Obtain from only one of the following material suppliers

Inform CA of selected supplier at an early date.

Select from local companies to support local economy and local employment.

See Preliminaries A90 Performance Specification A90/117.

### 209A → MANUFACTURER: HIGH CONTRAST PAINTED SCREENS

See W21/209

Manufacturer: Goo Systems, 4 Harvey Street, Kingston, ONTARIO, Canada, K7K 6A9

T → free phone → Canada (888) 541-0299

T → Canada (613) 541-0299 → F → Canada (613) 541-1765

Contact: Kevin: Sales & Marketing → E → [kevin@goosystems.com](mailto:kevin@goosystems.com)

Technical Support: → E → [techsupport@goosystems.com](mailto:techsupport@goosystems.com)

W → [www.goosystems.com](http://www.goosystems.com)

Goo Products: - <http://www.goosystems.com/index.php?cont=products>

Which Goo?: - <http://www.goosystems.com/index.php?cont=which>

Screen Goo: - <http://www.goosystems.com/index.php?cont=screen>

Goo Tips and FAQ: - <http://www.goosystems.com/index.php?cont=tips>

### 209B → MATERIAL SUPPLIERS: PAINT SYSTEMS

See W21/209

UK REGIONS:

ENGLAND: LONDON

Interactive View: 15 Bowling Green Lane, London, EC1R 0BJ

T → 020-7566-0433 → F → 020-7490-8404

E → [enquiries@interactiveview.co.uk](mailto:enquiries@interactiveview.co.uk) → W → [www.interactiveview.co.uk](http://www.interactiveview.co.uk)

Powered By Innovation Ltd: Innovation House, 31 Twyford Avenue, London, W3 9PY

T → 0208-992-7766 → F → 0208-992-0021

E → [sales@poweredbyinnovation.co.uk](mailto:sales@poweredbyinnovation.co.uk) → W → [www.poweredbyinnovation.com](http://www.poweredbyinnovation.com)

↑  
REGION·SOUTH·WALES--CENTRAL↑

[Bridgend](#), [Vale of Glamorgan](#), [Rhonda Cynon Taff](#) and [Cardiff](#)↑

Other information: <http://www.hdg.org.uk/> -> [List of Plants](#) -> [Area 8 Wales](#)↑

↑

[Joseph Ash Galvanizers](#) [Bridgend](#), [Prince's Way](#), [Bridgend Industrial Estate](#), [Bridgend](#), [Mid Glamorgan](#), [CF31 3AQ](#), [Wales](#)↑

T → 01656-668735 → F → 01656-767139↑

E → [bridge@josephash.co.uk](mailto:bridge@josephash.co.uk) → W → [www.josephash.co.uk](http://www.josephash.co.uk)↑

Registered to [BS-EN-ISO-9002](#)·Yes↑

Bath Size: 4.6·x·1.5·x·2.1·m.↑

Double Dipping: not permitted↑

Maximum Lift 4 tonnes↑

↑

[Cardiff Galvanizers \(1969\) Ltd.](#) [Cambria House](#), [East Moors Road](#), [Cardiff](#), [CF24 5EG](#), [Wales](#)↑

T → 02920-480321 → F → 02920-483728↑

E → [sales@cardiffgalvanizers.co.uk](mailto:sales@cardiffgalvanizers.co.uk) → W → ↑

Registered to [BS-EN-ISO-9002](#)·Yes↑

Bath Size: 7.0·x·1.5·x·3.0m, 9.0·x·1.1·x·0.3m and 4.6·x·1.5·x·3.4·m.↑

Double Dipping: not permitted↑

Maximum Lift 4 tonnes↑

↑

REGION·SOUTH·WALES--EAST↑

[Merthyr Tydfil](#), [Caerphilly](#), [Blaenau Gwent](#), [Torfaen](#), [Monmouthshire](#) and [Newport](#)↑

Other information: <http://www.hdg.org.uk/> -> [List of Plants](#) -> [Area 8 Wales](#)↑

↑

[Newport Ltd.](#) [Llanwern Works](#), [City Newport](#), [South Wales](#), [NP 19 4QX](#), [Wales](#)↑

T → 01633-277400 → F → 01633-277997↑

E → [newport@wedge-galv.co.uk](mailto:newport@wedge-galv.co.uk) → W → [www.wedge-galv.co.uk](http://www.wedge-galv.co.uk)↑

Registered to [BS-EN-ISO-9002](#)·Yes↑

Bath Size: 7.0·x·1.22·x·3.73·m.↑

Double Dipping: not permitted↑

Maximum Lift 6 tonnes.↑

↑

REGION·SOUTH·WALES--WEST↑

[Swansea](#) and [Neath&Port Talbot](#)↑

Full Screen ▾  
Close Full Screen



# NGS GreenSpec Project Specifications

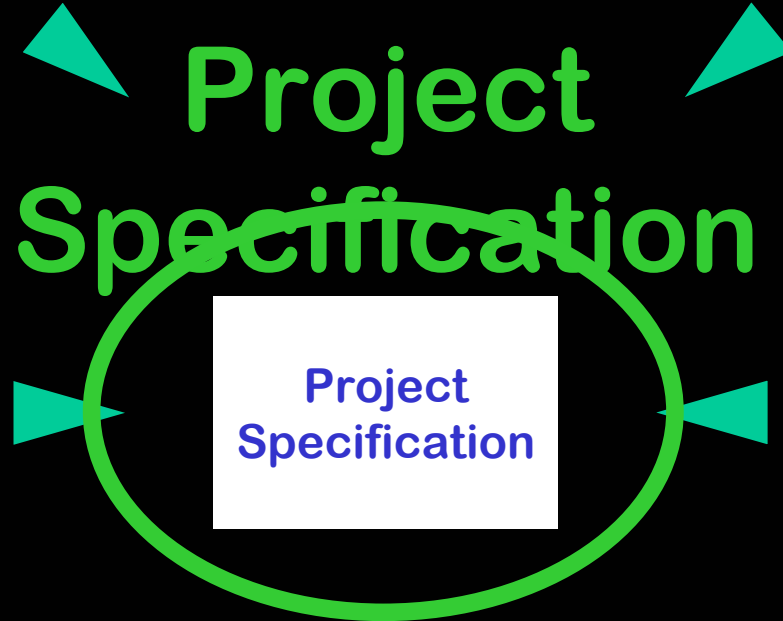
GreenSpec try to avoid doing project spec  
but collaborative work on practice spec is ok



GreenSpec

CLP  
Performance  
Requirements

Product  
Specification  
Clauses



Client's Brief  
To  
Design Team

Prescriptive  
Specification

Design & Build  
Spec

Employer's  
Requirements

GBS A90  
Performance  
Specification



# NGS GreenSpec Design Guidance

Will include links to CLP  
output documents

CLP  
Performance  
Requirements



GreenSpec

Sustainability  
Checklist  
+CLP notes

# Design Guidance

CLP  
Design  
Guidance

AECB & CLP  
Website  
Download



Level 4 & 6  
Guides  
Sub-divided

Project  
Design

Low  
Carbon  
House  
Guides



- HOME
- PRODUCTS
- MANUFACTURERS
- SPECIFICATIONS (available 2007)
- MATERIALS
- ENERGY
- CHECKLIST
- DESIGN**
- IMAGE BANK
- REFURBISHMENT
- FORUMS
- SITE WASTE
- DURABILITY
- SUPPLIERS & INSTALLERS
- FABRICATORS
- RECLAMATION
- CRAFTSMEN
- POLICIES & STRATEGIES
- RESEARCH & PAPERS
- RESOURCES
- CPD
- HOW WE SELECT PRODUCTS
- CONTACT GREENSPEC
- REGISTER YOUR PRODUCT
- DESIGN CONTENTS**
- BedZED Materials Report
- Housing Associations
- Design for recycling, reuse...

## Design - Contents

### Case Studies

#### BedZED: 'Construction materials report'. *Nicole Lazarus.*

- Credits, background and introduction
- Summary
- Materials in construction
- Measuring the environmental impacts of materials
- Material selection (examples): Window frames, reclaimed steel and recycled sand.

#### Housing Associations and sustainable construction. *Jenny Wain.*

- Introduction, lessons and resources
- Prime Focus on prefabrication - Watton Green
- [Ealing Family on super insulation - Wilton Road](#)
- Gwalia on conserving heritage - Swansea Foyer
- Housing Solutions and new technologies - Greenfields - INTERGER
- Arches and refurbishment- Valley Road

#### Construction techniques.

- Small-scale hand-made cob construction in Stoke Newington.

### Recycling, re-use and reclamation



# Ealing Family on super insulation - Wilton Road, Reading

## Scheme summary

The scheme comprises 25 ultra low energy homes (12 flats and 13 houses) built on a brown field site. They offer affordable rents to residents and ensure reduced environmental impact in use. Environmental efficiency measures exceeded a SAP of 100 and it achieved BRE's Environmental Standard Award. Completed in 2000.

## Scheme details

The scheme was developed using the benefits of experience gained with the THERMIE project of 50 energy efficient homes at Amersham Road (see previous case study). It reused a derelict laundry site in a residential part of Reading.

The scheme was developed as an Integrated Housing Initiative. This provides homes where both landlord and resident running costs are reduced, and where environmental performance is improved. This is achieved through increased levels of insulation, improved construction air-tightness, and improved water efficiency.

As part of the initiative the following issues were considered at the design stage:

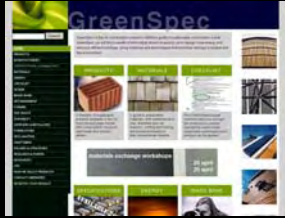
- energy efficiency – embodied and in use
- economical water usage
- environmental impact
- cost and life of building components.

## Environmental features

As with many brownfield sites contamination issues needed to be addressed. Prefabricated foundations were used to save time on site mitigation works. Pre-cast piles and ground beams with an extruded floor and 200mm of mineral wool insulation were chosen over traditional piled foundations and cast in situ ground beams.

A lightweight steel frame system from Forge-Llewellyn was used to enable fast erection times and allow high insulation levels to be added on site.





# Low Carbon House Design Guide

NGS GreenSpec  
website content



# Low Carbon House Siting & Orientation

NGS GreenSpec  
Design Guidance

CLP  
Performance  
Requirements



GreenSpec

Sustainability  
Checklist  
+CLP notes

# Design Guidance

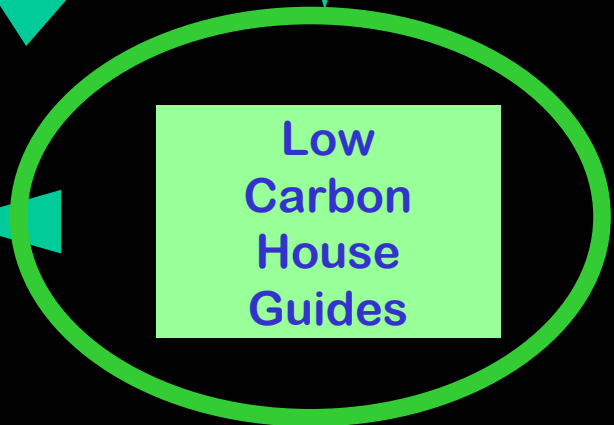
CLP  
Design  
Guidance

AECB & CLP  
Website  
Download

Design  
Guidance  
Articles

Level 4 & 6  
Guides  
Sub-divided

Project  
Design



Low  
Carbon  
House  
Guides

## The Low-Carbon House: Contents

- Energy Standards: CSH Level 4 / CarbonLite Step 1
- Energy Standards: CSH Level 5/ Passivhaus / CarbonLite Step 2
- Energy Standards: CSH Level 6 / CarbonLite Step 3
- Siting and Orientation
- Direct Solar Gain
- Indirect Solar Gain: Thermal Walls
- Thermal Mass
- Construction details

### Low Carbon House:

- **Contents**
- Standards Level 4
- Standards Level 5
- Standards Level 6
- Siting & orientation
- Direct Solar Gain
- Thermal Walls
- Thermal Mass
- Construction details

[HOME](#)[PRODUCTS](#)[MANUFACTURERS](#)[SPECIFICATIONS \(available 2007\)](#)[MATERIALS](#)[ENERGY](#)[CHECKLIST](#)[THE LOW CARBON HOUSE](#)[DESIGN](#)[IMAGE BANK](#)[REFURBISHMENT](#)[FORUMS](#)[SITE WASTE](#)[DURABILITY](#)[SUPPLIERS & INSTALLERS](#)[FABRICATORS](#)[RECLAMATION](#)[CRAFTSMEN](#)[POLICIES & STRATEGIES](#)[RESEARCH & PAPERS](#)[RESOURCES](#)[CPD](#)[HOW WE SELECT PRODUCTS](#)[CONTACT GREENSPEC](#)[REGISTER YOUR PRODUCT](#)[LOW CARBON HOUSE CONTENTS](#)

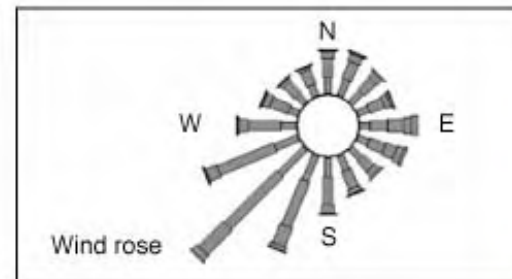
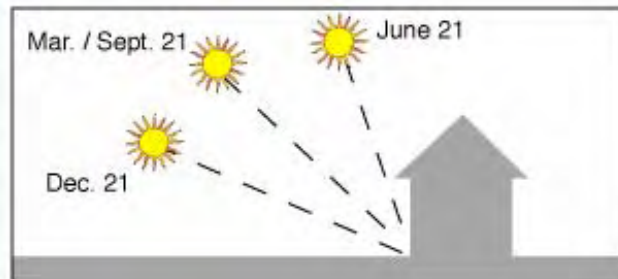
Search

- HOME
- PRODUCTS
- MANUFACTURERS
- SPECIFICATIONS (available 2007)
- MATERIALS
- ENERGY
- CHECKLIST
- THE LOW CARBON HOUSE**
- DESIGN
- IMAGE BANK
- REFURBISHMENT
- FORUMS
- SITE WASTE
- DURABILITY
- SUPPLIERS & INSTALLERS
- FABRICATORS
- RECLAMATION
- CRAFTSMEN
- POLICIES & STRATEGES
- RESEARCH & PAPERS
- RESOURCES
- CPD
- HOW WE SELECT PRODUCTS
- CONTACT GREENSPEC
- REGISTER YOUR PRODUCT
- LOW CARBON HOUSE CONTENTS

## The Low-Carbon House: Siting and Orientation

Passive solar design and providing a benign site microclimate both enhance the energy and environmental performance of a building. Ideally the building has good access to solar radiation and daylight, with a site which itself is pleasantly warm and sunny, with good shelter from the wind.

### Site analysis



- Determine the position of the sun throughout the year.
- Establish temperature ranges – both seasonal and daily.
- Identify the direction of the prevailing wind.
- Determine seasonal characteristics eg cold northerly winds in winter.
- Identify topographical features that might optimise or degrade the performance of the building(s) eg slopes, tree belts, the shape and orientation of the site.

### Orientation

The individual house



The main orientation of the building should be within 30° of

#### Low Carbon House:

- Contents
- Standards Level 4
- Standards Level 5
- Standards Level 6
- **Siting & orientation**
- Direct Solar Gain
- Thermal Walls
- Thermal Mass





# Low Carbon House Direct Solar Gain

NGS GreenSpec  
Design Guidance

## The Low-Carbon House: Contents

- Energy Standards: CSH Level 4 / CarbonLite Step 1
- Energy Standards: CSH Level 5/ Passivhaus / CarbonLite Step 2
- Energy Standards: CSH Level 6 / CarbonLite Step 3
- Siting and Orientation
- Direct Solar Gain
- Indirect Solar Gain: Thermal Walls
- Thermal Mass
- Construction details

### Low Carbon House:

- **Contents**
- Standards Level 4
- Standards Level 5
- Standards Level 6
- Siting & orientation
- Direct Solar Gain
- Thermal Walls
- Thermal Mass
- Construction details

[HOME](#)[PRODUCTS](#)[MANUFACTURERS](#)[SPECIFICATIONS \(available 2007\)](#)[MATERIALS](#)[ENERGY](#)[CHECKLIST](#)[THE LOW CARBON HOUSE](#)[DESIGN](#)[IMAGE BANK](#)[REFURBISHMENT](#)[FORUMS](#)[SITE WASTE](#)[DURABILITY](#)[SUPPLIERS & INSTALLERS](#)[FABRICATORS](#)[RECLAMATION](#)[CRAFTSMEN](#)[POLICIES & STRATEGIES](#)[RESEARCH & PAPERS](#)[RESOURCES](#)[CPD](#)[HOW WE SELECT PRODUCTS](#)[CONTACT GREENSPEC](#)[REGISTER YOUR PRODUCT](#)[LOW CARBON HOUSE CONTENTS](#)

Search[HOME](#)[PRODUCTS](#)[MANUFACTURERS](#)[SPECIFICATIONS \(available 2007\)](#)[MATERIALS](#)[ENERGY](#)[CHECKLIST](#)[THE LOW CARBON HOUSE](#)[DESIGN](#)[IMAGE BANK](#)[REFURBISHMENT](#)[FORUMS](#)[SITE WASTE](#)[DURABILITY](#)[SUPPLIERS & INSTALLERS](#)[FABRICATORS](#)[RECLAMATION](#)[CRAFTSMEN](#)[POLICIES & STRATEGES](#)[RESEARCH & PAPERS](#)[RESOURCES](#)[CPD](#)[HOW WE SELECT PRODUCTS](#)[CONTACT GREENSPEC](#)[REGISTER YOUR PRODUCT](#)[LOW CARBON HOUSE CONTENTS](#)

## The Low-Carbon House: Direct Solar Gain

↑ Simple

↓ Needs highly efficient thermal glazing or supplementary shuttering to prevent heat loss.

'Direct Gain' is the most basic form of solar gain. Solar energy enters through south-facing glazing and is absorbed by thermal mass incorporated into the floor and walls. Heat is stored in the thermal mass during the day and later released during the night into the living space. This re-radiation of collected heat can maintain a comfortable temperature during cool nights and can extend through several cloudy days without 'recharging'.



- Up to 75% of the solar energy striking the glass is converted into thermal energy.

- Solar radiation can provide a significant proportion of a buildings heating requirements.

- The area of glazing is determined in response to the duration and severity of winter temperatures; the building size; and the amount of interior thermal mass. A correct balance between these factors

### Low Carbon House:

- Contents
- Standards Level 4
- Standards Level 5
- Standards Level 6
- Siting & orientation
- **Direct Solar Gain**
- Thermal Walls
- Thermal Mass





# Low Carbon House Thermal Walls

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Design Guidance

## The Low-Carbon House: Contents

- Energy Standards: CSH Level 4 / CarbonLite Step 1
- Energy Standards: CSH Level 5/ Passivhaus / CarbonLite Step 2
- Energy Standards: CSH Level 6 / CarbonLite Step 3
- Siting and Orientation
- Direct Solar Gain
- Indirect Solar Gain: Thermal Walls
- Thermal Mass
- Construction details

### Low Carbon House:

- **Contents**
- Standards Level 4
- Standards Level 5
- Standards Level 6
- Siting & orientation
- Direct Solar Gain
- Thermal Walls
- Thermal Mass
- Construction details

[HOME](#)[PRODUCTS](#)[MANUFACTURERS](#)[SPECIFICATIONS \(available 2007\)](#)[MATERIALS](#)[ENERGY](#)[CHECKLIST](#)[THE LOW CARBON HOUSE](#)[DESIGN](#)[IMAGE BANK](#)[REFURBISHMENT](#)[FORUMS](#)[SITE WASTE](#)[DURABILITY](#)[SUPPLIERS & INSTALLERS](#)[FABRICATORS](#)[RECLAMATION](#)[CRAFTSMEN](#)[POLICIES & STRATEGIES](#)[RESEARCH & PAPERS](#)[RESOURCES](#)[CPD](#)[HOW WE SELECT PRODUCTS](#)[CONTACT GREENSPEC](#)[REGISTER YOUR PRODUCT](#)[LOW CARBON HOUSE CONTENTS](#)

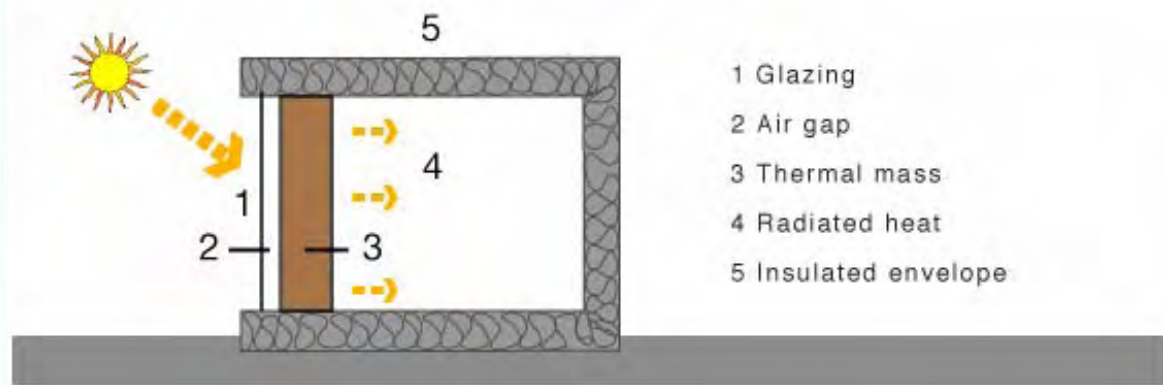
- HOME
- PRODUCTS
- MANUFACTURERS
- SPECIFICATIONS (available 2007)
- MATERIALS
- ENERGY
- CHECKLIST
- THE LOW CARBON HOUSE**
- DESIGN
- IMAGE BANK
- REFURBISHMENT
- FORUMS
- SITE WASTE
- DURABILITY
- SUPPLIERS & INSTALLERS
- FABRICATORS
- RECLAMATION
- CRAFTSMEN
- POLICIES & STRATEGES
- RESEARCH & PAPERS
- RESOURCES
- CPD
- HOW WE SELECT PRODUCTS
- CONTACT GREENSPEC
- REGISTER YOUR PRODUCT

## LOW CARBON HOUSE CONTENTS

## The Low-Carbon House: Indirect solar gain: Thermal walls

'Direct Solar Gain' is the heating of a space using the sun's energy directly through windows in the building envelope. 'Indirect Solar Gain' systems operate by transferring solar energy through conduction (thermal mass walls) or convection (sunspaces) from the outside of the envelope to the heated space.

### Basic Mass / Solar / Thermal Storage Wall



The basic Mass Wall consists of a wall of 200 – 400mm of masonry or other material of high thermal mass, facing south, with a dark, heat-absorbing material on the external surface. The wall is faced with a single or double layer of glass. The glass is placed from 20 – 50mm from the wall to create a small airspace.

Solar radiation passing through the glass is absorbed by the dark surface, stored in the wall, and conducted over a period of hours through the wall.

- Low Carbon House:
- Contents
  - Standards Level 4
  - Standards Level 5
  - Standards Level 6
  - Siting & orientation
  - Direct Solar Gain
  - **Thermal Walls**
  - Thermal Mass





# Low Carbon House Thermal Mass

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Design Guidance

## The Low-Carbon House: Contents

- Energy Standards: CSH Level 4 / CarbonLite Step 1
- Energy Standards: CSH Level 5/ Passivhaus / CarbonLite Step 2
- Energy Standards: CSH Level 6 / CarbonLite Step 3
- Siting and Orientation
- Direct Solar Gain
- Indirect Solar Gain: Thermal Walls
- Thermal Mass
- Construction details

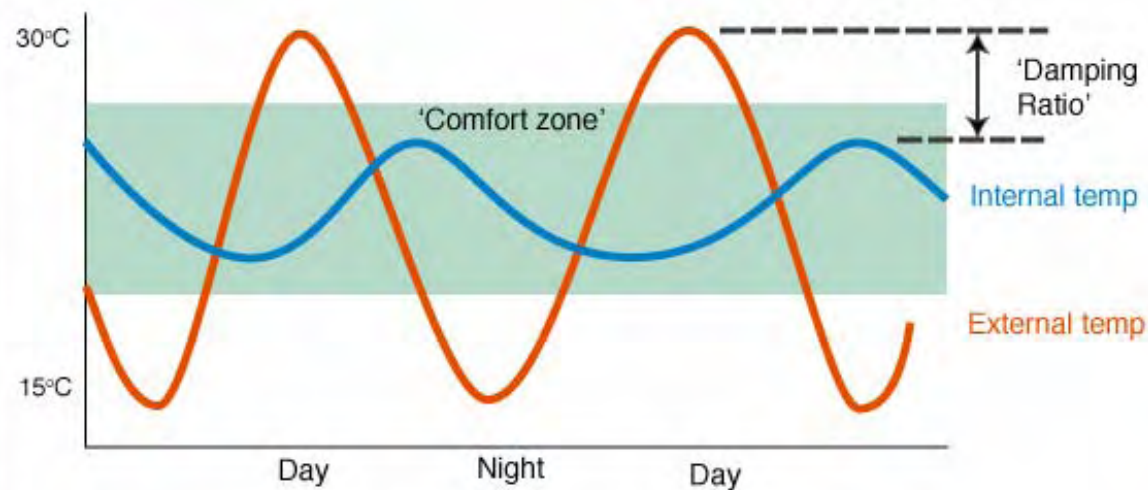
### Low Carbon House:

- **Contents**
- Standards Level 4
- Standards Level 5
- Standards Level 6
- Siting & orientation
- Direct Solar Gain
- Thermal Walls
- Thermal Mass
- Construction details

[HOME](#)[PRODUCTS](#)[MANUFACTURERS](#)[SPECIFICATIONS \(available 2007\)](#)[MATERIALS](#)[ENERGY](#)[CHECKLIST](#)[THE LOW CARBON HOUSE](#)[DESIGN](#)[IMAGE BANK](#)[REFURBISHMENT](#)[FORUMS](#)[SITE WASTE](#)[DURABILITY](#)[SUPPLIERS & INSTALLERS](#)[FABRICATORS](#)[RECLAMATION](#)[CRAFTSMEN](#)[POLICIES & STRATEGIES](#)[RESEARCH & PAPERS](#)[RESOURCES](#)[CPD](#)[HOW WE SELECT PRODUCTS](#)[CONTACT GREENSPEC](#)[REGISTER YOUR PRODUCT](#)[LOW CARBON HOUSE CONTENTS](#)

## The Low-Carbon House: Thermal Mass

- Thermal mass acts as a 'thermal battery'
- Thermal mass plays an important role in the performance of a building by moderating fluctuations in space temperature. This role becomes more important as summer temperatures in the UK increase.
- The use of heavyweight construction materials with high thermal mass can reduce total heating and cooling requirements.



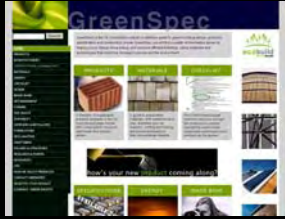
- The diagram shows the effect of thermal mass on indoor temperature. Whilst external temperatures in summer fluctuate between wide extremes, internal temperatures are moderated by thermal mass to within an acceptable comfort zone.

- There is no necessary correlation between thermal mass and structure. Both traditional masonry and more recent timber frame methods of construction can accommodate thermal mass.

### Low Carbon House:

- Contents
- Standards Level 4
- Standards Level 5
- Standards Level 6
- Siting & orientation
- Direct Solar Gain
- Thermal Walls
- Thermal Mass





# NGS GreenSpec Refurbishment

On the **GreenSpec** Website

- HOME
- PRODUCTS
- MANUFACTURERS
- SPECIFICATIONS (available 2007)
- MATERIALS
- ENERGY
- CHECKLIST
- DESIGN
- IMAGE BANK
- REFURBISHMENT**
- FORUMS
- SITE WASTE
- DURABILITY
- SUPPLIERS & INSTALLERS
- FABRICATORS
- RECLAMATION
- CRAFTSMEN
- POLICIES & STRATEGIES
- RESEARCH & PAPERS
- RESOURCES
- CPD
- HOW WE SELECT PRODUCTS
- CONTACT GREENSPEC
- REGISTER YOUR PRODUCT
- REFURBISHMENT CONTENTS:
- HOUSING REFURBISHMENT
- CASE STUDY: Carshalton Grove

## Refurbishment - Contents

### Housing

- The Quick Guide to Housing refurbishment:
  - Context
  - [Air tightness](#)
  - Ventilation
  - Wall Insulation
  - Roof insulation
  - Ground floor insulation
  - Windows and doors (to be published)
  - Heating (to be published)
  - Water conservation (to be published)
  
- Ongoing case study: Carshalton Grove by Parity Projects



Search

- HOME
- PRODUCTS
- MANUFACTURERS
- SPECIFICATIONS (available 2007)
- MATERIALS
- ENERGY
- CHECKLIST
- DESIGN
- IMAGE BANK
- REFURBISHMENT**
- FORUMS
- SITE WASTE
- DURABILITY
- SUPPLIERS & INSTALLERS
- FABRICATORS
- RECLAMATION
- CRAFTSMEN
- POLICIES & STRATEGIES
- RESEARCH & PAPERS
- RESOURCES
- CPD
- HOW WE SELECT PRODUCTS
- CONTACT GREENSPEC
- REGISTER YOUR PRODUCT
- REFURBISHMENT CONTENTS:
  - HOUSING REFURBISHMENT
  - CASE STUDY: Carshalton Grove

## Housing refurbishment: Airtightness

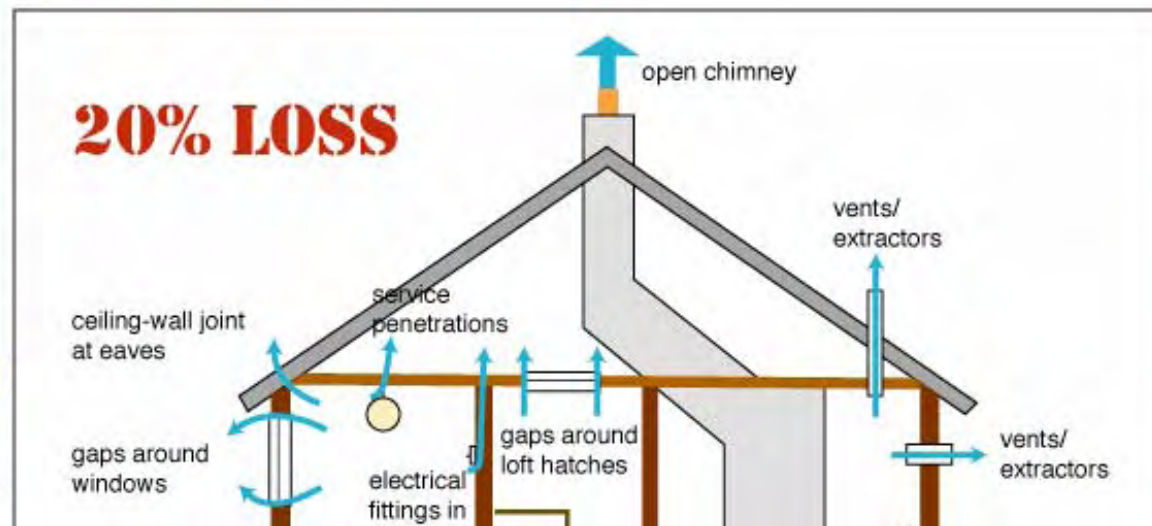
### Issues

- 'Build tight, ventilate right'
- Airtightness refers to the 'leakiness' of the building fabric
- 'Leakiness' is responsible for around 20% of heat loss from space heating
- Air filtration is the uncontrolled flow of air through the building fabric
- Air infiltration is unacceptable as a form of ventilation
- A 'culture' of airtight construction needs to be engendered throughout the design and construction process
- EST 'Best Practice' air permeability is  $5\text{m}^3/\text{h}/\text{m}^2$ . Best practice for dwellings with balanced mechanical ventilation is  $3\text{m}^3/\text{h}/\text{m}^2$  (based on CIBSE TM23 2000).

### Housing refurbishment:

- Context
- **Air tightness**
- Ventilation
- Wall insulation
- Roof insulation
- Ground floor insulation

### Where it all goes.....





# NGS GreenSpec Forum

Site  
Monitoring  
Photographic  
Evidence



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Email  
Dialogues

# Forum

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Forum  
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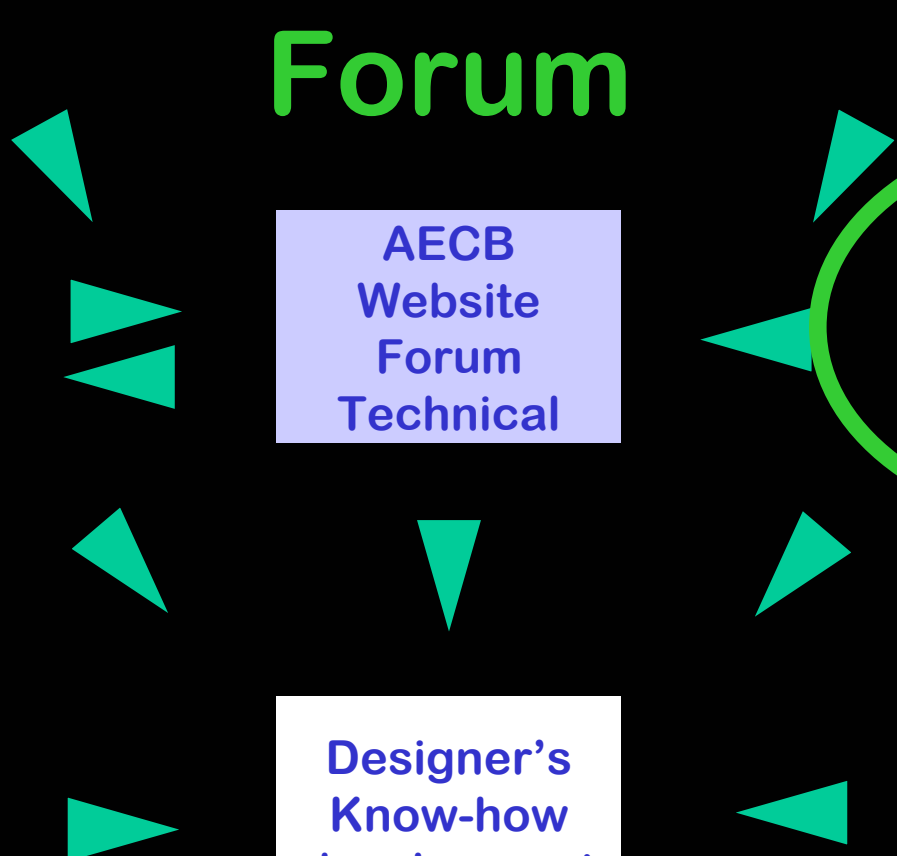
AECB  
Website  
Forum  
Technical



CLP  
Newsletter  
Lessons  
Learned

Designer's  
Know-how  
development

GreenSpec  
Website  
development





# GreenSpec forum

[GreenSpec Home](#) [GreenSpec Forums Portal](#)

[Calendar](#) [Members](#) [Search](#) [Help](#)

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
.....

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### ► General

Forum	Topics	Replies	Last Post Info
 <b>General issues</b> For postings concerning issues not yet covered by forums listed below	4	4	<input type="checkbox"/> May 31 2007, 03:48 PM <b>In:</b> <a href="#">Network across the value chain</a> <b>By:</b> <a href="#">amythink</a>

### ► Help/advice needed

Forum	Topics	Replies	Last Post Info
 <b>Help with finding materials / components / products</b> Use this forum if you want help in finding particular materials and products	4	3	<input type="checkbox"/> Jun 14 2007, 07:32 AM <b>In:</b> <a href="#">Rainwater goods</a> <b>By:</b> <a href="#">BrianSpecMan</a>
 <b>Help with design / construction</b> Use this forum if you need advice with design / construction	6	21	<input type="checkbox"/> May 28 2007, 09:31 AM <b>In:</b> <a href="#">U-values for low impact materi...</a> <b>By:</b> <a href="#">Guest_BrianSpecMan_*</a>

### ► Government policies

Forum	Topics	Replies	Last Post Info
 <b>Code for Sustainable Homes</b> - the Government's new initiative to drive a sustainable housing industry	1	1	<input type="checkbox"/> Jan 26 2007, 10:18 AM <b>In:</b> <a href="#">Does it have teeth?</a> <b>By:</b> <a href="#">Mr Sustainable</a>



# GreenSpec forum

[GreenSpec Home](#) [GreenSpec Forums Portal](#)

[Calendar](#) [Members](#) [Search](#) [Help](#)

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► [GreenSpec Forums](#) > [Design Forums](#) > [Products, components and materials](#)

[ADDREPLY](#) [NEWTOPIC](#)

## ► [Flooring insulation](#)

[Options](#) ▼

Philippa

□ Jun 4 2007, 11:03 AM

Post #1

I am interested in installing underfloor heating in our ground floor.

We have concrete beam and block with screed.

We don't want to raise the height of the floor too much, or go to all the time and trouble of removing the existing screed.

I like the look of the variocomp flooring, (which seems designed for just this purpose) however, I know it still requires insulation.

Guests

What is the minimum height of insulation we could use?

Also, does the overall level of insulation need to be less if we give up the idea of UFH and go for radiators?

[TOP](#)

[QUOTE](#) [REPLY](#)

◀ Next Oldest · [Products, components and materials](#) · Next Newest ▶

[FASTREPLY](#) [ADDREPLY](#) [NEWTOPIC](#)

1 User(s) are reading this topic (1 Guests and 0 Anonymous Users)

0 Members:

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# Training

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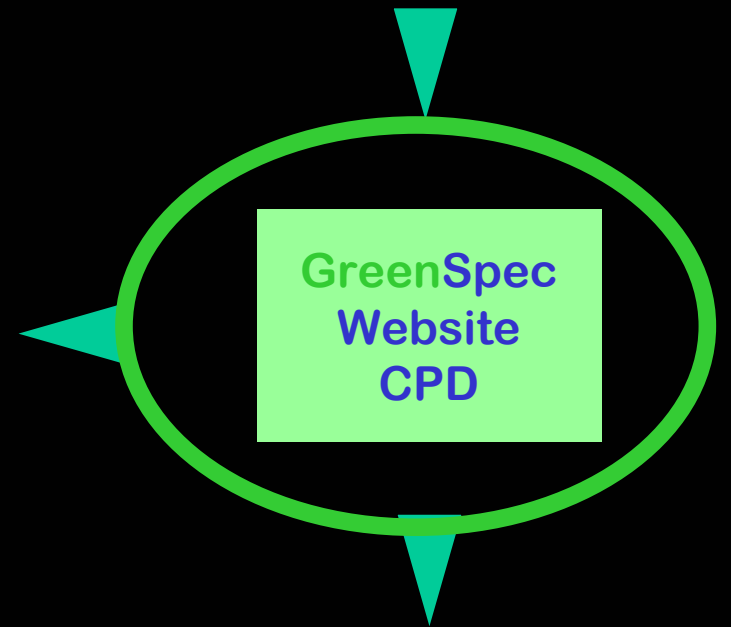
# NGS GreenSpec CPD

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Low  
Carbon  
House  
Design Articles

CPD

In-house  
CPD



GreenSpec  
Website  
CPD

Design  
Professionals

Individual  
CPD  
Downloads

Engagement with 28,000 Architects 30,000 Engineers



# GreenSpec

- HOME
- PRODUCTS
- MANUFACTURERS
- SPECIFICATIONS (available 2007)
- MATERIALS
- ENERGY
- CHECKLIST
- DESIGN
- IMAGE BANK
- REFURBISHMENT
- FORUMS
- SITE WASTE
- DURABILITY
- SUPPLIERS & INSTALLERS
- FABRICATORS
- RECLAMATION
- CRAFTSMEN
- POLICIES & STRATEGIES
- RESEARCH & PAPERS
- RESOURCES
- CPD**
- HOW WE SELECT PRODUCTS
- CONTACT GREENSPEC
- REGISTER YOUR PRODUCT

## CPD Seminars

GreenSpec offers a comprehensive collection of CPD seminars. To date, the organisation has run several hundred successful events including those involving architects, structural and civil engineers, surveyors, interior designers, contractors, interiors designers, landscape architects, planners and product manufacturers.

### What people have said:

'I have been to many sustainability events and paid lots of money and got nothing useful out of it. This is the best event I have attended. It's about real practical things I can do something about in my work. Thank you so much!'

*Helen Taylor, RIBA Council*

'Your infectious enthusiasm and detailed knowledge really drove the day and gave us a remarkable level of participation from the other delegates. Your presentations have provided us with a great deal of valuable information and food for thought.'

*Matt Adams, Groundwork, Merton*

'You have really inspired us to look at the issues you brought up and I'm sure the GreenSpec website will be getting good use'

*Haverstock Associates*

## Seminars

Below is a list of seminars that GreenSpec can offer. It is by no means exhaustive and potential users should feel free to discuss their particular needs.

### 1 What sustainability means to you

Includes looking at definitions, differentiating sustainable from conventional construction, design, specification and materials.



# GreenSpec CPD

- 510 PowerPoint files created
- Recording 6 years of learning and 30 years of experience
- Sustainability, Environmental, Specification and Procurement
- Presented to any audience including student Architects and Technologists at BSc to MSc, Architects CPD, etc.



# SDF “Specifiers’ Design Forum” Conferences

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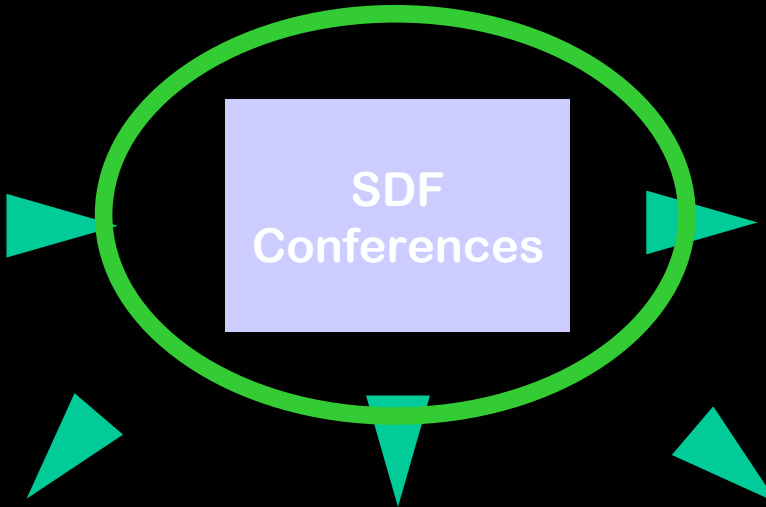
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SDF Specifiers  
Design Forum

GreenSpec  
Website  
Promotion

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Forum  
Lessons  
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# SPECIFIERS' DESIGN FORUM



Following the success of the Specifiers' Design Forum 'Specification is the Design Process' in 2006 we are proud to invite you to join us in exploring

## *The Building Envelope Performance' Specifiers' Design Forum 2007*

Key Note speakers will show how the exterior must be made to perform while maintaining the integrity of the design vision

### Featured Speakers:

- Mike Foster of Tooley and Foster (chairman)
- Howard de Mont of Sidell Gibson Architects (host)
- Peter Caplehorn of Scott Brownrigg Architects
- Alan Jones of SKM Anthony Hunts
- Brian Murphy, National Green Specification
- Stephen Cherry from Horden Cherry Lee
- Andrew Stanway, developer and psychologist

**Thursday 29<sup>th</sup> March 2007**  
**9am – 1pm**  
(Registration from 8.30am)  
**41 Portland Place, London W1N 4BN**

Tickets cost £20 (+vat) and can be purchased using the form on the back.  
For further information call the SDF team at Fuel PR on 0207 498 8211  
Email- [sdf@fuelrefuel.com](mailto:sdf@fuelrefuel.com)

For more information you can also visit:  
<http://www.greenspec.co.uk/html/features/conference/SpecConference.html>  
[http://www.architecture.com/go/Architecture/Events\\_499.html](http://www.architecture.com/go/Architecture/Events_499.html)



# SDF Specifiers' Design Forum Conferences

- Cheap to attend
- Topical half or whole day seminars
- Expert speakers
- Stuff useful in everyday work
- Disseminate Low Carbon House design
- Offer to disseminate **CLP** outputs