Materials credits within BREEAM – LCA, the Green Guide and timber

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BRE - www.bre.co.uk

Building a Better World Together…
Research, innovation, consultancy, testing, certification, training

Working in the built environment, but also transport, manufacturing, electronics, agriculture…
Building level assessment
BREEAM
Scale: global emissions energy & processes 28 GtCO$_{2e}$

- Industry: 37%
- Transport: 23%
- Buildings (operational): 32%
- Other: 8%

International Energy Agency, 2010
Scale: global emissions energy & processes 28 GtCO$_{2e}$

- Buildings (operational): 32%
- Industry: 37%
- Transport: 23%
- Other: 8%

International Energy Agency, 2010
BREEAM – Building level assessment methodology

– The world’s longest established and most widely used environmental assessment method for buildings and large scale developments

– Over 450,000 building assessments certified and over 1,900,000 registered for assessment

– Network of 4,000 independent certified assessors that certify Developments
Scale: global emissions energy & processes 28 GtCO$_{2e}$

International Energy Agency, 2010
The growing importance of embodied impact

Kg CO$_2$/m$^2$/year

- 2000
- 2010
- Best practice
- Future?

Yellow: Embodied
Blue: Operational

Allwood & Cullen, UIT, 2012
Life Cycle Assessment (LCA)
A BRE approach
Life Cycle Assessment

Cradle to gate → Gate to grave

Production → Construction → Use → End-of-life
BRE’s Environmental Profile Methodologies

- Measurement of the **environmental performance** of a material, product or system over a set time period.
  - Extraction of raw materials & transport (“cradle to gate”)
  - Production (“gate to gate”)
  - Transport, installation and end of life (“gate to grave”)

- Achieved using Life Cycle Assessment (LCA)
- Compliant with ISO14025, ISO14044 and EN15804
- Outcome is 3rd party Environmental Product Declaration (EPD)
Advantages of EPD

- Reduce manufacturing cost by improving energy, water and materials use efficiency
- Better understanding of supply chain
- Market differentiation – manufacturers or sector specific
- Gain credits/ comply with the requirements of BREEAM, LEED, clients or major events
Building Level Assessment – a BRE approach
The Green Guide to Specification & IMPACT
Comparison at building element level using a functional unit

Timber versus blocks

Cradle to gate
Impact per tonne

Cradle to grave
Impact per $m^2$
The Green Guide to Specification

- [www.thegreenguide.org.uk](http://www.thegreenguide.org.uk)
- 1500+ generic specifications each with summary Ratings
- Ratings A+ to E
- 13 impact category ratings and Ecopoints
- kgCO$_{2eq}$ per m$^2$
- Six building types
- UK specific

- Online & Paper publication
- FREE access online
- On-going development
Login or Register to Access The Green Guide Ratings

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Click the buttons below to view available options.

Please select a building type

- Domestic
- Health
- Industrial
- Commercial
- Retail
- Education
GREEN GUIDE 2008 RATINGS

Green Guide Home
Background to the Green Guide
Login/Register for Ratings
Search by Element Number
How to use this site
FAQ's
Downloads and Updates
The Green Guide Calculator

Green Guide 2008 ratings

Building type: Domestic

Please select an element:
- Upper Floor Construction
- Ground Floor Construction
- Internal Wall
- Domestic Windows
- External Wall Construction
- Insulation
- Separating Wall
- Separating Floor
- Roof Construction
- Landscaping
- Floor Finishes
Functional unit for floor finishes for Offices and Domestic (multi-residential)
1m² of floor finish or covering as fitted to a level surface, with underlay, backing, adhesive and/or grout, etc. as appropriate. To include regular cleaning and maintenance, and any repair, refurbishment or replacement over the 60 year study period based on typical practice in these sectors.

Functional unit for floor finishes for retail with frequent fitout
1m² of floor finish or covering as fitted to a level surface, with underlay, backing, adhesive and/or grout, etc. as appropriate. To include regular cleaning and maintenance, and any repair, refurbishment or replacement over the 60 year study period based on aesthetics.

Functional unit for floor finishes for healthcare, education, retail (infrequent fitout) and courts
1m² of floor finish or covering as fitted to a level surface, with underlay, backing, adhesive and/or grout, etc. as appropriate. To include regular cleaning and maintenance, and any repair, refurbishment or replacement over the 60 year study period based on durability.

The structural floor deck beneath the floor finish is assessed separately in "Upper floors" or "Ground floors" and is not included here. Raised access flooring has not been included within the Green Guide Online.

read more...

Please select the element type of Floor Finishes ratings you wish to review:

[Hard Floor Finishes]  [Soft Floor Finishes]
<table>
<thead>
<tr>
<th>Description</th>
<th>Element number</th>
<th>Summary rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>14mm Engineered Oak Flooring, 9.29 kg/m² with adhesive</td>
<td>1321580002</td>
<td>A+</td>
</tr>
<tr>
<td>20mm Engineered Oak Flooring, 13.3 kg/m² with adhesive</td>
<td>1321580001</td>
<td>A+</td>
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<tr>
<td>Ceramic floor tiles.</td>
<td>821580001</td>
<td>B</td>
</tr>
<tr>
<td>Ceramic mosaic tiles.</td>
<td>821580011</td>
<td>A+</td>
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<tr>
<td>Imported Chinese granite floor tiles.</td>
<td>821580015</td>
<td>A</td>
</tr>
<tr>
<td>Imported Italian Marble tiles.</td>
<td>821580004</td>
<td>C</td>
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<tr>
<td>in situ cement based terrazzo.</td>
<td>821580012</td>
<td>B</td>
</tr>
<tr>
<td>Porcelain Floor Tile (40% recycled content), 11mm thick, ISO13006 Type B1A</td>
<td>1021580001</td>
<td>A</td>
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<tr>
<td>Porcelain Floor Tile, 4mm thick, ISO13006 Type B1A</td>
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<tr>
<td>Printed laminate flooring (8mm) on acoustic underlay</td>
<td>821580016</td>
<td>B</td>
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<tr>
<td>Quarry tiles.</td>
<td>821580005</td>
<td>A</td>
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<tr>
<td>Resin based terrazzo/agglomerated stone/composite tiles (10% resin content)</td>
<td>821580018</td>
<td>D</td>
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<tr>
<td>Resin based terrazzo/agglomerated stone/composite tiles (2% resin content)</td>
<td>821580008</td>
<td>B</td>
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<tr>
<td>Solid hardwood flooring (14mm) with underlay</td>
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<td>Solid hardwood flooring (22mm) on underlay</td>
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<td>UK produced limestone floor tiles.</td>
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<tr>
<td>UK produced Slate floor tiles.</td>
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<td>Element</td>
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<td>Summary Rating</td>
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<tr>
<td>Climate Change</td>
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<tr>
<td>Water Extraction</td>
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<tr>
<td>Mineral Resource Extraction</td>
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<tr>
<td>Stratospheric Ozone Depletion</td>
<td>A+</td>
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<tr>
<td>Human Toxicity</td>
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<td></td>
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<tr>
<td>Ecotoxicity to Freshwater</td>
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<tr>
<td>Nuclear Waste (higher level)</td>
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<tr>
<td>Ecotoxicity to Land</td>
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<tr>
<td>Waste Disposal</td>
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<tr>
<td>Fossil Fuel Depletion</td>
<td>A+</td>
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<tr>
<td>Eutrophication</td>
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<td></td>
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<tr>
<td>Photochemical Ozone Creation</td>
<td>A+</td>
<td></td>
</tr>
<tr>
<td>Acidification</td>
<td>A+</td>
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<tr>
<td>Kg of CO₂ eq. (60 years)</td>
<td>-1.8</td>
<td></td>
</tr>
</tbody>
</table>
IMPACT – allows design decisions – BIM/LCA

Initial results

explore changes to optimise…

Final Results
BREEAM – Materials Specification

- Assessment covers main building elements

- Credits awarded using Green Guide ratings for the total combined rating score for assessed elements

- Calculate using a Calculator Tool

- Additional credits for using products with EPD

- Additional credits for using tools such as IMPACT

<table>
<thead>
<tr>
<th>Green Guide Rating</th>
<th>Credits</th>
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<tbody>
<tr>
<td>A+</td>
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<td>B</td>
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<tr>
<td>C</td>
<td>0.5</td>
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<tr>
<td>D</td>
<td>0.25</td>
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<td>E</td>
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Thank You

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