

Planning for Sustainability Ltd



ROOFMATE™
BREEAM 2011 Case Study



STYROFOAM™ and BREEAM credits

The environmental performance of insulating materials feeds into a number of issues in BREEAM New Construction 2011.

Planning for Sustainability worked on a commercial project where the design team was keen to maximise the BREEAM credits in the materials category. ROOFMATE™ SL-A (Trademark of the Dow Chemical Company (“Dow”) or an affiliated company) and ROOFMATE™ LG-X were part of the products considered and we examined how this material would contribute to the BREEAM score for the project.

Within the BREEAM New Construction methodology credits for insulating materials sit within the materials category. The insulating materials play a role in the first issue in this category: MAT01 Life Cycle Impacts. Most building materials are covered by the generic ratings provided in the BRE’s Green Guide to Specification and the type of insulation is not a discriminating factor there.

There is a specific issue in the materials category that deals with the environmental performance of insulating materials: MAT04 Insulation. Here different insulants can affect the BREEAM rating differently. In MAT04 there are two credits available: one credit relates to the embodied impact and one credit relates to responsible sourcing of materials. It is for these two credits that we examined the use of the two ROOFMATE™ products in more detail.

MAT04 insulation credits

Credit 1 - Embodied impact

The credit for the embodied impact of insulating materials is based upon the materials Green Guide rating, which can be found at www.thegreenguide.org.uk. There is a separate category for insulation materials in the Green Guide.

Our building comprised four different kinds of insulation: All walls were insulated using 150mm of glass wool, the concrete floor was insulated using FLOORMATE™ -A boards and the inverted roof was insulated using Dow Building Solutions’ ROOFMATE™ SL-A, a STYROFOAM™-A material. Finally the parapet was insulated using ROOFMATE™ LG-X.

Green Guide rating

The Green Guide rating for both the glass wool and the extruded polystyrene used for ROOFMATE™ LG-X could be easily found in the Green Guide to specification. However the two STYROFOAM™-A products are also made of extruded polystyrene but CO₂ is used as a blowing agent. It quickly became apparent that this material was not included in the Green Guide to Specification and we therefore had to make a specific rating request to the BRE.

A project specific rating request was therefore made by the registered BREEAM assessor. For our application, which is an inverted roof in an industrial building, the BRE returned an “A” rating. This was very helpful to the project, as combined with the other insulating materials it meant that the credit could be achieved.

The combined insulation index score for the project was 2.33, which is sufficient to award the MAT04 credit for embodied impact of insulating materials. (Refer to the BREEAM 2011 MAT04 Insulation Calculator on the opposite page).

Summary findings

Planning for Sustainability was appointed to fulfil the BREEAM assessor role on a factory extension project.

The design team aimed to achieve the maximum of 2 credits in the MAT04 BREEAM issue.

With a Green Guide rating of A on the project and responsible sourcing certification meeting the Tier 6 requirements STYROFOAM™-A contributed positively to achieving the full two credits.

Environmental Product Declaration

ISO 14040: Life cycle assessment – principles and framework

ISO 14025: Environmental labels and declarations- Type III environment declarations – Principles and procedures

EN 15804: Sustainability of construction works. Environmental product declaration. Core rules for the product category of construction



Environmental Product Declaration

BRE's Green Guide rating is based on a Life Cycle Analysis for generic construction products. It does not take account of any specific production methods used by a manufacturer. BREEAM 2011 therefore provides recognition for manufacturers that carry out a specific life cycle analysis for their product in accordance with the ISO 14040 series and prepare an Environmental Product Declaration in accordance with the international standard ISO 14025.

The recognition comes in the form of an uplift on the rating points used to calculate the first credit under MAT04. The value of this uplift depends on two items. Firstly the higher the generic Green Guide rating the higher the uplift will be. Secondly, the scope of the EDP influences the extent of the uplift; A tier 1 EPD covers the whole life cycle (cradle to grave) a larger uplift is awarded than a tier 2 EPD only covering a partial life cycle (i.e. cradle-to-gate, or cradle-to-gate with options). Table 1 provides an overview of the available uplift in a number of circumstances.

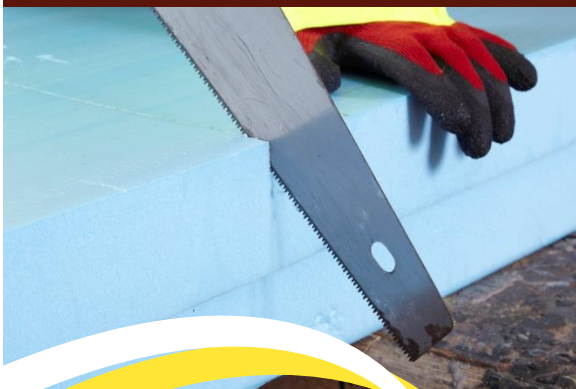
The Styrofoam™-A products by Dow have been subjected to an independently verified Life Cycle Analysis. The Life Cycle Assessment was carried out under EN 15804, which requires compliance with ISO 14040. The verification of the declaration and data EPD was carried out in compliance with ISO 14025 by the German organisation Institut Bauen und Umwelt e.V.

The scope of the Life Cycle Assessment included the product stage, the construction process stage, part of the end of life stage and the re-use, repair or recycling potential. This partial life cycle comfortably puts Styrofoam-A in the second tier for Environmental Product Declaration. Combined with the Green Guide rating of A Styrofoam™-A should be awarded an uplift of 0.75. This would mean the Green Guide rating points to be used in the MAT04 calculations should be increased from 2.00 to 2.75

The final insulation index score of our project is shown in table 2.

Table 1 Green Guide points uplift

Existing Green Guide Rating	Generic Green Guide rating points	EPD Tier 1 uplift	EPD tier 2 uplift
A+	3.00	1.00	0.75
A	2.00	1.00	0.75
B	1.00	1.00	0.5
C	0.50	0.50	0.25
D	0.25	0.25	0.125
E	0.00	0.00	0.00



Responsible Sourcing Certification

Tier level 2

- BES6001 Excellent

Tier level 3

- BES6001 Very Good
- Forest Stewardship Council (FSC)
- Re-used materials
- Programme for the Endorsement of Forest Certification (PEFC)
- Sustainable Forestry Initiative (SFI)

Tier level 4

- BES6001 Good

Tier level 5

- BES6001 Pass

Tier level 6

- Certified EMS for key process and supply chain
- Recycled materials certified EMS for key process
- Societe Generale de Surveillance's (SGS) Timber Legality and Traceability Scheme
- Rainforest Alliance's Verification of Legal Origin and Compliance Scheme



Credit 2 Responsible sourcing

The credit for responsible sourcing is available if at least 80% by volume of thermal insulation used in the main building elements is responsibly sourced. For this issue responsibly sourced means that the products are certified in accordance with tier levels 1, 2, 3, 4, 5 or 6 as described in the BREEAM manual. The higher tiers often require product specific supply chain management certification such as under the BES 6001 standard or Forest Stewardship Council (FSC). Tier level 6 includes environmental management system certification for the key process and supply chain extraction process.

For the production of extruded polystyrene an EMS certificate that covers the manufacturing of the products and one that covers the production of the polystyrene (as the principal polymer) would allow the credit to be awarded. We therefore contacted The DOW Chemical Company which confirmed that its own production process of STYROFOAM™-A and those of its suppliers of polystyrene were produced in facilities operating certified ISO14001 environmental management systems.

At the time of writing we identified the following suppliers and their EMS systems as:

- Dow Belgium BVBA, Tessenderlo, Belgium valid until 1 May 2016
- Styron Deutschland GmbH, Schkopau Germany valid until 13 June 2016
- Dow Hellas S.A., Thriko, Lvrio, Greece valid until 26 July 2014

Total BREEAM credits achieved		2					Insulation index	2.81
		Area (m ²)	Thickness (m)	Volume (m ³)	GGR	Responsibly sourced	97.53	
1	Floor – FLOORMATE™ 700-A	1500	0.05	75	A, plus EDP	100%		
2	Walls – glass wool	1380	0.15	198	A*	100%		
3	Roof - ROOFMATE™S L-A	1500	0.2	300	A, plus EDP	100%		
4	Parapet ROOFMATE™L G-X	69	0.08	5.52	E	0%		



Masterplanning
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Planning for Sustainability provides strategic advice and project support regarding the sustainability agenda in the area of land use planning and development of construction projects. Our services include masterplanning, town planning, environmental impact assessment and sustainable building design.

The multi-faceted nature of sustainable development requires a wide range of specialist input as well as an integrated approach. Planning for Sustainability's strength lies with the integration of a variety of specialist input and with ensuring a comprehensive and coherent narrative on sustainable development.



Consultants for sustainable development

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