ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804

Owner of the Declaration	Hume Cemboard Industries Sdn Bhd
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-HUM-20130186-IAD1-EN
Issue date	07.01.2014
Valid to	06.01.2019

Name of declared product

Hume Cemboard Industries Sdn Bhd

Institut Bauen
und Umwelt e.V.

www.bau-umwelt.com / https://epd-online.com

Hume Cemboard Industries
A Member of the Hong Leong Group

1. General Information

Hume Cemboard Industries Sdn Bhd

Name of the product

Programme holder
IBU - Institut Bauen und Umwelt e.V.
Panoramastr. 1
10178 Berlin
Germany

Owner of the Declaration
Hume Cemboard Industries Sdn Bhd
No. 12 Jalan Tandang,
46050 Petaling Jaya, Selangor, Malaysia.

Declaration number
EPD-HUM-20130186-IAD1-EN

Declared product / Declared unit
Per tonne of PRIMABOARD™

This Declaration is based on the Product Category Rules:
Fibre cement / Fibre concrete, 07-2012
(PCR tested and approved by the independent expert committee)

Scope:
This EPD declaration is based on average PRIMABOARD™ manufactured by Hume Cemboard Industries Sdn Bhd. These products are produced in the manufacturing plants located in Petaling Jaya, Selangor and Ipoh, Perak in which the production data for 2011 was recorded. Life Cycle Assessment (LCA) was conducted based on the cradle-to-gate approach (A1-A3 Modules), where the entire production phase of the PRIMABOARD™ was considered in this LCA study. The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

Issue date
07.01.2014

Valid to
06.01.2019

Verification

The CEN Norm EN 15804 serves as the core PCR
Independent verification of the declaration and data according to ISO 14025
☐ internally ☒ externally

Prof. Dr.-Ing. Horst J. Bossenmayer
(President of Institut Bauen und Umwelt e.V.)

Dr. Burkhart Lehmann
(Managing Director IBU)

Mr Carl-Otto Neven
(Independent tester appointed by SVA)

2. Product

2.1 Product description

PRIMABOARD™ are cellulose fibre reinforced cement boards, which consist of Portland cement, finely ground sand, softwood cellulose fibres, additives and pigments (optional). They are autoclaved curing to increase the durability, flexibility and dimensional stability.

PRIMABOARD™ present consumers with a material that is structurally durable, resistant to weather, water, fire, termites, rodents, and mould. The PRIMABOARD™ is highly versatile and its compositional strength makes it a commercial alternative to conventional building materials such as gypsum and wood.

The products for declaration are materials for construction that consist of cement, sand, pulp fibre, and water. The declared products for certification cover all aforementioned products. All declared PRIMABOARD™ were manufactured under the same manufacturing method with differences in the geometry data. The declaration of specific products as an average from these two manufacturers' plants (in accordance to *PCR Part A – EPD Type 1d "Declaration of an average product as an average from several of the manufacturer's plants"*, one producer with 2 manufacturing plants):

- Hume Cemboard Industries Petaling Jaya, Selangor, Malaysia
- Hume Cemboard Industries Ipoh, Perak, Malaysia

The declared PRIMABOARD™ products include:

- PRIMA*flex*™
- PRIMA*plank*™ / HUME*plank*™
- PRIMA*base*™
- PRIMA*liner*™
- PRIMA*aqua*™
- PRIMA*lux*™
- PRIMA *Ceramic Tile Underlay*™
- PRIMA*backer*™ / HUME*backer*™
- PRIMA*raya*™
- PRIMA*vent*™
- PRIMA*lattice*™ / HUME*lattice*™
- PRIMAsenepa™

2.2 Application

PRIMABOARD™ are multipurpose building materials, they are used extensively in renovations and the construction of residential and commercial buildings. They have a broad range of applications, both internal and external such as ceiling, internal lining, floor, partition, wall system, wall cladding, fencing, eaves & soffit lining, gable end, external siding, roof sarking, permanent formwork, water tank underlay etc.

2.3 Technical Data

Technical Data

Name	Value	Unit
Ageing resistance	YES	-
Calculation value for thermal conductivity	N/A**	W/(mK)
Coefficient of thermal expansion	7	$10^{-6}K^{-1}$
Compressive strength	N/A**	N/mm^2
Chemical resistance	YES	-
Density (*EMC)	1390	kg/m^3
Flexural Strength (dry)	≥14	MPa
Flexural Strength (wet)	≥7	MPa
Gross density (dry)	1300	kg/m^3
Modulus of elasticity	8	N/mm^2
Moisture content at 23 °C, 80% humidity	10	M.-%
Moisture content at EMC	7	%
Moisture content at Saturation	33	%
Moisture Movement (dry to saturation)	< 0.20	%
Permanent temperature resistance	N/A**	°C
Tensile strength	N/A**	N/mm^2
Thermal Conductivity, k value (at 40 degree Celsius)	0.20 - 0.24	W/mK
Sound absorption coefficient	N/A**	%
Sound Transmission Class (at 4.5 mm)	26	dB
Sound Transmission Class (at 6.0 mm)	28	dB
Sound Transmission Class (at 7.5 mm)	29	dB
Sound Transmission Class (at 9.0 mm)	30	dB
Sound Transmission Class (at 12.0 mm)	32	dB
Swelling (air-dry to water-saturated)	2	mm/m
Water vapour diffusion resistance factor acc. to /DIN V 4108-4, EN ISO 12572/	N/A**	-

**EMC = Equilibrium Moisture Content of 7%*
*** N/A = Not available*

2.4 Placing on the market / Application rules

For the placing on the market in the European Union the Regulation (EU) No 305/2011 dated from 9 March 2011 applies. The products need a Declaration of Performance taking into consideration BS EN 12467: 2012 and the CE-marking. For the application in the EU national provisions apply.

PRIMABOARD™ are conformed and certified to the following international fibre cement standards:

- Malaysia Standard - MS 1296:2010
- Oceania Standard - AS/NZS 2908.2:2000
- International Standard - ISO 8336: 2009
- European Standard - BS EN 12467: 2012
- US Standard - ASTM C1186-08 & ASTM C1288-04

2.5 Delivery status

The boards are manufactured in a range of thicknesses from 3.2mm to 16mm. The width of board can be up to 1,200mm and the length can be up to 4,200mm.

2.6 Base materials / Ancillary materials

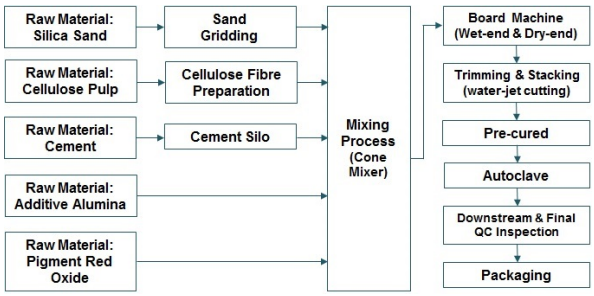
The base raw materials for PRIMABOARD™ are:

Name	Value	Unit
Base Material: Cement	30 - 40	% of dry mass
Base Material: Silica	50 - 60	% of dry mass
Base Material: Pulp / cellulose fibre (some with FSC certified)	7 - 9	% of dry mass
Auxiliary Substances / Additives: Alumina	0 - 4	% of dry mass
Auxiliary Substances / Additives: Red Pigment	0 - 1	% of dry mass

The silica sand is extracted from ex-mining pit with no impact on the primary eco-system and on the high conservation value communities. Furthermore, the cement purchased by Hume, have been tested negative for Chromium (VI).

2.7 Manufacture

The simplified process flow of PRIMABOARDTM production:



Below is the description:

- **Silica Preparation** - Locally acquired sand is fed into the ball mill. The sand is milled and ground to a silica slurry by use of steel balls and water. The slurry is then stored in a tank and supplied to a cone mixer for batching.
- **Cellulose Preparation** - *Hydro-pulper*: The slurry pulp is mixed with water and grinded to produce pre-processed fibre slurry; *Refiner*: The refiner comprises two counter rotating disks that mill the pre-processed fibres to the level required for fibre opening. Then the refined pulp is stored and then pumped to the cone mixer for batching.
- **Cement silo** - Trucks pick up the cement daily and pump it into cement silo for storage. It is then conveyed through a screw conveyor to cone mixer for batching.
- **Additive -** Additives such as Alumina is placed in a weigher. The additive is then

transferred into the cone mixer via screw feeder for batching.

- **Board Machine -** *Wet-End*: The slurry is measured and dosed into a density tank. Upon the completion of mixing at a constant water volume, the slurry is then processed by use of vats, agitators and rotating sieve cylinders – this mimics the Hatschek process. The rotation of the sieve cylinders allows the slurry to be deposited on sieve mesh. It is then transferred to the travelling felt; *Dry-End*: The solid film from the felt is transferred to a size drum. The number of revolutions of the size drum determines the thickness of the board based on the production requirements.
- **Trimming & Stacking -** The green sheets (work in process) are trimmed by a high pressure waterjet before stacking.
- **Pre-curing** - The green sheets are allowed to pre-cure before being sent to autoclave for the final curing stage.
- **Autoclave -** The pre-cured product is then loaded onto wagons and cured inside the autoclave with high steam pressure.
- **Downstream Process -** The downstream process includes: cutting, sorting, sanding, priming and product coding. Quality control (QC) inspection for each produced stack is executed at this phase.

2.8 Environment and health during manufacturing

The manufacturing of PRIMABOARDTM complies with /ISO14001/ Environmental Management System and /OHSAS 18001/ Occupational Health and Safety Management System.

Air: The fibre cement dust during the downstream process is collected through a dust collector and filtered before released to the environment. Dust emission is monitored regularly and is below the permissible level under Regulation 25 of the Environmental Quality (Clean Air) Regulations 1978, /Act 127/.

Water: The process water generated during the process is re-used within the production. Excess water accumulated during manufacturing and cleaning process is channeled to the wastewater treatment plant before discharged to the drainage. All discharged water meets the requirements of Environmental Quality (Sewage and Industrial Effluents) Regulations 1979 (Standard B) /Act 127/.

Noise: Noise protection analyses have established that all values communicated inside and outside the manufacturing premise are within the requisite technical standards by the better control of noise protection measures. Ear plugs or ear muffs are sufficient to reduce the high noise dB value.

Waste: All types of product waste such as sludge, scrap, reject are disposed by licensed industrial waste disposal in accordance with Malaysia Solid Waste and Public Cleansing Management Act 2007 /Act 672/.

2.9 Product processing/Installation

A dust mask and safety goggles should always be worn when cutting, drilling or grinding PRIMABOARD™ *(Use hand saw to cut the sides of the notch. Score along back of the notch with scoring knife and snap the waste piece upwards)* can actually reduce dust emission.

The information about the various installation methods of PRIMABOARD™ can be obtained from: www.primaboard.com.

2.10 Packaging

PRIMABOARD™ are packed horizontally on wooden or fibre cement pallets and covered with polyethylene stretch film, PET strap and cardboard edge protectors. The fibre cement pallets are made in-house by using the rejected or off-cut of fibre cement boards. The packing materials can be recycled at the mainstream recycling system and no halogenated packaging is used.

2.11 Condition of use

Due to the autoclaved curing, PRIMABOARD™ exist in a very stable crystalline calcium silicate hydrate matrix structure. It has a very low organic emission and negligible heavy metals content and thus is regarded as harmless to health. No hazard is associated with air, water and soil if the products are used as designated.

2.12 Environment and health during use

Environmental aspects: The Total Volatile Organic Compounds (TVCO) Emission Rate testing shows that the there is no Formaldehyde emission and minimal TVOC, Phthalates and particles emission released from PRIMABOARD™ (see Chapter 7.2).

Health aspects: The pesticide analysis conducted in accordance to EPA 3570, 8270C confirms that the pesticide content of the raw material, cellulose fibre contains a negligible content of pesticide. The heavy metals analysis in accordance to /SW 846:6010C/ shows that PRIMABOARD™ have very minimal heavy metals content.

Thus, it can be concluded that the environmental and health impacts arisen from using the PRIMABOARD™ are insignificant.

2.13 Reference service life

The reference service life is non-relevant to this EPD as it covers cradle-to–gate (up till the factory) (boundary condition). However, an up to 50-year durability assessment has been provided by BRANZ, Ltd., a testing authority from New Zealand to PRIMABOARD™ after a series of accelerated and natural weathering tests had been carried out.

2.14 Extraordinary effects

Fire

PRIMABOARD™ are classified as Class 'O' building materials under the Malaysian Uniform Building By-laws 1984 based on /BS476 Part 6 and 7/ Early Fire Hazard tests and Class 'A1', non-combustible building materials based on /EN 13501-1:2007/ standard. PRIMABOARD™ do not ignite and have no flame speed and do not support combustion.

Water
PRIMABOARD™ display mild alkaline (pH9-10) in water and no substances are washed out which could be hazardous to water. The results of the Leaching Test can be referred to Chapter 7.1.

Mechanical destruction
Irrelevant.

2.15 Re-use phase
PRIMABOARD™ can be deconstructed easily. They do not need to be treated as special waste when demolished or destroyed. In their undamaged form after dismantling, it can be reused according to their original application. The damaged form or waste incurred by these products can be recovered in building material recycling plants before being used as fillers or aggregates for various applications.

2.16 Disposal
According to Malaysia Solid Waste and Public Cleansing Management Act 2007 /Act 672/, remains of PRIMABOARD™ waste products from construction site or from demolition can be disposed as solid waste. Waste code '17 01 01 (Concrete)' in line with the European Waste Catalogue /EWC/.

2.17 Further information
Further information on the products can be obtained from our website www.primaboard.com.

3. LCA: Calculation rules

3.1 Declared Unit
Declared unit refers to the PRIMABOARD™, cellulose fibre reinforced cement board, which consists of Portland cement, finely ground sand, softwood cellulose fibre, additives and pigments. They have undergone autoclaved curing to increase the durability, flexibility and dimensional stability.

All declared products have the similar formula and are produced in the same production procedure with some differences in the quantity of pre-products for certain products as well as the geometrical data of the final product. The average1 metric ton of PRIMABOARD™ is calculated based on the annual production data where the average bulk density is 1390kg/m^3.

Declared unit

Name	Value	Unit
Declared unit	1	t
Gross density	1390	kg/m^3
Conversion factor to 1 kg	0.00071 9424	-

3.2 System boundary
Cradle-to-gate (Models A1, A2 and A3).

Type of EPD: *1d) Declaration of an average product as an average from several of the manufacturer's Plants*

3.3 Estimates and assumptions
No estimations or assumptions were made regarding the specifications outlined in this section (Chapter 3).

3.4 Cut-off criteria
All operating data, i.e. all of the starting materials used, internal fuel consumption and electricity consumption, all direct production waste as well as all emission measurements available were taken into consideration in the analysis. Assumptions were made as regards the transport associated with all input and output data taken into consideration. Accordingly, material flows with a share of less than 1% were also considered in this study. It can be assumed that the total of all neglected processes does not exceed 5% in the effective categories. Machinery, plants and infrastructure required in the manufacturing process are not taken into consideration.

3.5 Background data
The GaBi 6 software system for comprehensive analysis developed by PE INTERNATIONAL AG was used for modeling the Life Cycle Assessment (LCA). The consistent data items contained in the GaBi database are documented in the online GaBi documentation center. The basic data in the GaBi database was applied for energy, transportation, and consumables. The LCA was primarily developed based on the Malaysian database. Average data from the other regions were incorporated where the Malaysian database was not available.

3.6 Data quality
All background data records related to the manufacturing of PRIMABOARD™ were provided by Hume Cemboard Industries Sdn Bhd as well as GaBi database. The background data that was used was last revised less than 10 years ago.

3.7 Period under review
The LCA study was developed based on the operation activities from January to December of 2011.

3.8 Allocation
No allocation was applied in the life cycle assessment of the foreground data of the examined products.

3.9 Comparability
Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to /EN 15804/ and the building context, respectively the product-specific characteristics of performance, are taken into account.

4. LCA: Scenarios and additional technical information

The documentation of the RSL is not required for the EPD of PRIMABOARD™ as the entire life cycle is not declared (Module A1-A3).

5. LCA: Results

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE NOT DECLARED)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARYS
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement[1)]	Refurbishment[1)]	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 metric tonne of PRIMABOARD

Parameter	Unit	A1 - A3
Global warming potential	[kg CO_2-Eq.]	567.06
Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	8.17E-8
Acidification potential of land and water	[kg SO_2-Eq.]	3.496
Eutrophication potential	[kg $(PO_4)^{3-}$- Eq.]	0.26
Formation potential of tropospheric ozone photochemical oxidants	[kg Ethen Eq.]	0.222
Abiotic depletion potential for non fossil resources	[kg Sb Eq.]	6.75E-4
Abiotic depletion potential for fossil resources	[MJ]	6286.59

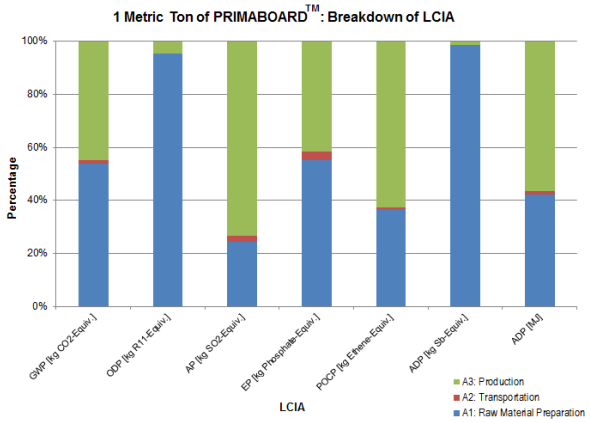
RESULTS OF THE LCA - RESOURCE USE: 1 metric tonne of PRIMABOARD

Parameter	Unit	A1 - A3
Renewable primary energy as energy carrier	[MJ]	325.2
Renewable primary energy resources as material utilization	[MJ]	1937.76
Total use of renewable primary energy resources	[MJ]	2262.96
Non renewable primary energy as energy carrier	[MJ]	6511.56
Non renewable primary energy as material utilization	[MJ]	0
Total use of non renewable primary energy resources	[MJ]	6511.56
Use of secondary material	[kg]	0.799
Use of renewable secondary fuels	[MJ]	93.85
Use of non renewable secondary fuels	[MJ]	987.77
Use of net fresh water	[m^3]	632.92

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: 1 metric tonne of PRIMABOARD

Parameter	Unit	A1 - A3
Hazardous waste disposed	[kg]	0.495
Non hazardous waste disposed	[kg]	119.74
Radioactive waste disposed	[kg]	0.091
Components for re-use	[kg]	-
Materials for recycling	[kg]	-
Materials for energy recovery	[kg]	-
Exported electrical energy	[MJ]	-
Exported thermal energy	[MJ]	-

6. LCA: Interpretation



[Please note, that the energy consumption (electricity and thermal energy consumed at plant) is allocated to module A3 within this study.]

As shown above, the raw material preparation process (A1 Module, blue bar) was the greatest contributor to the environmental indicators for the production of PRIMABOARDTM. A1 Module consistently demonstrated the considerable inputs in environmental considerations of the product's development; most notably is the module's dominance in the Abiotic Depletion-Element (ADP:kg Sb-Equivalent). It is here that the raw material preparation process accounted for nearly 98.82% of the total ADP-Element. Also presented as an energy intensive system component, the A1 Module as a major contributor to GHG emissions and environmental impacts.

This study also revealed that the A3 Module (green bar) has a relatively lower environmental impacts profile as compared to the A1 Module; with the exception of the Acidification Potential (AP) and Abiotic Depletion Potential for Fossil Resources (ADP-MJ) where the A3 Module is responsible for 73.19% and 62.77% respectively. This is mainly due to the energy intensive manufacturing process (including the consumption of Medium Fuel Oil and LPG during the autoclave process).

This is in grave contrast to the A2 Module, where the transportation of raw material constantly contributed the least to the all environmental impact categories. For instance, the A2 Module contributed 2.26% and 3.44% of the total AP and Eutrophication Potential (EP) respectively; whilst the A2 Module is responsible for less than 1.40% for the remaining environmental impact categories. As explained earlier, this is mainly due to the two main raw materials (sand and cement) which are locally supplied.

7. Requisite evidence

Leaching Test
The PRIMABOARD™ was tested for the Toxicity Characteristic Leaching Test (TCLP) for inorganic Ag, As, Ba, Cd, Cr, Pb and Se was conducted in accordance to /SW 846 6010C/ Heavy Metals analysis using ICP; whilst Hg was according to /APHA 3112 B/. Following are the results:

Name	Value	Unit
Arsenic, As	<0.01	mg/L
Barium, Ba	≤ 0.1	mg/L
Cadmium, Cd	≤ 0.002	mg/L
Chromium, Cr	≤ 0.01	mg/L
Lead, Pb	≤ 0.02	mg/L
Mercury, Hg	<0.001	mg/L
Slenium, Se	≤ 0.02	mg/L
Silver, Ag	< 0.0001	mg/L

VOC emissions
The PRIMABOARD™ was tested for Emission Rate Tests conducted in accordance to "/ASTM D5116-06/ – Standard Guide for Small-Scale Environmental Chamber determinations of Organic Emissions from Indoor Materials / Products" where the table below summarises the results (Test Report Reference Number: S09CHM02818-CSH-CR2):

Name	Value	Unit
Total VOC Emission Rate	0.08	mg per m^3 per hour
Formaldehyde Emission Rate (the method detection limit was 0.01)	Not detected	mg per m^3 per hour
4-Phenylcyclohexene Emission Rate (the method detection limit was 0.002)	Not detected	mg per m^3 per hour
Total Phthalate Emission	< 0.003	mg per m^3
Total Partical Emssion	0.01	mg per m^3

8. References

Institut Bauen und Umwelt
Institut Bauen und Umwelt e.V., Berlin (pub.): Generation of Environmental Product Declarations (EPDs);

General principles
for the EPD range of Institut Bauen und Umwelt e.V. (IBU), 2013-04
www.bau-umwelt.de

PCR Part A
Institut Bauen und Umwelt e.V., Königswinter (pub.): Product Category Rules for Construction Products from the range of Environmental Product Declarations of Institut Bauen und Umwelt (IBU), Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Background Report. April 2013
www.bau-umwelt.de

ISO 14025
DIN EN ISO 14025:2011-10: Environmental labels and declarations — Type III environmental declarations — Principles and procedures

EN 15804
EN 15804:2012-04: Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

PCR 2013, Part B
Institut Bauen und Umwelt e.V., Berlin (pub.): Product Category Rules for Construction Products from the range of Environmental Product Declarations of Institut Bauen und Umwelt (IBU), Part B: Requirements on the EPD for Fibre cement / Fibre concrete 2013
www.bau-umwelt.de

Act 127
Laws of Malaysia Act 127 – Environmental Quality Act 1974 – Environmental Quality (Clean Air) Regulations, 1978

Laws of Malaysia Act 127 – Environmental Quality (Sewage and Industrial Effluents) Regulations 1979 (Standard B)

Act 672
Laws of Malaysia Act 672 – Solid Waste and Public Cleansing Management Act 2007

Malaysia Uniform Building By-laws 1984
Source: Malaysia's Fire and Rescue Department

AS/NZS 2908.2:2000
Cellulose-cement products – Flat sheet

ASTM C1186-08
American Society for Testing and Materials. Standard Specification for Flat Fiber-Cement Sheets

ASTM D5116-06
American Society for Testing and Materials. Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/Products

ASTM C1288-04
American Society for Testing and Materials. Standard Specification for Discrete Non-Asbestos Fibre-Cement Interior Substrate Sheets

APHA 3112 B
American Public Health Association (APHA), Cold-Vapor Atomic Absorption Spectrometric Method

BS EN 12467:2012
Fibre-cement flat sheets. Product specification and test methods

BS 476 Part 6
Fire propagation.
Source: http://www.colorcoat-online.com/en/technical/regulations/fire_performance/bs476/

BS 476 Part 7
Surface spread of flame.
Source: http://www.colorcoat-online.com/en/technical/regulations/fire_performance/bs476/

EPA 3570, 8270C
Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometer (GC/MS)

EN 13501-1:2007
Fire classification of construction products and building elements. Classification using data from reaction to fire tests

European Waste Catalogue (EWC)
Chapter 17: Construction and demolition wastes (including excavated soil from contaminated sites)

ISO 14001:2004
Environmental Management systems – Requirements with guidance for use

ISO 8336: 2009
Fibre-cement flat sheets – Product specification and test methods

OHSAH 18001
Occupational Health and Safety Management

GaBi 6
GaBi 6: Software and database for life cycle engineering. LBP, University of Stuttgart and PE INTERNATIONAL AG, Leinfelden-Echterdingen, 2013

GaBi 6 Datasets
GaBi 6: Documentation of GaBi4-Datasets for life cycle engineering. LBP University of Stuttgart and PE INTERNATIONAL AG, 2010.
http://documentation.gabi-software.com/

MS1296
Malaysia Standard MS 1296: 2010 Fibre-Cement Flat Sheets

SW 846:6010C
Test Methods for Evaluating Solid Waste, Physical/Chemical Methods: Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP-AES)

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