ENVIRONMENTAL PRODUCT DECLARATION

In accordance with EN 15804 and ISO 14025

Saint-Gobain Denmark A/S
Gyproc
Gyptone
12.5 mm with Activ'Air

Date of issue: 2017-07-17
Valid until: 2022-05-16
Version : 1

EPD VERIFIED

Gyproc SAINT-GOBAIN

EPD®

THE INTERNATIONAL EPD® SYSTEM

N° VERIFICATION

S-P-00942

1. General information

Manufacturer: Saint-Gobain Denmark A/S Gyproc
Programme used: International EPD® System (www.environdec.com)
EPD registration number/declaration number: S-P-00942
PCR identification: The International EPD System PCR for Construction Products and CPC 54 Construction Services V2, with reference to the Saint Gobain Environmental Product Declaration Methodological Guide for Construction Products
Site of manufacture: Saint-Gobain Denmark A/S Gyproc – Hareskovvej 12, DK-4400 Kalundborg
Declaration owner: Malin Dalborg

Product / product family name and manufacturer represented: Saint-Gobain Denmark A/S Gyproc - Gyptone 12.5 mm with Activ'Air

Declaration issued: 2017-07-17
Valid until: 2022-05-16
Demonstration of verification: an independent verification of the declaration was made, according to ISO 14025:2010 and EN15804. This verification was external and conducted by the following third party: Dr. Andrew Norton, Renuables, based on the PCR mentioned above.
EPD Prepared by: Central SHEAR, Saint Gobain Gypsum. Contact. **acagen-epd.gypsum@saint-gobain.com**

Declaration of Hazardous substances: None

Environmental certifications held at both plants: ISO 14001

Scope: The EPD is based on 2015 production data for the Kalundborg site producing Gyptone 12.5 mm. This EPD covers information modules A1 to A3 (cradle to gate) as defined in EN 15804:2012 + A1:2013.

The declared unit is 1 m^2 of Gyptone 12.5mm with an average weight of 9.2 kg/m^2

CPC code: 37530

EPDs of construction products may not be comparable if they do not comply with EN 15804.

CEN standard EN 15804 serves as the core PCR[a]
Independent verification of the declaration, according to EN ISO 14025:2010 ☐ **Internal** ☒ **External**
Third party verifier[b]: **Dr Andrew Norton, Renuables**
[a] Product Category Rules **[b] Optional for business-to-business communication; mandatory for business to consumer communication (see EN ISO 14025:2010, 9.4)**

2. Product description

2.1 Description of the main product components and or materials:

Gyptone acoustic ceilings are based on a 12.5 mm specialized gypsum board suitable for most interior building applications where normal levels of fire resistance, structural strength and sound insulation are specified. Gyptone ceilings are produced with Active Air, which is standard in all Gyptone ceiling boards, a patent technology designed to degrade VOC emissions from emitting building materials, paint, furniture, carpets etc. Active Air degrades VOC's, like formaldehyde, into non harmful inert compounds. Active Air can reduce formaldehyde concentrations up to 70 %*. Gyptone ceilings can be mounted in suspended grid system with exposed or concealed grid as demountable or non-demountable boards with smooth surfaces. Gyptone ceilings are easy to install and have a robust surface with high impact resistance. Gyptone ceilings 12,5 mm are available in many formats and edges for optimal design options. The products are Gyptone 12,5 mm, Gyptone BIG 12,5 mm, Tiles 12,5 mm, Gyptone Plank 12,5 mm (korridor).

*The effectiveness of the ACTIVair technology has been tested by the accredited Eurofins and VITO laboratories to ISO 16000-23. Test show that ACTIVair decomposed up to 70% of the formaldehyde in a controlled test environment.

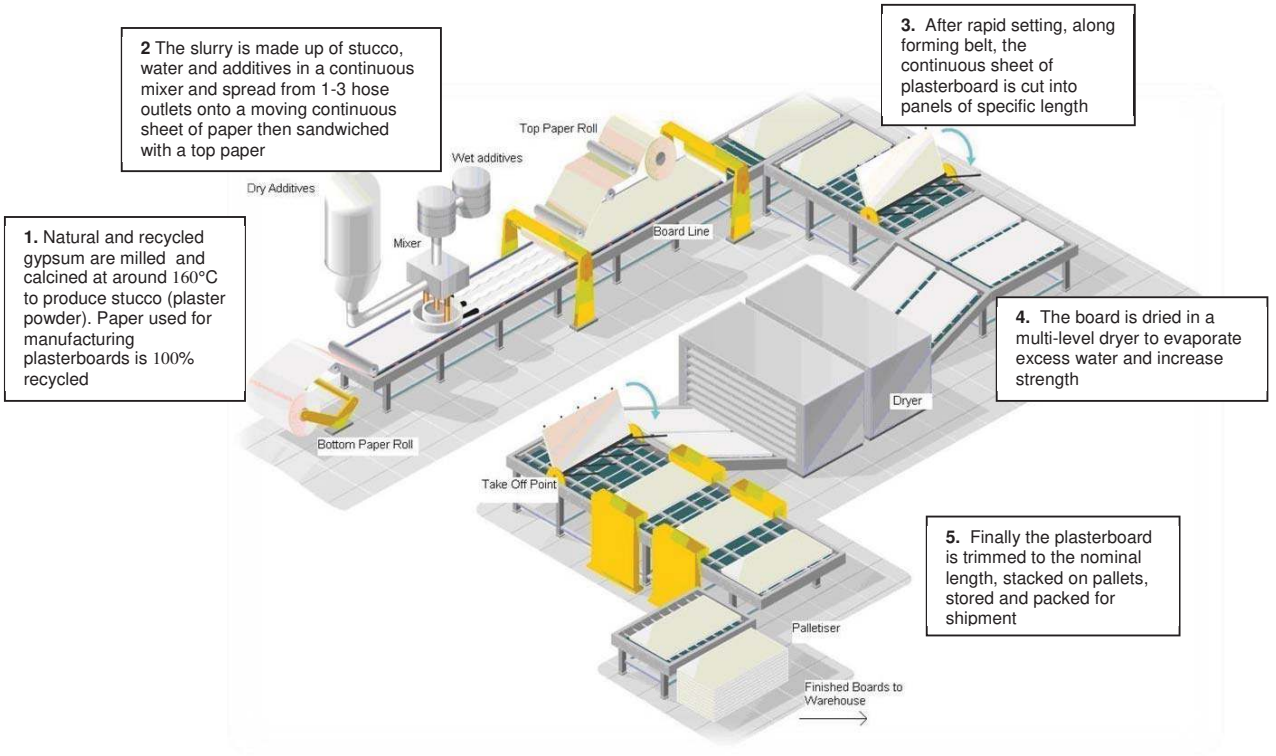
2.2 Technical data

EN CLASSIFICATION	EN 14190:2014
REACTION TO FIRE	A2-s1,d0
WATER VAPOUR RESISTANCE	NPD
THERMAL CONDUCTIVITY	NPD

Certifications:
Certifications:
ISO 9001:2008 Quality Management System
ISO 14001:2004 Environmental Management System - Including Energy Review according to par. 7 in Executive Order No. 1212/2014
BS OHSAS 18001:2007 Occupational Health and Safety Management System

2.3 Manufacturing process flow

Manufacturing process flow diagram



3. LCA calculation information

DECLARED UNIT	**1 m² of Gyptone 12.5mm with an average weight of 9.2 kg**
SYSTEM BOUNDARIES	Cradle to Gate: Upstream & Core processes (A1 – A3)
REFERENCE SERVICE LIFE (RSL)	60 years. This 60 year value is the amount of time that we recommend our products last for without refurbishment, and corresponds to standard building design life
CUT-OFF RULES	Life Cycle Inventory data for a minimum of 99% of total inflows to the upstream and core module shall be included
ALLOCATIONS	Production data. Recycling, energy and waste data have been calculated on a mass basis.
GEOGRAPHICAL COVERAGE AND TIME PERIOD	The product is produced in Denmark for global export. Data collected in Kalundborg, 2015. CML characterisation factors are used in the impact calculation. Ecoinvent 3.3 (updated in 2017), the GaBi Professional database and the GaBi Construction Products database are used.

According to EN 15804, EPDs of construction products may not be comparable if they do not comply with this standard. According to ISO 21930, EPDs might not be comparable if they are from different programmes.

4. Life cycle stages

Flow diagram of the Life Cycle

Product stage, A1-A3

Description of the stage:
A1, raw material extraction and processing, processing of secondary material input (e.g. recycling processes). This includes the extraction and processing of all raw materials and energy which occur upstream from the manufacturing process.
A2, transport to the manufacturer. The raw materials are transported to the manufacturing site. The modelling includes road, boat and/or train transportations of each raw material.
A3, manufacturing, including provision of all materials, products and energy, as well as waste processing up to the end-of-waste state or disposal of final residues during the product stage. This module includes the manufacture of products and the manufacture of packaging. The production of packaging material is taken into account at this stage. The processing of any waste arising from this stage is also included. In recent years an initiative was implemented to increase the content of recycled gypsum used for the plasterboard production. Currently 100% of the gypsum scrap from the production process is being reused.

Construction process stage, A4-A5

Description of the stage:
A4, transport to the building site,
A5, installation into the building, including provision of all materials, products and energy, as well as waste processing up to the end-of-waste state or disposal of final residues during the construction process stage. These information modules also include all impacts and aspects related to any losses during this construction process stage (i.e. production, transport, and waste processing and disposal of the lost products and materials).

Transport to the building site:

PARAMETER	VALUE (expressed per declared unit)
Fuel type and consumption of vehicle or vehicle type used for transport e.g. long distance truck, boat, etc.	Life cycle stage not assessed
Distance	Life cycle stage not assessed
Capacity utilisation (including empty returns)	Life cycle stage not assessed
Bulk density of transported products	Life cycle stage not assessed
Volume capacity utilisation factor	Life cycle stage not assessed

Installation in the building:

PARAMETER	VALUE (expressed per declared unit)
Ancillary materials for installation (specified by materials)	Life cycle stage not assessed
Water use	Life cycle stage not assessed
Other resource use	Life cycle stage not assessed
Quantitative description of energy type (regional mix) and consumption during the installation process	Life cycle stage not assessed
Wastage of materials on the building site before waste processing, generated by the product's installation (specified by type)	Life cycle stage not assessed
Output materials (specified by type) as results of waste processing at the building site e.g. of collection for recycling, for energy recovering, disposal (specified by route)	Life cycle stage not assessed
Direct emissions to ambient air, soil and water	Life cycle stage not assessed

Use stage (excluding potential savings), B1-B7

Description of the stage:

The use stage, related to the building fabric includes:
B1, use or application of the installed product;
B2, maintenance;
B3, repair;
B4, replacement;
B5, refurbishment, including provision and transport of all materials, products and related energy and water use, as well as waste processing up to the end-of-waste state or disposal of final residues during this part of the use stage. These information modules also include all impacts and aspects related to the losses during this part of the use stage (i.e. production, transport, and waste processing and disposal of the lost products and materials).

Maintenance:

PARAMETER	VALUE (expressed per declared unit) / DESCRIPTION
Maintenance process	Life cycle stage not assessed
Maintenance cycle	Life cycle stage not assessed
Ancillary materials for maintenance (e.g. cleaning agent, specify materials)	Life cycle stage not assessed
Wastage material during maintenance (specify materials)	Life cycle stage not assessed
Net fresh water consumption during maintenance	Life cycle stage not assessed
Energy input during maintenance (e.g. vacuum cleaning), energy carrier type, (e.g. electricity) and amount, if applicable and relevant	Life cycle stage not assessed

Repair:

PARAMETER	VALUE (expressed per declared unit) / DESCRIPTION
Repair process	Life cycle stage not assessed
Inspection process	Life cycle stage not assessed
Repair cycle	Life cycle stage not assessed
Ancillary materials (e.g. lubricant, specify materials)	Life cycle stage not assessed
Wastage material during repair (specify materials)	Life cycle stage not assessed
Net fresh water consumption during repair	Life cycle stage not assessed
Energy input during repair (e.g. crane activity), energy carrier type, (e.g. electricity) and amount if applicable and relevant	Life cycle stage not assessed

Replacement:

PARAMETER	VALUE (expressed per declared unit) / DESCRIPTION
Replacement cycle	Life cycle stage not assessed
Energy input during replacement (e.g. crane activity), energy carrier type, (e.g. electricity) and amount if applicable and relevant	Life cycle stage not assessed
Exchange of worn parts during the product's life cycle (e.g. zinc galvanized steel sheet), specify materials	Life cycle stage not assessed

Refurbishment:

PARAMETER	VALUE (expressed per declared unit) / DESCRIPTION
Refurbishment process	Life cycle stage not assessed
Refurbishment cycle	Life cycle stage not assessed
Material input for refurbishment (e.g. bricks), including ancillary materials for the refurbishment process (e.g. lubricant, specify materials)	Life cycle stage not assessed
Wastage material during refurbishment (specify materials)	Life cycle stage not assessed
Energy input during refurbishment (e.g. crane activity), energy carrier type, (e.g. electricity) and amount	Life cycle stage not assessed
Further assumptions for scenario development (e.g. frequency and time period of use, number of occupants)	Life cycle stage not assessed

Use of energy and water:

PARAMETER	VALUE (expressed per declared unit) / DESCRIPTION
Ancillary materials specified by material	Life cycle stage not assessed
Net fresh water consumption	Life cycle stage not assessed
Type of energy carrier (e.g. electricity, natural gas, district heating)	Life cycle stage not assessed
Power output of equipment	Life cycle stage not assessed
Characteristic performance (e.g. energy efficiency, emissions, variation of performance with capacity utilisation etc.)	Life cycle stage not assessed
Further assumptions for scenario development (e.g. frequency and time period of use, number of occupants)	Life cycle stage not assessed

End-of-life stage C1-C4

Description of the stage: The end-of-life stage includes:
C1, de-construction, demolition;
C2, transport to waste processing;
C3, waste processing for reuse, recovery and/or recycling;
C4, disposal, including provision and all transport, provision of all materials, products and related energy and water use.

End-of-life:

PARAMETER	VALUE (expressed per declared unit) / DESCRIPTION
Collection process specified by type	Life cycle stage not assessed
Recovery system specified by type	Life cycle stage not assessed
Disposal specified by type	Life cycle stage not assessed
Assumptions for scenario development (e.g. transportation)	Life cycle stage not assessed

Reuse/recovery/recycling potential, D

Description of the stage:
Module D includes: reuse, recovery and/or recycling potentials, expressed as net impacts and benefits.

5. LCA results

Description of the system boundary (X = Included in LCA, MNA = Module Not Assessed). The declared unit is 1 m² of Gyptone 12.5mm with an average weight of 9.2 kg.

CML characterisation factors are used in the impact calculation. Specific data has been supplied by the plant, and generic data come from the Ecoinvent 3.3 database (updated in 2017), the GaBi Professional database and the GaBi Construction Products database.
All emissions to air, water, and soil, and all materials and energy used have been included, with the exception of long-term emissions (>100 years).

PRODUCT STAGE			CONSTRUCTION STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
Raw material supply	Transport	Manufacturing	Transport	Construction-Installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-recovery
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA

ENVIRONMENTAL IMPACTS

Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse, recovery, recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
Global Warming Potential (GWP) - *kg CO_2 equiv/FU*	1.8E+00	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA
	The global warming potential of a gas refers to the total contribution to global warming resulting from the emission of one unit of that gas relative to one unit of the reference gas, carbon dioxide, which is assigned a value of 1.														
Ozone Depletion (ODP) *kg CFC 11 equiv/FU*	2.8E-08	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA
	Destruction of the stratospheric ozone layer which shields the earth from ultraviolet radiation harmful to life. This destruction of ozone is caused by the breakdown of certain chlorine and/or bromine containing compounds (chlorofluorocarbonsor halons), which break down when they reach the stratosphere and then catalytically destroy ozone molecules.														
Acidification potential (AP) *kg SO_2 equiv/FU*	7.7E-03	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA
	Acid depositions have negative impacts on natural ecosystems and the man-made environment incl. buildings. The main sources for emissions of acidifying substances are agriculture and fossil fuel combustion used for electricity production, heating and transport.														
Eutrophication potential (EP) *kg $(PO_4)^{3-}$ equiv/FU*	2.0E-03	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA
	Excessive enrichment of waters and continental surfaces with nutrients, and the associated adverse biological effects.														
Photochemical ozone creation (POPC) *kg Ethene equiv/FU*	7.6E-04	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA
	Chemical reactions brought about by the light energy of the sun. The reaction of nitrogen oxides with hydrocarbons in the presence of sunlight to form ozone is an example of a photochemical reaction.														
Abiotic depletion potential for non-fossil resources (ADP-elements) - *kg Sb equiv/FU*	6.4E-05	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA
Abiotic depletion potential for fossil resources (ADP-fossil fuels) - *MJ/FU*	3.6E+01	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA
	Consumption of non-renewable resources, thereby lowering their availability for future generations.														

RESOURCE USE

Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse, recovery, recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
Use of renewable primary energy excluding renewable primary energy resources used as raw materials *MJ/FU*	1.9E+01	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA
Use of renewable primary energy used as raw materials *MJ/FU*	0	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) *MJ/FU*	1.9E+01	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials - *MJ/FU*	3.7E+01	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA
Use of non-renewable primary energy used as raw materials *MJ/FU*	0	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) - *MJ/FU*	3.7E+01	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA
Use of secondary material *kg/FU*	1.3E-01	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA
Use of renewable secondary fuels- *MJ/FU*	0	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA
Use of non-renewable secondary fuels - *MJ/FU*	0	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA
Use of net fresh water - *m^3/FU*	1.5E-02	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA

WASTE CATEGORIES

Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse, recovery, recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
Hazardous waste disposed *kg/FU*	6.3E-07	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA
Non-hazardous (excluding inert) waste disposed *kg/FU*	1.7E-02	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA
Radioactive waste disposed *kg/FU*	3.0E-04	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA

OUTPUT FLOWS																
Parameters	Product stage	Construction process stage		Use stage							End-of-life stage				D Reuse, recovery, recycling
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
Components for re-use *kg/FU*	-	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA
Materials for recycling *kg/FU*	0	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA
Materials for energy recovery *kg/FU*	-	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA
Exported energy, detailed by energy carrier *MJ/FU*	0	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA

6. LCA results interpretation

[1] This indicator corresponds to the abiotic depletion potential of fossil resources.

[2] This indicator corresponds to the total use of primary energy.

[3] This indicator corresponds to the use of net fresh water.

[4] This indicator corresponds to the sum of hazardous, non-hazardous and radioactive waste disposed.

7. Comments

The natural gas use in stage A3 accounts for 71% of the total energy consumption for the A1-A3 stage. The next highest energy user is the production of the lining of the board, which accounts for 9% of energy use. Only 2% of waste generated on site is sent to landfill, while 40% is sent for incinerated and 58% is sent for recycling. Saint-Gobain Gyproc is constantly working on environmental impact reduction and energy efficiency through ISO 14001 implementation. We focus on energy efficiency by setting objectives and implementing projects to achieve them. Saint-Gobain Gyproc is constantly working on environmental impact reduction and energy efficiency through ISO 14001 implementation including energy survey according to Executive Order No. 1212/2014. We focus on energy efficiency by setting objectives and implementing projects to achieve them.

8. References

1. The International EPD System PCR for Construction Products and CPC 54 Construction Services V2

2. Saint Gobain Environmental Product Declaration Methodological Guide for Construction Products

3. EN 520:2004+A1:2009
Gypsum plasterboards - Part 1: Definitions, requirements and test methods

4. EN 15804:2012 + A1:2013
Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products

5. ISO 21930:2007
Sustainability in building construction – Environmental declaration of building products

6. ISO 14025:2006
Environmental labels and declarations – Type III environmental declarations – Principles and procedures

7. ISO 14040:2006
Environmental management. Life cycle assessment. Principles and framework

8. ISO 14044:2006
Environmental management. Life cycle assessment. Requirements and guidelines

9. ISO 9001:2008
Quality management systems. Requirements

10. DS/EN ISO 14001:2015 including energy review according to § 7
in Executive Order No.1212:2014. Environmental management systems – Requirements with guidance for use

11. OHSAS 18001:2007
Occupational health and safety management systems. Requirements

12. EN 14190:2014
Gypsum board products from reprocessing. Definitions, requirements and test methods


BUREAU VERITAS
Certification

Certification

Awarded to

Saint-Gobain Denmark A/S
Gyproc A/S
Hørskætvej 12, 4400 Kalundborg, Denmark

Bureau Veritas Certification Denmark A/S certifies that the Management System of the above organisation has been audited and found to be in accordance with the requirements of the Management System standards detailed below:

STANDARD

ISO 14001:2015
Including energy review according to § 7
in Executive Order No. 1212/2014

SCOPE OF CERTIFICATION

Development, production and delivery of plasterboard based products and delivery of complementary products.

DANAK