# ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804

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|---|---|
| Owner of the Declaration | **Schöck Bauteile GmbH** |
| Programme holder | Institut Bauen und Umwelt e.V. (IBU) |
| Publisher | Institut Bauen und Umwelt e.V. (IBU) |
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| Valid to | 07.04.2020 |

## Schöck Isokorb® Type KXT50-CV35-V6-H200-REI120

## Schöck Bauteile GmbH

Institut Bauen und Umwelt e.V.

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

ECO PLATFORM EPD EN 15804 VERIFIED

# 1. General Information

## Schöck Bauteile GmbH

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

**Declaration number**
EPD-SBG-20150013-IBC1-EN

**This Declaration is based on the Product Category Rules:**
Load-bearing thermal insulation elements, 07/2014
(PCR tested and approved by the SVR)

**Issue date**
08.04.2015

**Valid to**
07.04.2020

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

Dr. Burkhart Lehmann
(Managing Director IBU)

## Schöck Isokorb® Type KXT50-CV35-V6-H200-REI120

**Owner of the Declaration**
Schöck Bauteile GmbH
Vimbucher Straße 2
D-76534 Baden-Baden

**Declared product / Declared unit**
1 metre length of Schöck Isokorb® Type KXT50-CV35-V6-H200-REI120

**Scope:**
This EPD refers to a specific load-bearing thermal insulation element manufactured by Schöck Bauteile GmbH – Schöck Isokorb® Type KXT50-CV35-V6-H200-REI120. The compression modules required for Schöck Isokorb Type KXT are manufactured in the Schöck plant in Landsberg (near Halle, Germany). Final assembly of all required components takes place in the Schöck plant in Baden-Baden.

The EPD results for manufacturing Schöck Isokorb® Type KXT50-CV35-V6-H200-REI120 are also applicable to all Isokorb® types with less load-bearing capacity (KXT15 to KXT45).

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.

**Verification**

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

Manfred Russ
(Independent verifier appointed by SVR)

# 2. Product

### 2.1 Product description

Schöck Isokorb® Type KXT50-CV35-V6-H200-REI120 is a load-bearing thermal insulation element for thermal separation of reinforcement concrete elements projecting from the inner slab construction. It comprises a thermal insulation layer 120 mm thick made of polystyrene rigid foam (Neopor®) as well as an effective static framework system of welded steel bars (tension and shear bars), and a system of compression modules made of ultra-high-strength concrete (high thermal performance (HTE) compact compression modules). The forces are transferred to the respective adjacent components via bond stress and pressure.
Schöck Isokorb® Type KXT is available in several load-bearing capacities which are aligned towards the required load capacities. The number of tension bars, shear bars and HTE compression modules depends on the load-bearing capacity. The exact fittings displayed by Schöck Isokorb® Type KXT50-CV35-V6-H200-REI120 are indicated in the table in section 2.3.

The declared product is supplied in a fire-resistant version with fire-resistant slabs attached on the top and bottom in the factory, and displays a fire-resistance duration of 120 minutes (REI120).
The EPD results for manufacturing Schöck Isokorb® Type KXT50-CV35-V6-H200-REI120 are also applicable to all Isokorb® types with less load-bearing capacity (KXT15 to KXT45). The products with the respective load-bearing capacities (KXT15 to KXT45) have identical components and have a lower mass than the declared product on account of the lower number of fittings (smaller number of steel bars and compression modules). The manufacturing process for the products with load-bearing capacities (KXT15 to KXT45) is the same.

### 2.2 Application

Schöck Isokorb® Type KXT serves as static transfer of bending torques and shear forces, and is used on projecting reinforcement concrete constructions such as balconies, for example. It is arranged linearly in the external thermal insulation level (e.g. composite heat

insulation system) in such a way that the thermal flow between the interior and exterior area is minimised locally and thermal bridges are reduced.
Because of its thermal and statically optimised design, Isokorb® ensures effective thermal insulation which is indicated by the equivalent thermal conductivity ($\lambda_{eq}$).

## 2.3 Technical Data

**Technical Data**

| Name | Value | Unit |
|---|---|---|
| Description of product types KXT50-CV35-V6-H200-REI120 | - | - |
| Insulation thickness | 120 | mm |
| Concrete covering /DIN 1045-1/, /DIN EN 1992-1-1/NA/ | 35 | mm |
| Height | 200 | mm |
| Length | 1000 | mm |
| Tension bars (number; diameter) | 15 Ø 8 | mm |
| Shear bars (number; diameter) | 5 Ø 6 | mm |
| HTE compression modules (number) | 8 | - |
| Fire-resistance class /DIN EN 1365-2/, /DIN EN 13501-2/, /DIN 4102-2/, /Z-15.7-240/ | 120 | - |
| Equivalent thermal conductivity λeq /DIN EN ISO 2011/, /DIN EN ISO 6946/, /Z-15.7-240/ | 0.105 | W/(mK) |
| Thermal conductivity of the Neopor thermal insulation material /DIN EN 13163/ | 0.031 | W/(mK) |
| Moment resistance at C25/30 /DIN 1045-1/, /DIN EN 1992-1-1/NA/ | -44.2 | kNm/m |
| Shear resistance at C25/30 /DIN 1045-1/, /DIN EN 1992-1-1/NA/ | 35.3 | kN/m |

## 2.4 Placing on the market / Application rules

**Schöck Isokorb® :**
General technical approval No. Z-15.7-240 of Deutsches Institut für Bautechnik (DIBt)

## 2.5 Delivery status

Schöck Isokorb® Type KXT50-CV35-V6-H200-REI120 is manufactured at a length of 1000 mm and a height of 200 mm.

## 2.6 Base materials / Ancillary materials

| Name | Value | Unit |
|---|---|---|
| Reinforcement steel B500 | 36,3 | % |
| Stainless steel B500 NR | 12,9 | % |
| Plastic rails (PVC, PE) | 11,5 | % |
| Cement-boundfire safety boards | 17,6 | % |
| Insulation material (polystyrene rigid foam) | 2,8 | % |
| HTE Compression modules (fine concrete) | 17,9 | % |
| Raw materials with low proportional weights | 1,0 | % |

The product weight in relation to the declared unit is 14.695 kg.

## 2.7 Manufacture

**Processing raw materials**
The base material for the welded reinforcement steel-stainless steel compounds in Schöck Isokorb® is wound as "metal wire" on coils, delivered and decoiled in special plants, aligned and cut to the required length or manufactured straight from the coil using recognised and certified welding processes on special automatic welding machines within in-house production in Baden-Baden. The shear bars are bent on in-house bending machines and bundled using retaining clips.
The HTE compression modules made of high-performance concrete are cast in prefabricated plastic moulds which serve as integrated formwork in the plant in Landsberg in accordance with the mixtures stored at Deutsches Institut für Bautechnik.

**End assembly**
The materials required for final assembly of the various Schöck Isokorb® models are produced in-house and procured from selected suppliers. The various Schöck Isokorb® models are assembled on special manufacturing lines according to type and depending on specific customer requests. During final assembly in the plant in Baden-Baden, the requisite components (tension and shear bars, compression modules, plastic rails, foam parts and fire-resistant slabs) are bonded in accordance with the applicable manufacturing drawing and the corresponding quality guidelines using mechanical bonding technology as well as a special hot-melt adhesive.

## 2.8 Environment and health during manufacturing

The criteria for environmental and energy management as well as the requirements concerning health and safety in the workplace are maintained in line with the respective certifications:

**Health and safety during manufacturing**
Occupational health and safety management in accordance with BS OHSAS 18001:2007

**Environmental protection during manufacturing:**
Quality management in accordance with DIN EN ISO 14001
Energy management in accordance with DIN EN ISO 50001

**Quality management during manufacturing**
Quality management in accordance with DIN EN ISO 9001

The company has been certified to DIN EN ISO 9001 since 2006, DIN EN ISO 14001 since 2013 and DIN EN ISO 50001 since 2014, as well as to BS OHSAS 18001 by DEKRA Certification GmbH.

All types of waste, e.g. stainless steel, reinforcement steel, expanded polystyrene (EPS), plastic, wood (wooden pallets and wood sets) and packaging foil, incurred during manufacturing of the product or remaining as excess material are separated, stored and redirected to the material cycle.

## 2.9 Product processing/Installation

Schöck Isokorb® Type KXT50-CV35-V6-H200-REI120 is supplied as a metre element ready for installation and in a linear and flush arrangement between the inner slab and the balcony slab by means of a tongue-and-groove system. If necessary, it can be cut to length using a standard hand saw. Isokorb® is positioned in the building shell during or after installation of the inner slab and balcony slab reinforcement and without using any lifting equipment,

interconnected with the reinforcement available on site and secured against floating during the subsequent concrete process.
No special environmental protection measures need to be taken while processing Schöck Isokorb®.

### 2.10 Packaging
Schöck Isokorb® is stacked on wooden pallets with wood sets at the side and delivered wrapped with or without foil depending on the specific national requirements.
The individual packaging materials are separated and redirected to the material cycle. The wooden pallets are returned to authorised disposal companies within the framework of the Interseroh System.

### 2.11 Condition of use
On installation, all materials used are protected against external influences for the entire term of use and designed for the service life of the respective construction. No risks can arise to water, air and soil if the products are used as designated.

### 2.12 Environment and health during use
Integrated application of the products in the building shell does not incur any negative effects on the environment and health during the use phase.

### 2.13 Reference service life
A service life of at least 50 years confirmed by test scenarios is applicable for Schöck Isokorb® Type KXT50-CV35-V6-H200-REI120 which complies with the average building utilisation and plans. The practical service life can however be considerably longer. The service life is based on fatigue tests which simulate a useful life of 50 years based on sets of stress factors (temperature, deformation, environment) and are a component of the building approval. Another prerequisite for the useful life is that the requisite conditions governing packaging, transport, storage, installation and application are complied with.

### 2.14 Extraordinary effects

**Fire**
The declared product with fire slabs has a fire-resistance duration of 120 minutes in accordance with the fire tests required for general building approval and is classified in fire-resistance class REI120 in accordance with DIN EN 13501.

**Water**
By using stainless steel with the corresponding bond length in the structures to be connected, the risk of corrosion is eliminated. The materials contained in Schöck Isokorb® Type KXT50-CV35-V6-H200-REI120 are chemically neutral when exposed to water as well as being insoluble in water and they do not emit any substances which are hazardous to water.
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**Mechanical destruction**
Not of relevance

### 2.15 Re-use phase
De-construction is in conjunction with the bonded reinforcement steel slabs in the load-bearing construction. The steel components of the declared product can be returned to the material cycle and recycled. Importance should be attached to de-construction which is as pure as possible to ensure an efficient recycling process.

### 2.16 Disposal
The non-recyclable portions of Schöck Isokorb® Type KXT50-CV35-V6-H200-REI120 can be disposed of in any landfill with the corresponding waste code number (as per the waste code in the European Waste Catalogue: 170904).

### 2.17 Further information
For more details on the product, see www.schoeck.de.

## 3. LCA: Calculation rules

### 3.1 Declared Unit
This Declaration refers to one metre of specific load-bearing thermal insulation elements manufactured by Schöck Bauteile GmbH – Schöck Isokorb® Type KXT50-CV35-V6-H200-REI120.

**Deklarierte Einheit**

| Name | Value | Unit |
|---|---|---|
| Conversion factor to 1 kg | 0.0681 | - |
| Declared unit | 1 | m |
| Declared unit | 1 | 1 piece/product |
| Weight per declared unit | 14,695 | kg |

### 3.2 System boundary
Type of EPD: Cradle to factory gate – with options
The Environmental Product Declaration refers to the product stage (A1-A3), the end-of-life stage (C4) and recycling stage which is declared in the module governing benefits and loads outside the system boundaries (D). The consumption values associated with landfilling non-recyclable materials are outlined in Module C4.

### 3.3 Estimates and assumptions
Assumptions are made regarding the following raw materials / preliminary products: microfibres (raw material: steel fibres, 0.4% by mass) are estimated along with reinforcement concrete and fire-resistance strips (raw material: expanded graphite, 0.1% by mass) are modelled as synthetic graphite.

### 3.4 Cut-off criteria
All data from the operating data survey is taken into consideration, i.e. all starting materials used according to the formula, the thermal energy used as well as electricity. The materials accounting for less than 1 per cent are not taken into consideration.
Transport of the compression module and the packaging required for transport from Landsberg to Baden-Baden are considered as in-plant transport and in-plant auxiliaries and therefore not taken into consideration in the LCA.
The total material and energy volumes not taken into consideration are less than 5 per cent in terms of mass, energy or environmental relevance.

### 3.5 Background data

All background data used was taken from the GaBi 6 software data bases. The consistent data sets contained in the GaBi data base are documented in the online GaBi documentation (GaBi Data). The "stainless steel" data set is an association data set from EUROFER and comprises a representative industrial mix based on primary data supplied by European manufacturers of stainless steel. In order to guarantee comparability of the results, exclusively the consistent background data from the GaBi data base was used in the LCA (e.g. data sets on energy, transport, auxiliaries and consumables).

### 3.6 Data quality

Data from production year 2013 supplied by Schöck Bauteile GmbH was used for the product stage of Schöck Isokorb® Type KXT50-CV35-H200-REI120. The GaBi 6 background data used was last revised in 2013. The quality of the data surveyed can be regarded as high.

### 3.7 Period under review

The data in this LCA is based on data records from 2013. The period under review was 12 months.

### 3.8 Allocation

The production data was allocated by units in accordance with the annual volume of Schöck Isokorb® Type KXT50-CV35-H200-REI120. The raw materials and energy were calculated in line with this allocation key.
Of the steel scrap incurred in the system during the production and end-of-life phases, the requisite volume of recycled secondary steel for production is redirected or saturated ("closed loop"). It is assumed for steel scrap incurred after expiry of the use phase that it has reached its End-of-Waste status. Credits are allocated for such scrap volumes but only for the calculated net scrap volume.
This credit is awarded based on the assumption that steel production with steel scrap represents a substitution for primary steel production.

### 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 following technical information forms the basis for the declared modules or can be used for developing specific scenarios within the context of a building assessment.

**Referenz Nutzungsdauer**

| Name | Value | Unit |
|---|---|---|
| Reference service life | 50 | a |

**Ende des Lebenswegs (C1-C4)**

| Name | Value | Unit |
|---|---|---|
| Collected separately | 0 | kg |
| Collected as mixed construction waste | 14.695 | kg |
| Reuse | 5.93 | kg |
| Recycling (stainless steel) | 1.29 | kg |
| Energy recovery | 0 | kg |
| Landfilling (non-recyclable materials) | 7.46 | kg |

**Re-use, recovery and recycling potential (D), relevant scenario information**

The LCA includes the End-of-Life of the declared product after expiry of the use phase.
By using steel and stainless steel in the manufacture of Schöck Isokorb® Type KXT50-CV35-H200-REI120, two metal scrap groups are of relevance in the EoL: steel scrap and stainless steel scrap. The net scrap volume for steel scrap is negative (-0.392 kg), i.e. additional steel scrap needs to be added from outside the system boundaries (load) as the requirements for steel scrap in the manufacturing phase can not be satisfied by the production scrap ("prompt scrap") and EoL scrap ("post-consumer scrap") incurred. The net scrap volume for stainless steel scrap is positive (1.29 kg); a credit is allocated for this volume (as outlined in section 3.8).

| Name | Value | Unit |
|---|---|---|
| Collection rate | 100 | % |
| Net scrap volume - steel | -0,392 | kg |
| Net scrap volume - stainless steel | +1,29 | kg |

## 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 BOUNDARIES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Raw material supply | Transport | Manufacturing | Transport from the gate to the site | Assembly | Use | Maintenance | Repair | Replacement | Refurbishment | 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 | X | X |

**RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 m Schöck Isokorb® Type KXT50-CV35-H200-REI120**

| Parameter | Unit | A1-A3 | C4 | D |
|---|---|---|---|---|
| Global warming potential | [kg $CO_2$-Eq.] | 2.50E+1 | 1.01E-1 | -6.30E+0 |
| Depletion potential of the stratospheric ozone layer | [kg CFC11-Eq.] | 7.63E-7 | 1.27E-12 | -5.12E-8 |
| Acidification potential of land and water | [kg $SO_2$-Eq.] | 1.88E-1 | 6.43E-4 | -7.04E-2 |
| Eutrophication potential | [kg $(PO_4)^{3-}$-Eq.] | 9.14E-3 | 8.82E-5 | -3.46E-3 |
| Formation potential of tropospheric ozone photochemical oxidants | [kg ethene-Eq.] | 1.59E-2 | 6.04E-5 | -3.88E-3 |
| Abiotic depletion potential for non-fossil resources | [kg Sb-Eq.] | 1.82E-3 | 3.81E-8 | -1.28E-3 |
| Abiotic depletion potential for fossil resources | [MJ] | 3.30E+2 | 1.33E+0 | -7.29E+1 |

**RESULTS OF THE LCA - RESOURCE USE: 1 m Schöck Isokorb® Type KXT50-CV35-H200-REI120**

| Parameter | Unit | A1-A3 | C4 | D |
|---|---|---|---|---|
| Renewable primary energy as energy carrier | [MJ] | 7.04E+1 | - | - |
| Renewable primary energy resources as material utilization | [MJ] | 0.00E+0 | - | - |
| Total use of renewable primary energy resources | [MJ] | 7.04E+1 | 1.15E-1 | -3.37E+0 |
| Non-renewable primary energy as energy carrier | [MJ] | 3.85E+2 | - | - |
| Non-renewable primary energy as material utilization | [MJ] | 4.40E+0 | - | - |
| Total use of non-renewable primary energy resources | [MJ] | 3.89E+2 | 1.39E+0 | -7.71E+1 |
| Use of secondary material | [kg] | 8.45E+0 | 0.00E+0 | 0.00E+0 |
| Use of renewable secondary fuels | [MJ] | 0.00E+0 | 0.00E+0 | 0.00E+0 |
| Use of non-renewable secondary fuels | [MJ] | 0.00E+0 | 0.00E+0 | 0.00E+0 |
| Use of net fresh water | [$m^3$] | - | - | - |

**RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: 1 m Schöck Isokorb® Type KXT50-CV35-H200-REI120**

| Parameter | Unit | A1-A3 | C4 | D |
|---|---|---|---|---|
| Hazardous waste disposed | [kg] | - | - | - |
| Non-hazardous waste disposed | [kg] | - | - | - |
| Radioactive waste disposed | [kg] | - | - | - |
| Components for re-use | [kg] | 0.00E+0 | 0.00E+0 | - |
| Materials for recycling | [kg] | 6.24E-1 | 7.23E+0 | - |
| Materials for energy recovery | [kg] | 0.00E+0 | 0.00E+0 | - |
| Exported electrical energy | [MJ] | 0.00E+0 | 0.00E+0 | - |
| Exported thermal energy | [MJ] | 0.00E+0 | 0.00E+0 | - |

**Re.** Net use of fresh water, Hazardous waste for disposal, Disposed of, non-hazardous waste and Disposed of, radioactive waste: Not all of the data inventories used for calculating the LCA support the methodical approach for declaring the water and waste indicators. The material volumes depicted by these data inventories contribute 25% to product manufacturing. The significance of these data inventories has been examined by means of a sensitivity analysis. It is defined as high. The indicators can not therefore be accounted for (decision by the Expert Committee (SVA) on 07.01.2013).

## 6. LCA: Interpretation

In all impact categories, the main contribution to the overall environmental potentials can be found in the production phase (Modules A1-A3). The loads during this phase are primarily caused by the upstream chains associated with the raw materials.
The graph below depicts the results for the preliminary products (Module A1). The main driver in most categories is stainless steel which shows a relevant to significant influence. The manufacture of reinforcement steel has a certain influence on the following impact categories: Global Warming Potential (GWP), Total use of non-renewable primary energy sources (PENRT), Abiotic Depletion Potential Fossil Fuels (ADPF) and Eutrification Potential (EP). The manufacture of foam parts made of Neopor (EPS) is of little significance but has a relevant influence on the Photochemical Ozone Creation Potential (POCP) – caused by the use of pentane in the manufacture of this preliminary product.

Production of the compression module is rather unimportant or moderately important. Production of the fire-resistant slabs has a minor influence on the results. The contributions made by the fire-resistance panels are largely attributable to the upstream chains associated with cement production.

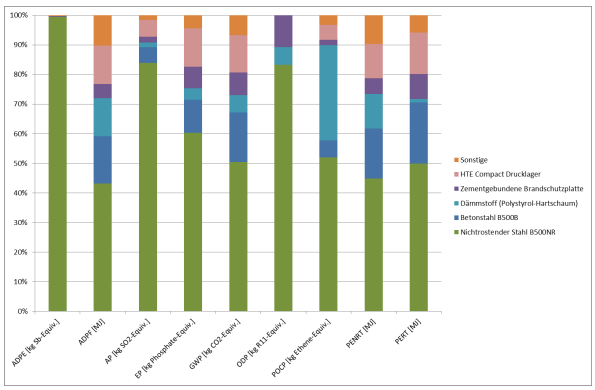

Fig.: Graphic representation of the results for the preliminary products (Module A1)

## 7. Requisite evidence

When used as designated, no negative effects on the environment and health are to be anticipated. The product is encased in concrete and does not have any contact with indoor air or the outer shell of the building. No legal evidence is required for the product.

## 8. References


**BS OHSAS 18001**
BS OHSAS 18001:2007-07-31: Occupational health and safety management systems Requirements

**DIN 1045-1**
DIN 1045-1:2008-08: Concrete, reinforced and pre-stressed concrete structures – Part 1: Rating and construction

**DIN 4102-2**
DIN 4102-2:1977-09: Fire behaviour of building material and building components; Building components; Definitions, requirements and tests

**DIN EN 1992-1-1/NA**
DIN EN 1992-1-1/NA:2013-04: National Annex – Nationally determined parameters - Eurocode 2: Design of concrete structures – Part 1-1: General rules and rules for buildings

**DIN EN 13501-2**
DIN EN 13501-2:2010-02: Fire classification of construction products and building elements – Part 2: Classification using data from fire resistance tests, excluding ventilation services; German version EN 13501-2:2007 + A1:2009

**DIN EN 13163**
DIN EN 13163:2013-03: Thermal insulation products for buildings – Factory-made expanded polystyrene (EPS) products – Specification; German version EN 13163:2012

**DIN EN 1365-2**
DIN EN 1365-2:2012-12: Fire-resistance tests for load-bearing elements – Part 2: Floors and roofs; German version prEN 1365-2:2012

**DIN EN ISO 10211**
DIN EN ISO 10211:2008-04: Thermal bridges in building construction – Heat flows and surface temperatures – Detailed calculations (ISO 10211:2007); German version EIN ISO 10211:2007

**DIN EN ISO 6946**
DIN EN ISO 6946:2008-04: Building components and building elements – Thermal resistance and thermal transmittance – Calculation method (ISO 6946:2007); German version EN ISO 6946:2007

**DIN EN ISO 9001**
DIN EN ISO 9001:2008: Quality management systems – Success through quality

**DIN EN ISO 14001**
DIN EN ISO 14001:2009-11: Environmental management systems – Requirements with guidance for use (ISO 14001:2004 + Cor. 1:2009); German and English versions EN ISO 14001:2004 + AC:2009

**DIN EN ISO 50001**
DIN EN ISO 50001:2011-12: Energy management systems – Requirements with guidance for use (ISO 50001:2011)

**GaBi 6 Data**
GaBi 6.4 data set documentation for the software system and data bases, LBP, University of Stuttgart and thinkstep AG (formerly PE INTERNATIONAL AG), Leinfelden-Echterdingen, 2013 (http://documentation.gabi-software.com/)

**GaBi 6 Software**
Software and data base for life cycle engineering, LBP, University of Stuttgart and thinkstep AG (formerly PE INTERNATIONAL AG), Leinfelden-Echterdingen, 2013

**IBU 2013, Part A**
PCR – Part A: Calculation rules for the LCA and requirements on the Background Report, Version 1.2, Institut Bauen und Umwelt e.V., www.bau-umwelt.com, 2013

**IBU 2014, Part B**
PCR – Part B: Requirements on the EPD for load-bearing thermal insulation elements, Version 1.1, Institut Bauen und Umwelt e.V., www.bau-umwelt.com, 2014

**Z-15.7-240**
General construction inspection approval no. Z-15.7-240: Schöck Isokorb with concrete compression module (applicable from 04.07.2014 to 31.12.2015)

**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

**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+A1 2013: Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

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