

Rieder Group

# Product sustainability fact sheet fibreC

## Product information for the building certification scheme LEED v4® (Leadership in Energy and Environmental Design)

The intention of this document is to support project teams pursuing LEED v4 certification by providing an overview of how your products contribute to LEED v4 credits. Basis of this information is LEED v4 credit library (2014 -07)<sup>1</sup>.

# Glassfiber reinforced concrete panels: fibreC, öko skin

## General Information

Company name: Rieder Smart Elements GmbH  
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Date: May 2015

## Product information

### Product description

fibreC is a glass fiber reinforced exposed concrete slab. The reinforcement is alkali-resistant glass fibers. The plate is colored throughout and has a standard thickness of 13 mm. The declaration applies for Matt, Ferro and Ferro Light surface finishes and for all available colors.

### Application

fibreC panels serve as interior or exterior cladding material, including use in ventilated facades and as floor slabs.

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<sup>1</sup> <http://www.usgbc.org/credits> (8/2014)

A photograph of a modern, multi-story building with large glass windows and a brown facade. The building is identified as the Rieder Group building. The text 'Rieder Group' is overlaid on the left side of the image.

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# Product sustainability fact sheet fibreC

## Technical data

Description	Value	Unit
Gross density /DIN EN 12467/	2.0 – 2.42	kg/dm <sup>3</sup> or g/cm <sup>3</sup>
E-module (longitudinal) /DIN EN 12467/	10,000-30,000	N/mm <sup>2</sup>
Bending tensile strength /DIN EN 12467/ category 4/	>18,0	N/mm <sup>2</sup>
Thermal conductivity	2.0	W/(m K)
Coefficient of thermal expansion /DIN 51045/	10*10 <sup>-6</sup>	1/°k
Building material class /DIN 1402/	A1 – non-combustible	

## Product declarations

### Environmental product declaration

Number	EPD-RSE-2012111-D <sup>2</sup>
Program operator	Institut Bauen und Umwelt (IBU) (Institute Construction and Environment)
Author of the LCA	PE INTERNATIONAL AG

<sup>2</sup> [http://construction-environment.com/download/CY5a0ba1adX13ba8257899X412e/EPD\\_RSE\\_2012111\\_D.pdf](http://construction-environment.com/download/CY5a0ba1adX13ba8257899X412e/EPD_RSE_2012111_D.pdf)

## Sustainable Sites (SS)

### Summary

Sustainable sites credits encourage strategies that minimize the impact on ecosystems and water resources.

### Heat island reduction

#### *Intent of this credit:*

To minimize effects on microclimates and human and wildlife habitats by reducing heat islands.

Product information for fibreC within this credit:

The solar reflectance  $\rho_{solar}$ , normal thermal emittance  $\epsilon$  and hemispherical thermal emittance  $\epsilon_h$  at a temperature of  $T = 300\text{ K}$ , together with the SRI-value (solar reflectance index) for “low wind conditions” ( $5\text{ W m}^{-2}\text{ K}^{-1}$ ), “medium wind conditions” ( $12\text{ W m}^{-2}\text{ K}^{-1}$ ) and “high wind conditions” ( $30\text{ W m}^{-2}\text{ K}^{-1}$ ) have been investigated.

Two samples of fibreC glass fiber concrete panels were tested.

Sample number	description
1	fibreC, 20mm
2	fibreC, 13mm

Sample number	$\rho_{solar}$	$\epsilon (T = 300\text{ K})$	$\epsilon_h (T = 300\text{ K})$	SRI Wind 5	SRI Wind 12	SRI Wind 30
1	$0.76 \pm 0.02$	$0.96 \pm 0.02$	$0.90 \pm 0.02$	94	95	95
2	$0.72 \pm 0.02$	$0.97 \pm 0.02$	$0.90 \pm 0.02$	88	89	89

Evidence/calculation formula:

The calculations of the solar reflectance and spectral reflectance are calculated in accordance to DIN EN 410 or ISO 9050, respectively.

SRI-values for different wind-conditions calculated in accordance to ASTM E 1980-01.

## Materials and Resources (MR)

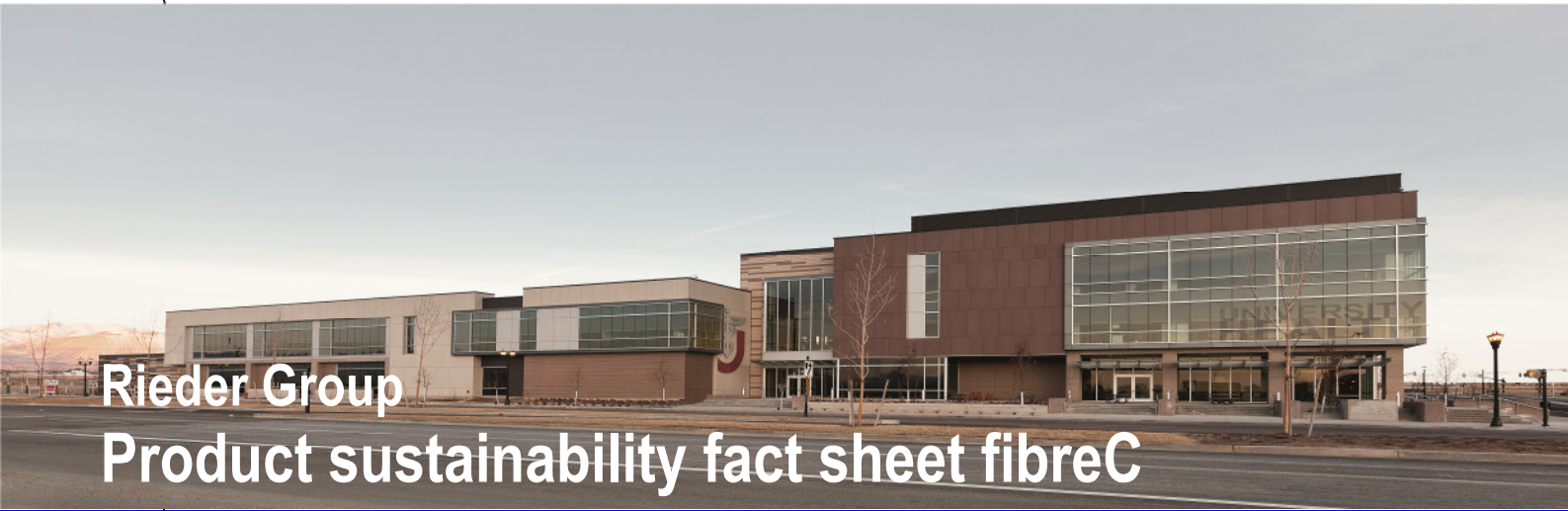
### Summary

Materials and Resources credits encourage using sustainable building materials and reducing waste. Indoor environmental quality credits promote better indoor air quality and access to daylight and views.

### Building product disclosure and optimization - environmental product declarations

#### *Intent of this credit*

To encourage the use of products and materials for which life-cycle information is available and that have environmentally, economically, and socially preferable life-cycle impacts. To reward project teams for selecting products from manufacturers who have verified improved environmental life-cycle impacts.



# Rieder Group

## Product sustainability fact sheet fibreC

Product information for fibreC within this credit:

Item	Value
Critically reviewed LCA acc. to ISO 14044	yes
Reviewer	Matthias Schultz
Download link of the document/study	<a href="http://bau-umwelt.de/download/CY5a0ba1adX13ba8257899X412e/EPD_RSE_2012111_D.pdf">http://bau-umwelt.de/download/CY5a0ba1adX13ba8257899X412e/EPD_RSE_2012111_D.pdf</a>
Product specific EPD (Type III, including external verification)?	yes
EPD program operator	IBU – Institut Bauen und Umwelt e.V. (Institute Construction and Environment)
EPD program operator country	Germany
EPD number	EPD-RSE-2012111-D
Download link of the EPD document	<a href="http://bau-umwelt.de/download/CY5a0ba1adX13ba8257899X412e/EPD_RSE_2012111_D.pdf">http://bau-umwelt.de/download/CY5a0ba1adX13ba8257899X412e/EPD_RSE_2012111_D.pdf</a>

### Results of the LCA – ENVIRONMENTAL IMPACTS:

Declared unit: 1 to glass fiber concrete panel Rieder fibreC	
Declared life cycle stages (standard DIN EN 15978)	PRODUCT STAGE
	A1-A3
GWP [kg CO <sub>2</sub> -eq.]	7.26E+02
ODP [kg CFC11-eq.]	1.46E-06
AP [kg SO <sub>2</sub> -eq.]	2.10E+00
EP [kg PO <sub>4</sub> 3-- eq.]	2.20E-01
POCP [kg Ethen-eq.]	2.30E-01
ADPE [kg Sb eq.]	5.86E-03
ADPF [MJ]	8.82E+03

Caption

GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources

## Results of the LCA – RESOURCE USE:

Declared unit: 1 to glass fiber concrete panel Rieder fibreC	
Declared life cycle stages (standard DIN EN 15978)	PRODUCT STAGE
	A1-A3
<b>PE total [MJ]</b>	1.06E+04
PERE [MJ]	1.05E+03
PERM [MJ]	0.00E+00
<b>PERT [MJ]</b>	1.05E+03
PENRE [MJ]	8.95E+03
PENRM [MJ]	6.47E+02
<b>PENRT [MJ]</b>	9.60E+03
SM [kg]	0.00E+00
RSF [MJ]	5.71E+01
NRSF [MJ]	5.33E+02
FW [m <sup>3</sup> ]	6.70E+02

**Caption**

PE total = Total use of primary energy resources (=PERT+PENRT); PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

## Results of the LCA – OUTPUT FLOWS AND WASTE CATEGORIES:

Declared unit: 1 to glass fiber concrete panel Rieder fibreC	
Declared life cycle stages (standard DIN EN 15978)	PRODUCT STAGE
	A1-A3
HWD [kg]	
NHWD [kg]	1.74E+03
RWD [kg]	3.15E-01
CRU [kg]	0
MFR [kg]	0
MER [kg]	0
EEE [MJ]	0
EET [MJ]	0

**Caption**

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EE = Exported energy per energy carrier; EEE = Exported energy, electric energy, EET = Exported energy, thermal energy

## Building product disclosure and optimization – sourcing of raw materials

*Intent of this credit*

To encourage the use of products and materials for which life cycle information is available and that have environmentally, economically, and socially preferable life cycle impacts. To reward project teams for selecting products verified to have been extracted or sourced in a responsible manner.

Product information for fibreC within this credit:

Option 1		Description / Unit
Third-party verified corporate sustainability report (CSR)?	no	
Download link to the report		
Option 2		Description / Unit
Participation in an extended producer responsibility program?	no	
Postconsumer recycled content	0	%
Preconsumer recycled content	0	%

## Building product disclosure and optimization – material ingredients

*Intent of this credit*

To encourage the use of products and materials for which life-cycle information is available and that have environmentally, economically, and socially preferable life-cycle impacts. To reward project teams for selecting products for which the chemical ingredients in the product are inventoried using an accepted methodology and for selecting products verified to minimize the use and generation of harmful substances. To reward raw material manufacturers who produce products verified to have improved life-cycle impacts.

Product information for fibreC within this credit:

Type of reporting	Certification program (e.g. Green screen, cradle to cradle version/level, REACH)	Value/ Comment	Link
Option 1: material ingredient reporting	Safety data sheet according 91 / 155 EWG	yes	
	Manufacturer Inventory	no	
ingredient optimization	International Alternative Compliance Path – REACH Optimization	no REACH ingredients used (see EPD)	
	USGBC approved program	no	



# Rieder Group Product sustainability fact sheet fibreC

## Indoor Environmental Quality (EQ)

### Summary

Indoor environmental quality credits promote better indoor air quality and access to daylight and views.

### Low-emitting materials

#### *Intent of this credit*

To reduce concentrations of chemical contaminants that can damage air quality, human health, productivity, and the environment.

Product information for fibreC within this credit:

Item	Value	Unit
Test institute / organization (Name)	Eco-institiut GmbH	-
Test report No.	No. 35964-001	-
Test method applied	Test chamber method (19/06/2012)	-
Applicable regulation	DIBt, AgBB, ISO 16000	-
Regulation requirements met	y	-
TVOC (28 days)	251	µg/m <sup>3</sup>
Criteria? (CDPH, AgBB, ISO 16000, DIBt method)	DIBt, AgBB, ISO 16000, DIN EN 717-1	-

**Projects outside the U.S.** may use products tested and deemed compliant in accordance with either (1) the California Department of Public Health (CDPH) standard method (2010) or (2) the German AgBB Testing and Evaluation Scheme (2010). Test products either with (1) the CDPH Standard Method (2010), (2) the German AgBB Testing and Evaluation Scheme (2010), (3) ISO 16000-3: 2010, ISO 16000-6: 2011, ISO 16000-9: 2006, ISO 16000-11:2006 either in conjunction with AgBB, or with French legislation on VOC emission class labeling, or (4) the DIBt testing method (2010). If the applied testing method does not specify testing details for a product group for which the CDPH standard method does provide details, use the specifications in the CDPH standard method. **U.S. projects** must follow the California Department of Public Health (CDPH) standard method.

A photograph of a modern, multi-story building with large glass windows and a brown facade. The building is situated in an open area with a paved road in the foreground. The sky is overcast.

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A circular icon containing a stylized red and white symbol, possibly representing a document or a process.

## Innovation

### *Intent of this credit*

To encourage projects to achieve exceptional or innovative performance.

Product information for fibreC within this credit:

### Description:

Rieder runs the "Supply-Plus-System" in order to support designers and project managers: Each project is allocated to a certain category of complexity: It starts with Level 1 (simple) up to Level 3 (complex). Depending on the allocation of a project to the category of complexity Rieder offers special support provided by an internal project manager who starts specific supporting process chains. This "Supply-Plus-System" aims to project support of designers and project developers in the early design phases in order to support the planning team with all available technical and technological know-how. Rieder runs a R&D-Department which steadily works on optimization of the core-products regarding usability of new raw materials, new production processes. One core-activity of this R&D-Department is also the adjustment of the core product regarding special requests concerning specific projects. The development of new products is also the task for this department.

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