

ZEITRAUM

OKITO STOOL

Design by Läufer & Keichel, 2018



Furniture Footprint

OKITO STOOL

Design by Läufer & Keichel, 2018

OKITO STOOL – the stool in three heights. OKITO STOOL is available in three seating heights: in dining table height 46 cm, as kitchen stool in height of 65 cm and as bar stool in height of 80 cm. The heart of the minimalist stool is the solid wood seat. With its CNC-milled recesses, the solid wood seat takes up the chair frame. All connections are screwed without being visible on the top. The small OKITO STOOL in h 46 is stackable and can be shipped flat packaged, which significantly reduces the packaging size.

ZEITRAUM furniture meets the highest quality and environmental standards and is primarily made of solid wood. All the materials we use come from responsible manufacturing and are for the most part sourced directly from Germany. The following describes the product: OKITO STOOL. Due to the proportion of renewable raw materials, among other things, ZEITRAUM products can contribute to a good rating in certification programmes for sustainable buildings, such as LEED. For more information, please do not hesitate to contact us at any time.

Product details

Product category	Chairs			
Weight	ca. 4,2 kg			
Certification	CATAS Test EN 1728:2012 + AC:2013 Level 1 – general			

Environmental details (wooden seat)

Recycled content/ renewable raw materials	ca. 26 % recycled material (steel, share: 52 %, ø 50 % recycled content) ca. 47 % renewable materials			
Recyclability	ca. 47 % wood (waste wood category 2) ca. 52 % steel ca. 1 % plastic			
Repairability	Moderately repairable. We will be happy to assist with spare parts and service where necessary and possible.			

Manufacturing details

Furniture element	Production site	Production partner since	Visited by ZEITRAUM	Code of Conduct signed
Metal frame	Turkey	2018	Yes	Yes
Seat	North Rhine-Westphalia, Germany	2008	Yes	Yes

Packaging

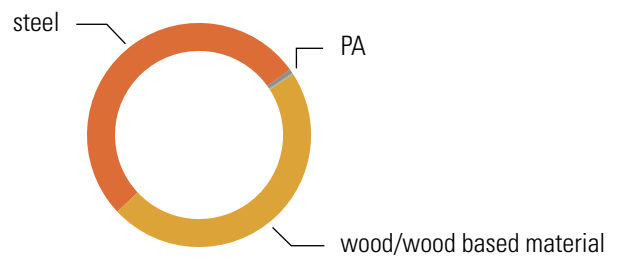
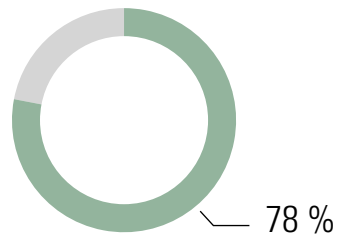
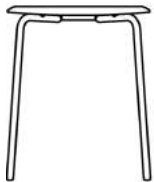
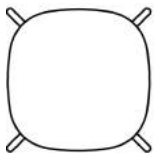
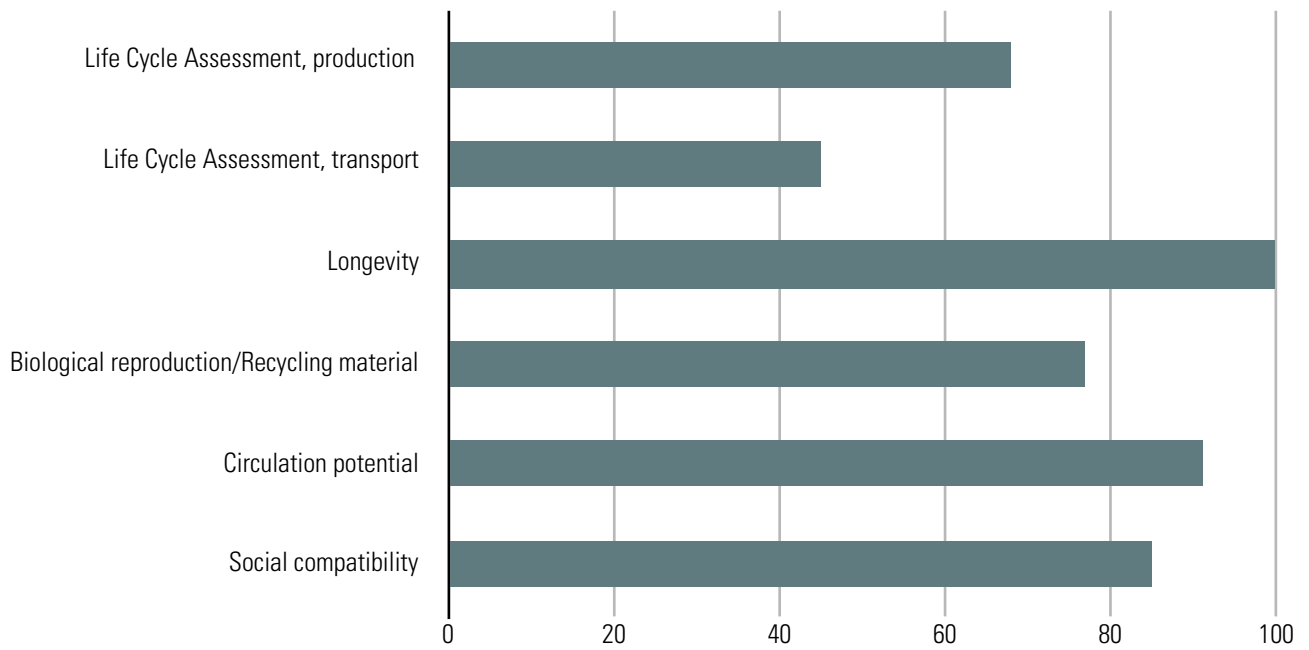
Flatpack	On request
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Two pieces of furniture can be packed in one box

Warehouse

Country	Federal state
Germany	North Rhine-Westphalia

OKITO STOOL, h 46, wooden seat; walnut



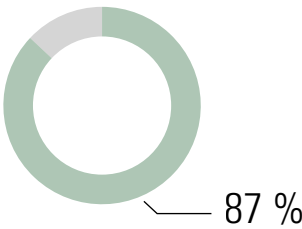
- wood/wood based material
- steel
- PA
- natural oil
- PVAC adhesive

OKITO STOOL, h 46, wooden seat; walnut	Material/Product rating					
	Walnut	Steel	Plastic, PA	Natural oil, Osmo	PVAC	Weighted rating, %
Life Cycle Assessment, production	10	4,3	3	5	10	68,3396 %
Life Cycle Assessment, transport	5	4	6,5	9	6,5	44,6885 %
Longevity	10	10	8	10	9	99,836 %
Biological reproduction/ Recycling material	10	6	0	6	0	77,336 %
Circulation potential	8	10	10	10	4	91,002 %
Social compatibility	9	8	9	10	9	84,525 %
Average rating, ø	8,666	7,05	6,083	8,333	6,416	Total weight
Share in kg	1,8	2,21	0,025	0,006	0,005	4,046
Share in %	44,48 %	54,62 %	0,61 %	0,14 %	0,12 %	
Weighted rating	3,854	3,85	0,037	0,011	0,007	
Product rating in %	77,59					

Packaging	Material/Product rating	
	Cardboard	Weighted rating, %
Life Cycle Assessment, production	10	100 %
Life Cycle Assessment, transport	9	90 %
Longevity	4	40 %
Biological reproduction/Recycling material	9	90 %
Circulation potential	10	100 %
Social compatibility	10	100 %
Average rating, ø	8,666	Total weight
Share in kg	3,4	3,4
Share in %	100 %	
Weighted rating	8,666	
Product rating in %	86,66	



1 American walnut



Tab. 1 A: Material data sheet, American walnut, general¹²

Material group	Natural material; wood; hardwood
Botanical name	<i>Juglans nigra</i> L. (<i>Juglandaceae</i>)
Name	American Walnut (GB); Black Walnut (US); Amerikanischer Nussbaum, Schwarznuss, Schwarze Walnuss (D); Noyer Noir (F)
Material Norm. Ref.	DIN EN 13556: JGNG
Origin	Missouri
Occurrence	Midwestern and northeastern U.S.; Ontario to Florida, Minnesota to Texas; southeastern Canada. Prefers deep, loose fresh loam soils and mild climate; fairly winter hardy
Use	Solid and veneer, furniture and interior finishing; turning; marine interiors; small and seating furniture; piano making; musical instruments; buttons; inlays; etc.

¹ WAGENFUEHR, R. (2007) - Wood Atlas. (6) Leipzig: Hanser Wirtschaft, Fachbuchverlag Leipzig, pp. 551-554

² LOHMANN, U. (2010) - Wood encyclopedia. The standard work for wood and forestry. (4) Hamburg: Nikol-Verlag, page 859

Tab. 1 B: Material data sheet, American walnut, specific³**General description**

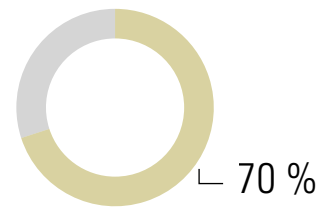
Certifications/Information	The Evergreen Initiative; NHLA; FSC on request	
Life cycle assessment data hardwood, average (GER)		10
Resource input per kg	A1-A3	
Total non-renewable primary energy (PENRT)	2,18 MJ	10
Use of freshwater resources (FW)	0,00048 m ³	10
Environmental impact per m³	A1-A3	
Global Warming Potential (GWP)	-1,74 Kg CO ₂ -eqv.	10
Environmental impact Transport, per 1000 kgkm (580 kg/m³)		5
Production site: Germany/ZEITRAUM		
Truck - ca. 300 km	A4	10
Total non-renewable primary energy (PENRT)	362,4 MJ	
Use of freshwater resources (FW)	0,019164 m ³	
Global Warming Potential (GWP)	26,907 Kg CO ₂ -eqv.	
Main raw material origin: Missouri/Production site		0
Truck - ca. 2000 km	A4	
Total non-renewable primary energy (PENRT)	2416 MJ	
Use of freshwater resources (FW)	0,12776 m ³	
Global Warming Potential (GWP)	179,38 Kg CO ₂ -eqv.	
Container ship - ca. 10000 km	A4	
Total non-renewable primary energy (PENRT)	1094 MJ	
Use of freshwater resources (FW)	0,005636 m ³	
Global Warming Potential (GWP)	90,11 Kg CO ₂ -eqv.	
Sustainability Assessment		
Longevity	Very durable/repairable (> 20 years)	10
Biological reproduction/ Recycled material	100 %	10
Circulation potential	70 % - 99 % (technological/recycling)	8
Socially compatible	Yes	9

³ BMI 2021: Oekobaudat. Database <https://www.oekobaudat.de/no_cache/en/database/search.html> Accessed, on 10/27/2021

Total average rating		8,66
Processing		
Mechanical	Very good; can be cut and peeled, suitable for turning and carving; low tendency to crack and warp	
Drying	good; but slow; low tendency to tear and shed; good stability	
Adhesion	good; alkalis can cause stains	
Surface finishing	Very good; can be stained and excellently varnished; tinting of the wood color by smoking	
Natural durability DIN EN 350-2 (with weathering)	Moderately durable; sapwood low; heartwood fairly good; resistant to fungi and insects; durability class 3	
Physical properties		
Kiln density (0 % wood moisture content)	560... 610 kg/m ³	
Bulk density (12 - 15 % wood moisture)	580... 640... 810 kg/m ³	
Pore ratio	ca. 63 %	
Shrinkage rate at 1 % moisture reduction	radial - 0.19 %; tangetial - 0.26 %; volume - 0.40 %	
Mechanical properties		
Compressive strength (σ_{dB})	44... 53 N/mm ²	
Flexural strength (σ_{bB})	90... 103 N/mm ²	
Tensile strength ($\sigma_{zB \perp}$)	ca. 4,7 N/mm ²	
Shear strength (τ_{aB})	8,8... 9,6 N/mm ²	
Hardness (HB)	ca. 50 N/mm ²	
Hardness (HB \perp)	ca. 26 N/mm ²	
E-modulus (E_b)	11000... 13500 N/mm ²	



2 Steel, powder coated frames



Tab. 2 A: Material data sheet, steel, powder coated frames, general⁴

Material group	Natural material; metals; transition metals
Parts origin	Italy
Occurrence	Worldwide; South America, Western Australia, China and Eastern Europe, Canada
Use	According to application: building structural and tool steel, structural steel for machinery, vehicle and shipbuilding or mechanical engineering; line pipe, pressure vessel, etc.; handicraft and design; furniture making

⁴ KALWEIT, A., a.o. (2012) - Handbook of Technical Product Design, Materials and Manufacturing - Decision Bases for Designers and Engineers (2) Berlin: Springer-Verlag Berlin Heidelberg GmbH

Tab. 2 B: Material data sheet, steel, powder coated frames, specific⁵⁶

General description		
Certifications/Information	ISO 14001, ISO 9001	
Emission class (formaldehyde)	Formaldehyde free	
Surface	smooth, hard	
Color	Black	
Life cycle assessment data Steel profile, powder-coated (GER)		4,33
Resource input per kg	A1-A3	
Total non-renewable primary energy (PENRT)	12,49 MJ	2
Use of freshwater resources (FW)	0,0026 m ³	4
Environmental impact per kg	A1-A3	
Global Warming Potential (GWP)	1,09 Kg CO ₂ -eqv.	7
Environmental impact Transport, per 1000 kgkm (7850 kg/m³)		4
Production site: Italy/ZEITRAUM		
Truck ø - ca. 1500 km	A4	8
Total non-renewable primary energy (PENRT)	1812 MJ	
Use of freshwater resources (FW)	0,09582 m ³	
Global Warming Potential (GWP)	134 Kg CO ₂ -eqv.	
Main raw material origin: China/production location		0
Truck - ca. 2000 km	A4	
Total non-renewable primary energy (PENRT)	2416 MJ	
Use of freshwater resources (FW)	0,12776 m ³	
Global Warming Potential (GWP)	179,38 Kg CO ₂ -eqv.	
Container ship - ca. 10000 km	A4	
Total non-renewable primary energy (PENRT)	1094 MJ	
Use of freshwater resources (FW)	0,005636 m ³	
Global Warming Potential (GWP)	90,11 Kg CO ₂ -eqv.	
Sustainability Assessment		

⁵ BMI 2021: Oekobaudat. Database <https://www.oekobaudat.de/no_cache/en/database/search.html> Accessed, on 10/27/2021

⁶ MATERIALARCHIV (2019) - Materialarchiv <<http://www.materialarchiv.ch/app-tablet/#search>> Accessed, on 03/01/2019

Longevity	Very durable/repairable (> 20 years)	10
Biological reproduction/ recycled material	50 - 60 %	6
Circulation potential	100 % (technological)	10
Socially compatible	Yes	8
Total average rating		7,05

Processing

Mechanical	More difficult to machine due to hardness, drilling, turning, milling, cutting; forming (bending, compression, tension forming)	
Joints	Riveting; screwing and welding	
Surface finishing	Engraving, polishing, embossing, grinding, lasereng	
Other	High plastic deformability under impact loading; materials with low carbon content are easier to deform	

Durability

Heat resistant, corrosion and heat resistant

Physical properties

Density	7,85 g/cm ³	
Electrical conductivity	9,93*10 ⁶ S/m	
Thermal Abrasiveness	80,2 W/(m*K)	

Mechanical properties mild steel

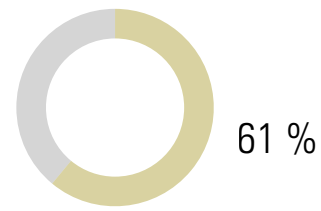
Yield strength (R _s)	185 - 360 N/mm ²	
Tensile strength (R _m)	310 - 680 N/mm ²	
Elongation at break	18 - 26 %	
E-modulus (E)	210*10 ³ N/mm ²	
Shear modulus (G)	85*10 ³ N/mm ²	
Poisson's ratio	0,28	

Notes

The life cycle assessment of iron improves the more often the material has been recycled or the proportion of recycled material increases



3 Polyamide



Tab. 3 A: Material data sheet, polyamide, general⁷

Material group	Synthetic material; plastic
Name	Polyamide (GB, US); Polyamid (D)
Short name	PA
Manufactured in	Germany (GER)
Use	Machine and equipment construction; vehicle construction; electrical engineering; furniture construction

⁷ KALWEIT A. (2012) - Handbook of technical product design - materials and manufacturing. Berlin: Springer Verlag

Tab. 3 B: Material data sheet, polyamide, specific⁸⁹**General description**

Certifications/Information	n.a.	
Delivery forms	Granules, fibers, pipes, films, molded parts	
Color	Available in all colors	

Life cycle assessment data Nylon casting (PA 6.6) (GER) 3

Resource input per kg	A1-A3	
Total non-renewable primary energy (PENRT)	251,7 MJ	0
Use of freshwater resources (FW)	0,04378 m ³	10

Environmental impact per kg	A1-A3	
Global Warming Potential (GWP)	16,91 Kg CO ₂ -eqv.	0

Environmental impact Transport, per 1000 kgkm (1140 kg/m³) 6,5**Production site: Germany/ZEITRAUM**

Truck - ca. 500 km	A4	10
Total non-renewable primary energy (PENRT)	604 MJ	
Use of freshwater resources (FW)	0,03194 m ³	
Global Warming Potential (GWP)	44,845 Kg CO ₂ -eqv.	

Main raw material origin: n.a./production site

n.a. - ø > 7000 km	A4	3
Total non-renewable primary energy (PENRT)	8456 MJ	
Use of freshwater resources (FW)	0,44716 m ³	
Global Warming Potential (GWP)	627,83 Kg CO ₂ -eqv.	

Sustainability Assessment

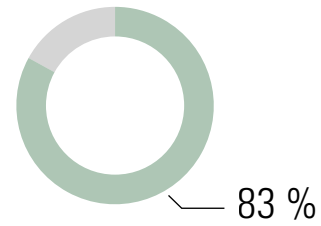
Longevity	Very durable (> 20 years)	8
Biological reproduction/ recycled material	0 %	0
Circulation potential	100 % (technological)	10
Socially compatible	Yes	9
Total average rating		6,08

Processing⁸ BMI 2021: Oekobaudat. Database <https://www.oekobaudat.de/no_cache/en/database/search.html> Accessed, on 10/27/2021⁹ MATERIALARCHIV (2019) - Materialarchiv <<http://www.materialarchiv.ch/app-tablet/#search>> Accessed, on 03/01/2019

Mechanically	Very good; with conventional plastic processing machines; drilling, sawing; milling; etc.	
Adhesion	Good; with adhesives for low-energy plastics	
Surface processing	Brushing; Sanding; Painting; Oiling; Embossing	
Resistance	Easy care; water resistant; resistant to fungi and insects	
Properties		
Elongation at break	50,0 %	
Density	1140 kg/m ³	
Moisture absorption	2,5 - 3,5 %	
Dielectric strength	25 kV/mm	
Notched impact strength (Charpy)	3,0 kJ/m ²	
Thermal properties		
Vicat softening temperature according to DIN EN ISO 306 Vicat B/50	250 °C	
Continuous operating temperature	-30 bis 95 °C	



4 Osmo, hard wax oil



Tab. 4 A: Material data sheet, Osmo, hard wax oil, general¹⁰¹¹

Material group	Coating materials; Oils
Name	Hard wax oil (GB, US); Hartwachsöl (D)
Manufacturer	Osmo Holz und Color GmbH & Co. KG
Manufactured in	Germany (GER)
Version	Osmo Hard Wax Oil 3032 satin, 3062 matt
Use	Furniture construction; for interior use; also suitable for parquet, cork and terracotta

¹⁰ KALWEIT A. (2012) - Handbook of technical product design - materials and manufacturing. Berlin: Springer Verlag

¹¹ Osmo (2019) - Osmo Hard Wax Oil 3032 satin, 3062 matte <<https://www.osmo.de>> Accessed, on 03/02/2019

Tab. 4 B: Material data sheet, Osmo, hard wax oil, specific¹²¹³**General description**

Certifications/Information	ISO 9001, ISO 14001, ISO 18001	
Emission class (formaldehyde)	Formaldehyde-free	
VOC's	< 500 g/l (volatile components emit during curing)	
Delivery forms	Liquid	
Color	yellowish (transparent/yellowish in cured form)	
Texture	Glossy to matt (cured)	
Contents		
50 - 60 % solids	Natural oils and waxes (sunflower oil, soybean oil, safflower oil, carnauba and candellila wax) Paraffins	
Additives	Siccatives (desiccants) and water-repellent additives	
Solvent	Desaromatized white spirit (gasoline-free - according to the purity requirements of the European Pharmacopoeia)	

Life cycle assessment data hard wax oil (GER) 5

Resource input per kg	A1-A3	
Total non-renewable primary energy (PENRT)	n.a.	
Use of freshwater resources (FW)	n.a.	
Environmental impact per kg	A1-A3	
Global Warming Potential (GWP)	n.a.	

Environmental impact Transport, per 1000 kgkm 9**Production site: Germany/ZEITRAUM**

Truck - ca. 200 km	A4	10
Total non-renewable primary energy (PENRT)	172,12 MJ	
Use of freshwater resources (FW)	0,012106 m ³	
Global Warming Potential (GWP)	12,822 Kg CO ₂ -eqv.	

Main raw material origin: n.a./production site

n.a. - ø 3000 km	A4	8
Total non-renewable primary energy (PENRT)	3624 MJ	
Use of freshwater resources (FW)	0,19164 m ³	

¹² BMI 2021: Oekobaudat. Database <https://www.oekobaudat.de/no_cache/en/database/search.html> Accessed, on 10/27/2021¹³ MATERIALARCHIV (2019) - Materialarchiv <<http://www.materialarchiv.ch/app-tablet/#search>> Accessed, on 03/01/2019

Global Warming Potential (GWP)	296,07 Kg CO ₂ -eqv.	
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Sustainability Assessment

Longevity	Very durable/repairable (> 20 years, with good care)	10
Biological reproduction/ recycled material	51 - 60 %	6
Circulation potential	100 % (biodegradable)	10
Socially compatible	Yes	10
Total average rating		8,33

Processing

Application	With brush, spatula or spray gun	
Storage	Can be stored up to 5 years with tight closure	

Properties

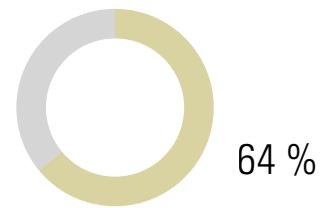
Density	0,89 g/cm ³	
Viscosity	Thixotropic, creamy	
Consistency	Medium viscosity	
Moisture resistance	Good	

Notes

Osmo Polyx®-Oil is based on natural vegetable oils and waxes; Osmo Polyx®-Oil contains neither biocides nor preservatives. It is harmless to humans, animals and plants when dry and complies with DIN 53160 (sweat- and saliva-proof) and EURO-NORM EN 71 (suitable for children's toys)



5 PVAc dispersion adhesive, D3



Tab. 5 A: Material data sheet, PVAc dispersion adhesive, D3, general¹⁴¹⁵

Material group	Synthetic material; adhesives; dispersion adhesives
Name	Dispersion Adhesive (GB, US); Dispersionsklebstoff, PVAc-(Polyvinylacetat) Klebstoffe, Weißleim (D)
Manufacturer	Kleiberit Klebstoffe GmbH
Manufactured in	Germany (GER)
Version	Kleiberit 303, D3-adhesive
Use	Furniture construction; especially for interiors; staircase construction, ship interior finishing; surface bonding of HWS; door and window production

¹⁴ KALWEIT A. (2012) - Handbook of technical product design - materials and manufacturing. Berlin: Springer Verlag

¹⁵ KEIBERIT (2019) - KLEIBERIT 303, D3, PVAC Adhesive <https://interior-construction.kleiberit.com/fileadmin/Content/Documents/DE/Infoblaetter/303_D3_Leim_D.pdf> Accessed, on 02/03/2019

Tab. 5 B: Material data sheet, PVAc dispersion adhesive, D3, specific¹⁶¹⁷**General description**

Certifications/Information	ISO 9001, ISO 14001, ISO 50001	
Emission class (formaldehyde)	Formaldehyde-free	
Delivery forms	Liquid	
Color	Whitish (transparent in cured form)	
Texture	Glossy	

Life cycle assessment data Dispersion-based solvent-free adhesives, coatings and sealants (GER) 10

Resource input per kg	A1-A3	
Total non-renewable primary energy (PENRT)	26,7 MJ	10
Use of freshwater resources (FW)	0,00758 m ³	10
Environmental impact per kg	A1-A3	
Global Warming Potential (GWP)	0,955 Kg CO ₂ -eqv.	10

Environmental impact Transport, per 1000 kgkm 6,5**Production site: Germany/ZEITRAUM**

Truck - ca. 200 km	A4	10
Total non-renewable primary energy (PENRT)	172,12 MJ	
Use of freshwater resources (FW)	0,012106 m ³	
Global Warming Potential (GWP)	12,822 Kg CO ₂ -eqv.	

Main raw material origin: n.a./production site

n.a. - ø > 7000 km	A4	3
Total non-renewable primary energy (PENRT)	8456 MJ	
Use of freshwater resources (FW)	0,44716 m ³	
Global Warming Potential (GWP)	627,83 Kg CO ₂ -eqv.	

Sustainability Assessment

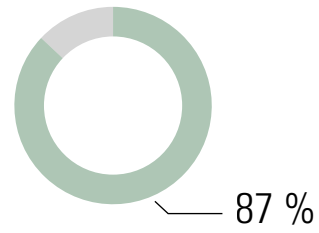
Longevity	Very durable/moderately repairable (> 20 years)	9
Biological reproduction/ recycled material	0 %	0
Circulation potential	Only thermally recyclable	4
Socially compatible	Yes	9

¹⁶ BMI 2021: Oekobaudat. Database <https://www.oekobaudat.de/no_cache/en/database/search.html> Accessed, on 10/27/2021¹⁷ MATERIALARCHIV (2019) - Materialarchiv <<http://www.materialarchiv.ch/app-tablet/#search>> Accessed, on 03/01/2019

Total average rating		6,41
Processing		
Adhesion	With brush, spatula or glue roller	
Properties		
Density	1,1 g/cm ³	
PH level	3	
Consistency	Medium viscosity	
Moisture resistance	D3	
Heat resistance	Up to 120 °C	
Notes	PVAc adhesive is available solvent-free and solvent-based	



6 Cardboard, chairs



Tab. 6 A: Cardboard, chairs, general

Material group	Packaging
Name	Cardboard (GB, US); Karton (D)
Manufacturer	Schuhmacher Packaging GmbH
Manufactured in	Germany (GER)
Use	Packaging material for the production of cardboard boxes

Tab. 6 B: Cardboard chairs, specific¹⁸¹⁹**General description**

Certifications/Information	ISO 9001, ISO 50001, DIN ISO 22000, DIN EN ISO 14001, EMAS, ISO 28000;2007, FSC	
Color	Brown	
Texture	matt	
Contents		
85 %	Recycled paper	
15 %	Primary raw material	

Life cycle assessment data „Kraftpapier“ (GER) 10

Resource input per kg	A1-A3	
Total non-renewable primary energy (PENRT)	5,888 MJ	
Use of freshwater resources (FW)	0,004899 m ³	
Environmental impact per kg	A1-A3	
Global Warming Potential (GWP)	-0,8973 Kg CO ₂ -eqv.	

Environmental impact Transport, per 1000 kgkm 9**Production site: Germany/ZEITRAUM**

Truck - ca. 200 km	A4	10
Total non-renewable primary energy (PENRT)	172,12 MJ	
Use of freshwater resources (FW)	0,012106 m ³	
Global Warming Potential (GWP)	12,822 Kg CO ₂ -eqv.	

Main raw material origin: Germany, Central Europe/Production site

Truck - ca. 1500 km	A4	8
Total non-renewable primary energy (PENRT)	1812 MJ	
Use of freshwater resources (FW)	0,09582 m ³	
Global Warming Potential (GWP)	134,535 Kg CO ₂ -eqv.	

Sustainability Assessment

Longevity	Moderately durable/repairable (< 10 years)	4
Biological reproduction/ recycled material	85 %	9

¹⁸ BMI 2021: Oekobaudat. Database <https://www.oekobaudat.de/no_cache/en/database/search.html> Accessed, on 10/27/2021¹⁹ MATERIALARCHIV (2019) - Materialarchiv <<http://www.materialarchiv.ch/app-tablet/#search>> Accessed, on 03/01/2019

Circulation potential	100 % (technological)	10
Socially compatible	Yes	10
Total average rating		8,66
Disposal note	Waste paper	

Information on all materials used by ZEITRAUM
can be found in our material library at:

www.zeitraum-moebel.com

Important note: Our Furniture Footprint product data sheets have no scientific claim and are to be understood as a guide for our customers and us. All data are marked with corresponding source information. The contents of our Furniture Footprint product database have been compiled with the utmost care. However, we do not guarantee the accuracy, completeness and timeliness of the content, so we do not assume any liability for incorrect, outdated or incomplete information.