ZEITRAUM

OKITO PLY BAR

Design by Läufer & Keichel, 2018

Furniture Footprint

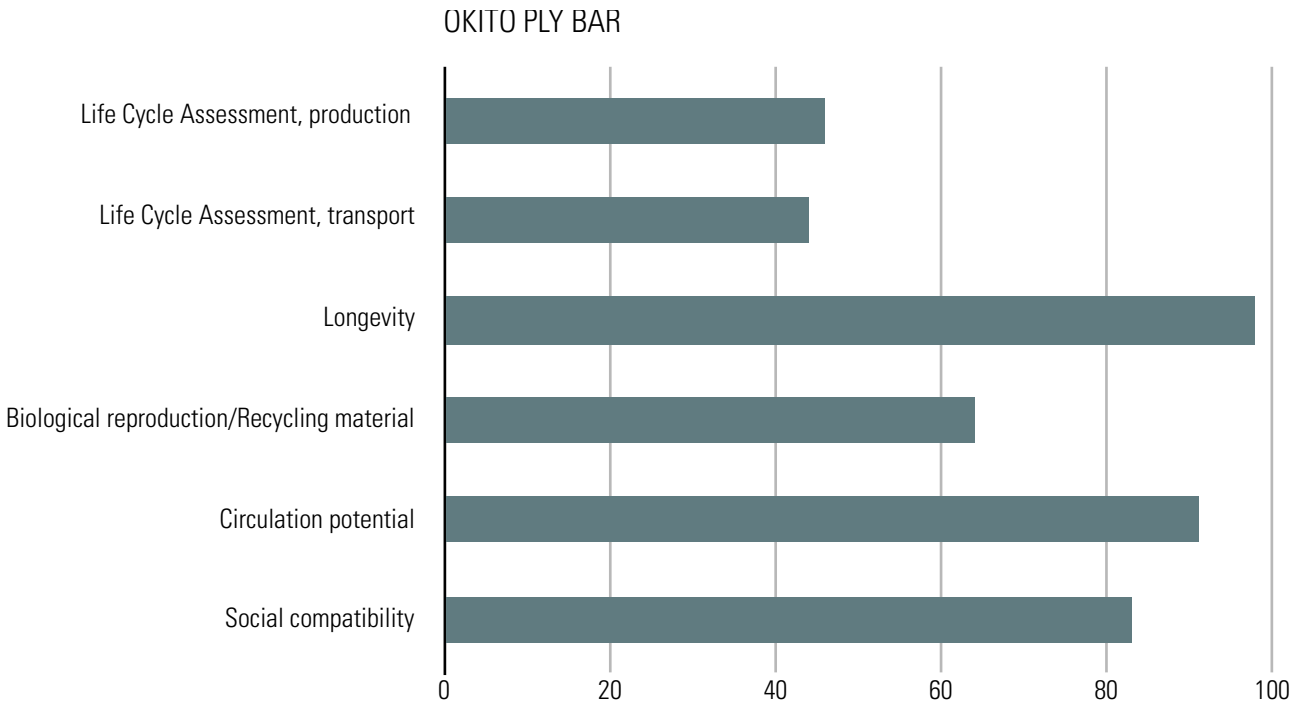
OKITO PLY BAR

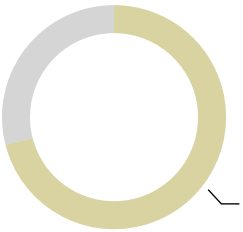
Design by Läufer & Keichel, 2018

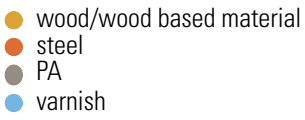
The bar chair OKITO PLY BAR is available in seat height 80 cm. The focus therein lies on the reduced use of plywood and steel. This makes the barstool not only visually light, it is also. The backrest is attached to the chair without any visible screw connections and, thanks to the spring-loaded support, ensures high seating comfort. The molded wood elements are also ergonomically shaped and available in different materials. Despite its lightness, the OKITO PLY BAR is extremely stable and offers plenty of room for movement.

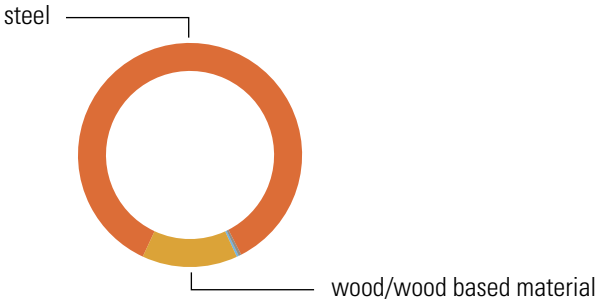
ZEITRAUM furniture meets the highest quality and environmental standards and is primarily made of solid wood. All the materials we use come from responsible manufacturing and are for the most part sourced directly from Germany. The following describes the product: OKITO PLY BAR. Due to the proportion 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. 6,3 kg			
Certification	CATAS Test EN 1728:2012 Level 2 – extreme			
Environmental details (wooden seat)				
Recycled content/ renewable raw materials	ca. 42,75 % recycled material (steel, share: 85,5 %, ø 50 % recycled content) ca. 12 % renewable materials			
Recyclability	ca. 13,5 % wood based materials (thermal utilisation) ca. 85,5 % steel ca. 1 % plastic			
Repairability	Moderately repairable. We will be happy to assist with spare parts and service where necessary and possible.			
Removeable cover				
Leather	No			
Fabric	No			
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
Upholstery	Bavaria, Germany	1999	Yes	Yes
Packaging				
Flatpack	No			
Warehouse				
Country		Federal state		
Germany		North Rhine-Westphalia		


OKITO PLY BAR
Life Cycle Assessment, production
Life Cycle Assessment, transport
Longevity
Biological reproduction/Recycling material
Circulation potential
Social compatibility
0
20
40
60
80
100


71 %

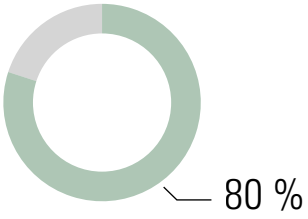

wood/wood based material
steel
PA
varnish


steel
wood/wood based material

OKITO PLY BAR	Material/Product rating				
	Plywood (moulded)	Steel	Plastic, PA	Varnish	Weighted rating, %
Life Cycle Assessment, production	6,33	4,3	3	5	45,75771 %
Life Cycle Assessment, transport	9,5	3,5	6,5	9	43,5425 %
Longevity	9	10	8	9	98,494 %
Biological reproduction/Recycling material	9	6	0	0	63,699 %
Circulation potential	4	10	10	0	91,408 %
Social compatibility	10	8	9	9	82,808 %
Average rating, ø	7,971	6,966	6,083	5,333	Total weight
Share in kg	0,87	5,4	0,025	0,02	6,315
Share in %	13,77 %	85,51 %	0,39 %	0,31 %	
Weighted rating	1,097	5,956	0,023	0,016	
Product rating in %	**70,92**				

Packaging	Material/Product rating		
	Cardboard	PE fleece	Weighted rating, %
Life Cycle Assessment, production	10	3	94,607 %
Life Cycle Assessment, transport	9	6,5	88,0685 %
Longevity	4	5	40,765 %
Biological reproduction/Recycling material	9	0	83,07 %
Circulation potential	10	10	99,99 %
Social compatibility	10	9	99,221 %
Average rating, ø	8,666	5,583	Total weight
Share in kg	3	0,25	3,25
Share in %	92,3 %	7,69 %	
Weighted rating	7,998	0,429	
Product rating in %	**84,27**		

1 Plywood, veneer panel (moulded wood)



Tab. 1 A: Material data sheet, plywood, veneer panel, general[1]

Material group	Natural-synthetic material; wood-based materials; plywood; veneer panels
Name	Plywood (GB, US); Furnierplatten; Schichtholz; Kunstharzpressholz; Brettsperrholz; etc. (D)
Short name	FU
Manufactured in	Germany
Origin of the wood	Germany (top veneer outside Germany if necessary)
Version	Moulded wood
Use	Mainly for industrial furniture making and interior design; plywood moldings; boat and aircraft building; special parts: bulletproof elements impregnated in resin; model and tool making

[1] 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. 1 B: Material data sheet, plywood, veneer panel, specific[2][3]

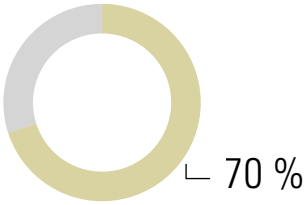
General description (manufacturer spec.)		
Certifications/Information	FSC, PEFC, E1 (EU), ISO 50001, REACH	
Emission class	E1 (CARB not relevant)	
Fire resistance	**Fire behavior**: The tested product fulfills the requirements of building material class B1 for flame-retardant building materials according to DIN 4102, Part 1 (May 1998) when freely suspended or at a distance greater than 40 mm from the same or other flat building materials	
General description (general)		
Length	1220 - 3050 mm	
Wide	1220 - 3050 mm	
Thickness	4 - 80 mm	
Color	mostly light white yellowish (birch, spruce, pine, maple and poplar), to reddish (beech) rotary cut veneer, birch, beech or poplar; figured, plain	
Texture	plain, figured, smooth (top view), structure of several layers of veneer, smooth (cross section)	
Basic materials/auxiliary materials		
Veneer layers	From at least three layers; 0.8 - 2.5 mm thick veneer layers	
Binder	Synthetic binders; UMF adhesive (melamine-formaldehyde resin), urea-formaldehyde resin (UF adhesive); approx. 5%	
Life cycle assessment data plywood, average (GER)		6,33
Resource input per kg	**A1-A3**	
Total non-renewable primary energy (PENRT)	6,8 MJ	8
Use of freshwater resources (FW)	0,004 m^3	1
Environmental impact per m^3	**A1-A3**	
Global Warming Potential (GWP)	-1,5 Kg CO_2-eqv.	10
Environmental impact Transport, per 1000 kgkm (1200 kg/m^3)		9,5
Production site: Germany/ZEITRAUM		
Truck - ca. 1000 km	A4	9
Total non-renewable primary energy (PENRT)	1208 MJ	
Use of freshwater resources (FW)	0,064 m^3	

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

[3] WEZEL, O. (2019) - Strength properties of wood-based materials according to DIN EN 622 <http://www.tischler-ole-welzel.de/Holzwerkstoffe/Faserplatten%20nach%20DIN%20EN%2013986.pdf> Accessed, on 09/03/2019

Global Warming Potential (GWP)	89,69 Kg CO_2-eqv.	
Main raw material origin: Germany/Production site		
Truck - ca. < 100 km	A4	10
Total non-renewable primary energy (PENRT)	120,8 MJ	
Use of freshwater resources (FW)	0,006388 m^3	
Global Warming Potential (GWP)	8,969 CO_2-eqv.	
Sustainability Assessment		
Longevity	Very durable/moderately repairable (> 20 years)	9
Biological reproduction/ recycled material	90 %	9
Circulation potential	Only thermally recyclable	4
Socially compatible	Yes	10
Total average rating		**7,97**
Processing		
Mechanical	Very good; can be sawed, drilled and milled with common machines	
Adhesion	Very good	
Surface finishing	Good; varnishable; coating possible	
Durability	By changing the synthetic binder or adding further additives, an increase in fire resistance, resistance to fungi and insects and moisture resistance can be achieved (see manufacturer's instructions)	
Physical properties		
Bulk density according to EN 323	400… 1000 kg/m^3	
Basis weight (18 mm)	n.a.	
Material moisture at delivery	8 %	
Mechanical properties		
Compressive strength (σ_{dB})	n.a.	
Flexural strength (σ_{bB})	5… 120 N/mm^2	
Tensile strength (σ_{zB} ||)	n.a.	
Shear strength (τ_{aB})	n.a.	
E-modulus (E_b ||)	500… 14000 N/mm^2	

2 Steel, powder coated frames



Tab. 2 A: Material data sheet, steel, powder coated frames, general[4]

Material group	Natural material; metals; transition metals
Parts origin	Turkey
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, specific[56]

General description		
Certifications/Information	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/m^3)		3,5
Production site: Turkey/ZEITRAUM		
Truck ø - ca. 2000 km	A4	7
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.	
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		**6,97**
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, lasering	
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/cm³	
Electrical conductivity	9,93*10^6 S/m	
Thermal Abrasiveness	80,2 W/(m*K)	
Mechanical properties mild steel		
Yield strength (ßs)	185 - 360 N/mm²	
Tensile strength (ßz)	310 - 680 N/mm²	
Elongation at break	18 - 26 %	
E-modulus (E)	210*10^3 N/mm²	
Shear modulus (G)	85*10^3 N/mm²	
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

61 %

Tab. 3 A: Material data sheet, polyamide, general[7]

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, specific[89]

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/m^3)		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**
Processing		

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

[9] 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/m³	
Moisture absorption	2,5 - 3,5 %	
Dielectric strength	25 kV/mm	
Notched impact strength (Charpy)	3,0 kJ/m²	
Thermal properties		
Vicat softening temperature according to DIN EN ISO 306 Vicat B/50	250 °C	
Continuous operating temperature	-30 bis 95 °C	

4 Varnish (moulded plywood)

53 %

Tab. 4 A: Material data sheet, lacquer, general[10][11]

Material group	Synthetic material; coating materials; varnish
Name	varnish (GB, US); Lack (D)
Manufacturer	Heidelberg Coatings Dr. Rentzsch GmbH
Manufactured in	Germany (GER)
Version	HD-AQUA TOP Farblos
Use	For the varnishing of heavily stressed surfaces in furniture and interior finishing, for hotel and school furnishings, for kitchen and sanitary furniture

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

[11] ADLER (2019) - ADLER PUR-Antiscratch HQ <https://www.adler-lacke.com/de> Accessed, on 02/03/2019

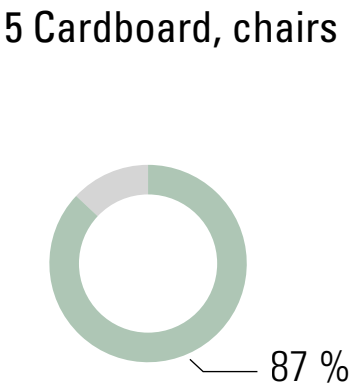
Tab. 4 B: Material data sheet, paint, specific[12][13]

General description		
Certifications/Information	DIN EN 71 - 3, DIN 68861 - 1, DIN EN 13501 - 1, DIN 4102 B1	
Emission class (formaldehyde)	Formaldehyde-free	
VOC's	5,76 %	
Delivery forms	Liquid	
Color	Transparent, colorless	
Texture	Glossy to matt (cured)	
Life cycle assessment data n.a. (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 nicht erneuerbare Primärenergie (PENRT)	172,12 MJ	
Einsatz von Süßwasserressourcen (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 nicht erneuerbare Primärenergie (PENRT)	3624 MJ	
Einsatz von Süßwasserressourcen (FW)	0,19164 m^3	
Global Warming Potential (GWP)	296,07 Kg CO_2-eqv.	
Sustainability Assessment		
Longevity	Very durable/moderately repairable (> 20 years)	9
Biological reproduction/ recycled material	0 %	0
Circulation potential	Hazardous waste	0

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

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

Socially compatible	Yes	9
Total average rating		**5,33**
Processing		
Apply	Spray gun	
Storage	Can be stored up to 5 years with tight closure	
Notes	For hardly combustible or hardly flammable superstructures	



Tab. 5 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. 5 B: Cardboard chairs, specific[14][15]

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

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

[15] 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	

6 Polyester fleece

56 %

Tab. 6 A: Material data sheet, polyester fleece, general

Material group	Packaging
Name	Polyester fleece (GB); Polyestervlies (D)
Material abbreviation	PES
Manufactured in	Germany (GER)
Use	Packing material for protection

Tab. 6 B: Material data sheet, polyester fleece, specific[16][17]

General description		
Certifications/Information	n.a.	
Delivery form	Mats, wadding, etc.	
Texture	soft, fibrous	
Life cycle assessment data Comparative material for PE wadding (no data available) - PE nonwoven (GER)		3
Resource input per kg	**A1-A3**	
Total non-renewable primary energy (PENRT)	22 MJ	
Use of freshwater resources (FW)	0,00252 m^3	
Environmental impact per kg	**A1-A3**	
Global Warming Potential (GWP)	0,73 Kg CO_2-eqv.	
Environmental impact Transport, per 1000 kgkm (approx. 0.5 kg/m^2)		6,5
Production site: Germany/ZEITRAUM		
Truck - ca. 500 km	A4	10
Total non-renewable primary energy (PENRT)	430,3 MJ	
Use of freshwater resources (FW)	0,030265 m^3	
Global Warming Potential (GWP)	32,055 Kg CO_2-eqv.	
Main raw material origin: n.a./production site		3
n.a. - ø > 7000 km	A4	
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	Durable (10 - 20 years)	5
Biological reproduction/ recycled material	0 %	0
Circulation potential	100 % (technological)	10
Socially compatible	Yes	9
Total average rating		**5,58**

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

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

Disposal note	Recyclable waste	

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.