

**ZEITRAUM**

# SIMPLE

Design by Formstelle, 2006



# Furniture Footprint

## SIMPLE

Design by Formstelle, 2005

The puristic design of SIMPLE foregrounds the living material. The lightness of the construction is intensified by the floating frame. SIMPLE – the bed in the simplest form and function. The bedside tables DEPO, DOZY and WAITER & WAITRESS are the perfect accompaniments.

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: SIMPLE. 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	Bed			
Weight	ca. 41 kg			

### Environmental details

Recycled content/ renewable raw materials	ca. 1,1 % recycled material (steel, share: 2,2 %, ø 50 % recycled content) ca. 97 % renewable materials
Recyclability	ca. 97,8 % wood (waste wood category 2) ca. 2,2 % steel
Repairability	Due to the modular construction and the use of solid wood, the furniture can be repaired and refurbished almost indefinitely. 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
Frame	Bavaria, Germany	1998	Yes	Yes

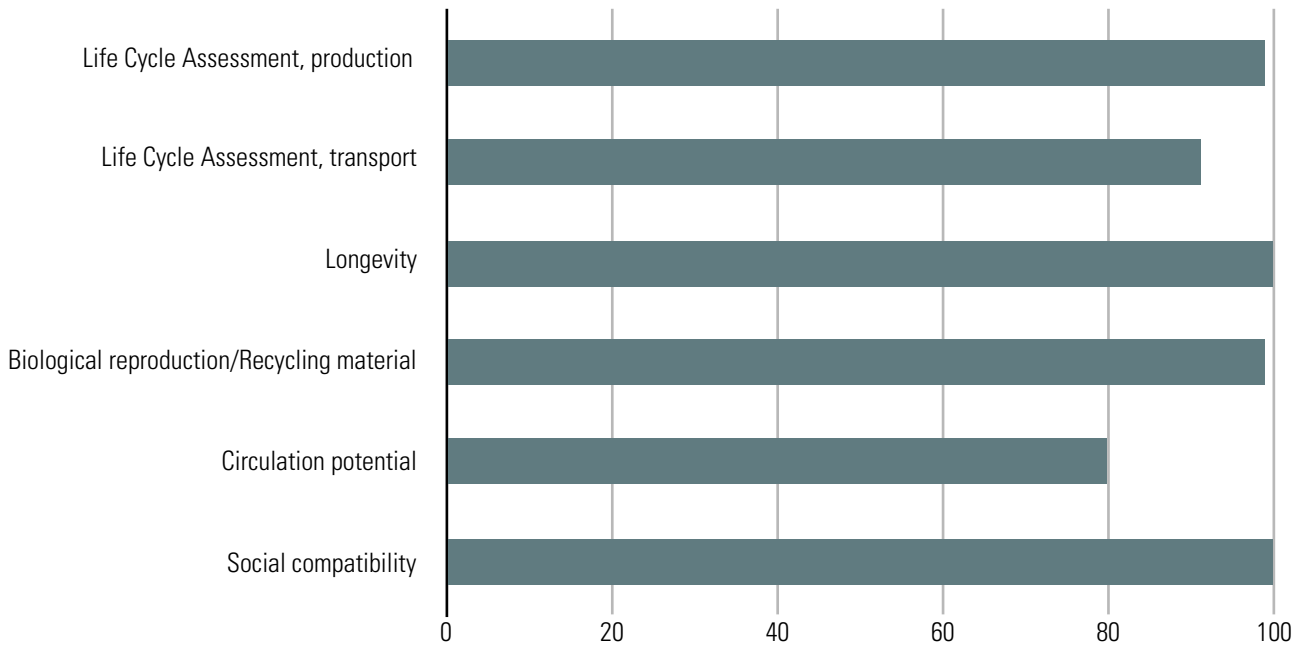
### Packaging

Flatpack	Yes
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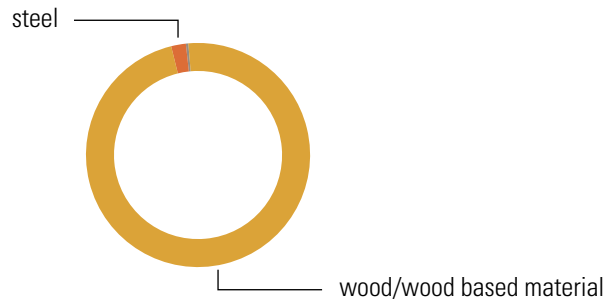
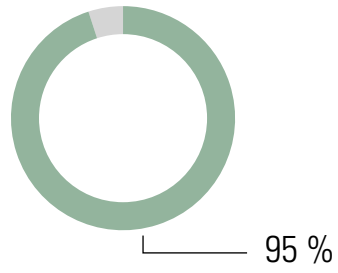
### Warehouse

Country	Federal state
Germany	Bavaria

SIMPLE; oak



- wood/wood based material
- steel
- other



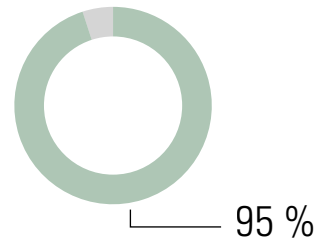
Flat pack

<b>SIMPLE; oak</b>	Material/Product rating						
	Oak	Beech	Steel	Plastic, PA	Natural oil, Osmo	PVAC	Weighted rating, %
Life Cycle Assessment, production	10	10	5,33	3	5	10	98,83796 %
Life Cycle Assessment, transport	9	10	4	6,5	9	6,5	91,286 %
Longevity	10	10	10	8	10	9	99,929 %
Biological reproduction/ Recycling material	10	10	6	0	6	0	98,868 %
Circulation potential	8	8	10	10	10	4	80,4 %
Social compatibility	10	10	8	9	10	9	99,516 %
Average rating, $\bar{\sigma}$	9,5	9,666	7,221	6,083	8,333	6,416	Total weight
Share in kg	31,3	10,4	0,91	0,05	0,051	0,04	42,751
Share in %	73,21 %	24,32 %	2,12 %	0,11 %	0,11 %	0,09 %	
Weighted rating	6,954	2,35	0,153	0,006	0,009	0,005	
<b>Product rating in %</b>	<b>94,77</b>						

<b>Packaging</b>	Material/Product rating			
	Cardboard	PE fleece	PP strapping	Weighted rating, %
Life Cycle Assessment, production	10	3	5	95,18 %
Life Cycle Assessment, transport	9	6,5	6,5	88,141 %
Longevity	4	5	5	40,736 %
Biological reproduction/Recycling material	6	0	0	55,554 %
Circulation potential	10	10	10	99,99 %
Social compatibility	10	9	10	99,435 %
Average rating, $\bar{\sigma}$	8,166	5,583	6,083	Total weight
Share in kg	5	0,3	0,1	5,4
Share in %	92,59 %	5,55 %	1,85 %	
Weighted rating	7,56	0,309	0,112	
<b>Product rating in %</b>	<b>79,81</b>			



## 1 Oak



**Tab. 1 A:** Material data sheet, oak, general<sup>12</sup>

Material group	Natural material; wood; hardwood
Botanical name	<i>Quercus robur L./Q. patrea Liebl. (Fagaceae)</i>
Name	European Oak (GB, US); Eiche (D), Sommereiche (D); Chêne (F)
Material Norm. Ref.	DIN EN 13556: QCXE
Origin	Germany, (Central Europe)
Occurrence	Europe to Asia Minor; North America; most common European occurrence in France
Use	Solid and veneer, mainly sliced veneer; furniture and interior fittings; paneling and parquet; structural timber, etc.

<sup>1</sup> WAGENFUEHR, R. (2007) - Wood Atlas. (6) Leipzig: Hanser Wirtschaft, Fachbuchverlag Leipzig, pp. 255-277

<sup>2</sup> LOHMANN, U. (2010) - Wood encyclopedia. The standard work for wood and forestry. (4) Hamburg: Nikol-Verlag, pp. 284-285

**Tab. 1 B:** Material data sheet, oak, specific<sup>3</sup>

**General description**

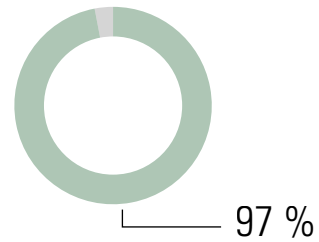
Certifications/Information	FSC and PEFC on request	
<b>Life cycle assessment data hardwood, average (GER)</b>		<b>10</b>
<b>Resource input per kg</b>	<b>A1-A3</b>	
Total non-renewable primary energy (PENRT)	2,18 MJ	10
Use of freshwater resources (FW)	0,00048 m <sup>3</sup>	10
<b>Environmental impact per m<sup>3</sup></b>		
Global Warming Potential (GWP)	-1,74 Kg CO <sub>2</sub> -eqv.	10
<b>Environmental impact Transport, per 1000 kgkm (690 kg/m<sup>3</sup>)</b>		<b>9</b>
<b>Production site: Germany/ZEITRAUM</b>		
<b>Truck - ca. 300 km</b>	A4	10
Total non-renewable primary energy (PENRT)	362,4 MJ	
Use of freshwater resources (FW)	0,019164 m <sup>3</sup>	
Global Warming Potential (GWP)	26,907 Kg CO <sub>2</sub> -eqv.	
<b>Main raw material origin: Germany, Central Europe/Production site</b>		
<b>Truck - ca. 1500 km</b>	A4	8
Total non-renewable primary energy (PENRT)	1812 MJ	
Use of freshwater resources (FW)	0,09582 m <sup>3</sup>	
Global Warming Potential (GWP)	134,535 Kg CO <sub>2</sub> -eqv.	
<b>Sustainability Assessment</b>		
Longevity	Very durable/repairable (> 20 years)	10
Biological reproduction/ recycled material	100 %	10
Circulation potential	70 % - 99 % (technological/recycling)	8
Socially compatible	Yes	10
<b>Total average rating</b>		<b>9,5</b>
<b>Processing</b>		
Mechanical	Good; can be cut and peeled, suitable for turning and carving; pre-drill thin wood for nailing	
Drying	Moderately good; slow; tendency to tear and warp; predrying outdoors favorable; good durability	

<sup>3</sup> BMI 2021: Oekobaudat. Database <[https://www.oekobaudat.de/no\\_cache/en/database/search.html](https://www.oekobaudat.de/no_cache/en/database/search.html)> Accessed, on 10/27/2021

Adhesion	Good; alkalis can cause stains	
Surface finishing	Good; can be stained and varnished, if necessary use pore filler when varnishing; tinting of wood color by smoking	
<b>Natural durability DIN EN 350-2</b>	durable; sapwood low; heartwood durable; also in water; durability class 2	
<b>Physical properties</b>		
Kiln density (0 % wood moisture content)	390... 650... 930 kg/m <sup>3</sup>	
Bulk density (12 - 15 % wood moisture)	430... 690... 960 kg/m <sup>3</sup>	
Pore ratio	ca. 57 %	
Shrinkage rate at 1 % moisture reduction	radial - 0,20 %; tangential - 0,32 %; volume - 0,45 %	
<b>Mechanical properties</b>		
Compressive strength ( $\sigma_{dB}$ )	Q. robur: 54... 61... 67 N/mm <sup>2</sup> Q. petraea: 48... 65... 70 N/mm <sup>2</sup>	
Flexural strength ( $\sigma_{bB}$ )	Q. robur: 74... 88... 105 N/mm <sup>2</sup> Q. petraea: 78... 110... 117 N/mm <sup>2</sup>	
Tensile strength ( $\sigma_{zB}   $ )	50... 90... 180 N/mm <sup>2</sup>	
Tensile strength ( $\sigma_{zB} \perp$ )	2,6... 4,0... 9,6 N/mm <sup>2</sup>	
Shear strength ( $\tau_{aB}$ )	6,0... 11,0... 13,0 N/mm <sup>2</sup>	
Hardness (HB   )	50... 66 N/mm <sup>2</sup>	
Hardness (HB $\perp$ )	25... 34 N/mm <sup>2</sup>	
E-modulus ( $E_b   $ )	Q. robur: 10000... 11700... 13200 N/mm <sup>2</sup> Q. petraea: 9200... 13000... 13500 N/mm <sup>2</sup>	



## 2 Beech



**Tab. 2 A:** Material data sheet, beech, general<sup>45</sup>

Material group	Natural material; wood; hardwood
Botanical name	<i>Fachs sylvatica L. (Fagaceae)</i>
Name	Beech (GB); Buche, Rotbuche (D); Hêtre (F)
Material Norm. Ref.	DIN EN 13556: FASY
Origin	Northern Germany, Germany, (Central Europe)
Occurrence	Western, central and southern Europe; prefers loose, mineral-rich and well-watered soils; sensitive to low temperatures and late frosts
Use	Veneer; mainly as peeling lumber for plywood, composite panels, etc.; furniture making; paneling and parquet; structural lumber for medium duty, automotive and mechanical engineering, building construction and civil engineering; specialty lumber for particleboard and fiberboard, pulp and paper, sports equipment, workbenches, stairs; musical instruments, etc.

<sup>4</sup> WAGENFUEHR, R. (2007) - Wood Atlas. (6) Leipzig: Hanser Wirtschaft, Fachbuchverlag Leipzig, pp. 672-676

<sup>5</sup> LOHMANN, U. (2010) - Wood encyclopedia. The standard work for wood and forestry. (4) Hamburg: Nikol-Verlag, page 192



**Tab. 2 B:** Material data sheet, beech, specific<sup>6</sup>

**General description**

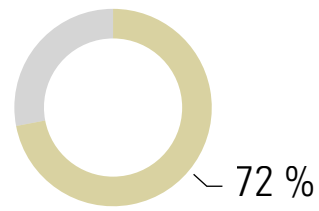
Certifications/Information	FSC and PEFC on request	
<b>Life cycle assessment data hardwood, average (GER)</b>		<b>10</b>
<b>Resource input per kg</b>	<b>A1-A3</b>	
Total non-renewable primary energy (PENRT)	2,18 MJ	10
Use of freshwater resources (FW)	0,00048 m <sup>3</sup>	10
<b>Environmental impact per m<sup>3</sup></b>	<b>A1-A3</b>	
Global Warming Potential (GWP)	-1,74 Kg CO <sub>2</sub> -eqv.	10
<b>Environmental impact Transport, per 1000 kgkm (720 kg/m<sup>3</sup>)</b>		<b>10</b>
<b>Production site: Germany/ZEITRAUM</b>		
<b>Truck - ca. 300 km</b>	A4	10
Total non-renewable primary energy (PENRT)	362,4 MJ	
Use of freshwater resources (FW)	0,019164 m <sup>3</sup>	
Global Warming Potential (GWP)	26,907 Kg CO <sub>2</sub> -eqv.	
<b>Main raw material origin: Germany, Central Europe/Production site</b>		
<b>Truck - ca. 1000 km</b>	A4	10
Total non-renewable primary energy (PENRT)	1208 MJ	
Use of freshwater resources (FW)	0,06388 m <sup>3</sup>	
Global Warming Potential (GWP)	89,69 Kg CO <sub>2</sub> -eqv.	
<b>Sustainability Assessment</b>		
Longevity	Very durable/repairable (> 20 years)	10
Biological reproduction/ recycled material	100 %	10
Circulation potential	70 % - 99 % (technological/recycling)	8
Socially compatible	Yes	10
<b>Total average rating</b>		<b>9,66</b>
<b>Processing</b>		
Mechanical	Good for sawing, planing, turning, bending, carving; optimum cutting speed 30 m/s, can be cut and peeled	
Drying	Good; tendency to tear and warp; dry gently as it shrinks a lot	

<sup>6</sup> BMI 2021: Oekobaudat. Database <[https://www.oekobaudat.de/no\\_cache/en/database/search.html](https://www.oekobaudat.de/no_cache/en/database/search.html)> Accessed, on 10/27/2021

Adhesion	Good	
Surface finishing	Good; can be stained and varnished	
<b>Natural durability DIN EN 350-2</b> (with weathering)	Low; susceptible to fungus and insects; not weather resistant; protect carefully in outdoor areas; durability class 3 to 4	
<b>Physical properties</b>		
Kiln density (0 % wood moisture content)	490... 680... 880 kg/m <sup>3</sup>	
Bulk density (12 - 15 % wood moisture)	540... 720... 910 kg/m <sup>3</sup>	
Pore ratio	ca. 55 %	
Shrinkage rate at 1 % moisture reduction	radial - 0,20 %; tangetial - 0,40 %; volume - 0,46... 0,60 %	
<b>Mechanical properties</b>		
Compressive strength ( $\sigma_{dB}$ )	41... 62... 99 N/mm <sup>2</sup>	
Flexural strength ( $\sigma_{bB}$ )	74... 123... 210 N/mm <sup>2</sup>	
Tensile strength ( $\sigma_{zB \perp}$ )	7,0... 10,7 N/mm <sup>2</sup>	
Shear strength ( $\tau_{aB}$ )	6,5... 8,0... 19,0 N/mm <sup>2</sup>	
Hardness (HB   )	ca. 72 N/mm <sup>2</sup>	
Hardness (HB $\perp$ )	ca. 34 N/mm <sup>2</sup>	
E-modulus ( $E_b$   )	10000... 16000... 18000 N/mm <sup>2</sup>	



### 3 Steel



**Tab. 3 A:** Material data sheet, steel, general<sup>7</sup>

Material group	Natural material; metals; transition metals
Parts origin	n.a.
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

<sup>7</sup> 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. 3 B:** Material data sheet, steel, specific<sup>89</sup>

**General description**

Certifications/Information	n.a.	
Emission class (formaldehyde)	Formaldehyde free	
Surface	smooth, hard	
Color	Grey	
<b>Life cycle assessment data Steel profile, (GER)</b>		<b>5,33</b>
<b>Resource input per kg</b>	<b>A1-A3</b>	
Total non-renewable primary energy (PENRT)	10,99 MJ	4
Use of freshwater resources (FW)	0,002314 m <sup>3</sup>	4
<b>Environmental impact per kg</b>	<b>A1-A3</b>	
Global Warming Potential (GWP)	0,9944 Kg CO <sub>2</sub> -eqv.	8
<b>Environmental impact Transport, per 1000 kgkm (7850 kg/m<sup>3</sup>)</b>		<b>4</b>
<b>Production site: Europe/ZEITRAUM</b>		
<b>Truck ø - ca. 1500 km</b>	A4	8
Total non-renewable primary energy (PENRT)	1812 MJ	
Use of freshwater resources (FW)	0,09582 m <sup>3</sup>	
Global Warming Potential (GWP)	134 Kg CO <sub>2</sub> -eqv.	
<b>Main raw material origin: China/production location</b>		<b>0</b>
<b>Truck - ca. 2000 km</b>	A4	
Total non-renewable primary energy (PENRT)	2416 MJ	
Use of freshwater resources (FW)	0,12776 m <sup>3</sup>	
Global Warming Potential (GWP)	179,38 Kg CO <sub>2</sub> -eqv.	
<b>Container ship - ca. 10000 km</b>	A4	
Total non-renewable primary energy (PENRT)	1094 MJ	
Use of freshwater resources (FW)	0,005636 m <sup>3</sup>	
Global Warming Potential (GWP)	90,11 Kg CO <sub>2</sub> -eqv.	

**Sustainability Assessment**

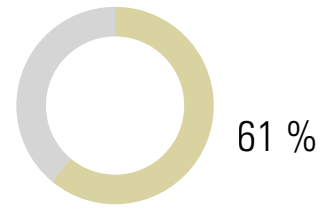
<sup>8</sup> BMI 2021: Oekobaudat. Database <[https://www.oekobaudat.de/no\\_cache/en/database/search.html](https://www.oekobaudat.de/no_cache/en/database/search.html)> Accessed, on 10/27/2021

<sup>9</sup> 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
<b>Total average rating</b>		<b>7,22</b>
<b>Notes</b>	The life cycle assessment of iron improves the more often the material has been recycled or the proportion of recycled material increases	



## 4 Polyamide



**Tab. 4 A:** Material data sheet, polyamide, general<sup>10</sup>

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

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

**Tab. 4 B:** Material data sheet, polyamide, specific<sup>11,12</sup>**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
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Use of freshwater resources (FW)	0,04378 m <sup>3</sup>	10
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**Environmental impact per kg** A1-A3

Global Warming Potential (GWP)	16,91 Kg CO <sub>2</sub> -eqv.	0
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**Environmental impact Transport, per 1000 kgkm (1140 kg/m<sup>3</sup>)** 6,5**Production site: Germany/ZEITRAUM****Truck - ca. 500 km** A4 10

Total non-renewable primary energy (PENRT)	604 MJ	
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Use of freshwater resources (FW)	0,03194 m <sup>3</sup>	
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Global Warming Potential (GWP)	44,845 Kg CO <sub>2</sub> -eqv.	
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**Main raw material origin: n.a./production site****n.a. - ø > 7000 km** A4 3

Total non-renewable primary energy (PENRT)	8456 MJ	
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Use of freshwater resources (FW)	0,44716 m <sup>3</sup>	
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Global Warming Potential (GWP)	627,83 Kg CO <sub>2</sub> -eqv.	
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**Sustainability Assessment**

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

<sup>11</sup> BMI 2021: Oekobaudat. Database <[https://www.oekobaudat.de/no\\_cache/en/database/search.html](https://www.oekobaudat.de/no_cache/en/database/search.html)> Accessed, on 10/27/2021

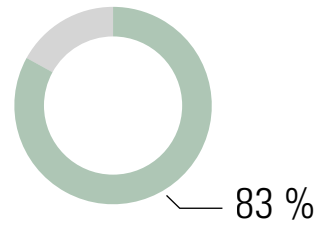
<sup>12</sup> MATERIALARCHIV (2019) - Materialarchiv <<http://www.materialarchiv.ch/app-tablet/#search>> Accessed, on 03/01/2019

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	
<b>Resistance</b>	Easy care; water resistant; resistant to fungi and insects	
<b>Properties</b>		
Elongation at break	50,0 %	
Density	1140 kg/m <sup>3</sup>	
Moisture absorption	2,5 - 3,5 %	
Dielectric strength	25 kV/mm	
Notched impact strength (Charpy)	3,0 kJ/m <sup>2</sup>	
<b>Thermal properties</b>		
Vicat softening temperature according to DIN EN ISO 306 Vicat B/50	250 °C	
Continuous operating temperature	-30 bis 95 °C	





## 5 Osmo, hard wax oil



**Tab. 5 A:** Material data sheet, Osmo, hard wax oil, general<sup>1314</sup>

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

<sup>13</sup> KALWEIT A. (2012) - Handbook of technical product design - materials and manufacturing. Berlin: Springer Verlag

<sup>14</sup> Osmo (2019) - Osmo Hard Wax Oil 3032 satin, 3062 matte <<https://www.osmo.de>> Accessed, on 03/02/2019

**Tab. 5 B:** Material data sheet, Osmo, hard wax oil, specific<sup>1516</sup>

<b>General description</b>		
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)	
<b>Contents</b>		
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)	
<b>Life cycle assessment data hard wax oil (GER)</b>		<b>5</b>
<b>Resource input per kg</b>	<b>A1-A3</b>	
Total non-renewable primary energy (PENRT)	n.a.	
Use of freshwater resources (FW)	n.a.	
<b>Environmental impact per kg</b>	<b>A1-A3</b>	
Global Warming Potential (GWP)	n.a.	
<b>Environmental impact Transport, per 1000 kgkm</b>		<b>9</b>
<b>Production site: Germany/ZEITRAUM</b>		
<b>Truck - ca. 200 km</b>	A4	<b>10</b>
Total non-renewable primary energy (PENRT)	172,12 MJ	
Use of freshwater resources (FW)	0,012106 m <sup>3</sup>	
Global Warming Potential (GWP)	12,822 Kg CO <sub>2</sub> -eqv.	
<b>Main raw material origin: n.a./production site</b>		
<b>n.a. - ø 3000 km</b>	A4	<b>8</b>
Total non-renewable primary energy (PENRT)	3624 MJ	
Use of freshwater resources (FW)	0,19164 m <sup>3</sup>	

<sup>15</sup> BMI 2021: Oekobaudat. Database <[https://www.oekobaudat.de/no\\_cache/en/database/search.html](https://www.oekobaudat.de/no_cache/en/database/search.html)> Accessed, on 10/27/2021

<sup>16</sup> MATERIALARCHIV (2019) - Materialarchiv <<http://www.materialarchiv.ch/app-tablet/#search>> Accessed, on 03/01/2019

Global Warming Potential (GWP)	296,07 Kg CO <sub>2</sub> -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
<b>Total average rating</b>		<b>8,33</b>

### Processing

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

### Properties

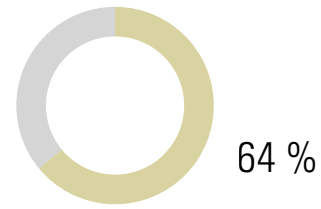
Density	0,89 g/cm <sup>3</sup>	
Viscosity	Thixotropic, creamy	
Consistency	Medium viscosity	
Moisture resistance	Good	

### 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)



## 6 PVAc dispersion adhesive, D3



**Tab. 6 A:** Material data sheet, PVAc dispersion adhesive, D3, general<sup>1718</sup>

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

<sup>17</sup> KALWEIT A. (2012) - Handbook of technical product design - materials and manufacturing. Berlin: Springer Verlag

<sup>18</sup> KEIBERIT (2019) - KLEIBERIT 303, D3, PVAc Adhesive <[https://interior-construction.kleiberit.com/fileadmin/Content/Documents/DE/Infoblaetter/303\\_D3\\_Leim\\_D.pdf](https://interior-construction.kleiberit.com/fileadmin/Content/Documents/DE/Infoblaetter/303_D3_Leim_D.pdf)> Accessed, on 02/03/2019

**Tab. 6 B:** Material data sheet, PVAc dispersion adhesive, D3, specific<sup>1920</sup>**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
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Use of freshwater resources (FW)	0,00758 m <sup>3</sup>	10
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**Environmental impact per kg** A1-A3

Global Warming Potential (GWP)	0,955 Kg CO <sub>2</sub> -eqv.	10
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**Environmental impact Transport, per 1000 kgkm** 6,5**Production site: Germany/ZEITRAUM**

<b>Truck - ca. 200 km</b>	A4	10
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Total non-renewable primary energy (PENRT)	172,12 MJ	
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Use of freshwater resources (FW)	0,012106 m <sup>3</sup>	
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Global Warming Potential (GWP)	12,822 Kg CO <sub>2</sub> -eqv.	
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**Main raw material origin: n.a./production site**

<b>n.a. - ø &gt; 7000 km</b>	A4	3
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Total non-renewable primary energy (PENRT)	8456 MJ	
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Use of freshwater resources (FW)	0,44716 m <sup>3</sup>	
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Global Warming Potential (GWP)	627,83 Kg CO <sub>2</sub> -eqv.	
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**Sustainability Assessment**

Longevity	Very durable/moderately repairable (> 20 years)	9
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Biological reproduction/ recycled material	0 %	0
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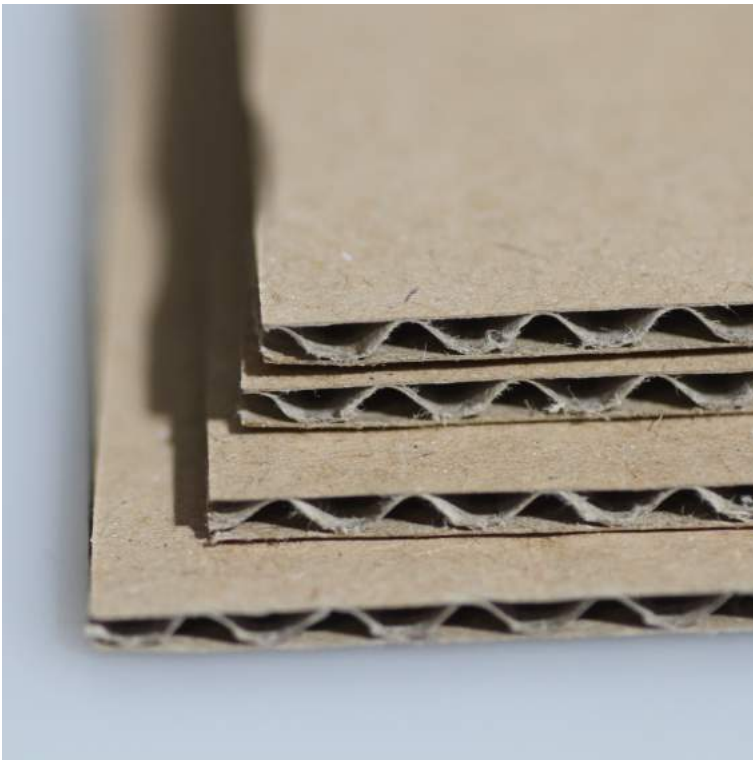
Circulation potential	Only thermally recyclable	4
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Socially compatible	Yes	9
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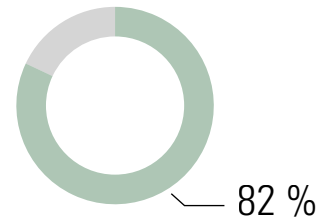
<sup>19</sup> BMI 2021: Oekobaudat. Database <[https://www.oekobaudat.de/no\\_cache/en/database/search.html](https://www.oekobaudat.de/no_cache/en/database/search.html)> Accessed, on 10/27/2021

<sup>20</sup> MATERIALARCHIV (2019) - Materialarchiv <<http://www.materialarchiv.ch/app-tablet/#search>> Accessed, on 03/01/2019

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



## 7 Cardboard, beds, tables & storage



**Tab. 7 A:** Cardboard, beds, tables & storage, general

Material group	Packaging
Name	Cardboard (GB, US); Karton (D)
Manufacturer	Monowell GmbH & Co. KG
Manufactured in	Germany (GER)
Use	Packing material for individual wrapping of the furniture

**Tab. 7 B:** Cardboard, beds, tables & storage, specific<sup>2122</sup>

**General description**

Certifications/Information	ISO 9001, ISO 50001, ISO 22000 DE, ISO 22000 EN, FSC	
Color	Brown	
Texture	matt	
Contents		
60 %	Recycled paper	
40 %	Primary raw material	

**Life cycle assessment data „Kraftpapier“ (GER)** 10

<b>Resource input per kg</b>	<b>A1-A3</b>	
Total non-renewable primary energy (PENRT)	5,888 MJ	
Use of freshwater resources (FW)	0,004899 m <sup>3</sup>	

<b>Environmental impact per kg</b>	<b>A1-A3</b>	
Global Warming Potential (GWP)	-0,8973 Kg CO <sub>2</sub> -eqv.	

**Environmental impact Transport, per 1000 kgkm** 9

**Production site: Germany/ZEITRAUM**

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

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

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

**Sustainability Assessment**

Longevity	Moderately durable/repairable (< 10 years)	4
Biological reproduction/ recycled material	60 %	6
Circulation potential	100 % (technological)	10

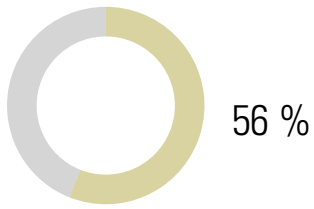
<sup>21</sup> BMI 2021: Oekobaudat. Database <[https://www.oekobaudat.de/no\\_cache/en/database/search.html](https://www.oekobaudat.de/no_cache/en/database/search.html)> Accessed, on 10/27/2021

<sup>22</sup> MATERIALARCHIV (2019) - Materialarchiv <<http://www.materialarchiv.ch/app-tablet/#search>> Accessed, on 03/01/2019



Socially compatible	Yes	10
<b>Total average rating</b>		<b>8,16</b>
<b>Disposal note</b>	Waste paper	

## 8 Polyester fleece



**Tab. 8 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. 8 B:** Material data sheet, polyester fleece, specific<sup>2324</sup>

<b>General description</b>		
Certifications/Information	n.a.	
Delivery form	Mats, wadding, etc.	
Texture	soft, fibrous	
<b>Life cycle assessment data Comparative material for PE wadding (no data available) - PE nonwoven (GER)</b>		<b>3</b>
<b>Resource input per kg</b>	<b>A1-A3</b>	
Total non-renewable primary energy (PENRT)	22 MJ	
Use of freshwater resources (FW)	0,00252 m <sup>3</sup>	
<b>Environmental impact per kg</b>	<b>A1-A3</b>	
Global Warming Potential (GWP)	0,73 Kg CO <sub>2</sub> -eqv.	
<b>Environmental impact Transport, per 1000 kgkm (approx. 0.5 kg/m<sup>2</sup>)</b>		<b>6,5</b>
<b>Production site: Germany/ZEITRAUM</b>		
<b>Truck - ca. 500 km</b>	A4	10
Total non-renewable primary energy (PENRT)	430,3 MJ	
Use of freshwater resources (FW)	0,030265 m <sup>3</sup>	
Global Warming Potential (GWP)	32,055 Kg CO <sub>2</sub> -eqv.	
<b>Main raw material origin: n.a./production site</b>		<b>3</b>
<b>n.a. - ø &gt; 7000 km</b>	A4	
Total non-renewable primary energy (PENRT)	8456 MJ	
Use of freshwater resources (FW)	0,44716 m <sup>3</sup>	
Global Warming Potential (GWP)	627,83 Kg CO <sub>2</sub> -eqv.	
<b>Sustainability Assessment</b>		
Longevity	Durable (10 - 20 years)	5
Biological reproduction/ recycled material	0 %	0
Circulation potential	100 % (technological)	10
Socially compatible	Yes	9
<b>Total average rating</b>		<b>5,58</b>

<sup>23</sup> BMI 2021: Oekobaudat. Database <[https://www.oekobaudat.de/no\\_cache/en/database/search.html](https://www.oekobaudat.de/no_cache/en/database/search.html)> Accessed, on 10/27/2021

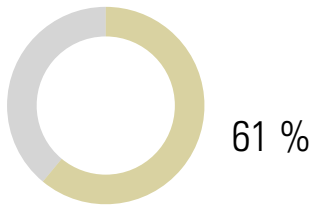
<sup>24</sup> MATERIALARCHIV (2019) - Materialarchiv <<http://www.materialarchiv.ch/app-tablet/#search>> Accessed, on 03/01/2019

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**Disposal note**

Recyclable waste

## 9 PP strapping



**Tab. 9 A:** Material data sheet, PP strapping, general

Material group	Packaging
Name	TEWE® Polypropylene strapping
Material abbreviation	PP
Manufacturer	Teufelberger
Manufactured in	Austria (AT)
Use	Packing material for protection

**Tab. 9 B:** Material data sheet, PP strapping, specific<sup>2526</sup>

<b>General description</b>		
Certifications/Information	ISO 9001, ISO 14001	
<b>Life cycle assessment data Comparative material for PP (no data available) (GER)</b>		<b>5</b>
<b>Resource input per kg</b>	<b>A1-A3</b>	
Total non-renewable primary energy (PENRT)	n.a.	
Use of freshwater resources (FW)	n.a.	
<b>Environmental impact per kg</b>	<b>A1-A3</b>	
Global Warming Potential (GWP)	n.a.	
<b>Environmental impact Transport, per 1000 kgkm (approx. 0.5 kg/m<sup>2</sup>)</b>		<b>6,5</b>
<b>Production site: Austria/ZEITRAUM</b>		
<b>Truck - ca. 300 km</b>	<b>A4</b>	<b>10</b>
Total non-renewable primary energy (PENRT)	362,4 MJ	
Use of freshwater resources (FW)	0,019164 m <sup>3</sup>	
Global Warming Potential (GWP)	26,907 Kg CO <sub>2</sub> -eqv.	
<b>Main raw material origin: n.a./production site</b>		<b>3</b>
<b>n.a. - ø &gt; 7000 km</b>	<b>A4</b>	
Total non-renewable primary energy (PENRT)	8456 MJ	
Use of freshwater resources (FW)	0,44716 m <sup>3</sup>	
Global Warming Potential (GWP)	627,83 Kg CO <sub>2</sub> -eqv.	
<b>Sustainability Assessment</b>		
Longevity	Durable (10 - 20 years)	<b>5</b>
Biological reproduction/ recycled material	0 %	<b>0</b>
Circulation potential	100 % (technological)	<b>10</b>
Socially compatible	Yes	<b>10</b>
<b>Total average rating</b>		<b>6,08</b>
<b>Disposal note</b>	Recyclable waste	

<sup>25</sup> BMI 2021: Oekobaudat. Database <[https://www.oekobaudat.de/no\\_cache/en/database/search.html](https://www.oekobaudat.de/no_cache/en/database/search.html)> Accessed, on 10/27/2021

<sup>26</sup> MATERIALARCHIV (2019) - Materialarchiv <<http://www.materialarchiv.ch/app-tablet/#search>> Accessed, on 03/01/2019

Information on all materials used by ZEITRAUM  
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**[www.zeitraum-moebel.com](http://www.zeitraum-moebel.com)**

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