

**ZEITRAUM**

# MORPH LOUNGE

Design by Formstelle, 2011



# Furniture Footprint

## MORPH LOUNGE

Design by Formstelle, 2011

MORPH LOUNGE brings together an unusual combination of materials: The solid wood frame carries a comfortable upholstered shell. The positioning of the legs gives the chair a unique posture, as if it had a support and a free leg. The softly formed seat invites to take a seat. Due to its compact dimensions this straightforward chair exudes an air of lightness that requires only a small area. He feels at home in a wide diversity of spacial situations.

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: MORPH LOUNGE. 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	Upholstery			
Weight	ca. 9 kg			
<b>Certification</b>	CATAS Test EN 1728:2012 Level 2 – extreme			

### Environmental details

Recycled content/ renewable raw materials	ca. 18,5 % recycled material (steel, share: 37 %, ø 50 % recycled content) ca. 38 % renewable materials			
Recyclability	ca. 30 % wood (waste wood category 2) ca. 9 % textiles / 11 % leather ca. 37 % steel			
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
Frame	Bavaria, Germany	2012	Yes	Yes
Metal seat shell	Bavaria, Germany	2011	Yes	Not yet
Upholstery	Bavaria, Germany	1999	Yes	Yes

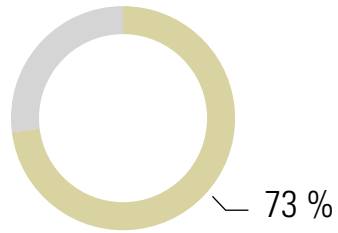
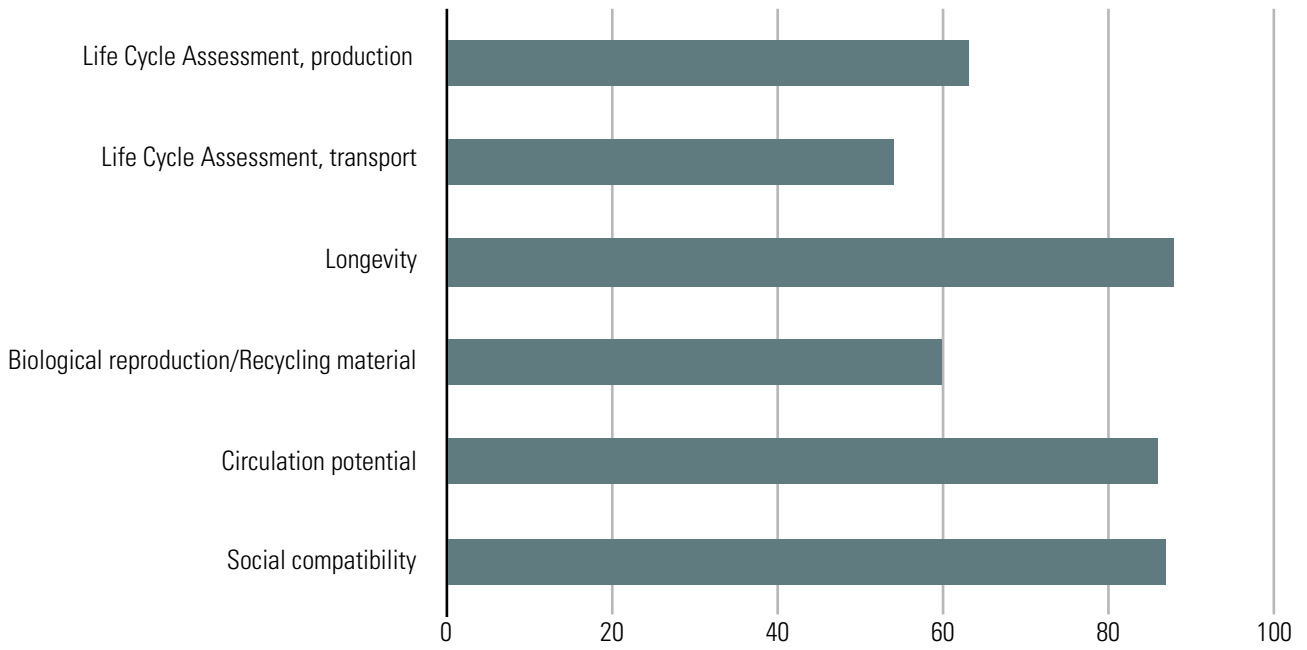
### Packaging

Flatpack	No			
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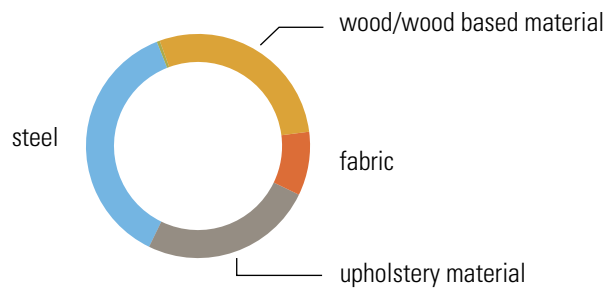
### Warehouse

Country	Federal state			
Germany	Bavaria			

MORPH LOUNGE, fabric; walnut



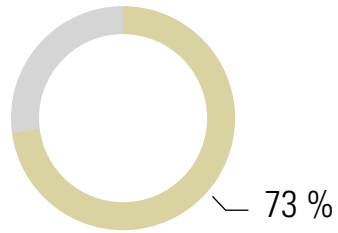
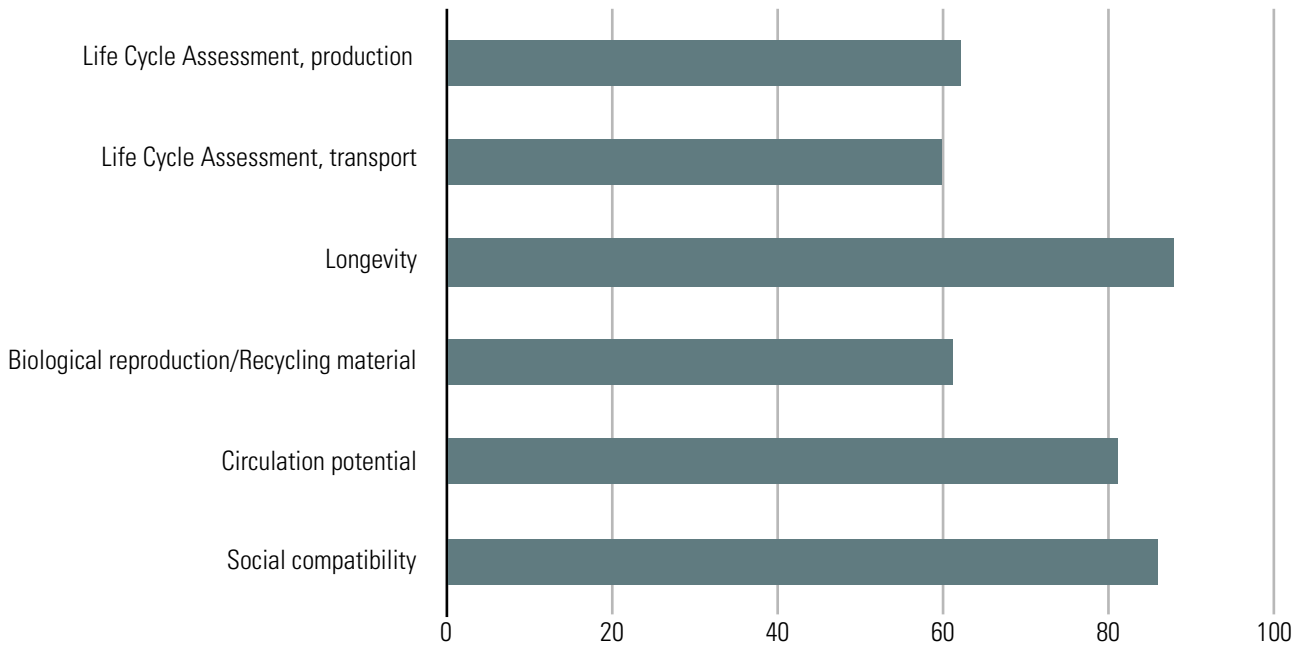
- wood/wood based material
- fabric
- upholstery material
- steel
- other



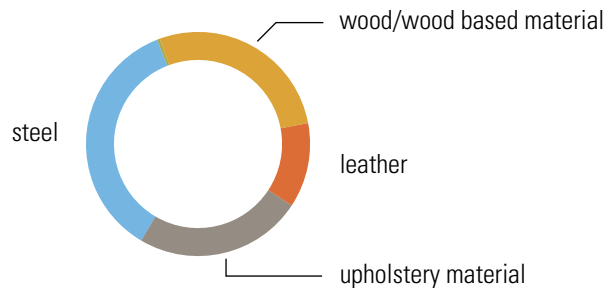
<b>MORPH LOUNGE, fabric; walnut</b>	Material/Product rating									
	Walnut	Fabric, Rohi, Opera	PUR, Upholstery	Poly- ester fiber	Steel	PA	Natural oil, Osmo	PVAC	PUR adhesive	Weighted rating, %
Life Cycle Assessment, production	10	5,33	3	9	5,33	3	5	10	0	63,33701 %
Life Cycle Assessment, transport	5	5	6,5	6,5	5	6,5	9	6,5	6,5	53,8485 %
Longevity	10	9	5	8	10	8	10	9	9	87,793 %
Biological reproduction/ Recycling material	10	10	0	0	6	0	6	0	0	59,866 %
Circulation potential	8	8	7	10	10	10	10	4	4	86,11 %
Social compatibility	9	10	9	9	8	9	10	9	9	87,223 %
Average rating, $\bar{\mu}$	8,666	7,888	5,083	7,083	7,388	6,083	8,333	6,416	4,75	Total weight
Share in kg	2,48	0,8	1,8	0,38	3,2	0,008	0,016	0,008	0,008	8,7
Share in %	28,5 %	9,19 %	20,68 %	4,36 %	36,78 %	0,09 %	0,18 %	0,09 %	0,09 %	
Weighted rating	2,469	0,724	1,051	0,308	2,717	0,005	0,014	0,005	0,004	
<b>Product rating in %</b>	<b>72,97</b>									

<b>Packaging</b>	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, $\bar{\mu}$	8,666	Total weight
Share in kg	4,2	4,2
Share in %	100 %	
Weighted rating	8,666	
<b>Product rating in %</b>	<b>86,66</b>	

MORPH LOUNGE, leather; walnut



- wood/wood based material
- leather
- upholstery material
- steel
- other

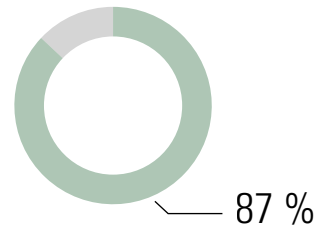


<b>MORPH LOUNGE, leather; walnut</b>	Material/Product rating									
	Walnut	Leather, Jepard	PUR, Upholstery	Poly- ester fiber	Steel	PA	Natural oil, Osmo	PVAC	PUR adhesive	Weighted rating, %
Life Cycle Assessment, production	10	5	3	9	5,33	3	5	10	0	62,59515 %
Life Cycle Assessment, transport	5	10	6,5	6,5	5	6,5	9	6,5	6,5	59,822 %
Longevity	10	9	5	8	10	8	10	9	9	87,852 %
Biological reproduction/ Recycling material	10	10	0	0	6	0	6	0	0	61,202 %
Circulation potential	8	4	7	10	10	10	10	4	4	81,012 %
Social compatibility	9	9	9	9	8	9	10	9	9	86,417 %
Average rating, $\bar{\mu}$	8,666	7,833	5,083	7,083	7,388	6,083	8,333	6,416	4,75	Total weight
Share in kg	2,48	1,1	1,8	0,38	3,2	0,008	0,016	0,008	0,008	9
Share in %	27,55 %	12,22 %	20 %	4,22 %	35,55 %	0,08 %	0,17 %	0,08 %	0,08 %	
Weighted rating	2,387	0,957	1,016	0,298	2,626	0,004	0,014	0,005	0,003	
<b>Product rating in %</b>	<b>73,1</b>									

<b>Packaging</b>	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, $\bar{\mu}$	8,666	Total weight
Share in kg	4,2	4,2
Share in %	100 %	
Weighted rating	8,666	
<b>Product rating in %</b>	<b>86,66</b>	



## 1 American walnut



**Tab. 1 A:** Material data sheet, American walnut, general<sup>1,2</sup>

Material group	Natural material; wood; hardwood
Botanical name	<i>Juglans nigra L. (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.

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

<sup>2</sup> 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, specific<sup>3</sup>

**General description**

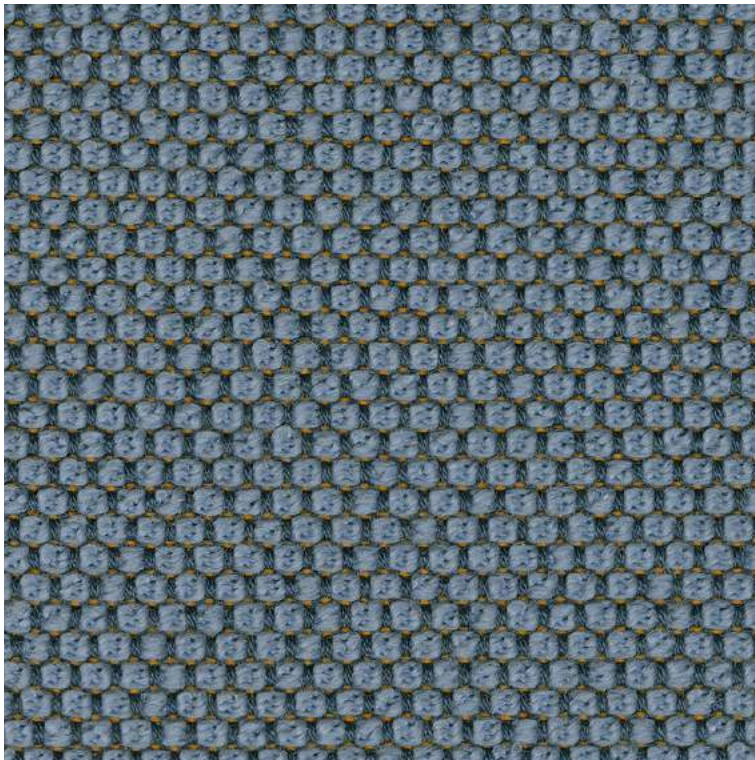
Certifications/Information	The Evergreen Initiative; NHLA; FSC on request	
<b>Life cycle assessment data hardwood, average (GER)</b>		<b>10</b>
<b>Resource input per kg</b>	<b>A1-A3</b>	
Total non-renewable primary energy (PENRT)	2,18 MJ	10
Use of freshwater resources (FW)	0,00048 m <sup>3</sup>	10
<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 (580 kg/m<sup>3</sup>)</b>		<b>5</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: Missouri/Production site</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.	
<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	9

<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

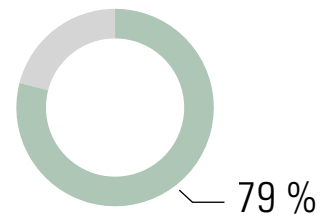


<b>Total average rating</b>	<b>8,66</b>
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<b>Processing</b>	
Mechanical	Very good; can be cut and peeled, suitable for turning and carving; low tendency to crack and warp
Drying	good; but slow; low tendency to tear and shed; good stability
Adhesion	good;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



## 2 Rohi, Opera



**Fig. 2:** [www.rohi.com](http://www.rohi.com)

**Tab. 2 A:** Material data sheet, Opera, general<sup>4</sup>

Material group	Natural synthetic material; textiles; upholstery fabric; virgin wool, polyamide
Name	Opera
Material abbreviation	WV (virgin wool); PA (polyamide)
Manufacturer	Rohi, Germany (GER)
Manufactured in	Germany (GER)
Designer	Rohi
Version	29 different colors
Use	Object areas and private living spaces with very high stresses

<sup>4</sup> ROHI (2021) - Rohi; Products <<https://www.rohi.com/en/products/living/>> Accessed, on 11/12/2021

**Tab. 2 B:** Material data sheet, Opera, specific<sup>56</sup>

**General description** (manufacturer spec.)

Certifications/Information	RAL-UZ 117 2+3, IWTO Guidelines for Sheep Welfare, FR-free, AB2998 (US Export Norm), ISO 9001, REACH, CP65 (on request)	
Fire resistance	<p><b>Fire tests (without additional flame retardant finish):</b> CAL TB 117 - 2013 • DIN EN 1021-1/-2 • BS 5852 Part 1: 1979 • UNI 9175 1 IM • ÖNORM B1/Q1 • IMO 2014/90/EU</p> <p><b>Fire tests (with optional flame retardant finish):</b> BS 5852: 2006 Crib5 • DIN 4102-1 B2 • DIN EN 13501-1 E • FAR 25.853 12 sec. vertical • NF P92-507 M2</p>	

**Environmental benefits**

AZO dyes	Not contained	
Heavy metals	Not contained	
Formaldehyde	Not contained	
Brominated flame retardants	Not contained	
Spinning oil used	n.a.	

**Appearance**

Pattern	Solid	
Length	n.a.	
Width	140 cm	
Thickness	n.a.	
Color	www.rohi.com; Differences may occur	
Textile surface	n.a.	

**Basic materials**

Virgin wool	96 %	
Polyamide (Nylon)	4 %	

<b>LCA data comparator for Opera, Rohi (no data available) - Hero (96 % WV, 4 % PA), Kvadrat</b>		5,33
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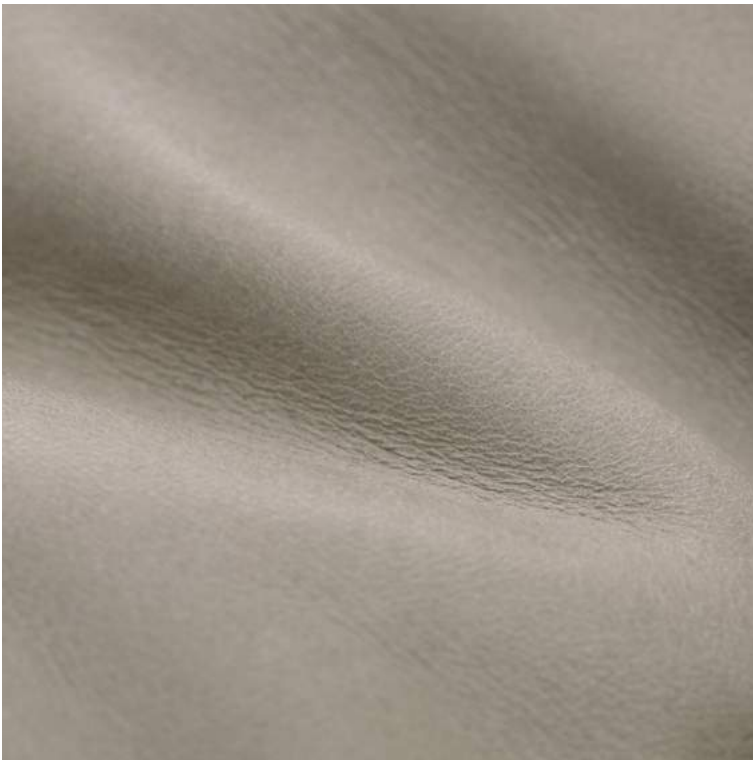
<b>Resource use per m<sup>2</sup></b>	<b>A1-A3</b>	
Total non-renewable primary energy (PENRT)	89 MJ	7
Use of freshwater resources (FW)	0,34 m <sup>3</sup>	4
<b>Environmental impact per m<sup>2</sup></b>	<b>A1-A3</b>	
Global Warming Potential (GWP)	7,3 Kg CO <sub>2</sub> -eqv.	5
<b>Environmental impact Transport, per 1000 kgkm (0.870 kg/m)</b>		5

<sup>5</sup> ROHI (2021) - Rohi; Products <<https://www.rohi.com/en/products/living/>> Accessed, on 11/12/2021

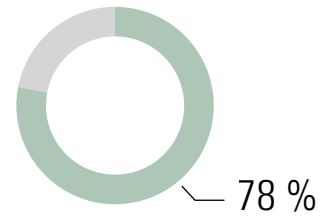
<sup>6</sup> BMI 2021: Oekobaudat. Database <[https://www.oekobaudat.de/no\\_cache/en/database/search.html](https://www.oekobaudat.de/no_cache/en/database/search.html)> Accessed, on 10/27/2021

<b>Production site: Germany/ZEITRAUM</b>		
<b>Truck - &lt; 100 km</b>	A4	10
Total non-renewable primary energy (PENRT)	120,8 MJ	
Use of freshwater resources (FW)	0,006388 m <sup>3</sup>	
Global Warming Potential (GWP)	8,969 Kg CO <sub>2</sub> -eqv.	
<b>Main raw material origin: Australia/production site</b>		0
<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.	
<b>Sustainability Assessment</b>		
Longevity	Very durable/moderately repairable (> 20 years)	9
Biological reproduction/ recycled material	96 %	10
Circulation potential	70 - 99 % technological/recycling	8
Socially compatible	Yes	10
<b>Total average rating</b>		<b>7,88</b>
<b>Resistance to dirt</b>	Not sensitive to dirt	
<b>Physical properties</b>		
Weight	ca. 1010 g/m	
<b>Mechanical properties</b>		
Resilience	90.000 Martindale	
Pilling (ISO1-5)	min. 4 - 5	
Light fastness (ISO 1-5)	min. 5 - 8	
Seam slippage	n.a.	
<b>Care</b>		
Washing	Professional cleaning recommended	
Chlorine	Do not bleach	
Drying drum	Do not dry	

Ironing	Moderate hot ironing	
Dry cleaning	Professional cleaning recommended	



### 3 Reinhardt Leather, Jepard



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

Material group	Natural materials; animal products; mammalian leather, cowhide (mineral tanning)
Name	Jepard
Manufacturer	Leder Reinhardt GmbH
Manufactured in	Germany (GER)
Cattle origin	Italy
Version	13 different colors
Use	Clothing: jackets, pants, bags, backpacks, belts, etc.; jewelry; hats; caps; shoe soles, straps Furniture making: upholstery materials, seat shells, etc.; saddlery; automotive industry; book covers; art objects; etc.

<sup>7</sup> MATERIALARCHIV (2019) - Materialarchiv <<http://www.materialarchiv.ch/app-tablet/#search>> Accessed, on 03/01/2019

**Tab. 3 B:** Material data sheet, Jepard, specific<sup>89</sup>**General description** (manufacturer spec.)

Certifications/Information	n.a.	
Fire resistance	<b>Fire tests:</b> CA TB 117-2013	
<b>Appearance</b>		
Size	4,2... 5,2 m <sup>2</sup>	
Thickness	1,1... 1,3 mm	
Color	13 color versions	
Texture	Pappillary layer - smooth, scarred Reticular layer: fibrous (also called flesh side)	
<b>Life cycle assessment data leather</b>		<b>5</b>
<b>Resource use per m<sup>2</sup></b>	<b>A1-A3</b>	
Total non-renewable primary energy (PENRT)	n.a.	
Use of freshwater resources (FW)	n.a.	
<b>Environmental impact per m<sup>2</sup></b>	<b>A1-A3</b>	
Global Warming Potential (GWP)	n.a.	
<b>Environmental impact Transport, per 1000 kgkm (approx. 0,9 kg/m<sup>2</sup>)</b>		<b>10</b>
<b>Production site: Germany/ZEITRAUM</b>		
<b>Truck - ca. 200 km</b>	A4	10
Total non-renewable primary energy (PENRT)	241,6 MJ	
Use of freshwater resources (FW)	0,012776 m <sup>3</sup>	
Global Warming Potential (GWP)	17,938 Kg CO <sub>2</sub> -eqv.	
<b>Main raw material origin: Italy/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/moderately repairable (> 20 years)	9
Biological reproduction/ recycled material	> 95 % (chrome tanning)	9

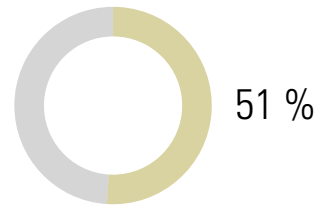
<sup>8</sup> MATERIALARCHIV (2019) - Materialarchiv <<http://www.materialarchiv.ch/app-tablet/#search>> Accessed, on 03/01/2019<sup>9</sup> BMI 2021: Oekobaudat. Database <[https://www.oekobaudat.de/no\\_cache/en/database/search.html](https://www.oekobaudat.de/no_cache/en/database/search.html)> Accessed, on 10/27/2021

Circulation potential	40 - 70 % technological/downcycling	4
Socially compatible	Yes	9
<b>Total average rating</b>		<b>7,66</b>
<b>Resistance to dirt</b>	Not sensitive to dirt	
<b>Processing</b>		
Mechanically	Mechanical processing of the material with tools designed for this purpose; cutting possible; offcut (upholstered furniture) approx. 30-45 %	
Storage	Relative humidity: 50-70 %; Temperature: 5-15 %	
Adhesion	good; possible with suitable adhesives	
Surface processing	good; can be dyed; smooth leather can and should be greased, oiled or waxed to protect the der from drying out; too much grease can also cause the leather to dry out; leather can be cleaned with lukewarm water; avoid using solvents	
Other	Untreated leather is porous and permeable to water and air; direct sunlight can cause drying and color change	
<b>Natural durability</b>	With regular care, the service life of leather can be increased many times over	
<b>Properties</b>	Very tear-resistant; elastic; water-permeable; breathable	
<b>Physical properties</b>		
Density	400... 900 kg/m <sup>3</sup>	
<b>Mechanical properties</b>		
Continuous folding behavior (EN ISO 5402)	30.000	
Light fastness (ISO 105-B02)	3	
Wet abrasion (ISO 11640)	20	
Dry abrasion (ISO 11640)	50	
Elongation at break (unwashed underleather)	n.a.	
<b>Notes</b>	The most important leather is cowhide; leather is largely a by-product of the meat industry; some animals are bred only for their leather, e.g. snakes, crocodiles or lizards	





## 4 PUR flexible foam, (MDI)



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

Material group	Synthetic Material; Synthetic Upholstery Material
Name	Polyurethane Foam (GB); Polyurethan Weichschaum (D);
Material abbreviation	PUR foam
Manufactured in	Germany (GER)
Use	Automotive industry (upholstery, fittings); furniture upholstery; shoe soles; etc.

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

**Tab. 4 B:** Material data sheet, PUR flexible foam, specific<sup>11,12</sup>

**General description** (manufacturer spec.)

Certifications/Information	ISO 9001, DE-UZ 117 (Blue Angel)	
Fire resistance	CAL117, DIN EN 10211 EUFAC, DIN EN 10212 EUFAC	
Delivery form	Bales, flakes, mats, etc.	
Texture	soft, porous	
Color	Available in all colors	
<b>Life cycle assessment data Comparative material for PUR flexible foam (no data available) - PU slabstock foam insulation panels (GER)</b>		<b>3</b>
<b>Resource input per kg</b>	<b>A1-A3</b>	
Total non-renewable primary energy (PENRT)	98,5 MJ	0
Use of freshwater resources (FW)	0,028696 m <sup>3</sup>	9
<b>Environmental impact per kg</b>	<b>A1-A3</b>	
Global Warming Potential (GWP)	4,48 Kg CO <sub>2</sub> -eqv.	0
<b>Environmental impact Transport, per 1000 kgkm (approx. 75 kg/m<sup>3</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	70 - 99 % technological/downcycling	7

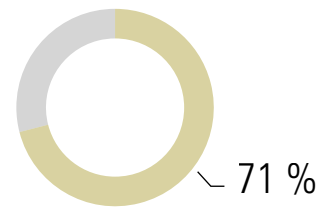
<sup>11</sup> BMI 2021: Oekobaudat. Database <[https://www.oekobaudat.de/no\\_cache/en/database/search.html](https://www.oekobaudat.de/no_cache/en/database/search.html)> Accessed, on 10/27/2021.

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

Socially compatible	Yes	9
<b>Total average rating</b>		<b>5,08</b>
<b>Resistance to dirt</b>	Not sensitive to dirt	
<b>Notes</b>	MDI: methylene diphenyl isocyanate; chemical compounds from the group of aromatic isocyanates	



## 5 Polyester fibers



**Tab. 5 A:** Material data sheet, polyester fibers, general<sup>13</sup>

Material group	Synthetic Material; Synthetic Upholstery Material
Name	Polyester Fibers (GB); Polyesterfaser (D)
Material abbreviation	PES
Manufactured in	Germany (GER)
Use	Furniture upholstery

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

**Tab. 5 B:** Material data sheet, polyester fibers, specific<sup>1415</sup>**General description**

Certifications/Information	REACH, OEKO-TEX® STANDARD 100, DIN EN ISO 9001, DIN EN ISO 14001, DIN EN ISO 50001, CP65	
Fire resistance	BS 5852 Part 2, CAL117	
Delivery form	Mats, wadding, etc.	
Texture	soft, fibrous	
Color	Available in all colors	

<b>Life cycle assessment data Comparative material for PE wadding (no data available) - PE nonwoven (GER)</b>		9
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<b>Resource input per kg</b>	<b>A1-A3</b>	
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Total non-renewable primary energy (PENRT)	22 MJ	8
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Use of freshwater resources (FW)	0,00252 m <sup>3</sup>	10
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<b>Environmental impact per kg</b>	<b>A1-A3</b>	
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Global Warming Potential (GWP)	0,73 Kg CO <sub>2</sub> -eqv.	8
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<b>Environmental impact Transport, per 1000 kgkm (approx. 0.5 kg/m<sup>2</sup>)</b>		6,5
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<b>Production site: Germany/ZEITRAUM</b>		
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<b>Truck - ca. 500 km</b>	A4	10
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Total non-renewable primary energy (PENRT)	430,3 MJ	
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Use of freshwater resources (FW)	0,030265 m <sup>3</sup>	
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Global Warming Potential (GWP)	32,055 Kg CO <sub>2</sub> -eqv.	
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<b>Main raw material origin: n.a./production site</b>		3
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<b>n.a. - ø &gt; 7000 km</b>	A4	
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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 (> 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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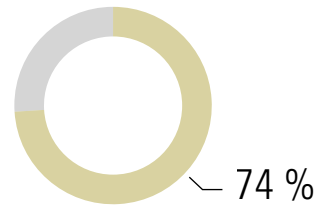
<sup>14</sup> BMI 2021: Oekobaudat. Database <[https://www.oekobaudat.de/no\\_cache/en/database/search.html](https://www.oekobaudat.de/no_cache/en/database/search.html)> Accessed, on 10/27/2021

<sup>15</sup> MATERIALARCHIV (2019) - Materialarchiv <<http://www.materialarchiv.ch/app-tablet/#search>> Accessed, on 03/01/2019

Socially compatible	Yes	9
<b>Total average rating</b>		<b>7,08</b>
<b>Resistance to dirt</b>	Not sensitive to dirt	
<b>Properties</b>		
Density	1380 kg/m <sup>3</sup>	
Acid resistance	Conditionally resistant to organic and mineral acids	
Moisture absorption	0,2 to 0,5 %	
<b>Thermal properties</b>		
Softening temperature Vicat	ca. 230 °C to 240 °C	
Melting point/range	250 °C	



## 6 Steel, MORPH LOUNGE/ DINING



**Tab. 6 A:** Material data sheet, steel, MORPH LOUNGE/DINING, general

Material group	Natural material; metals; transition metals
Parts origin	Bavaria, Germany
Occurrence	Worldwide; South America, Western Australia, China and Eastern Europe, Canada
Use	Metal chair frame

**Tab. 6 B:** Material data sheet, steel, MORPH LOUNGE/DINING  
specific<sup>1617</sup>

<b>General description</b>		
Certifications/Information	n.a.	
Emission class (formaldehyde)	Formaldehyde free	
Surface	smooth, hard	
Color	Grey	
<b>Life cycle assessment data Steel profile, (GER)</b>		5,33
<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>		5
<b>Production site: Germany/ZEITRAUM</b>		
<b>Truck ø - ca. 200 km</b>	A4	10
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>		0
<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.	
<b>Sustainability Assessment</b>		

<sup>16</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>17</sup> MATERIALARCHIV (2019) - Materialarchiv <<http://www.materialarchiv.ch/app-tablet/#search>> Accessed, on 03/01/2019



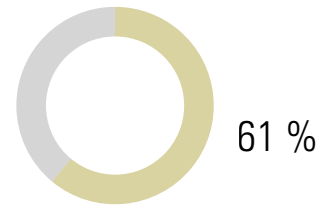
Longevity	Very durable/repairable (> 20 years)	10
Biological reproduction/ recycled material	50 - 60 %	6
Circulation potential	100 % (technological)	10
Socially compatible	Yes	8
<b>Total average rating</b>		<b>7,38</b>

### **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	
<b>Durability</b>	Heat resistant, corrosion and heat resistant	
<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	



## 7 Polyamide



**Tab. 7 A:** Material data sheet, polyamide, general<sup>18</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>18</sup> KALWEIT A. (2012) - Handbook of technical product design - materials and manufacturing. Berlin: Springer Verlag

**Tab. 7 B:** Material data sheet, polyamide, specific<sup>1920</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
Use of freshwater resources (FW)	0,04378 m <sup>3</sup>	10

**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	
Use of freshwater resources (FW)	0,03194 m <sup>3</sup>	
Global Warming Potential (GWP)	44,845 Kg CO <sub>2</sub> -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 <sup>3</sup>	
Global Warming Potential (GWP)	627,83 Kg CO <sub>2</sub> -eqv.	

**Sustainability Assessment**

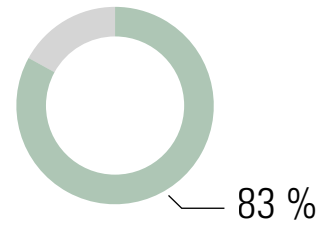
Longevity	Very durable (> 20 years)	8
Biological reproduction/ recycled material	0 %	0
Circulation potential	100 % (technological)	10
Socially compatible	Yes	9
<b>Total average rating</b>		<b>6,08</b>

**Processing**<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

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	



## 8 Osmo, hard wax oil



**Tab. 8 A:** Material data sheet, Osmo, hard wax oil, general<sup>2122</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>21</sup> KALWEIT A. (2012) - Handbook of technical product design - materials and manufacturing. Berlin: Springer Verlag

<sup>22</sup> Osmo (2019) - Osmo Hard Wax Oil 3032 satin, 3062 matte <<https://www.osmo.de>> Accessed, on 03/02/2019

**Tab. 8 B:** Material data sheet, Osmo, hard wax oil, specific<sup>2324</sup>

**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)	

<b>Life cycle assessment data hard wax oil (GER)</b>		<b>5</b>
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<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>
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<b>Production site: Germany/ZEITRAUM</b>		
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<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>		
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<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>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

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

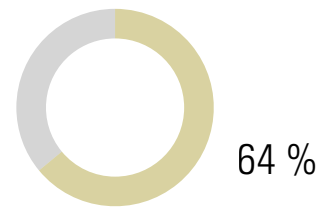
Density	0,89 g/cm <sup>3</sup>	
Viscosity	Thixotropic, creamy	
Consistency	Medium viscosity	
Moisture resistance	Good	

### 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)



## 9 PVAc dispersion adhesive, D3



**Tab. 9 A:** Material data sheet, PVAc dispersion adhesive, D3, general<sup>25,26</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>25</sup> KALWEIT A. (2012) - Handbook of technical product design - materials and manufacturing. Berlin: Springer Verlag

<sup>26</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. 9 B:** Material data sheet, PVAc dispersion adhesive, D3, specific<sup>2728</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
Use of freshwater resources (FW)	0,00758 m <sup>3</sup>	10

**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**

**Truck - ca. 200 km 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: 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 <sup>3</sup>	
Global Warming Potential (GWP)	627,83 Kg CO <sub>2</sub> -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

<sup>27</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>28</sup> 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	
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**Properties**

Density	1,1 g/cm <sup>3</sup>	
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PH level	3	
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Consistency	Medium viscosity	
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Moisture resistance	D3	
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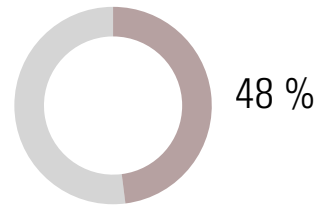
Heat resistance	Up to 120 °C	
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**Notes**

PVAc adhesive is available solvent-free and solvent-based	
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## 10 PUR adhesive



**Tab. 10 A:** Material data sheet, PUR adhesive, general<sup>2930</sup>

Material group	Synthetic material; adhesives; polyurethane adhesives
Name	Polyurethane-Adhesive (GB, US); Polyurethan Klebstoff (D);
Manufacturer	beko GmbH
Manufactured in	Germany (GER)
Version	Fibcon 15
Use	Furniture construction, or similar; joining wood, ODB, MDF, chipboard, fiberboard, coated board, natural stone, artificial stone, concrete, acrylic, ceramics, gypsum board, foam (EPS), rigid foam, insulation, etc.; Indoor and outdoor

<sup>29</sup> KALWEIT A. (2012) - Handbook of technical product design - materials and manufacturing. Berlin: Springer Verlag

<sup>30</sup> Beko (2019) - Fibcon 15, Beko <[https://www.beko-group.de/Produkte/\(location\)/1415-260-100-501-Fibcon-PU-Fiber-Glue](https://www.beko-group.de/Produkte/(location)/1415-260-100-501-Fibcon-PU-Fiber-Glue)> Accessed, on 03/02/2019

**Tab. 10 B:** Material data sheet, PUR adhesive, specific<sup>3132</sup>

**General description**

Certifications/Information	n.a.	
Emission class (formaldehyde)	Formaldehyde-free, no volatile components	
Delivery forms	Liquid, viscous	
Color	Yellowish	
Texture	Glossy	
Smell	Low smell	

<b>Life cycle assessment data Polyurethane-based adhesives and sealants, unfilled/solvent-free, polyol-containing (GER)</b>		0
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<b>Resource input per kg</b>	<b>A1-A3</b>	
Total non-renewable primary energy (PENRT)	119 MJ	0
Use of freshwater resources (FW)	2,68 m <sup>3</sup>	0

<b>Environmental impact per kg</b>	<b>A1-A3</b>	
Global Warming Potential (GWP)	5,87 Kg CO <sub>2</sub> -eqv.	0

<b>Environmental impact Transport, per 1000 kgkm</b>		6,5
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<b>Production site: Germany/ZEITRAUM</b>		
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<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.	

<b>Main raw material origin: n.a./production site</b>		
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<b>n.a. - ø &gt; 7000 km</b>	A4	3
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.	

**Sustainability Assessment**

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

<sup>31</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>32</sup> MATERIALARCHIV (2019) - Materialarchiv <<http://www.materialarchiv.ch/app-tablet/#search>> Accessed, on 03/01/2019

Socially compatible	Yes	9
<b>Total average rating</b>		<b>4,75</b>

**Processing**

Adhesion	With brush, spatula	
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**Properties**

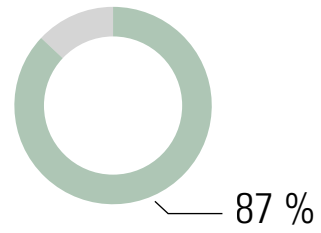
Durability	6 months	
Wood moisture	8 - 18	
Consistency	Medium viscosity	
Moisture resistance	Indoor and outdoor	
Heat resistance	- 40 to 120 °C	

**Notes**

Fiber-reinforced, with "reinforcement", waterproof bonding, resistant to weathering and aging, solvent-free, resistant to many chemicals; can probably cause cancer



## 11 Cardboard, chairs



**Tab. 11 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. 11 B:** Cardboard chairs, specific<sup>3334</sup>

**General description**

Certifications/Information	ISO 9001, ISO 50001, DIN ISO 22000, DIN EN ISO 14001, EMAS, ISO 28000;2007, FSC	
Color	Brown	
Texture	matt	
<b>Contents</b>		
85 %	Recycled paper	
15 %	Primary raw material	
<b>Life cycle assessment data „Kraftpapier“ (GER)</b>		<b>10</b>
<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.	
<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: Germany, Central Europe/Production site</b>		
<b>Truck - ca. 1500 km</b>	A4	<b>8</b>
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	Moderately durable/repairable (< 10 years)	<b>4</b>
Biological reproduction/ recycled material	85 %	<b>9</b>

<sup>33</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>34</sup> MATERIALARCHIV (2019) - Materialarchiv <<http://www.materialarchiv.ch/app-tablet/#search>> Accessed, on 03/01/2019

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



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

**[www.zeitraum-moebel.com](http://www.zeitraum-moebel.com)**

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**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.