Building/Material resource passport

The construction sector accounts for around 50% of material resource consumption and 55% of the waste generated in Germany. At the same time, raw materials are becoming increasingly scarce, and the CO2 emissions associated with the production of new materials are often higher than when recycled materials are used.

The future lies in closed material cycles and a fundamental rethink regarding resource usage. The goal is to reduce the use of building materials before reusing or recycling them, or even disposing of them, which would result in the loss of these resources.

Building materials should be given an identity: It must be clear which materials are used in which buildings. This transparency transforms cities into the urban mines of the future and lays the foundation for an effective circular economy.

The building resource passport with the goal of "transparency" for a sustainable future

The building resource passport concept is similar to the energy performance certificate and aims to create the necessary transparency to optimize resource usage during renovation, demolition, or urban mining – **This passport serves as the foundation for a consistent circular economy.**

The **Deutsche Gesellschaft für Nachhaltiges Bauen** (DGNB) has developed a comprehensive building resource passport based on existing approaches such as Concular, Madaster or the Circularity Design Toolkit. It comprises six overarching areas with 25 sub-aspects and a total of 256 parameters that consider the building, layer, and component levels. It provides information on building parameters such as the materials used, the origin of the materials, construction and demolition waste, CO2 emissions over a lifecycle of 50 years, flexibility of the building structure, disassembly capability, material recycling potential and circularity. In addition, information is also provided on documentation.

Benefits for the construction industry, its stakeholders and future generations

For **building owners**, the building resource passport offers transparency regarding the materials used and their environmental impact. It provides a basis for reducing costs in the long term through clever material selection and reuse, and for increasing the property's value retention. Built-in materials are the capital of the future.

Architects benefit from clear information about material properties and origin, which helps them to plan sustainable and flexible structures. The passport also supports compliance with legal requirements and identifies materials that are particularly suitable for sustainable and future-oriented buildings.

The resource passport creates efficiency and clarity for **processors of building materials**. By using materials that can be easily dismantled, separated and reused or recycled, they not only strengthen their company's market position but also contribute to sustainability.

Fural Metalit Dipling Brünsch provides all the necessary information based on the DGNB building resource passport and supplies it with every delivery of goods. This ensures that all parties involved have complete transparency and information regarding the installed metal ceilings and walls.

Using the resource passport signifies a commitment to responsibility – those who use it actively participate in the transition to a circular economy in which resources are conserved and waste is minimized. The consequences of decisions made in the construction industry become tangible, fostering a sustainable future where buildings serve not only as living spaces but also as valuable material banks.

Not yet assessable: fire protection and expanded metal systems, profiles or purchased parts (mineral wool, etc.)

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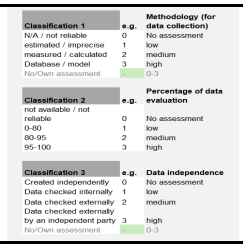
FURAL METALIT DIPLING BRUNSCH

INPUT VALUES Metal ceiling systems made of aluminium

BUILDING RESOURCE PASSPORT – VERSION 1.2.1 – JANUARY 2025

+ INFORMATION CONSTRUCTION

No.	Contents for Building Resource Passport	Data/input	[Unit] / method / detail value / definition	Data quality / (explanation)	Index (DQI)	Relevance / completeness	Level of consideration
No. (bold)	**SECTION on output sheet '1-BRP-full/red'** (3-digit no.: 1st digit = section no., 2nd digit = topic no., 3rd digit = serial no.)	Selection field (drop-down list) 'Own description' on 'Drop-down' sheet				Mandatory information (DQI= 0-3; at least N/A to be entered)	Building
No. (normal)	on additional sheets 2-7 (OPTIONAL) (system for no. extensions: digits (1st, 2nd, 3rd etc.) = assigned to the no. as detailed information/indicator; Letters (a,b,c,etc.) = input values at component/layer/product level)	*Input field (for free input)*				Optional information (optional; DQI: - / 0-3 optional)	Component / layer (note: filter hidden) **No input!** (Format template for input values to be determined at component/ layer/ product level)
0	**Project information**						
1	**Building information and masses**				0,00		
108a	Cost group and/or trade/craft and/or assignment to "Functional Components"	*350*		-	-	Optional information	Component / component layer
109a	Reference service life of the component/component layers/product	≥50	*[a]*	-	-	Optional information	Component / component layer
110a	Total mass of the component / product / material or component layer		*[kg]*	measured / calculated	2	Optional information	Component / component layer
120a	Component or component layer	*350 Ceilings, horizontal building structures*		-	-	Optional information	Component /
	m² in delivery call-off		*m²*				
	Total CO2e emissions of the production call-off		*kgCO2e*				
	CO2e emissions/m²		*kgCO2e/m²*				
	CO2e emission savings per m² through greentec steel Edition 600 compared to average steel (worldsteel-LCA)		*kgCO2e/m²*				
2	**Materiality, material origin, harmful substances / pollutants, construction / demolition waste**				1,44		
201	**Materiality of the building**	*Reference to data source EPD;100 [Mass %]*	*[Mass %]*	measured / calculated	2	Mandatory information	Building
201.4	Materiality: Material mix	*4,00*	*[Mass %]*	measured / calculated	2	Mandatory information	Building/component
201.6	Materiality: Metals	*96,00*	*[Mass %]*	measured / calculated	2	Mandatory information	Building/component
201a	Materiality of the component/product or component layer	*100*	*[Mass-%]*	data checked externally	2	Optional information	Component / component layer
211	**Material compatibility [M-%]**	*Free of pollutants*	*Objective / target*	data checked externally by an independent party	3	Mandatory information	Building
211.1	Material compatibility: Objective / target	*100*	*[Mass %]*	data checked externally	2	Optional information	Building/component
211a	Material compatibility of the component / product [Mass %] *	*100*	*[Mass %]*	data checked externally	2	Optional information	Component / component layer
211b	Substances contained according to restrictions according to CLP-VO / REACH-VO	*below threshold*	*Threshold: from 0.1%*	data checked externally by an independent party	3	Optional information	Component / component layer
211c	Hazardous substances (SVHC), of particular concern	*below threshold*	*Threshold: from 0.1%*	data checked externally by an independent party	3	Optional information	Component / component layer
211d	Carc1A/1B	*not present*	*Threshold: from*	data checked externally by an independent party	3	Optional information	Component / component layer
211e	CMR1A/1B	*not present*	*Threshold: from*	data checked externally by an independent party	3	Optional information	Component / component layer
211h	Heavy metals	*not present*	*Threshold: from*	data checked externally	2	Optional information	Component / component layer
211i	Halogens	*not present*	*Threshold: from*	data checked externally	2	Optional information	Component / component layer
211j	Volatile / semi-volatile organic compounds (VOC, SVOC) , incl. org. solvents	*below threshold value according to AgBB 2018*	*Threshold: from*	data checked externally by an independent party	3	Optional information	Component / component layer
211l	Fire retardant	*present in the acoustic fleece, 0.2 % of the total system weight; cassettes without acoustic fleece do not contain fire retardants*	*Threshold: from 0.1%*	data checked externally	2	Optional information	Component / component layer
211m	Formaldehyd	*below threshold*	*Threshold value: from 60 micrograms/m³*	data checked externally	2	Optional information	Component / component layer
212	Pollutant input based on use (of hazardous/harmful substances and pollutants)	*not to be expected*	*Other information/source*	Created independently	0	Mandatory information	Building/component
221	**Material origin –** Pre-use circularity	*Reference to data source; Declaration of the material suppliers;100 Mass %]*	*[Mass %]*	measured / calculated	2	Mandatory information	Building
221.3	Material origin: Recycled, closed loop	*21*	*[Mass %]*	measured / calculated	2	Mandatory information	Building/component
221.4	Material origin: Recycled, open-loop	*4*	*[Mass %]*	measured / calculated	2	Mandatory information	Building/component
221a	Material origin - pre-use circularity (implemented)	*21*	*[Mass %]*	measured / calculated	2	Optional information	Component / component layer
221c	Post-consumer recycled content	*4*	[Mass %]	data checked externally	2	Optional information	Component / component layer
232b	Indication of whether component / material is "inhibiting post-use circularity" due to the pollutants/risks/impurities it contains	*Nein*	*Metal ceiling tiles can be recycled without any problems.*	data checked externally	2	Optional information	Component / component layer
241	**Construction and demolition waste** (of the building measure under	*Reference to data source EPD;100 [Mass %]*	*[Mass %]*	database / model	3	Mandatory information	Building/component
241.2	C&D waste: Recycling, closed-loop	*98,00*	*[Mass %]*	database / model	3	Optional information	Building/component
241.7	C&D waste: Energy recovery, Non-	*2,00*	*[Mass %]*	database / model	3	Optional information	Building/component

3	**Environmental impact over the life cycle**				2,14		
301	Building-related greenhouse gas emissions	*1,94*	*[kgCO2e/kg ceiling]*	database / model	3	Mandatory information	Building/component
301.1	Production [A1-A3]	*8,63*	*[kgCO2e/kg ceiling]*	database / model	3	Mandatory information	Building/component
301.4	Disposal / waste [C3, C4]	*0,04*	*[kgCO2e/kg ceiling]*	database / model	3	Mandatory information	Building/component
301.5	Recycling potential [D1]	*-6,73*	*[kgCO2e/kg ceiling]*	database / model	3	Mandatory information	Building/component
301a	Greenhouse gas emissions of the component / product / material *	*1,94*	*[kgCO2e/kg ceiling]*	data checked externally by an independent party	3	Optional information	Component
311	Primary energy demand (non-renewable) of the building*	*31,30*	*[MJne/kg ceiling]*	database / model	3	Optional information	Building
311.1	Production [A1-A3]	*118,00*	*[MJne/kg ceiling]*	database / model	3	Optional information	Building/component
311.5	Recycling potential [D1]	*-86,70*	*[MJne/kg ceiling]*	database / model	3	Optional information	Building/component
311a	Primary energy demand (non-renewable) of the component	*118,16*	*[MJne/kg ceiling]*	database / model	3	Optional information	Component
323	Applied life cycle assessment method:	*The LCA considers the system boundaries "from the cradle to the grave" and follows the modular structure according to /EN 15804/. Data from the member companies of TAIM e.V. from the production year 2017 was collected and used to model the life cycle for the manufacture of metal ceiling systems made of steel. All other relevant background data was taken from the database /GaBi 8:2018/. All relevant input and output flows were taken into account for the Life Cycle Inventory. The representativeness and data quality can be classified as good.*	*30.01.2019*	data checked externally by an independent party	3	Mandatory information	Building/component
323b	EPD (Environmental Product Declaration) available	*TYP III nach ISO 14025 und EN 15804*	*(Typ / Klassifikation)*	-	-	Optional information	Component / component layer
4	**Flexibility and adaptability of the building structure**				0,00		
5	**Detachability, separability, material recovery and circularity assessment**				1,43		
502a	Evaluation of the dismantling capability of component / layer / product (qualitative)	*Yes, optimized, process: no*	*Reference to source*	database / model	3	Optional information	Component / component layer
503	Detachability (qualitative classification according to structural levels)	Fully detachability	Exact determination	database / model	3	Mandatory information	Building/component
503.3	3: Interior fittings (CG340-390)	*yes*	*100,00 %*	database / model	3	Mandatory information	Building/component
504	Detachable mass (mass-based quotas)	*100,00*	*[Mass %]*	measured / calculated	2	Mandatory information	Building/component
504.1	Detachability: Optimised	*100,00*	*[Mass %]*	measured / calculated	2	Optional information	Building
511	Product performance data is available for all components*	*Complete*		measured / calculated	2	Optional information	Building/component
511a	(Access to) Product performance data (data sheets, technical description, ...)	*Yes - www.fural.com*	*Reference to source*	data checked externally	2	Optional information	Component
511b	Product design to increase service life	*Yes*	*Reference to source*	data checked externally	2	Optional information	Component
511c	Ease of maintenance and repair: no maintenance or repair required	*Yes*	*Reference to source*	data checked externally	2	Optional information	Component
511d	Ease of maintenance and repair: maintenance/repair possible during use	*Yes*	*Reference to source*	data checked externally	2	Optional information	Component
511e	Ease of maintenance and repair: Maintenance/repair by untrained personnel at the installation site possible	*Yes*	*Reference to source*	data checked externally	2	Optional information	Component
511f	Ease of maintenance and repair: Maintenance/repair by trained personnel at the installation site possible	*Yes*	*Reference to source*	data checked externally	2	Optional information	Component
511g	Ease of maintenance and repair: Replacement of consumables possible	*No consumable material included*	*Reference to source*	data checked externally	2	Optional information	Component
511h	Information on upgradability / refurbishment	*Yes*	*Reference to source*	data checked externally	2	Optional information	Component
511i	Information on ease of cleaning	*Yes - www.fural.com, Cleaning instructions*	*Reference to source*	data checked externally	2	Optional information	Component
511j	Information on accident risks and safe use	*Yes - www.fural.com, User guidelines*	*Reference to source*	data checked externally	2	Optional information	Component
511k	Product services (e.g. leasing, Product as a Service (PaS))	*in progress*	*Reference to source*	data checked externally	2	Optional information	Component
521	**Material separability** (qualitative classification of building)	*Completely materially separable*	*Reference to source*	data checked externally by an independent party	3	Mandatory information	Building/component
521a	Evaluation of the material separability of component / layer / product has taken place (qualitative)	*Yes, all products can be detached from each other using screw connections or plug-in clips.*	*Reference to source*	measured / calculated	2	Optional information	Component / component layer
522	Material separability (qualitative classification according to structural levels)	Completely materially separable	Determination	measured / calculated	2	Mandatory information	Building/component
522.3	3: Interior fittings (CG340-390)	*yes*	*100,00 %*	measured / calculated	2	Mandatory information	Building/component
522a	Connection of the components/layers, each with indication of fastener	*Components are screwed or riveted together. Acoustic fleece is glued into the cassette with hot-melt adhesive*		data checked externally	2	Optional information	Component / component layer

522b	Description of the connections actually made within the component and, if necessary, coatings and joining techniques for other components or aggregated information on 'dismantling costs'	*Yes*	*Reference to source: www.fural.com*	data checked externally	2	Optional information	Component / component layer
522c	Information/instructions for non-destructive disassembly and for the separation of the component by type available	*Yes*	*Reference to source: www.fural.com*	data checked externally	2	Optional information	Component
523	Separable mass (mass-based quotas)	*100,00 %*	*[Mass %]*	measured / calculated	2	Mandatory information	Building/component
523.1	Separability: Optimised	*100*	*[Mass %]*	measured / calculated	2	Optional information	Building/component
531	**Material recovery** - post-use circularity (potential)	*Reference to data source EPD;100 [Mass %]*	*[Mass %]*	database / model	3	Mandatory information	Building/component
531.2	Material recovery: Recycling, closed-loop	*98*	*[Mass %] per secondary*	database / model	3	Mandatory information	Building/component
531.7	Material recovery: Energy recovery, Non-renewable	*2*	*[Mass %] per secondary use*	database / model	3	Mandatory information	Building/component
531a	Material recovery - post-use circularity (potential) for component / product / material	*98*	*[Mass %]*	database / model	3	Optional information	Component / component layer
531b	Indication of whether a take-back system / collection system is available, e.g. from the manufacturer / industry association (perspective today: future state of the art)	*Yes*	*Reference to source*	data checked externally by an independent party	3	Optional information	Component / component layer
531c	Component/product is biodegradable	*No*	*Reference to source*	data checked externally	2	Optional information	Component
531d	Component/product is designed for composting in a home composter	*No*	*Reference to source*	data checked externally	2	Optional information	Component
531e	Component/product is designed for composting in an industrial plant	*No*	*Reference to source*	data checked externally	2	Optional information	Component
531f	Component/product has been specially designed to be able to carry out maintenance measures for the purpose of extending the service life	*Yes*	*Reference to source*	data checked externally	2	Optional information	Component
531g	Component/product has been specially designed to be upgraded to the current state of the art	*Yes*	*Reference to source*	data checked externally	2	Optional information	Component
531h	Manufacturers/industry association offers collection system to collect products after the end of use	*Yes*	*Reference to source*	data checked externally	2	Optional information	Component
531i	Manufacturer/industry association offers collection system set up to collect construction site offcuts or opening	*Yes*	*Reference to source*	data checked externally	2	Optional information	Component
532a	Material recovery – post-use circularity (potential) for component / product / material (future state of the art)*	*Reuse, recycling, closed cycle*	*Reference to source*	database / model	3	Optional information	Component / component layer
541a	Product with a long service life*	*Yes*	*Reference to source*	data checked externally	2	Optional information	Component /
6	**Documentation**				**0,00**		