JUMBO BLOCK FOOTPRINT

Carbon footprint and life-cycle comparison



Manual · Version 1.1.0
November 2026
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1. Overview

FOOTPRINT determines the global warming potential (GWP, in kg CO_2 equivalent) of a JUMBO BLOCK installation over its entire life cycle and compares it with a plastic crate system of the same usable volume. It is based on EN 15978 (assessment of buildings and construction works) and on environmental product declarations per EN 15804.

The program runs entirely offline in the browser – also directly from a USB stick (`file://`). It transmits no data; all characteristic values are stored in the program.

- **Quantities from the structural analysis:** concrete and steel of every component come from the STATIC steel and material schedule, not from estimates.
- **Functional installation:** the crate system is calculated with all layers the manufacturer requires for its function – sealing or filter nonwoven, minimum soil cover and bedding.
- **Two result levels:** a realistic result with equivalent, evidenced assumptions for both systems, and a conservative lower bound in which all open assumptions favour the crate system.
- **Evidence, not claims:** every characteristic value is shown with source, version and validity in the program and in the report, every system boundary with its reason.

> FOOTPRINT is a comparative calculation per EN 15978 based on environmental product declarations. It is not an environmental product declaration (EPD) and not an independently verified life-cycle assessment. The result applies to the calculated project and is not a statement about individual products or manufacturers.

2. Workflow

1. **Plan the installation** in Hydro, Plan and Design. In Plan, select the appropriate **sealing mode** (see section 3).
2. **Run the structural analysis** in STATIC version 12.3.0 or later and export the project.dbm after a completed solver run.
3. **Import the project.dbm** into FOOTPRINT (section *1 · Data exchange*).
4. **Check the status messages** – import, hash status and STATIC quantities must be green.
5. **Set the inputs** – joint width, transport chain, service life and application.
6. **Read the result** – comparisons, life-cycle stages and system boundaries.
7. **Create the PDF report.**
8. **Export the project.dbm** – inputs and results are written to the project file.

> All inputs are recalculated immediately. There is no save function in the program – saving is done by exporting the project.dbm.

3. Data exchange and prerequisites

With **Import project.dbm** you select the project file of the suite. FOOTPRINT reads the quantities and project data from it and, on export, writes exclusively to its own `footprint_*` area. All values of other programs remain unchanged.



Fig. 1: Data exchange with status messages after import

Message	Meaning
project.dbm imported successfully	The file could be read.
Hash status: clean	The shared project hash (SHA-256) matches – the file is unchanged since the last export.
Hash mismatch detected	The file was modified outside the suite. The calculation runs; the report shows the hash as not valid.
STATIC quantities available	The quantities from STATIC (12.3.0 or later) are present. FOOTPRINT does not calculate without them.
On-site foundation detected	STATIC has verified the foundation as a slab; it can optionally be included.

What FOOTPRINT reads from the project.dbm

Source	Use
STATIC – quantities (`staticResults_quantities_*`)	Count, concrete (m^3) and steel (kg) for modules, cover, side and floor slabs and the on-site foundation; reinforcement details.
STATIC – soil cover	Soil cover of the JUMBO BLOCK installation for the excavation.
Plan – usable volume, excavation, footprint area, grid	Reference size of the crate system, JUMBO BLOCK excavation, aspect ratio of the crate system.
Plan – joint length incl. reserve	Sealant quantity SABA Ecoseal Bio HM.
Plan – sealing mode	Application retention or infiltration.
Project	Project name, location, organisation for interface and report.

Sealing mode and floor slabs

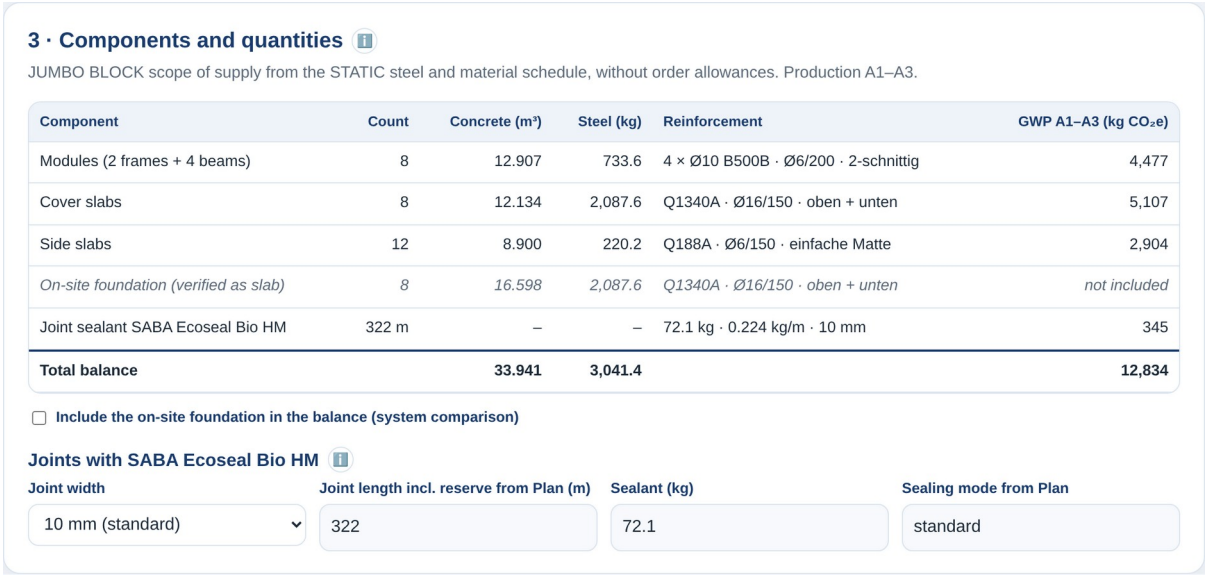
The application is derived from the sealing mode in Plan:

- **Standard sealing** – retention. Joints are sealed with SABA Ecoseal; the crate system is calculated as sealed.
- **Infiltration without bonding** – the standard case for infiltration, 0 m of joints. Side slabs are bolted, there is no nonwoven.
- **Infiltration with bonding** – infiltration with the joint length determined in Plan.

For infiltration, JUMBO BLOCK has no floor slabs. Set the number of floor slabs to 0 manually in STATIC and recalculate before importing the project.dbm into FOOTPRINT. Strip foundations are usually provided on site.

4. Components, quantities and joints

Section *3 · Components and quantities* shows the JUMBO BLOCK scope of supply with concrete, steel, reinforcement and the global warming potential of production (A1–A3) per component. The quantities come from the STATIC steel and material schedule, without order allowances – the environmental product declarations already include plant losses.



3 · Components and quantities

JUMBO BLOCK scope of supply from the STATIC steel and material schedule, without order allowances. Production A1–A3.

Component	Count	Concrete (m³)	Steel (kg)	Reinforcement	GWP A1–A3 (kg CO_2e)
Modules (2 frames + 4 beams)	8	12.907	733.6	4 × Ø10 B500B · Ø6/200 · 2-schnittig	4,477
Cover slabs	8	12.134	2,087.6	Q1340A · Ø16/150 · oben + unten	5,107
Side slabs	12	8.900	220.2	Q188A · Ø6/150 · einfache Matte	2,904
On-site foundation (verified as slab)	*8*	*16.598*	*2,087.6*	*Q1340A · Ø16/150 · oben + unten*	*not included*
Joint sealant SABA Ecoseal Bio HM	322 m	–	–	72.1 kg · 0.224 kg/m · 10 mm	345
Total balance		**33.941**	**3,041.4**		**12,834**

☐ Include the on-site foundation in the balance (system comparison)

Joints with SABA Ecoseal Bio HM

Joint width	Joint length incl. reserve from Plan (m)	Sealant (kg)	Sealing mode from Plan
10 mm (standard)	322	72.1	standard

Fig. 2: Components and quantities with joints

- **Concrete:** all components of the scope of supply are evaluated with the BBW plant mix FB-S 4530 (C40/50, 430 kg/m³ CEM II/A-S 52,5 N). The value is scaled up from an industry EPD for concrete with CEM II/A-S in proportion to the cement content.
- **Reinforcing steel:** generic ÖKOBAUDAT dataset.
- **On-site foundation:** not part of the scope of supply. The checkbox includes it for a system comparison; it is then evaluated as cast-in-place concrete with the industry average.

Joints with SABA Ecoseal Bio HM

The joint length including reserve comes from Plan. Consumption per metre follows from the content of the sausage pack (600 ml), the density (1,400 kg/m³) and the joint length per pack:

Joint width	Joint length per pack	Sealant per m of joint
10 mm (standard)	approx. 3.75 m	0.224 kg/m
15 mm	approx. 2.5 m	0.336 kg/m

10 mm is the standard case because the side slab sits flush with the frame. The sealant is evaluated with the model EPD of the German adhesives association for products based on MS polymer (worst-case product of the group).

5. Life cycle and transport

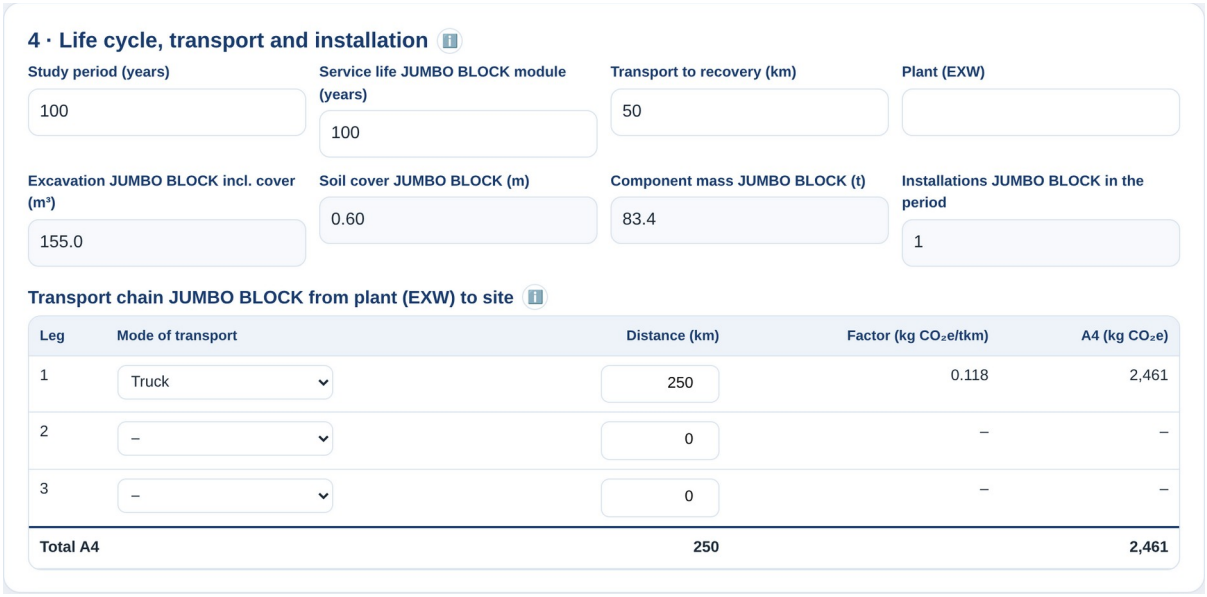


Fig. 3: Life cycle, transport and installation with transport chain

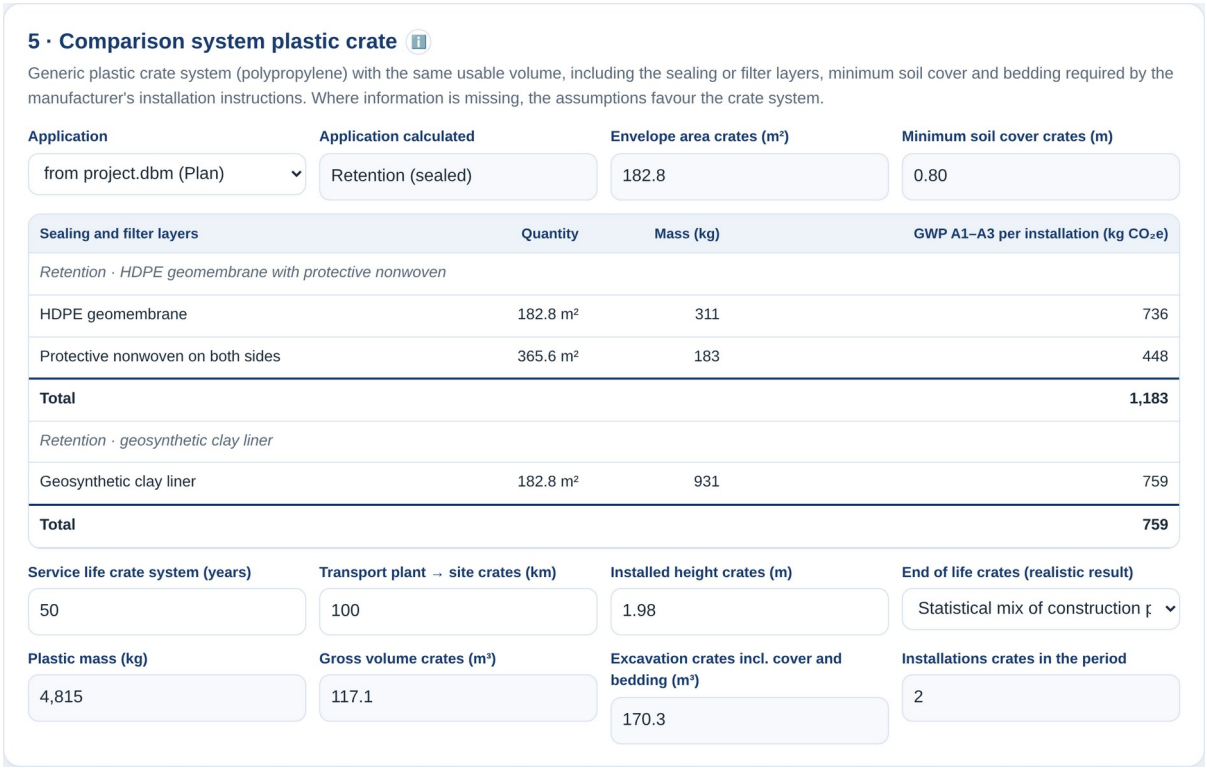
Input	Meaning
Study period	Default 100 years (mean of the service lives for civil engineering structures per EN 1990).
Service life JUMBO BLOCK module	Default 100 years, at most 120 years.
Transport to recovery	Distance to processing at end of life (truck), for both systems.
Plant (EXW)	Name of the plant for the report.
Transport chain	Up to three legs from the plant to the site, each with mode of transport and distance.

Each leg of the transport chain uses the emission factor of its mode of transport including upstream processes per the German Environment Agency (TREMOD): truck, rail freight (average, electric, diesel) or inland waterway vessel. The basis is component mass in tonnes times kilometres. Enter pre- and on-carriage to rail or ship as a separate truck leg.

> Every kilometre from the plant worsens the JUMBO BLOCK balance. Therefore always calculate with the actual supplying plant and transport route.

6. Comparison system plastic crates

The comparison is made with a generic plastic crate system made of polypropylene with the same usable volume – not a specific product of a specific manufacturer.



5 · Comparison system plastic crate

Generic plastic crate system (polypropylene) with the same usable volume, including the sealing or filter layers, minimum soil cover and bedding required by the manufacturer's installation instructions. Where information is missing, the assumptions favour the crate system.

Application	Application calculated	Envelope area crates (m²)	Minimum soil cover crates (m)
from project.dbm (Plan)	Retention (sealed)	182.8	0.80

Sealing and filter layers	Quantity	Mass (kg)	GWP A1–A3 per installation (kg CO_2e)
Retention · HDPE geomembrane with protective nonwoven			
HDPE geomembrane	182.8 m²	311	736
Protective nonwoven on both sides	365.6 m²	183	448
Total			**1,183**
Retention · geosynthetic clay liner			
Geosynthetic clay liner	182.8 m²	931	759
Total			**759**

Service life crate system (years)	Transport plant → site crates (km)	Installed height crates (m)	End of life crates (realistic result)
50	100	1.98	Statistical mix of construction p

Plastic mass (kg)	Gross volume crates (m³)	Excavation crates incl. cover and bedding (m³)	Installations crates in the period
4,815	117.1	170.3	2

Fig. 4: Comparison system with application and sealing layers

Application

The default is *from project.dbm (Plan)*. You can also select retention or infiltration manually. If the selection does not match the sealing mode in Plan, a warning appears in the result; for infiltration against a retention design, FOOTPRINT sets the joints to 0 m.

Case	JUMBO BLOCK	Plastic crates
Retention, liner variant	Floor slabs or on-site foundation, joints with SABA Ecoseal	HDPE geomembrane with protective nonwoven on both sides (500 g/m² each)
Retention, clay liner variant	as above	Geosynthetic clay liner
Infiltration	no floor slabs, side slabs bolted, no joints, no nonwoven	Separation and filter nonwoven on all sides (min. 150 g/m²)

For retention, FOOTPRINT always calculates both sealing variants. The main result uses the one more favourable for the crates.

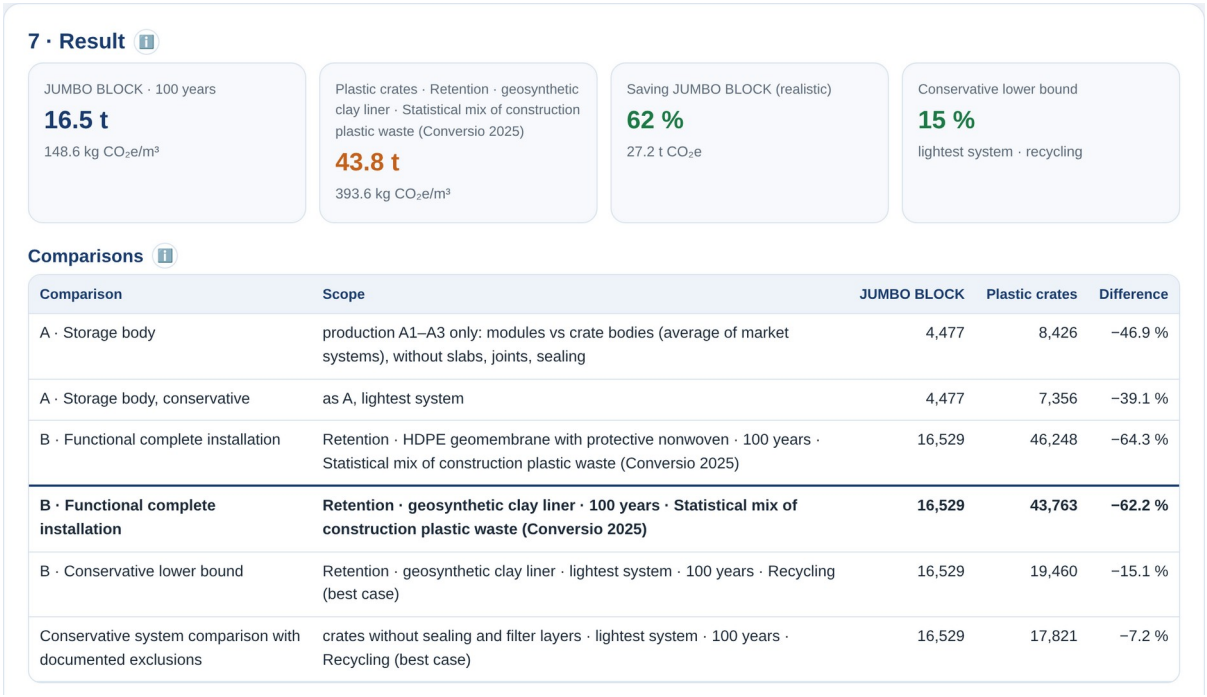
Geometry, soil cover and mass

- **Gross volume** = usable volume / storage coefficient (95 %).
- **Envelope area** from gross volume, installed height and the aspect ratio of the JUMBO BLOCK installation, without overlaps.
- **Excavation** = gross volume + footprint area × (minimum soil cover 0.80 m + bedding 0.10 m) per the installation instructions – independent of the JUMBO BLOCK soil cover.
- **Mass:** realistically the average of several market systems per data sheets (43.3 kg/m³ usable volume), conservatively the lightest system evaluated (37.8 kg/m³).

- **Service life:** 50 years, the maximum of the manufacturer statements. Over 100 years this results in two installations.

7. Result

Section *7 · Result* shows the key figures at the top, followed by all comparisons, the life-cycle stages, the time profile and the end-of-life scenarios.



7 · Result

JUMBO BLOCK · 100 years	Plastic crates · Retention · geosynthetic clay liner · Statistical mix of construction plastic waste (Conversio 2025)	Saving JUMBO BLOCK (realistic)	Conservative lower bound
16.5 t	**43.8 t**	**62 %**	**15 %**
148.6 kg CO_2e/m^3	393.6 kg CO_2e/m^3	27.2 t CO_2e	lightest system · recycling

Comparisons

Comparison	Scope	JUMBO BLOCK	Plastic crates	Difference
A · Storage body	production A1–A3 only: modules vs crate bodies (average of market systems), without slabs, joints, sealing	4,477	8,426	−46.9 %
A · Storage body, conservative	as A, lightest system	4,477	7,356	−39.1 %
B · Functional complete installation	Retention · HDPE geomembrane with protective nonwoven · 100 years · Statistical mix of construction plastic waste (Conversio 2025)	16,529	46,248	−64.3 %
B · Functional complete installation	**Retention · geosynthetic clay liner · 100 years · Statistical mix of construction plastic waste (Conversio 2025)**	**16,529**	**43,763**	**−62.2 %**
B · Conservative lower bound	Retention · geosynthetic clay liner · lightest system · 100 years · Recycling (best case)	16,529	19,460	−15.1 %
Conservative system comparison with documented exclusions	crates without sealing and filter layers · lightest system · 100 years · Recycling (best case)	16,529	17,821	−7.2 %

Fig. 5: Key figures and comparisons

Two result levels

	Realistic (main result)	Conservative lower bound
Mass of the crates	average of market systems	lightest system evaluated
End of life of the crates	selected scenario, default: statistical mix of construction plastic waste (Conversio 2025)	Recycling
Sealing	variant more favourable for the crates	variant more favourable for the crates

The conservative lower bound answers the question: how much does JUMBO BLOCK save if every open assumption is chosen in favour of the plastic crates?

Comparisons

- **A · Storage body:** production only (A1–A3) of the modules vs the crate bodies – without slabs, joints and sealing. Once with the average, once with the lightest system.
- **B · Functional complete installation:** full life cycle with all components required for the function, per sealing variant. The row in bold is the main result.
- **B · Conservative lower bound:** as B, with the lightest system and recycling.
- **Conservative system comparison with documented exclusions:** as the lower bound, but the crates without sealing and filter layers.

The *Difference* column refers to the crates: −62 % means JUMBO BLOCK causes 62 % less CO_2 than the crates.

Life-cycle stages · comparison B, functional complete installation

Life-cycle stage (kg CO_2e)	JUMBO BLOCK	Crates · Retention · HDPE geomembrane with protective nonwoven	Crates · Retention · geosynthetic clay liner
A1–A3 production (initial)	12,834	9,610	9,185
A4 transport to site	2,461	63	68
A5 installation (excavation)	201	220	220
B1 CO_2 uptake through carbonation	-103	0	0
B4 replacement (0 / 1 replacements)	0	23,124	21,882
C1 deconstruction incl. excavation	313	227	227
C2 transport to recovery	492	31	34
C3–C4 processing / disposal	331	12,973	12,147
Total over 100 years	**16,529**	**46,248**	**43,763**
per m³ usable volume	149	416	394
Information: module D (not offset)	*-46*	*-14,030*	*-13,271*

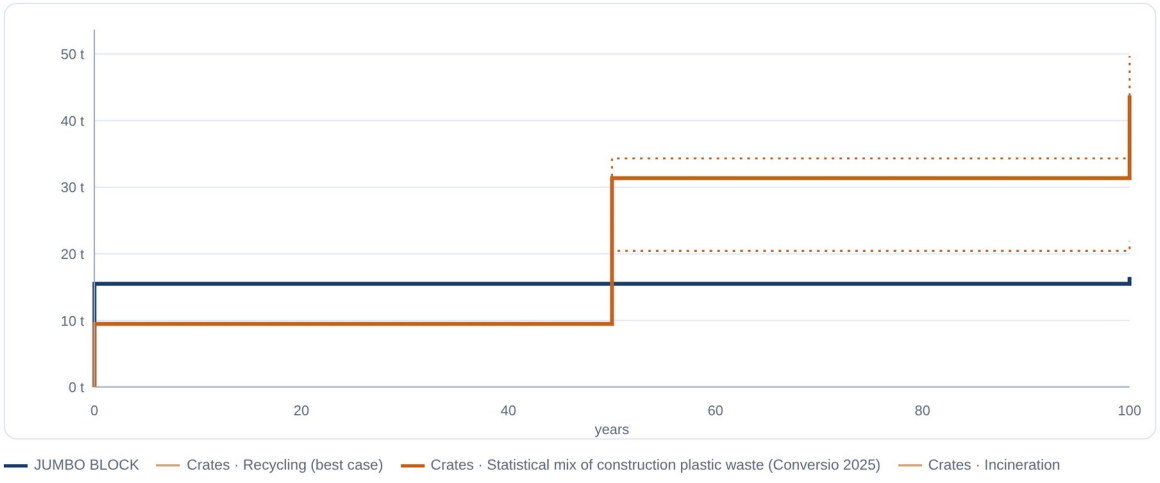


Fig. 6: Life-cycle stages and time profile over 100 years

Life-cycle stages

Module	Content
A1–A3 production	Concrete, steel, sealant (JUMBO BLOCK); polypropylene, sheets and nonwovens (crates).
A4 transport	Transport chain from the plant (JUMBO BLOCK) or truck distance (crates).
A5 installation	Excavation including soil cover and bedding.
B1 carbonation	CO_2 uptake of the concrete per EN 16757 and CEN/TR 17310, with the lowest table value k = 0.2 mm/√a and 80 % clinker.
B4 replacement	Every replacement within the study period with removal, new production and installation.
C1–C4 end of life	Removal with excavation, transport and recovery or disposal.
Module D	Credits beyond the system boundary, declared separately per EN 15804 and not offset.

> In production alone, the plastic crates are ahead. The difference arises over the service life: the crates must be replaced within 100 years, and every replacement causes excavation, disposal, new production and installation again.

End-of-life scenarios of the crates

The table below the chart shows the crates with recycling, with the statistical mix of construction plastic waste and with incineration. There are no separate statistics for removed crates; the mix is based on the recovery rates of plastic waste from construction as a whole.

8. Datasets

Section *6 · Datasets* lists all characteristic values with value, unit, source and validity. Sources with a reference are linked.

- **valid until** (green) – the dataset is valid.
- **expired** (yellow) – the validity has passed; the value continues to be used and is marked in the report.
- **changed** – the value was overridden for this project.

Values can be overridden per project, for example if a supplying plant has its own EPD. Changed values are shown in the report and are part of the input hash. **Default values** resets all inputs and datasets.

> Only change characteristic values with evidence. Every change is visible in the report.

9. System boundaries and comparison method

Section *8 · System boundaries* states for each item whether it is included, excluded or not quantified, with reason and reference. In case of doubt, exclusions favour the crates. The key points:

Item	Treatment
Overlaps of the sheets	excluded – only the envelope area is included (in favour of the crates).
Renewal of joints and sealing layers	excluded for both systems – there is no evidenced service life.
Laying, welding, assembly	not quantified for both systems.
Chippings bedding and sand levelling	excavation included, material not quantified (in favour of the crates).
Manholes, connections, backfilling	excluded for both systems – project-dependent or comparable.
Carbonation after crushing	not included (to the disadvantage of JUMBO BLOCK).

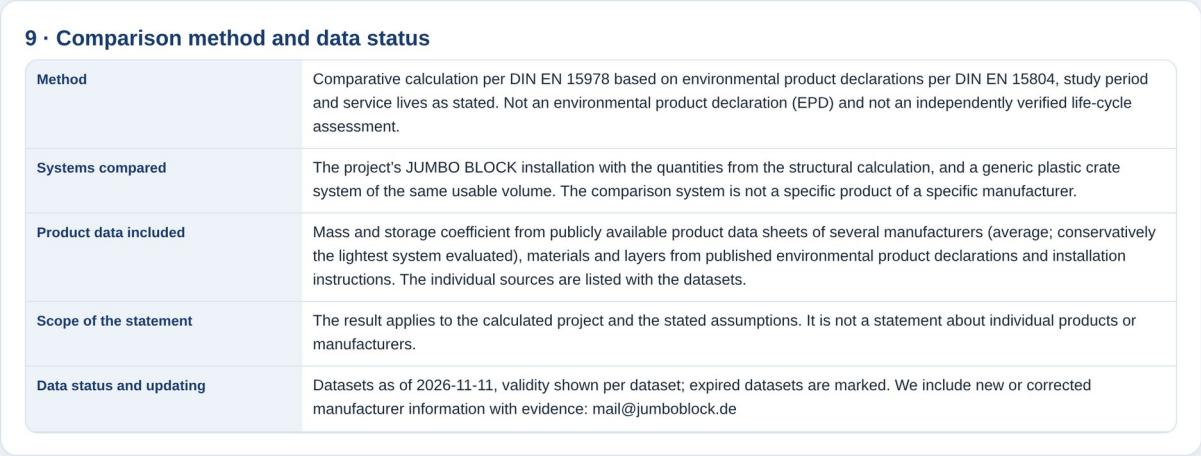
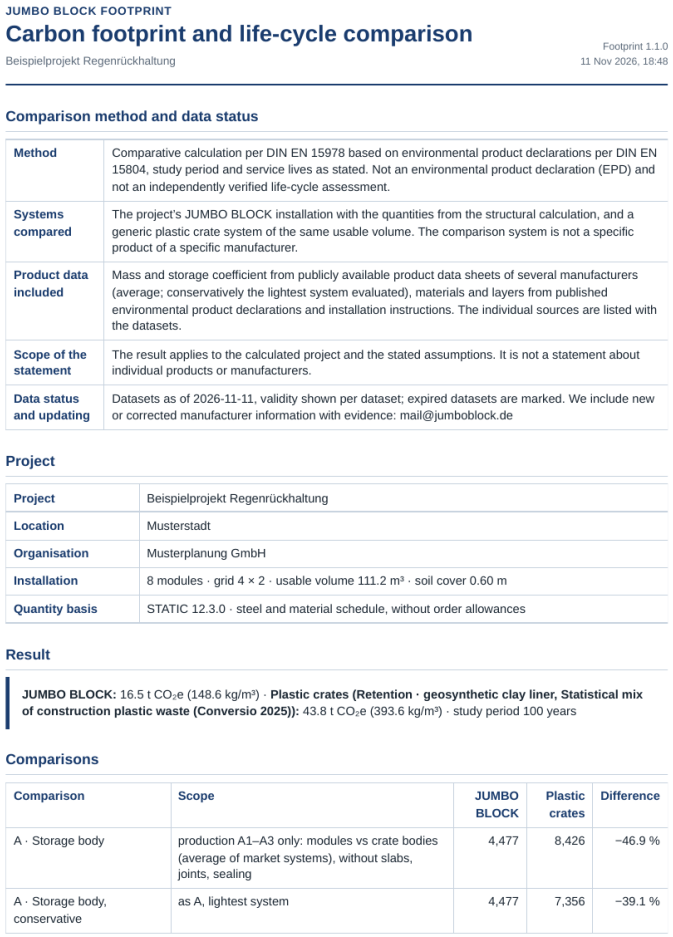


Fig. 7: Comparison method and data status

Section *9 · Comparison method and data status* contains the information that German unfair competition law requires since 27 September 2026 for comparisons of environmental characteristics: method, systems compared, product data included, scope of the statement, and data status and updating. We include new or corrected manufacturer information with evidence via mail@jumboblock.de.

10. Report

PDF report opens the report in A4 format in a new window and starts the browser's print dialog. There it can be printed or saved as PDF. If the browser blocks the new window, allow pop-ups for this page.



JUMBO BLOCK FOOTPRINT

Carbon footprint and life-cycle comparison

Beispielprojekt Regenrückhaltung

Footprint 1.1.0
11 Nov 2026, 18:48

Comparison method and data status

Method	Comparative calculation per DIN EN 15978 based on environmental product declarations per DIN EN 15804, study period and service lives as stated. Not an environmental product declaration (EPD) and not an independently verified life-cycle assessment.
Systems compared	The project's JUMBO BLOCK installation with the quantities from the structural calculation, and a generic plastic crate system of the same usable volume. The comparison system is not a specific product of a specific manufacturer.
Product data included	Mass and storage coefficient from publicly available product data sheets of several manufacturers (average; conservatively the lightest system evaluated), materials and layers from published environmental product declarations and installation instructions. The individual sources are listed with the datasets.
Scope of the statement	The result applies to the calculated project and the stated assumptions. It is not a statement about individual products or manufacturers.
Data status and updating	Datasets as of 2026-11-11, validity shown per dataset; expired datasets are marked. We include new or corrected manufacturer information with evidence: mail@jumboblock.de

Project

Project	Beispielprojekt Regenrückhaltung
Location	Musterstadt
Organisation	Musterplanung GmbH
Installation	8 modules · grid 4 × 2 · usable volume 111.2 m³ · soil cover 0.60 m
Quantity basis	STATIC 12.3.0 · steel and material schedule, without order allowances

Result

> **JUMBO BLOCK:** 16.5 t CO_2e (148.6 kg/m³) · **Plastic crates (Retention · geosynthetic clay liner, Statistical mix of construction plastic waste (Conversio 2025)):** 43.8 t CO_2e (393.6 kg/m³) · study period 100 years

Comparisons

Comparison	Scope	JUMBO BLOCK	Plastic crates	Difference
A · Storage body	production A1–A3 only: modules vs crate bodies (average of market systems), without slabs, joints, sealing	4,477	8,426	−46.9 %
A · Storage body, conservative	as A, lightest system	4,477	7,356	−39.1 %

Fig. 8: First page of the PDF report

The report contains: comparison method and data status, project, result with comparisons, life-cycle stages with chart, scenarios, sealing and filter layers, components and quantities, assumptions, system boundaries, all datasets and the checksums.

11. File and integrity

On export, FOOTPRINT writes only keys with the prefix `footprint_` to the project.dbm and updates the shared project hash. Older `footprint_*` keys are replaced completely.

Area	Content
`footprint_inputs_*`	all inputs (study period, service lives, transport chain, joint width, application, scenario …)
`footprint_datasets_*`	all characteristic values, including those changed for the project
`footprint_results_*`	results: JUMBO BLOCK total, crates per variant and scenario, conservative lower bound, storage bodies, sealant quantity
`footprint_meta_*`	program version, timestamp, input and result hash

The **input hash** (SHA-256) combines program version, inputs, datasets and the quantities read, the **result hash** the results. On re-import, FOOTPRINT checks both: if they match, printout and project state demonstrably belong together. If they differ, the program version, datasets or quantities have changed.

12. Frequently asked questions

Why does FOOTPRINT not calculate?

The STATIC quantities are missing. The project.dbm must be exported from STATIC version 12.3.0 or later after a completed solver run.

Why is production higher for JUMBO BLOCK?

Reinforced concrete has more mass per m³ of storage than plastic. The advantage arises over the service life because the crates must be replaced. This is exactly what comparison A (production only) and comparison B (life cycle) show side by side.

Why are there two result levels?

The realistic result uses equivalent, evidenced assumptions for both systems. The conservative lower bound shows what remains for JUMBO BLOCK in the least favourable case. Both are always shown together in the program and in the report.

May I use the results in tenders and advertising?

Yes, stating the case: for example “realistic” or “in the case most favourable to plastic, at least …”. Always include the report or the comparison method. Do not name manufacturers or products; the comparison system is generic.

What happens with infiltration and floor slabs?

FOOTPRINT calculates the quantities that STATIC supplies. For a correct balance, set the floor slabs to 0 in STATIC and select “infiltration without bonding” in Plan.

Language

The language is switched via the shared menu of the suite (DE / EN). Interface and report follow the selected language.