ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025 and EN 15804:2012+A2:2019

Kattopojat Series Bitumen Sheet

from Ravago



PROGRAMME
The International EPD® System
www.environdec.com

EPD REGISTRATION NUMBER
S-P-10644

PROGRAMME OPERATOR
EPD Turkey

PUBLICATION DATE
2024-01-10

REVISION DATE
2024-05-06

GEOGRAPHICAL SCOPE
Global

VALID UNTIL
2029-01-09

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at: **environdec.com**

PROGRAMME INFORMATION

Programme Information

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Information about verification and reference PCR:

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)

Product category rules (PCR)
PCR: PCR 2019:14 Construction products (EN 15804:A2) Version 1.3.1
and UN CPC code(s) 5453 Roofing and waterproofing services

PCR review was conducted by
The Technical Committee of the International EPD® System. See www.environdec.com/TC for a list of members.
Review chair: Claudia A. Peña, University of Concepción, Chile.
The review panel may be contacted via the Secretariat www.environdec.com/contact.

Independent third-party verification of the declaration and data, according to ISO 14025:2006, via

☐ EPD process verification ☑ EPD verification

Third party verifier
Sunil Kumar
SIPL Pvt Ltd, New Delhi, India

Approved by
International EPD System Technical Commiee,
supported by the Secretariat

Procedure for follow-up of data during EPD validity involes third party verifier:

☐ Yes ☑ No

LCA Study & EPD Design Conduced by

Semtrio Sustainability Consulting
BUDOTEK Teknopark, No 8/27
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EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

COMPANY INFORMATION

Owner of the EPD

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Being one of the historic cornerstones of the Ravago Group, the Ravago Building Solutions (RBS) business has grown from a local Belgian activity in the sixties to a pan-European division dedicated to developing and distributing specialized building & construction solutions across European and Turkish markets.

RBS has invested in its own production activities in insulation, waterproofing, metal profiles for dry construction and finished plastics such as foil, bags, buckets, and pipes. Across a wide range of countries, RBS has its own outlets or access to the local network of dealers serving thousands of customers.

The portfolio includes products for thermal and sound insulation, waterproofing, dry construction, construction chemicals, geosynthetics, façade systems, ETICS, foils and bags. RBS benefits from strategic partnerships with leading brands that have a longstanding expertise in the building material industry.



Production Site

Kocaeli
Arslanbey Organize Sanayi Bölgesi
41285

PRODUCT INFORMATION

Product Name

Kattopojat Series Bitumen Sheet



Bitumen sheets, versatile construction materials for effective waterproofing, are composed of bitumen, calcite, IPP, and SBS modified compounds. Ideal for roofing and sealing, they provide a reliable moisture barrier, demonstrating exceptional adherence, elasticity, and flexibility. Their incorporation of elastomeric polymers enhances resilience to mechanical stress and environmental changes. Recognized for excellent cold bending performance, these sheets are suitable for temperatures from -5°C to -25°C and exhibit high flow resistance from 100°C to +120°C. In summary, bitumen sheets offer a durable solution for structures, ensuring longevity and performance in diverse environmental conditions.

Production

The production of bitumen sheets involves two primary processes. The first process entails preparing the mixture to be applied to the felt. Raw materials such as bitumen, calcite, IPP, and SBS are introduced into the mixers in accordance with specified process conditions. A mixture is then produced at the designated temperature, time, and quantities. Subsequently, the mixture is transferred to holders for the application, dipping, and impregnation processes.

Initially, the mixture is heated to the specified temperature to achieve a softened consistency suitable for application to the felt. Once the mixture attains the appropriate viscosity, the felt is dipped into the mixture. Depending on customer requirements, coating processes are executed using thin polyethylene film, sand, slate, or stone. The final product is cut to specified dimensions, rolled up, automatically arranged on pallets, and subsequently conveyed into the oven. Following the performance of pallet shrink-wrapping, the finished product is then moved to the warehouse.

Intended use of the product

Bitumen sheets, designed for exceptional waterproofing, play a crucial role in roofing and foundation protection. In roofing, they create a robust shield against rain and environmental elements, ensuring structural longevity. As foundational layers, these sheets protect against soil moisture, preserving stability and enhancing construction durability. Their dual functionality underscores their significance in contributing to overall project resilience.

Technical Specification

Kattopojat Series Bitumen Sheet

Property	Test Method
Length	EN 1848-1
Width	EN 1848-1
Mass per unit area	EN 1848-1
Straighness	EN 1848-1
Visible Defects	EN 1850-1
Tensile Resistance MD/CMD	EN 12311-1
Elongation at Break MD/CMD	EN 12311-1
Resistance to Tearing (Nail Method)	EN 12310-1
Shear Resistance of Joint	EN 12317-1
Resistance to Impact (Method A)	EN 12691
Dimensional stability min/max	EN 1107
Flexibility at Low Temperatures	EN 1109
Flow Resistance at High Temperatures	EN 1110
Watertightness (Method B)	EN 1928
Water Vapour Transmission	EN 1931
External Fire Performance	EN 13501-5

UN CPC Code: 5453 Roofing and waterproofing services

LCA Information

Functional unit
1 m^2 of Kattopojat Series Bitumen Sheet manufactured in RBS RAVAGO Manufacturing plant in Kocaeli (TR).

Time representatives
The production data in this LCA study represents the period of 1st January 2022 and 31st December 2022

Database(s) and LCA software used
Ecoinvent v3.7.1 and Simapro v9.2

Description of system boundaries
This EPD covers the Cradle to gate with options, modules C1–C4, module D (A1–A3 + C1-4 + D) stages.

Data quality and data collection
According to EN 15804:2012+A2:2019 specific data was used for module A3 (Processes the manufacturer has influence over) and was gathered from the RBS Ravago manufacturing plant. Specific data includes actual product weights, amounts of raw materials used, product content, energy consumption, transport figures, water consumption and amounts of wastes. Data represents the period from 1st January 2022 and 31st December 2022. For secondary data Ecoinvent v3.7.1 data sets was used. LCA was modelled in SimaPro v9.2.

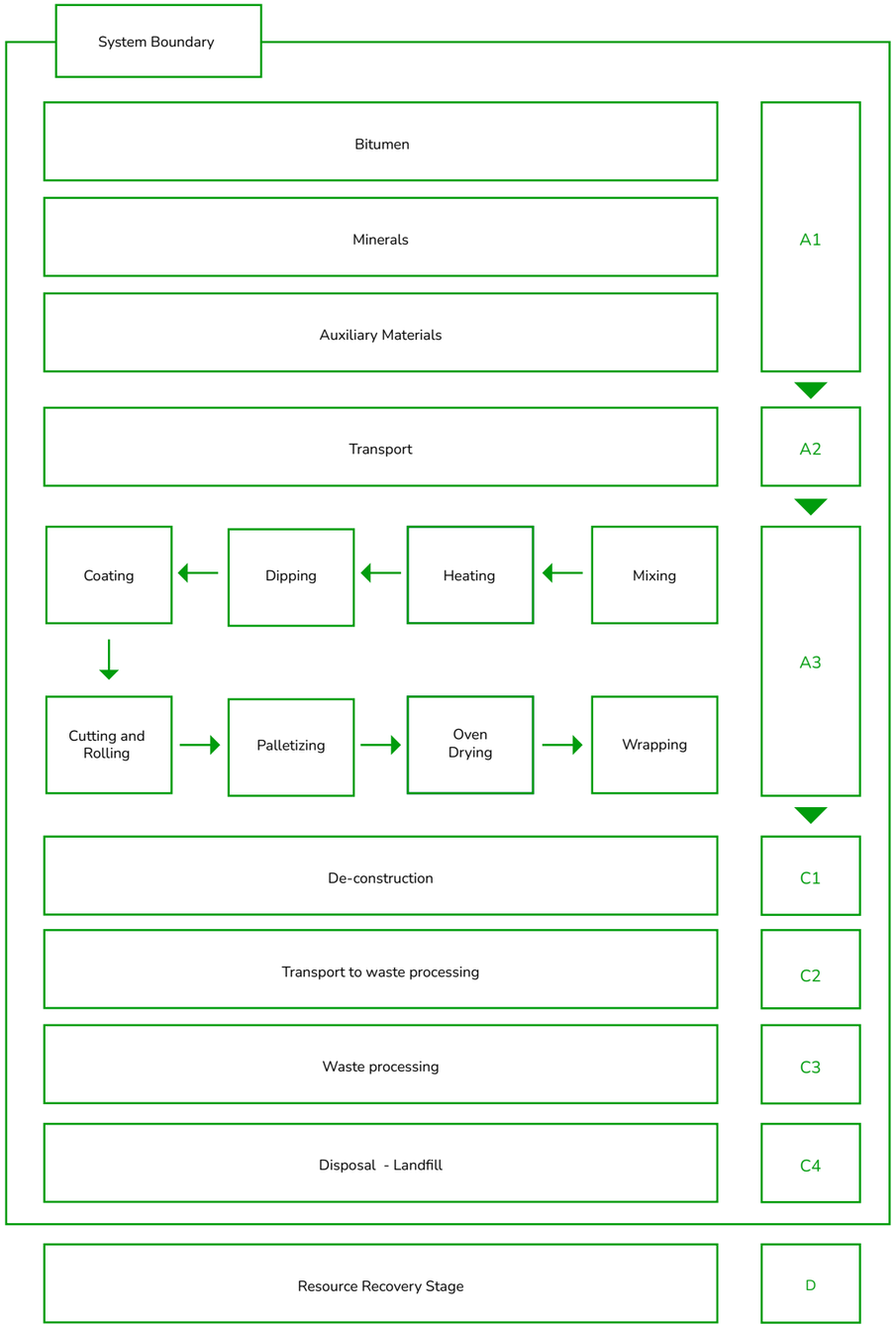
Allocation
The total values for the plant's raw material, energy consumption, water consumption, and waste output over a one-year period have been divided by the annual output of each product to provide a value per kg of steel coil produced.

Cut-off rules
Life Cycle Inventory data for a minimum of 99% of total inflows to the three life cycle stages have been included and a cut-off rule of 1% regarding energy, mass and environmental relevance was applied. Impacts caused by treatment operations have been calculated lower than 1% environmental relevance.

Modules declared, geographical scope, share of specific data (in GWP-GHG indicator) and data variation

	Product Stage			Construction Process Stage		Use Stage							End of Life Stage				Resource Recovery Stage
X Declared *ND Not Declared*	Raw Material Supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintanence	Repair	Replacement	Refurbisment	Operational Energy Use	Operational Water Use	De-construction demolition	Transport	Waste processing	Disposal	Recycling potential
Modules	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules Declared	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	GLO	GLO	TR	–	–	–	–	–	–	–	–	–	GLO	GLO	GLO	GLO	GLO
Specific data used	>99.5%			–	–	–	–	–	–	–	–	–	–	–	–	–	–
Variation-products	Not Relevant			–	–	–	–	–	–	–	–	–	–	–	–	–	–
Variation-sites	Not Relevant			–	–	–	–	–	–	–	–	–	–	–	–	–	–

System Diagram



Description of Raw Materials

A1 - Raw Materials Supply
This module takes into account raw material extraction, processing and energy used in the production process.

A2 - Transport to the Manufacturer
This module includes transportation of the raw materials from supplier to factory gate. Transportation types are considered as seaway and roadway.

A3 - Manufacturing
This module includes energy and water consumption during the manufacturing process. Additionally, packaging materials are covered in this module. Followed production processes are as;

- Mixing
- Heating
- Dipping
- Coating
- Cutting & Rolling
- Palletizing
- Oven Drying
- Wrapping

C1 - De-construction
The common manual dismantling impact of bitumen sheet is considered as very small and can be neglected in C1. Given the scenario that is assumed, environmental impact of de-construction process is not considered in this study.

C2 - Transport to Waste Processing
An average distance of 100 km has been assumed for the transport to sorting facility. Transport is calculated on the basis of a scenario with the parameters described in the attached table.

Parameters C2 Module	
Transport by road	Lorry, >32 metric ton
Distance (km)	100
Database	Ecoinvent v3.7.1

**Technology is Euro 6*



C3 - Waste Processing for Reuse, Recovery and/or Recycling
The material and energy expenses required for Module C3 are negligible. It is assumed that there is no sorting or processing required for bitumen sheet.

C4 - Final disposal
Although bitumen sheet products are partly recycled at their end-of-life, an established collection system does not yet exist. Therefore, the assumption chosen in this study, 100% landfill after the use phase, is the most conservative approach.

D - Reuse. Recovery or Recycling Potential
In this LCA study, it is assumed that 100% of the product is sent to a landfill in the end-of-life section; therefore, none of the product is recovered.

Functional Unit

Name	Value	Unit
Functional Unit	1	m^2
Grammage	0.33	kg/m^2
Conversion factor to 1 kg	2.99	-

Content Declaration

Content Declaration of 1 m2 Kattopojat Series Bitumen Sheet

Product	Bitumen, weight %	Minerals, weight %	Auxiliary Materials, weight %	Renewable material, %	Biogenic carbon, %
Bitumen Sheet	35-40	35-40	20-30	0	0

Content Declaration of Packaging Materials of Kattopojat Series Bitumen Sheet

Product	PE film, weight %	Pallet, weight %	Shrink, weight %	Renewable material, %	Biogenic carbon, %
Bitumen Sheet	1%	<1%	<1%	0	0

Environmental Performance

Potential Environmental Impact

Mandatory Indicators According to EN 15804:2012+A2:2019/AC:2021

Results for 1 m2 of Kattopojat Series Bitumen Sheet							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-fossil	kg CO_2 eq	4.71	0	2.59E-02	0	0.46	0
GWP-biogenic	kg CO_2 eq	-0.10	0	0	0	0.10	0
GWP- luluc	kg CO_2 eq	2.48E-03	0	7.55E-06	0	2.17E-05	0
GWP-total	kg CO_2 eq	4.61	0	2.59E-02	0	0.56	0
ODP	kg CFC11 eq	2.64E-06	0	6.36E-09	0	1.17E-08	0
AP	mol H^+ eq	1.53E-02	0	8.17E-05	0	5.44E-04	0
EP-freshwater	kg P eq	9.35E-05	0	1.94E-07	0	7.01E-07	0
EP- marine	kg N eq	2.64E-03	0	1.83E-05	0	4.07E-04	0
EP-terrestrial	mol N eq	3.03E-02	0	2.03E-04	0	1.28E-03	0
POCP	kg NMVOC eq	1.10E-02	0	7.96E-05	0	4.75E-04	0
ADP-minerals&metals	kg Sb eq	4.26E-05	0	6.35E-08	0	1.44E-07	0
ADP-fossil	MJ	84.2	0	0.42	0	0.90	0
WDP	m^3	1.37	0	1.39E-03	0	3.30E-02	0

Acronmys

GWP-fossil = *Global Warming Potential fossil fuels;* **GWP-biogenic** = *Global Warming Potential biogenic;* **GWP-luluc** = *Global Warming Potential land use and land use change;* **ODP** = *Depletion potential of the stratospheric ozone layer;* **AP** = *Acidification potential, Accumulated Exceedance;* **EP-freshwater** = *Eutrophication potential, fraction of nutrients reaching freshwater end compartment;* **EP-marine** = *Eutrophication potential, fraction of nutrients reaching marine end compartment;* **EP-terrestrial** = *Eutrophication potential, Accumulated Exceedance;* **POCP** = *Formation potential of tropospheric ozone;* **ADP-minerals&metals** = *Abiotic depletion potential for non-fossil resources;* **ADP-fossil** = *Abiotic depletion for fossil resources potential;* **WDP** = *Water (user) deprivation potential, deprivation-weighted water consumption*

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

Potential Environmental Impact

Additional Mandatory and Voluntary Indicators

Results for 1 m2 of Kattopojat Series Bitumen Sheet							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP - GHG[1]	kg CO_2 eq	4.51	0	2.58E-02	0	0.39	0

Results for 1 m2 of Kattopojat Series Bitumen Sheet							
PM	[disease inc.]	1.19E-07	0	2.26E-09	0	6.31E-09	0
IRP	[kBq U235 eq]	0.24	0	1.85E-03	0	3.53E-03	0
ET-freshwater	[CTUe]	57.9	0	0.32	0	1.20	0
HT-cancer	[CTUh]	1.87E-09	0	9.90E-12	0	3.27E-11	0
HT-non-cancer	[CTUh]	4.27E-08	0	3.35E-10	0	9.33E-10	0
SQP	[pt]	26.4	0	0.48	0	1.90	0

Acronmys

GWP-GHG = *Global Warming Potential total excl. biogenic carbon following IPCC AR5 methodology;* **IRP** = *Ionizing radiation, human health;* **ET-freshwater** = *Eco-toxicity (freshwater);* **HT-cancer** = *Human toxicity, cancer effects;* **HT-non-cancer** = *Human toxicity, non-cancer effects;* **SQP** = *Potential soil quality index (SQP)*

1 The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

Use of Resources

Results for 1 m2 of Kattopojat Series Bitumen Sheet							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	4.99	0	5.15E-03	0	1.71E-02	0
PERM	MJ	0	0	0	0	0	0
PERT	MJ	4.99	0	0.01	0	1.71E-02	0
PENRE	MJ	89.9	0	0.45	0	0.96	0
PENRM	MJ	0	0	0	0	0	0
PENRT	MJ	89.9	0	0.45	0	0.96	0
SM	kg	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0
FW	m^3	0.21	0	0	0	0	0

Acronmys

PERE = *Use of renewable primary energy excluding renewable primary energy resources used as raw materials;* **PERM** = *Use of renewable primary energy resources used as raw materials;* **PERT** = *Total use of renewable primary energy resources;* **PENRE** = *Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials;* **PENRM** = *Use of non-renewable primary energy resources used as raw materials;* **PENRT** = *Total use of non-renewable primary energy resources;* **SM** = *Use of secondary material;* **RSF** = *Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels;* **FW** = *Use of net fresh water*

Waste Production

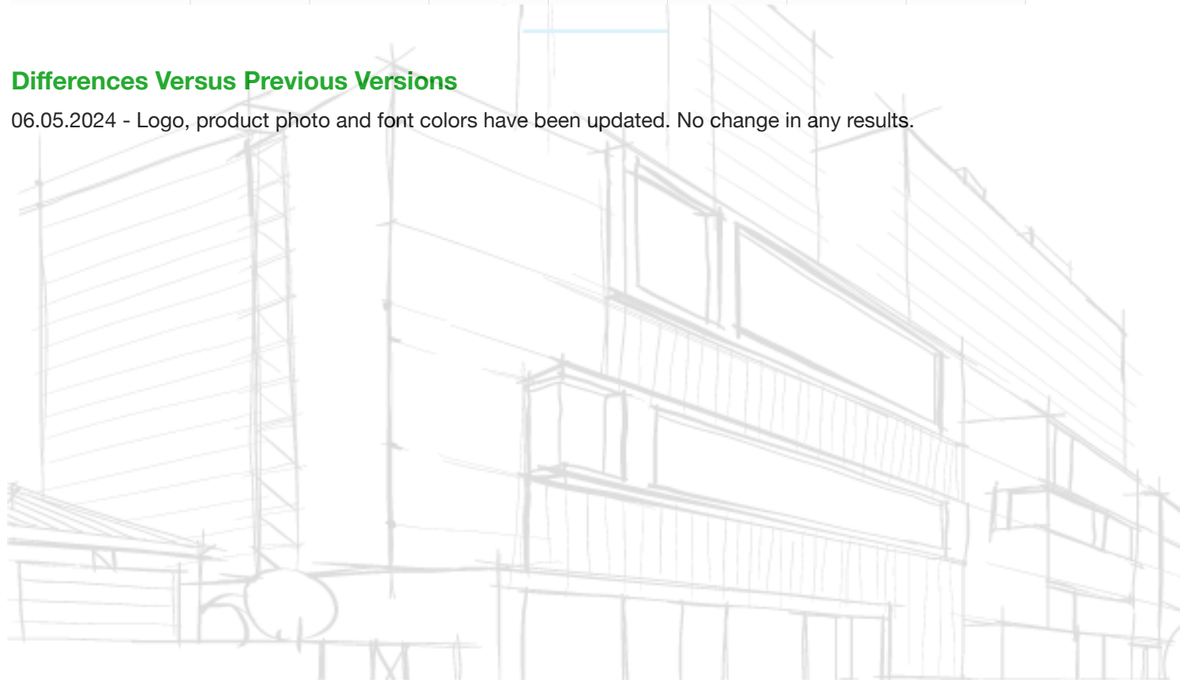
Results for 1 m2 of Kattopojat Series Bitumen Sheet							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	4.79E-03	0	0	0	0	0
Non-hazardous waste disposed	kg	1.21E-05	0	0	0	2.99	0
Radioactive waste disposed	kg	0	0	0	0	0	0

Output Flows

Results for 1 m2 of Kattopojat Series Bitumen Sheet							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Components for re-use	kg	0	0	0	0	0	0
Material for recycling	kg	0.56	0	0	0	0	0
Materials for energy recovery	kg	7.03E-02	0	0	0	0	0
Exported energy, electricity	MJ	0	0	0	0	0	0
Exported energy, thermal	MJ	0	0	0	0	0	0

Differences Versus Previous Versions

06.05.2024 - Logo, product photo and font colors have been updated. No change in any results.



References

ISO 14040: 2021
Environmental management - Life cycle assessment - Principles and framework

ISO 14044: 2021
Environmental management - Life cycle assessment - Requirements and guidelines

ISO 14025: 2010
Environmental labels and declarations - Type III environmental declarations - Principlesand and procedures

ISO 14020: 2000
Environmental labels and declarations - General principles

EN 15804:2012+A2: 2019
Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products

c-PCR005
Thermal insulation products

EN 16783: 2017
Thermal insulation products — Product category rules (PCR) for factory made and in-situ formed products for preparing environmental product declarations

The International EPD® System
www.environdec.com

The International EPD® System
The General Programme Instructions v4.0

The International EPD® System
PCR 2019:14 Construction products v1.3.1 (EN 15804:A2)

Ecoinvent 3.7.1
www.ecoinvent.org

SimaPro LCA Software
www.simapro.com

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