

Environmental Product Declaration

according to ISO 14025 and EN 15804



This declaration is for:
**DULUX TRADE DIAMOND GLAZE
GLOSS**

Provided by:
AkzoNobel Decorative Paints



program operator
Stichting MRPI®
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1.1.00284.2022
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COMPANY INFORMATION



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PRODUCT

DULUX TRADE DIAMOND GLAZE GLOSS

DECLARED UNIT/FUNCTIONAL UNIT

All impacts are calculated using the declared unit
"decoration of 1 m² of surface"

DESCRIPTION OF PRODUCT

Diamond Glaze Varnish from Dulux Trade is a water-based maximum durability interior clear wood varnish. It is a simple one pack system and is ideal for use on wooden floors and other high wear interior wood surfaces.

VISUAL PRODUCT



MRPI® REGISTRATION

1.1.00284.2022

DATE OF ISSUE

20-04-2022

EXPIRY DATE

20-04-2027

MORE INFORMATION

<https://www.duluxtradepaintexpert.co.uk/en/products/varnish/dulux-trade/dulux-trade-diamond-glaze>

SCOPE OF DECLARATION

This MRPI®-EPD certificate is verified by **ing. Kamiel Jansen, Aveco de Bondt**.

The LCA study has been done by **Joanna Zhuravlova & Mart van Assem, Ecomatters**.

The certificate is based on an LCA-dossier according to ISO14025 and EN15804+A1. It is verified according to the 'MRPI®-EPD verification protocol November 2020.v4.0'. EPDs of construction products may not be comparable if they do not comply with EN15804+A1. Declaration of SVHC that are listed on the 'Candidate List of Substances of Very High Concern for authorisation' when content exceeds the limits for registration with ECHA.

PROGRAM OPERATOR

Stichting MRPI®
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ir. J-P den Hollander, Managing director MRPI®

DEMONSTRATION OF VERIFICATION

CEN standard EN15804 serves as the core PCR[a]

Independent verification of the declaration and data,
according to EN ISO 14025:2010:
internal: external: X

Third party verifier:

ing. Kamiel Jansen, Aveco de Bondt

[a] PCR = Product Category Rules



DETAILED PRODUCT DESCRIPTION

Diamond Glaze Varnish from Dulux Trade is a water-based maximum durability interior clear wood varnish. It is a simple one pack system and is ideal for use on wooden floors and other high wear interior wood surfaces. It is up to ten times tougher than conventional varnish and is resistant to common chemicals, alcohol and water.

Suitable for use over materials such as cork tiles, hardwood and chipboards. Not suitable for laminate floors.

Application Method

Brush or short pile mohair roller only. Do not spray. Do not use below 10C or in areas of high humidity or condensation.

Pack size

The products are packed in a packaging with a capacity of 1L, 2.5L and 5L.

Production process and conditions of delivery

During paint production, the raw materials are pre-weighed according to the percentage of each in the formulation. The pigment is then dispersed in a mixture of binder and solvent using a variety of machines. The amount and type of dispersion is product specific and depends on the type of finish required. Finally, tinter is added to correct the colour, the paint is thinned to viscosity, filtered and filled into the appropriate packaging container. All paint containers are transported from the production sites to a distribution center and finally to the customers in the UK and EU.

COMPONENT (> 1%)	[kg / %]
Inert matting agents	Confidential
Acrylic - urethane copolymer emulsion	Confidential
Water	Confidential

(*) > 1% of total mass

SCOPE AND TYPE

The type of this EPD is Cradle-to-Gate with options. All major steps from the extraction of natural resources to the final disposal of the product are included in the environmental performance of the manufacturing phase, except those that are not relevant to the environmental performance of the product. This declaration does not imply an indicator result of zero.

This EPD is representative for products produced in the UK and EU. The paint is produced in Pilawa, Poland and the application market is for customers in the UK and EU. Likewise, for the end-of-life, the fate of the paint product is described within an UK and EU context. The software GaBi 10.5.0.78 Professional is used to perform the LCA. In the model Ecoinvent 3.6 database was used. The validity of this EPD is in correspondence with the specifications of the LCA project report.

All impacts associated with the upstream production of materials and energy are included in the system boundaries. Mining activities and controlled landfills are included in the product systems. Similarly, wastewater treatment activities are also considered within the technological systems. The emissions and resource extractions derived from these processes are considered elementary exchanges between the product systems and the environment.



PRODUCT STAGE			CONSTRUCTION					USE STAGE							END OF LIFE			BENEFITS AND
			PROCESS												STAGE			LOADS BEYOND THE
			STAGE															SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport gate to site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential		
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D		
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	ND		

X = Modules Assessed

ND = Not Declared

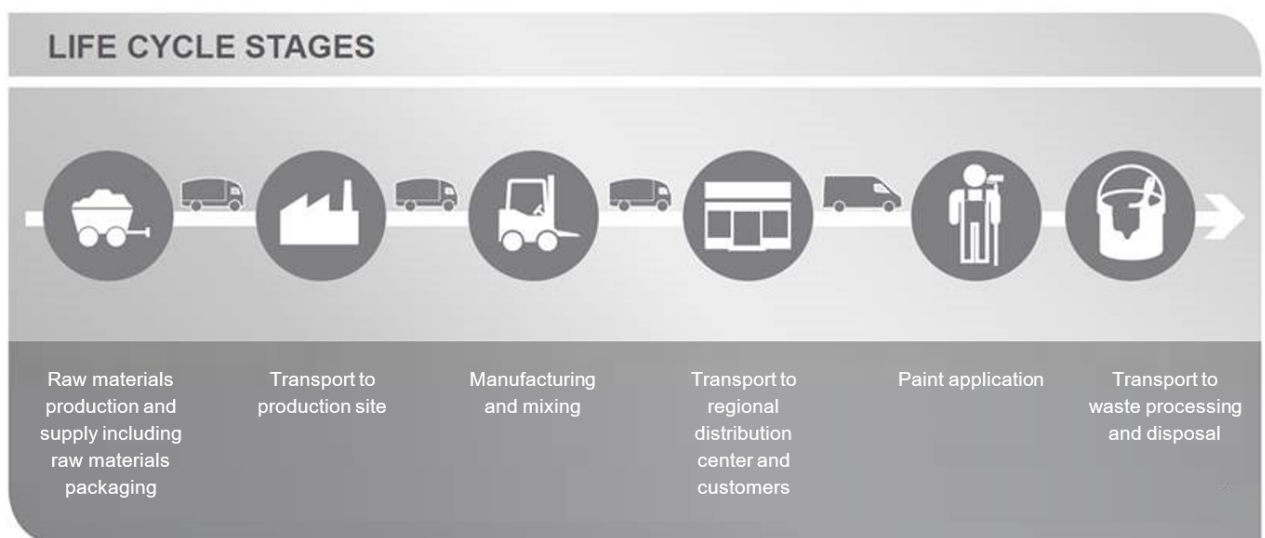


Figure: LCA process diagram according to EN 15804 (7.2.1)

REPRESENTATIVENESS

The EPD is representative for the paint manufactured in the UK and sold in the UK and EU. The paint is produced at one production site: Pilawa, Poland

ENVIRONMENTAL IMPACT per functional unit or declared unit (indicators A1)

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
ADPE	kg Sb eq.	4.64 E-7	5.77 E-9	1.30 E-8	4.82 E-7	3.25 E-8	2.47 E-9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.28 E-9	0.00	2.05 E-9
ADPF	MJ	3.04 E+0	3.71 E-2	3.33 E-1	3.41 E+0	1.54 E-1	1.54 E-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.45 E-2	0.00	1.60 E-2
GWP	kg CO2 eq.	1.36 E-1	2.39 E-3	2.81 E-2	1.66 E-1	1.01 E-2	5.04 E-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.28 E-4	0.00	3.04 E-2
ODP	kg CFC11 eq.	1.52 E-8	4.35 E-10	2.45 E-10	1.59 E-8	1.79 E-9	1.79 E-10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.75 E-10	0.00	1.80 E-10
POCP	kg ethene eq.	6.51 E-5	9.81 E-7	1.45 E-5	8.05 E-5	3.89 E-6	3.41 E-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.83 E-7	0.00	5.17 E-7
AP	kg SO2 eq.	1.43 E-3	9.41 E-6	7.73 E-5	1.52 E-3	3.96 E-5	4.12 E-6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.60 E-6	0.00	5.30 E-6
EP	kg (PO4)3- eq.	1.94 E-4	2.80 E-6	1.28 E-5	2.09 E-4	1.18 E-5	4.84 E-6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.07 E-6	0.00	5.63 E-6

ADPE = Abiotic Depletion Potential for non-fossil resources
 ADPF = Abiotic Depletion Potential for fossil resources
 GWP = Global Warming Potential
 ODP = Depletion potential of the stratospheric ozone layer
 POCP = Formation potential of tropospheric ozone photochemical oxidants
 AP = Acidification Potential of land and water
 EP = Eutrophication Potential

RESOURCE USE per functional unit or declared unit (A1 / A2)

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
PERE	MJ	6.86 E-2	4.03 E-4	8.93 E-2	1.58 E-1	1.72 E-3	1.76 E-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.79 E-4	0.00	1.78 E-4
PERM	MJ	1.15 E-4	2.26 E-10	9.53 E-5	2.11 E-4	1.15 E-9	1.14 E-10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.80 E-11	0.00	3.15 E-10
PERT	MJ	6.87 E-2	4.03 E-4	8.94 E-2	1.59 E-1	1.72 E-3	1.76 E-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.79 E-4	0.00	1.78 E-4
PENRE	MJ	3.19 E+0	3.76 E-2	3.45 E-1	3.57 E+0	1.55 E-1	1.57 E-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.47 E-2	0.00	1.63 E-2
PENRM	MJ	9.93 E-7	0.00	1.20 E-9	9.94 E-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PENRT	MJ	3.19 E+0	3.76 E-2	3.45 E-1	3.57 E+0	1.56 E-1	1.57 E-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.47 E-2	0.00	1.63 E-2
SM	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	6.55 E-2	4.58 E-6	-8.65 E-6	6.55 E-2	1.78 E-5	2.54 E-6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.70 E-6	0.00	1.67 E-5

PERE = Use of renewable energy excluding renewable primary energy resources

PERM = Use of renewable energy resources used as raw materials

PERT = Total use of renewable primary energy resources

PENRE = Use of non-renewable primary energy resources excluding non-renewable 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 materials

RSF = Use of renewable secondary fuels

NRSF = Use of non renewable secondary fuels

FW = Use of net fresh water

OUTPUT FLOWS AND WASTE CATEGORIES per functional unit or declared unit (A1 / A2)

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
HWD	kg	0.00	0.00	3.26 E-4	3.26 E-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NHWD	kg	0.00	0.00	1.62 E-3	1.62 E-3	0.00	1.64 E-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.04 E-1
RWD	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CRU	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MFR	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MER	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EEE	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ETE	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

HWD = Hazardous Waste Disposed

RWD = Radioactive Waste Disposed

MFR = Materials for recycling

EEE = Exported Electrical Energy

NHWD = Non Hazardous Waste Disposed

CRU = Components for reuse

MER = Materials for energy recovery

ETE = Exported Thermal Energy



CALCULATION RULES

Cut off criteria

The cut-off is considered in the raw material supply stage (A1). Cut-off of inputs comprises of the raw materials, for which no appropriate proxies were found. In this studies there were no cut-off inputs or outputs. The energy consumed during application, used for instance in spray applicators, has not been included due to its insignificance.

Data quality and data collection period

Specific data was collected from AkzoNobel through a questionnaire, including inquiries about paint characteristics and packaging, logistics data (e.g. transport), production information and end-of-life. The data collection period for specific data was the year 2021.

Data gaps (i.e. transport data, end of life scenarios) were covered with data generic values for transport as described in the Product Environmental Footprint Category Rules - Decorative Paints document version 1.0 published by CEPE and reviewed in April 2018. Further data gaps (i.e. end-of-life transport data) were covered with data from internal AkzoNobel LCA studies concerning the same type of products (paints and coatings). Generic data (i.e. upstream acquisition and production of raw materials, energy generation, transport, waste treatment processes) was selected from Ecoinvent 3.6 database. In the case of missing data, a relevant proxy was searched and adjusted to the corresponding unit process.

Allocation procedure

To allocate the emissions and inputs to the manufactured products, the decision-hierarchy in ISO 14044 is used (ISO 2006). It is not possible to sub-divide the site data into a more detailed level or find physical causalities between inputs and outputs, thus allocation is done based on mass, considering the annual production of paint product for each site. The paint production is basically a process of mixing ingredients and, therefore, the environmental impact is fairly to be related to the mass of the products.

Parameter	Unit	Value
VOC content	kg/l	0.129
Density	kg/l	1.04
Coverage	m ² /l	20
Number of layers	Quantity	2
Total product used	kg/m ²	0.104

SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION

A1. Raw materials supply

This module considers the extraction and processing of all raw materials and energy which occur upstream to the Dulux Trade High Performance Floor Paint manufacturing process, as well as waste processing up to the end-of waste state.

A2. Transport of raw materials to manufacturer

This includes the transport distance of the raw materials to the manufacturing facility via road.

Vehicle type used for transport	Truck
Distance, km	460
Capacity	>32 t ,64% payload
Bulk density of transported products, kg/m3	1040 kg/m3

A3. Manufacturing

This module covers the manufacturing of the Dulux Trade Diamond Glaze Gloss and includes all processes linked to production such as storing, mixing, packing and internal transportation. Use of electricity, fuels and auxiliary materials in paint production is taken into account as well.

Data regarding paint production was provided for the manufacturing site where the Dulux Trade Diamond Glaze Gloss is produced: Pilawa, Poland. Furthermore, the specific transportation distances and transportation modes for raw materials, paint packaging and transportation to customer were collected from the AkzoNobel logistics department. Primary data and site-specific data were retrieved. For electricity sources (wind power used at the Stowmarket site), Ecoinvent 3.6 dataset was used. For upstream (raw material processes) and downstream processes (application, use, and waste processing) generic data is used when no specific data is obtained. The construction site data includes lighting, heating, offices, etc. The manufacture of production equipment and infrastructure is not included in the system boundary.

A4. Transport to Regional Distribution Centre and customer

All paint containers are transported from the production facility into a distribution centre and then finally to the customer. On average, the transport characteristics for this life cycle stage are the following

Coatings transport type	Transport from factory to RDC	Transport from RDC to customer	Dried paint
Transport Type	Truck 1	Truck 2	0
Distance (km)	350	370	1
Capacity	>32 t, 64% payload	> 32 t ,64% payload	NA
Bulk density of transported products	1040 kg/m3	1441 kg/m3	NA

A5. Application and use

This module includes the environmental aspects and impacts associated with the application and of the paint. It is assumed that no energy is required during the application of this paint. The use of paintbrushes and other appliances used during application are not included. There are some raw materials added in the paint formulations which contain small amounts of solvents.

emissions during application of paint are included in this module.

C2. Transport to incineration or landfill

This module includes one-way transportation distance of the demolition or sorting site to the dump site.

End-of-life transport type	Transport to waste processing
Vehicle type	Truck 34t-40t payload average fleet
Distance	100 km
Capacity utilisation	60%
Bulk density of transported products	1040 kg/m ³

C3. Waste processing and C4. Disposal

The end of life stage is encompassed in these modules. It is assumed that paint is used as interior paint and exterior paint. In both cases, it is assumed that part of the paint is lost during application and the rest is applied.

The main difference between interior and exterior paint is that for interior paints it is assumed that a percentage (20%) of the applied paint stays for more than 100 years. This is not valid for exterior paint because it is assumed that the polymer in exterior conditions will be flaking and finally disposed away.

Classification of paint, based on function	% Sold paint in walls	% of sold paint to	% of sold paint to
	> 100 years	landfill	incineration
Interior Masonry Wall	20%	88%	88%
Exterior, Trim and other paints	0%	12%	12%

ADDITIONAL INFORMATION ON ENVIRONMENTAL IMPACTS

The CML-IA methods do not have characterization factors for the “unspecified VOC” emission flow in the Global Warming Potential environmental impact category. However, VOCs are known to have influence in this category. In order to include the impacts of the VOCs and align with current practice of AkzoNobel, it was decided to calculate the VOC impact on Global Warming Potential separately. The Global Warming Potential impact category has been modified, adding a generic factor of 4.23 kgCO₂-eq/kg VOC, which is in line with AkzoNobel characterisation factors for carbon reporting.

Environmental Impact	A1	A2	A3	TOTAL A1-A3	A4	A5	C2	C4
Global Warming potential (GWP 100 years)	1.36E-1	2.39E-3	2.81E-2	1.66E-1	1.01E-2	5.04E-3	9.28E-4	3.04E-2
Global Warming potential (GWP 100 years) including VOC characterization factor	1.36E-1	2.39E-3	2.82E-2	1.67E-1	1.01E-2	5.51E-1	9.28E-4	3.04E-2





DECLARATION OF SVHC

None of the substances contained in the product are listed in the “Candidate List of Substances of Very High Concern for authorisation”, or they do not exceed the threshold with the European Chemicals Agency.

REFERENCES

- EN 15804:2012+A1:2013 Sustainability of construction works. Environmental product declarations. Core rules for the product category of construction products, of 11/2013.
- ISO 14040/14044 on Life Cycle Assessments
- Product Environmental Footprint Category Rules - Decorative Paints version 1.0, 2018. Developed by the Technical Secretariat Decorative Paints of the European Council of the Paint, Printing Ink and Artists' Colours Industry.
- Willener Y., 2021. Personal communication with Yasmine Willener, Quality & Regulations Manager Akzo Nobel Decorative Paints, UK.
- Thinkstep GaBi Software-System and Database for Life Cycle Engineering. Copyright 1992-2018 ThinkStep AG.
- Wernet, G., Bauer, C., Steubing, B., Reinhard, J., Moreno-Ruiz, E., and Weidema, B., 2016. The ecoinvent database version 3 (part I): overview and methodology. The International Journal of Life Cycle Assessment, [online] 21(9), pp.1218–1230. Available at: <<http://link.springer.com/10.1007/s11367-016-1087-8>> [Accessed 21 12 2021.]

REMARKS

None

