



Environment Product Declaration

Professional cleaning service for
high-speed passenger trains provided
by **Dussmann Service S.r.l.**



UN CPC code:	853 cleaning services
Programme:	The international EPD® System, www.environdec.com
Programme Operator:	EPD International AB
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This EPD is compliant with ISO 14025.

1. An EPD must provide current information and must be updated
in the event of changes. Validity is therefore subject to
continuous registration and publication on www.environdec.com



Presentation of the Organisation and the Service

The Company

Dussmann Service is a world leader in the provision of integrated services in the healthcare and hospital, business, school, assistance for senior citizens, military and transport sectors. For over 40 years it has been dealing with sanitation, catering and Facility Management with just one goal: customer satisfaction. Widespread presence on the territory and high specialisation of the functions allows the development of innovative and customised solutions to be guaranteed. Dussmann Service is part of Dussmann Group, an international network of specialist services for public bodies and companies. It was established in Italy in 1969 (initially with the name "Pedus Service S.r.l.") on the initiative of the Group established by Peter Dussmann in 1963 in Munich.

COMPANY	
DUSSMANN SERVICE SRL	Via Papa Giovanni XXIII, 4 24042 CAPRIATE SAN GERVASIO (BG) Tel: (+39) 02.915.18 Fax: (+39) 02.915.18.499 www.dussmann.it
CONTACTS	
Development and Quality Manager	Tel: (+39) 02.915.18.302 e-mail: santinon@dussmann.it
Technical Support	The LCA study was performed with the collaboration and support of Studio Mazzalovo (sustainabilityoffice@icloud.com)

Certifications

Over the years DUSSMANN SERVICE has implemented and adopted the following Management systems:

- **ISO 9001:2015** Quality Management System (certificate n. 25590 issued by Certiquality);
- **ISO 14001:2015** Environment Management System (certificate n. 26016 issued by Certiquality);
- **OHSAS 18001:2007** Occupational Health and Safety Management System (certificate n. 25951 issued by Certiquality);
- **ISO 22000:2005** Food Safety Management System (certificate n. 25952 issued by Certiquality);
- **ISO 22005:2008** Traceability in the Feed and Food Chain System (certificate n. P3708 issued by Certiquality);
- **EMAS ENVIRONMENTAL CLAIM VERIFICATION** (certificate n. E-563 dated 18.01.2019 issued by Certiquality).

Description of the Service and the site

This EPD is applied to the professional cleaning service for high-speed “Frecciarossa” passenger trains, provided by DUSSMANN SERVICE SRL, which in agreement with the PCR are classified as:

“High-speed trains: special inter-city trains that operate at much higher speeds than conventional railways”.

The types of trains considered envision 2 fixed compositions:

ETR1000 made up from 8 cars and an average of 77 passenger seats per car

ETR500 made up from 13 cars and an average of 58 passenger seats per car

The data used for the study was collected directly at the **Napoli IMC** site - Via Gianturco 106, where the cleaning service is carried out daily both mechanically and manually and includes routine and periodic activities. The cleaning service includes the use of machinery located permanently in the structure, i.e. washing machines, wet vacuum cleaners, vacuum cleaners, buffers, various cleaning equipment (buckets, brushes, PPE, etc.). An average life span of approx. 7 years has been assumed for all machinery. The data refers to the service carried out in 2018; the year in which the service involved 121,883 cars.

Table 1 – Description of the cleaning service

Cleaning operations	Description of the cleaning procedures	Frequency (e.g. daily, weekly, etc.)
Routine cleaning	Collecting bulk waste and emptying containers Washing bathroom facilities Vacuum cleaning or brushing, washing and drying floor Cleaning windows and mirrors, tables, waste baskets and seats Cleaning ceiling and walls Washing carpet Washing inter-car gangways Cleaning platforms, steps and ledges Washing the front windows of the locomotive/driving van trailer	Daily
Rebound cleaning	Emptying waste baskets Washing bathroom facilities Washing the front windows	daily
Intensive cleaning	Collecting bulk waste and emptying containers Washing bathroom facilities Vacuum cleaning or brushing, washing and drying floor Cleaning windows and mirrors, tables, waste baskets and seats Cleaning ceiling and walls Washing carpet Washing inter-car gangways Cleaning platforms, steps and ledges Intensive washing of the floor (de-waxing and waxing) Washing external casing Routine pest control	every 20 / 30 days
Extraordinary cleaning	Extraordinary pest control	annually/on customer request

Methodology

This EPD is compliant with the requirements of the General Programme instructions for Environmental Product Declarations (version 3.0), of the PCR 2017:02 ver. 1.1 dated 2019-02-13, the ISO 14025 and ISO 14040 Standards. The recipients of the information contained in this EPD are customers, employees, suppliers of services and materials, contractors and communities.

The Life Cycle Analysis method (LCA) and SimaPro ver.9 software (see references) were used to quantify environmental performance associated with the cleaning carried out in one year.

The functional unit is equal to 1 passenger car kept clean over the period of 1 year.

The data used in the LCA study refer to **2018** and include specific and generic data selected and proxy data, in agreement with legal requirements. The relationship of the **proxy data** with environmental impact resulted less than 1% of the total environmental impact in all categories considered in this EPD.

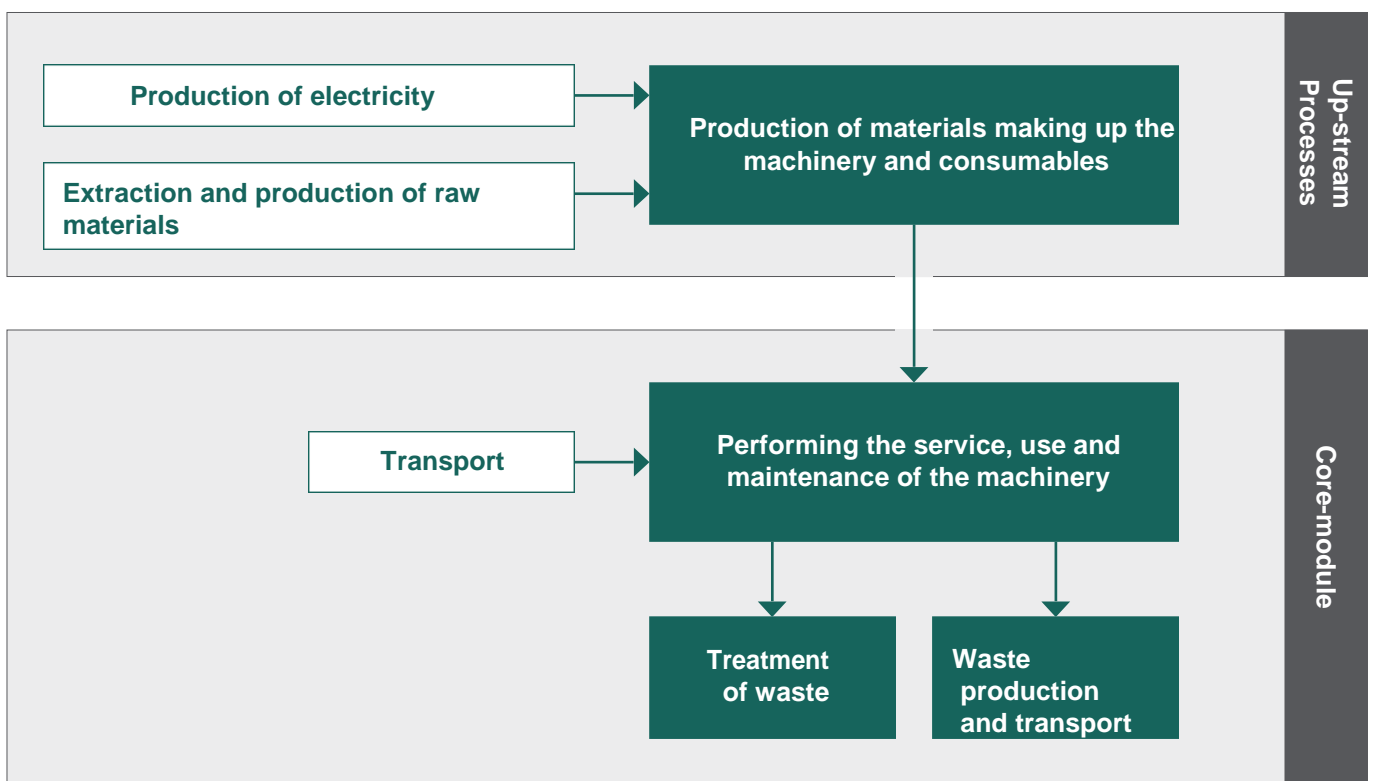
In fact, all data was acquired directly from DUSSMANN SERVICE SRL and the corporate structure.

System Boundaries

The boundaries of the system analysed, according to PCR 2017:02, included the following stages of the life cycle:

- *Up-stream processes;*
- *Core Module*

In relation to the downstream processes, the impact of this stage has not been calculated quantitatively, but only some qualitative information is provided, in accordance with the reference PCR.



Environmental Performance Declaration

The results are given below, related to the functional unit (1 passenger carriage).

Table 1 – Environmental impact associated with cleaning a passenger carriage

Potential environmental impact		Unit	Total	Up-Stream	Core Module
Global Warming (GWP)	Fossil	kg CO ₂ eq	1.2972	0.4818	0.8155
	Biogenic	kg CO ₂ eq	0.2631	0.1036	0.1594
	Use and transformation of the ground	kg CO ₂ eq	0.102	0.1014	0.0006
	Total	kg CO ₂ eq	1.6623	0.6868	0.9755
Acidification	AP	kg SO ₂ eq	0.0065	0.0028	0.0037
Eutrophication	EP	kg PO ₄ --- eq	0.0029	0.0013	0.0016
Photochemical smog	POCP	kg NMVOC	0.0058	0.0021	0.0037
Abiotic depletion	Elements	kg Sb eq	<0.0001	<0.0001	<0.0001
Abiotic depletion	Fossil fuels	MJ	21.5394	11.1901	10.3493
Water scarcity		m ³ eq	0.1245	0.4071	-0.2826

Table 2 – Consumption of resources associated with cleaning a passenger carriage

Use of resources		Unit	Total	Up-Stream	Core Module
Consumption of primary energy resources – renewable	Used as energy carriers	MJ	4.813	2.0711	2.7419
	Used as raw materials	MJ	1.4065	0.2721	1.1344
	Total		6.2195	2.3432	3.8763
Consumption of primary energy resources – non-renewable	Used as energy carriers	MJ	23.1366	11.0343	12.1023
	Used as raw materials	MJ	1.9995	1.9995	<0.0001
	Total	MJ	25.1361	13.0338	12.1023
Secondary raw materials		kg	-	-	-
Renewable secondary fuels		MJ	-	-	-
Non-renewable secondary fuels		kg	-	-	-
Water consumption		m ³	0.0253	0.0151	0.0102

Table 3 – Production of waste associated with cleaning a passenger carriage

Production of waste	Unit	Total	Up-Stream	Core Module
Hazardous waste	kg	0.0094	0.0016	0.0078
Non-hazardous waste	kg	0.2022	0.0707	0.1315
Radioactive waste	kg	<0.0001	<0.0001	<0.0001
Re-cycled materials	kg	0.0094	0.0016	0.0078
Water consumption	m ³	0.0253	0.0151	0.0102

The service performed does not generate hazardous or radioactive waste.

Table 4 – Output flow indicators

Production of waste	Unit	Total	Up-Stream	Core Module
Components for re-use	kg	-	-	-
Materials for re-cycling	kg	-	-	-
Exported energy, electricity	MJ	-	-	-
Exported energy, heat	MJ	-	-	-

Other information

Table 5 – Production of waste associated with cleaning a passenger carriage

Other indicators	Unit	Core Module
Direct use of toxic substances in the Core	Kg/f.u.	0.09
Direct use of electricity in the Core	kWh/f.u.	1.91

Substances such as PAHs or heavy metals are not present in the products used in the service.

End-of-life

In accordance with the PCR, the information relative to end-of-life is the qualitative type and concerns the features of the materials making up the machinery. In particular, a useful life span for all machinery has been assumed equal to 75 years, at the end of which the machinery is replaced completely.

Interpretation

On the basis of the results obtained, DUSSMANN SERVICE SRL has been able to make the following considerations regarding the environmental performance of the service carried out:

- The impact is substantially distributed between up-stream and core-module in all categories;
- Only with relation to the GWP is there an incidence of more than double due to the contribution of the Core Module. This is because of the use of fossil fuels (diesel and petrol) to move the machinery and also the use of mains electricity;
- Regarding the consumption of renewable and non-renewable resources, energy and materials, the analysis of the previous tables shows the impact between up-stream and Core Module is distributed similarly.

Information regarding the Programme

Information

EPDs within the same product category, but developed according to different programmes may not be comparable. Different EPDs must be compared taking the following into consideration:

- The type of train (regional, inter-city, high speed);
- The dimensions of the car considered as a unit in the LCA study;
- The level of cleanliness provided by the service.

DUSSMANN SERVICE SRL has the ownership and responsibility of this EPD.

Product category Rules (PCR):	Professional cleaning services for passenger trains. UN CPC 853 ver. 1.1 dated 13/02/2019
PCR Revision, performed by:	The Technical Committee of the International EPD System. Contact via info@environdec.com Chair Filippo Sessa
Independent verification of the declaration and information, pursuant to ISO 14025:2006	<input type="checkbox"/> Process EPD Certification <input checked="" type="checkbox"/> EPD Verification (external)
Third party verifier	Prof. Adriana Del Borghi e-mail: delborghi@tetisinstitute.it <div>.....</div> Signature
The updating procedures during validity of the EPD involve the third party verifier:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Programme Operator	EPD International AB Box 210 60, SE-100 31 Stockholm, Sweden e-mail: info@environdec.com

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References

- Product Category Rules for preparing an environmental product declaration for professional cleaning services for passenger train (PCR 2017:2 ver. 1.1 dated 13/02/2019, UN CPC 853 cleaningservices)
- General Programme instructions for Environmental Product Declarations (version 3.0, www.environdec.com)
- LCA study applied to the DUSSMANN SERVICE SRL passenger train cleaning service, rev. 1 dated 19/11/2019
- PE Plastics Europe (former APME Association of Plastics Manufacturers in Europe) www.plasticseurope.org
- IISI (International Iron and Steel Institute) www.worldsteel.org
- EAA (European Aluminium Association) www.aluminium.org
- Sima Pro vers. 9
- Ecoinvent vers 3.3
- ISO 14025, ISO 14040

Glossary

AP ACIDIFICATION

Due to this phenomenon, rainfall as a pH lower than the standard value, it can cause damage to forests and crop cultivations, as well as to aquatic ecosystems and constructions. It is due mainly to the emissions of SO₂, NO_x and NH₃, which are included in the Acidification Potential (AP) indicator, expressed as kg SO₂- equivalent.

EP EUTROPHICATION

The excessive growth of aquatic plants, due to the effect of the presence of doses of nutrients such as nitrogen or phosphorus or sulphur in the aquatic ecosystem that are too high and which originate from natural and anthropogenic sources, with the consequent deterioration of the environment, which becomes asphyxial. The EP (Eutrophication Potential) indicator is expressed as grams of kg PO₄³⁻- equivalent.

POCP PHOTO-OXIDANT CREATION POTENTIAL

Production of compounds, which due to the action of light, can promote an oxidation reaction that leads to the production of ozone in the troposphere. The POCP (Photochemical Ozone Creation Potential) indicator mainly includes the emissions of Volatile Organic Compounds or VOCs and is expressed as grams of ethylene equivalent (g C₂H₄).

GWP100 GLOBAL WARMING POTENTIAL

It is an indicator (Global Warming Potential) which, in the first place, includes carbon dioxide emissions, the main greenhouse gas, in addition to other gases with a lower degree of absorption of infrared rays, such as methane (CH₄), nitrous oxide (N₂O), chlorofluorocarbons (CFC). The indicator is expressed as a function of the degree of absorption of CO₂ (g CO₂).

LCA

Analysis of the life cycle (Life Cycle Assessment).

PCR

Specific Product Requirements (Product Category Rules).