

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804



Owner of the Declaration	ArcelorMittal Europe - Flat Products
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
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Valid to	26/11/2024

Organic coated steel coils
Granite® and Estetic®
ArcelorMittal

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General Information

ArcelorMittal Programme holder IBU – Institut Bauen und Umwelt e.V. Panoramastr. 1 10178 Berlin Germany	Organic coated steel coils Owner of the declaration ArcelorMittal Europe – Flat Products 24-26 Boulevard d'Avranches L-1160 Luxembourg Luxembourg
Declaration number EPD-ARM-20190058-CBD1-EN	Declared product / declared unit The declared unit is 1m ² of organic coated steel from the Granite® and Estetic® product range.
This declaration is based on the product category rules: Structural steels, 07.2014 (PCR checked and approved by the SVR)	Scope: The Life Cycle Assessment is based on data collected from the ArcelorMittal plants producing organic coated steel, representing 95% of the production in 2014.
Issue date 27/11/2019	The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.
Valid to 26/11/2024	Verification The standard <i>EN 15804</i> serves as the core PCR Independent verification of the declaration and data according to <i>ISO 14025:2010</i> <input type="checkbox"/> internally <input checked="" type="checkbox"/> externally
 Dipl. Ing. Hans Peters (chairman of Institut Bauen und Umwelt e.V.)	 Mr Carl-Otto Neven (Independent verifier appointed by SVR)
 Dr. Alexander Röder (Managing Director Institut Bauen und Umwelt e.V.)	

Product

Product description/Product definition

This Environmental Product Declaration refers to organic coated steel coil in the Granite® and Estetic® product range. The Granite® and Estetic® range combines metallic coated steel substrates with a protective organic coating system to create robust products with longer life and high resistance. Granite® & Estetic® prepainted steels are delivered in compliance with standard *EN 10169*. These two types of prepainted products are available in a wide range of steel grades aimed for architectural buildings for outdoor use (roofing, cladding) and indoor use (domestic appliance, industry, building parts) processed by drawing, roll forming, flanging or spinning.

Granite® & Estetic® prepainted steels are constituted of a metallic coating with coating masses from 18 to 350 g/m² and an organic coating with thicknesses as follows:

- Top side 25 µm to 70 µm for Granite® and 15 µm to 55 µm for Estetic®
- Back side 5 µm to 70 µm for Granite® and 5 µm to 25 µm for Estetic®

More info available at:

https://industry.arcelormittal.com/catalogue#family_f

Application

ArcelorMittal's colored organic coated steel coils comprise hot dip galvanized coils as a substrate over which organic coatings are applied. The coils are then delivered to manufacturers for shaping into end products to be included in building works, generally to precise dimensions, thereby avoiding losses on the construction site.

Organic coated steel is used in all sectors of industry. In building and construction, it is used as profiles for cladding, roofing, tiles, gutters etc.

Technical Data

The thickness of coatings (i.e. metallic layer plus organic coating) varies according to the intended end use of the products. Granite® is suitable for outdoor applications whereas Estetic® is preferred for indoor applications. Granite® and Estetic® products can be processed by bending, profiling, cold roll forming and deep drawing without damaging the top surface. They can be joined using techniques such as clinching, riveting and adhesive bonding. These products are in compliance with standard *EN 10169+A1*.

Detailed steel and coating properties and chemical compositions for the different products in the Granite® and Estetic® range are available at: <https://industry.arcelormittal.com/catalogue/F30/EN>, <https://industry.arcelormittal.com/catalogue/F40/EN>, and <https://industry.arcelormittal.com/catalogue/F20/EN>.

Base materials/Ancillary materials

The base material of steel is iron. Alloying elements are added on the form of ferroalloys or metals. The metallic coating includes only Zinc, Aluminum and Magnesium. The organic coatings are made from polyester, polyurethane or polyvinylidene fluoride (PVDF) resins. ArcelorMittal's organic coated steel is produced in full compliance with the European *REACH* Regulation (Registration, Evaluation, Authorization and Restriction

of Chemicals. In particular, all coatings and surface treatments used for Granite® and Estetic® are free of hexavalent chromium compounds, which are substances of very high concern (SVHC) included in *REACH* Annex XIV, and hazardous heavy metals (Pb, Hg and Cd).

Reference service life

Construction process (stages A4 & A5) and Use stage (B1-B7) are not declared in this EPD. A reference service life for the Granite® and Estetic® product range is not declared, since the lifetime will depend on specific application as well as environmental conditions.

LCA: Calculation rules

Declared Unit

The declared unit is 1m² of organic coated steel in the Granite® and Estetic® product range.

waste status once it is shredded and sorted, thus becomes input to the product system in the inventory.

Declared unit

Name	Value	Unit
Declared unit	1	m ²
Surface weight	4.67	kg/m ²
Conversion factor to 1 kg	0.214	-

Module C3 takes into account the sorting and shredding of after-use steel, as well as the non-recovered scrap due to sorting efficiency which is landfilled. A conservative value of 2% landfill is considered.

System boundary

Type of the EPD: cradle to gate - with Options. Module A1-A3, Module C3 and module D were considered.

Module D refers to the End-of-Life of the steel product, i.e. recycling.

Data quality

All relevant background datasets are taken from the *GaBi* software database *GaBi ts Software*. Regarding foreground data, this study is based on high quality of primary data, collected by ArcelorMittal. The *GaBi*-database contains consistent and documented datasets which can be viewed in the online *GaBi* documentation *GaBi ts Documentation*.

Modules A1-A3 of the steel production include:

- The provision of resources, additives and energy
- Transport of resources and additives to the production site
- Production processes on site including energy, production of additives, disposal of production residues, and consideration of related emissions
- Recycling of production/manufacturing scrap. Steel scrap is assumed to reach the end-of-

Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account.

LCA: Scenarios and additional technical information

Current practice for the average organic coated steel consist of 98% recycling and 2% landfill according to the /European Commission Technical Steel Research/.

Reuse, recovery and/or recycling potentials (D), relevant scenario information

Name	Value	Unit
Recycling	98	%

End of life (C3)

Name	Value	Unit
Landfilling	2	%

LCA: Results

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE NOT DECLARED; MNR = MODULE NOT RELEVANT)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the 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	MND	MND	MND	MND	MNR	MNR	MNR	MND	MND	MND	MND	X	MND	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 m² of organic coated steel

Parameter	Unit	A1-A3	C3	D
Global warming potential	[kg CO ₂ -Eq.]	1.27E+1	9.35E-3	-8.11E+0
Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	2.51E-11	3.22E-14	1.59E-12
Acidification potential of land and water	[kg SO ₂ -Eq.]	2.40E-2	3.16E-5	-1.96E-2
Eutrophication potential	[kg (PO ₄) ³ -Eq.]	2.34E-3	3.73E-6	-1.67E-3
Formation potential of tropospheric ozone photochemical oxidants	[kg ethene-Eq.]	4.23E-3	2.22E-6	-2.51E-3
Abiotic depletion potential for non-fossil resources	[kg Sb-Eq.]	8.77E-4	4.45E-9	8.33E-7
Abiotic depletion potential for fossil resources	[MJ]	1.21E+2	1.05E-1	-6.43E+1

RESULTS OF THE LCA - RESOURCE USE: 1 m² of organic coated steel

Parameter	Unit	A1-A3	C3	D
Renewable primary energy as energy carrier	[MJ]	8.85E+0	5.22E-2	5.88E+0
Renewable primary energy resources as material utilization	[MJ]	0.00E+0	0.00E+0	0.00E+0
Total use of renewable primary energy resources	[MJ]	8.85E+0	5.22E-2	5.88E+0
Non-renewable primary energy as energy carrier	[MJ]	1.26E+2	1.60E-1	-6.06E+1
Non-renewable primary energy as material utilization	[MJ]	0.00E+0	0.00E+0	0.00E+0
Total use of non-renewable primary energy resources	[MJ]	1.26E+2	1.60E-1	-6.06E+1
Use of secondary material	[kg]	3.15E-1	0.00E+0	4.26E+0
Use of renewable secondary fuels	[MJ]	2.46E-14	3.02E-25	-1.71E-21
Use of non-renewable secondary fuels	[MJ]	2.88E-13	3.55E-24	-2.01E-20
Use of net fresh water	[m ³]	3.20E-2	7.15E-5	2.84E-3

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES:

1 m² of organic coated steel

Parameter	Unit	A1-A3	C3	D
Hazardous waste disposed	[kg]	3.18E-7	1.02E-9	-4.26E-8
Non-hazardous waste disposed	[kg]	6.95E-2	9.36E-2	-1.29E-1
Radioactive waste disposed	[kg]	2.06E-3	2.19E-5	1.45E-3
Components for re-use	[kg]	0.00E+0	0.00E+0	0.00E+0
Materials for recycling	[kg]	0.00E+0	4.57E+0	0.00E+0
Materials for energy recovery	[kg]	0.00E+0	0.00E+0	0.00E+0
Exported electrical energy	[MJ]	0.00E+0	0.00E+0	0.00E+0
Exported thermal energy	[MJ]	0.00E+0	0.00E+0	0.00E+0

Note: 0,315 kg scrap is used to manufacture 4,67 kg of organic coated steel. After use, 4,57 kg steel is recycled. The potential environmental impact calculated for module D depends on the net amount of scrap left in the system, which is (4,57) - (0,315) kg = 4,26 kg. This means that the system generates a net output of 4,26 kg of steel scrap, thus module D shows an environmental benefit.

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EN 15804

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/EN 10169+A1:2012/ Continuously organic coated (coil coated) steel flat products - technical delivery conditions

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