Environmental Product Declaration
Steel Color Spa manufactured stainless steel sheets

TSteel, SuperMirror, Colored Mirror and Patterned sheets

UN CPC 422 & 429 "Fabricated steel products, except construction products, machinery and equipment"-
PCR 2014:10-version 1.0 dated April 9th 2014
Declared Unit: 1.000 Kg of manufactured stainless steel
System limits: "cradle-to-grave"
Geographic application area: all the world
Endorsement date: 12/11/2014
Time validity: 3 years
Registration number: S-P-00690
Revision 02 dated 27/10/2014

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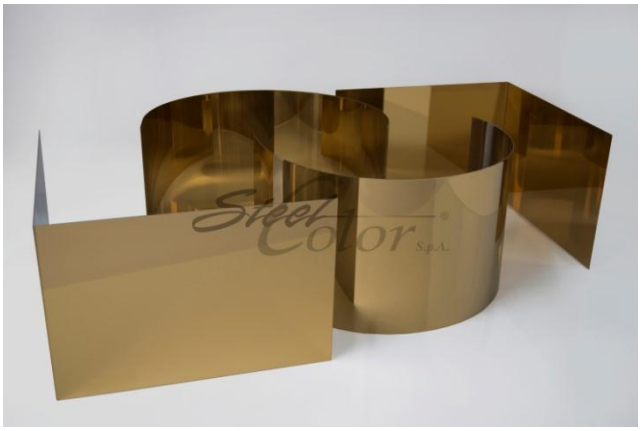
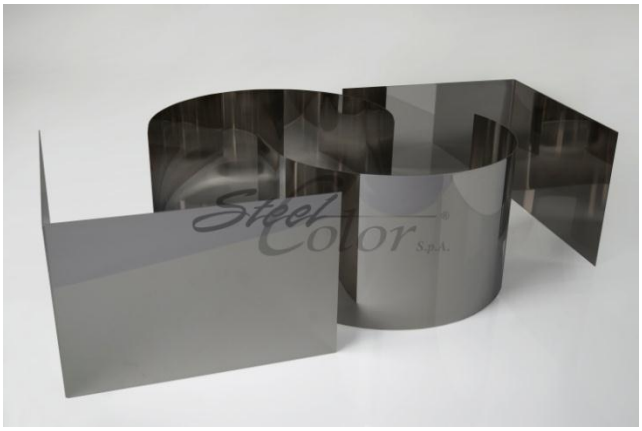
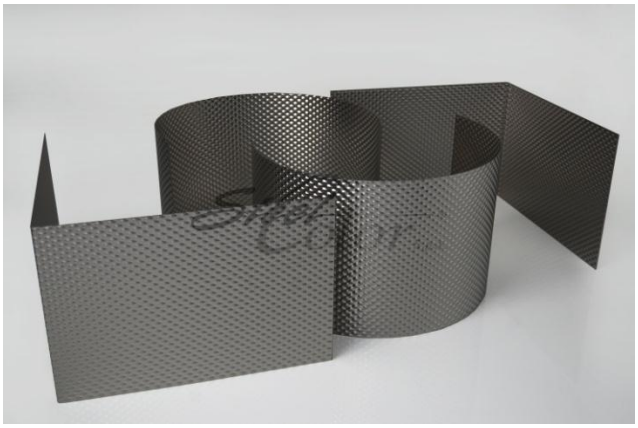
www.environdec.com

INTRODUCTION

THE COMPANY AND THE PRODUCT







The company

Steel Color Spa operates since 1979 in the field of surface treatment, coloring and screen printing /chemical etching of stainless steel and non-ferrous metals, mainly intended for the lift industry, construction and furniture componentsfield.

The productive plant was located in Italy up to December 2000, in Cignone (Corte de' Cortesi), in a location where the productive needsof the company were not met.

In order to rationalize the productive cycle and improve employees' working conditions, the company decided to transfer the production department in the new Pescarolo warehouse. The transfer took place in January 2001.

The establishment carries out surface processing of stainless steel sheets and, even to a lesser extent, aluminium and brass products through the machining, polishing, electro-coloration and decoration phases.

Stainless steel is well known for its valuable mechanical and physical properties, which make it a considerable choice in several application fields. Due to resistance to corrosion, it is a suitable material to be used everywhere environmental conditions are particularly aggressive, both in construction and industry fields. It is highly elastic and fire resistant, which make it particularly functional for the realization of anti-

seismic structures. It is easy to be processed and cleaned and its hygienic properties allow the use in the food industry as well as the health field.

Stainless steel is also an environmentally sustainable choice, being completely recyclable endless times without losing its intrinsic characteristics[1].

Productiveprocess

The following Life Cycle Assessment study is about the production of 4 different types of stainless steel sheets, which can be distinguished for their different surface treatments that allow to realize a huge range of polishing, brushing and decorations.

The productiveprocessincludes:

- specific surface treatments of the stainless steel
- primary packing with plastic protection
- secondary packing on customized pallets following the specific dimensions of the product.

Hereby the chemical composition (casting analysis) and the main mechanical and functional properties of the stainless steels at room-temperature regarding the alloys under consideration, according to the norms UNI EN 10088-1 and UNI EN 10088-2:

CHEMICAL COMPOSITION (CASTING ANALYSIS)											
AISI	**C**	**Si**	**Mn**	**P max**	**S**	**N**	**Cr**	**Mo**	**Nb**	**Ni**	**Other**
304	≤0,07	≤1,00	≤2,00	0,045	≤0,015	≤0,11	from 17,5 to 19,5	-	-	from 8,0 to 10,5	-
316	≤0,07	≤1,00	≤2,00	0,045	≤0,015	≤0,11	from 16,5 to 15,5	From 2,00 to 2,50	-	from 10,0 to 13,0	-
430	≤0,08	≤1,00	≤1,00	0,04	≤0,015	-	from 16,0 to 18,0	-	-	-	-
441	≤0,030	≤1,00	≤1,00	0,04	≤0,015	-	from 17,5 to 18,5	-	from [3xC+0,30] to 1,00	-	Ti from 0,10 to 0,60

[1]The stainless steel quality and recyclability declarations are extracted from the Centro Inox Servizi publications (Italian association for stainless steel development); further technical information is available on the official web site: http://www.centroinox.it/pubblicazioni

CHEMICAL AND FUNCTIONAL PROPERTIES:					
AISI	**Unit Load proof strength at 0,2% $R_{p0,2}$**	**Unit Load proof strength at 0,1% $R_{p1,0}$**	**Tensile Strength Rm**	**Elongation after rupture**	**Intergranular Corrosion Resistance**
	MPa min. transversal		**MPa**	**A80 %min. (transversal)**	**At the supply state**
304	230	260	from 540 to 750	45	Yes
316	240	270	from 530 to 680	40	Yes
430	280	-	from 450 to 600	20	yes
441	250	-	from 430 to 630	18	yes

Cleaninginstructions

After taking the coating off, if you can still see any marks and/or stains, firstly clean the steel with a nitro solvent and secondly with neutral soap or a liquid detergent, only using soft cloths and always following the finishing direction and never with a circular movement or transversely with respect to the finishing.
For routine cleaning,it is recommended to use neutral soap or liquid detergents, use soft cloths and always wipe following the finishing direction and never with a circular movement.
Cleaning should be done before a visible build-up of dirt causes abrasive phenomena, so asto minimize the risk of scratching or altering the appearance of the surface.
The exposure to aggressive environments, such as those laden with industrial pollutants and/or air pollution and traffic film, requires cleaning to be done at regular intervals to avoid excessive accumulation of dirt.
Before washing, remove any dust particles by air or vacuum, so as to prevent friction of the particles on the surface.

If the water has been used to clean or rinse, especially in significant limestone areas, it is recommended to dry the surface to prevent any spot creation.
To avoid iron contamination, make sure that the tools chosen for cleaning have not been previously used on other metals or alloys.
The materials used for the cleaning of stainless steel products are to be reserved exclusively for this purpose.
During routine cleaning particular attention must be given to covered areas to ensure that accumulations of contaminants are removed from the air flow.

Shown below we describe in more details the productive processes of the four kinds of stainless steel sheets under study.

Tsteel sheet®, dimensions 1250x2500 mm, mirror colored PVD finish

Starting from the stainless steel coil it is possible to obtain the sheets in the required length through the decoiling plant.

Thus, the obtained sheet is first processed through supermirror polishing and then to pvd coloring plant (physical vapor deposition).

The coloration of the stainless steel is obtained through the deposition of aplasma which allows the synthesis of nano-structured thin film coatings. This process occurs within vacuum chamber where the vaporized and activated metal ions condense on the surface of the stainless steel sheet, forming coatings of different nature (oxides, nitrides, carbides). The nanometric thickness of the coating adheres perfectly to the stainless steel substrate and does not change the aspect of the metal base finish. Thereforewe can obtain as many products as the possiblecombinations ofcolors and finishes.

Then, the product is protected with a specific plastic film and packed on a wooden pallet, ready to be sent to the customer.

Thanks to the versatility and the intrinsic properties of the stainless steel, Tsteel sheets can satisfy several aesthetical needsin architecture and design fields (coatings for internal and external areas, pieces of furniture).

Electro-colored sheet, dimensions 1250x2500 mm, polishing finish

Starting from the stainless steel coil it is possible to obtain the sheets in the required length through the decoiling plant. Thus, the obtained sheet is first processed through mirror polishing and then colored. The stainless steel coloring consists in the immersion of the stainless steel sheet in several galvanized baths; a surface conversion phenomena determines the color, given that a molecular change on the surface creates different oxide layers which are overlapping to the passivation film, typical of the stainless steel. The formation of the colors is made by “interference”, taking advantage of the difference in phase of the rays of light refracted by the layers of oxide and the rays reflected by the surface of the underlying metal.

Then, the product is protected with a specific plastic film and packed on a wooden pallet, ready to be sent to the customer.

Patterned / Embossed sheet, dimensions 1250x2500 mm, patterned finish

The patterned sheet is obtained by lamination, done with double rollers which imprint an embossed design on the stainless steel coil; this decoration can be impressed on both sides or only one side, depending on the customer's request. Then it is possible to obtain the sheets in the required length through the decoiling plant.

Then, the product is protected with a specific plastic film and packed on a wooden pallet, ready to be sent to the customer.

Supermirror sheet, dimensions 1250x2500 mm, supermirror manufacture

Starting from the stainless steel coil it is possible to obtain the sheets in the required length through the decoiling plant. Thus, the obtained sheet is processed with a supermirror finish using damp polishing heads.

Then, the product is protected with a specific plastic film and packed on a wooden pallet, ready to be sent to the customer.

Content of materials and chemical substances

The following charts show the percentage by weight of the different materials making up the products under the LCA study.

In order to distribute to the final customer or to the supplier, the products are preserved with plastic film (polyethylene) and transported on wooden pallets protected with cardboard corners (for shipments in Italy) or wooden cases (for foreign shipments). In addition, as requested by the PCR, the dangerousnessinformation of these materials and the chemical substances listed below is indicated, according to the European Regulation no. 1907/2006 (REACH) and the European Regulation no. 1272/2008 (CLP).

List of materials that originate the products under the LCA study			
Type of product	**material/substance**	**% by weight**	**kg**
post-usage recycle stainless steel sheet at 80%	Stainless steel AISI 304,316,430 and 441	100	1000
primary packaging	Polyethylene plastic film (PE)	100	17 (*)
secondary packaging	Wooden pallet	70	186 (*)
	Iron cross support	2	5 (*)
	Cardboard corners	1	2 (*)
	Wooden cases	27	73 (*)

(*) average value

For secrecyreasons, the finish used with these substances is not specified, even when the final product does not contain them:

List of risk information of auxiliary substances used in production	
substance	**risk information (REACH & CLP)**
acetylene	• Flammable Gases - Category 1 - Danger (H220) • Gases under pressure – Dissolved Gases - Attention (H280) • Explosive with or without air contact (EUH006)
argon	• Gases under pressure – Dissolved Gases - Attention (H280)
nitrogen	• Gases under pressure – Dissolved Gases - Attention (H280)
oxygen	• Flammable Gases - Category 2- it can cause or increase a fire; combustive agent (H270) • Gases under pressure – Dissolved Gases - Attention (H280)
nitric acid	• It can increase a fire; combustive agent (H272) • It causes severe skin burns and severe eye damage (H314) • It can be corrosive for metals (H290)
chromic acid	• It can cause a fire or an explosion;very combustive agent (H271) • Toxicifingested (H301) • Toxic in contact with skin (H311) • Fatalifinhaled(H330) • It causes severe skin burns and eye damage (H314) • It can cause an allergic skin reaction (H317) • It can cause allergy or asthma symptoms or breathing difficulties if inhaled(H334) • It can cause genetic damage (H340) • It can cause cancer (H350)

	• It is suspected to damage fertility (H361f) • It can cause respiratory irritation (H335) • It causes damage to organs in the event of prolonged or repeated exposure(H372) • Very toxic to aquatic life with long lasting effects (H410)
Sulphuric acid	• It causes severe skin burns and severe eye damage (H314)
Caustic soda	• It causes severe skin burns and severe eye damage (H314)

ENVIRONMENTAL PERFORMANCE DECLARATION

Methodology

In order to value the datareported in this environmental product declaration, we have used the standard methodology LCA **(Life Cycle Assessment)**, according to the Regulations **ISO 14040:2006** (Environmental management - Life cycleassessment - Principles and frame work) and **ISO 14044:2006** (Environmental management - Life cycleassessment - Requirements and guidelines) and concerning the evaluation of the environmental impact associated to each phase of a product life cycle. Moreover, we have considered the PCR references indications for stainless steel products: **UN CPC 422 & 429 "Fabricatedsteelproducts, exceptconstructionproducts, machinery and equipment"**.

The LCA methodology allows to determine the environmental impacts of a product or service in terms of resource consumption and environment emissions and production of waste during the life cycle ("cradle to grave").

The declared unit is **1000 kg of manufactured stainless steel**.

It should be noted that the manufactured stainless steel sheets are produced ranging in size from 0,6 up to 3 mm thickness, from 1000 to 1500 mm width and up to 6000 mm length; these variations depend on the final customer/ supplier's requests.

The calculation was performed through the SimaPro 8.0.3 software, using the EPD 2013 method.

The data used to realize the analysis include site-specific data, directly collected in steel Color Spa warehouse, located in Pescarolo ed Uniti (CR), and generic data (selected generics and other generics) that come from the Ecoivent 3.0.1 data bank, integrated in the SimaPro 8.0.3 software used to elaborate the results.

Conforming to the PCR 2014:10 version 1.0 dated 09/04/2014 "Fabricated steel products, except construction products, machinery and equipment", <u>the contribution of other generic data does not exceed the 10% of the total environmental impacts</u>.

System limits

As indicated in the PCR references (UN CPC 422 & 429 "Fabricatedsteelproducts, exceptconstructionproducts, machinery and equipment") shown here below, system limits of stainless steel include the production and the transport of the raw material, the stainless steel surface manufacturing, the transport, the use phase and the end life of the product and its own packaging.

In details, the processes to consider for the assessment of the life cycle of the stainless steel sheets are branched as follows:

<u>UPSTREAM MODULE</u>

They are the "upstream" processes of the stainless steel sheets manufacturing in the Steel Color Spa's warehouse and include:

- ✓ extraction/ production of raw material;
- ✓ recycle processes of the recycled material used in the product;
- ✓ transport of raw material to the suppliers;
- ✓ Production of the primary packaging (protective film) and the secondary packaging (wooden pallet and protective cases).

CORE MODULE

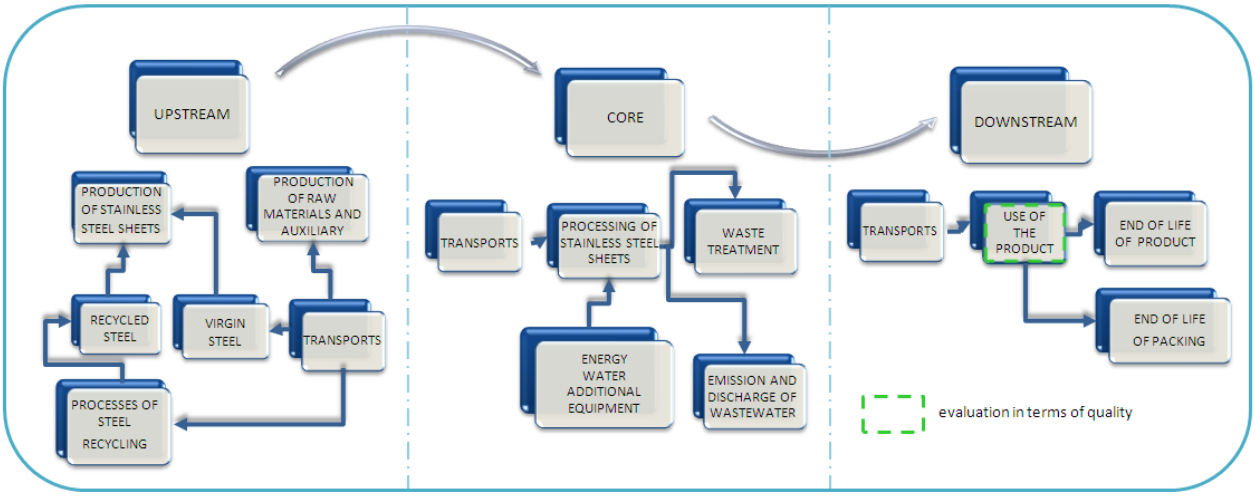
They are the processes related to the production and they include:

- ✓ transport of the raw material from suppliers to Steel Color SpA;
- ✓ manufacturing activity and possible assembly;
- ✓ treatment of the waste generated during the production;
- ✓ Impacts due to the production of electric energy, in agreement with the hypothesis of the fuel mix used.

DOWNSTREAM MODULE

Here are the "downstream" processes of the stainless steel sheet production:

- ✓ transport and distribution of the final product;
- ✓ the use phase of the product;
- ✓ the end life of the product;
- ✓ the end life of the primary and secondary packaging.



Limits of the under study system

The following items are not included in the system, based on what specified in the PCR:

- ✓ the construction of the establishment, the production of manufacturing equipment and other capital goods with an average duration of life beyond three years;
- ✓ research and developmentactivities;
- ✓ Staff activities and business trips.

Regarding the use phase, it is necessary to consider not only the variety of the different applicationswhere the product can be provided (ex. Realization of art works, floor coverings or building

façades, realization of surfaces for expositions or other use), but also the subjectivity in the management and in the maintenance of the own product.

As a safety precaution and as a function of the maintenance mode of the product during itslifetime, we assume the following use scenario, considered the most impactful among the many feasible in terms of energy and resources consumption: the manufactured stainless steel sheets are used to cover a walkable surface area of 50 m2, assuming a cleaning of the stainless steel surfaces that includes water and detergent once a week for ten years.

The evaluation of the impacts regarding the use phase wasmade as a qualitative analysis, since the hypothesis connected to the sheet surface maintenance (cleaning frequency and used detergents) are strictly dependent on the routine of the final customer.

Regarding transport, we do not include the return trip, because the return of the means is arranged in function of the other supplier's deliveries.

The end of life data of the primary and secondary packaging and the end of life data of the final product are based on situations (recycling, incineration, landfill) extracted from the Urban Waste Report 2013 – waste and packing section – of ISPRA (superior institute for the protection and the environmental research); this document testifies that the percentages of Italian treatment are similar to the European ones.

Regarding the percentages of treatment of packing waste in the rest of the world, there is a remarkable change from country to country; so, for the extra European country where there is a major export of the product (Australia), we considered the specific scenario of end life, extracted from the document of the Australian environmental department regarding the waste treatment for year 2011(*Waste and Recycling in Australia 2011: incorporating a revisedmethod for compilingwaste and recycling data*).

In order to dispose the packaging and the final product we took the Polluter-Pays (PP) principle into account, according to which the impacts of the recycling wastes are not considered within the under study system limits, whereas the waste generator is the responsible of the environmental impacts connected to the treatment and its disposal processes.

Data representativeness

The remaining generic data are taken from the Ecoinvent v. 3.0.1 bank data, chosen considering the under listed quality requirements and by following the principles of accuracy, completeness, representativeness, consistency and reproducibility:

- time factors: the data relate to the last three years maximum;
- geography: the data refers to the country of origin or, failing this, it refers to the geographical continental area that the country of origin belongs to.
- Technology: the data regard a combination of technologies, that is the average weight of the available technologies, except for transport for which, in absence of detailed information, we considered the more unfavorable technology as a precaution.

As regards the cut-off, this has not been applied because we considered all the production processes.

Environment performance

The following chart resumes the results of the evaluation of the four products under study life cycle.
More specifically, for each life cycle phase of the manufactured stainless steel sheet, the environmental impact data was recorded through quantification of:

- ✓ greenhouse gas emissions (kg CO2eq);
- ✓ emissions of acidifying gases (kg SO2eq);

- ✓ gas emissions that contribute to create a ground-level of ozone (kg C2H4eq);
- ✓ emissions of substances that are responsible for the eutrophication process (kg PO43-eq);
- ✓ consumption of renewable and non-renewable material resources (kg);
- ✓ consumption of renewable (MJ) and non-renewable energy resources (kg);
- ✓ consumption of secondary material resources (kg);
- ✓ consumption of secondary energetic resources (MJ);
- ✓ recoveredenergyflows (MJ);
- ✓ products waste (kg), divided in dangerous, non-dangerous and radioactive;
- ✓ water consumption (l).

The characterization factors here used are in line with the recommendation of Environdec to use the last updated version issued by the CML (*Institute of EnvironmentalSciences Leiden University*).

The impacts related to renewable energy consumption (hydroelectric, wind and solar) and to the consumption of renewable material resources is nil because the current software version SimaPro 8.0.3, integrated with Ecoinvent 3.0.1., does not include the possibility to quantify the impacts. The problem will be resolved as soon as the next software update will be available. This software will be integrated with the new Ecoinvent 3.1 bank data version.
In order to overcome this lack, the same project was carried out in parallel with Ecoinvent 2, which allows the counting of renewable material resources instead. Therefore, the results related to the impact of renewable energy consumption and the impact of renewable material consumption have the Ecoinvent 2 database as a foundation, differently from all other data, that use the Ecoinvent 3.0.1 database as a source.

For each product under study, the results are separated according to the actual distribution scenario of the final product.
All data contained in the following chartsare related tothe declared unit (1000 kg of manufactured stainless steel).

Environmental results

The following schedules express the **potential environmental impacts** of the four products under study, according to the categories in the PCR references.

TSTEEL® SHEET (data refer to 1000 kg manufactured stainless steel)									
IMPACT CATEGORIES		Measure Unit	Total	UPSTREAM		CORE	DOWNSTREAM		
				Rawmaterial (production)	Packaging (production)	Production	Steel (end life)	Packaging (end life)	Distribution
POTENTIAL ENVIRONMENTAL IMPACTS	**Greenhouse gas emission**	**kg CO_2eq**	**6015,427**	2968,808	111,587	2756,350	1,571	33,504	143,607
	Acidification	**kg SO_2eq**	**48,960**	37,692	0,500	10,009	0,011	0,021	0,728
	Photochemical oxidation	**kg C_2H_4eq**	**2,862**	1,667	0,049	1,118	0,001	0,003	0,024
	Eutrophication	**kg PO_4^{3-} eq**	**5,283**	1,317	0,113	3,242	0,002	0,438	0,171

ELECTRO-COLORED POLISHED SHEET (data refer to 1000 kg manufactured stainless steel)									
IMPACT CATEGORIES		Measure Unit	Total	UPSTREAM		CORE	DOWNSTREAM		
				Rawmaterial (production)	Packaging (production)	Production	Steel (end life)	Packaging (end life)	Distribution
POTENTIAL ENVIRONMENTAL IMPACTS	**Greenhouse gas emission**	**kg CO_2eq**	**6205,702**	3279,191	93,276	2690,857	1,571	24,217	116,590
	Acidification	**kg SO_2eq**	**49,381**	39,212	0,417	8,636	0,011	0,032	1,073
	Photochemical oxidation	**kg C_2H_4eq**	**3,104**	1,763	0,047	1,252	0,001	0,004	0,038
	Eutrophication	**kg PO_4^{3-} eq**	**6,765**	2,054	0,100	4,013	0,002	0,427	0,168

PATTERNED SHEET (data refer to 1000 kg manufactured stainless steel)									
IMPACT CATEGORIES		Measure Unit	Total	UPSTREAM		CORE	DOWNSTREAM		
				Rawmaterial (production)	Packaging (production)	Production	Steel (end life)	Packaging (end life)	Distribution
POTENTIAL ENVIRONMENTAL IMPACTS	Greenhouse gas emission	kg CO_2eq	**3444,364**	2834,897	55,485	413,859	1,571	15,055	123,496
	Acidification	kg SO_2eq	**32,543**	29,556	0,248	2,048	0,011	0,008	0,673
	Photochemical oxidation	kg C_2H_4eq	**1,469**	1,334	0,022	0,089	0,001	0,001	0,022
	Eutrophication	kg PO_4^{3-} eq	**1,960**	1,137	0,055	0,454	0,002	0,161	0,150

SUPERMIRROR SHEET(data refer to 1000 kg manufactured stainless steel)									
IMPACT CATEGORIES		Measure Unit	Total	UPSTREAM		CORE	DOWNSTREAM		
				Rawmaterial (production)	Packaging (production)	Production	Steel (end life)	Packaging (end life)	Distribution
POTENTIAL ENVIRONMENTAL IMPACTS	Greenhouse gas emission	kg CO_2eq	**5079,669**	2951,683	66,648	1946,400	1,571	17,451	95,916
	Acidification	kg SO_2eq	**45,342**	37,895	0,299	6,559	0,011	0,008	0,571
	Photochemical oxidation	kg C_2H_4eq	**2,662**	1,672	0,025	0,944	0,001	0,001	0,019
	Eutrophication	kg PO_4^{3-} eq	**3,983**	1,290	0,064	2,353	0,002	0,154	0,120

Resource Consumption

The following charts show the **material and energy resource consumption** (renewable and non-renewable) regarding the life cycle of the four products under study.

TSTEEL® SHEET(data refer to 1000 kg manufactured stainless steel)									
IMPACT CATEGORIES		Measure Unit	Total	UPSTREAM		CORE	DOWNSTREAM		
				Rawmaterial (production)	Packaging (production)	Production	Steel (end life)	Packaging (end life)	Distribution
ENERGY RESOURCES CONSUMPTION	**Non-renewable**	**Kg**	**1938,856**	**991,426**	**59,198**	**835,982**	**0,992**	**1,077**	**50,180**
	Oil	Kg	330,572	179,667	23,250	94,870	0,630	0,586	31,569
	Natural Gas	Kg	468,661	223,201	16,449	216,700	0,234	0,250	11,826
	Coal	Kg	1139,617	588,558	19,499	524,406	0,128	0,241	6,785
	Uranium	Kg	0,007	0,000	0,000	0,006	0,000	0,000	0,000
	Renewable	**MJ**	**6491,411**	**29,863**	**37,655**	**6398,389**	**0,357**	**0,850**	**24,298**
	Hydroelectric	MJ	6220,391	27,839	35,891	6132,225	0,340	0,821	23,275
	Wind	MJ	270,052	1,997	1,740	265,266	0,016	0,028	1,004
	Solar	MJ	0,968	0,027	0,024	0,897	0,000	0,001	0,019
MATERIAL RESOURCES CONSUMPTION	**Non-renewable**	**Kg**	**7579,078**	**6375,445**	**53,855**	**945,165**	**30,603**	**28,043**	**145,966**
	Inert Rock	Kg	4506,080	4506,080	0,000	0,000	0,000	0,000	0,000
	Coal	Kg	1139,617	588,558	19,499	524,406	0,128	0,241	6,785
	Chrome	Kg	602,065	601,952	0,008	0,088	0,000	0,001	0,016
	Gravel	Kg	430,128	12,077	11,762	217,736	30,411	27,455	130,687
	Other	Kg	901,188	666,778	22,587	202,936	0,064	0,346	8,477
	Oil (Feedstock)	Kg	0	0	23,165	0	0	0	0
	Natural Gas (Feedstock)	Kg	0	0	4,074	0	0	0	0
	Renewable(wood)	**Kg**	**28,669**	**6,502**	**11,966**	**10,062**	**0,002**	**0,004**	**0,133**
SECONDARY RESOURCES CONSUMPTION	**Materials(steel)**	**Kg**	**800**	**800**	**0**	**0**	**0**	**0**	**0**
	Energy	MJ	0	0	0	0	0	0	0
RECOVERED ENERGY FLOWS		MJ	0	0	0	0	0	0	0

ELECTRO-COLORED POLISHED SHEET (data refer to 1000 kg manufactured stainless steel)									
IMPACT CATEGORIES		Measure Unit	Total	UPSTREAM		CORE	DOWNSTREAM		
				Rawmaterial (production)	Packaging (production)	Production	Steel (end life)	Packaging (end life)	Distribution
ENERGY RESOURCES CONSUMPTION	**Non-renewable**	**Kg**	**1874,349**	**1102,494**	**47,906**	**680,844**	**0,992**	**1,174**	**40,939**
	Oil	Kg	336,935	187,859	17,871	105,333	0,630	0,589	24,653
	Natural Gas	Kg	439,169	247,039	12,603	169,578	0,234	0,288	9,427
	Coal	Kg	1098,240	667,595	17,431	405,929	0,128	0,297	6,860
	Uranium	Kg	0,005	0,001	0,000	0,003	0,000	0,000	0,000
	Renewable	**MJ**	**3163,597**	**139,954**	**29,226**	**2973,049**	**0,357**	**1,062**	**19,949**
	Hydroelectric	MJ	3012,885	125,545	27,797	2839,537	0,340	1,028	18,638
	Wind	MJ	149,835	14,207	1,409	132,880	0,016	0,033	1,289
	Solar	MJ	0,877	0,203	0,020	0,632	0,000	0,001	0,021
MATERIAL RESOURCES CONSUMPTION	**Non-renewable**	**Kg**	**7313,066**	**6184,764**	**50,286**	**924,915**	**30,603**	**27,503**	**94,994**
	Inert Rock	Kg	4068,057	4068,057	0,000	0,000	0,000	0,000	0,000
	Coal	Kg	1098,240	667,595	17,431	405,929	0,128	0,297	6,860
	Chrome	Kg	621,210	621,098	0,007	0,091	0,000	0,001	0,013
	Gravel	Kg	525,389	104,437	10,863	270,968	30,411	26,604	82,106
	Other	Kg	1000,169	723,577	21,984	247,928	0,064	0,601	6,015
	Oil (Feedstock)	Kg	0	0	17,082	0	0	0	0
	Natural Gas (Feedstock)	Kg	0	0	3,004	0	0	0	0
	Renewable(wood)	**Kg**	**27,722**	**9,569**	**11,977**	**6,038**	**0,002**	**0,005**	**0,131**
SECONDARY RESOURCES CONSUMPTION	**Materials(steel)**	**Kg**	**800**	**800**	**0**	**0**	**0**	**0**	**0**
	Energy	MJ	0	0	0	0	0	0	**0**
RECOVERED ENERGY FLOWS		MJ	0	0	0	0	0	0	0

PATTERNED SHEET (data refer to 1000 kg manufactured stainless steel)									
IMPACT CATEGORIES		Measure Unit	Total	UPSTREAM		CORE	DOWNSTREAM		
				Rawmaterial (production)	Packaging (production)	Production	Steel (end life)	Packaging (end life)	Distribution
ENERGY RESOURCES CONSUMPTION	**Non-renewable**	**Kg**	**1223,305**	**995,900**	**29,115**	**153,733**	**0,992**	**0,392**	**43,173**
	Oil	Kg	223,044	142,656	11,139	41,353	0,630	0,213	27,052
	Natural Gas	Kg	286,336	207,499	7,870	60,489	0,234	0,091	10,153
	Coal	Kg	713,924	645,744	10,107	51,890	0,128	0,088	5,967
	Uranium	Kg	0,001	0,000	0,000	0,001	0,000	0,000	0,000
	Renewable	**MJ**	**871,968**	**33,632**	**17,349**	**799,406**	**0,357**	**0,308**	**20,917**
	Hydroelectric	MJ	834,316	30,210	16,571	766,908	0,340	0,297	**19,990**
	Wind	MJ	37,472	3,377	0,767	32,391	0,016	0,010	0,910
	Solar	MJ	0,181	0,046	0,011	0,107	0,000	0,000	**0,017**
MATERIAL RESOURCES CONSUMPTION	**Non-renewable**	**Kg**	**6940,562**	**6579,022**	**28,453**	**169,092**	**30,603**	**10,170**	**123,221**
	Inert Rock	Kg	4719,778	4719,778	0,000	0,000	0,000	0,000	0,000
	Coal	Kg	713,924	645,744	10,107	51,890	0,128	0,088	5,967
	Chrome	Kg	540,202	540,163	0,003	0,022	0,000	0,000	0,014
	Other	Kg	966,658	673,337	18,344	117,181	30,475	10,081	117,240
	Oil (Feedstock)	Kg	0	0	11,402	0	0	0	0
	Natural Gas (Feedstock)	Kg	0	0	2,005	0	0	0	0
	Renewable (wood)	**Kg**	**13,029**	**7,969**	**3,737**	**1,203**	**0,002**	**0,001**	**0,117**
SECONDARY RESOURCES CONSUMPTION	**Materials(steel)**	**Kg**	**800**	**800**	**0**	**0**	**0**	**0**	**0**
	Energy	MJ	0	0	0	0	0	0	**0**
RECOVERED ENERGY FLOWS		MJ	0	0	0	0	0	0	0

SUPERMIRROR SHEET (data refer to 1000 kg manufactured stainless steel)									
IMPACT CATEGORIES		Measure Unit	Total	UPSTREAM		CORE	DOWNSTREAM		
				Rawmaterial (production)	Packaging (production)	Production	Steel (end life)	Packaging (end life)	Distribution
ENERGY RESOURCES CONSUMPTION	**Non-renewable**	**Kg**	**1539,683**	**985,326**	**35,655**	**483,782**	**0,992**	**0,376**	**33,551**
	Oil	Kg	299,338	184,362	14,089	79,145	0,630	0,199	20,913
	Natural gas	Kg	347,527	221,225	9,993	108,119	0,234	0,089	7,868
	Coal	Kg	892,815	579,740	11,574	296,516	0,128	0,088	4,770
	Uranium	Kg	0,003	0,000	0,000	0,002	0,000	0,000	0,000
	Renewable	**MJ**	**2101,955**	**27,059**	**22,079**	**2035,887**	**0,357**	**0,306**	**16,268**
	Hydroelectric	MJ	2005,852	25,432	21,101	1943,184	0,340	0,295	15,500
	Wind	MJ	95,593	1,605	0,964	92,242	0,016	0,010	0,754
	Solar	MJ	0,510	0,021	0,014	0,461	0,000	0,000	0,014
MATERIAL RESOURCES CONSUMPTION	**Non-renewable**	**Kg**	**7710,352**	**6856,101**	**31,670**	**689,178**	**30,603**	**9,451**	**93,349**
	Inert Rock	Kg	5033,068	5033,068	0,000	0,000	0,000	0,000	0,000
	Coal	Kg	892,815	579,740	11,574	296,516	0,128	0,088	4,770
	Chrome	Kg	581,337	581,252	0,004	0,069	0,000	0,000	0,011
	Other	Kg	1203,132	662,041	20,093	392,593	30,475	9,362	88,568
	Oil (Feedstock)	Kg	0	0	14,616	0	0	0	0
	Natural Gas (Feedstock)	Kg	0	0	2,570	0	0	0	0
	Renewable(wood)	**Kg**	**15,179**	**6,473**	**4,301**	**4,309**	**0,002**	**0,001**	**0,093**
SECONDARY RESOURCES CONSUMPTION	**Materials (steel)**	**Kg**	**800**	**800**	**0**	**0**	**0**	**0**	**0**
	Energy	MJ	0	0	0	0	0	0	**0**
RECOVERED ENERGY FLOWS		MJ	0	0	0	0	0	0	0

Other impacted categories

The following chartsshow the **amount of waste produced** and the **volume of water consumed** along the life cycle of the four products under study.

TSTEEL® SHEET (data refer to 1000 kg manufactured stainless steel)									
IMPACT CATEGORIES		Measu reUnit	Total	UPSTREAM		CORE	DOWNSTREAM		
				Rawmaterial (production)	Packaging (production)	Production	Steel (end life)	Packaging (end life)	Distribution
WASTE PRODUCTION	**Dangerous waste**	kg	466,616	0,000	0,000	466,616	0,000	0,000	0,000
	Non-dangerouswaste	kg	472,153	0,000	0,000	15,347	275,285	181,521	0,000
	Recyclablewaste	kg	3876,651	0,000	0,000	181,128	3479,160	216,363	0,000
	Radioactivewaste	kg	0,000	0,000	0,000	0,000	0,000	0,000	0,000
WATER CONSUMPTIO N	**Total water consumption**	l	155107,620	81859,996	4182,568	67765,829	56,227	94,053	1148,947
	Direct water consumption of the productive processes	l	0	0	0	716,497	0	0	0

ELECTRO-COLORED POLISHED SHEET (data refer to 1000 kg manufactured stainless steel)									
IMPACT CATEGORIES		Measureunit	Total	UPSTREAM		CORE	DOWNSTREAM		
				Rawmaterial (production)	Packaging (production)	Production	Steel (end life)	Packaging (end life)	Distribution
WASTE PRODUCTION	**Dangerous waste**	kg	613,573	0,000	0,000	613,573	0,000	0,000	0,000
	Non-dangerouswaste	kg	660,453	0,000	0,000	159,746	275,285	225,423	0,000
	Recyclablewaste	kg	6296,152	0,000	0,000	181,128	5883,771	231,252	0,000
	Radioactivewaste	kg	0,000	0,000	0,000	0,000	0,000	0,000	0,000
WATER CONSUMPTION	**Total water consumption**	l	140835,910	91982,607	3456,088	44228,856	56,227	159,578	952,556
	Direct water consumption of the productive processes	l	0	0	0	3085,773	0	0	0

PATTERNED SHEET (data refer to 1000 kg manufactured stainless steel)									
IMPACT CATEGORIES		Measure Unit	Total	UPSTREAM		CORE	DOWNSTREAM		
				Rawmaterial (production)	Packaging (production)	Production	Steel (end life)	Packaging (end life)	Distribution
WASTE PRODUCTION	Dangerous waste	kg	0,070	0,000	0,000	0,070	0,000	0,000	0,000
	Non-dangerouswaste	kg	353,817	0,000	0,000	12,409	275,285	66,124	0,000
	Recyclablewaste	kg	2172,764	0,000	0,000	181,128	1914,278	77,357	0,000
	Radioactivewaste	kg	0,000	0,000	0,000	0,000	0,000	0,000	0,000
WATER CONSUMPTION	Total water consumption	l	71195,559	60062,033	2101,626	7950,967	56,227	34,726	989,981
	Direct water consumption of the productive processes	l	0	0	0	172,296	0	0	0

SUPERMIRROR SHEET (data refer to 1000 kg manufactured stainless steel)									
IMPACT CATEGORIES		Measure Unit	Total	UPSTREAM		CORE	DOWNSTREAM		
				Rawmaterial (production)	Packaging (production)	Production	Steel (end life)	Packaging (end life)	Distribution
WASTE PRODUCTION	Dangerous waste	kg	466,616	0,000	0,000	466,616	0,000	0,000	0,000
	Non-dangerouswaste	kg	355,862	0,000	0,000	15,347	275,285	65,230	0,000
	Recyclablewaste	kg	3724,320	0,000	0,000	181,128	3470,797	72,395	0,000
	Radioactivewaste	kg	0	0	0	0	0	0	0
WATER CONSUMPTION	Total water consumption	l	109307,130	74051,658	2536,379	31853,973	56,227	38,026	770,870
	Direct water consumption of the productive processes	l	0	0	0	716,491	0	0	0

Further information

Waste production represents (…) a lossof material and energyresources (…). Among the resources used in Europe, one-third is converted in scraps and emissions with over 1.8 billion tons of waste every year. (…) Each European citizen produces 520 kg of domestic waste per year, with an expected increase of 25% from 2005 to 2020" ("Linee guida sulla prevenzione dei rifiuti urbani", Osservatorio Nazionale Rifiuti/Federambiente, 2010).

All the measures taken to avoid or delaythe creation of wastewhenever possible and to use the minimum raw material quantity in the production of objects is defined "waste prevention". In addition to the waste prevention there is the "minimization", i.e. the actions reducing the amount of waste going to disposal and maximizing the recovery/ recycle. The Regulation dictates a detailed hierarchy of the management tools of waste:

- before the waste is created: prevention (reduction to source and reuse)
- when the waste is already formed: material recovery (preparation for the re-use and recycling)
- energyrecovery
- disposal

The products shown in this EPD are made of 100% stainless steel, potentially entirely recyclable material. According to the current available technologies, it is possible to recycle these products without any treatment.
Referring to the materials that constitute the primary packing in polyethylene and secondary packing in wood and iron, it is recommended to favor its recovery/ recycle, as suggested by the current European Regulation (waste framework directive, 2008/98/CE) and by the national regulation (D.Lgs. 152/2006 e s.m.i.).

Examples for using EPD

The evaluation of the environmental product impact represents an innovative approach in the sustainable planning.

Steel Color SPA's EPD provides information that helps to summarize the environmental impact of an object, in terms of the used energy and greenhouse gas emissions generated by the construction, and compare them to the ones that refer to different solutions employed in the same object for the same life cycle.

By convention, the data in the EPD refer to a hypothetical object that works as a reference, called Declared Unit, which corresponds, in the case under study, to **1000 kg of manufactured stainless steel**.

In order to use the data provided for a project evaluation, considering that the stainless steel sheets dimensions change depending on the customer/ supplier's needs, it is necessary to readjust the greenhouse gas emission impacts of a **sheet with dimensions 1x1250x2500 mm**, which are the most required dimensions.

	TSteel®	Electro-colored polished	Patterned	Supermirror
Declared Unit: 1000 kg manufactured stainless steel, except the transport to the final customer/ supplier				
Greenhouse emissions [kg CO_2eq/1000kg U.D.]	**5871,820**	**6089,112**	**3320,868**	**4983,753**
Acidification[kg SO_2eq/1000kg U.D.]	48,232	48,308	31,870	44,771
Photochemical Oxidation [kg C_2H_4eq/1000kg U.D.]	2,838	3,066	1,447	2,643
Eutrophication [kg PO_4^{3-}eq/1000kg U.D.]	5,112	6,597	1,810	3,863
Transformation to single sheet with standard dimensions 1x1250x2500mm (25 kg per sheet)				
Greenhouse emissions [kg CO2 eq/25kg U.F.]	**146,796**	**152,228**	**83,022**	**124,594**
Acidification[kg SO_2eq/25kg U.F.]	1,206	1,208	0,797	1,119
Photochemical Oxidation [kg C_2H_4eq/25kg U.F.]	0,071	0,077	0,036	0,066
Eutrophication [kg PO_4^{3-}eq/25kg U.F.]	0,128	0,165	0,045	0,097

Furthermore, if we consider the distances for distributing the final product to a potential customer or to major providers of Steel Color SPA, the following charts show the distribution segments of interest:

- Distribution segmentsto a potential customer through vehicle (lorry 16-32 metric ton EURO3):

	ITALY				SPAIN (Madrid)
Traveledkm	**50**	**100**	**200**	**500**	**1630**
kg CO2 eq*1000kg produced steel	9,5	19	38	95	309,7
kg CO2 eq* single sheet with dimensions 1x1250x2500mm	**0,237**	**0,475**	**0,950**	**2,375**	**7,742**

- Distribution segments to the major Steel Color SpA suppliers:

	SWITZERLAND (Biel)	FRANCE (Satolas-et-Bonce)	ENGLAND (Kingswinford)	AUSTRALIA (Bexley NSW)
km by vehicle (lorry 16-32 metric ton EURO3)	**460**	**506**	**1321**	**216**
km by ship (transoceanic tanker)	**-**	**-**	**196**	**18159**
kg CO2 eq*1000kg produced steel	87,400	96,140	252,340	151,991
kg CO2 eq*single sheet with dimensions 1x1250x2500mm	**2,185**	**2,403**	**6,308**	**3,799**

For example, considering the impacts in terms of greenhouse gases coming from the production of 10 Tsteel sheets and to the related transport to Rome (500 km), the consequence is that these impacts correspond to:

10 Tsteel sheets transported to a customer in Rome (IT)=10 x (143,553 +2,375) = **1459,28 kg CO2 eq**

Environmental and social responsibility

Thanks to the attention for the environment management, the company Steel Color SpA always stood out. Steel Color SpA adopted since 2000 a certified Environmental Management System, according to the Regulation ISO 14001. The Quality Environment Safetyintegrated management System, according to the Regulations UNI EN ISO 9001, UNI EN ISO 14001 and OHSAS18001 is certified by the RINA Certification Institute with:

- certificate n° 891/97/S for the compliance to Regulation UNI EN ISO 9001:2008
- certificate n° EMS-178/Sfor the compliance to RegulationUNI EN ISO 14001:2004
- certificate n° OHS-616 for the compliance to RegulationOHSAS 18001:2007

Therefore, Steel Color S.p.A. has accepted precise and defined commitments regarding Quality, Environment and Safety. For this purpose the company works hard to reach the targets defined in its own Environmental and Safety Policy, that are:

- respect of current laws, contractual, environmental and safetynorms
- plan and realize actions for a major environmental sustainability
- reduce the more important environmental impacts related to the establishment activity with specific attention for the management of dangerous substances;
- minimize the waste volume to be disposed;
- evaluate the risks and arrange the prevention and protection measures in order to avoid accidents, situation of risks and damage to people;
- collaborate with the local authority;
- Aim for a continuous improvement.

In order to reach these goals, the company considers strategic what follows:

- extending this policy to all company levels;
- making the staff feel responsible, educate and train them, informing about the achievement of the set goals;
- monitoring the company processes, the environmental aspects and the risks of any related accident;
- managing the plants according to the high environmental standards and safety;
- planning and implementing action plans to improve continuously the company results, in terms of quality, environment and safety;
- Reviewing periodically the objectives and targets, ensuring the policy effectivenessover the time.

INFORMATION

AND REFERENCES

Specific reference requirements

EPD programme	The International EPD® System Vasagatan 15-17 se-111 20 Stockholm Sweden. www.environdec.com
Registration Nº	Nº S-P-00690
Date of publication	Date 2015-03-02
EPD validity	Date **12/11/2017**
EPD valid within the following geographical area	World
EPD Type	Cradle-to-gate **X**Cradle-to-grave
Independent verification of the declaration and data, according to ISO 14025:2006	**X**EPD External verification EPD Process certification
Third party verifier	Rina Services Spa, Via Corsica, 12 – 16128 - Genova - ITALY, www.rina.org
Third party verifier accredited or approved by	
Reference Product category rules (PCR)	PCR 2014:10 Fabricated steel products, except construction products, machinery and equipment
Product category rules (PCR) review conducted by	The Technical Committee of the International EPD® System. Chair: Massimo Marino Contact via info@environdec.com
Product category rules (PCR) prepared by:	PCR Moderator: Gorka Benito Alonso – IK INGENIERIA. Contact via g.benito@ik-ingenieria.com
EPD within the same product category but coming from different programs may not be comparable.	

Contacts

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Bibliography and data sources

- General Programme Instructions for the International EPD® System, Version 2.01, 18/09/2013 (www.environdec.com)
- PCR UN CPC 422 & 429 “Fabricated steel products, except construction products, machinery and equipment”, Version 1.0, 09/04/2014 (www.environdec.com)
- “Life Cycle Assessment Report: Lastre di acciaio inox lavorato di Steel Color SpA; TSteel®, Supermirror, Colorata Lucida e Goffrata” - rev. 02dated27/10/2014
- “LCI data for steel products”, provided by Eurofer Stainless, The European Steel Association (www.eurofer.eu)
- “Rapporto Rifiuti Urbani 2013” -sezione rifiuti di imballaggio- di ISPRA (Istituto Superiore per la Protezione e Ricerca Ambientale)
- “Waste and recycling in Australia 2011: Final Report” (Department of Sustainability, Environment, Water, Population and Communities)
- banca dati Ecoinvent versione 2
- banca dati Ecoinvent versione 3.0.1