AGIS
Al Ghurair Iron & Steel LLC
الغرير للحديد والاءستيل(ذ.م.م.)

ENVIRONMENTAL FOOTPRINT INSTITUTE

Environmental Product Declaration

Under the general rules of the Environmental Footprint Institute
Product Group Classification: UN CPC 88731
In accordance with ISO 14025 and EN 15804 for:

Hot Dip Galvanized Steel Coil

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1.0 DOCUMENT INFORMATION

Program	The Environmental Footprint Institute
Product Group Classification	UN CPC 88731
EPD Registration Number	REF:210623EPD CR:P-15804
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Geographical Scope	United Arab Emirates (UAE)

2.0 INTRODUCTION

This report contains the environmental performance of the manufacturing process of Hot Dip Galvanized Steel Coil manufactured by Al Ghurair Iron & Steel LLC. This Environmental Product Declaration (EPD) has been developed using the Life Cycle Assessment (LCA) methodology. The environmental impact values calculated are expressed to one-meter square of average galvanized steel coil.

The assessed life cycle includes all phases in the manufacturing process of Hot Dip Galvanized Steel Coil in a "cradle to gate with options" scope. This LCA covers transportation of Hot Rolled Steel Coils (HRC) & Cold Rolled Full Hard Steel Coils (CRFH), production & transportation of other materials such as Zinc, Chrome Passivator etc..., galvanizing processes and up to the distribution of final product to the customer.

This EPD has been conducted according to the Environmental Footprint Institute regulations and it has been certified and registered in The Environmental Footprint Institute. The EPD regulation is a system for the international use of Type III Environmental Declarations, according to ISO 14025:2010. Not only the system, but also its applications, is described in the Programmer's General Indications (PGI). This report has been made following the specifications given in the European standard EN 15804:2012+A2:2019.

The direct and indirect emissions and the corresponding environmental impacts calculated in the life cycle assessments and reported in this EPD include, amongst other, the calculation of the carbon footprint, the water footprint and other environmental impacts to air, land and water, according to the selected Product Category Rules.

3.0 GENERAL INFORMATION

Al Ghurair Iron & Steel LLC (AGIS) is the first Flat Steel Cold rolling and hot-dip galvanizing complex in the United Arab Emirates and one of the largest producers of Galvanized steel in the Middle East & North Africa Region. AGIS is a joint venture of the Saif Al Ghurair Group, one of the largest and well diversified business houses of UAE and Nippon Steel Corporation, Japan's largest & one of the biggest steelmakers in the world. Located strategically in the Industrial City of Abu Dhabi (ICAD), Mussafah, Abu Dhabi, the 500,000TPA facility caters to the requirement of the construction, fabrication & other non-automotive industries in the MENA region and other parts of the world.

AGIS produces 500,000 TPA of Hot Dip Galvanized Coils with a thickness range of 0.20 to 2.5mm and width up to 1250mm from its two continuous Galvanizing lines. The production lines have been engineered & designed to cater to the requirement of the end-users in the region. Sheets & Slitted coils are also offered as per customer requirements. All grades of GI-CQ, LFQ, SQ & HSLA for a wide variety of applications are produced in AGIS. It also offers Skin Passed GI and Oiled Hot Dip Galvanized Coils for some special applications.

The main production lines include a Semi-continuous Pickling Line, a 6-Hi Reversing Cold Rolling Mill and two continuous galvanizing lines.

Product Range & Capabilities:

Hot Dip Galvanized Coils – Thickness: 0.20 to 2.50 mm – 500,000 MT/annum.

Galvanized Steel Sheets and slit coils are also offered as per customer requirement.

AGIS is committed to maintaining the health and safety of its employees, customers, contractors and other stakeholders, as well as preserving the integrity of our environment. The company is a proud recipient of the ISO 9001:2015, ISO 14001:2015 and ISO 45001:2018 Certificates for its Quality, Environment and Health & Safety Management Systems. The Environment, Health & Safety Management System (EHMS) of the Company has been certified by ZonesCorp.

With a presence in over 20 countries, AGIS covers all of the key steel markets in the region, from emerging to mature. The quality of the products has been very well accepted and AGIS is a well-established brand in the MENA markets and other parts of the world.

The convenience of being close to the seaports of Abu Dhabi & Jebel Ali is seen in the ease of shipments to all parts of the world – both in containers and by break bulk. The company also uses the road & other transport networks to cater to the markets. Consumers have the ease of getting their material delivered at their doorstep straight from the Mill.

3.1 AGIS Mission

At AGIS, we provide high Quality and cost effective Flat Steel products and services on time, to our customers. We achieve this by abiding by the highest standards of Operational excellence, Safety, Transparency and Accountability that rewards all our stakeholders and the communities we operate in.

3.2 AGIS Vision

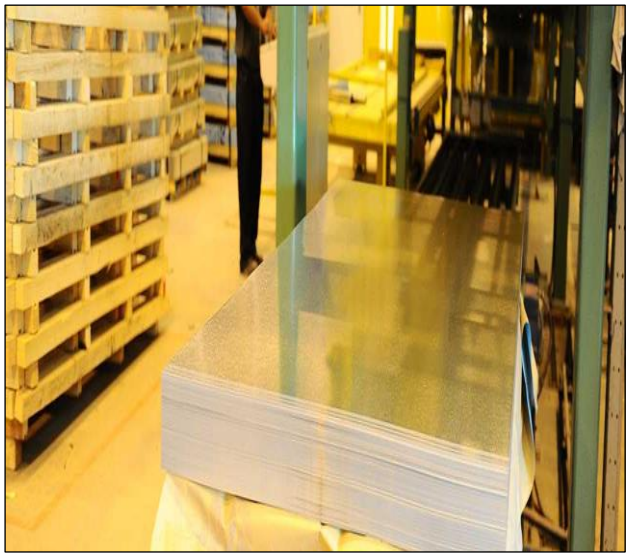
By 2023, AGIS will be the leading manufacturer and supplier of Coated Flat Steel products in the MENA region, constantly Exceeding Customer Expectations and providing our employees with a healthy work environment with opportunities for growth.

3.3 Analyzed Product

The assessed system in this Environmental Product Declaration (EPD) comprises the full life cycle of **Hot Dip Galvanized Steel Coil** by AGIS LLC in its factory in Abu Dhabi. The assessment has been done using the production data from December 2019 – November 2020. The galvanized coils are further slit into coils and sheets. This Environmental Product Declaration refers to a double-sided hot dip galvanized steel, consisting of steel substrate with a specific metallic alloyed zinc coating, applied by means of a continuous hot dip galvanizing process.

Coils

Slit Coils



Sheets

3.4 Product Sizes

Thickness Range(mm)	Width Range (mm)	Form	Remarks
0.20 - 2.50	900 – 1250	Coil Form	Zinc coated, galvanized coil mill edge
0.20 – 2.50	35 - 1250	Coil Form	Zinc coated galvanized coil, trimmed/slitted edge
0.30 – 2.50	650 - 1250	1200 – 4000 (Plain Sheet)	Zinc coated sheet cut from galvanized coil

3.5 Zinc Coating

GP Thickness* Range, mm	CQ / LFQ	DQ	DDQ	EDDS
	CS Type	FS Type	DDS	EDDS
0.200 – 0.239	60 - 120	-	-	-
0.240 – 0.300	60 - 180	-	-	-
0.301 – 0.479	60 – 275	-	-	-
0.480 – 0.700	60 – 350	60 – 350	-	-
0.701 – 0.800	60 – 350	60 – 350	-	-
0.801 – 1.200	90 – 350	90 – 350	-	-
1.201 – 1.500	90 – 350	90 – 350	-	-
1.510 – 2.000	90 – 350	90 – 350	-	-
2.001 – 2.500	90 – 275	90 – 275	-	-
2.510 2.800	120 - 275	-	-	-

GP Thickness* Range, mm	Structural Quality (SQ)				SQ/Full Hard	HSLA
	SS 33	SS 37	SS 50	G450	SS 80	HSLAS 40
0.200 – 0.239	60 – 120	-	-	-	90 – 120	-
0.240 – 0.300	60 – 180	-	-	-	90 – 180	-
0.301 – 0.479	60 – 275	-	-	-	90 – 275	-
0.480 – 0.700	60 – 350	90 – 350	90 – 350	-	90 – 275	-
0.701 – 0.800	60 – 350	90 – 350	100 – 350	100 – 350	90 – 275	-
0.801 – 1.200	90 – 350	90 – 350	100 – 350	100 – 350	90 – 275	-
1.201 – 1.500	90 – 350	90 – 350	100 – 350	100 – 350	-	90 – 350
1.510 – 2.000	90 – 350	90 – 275	100 – 275	100 – 275	-	90 – 275
2.001 – 2.500	90 – 275	90 – 275	100 – 275	100 – 275	-	90 – 275
2.510 2.800	-	-	-	-	-	-

3.6 Typical End Uses

Product	Form	End Uses
Hot Dip Galvanized (HDG) • Full Hard (FH) • Commercial Quality (CQ, LFQ) • Drawing Quality (DQ) • Deep Drawing Quality (DDQ) • Structural Quality (SQ)	Coil/Sheet	• **Construction** : Roofing, Sidewall, Partition, Panel, valley gutter, Louvers, False Ceiling, Duct, Heating Ventilation cold rolled sections, Lintels, color coating (pre-painting), Z,C purlins, Decking, Steel buildings etc. • **Domestic** : Trunk, ICE Box, Household Machine, Tub, Bucket, Storage Bin, Dustbin, Water tank, Washing Machine body, Door/Window Frame (powder coating), Building Panel etc. • **Agriculture**: Grain Silo, Sprayer, Pan, Feeding through etc. • **White Goods/Electrical Appliances**: Cabinet of Air Conditioner/Water Cooler, Refrigerator, Freezer, VCR, Water Heater, PC Hard Disk, Electrical Panel, Cable Treys and accessories etc. • Furniture and Fixtures : Desk, Locker, Rack, Cabinet, Shelf, Almirah etc • **Industrial Components**: Ducting, Drum/Barrel, Rolling Shutter, Container, Packaging materials etc. • **Outdoor** : Sign – Board, Hoarding, Road Signs etc.

3.7 Declared Unit

The Declared Unit of the Life Cycle Assessments is Hot Dip Galvanizing of one square meter (1m2) of Steel Coil product at the gate of the customer.

All direct and indirect environmental impacts, as well as the use of resources, are reported referred to this unit. This EPD presents separately the environmental impacts associated to the LCA of all the Hot Dip Galvanized Steel Coil.

3.8 System Boundaries

This EPD covers all product stages from "cradle to gate with options", i.e this LCA covers transportation of Hot Rolled Steel Coils (HRC) & Cold Rolled Full Hard Steel Coils (CRFH), production & transportation of other materials such as Zinc, Chrome Passivator etc..., galvanizing processes and up to the distribution of final product to the customer. Use and final disposal is not included in this LCA.

AGIS buys the raw materials (Hot Rolled Steel Coils (HRC), Cold Rolled Full Hard Steel Coils (CRFH), Zinc and Chemicals) from external suppliers. From this point AGIS controls all the process: slitting, pickling, cold rolling, galvanizing, CRS, CTL and packing, etc. AGIS buy raw materials from Europe, Asia, Australia, Japan and GCC countries.

The procedures that are not controlled by the company, but are included in this environmental study, are:

- The extraction and production of fuels.
- The production of electricity.
- The production of the machinery, buildings, and vehicles.

All related direct and indirect environmental impacts related to these elements have been calculated and were included in the LCAs in this EPD.

Production Stage			Construction Process Stage		Use Stage						End of Life Stage					Resource Recovery Stage
Raw Materials	Transport	Manufacturing	Transport	Construction Installation	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	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

X = Included, ND=Module not declared, NR= Module not relevant

Modules from A5 to D are not included (X refers to considered stage; NR refers to not relevant stage and ND to not declared stage).

Upstream Processes (A1: Raw Material Supply): Production for each product starts with mainly transported from other parts of the world and some locally sourced. 'Raw material supply' includes raw material extraction and pre-treatment processes before production.

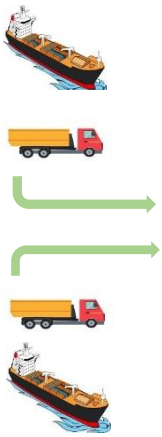
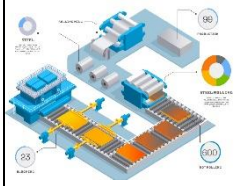
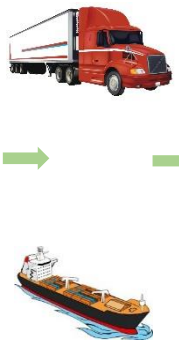
Core Processes (A2: Transportation, A3: Manufacturing and A4: Transport): Transport is relevant for delivery of raw materials to the plant (Hot Rolled Steel Coils (HRC), Cold Rolled Full Hard Steel Coils (CRFH), High Grade Zinc & Zinc alloys & chemicals, etc.) and the transport of materials within the plant. Hot Dip Galvanized Steel Coil production starts with slitting, pickling, cold rolling, galvanizing, CRS, CTL and packaging. Electricity and Diesel are consumed at Hot Dip Galvanized Steel Coil production process.

Hot Dip Galvanized Steel Coils are distributed to customer's sites.

3.9 Product Stages

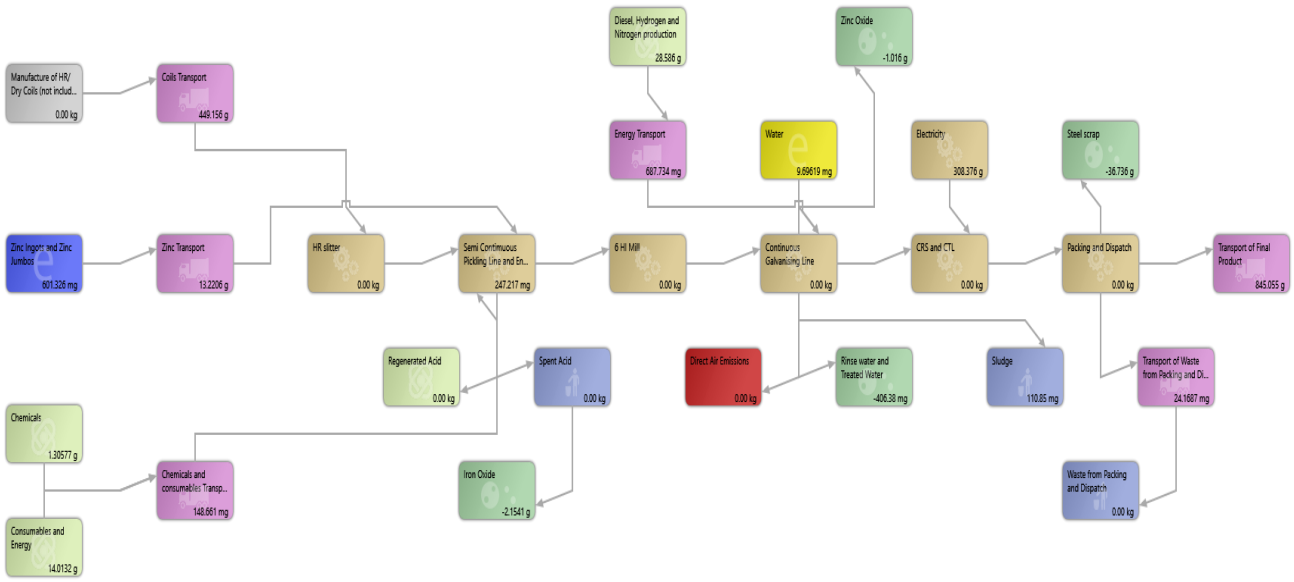
A simplified model of the manufacturing and distribution process is described in the following diagrams, enumerating the main activities included in the system boundaries. The process and facilities are also linked to the phases of the product life cycle (A1-A4) The first phase in the LCA is the production of Hot Dip Galvanized Steel Coil. AGIS buys the Hot Rolled Steel Coils (HRC), Cold Rolled Full Hard Steel Coils (CRFH), High Grade Zinc & Zinc alloys, Chemicals and other raw materials from different suppliers in Europe, Asia, Australia, Japan and GCC Countries (A1-A2). After the slitting, pickling, cold rolling, galvanizing, CRS and CTL, the Hot Dip Galvanized Steel Coils are packaged (A3).

The Hot Dip Galvanized Steel Coils are distributed to customers around the world (A4). In this EPD environmental impacts are reported by Hot Dip Galvanized Steel Coil type of product.

Scope of this Life Cycle Assessment 'Cradle to Gate with Options'					
A1 Raw Materials Production	**A2 Transport raw materials**	**A3 Manufacture**	**A4 Distribution**	**USE**	**Recovering and Recycling**
					
Raw Materials and Chemicals	Transport from supplier by land or sea	slitting, pickling, galvanizing, CRS and CTL	Transport to customers by trucks	NOT DECLARED	NOT DECLARED

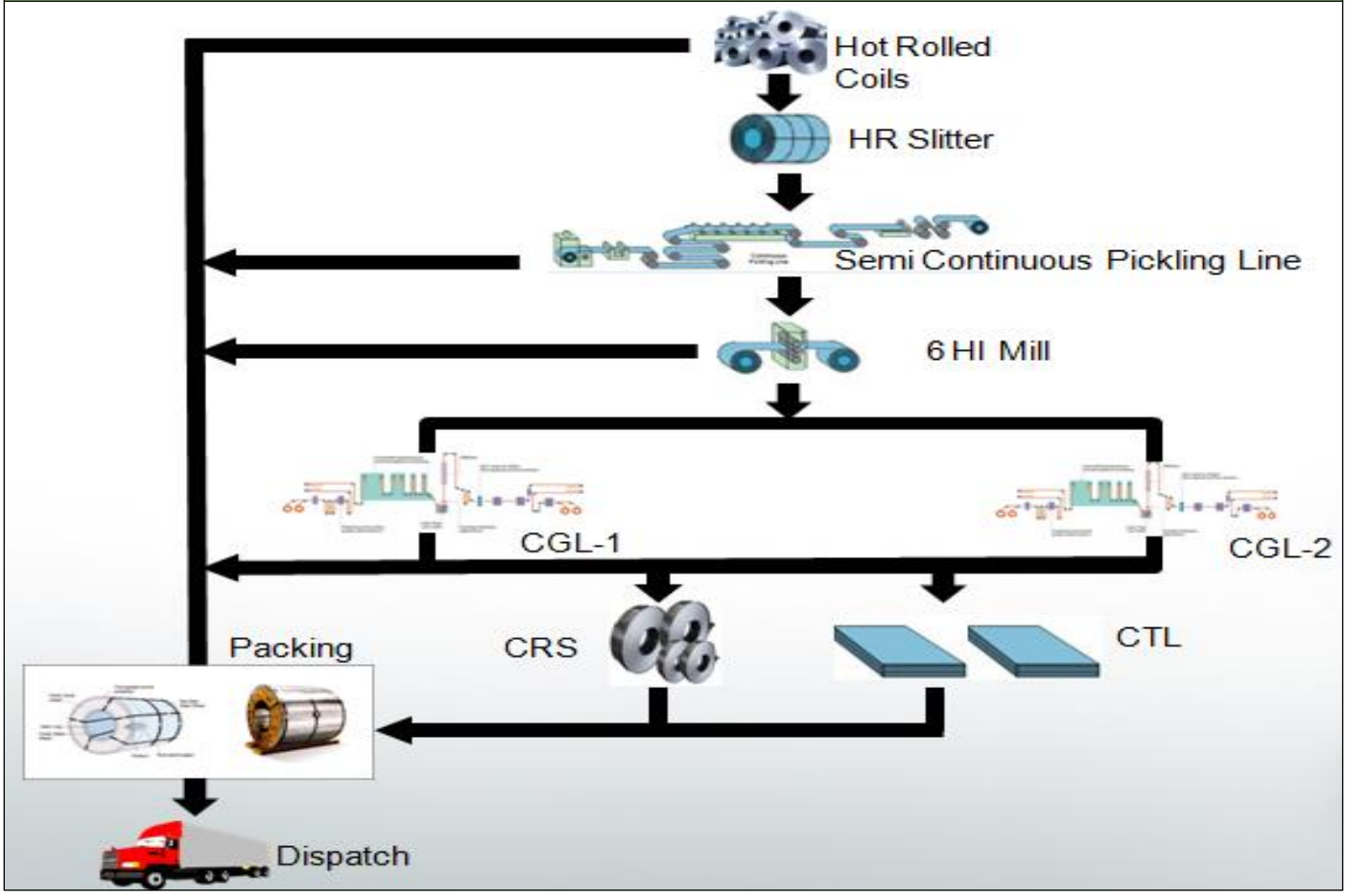
The following diagram designed using Air.e LCA software shows and example of the materials, fuels consumption, energy consumption, transports and other elements and procedures included in the assessments.

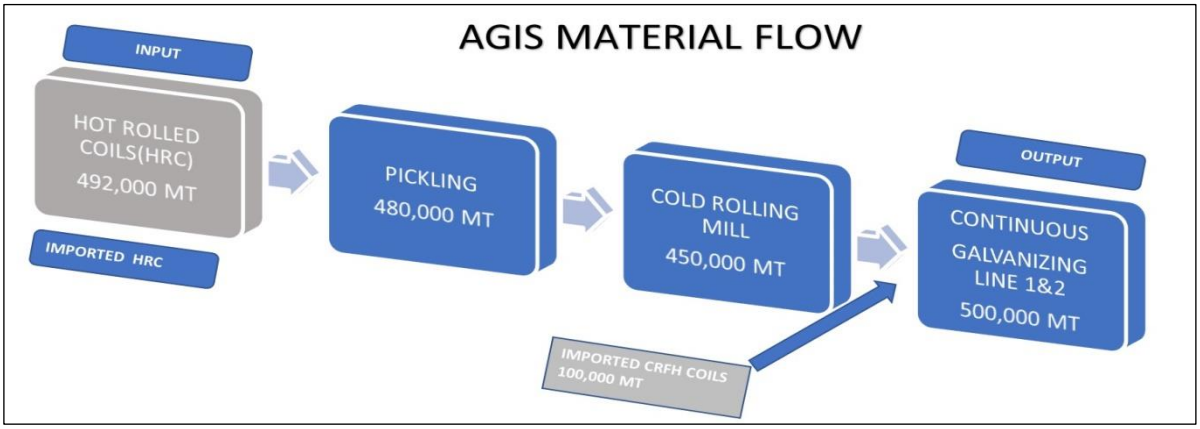
Life Cycle Assessment Modeling



The following diagram is a more detailed description of the A3 phase.

Manufacturing Process





3.10 Content Declaration

Materials	Percentage
Zinc	2.95
Chrome Passivator	0.012
Hydrochloric Acid	Not part of final product
Nitrogen	Not part of final product
Rolling Oil	Not part of final product
NaOH Powder	Not part of final product
Hydrogen	Not part of final product

The mass ratio of the steel coils and the zinc coating are 97.05:2.95.

3.11 Substances listed in the "Candidate List of SVHC"

The following list includes all the substances used to provide the service that are included in the Candidate List of substances of very high concern by European Chemicals Agency.

Material Component	Substance	Weight	CAS Number	Hazard Class and Category Code(s)1	Hazard statement Code(s)1
Conversion Coating	Dichromium tris(Chromate)	0.012%	24613-89-6	Ox. Sol. 1 Carc. 1B Skin Corr. 1A Skin Sens. 1 Aquatic Acute 1 Aquatic Chronic	H271 H350 H314 H317 H400 H410

4.0 TECHNICAL INFORMATION

4.1 Calculation Methodology

This EPD represents a Type III Environmental Declarations according to ISO 14025:2010. The Life Cycle Assessment (LCA) has been developed following the ISO 14040 International Standard. The environmental impacts calculation method reported in this EPD follow the CML-IA, Baseline Version 4.8, 2016. The report has been done following the specifications given in the European standard EN 15804:2012+A2:2019, as Product Category Rules.

4.2 Emission Factors

Emission factors and environmental impacts of elements in life cycles that are not directly controlled by AGIS ((Hot Rolled Steel Coils (HRC), Cold Rolled Steel Coils (CRFH), Zinc, Chemicals, Electricity, Fuels Production, etc.) have been analyzed using external studies and external emissions factors databases like Ecoinvent due to the lack of direct data. The next paragraphs describe the calculation rules and criteria applied in the calculation of the environmental performance of this type of elements in the LCA.

Raw Materials and Chemicals

Datasets from Ecoinvent 3.6 with emission factors raw materials for Hot Dip Galvanzied Steel Coil has been characterized to adjust them to the characteristics of manufacturing of AGIS suppliers or counties where suppliers are located.

Datasets from Ecoinvent 3.6 with emission factors for generic chemicals have been characterized to adjust them to the characteristics of the products manufactured by AGIS's suppliers.

Electricity

A specific dataset with the Life Cycle Inventory (LCI) corresponding to the electricity mix in Abu Dhabi, UAE in 2019-2020 has been developed by GCAS for this LCA.

Fuels Production and Consumption

Specific datasets with the emissions factors corresponding to the fuel combustion in AGIS plant and machinery have been developed for these LCAs. Indirect emissions due to diesel production and transportation are also included in the environmental impact values calculation reported in this report. In the calculation was estimated a diesel calorific value of 43 kg/l and a density of 0,85 kg/l for diesel.

Transport to the construction site Stage – A4

The hot dip galvanized steel coils are provided to customers all over the world. To create a scenario of the A4 phase, all the coils sold from December 2019 to November 2020 has been analyzed as representative of the international transport. The transport means are international cargo ships and 3.5-7.5t & >32t trucks, as described in the following table.

Scenario	Parameter	Units	Value Per functional unit
A4 – Cargo Ship	Vehicle type used for transport	Transoceanic cargo ship	n/a
	Vehicle load capacity	Kg (dw)	50,000
	Fuel type and consumption	Litres of heavy fuel oil per km	0.24
	Distance to construction site	Km	See detailed table
	Capacity utilization	%	See detailed table
	Bulk density of transported products	Kg/m3	n/a
	Volume capacity utilisation factor	n/a	1
A4 - Truck	Vehicle type used for transport	>32t truck, 3.5-7.5t truck	n/a
	Vehicle load capacity	Kg	25,000
	Fuel type and consumption	Litres of diesel per km	0.38
	Distance to construction site	Km	See detailed table
	Capacity utilization	%	See detailed table
	Bulk density of transported products	Kg/m^3	n/a
	Volume capacity utilisation factor	n/a	1

For every destination, the total amount of products delivered to customers has been taken to account according to the following detailed table:

Means of Transport	Destination	Distance	% FU
Cargo Ship	Algeria – Bejaia	4958 nmi	0.099
	Algeria - Oran	5265 nmi	0.017
	Bahrain – Manama	322 nmi	0.663

	Belgium - Antwerp	7019 nmi	2.037
	Canada – Montreal, QC	7994 nmi	0.116
	Cyprus – Limassol Port	3533 nmi	0.079
	Egypt – Port Said	2914 nmi	3.880
	Georgia - Poti	4989 nmi	0.037
	Ghana – Tema Port	8489 nmi	0.025
	Iraq – Umm Qasr	605 nmi	0.025
	Jordan - Amman &Aqaba	3023 nmi	1.188
	Kuwait - City	560 nmi	2.638
	Kuwait – Shuaiba Port	534 nmi	0.701
	Mexico - Ensenada	14227 nmi	0.347
	Morocco - Casablanca	5679 nmi	0.374
	Oman - Muscat	456 nmi	0.211
	Oman - Sohar	345 nmi	0.097
	Pakistan - Karachi	827 nmi	0.008
	Paraguay - Asuncion	9902 nmi	0.042
	Poland – Gdynia port	8103 nmi	0.027
	Portugal - Leixoes	5262 nmi	0.019
	Puerto Rico – San Juan	8191 nmi	0.057
	Romania - Constanta	3878 nmi	0.419
	Srilanka - Colombo	1938 nmi	0.013
	Turkey – Iskenderun	3282 nmi	0.096
	Turkey - Mersin	3262 nmi	0.009
	USA – Baltimore, MD	8305 nmi	1.576
	USA – Houston, TX	9572 nmi	2.114
	USA Jacksonville, Florida	8597 nmi	1.022
	USA Los Angeles, CA	11159 nmi	0.238
	USA New Orleans, LA	9363 nmi	3.518
	USA Oakland, CA	10863 nmi	0.022
	USA Philadelphia, PA	8176.81 nmi	1.373
	USA Savannah, GA	8524 nmi	3.649
	USA Tacoma, WA	10583 nmi	0.875

Truck	Ex Works	112 kms	1.322
	KSA – Dammam	683 kms	5.069
	KSA – Hail	1537 kms	0.019
	KSA - Jeddah	1807 kms	3.199
	KSA – Jubail	770 kms	0.288
	KSA – Khamis Mushayt	1845 kms	0.027
	KSA – Riyadh	933 kms	13.39
	KSA – Tabuk	2206 kms	0.050
	KSA – Yanbu	1965 kms	0.364
	Oman - Misfah	444 kms	0.028
	Oman - Rusayl	471 kms	0.016
	UAE – Abu Dhabi	32.2 kms	0.095
	UAE – Ajman	202 kms	3.351
	UAE – Al Ain	157 kms	0.103
	UAE – Al Aweer	167 kms	0.139
	UAE – Al Jazirah Al Hamra, RAK	239 kms	0.089
	UAE – Al Quoz	133 kms	0.991
	UAE – DIC, Dubai	124 kms	2.023
	UAE – DIP, Dubai	125 kms	1.629
	UAE – Dubai	141 kms	0.768
	UAE - Fujairah	270 kms	0.023
	UAE – Hamriya Port, FOB	217 kms	0.120
	UAE – HFZ, Sharjah	193 kms	1.093
	UAE – Jebel Ali	110 kms	11.19
	UAE – Kizad, Abu Dhabi	68.4 kms	1.272
	UAE - Mussafah	7.6 kms	0.960
	UAE – National Ind Park, Dubai	104 kms	2.573
	UAE – Ras Al Khaimah	253 kms	1.600
	UAE – Ras Al Khor, Dubai	151 kms	0.309
	UAE - Rashidiya	154 kms	0.079
	UAE - Sharjah	170 kms	1.419
	UAE – Umm Al Quwain	206 kms	1.185

4.3 Calculation Rules

Version 3.10.0.6 of software Air.e LCA™ with Ecoinvent™ 3.6 database have been used for LCA modeling and impacts calculations.

Annual Statistics 2020 reports from Abu Dhabi Electricity Company have been used to create the model of electricity mix in the country.

Minor components are not directly related to the product, with less than 1% impact, such as office supplies, has been excluded from the assessment.

All transports of components have been included in the LCA considering real distances travelled by materials used from December 2019 to November 2020. Transport of raw materials needed to produce Hot Dip Galvanized Steel Coil is estimated in a global scale according to Ecoinvent™ criteria. Main means of transport have been included for materials purchases. As exact port locations are not known in detail, transport distances have been calculated from a one of the ports in the country of origin to the factory. Operation in port has also been excluded.

Road distances calculated using Google Maps. Maritime distances calculated using MarineTraffic Voyage Planner.

Cut-off rules: more than 99% of the materials and energy consumption have been included. The Polluter Pays Principle and the Modularity Principle have been followed.

4.4 By Products Assignment

Economic allocation was applied and the allocation was performed according to the PCR. Economic allocation was based on the income of each product. List of By Products used in this EPD are:

- Iron Oxide
- Zinc Oxide

5.0 ENVIRONMENTAL PERFORMACE

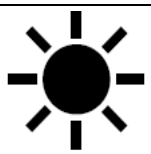
5.1 Potential Environment Impacts

In the following tables, the environmental performance of the declared units "One meter square of Zinc Coating Coils" are presented for the AGIS product totalized and for every sub-phase of the life cycles.

Environmental impacts are calculated using the CML-IA, Baseline Version 4.8, 2016.

	Impacts	A1 – A2 Materials	A3 Manufacturing	A4 Distribution	Total
	Global Warming Potential (GWP100) (kg of CO2 equivalent)	0.478	0.297	0.845	1.62
	Ozone depletion (kg of CFC11 equivalent)	6.306e-8	1.373e-8	2.537e-8	10.216e-8
	Acidification of land & water (kg of SO2 equivalent)	0.0101643	- 0.0001782	0.006608	0.0165945
	Eutrophication (kg of PO43- equivalent)	0.0010462	- 4.8846e-6	1.085e-6	0.00218528
	Photochemical ozone creation (kg of C2H4 equivalent)	26.6452e-5	1.6268e-5	15.1e-5	43.3788e-5
	Depletion of abiotic resources (elements) (kg of Sb equivalent)	8.22364e-5	6.43e-5	2.01e-5	16.6636e-5
	Depletion of abiotic resources (fossil) MJ net calorific value	5.114	5.3989	2.007	12.52

5.2 Energy Resources

	**A3** **Manufacturing**
Use of RENEWABLE primary energy fuels excluding renewable primary energy resources used as raw materials	0.147
Use of RENEWABLE primary energy fuels used as raw materials	0
Total use of RENEWABLE primary energy fuels (primary energy and primary energy fuels used as raw materials)	0.147

Data in MJ, net calorific value

	A3 **Manufacturing**
Use of NON- RENEWABLE primary energy fuels excluding non- renewable primary energy resources used as raw materials	13.2
Use of NON-RENEWABLE primary energy fuels used as raw materials	0
Total use of NON-RENEWABLE primary energy resources (primary energy and primary energy resources used as raw materials)	13.2

Data in MJ, net calorific value

5.3 Use of Resources

The following resources use assessment refers to the production phases and do not include the distribution phase (A4).

	A3 Manufacturing	Description
Use of secondary material	<0.01	Use of regenerated acid

Data in Kg

	A1-A4 Total use of water
Total Amount of water used in indirect way	1.003
Total amount of water used direct way	172.8

Data in m3

5.4 Waste Disposed

The waste disposal assessment refers to the production phases (A1-A3), distribution phase (A4) is not included.

	A3 Manufacturing	Description
Hazardous waste disposed	40e+3	Sludge from ETP
Non-hazardous waste disposed	27127e+3	Plastic/paper/carton Steel Scrap/small wooden pieces/packing strap
Radioactive waste disposed	<0.01	No nuclear energy used

Data in kg

5.5 Other output flows

The following output flows assessment refers to the production phases (A1-A3), distribution phase (A4) is not included.

	**A3 Manufacturing**
Components for re-use (Kilo Liters) – Regenerated Acid	17743
Materials for recycling (Kg)	27127e+3
Materials Recycled In-house (Kilo Liters) – Spent Acid and Rinse Water	34,934
Materials for energy recovery (MJ)	0
Exported energy (MJ)	0

6.0 ADDITIONAL INFORMATION

6.1 Recycling Content – Input Material (Hot Rolled Steel Coils)

AGIS has purchased Hot Rolled Steel coils total of 503,825 MT during the period of December 2019 to November 2020. From which 466,118 MT has recycle content between 9 to 25% as declared by their manufacturers.

6.2 Recycling Initiative – Processing Stage

Spent Acid, Rinse Water, Regenerated Acid used in the galvanizing process are recycled internally.

6.3 Recycling Content – End of Life

All steel products are recyclable at end of life. Current practice for the average hot dip galvanized steel consist of 98% recycling and 2% landfill according to the /European Commission Technical Steel Research.

7.0 VERIFICATION

Diffusion Institution	The Environmental Footprint Institute Calle CIRCE 49A Madrid 28022 Spain www.environmentalfootprintinstitute.org
EPD Registration Number	REF:210623EPD CR:P-15804
Published	23/06/2021
Valid until	23/06/2024
Product Category Rules	EN 15804:2012+A2:2019 Sustainability of construction works
Product Group Classification	UN CPC 88731 (CPC Version 2.1)
Reference year for Data	December 2019 to November 2020
Geographical Scope	United Arab Emirates

Product category rules (PCR): EN 15804:2012+A2:2019 Sustainability of construction works
PCR review was conducted by: The Environmental Footprint Institute. Chair: María Dolores Núñez Contact: Alfredo Costalago Alcántara
Independent verification of the declaration and data, according to ISO 14025:2006 and ISO 14040: ☐ EPD Process Certification (internal) ☒ EPD Verification (external)
Third party verifier: Mariola Nuñez Accredited by: The Environmental Footprint Institute.

8.0 MANDATORY STATEMENTS

Explanatory material can be obtained from EPD owner and/or LCA author. Contact information can be found below. The owner of the declaration shall be liable for the underlying information and evidence. The LCA Author shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

The verifier and The Environmental Footprint Institute do not make any claim or present any responsibility about the legality of the product.

EPDs within the same product category but from different programmes may not be comparable.

9.0 CONTACT INFORMATION

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Programme Operator	The Environmental Footprint Institute Calle Circe 49A Madrid, Spain www.environmentalfootprintinstitute.com info@environmentalfootprintinstitute.com

10.0 REFERENCES

This Environmental Footprint has been developed and diffused following the instructions of the Environmental Footprint Institute. Further information, and the document itself with reference REF:210623EPD CR:P-1580

LCA Report: Life Cycle Inventory of Hot Dip Galvanized Steel Coil by AGIS LLC.

Software: Air.e LCA rev. 3.10.0.6 www.solidforest.com

Main database: Ecoinvent 3.6 www.ecoinvent.org

Geographical scope of the EPD: United Arab Emirates

Normative: ISO 14040:2006 “Environmental management -- life cycle assessment -- principles and framework”; ISO 14044:2006 “Environmental management -- life cycle assessment -- requirements and guidelines”; ISO 14020 “Environmental Labelling: General Principles”; ISO 14025:2006 “Environmental labels and declarations -- type III environmental declarations -- principles and procedures” and EN 15804 “Sustainability of construction works”.