



GRÄNGES

Gränges' internal LCA/CF tool

Routines and procedures, Gränges Americas Newport Plant

Version: 1.0

Date: December 31, 2022

Issued by: SVP Procurement & Commercial HVAC Sales, Gränges Americas Inc.

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1 INTRODUCTION

1.1 Aim

The aim of this document is to describe the routines and procedures connected to Gränges' internal carbon footprint (LCA/CF) tool.

1.2 Review and key contacts

This document is issued by the SVP Procurement and Commercial HVAC Sales, Gränges Americas (e.g. 'Issuer') and approved by President Gränges Americas (e.g. 'Approver'). It is reviewed annually in conjunction to updating the model with latest full year data.

For any questions, please contact the document Issuer.

1.3 Author of report

The original version of this document has been compiled by Mark Lienhart, SVP Procurement and Commercial HVAC Sales. Mark Lienhart has acted as the Project Manager and Ryan Shukis as the Data Modelling Expert for the LCA/CF project conducted in Gränges Americas in 2021 and 2022.

2 GRÄNGES' LCA/CF TOOL

2.1 Description of the tool

Gränges' LCA/CF tool is built in the spreadsheet software Excel. It aims to automatically calculate the environmental impacts of the company's products and articles, initially covering the product carbon footprint. The tool and the calculations are built on the scope and methodological choices described in Gränges' *Carbon footprint report*.

2.2 File storage

Gränges' LCA/CF tool and all connected documents are stored on a Gränges Americas Shared Drive at file location L/Corp/SpecialProjects/LCA. The input data from Gränges' internal production will be collected in a Gränges Americas Shared Drive. All new and previous versions of the LCA/CF tool will be saved and stored for 10 years.

2.3 Navigation of the LCA/CF tool

NR	TAB	DESCRIPTION	SOURCES
1	Intensity_Calc	This is the main tab in which all the different intensity sources are summed up and the total intensity per spec is calculated	Reference Tables tab, RM Usage Data, MWH MMBTU Pivot, NRM Data Pivoted
2	Intensity_Pivot	This is a summarized editable version of the intensity calc tab	Intensity Hardcoded Data
3	Intensity_Hardcoded_Data	This is just the hardcoded version of the Intensity	Intensity Calc tab

Calc tab to fuel the pivot table.			
4	Reference_Tables	Shows the allocations per machine of MWh and MMBTU and where we log the total plant-wide usage of MWh and MMBTU to allocate out to the machines. We also have the electricity and natural gas intensity factors along with the external reroll intensities.	Everything here is sourced from Jana Barger's (NRM Plant Controller) monthly allocations file that she uses to distribute energy costs to different work centers/machines. The electricity and natural gas factors come from Chad Pinson, the external reroll factors come from Mark Lienhart.
5	Casted_Coil_Sources	Here is where we list each spec and the casted coil source. So, we need to know what % of lbs had an internal source vs ASAS vs Hot Springs so we can apply the right carbon intensity. Sourced from the manufacturing Data for NRM	This is sourced from our customer margins database where all the manufacturing data is gathered (mfgng_data_NRM table name).
6	Alloy_Emission_Calculation	This is where we calculate the total intensity per alloy	RM Usage Data
7	RM_Usage_Data	Our internal raw material database where we store the charge information and what % of scrap, prime and other material went into that charge.	Data_Mart database
8	MWH_MMBTU_Pivot	Hours Per Machine Per Packed Spec. We take the hours per spec per machine and divide that by the total hours for that machine. Then we multiply it by the total mmbtu for that machine to get the mmbtu used by that spec for that month on that machine. Same thing for Electricity MWh. This pulls into the "Intensity Calc" tab. Sourced from the NRM Data Pivoted tab	NRM_Data_Pivoted
9	NRM_Data Pivoted	A pivoted version of our NRM Timing Data. We have this tab just to make the building of formulas easier.	NRM Timing Data

10	NRM_Timing_Data	The time spent per spec on each machine, sourced from the manufacturing data for NRM	This is sourced from our customer margins database where all the manufacturing data is gathered (mfng_data_NRM table name).
11	Machine_List	Just a list of the machines in our database and the cost centers their associated with. We do not necessarily log all energy usage by machine, but some by overall work centers. So, for example we do not separate out the energy usage by each caster, but by the group of casters in our west, then east plants.	Itself

3 DATA COLLECTION AND UPDATES

3.1 Data sources

Gränges' LCA/CF tool uses information from the following data sources:

- Internal systems – Production and product data, specifications, energy use, article yield, calculated “virtual” yield. Details about which data is collected from internal systems is given in column “Source” in the table above.
- Suppliers – Emission factors for the specific material/energy product delivered to Gränges. Supplier emission factors are collected for external reroll and primary aluminium ingots, electricity, and natural gas.

More details about specific data sources can be found in Gränges' *Carbon footprint report*.

3.2 Frequency of updates

The data in the LCA/CF tool is updated annually in Q1 each year and after the annual environmental data collection has been finalized.

- The CO₂ emission factors used in the calculations are reviewed and annually updated as specified below. Gränges has engaged IVL Swedish Environmental Research Institute to support with the updating. The data consists of the following input: Supplier emission factors for primary aluminium ingots, purchased reroll coils, electricity and natural gas, which all will be updated annually.
- Calculated emission factor for internal scrap will be updated annually, based on annual delivered volumes from each supplier of purchased materials.

The updating and maintenance of the emission factors are coordinated with the annual carbon footprint calculations for Gränges, which are made in accordance with GHG Protocol.

3.2.1 LCA/CF tool update

Requests and suggestions for improvements of the LCA/CF tool will be collected by Gränges' Business Control function. Decisions connected to performing suggested updates are to be approved by the Issuer and Approver of this document.

- The carbon footprint certificate will be linked to the LCA/CF tool version number for traceability.

3.2.2 Checklist for annual update

- The Group Sustainability department coordinates and facilitates the annual environmental data collection.
- The Business Control function in the Americas coordinates the data collection and the update of the LCA/CF tool, and announces when the update of the LCA/CF tool will be performed.
- The Production departments in the Americas collect the internal data for the LCA/CF tool, such as energy, production volumes and yield.
- The Purchasing department in the Americas collects the external data from suppliers.

3.2.3 Test and verification of updated LCA/CF tool version

The Business Control function in the Americas performs a test and verification of the updated LCA/CF tool by comparing with the previous LCA/CF tool version. See 2.2 for description of where and how long the LCA/CF tool shall be stored.

3.3 Internal responsibilities

The Business Control function at Gränges Americas is responsible for updating and maintaining the LCA/CF tool. After the annual update of the input data, an internal review of the LCA/CF tool is performed by representatives from Production and Supply Chain. After the internal review, the outcome is presented to and approved by the document Issuer and Approver.

4 CARBON FOOTPRINT CERTIFICATES

4.1 Description

The aim of Gränges' third-party verified carbon footprint certificate is to provide Gränges' customers with a credible carbon footprint assessment at product level. The carbon footprint certificate refers to the quality standards and methodological choices used for this assessment. It also specifies that the calculation has been third-party verified.

The certificate is signed by the Key Account Manager on behalf of the President for Gränges Americas, and the product information is compiled by the Sales & Marketing function, retrieving carbon footprint and alloy combination results from the internal LCA/CF tool. The

certificate is based on a Word file template that should be completed with the description of the combination alloy and the carbon footprint threshold.

Carbon footprint thresholds will be decided annually in conjunction with the annual update of the data in the LCA/CF tool. The threshold value is approved annually by the President of Gränges Americas, in conjunction with the annual carbon footprint data update in the internal LCA tool, and after having assessed the range and spread of the current carbon footprint values among the products in the site's total product portfolio.

In order to fill the certificate for a specific article/alloy combination, the Key Account Manager will retrieve the carbon footprint value from the LCA/CF tool, and compare it with the carbon footprint thresholds. The carbon footprint threshold to be declared in the certificate will correspond with the closest higher threshold to the carbon footprint value from the LCA/CF tool. For example: The carbon footprint value of article 229247 is 6472 kg CO₂e/tonne finished product, as retrieved from the model in year 202X. If the carbon footprint thresholds for the year 202X has been set to for example 6.0 tonnes CO₂e/tonne aluminium and 8.0 tonnes CO₂e/tonne aluminium, the article 229247 will be using the threshold 8.0 tonnes CO₂e/tonne aluminium as the carbon footprint threshold to be declared in the certificate is the closest higher threshold value.

4.2 File storage

Gränges' carbon footprint template is stored on disk L\Special Projects\LCA. For the sake of traceability, issued carbon footprint certificates should be stored on disk L\Special Projects\LCA in the relevant customer directory

4.3 Data source

The source of data is the internal LCA/CF tool, stored as specified in 2.2. The summary tab calculates the carbon footprint value (kg CO₂e/tonne) for a specific Gränges article.

4.4 Frequency of updates

Any improvement suggestion related to the carbon footprint certificate should be addressed to the Sustainability representative in the Americas Sales organization. The carbon footprint thresholds, the carbon footprint template, and any improvements will be reviewed annually in Q1 each year in conjunction with the update of the internal LCA/CF tool.

4.5 Internal responsibilities

- Upon customer request, the KAM is responsible for filling the certificate template with the alloy description and the corresponding carbon footprint threshold. The alloy description can either be the Gränges code, or the FA/AA alloy description, depending on the name used in the contracts or on the orders. The file should be converted to .pdf and signed before sending to customer.
- Carbon footprint thresholds will be decided annually in conjunction with the annual update of the data in the LCA/CF tool. Decisions will be made by the document

Issuer and Approver, who will involve relevant internal stakeholders to provide feedback and comments prior to making the decision.

- Any change in the carbon footprint certificate template should be approved by the document Issuer and Approver.
- Any customer request to divulge specific carbon footprint values should be discussed with and approved by the document Issuer.

5 THIRD-PARTY REVIEW

In order to enable credible and transparent sustainability information on its products, Gränges has decided to use an external party to conduct a third-party review of the LCA/CF process and results. For this purpose, IVL Swedish Environmental Research Institute has been engaged to conduct such a review.

5.1 Frequency of third-party review

A third-party review has been conducted as part of establishing the LCA/CF tool. A new third-party review will be initiated in case of the following events:

- Changes in modelling of the product system, such as changes in system boundaries (inclusions or exclusions of materials or process steps), changes in allocation procedures, etc.
- Significant changes in the production process that has an effect on the results, e.g. introduction of additional process steps at the site.
- New products that require a different modelling of the product system.

5.2 Third-party verification report

More information about the third-party review can be found in the third-party *Verification report*, available online at [link](#).