Höganäs *re*-Astaloy 85 Mo

Expected product carbon footprint

Product information

Astaloy 85 Mo is a water atomised steel powder pre-alloyed with 0.85% Mo. This grade exhibits excellent compressibility and a homogeneous microstructure after sintering. This, in combination with its optimal hardenability, makes this powder an excellent choice for parts requiring surface hardening. The result is high surface hardness and good core toughness. Astaloy 85 Mo is often used as-sintered with additions of copper and/or nickel. The lower molybdenum content compared to Astaloy Mo gives Astaloy 85 Mo a somewhat higher compressibility, and a lower hardenability, making it easier to avoid through hardening of thin sections during surface heat treatment.

***re*-Astaloy 85 Mo** is the first Höganäs product to be offered as an alternative with a lower product carbon footprint (PCF) compared to a typical Astaloy 85 Mo. ***re*-Astaloy 85 Mo** has identical properties as Astaloy 85 Mo. The improvement associated to ***re*-Astaloy 85 Mo** is that natural gas has been replaced by biogas along the production process both as energy input as well as feedstock material by the means of mass balance. This would result in a product with a lower product carbon footprint compared to the alternative following the typical production route.

Expected Product Carbon Footprint

The expected product carbon footprint (PCF) of ***re*-Astaloy 85 Mo** is calculated according to the same principles and modelling approach to Höganäs PCF methodology that follows the International Standard on Carbon Footprints of Products; ISO 14067:2018 and is externally reviewed by a third party.

The declared unit is 1 kg of ***re*-Astaloy 85 Mo** base powder. The result presents the Global Warming Potential (GWP) expressed in kg CO_2 equivalents (kg CO_2eq.).

Method details

The expected PCF calculation follows the same principles and modelling approach to Höganäs PCF methodology. The only difference relates to the activity data for energy and gas consumption that is based on typical values and not actual reported values. Typical values for energy consumption are available per ton material and are therefore not related to the final produced volume. At the end of the year and when actual activity data are available the PCF of ***re*-Astaloy 85 Mo** will be recalculated and can be communicated to the customer.

The system boundary of the assessment is set as cradle-to-gate. It includes all related activities from raw material acquisition and inbound transport, energy and fuel production, and processing activities at Höganäs sites. Downstream activities such as product distribution to customers, components manufacturing, use and end-of-life (EOL) are excluded.

The expected PCF assessment has been estimated with data to represent production year 2025. The production location is Sweden.

Allocation has been avoided by increasing the detail level of the unit processes. For certain flows, allocation was necessary. In such cases mass allocation was used as the primary choice. For secondary raw materials, the cut-off approach is followed. Secondary raw materials e.g., scrap from various sources is considered as free of environmental burden prior to their collection and sorting process. The same principle is applied both for post- and pre-consumer scrap. No co-products allocation has been considered, i.e., no environmental impact has been allocated to co-products of the process. In addition, no credits at EOL are allocated to the studied product.

Höganäs Sweden AB purchases fossil free electricity. For ***re*-Astaloy 85 Mo** all other energy needs are covered 100% by biogas by means of mass balance. The process of monitoring biogas consumption and allocation has been externally reviewed.

The PCF is modelled in 'LCA for Experts' by Sphera®. Site specific data are collected for all processes where Höganäs has direct control of, i.e., all production steps within Höganäs operations. Background processes are modelled using generic Life Cycle Inventory (LCI) databases; Sphera's Managed Life Cycle Databases content version 2023.02 and Ecoinvent 3.9.1. The result is expressed as GWP, measured in kg CO_2 eq., using the GWP values of the Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report (AR6) for the 100-year time horizon. Only GWP-fossil is presented in this document. The remaining indicators listed in ISO 14067 are calculated but not presented here as the contributions were considered minor.

Quick summary	
Product name	*re*-Astaloy 85 Mo
Production year	Expected 2025
Production location	Sweden
System boundary	Cradle-to-gate
Expected product carbon footprint	0.35 kg CO_2 equivalents/kg
Standard	ISO 14067
Impact assessment method	GWP100, Fossil GHG emissions (AR6 GWP-100 values)

Contact details

This PCF assessment and report has been compiled by the LCA team at Group Sustainability, Höganäs AB.

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For more info: Scan or click the QR code

*Products with the *re*-prefix have been developed and proven to offer one or more benefits aligned with Höganäs' Product Sustainability Principles: Net-zero emissions, Enabling circular material flows, Resource productive, Safe and ethical.

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