

Product Carbon Footprint:
Life Cycle Assessment Report for
Orion Corporation, Orion Pharma



A study of 6 Easyhaler varieties



Executive Summary

This executive summary provides an overview analysis of the greenhouse gas (GHG) emissions associated with Orion Corporation, Orion Pharma (Orion)'s Easyhalers. This *Cradle-to-Grave* assessment focuses on the embodied GHG emissions of raw materials, the transport of these materials, the manufacture/processing, distribution and disposal of each product.

Orion Pharma's Easyhalers are inhalers used to distribute dry-powder active pharmaceutical ingredients (APIs). Within this assessment, six variations of the Easyhaler, each with different APIs, have been assessed: the Easyhaler with salbutamol, Easyhaler with salmeterol-fluticasone, Easyhaler with formoterol, Easyhaler with budesonide-formoterol, Easyhaler with budesonide and Easyhaler with beclomethasone.

The inhaler itself is predominantly made from injection moulded thermoplastic components; and within the medicine, the lactose 'carrier' accounts for the largest proportion in mass. Considering the product as a whole with its packaging, the cardboard accounts for 36% of the total mass of the product. The raw materials are all sourced from within Europe and the inhaler is assembled at Orion Pharma's factory in Espoo, Finland. These are then transported to the warehouse in Salo, Finland, where the Easyhalers are distributed to distribution centres across the world. After use, customers are recommended to return the empty Easyhalers to the pharmacies where they were purchased so that they can be incinerated; when this is not followed, the Easyhalers are assumed, in this study, to be disposed of through landfill.

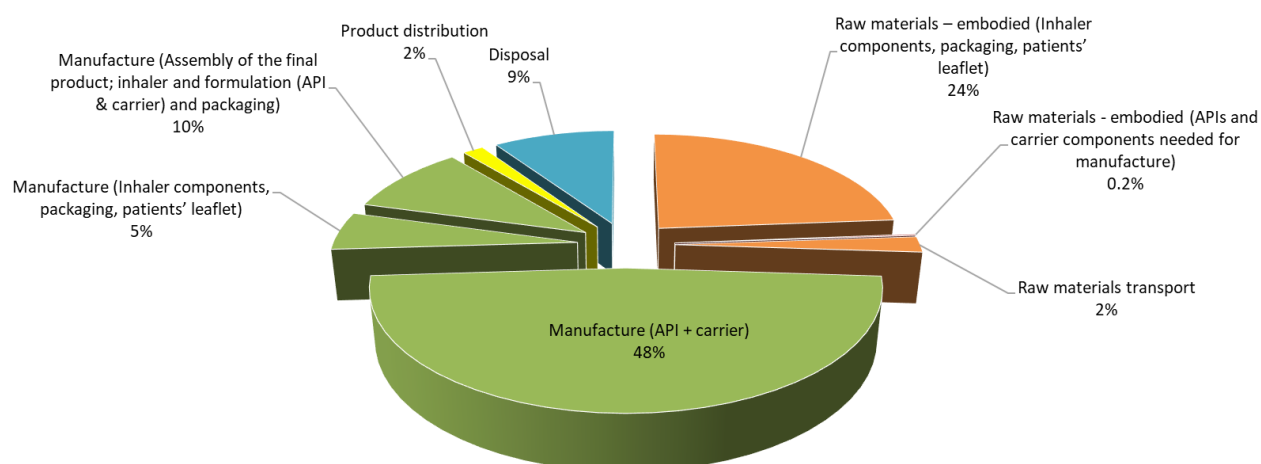
Total **cradle to grave** product life cycle carbon emissions for an Easyhaler is **547.47 gCO₂e** (averaged from the 6 varieties), reducing from **579.84 gCO₂e** based on the 2020 assessment. The main differences in the emissions associated with the different types of Easyhaler arise from the manufacture. This is due to the different APIs used in the inhalers and the amount of lactose. The Easyhaler with budesonide has the largest emissions associated with its manufacture since it requires the largest amount of lactose.



The breakdown of life cycle carbon emissions for each Easyhaler is shown in the following table:

| Process | Life Cycle Emissions per one Easyhaler (gCO ₂ e) | | | | | |
|---|---|---------------------------------------|---------------------------|--------------------------------------|---------------------------|-------------------------------|
| | Easyhaler with salbutamol | Easyhaler with salmeterol-fluticasone | Easyhaler with formoterol | Easyhaler with budesonide-formoterol | Easyhaler with budesonide | Easyhaler with beclomethasone |
| Strength and Dose ¹ | 100 µg 200 doses | 250 / 50 µg 60 doses | 12 µg 120 doses | 160 / 4.5 µg 120 doses | 200 µg 200 doses | 200 µg 200 doses |
| Raw materials – embodied (Inhaler components, packaging, patients' leaflet) | 128.43 | 128.43 | 128.43 | 128.43 | 128.43 | 128.43 |
| Raw materials - embodied (APIs and carrier components needed for manufacture) | 0.81 | 2.33 | 0.26 | 0.55 | 0.62 | 0.66 |
| Raw materials transport | 18.11 | 18.11 | 18.08 | 18.03 | 17.99 | 18.11 |
| Manufacture (API + carrier) | 298.86 | 250.41 | 224.05 | 164.74 | 329.49 | 289.95 |
| Manufacture (Inhaler components, packaging, patients' leaflet) | 28.48 | 28.48 | 28.48 | 28.48 | 28.48 | 28.48 |
| Manufacture (Assembly of the final product; inhaler and formulation (API & carrier) and packaging) | 52.21 | 52.21 | 52.21 | 52.21 | 52.21 | 52.21 |
| Product distribution | 8.88 | 8.81 | 8.78 | 8.70 | 8.70 | 8.87 |
| Disposal | 51.04 | 51.04 | 51.04 | 51.04 | 51.04 | 51.04 |
| Total | 586.81 | 539.81 | 511.32 | 452.17 | 616.95 | 577.73 |
| Emissions per dose | 2.93 | 9.00 | 4.26 | 3.77 | 3.08 | 2.89 |
| Emissions per day² | n/a | 17.99 | 8.52 | 7.54 | 6.17 | 5.78 |

Breakdown of Carbon Emissions for one Easyhaler (average)



¹ For each product, the strength and dose of the most used product in Europe was used in this analysis.

² CO₂e per day was estimated for all products with the exception of Salbutamol Easyhaler, since its typical daily use cannot be assessed as the product is only used as rescue medication. For all other Easyhaler products the typical use according to each respective SPC is two doses per day.

Orion in conjunction with Carbon Footprint Ltd, has assessed and reduced the **Cradle-to-Grave** carbon emissions associated with the Easyhaler (Easyhaler with salbutamol, Easyhaler with salmeterol-fluticasone, Easyhaler with formoterol, Easyhaler with budesonide-formoterol, Easyhaler with budesonide and Easyhaler with beclomethasone). By achieving this, Orion has qualified to use the Carbon Footprint Standard branding.



Carbon savings from the previous year are mostly due to reduced embodied, waste, and manufacturing factors. These have all come down since the past assessment (This is very common as materials become on average more sustainable and most energy grids are trending downwards in their emissions per kWh). This is a similar story for the manufacturing based on kWhs used, as the emissions per kWh have come down due to decarbonisation of the energy grids.