

## Life Cycle Assessment Study

### r-HDPE Granule

The Life Cycle Assessment was conducted in accordance with the UNI EN ISO 14040:2021 and UNI EN ISO 14044:2021 standards.

Modularization was performed using SimaPro software with the Ecoinvent database. The assumptions applied follow the guidelines of the EPD System and the PCR '*Plastics in Primary Forms*'.

#### Production Plants:

Centro Plastica S.r.l.; Via Galileo Galilei, 10, 30035 Mirano Due VE, Italy

Centro Plastica S.r.l.; Via Spirano, 528, 24059 Ugnano BG, Italy

#### Partnership:

Prof. Daniele Landi; PhD, Associate Professor, University of Bergamo, Department of Management, Information and Production Engineering

**Functional Unit:** 1 kg of r-HDPE granule

**System Boundary:** Cradle to Gate

Parameter	Description	Unit	Totale
Global Warming	Measures a GHG's ability to trap heat in the atmosphere relative to CO <sub>2</sub>	kg CO <sub>2</sub> eq	4,86E-01
Ozone depletion	Degradation of the stratospheric ozone layer caused by emissions of substances containing chlorine and bromine	kg CFC11 eq	2,18E-07
Ionizing radiation	Harm to human health from exposure to radioactive emissions	kBq Co-60 eq	4,29E-02
Ozone formation	Formation of ground-level ozone due to air pollutants like NO <sub>x</sub> and VOCs, causing health and ecosystem damage	kg NO <sub>x</sub> eq	8,01E-04
Fine particulate matter	Health impacts from exposure to PM <sub>2.5</sub> and other fine particles emitted during combustion and industrial processes	kgPM2.5 eq	4,59E-04
Terrestrial ecosystems	Impacts on land-based ecosystems from pollution, habitat disruption, and resource use	kg NO <sub>x</sub> eq	8,68E-04

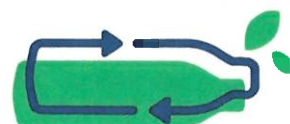
#### Centro Plastica S.r.l. Socio Unico

Sede legale e produttiva: Via G. Galilei, 10 - 30035 Mirano (VE) - Italy - Tel. +39 041 5728484

Unità locale produttiva: Via Spirano, 528 - 24059 Ugnano (BG) - Italy

P.IVA e C.F. 03817170271 - R.E.A. VE - 341055

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CENTRO PLASTICA

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Terrestrial acidification	Soil and vegetation damage caused by acidifying air pollutants like SO <sub>2</sub> , NO <sub>x</sub> , and NH <sub>3</sub>	kg SO <sub>2</sub> eq	1,10E-03
Freshwater eutrophication	Excess nutrients (mainly nitrogen and phosphorus) cause algal blooms, leading to oxygen depletion and aquatic life degradation	kg P eq	1,24E-04
Marine eutrophication	Excess nutrients (mainly nitrogen) in marine waters cause algal blooms, leading to oxygen depletion and marine life degradation	kg N eq	9,28E-06
Terrestrial ecotoxicity	Toxic impacts of pollutants on land-based organisms, affecting ecosystem health and biodiversity	kg 1,4-DCB	3,02E+00
Freshwater ecotoxicity	Toxic effects on freshwater species, altering ecosystem structure and function	kg 1,4-DCB	4,24E-02
Marine ecotoxicity	Toxic effects of pollutants on marine species, altering ecosystem health and biodiversity	kg 1,4-DCB	5,48E-02
Human carcinogenic toxicity	Harm to human health from exposure to carcinogenic substances via air, food, water, or skin contact	kg 1,4-DCB	6,81E-02
Human non-carcinogenic toxicity	Harm to human health from exposure to non-carcinogenic toxic substances via air, water, food, or skin contact	kg 1,4-DCB	6,45E-01
Land use	Effects of land occupation and transformation on ecosystems, biodiversity, and soil quality	m <sup>2</sup> a crop eq	2,51E-02
Mineral resource scarcity	Depletion risk of mineral resources due to extraction and consumption	kg Cu eq	1,77E-03
Fossil resource scarcity	Risk of depletion of fossil fuel reserves from extraction and use	kg oil eq	1,59E-01
Water consumption	Use of freshwater resources, considering local availability and water scarcity	m <sup>3</sup>	5,83E-03

Reference period: 2023

This assessment provides a clear overview of the environmental impacts associated with the production of Centro Plastica's recycled HDPE granules. We use this information to support ongoing efforts in improving our processes and contributing to resource efficiency within the framework of a circular economy.

Mirano, 09 June 2025

Giuseppe Paganoni  
Sole Director - Centro Plastica

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