



◆◆ ECOLEAF

A New Category of Metallic Embellishment
for Labels, fulfilling the needs for
Sustainability, Productivity and Costs.

Paolo GRASSO – Sales Director



Sustainability / Zero-Waste Metallization Breakthrough



1 kg of ECOLEAF flakes
effectively replaces
3000 kg of foil

ALTANA Corporate Structure



- ◆ ACTEGA Metal Print is part of the ALTANA Group, a leading global multi-billion company and family business owned by Susanne Klatten

Sales €2,178 m
Employees 6,529

BYK

Paint additives
Plastics additives
Industrial applications
Exploration
Measuring and testing instruments

Sales in €m: 1,009
Employees: 2,307

ECKART

Coatings
Graphic arts
Cosmetics and personal care
Plastics industry
Functional applications

Sales in €m: 315
Employees: 1,694

ELANTAS

Wire enamels
Electrical
Electronic
Engineering materials

Sales in €m: 463
Employees: 1,071

ACTEGA

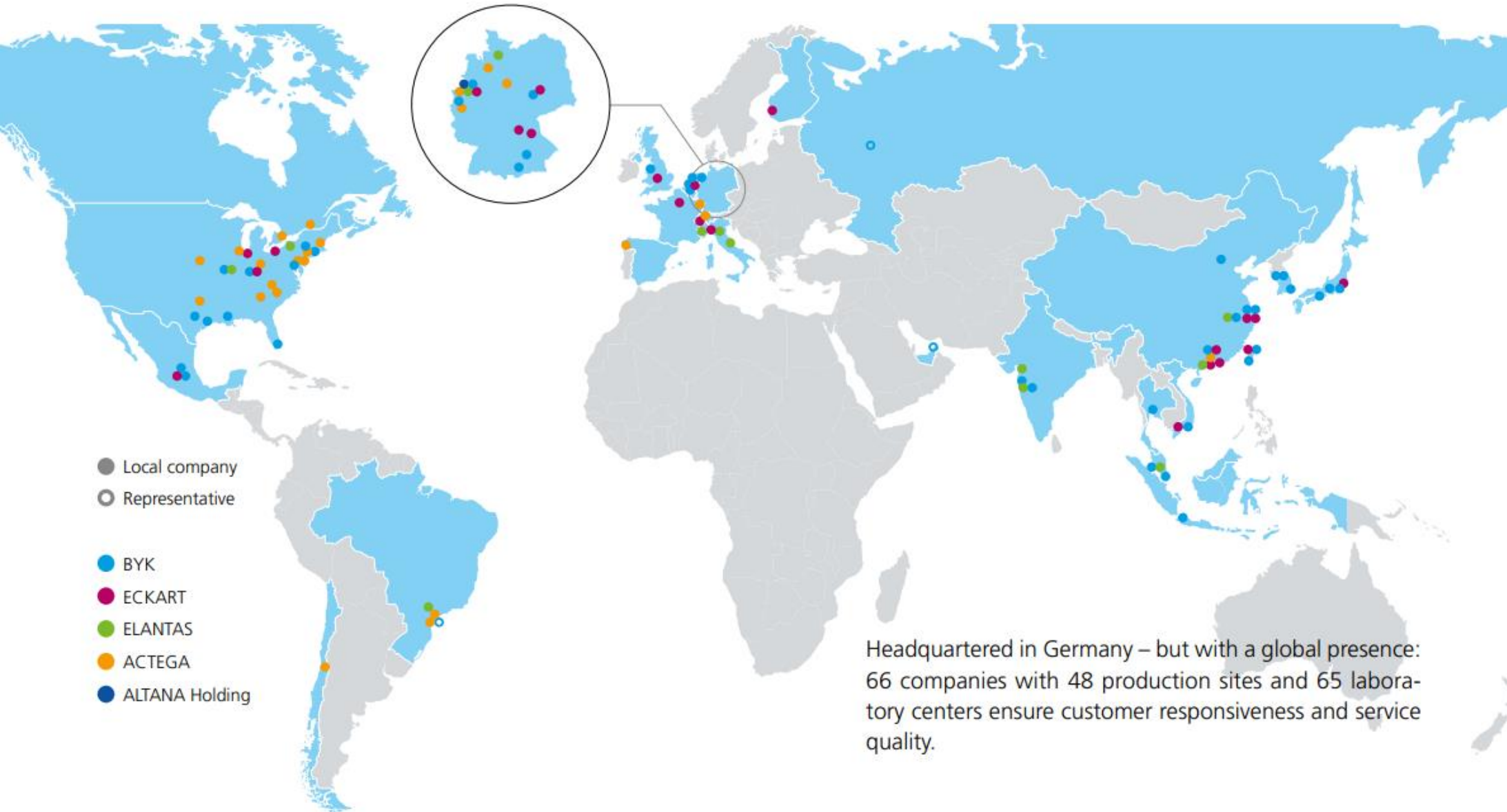
Flexible Packaging
Metal Packaging Solutions
Paper & Board

Sales in €m: 391
Employees: 1,238



All figures relate to the fiscal year 2020.

ALTANA Is Present All Over the World: Global Network – Local Presence

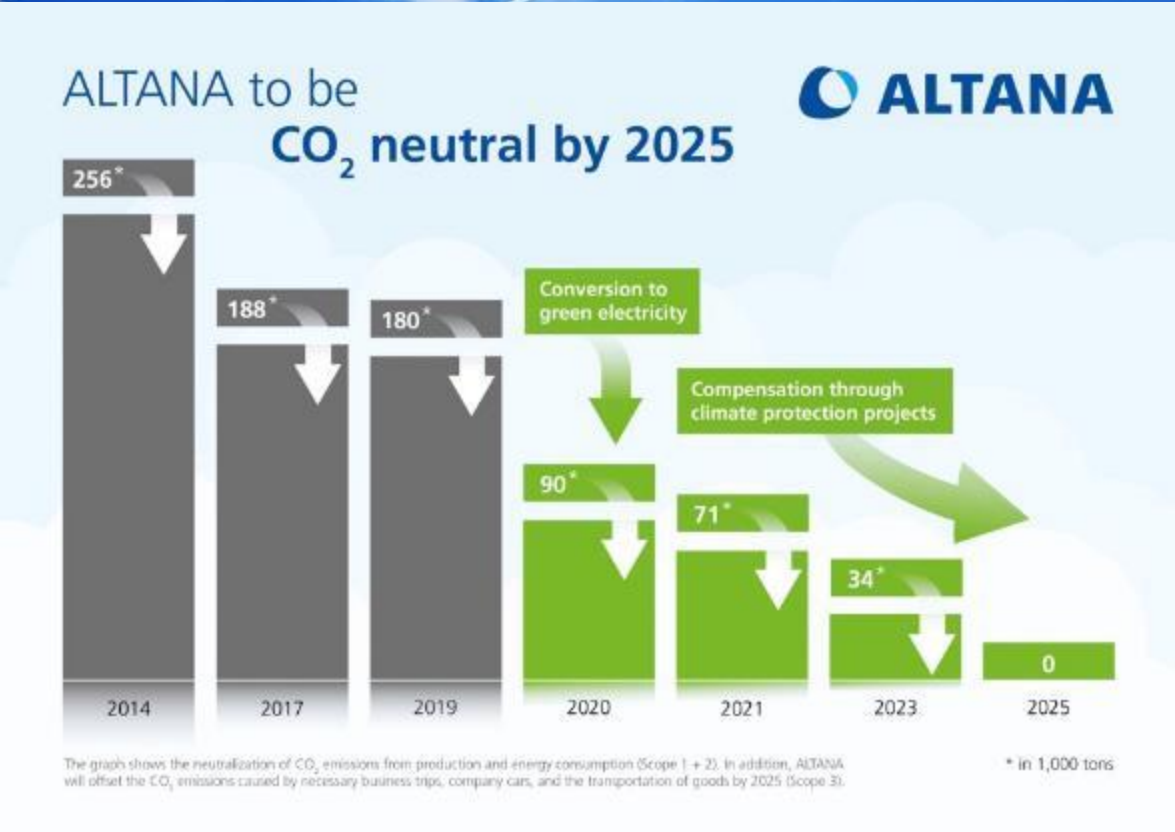


Headquartered in Germany – but with a global presence: 66 companies with 48 production sites and 65 laboratory centers ensure customer responsiveness and service quality.

SUSTAINABILITY:

MEETING OUR OWN NEEDS WITHOUT
COMPROMISING THE ABILITY OF FUTURE
GENERATIONS TO MEET THEIR OWN NEEDS

ALTANA – Climate Neutral by 2025



The graph shows the neutralization of CO₂ emissions from production and energy consumption (Scope 1 + 2). In addition, ALTANA will offset the CO₂ emissions caused by necessary business trips, company cars, and the transportation of goods by 2025 (Scope 3).



ACTEGA Metal Print



- ◆ Technology unveiled at Drupa 2016 by Benny Landa
- ◆ ACTEGA Metal Print was founded in 2017
- ◆ Headquartered in Lehrte, near Hanover, Germany, in a purpose-built infrastructure
- ◆ About 50 employees, experts from other ALTANA divisions and external specialists
- ◆ Worldwide network of R&D and production partners
- ◆ In house sales & service organization



◆ Stephan Plenz, CEO



◆ Harald Jasper, COO

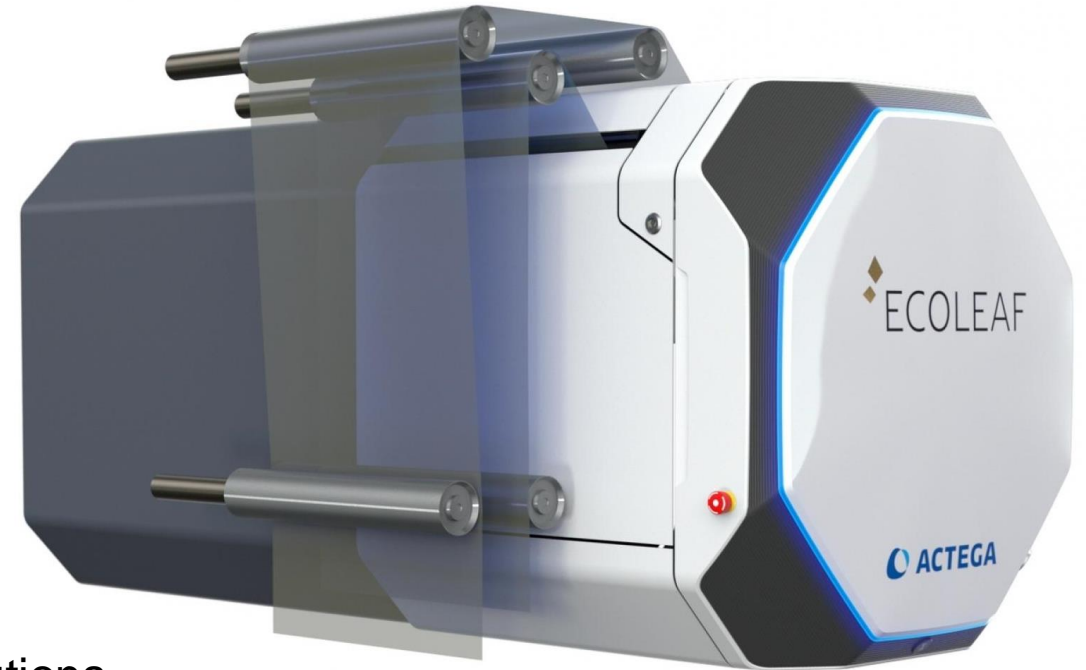


◆ Paolo Grasso, Sales Director



ACTEGA Metal Print - Mission

- ◆ Revolutionize the label industry with “ECOLEAF”, a sustainable metallization technology compared to today’s conventional processes that are mainly foil-based or utilising metalised substrates or gravure inks, by offering
 - ◆ Zero-waste.
 - ◆ More jobs – less set up time.
 - ◆ Large media range.
 - ◆ No inventories.
 - ◆ “Made for Recycling” certification .
 - ◆ Extremely reduced CO2 footprint vs foils
- ◆ Easy integration with the defined flexo - and digital solutions.
- ◆ Easy to operate.



The legislation and tax-impact on sustainability is changing rapidly.

European Strategy

90% of all plastic packaging waste must be recyclable by 2030.

**A European Strategy for Plastics in a Circular Economy
[EUR-Lex - 52018DC0028 - EN - EUR-Lex \(www.europa.eu\)](#)

Taxes at EU Level Since Jan 2021

800 € / ton for unrecycled plastic packaging waste is currently by the EU-member states.

*European Council, Conclusion - Page 64 / Article 146
[210720-euco-final-conclusions-en.pdf \(www.europa.eu\)](#)

Applicable Taxes on Plastics in Italy - UK

Italy: 450 €/T - July 2021
UK: 200 £/T - plastic with recycled content below 30%.
Other countries are following

Expectation: to be paid by the producer.



ECOLEAF – A Game Changing Technology



Luxurious Effects for Labels & Packaging with Zero Waste

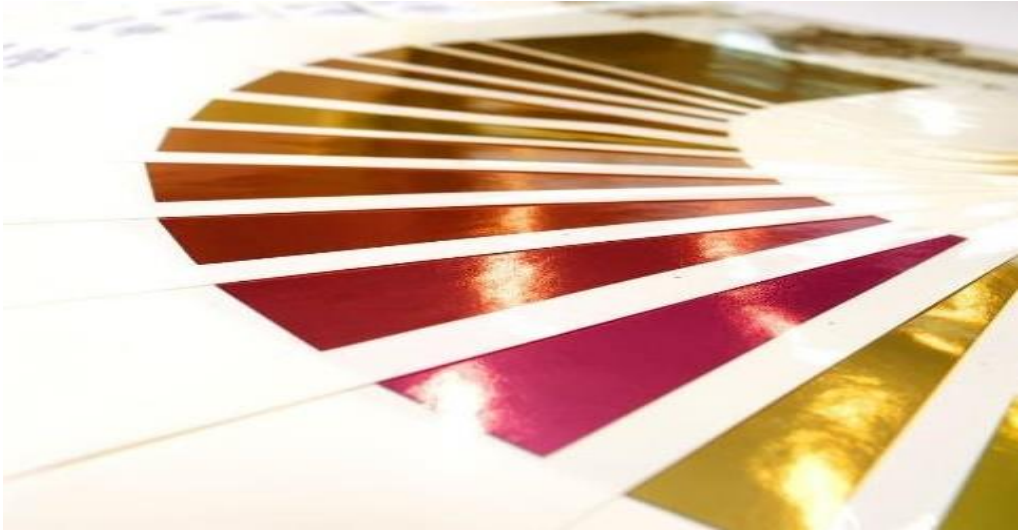
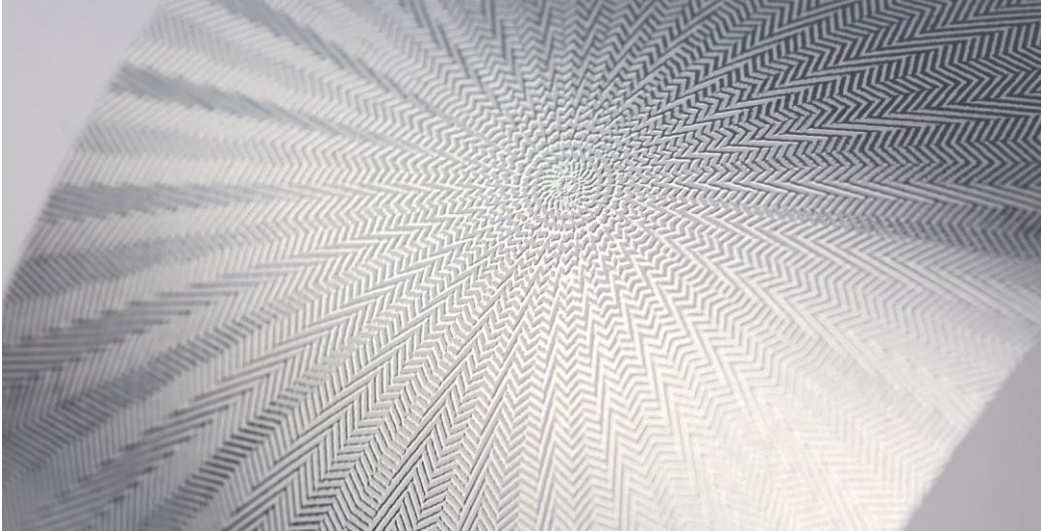
ECOLEAF offers a sustainable, zero-waste metallization solution in PSL embellishment



Using the precise amount of metal required

Acting as an ink but shining as a Foil

Multiple Overprint possibilities. Different Varnishes, Gold and Color Layers.



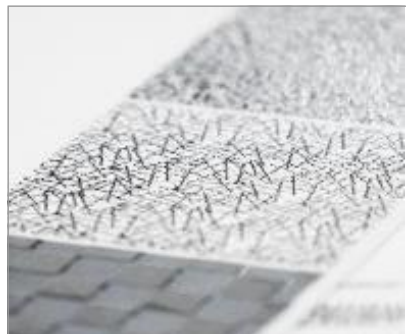
Unique Benefits for Current and New Application



Very fine
Details, high resolution
imaging and without
“stripping” defects



Potential to utilize bespoke
software for creation of
colored metallic effects



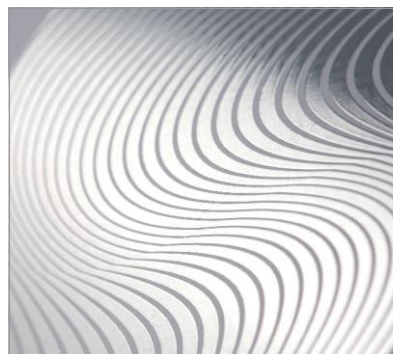
Tactile Effects
on filmic substrates and
paper without embossing



Back side printing on
transparent substrates
without using gravure (VOC)



New effects can be
created as the system
acts like an ink. Eg: mix
of matt/gloss
simultaneously



Replaces cold- and hot foil
(costly Tooling)
large area metallization possible
(no HF pressure limit)

An abstract graphic on the left side of the page, composed of a dense grid of thin, light gray lines that form a flowing, ribbon-like shape, suggesting flexibility and movement.

High Flexibility and quality

Over- and Under Print Metallization for Metallic Effects



Large
Media
Range



A Wide Range of Metallic Effects Using Different Printing Technologies.



Very fine metallization at the highest resolution with

Flexo Trigger Image



Tactile metallic effects on paper & films with

Rotary or Flat Bed Screen Trigger Image



Seamless and variable metallization with

Inkjet Trigger Image

High Resolution – Very Fine Details



Technical Details

Substrate

Sappi Labelcar MT

Production

Gallus RCS with speed 75 m/min (at Kolbe-Coloco)

Metallization

EcoLeaf with Haptic

Haptic

Produced with a rotary screen trigger image with 14micron

Over Print Varnish

ACTEGA Schmid Rhyner – Wessco LM UV-Lack

High Resolution – Very Fine Details



Substrate: Fasson High Gloss Paper
Colour: Offset Black
Trigger Image: ECOLEAF F- UV 120
Gold: OPV - F Gold 109
OPV: Wessco LM 2003



High Resolution – Very Fine Details



Substrate: Fedrigoni PE clear TC8
Trigger image: ECOLEAF F – UV 900
Gold: OPV-F UV Gold 109
Colors: Printed on Gallus Labelfire LM

An abstract graphic on the left side of the page, consisting of multiple overlapping, wavy, mesh-like surfaces in shades of light gray and white, creating a sense of depth and movement.

Integrated Solution for Flexo, Rotary, Flatbed Screen and Inkjet

ECOLEAF Demo & Application Center in Lehrte – Germany



ECOLEAF LA 420- Easy Integration



Metalization Unit



Digital Printbar for
ECOLEAF trigger
image

ECOLEAF

**Higher Sustainability
and lower costs**

Cradle to Gate LCA, Sphera, Independent Experts

This LCA study was conducted by Sphera and critically reviewed by an expert review panel.



CRITICAL PEER REVIEW PANEL

Dr.-Ing. IVO MERSIOWSKY
Sustainability and Leadership Consultant,
LCA Expert

Prof. Dr. VOLKER JANSEN
Print Media Technologies Expert

MATTHIAS SCHULZ
Sustainability Consultant, LCA Expert

Sphera, a global provider of software and services on Environment, Health, Safety & Sustainability, Operational Risk Management & Product Stewardship, along with an expert third-party critical review panel, has conducted a comparative Life Cycle Assessment (LCA) to provide a transparent and holistic view of the sustainability and environmental impacts of metallization décor elements compared to EcoLeaf Metallization.

ECOLEAF CO2 Life Cycle Assessment

Scope of Cradle to Gate LCA

Production chain from raw materials, energy, auxiliaries and respective transport (EU-28) to manufacturing of metallized print incl. waste treatment.

sphera

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Wastewater treatment

Energy recovery

1 m² 3.030 m 0.380 m

CO2 calculated usage for Flexo

- ◆ Step 1 : 1 m² of label substrate with a flat printed metallization area of 10%
- ◆ Step 2 : A production job of 100,000 labels

CO2 calculated usage for Screen

- ◆ Step 1 : 1 m² of label substrate with 20 microns haptic and 10% metallization.
- ◆ Step 2 : A production job of 100,000 labels, with 20 microns haptics.

Total Environmental Impact [kg CO₂ eq.]

- ◆ ECOLEAF metallization achieves up to **5x lower emissions** than the equivalent cold foil process with no foil savings.
- ◆ ECOLEAF metallization achieves up to **7 x lower emissions** with textured or relief printed labels then the equivalent hotfoil process with no foil savings.

Without other essential indicators showing an additional environmental burden.

CO₂e Indicator for ECOLEAF Metallization with Flexo – NO Haptic

Total environmental impact [kg CO₂ eq.]

for 1 m² of label substrate, flat printed area of 10% metallization of its surface



* 2.34E-02 = 0,0234kg

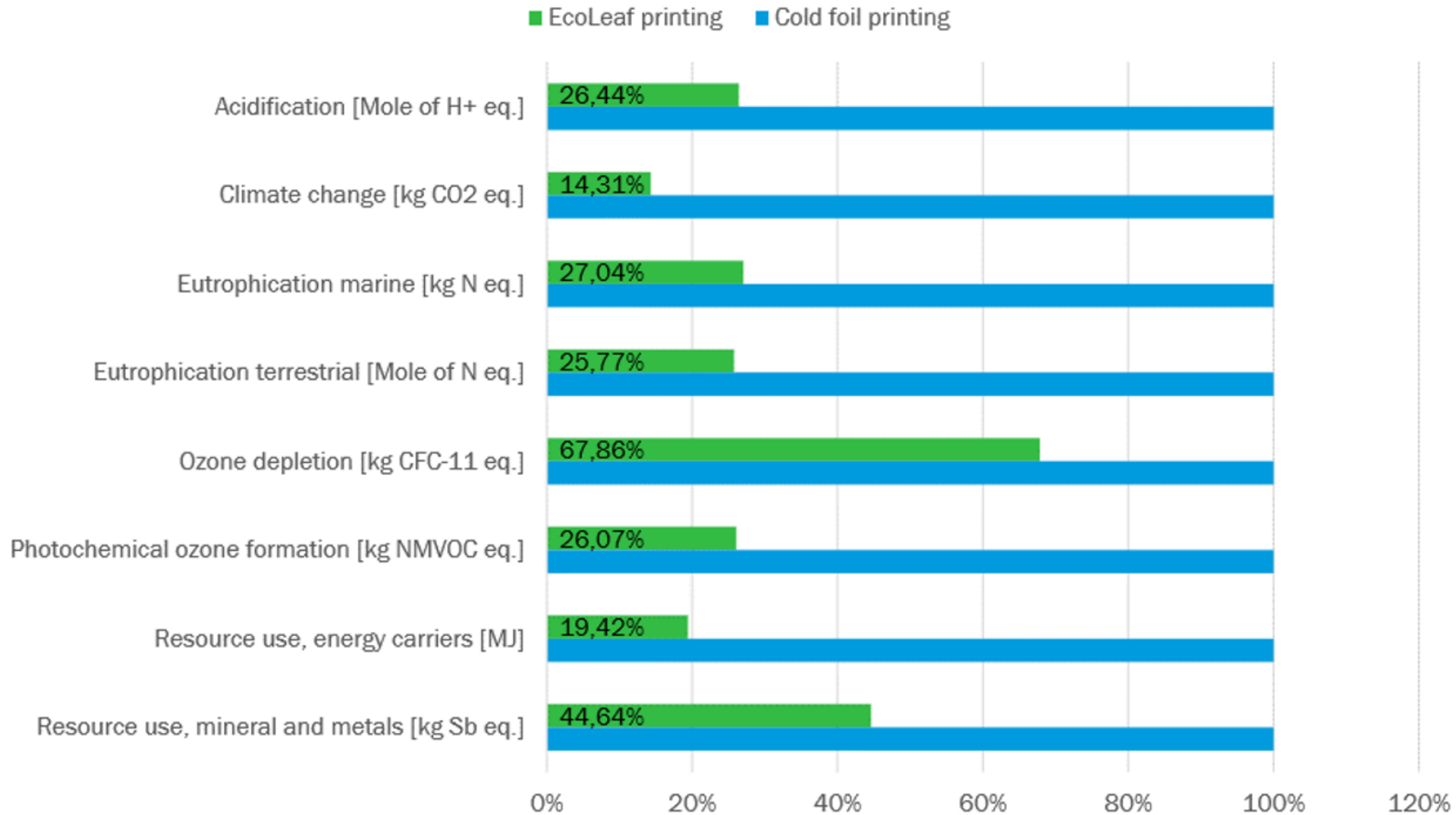
CO₂e Indicator for ECOLEAF Metallization with Screen – 20 µm Haptic

Total environmental impact [kg CO₂ eq.]

for 1 m² of label substrate, 20 µm haptic printed area of 10% metallization of its surface



Total Environmental Impact [kg CO2 eq.]



ECOLEAF “Made For Recycling“ Certification

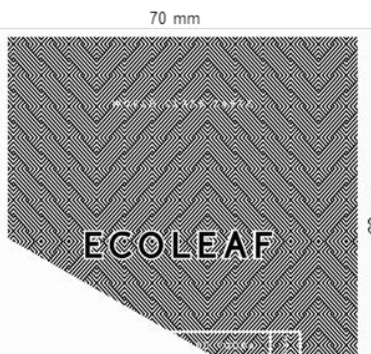


- ◆ Packaging, designed for recyclability, based on recognized standard ratings.
- ◆ Packaging, suitable for recycling, A differentiator for consumers, retailers and brands.
- ◆ Bottles made of polyethylene terephthalate (PET) can be recycled and used to manufacture new bottles and containers, thermoform packaging, strapping and are also used in fiber applications such as carpet and apparel.

A requirement of the verta European Strategy for Plastics in a Circular Economy.

Test Lab	Interseroh, ALBA Group, Germany
Certification	“Made for Recycling“
Test Sample	PET container with PP Label HDPE Container with PE Label
Label Size	70 x 60 mm
Coverage	75%, ECOLEAF Metallisation

Test case1: PET Container with PP Label



The applied metallization with ECOLEAF does not interfere with the recycling process in the PET stream.

Test case2: HDPE Container with PE Label



Recycling test with HDPE container for beauty and personal care products, because of different recycling path as PET container.

Test case of metallization, ink and label around 2% of proportion mass of total container

Is the packaging with ECOLEAF Imprint be magnetizable?	NO Impact
Is the ECOLEAF printed Packaging conductive?	NO Impact
NIR Sorting – Detectability of the Target material on the surface?	NO Impact

Sample PET with PP	Recyclable – metallisation does not interfere the recycling process
Sample HDPE with PE	Recyclable – Metallisation, Ink and Label if < 1% proportion by mass



ECOLEAF Benefits (summary)



- ◆ Creative over- and under print metallization for metallic effects
- ◆ Large media range

ECOLEAF Benefits (summary)

- ◆ Plastic-free process
- ◆ Reduced CO2 footprint
- ◆ Fully certified
- ◆ UpTo 7X less impact vs foil processes
- ◆ Helps companies' in their sustainability management

Sustainability / Zero-Waste Metallization Breakthrough



Sustainability / Zero-Waste Metallization Breakthrough



1 kg of ECOLEAF flakes
effectively replaces
3000 kg of foil



Paolo GRASSO
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