

HP Indigo



Frequently Asked Questions



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Circular from every angle



Haim Levit
SVP & GM Industrial Print,
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In the late 18th Century, the first Industrial Revolution launched humanity into 200 plus years of innovation with each subsequent era of technological revolution more stunning than the previous one in its ability to progress inventions for mankind. Innovation in modern times, has not slowed down, nor should it.

Our modern understanding of innovation, however, recognizes that innovation can only be considered progress if we are taking care to protect our natural resources and the foundations of our earth, the only home mankind has ever known. Technology's contribution to society must go hand in hand with strengthening our planet and creating the framework for our communities to thrive.

Indigo was founded in 1977, the same year that UNESCO organized the world's first intergovernmental conference on environmental education attended by 66 member states. Since our beginnings, sustainability has been embedded in our DNA. We have driven sustainability for decades by considering our entire value chain to ensure that our best business practices are aligned with the need to reduce the overall environmental impact of printing.

Our goals are united with the greater HP family to achieve the objectives set out in the HP Sustainable Impact Report. Even more so, while we are extremely conscious of our own sustainability targets, we also strive to enable our customers to be as sustainable as possible. We are advancing a fully regenerative economy, engineering throughout the entire process of product design, production, and delivery, we aim to lesson our carbon footprint, reduce the amount of energy and waste, and recycle our materials from the raw materials to the end life of both our printed products and the machines that produce them. With these initiatives, we are empowering brands to meet their own sustainability goals through digital print.

We know that we must leave the planet in a better state than we found it, our societies less fractured and our communities stronger and more vibrant. We fundamentally believe this is the right path for our future and the children who will inherit our legacy. We will continue to be ambitious in our business goals and equally motivated and dedicated to making our world better for us having been a part of it.



Brands set clear goals for a circular economy

Increasingly, the world's leading brands are moving toward a circular economy, and it's not only because they want to, but because the market demands it. With efforts being led overwhelmingly by the millennials, consumer pressure is mounting, and the world is watching. So, don't be left behind. Sustainability isn't just a trend, it's a long-lasting movement for the planet, and if done right, it can do wonders for your bottom line.

A circular economy is a shift in focus from the 'take, make, and dispose' linear model to reusing materials and products at the end of their service life to create a new product 'in an infinite loop.' What used to be regarded as waste can thus be turned into a valuable resource.

The Ellen MacArthur Foundation, a UK-based non-profit organization, is a leading advocate for the transition to a circular economy, putting it on the map among decision-makers worldwide in business, government, and academia. Through the Ellen MacArthur Foundation Circular Economy 100 Program, HP works with other top companies and innovators to drive progress toward a more material- and energy-efficient future.

HP Indigo is a member of the Circular Economy for Flexible Packaging (CEFLEX), as the first digital press provider. CEFLEX is a European consortium of companies collaborating to advance the performance of flexible packaging in a circular economy, throughout the value chain.

Recyclability of print

The world's biggest consumer goods brands have made public commitments to work toward making packaging 100% recyclable or reusable by 2025.² This has become an increasingly important subject for all their packaging suppliers. Partnering with HP puts you in a position to be the go-to print service provider for brands that are working toward fulfilling their commitment.

Are HP Indigo printed packages recyclable?



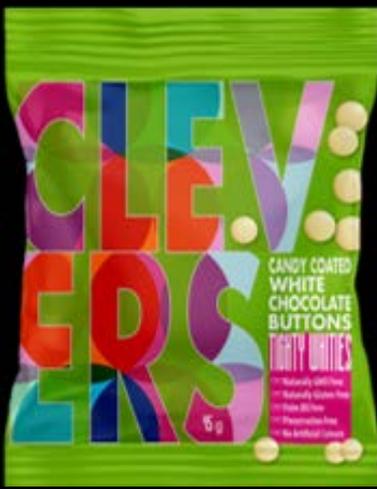
Yes, HP Indigo's print can support comprehensive recyclability requirements of labels and packaging (L&P) applications from print processes to packaging processes, on the store shelf, end use, and after use, which enable HP Indigo-printed L&P products to be recyclable. In accordance with the test results, the potential yield of the packaging amounts to 100%³.

The Institute cyclos-HTP GmbH, the Institute for Recyclability and Product Responsibility, independently tested the PE-based laminated pouch and folding carton box with HP Indigo digital print and issued a certificate on the basis of requirements and assessment catalog of the institute cyclos-HTP for EU-wide certification.³ They rated 97% recyclability for the laminated pouch and 99% recyclability for the folding carton box.

The certification of a product as 'recyclable' is defined according to the recyclability definition in DIN EN ISO 14021 'Environmental labels and declarations - Self-declared environmental claims (Type II environmental labeling)' and DIN EN 13430 'Packaging - Requirements for packaging recoverable by material recycling.'

Are HP Indigo-printed Pressure-Sensitive (PS) labels compatible with PET bottle recycling?

Printed Pressure-Sensitive (PS) labels often limit PET bottle recyclability into food-grade rPET due to ink and adhesive contamination in the sink-float process at recyclers. Institute cyclos-HTP GmbH independently tested ink bleeding on HP Indigo-printed PS labels in accordance with EPBP testing protocol and certified them compatible for recycling. Test results proved a clean separation of ink from the PET flake without ink bleeding.³



Deinking of print

As a leading printing equipment and supplies company, HP Indigo cares a great deal about the ease of recycling paper and print media. HP Indigo prints can be recycled into many useful fiber-based materials. Some recycling applications also require deinking (separation of ink from the fibers and polymers), and HP Indigo prints can be deinked in relevant recycling applications that require ink removal.

Are HP Indigo's prints on paper deinkable?

Yes, the printed paper from HP Indigo digital presses is recyclable and deinkable. Over the last few years, HP's deinking experts have collaborated with many industry and academic deinking experts to gather lab, pilot, and mill-scale deinking data. The test results demonstrate that HP Indigo prints can be deinked in standard two-loop processes for relevant recycling applications that require ink removal, such as wood-containing and wood-free graphic paper deinking mills and other relevant applications. The proportion of Indigo prints in the tested batches was between 5 and 10%, which is far above what any other deinking mill is likely to encounter.

Are HP Indigo's prints on plastic film deinkable?

Yes. CADEL DEINKING is a Spanish technology company created to implement a novel plastic recycling process that can remove printed ink from plastic surfaces in recycling and converting companies. Deinking tests conducted by them in August 2020 verified that HP Indigo's digitally printed flexible packaging, including coating, can be fully deinked. Test results obtained a product with a quality similar to that of new plastic. The results on a range of substrates open new ways for brands and service providers to work toward higher sustainability, where deinking is an essential stage in the recycling process.

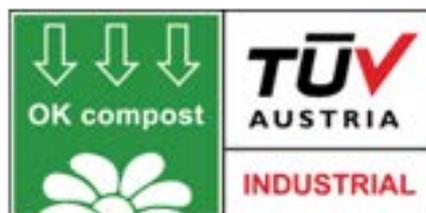


Compostability of print

Biodegradable and compostable are terms used to describe the break down of organic material in a specific environment. Composting is the process of breaking down organic waste by microbial digestion to create compost. This compost can fertilize soil if it is placed in an appropriate composting facility, and can thus be safely returned to the biosphere.

Are HP Indigo's prints compostable?

Yes, selected HP Indigo ElectroInks and Michelman Primers have been certified by TÜV AUSTRIA and DIN CERTCO for use as Printing Inks for compostable Labels and Flexible Packaging (up to certain allowable limits) as per the EU standard for compostability testing EN 13432, which also allows prints to comply with the requirements of the EU Packaging Directive (94/62/EEC) and ASTM 6400 in NA. TÜV AUSTRIA awarded HP with the 'OK Compost Home' and 'OK Compost Industrial' marks. DIN CERTCO awarded HP with the "Additives according to DIN EN 13432" mark.



TÜV AUSTRIA ink certificates⁴

- TA8011903151 & TA8021903152 for:
HP Indigo WS6000, 7000, W7200, 8000, 6K, 7K, 8K Digital Presses
- TA8012004775 & TA8022004776 for:
HP Indigo 20000, 30000, 25K, 35K Digital Presses

TÜV AUSTRIA primer certificates⁵

- TA8011903760 - DP050
- TA8011903761 - DP680
- TA8011903763 - ILP030

Can we put compostable certification on any of our HP Indigo prints?

No, when HP Indigo prints on compostable material, the printed product can be composted under a certain product structure which was established by TÜV for 'OK Compost Home' and 'OK Compost Industrial.' A design guideline for creating HP Indigo printed compostable label and packaging is available for HP Indigo users, on request.



Safety of print



We, at HP, are committed to high standards of safety, security, and privacy for our customers. HP Indigo continues to innovate across the portfolio, working toward identifying opportunities for ongoing improvements, and sharing extensive product safety information.

Are HP Indigo presses and prints safe to use?

The HP Indigo Liquid Electrophotographic (LEP) digital printing process helped remove the use of many hazardous substances that are typically used in conventional printing, such as offset printing technology. It does not contain substances of specific concern, heavy metals, or aromatic amines.⁶

None of the ingredients of the fluids used for printing on HP Indigo presses are listed in the US Federal List of Hazardous Air Pollutants as established under Section 112 of the Federal Clean Air Act (42 USCA § 7412).

HP Indigo Electrolink is suitable for printing labels and packaging applications on the non-food contact side of food packaging, under certain conditions of use and in compliance with Good Manufacturing Practice (GMP).



The benefits of printing with HP Indigo

The shift from analog to digital print production means reducing waste by decreasing printing plates, make-ready, and the intensive cleaning cycles associated with analog printing. Additionally, more agile and on-demand printing can reduce inventory waste throughout the supply chain. HP Indigo's printing technology is designed for sustainability, quality, workplace safety, and cost-effectiveness, to help you boost your sustainability bottom line.



Environmental impact of press use

The printing industry has undergone major changes over trends emerging from efforts to make a sustainable impact. For the print service provider (PSP), this can mean huge changes throughout the print production service. Investing in more energy-efficient machinery, designed with making a sustainable impact, can help reduce the emission of the greenhouse gases and other volatile substances to help safeguard the climate.

How does HP Indigo achieve energy savings in printing processes?

True digital offset architecture, powered by HP Indigo's unique proprietary Liquid Electrophotography (LEP) technology, enables a high ink coverage job with low energy consumption, without compromising on the safety aspect of food packaging use. HP Indigo presses are equipped with advanced energy recovery mechanisms such as regenerative braking and an advanced heat recovery system. Thereby, these presses achieve optimal press productivity by reducing media waste and energy consumption (e.g. 25% by EPM⁷ 15% by Premium White⁸).

Does the press emit Volatile Organic Compounds (VOCs)?

The HP Indigo digital press emits a fraction of the VOCs used in conventional printing processes.⁹

The HP Indigo digital press has a capture and control system that allows the capturing of VOCs in the recycling system located in the utility cabinet of the press. The efficiency of this system depends on the chiller parameters such as temperature and the flow of cold water. In order to minimize the VOC emissions on-site, several guidelines must be followed:

- The press installation guidelines must be followed and the engine doors must be properly sealed
- Use a chiller that allows water temperature and water flow levels to be maintained as per the recommendations in the site preparation guide
- Do not operate the press with the engine doors open and the enclosure panels not in place.

For more information, please refer to the site preparation guide of the relevant press model.

Where can the safety data sheets (SDS) for HP Indigo ElectroInk and other supplies be found?

The safety data sheets (SDS) for HP Indigo supplies such as HP Indigo ElectroInk, imaging oil, imaging agent, and recycling agent are available online on the following link:
<http://h22235.www2.hp.com/hpinfo/globalcitizenship/environment/productdata/iimdsileng.html>

Can we use HP Imaging Oil as a cleaning agent?

The HP Imaging Oil used in the printing process of HP Indigo digital presses can be used as a cleaning agent, unless regulations on cleaning agent VOC content apply, for example, in the case of the Sacramento Metropolitan and South Coast Air Quality Management Districts in California.

Do HP Indigo ElectroInks for packaging include mineral oil?

The carrier liquid used in HP Indigo ElectroInks is a high-purity, virtually odorless, synthetic isoparaffinic fluid comprised of low weight hydrocarbon chains (C11-C13), commonly used in personal care products and allowed for use in food contact materials across various jurisdictions. Mineral oil is defined as an oil that has a long hydrocarbon chain (>C20). All HP Indigo ElectroInks used for our packaging presses (HP Indigo 20000, 30000, 25K, 35K digital press series) do NOT include mineral oil in their formulation.



Print on sustainable media

With the demand for sustainable prints on the rise, your choice of print media really matters today. Papers with environmental credentials demonstrate that the paper is either sourced from a well-managed forests is recycled or is procured from mixed sources. HP Indigo media partners offer products that carry environmental credentials in almost every media category, helping you make choices that can boost your company's sustainability credentials.

How does HP Indigo help customers print more sustainably?

HP Indigo helps customers print more sustainably by responsibly sourcing the paper we sell, by facilitating more efficient paper use, and by collaborating across the paper industry to encourage best practices. HP Indigo users can choose from a wide array of media options, from FSC® certified papers to biodegradable, compostable films (that can help in reducing the adverse impact of economic activities on biodiversity).

Where can I find the list of sustainable media and supplier contacts for my country?

The HP Indigo Media Locator can provide either certified or validated media with sustainability credentials. For additional information, click on, <https://www.printos.com/ml/#/homeMediaLocator>



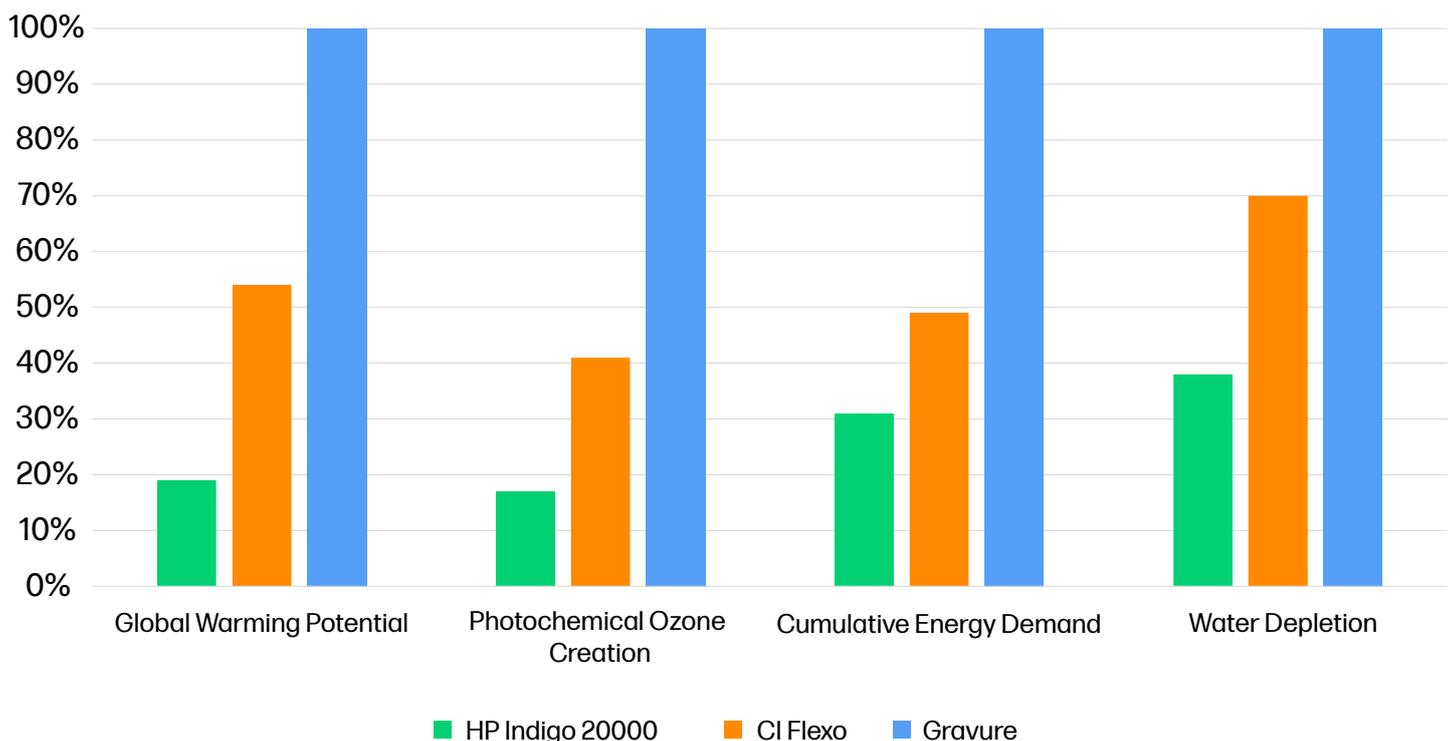
Life Cycle Assessment (LCA) of print

Environmental impact refers to all relevant resource extractions from the environment, as well as emissions (e.g. wastes and carbon dioxide). Life Cycle Assessment (LCA) is a data-based methodology that considers environmental impact and benefits at each stage of the product life cycle from raw material selection to disposal of the product at the end of its life cycle. It is a tool that evaluates the potential environmental impact of a product, system, or process. For this reason, LCA is often called a 'cradle-to-grave analysis.' The International Organization for Standardization (ISO) provides guidelines for conducting an LCA according to ISO 14040 and 14044.

How does HP Indigo measure the environmental impact of presses and prints?

We use the LCA method according to ISO 14040/14044 and evaluate the environmental impacts of HP Indigo presses, solutions, and prints. This helps us bring in a scientific perspective on our goals and continuous efforts to improve. Through these efforts, we identify the processes, components, and materials with the largest potential environmental impacts, compare them with possible alternatives, and target product performance improvements that deliver value to our customers and our businesses. Economical run sizes of HP Indigo prints have low environmental impact in key areas, as quantified in peer-reviewed LCA studies conducted in 2020.¹⁰ For additional information, click on: <http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=4AA7-5259ENW>

Environmental Impact Comparison_≈ 3,000 m² coffee pouch job_Europe



User site readiness & waste management

Is a permit required to install an HP Indigo digital press?

The installation of an HP Indigo digital press might require a permit, depending on the jurisdiction, and the intended utilization of the press. The authorities in the relevant jurisdiction may need to be contacted prior to installation.

How should I handle waste?

It is the customer's responsibility to verify that the waste treatment company they've chosen meets all the applicable legal and regulatory requirements as well as the customer's commercial and logistical needs. As part of HP Indigo's environmental awareness drive, we offer a supplies take-back program in some countries.

How can I discharge the wastewater of an HP Indigo digital press?

Wastewater must be disposed according to applicable waste disposal regulations. If necessary, the collection and disposal of wastewater must be ensured by an appropriately licensed waste contractor.

Can I discharge the HP Imaging Oil waste of an HP Indigo digital press into the sewage system?

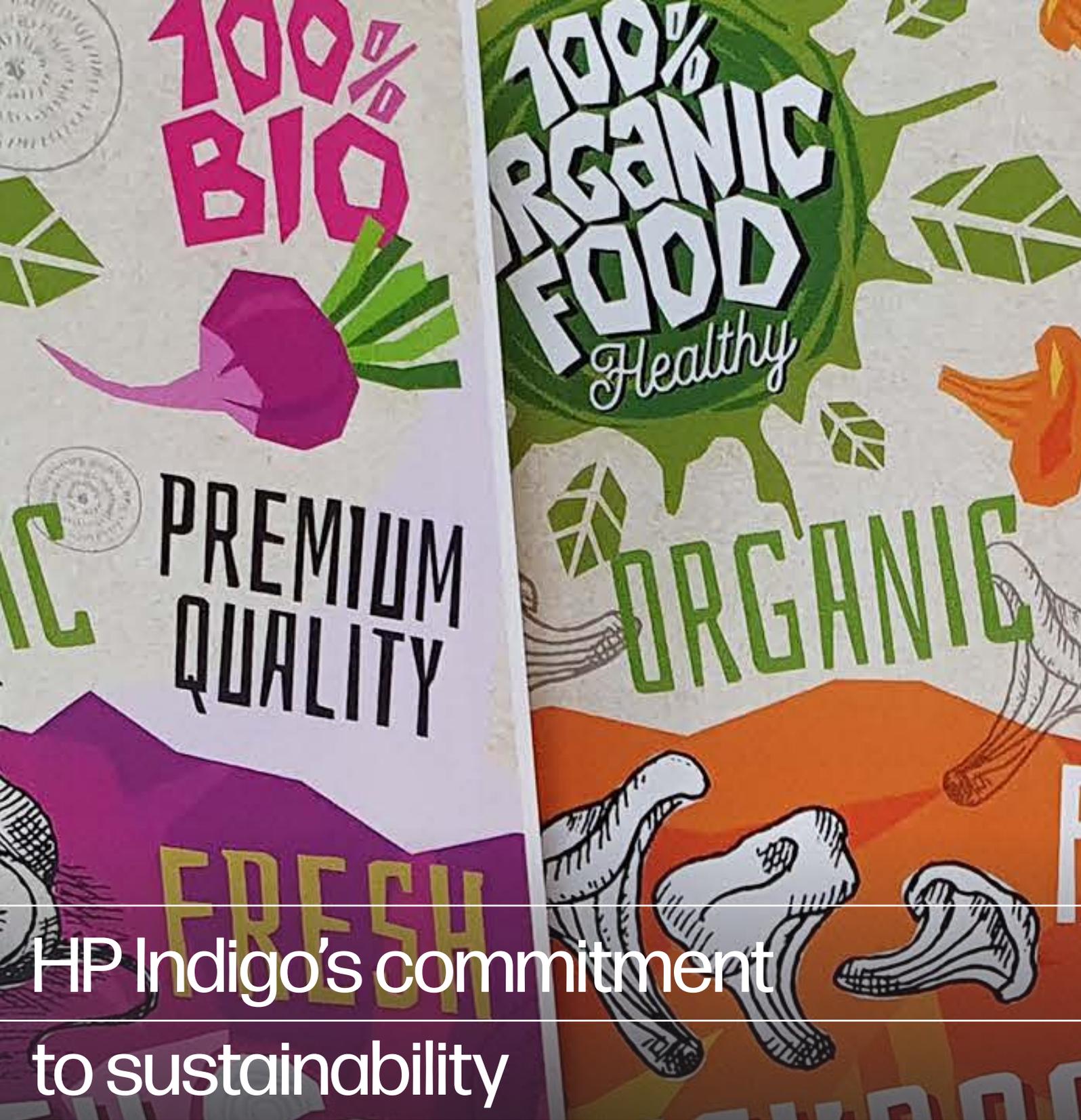
As specified in SDS Section 13, please do not allow HP Imaging Oil material to drain into sewers or water outlets. Oily waste material must be disposed of according to applicable waste disposal regulations. The collection and disposal of waste material must be ensured by an appropriately licensed waste contractor.

What is the aim of HP Indigo's take-back program?

As a part of HP's commitment to the environment and toward sustainability, HP Indigo's supplies take-back program aims to reduce the overall impact of HP Indigo print operations on the environment. It is a free-of-charge service for used supplies, for product take-back, and to enable reuse of select product components. The supplies collected in the take-back program may vary from one country to another, in compliance with local regulations.

Which supplies are included in the program?

Binary Ink Developer (BID) of all series and spare parts are valid in all countries. The full take-back program includes collecting and recycling of all series BID units, base, and roller, imaging oil, and ink cartridges/tubes that may vary from country to country.¹¹



HP Indigo's commitment to sustainability

Successful transformation into a circular business requires a considerable shift in capabilities and mindset, along with active collaborations, as manufacturing companies adapt their products and solution designs, and continuously engage with their customers and ecosystem partners. HP Indigo has been successfully adapting to the circular model for decades now and has been assisting the printing industry in its commitment to sustainability when moving toward a low-carbon circular economy.

Energy and waste reduction in HP Indigo's facilities

HP has been investing in more energy-efficient machinery, designed with making a sustainable impact in all its HP Indigo facilities, thereby reducing the emission of greenhouse gases and other volatile substances.

How does HP Indigo limit its environmental impact?

HP Indigo owns and leases facilities around the world. We pursue environmental management certifications at all these facilities when feasible. Our Environmental, Health, and Safety (EHS) Policy and EHS Management System help limit our environmental impact. It also improves worker safety, meets internal standards, and complies with all applicable laws and regulations. Both the manufacturing facilities in Israel and Singapore were certified to were certified ISO 14001.¹²

Does HP Indigo use renewable energy in its operations?

Yes. HP Indigo installed 920 KW solar panels at the ink manufacturing plant in Israel, as of 2012.

Is there water monitoring at the facilities?

HP Indigo implemented an artificial intelligence system to save water by detecting and setting off alarms/alerts on water leaks and faulty valves the moment they happen, thus, potentially saving liters of water.

How does HP Indigo reduce energy consumption in its facilities?

HP Indigo constantly invests in energy reduction projects such as using more efficient chiller units and better Air Handling Units (AHUs) control. HP Indigo Israel's electricity consumption per worldwide impression decreased by 35% between 2014 and 2019.¹³



Carbon-neutral press manufacturing¹ in HP Indigo's facilities

Carbon offsetting of a press involves calculating and analyzing all manufacturing and integration components in order to find and quantify the sources of greenhouse gas (GHG) emissions, i.e., raw materials used to build the press, their transportation to the manufacturing plant, and energy consumption during manufacturing and integration. Once these components are identified, quantified, and verified, the total CO₂ emission per press is declared. HP Indigo compensates elsewhere for the CO₂ we emit during the manufacturing process (from raw material to the gate) by supporting external reduction programs.

Are HP Indigo presses carbon-neutral?

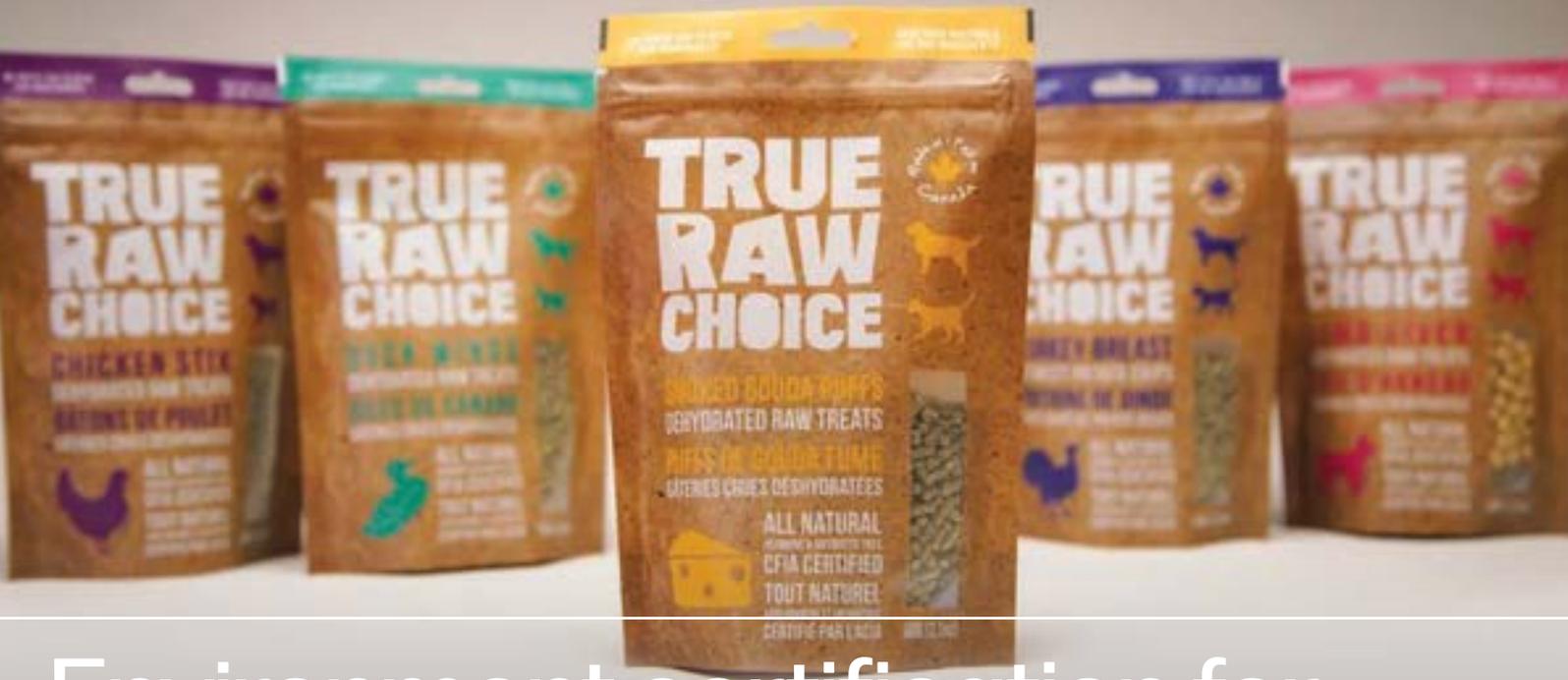
Yes, all HP Indigo presses are manufactured carbon-neutral.¹ We have mapped, calculated, and executed the necessary steps to offset the greenhouse gas emissions associated with the manufacturing of our presses from cradle (raw materials mining) to the factory gate. More than 170,000,000 kg CO₂eq have been reduced through offsetting projects since 2012, representing the equivalent of a reduction of 1 billion kilometers of car usage.¹⁴

Can I put carbon-neutral certification on any HP Indigo print?

No. Carbon-neutral certification is allocated after considering carbon offset during press manufacturing. If you wish to make your HP Indigo print carbon-neutral, your production must be assessed and then you can purchase carbon credits accordingly.

What do I need to make my print company carbon-neutral?

This extends beyond HP Indigo's business and expertise and must be personalized to your business. There are some options at your disposal. There are a few standards such as ISO standard 14064 and PAS 2050 that detail carbon accounting, and PAS 2060 from the British Standards Institute on carbon neutrality. There are also companies that specialize in carbon accounting and offsetting, that could perform the activities with, or, for your business.



Environment certification for HP Indigo digital presses

Responsible manufacturers need to go beyond self-declared claims of operating with the environment in mind. HP Indigo chooses the Intertek Green Leaf Mark to demonstrate rigorous, independent verification of environmental claims associated with select HP Indigo presses. Intertek's Green Leaf Certification Mark is a third-party assessment and certification program. The mark provides proof that a product has been independently verified and found to conform to multiple existing environmental regulations. It is used on products and packaging, in point-of-purchase displays, product advertising, and literature to promote and explain a product's environmental credentials and environmental claims.

Is there any environmental certification for HP Indigo presses?

Yes. HP Indigo uses the Intertek Green Leaf Mark to demonstrate rigorous, independent verification of environmental claims associated with selected HP Indigo presses. Most of HP Indigo presses, manufactured 2012 onward, have a Green Leaf Mark by Intertek.





Reducing transport emissions

We have been continuously increasing the efficiency of the distribution of our products. While designing products, we take into account greenhouse gas emissions associated with transporting presses, inks, and consumables along the supply chain.

How does HP Indigo reduce the carbon footprint of ink transportation?

HP Indigo ElectroInk provides 35% of high solids (Non-Volatile Substance or NVS) in all process colors and 50% in premium white, which reduces the net weight of ink transportation, thereby reducing its carbon footprint. Following this change, we saved approximately 550 tons of ink shipments, which is equivalent to the reduction of 750 tons of CO₂ emissions during 2020.



Forward - looking statements

This report contains forward-looking statements that involve risks, uncertainties, and assumptions. If the risks or uncertainties ever materialize or the assumptions prove incorrect, the results of HP Inc. and its consolidated subsidiaries ("HP") may differ materially from those expressed or implied by such forward-looking statements and assumptions. All statements other than historical facts are those that could be deemed forward-looking statements.

Footnotes:

1. From 2012 through 2018. Carbon offsetting is done in collaboration with the Good Energy Initiative. For more information, please visit: goodenergy.org.il
2. The Ellen MacArthur Foundation, January 2018.
3. Testing conducted for folding carton - June 2020; flexible packaging - March 2020.
4. July 2020, valid for 5 years.
5. July 2019, valid for 5 years.
6. Per the Intertek Green Leaf Certification Mark.
7. Enhanced Productivity Mode (EPM) is defined as printing color (CMYK) jobs using only three colors (CMY) and generating the black separation by overlapping the three colors cyan/magenta/yellow.
8. HP Indigo ElectroInk Premium White with one hit matches the opacity of two hits of the regular HP Indigo ElectroInk White.
9. Based on on-going internal HP testing.
10. Conducted in 2016 and re-evaluated in 2020.
11. The full take-back program is available in the following countries as of the date of this publication: Austria, Australia, Belgium, France, Germany, Luxembourg, Netherlands, Slovakia, The Czech Republic, and the UK.
12. The ISO 14001 certificate has been renewed and is valid from 2021-2024
13. Using 920 KW solar panels at the ink manufacturing plant in Israel.
14. Calculated 0.12 kg CO₂eq per km.

For more information, visit hp.com/indigo

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