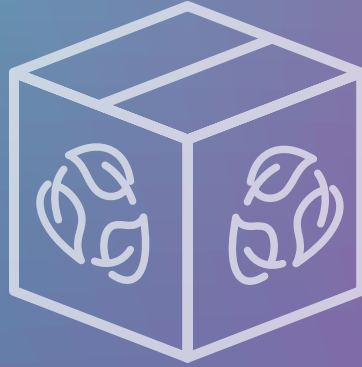




Sustainability in packaging:

Discover the
environmental
impact of
single-pass
inkjet printing of
corrugated boxes
and packages

efi[®]



Sustainable products are here to stay

Society's environmental awareness is no longer a trend but a reality. Growth in sales and increased store space of sustainable, ecological and organic products just proves it.

Various studies show that a majority of consumers are willing to change their habits in search of more sustainable products, that they are willing to pay more for them, and that they expect brands to act proactively protecting the environment.

Sustainable product sales are growing faster than overall sales in most countries, for most product categories, and for most sizes of companies:



85%

of retailers report **increased sales of sustainable products** over the past five years¹



81%

of consumers think that **companies should help improve the environment**²



73%

of consumers say that they would **definitely change their consumption habits** to reduce their environment impact²

¹ According to EU Market for sustainable products report (https://www.intracen.org/uploadedFiles/intracenorg/Content/Publications/EU%20Market%20for%20Sustainable%20Products_Report_final_low_res.pdf)

² Source: Nielsen Report The education of the sustainable mindset (<https://www.nielsen.com/us/en/insights/report/2018/the-education-of-the-sustainable-mindset/>)



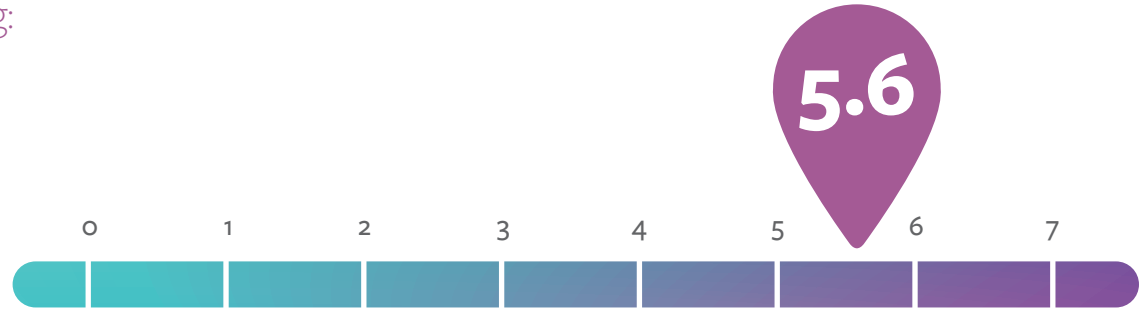
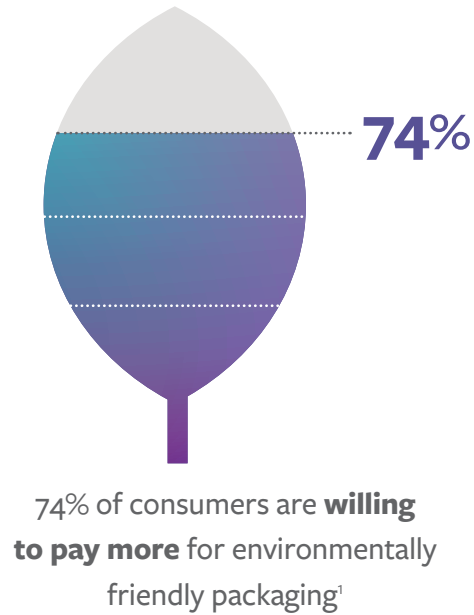
6 out of 10 millennials
(22-35 years) are willing to pay
a higher ticket for ecological
and sustainable products¹

Consumers are committed to the planet and to sustainable brands

With the growing global priority towards sustainability, consumers feel committed to the planet, and this affects brands and the rest of the agents in the distribution chain that need to respond to citizens who are “empowered and aware of the impact that their habits have on the environment.”

¹ Source: GlobalWebindex study <https://revistamercados.com/los-millennials-dispuestos-a-pagar-mas-productos-sostenibles-y-ecologicos/>

And this specifically affects packaging:



IMPORTANCE OF PACKAGING FOR BRANDS SCORES 5.6

on a scale of 1 to 7, with 7 being “very important.” Brand’s increase in spend is powered primarily by four sweeping market trends that signal high-growth opportunities — and barriers — for packaging converters and suppliers:

The demand for sustainable packaging solutions

Stock-keeping unit (SKU) proliferation

Use of innovative packaging substrates and packaging formats

The imperative of consumer convenience in a fast-paced world²

¹ Source: Boston Consulting Group and includes responses from more than 15,000 US Europe and South America consumers, published 2020

² According to L.E.K. Consulting, third annual brand owner packaging study in January 2020 <https://www.circularonline.co.uk/news/three-fourths-of-consumers-willing-to-pay-more-for-sustainable-packaging/>

The packaging industry is in the spotlight



This pressure is more than logical when we think of the instrumental function of packaging, which is a disposable part of the product with a short lifespan. And even more so in the case of secondary packaging that is usually made of corrugated.

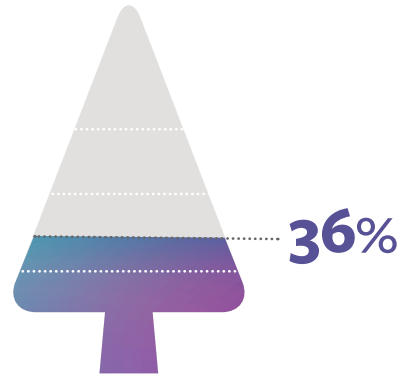
E-commerce is putting even more pressure on brands, box manufacturers and e-tailers around the globe to make an effort to review their concepts and redesign their products, looking for an improvement in their environmental impact.

The initiatives have multiplied in recent times:

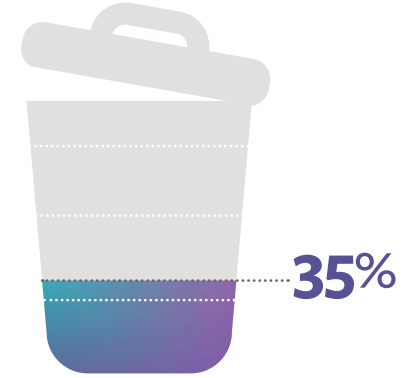
In the past two years, a majority of brands have introduced environmentally friendly products (67%) and packaging (53%) in a bid to appeal to the growing green-conscious consumer base:



42% of brands have made the switch to a portion of the **packaging being made from recycled substrates**



36% of respondents have embraced some form of **biodegradables**



35% of respondents have made **efforts to lightweight** (i.e., reduce the amount of material) in their packaging

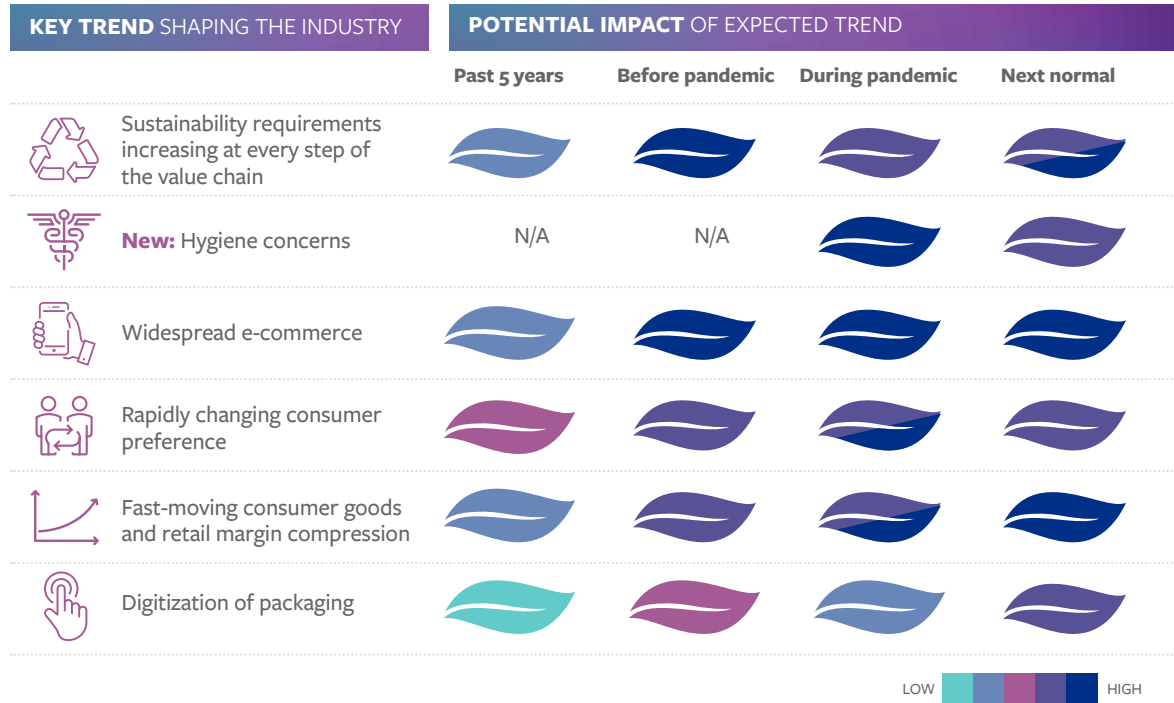
Source: L.E.K. Consulting, third annual brand owner packaging study in January 2020



Brand owners expect the total value of packaging with biodegradable, recycled or compostable material to grow by 15%-20% over the next two years

The COVID crisis has accelerated important megatrends

The impact of the pandemic slightly alters and increases the megatrends that were already reshaping the packaging industry. One of the trends that remains is that of sustainability, which is now complemented by concern for health and safety issues that translates into single-use formats.



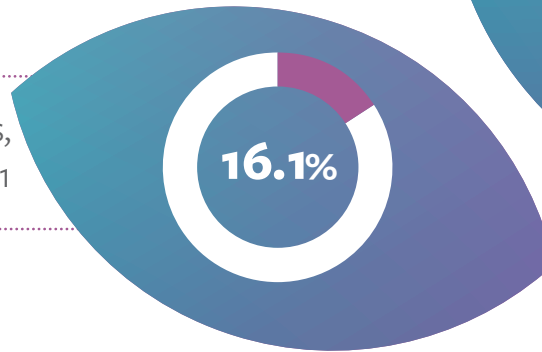
Source: McKinsey Company “Shaping the next normal of packaging beyond Covid-19” <https://www.mckinsey.com/-/media/McKinsey/Industries/Paper%20and%20Forest%20Products/Our%20Insights/Shaping%20the%20next%20normal%20of%20packaging%20beyond%20COVID%2019/Shaping-the-next-normal-of-packaging-beyond-COVID-19-vF.ashx>

E-commerce is now the new normal

E-commerce has shot up dramatically during the COVID crisis and it is expected to be a definitive change in consumer habits.



Consumers spent nearly \$212 billion between April and June 2020 on e-commerce



16.1% of all US sales, compared to 11.8% in Q1



31.8% QoQ increase

Source: ROI evolution <https://www.roirevolution.com/blog/2020/10/coronavirus-and-e-commerce/>

As products of all categories are sold online on a regular basis, this will have direct implications for the packaging industry that will have to provide specific solutions for this channel. Some of these changes have already begun in earnest:



Shopping experience:

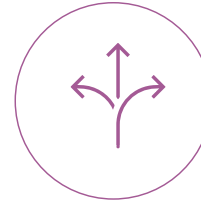
It is already the key factor.

Proving it, the Uboxing phenomenon that accumulates 18 million videos on platforms like Youtube.



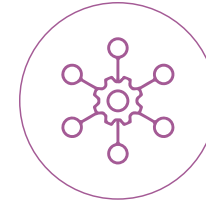
Ease of handling and reduction of waste:

Here is where most companies have put the focus so far.



Flexibility:

Management of a high number of packaging references is not feasible, especially for small specialized vendors at the end of the Long Tail.



Primary and secondary packaging tend to merge under an omnichannel strategy.

Source: Alimarket Informe sobre el comercio electrónico <https://www.alimarket.es/alimentacion/informe/317055/informe-2020-sobre-ecommerce>
Chris Anderson, Long Tail: [https://en.wikipedia.org/wiki/The_Long_Tail_\(book\)](https://en.wikipedia.org/wiki/The_Long_Tail_(book))



Corrugated packaging is a clear winner in responding to e-commerce needs and digital printing contributes, specifically in terms of image and shopping experience.

Recycled and recyclable packaging can enhance the brand, as well as purchase and consumption experience thanks to unique elements of digital printing, such as photo printing, versions or personalization.

Corrugated: At the center of it all



Corrugated, a substrate that can be recycled up to seven times, contributes to a true circular economy considering that, in the packaging industry, the circular economy model does not simply refer to recycling but to all stages of the product life cycle: design, production, distribution, use and recovery.

Therefore, it affects concepts that have to do with manufacturing location, saving of resources, and reduction of emissions and waste.

Circular Economy



Digital single-pass inkjet printing strengthens and reinforces this circle thanks to intrinsic advantages of the technology that not only have to do with process efficiency but also with new added value and better market response.

In the packaging industry, the circular economy model is about more than just recycling. It handles all stages of a product's lifecycle, namely its design, production, distribution and use, and also its recovery. It includes notions such as local integration and proximity. It also includes saving resources (materials, water, energy), mostly through:

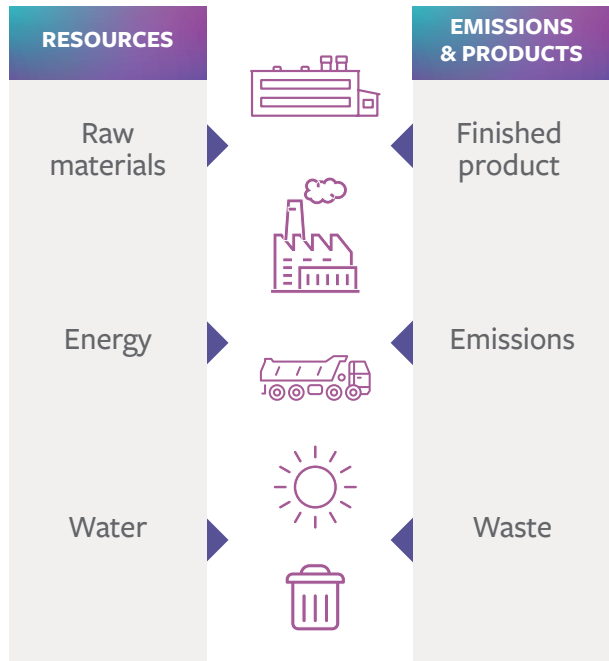
- Conceiving the product/packaging combination in an eco-friendly way;
- Using resources parsimoniously;
- Reusing packaging, especially on a business-to-business basis;
- Preventing packaging waste;
- Preventing product waste;
- Preventing waste by improving recyclability of products and packaging;
- And reusing materials to optimize material flow.

It also includes any and every initiative to change people's behaviour to improve packaging.

Source: Packaging and circular economy report from French packaging council

<https://circulareconomy.europa.eu/platform/sites/default/files/packaging-and-circular-economy-final-report-en-september-2014.pdf>

Digital single-pass inkjet printing – think of it as a sustainable technology



Industrial inkjet printing for corrugated boxes and displays is a sustainable technology that considers the total life cycle of the product (LCA) as it improves its environmental impact in two ways:

- Reduction of resources consumed: raw materials, energy, time, space
- Reduction of waste generated: emissions, waste

Enjoy sustainable digital technology with **EFI Nozomi C18000 Plus** single-pass inkjet printer



Eliminates the need for plates

- And also, the transport, logistics and storage of this tooling.
- Make ready and model changes are immediate; downtime is reduced

Reduces storage

- No need of ink mixes stock
- Facilitates just in time production, reducing inventories

Reduces power consumption

- Power consumption of LED curing is lower than traditional arc lamps
- UV LED curing instantly dries inks, avoiding any post-print drying equipment

Reduces waste of overproduction

- By printing what you need when you need it
- Inkjet printing, along with digital analytics, helps implement efficient supply chain management

Eliminates wasted water

- To wash presses and inks in manufacturing plant.

Eliminates ink waste

- Through jetting, at picoliter size, drops of the exact amount needed

Reduces total carbon footprint

- Facilitating near shoring and printing everywhere thanks to color consistency from batch to batch

Image quality just
got brilliant.

Productivity just
went turbo.

Capabilities just
expanded.

And your competitive
edge just got sharper.



Revolutionize your business in a single pass with the **EFI Nozomi C18000 Plus** digital press for corrugated packaging. It brings stunning image quality, productivity and uptime to your manufacturing floor in the form of six major enhancements. Together, they make the **Nozomi C18000 Plus** the single best LED technology for your packaging or display business goals. Our cross-functional teams understand the unique demands of corrugated and have leveraged our latest advances in printing and inkjet technology to create a revolutionary solution that will drive your business success now and in the future.

Six improvements that turn this Nozomi into a Plus.



1. Image quality

Smart Technology and Fiery® R5 combined create a more flexible and reliable system with drop-on demand control, color registration and PH alignment optimization to deliver the highest print quality.



2. Transport optimizer

Optimized warp control designed to print higher volumes profitably. Innovations driving higher speed and productivity will unlock new opportunities for the analog-to-digital transformation.



3. Software performance

Renewed software with new applications, such as nozzle compensation predictor, rush-proof and an enhanced UI, that results in reduced set-up times, errors, reprints and more.



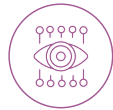
4. Professional services

The Nozomi Digital Solutions Program provides the support and training to ensure you are successful with your investment in digital print.



5. Uptime maximizer

Tools such as Cloud monitoring, EFI IQ and new Fiery features will allow tracking of production and operator performance for making better decisions based on data.



6. On board quality agent

Artificial vision (AV) for accurate color adjustment, nozzle out and defect detection deliver optimum print quality and an efficient quality control process that increases operator satisfaction.

EFI UV LED inks – always green for direct environmental benefits

Zero VOCs

UV inks don't evaporate; they must be cured. That is, the ink does not penetrate the substrate as it dries as soon as it's cured and rapidly adheres to the substrate. The combination of UV ink formulation and the curing process means UV printing emits virtually no volatile organic compounds (VOC).

Inks are also a critical component of the quality equation and the solidification of the ink is also the reason behind intense coloration and yield exceptionally high quality. EFI™ UV LED inks have been formulated with the specific properties for corrugated packaging and display in terms of color and performance. They are odorless and maintain flexibility for creasing and are hard enough to withstand rubbing. They are also extremely efficient when considering the total cost of the printed unit.

White ink capabilities

Unique white ink allows photographic printing and color brand fidelity on brown recycled liners. This is an unusual novelty. Your customers will benefit from great appealing image and eco-friendly look and feel.

LED curing requires less power consumption

LED technology decreases your power consumption by eliminating the need for high power lamps to ensure proper image adhesion and additional heat to evaporate off water waste from printed images.

Traditionally mercury vapor lamps, by their nature, emit extremely high heat. Yet only five percent of this energy is used to cure the ink. The other 95 percent heats up the substrate and the entire print engine. In contrast, LED lamps use approximately 20 percent of UV radiation for curing and only 80 percent of the energy is converted into heat.

An LED lamp is guaranteed for several years while a mercury lamp provides 1.5 years at best. There's also no warm-up time with instant on/off LED, so you use less energy while increasing uptime and productivity. You also won't have to deal with the wasted output associated with uneven curing or color shifts that often result from mercury bulb degradation or from operators trying to find the right mix of cure energy for ink on a particular substrate.

Certifications you can trust



GREENGUARD certification

As part of EFI's ongoing efforts to provide environmentally friendly products to the marketplace, EFI has secured GREENGUARD Certification on EFI Nozomi UV LED inks. The low-odor inks contain no hazardous VOCs and do not require vapor recovery.

GREENGUARD Certification helps identify healthier products by ensuring that a product has met some of the world's most rigorous and comprehensive standards for low emissions of VOCs into indoor air. The GREENGUARD Gold standard includes health-based criteria for additional chemicals and also requires lower total VOC emissions levels to ensure that products are acceptable for use in school and healthcare facility environments, for example.



OCC certification for recyclability and repulpability

The WMU Pilot Plant provided an old corrugated containers (OCC) certification to EFI Nozomi UV LED inks, extending the solid, research-driven evidence that Nozomi inkjet-printed corrugated boards can safely, efficiently and effectively enter recycling streams.

EFI Nozomi inks are the first and only single-pass digital corrugated printer inks to achieve the certification, a key validation developed by modeling wax coating replacement protocols of the Fiber Boxboard Association, a group that represents approximately 95% of all U.S. corrugators.

Given the prevalence of OCC in packaging, the certification is important to ensure that corrugated packaging is safely recycled.



Fogra Energy Efficiency certification

The Fogra Research Institute for Media Technologies certified the ultra-high-speed, single-pass EFI Nozomi C18000 Plus LED printer.



Visit efi.com to learn more about
the new EFI Nozomi C18000 Plus LED
digital inkjet printer for corrugated.

We develop breakthrough technologies for the manufacturing of signage, packaging, textiles, ceramic tiles, building materials add personalized documents, with a wide range of printers, inks, digital front ends, and a comprehensive business and production workflow suite that transforms and streamlines the entire production process, increasing your competitiveness and boosting productivity. Visit www.efi.com or call 650-357-3500 for more information.



Nothing herein should be construed as a warranty in addition to the express warranty statement provided with Efi products and services.

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