



eBook

Circular economy and the footwear industry

Reducing the carbon footprint of the footwear industry

Over recent decades, the footwear industry has acquired increasing economic relevance worldwide. This growth has increased the environmental impact of footwear production, in particular higher global carbon dioxide emissions, which are responsible for global warming and climate change.

In view of the major environmental challenges facing the sector, the footwear industry has developed measures to improve sustainability and innovation throughout the lifecycle of shoes - from the production and processing of raw materials to recycling of used shoes.

Use of raw materials from the circular economy is one of the areas where the sector has made a major investment. Amorim Cork Solutions makes a vital contribution in this context, through the development of a new generation of cork components intended for production of footwear based on the principles of the circular economy.

Throughout this e-book we invite you to learn more about the footwear industry and discover the innovative ways it has been reducing its impact on human health and the environment.

We also address the circular economy and its significance for the sector, and present the steps taken by Amorim Cork Solutions to help manufacturers reduce their carbon footprint.



AMORIM CORK SOLUTIONS

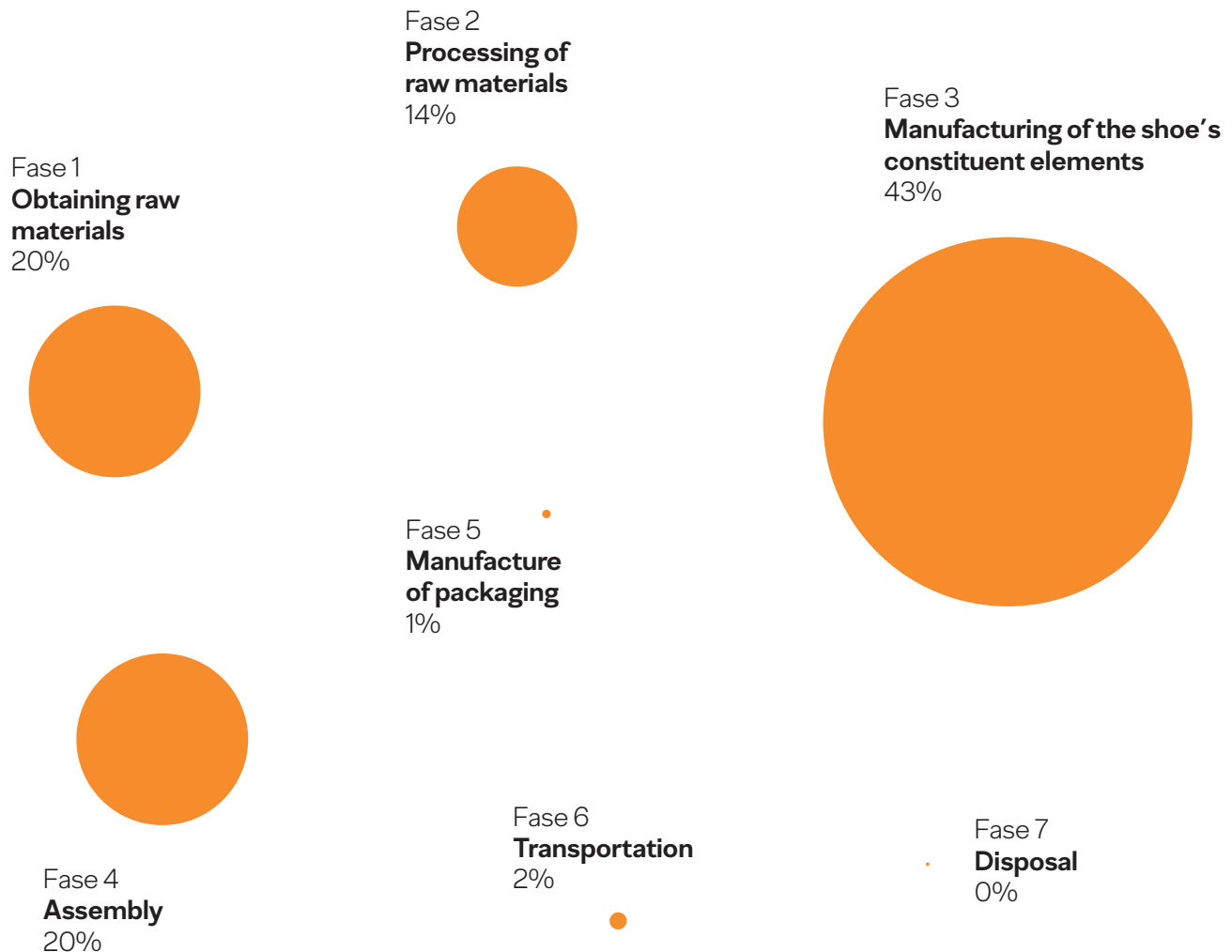
Environmental impact throughout the lifecycle of footwear

Every year, approximately 23 billion pairs of shoes are produced worldwide⁽¹⁾. In Portugal alone, 57 million pairs were sold in 2016⁽²⁾. That same year, the European footwear

industry was responsible for emissions equivalent to 10 million tons of CO₂ and 500,000 tons of waste⁽³⁾.

7 life cycle stages of footwear

Life cycle hot spots vary depending on the material used.



(1) World Footwear Yearbook, 2017, APICCAPS

(2) World Footwear Yearbook, 2017, APICCAPS

(3) http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=6746&docType=pdf



The exponential growth of footwear consumption, coupled with mass production and low levels of reuse or recycling of this type of product, means that the vast majority of shoes end up in landfills, constituting a complex environmental challenge.

Alongside issues related to the origin and method of production of the different raw materials needed to make the shoes - including leather, rubber, synthetic materials and textiles - the greatest environmental concern is associated to the production stage.

Footwear factories are responsible for emitting large quantities of carbon dioxide, which contribute to global warming and climate change, and also release toxins and chemicals harmful to the atmosphere due to the application of glues and finishing products.

At the same time, the various processes associated to the manufacturing stage generate large amounts of waste, both hazardous (solvents, glues and waste oils) and nonhazardous (leather waste, plastic waste, paper and paperboard), which require specific treatment. Footwear companies also discharge the wastewater used in paint booths, which sometimes contain high concentrations of chemicals that are harmful to the environment and human health.

Although on a smaller scale, the transport phase also generates an environmental impact, since many companies relocate their production to countries with cheaper labour and a large percentage of the shoes available on the market are produced far from the final point of sale.

Finally, the end stage of the life cycle of footwear also requires attention, since most shoes are not sent for recycling and end up in landfills, which can lead to soil and water contamination. Moreover, recycling of footwear is not a simple process because it is a product composed of several elements, produced using different materials and whose

Moving towards a more sustainable and ecological industry

Given the environmental impact of the footwear industry, manufacturers have been making investments to improve and modernise the selection processes of raw materials, manufacturing and recycling, seeking to manage the resources used more efficiently and reduce the amount of emissions and waste generated.

At the European level there are many initiatives in this field, such as the recent LIFE GreenShoes4All project, coordinated by the Portuguese Footwear Technological Centre (CTCP) and involving partners from four European Union countries.

Aimed at reducing the carbon footprint of the footwear industry, the project envisages creation of an "Environmental Footprint of the Product" methodology designed to reduce the sector's overall impact on natural resources, plastic residues and greenhouse gas emissions.

However, the constant growth of consumption of this type of product, determined by market demands and fashion trends, means that the various initiatives in progress are insufficient to deal with the problem, and a global paradigm shift is necessary. For this reason, over recent years, the footwear sector has been adopting the circular economy as an alternative business model to the linear economy model of "extraction, transformation and elimination" of resources.

Footwear industry: a global business

The footwear industry is currently an important sector of the national economy. Portugal is among the top 10 largest exporters of leather footwear worldwide and has one of

the most advanced industries in the world, presenting and promoting itself as "the sexiest industry in Europe."



95%

95% of Portugal's annual footwear production is exported to more than 150 countries.



83M

In 2017, Portugal sold 83 million pairs of shoes in international markets.



47.000

The sector employs more than 47,000 people.



350

Over the past ten years, more than 350 new national footwear brands have emerged, including "As Portuguesas," the world's first cork flip-flop brand, supported by Corticeira Amorim.

The circular economy in the footwear sector

Inspired by natural ecosystems capable of constant regeneration over the long term, the circular economy promotes a reorganised economic model, through coordination of production and consumption systems in closed circuits. It makes it possible to disassociate economic growth from waste generation and aims to reduce pollution and foster environmental protection and sustainable development.⁽¹⁾

According to ECO.NOMIA, a portal created by the Portuguese Ministry of the Environment to promote the circular economy, it is estimated that waste prevention measures, eco-design, reuse, and other “circular” actions could generate net savings of around 600 billion euros for EU companies (approximately 8% of their total annual turnover).

In addition, these measures could create 170,000 new direct jobs in the waste management sector while also reducing total annual greenhouse gas emissions by 2 to 4%.

The circular model presupposes an increase in the use of renewable or recyclable resources, reduction of consumption of raw materials and energy and, at the same time, reduction of emissions and raw material losses. When applied to the footwear industry, the principles of the circular economy can be achieved through ecodesign, efficient use of resources, waste minimisation, industrial symbiosis or creation of new business models and management.

For example, in terms of design, it is essential that products be designed from a circular perspective from their origin – preferably using recycled and recyclable raw materials with low environmental impact, avoiding the use of toxic substances in their processing and creating shoes that are easier to recycle or reuse.

In terms of innovation of business models, new initiatives are emerging in the fashion industry, such as Rent the Runway (renttherunway.com) and Mud Jeans (mudjeans.eu) in which the consumer does not buy the product, but instead pays for its use. These models may work in the future as an incentive for designing products with a longer life cycle.

(1) <http://economy.circular.gov.pt>

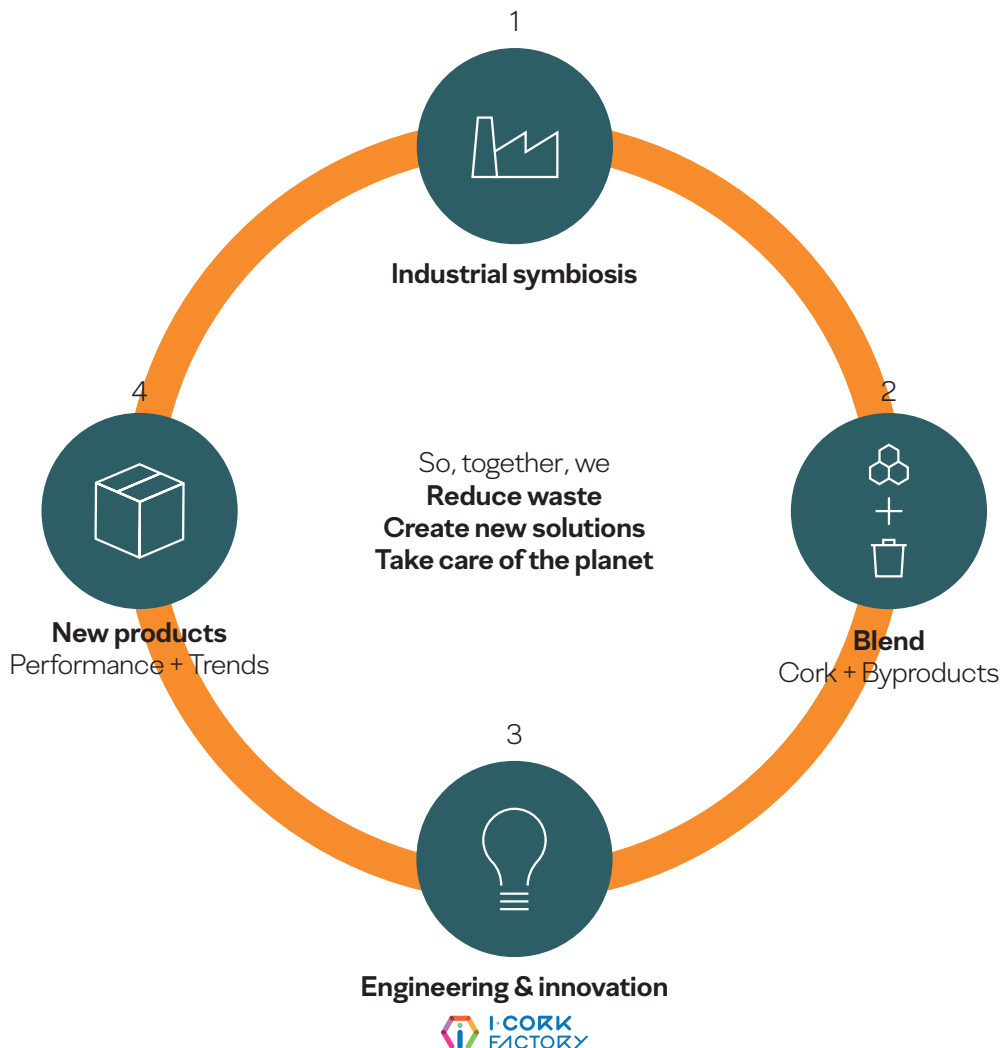
Amorim Cork Solutions, example of the circular economy

Founded in 1963 with the aim of valuing cork that is not used in the production of cork stoppers, Amorim Cork Solutions has always been orientated towards the principles of the circular economy.

Using by-products that had formerly only been used on a residual basis, it has developed a portfolio of high performance materials, applicable in a wide range of industries – such as aerospace, panels and composites, automobiles, seals and joints, the electricity industry, construction, sports surfaces, flooring, consumer goods, furniture and footwear.

Committed to improving the sustainability of its composite products, it has been incorporating non-cork by-products, derived from the footwear, automotive and packaging industries – such as synthetic rubbers, polyethylenes, polyurethanes and EVA foams. This combination makes it possible to value these waste residues, originating innovative solutions that enhance cork's characteristics.

Amorim Cork Solutions' eco-efficient profile is further reinforced by the fact that the waste produced by its production activity (so-called cork dust) is used for the cogeneration of electricity. In fact, more than 60% of the energy used by the company is obtained by burning cork dust, thereby helping to minimise greenhouse gas emissions and reduce the company's carbon footprint.



How can cork reduce the environmental footprint of the footwear industry?

Contributing to a More Balanced and Sustainable World
100% natural, reusable, and recyclable, cork is one of the most versatile materials in the world from an environmental, social, and economic perspective.

Cork oak forests, commonly known as “montado”, support a unique and fragile ecosystem, serving as a habitat for rare and endangered species. They are part of one of the 36 global ecosystems that contribute the most to biodiversity conservation, comparable to the Amazon, the African savanna, and Borneo. More than 200 animal species and 135 plant species find ideal conditions for survival in the montado.

Montados protect against soil erosion and desertification. They act as natural fire barriers due to cork’s low flammability and play a key role in regulating the water cycle. They also contribute significantly to the air we breathe by absorbing carbon dioxide (CO₂) that would otherwise be released into the atmosphere.

Fighting Climate Change

The cork oak is a slow-growing species that plays a crucial role in capturing CO₂, storing it in its roots, leaves, trunk, and bark (cork) throughout its lifetime. Studies indicate that for every ton of cork produced, the montado can sequester up to 73 tons of CO₂, helping in the fight against climate change. Cork products retain this carbon storage capacity throughout their entire lifecycle, reducing the carbon footprint of various applications.

Positive Impact on Carbon Balance

Considering the CO₂ sink effect of the montado, enabled by the cork industry, studies show that annual carbon sequestration can be 17 times higher than the greenhouse gas emissions from the entire value chain of Corticeira Amorim⁽¹⁾. In a time when carbon neutrality is one of society’s greatest challenges to ensure the preservation of our planet, Corticeira Amorim operates in a way that positively impacts climate regulation, promoting CO₂ sequestration at levels that exceed its emissions.

(1) Source: Instituto Superior de Agronomia (ISA), 2016 (<http://uaonline.ua.pt/pub/detail.asp?lg=pt&c=45245>)



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How can cork reduce the environmental footprint of the footwear industry?

AMORIM FOOTCORK

Amorim Footcork® : Nature promoting high quality of life.

Amorim Footcork® is the Amorim Cork Solutions brand that is exclusively dedicated to the development and supply of solutions and materials for the footwear industry. With three product lines - fashion, comfort and health - it focuses on the research and application of the benefits of cork to maximise foot comfort and health. Amorim Cork Solutions' extensive experience in the footwear industry, in partnership with its customers and partners, has resulted in the high technical competence of its products and has positioned the footwear industry as a strategic sector for the company.

Amorim Footcork® sheets and rolls, which consist of carefully selected raw materials, enable simple and straightforward usability and thermoforming.

The different compositions and the diversity of the granulometry of the carefully selected raw materials make it possible to model simple and comfortable products that will satisfy customers' most demanding requirements.

Manufacturers have recognised the advantages of using cork in the production of footwear for many years. From specialist orthopaedic models to up-to-date visuals, cork offers a wide range of applications for footwear, guaranteeing high performance in terms of comfort, lightness, distribution of body weight, impact absorption, compression recovery and excellent thermal insulation. Cork ensures a user-friendly process that makes manufacturing components an easy and economical task.

Our mission is to systematically develop solutions that allow us to be competitive and explore strategic areas in which cork's characteristics are highly valued by our customers and consumers. Amorim Cork Solutions' approach is based on the knowledge that the design of the product, across its life cycle, can have a high environmental impact. We are committed to ensuring that the design of our products extends their functionality as far as possible. This is our philosophy and the main message that we aim to convey.

Always committed to the sustainability of its products, Amorim Cork Solutions is now going even further. Under the Amorim Footcork® brand, it presents a new generation of composites designed for the production of footwear components, developed with 100% circular economy materials. These innovations support the industry's transition to this business model while reducing its carbon footprint.

Specially conceived in Amorim Cork Solutions' I Cork Factory, we are now launching a new thermoformable material in the market. Ecological and easily adaptable to manufacturing processes, EVOLUTION consists of recycled cork, EVA and polyurethane from the footwear industry itself, and from the automotive and packaging industries. The new composite is therefore fully aligned with the principles of the circular economy, and responds to the demands of the market and consumers for more environmentally-friendly and sustainable manufacturing processes.

Amorim Cork Solutions

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