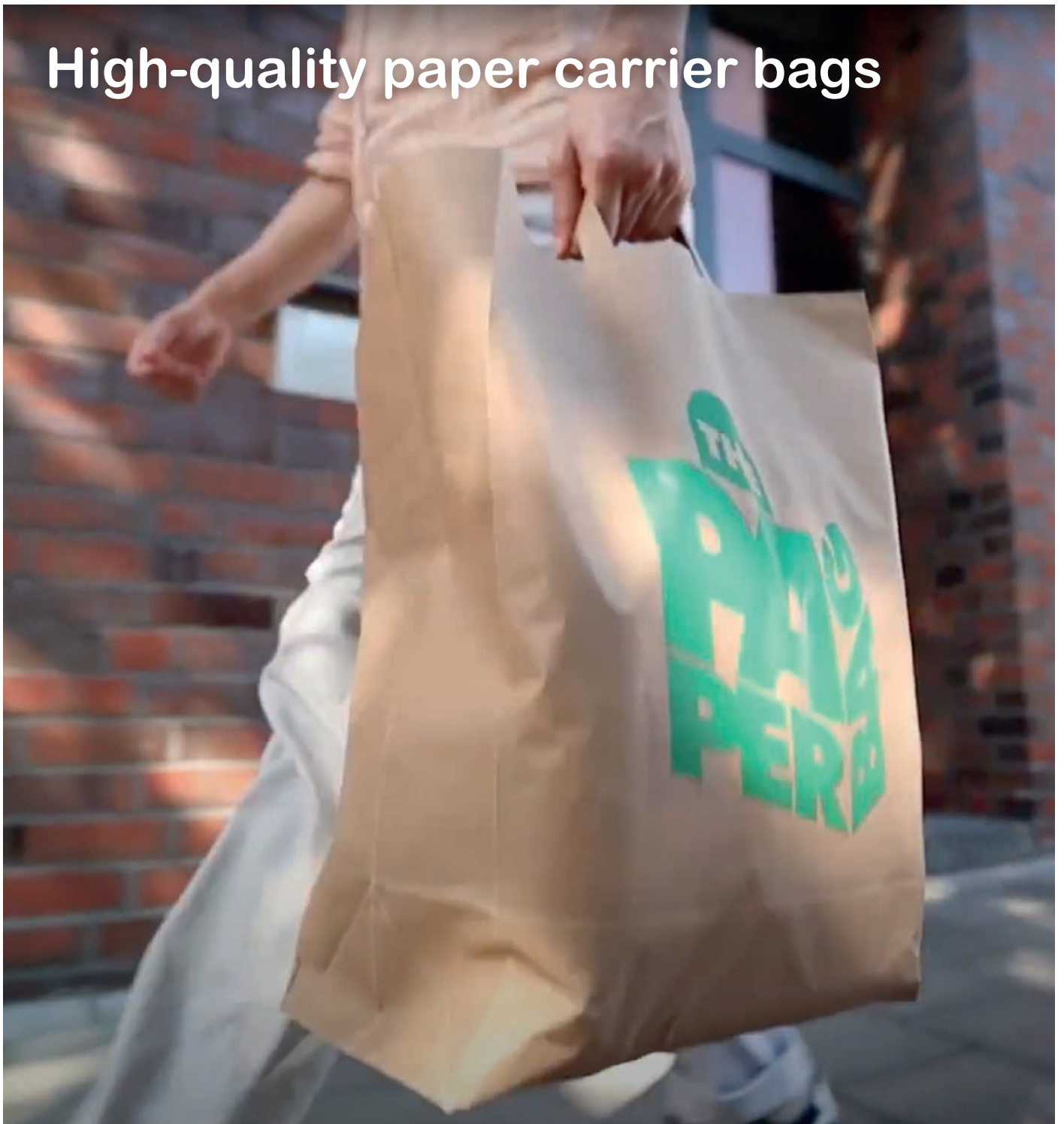


## INDUSTRY GUIDELINES

### High-quality paper carrier bags



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# INTRODUCTION

With these Industry Guidelines we intent to provide orientation to paper carrier bag converters and their customers on the parameters that influence the durability of a paper carrier bag. Together, they can work on the necessary requirements to ensure good bag quality. The aim is that high-quality paper carrier bags shall be able to carry home at least 6 kg of products from the supermarket and that they can be reused up to five times for the same purpose.

The guidelines include established technical methods and recommendations on how to produce a high-quality paper carrier bag that will protect the products packed in it during normal usage and reuse.

We have tried to be as precise and exhaustive as possible, but since there are many different bag sizes, constructions and end uses, we concentrated on the common features that apply to most paper carrier bags. Nevertheless, there may be other solutions to the ones described here. In addition, there may be other reasons why paper carrier bags do not meet the requirements.

## Produced by

The Industry Guidelines are produced by The Paper Bag, a collaboration between the two organisations CEPI Eurokraft and EUROSAC.

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The boards of CEPI Eurokraft and EUROSAC.



# 1. THE IMPORTANCE OF HAVING A HIGH-QUALITY PAPER CARRIER BAG



## A. Usability and reusability

Customers can trust the carrier bag on their way home from the supermarket and they can reuse it afterwards.



## B. Customer satisfaction

The paper carrier bag fulfils customer expectations, leading to brand owners with fewer complaints.



## C. Environmental impact

1. A high-quality paper carrier bag protects the products packed in it. This keeps the carbon footprint of the products as low as possible (no loss due to product damage).
2. At the same time, the use of a bio-based, renewable and recyclable raw material minimises the environmental impact of packaging.
3. If natural water-based inks and starch-based adhesives are used, paper bags do not harm the environment.



## D. Branding

1. A high-quality paper carrier bag is an excellent vehicle to project a brand image. Its outstanding print quality and colour reproduction allow for great creativity in advertising and development of brand image.
2. Using high-quality paper carrier bags sends a clear signal of commitment to the environment. Thus, paper bags are a visible part of a brand's corporate social responsibility and create a sustainable image along the value chain!

## 2. PAPER CARRIER BAG PRODUCTION

Paper carrier bags can be produced in many ways, with various raw materials, constructions and additional features. The carrier bag needs to be fit for purpose – its transportation route, where it is supposed to be used, what is going to be packed into it and how much volume and kilos it will have to hold must be considered.

For a high-quality paper carrier bag that is intended to carry at least 6 kg of items from the supermarket and be reusable up to five times, it is important to select the right paper material, glue, converting and handle type. What has to be taken into consideration will be explained in the following chapters.

After the final use of a paper carrier bag, it should be recycled. The recycling opportunities vary depending on the country and municipality and should be checked. The paper raw material is a valuable source for paper recycling mills and can be recycled into new paper products.



## 2.1 MATERIAL

### A. Paper strength parameters

Its storage can greatly influence the quality of a paper carrier bag. The paper and the finished paper bags must be stored in a dry and well-ventilated place to avoid deterioration of the paper strength properties and potential mould growth (in really wet conditions). For the best possible storage, paper carrier bag converters, brand owners and retailers must follow the recommendations from their paper suppliers.

Papers are characterised by a number of different strength properties. For a high-quality paper carrier bag, using a paper with high mechanical strength properties is recommended in order to ensure that the bag will withstand loads of at least 6 kg.

Important mechanical strength parameters:

#### 1. Tensile strength

Maximum force that the paper will withstand before breaking. In the test, described in "ISO 1924-3:2008 Paper and board – Determination of tensile properties", a test piece of 15 mm width and 100 mm length is pulled until rupture using increasing force. The elongation, or stretch, is the measurement of how much the paper will stretch before rupture. The stretch level is sometimes used to characterise the type of paper – natural (flat) or extensible kraft paper.

#### 2. TEA (= Tensile Energy Absorption)

A combination of tensile strength and elongation. It describes how much energy the paper can absorb and is measured in J/m<sup>2</sup>. The TEA is a good indication of how well the carrier bag will perform in, for example, a drop test.

#### 3. Bursting strength

The maximum pressure on the paper surface in a perpendicular direction that is required to break the paper. The test is further described in "ISO 2758:2014 Paper – Determination of bursting strength".

#### 4. Tear strength

The resistance of a paper sheet to a tearing force to which it is subjected. It is measured using the standard "ISO 1974:2012 Paper – Determination of tearing resistance, Elmendorf method".

#### Recommendation

Select paper that fulfils all strength parameters in terms of the desired load and number of reuses of the bag.



## 2.1 MATERIAL

### B. Glue

There are different types of glues that can be used depending on the application. For a high-quality paper carrier bag, using a strong, water-based glue is recommended due to its better environmental footprint. The viscosity of the glue must be matched to the converting machine and the paper used. Furthermore, the glue must be applied in the right position on the paper and its adhesive strength must hold the paper in place throughout the whole forming cycle of the bag.

#### **Recommendation**

Choose a strong, water-based glue that has the right viscosity and adhesive strength to complement the selected paper and converting machine.

## 2.2 CONSTRUCTION OF THE PAPER CARRIER BAG

### A. Converting

The forming of the tube takes place by folding the flat web twice. The flat web of paper is run over forming plates inside the tube, which essentially take on gliding and guiding functions. Guiding shoes and pressing rollers help to fold the paper, maintain the tube width and reduce the flapping of the web. The endless tube will then be cut and folded to become the final product.

This process of folding the paper is used to form the face, gussets and bottom of the bag.

- » The gusset is the "side" or the "expandable" part of the bag. It is formed by running the paper through a gusseting assembly with pairwise inner and additional outer former plates equipped with disks, to determine the tube width and the gusset depth. Guiding shoes and rollers help to form and press on the fold. The gussets are created before the tube enters the bag machine.
- » The bottom is formed once the paper has been drawn into the bag machine. This is where the cutting of the tubes, forming and gluing of the bottom happens. During the formation, many different processes take place within a split second: the "grippers" grab the gussets and fully open the bottom of the tube. It then goes through a series of breakers and folders, which help form the bottom and prepare it for gluing. Afterwards, glue is applied, the bottom of the bag is closed and, finally, it is pulled through the machine into the delivery chute.



#### Recommendation

To produce a high-quality paper carrier bag, ensure that all the processes during converting run smoothly and correctly.





## 2.2 CONSTRUCTION OF THE PAPER CARRIER BAG

### B. Handles

Studies have shown that the handles are the fragile point when using and reusing a paper carrier bag. However, this fragile point can be eliminated by selecting the right paper quality for the handle and the best construction to fix it to the bag.

#### Quality

As important as paper strength is for the bag, it is equally so for the handles. The paper for the handles must have high-strength properties taking into consideration the desired load and number of reuses of the bag. For detailed information on paper strength properties, see the chapter "Paper strength parameters".

#### Construction

Handles can be flat (a strip of paper folded several times) or made with twisted paper. Flat handles can either be fixed to the inside or outside of the bag, and they can be reinforced with a paper patch. Twisted handles are usually fixed inside the bag with a reinforcing patch.

#### Recommendation

For maximum strength, use handles made from paper with high-strength properties that are fixed inside the bag and reinforced with a paper patch.



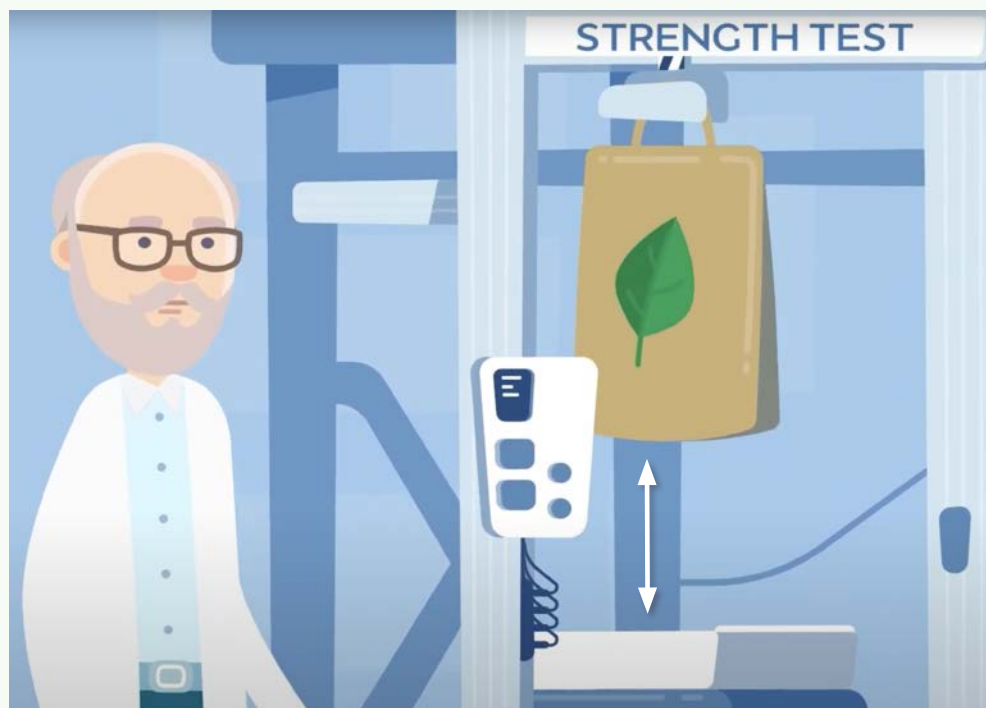
### 3. QUALITY CERTIFICATION

Paper carrier bag durability can be measured in accordance with the European test standard EN13590. This standard describes test methods to determine the volume and carrying capacity of carrier bags for retail goods. It is based on scientifically conducted studies and helps retailers to avoid poor-quality carrier bags.

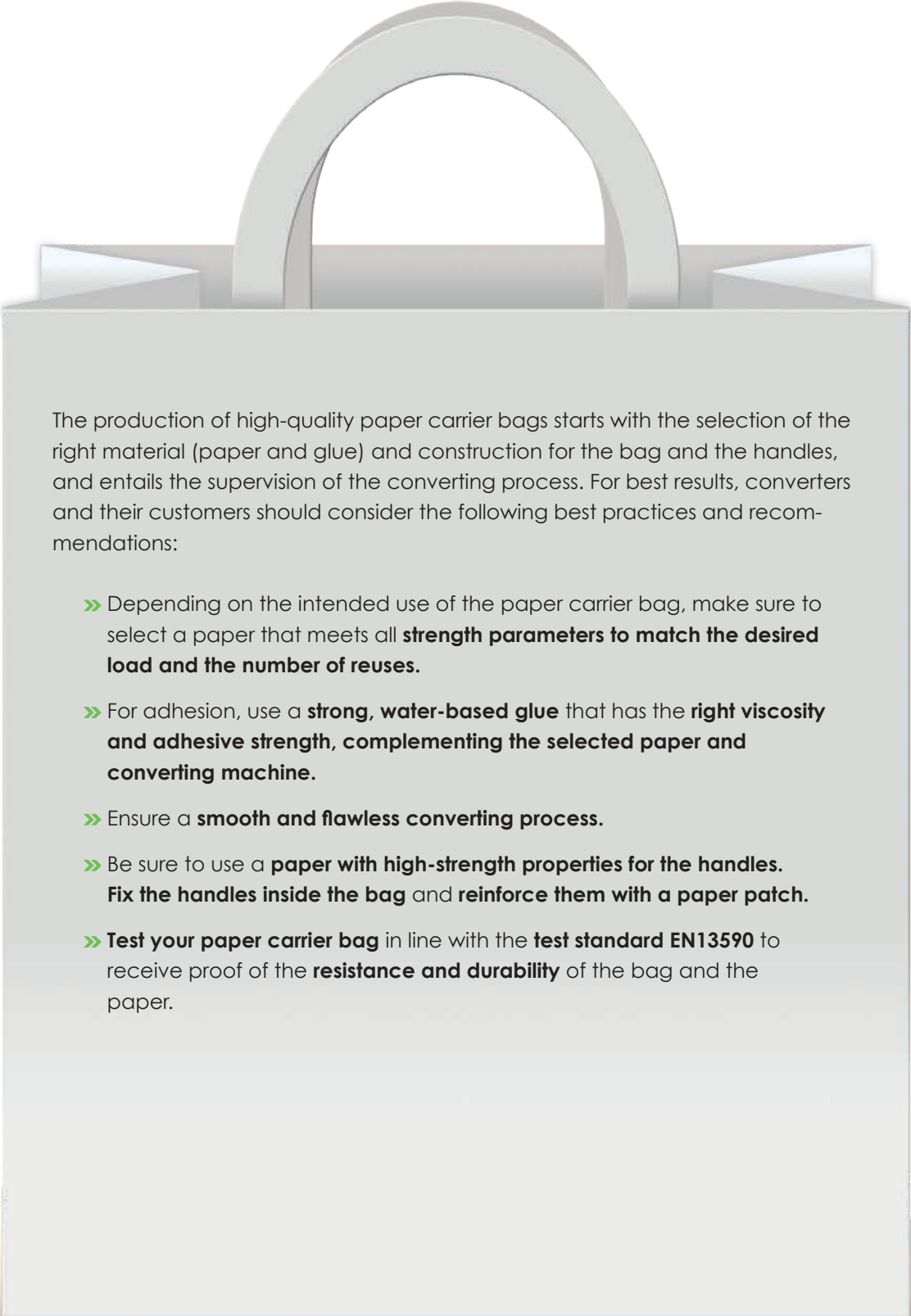
The quality certification system for paper bags is based on this standard and offers proof of the resistance and durability of the bag and the paper. The test method subjects the carrier bag to heavy weights while being lifted repeatedly. The tests take into account the size of the carrier bag, since the larger its volume, the heavier the load it must be able to carry. As a result of the certification, the paper bag can be marked with the weight and volume it is able to carry.

#### **Recommendation**

If you want to offer a high-quality paper carrier bag, test your bag according to the test standard EN13590.



## CONCLUSION



The production of high-quality paper carrier bags starts with the selection of the right material (paper and glue) and construction for the bag and the handles, and entails the supervision of the converting process. For best results, converters and their customers should consider the following best practices and recommendations:

- » Depending on the intended use of the paper carrier bag, make sure to select a paper that meets all **strength parameters to match the desired load and the number of reuses.**
- » For adhesion, use a **strong, water-based glue** that has the **right viscosity and adhesive strength, complementing the selected paper and converting machine.**
- » Ensure a **smooth and flawless converting process.**
- » Be sure to use a **paper with high-strength properties for the handles. Fix the handles inside the bag and reinforce them with a paper patch.**
- » **Test your paper carrier bag** in line with the **test standard EN13590** to receive proof of the **resistance and durability** of the bag and the paper.

## MORE INFORMATION

For more information on paper carrier bags, contact your paper bag producer or either of the two organisations CEPI Eurokraft and EUROSAC – see contact details below.

### About the organisations

**CEPI Eurokraft** is the European Association for Producers of Sack Kraft Paper for the Paper Sack Industry and Kraft Paper for the Packaging Industry. It has nine member companies representing a volume of around 3 million tonnes of paper produced in ten countries. [www.cepi-eurokraft.org](http://www.cepi-eurokraft.org)

**EUROSAC** is the European Federation of Multiwall Paper Sack Manufacturers. The federation embodies over 75% of the European paper sack manufacturers operating in 20 countries. Production represents more than 5 billion paper sacks, representing 650 000 tonnes of paper converted in 60 plants. [www.eurosac.org](http://www.eurosac.org)

We would be grateful for any comments and feedback on this guide.

**Please contact [info@thepaperbag.org](mailto:info@thepaperbag.org)**

Industry Guidelines – High-quality paper carrier bags, 1st edition,  
CEPI Eurokraft, Stockholm and EUROSAC, Paris, January 2023

**The publication can be downloaded on [www.thepaperbag.org](http://www.thepaperbag.org).**



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