



RESPONSIBLE PACKAGING FOR BREAKFAST CEREALS

Pack-fill standard

Last update: May 2016

Introduction

This document has been prepared by CEEREAL, which represents all major breakfast cereal manufacturers in the EU.

This document sets out provisions for CEEREAL member companies with regard to responsible packaging practice and current packaging legislation. The provisions apply to breakfast cereals packed in cartons. In particular, this document sets a minimum target fill level.

This document also sets out industry obligations to minimize packaging waste. It may serve to inform regulatory and enforcement authorities with regard to how the industry meets the needs of consumers through adherence to responsible packaging practice.

CEEREAL member companies have voluntarily agreed to conform to the advice, guidelines and standards below.

1. Relevant Legislation

Member companies package breakfast cereals with reference to the following legislation:

1.1 Directive 2000/13/EC on the Labelling, Presentation and Advertising of Foodstuffs. This legislation includes provision within Article 2 of the Directive, that methods used for the labelling, presentation (including packaging) and advertising of pre-packaged foodstuffs for sale to the ultimate customer should not mislead the consumer to a material degree as to, amongst other things, the quantity of product.

1.2 Directive 94/62/EC on packaging and packaging waste. Annex II of the Directive requires that packaging shall be so manufactured that the packaging volume and weight be limited to the minimum adequate amount to maintain the necessary level of safety, hygiene and acceptance for the consumer (amended by the following point 1.3, 1.4, 1.5, 1.6, 1.7).

1.3 Regulation (EC) No 1882/2003 of the European Parliament and of the Council of 29 September 2003 adapting to Council Decision 1999/468/EC the provisions relating to committees which assist the Commission in the exercise of its implementing powers laid down in instruments subject to the procedure referred to in Article 251 of the EC Treaty.

1.4 Directive 2004/12/EC of the European Parliament and of the Council of 11 February 2004 amending Directive 94/62/EC on packaging and packaging waste.

1.5 Directive 2005/20/EC of the European Parliament and of the Council of 9 March 2005 amending Directive 94/62/EC on packaging and packaging waste.

1.6 Regulation (EC) No 219/2009 of the European Parliament and of the Council of 11 March 2009 adapting a number of instruments subject to the procedure referred to in Article 251 of the Treaty to Council Decision 1999/468/EC with regard to the regulatory procedure with scrutiny (3. Environment, 3.3).

1.7 Commission Directive 2013/2/EU of 7 February 2013 amending Annex I to Directive 94/62/EC of the European Parliament and of the Council on packaging and packaging waste.

1.8 Directive 75/106/EEC and 66/211/EEC as amended. This legislation introduces average weight control for packed goods.

It defines the relationship between declared weight and the variation in pack weight encountered during production. It ensures that the actual average weight is always at or above the declared weight.

1.9 Directive 98/6/EC on Unit Pricing makes provision in respect of the display of selling price and unit price of products which are for sale by retailers to consumers. The directive seeks to ensure transparency of pricing information for consumers.

Breakfast Cereals are listed within Schedule 1 of the Directive which allows the product to be unit priced per 100g. Where breakfast cereals are sold by unit (cereal biscuits), the product is unit priced by unit.

2. Packing Process for Breakfast Cereals

There are two types of breakfast cereal product: biscuits and “loose” breakfast cereals.

Breakfast cereal biscuits are manufactured to a predetermined physical size, are wrapped in a sleeve and closely packed in cartons to completely fill the box. They are sold by number.

Loose breakfast cereals are packed into cartons in two ways:

- i) bag-in-box, where a poly-cereal liner is filled with cereal and inserted into a pre-formed carton
- ii) ii) direct fill, where cereal is directly added into a carton.

Most products are bag-in-box and are sold by weight. The intrinsic nature of these products and the capabilities of the packing process precludes total filling of the box. This can be understood from the following description:

2.1 High speed packing lines

Packing lines operate at very high speed, 24 hours a day with throughputs of 60-100 packs per minute. Lines must operate at high speed and at optimum capacity to allow economies of scale which in turn help contain prices.

2.2 Bag-in-box

Modern weighing systems are very accurate giving consumers the guarantee that all packs are at or extremely close to the declared weight. The product is initially weighed into bags (see Annex I).

The bag is required to preserve the integrity and freshness of the product and acts as a barrier to moisture. As a result of high-speed packing, the bag will inevitably contain some air. This has the added advantage of physically protecting the product from factory to kitchen shelf.

The bag is then inserted at high speed into the carton. The carton provides rigidity and protects the product. Bag-in-box packaging allows continuous high-speed packing of products with differing bulk densities and shapes. This allows the consumer to benefit from a wide variety of distinctive and innovative products.

2.3 Direct Fill

Volumetric feeders individually dose product at the required weight into formed cartons. A feedback mechanism compensates for changes in product density. The cartons are then glued and sealed.

As the box is the only containing/protecting unit its integrity is of particular importance.

3. Pack Size and Shape

The following factors help determine pack size and shape:

3.1 Packaging Waste

In accordance with Directive 94/62/EC (and subsequent amendments) on packaging and packaging waste, pack sizes should be kept to the minimum necessary for maintaining levels of safety, hygiene and acceptance for the consumer. This also allows packaging costs to be kept to a minimum.

Flat packs (flats) are cut from standard width sheets of carton board. The dimensions of the flats, including gluing flaps, therefore determine total board usage (and hence wastage and costs). The shape of the pack also has an impact on board thickness. Generally, narrower side panels provide more rigidity and permit the use of lighter board than squatter shapes. Although squatter shapes have a smaller surface area to volume ratio, the intuitive expectation of less carton board usage is offset by the need for larger end flaps, plus the wastage from the carton board sheet.

The interrelation between pack size, shape and board usage and waste is therefore complex and there is no single optimum shape.

3.2 Pallet Fill

Packs should be the optimum size and shape for ensuring maximum pallet fill. This allows fewer journeys for product distribution, due to the greater number of packs which can be stored within a goods vehicle. This in turn generates lower distribution costs for the manufacturer and contains prices.

3.3 Handling Convenience

Pack size and shape should allow the consumer to pick-up the pack easily with one hand. This particularly applies to children.

4. CEEREAL Pack Fill Standard

This standard sets a minimum target fill level for bag-in-box and direct fill breakfast cereal cartons at the point of packing. It includes a protocol for the consistent measurement of these pack fill levels.

The guidelines for the standard are set out below:

4.1 Scope

The pack fill standard applies to all breakfast cereal products for retail sale to the final consumer. It does not apply to small packs (including portion packs and sampler packs) or catering packs.

4.2 Purpose

The minimum pack fill standard will ensure that consumers will be provided with cereal cartons that are filled to an acceptable level.

A minimum pack fill level also allows for the efficient operation of high speed packing lines operating at optimum capacity (see Target Values) without damage to the product or pack, including its seals.

This generates economies of scale and lower costs for industry and the consumer.

4.3 Target Value

By adopting best practice, a minimum pack fill value of 70% should normally be achieved for all products at time of filling. 100% pack fill is unattainable due to the intrinsic nature of the products and the capabilities of the packing process. (See above).

Levels will rarely exceed 90% because of the tolerances required for high-speed packing lines; the pack fill will therefore usually range between 70% and 90%.

In practice, pack fills higher than 70% are targeted in order to achieve the 70% minimum on a consistent basis.

Due to the wide variety of bulk densities unique to breakfast cereal products, minor variations may occur in the pack fill levels set out

4.4 Filling Allowances

The minimum 70% pack fill standard takes into account the following factors:

- i) *Settlement*: the product will not have fully settled at the point of packing, therefore space allowance is required to ensure bags and boxes are sealed efficiently.
- ii) *Weight/density/shape variations*: Any one product comprises a multitude of individual pieces varying in shape, size and weight. Therefore, for a given pack weight, there is a density range which has to be accommodated in the pack size. The density range varies from product to product according to the characteristics of the product.

To avoid costs arising from pack size changes (interruptions to production can last several hours) and to minimise carton costs (see paragraph 3.1) common pack sizes are used wherever possible (subject to the limitations of Prescribed Quantity Legislation).

- iii) *Bag crimping/sealing*: To protect the product, the bag forming and filling cycle (see Annex 1) is designed to ensure the integrity of the bag seal is not compromised by product trapped in the crimp. Heat sealers must be able to operate freely and effectively and the cutting mechanism must be clear for the bag to drop unhindered. To this end, product falls into the packaging tube well below the jaws of the sealer and prior to sealing as much air as possible is squeezed from the bag without damaging the product.
- iv) *Cartoning*: Bags are inserted into boxes at high speed. They are vibrated prior to insertion to remove ballooning. Nevertheless, bag surfaces are not perfectly flat, and there has to be a tolerance on the clearance between the bag and the box to prevent jamming.

4.5 Measurement

Measurements are made at the packing stage, as measurements made beyond that point are beyond the manufacturers' control (see Section 5).

The following protocol is designed to ensure that measurements are made in a consistent manner and whilst the pack is not bowed.

Bowing will reduce the apparent pack fill level by 5-10% and will distort the accuracy of pack fill measurements.

Bag-in-box: the inner bag containing the product is withdrawn from the outer carton and the carton is placed in a rigid container, the internal dimensions of which exactly match the external dimensions of the carton. The bag is opened and eased into the carton. A flat-faced plunger is placed on the top surface of the product enabling the height of the product to be measured. (NB exact height measurement details need not be given - rulers and pre-calibrated plungers may be used).

Direct fill: the carton is opened and eased into a container of the type above, and the same procedure followed.

For both cases, the pack fill percentage is given by:

$$\frac{\text{Product Height} \times 100}{\text{Carton Height}}$$

Carton height is the internal height taken from the carton specification.

5. Settlement in Transit

Settlement does not occur with large breakfast cereal biscuits, which, because of their size and regular shape and strength, can be packed in sleeves completely filling the carton.

Loose packed breakfast cereals will invariably settle in transit which takes place throughout the journey from the point of packing to the consumer's breakfast table.

Vibration causes the product to settle inside its pack. Vibration arises as packs are moved over conveyor systems, as they are packed into cases, as cases are transferred to pallets, as pallets are loaded and unloaded, and during transport in trucks to retailers and from retailers in customers' cars. The amount of settling also varies from product to product according to size, shape and heterogeneity.

If there is rough handling at any point, breakage will occur, increasing fines and further reducing pack fill.

Cartons are rigid until they are opened, at which point the sides can bow, further reducing the apparent pack fill.

For all the above reasons, manufacturers are unable to control or predict the amount of settlement after the product is filled into the carton.

Annex

