



**British Glass**

# **TEC 4**

## **Glass container tolerances**

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## 1.0 Introduction

TEC 4 gives guidance to packers and glass container manufacturers on the dimensional and capacity tolerances which can be economically achieved during the automatic production of glass containers. Drawn up under the supervision of the British Glass Technical Committee, the document is based on generally accepted principles, but its contents are in no way mandatory.

The overall objective is to recommend standards of glass container manufacture which will help to minimise the overall cost of manufacturing, purchasing, filling and marketing the containers. This objective is unlikely to be met if unnecessarily severe control methods are adopted because glass containers which would give satisfactory performance might well be rejected. But equally, excessive dimensional variation could easily affect filling line efficiency and field performance, so the need clearly exists for a well judged set of tolerance standards to balance these factors to ensure good performance without being unreasonably costly.

In addition to economic considerations, there is also a need to optimise energy use and environmental considerations are becoming more important. This has many repercussions which support the main objective of ensuring that every glass container made is functional and acceptable. With these aims in mind, a 'holistic' approach must be taken when performance improvements are being sought i.e. the 'best' solution taking the whole glass production, filling line, etc. into account.

Improvements in glass manufacturing and inspection techniques have led to better dimensional controls. These improvements have coincided with greatly increased filling speeds, which demanded better consistency for certain dimensions, especially for those containers destined for particularly fast filling lines. Previously, and in accordance with general UK and European practice, both dimensional and capacity tolerances were defined as two standard deviation limits and conformed to a 2.5% AQL for each dimensional limit. Improved control has meant that in practice the more important dimensions, e.g. maximum body diameter can usually be controlled within an AQL of 1.0% and maximum height within an AQL of 1.5%. Dimensions of less significance such as minimum height and minimum body diameter still conform to a 2.5% AQL, which is perfectly satisfactory in most cases.



However, it must be emphasised that if a particular dimension requires a more tightly controlled or narrower tolerance band this can be discussed separately with the glass manufacturer who will do their best to achieve the tighter standard. Compliance with dimensional tolerances can be readily checked using the sampling data from the sampling tables in *ISO 2859-1 Sampling procedures for inspection by attributes — Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*, checking each dimensional limit with GO/NO GO gauges and applying the appropriate AQL value.

As far as capacity is concerned, most glass bottles are now manufactured as Measuring Container Bottles (MCBs) in conformance with the Measuring Container Bottles (EEC Requirements) Regulations 1977<sup>1</sup>. The Regulation defines the tolerances required (See Table 4) and the legally prescribed methods of checking against the compliance criteria (see section 3.2). They are subject to scrutiny and independent assessment by Trading Standards Officers in the glassworks as well as at the filling site. Neither the glass manufacturer nor the packer has any remit to alter these criteria or tolerances.

For bottles not manufactured as MCBs, such as those which are volumetrically filled or certain bottles which have abnormal shape characteristics, different tolerances and capacity controls are available. The choice is usually determined by either the bottle shape or the value of the contents (see Table 5). In these cases, the capacity may be checked by a simpler method which determines the mean capacity of the samples of 12 containers (the traditional bulk test) using the tolerances in Table 5.

The glass container tolerances in Tec 4 are currently consistent with those specified by Cetie in their general data sheet, *DT02- Standard tolerances for bottles*.

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<sup>1</sup> The Measuring Container Bottles (EEC Requirements) Regulations 1977, transpose the requirements of EU Directive 75/107/EEC on the approximation of the laws of the Member States relating to bottles used as measuring containers.