



Method sheet: Blow Moulder
Sheet no.: 050902 – 1.02
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Machine: Blow Moulder
Criteria: Main dimensions of blown bottles

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Main dimensions of blown bottles

1. Definition: Machine and Criteria

An important parameter of a Blow Moulder is the accuracy and consistency of the main dimensions of the blown bottles, specifically throughout the different cavities in the Blow Moulder as well as over time.

For all actions the relevant safety instructions must be strictly adhered to.

Further related documents:

- MEBAK Band V
- TNO Nutrition and Food Research: Guidelines for an Industrial Code of Practice for refillable PET Bottles, Edition 1, 1993-1994
- ISBT International Society of Beverage Technologists

2. Inspection

2.1 Scope

Detection of the main dimensions of blown bottles, such as height and diameter by means of a sliding calliper or a vision system.

2.2 Apparatus

Sliding calliper, which can be fixed on the set diameter and the plus and minus tolerances.

The recommended accuracy of the measurement instruments is $\pm 0,01$ mm.

Ruler for gauging the diameter, the recommended accuracy of the measurement instruments is $\pm 0,1$ mm.

Better and easier to use is a calibrated optical measurement system.

A visual inspection of the used measurement devices by a person is necessary.

2.3 Procedure

From each bottle the height and the maximal diameter have to be detected by means of a sliding calliper.

Total bottle height and diameter must not deviate more from the respective nominal dimensions than agreed with the producer of the Blow Moulder in the specification. Normally the deviation of the dimensions is depending on the nominal volume of the bottles.



3. Sampling

To check if the Blow Moulder is running at the right process, samples need to be taken from each station, proving the machine capability throughout all stations to meet the specified main dimensions. Samples have to be taken at nominal machine capacity, after stabilization of processing. The suggested start of sampling is after a minimum of 15 minutes and a maximum of 1 hour. Take five complete rounds, i.e. 5 bottles of each station.

3.1 Calculation

Calculate the average \bar{x} of the results following the formula:

$$\bar{x} = \frac{1}{n} \cdot \sum_{i=1}^n x_i$$

Calculate the resulting standard deviation σ following the formula:

$$\sigma = \sqrt{\frac{1}{n-1} \cdot \sum_{i=1}^n (x_i - \bar{x})^2}$$

Where the random sample range from $i=1$ to n (here $n = 5$)

3.2 Results and data sheets

3.2.1 Data sheet part (I/III)

Date: _____ Line: _____ Bottle shape: _____

Preform weight: _____ Nominal volume: _____ Miscellaneous: _____



3.2.2 Data sheet part (II/III)

Number n:	height [H][mm]	diameter [D][mm]	height [H][mm]	diameter [D][mm]	height [H][mm]	diameter [D][mm]	height [H][mm]	diameter [D][mm]	height [H][mm]	diameter [D][mm]
	sample 1		sample 2		sample 3		sample 4		sample 5	
1										
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3.2.3 Data sheet part (III/III)

Number n:	height diameter [H][mm][D][mm]	height diameter [H][mm] [D][mm]	height diameter [H][mm] [D][mm]	height diameter [H][mm] [D][mm]	height diameter [H][mm] [D][mm]
	sample 1	sample 2	sample 3	sample 4	sample 5
35					
36					
37					
38					
39					
40					

4. Evaluation and Documentation

4.1 Evaluation of height

Average of the results \bar{H} _____ mm

Standard deviation σ_{height} : _____ mm

$H_{\text{set min}}$ = _____ °

$\bar{H}_{\text{set max}}$ = _____ °

$\bar{H} + \sigma$ = _____ °

$\bar{H} - \sigma$ = _____ °

_____ $H_{(\text{set min})} \leq$ _____ $\bar{H} - \sigma$ ^ _____ $H_{(\text{set max})} \geq$ _____ $\bar{H} + \sigma$

4.2 Evaluation of diameter

Average of the results \bar{D} _____ mm

Standard deviation σ_{Diameter} : _____ mm

$D_{\text{set min}}$ = _____ °

$\bar{D}_{\text{set max}}$ = _____ °

$\bar{D} + \sigma$ = _____ °

$\bar{D} - \sigma$ = _____ °

_____ $D_{(\text{set min})} \leq$ _____ $\bar{D} - \sigma$ ^ _____ $D_{(\text{set max})} \geq$ _____ $\bar{D} + \sigma$



4.3 Documentation for bottle height

The Test is passed if the results for height fulfill aforesaid equation:

$$\text{_____ } H_{(\text{set min})} \leq \text{_____ } \bar{H} - \sigma \wedge \text{_____ } H_{(\text{set max})} \geq \text{_____ } \bar{H} + \sigma$$

= height is o.k. ☐

$$\text{_____ } H_{(\text{set min})} \leq \text{_____ } \bar{H} - \sigma \vee \text{_____ } \bar{H}_{(\text{set max})} \geq \text{_____ } \bar{H} + \sigma$$

= height is not o.k. ☐

Name and signature of inspector: _____

4.4 Documentation for bottle diameter

The Test is passed if the results for diameter fulfill aforesaid equation:

$$\text{_____ } D_{(\text{set min})} \leq \text{_____ } \bar{D} - \sigma \wedge \text{_____ } D_{(\text{set max})} \geq \text{_____ } \bar{D} + \sigma$$

= diameter is o.k. ☐

$$\text{_____ } D_{(\text{set min})} \geq \text{_____ } \bar{D} - \sigma \vee \text{_____ } D_{(\text{set max})} \leq \text{_____ } \bar{D} + \sigma$$

= diameter is not o.k. ☐

Name and signature of inspector: _____