

WORLD BREWING CONGRESS 2016

Packaging Evaluation in Quality Control of Beverages

(Johann Angres, Steinfurth)

World Brewing Congress

August 13-17, 2016 Sheraton Downtown Denver Denver, CO 80202, U.S.A.

Growing importance of packaging evaluation in combination with the quality control on bottled beverages

> Customized solutions for standardized beverage& packaging evaluation













Beverage/package quality in broader customer sense:

- Taste and aroma
- Thirst quenching ability, health and life style value
- Handling properties (firm grip, no sharp edges, acceptable closure torque)
- Visual impression of the beverage and package
- Sustained sealing properties after repeated opening and closing or under the influence of elevated temperatures (e.g. inside of a car)
- Safety against damages or injuries due to internal pressure (mechanical strength, safe closures and finishes, predetermined breaking points)
- Environmentally friendly packaging (complete recycling chain, separation of materials, reduced use of raw materials, decomposable material)

...at attraktive pricing



Requirements on test methods and QA instrumentation:

- Optimal possibly user independent sample preparation and handling
- Consideration of customer felt and tasted quality
- Optimal package adaptation to the test environment and situation
- Possibly easy and safe handling / operation
- Automated data collection, distribution and evaluation
- Optimal / sufficient accuracy
- Easy verification and calibration
- Low maintenance requirements

IMPORTANT:

professional technical support and service (on short call)

Example: CO2 content and measurement

Measurement in sealed packages filled with real beverage

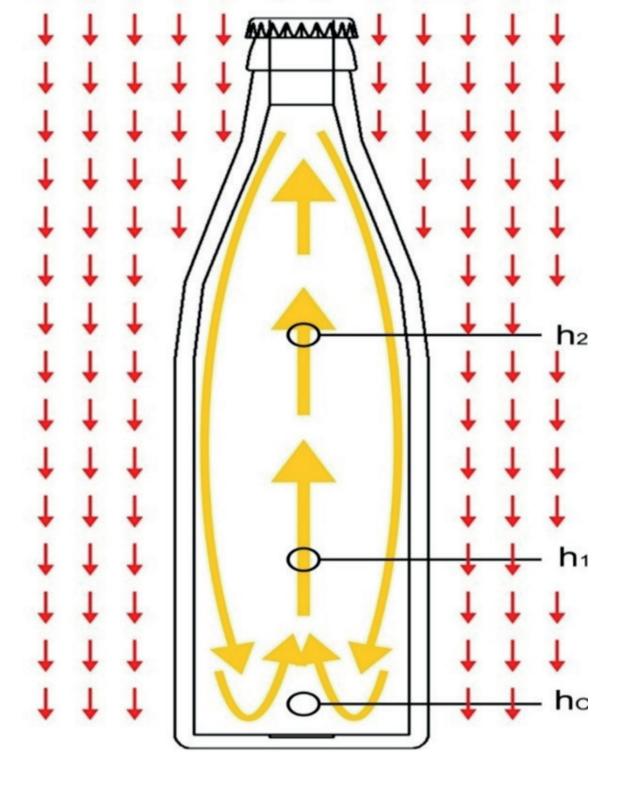
- Measurement of the beverage temperature in Cold Spot Motionless attachment of the temperature probe
- to the beverage package

Consideration of pressure stability of the package and closure

PACKAGING INFLUENCE: Packaging material and wall thickness, pressure & temperature stability

Example: Monitoring of pasteurization

(deformation, damage), side impact resistance



1 1 1 1 1 1 1 1 1 1 1

Actual situation

and all this...

Directly after filling: Focus on consumer related / tasted quality no equilibrium Sample preparation & measurement in equilibrium In headspace: Mix of CO2 and Approx: 0,4 g CO2 Consideration of the package flexibility air under ambient out of the beverage Consideration of package gas permeability temperature air at pressure p' Consideration of pressure stability of the package and closure with temperature of PACKAGING INFLUENCE: Packaging extension under pressure, sealing properties closure, packaging and closure gas permeability 1 I beverage containing 8 g CO2 =8 g/l ~ 4 vol =7,6 g/l ~ 3,8 vol space of 50 ml = 5%

of fill volume



Johann Angres Steinfurth General Manager New Business Development Cell (USA): +1-404-918-5061 Cell (Germany): +49-172-299-5571

Email: j.angres@steinfurth.com

STEINFURTH® Electromechanical Measuring Systems

Actual situation:

New beverage types and ingredients, packaging materials and designs, closure solutions, price and cost sensibility are the sources of the actual dynamic challenges in the area of quality control on beverages.

In these days the beverage and packaging quality have to be evaluated as directly related quality parameters of beverages.

Non consideration of the packaging impact in the evaluation of the beverage quality can results in unexpected consumer complains and confusions.



Packaging requirements according to the beverage quality:

- Sealing properties (e.g. leakages due to impacts, insufficient closing torque)
- Barrier properties against gases (e.g. CO2, O2)
- Mechanical and pressure stability
- Barrier properties and safety against chemical and microbiological contamination
- Resistance against corrosion (cans or metal closures)
- Migration of chemicals or aromas from the package into the beverage
- Barrier properties against radiation (visible light, UV, ...)
- Suitability for sterilization / pasteurization
- Suitability for cleaning (refillable packages) and all this possibly environmental friendly

