

World Ceramic Tiles Forum – Water absorption test methods



Agenda



- I. Introduction
- II. Different test methods
- III. Water absorption test methods in the light of the HS code revision
- IV. North American research on water absorption test methods
- V. European research on water absorption test methods

I. Introduction



Present situation:

- Different water absorption test methods used internationally
- New classification of tiles increases importance of choice of a unique test method

II. Different test methods



ASTM C373

- Published in 1955
- Procedure: 5h boil followed by 24h soak

ISO 10545-3 (boil and vacuum method)

- Published in 1995
- Procedure boiling method: 2h boil followed by 4h soak (used for standard group classification purposes)
- Procedure vacuum method: 0.5h vacuum followed by 0.25h soak

III. Water absorption test methods in the light of the HS code revision

New HS codes classify ceramic tiles according to their water absorption capacity:

- Low water absorption: $0\% \leq WA \leq 0.5\%$
 - Medium water absorption: $0.5\% < WA \leq 10.0\%$
 - High water absorption: $WA > 10\%$
- ▶ Measured water absorption value can differ depending on test method used
- ▶ Choice of test method can influence product classification in new HS code system

Other issues:

- Variation in procedural interpretations worldwide
- Need for a quicker test
- Would be more efficient if procedures were harmonised globally

IV. North American research on water absorption test methods

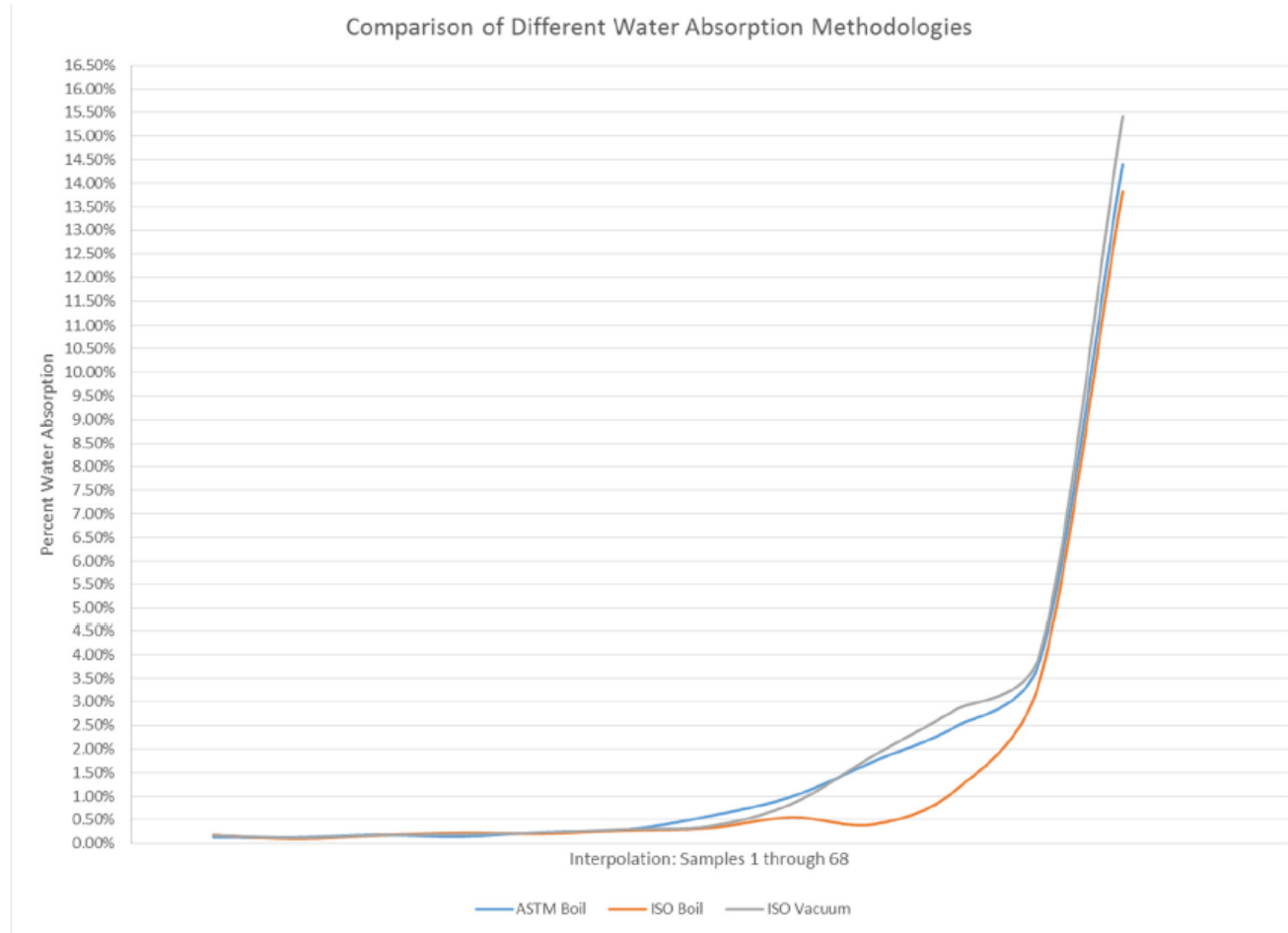
Objectives:

- Find out about differences between methods
- Deeper investigation on ISO vacuum method

Results:

- Close correlation of results between ASTM C373 boil method and ISO 10545-3 vacuum method
- Less correlation of results between ISO 10545-3 boil method and other methods

IV. North American research on water absorption test methods



Source: presentation "Update on North American water absorption research/discussion"; WCTF 2013; Rio de Janeiro

IV. North American research on water absorption test methods

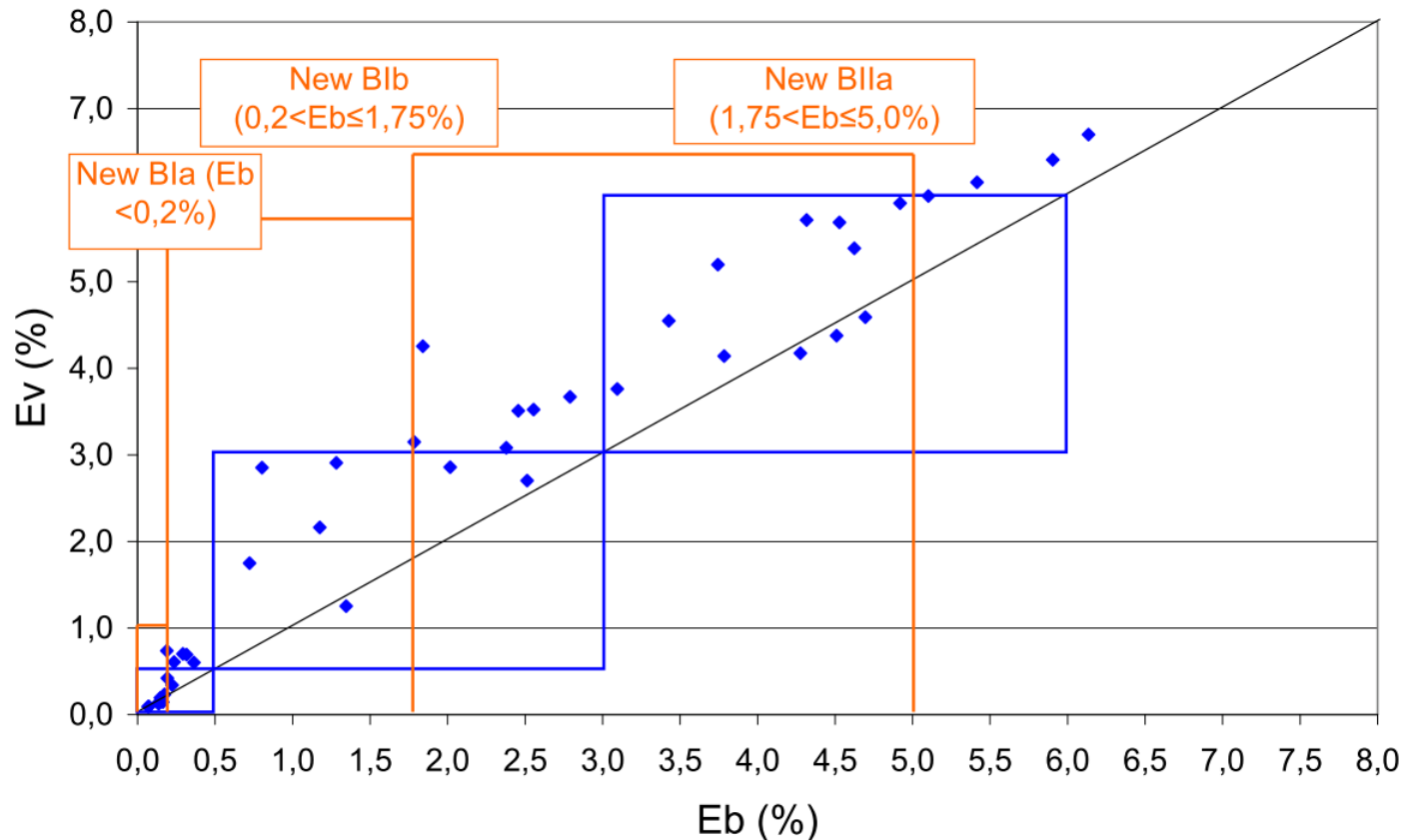
Observations:

- Consistent results up to 0.2/0.3% water absorption for all test methods
- Consistent results form 0.2/0.3% water absorption for ASTM boiling test method and ISO vacuum test method
- Diverging results from 0.2/0.3% water absorption for ISO boiling test method
- Very similar results for all test methods from 3.5% to 10% water absorption (ISO boiling method less strict than others)

V. Current European research on water absorption test methods

Preliminary results show that a change to the vacuum test method will cause some products to shift to a higher classification group

Boiling & vacuum - changes in classification groups



V. Current European research on water absorption test methods

Objective:

- Determine the influence of modifying test parameters of the ISO vacuum test on the results obtained and evaluate the impact in the context of EU production i.e. test at different pressures and immersion times.

Work plan developed:

scenario	Sampling	Absolute pressure in mbar	Time in minutes (submerged/ holding time)
1	1 cut edge	200, 400, 600	30, 60, 120, 240 / 30
2	1 cut edge	400	30, 60, 120, 240 / 15, 30, 60
3	uncut, 1 cut edge, 4 cut edges	400	30, 60, 120, 240 / 30
4	centre, side and corner position; 4 cut edges each sample	400	30, 60, 120, 240 / 30