



Correspondence:
Dr. José Ignacio Zorzín
Dental Clinic 1 -
Operative Dentistry and Periodontology
Glückstr. 11
91054 Erlangen
Germany
zorzin@dent.uni-erlangen.de

CAD/CAM Resin-Composite Blocks: Influence of Water Sorption on Tensile Bond Strength

J.I. Zorzín¹, R. Belli¹, J. Ripper¹, A. Petschelt¹, U. Lohbauer¹
¹ Dental Clinic 1 - Operative Dentistry and Periodontology

INTRODUCTION & OBJECTIVES

In contrast to glass or oxide ceramics, resin-composite materials are subjected to water sorption under oral conditions. Water sorption is known to affect the mechanical properties of resin-composite materials. The aim of the present study was to investigate the influence of water sorption on the adhesion potential of novel CAD/CAM resin-composite blocks, in terms of tensile bond strength.

MATERIALS & METHODS

Tested Materials

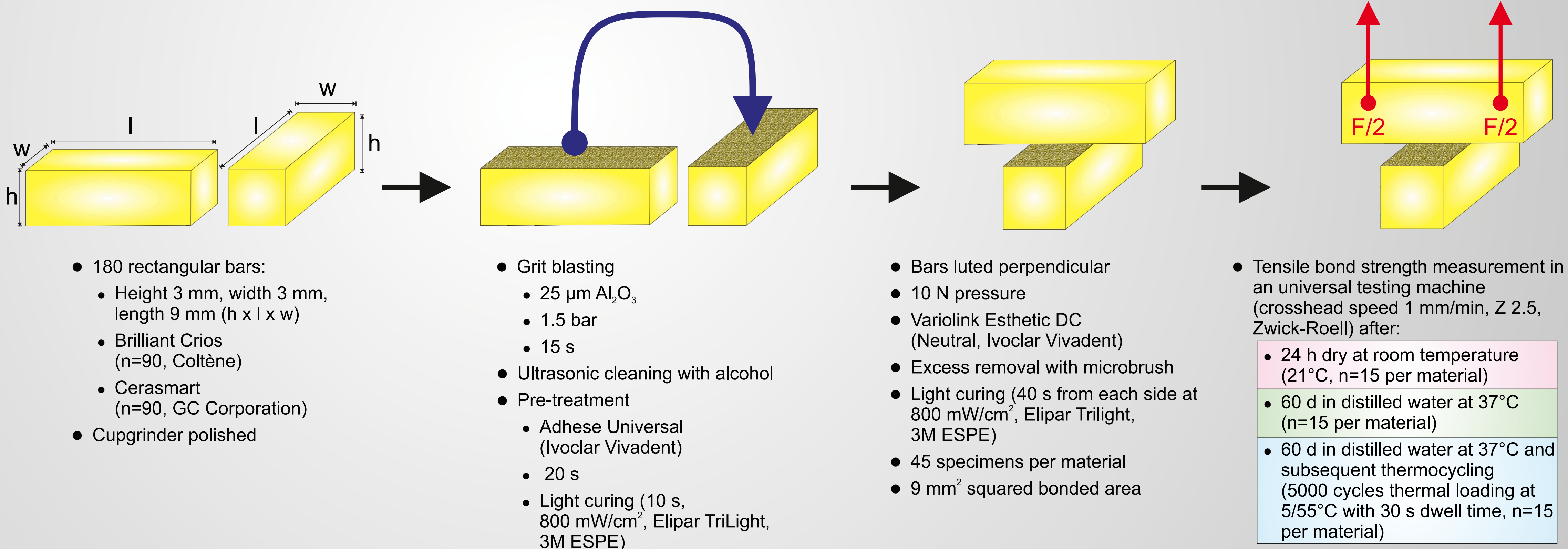


CAD/CAM Resin-composite blocks
Brilliant Crios A2 LT 14 (left, Coltène)
Cerasmart A2 LT 14L (right, GC Corporation)

Water Sorption

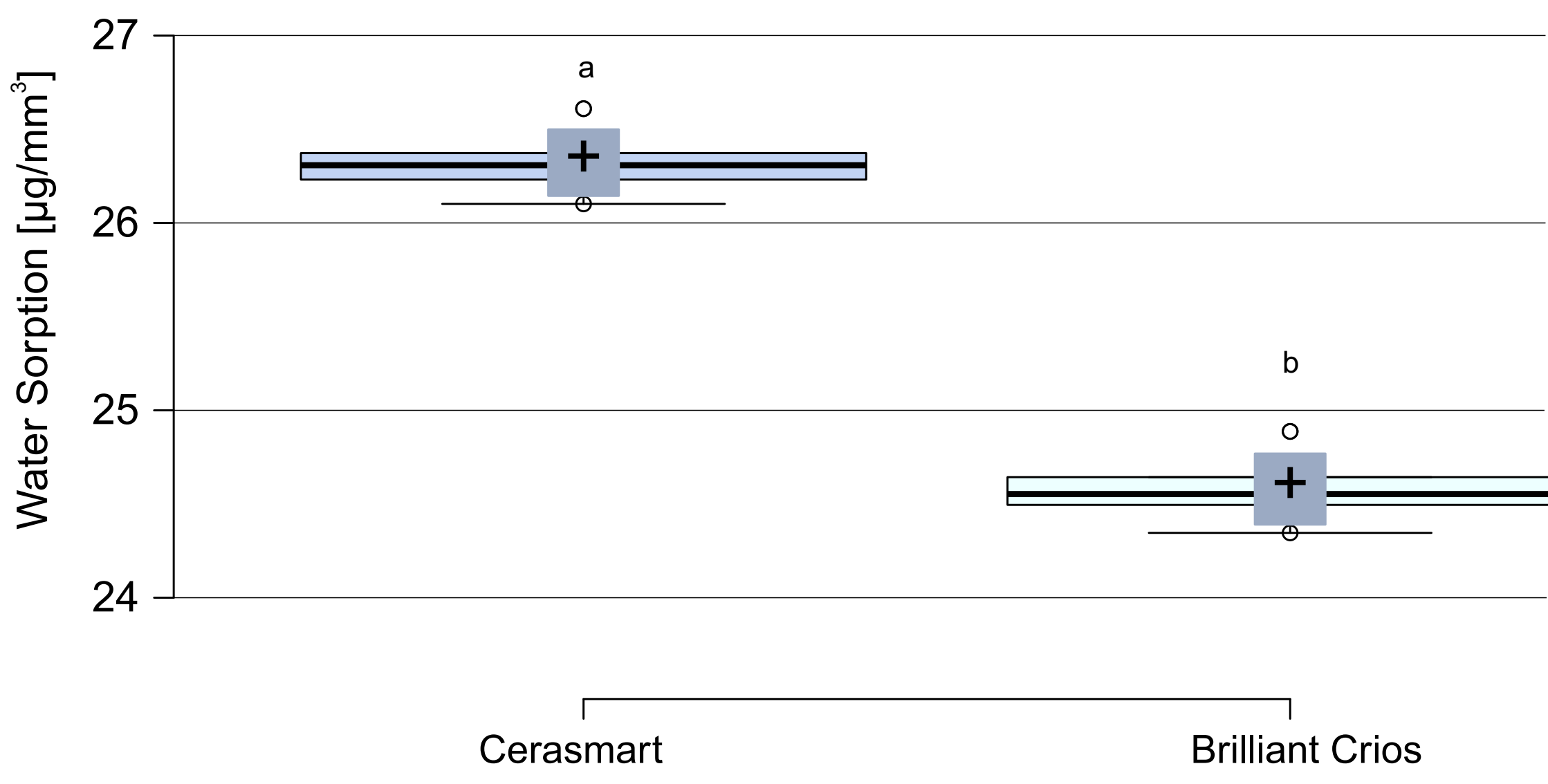
- 5 Specimens per material (12 mm in diameter and 1 mm in thickness, n=5 Brilliant Crios, n=5 Cerasmart)
- Drying until a constant weight (volume measurement)
- Specimens were subsequently stored in distilled water for 60 d at 37°C
- Water sorption was calculated as the difference in weight per volume between baseline and 60 d of storage in distilled water

Tensile Bond Strength



RESULTS

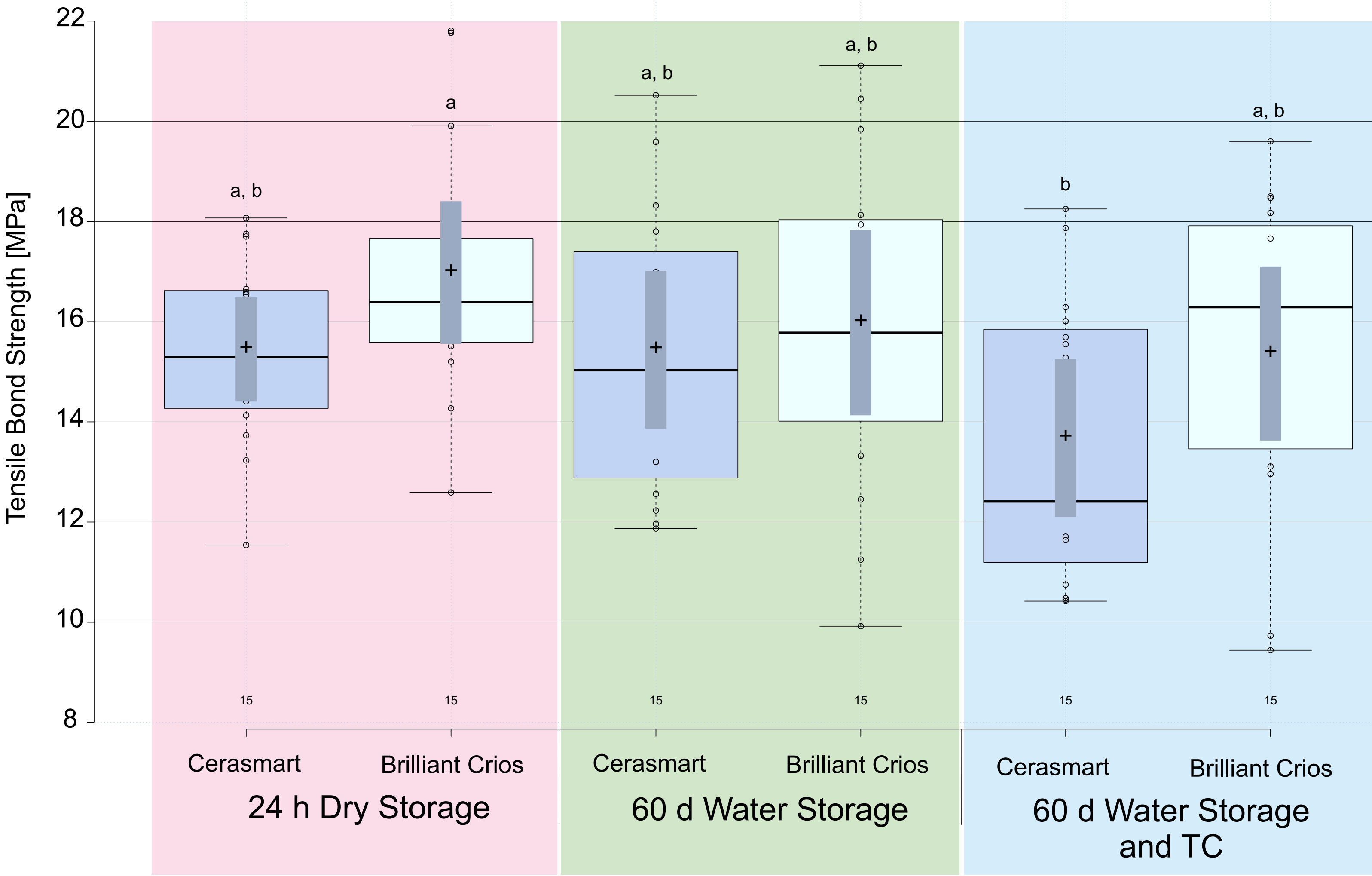
Water Sorption after 60 Days



Boxplot of measured water sorption for all groups under investigation (top) and tensile bond strength (right). Center lines show the medians; box limits indicate the 25th and 75th percentiles as determined by R software; whiskers extend 1.5 times the interquartile range from the 25th and 75th percentiles, outliers are represented by dots; crosses represent sample means; bars indicate 95% confidence intervals of the means; width of the boxes is proportional to the square root of the sample size; data points are plotted as open circles. n = 15 sample points.

Same letters indicate homogeneous subsets ($\alpha=.05$, one-way ANOVA, Student-Newman-Keuls post-hoc test).

Tensile Bond Strength



CONCLUSION

Within the limits of the study it could be demonstrated that the extent of water sorption did not influence the adhesion potential of novel CAD/CAM resin-composite blocks.