



REPORT
**IMPROVE EXTRUSION, INCREASE STRENGTH AND
OPTIMISE DRYING**

Green efficiency for ceramic applications



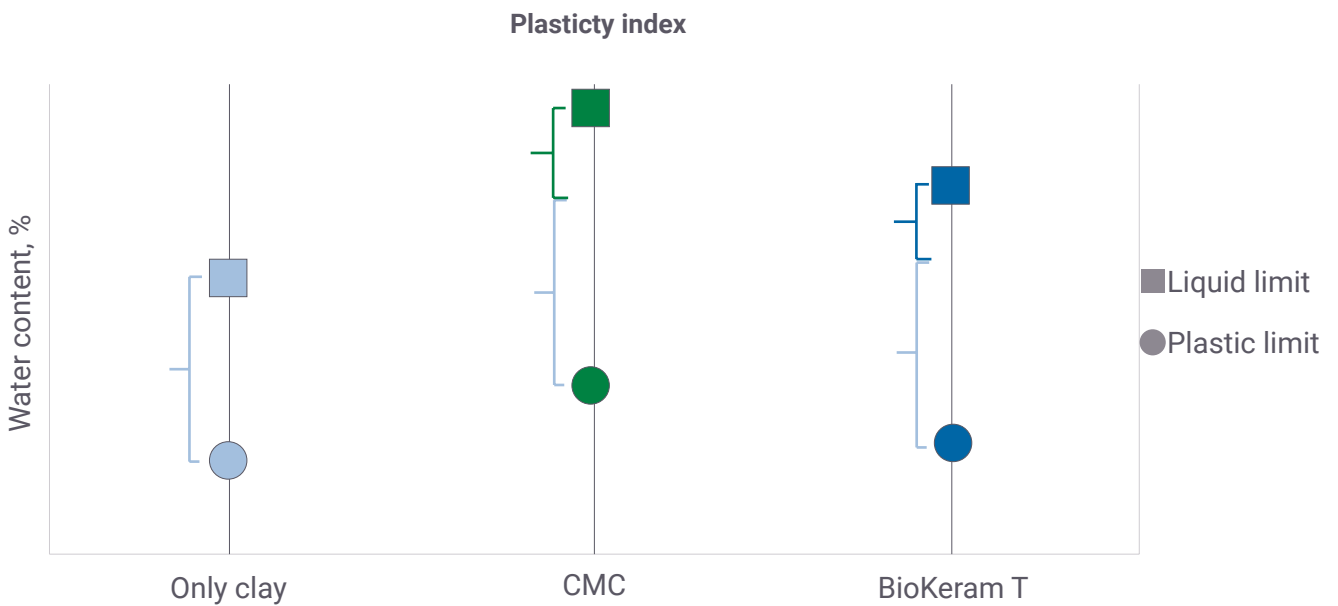
CONTENTS

Clay workability and extrusion	3
Strength increase	6
Drying and firing	7
Conclusions	9
About us	10



CLAY WORKABILITY AND EXTRUSION

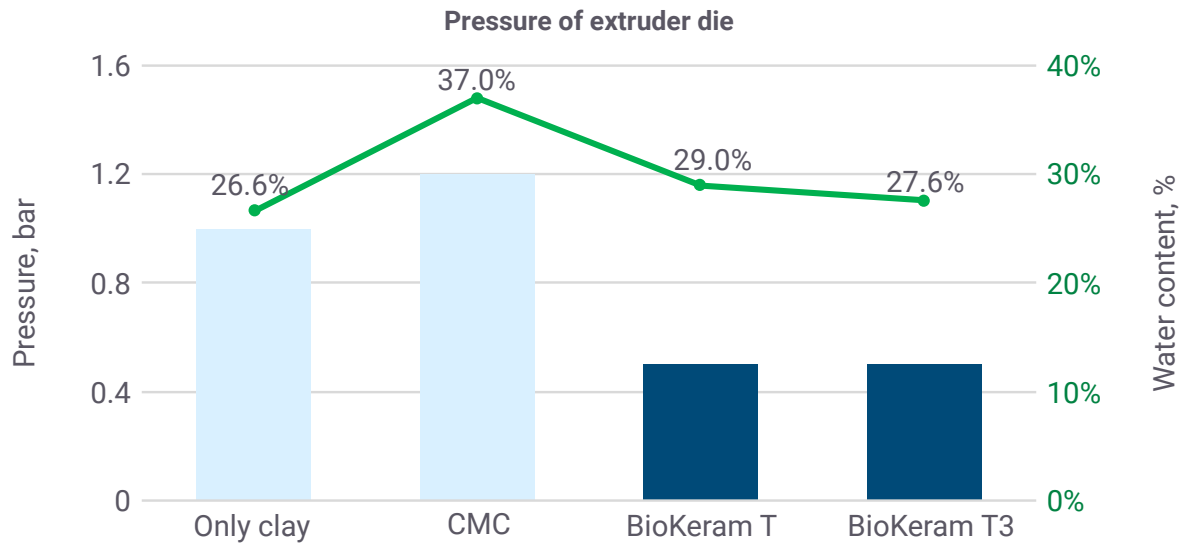
BioKeram T increases the plasticity index, (the difference between the plastic and the liquid limit), therefore increasing the liquid limit of the clay.



Data obtained using 0.5% of each additive and extruding with the same clay consistency (0.5 kg/cm²).



Working with the same consistency, BioKeram T reduces the pressure in the extruder, minimizing cracks during shaping.



Data obtained using 0.5% of each additive and extruding with the same clay consistency (0.5 kg/cm²).

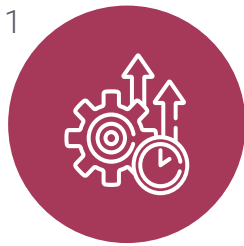
CMC



BioKeram T3



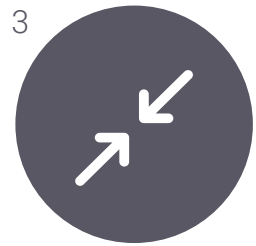
It is able to work with high water content while:



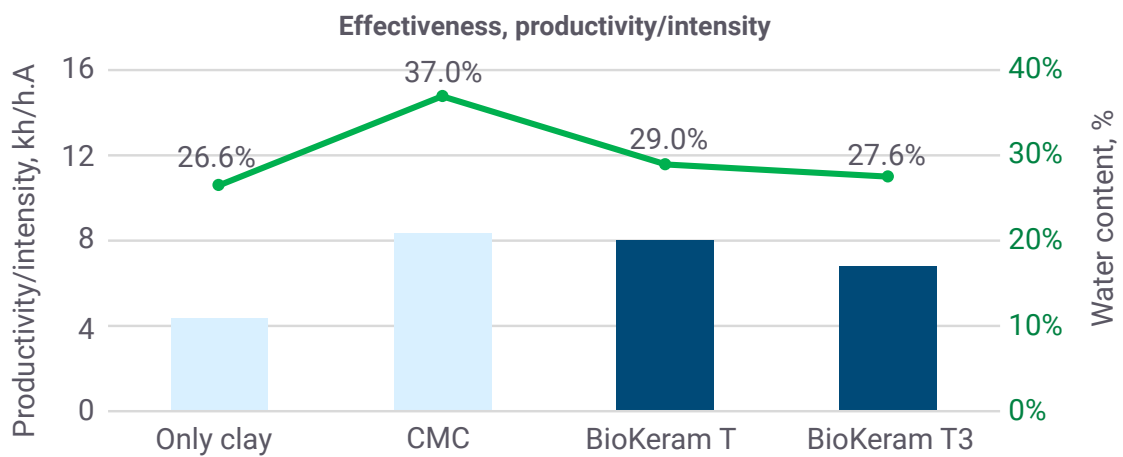
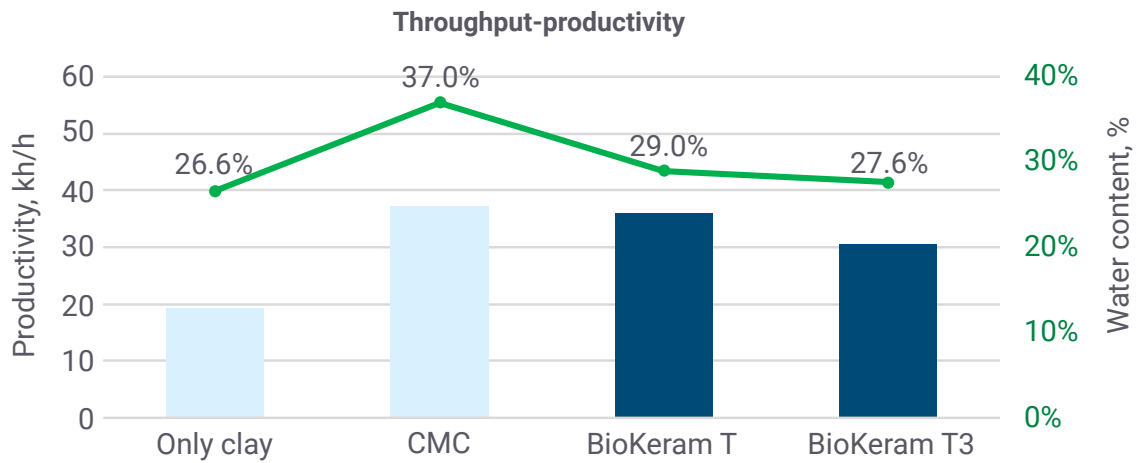
Increasing productivity



Increasing productivity considering amperage



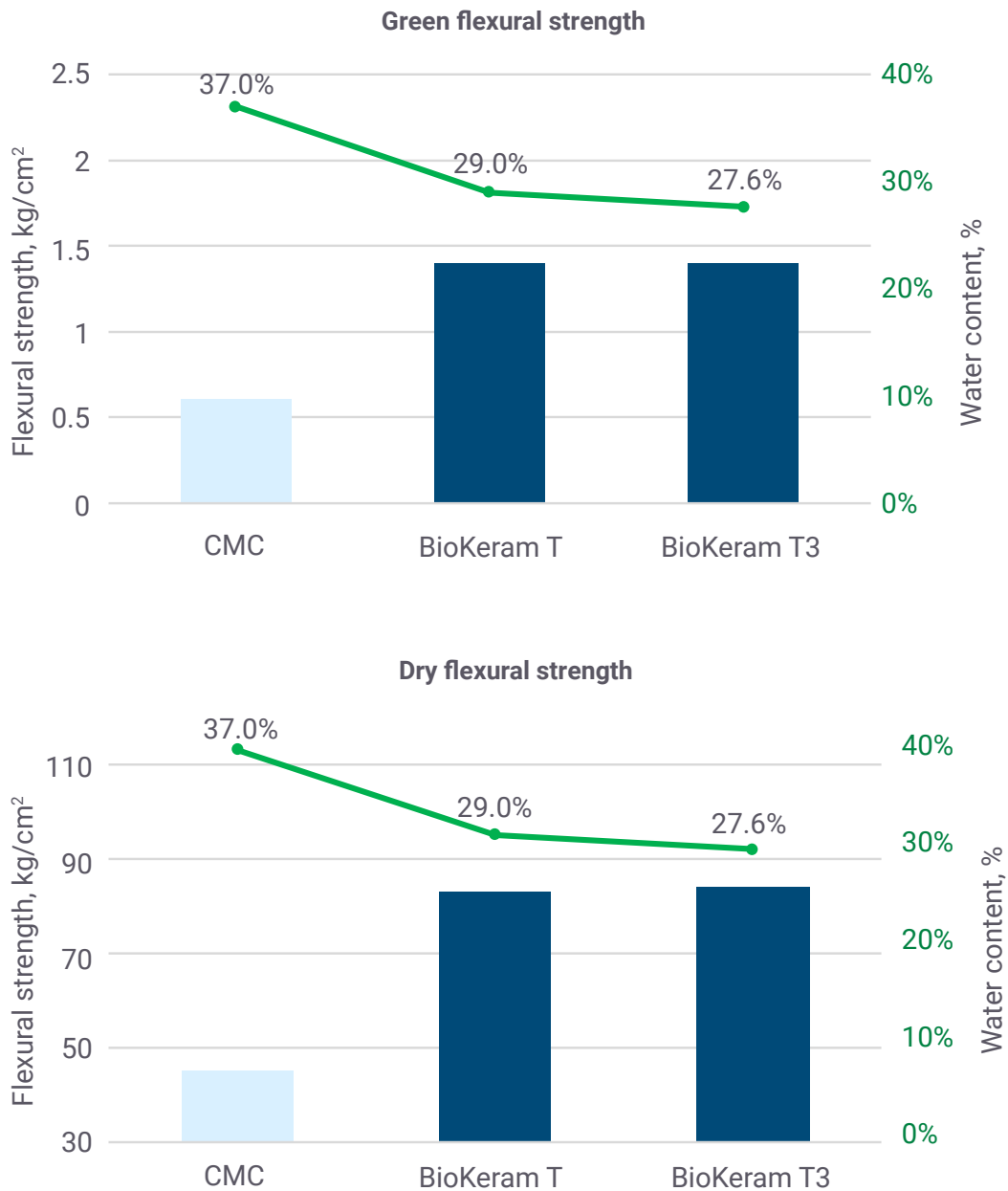
Not increasing shrinkage



Data obtained using 0.5% of each additive and extruding with the same clay consistency (0.5 kg/cm²).

STRENGTH INCREASE

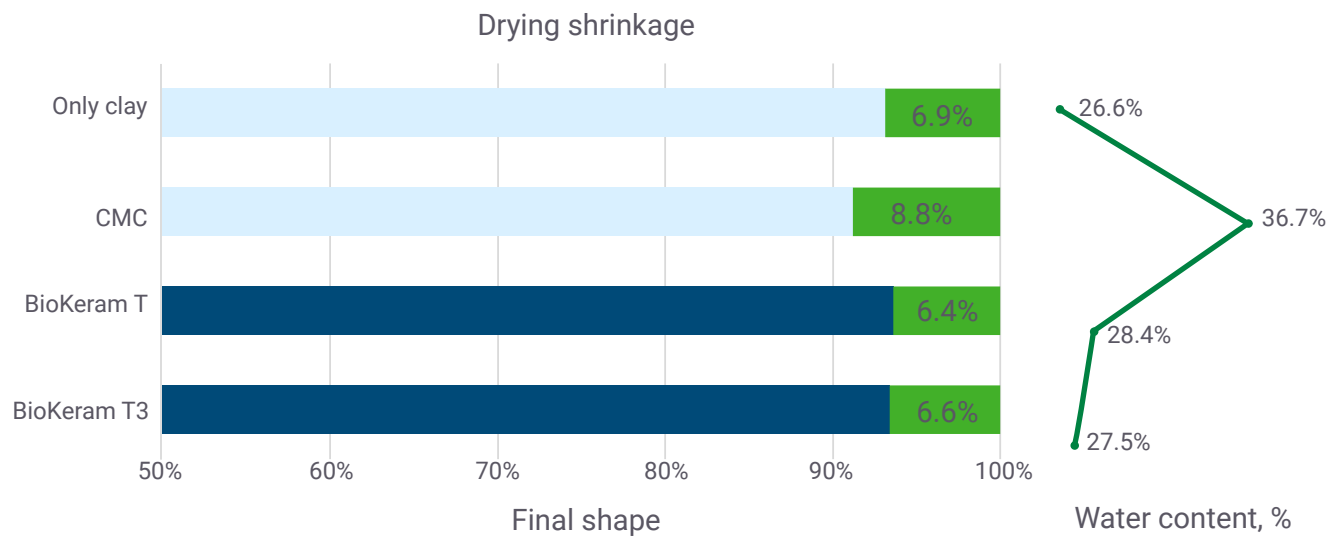
Compared to standard CMC, BioKeram T increases green and dry flexural strength significantly, leading to lower breakage in production.



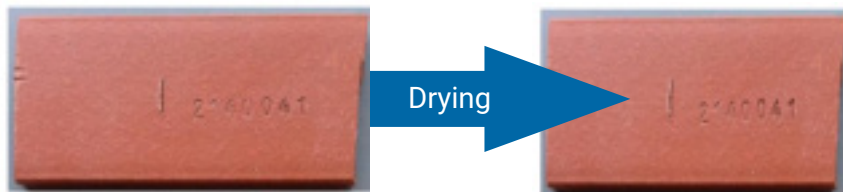
Data got using 0.5% of each additive and extruding with the same clay consistency (0.5 kg/cm²).

DRYING AND FIRING

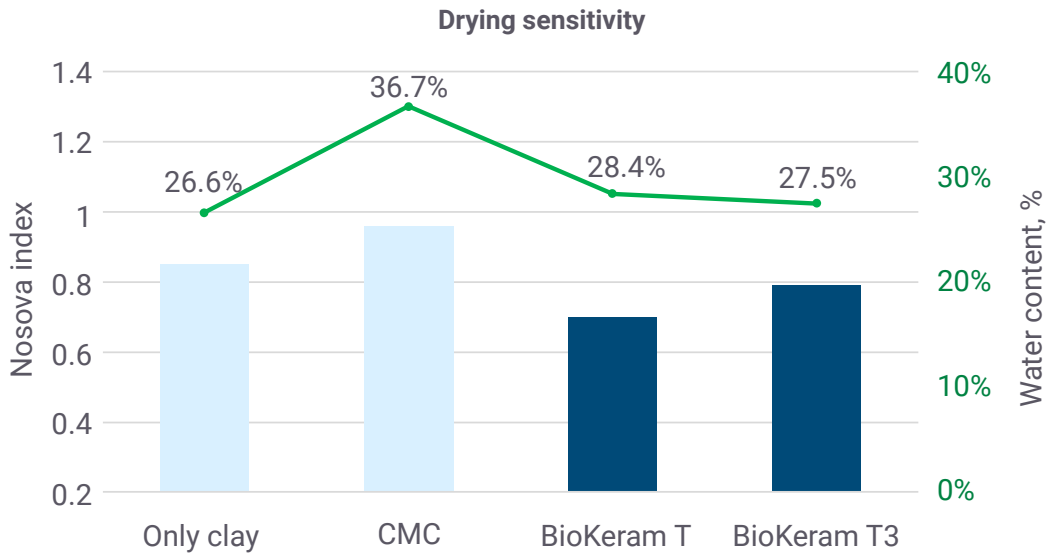
It improves drying, reducing contraction despite the high water content which can help to minimize challenges with drying.



Data got using 0.5% of each additive and extruding with the same clay consistency (0.5 kg/cm²).



BioKeram T improves the drying process, decreasing the Nosova index (water content/pores volume) - the lower Nosova Index, the better the drying behavior.



Data got using 0.5% of each additive and extruding with the same clay consistency (0.5 kg/cm²).

FINAL FIRED EXTRUDED TILES

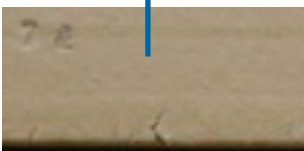
CMC



BioKeram T



BioKeram T3



TAKE A LOOK AT THE CRACKS!

CONCLUSIONS

Some benefits of using BioKeram T instead of standard CMC:

- BioKeram T decreases the pressure in the extruder.
- BioKeram T minimizes cracks during shaping.
- BioKeram T increases green and dry strength significantly (133% and 85% respectively).
- BioKeram T improves drying process:
 - Decreasing drying shrinkage (8.8 to 6.5%).
 - Improving drying behaviour, decreasing Nosova index (water content/pores volume).



ABOUT US

Borregaard operates the world's most advanced and sustainable biorefinery. By using natural, sustainable raw materials, Borregaard produce advanced and environmentally friendly biochemicals and biomaterials that replace oil-based products. Our world-wide network of production facilities and sales offices assures the very best local service and competence where you need it. For us, providing our customers with the most dedicated technical assistance is key. Therefore, the company invests considerable resources in research and development. We continuously strive to develop wood based renewable products for new applications, and through that we contribute to delivering present alternatives to oil based synthetic products in a wide variety of industries.

If you need more information please contact us:

biopolymers@borregaard.com

