

TECHNICAL BULLETIN

BORREGAARD PRODUCTS FOR STRENGTH ADJUSTMENT OF REACTIVE DYES



Borregaard

OVERVIEW

Strength standardization of reactive dye powder formulations often requires 30% to 40% strength reduction. Many dye manufacturers and formulators have chosen synthetic products or an inorganic cutting agent for this task.

Borregaard's biopolymers are a sustainable and high-performance alternative for adjusting the strength of different types of reactive dyes. Our products have shown to provide significant benefits compared to alternatives.



WHY USE OUR SUSTAINABLE BIOPOLYMERS

- High-performing dispersants.
- Decreased specking compared to inorganic salts.
- Provide thermal protection to the atomized dye droplets.
- Allow increased inlet temperatures, therefore, increased throughput.
- Exhibit low fibre staining.
- Sustainable alternatives to synthetics and salts.
- Non-toxic, lignin-based and safe to use product.



FIBER-STAINING TESTS

Fiber Staining tests were conducted on reactive dyes to illustrate the effectiveness of our lignin-based biopolymers as cutting/dispersing agents for adjusting strength. In each case the dye crude was ultrafiltered and spray dried. The strength was adjusted with different dispersants: Borregaard's lignin-based biopolymers and synthetic alternatives.

Reflectance readings on cotton dyed with the test formulations were made using a Hunter Lab ColorQuest XE instrument. ΔE_{cmc} was used to evaluate colour consistency. The ΔE_{cmc} 's were plotted on the following graphs to illustrate the relative staining versus the control for each dye formulation of the cutting/dispersing agent. Higher values indicate greater staining.

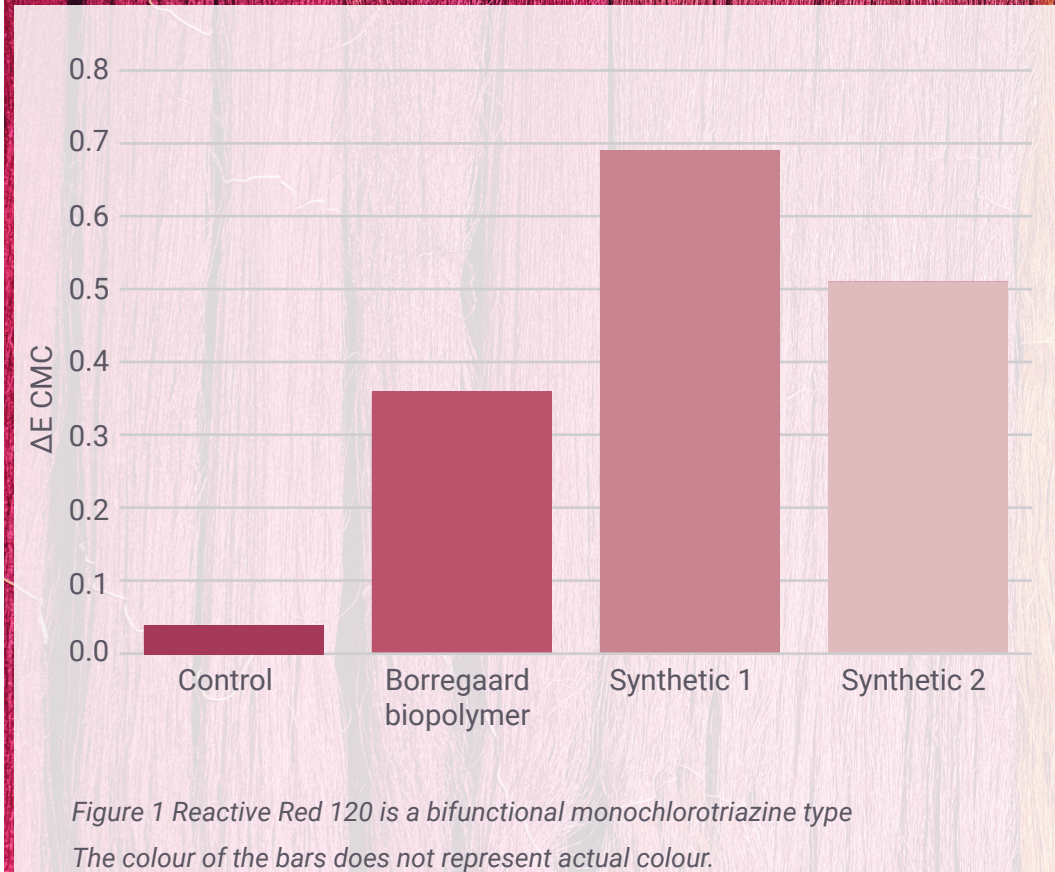


Figure 1 shows that compared to the synthetic alternatives our product allows the dyeing of cotton closer in shade to the ultrafiltered crude Reactive Red 120.

Figure 2 shows that our lignin biopolymer at 2% dyeing is closer in shade to the ultrafiltered crude Reactive Yellow 95 than the tested synthetic alternative cutting agent.

Figure 3 demonstrates that our dispersant is effective for the dyeing of Reactive Blue 19 crude as well. The ΔE_{cmc} indicates that the product strength-adjusted Reactive Blue 19 with our product dyes closer in shade than the tested synthetic.

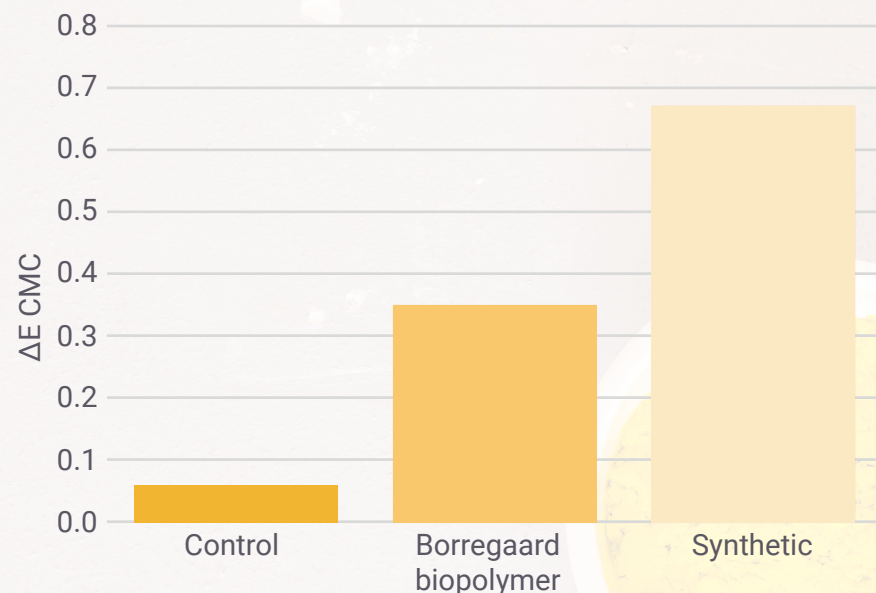


Figure 2 Reactive Yellow 95 is a monochlorotriazine type reactive dye. The colour of the bars does not represent actual colour.

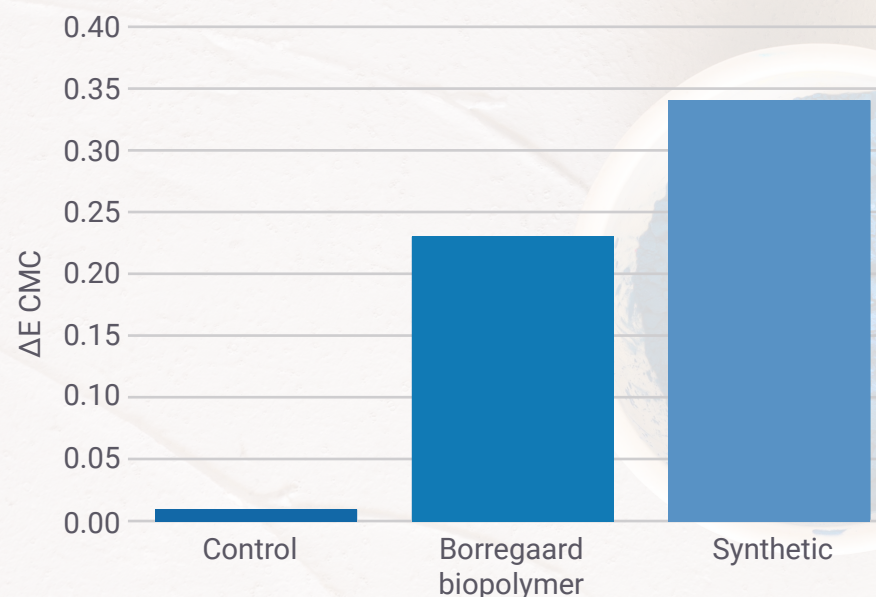
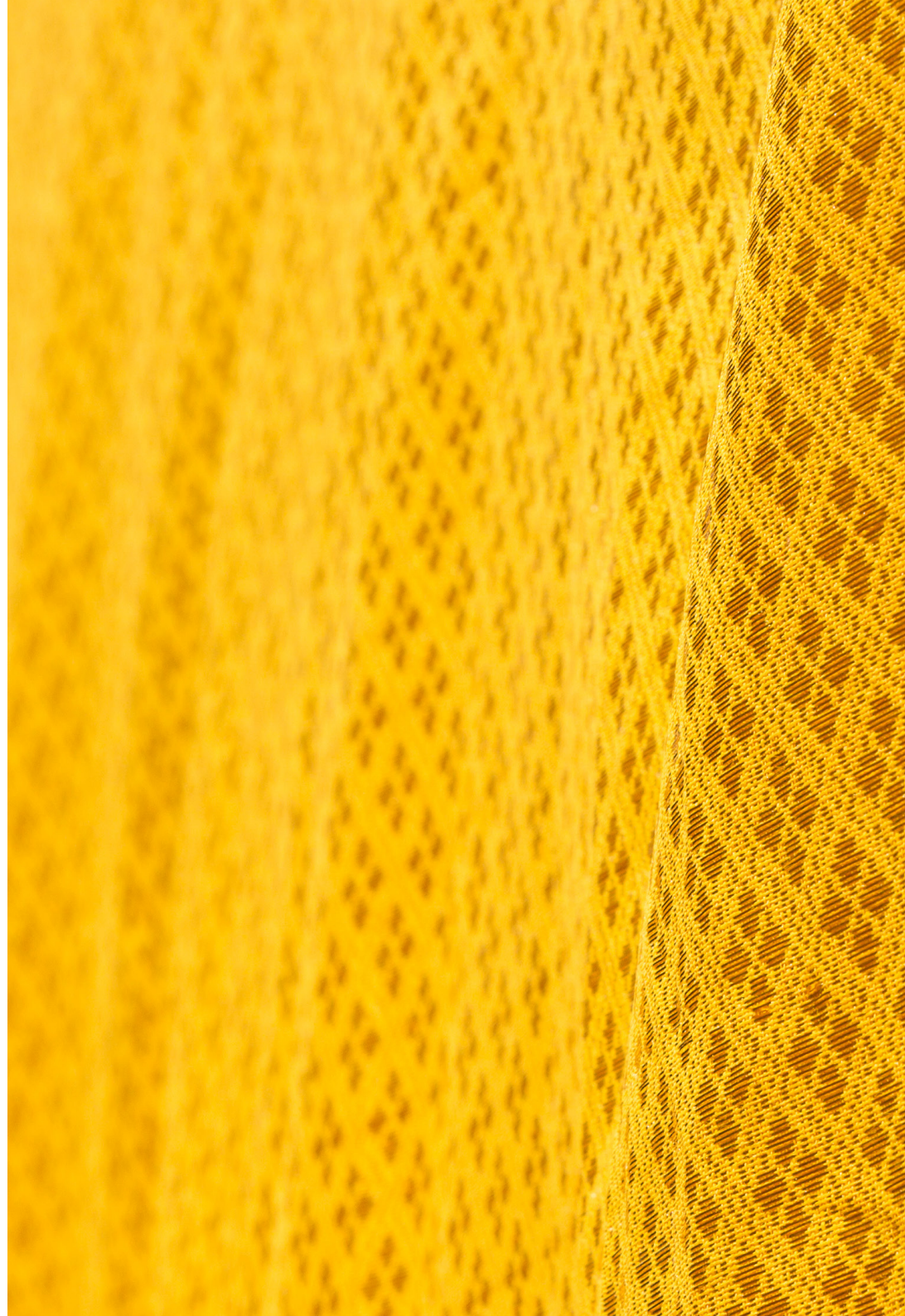


Figure 3 Reactive Blue 19 is a vinyl sulfone type reactive dye. The colour of the bars does not represent actual colour.

CONCLUSION

Our sustainable dispersants can effectively be utilised to cut and adjust the strength of a wide range of Reactive Dyes with lower staining values than is typically associated with synthetics. Using our biobased products will improve the environmental footprint of your dyes. In addition, Borregaard's products are non-toxic and come from sustainable raw materials.



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**](mailto:biopolymers@borregaard.com)