



Finnfix[®] PB, PB MAX and GB carboxymethyl cellulose

Anti-redeposition aids with up to
100% renewable carbon index for
laundry powder applications

Nouryon

Finnfix® PB, PB MAX and Finnfix® GB carboxymethyl cellulose

For decades, carboxymethyl cellulose (CMC) has provided anti-redeposition (ARD) performance in laundry powder detergent systems to help keep whites white and colors bright.

Introducing our newest CMC offerings

Today, our newest CMC offerings – Finnfix® PB, PB MAX and GB – can deliver up to 4 times the weight efficiency of standard CMCs.

With Finnfix® PB, PB MAX and GB CMC,

customers can now significantly reduce the amount of biopolymer ARD agent used in their formulations, saving space in the formula for additional performance additives or simply reducing the product's overall weight.

Finnfix® PB

Minimum 65%
active CMC polymer
powder

Finnfix® PB MAX

Minimum 65%
active CMC polymer
powder with 100%
renewable carbon
index (RCI)

Finnfix® GB

Minimum 98%
active CMC polymer
granule



Unique, strong sustainability profile

Reducing product weight without sacrificing performance significantly reduces the polymer emitted into the environment. While most synthetic ARD agents have little to no biodegradability, our CMC ingredients are made primarily from natural wood-based cellulose derived from sustainably managed forests and are ultimately biodegradable; ~80% of the renewable carbon content of CMC comes from cellulose.

We also now offer Finnfix® PB MAX CMC – a novel, fully renewable CMC made from natural cellulose and renewable MCA (ISCC PLUS certified).

Finnfix® PB MAX CMC is the only 100% RCI CMC available on the market. It delivers the ultimate in sustainable ARD performance for laundry powders, offering all of the sustainability benefits of Finnfix® PB CMC but with the maximum renewable carbon content and minimal carbon footprint.

Laundry performance benefits

- Superior weight efficacy ARD biopolymer
- Exceptional whiteness retention for cellulosic fabrics
- Effective in both warm and cold wash conditions (40°C/104°F and 10°C/50°F)
- Some anti-dye transfer functionality
- Stain release benefits in the second wash
- Improved cellulase compatibility

Sustainability benefits

- Produced from natural wood fibers, from sustainably managed forests
- Minimum 78% RCI
- Inherently, ultimately biodegradable biopolymers
- Non-label ingredient
- Non-hazardous
- Non-GMO
- Ecolabel compliant
- Low product carbon footprint products vs. synthetic ARD agents
- Up to 4x superior weight-efficiency vs. conventional CMC's
- Suitable for cold water wash

Select the Finnfix® CMC option best suited to your formulation

Finnfix® PB CMC

- Most cost-efficient CMC grade
- Standard activity grade – minimum 65% CMC active, so no extra cost in purification of the CMC if not needed in application
- 78% RCI product from natural wood sources
- Optimized weight efficiency vs standard CMCs
- Powder product is simple and easy to use with fast dissolution

Finnfix® GB CMC

- Highest purity CMC grade – minimum 98% CMC active, packing as much active polymer into each gram of product as possible
- Lowest dose requirement to give superior ARD performance relative to Finnfix® PB CMC variants
- Granular form, with easiest handling and low dusting performance

Finnfix® PB MAX CMC

- Unique 100% RCI CMC grade that uses renewable MCA and cellulose in manufacture
- Standard activity grade – minimum 65% CMC active eliminates need for post-production purification step
- Optimized weight efficiency vs. standard CMCs
- Powder product is simple and easy to use with fast dissolution



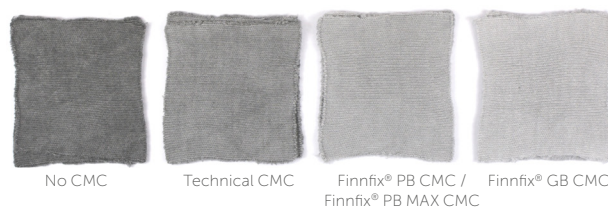


Proven ARD performance

ARD aids reduce the transfer of soils released from unclean clothing during the wash onto clean white or colored garments. Insufficient use of ARD agents can result in greying of whites and a dulling of colors over time. Fatty and oily soils in particular contribute to this problem.

Finnfix® PB, PB MAX and GB CMC each demonstrated superior ARD performance and weight efficiency when compared to standard CMC when tested under simulated wash conditions using a tergotometer. In these studies, white cotton knit swatches were washed using CMC containing detergent and greasy particulate soil. Soil deposition takes place at different levels depending on type of CMC product used.

Visual discoloration of cotton knit swatches treated with 1 wt% CMC



ARD benefit of 1 wt% CMC in powder detergent
 Conditions: Tergotometer, 8 int.rep, 25°C, 18°dH, 1 cycle,
 60 min wash + 15 min rinse
 (Ref. = Commercial detergent w/o CMC)

Finnfix® GB CMC clearly provides superior ARD performance, with Finnfix® PB and PB MAX CMC offering significantly boosted performance over the benchmark.

While technical CMC does provide some ARD of soil vs no CMC, most consumers would seek a higher performing detergent, although these test conditions may be worst-case scenario.

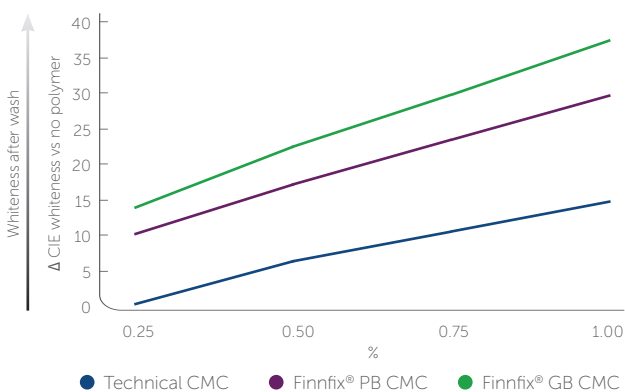
Whiteness retention

To measure whiteness retention, we ran a test using detergent powder with 1 wt% of CMC, employing a spectrophotometer to quantify whiteness retention (Δ CIE whiteness D65/10°+UV*) of the differing CMC products to assess ARD performance and assess weight-efficiency advantage vs. the baseline standard technical CMC.

The test demonstrates that Finnfix® PB CMC reaches the same level of performance with nearly three times lower dosage than standard technical CMC with 1 wt%. Finnfix® GB CMC by comparison is the highest performing option performing the same as technical CMC at only 1/4 the dosage. At higher levels, Finnfix® PB, PB MAX and GB CMC continue to deliver anti-redeposition benefits well beyond what technical CMC can achieve.

*Commission Internationale de l'Éclairage (Δ CIE) is an internationally recognized numerical system for defining and measuring color, including whiteness.

Whiteness after wash



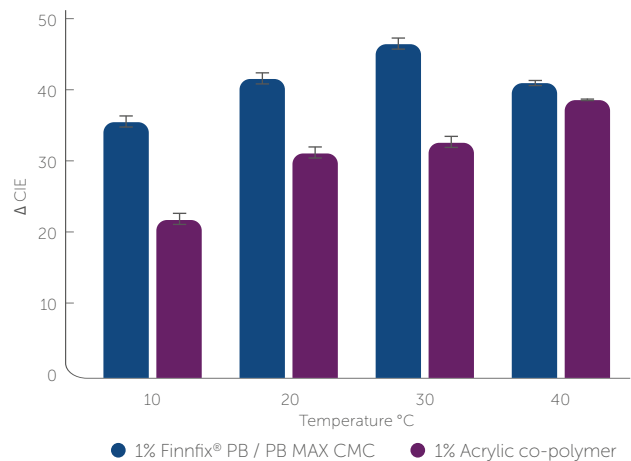
Outstanding performance in cold and warm wash

Finnfix® CMC biopolymers provide great flexibility when used in a variety of wash conditions, from more traditional warm water wash (40°C / 104°F) to the more sustainable cold water wash (10°C / 50°F). In this laundry study we benchmarked the performance of Finnfix® PB CMC against that of a synthetic polyacrylic acid copolymer widely used in laundry powder formulations. Both polymers were included at 1% active and the performance studied across a range of wash temperatures.

Finnfix® PB / PB MAX CMC shows performance largely independent on temperature, and superior to non-biodegradable polyacrylate copolymer alternatives across the range.

Δ CIE whiteness vs ref (no polymer)

Lamp black – Knitted cotton



Specifications

Analysis	Finnfix® PB	Finnfix® PB MAX	Finnfix® GB
Purity (Sodium CMC), %	min. 65	min. 65	min. 98
Viscosity, 2% Brookfield, mPa.s	50-600 (3/30)	50-600 (3/30)	2000-4000 (3/60)
Moisture (as packed)	<10%	<10%	<10%
Degree of substitution	0.65-0.85	0.65-0.85	0.65-0.90
Bulk density, g/l	>530	>530	>530
pH	7-10	7-10	7-10
ISCC PLUS certification*	no	yes	no

Dosage guidance

Typical inclusion rates as follows:

- Finnfix® PB and PB MAX CMC – 0.5 wt%
- Finnfix® GB CMC – 0.3 wt%

Customers should confirm dosage amounts based on their own performance-in-use criteria. The dose levels here represent significant reductions over technical CMC usage.



Finnfix® PB MAX CMC: 100% RCI ARD agent with ISCC PLUS certification*

ISCC PLUS is a voluntary certification scheme for sustainable, traceable, and circular materials, covering markets including chemicals. It ensures responsible sourcing, good environmental/social practices (soil, water, labor rights), and clear supply chain communication, helping companies transition to a circular economy with verifiable claims.

We are the first in the cleaning industry to offer 100% RCI CMC products to the cleaning market – initially with Finnfix® PB MAX. This development enables laundry detergent consumer brands to choose all new carbons in their sourced ARD ingredients. In choosing to do so, this also provides significant reduction of the product carbon footprint of CMC ARD

ingredient in laundry powder applications, without compromising cleaning performance for consumers.

We are excited to offer this most-sustainable option to the market, and with the weight efficiency reduction as described above, can offer optimally functionalized products with significantly reduced product carbon footprint. Our manufacturing facilities are certified by ISCC PLUS and undergo annual review and audit to ensure compliance with this voluntary standard.

* ISCC PLUS certification based on the mass balance approach

Contact us directly for detailed product information and sample request
website | nouryon.com/markets/cleaning
email | cleaning@nouryon.com



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