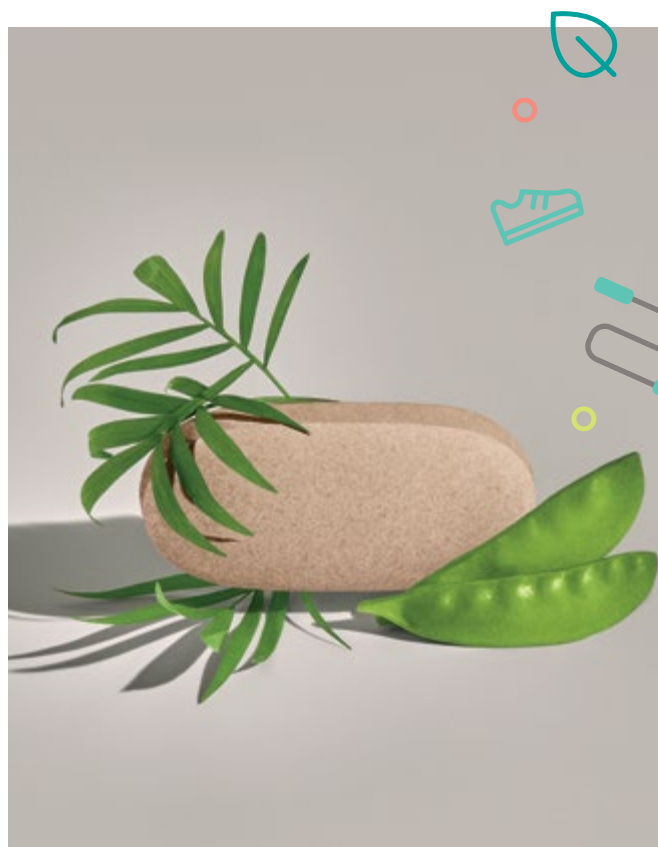


nutrapress™ bnd organic tablet binder

Nutrapress™ BND tablet binder is an organic, multi-functional tablet binder designed for customers who are creating tablets for the organically minded consumer. Nutrapress™ BND organic tablet binder is engineered to enhance tablet robustness and tablet disintegration and provide optimal powder flow for direct compression tablet manufacturing.

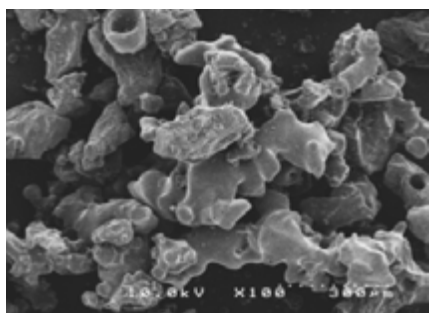
features and benefits

- certified organic ingredients
- proprietary processing to provide consistent performance and particle characteristics
- excellent tablet robustness
- good tablet disintegration and dissolution performance
- optimized powder flow, enabling direct compression tablet manufacturing
- non-GMO
- allergen free
- kosher and halal certified



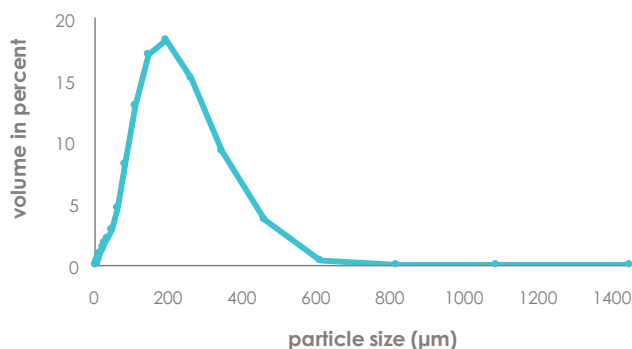
technical data

Nutrapress™ BND tablet binder is processed in a proprietary manner to yield a free-flowing and consistent granular particle morphology. Components have been selected to provide an organic composition with excellent binding properties.



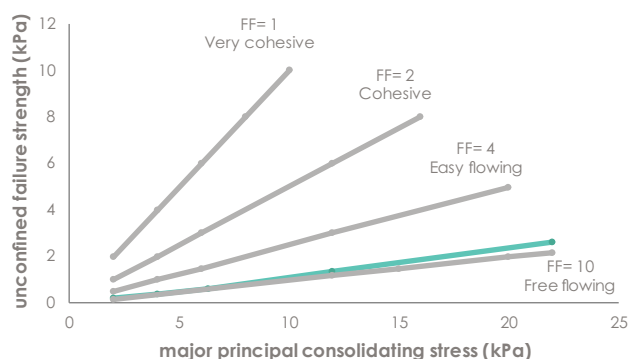
Scanning electron micrographs of Nutrapress™ BND tablet binder particles (100 fold magnification)

typical particle size distribution for nutrapress™ BND tablet binder



The free-flowing nature of Nutrapress™ BND tablet binder is particularly noteworthy, which makes it optimal for direct compression tablet manufacturing

Powder flow behavior of Nutrapress™ BND tablet binder (shown in blue on the graph), as assessed by measuring the flow function value (FF) using an annular shear cell (Brookfield Powder Flow Tester).



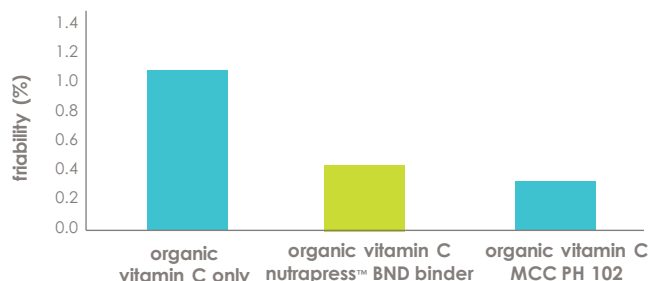
To demonstrate Nutrapress™ BND tablet binder, we made a model organic vitamin C tablet formulation. We made three formulations, one containing Vitamin C only, one with Nutrapress™ BND binder, and one with MCC. The tablets made with vitamin C only are for reference, showing how adding a binder reduces the friability and improves the disintegration time of the tablets.

Ingredients	%w/w	weight (mg)
organic vitamin C	99.5 and 89.5	1000
nutrapress™ BND binder or microcrystalline cellulose (MCC)*	0 and 10	0 and 111.7
magnesium stearate	0.5	1.5
total	100	1005.0 and 1117.3

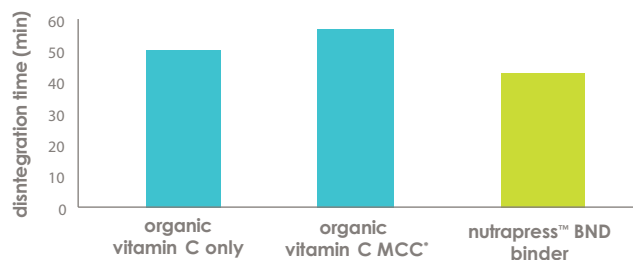
*Note: MCC is not organic, but is commonly used as a binder.

As shown in the following graphs, Nutrapress™ BND tablet binder provides excellent tablet robustness, yields similar results to the non-organic binder microcrystalline cellulose and also allows for faster tablet disintegration

Tablet friability graph shows excellent robustness for organic tablets made with Nutrapress™ BND binder.



Disintegration times for the vitamin C formulations using the USP disintegration apparatus.



conclusion

Nutrapress™ BND binder is an organic tablet binder that enables the formulation and direct compression manufacturing of organic tablet supplements with good mechanical integrity, strength, disintegration and flow properties.

Ashland also provides an organic coating in our Aquarius™ coating system portfolio, which can be used in conjunction with Nutrapress™ BND binder. For organic chewable supplements, Ashland makes Nutrapress™ CHW organic chewable tablet system. Please contact your Ashland representative for more information.



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