

Maximize® Fiber Modification Enzyme

Frequently Asked Questions

Effect on the wet end and wet end chemistry

Will this impact my wet end? Yes, for example Maximize will increase strength allowing for less refining, thus less fines generated which will reduce cationic demand, and improve drainage, etc. Because Maximize is only slightly cationic and is added at very low dosages, it does not typically impact other wet end applications.

We know that Maximize creates more reactive sights for traditional chemistry such as DSR, starch and other reactive chemistry and thus there can be a synergistic effect.

Can I bypass my refiners? It depends on what level of strength is needed. Some customers have used Maximize to bypass refining completely but fibrillation and strength development is maximized when a minimal amount of refining energy is applied. Maximize and appropriate refiner energy is synergistic.

Wet strength resin: First generation enzymes are known to negatively affect WSR efficiency. However, the latest, 3rd generation Maximize products have minimal impact on WSR efficiency.

Dry strength resin: Focus on your fiber not your chemistry. Maximize could be a better fit: For tissue, DSR can reduce bulk, increase stiffness, and thus reduce handfeel. In many cases Maximize can replace most if not all DSR chemistry. For packaging, Maximize can be use in place of DSR or in combination.

Starch: Maximize will not affect starch, however, starch for strength may be reduced or eliminated as Maximize can boost strength.

CMC: CMC, carboxy methyl cellulose, is a substrate for Maximize. It is possible to use CMC with Maximize, but CMC should be added as close to the headbox as possible to minimize modification of CMC performance. If CMC is used only for charge control, there are other options we can offer.

What is your market share? For fiber modification we have more than 100 applications globally.

Who is the industry leader? Buckman

Do you make your own enzymes? Are you basic in this technology? We have the capability to identify, isolate, sequence and replicate the genes needed for these enzymes. We can manufacture and separate enzymes. We do not make all enzymes we sell. We are the preferred partner for Pulp & Paper applications for the largest and best enzyme manufacturer in the world: Novozymes.

Why are your enzymes better or different than the other guy's? Buckman has been working with enzymes for over 20 years and has developed the techniques and protocol to select the best enzymes for our applications. We have perfected and patented techniques to boost enzyme performance and have the best knowledge of how to apply enzymes in the paper industry.

Safety

What are the hazards? OSHA? Maximize is safer than traditional chemistries and easy to handle. As with any chemistry, please use the appropriate PPE. Refer to the SDS.

What about worker exposure? There is very little risk of worker exposure while using Maximize. Use the appropriate housekeeping, hygiene and PPE. Refer to the SDS.

Can you test for the enzyme in my final sheet? It is possible, however, should not be necessary. We have tested for enzyme activity in the final sheet in tissue and board samples and found no activity.

Why Buckman?

Why should we choose Buckman for enzymes?

Buckman's expertise in the application of enzymes in the pulp and paper industry is unmatched. We provide the latest and patented 3rd generation products backed by Fiberlytics™, a proprietary method for fiber characterization. Our expertise ensures that customers get the right enzyme for their process and that it is applied optimally to achieve their end goals.

Environmental

Will I see increased COD or BOD in the effluent?

Addition rates are low, so there is minimal if any impact on COD or BOD.

Will the enzyme be denatured in the dryer section?

Or bleaching? Maximyze® is denatured by excessive heat over time. Linerboard machines and tissue machines have the temperature necessary to denature the enzyme. Oxidative bleaching can destroy Maximyze. Free chlorine is most effective for destroying Maximyze. Reductive bleaching can reduce the activity of Maximyze. Once the reductive bleach is removed, Maximyze can regain activity.

Will Maximyze reduce our carbon footprint? Yes, it can. Maximyze is made from renewable resources. Using Maximyze in place of a DSR (not renewable) will reduce the shipping volume necessary, thus reducing the amount of carbon used in transport. Maximyze won the US EPA Presidential Green Chemistry Challenge Award in 2012.

Application Conditions

What types of fiber is Maximyze effective on? Most effective on bleached Kraft of all kinds. Unbleached Kraft. Recycled fiber (OCC, MOW, SOW etc.) Because of the excessive heat, TMP, BCTMP and other mechanical pulps are more difficult to treat but we are developing products and application knowledge in these areas.

Where is the best addition point? Prior to refining with good mixing available, with adequate retention time, optimal temperature and pH.

How much contact time is ideal? At least 1 hour at 50°C; however, shorter times are still effective but may require a higher dosage to achieve the same result.

What temperature is best? Each Maximyze product will have an optimum temperature and a range where it is still acceptable. Generally, 30°C to 60°C is acceptable with 50°C being ideal. Refer to your application guide.

What pH is best? Maximyze has a broad pH range but in general 5 – 9 is acceptable and 6 to 7.5 is ideal. Refer to your application guide.

What will inhibit the enzyme? Oxidizing and reducing agents. Excessive heat can permanently denature enzymes. Excessive cold can reduce the activity rate of enzymes. Oxidants can permanently destroy Maximyze. Reducing agents will reduce activity, but the enzyme can recover once the reducing agent is below a certain level.

How do we know if the enzyme is still active? We have test methods to determine if the enzyme is active in whitewater.

Where does the enzyme go in the process? Some of the enzyme will remain attached to the fiber, however, most will be found in the water and will be consumed slowly over time.

Contingency Plans

How can I stop the enzyme if needed? Stop feeding it. Add an oxidant. Bleach is most effective (0.5 ppm free Cl).

What if we accidentally overdose the enzyme? Stop the application. In extreme instances, bleach can be added to stop the enzyme activity (0.5 ppm free Cl).

What happens if the machine shuts down with Maximyze in the process? Nothing at typical application dosage levels as long as the enzyme pump is stopped when the machine stops. At normal dosage there should be minimal impact during machine downtime. If the pump continues to feed during the downtime, this could cause some degradation of properties. However, it also depends on the furnish. For example, OCC or other recycled grades contain much more fines and anionic trash that consumes Maximyze activity. Maximyze activity can be stopped with a bleach addition to 0.5 ppm free residual Cl. If unplanned machine stoppage is a known issue, Maximyze pumps can be tied to the fan pump or other production indicator.

What happens if Maximyze is overdosed? Our products are designed to work on the surface of the fiber and are not likely to impact the entire fiber. However, overdosage combined with a machine outage of several hours should be avoided.

BuckmanTM
Chemistry, connected.

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