

## Mr. Malt® GF-Clear Zyme FAQ

### Q. What is Mr. Malt® GF-Clear Zyme and what is it for?

A. Mr. Malt® has repacked valuable brewing enzymes from an industry leading manufacturer to make these solutions available to brewers on a smaller scale. Home brew, brewing trials or for craft and smaller independent brewers. The enzyme is a proline specific endo-protease (PEP) used for degrading gluten and keeping clear beer clear. Enzymatic stabilization can eliminate the need for traditional stabilization techniques such as long-cold maturation, silica gels and even PVPP.

### Q. How can it help my range of beers?

A. As a known allergen, a significant number of consumers are attracted to beer that has a reduced gluten. Although it is possible to make beer under 20ppm of gluten without using a PEP enzyme, most craft producers opt for an enzymatic solution due to consistent results and the ease of introduction into the process. It can also be a highly effective way to ensure that chill haze and permanent haze does not become a problem through the shelf life of beers that are designed to be bright and clear. Significant reductions in energy, emissions and costs can be achieved. PEP can be a good match with unfiltered beer where clarity is achieved gently with finings and then stabilized with a simple enzyme addition prior to the start of fermentation. Our PEP has also been shown to improve beer foam!

### Q. I don't like using chemicals/aids. Isn't there a more natural way to produce Gluten free & bright stable beers?

A. Most things are possible with beer, but there is always a compromise! Natural is a challenging term with many grey areas. Enzymes are both natural and high-tech as they are created by living organisms but are powered by clever biotechnology, much like modern beer! Gluten free beer can be made with alternative cereals which are often difficult to process (especially without exogenous enzymes). Bright beer can be kept clear with traditional stabilization but cold temperatures are required and it tends to involve more work for the brewer. Gluten reduction can also be achieved through traditional processing but most brewers prefer the enzymatic approach for consistency and convenience.

### Q. How does Mr. Malt® GF-Clear Zyme work?

A. Chill haze and eventually permanent haze is formed through beer aging through the interaction of haze sensitive proteins and polyphenols. GF-Clear Zyme targets the proline rich haze sensitive proteins meaning they cannot form large particles through polyphenol interactions which cause the haze through the scattering of light. Through the enzyme action gluten content is also reduced & measurement is possible to confirm reduction falls below 20ppm.

**Q. How should I dose Mr. Malt® GF-Clear Zyme?**

A. A simple addition into cold wort prior to the start of fermentation of 0.1-2g/hl of wort. Fast gluten reduction and stabilization have been achieved at low dose rates & typically rates are ~50% lower than benchmark PEPs. PEP addition is simple compared to traditional stabilization regimes & does not require deep cooling to form protein-polyphenol complexes for removal through adsorption. Significant energy savings and lower utility demands are possible. **Contact our technical team for detailed guidance around dosage optimization with different recipes and adjuncts.**

**Q. What beers should Mr. Malt® GF-Clear Zyme be used for?**

A. Any beers requiring consistent clarity through the shelf life or gluten reduction. For hazy styles, the PEP is not recommended, for hazy gluten reduced beers contact our technical team to discuss your process and the best approach.

**Q. Does the activity of Mr. Malt® GF-Clear Zyme continue? How is the enzyme denatured/deactivated & does it impact flavour?**

A. The high specificity of the PEP means that the haze sensitive proteins will continue to be targeted until there is no more substrate & the enzyme becomes inactive. Unlike early enzymes targeting haze & traditional stabilizers such as silica gels, foam is **improved** rather than deteriorating through stabilization. Mr. Malt® GF-Clear Zyme is considered a brewing aid/processing aid and is not typically labelled. In depth testing from the manufacturer have shown no significant flavour impacts with controlled sensory analysis.

**Q. What about microbial and food safety?**

The product is stable under recommended storage conditions, with exacting standards of manufacturing and repacking. Any additions to be and wort should be made with care as the brewer would with any other additions e.g. yeast or dry hopping.

**Q. Is Mr. Malt® GF-Clear Zyme a GMO?**

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A. Mr. Malt<sup>®</sup> GF-Clear Zyme is not a GMO, does not contain GMOs, and is classified as a technological aid. It is produced by fermentation of microorganisms optimized through modern biotechnologies that are not present in the final product.

**Q. Is GF-Clear Zyme Expensive**

GF-Clear Zyme is highly effective at stabilizing clear beers and reducing gluten at low dose rates, typically half that of many PEPs on the market. Savings in energy and time can also be significant as is the cost of traditional stabilization products which may no longer be required.

**Q. Who can I contact if I have questions?**

A. Our technical team our happy to help!

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English + German: [adam.johnson@caldic.com](mailto:adam.johnson@caldic.com)