

Leader in flour applications.

# EMCEgluten Enhancer



**Mühlenchemie**  
makes good flours even better

The great all-rounders for weak and composite flours

## Flour quality is not always optimal

In practice, mills are not always able to use wheat with optimal properties. The reasons include lack of availability, crop damage and widely fluctuating prices. Mills therefore tend to mix high-quality hard wheat with poorer quality soft wheat, or they work in wheat lots that have not developed as they should because of climatic conditions. In some places it is usual, or even prescribed by law, to add alternative flours made from soy, maize, beans or cassava. The disadvantage of this practice is that the weaker the wheat gluten, or the smaller the proportion in the mixture, the greater are the negative effects on dough stability and volume. The answer is to compensate for this loss of quality with suitable flour improvers.

## Vital wheat gluten has its limitations

One possibility is to add wheat protein. But the prices and availability of vital wheat gluten vary enormously, and the results in the baked goods are not always satisfactory.

## EMCEgluten Enhancers make up for deficiencies

Against this background we have developed a product series that greatly improves the structure of the dough: **EMCEgluten Enhancers** make it possible to use low-

## Benefits of an EMCEgluten Enhancer

Baking
<ul style="list-style-type: none"><li>• Increases the water absorption capacity</li><li>• Optimizes dough stability</li><li>• Enhances the crumb structure</li><li>• Compensates for the use of composite flours</li></ul>
Economy
<ul style="list-style-type: none"><li>• Maintains good baking properties when soft wheat is used</li><li>• Makes it possible to replace vital wheat gluten at 1/10 of the usage level</li><li>• Lower cost through the use of cheaper raw materials</li></ul>

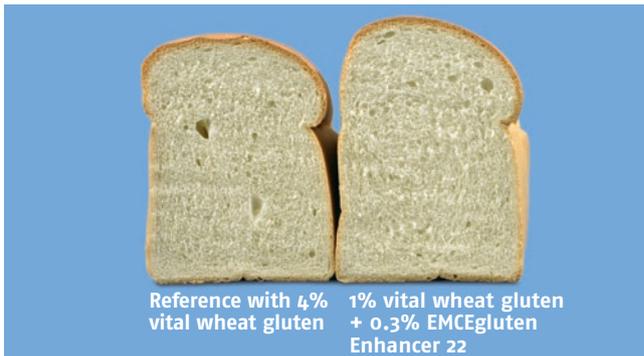
gluten soft wheat or work in non-bread flours without loss of baking quality and to do without vital wheat gluten. The effects of the new compounds were tested in our applications laboratory with various mixtures of hard and soft wheat and the addition of cassava.

Tab. 1: Effect of hard and soft wheat mixtures on water absorption in the farinograph

Hard/soft wheat	100	90/10	80/20	70/30	60/40	50/50
Protein (NIR)	14.8	14.6	14.5	14.2	13.9	13.7
WA farinograph in %	64.6	64.1	63.7	63.2	62.7	62.1
With EMCEgluten Enhancer 22						
Usage level in %	0	0.05	0.1	0.2	0.25	0.3
WA farinograph in %	64.6	64.5	64.4	64.3	64.3	64.1
Stability farinograph in min.	20:19	20:04	19:45	19:02	19:05	19:43



**Fig. 1: Optimization of the mixture ratio of hard and soft wheat using EMCEgluten Enhancer 22 and uniform standard treatment**



**Fig. 2: Enhancing the efficacy of vital wheat gluten leads to much better results in products baked with composite flour containing 10% cassava.**

## Optimization of hard and soft wheat mixtures

The initial reason for this series of tests was the poor availability of hard wheat in some regions. We were looking for a flour improver that would permit mixing with soft wheat and compensate for the resulting loss of protein quality.

**EMCEgluten Enhancer 22** brought about a considerable improvement in quality. Whereas water absorption in the farinograph sank, without the additive, as the proportion of soft wheat increased, the addition of **EMCEgluten Enhancer 22** maintained the required level. It also had a positive effect on stability (Table 1). The baking trials confirmed the rheological results. For example, a 70/30 mixture of hard and soft wheat with the addition of 0.1% **EMCEgluten Enhancer 22** produced a loaf similar to an 80/20 mixture without the additive (Figure 1).

## Cassava flour: EMCEgluten Enhancer proves superior to vital wheat gluten

In the second series of tests, cassava flour was used – a raw material that contains no gluten and disrupts the structure-forming function of the protein from the

wheat flour. In order to produce cassava loaves capable of competing with pure wheat bread, the dough must be strengthened and the baking properties improved. Vital wheat gluten is often added to achieve this.

Figure 2 shows our test with 10% cassava flour, 4% wheat gluten being replaced with 1% wheat gluten and 0.3% **EMCEgluten Enhancer 22**. This modification significantly improved the quality of the end products, which was reflected above all in a noticeable increase in volume and a more even crumb structure.

## Processing

The use of **EMCEgluten Enhancers** does not require either a change in dough processing or adjustment of the baking process.

## Examples of usage levels

*Gluten replacement:* 0.1% **EMCEgluten Enhancer** replaces 1% vital wheat gluten.

*Mixtures of hard and soft wheat:* 0.05–0.1% **EMCEgluten Enhancer** to each 10% soft wheat.

Examples of products		
Product	Active ingredients	Objective
<b>EMCEgluten Enhancer 21</b>	Enzymes, vegetable fibres, hydrocolloids	Basic version for increasing water binding without changing dough properties
<b>EMCEgluten Enhancer AS</b>	Enzymes, vegetable fibres, ascorbic acid	Optimized dough stability due to ascorbic acid
<b>EMCEgluten Enhancer 22</b>	Enzymes, vegetable fibres, ascorbic acid	Large baked volume through a varied enzyme system



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A member of the Stern-Wywiol Gruppe

Muehlenchemie GmbH & Co. KG, Kurt-Fischer-Straße 55, 22926 Ahrensburg, Germany  
Phone: +49 / (0) 41 02 / 202-001, Fax: +49 / (0) 41 02 / 202-010  
info@muehlenchemie.com, www.muehlenchemie.com

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