



**FLOUR IMPROVERS**





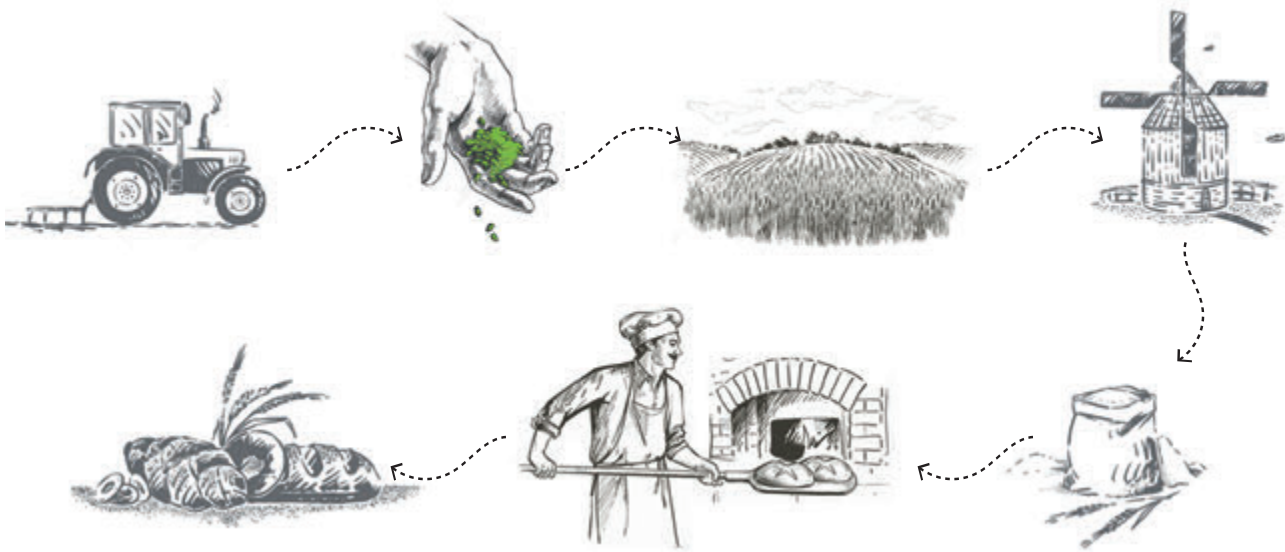
## **Your Reliable Partner For Flour Improvement**

The keys to Polen Food's success are the importance placed on innovation and quality as well as the enthusiasm of its employees. With a range of more than 400 products within the different company divisions, Polen Food is reaching every year 60 countries through its exports sales. Since its foundation in the 1997 Polen Food focused its efforts on providing to the millers the best flour improvement solutions.

A global approach but with personalized solutions, a chain of expertise from ingredients through market till bakery and a strong passion for "What We do". All of this allows Polen Food to produce not only products but also valuable solutions for its partners.

The success in the market is guaranteed by sharing idea and projects with customers and by organizing training courses and application studies, not only in its head quarter in Istanbul but in each single country too.

## Not Only Products, “Solutions”



As far as we do not produce only products but solutions, we invest every year our turnover mostly in R&D. Like few companies in the world, the 30% of Polen Food’s employees are food scientists/engineers, not only in the R&D but in the production, sales and management departments too. We are passionate for the sector we are working in and wheat, flour, bread and ingredients are our daily words for a job that we are enthusiastic for.

Polen Food is aware that the wheat quality changes every year so, we collect, analyze and list samples of wheat from each region and for every single harvest; therefore we are able to support our millers in wheat purchasing strategy and in milling technology adjustment. By this we are also capable of predicting the future flour quality and of formulating the best flour improvement solutions accordingly.

Every day we analyze 30 samples of flour and wheat from domestic and overseas market. Every month we conduct more than 500 bread trials in our application laboratory. Thanks to this innovation mind-set and to our daily efforts for the full satisfaction of our worldwide customers we developed a database with more than 1.000 improver formulations.



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## Our Laboratories

With the aim of developing the best improvers and supporting our customers, we constantly make investments in the most modern and precise flour analysis instruments for our labs.

### Flour testing methods in our analytical laboratory:

- Moisture
- Falling number
- Fungal Falling Number
- Wet gluten
- Gluten index
- Zeleny Sedimentation
- Farinograph
- Extensograph
- Alveo-Consistograph
- Reo-Fermentometer
- Mixolab
- Starch damage
- Bug damage determination





## Application Laboratories

We believe that improvers are not just a matter of flour rheological parameters correction. For this reason we confirm each result obtained in the analysis lab through our application trials.

After several years of studies, experience and after plenty of technical visits around our international customers we have developed product processes for each type of baking goods.

When making application trials we do consider different variables. Technical ones such as product recipe, level of process automation and sort of oven, as well as geographical ones like temperature and humidity conditions of the country. Thanks to our wide range of equipment we are able to realize application tests for different kind of products and processes. As a little example: frozen dough, par-baked breads, controlled fermentation dough, laminated products, flat bread, loafs and buns.

Moreover, in the facilities of our industrial customers we have the possibility of making on-line and start up industrial trials for improvers that will be used in fully automated lines.





## Toast Bread

Toast is maybe the most spread bread around the world and even if plenty of types can be found in different countries the common desired characteristics are a good volume, a homogeneous crumb, a soft and thin golden crust as well as the avoidance of crumbling in the product, whilst a good dough structure and development, a fermentation stability and a great oven spring are expected on the process side.

Throughout several technical visits in different countries Polen Food developed a wide varieties of flour improvers that according to the wheat quality, the milling process and the flour's final user production process allow its customer around the world to standardize the flour quality for baking goods production, thus guarantying the bakers to obtain a perfect loaf.



With Improver



Without Improver



With Improver



Without Improver

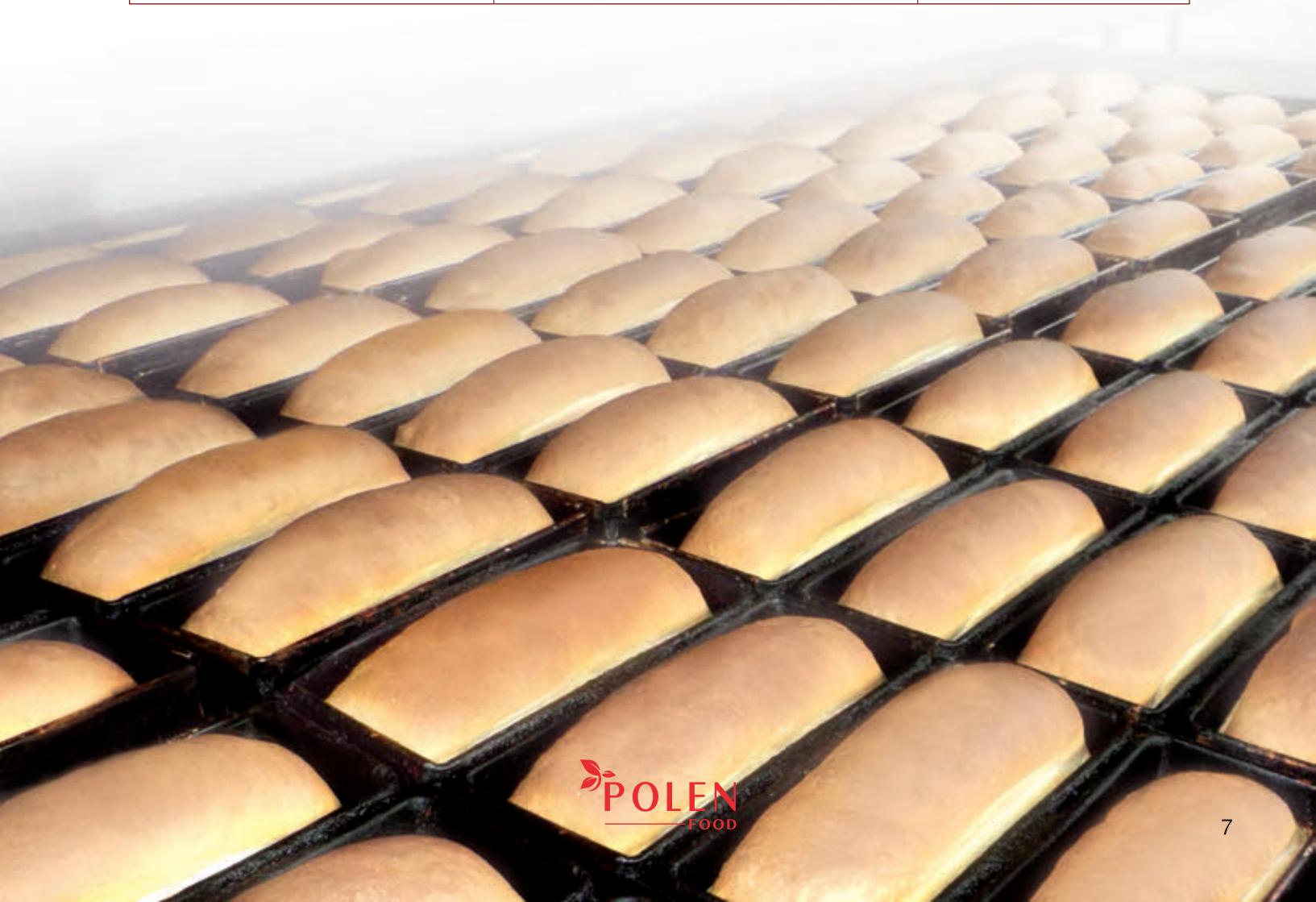






## Toast Bread

Product Name	Improvement	Dosage
<b>Exper Gold</b> <b>Exper Gold SFT</b> <b>Exper Gold SX SOFT</b> <b>Exper Gold KNG</b> <b>Revizyon PWR</b> <b>Revizyon SPR</b>	<ul style="list-style-type: none"><li>● Increased gas retention</li><li>● Improved fermentation tolerance</li><li>● Increased loaf volume</li><li>● Avoidance of crumbling</li></ul>	10-30 g / 100 kg





## French Baguette

Together with toast bread our main focus and objective is to help millers improving the quality of their flours destined to baguette production. For this very famous bread type as well, we are aware of how great is the variability of the ways it is produced around different countries in the world. Long and short baguette, crunchy and thick crusty as well as light colored and soft in crumb ones.

So, what Polen food is doing is firstly analyzing the wheat and flour characteristics of its customers, then studying what are the expectations of bakers and final consumers in the country. That means how should the baguette be in order to be accepted and appreciated by those who daily but it. According to this first analysis the R&D team develops then an improver that will provide the main desired effects such as improved extensibility, proofing stability, clear slit cuts and oven spring.



With Improver



Without Improver



With Improver



Without Improver



## French Baguette

Product Name	Improvement	Dosage
<b>Exper Gold</b> <b>Exper Gold SX</b> <b>Exper Gold BGT</b> <b>Exper Gold Plus BGT</b> <b>Exper Gold 21</b> <b>Revizyon PWR</b> <b>Revizyon SPR</b> <b>Revizyon 202</b> <b>Revizyon 808</b>	<ul style="list-style-type: none"> <li>• High ovenspring</li> <li>• High loaf volume</li> <li>• Optimized Crumb structure</li> <li>• Extended crumb softness and structure</li> </ul>	10-30 g / 100 kg





## Soft Breads

Soft breads such as burger buns and sandwiches are generally produced in industrial lines and besides the dough and bread structure quality, a long lasting freshness and shelf-life is what producers more expect for. Because of its process and its desired qualities, burger buns and other soft breads require the utilization of strong flours and they are one of the hardest breads to produce without any enzymatic improvement.

Polen Food developed special flour improvers which allow reducing or even avoiding the extra addition of gluten as well as make weaker flour use for these products possible.



Product Name	Improvement	Dosage
<b>Exper Gold</b> <b>Exper Gold SX SOFT</b> <b>Exper Gold SFT</b> <b>Exper Gold 1000</b>	<ul style="list-style-type: none"> <li>• Extended shelf life</li> <li>• High oven spring</li> <li>• Improved loaf volume and softness</li> <li>• Crumbling Prevention</li> </ul>	10-30 g / 100 kg





## Flat Breads

The bakery experts say that despite what it would look like, the hardest breads to improve are not the toast, baguette or buns but flat ones. Improving the flour for the right extensibility, keeping a good final color of the bread without renouncing to its softness or sometimes crunchiness (according to the bread), avoiding the chewiness and guarantying its freshness during 2-3 days after baking is something that few companies are able to do and we know that.

The successful story, in different countries, of our improvers for flat breads such as Lavash, Pita, Sangak, Berberi, Chapatti, Parotta and Tortillas makes us say that Polen Food is for sure one of those few companies.

Product Name	Improvement	Dosage
<b>Exper Gold 4000</b> <b>Exper Gold 4000 PLUS</b> <b>Exper Gold 3000</b> <b>Exper Gold 6000</b> <b>Exper Gold 6000 B</b>	<ul style="list-style-type: none"> <li>● Improved dough handling</li> <li>● Increased Dough extensibility</li> <li>● Optimized tolerance for process conditions</li> <li>● Crumbling Prevention</li> </ul>	5-30 g / 100 kg
<b>Exper Gold FX</b> <b>Exper Gold 7000</b> <b>Exper Gold 8000</b>		10-30 g / 100 kg





## World Bread

“A world of improvers” is what we say to our customers. Not only because the improvers’ one is really a wide world but especially because Polen Food developed different enzyme combinations for supporting its customers in the 60 countries it is exporting to, in order to produce quality flours for all kind of breads. The Russian baton bread, the Uzbek Lebyoshka and the Balkans bread are just few examples of the several breads our millers are improving everyday by using Polen Food solutions.

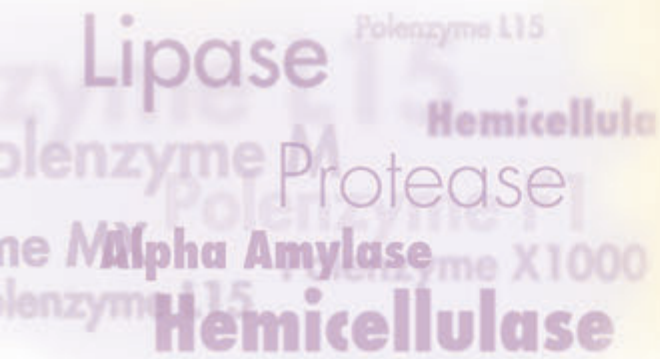




## World Bread

Product Name	Improvement	Dosage
<b>Exper Gold UZB</b> <b>Exper Gold BRB</b> <b>Exper Gold GRG</b> <b>Exper Gold 1000</b> <b>Exper Gold 2000</b> <b>Exper Gold 3000</b> <b>Exper Gold 4000</b> <b>Exper Gold 5000 XL</b> <b>Exper Gold D1030</b>	<ul style="list-style-type: none"> <li>• Optimized enzymatic activity</li> <li>• Improved dough handling tolerance</li> <li>• Increased bread proofing stability</li> <li>• Increased bread volume</li> <li>• Excellent crust color</li> <li>• Improved crumb structure</li> </ul>	10-30 g / 100 kg
Product Name	Improvement	Dosage
<b>Exper Gold D515</b> <b>Exper Gold 1000 YK</b> <b>Exper Gold YZ</b>	Special solutions for wheat flour obtained from wheat exposed to preharvest rain.	10-30 g / 100 kg





## Enzymes

Polen Food developed the Polenzyme portfolio for those customers willing on creating their own improvers. In some countries in fact the availability of wheat is limited and the importation of foreign ones is drastically fluctuating. In this case, it is important for the millers to rebalance the weekly or even daily wheat blends and so flour quality variability by using singles enzymes. Therefore, the addition of Polenzyme products enables millers to standardize flours and so, to control rheological behavior, kneading properties, fermentation stability and baking time of the dough.

As a great investor in R&D and new technologies, Polen Food launched into the market also 3 successful and unique products: POLENZYME RST, POLENZYME VLM and POLENZYME ELS.

Product Name	Description	Dosage g / 100 kg Flour	Activity
<b>Polenzyme P</b>	Protease	150 -200	1 AU/g
<b>Polenzyme P 1000</b>	Protease	0,5 - 2	0,1 AU/g
<b>Polenzyme X1000</b>	Fungal Xylanase	0,5 - 2,5	1.500 FXU/g
<b>Polenzyme X2000</b>	Fungal Xylanase	0,5 - 2,5	1.500 FXU/g
<b>Polenzyme G2500</b>	Glucose Oxidase	0,5 - 2,5	2.500 GDU/g
<b>Polenzyme L15</b>	Lipase	0,5 - 2	15.000 LU/g
<b>Polenzyme F1000</b>	Fungal Alpha Amylase	3 - 7	40.000 SKB
<b>Polenzyme F2000</b>	Fungal Alpha Amylase	1,5 - 4,5	60.000 SKB
<b>Polenzyme F3000</b>	Fungal Alpha Amylase	1- 3	100.000 SKB
<b>Polenzyme F4000</b>	Fungal Alpha Amylase	0,5 - 2	140.000 SKB





Lipase Polenzyme L15  
 Polenzyme M15 Hemicellulase  
 Protease  
 Polenzyme P1  
 Polenzyme X1000  
 Polenzyme L15  
 Hemicellulase

## Enzyme Combination

Special enzyme mixes developed by Polen Food for the milling industry

### POLENZYME RST

Flour Strength • Dough Resistance • Oven Spring

### POLENZYME VLM

Complete Rheological Flour Improvement • Balanced Dough • Bread Volume

### POLENZYME ELS

Enhanced Extensibility • Easy Dough Processability • Bread Color And Softness

Polenzyme RST	Polenzyme VLM	Polenzyme ELS
<ul style="list-style-type: none"> <li>• Suggested for flours which need an extra strength and a lower extensibility</li> <li>• Used to ensure high resistance to kneading and long stability during fermentation</li> <li>• Useful for strengthening excessively relax dough and for improving raising</li> <li>• Recommended dosage: 1- 5 g /100kg of flour</li> </ul>	<ul style="list-style-type: none"> <li>• Suggested for balanced but weak flours which need extra energy</li> <li>• Used for a global improvement of dough processability and extensibility</li> <li>• Useful for increasing dough stability during fermentation and for enhancing bread volume and color</li> <li>• Recommended dosage: 1- 5 g /100kg of flour</li> </ul>	<ul style="list-style-type: none"> <li>• Suggested for flours which need an extra extensibility and a lower strength</li> <li>• Used to ensure dough relaxing and promoting extensibility</li> <li>• Useful for intense color in bread, softness and freshness during storage</li> <li>• Recommended dosage: 1- 5 g /100kg of flour</li> </ul>

Thiamine  
Vitamin A  
Iron  
Zinc  
Thiamine  
Folic Acid  
Thiamine  
Zinc  
Iron  
Vitamin D  
Niacin  
Riboflavin  
Iron  
Vitamin A  
Vitamin D  
Riboflavin



## Flour & Maize Products Fortification

Flour improvement is not just a technological matter but sometimes a nutritional issue too. Several studies report that in some countries the lack of sufficient vitamins and minerals is the main cause of several diseases, natural abortion and birth mortality.

In line with the flour fortification requirements published by the WHO and other national organization, Polen Food develops and delivers to its customers country-specific flour fortifiers.

Polen Food's fortifiers help millers to guarantee consumers a right vitamins and minerals income, for a balanced and correct diet.





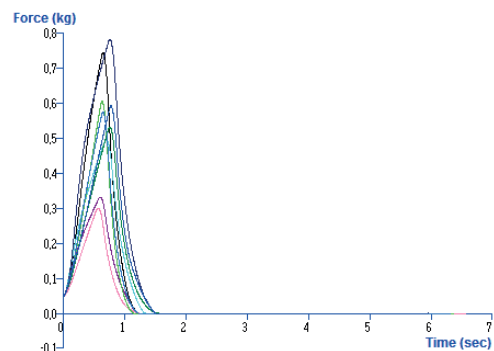
## Shelf Life Improvers

The bread production industrialization process started on the second half of the 19th century and since that time till our days the bread quality issue has greatly changed. Fresh bread nowadays does not simply mean “daily made”. For the producers it means late staling, no crumbling, no drying and absent mold growth. On the other side, it is a synonymous of softness and long shelf life for the consumers. Polen Food developed a specific line of products that improve the shelf life of baked goods both microbiologically, by inhibiting mold activity and texturally, by delaying staling and firmness.



### T.A SETTINGS & PARAMETERS

Sequence Title: Return to Start (Set Dist)  
 Test Mode: Compression  
 Pre-Test Speed: 1,0 mm/sec  
 Test Speed: 8,0 mm/sec  
 Post-Test Speed: 8,0 mm/sec  
 T.A. Variable No: 5: 0,0 g  
 Target Mode: Strain  
 Distance: 5,0 mm  
 Strain: 20,0 %  
 Trigger Type: Auto (Force)  
 Trigger Force: 50,0 g  
 Probe: A/BSR ; BREAD SQUEEZE  
 RIG  
 Batch:  
 Points per second: 500



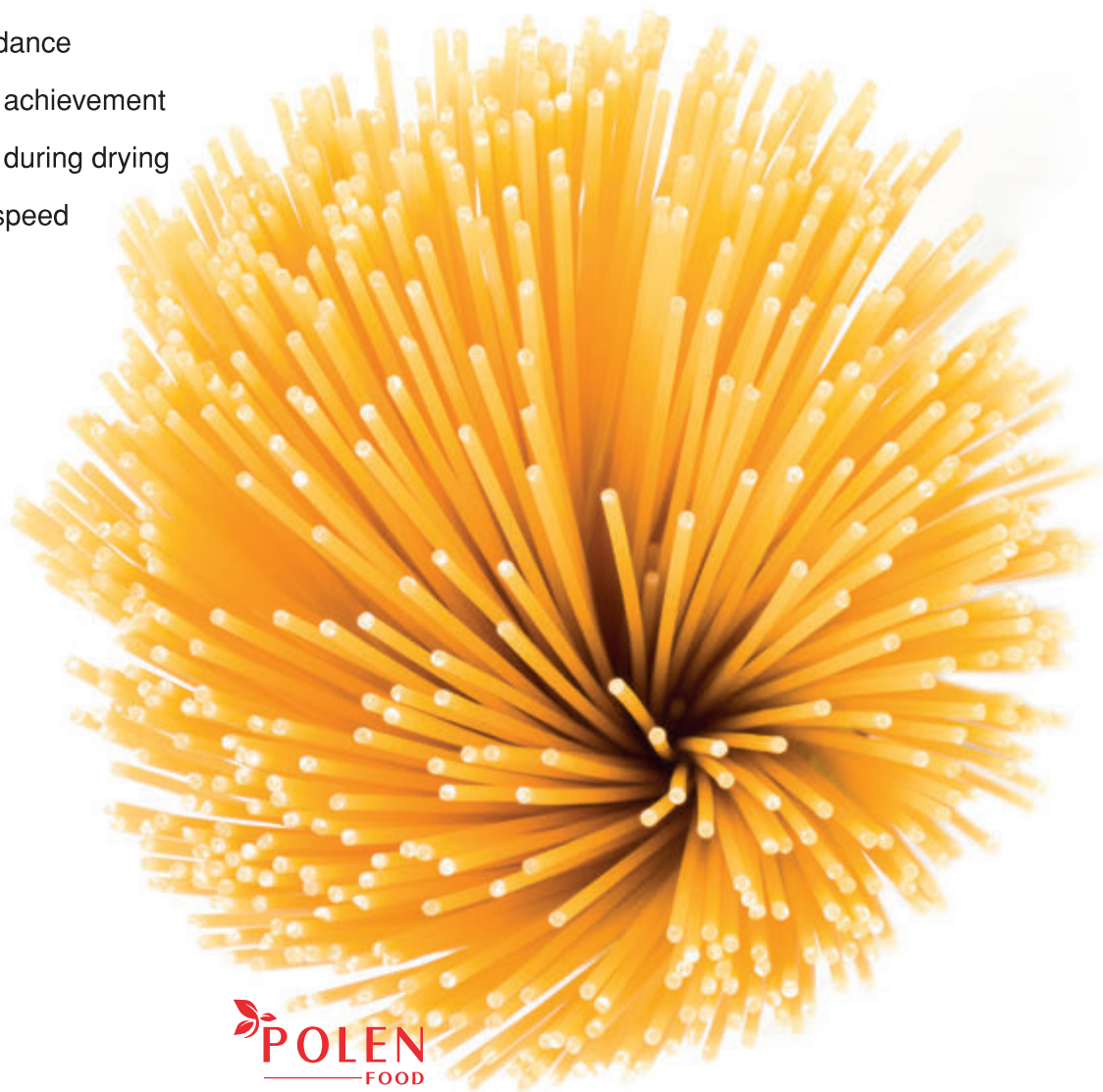


## Pasta & Noodle

**Exper Gold M** is a specific improver for pasta production. It is particularly recommended for those producers which combine soft and hard wheat flour in the line. The use of soft wheat flour in pasta manufacturing in fact unavoidably leads to a critical quality loss in terms of color and texture.

The advantages of Using Exper Gold M are:

- Reduced starch release during cooking
- Cooking time extension
- Pasta clumping avoidance
- Desired amber color achievement
- Absence of cracking during drying
- Increment of drying speed



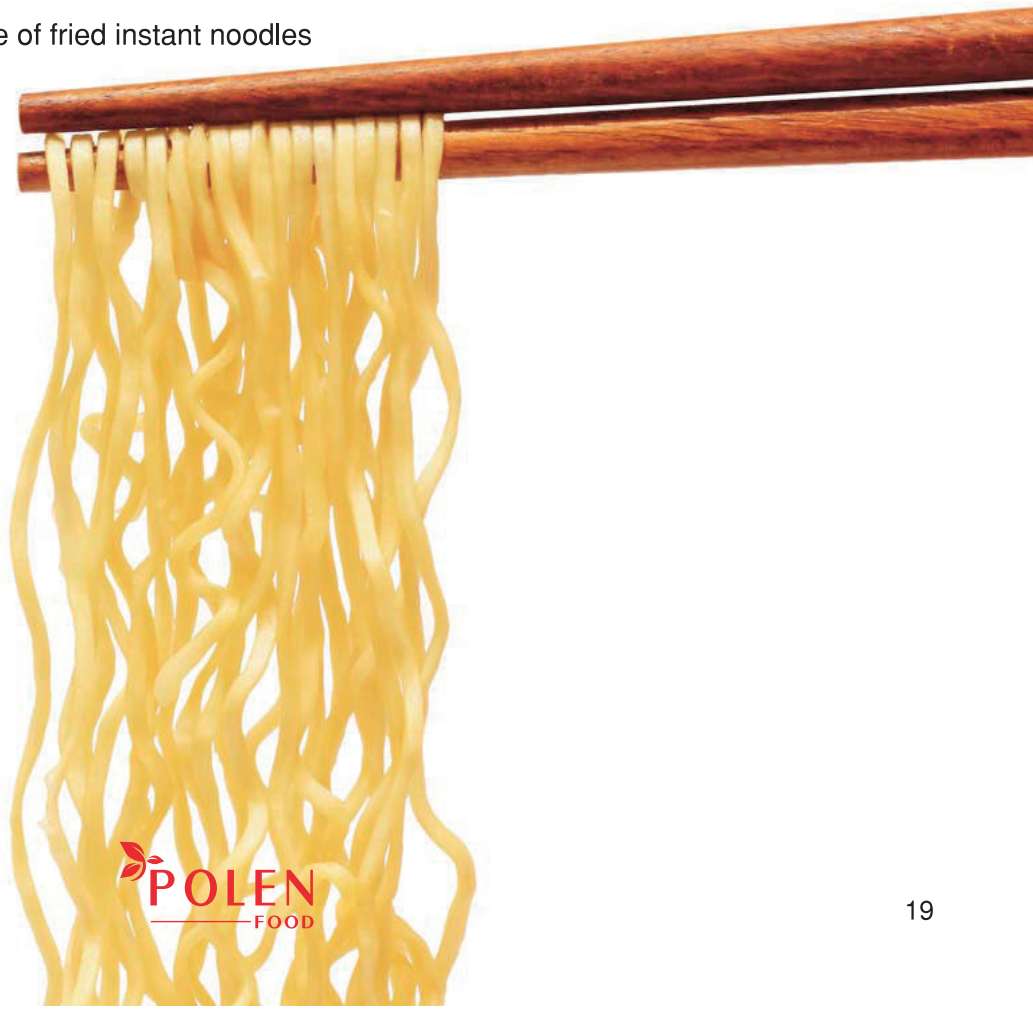


## Pasta & Noodle

**Exper Gold N** is a specific improver for noodle production. This product has been developed with the same approach of Exper Gold M. With the addition of this noodle improver our customers can in fact reduce the manufacturing cost by blending the hard wheat flour with the soft wheat one as well.

The advantages of Using Exper Gold N are:

- Increased color stability during sheeting,
- Improved firmness on the final product,
- Enhanced cooking tolerance
- Decreased drying time
- Extended cooking time
- Cutting down on oil uptake of fried instant noodles





## Biscuits & Crackers & Wafers

Biscuits	Improvement	Dosage
<b>Polenzyme P</b> <b>Exper Gold 4000 B</b> <b>Polenzyme P-B</b>	<ul style="list-style-type: none"> <li>● Cracking and crumbling prevention</li> <li>● Balanced good color</li> <li>● Homogeneous structure.</li> <li>● Regular edges</li> </ul>	100 - 150 g / 100 kg 100 - 150 g / 100 kg 30 - 60 g / 100 kg



Wafers	Improvement	Dosage
<b>Polenzyme W</b>	<ul style="list-style-type: none"> <li>● Viscosity reduction</li> <li>● Hydration rate improvement</li> <li>● Right color achievement</li> <li>● Homogeneous dough structure</li> <li>● Shelf life extension</li> </ul>	50 -100 g / 100 kg

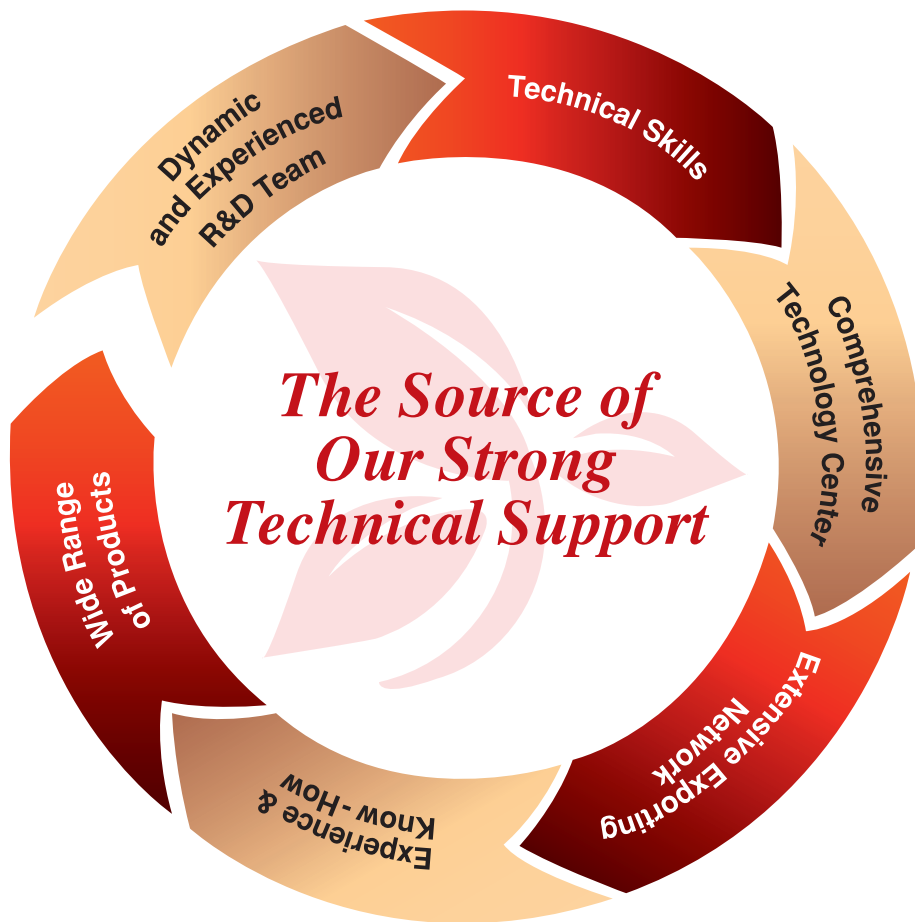


Crackers	Improvement	Dosage
<b>Polenzyme P</b>	<ul style="list-style-type: none"> <li>● Cracking prevention during baking</li> <li>● Right viscosity achievement</li> <li>● Balanced pore structure</li> <li>● Improved color</li> </ul>	100 -200 g / 100 kg



## Technical Support Team

Polen Food's technical team supports its customers with sample analysis, bread trials and application studies in the Istanbul's head quarter. When needed, Polen Food's technical team visits the millers for trials on the line as well.





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