LYVEN produces enzymes on an industrial scale by Solid State Fermentation on natural substrates (e.g. beet pulp, wheat bran...) using selected strains widely accepted in the food industry: Aspergillus, Bacillus, and Trichoderma...
# Baking Enzymes

## Biscuits and Snacks and Other Specialities

### Panlyve BR
- **Bacterial protease from Bacillus subtilis for biscuit making**
- Particularly adapted to biscuits and crackers manufacture, possible substitute for metabisulfite or cystein hydrochloride.
- **Dosages/100 kg flour**
  - 30 – 90 ppm for yeasted dough
  - 100 – 300 ppm for non-yeasted dough

### Lypaïne 48000
- **Plant protease in powder form**
- Favours a regular biscuits sizing.
- **Dosage**
  - 50 - 100 ppm

### Lypaïne 6500 L
- **Plant protease in stable liquid form.**
- Favours a regular biscuits sizing.
- **Dosage**
  - 400 - 700 ppm

### Panlyve MBSR
- **Cysteine optimized Plant protease**
- Meta Bi-Sulfite Replacer.
- **Dosage**
  - 300 - 700 ppm

### Panlyve TDR ou LDR: 3 – 10 ppm
- Economically attractive substitute of emulsifier (SSL, DATEM, mono / diglyceride).

### Panlyve TGM: 40 - 100 ppm
- Transglutaminase Increases wheat flour strength.

### Panlyve AG: 100 – 300 ppm
- Glucoamylase from Aspergillus niger with amylose side activities
- Converts damaged starch into glucose mainly. This latter is quickly transformed by baker’s yeast which speeds up CO₂ production necessary for dough leavening. This effect may be essential in frozen dough processes.

### Panlyve AG CONC: 20 – 50 ppm

### Panlyve BI: 30 – 90 ppm for yeasted dough
- **Bacterial protease from Bacillus subtilis for biscuit making**
- Particularly adapted to biscuits and crackers manufacture, possible substitute for metabisulfite or cystein hydrochloride.

### Panlyve AR100: 100 – 300 ppm for non-yeasted dough
- **Optimal combination of amylases and hemicellulases.**
- For a good water distribution in dough leading to less biscuits break (checking).
- **Dosage**
  - 50 – 100 g / 100 kg flour

### Panlyve UHT NEW Thermo-stable amylase
- Helps to monitor viscosity before extrusion.
- **Dosage**
  - 50 - 70 ppm in slurry

### Cellulyve TS NEW Thermo-stable hemi-cellulases
- Leads to improved crispiness thanks to a better WAI monitoring (WAI = Water Absorption Index)
- **Dosage**
  - 0.1- 0.5 % in slurry

### Panlyve AGH NEW Optimal combination of amylases and hemicellulases
- Favours pretzel dough development.
- **Dosage**
  - 30 - 70 ppm

### Panlyve AR super NEW Optimal combination of amylases and hemicellulases
- Enables to reach long shelf lives.
- **Dosage**
  - 50-100 g / 100 kg flour

### Panlyve W NEW Optimal combination of proteases and xylanases
- Its rapid action on dough viscosity favours the production of even and steady batches of wafers.
- **Dosage**
  - 30 - 150 ppm

### Panlyve W2X NEW Optimal combination of proteases and xylanases
- Its rapid action on dough viscosity favours the production of even and steady batches of wafers.
- **Dosage**
  - 15 - 75 ppm

### Panlyve H3 NEW Optimal combination of hemi-cellulases
- Helps to maintain crispiness for a longer period of time.
- **Dosage**
  - 80 - 120 ppm

### Inverlyve L2400
- Invertase.
- Enhances crust colour.
- **Dosage**
  - 10 - 50 ppm

### Panlyve BR
- Ready-to-use formulation
- Bromate substitute.
- **Dosage**
  - 100 – 300 ppm

### Panlyve TDR (GMO) or Panlyve LDR (non GMO)
- Soft breads
- Economically attractive substitute of emulsifier (SSL, DATEM, mono / diglyceride).

### Panlyve TGM
- Transglutaminase
- Increases wheat flour strength.
- **Dosage**
  - 40 - 100 ppm

### Panlyve AG
- Glucoamylase from Aspergillus niger with amylose side activities
- Converts damaged starch into glucose mainly. This latter is quickly transformed by baker’s yeast which speeds up CO₂ production necessary for dough leavening. This effect may be essential in frozen dough processes.

### Panlyve AG CONC
- 20 – 50 ppm

---

**To catalyse your ambition**
### Panlyve range

**Flour improvers - antistaling formulations**

<table>
<thead>
<tr>
<th>Composition</th>
<th>Properties</th>
<th>Dosages/100 kg flour</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Panlyve AMY</strong></td>
<td>Fungal amylases from <em>Aspergillus oryzae</em> without any side activity</td>
<td>Converts damaged starch into maltose mainly. The latter is consumed by baker’s yeast to produce CO₂ necessary for dough leavening.</td>
<td>Various concentrations available, allowing incorporations ranging from 5000 to 50000 SKB/100 kg flour.</td>
</tr>
<tr>
<td><strong>Panlyve HCB</strong></td>
<td>Fungal hemicellulases from <em>Aspergillus niger</em></td>
<td>Converts insoluble pentosans into soluble pentosans which favour gas retention of dough and improve gluten elasticity. The consequence is higher loaf volumes and improved crumb structure. All HBC products (HBC 5, 10 or 20) may be combined with Panlyve AMY to formulate a wide range of bread improvers.</td>
<td>Panlyve HCB 5: 60 – 200 ppm&lt;br&gt;Panlyve HCB 10: 30 – 100 ppm&lt;br&gt;Panlyve HCB 20: 15 – 50 ppm</td>
</tr>
<tr>
<td><strong>Panlyve XT</strong></td>
<td>Fungal hemicellulase from <em>Trichoderma longibrachiatum</em></td>
<td>Quickly converts insoluble pentosans into soluble pentosans in all kinds of cereals (wheat, rye,...). It is recommended for short bread making, multigrain bread (rye, oat,...) or biscuits making processes. Expected effects are dough’s viscosity lowering and improved water distribution in dough, which reduces risks of checking in biscuits.</td>
<td>50 – 150 ppm</td>
</tr>
<tr>
<td><strong>Panlyve AXN</strong></td>
<td>Bacterial hemicellulases from <em>Bacillus subtilis</em></td>
<td>Should be used in combination with Panlyve AMY and ascorbic acid (3 – 6 g/100 kg flour), and Panlyve HCB to obtain strong over spring.</td>
<td>20 – 40 ppm</td>
</tr>
<tr>
<td><strong>Panlyve GO</strong></td>
<td>Glucose oxidase from <em>Aspergillus niger</em></td>
<td>Active during mixing whereby oxygen is incorporated into the dough. SH groups of gluten proteins are oxidized into S-S bridges. Gluten network is then reinforced. Combined with most hemicellulases Panlyve GO enables to substitute usual redox mediators like ascorbic acid and bromate.</td>
<td>Panlyve GO: 50 – 150 ppm&lt;br&gt;Panlyve GO 10000: 10 – 20 ppm</td>
</tr>
<tr>
<td><strong>Panlyve NPB</strong></td>
<td>Ready-to-use combination of alpha-amylase and proteases from <em>Aspergillus oryzae</em></td>
<td>Impacts dough rheology as shown by Chopin alveograph traces modifications: P/L is lowered without any significant W reduction. Dough expansion is improved both during proofing and baking steps. To be applied successfully in pizza dough and pancakes.</td>
<td>5 – 50 ppm</td>
</tr>
<tr>
<td><strong>Panlyve NP conc</strong></td>
<td>Proteases concentrated neutral protease from <em>Aspergillus oryzae</em></td>
<td>Increases dough extensibility; particularly relevant for typical french baguette manufacture.</td>
<td>1 - 10 ppm</td>
</tr>
</tbody>
</table>

**ANTI-STALING FORMULATIONS**

<table>
<thead>
<tr>
<th>Composition</th>
<th>Properties</th>
<th>Dosages/100 kg flour</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Panlyve AR6</strong></td>
<td>Thermo-stable amylase based formulation.</td>
<td>Especially free of any proteolytic activity. Improves the softness and shelf-life of many baked goods.</td>
<td>20 – 50 ppm</td>
</tr>
<tr>
<td><strong>Panlyve AR Soft and AR Soft Plus</strong></td>
<td>Optimal combination of amylases</td>
<td>Bread softness fresh keeping.</td>
<td>Typically 15 – 21 days of shelf life when dosed at 120 – 150 ppm&lt;br&gt;At lower dosage (20 – 40 ppm), bread softness may be maintained for 4 – 6 days. Panlyve AR Soft Plus may be applied at 50% dosage of Panlyve AR Soft.</td>
</tr>
<tr>
<td><strong>Panlyve AR 100</strong></td>
<td>Optimal combination of amylases and hemicellulases (GMO free)</td>
<td>Enables to reach long shelf lives via increased water binding capacity of dough</td>
<td>50 – 150 g / 100 kg flour.</td>
</tr>
</tbody>
</table>
Baking enzymes from Lyven

Flour correction, process improvement, antistaling formulations...

Enzymes are useful tools at each transformation step from cereals to the final consumer

- **Diastasic power**
  amylase supplementation may be needed according to the quality of the crop.

- **Extensibility**
  mild gluten protein hydrolysis will increase elasticity which is essential for baguettes and pizza manufacture.

- **Oven spring**
  hemicellulases degrade non starch polysaccharides into fibres which optimize gas retention in dough.

- **Crispiness**
  combine action of several hemicellulases, prevents water absorption of baked goods.

- **Antistaling**
  optimized combination of amylases enable to prevent starch retrogradation responsible for staling.

- **Softness**
  combined action of several enzymes (lipases, amylases, hemicellulases,) stabilizes the starch-gluten network for an improved softness.