



Advanced Mixing Technologies

## Admix Processing Report

**Industry:** Food Processing  
**Application:** Mayonnaise Pre-Mix  
**Report #:** APR-FP-101

### OBJECTIVE

Prepare a stable oil-in-water emulsion using egg yolk or whole egg as the emulsifying agent, and vinegar as an acidifying ingredient or preservative. Highest possible viscosity insures a long shelf life.

### TYPICAL INGREDIENTS

- |                            |                                |
|----------------------------|--------------------------------|
| ✓ Whole Egg or Egg Yolk    | ✓ Lemon Juice                  |
| ✓ Vegetable or Soybean Oil | ✓ Potassium Sorbate            |
| ✓ Vinegar                  | ✓ Calcium Disodium EDTA        |
| ✓ Sugar                    | ✓ Xanthan Gum                  |
| ✓ Salt                     | ✓ Natural & Artificial Flavors |
| ✓ Modified Food Starch     | ✓ Beta Carotene                |



### GUIDELINES

- |   |   |
|---|---|
| ✓ Tip speeds of at least 50 ft/sec      | ✓ Minimum turnover rate of 5 turns/minute |
| ✓ Intensity in water of at least 25     | ✓ Typical mix time = 15 minutes           |
| ✓ Intensity at 5000 cps of 10 (minimum) |   |

In preparing a typical batch of mayonnaise pre-mix, egg is added to the appropriate water and vinegar volume while maintaining the proper temperature. After a smooth mixture is obtained, spices or gums are added, and oil is slowly added with high shear mixing until the emulsion begins to build. This starter batch is typically 1/4 to 1/2 of the design batch.



Once emulsion begins, the oil can be rapidly introduced along with the balance of vinegar and water. A uniform pre-mix should be obtained after 10-15 minutes, with final viscosity in the 5,000 to 25,000 cps range depending upon the formulation. A mayo pre-mix can also be done continuously with our specially designed sump tank, which provides for a 10-15 gallon "seed" batch (similar to above, but a much smaller volume). Once the emulsion is formed, a continuous flow of up to 65 gpm is possible.

### TESTING & CAUTIONS

The mayo pre-mix is typically pumped through a colloid mill to develop the final consistency, viscosity and stability desired. A drop in final viscosity of the finished mayonnaise after aging could be caused by a poor pre-mix, or from insufficient milling. It is critical not to break the emulsion once formed, and a viscosity of 200,000 cps of the final blend is typical. Consistency of temperature, mix time and intensity is important to insure uniformity of batches.

### ADMIX EQUIPMENT

- Rotosolver®** - for high shear emulsification of the seed batch (with or without Admix sump tank)
- Dynashear®** - for in-line high shear with recirculation for continuous flow processing
- Admixer™** - static mixers for in-line pre-blending of oil and vinegar prior to introduction to the seed batch



Contact Admix to schedule a plant audit, equipment test or to learn about an equipment trial or process assurance warranty.