APPLICATION NOTE

F&F-O-003-2014/A1

# Oxidation Stability of Mayonnaise

Reference: **EURACHEM GUIDELINES**

Tested with **VELP Scientifica OXITEST Oxidation Stability Reactor** (Code F30900248)


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# OXIDATION STABILITY OF MAYONNAISE

## Introduction

Mayonnaise is a white or pale yellow cream used as dressing for salads, fish or meat dishes. It is a stable emulsion of vegetable oil fractionated in water, with egg yolk as an emulsifier, and flavored with vinegar or lemon juice. Commercial product has a fat content ranging between 70-80%, however an handmade mayonnaise can reach 85%. The low-fat mayonnaise contains starches, cellulose gel or other similar ingredients to simulate the texture of normal mayonnaise.

## Oxidation Stability of Food

One of the most important quality alteration of food is due to oxygen absorption by the unsaturated fatty acids, free or esterified. The auto-oxidation of fats is a chemical reaction promoted by light, high temperatures, metal traces and, sometimes enzymes.
OXITEST can determine the oxidation stability of various sample types, without the need for preliminary fat separation.

## OXITEST Principle

OXITEST speeds up the oxidation process because of the two accelerating factors, temperature and oxygen pressure, according to the most common applications.
The instrument measures the absolute pressure change inside the two chambers, monitoring the oxygen uptake by reactive components in the sample and automatically generates an IP value.

**IP Definition**: IP stands for Induction Period and it is the time required to reach the starting point of oxidation, corresponding to either a level of detectable rancidity or a sudden change in the rate of oxidation. The longer the Induction Period, the higher the stability against oxidation over time.

## Sample

Mayonnaise
Fat labeled value: 70.0 g / 100 g

## Equipment and Chemicals

- Analytical balance, 3 decimals
- Silicone grease
- Oxygen, purity grade 5.0

## Sample Preparation

Keep the samples refrigerated during the storage.
Put 10 grams of homogeneous sample directly on the surface of the titanium sample holder, by using a spatula.
In each reaction chamber (A and B), place 1 sample holders (containing the sample) and 2 spacers.

## Analysis Procedure

Grease the O-rings with silicon grease and set them in their position. Close the chambers with the titanium covers and turn the discharge valves in open position. Set the following conditions on the OXISoft™ software:
**Temperature**: 90 °C
**Oxygen Pressure**: 6 bars

When the temperature set is reached inside the chambers, close the discharge valves and start loading oxygen.
Data acquisition is automatically started by the software.


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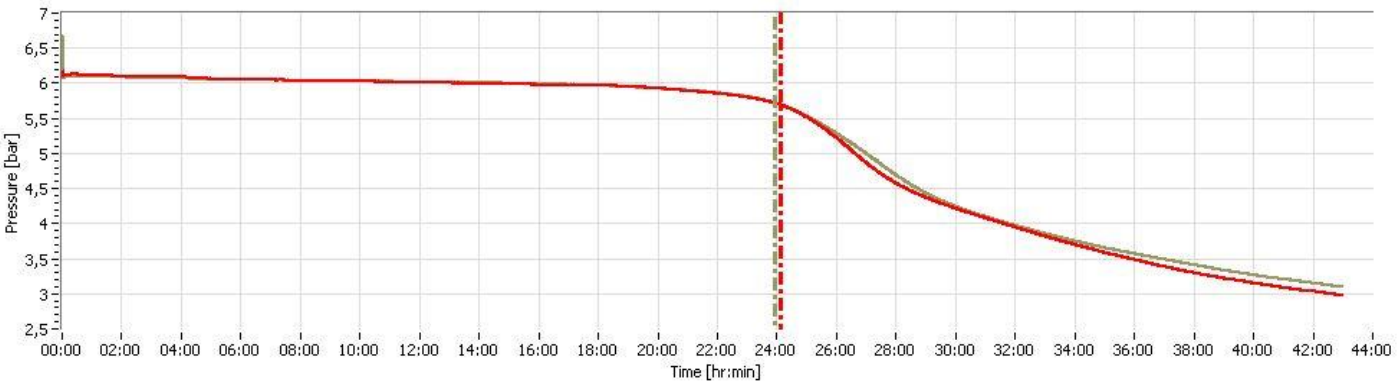
## Typical Results on Mayonnaise

The sample has been monitored twice.
At the end of the oxidation tests, the IP of every run is calculated by the software OXISoft™.

| Sample | Weight (g) | Set Point (bars) | Set Point (°C) | IP (hh:mm) | Line |
|---|---|---|---|---|---|
| Mayonnaise A | 10 | 6,0 | 90,0 | 24:07 | |
| Mayonnaise A | 10 | 6,0 | 90,0 | 23:56 | |




## Conclusion

OXITEST unit is able to investigate the oxidation stability of mayonnaise. The longer the Induction Period, the higher the stability against oxidation over time. Mayonnaise is an important ingredient in food industry and, knowing its stability, can help to choose it in making end product's formulation as base for many other chilled sauces and salad dressings.

Benefits of OXITEST are:

- Test is made directly on the whole sample
- No need for preliminary fat separation of the sample
- Resistant titanium chamber
- Time saving analysis, if compared to the traditional methods
- Especially designed for R&D, Product Development and Quality Control labs
- Many investigations available through the software OXISoft™:
  1. Repeatability test: a series of tests run on the same sample or standard to verify its IP period, to calculate accuracy and repeatability of the data
  2. Freshness test: to verify the quality of different lots, for example of the same raw material, and compare them
  3. Formula comparison: to identify the most stable formula of a finished product, under the same conditions
  4. Packaging comparison: for testing which packaging maintains the product in the freshest condition
  5. IP during ageing: to obtain a graph of the decrease of the product IP during the shelf-life period
  6. Estimated shelf life: to have a prediction of oxidation stability during the shelf life.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