

TECHNICAL BULLETIN

Internal Information

GENERAL INFORMATION

Specifications of Hydrogen Peroxide in TBA packaging machines

Machines affected: TBA packaging machines

BACKGROUND

This Technical Bulletin replace the previous issues 1,2 and 3 and recommends new specifications for Hydrogen Peroxide suitable for Tetra Brik Aseptic packaging machines.

The new specifications are in Table 1. Hydrogen peroxide must comply with the specifications at the delivery to the customer; dilution or any other chemical manipulation at the food plant is **explicitly excluded** from the specifications.

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Technical Specifications	
Parameter	Value
Chemical designation	H ₂ O ₂
Quality	Food Grade Aseptic Grade Packaging grade (*)
Concentration	35% ÷ 40% w/w
Appearance	Clear, Colourless
Density at 20°C (g/l)	1132 ÷ 1153
Stability (relative percentage of titration loss after 16 hours at 96°C)	≤5% (ISO method) (**)
Acidity	≤5 meq/l
Phosphate as PO ₄	≤100 ppm
Pyrophosphate	≤100 ppm
Phosphate as P	≤35 ppm
Chloride	< 1 ppm
Conductivity	> 130 μS/cm
Non volatile matter (at 105 °C)	≤150 ppm

Table 1

- (*) The peroxide producer guarantees that the product does not leave upon evaporation residues that are incompatible with food as quality or amount.
- (**) Furthermore the peroxide concentration must be stable during 120 hours production in machine (see appendix).

The new specifications of Business Unit Tetra Brik shall be fully implemented as of **October 1st, 2000**.

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REASONS

The new specification was introduced because of the new synthesis technologies of hydrogen peroxide developed in the last years.

These technologies allow a purer product.

The use of purer hydrogen peroxide, while retaining stability, will reduce residues on spray nozzles and on squee-gee rollers, thus reducing the need for maintenance operations on the filling machines.

In fact this is not a real change because most of products (Hydrogen Peroxide Food Grade) currently on the market have values of the listed parameters within the new Business Unit Tetra Brik specifications (even if the technical schedule normally attached to the product reports old Tetra Pak recommendations).

EXPLANATION OF ITEMS

In order to help our customers to choose the best product, here is some general information about the most important parameters, which are normally found in the technical schedules given with the product.

Stability This parameter gives an indication on stability of Hydrogen peroxide.

It allows also to distinguish Bath peroxide quality from Spray peroxide quality.

Bath peroxide quality has to be stable, to resist at high temperatures for long time without breakdown.

Spray peroxide quality must not be stable cause it has to decompose as fast as possible.

The stability is measured as ml of oxygen delivered by heating a sample of peroxide for 16 hours at 96°C. The more oxygen is delivered, the more the hydrogen peroxide is broken down.

Density: is strictly related to the concentration of peroxide and to the temperature.

The higher the density, the higher the concentration of peroxide is.

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The higher the temperature, the lower the density of peroxide is.
35% hydrogen peroxide at 20 °C has a density of 1.132 Kg/l
50% hydrogen peroxide at 20 °C has a density of 1.195 Kg/l
Check the density of hydrogen peroxide at temperatures different from 20 °C by using the nomogram on the OM

Orthophosphate or Pyrophosphate or Phosphor:

These parameters are related to a family of stabilizers inside the peroxide.

A peroxide quality with a low amount of Phosphate will give a low amount of deposits in the filling machine.

The higher these values, the higher the amount of residues on squee-gee rollers and in spray nozzles (in the same operating time of the machine).

However, with too low stabilized hydrogen peroxide it may be difficult to keep a proper hydrogen peroxide concentration; be sure that the peroxide quality under exam is formulated for bath-machines and not for spray-machines. Spray-machines need less stable hydrogen peroxide.

The new limits fixed by Business Unit Tetra Brik for phosphor-based stabilizers are:

- Phosphor: • 35 ppm
- Phosphate: • 100 ppm
- Pyrophosphate: • 100 ppm

Non volatile matter or Residue on Evaporation:

This parameter shows the total content of stabilizers and impurities after complete evaporation of a known quantity of peroxide.

The higher this value, the higher the amount of residues on squee-gee rollers and in spray nozzles (in the same operating time of the machine).

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IMPORTANT: If it is needed to evaluate the quality of a product from the analysis of the technical schedule it is very important to distinguish between **Specifications** and **Typical values**:

Specifications: These values are guaranteed by the producer of Hydrogen Peroxide.

This means that the parameters of the Hydrogen Peroxide **must correspond** to the technical specification written on technical schedule.

Typical values: These values are generally calculated as average values over a certain period of production of the plant.

In practice these values are not guaranteed: this means that the producer is not to be held liable in case of non-compliance of the product with the technical schedule.

Should you have any doubt with regard to the matter, please contact:

**Giacomo Tarzia at Business Unit Tetra Brik R&D
Via Delfini 1, 41100 Modena, ITALY
Tel. +39 59 898632; Fax +39 59 898370**

The use of hydrogen peroxide qualities not complying with the specifications of Table 1 is in any case under full responsibility of the user.

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SUPPORT BY TETRA BRIK TO MARKET COMPANIES

Business Unit Tetra Brik, as Product Company, is responsible for its products (among which packaging machines) and for the chemicals suggested.

Business Unit Tetra Brik guarantees its complete availability and willingness to help Market Companies in case their customers find problems possibly related to the quality of peroxide.

Business Unit Tetra Brik will help by means of troubleshooting and analysis.

If some customer complains with a Market Company about peroxide, the Market Company may:

- A call the responsible for chemicals on use on Tetra Brik Aseptic machines **and/or**
- B send a sample of the peroxide for analysis. Together with the sample **always** send the following information. **Samples which arrive without these information, will not be analysed.**

INFORMATION SCHEDULE

1. Market Company (address, telephone and fax number, contact person)
2. Hydrogen Peroxide supplier
3. Hydrogen Peroxide producer
4. Technical schedule of Peroxide
5. Reason for the choice
6. Frequency of Peroxide concentration control during production
7. Frequency of maintenance of spray nozzles and squee-gee rollers
8. Frequency of the total change of Peroxide in the tank (hours and production hours)
9. Filled product
10. Type of packaging material
11. Type of problem
12. Frequency of problem
13. Date of the last Peroxide purchase
14. Peroxide drum size
15. Information about Peroxide storage (Temperature, Bulk dimensions and material, Exposure...)
16. Peroxide pouring system

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17. Model and version of Packaging machine
18. Type(s) and P-Order(s) of packaging material

If there is **other** information which could be relevant, please attach it.

Always call before shipping a sample so it will be possible to manage at the best for the analysis.

PEROXIDE SAMPLING AND SHIPPING INSTRUCTIONS

- Take a 1-litre sample in two 500ml dark PE bottle (polyethylene bottle).
- Important: Always take the sample from a new drum and carefully seal the bottle.
- Place the bottles in a plastic envelope.
- Take a plywood box and fill it with 3 litres of absorbing material, which must not be combustible.
- Place the bottles upright in the box and fill it up with chips to keep the bottles steady.
- Place warnings for “CORROSIVE” and “OXIDIZING” on the plywood box and marks for “THIS SIDE UP”.
- You have to write on the box that it is:
Hydrogen Peroxide aqueous solution 35% w/w, UN N° 2014.
- It is possible to send Hydrogen Peroxide by air, but it must be sent as dangerous goods according to **UN N° 2014 (Class 5.1; Sub. Risk 8; Packaging group II; EPG 5EI).**
- You also have to write a proforma invoice describing what it is and that it is for the purpose of quality test with no commercial value.
- Do not forget the schedule with all information

Send to:

Giacomo Tarzia
c/o Business Unit Tetra Brik
Chemical Laboratory
Via Delfini, 1
41100 Modena
Italy

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SUPPORT BY MARKET COMPANIES TO TETRA BRIK

Market companies are welcome to help Business Unit Tetra Brik by providing useful information such as:

- New producer of hydrogen peroxide which asks for contacts
- New products to be tested on TBA machines
- Information on Occupational Exposure Limits to Hydrogen Peroxide fixed from the law in their country
- Information on legislation concerning Hydrogen Peroxide: storage, residues in food beverages,...

APPENDIX

Recently even peroxide qualities used satisfactorily for several years by our customer showed a worsening in behaviour on Tetra Brik Aseptic machines (the peroxide concentration drops after 2 or 3 days production while before the same peroxide could be used for at least a week). That seems to be related to the extreme reduction of stabilisers. Furthermore, on the market Hydrogen Peroxide grades can be found, which comply with specifications, but show a poor behaviour on the machines (i.e. Hydrogen Peroxide for spraying-based aseptic packaging machines).

The chemical specification of Hydrogen Peroxide may not be sufficient to guarantee the behaviour on Tetra Brik machines.

Tetra Brik is however interested in Hydrogen Peroxide only in relation to its behaviour on the filling machines.

In that sense, all Hydrogen Peroxide qualities used on Tetra Brik Systems **must comply** with the specifications fixed in the above Technical Bulletin **and** have an acceptable behaviour with all models of Tetra Brik machines: the peroxide concentration **must not** drop during the first 120 hours of production.

It is thus recommendable, when using Hydrogen Peroxide quality intended for use on Tetra Brik Aseptic machine, to verify that:

- the concentration of peroxide in the tank does not drop below 30% w/w during 1 week (120 hours of production on 3 shifts).
- the maintenance to be performed on the machine (cleaning of the spraying nozzles and of the rollers after the bath) is not increased in frequency.
- no physico-chemical properties of the peroxide prevent proper running of the machine (e.g. the peroxide conductivity is too low and the level probes can not work properly).

Moreover when using an hydrogen peroxide on Tetra Brik Aseptic machines:

- it must be declared by the manufacturer as food-grade quality

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- the peroxide manufacturer ensures that it complies with international rules and regulations for the intended use (F.C.C. or European Pharmacopoeia) and gives to Business Unit Tetra Brik all requested documentation (Technical Schedule, Safety Sheet, Labels)
- the peroxide manufacturer ensures that the product will not damage or cause exceptional wear on Tetra Brik machines or equipment.

Business Unit Tetra Brik takes the opportunity to remind that following manufacturers have products that can fulfil the above requirements; you can find addresses and telephone numbers on your local directory.

SOLVAY

DEGUSSA-HÜLS

ELF ATOCHEM / ATOFINA

F.M.C.

AKZO / EKA NOBEL

KEMIRA

AUSIMONT