ALUMINIUM AND ALUMINIUM ALLOYS

- SHEET No.1: COATED ALUMINIUM – SINGLE USE LONG DURATION CONTACT – (PACKAGING)

1. Scope

Objects in aluminium or aluminium alloys coated with an organic coating intended for single use and long duration contact. This section deals with packaging, the main examples are:

- Cans for sterilized preserved foods;
- Drink cans;
- Pressurized cans;
- Tubes;
- Dishes.
- Crown caps;
- Pharmacological blister ;
- Lacquered caps for milk products;
- Thin sheet of process cheese;

2. Definitions of criteria for aptitude to food contact

2.1. TEXTS

2.1.1. Regulatory texts

- Coatings:
  - *Order of 2nd April 2003* relating to the use of some epoxy derivatives in materials and objects put in or intended to be in contact with foodstuffs (BADGE, BFDGE, NOGE);
  - *Order of 30th January 1984* relating to materials and objects containing vinyl chloride monomer intended to be in contact with foodstuffs and food and drink products;
  - *Order of 30th January 1984* relating to official analysis methods relating to the determination of the content of vinyl chloride monomer in materials and objects intended to be in contact with foodstuffs, food and drink products and the determination of vinyl chloride transferred by the materials and objects to the foodstuffs, food and drink products put in contact with them;
  - Other texts brought together in brochure No. 1227 of the Official Journal of the French Government.
- Aluminium:
  - *Order of 27 August 1987* relating to materials and objects in aluminium or aluminium alloys in contact with foodstuffs and food and drink products.

2.1.2. Texts to be used provisionally while waiting for regulations on organic coatings for metals.

- *Order of 2nd January, 2003* relating to materials and objects in plastic put in or intended to be in contact with foodstuffs, food products and drinks.
- Resolution of the Council of Europe AP (96) 5 of 02/10/1996 on surface coating intended to come into contact with foodstuffs.
- Information notice No 2003-27 from the DGCCRF relating to additives of plastic materials intended to be in contact with foods.
- Texts relating to coatings and lacquers brought together in brochure 1227 of the Official Journal of the French Government.

2.2. CRITERIA TO BE USED

2.2.1 Coating only

- The coating supplier must ensure that the monomers and additives used are included in the positive list of constituents for plastic materials (order of 2 January 2003, Information notice No.2003-37 and brochure 1227 from the Official Journal of the French Government) or in the list in resolution AP (96) 5 of the Council of Europe relating to surface coating .

  Among the substances mentionned in resolution AP(96) 5, the substances in of lists 1-1 & 1-2 have been evaluated by a scientific authority and their use does not appear to cause problems taking account this evaluation. For a period of 5 years from the date of adoption of this sheet, the substances in lists 2-1 and 2-2 can be used if they have been authorised by a member state or by the FDA. This period should allow the industries to produce evidence relating to the safety of use for these substances.
- When the material or metal is varnished, manufacturers shall check that overall migration conforms to the limits laid down in the order of 2 January 2003 (Directive 2002/72/CE) according to the measurement regulations mentionned below.
- When a substance is subject to restrictions of use (particularly specific migration limit), the *decree of 8 July 1992* (cf. articles 3 & 4) assumes that professionals must check compliance with this limit. This verification can be done in several ways: by analysis (specific migration test), by calculation based on the residual quantity of the substance in the material or from the overall migration.

2.2.2 Aluminium

Chemical composition according to the *order of 27/08/1987.*

2.2.3. Finished product

Overall and specific migrations: cf. 2.2.1.

3. Acceptability limits

- Overall migration limit for organic coverings flaid down in the *order dated 2 January 2003* (Art. 2), i.e. 10 mg/dm^2 or 60 mg/kg of food depending on the geometry of the material or the object. A material or an object whose migration level exceeds the overall migration limit by an amount not exceeding the analytical tolerance defined below will be considered as conform to the order (art.8 and chapter VI of the annex of the order):
  - 20 mg/kg or 3 mg/dm^3 in migration tests using rectified olive oil or its substitutes;
  - 12 mg/kg or 2 mg/dm^3 in migration tests using other simulators laid down in directives 82/711/CEE and 85/572/CEE.
- Specific migration limit: Cf. 2.2.1 In the case of epoxy derivatives (BADGE BFDGE, NOGE), the limits are specified in the order of 2 April 2003. Aluminium must satisfy the purity criteria laid down in the order of 27th August 1987

:

- Fe + Si < 1% ;
- Ti ≤ 0.15 % ;
- Each of the following elements: Cr, Zn, Cu, Mn, Mg, Ni, Sn ≤ 0.10 %;
- Each of the following elements: Pb, Ti, Be, and each of the impurities: ≤ 0.05 % ;
- The copper content may reach 0.20 % if those of chromium and manganese contents are down to 0.05 %.

The aluminium alloy must comply with the following composition limits:

- Si ≤ 13.5 %
- Mg ≤ 11%
- Mn ≤ 4%
- Ni ≤ 3%
- Fe ≤ 2%
- Cu ≤ 0.6%
- Sb ≤ 0.4%
- Cr ≤ 0.35%
- Ti ≤ 0.3%
- Zr ≤ 0.3%
- Zn ≤ 0.25%
- Sr ≤ 0.2%
- Sn ≤ 0.10%
- As, Ta, Be, Ti, Pb, and each of the other present elements : ≤ 0.05%, total ≤ 0.15%.

4 Rules to check the criteria defined in paragraph 2.

4.1 COATING ONLY

The coating manufacturer supplies the ready-to-use packaging manufacturer with :

a) A certificate testifying that the composition, overall migration and, if necessary, specific migrations, comply with the tests mentionned above;

b) An analysis report indicating the results of inertia tests (overall migration) carried out on the coating put on inert support (stainless steel or glass) with simulators chosen according to the use, according to directive 82/711/CEE (lastly amended by directive 97/48/CEE), and 85/572/CEE.

2.1 ALUMINIUM ONLY

The aluminium manufacturer must supply the packaging manufacturer with:

a) A evidence of conformity with the order of 27/08/1987.

b) An analysis report of the chemical composition which must comply with the order of 27/08/1987.

4.3. FINISHED PRODUCT

a) Coating Inertia : inertia test (overall and specific migration) to be carried out on the coating of the ready-to-use packaging.

- Test conditions according to directives 82/711/CEE (lastly amended by directive 97/48/CEE) and 85/572/CEE:
  - Temperature and contact duration
  - Simulator liquids chosen according to the use:

:

Foodstuff	Simulator Liquid
Aqueous food (pH>4.5)	Distilled water or water of equivalent quality
Acid food (pH≤4.5)	Ethanol at 10% (v/v).
Alcoholic food	Ethanol at 10% (v/v). This concentration should be adapted according to the alcoholic content of the food if it exceeds 10% (v/v).
Fatty food	Oil or substitute simulator liquid
Dry food	No migration test

Methods to be used for overall migration according to standards in series NF EN 1186, XP CEN/TS 14235 of April 2003 (polymer coatings on metal support).

b) Inertia of aluminium: the manufacturer is responsible for testing the ready-to-use product. The evaluation carried out through long duration tests according to procedures different from a manufacturer to another .