

GLASS – CRYSTAL – CERAMICS – VITREOUS CERAMIC ENAMELLED OBJECTS

1. Scope

This section deals with materials made up of glass, crystal, ceramic, glass ceramic and enamelled objects and when they are finished products, are intended to be in direct contact with foodstuffs, food and drink products.

"**glass**" means a non-metallic inorganic material obtained by complete melting of raw materials at high temperatures, into a homogeneous liquid which cools down afterwards into a rigid state essentially without crystallisation. Glass materials can be combined together and/or decorated.

"**ceramic**" means a mixture of inorganic materials with a generally high clay and silicate content to which small quantities organic materials are added. Ceramic objects are firstly formed, and the shape obtained is fixed permanently by cooking. They can be glazed, enamelled and/or decorated.

"glass **ceramic**" means an inorganic non-metallic material obtained by melting of mainly mineral raw materials at high temperature, the homogeneous liquid being cooled down progressively after contitution then crystallised to a certain degree by heat treatment. Glass ceramic materials may be combined together and/or decorated.

"**crystal**" means inorganic non-metallic materials as described in directive 69-493 of 15/12/69.

"**enamelled objects**" means objects having a cast lining in one or more layers resulting from the melting or sintering of non-organic constituents.

2. Definitions of performance criteria for food contact

2.1 Texts to be used

2.1.1 Regulatory texts

- **Order of 07/11/85 (Directive 84-500 of 15/10/84):** limitation of quantities of lead and cadmium extractable from ceramic objects

2.1.2 Other texts

- **Standard ISO 6486/1 and 2:** ceramic articles in contact with food. Emission of lead and cadmium. Test methods, admissible limits (06/01/1981).
- **Standard ISO 7086/1:** articles in glass and vitreous ceramic in contact with foods. Emission of lead and cadmium. Test methods, admissible limits (15/11/1982).
- **Standard NF EN 1388-1 and 2** (classification index D 25 501): materials and articles in contact with foodstuffs, silicate surface. Determination of the release of lead and cadmium (January 96).
- **B.O.C.C.R.F. Notification of 13/02/96:** transfer of chromium 6 from materials in contact with foodstuffs.

2.2 Criteria to be used

At the product or material stage, the manufacturer or the user shall check that the inertia criteria are met, i.e.:

- as far as ceramics are concerned, migration of lead and cadmium,
- as far as glass, crystal and glass ceramic are concerned, migration of lead and cadmium,
- as far as all enamelled or decorated objects are concerned (except ceramics), the migration of lead, cadmium and hexavalent chromium.

For internal surface treatments, they shall be carried out with products suitable to be in contact with food.

3. Acceptability limits

3.1 Ceramics and enamelled or decorated ceramics

	Lead	Cadmium
<p>Category 1: Objects which can be filled and objects which cannot be filled whose internal depth measured between the lowest point and the horizontal plane passing through the upper edge is less than or equal to 25mm.</p> <p>Limits in mg/dm²</p>	0.8	0.07
<p>Category 2: Fillable objects other than:</p> <ul style="list-style-type: none"> - Packaging or storage containers with a capacity up to 3 litres; - Cooking utensils. <p>Limits in mg/l</p>	4.0	0.3
<p>Category 3: Cooking utensils; packaging and storage containers with a capacity up to 3 litres.</p> <p>Limits in mg/l</p>	1,5	0,1
<p>Oral contact (for all objects decorated externally over 20mm in width measured from the external edge).</p> <p>Limits in mg/article</p>	2	0.2

3.2 Glass – crystal – glass ceramic – enamelled objects

	Lead	Cadmium
<p>Category 1: Objects which can be filled and objects which cannot be filled (including cooking utensils) whose internal depth measured between the lowest point and the horizontal plane passing through the upper edge is less than or equal to 25mm.</p> <p>Limits in mg/dm²</p>	0.8	0.07
<p>Category 2: Fillable objects other than:</p> <ul style="list-style-type: none"> - Packaging or storage containers with a capacity up to 3 litres; - Cooking utensils. <p>Limits in mg/l</p>	4.0	0.3
<p>Category 3: Cooking utensils (other than those in category 1) ; packaging and storage containers with a capacity up to 3 litres.</p> <p>Limits in mg/l</p>	1,5	0,1
<p>Oral contact (relating to objects decorated externally over a width of 20mm measured from the external edge).</p> <p>Limits in mg/article</p>	2	0.2

* only concerns enamelled objects, whatever the support medium, other than ceramic, in direct contact with foodstuffs, food products and drinks.

4. Rules to check the criteria defined in paragraph 2.

4-1 Test conditions

- Washing of the samples according to the standards applicable to the material under consideration. - Simulator liquid: Acetic acid solution at 4 %.
- Temperature: 22°C ± 2°C.
- Contact time: 24 hours ± 30 mins.
- Contact conditions:
 - Categories 1-2-3: Fill up to 1mm to the overflowing point,
 - Carafes: Fill the carafe up to the overflowing point and insert softly the closer letting the excess acetic acid run away.
 - Oral contact: Immerse over 20 mm in height, measured all round the rim, of the upper part of a drinking container.

4-2 Test methods

- Determination of the specific migration of lead and cadmium by atomic absorption spectrophotometry or any other equivalent method with a detection limit at least equal to one tenth of the limits indicated in 3.1 and 3.2.
- Determination of chromium 6 by diphenylcarbazide colorimetry according to NF T 90 043 or any other equivalent method having (if possible) a detection limit at least equal to one tenth of the limits indicated in 3.2.

4-3 Results

For a tested object, when the migrations of lead, cadmium, chromium 6 or one of the three exceed the limits indicated in paragraph 3, but do not exceed these limits by more than 50%, the object is nevertheless considered conform if the quantities of lead, cadmium and chromium 6 from at least three other objects, similar in shape, dimensions, decoration and lacquer, and subjected to a test carried out in the conditions laid down in paragraph 4, do not exceed, on average, the limits fixed and if, for each of these objects, the limits are not exceeded by more than 50%.