



**OrganiTrust<sup>®</sup>**

**OrganiTrust<sup>®</sup> Glass Food Contact  
Material Products and Associated  
Articles Standard**

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## **1. Principles of circular economy for glass food contact materials**

1.1. OrganiTrust<sup>®</sup> supports the use of glass as a food contact material (FCM) wherever possible; glass is considered the gold standard of FCMs as it is a highly pure material, safe, non-toxic and sustainable.

1.2. The inherent stability, durability and inertness of glass make it an excellent barrier, as it preserves the integrity of the contents and does not chemically react with or decompose into the food goods.

1.3. The ability for glass to remain impermeable to oxygen results in the preservation of product freshness, reducing the need for food additives or preservatives.

1.4. Glass can be endlessly reused as an FCM within its life cycle, regardless of the food or drink that it is used to contain (e.g., acidic foods or alcoholic beverages), the temperature conditions in which it is used or the number of times it has been reheated.

1.5. Where glass is pure and contains no harmful contaminants, it can be effectively recycled and reformed into new glass FCMs, allowing full product sustainability.

## **2. Glass food contact material statutory regulations**

### **2.1. Safety**

2.1.1. Both the European Food Standards Agency and the Food and Drug Administration (FDA) have long determined that glass is inert under a broad range of conditions, and therefore accepted for use in contact with foods and beverages as a packaging material under all circumstances.

2.1.2. Glass is the only widely used food packaging material granted the FDA status of 'generally recognized as safe'.

2.1.3. The European Union (EU) Framework Regulation (EC) No 1935/2004 on materials and articles intended to come into contact with food regulates the use of glass as a food packaging material, stating that 'any material or article intended to come into contact with food should be sufficiently inert to preclude substances to being transferred to food in quantities large enough to endanger human health or to bring about an unacceptable change in the composition or deterioration in its organoleptic properties'.

2.1.4. The only specific EU measure in place is the European Standard EN 1388-2, which states that no raw materials containing lead and cadmium are permitted for use in the manufacture of soda-lime-silica glass or borosilicate glass.

2.1.5. Polymer-based gaskets used to seal glass packagings are regulated under Commission Regulation (EC) No 10/2011 on plastic materials and articles intended to come into contact with food (Art. 2).

2.1.6. With regards to European Council Directive 84/500/EEC, glass manufacturers may voluntarily adhere to the food contact rules established for ceramics and should include this information in the certification application pack.

## 2.2. Sustainability

2.2.1. In the EU and USA, regulations are in place to control the disposal of glass containing heavy metals.

2.2.2. The Resource Conservation and Recovery Act (RCRA) in the USA limits the presence of mercury, lead, cadmium and hexavalent chromium in packaging materials, ensuring these materials are not incinerated or disposed of in landfills as they would, over time, release compounds that may be harmful to the environment. However, these regulations do not refer to glass FCMs where heavy metals are 'incidentally present' (i.e., are unintended or undesired ingredients in the packaging or its components), so as to not limit the use of recycled materials.

2.2.3. Similarly, EU Directive 94/62/EC on packaging and packaging waste restricts the same four heavy metals to a total concentration of 100 ppm by weight, with the ultimate goal of minimising emissions occurring as a result of incineration or disposal in a landfill.

2.2.4. In 2006, the EU extended an indefinite exemption for compliance of glass FCMs with heavy metal concentration limitations, and under Council Decision 2003/33/EC, glass is accepted at landfills without the need for testing of potential hazards.

## 3. Approved glass types

### 3.1. Glass types

3.1.1. Non-alkaline-earth borosilicate glass:

- a. Primary components:
  - i.  $B_2O_3$  (maximum  $B_2O_3$  content of up to 15% is permissible)
  - ii.  $SiO_2$
  - iii. Sodium oxide
- b. An amorphous, non-crystalline, insoluble solid with excellent thermal and mechanical strength, representing the least reactive commercial glass material with a highly resistant composition and therefore the least leaching characteristics.
- c. Non-alkaline-earth borosilicate glass is approved for use by OrganiTrust® as an FCM for direct and indirect contact, providing that durability and thermal resistance are confirmed to be adequate for FCM application.
- d. No hazards are listed for non-alkaline-earth borosilicate glass according to Globally Harmonized System of Classification and Labeling of Chemicals (GHS).
- e. High-borate borosilicate glass, which can contain 15–25%  $B_2O_3$ , with alkaline-earth metals and  $Al_2O_3$  as additional components, is not approved for use as an FCM by OrganiTrust®.
- f. Alkaline-earth-containing borosilicate glasses, which can contain up to 5% alkaline-earth metals and alumina ( $Al_2O_3$ ), are not approved for use as an FCM by OrganiTrust®.

3.1.2. Dealkalised soda-lime-silica glass:

- a. Primary components:
  - i.  $Na_2O$

- ii.  $\text{SiO}_2$
- iii.  $\text{CaO}$
- b. An amorphous, non-crystalline, insoluble solid formed from treated soda-lime-silica glass, with good thermal and mechanical strength and with dealcalised internal surfaces to obtain good chemical resistance and to minimise leaching.
- c. Approved for use by OrganiTrust<sup>®</sup> as an FCM for direct and indirect contact.
- d. Reduced thermal resistance compared to borosilicate glass, therefore not approved for use by OrganiTrust<sup>®</sup> as an FCM for products where heating is likely or possible.
- e. No hazards are listed for dealcalized soda-lime-silica glass according to GHS.

### 3.1.3. Untreated soda-lime-silica glass:

- a. Primary components:
  - i.  $\text{Na}_2\text{O}$
  - ii.  $\text{SiO}_2$
  - iii.  $\text{CaO}$
- b. An amorphous, non-crystalline, insoluble solid formed from untreated soda-lime-silica glass, with good thermal and mechanical strength.
- c. Approved for use by OrganiTrust<sup>®</sup> as an FCM for direct and indirect contact.
- d. Reduced thermal resistance as compared to borosilicate glass, therefore not approved by OrganiTrust<sup>®</sup> for use as an FCM for products where heating is likely or possible.
- f. No hazards are listed for untreated soda-lime-silica glass according to GHS.

## 3.2. Recyclability

3.2.1. Glass FCMs must be marked on the material itself to confirm it is fit for food contact either with the wording 'FIT FOR FOOD' or the following symbol:



3.2.2. Due to the energy- and cost-intensive processes associated with glass production, OrganiTrust<sup>®</sup> glass FCMs must be either made from recycled glass FCMs or re-use the reverse vended glass FCMs, where OrganiTrust<sup>®</sup> quality assured reverse vending schemes are in operation.

### **3.3. Biodegradability**

3.3.1. Glass packaging products are non-biodegradable, as they do not disintegrate upon disposal.

3.3.2. Processors must take active measures to avoid the addition of glass FCMs to the landfill upon waste disposal, due to its lack of biodegradability, with instructions for reuse, return or recycling included on the product labelling.

3.3.3. No additives or components are allowed that may cause environmental impact due to leaching if the product is disposed in landfills.

## **4. Usage restrictions**

### **4.1. Temperature requirements**

4.1.1. OrganiTrust<sup>®</sup> approves the use of borosilicate glass FCMs for products where high temperatures are required, with testing required to ensure stability up to 300°C and stability with thermal shock up to 200°C.

4.1.2. OrganiTrust<sup>®</sup> approves the use of dealkalised soda-lime-silica and untreated soda-lime-silica glass FCMs only for products not intended to be heated above ambient temperatures, with testing required to ensure stability up to 250°C and stability with thermal shock up to 100°C.

4.1.3. Untreated soda-lime-silica glass is not suitable for autoclaved products, as the autoclaving process will accelerate the corrosion reaction of the glass; dry heat sterilisation should be utilized instead.

### **4.2. Food type**

4.2.1. Borosilicate glass FCMs are approved for use by OrganiTrust<sup>®</sup> for all food goods types, without restriction.

4.2.2. Dealkalised soda-lime-silica and untreated soda-lime-silica glass are not approved for any extremely acidic food goods with a pH below 4, as these may react with alkaline residues on internal glass surfaces and cause increased leaching due to corrosion.

4.2.3. Any intended use of soda-lime-silica glassware for food goods below pH 7 must have migration testing performed to confirm acid tolerance.

## **5. Hazard and risk assessment**

### **5.1. Migration test**

5.1.1. Critical migration tests required for all OrganiTrust<sup>®</sup> certified glass FCMs include:

- a. overall migration testing of final products to ensure the migration of substances from any component of the FCM is below the Organics Council® approved migration limits;
- b. migration testing to ensure no harmful substances migrate from closures, caps, stoppers, outer coatings or other additional components;
- c. microwave heating migration tests must be performed for any glass FCM product which may realistically be exposed to microwaves by consumers, even though not recommended for microwave heating use, such as cookware and food storage containers;
- d. repeated-use and long-term storage migration tests are required for all non-single-use glass FCMs, with specific migration testing repeated following the simulation of intended usage conditions to ensure complete safety for the intended purpose, including but not limited to:
  - i. dishwasher safety;
  - ii. long-term food storage safety;
  - iii. freezer storage safety;
  - iv. repeated wash and reuse safety;
  - v. or any other use as relevant.

#### 5.1.2. Specific glass FCM migration test method guidance:

5.1.2.1. NIAS migration testing is required. According to ISO 7086-1:2000, the test method for this requires contact with simulant B at 22°C for twenty-four hours.

5.1.2.2. Testing of overall migration of metals should be performed with the full spectrum of food simulants, with a minimum of the following simulants:

- a. simulant A;
- b. simulant B;
- c. simulant D1;
- d. simulant C2;
- e. sterilization migration using distilled water at 120°C for two hours.

5.1.2.3. In case of repeated use, the contact procedure has to be performed three times in total (with two intermediate rinses), and the result of the third contact has to be compliant. The procedure must be conducted on four samples and for all potential contaminants.

#### 5.1.3. OrganiTrust® approved standards for assessment of overall migration from glass FCMs:

- a. ISO 6486-1:1999: ceramic ware, glass-ceramic ware and glass dinnerware in contact with food; release of lead and cadmium (Part 1: Test method);
- b. ISO 7086: Glass hollowware in contact with food; release of lead and cadmium;
- c. BS EN 1388: materials and articles in contact with foodstuffs; silicate surfaces (Part 1: Ceramic; Part 2: Non ceramic);

- d. CEN/TS 12983-2:2005: domestic cookware for use on top of a stove, cooker or hob (Part 2: Further general requirements and specific requirements for ceramic, glass and glass ceramic cookware).

## **5.2. Chemical resistance test**

- a. DIN ISO 719: Hydrolytic resistance of glass grains at 98°C; method of test and classification;
- b. DIN ISO 720: Hydrolytic resistance of glass grains at 121°C; method of test and classification;
- c. DIN 52322: Glass resistance to alkali attack by a boiling aqueous solution of mixed alkali; method of test and classification;
- d. DIN 12116: Glass resistance to acid attack by a boiling aqueous solution of hydrochloric acid; method of test and classification.

## **6. Specific product requirements**

### **6.1. Multi-material products**

6.1.1. Glass components of multi-material FCMs must meet the requirements established in this Standard, with all glass components, whether in direct contact with food goods or not, meeting the requirements established in this Standard.

6.1.2. Fixed coatings and layers are considered secondary, non-direct contact FCMs and are permitted to provide lubrication during production, as well as to increase and preserve the strength of glass FCMs. Manufacturers must confirm that any materials applied as a secondary glass FCM layer are OrganiTrust<sup>®</sup> approved and contain only substances approved by the Organics Council<sup>®</sup>. Conformity testing must confirm that the material is fit for purpose.

6.1.3. Removable outer labels and wrapping for glass FCMs are classed as tertiary non-direct contact FCMs and may be made from any OrganiTrust<sup>®</sup> approved material type, providing that conformity testing confirms the material is fit for purpose and conforms to the OrganiTrust<sup>®</sup> usage and disposal requirements.

6.1.4. Adhesives, sealants, inks or any other accessory or associated component of glass FCMs must meet the requirements established in this Standard, using only substances included in the Organics Council<sup>®</sup> approved substance list and subject to those usage conditions.



## 6.2. Closure systems

6.2.1. OrganiTrust<sup>®</sup> supports a range of closures, depending on the type of foodstuff, to ensure food goods are kept sterile and free from contamination, subject to relevant material OrganiTrust<sup>®</sup> Standards:

- a. glass;
- b. metal;
- c. wood or cork;
- d. high-density polyethylene (HDPE) or polypropylene (PP) plastic.

6.2.2. Foods that require sterilisation after filling by heat and pressure application must be closed with a gasket-type seal that is heat resistant and airtight:

- a. such gaskets may be made with PP or HDPE plastics;
- b. polymer-based gaskets are also regulated under Commission Regulation (EC) No 10/2011 on plastic materials and articles intended to come into contact with food (Art. 2).

6.2.3. Migration tests must prove compliance with pertaining material OrganiTrust<sup>®</sup> Standards.