



COLLABORATIVE STUDY

“TESTING APPROACHES FOR THE RELEASE OF METALS FROM ENAMELLED OBJECTS USED FOR COOKING AND BAKING”

GENERAL INFORMATION

Manufacturers of enamelled products sold in the European market do not have a harmonized European measure specifying the requirements Porcelain Enamel must meet in order to be considered compliant for food contact.

Existing national measures significantly differ from one another. Some require a test at room temperature and some at high temperatures. Moreover, there is no list of metals to be traced and their limits.

To this day, only Regenerated Cellulose (Dir. 2007/42), Active and Intelligent Materials (Reg. No. 450/2009), Plastics (Reg. No. 10/2011) and Ceramics (Dir No. 500/1984) have specific measures stating the requirements these materials are asked to meet, in terms of positive lists, tests to be performed and the release or migration limits. As to Ceramics, Directive No. 500/1984 is currently under revision and could expand its scope to Porcelain (Vitreous) Enamel, as well as broadening the list of metals to be traced.

In support of the revision of the Ceramics Directive, JRC conducted a study to investigate the release of metals in food from ceramic products and determine appropriate methodologies for testing them. The study included some enamelled objects, but in small number, not allowing to obtain significant evidence on this kind of material.

In order to support the industry and the European legislator, the **Italian Enamellers Association**, member of the **International Enamellers Institute (I.E.I.)** and the **European Enamel Authority (EEA)**, has decided to undertake a collaborative (non-evaluative) study (Round Robin Test) aimed at expanding the evidence collected through the study on Ceramics (attached, Annex 2). The study will use the same approach and the criteria set by the Standards **ISO/IEC 17043 Conformity assessment - General requirements for interlaboratory evaluation tests** and **ISO 13528 Statistical methods used in the evaluation tests by interlaboratory comparisons**.

The study "**Testing Approaches for the Release of Metals from Enamelled Objects for Cooking and Baking**" takes into consideration **four** different types of **real samples**, produced according to the requirements of the **in-standard type samples**, for a total of **370 objects**.

Due to the lack of a specific measure including Porcelain (Vitreous) Enamel in its scope and listing release limits for this material, EDQM Guideline of Metals and Alloys, published by the Council of Europe (CoE), has often been used as reference by laboratories, customs and controls authorities, despite CoE's official letter, dated August 16th 2013, stating that **Guidelines on Metals and Alloys do not refer to Porcelain (Vitreous) Enamel**.

Porcelain (Vitreous) Enamel is a vitreous inorganic material, used as coating for metals (mainly steel and cast iron), which creates a barrier effect and isolates the underlying support. Its nature, **more similar to glass, differentiates it from metals**. After its application on the support, vitrification firing at very high temperatures develops, between the two surfaces, a chemical-physical reactions which creates a **new**

material, bringing together the characteristics of glass (hygiene and hardness) and those of the support (in the case of metal, strength and lightness).

For these reasons the **European Enamel Authority** has drafted **Guidelines** for the sector suggesting tests as close as possible to the stricter tests required by national legislation. EEA Guidelines recommend **high-temperatures tests**, as enamelled products are used for cooking and baking, and a **list of searchable elements**.

However, as the Enamel sector does not have specific directions on the approach the European legislator intends to adopt towards this material, the Italian Enamellers Association will collect data on release from enamelled objects with the testing approaches available in (similar) European or (specific) National measures or Guidelines dealing with food compliance. The purpose of the study is to assess the **traceability of elements**, **define the measurement uncertainty** and the **variability of the preparation phase**. The results of the study will identify the **detectable limits (LOQ and LOD)** and **technological boundaries** that the European legislator must take into account when approaching this material.

The final report of the study will then provide useful information to identify the most appropriate **legislative framework** for Porcelain (Vitreous) Enamel.

The Italian Enamellers Association has therefore sent **notification** of the Round Robin Test **to the standardization bodies** that are currently working on a standard for Porcelain (Vitreous) Enamel.

The study is divided into two sections: **Multi-Matrix Complete Phases Group** (group of 10 laboratories with the aim of validating the standard) and **Reduced Numerosity Sample Group** (20 laboratories – with the aim of collecting data to enable comparison with the Study on Ceramics, which included 50 laboratories). This division was necessary to **grant a sufficient number of samples for the study** while avoiding a number of samples which was too high to be provided by the companies which volunteered to produce and ship them.

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