



## CONFIDENTIAL

### The quartz-resin product.

It is constituted for about 90% in weigh of natural quartz in powder and grits coming from quarries, and for the remaining 10% in weigh of cured polyester resin. The quartz grits of few millimetres could be transparent, semi-transparent or milky for obtaining the different aesthetic effects.

The hardening of the resin is obtained from the reaction on an unsaturated polyester resin with a peroxide catalyst (for example *ter*-butyl-perbenzoate), promoted by Cobalt salts. The adhesion between the quartz and the resin is achieved through the additions of an organo-functional sylane (the more used is the metacryloxy-propyl-trimetoxy-sylane).

The different colours of the products are obtained by pigmentation of the resin with small quantities of inorganic pigments, generally iron oxides. No other chemicals are added.

### The manufacturing process.

The moulding to manufacture the slabs is a room temperature operation made by vibration and simultaneous compression of the mixture. Both these phase are performed under vacuum to eliminate the porosity due to any residual entrapped air bubbles.

The subsequent hardening of the resin is obtained placing the slabs into oven at about 110 °C for 30-45 minutes according to the thickness of the slabs.

The following polishing operation is a common mechanical process, exactly the same used for natural granite.

## COMMENTS ON THE REPORTS 160124-01 AND 160620-01

General: we claim about the conclusions of the reports because all the manufacturers belonging to the Association have put their products on the market as kitchen tops after having received the approval for the use by International Certification Bodies, such as for example NSF, for materials which enter in contact with foods, and GREENGUARD which evaluates the eventual release of dangerous substances in the air. These are the only Administrative and technical Bodies titled to determine whether a product is

suitable for the proposed use.

Sampling: to test the suitability of a product that must be used as countertop we contest that it must be crushed and pulverized. In fact the CEN-TC/246 – Working Group 4 that is the Standardization Body titled to study the standard tests to be used in the sector has developed the following draft project: “Agglomerated stone - Test methods – Part 17: Determination of the residual styrene by extraction with methanol”.

We recall here some points of this test method to demonstrate that the sampling used by the French laboratory is wrong:

### **Principle**

The principle of this method is based on a laboratory test of extraction of not reacted residual styrene by mean of methanol from a **massive solid element of the agglomerated stone product**, followed by a gas-chromatographic (GC) analysis of the obtained solution.

### **Sampling**

The sampling is not responsibility of the laboratory except when specially requested. For the test at least 3 specimens shall be selected from an homogeneous batch of tiles; **samples shall be cut to size in order to obtain a ratio between the total surface and the volume in the range  $0.45 \pm 0.3 \text{ mm}^{-1}$**  (for example the size shall be 10 mm x 12 mm x 40 mm). During the cutting procedure, warming the specimens shall be avoided in order to prevent any modification in styrene content.

Analysis of the inorganic elements: it is quite obvious that if we are looking for the content of heavy metals in ppm we must take care that the samples are not contaminated by other metals during the sampling phase.

Therefore we cannot enter into a technical discussion about a method of analysis where the analytical sample has been obtained crushing the quartz with a stainless steel hammer in a stainless steel melting pot.

GC-MS analysis: many of the analysis in the report have ben made by the use of the gas chromatography-mass spectrometry. Indicated with the acronym GC-MS is the analytical technique based on the use of a gas chromatograph coupled to a mass spectrometer. The gas chromatograph separates compounds present in the sample while the mass spectrometer works as a detector. This technique together with the LC-MS is one of the most advanced analytical methods and allows the identification and quantification of organic substances in a variety of matrices.

A schematic representation of a modern GC-MS includes: a chromatograph, a mass spectrometer and a system of collection and analysis of data that constitutes the system for the analysis and separation (qualitative and quantitative) of complex mixtures.

The signals obtained in this way are then transmitted to a computer able, with the appropriate software, to represent the abundance of each ion depending

on its mass, i.e. the final mass spectrum.

The use of computers also allows to quickly combine the management of the instrument parameters with the literature search in libraries of spectra in electronic format, in order to automate the identification of the compounds according to their spectrum and to the operating conditions in which it was conducted the analysis.

The results are expressed in terms of probability of identification: %ID.

In the test listed in the French report there is not information about the instrument conditions, such as for example:

### **Gas-Chromatography Conditions**

The column used must be specific for aromatic volatile organic compounds, for example column: HP5Ms, 30 m x 0.25 mm x 0.25 µm.

An example of set up conditions of the instrument, which may vary depending on the instrument and column manufacturer's recommendations, will follow:

Initial temperature: 35°C, hold for 2 minutes

Temperature program: 6°C/min to 90°C; 25°C/min to 290°C

Injector temperature: 250°C

Flame Ionization Detector (FID) temperature: 300°C

Carrier gas: Helium or Nitrogen

The injection volume will depend upon the liner, technique of injection and pressure of injection chosen.

Moreover there is not any information about the "Extraction Procedure" used in terms of temperature, time and ratio between the solvent and the powdered components.

At the same time no information is reported about the Internal Standards and the Calibrations Solutions used for the instrument.

Preparation of the solutions: they have used different solvents to prepare the solutions to be injected in the GC-MS instrument. They have used Carbon Disulfide, Acetonitrile, Hexane, Methanol, Nitric acid and Hydrogen peroxide. It seems more a trial to find which reaction products can be obtained from the contact of these solvents with the pulverized samples, rather than the performance of an objective analysis with a neutral solvent used as "carrier".

The tests 4.2; 4.3; 4.6; 4.7; 4.8 have been made by comparison with a reference sample therefore we cannot exclude a pollution of the instrument which has revealed organic molecule not contained in any raw materials of products under exam. In fact in the tables are listed many chemicals that are not contained in the raw materials used to manufacture the product.

The tests 4.4 and 4.5 have been made by comparison with the library of the

instrument taking into consideration as acceptable a %ID > 75% that is absolutely not correct from a technical point of view (a %ID > 90% should be used as minimum in such an analysis).

Coming to some detailed aspects in the Report 160620-01.

Point 4.2: the use of CS<sub>2</sub> as extraction solvent is not acceptable due to the fact that it is a too strong solvent that can react with the polymeric part of the sample and therefore cannot be considered neutral.

Moreover it will never find presence in the domestic use of a countertop: so that its use does not make sense.

At the end the results are also misleading because they state that: “ 9 of the other VOC have been found at a concentration lower at the limit of quantification of the method of analysis but higher than the limit of measurement of the instrument”. This sentence is completely misleading because it is technically obvious that you have to consider only as trustworthy results those that are higher of the limit of the analysis.

To introduce even more confusion they have quoted also the Toluene that is in the limit of the instrument.

Point 4.3: same consideration of the previous point concerning the use, in this case, of Acetonitrile.

Point 4.4: other than the considerations made in the previous point about the solvent we have to claim the fact that in the analysis they have mentioned chemicals pointed out by the instrument with a %ID very low (>75%). This is unacceptable from a technical point of view.

Points 4.5; 4.6; 4.7: all the same considerations of the previous points.

The Results at Point 5 and the Conclusions at Point 6 are therefore completely to be disputed and they are misleading about the use of the product as kitchen tops.

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