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**GASPAR LLORET**  
Deputy Director

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## 2. INTRODUCTION

### 2.1. PROVIDED MATERIAL

The following materials were provided by the company GARCIMA, S.L.:

- Three flat frying pans with two handles, 20-cm external diameter, made of steel, and covered by a black ceramic enamel coating speckled with white.
- Three flat frying pans with two handles, 24-cm external diameter, with a label indicating that they were manufactured with 18/10 stainless steel.
- Three flat frying pans with two handles, 22-cm external diameter, with a label indicating that they were manufactured with polished steel.

### 2.2 TESTS REQUESTED

The corresponding tests to demonstrate suitability as cooking utensils for cooking food, according to regulation CE 1935/2004, were requested.

### 3. TEST CARRIED OUT

#### 3.1 CURRENT REGULATIONS FOR COOKING UTENSILS

Steel, stainless steel and enameled frying pans

Royal Decree 397/1990 of Mar. 16 approves general standards for materials (other than polymeric materials) for use with foods, based on the following guidelines of the European Council: 89/109/CEE of Dec. 21, 1989 states in its third section: All materials included in the following list are authorized for use with food and foodstuffs:

1. Metals and their alloys

Noble metals, nickel and chromium  
Aluminum and its alloys  
Cast iron and molded, wrought or sheet steel  
Steel coated with tin or zinc  
Stainless steels  
Electrolytic or hot-tinned tinplates  
Zinc and its alloys  
Tin and its alloys  
Copper and its alloys

2. Glass, ceramic, marble and cement

Glasses, vitreous crystals, crystal, and other lead glasses  
Ceramic materials; porcelain; vitreous materials; pottery, tiles and other ceramic materials; construction, earthenware and pottery materials; coated or not with ceramic enamels  
Metals coated with vitrified ceramic enamels  
Marble and other stony materials  
Cement derivatives

In accordance with this Royal Decree, all the materials provided are suitable for use with foods.

However, tests were carried out with the different frying pans in order to:

Polished steel frying pan: to verify that it is actually made of steel and that, after the first cleaning procedure, no traces of the oils used for storage and sale remain

Stainless steel frying pan: to verify that it is really made with this type of material

Enameled steel frying pan: to verify possible lead and cadmium migrations on the enamel coating.

### 3.2 TESTS CARRIED OUT

#### **Enameled steel frying pan:**

Based on CE 1935/2004 Regulation of the European Parliament and the European Council, dated Oct. 27 2004, Royal Decree 891/2006 of Jul 21 is produced, approving technical and health standards applicable to ceramic objects for use with foods in accordance with Regulation 2005/31/CE of the Commission, dated Apr 29 2005, and Royal Decree 1043/1990, dated Jul 27, related to the migration of lead and cadmium in ceramic enamels, and stating that enameled frying pans should be tested in accordance with this Royal Decree, which is in agreement with ISO Standard 6486/1.

Testing time: 24 hours

Testing temperature: 20°C

Testing dissolution: Acetic acid, 4%

Measurement equipment: JY Ultima 2 induced coupled plasma (ICP) emission spectrophotometer

Acid volume used per frying pan: 500 ml

Results obtained:

Element	Values obtained	Maximum values Grade 1	Maximum values Grade 2	Maximum values Grade 3
Lead	<0.05 mg/l	0.8 mg/dm	4 mg/ l	1.5 mg/l
Cadmium	<0.05 mg/l	0.07 mg/dm	0.3 mg/l	0.1 mg/l

The results obtained are in accordance with European Regulation CE 1935/2004, and therefore the enameled steel frying pan is suitable for cooking foods.

**Stainless steel frying pan:**

This type of recipients is suitable for use with foods; however, the base material was analyzed to verify that it really is a stainless steel.

Testing equipment: Spectromax optical emission spectrophotometer

Element	Concentration (%)
Carbon	0.041
Sulfur	0.0056
Silicon	0.32
Manganese	1.81
Nickel	7.7
Chromium	18.8
Molybdenum	0.062

The results obtained are in accordance with European Regulation CE 1935/2004, and therefore the stainless steel frying pan is suitable for cooking foods.

## Polished steel frying pan

As a first step, material composition was verified. After this, the frying pan was cleaned following the instructions provided on the manufacturer's product label (boil in water before using for the first time), and then the surface of the pan was analyzed by infrared spectrometry to check the absence of organic traces, which was successfully verified.

### Steel composition

Element	Concentration (%)
Carbon	1.2
Sulfur	0.014
Silicon	0.010
Manganese	0.16
Nickel	0.029
Chromium	0.018
Phosphorus	0.012

The results obtained are in accordance with European Regulation CE 1935/2004, and therefore the polished steel frying pan is suitable for cooking foods.

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