# International Standard 4535

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# Vitreous and porcelain enamels — Apparatus for determination of resistance to hot detergent solutions used for washing textiles

*Émaux vitrifiés — Appareillage pour la détermination de la résistance aux solutions chaudes de détergent utilisées pour le lavage des textiles*

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## Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 4535 was developed by Technical Committee ISO/TC 107, *Metallic and other non-organic coatings*, and was circulated to the member bodies in February 1982.

It has been approved by the member bodies of the following countries :

| | | |
|---|---|---|
| Australia | Hungary | Romania |
| Czechoslovakia | India | South Africa, Rep. of |
| Egypt, Arab Rep. of | Italy | Spain |
| France | Netherlands | Sweden |
| Germany, F. R. | Poland | Switzerland |

The member bodies of the following countries expressed disapproval of the document on technical grounds :

United Kingdom
USA





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# Vitreous and porcelain enamels — Apparatus for determination of resistance to hot detergent solutions used for washing textiles

## 1 Scope and field of application

This International Standard specifies requirements for the apparatus to be used for the determination of the resistance of flat surfaces of vitreous and porcelain enamels to attack by hot detergent solutions used for washing textiles.

## 2 Reference

ISO 48, *Vulcanized rubbers — Determination of hardness (Hardness between 30 and 85 IRHD).*

## 3 General description

The apparatus (see figures 1 to 4) consists of a hexagonal vessel having a circular opening in each side. A specimen is pressed against each of these openings by means of gripping plates which are held in place by wing nuts, sealing rings being placed between the vessel and the specimens. A lid having four holes, for a paddle stirrer, two immersion heaters and a temperature controlling device, is screwed on to the vessel, a sealing ring being placed between the vessel and the lid. The paddle stirrer, immersion heaters and temperature controlling device are fixed such that their distance from the bottom of the vessel is 30 mm.

## 4 Requirements

### 4.1 Hexagonal vessel

The vessel (see figures 1 to 3) shall have four threaded bolts welded to each side for fastening the gripping plates, and six threaded bolts welded to the upper surface for fastening the lid. The vessel should preferably have an outlet for drainage.

### 4.2 Lid

The lid (see figure 4; shown also in figures 1 and 3) shall have a centrally placed support for receiving the paddle stirrer, and three further supports for receiving the immersion heaters and the temperature controlling device.

### 4.3 Gripping plates

Six gripping plates, of thickness 4 mm, and which can be fitted to the sides of the hexagonal vessel, are required.

### 4.4 Fasteners

Thirty wing nuts are required for fastening the gripping plates and the lid to the vessel.

### 4.5 Sealing rings

Six sealing rings, of external diameter 100 mm, internal diameter 80 mm and thickness 8 mm, are required for sealing the side openings.

An additional ring, of internal diameter 140 mm, and of thickness 3 mm, is required to serve as in intermediate layer between the lid and the vessel.

### 4.6 Paddle stirrer

The paddle stirrer shall have the dimensions shown in figure 3. It shall operate at a rotational frequency of 1 350 ± 50 $min^{-1}$.

### 4.7 Immersion heaters

Two cylindrical immersion heaters, each of 600 W, are required.

### 4.8 Temperature controlling device

This shall be a contact thermometer with a temperature controlling device, accurate to ± 1 °C. The use of a temperature recording instrument is recommended.

## 5 Materials

**5.1** The vessel (4.1), lid (4.2), gripping plates (4.3) and paddle stirrer (4.6) shall be made of the same austenitic stainless steel.

**5.2** The cylindrical immersion heaters (4.7) shall be made of nickel-plated copper or of austenitic stainless steel.

**5.3** The sealing rings (4.5) shall be made of a synthetic rubber of hardness 70 IRHD when determined in accordance with ISO 48. The material shall be resistant to alkaline solutions at 100 °C (chloroprene is suitable for example).

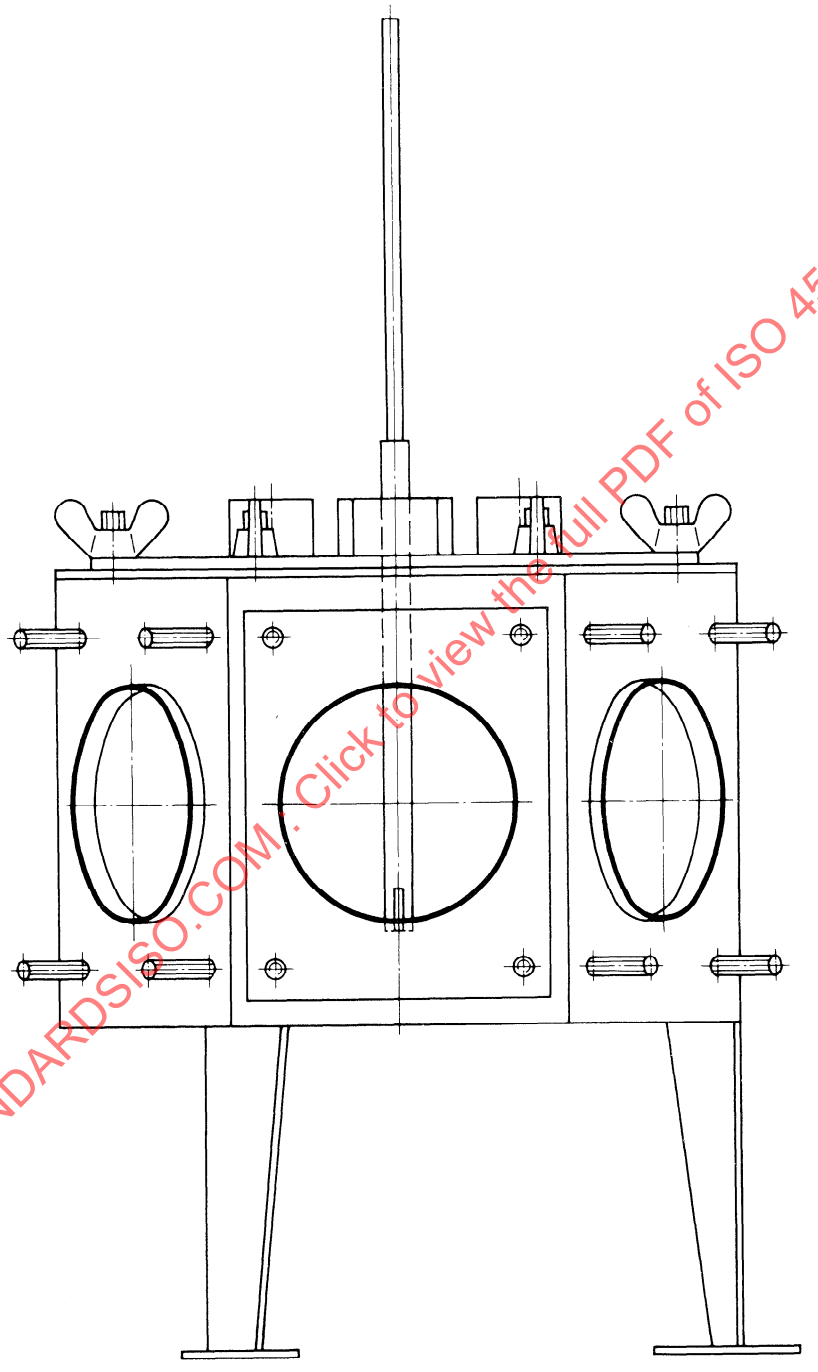



Figure 1 — Hexagonal vessel with lid, stirrer and gripping plate

Dimensions in millimetres

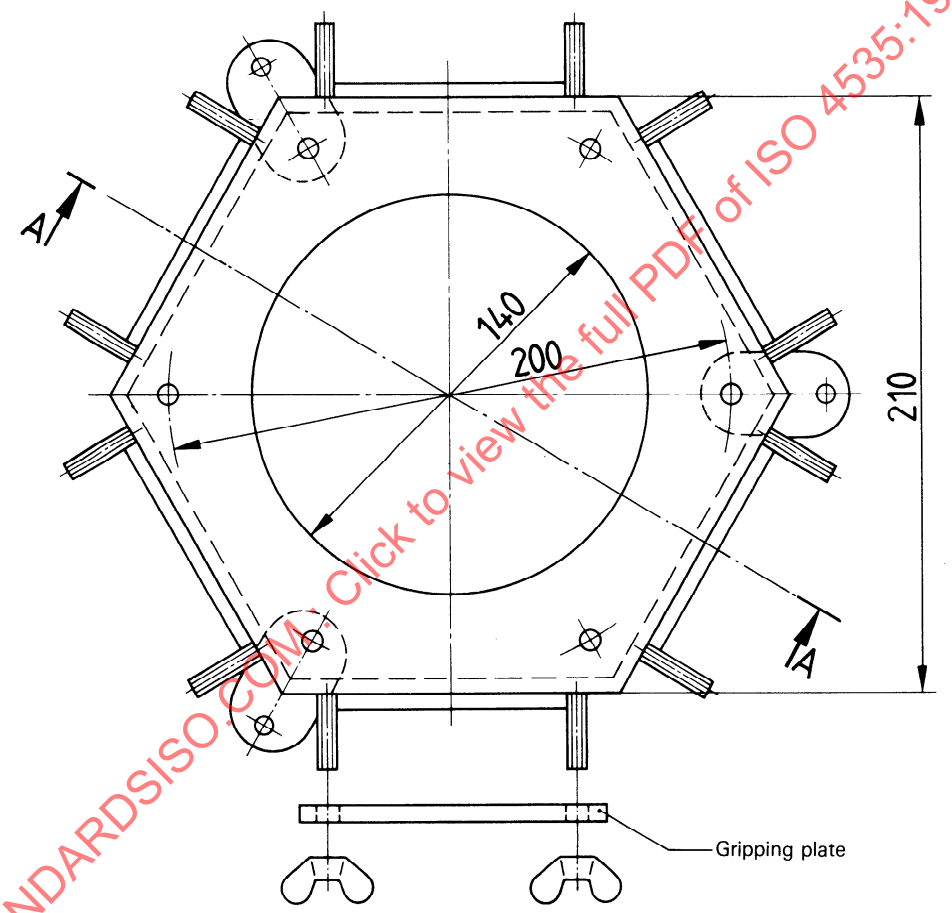




**Figure 2 — Top view of hexagonal vessel without lid and paddle stirrer**

Dimensions in millimetres

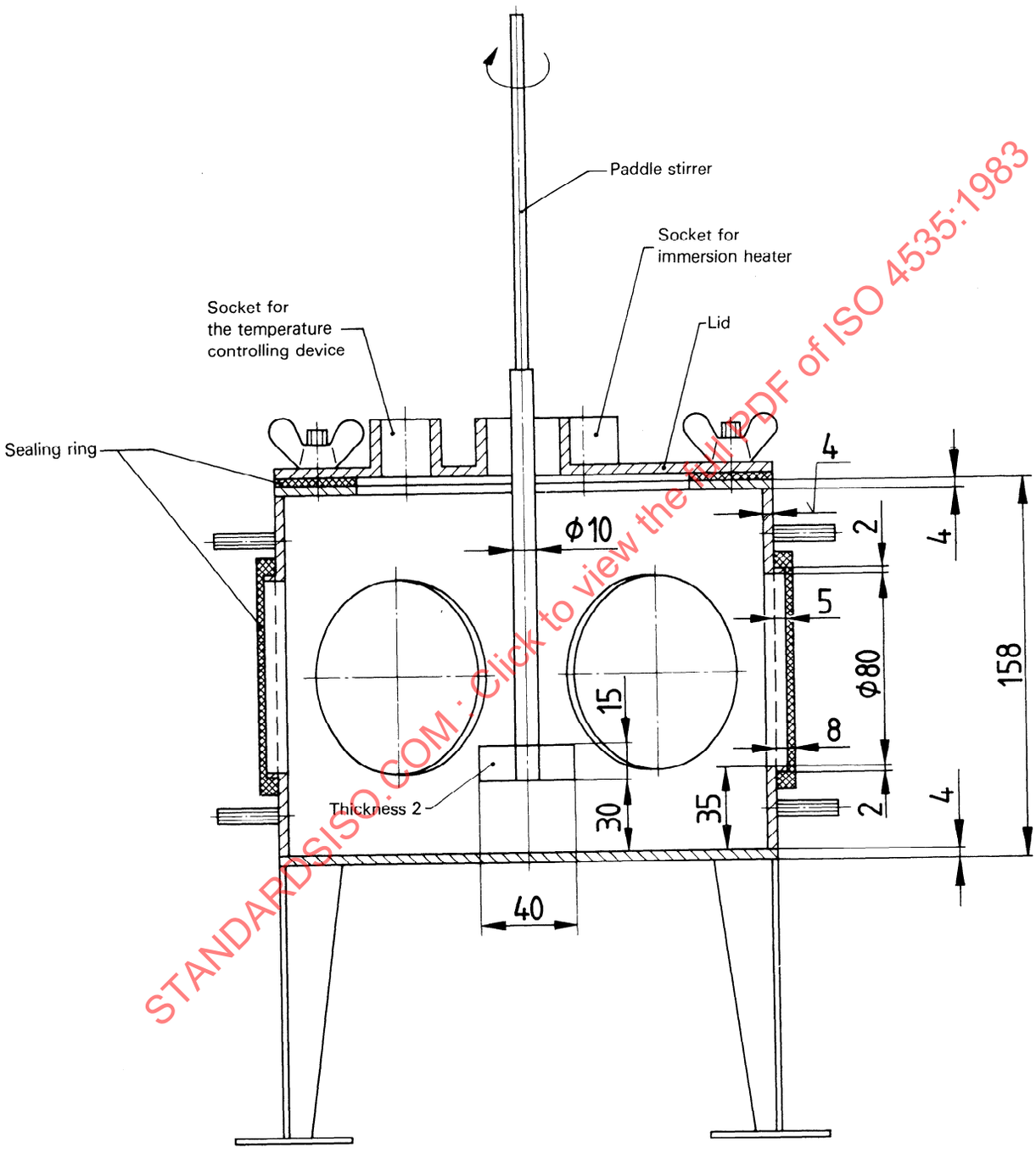




**Figure 3 — Section A-A of the hexagonal vessel, lid and paddle stirrer, with additional sealing in the cutting plane**