

**DRAFT KENYA STANDARD**

**DKS 452:2024**

**ICS 91.140.70**

**Third Edition**

**Stainless steel sinks for domestic purposes —  
Specification**

**Public Review Draft**

## **TECHNICAL COMMITTEE REPRESENTATION**

The following organizations were represented on the Technical Committee:

University of Nairobi

Tononoka Steels

ASL Limited Engineering

Mabati Rolling Mills

Kenya Association of Manufacturers

Devki Steel Mills Ltd

Corrugated Sheets Ltd

Kenya Industrial Research and Development Institute

Royal Mabati Factory

Kenya Bureau of Standards — Secretariat

## **REVISION OF KENYA STANDARDS**

In order to keep abreast of progress in industry, Kenya Standards shall be regularly reviewed. Suggestions for improvements to published standards, addressed to the Managing Director, Kenya Bureau of Standards, are welcome.

© Kenya Bureau of Standards, 2024

*Copyright. Users are reminded that by virtue of Section 25 of the Copyright Act, Cap. 130 of 2001 of the Laws of Kenya, copyright subsists in all Kenya Standards and except as provided under Section 25 of this Act, no Kenya Standard produced by Kenya Bureau of Standards may be reproduced, stored in a retrieval system in any form or transmitted by any means without prior permission in writing from the Managing Director.*

**DRAFT KENYA STANDARD**

**DKS 452: 2024**

**ICS 91.140.70**

**Third Edition**

**Stainless steel sinks for domestic purposes —  
Specification**

Kenya Bureau of Standards, Popo Road, Off Mombasa Road,  
P.O. Box 54974 - 00200, Nairobi, Kenya



+254 020 6948000, + 254 722202137, + 254 734600471



info@kebs.org



@KEBS\_ke



kenya bureau of standards (kebs)

## **Foreword**

This Kenya Standard was prepared by the **Steel and Aluminium Products and Metallurgy** Technical Committee under the guidance of the Standards Projects Committee, and it is in accordance with the procedures of the Kenya Bureau of Standards.

Kenya Bureau of Standards (KEBS) has established Technical Committees (TCs) mandated to develop Kenya Standards (KS). The Committees are composed of representatives from the public and private sector organizations in Kenya.

Kenya Standards are developed through Technical Committees that are representative of key stakeholders including government, academia, consumer groups, private sector and other interested parties. Draft Kenya Standards are circulated to stakeholders through the KEBS website and notifications to World Trade Organization (WTO). The comments received are discussed and incorporated before finalization of the standards, in accordance with the Procedures for Development of Kenya Standards.

Kenya Standards are subject to review, to keep pace with technological advances. Users of the Kenya Standards are therefore expected to ensure that they always have the latest versions of the standards they are implementing.

This third edition cancels and replaces the second edition (KS 06-452:1998), which has been technically revised.

During the preparation of this standard, reference was made to the following document (s):

ISO 15510: 2014 Stainless steels — Chemical composition

ISO 4211-3:2013 Furniture — Tests for surface finishes Part 3: Assessment of resistance to dry heat

Acknowledgement is hereby made for the assistance derived from this (these) source (s).

## Contents

Page

1	Scope .....	1
2	Normative references .....	1
3	Terms and definitions .....	1
4	Types and dimensions .....	1
4.1	Types .....	1
4.2	Dimensions .....	1
4.2.1	Bowls .....	2
4.2.2	Bowl location limits .....	2
5	Material requirements .....	2
5.1	Thickness of sheet/strip .....	2
6	Manufacture .....	3
7	Requirements .....	3
7.1	General .....	3
7.2	Connecting dimensions .....	3
7.3	Draining of water .....	3
7.4	Resistance to dry heat .....	4
7.5	Resistance to temperature changes .....	4
7.6	Resistance against chemicals and staining agents .....	4
7.7	Load stability .....	4
7.8	Flow rate of the overflow .....	4
7.9	Durability .....	4
8	Test methods .....	4
8.1	General .....	4
8.2	Draining of water test Procedure .....	5
8.3	Resistance to dry heat procedure .....	5
8.3.1	Test apparatus and chemicals .....	5
8.3.2	Procedure .....	5
8.3.3	Test results .....	5
8.4	Resistance to temperature changes .....	6
8.4.1	Test apparatus .....	6
8.4.2	Procedure .....	6
9	Marking .....	10



## Stainless steel sinks for domestic purposes — Specification

### 1 Scope

This Draft Kenya Standard specifies the dimensional, Functional and test methods requirement for stainless steel sinks intended for domestic use.

### 2 Normative references

The following referenced documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

### 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

### 4 Types and dimensions

#### 4.1 Types

Some common types of stainless-steel sinks are illustrated in Figures 1, 2, 3, and 4.

Type A Single bowl, Single drainer, Right or left hand, (Figures 1 and 2)

Type B Single bowl, Single drainer, (Figures 1 and 3)

Type C Double bowl, Single drainer, (Figure 1)

Type D Double bowl, (Rectangular or round) without drainer, (Figure 1)

Type E Double bowl, Double drainer, (Figure 4)

Type F Single bowl Single drainer ) (Figure.. )

#### 4.2 Dimensions

# DKS 452: 2024

The dimensions of common sinks shall comply with Table 1, specifying sizes.

## 4.2.1 Bowls

The minimum depth of sinks shall be 145 mm. The depth shall be measured from the effective top radius of bowl (see Figures 1, 2, 3 and 4). The minimum internal top dimensions shall be 370 mm x 340 mm for rectangular bowls, and 380 mm for round bowls.

**Table 1 — Sizes**

All dimensions in millimeters (minimum)

	Type A	Type B	Type C	Type D	Type E	Type F
Length	1 000	1425	1425	1425	1450	500
Width	500	500	500	500	500	500

## 4.2.2 Bowl location limits

The minimum distance from the front of the sink to the edge of the bowl shall be 30 mm. The minimum distance between the edges of two bowls when filled shall be 20 mm. The drainer shall have an incline 5 degrees in 750 mm towards the centre line of the bowl.

## 5 Material requirements

Sinks shall be manufactured of stainless steel which shall comply with the following requirements in regard to quality.

### 5.1 Thickness of sheet/strip

5.1.1 Nominal thickness of stainless-steel sheet/ strip used in the construction of sink shall be not less than 1.00mm before forming.

5.1.2 Thickness at any point of sink, after forming, shall not be less than 0.75 mm. ( Reference IS 13983).

5.1.3 The material used in the manufacture of stainless- s t e e l sinks shall comply with requirement in ISO 15510.

5.1.4 The stainless steel used shall have the appropriate composition given in table 1, for AISI type 430, type 304, or type 316, (SANS 907: ).



Table 1 — Chemical composition of stainless steel

1	2	3	4	5
AISI type number*	Chemical composition %			
	Chromium	Nickel	Carbon max.	Molybdenum
430	14 – 18	–	0.12	–
304	17 – 20	7, min.	0.08	–
316	16 – 18	10 – 14	0.08	2.0 – 3.0

\* Type 430 is a magnetic stainless steel whose corrosion resistance is adequate for normal conditions. Type 304 is a non-magnetic austenitic stainless steel (commonly known as 18/8) having superior resistance to corrosion and to staining. Type 316 is an austenitic stainless steel suitable for severe conditions such as those in photographic laboratories. The type numbers are those given by the American Iron and Steel Institute.

5.2 The material shall have the following mechanical properties in annealed conditions:

Yield stress	–	210 mPa min
Tensile strength	–	490 mPa min
Elongation	–	30 % min
Hardness (Vickers)/Bra	–	135 min/ 128min

## 6 Manufacture

6.1 Sink bowls shall have rounded corners to facilitate cleaning. Folded corners shall be welded. There shall be no sharp or rough edges adjoining working surfaces when installed.

6.2 Draining boards shall be grooved and shall be inclined towards the sink bowls in accordance with 2.2.2.

6.3 A suitable sieve to prevent large particles from entering the drain shall be provided.

6.4 A drain rubber plug shall be provided on every sink.

## 7 Requirements

### 7.1 General

For installation, use and care shall be supplied by the manufacturer.

### 7.2 Connecting dimensions

The connecting dimensions shall meet the requirements provided in this standard.

### 7.3 Draining of water

## **DKS 452: 2024**

When tested in accordance with 6.2 all surfaces of the kitchen sink shall be inclined towards the bowl(s) and/or outlet(s) to ensure the drainage of water.

### **7.4 Resistance to dry heat**

The test is intended to determine the suitability of kitchen sink surfaces where contact with moderately hot cooking pots is to be expected.

When tested in accordance with 6.3, or alternatively at a temperature of 180 °C in accordance with ISO 4211-3, the kitchen sink shall not show surface changes which influence its usage, e.g. cracks, crazing, through cracks, blistering.

### **7.5 Resistance to temperature changes**

When tested in accordance with 6.4, the kitchen sink shall not show surface changes which influence its intended usage, e.g. cracks, de-lamination.

### **7.6 Resistance against chemicals and staining agents**

Kitchen sinks, when used as intended, shall be resistant to household chemicals, foodstuffs and cleansing agents.

When tested in accordance with 6.5, the kitchen sinks shall not show any permanent surface deterioration, such as stains or deterioration which are not removable with water or abrasive agents.

### **7.7 Load stability**

When tested in accordance with 6.8, the wall-hung sink shall not crack, fall down or show permanent distortion. (Expand the types).

### **7.8 Flow rate of the overflow**

Every kitchen sink shall be protected against overflowing. When tested in accordance with 6.9, the flow rate of the overflow shall not be less than 0,20 l/s.

NOTE In kitchen sinks with two or more bowls, it is possible to have only one overflow if the overflow from one bowl is interconnected to the other. A non-closeable outlet can also be used as an overflow.

### **7.9 Durability**

Kitchen sinks conforming to the requirement of clause 5.3 to 5.8 are deemed to be durable.

## **8 Test methods**

### **8.1 General**

The tests shall be performed in the following order:

Clause 6.2 – Clause 6.9 – Clause 6.8 – Clause 6.4 - Clause 6.3

The testing in accordance with clauses 6.5, 6.6 and 6.7 can be conducted in any order but shall be conducted on a new test piece material for each test.

If the kitchen sink is designed with only one bowl, then for the test conducted in accordance with 6.3 the specimens shall be cut from a second kitchen sink.

All tests shall be carried out at a room temperature of  $(23 \pm 5)$  °C, except when stated differently.

## 8.2 Draining of water test Procedure

- Install the kitchen sink horizontally in accordance with the manufacturers' installation instructions.
- The kitchen sink shall be cleaned with suitable cleansing agent kitchen sink and afterwards shall be rubbed dry.
- Use tap water coloured to contrast with the colour of the kitchen sink.
- Pour not less than 1 litre of this water along the highest part of the draining area, if present, and bowl(s).
- Determine whether the water has drained to waste outlet hole(s). Water remaining due to surface tension is permitted.

## 8.3 Resistance to dry heat procedure

### 8.3.1 Test apparatus and chemicals

- Rigid frame-work or test-rack of such a construction that a kitchen sink can be mounted horizontally, in such a way that all the outer rim is supported. The kitchen sink shall not be fastened or fixed to the frame-work or test-rack;
- Thermometer, capable of measuring temperatures between 0 °C and 250 °C to an accuracy of  $\pm 1$  °C;
- Cast cylindrical aluminium or aluminium alloy vessel, without a lid, the bottom of which has been machined flat. It shall have an external diameter of  $(100 \pm 1,5)$  mm and an overall height of  $(70 \pm 1,5)$  mm. The wall thickness shall be  $(2,5 \pm 0,5)$  mm and the base thickness  $2,5 \pm 0,5$  mm;
- Heat source, for heating the vessel uniformly;
- Stirrer;
- Heat-insulating board;
- Glycerol tristearate  $[C_{17}H_{35}CO_2CH_2(CH_2)_7C_{17}H_{35}]_2$  or any other material of similar specific heat which will produce the same result.

The same glycerol tristearate or other material can usually be used for at least 20 tests, but if it has been heated to a temperature above 200 °C, or in case of dispute, fresh material should be used.

### 8.3.2 Procedure

- Fill the vessel with glycerol tristearate up to 10 mm below the top.
- Fix the thermometer centrally in the vessel with its bulb about 6 mm from the bottom.
- Use the heat source to raise the temperature of the glycerol tristearate to approximately 185 °C, stirring from time to time.
- Transfer the vessel to the heat-insulating board.
- Allow the temperature to fall to  $(180 \pm 1)$  °C, stirring continuously.
- Immediately place the vessel of hot glycerol tristearate in the centre of the bowl.
- Allow to stand for 20 min without further stirring.
- At the end of this period, remove the vessel and allow the kitchen sink to cool for a period of 45 min.
- Using a sponge or brush spread a coloured test solution over the surface to be tested and allow 5 min for it to react. Wipe off the reagent with a moist sponge and examine the kitchen sink. The coloured test solution shall be prepared as follows: Add 1 ml liquid detergent to 100 g of eosine or methylene blue. This mixture shall be made up with deionized water to a volume of 1 l.

### 8.3.3 Test results

Note any change of appearance of the tested surface of the kitchen sink when inspected from all sides with the naked eye at a distance of 60 cm and illuminated by a cool neon light of 150 lx measured at the surface of the sample.

## 8.4 Resistance to temperature changes

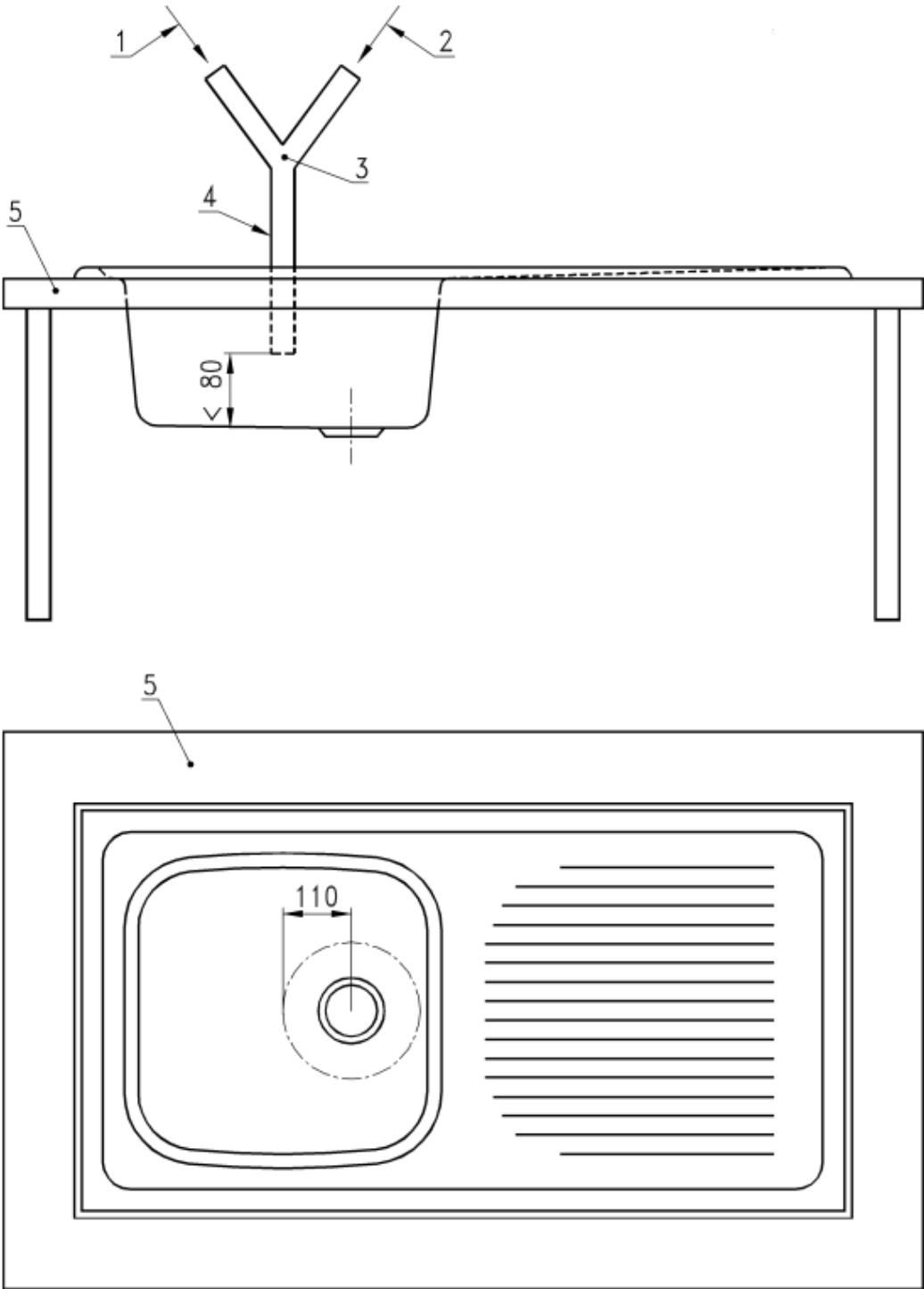
### 8.4.1 Test apparatus

- a) Hot water supply, capable of delivering water at a temperature of about 95 °C.
- b) Cold water supply, capable of delivering water at a temperature of about 15 °C.
- c) Manifold, for connecting the hot water supply and the cold water supply to a discharge pipe.
- d) Discharge pipe, with an internal diameter of 10 mm.
- e) Rigid framework or test rack (see Figure 5) of such a construction that a kitchen sink can be mounted horizontally, in such a way that all the outer rim is supported. The kitchen sink shall not be fastened or fixed to the framework or test rack.
- f) Thermometer, capable of measuring temperatures between 0 °C and 100 °C to an accuracy of  $\pm 1$  °C.
- g) Flow meter, capable of measuring a flow rate of water of  $(0,1 \pm 0,01)$  l/s.

### 8.4.2 Procedure

- a) Carry out the test on a kitchen sink that is fitted with a waste outlet that shall be open during the whole period of the test.
- b) The test shall be carried out in such a way that: 1) the outlet of the pipe is positioned not more than  $(80 \pm 5)$  mm above the bottom of the sink; 2) the water impinges upon the bottom of bowl of the kitchen sink at a point anywhere on a circle with a radius of  $(110 \pm 5)$  mm around the waste outlet hole.
- c) Discharge through the pipe during a period of  $(90 \pm 1)$  s hot water with a flow rate of  $(0,1 \pm 0,01)$  l/s. The temperature of this water at the outlet shall be  $(90 \pm 2)$  °C.
- d) During a resting time of  $(30 \pm 1)$  s there shall not be any further supply of water.
- e) Discharge through the pipe during a period of  $(90 \pm 1)$  s cold water with a flow rate of  $(0,1 \pm 0,01)$  l/s. The temperature of this water at the outlet shall be  $(15 \pm 2)$  °C.
- f) During a resting time of  $(30 \pm 1)$  s there shall not be any further supply of water.
- g) Repeat this procedure 1000 times without interruption. For kitchen sinks made from ceramic material stop the test procedure after 5 cycles.
- h) Using a sponge or brush spread a coloured test solution over the surface to be tested and allow 5 min for it to react. Wipe off the reagent with a moist sponge and examine the kitchen sink.
- i) The coloured test solution shall be prepared as follows: Add 1 ml liquid detergent to 100 g of eosine or methylene blue. This mixture shall be made up with deionized water to a volume of 1 l.

**8.4.3 Test results** Note any change of appearance of tested surface of the kitchen sink when inspected from all sides with the naked eye at a distance of 60 cm and illuminated by a cool neon light of 150 lx measured at the surface of the sample.



Dimensions in millimetres

Key 1 cold water supply 4 discharge pipe 2 hot water supply 5 rigid framework 3 manifold Figure 5 — Test rack

**8.5 Resistance against chemicals and staining agents**

**8.5.1 Test apparatus and chemicals a) chemicals/reagents**

- a) The list of chemicals is given in Table 1. Each solution shall be prepared immediately before use with deionized water, and applied at a temperature of  $(23 \pm 5) \text{ }^\circ\text{C}$ .

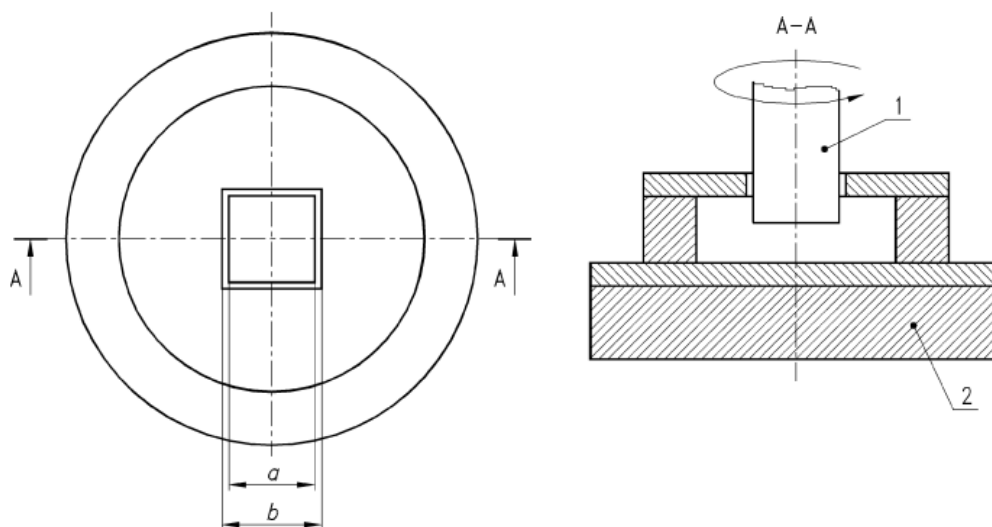
**Table 1 — Chemicals**

Family	Product
Acids	Acetic acid ( $\text{CH}_3\text{COOH}$ ), 10 % V/V
Alkalines	Sodium hydroxide ( $\text{NaOH}$ ), 5 % m/m
Alcohols	Ethanol ( $\text{C}_2\text{H}_5\text{OH}$ ), 70 % V/V
Bleaches	Sodium hypochlorite ( $\text{NaOCl}$ ), 5 % active chlorine ( $\text{Cl}_2$ ) <sup>a</sup>
Staining agents	Methylene blue, 1 % m/m
Salts	Sodium chloride ( $\text{NaCl}$ ), 170 g/l, diluted to 50 %

<sup>a</sup> Given bleach may be replaced by sodium percarbonate ( $2 \text{Na}_2\text{CO}_3 \cdot 3 \text{H}_2\text{O}_2$ ) prepared as follows: Dissolve 1 g of a commercial available powdery bleach based on sodium percarbonate containing 15 % to 30 % of the active component in 100 ml deionized water at room temperature.

- b) borosilicate watch glasses: 40 mm nominal diameter;  
 c) pipettes;  
 d) cleaning appliance;

This appliance is shown in Figure 6, consisting of synthetic flexible open cell foam disc of 75 mm diameter and 15 mm thickness. This appliance is driven by means of a square axle which fits loosely into the device. Any rotating device having a mass of  $(1\ 000 \pm 50) \text{ g}$  can be used.



Key 1

square axle 2 foam a length of edge of square axle with  $a = b - 1 \text{ mm}$  b length of square opening in cleaning device for fitting the axle Figure 6 — Cleaning appliance

- e) 12 h-alumina (suspension of aluminium oxide in water)1).

### 8.5.2 Test specimens

Carry out the tests on a flat part of the kitchen sink.

If necessary, use test specimens  $(100 \pm 5)$  mm  $\times$   $(100 \pm 5)$  mm cut from a flat surface of the kitchen sink.

### 8.5.3 Procedure

— Select a test area.

— Use each test area for only one reagent. Clean the test area thoroughly with hot soapy water and then dry with a clean cloth.

— At each of the test areas, deposit a drop of the test solution. Cover the drop thus formed with a watch glass concave side downwards. The drop size shall be determined so that it is completely covered by the watch glass. Allow the selected chemical to act for a time of  $(16 \pm 0,25)$  h at a temperature of  $(23 \pm 5)$  °C with the test areas protected from the sun.

— Thoroughly rinse the test areas with deionized water and check for adverse changes in appearances by visual examination. If deterioration is detected, dip the foam disc in deionized water and place it on the surface to be cleaned and rotate it at 60 min<sup>-1</sup>. Clean for 30 revolutions.

— Rinse with deionized water and visually examine the test area. If deterioration persists repeat the cleaning with the 12 h-alumina and re-examine the test area.

### 8.5.4 Expression of results

— Note the exact test area.

— Note whether or not the reagent has caused a stain or deterioration when inspected with the naked eye at a distance of 60 cm, and illuminated by cool neon light of 150 lx at the surface of the sample.

Further note whether or not such stain or deterioration is removed and if so with water or abrasive agent.

### 8.6 Load stability

— Wall-hung sinks shall be installed in accordance with the-manufacturers' instructions.

— Gradually apply a load of  $(1,50 \pm 0,01)$  N on top of a wooden beam with a cross section of 100 mm  $\times$  100 mm positioned across the geometric centre of each bowl of the kitchen sink according to Figure 11 and allow the load to remain in position for a period of 1 h.

— Any distortion due to point loading caused by the wooden timbers shall be disregarded.

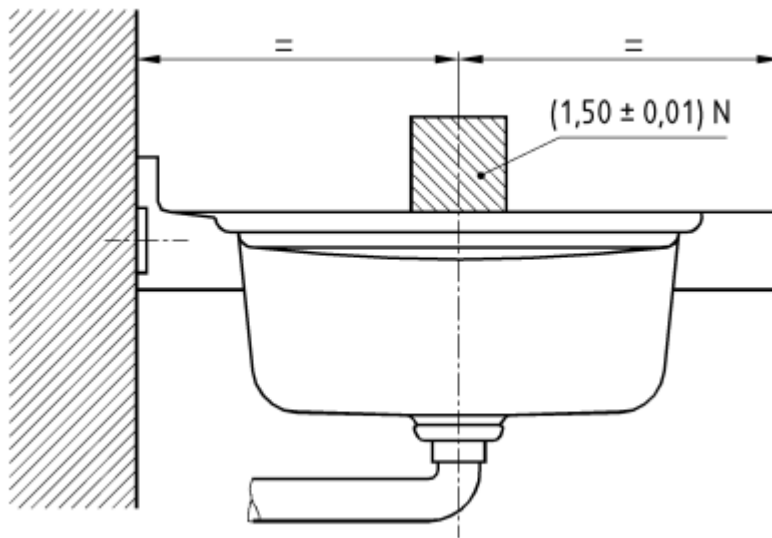


Figure 8 — Test arrangement

### 8.7 Determination of the flow rate of overflow

- The kitchen sink shall be installed horizontally in accordance with the manufacturer's instructions.
- Install the waste outlet, overflow and the trap to the kitchen sink. The trap shall not be connected to the discharge pipe, but is to be left open.
- Afterwards, the waste outlet(s) shall be closed.
- Introduce the water supply by means of a flexible tube with an inner diameter of 20 mm which leads to the bottom of the bowl. Adjust the quantity of water supply in such a way that no water spills over the external rim of the kitchen sink or work top.
- Read the water flow rate after a steady-state condition has been established for a period of 60 s by means of a flow meter fitted into the supply pipe.

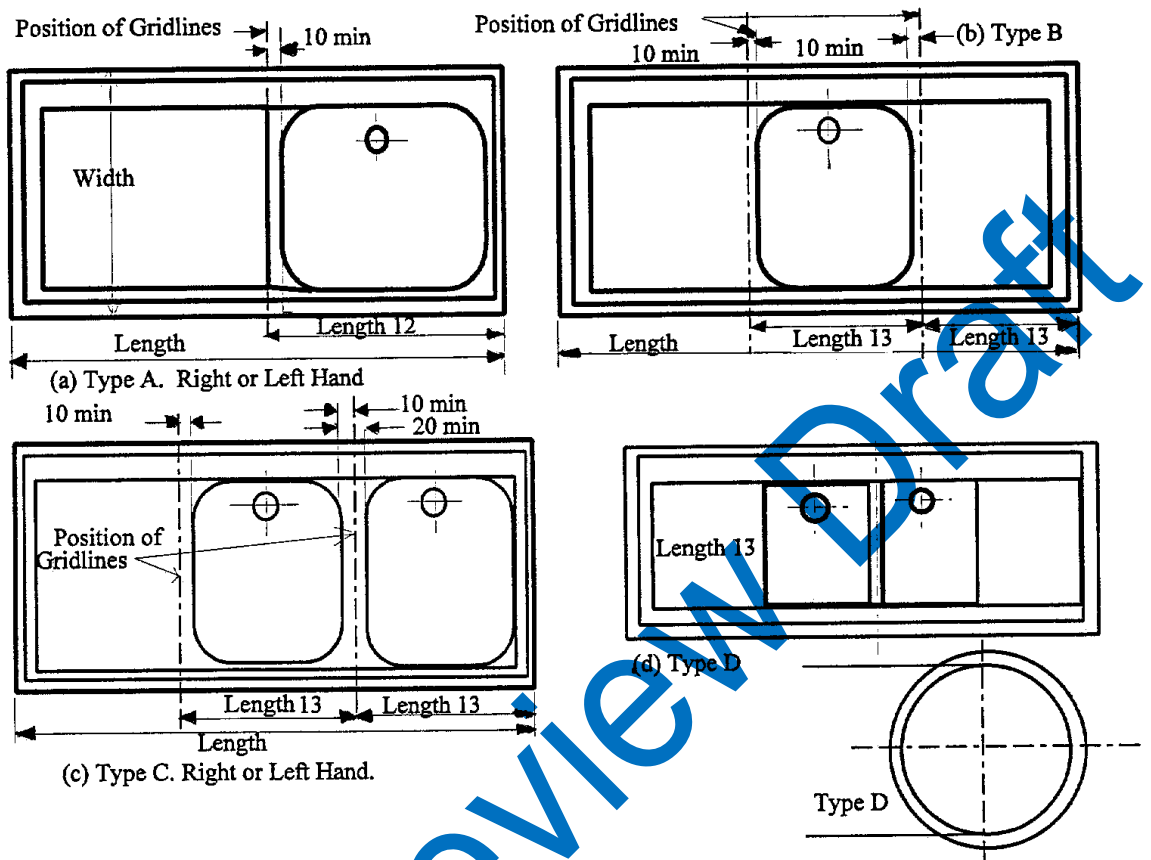
## 9 Marking

Each sink shall be legibly and indelibly marked with the following particulars:

- a) The manufacturer's name or trade mark;
- b) Type of sink as per 2.1;
- c) Grade of the stainless steel;
- d) The standard number (KS 452); and
- e) Country of origin.



All dimensions are in millimeters



NOTE 1 Hand of sinks refers to position of drainer when viewed from the front.

NOTE 2 Drawings are diagrammatic only.

Figure 1 — Typical examples of sit-on sink types

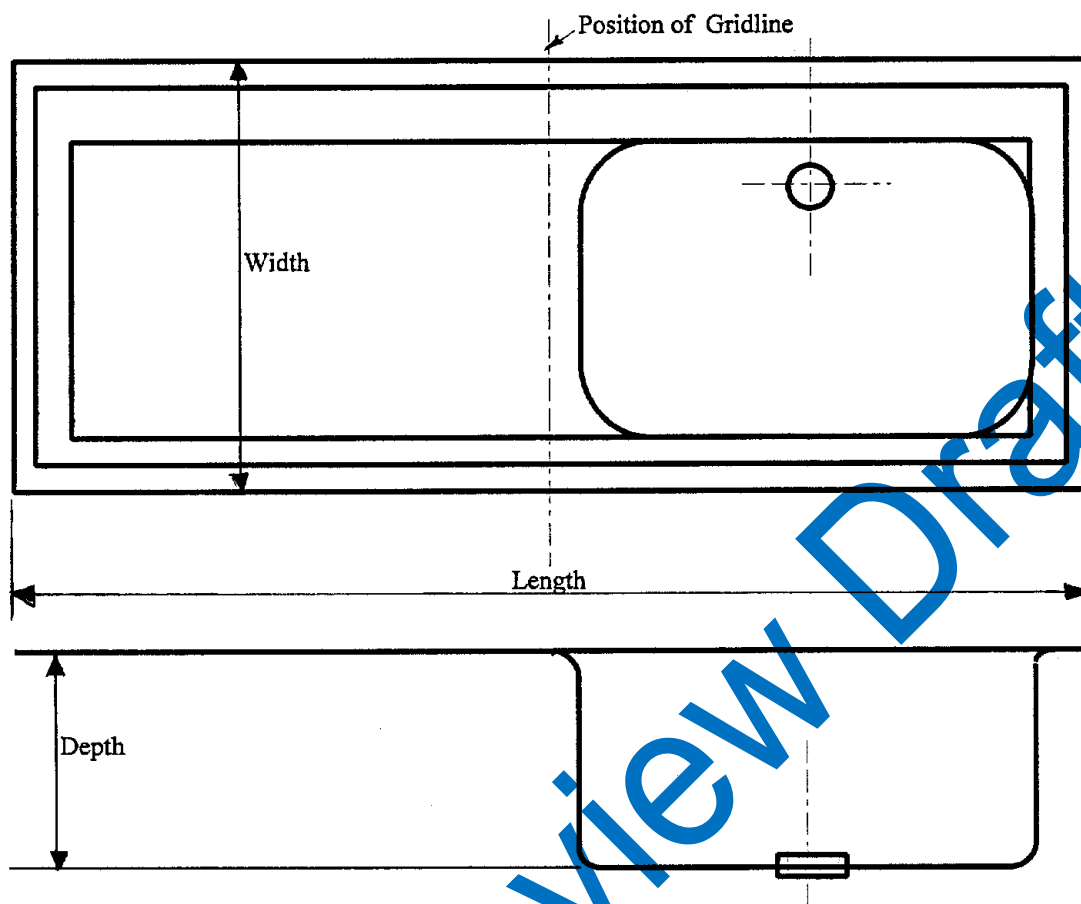


Figure 2 — Type A — Single bowl, single drainer right or left hand

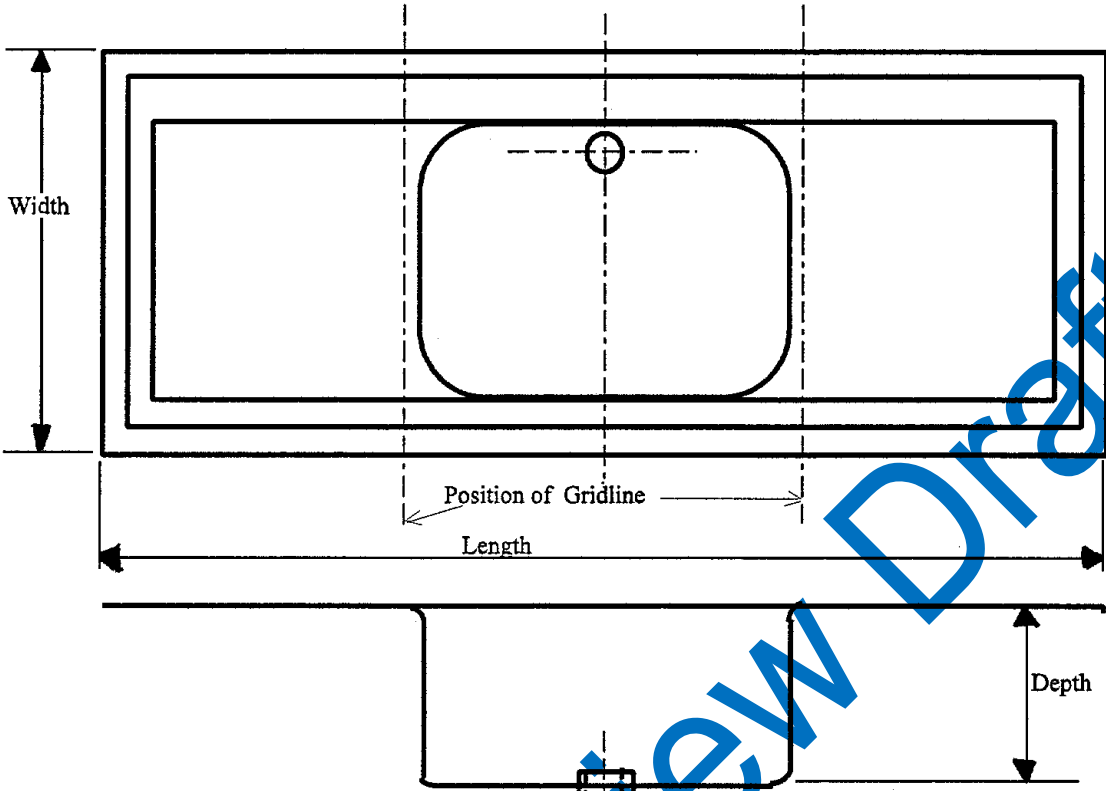


Figure 3 — Type B — Single bowl, single drainer

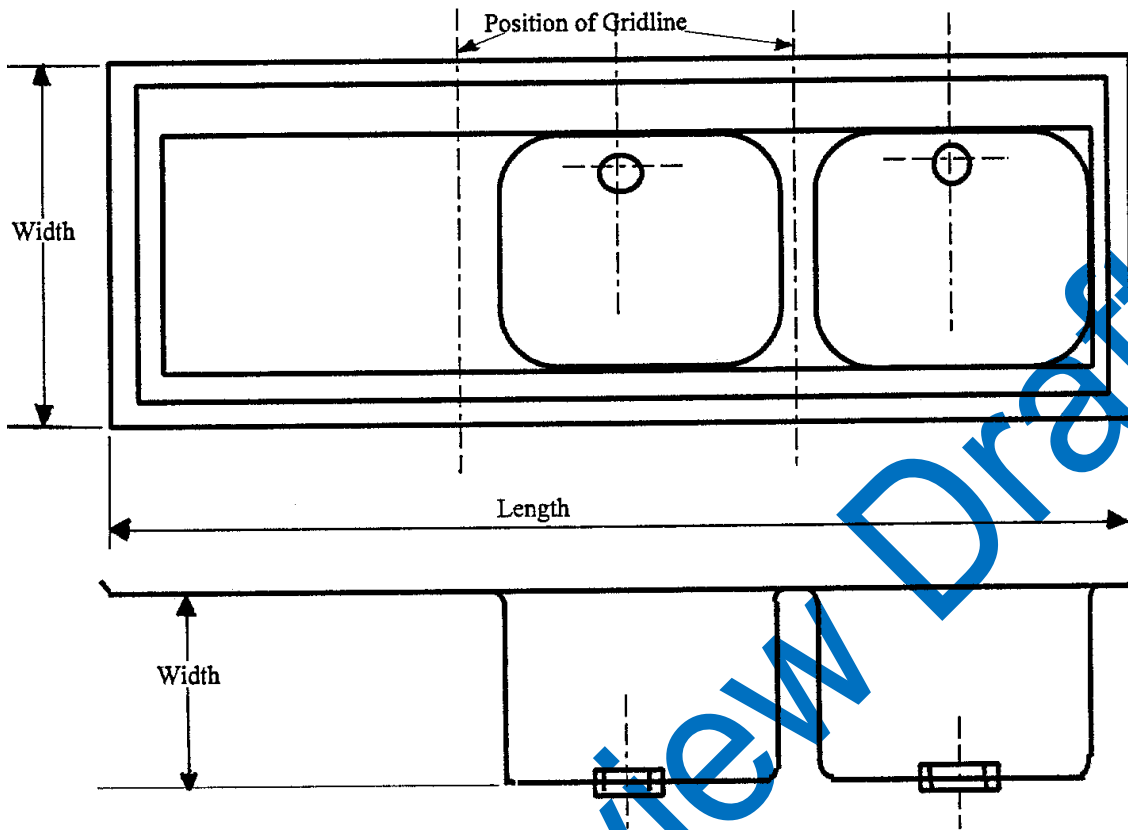


Figure 4 — Type E — Double bowl, double drainer right or left hand

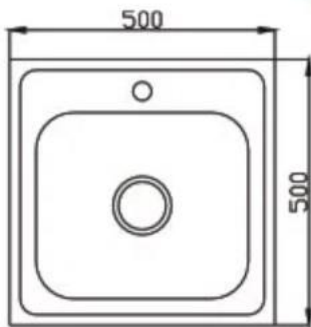


Figure 5 — Type F - Single Bowl, Single drain sink

## Bibliography

IS 13983:1994 Stainless steel sinks for domestic purposes

Public Review Draft

Public Review Draft