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**Cleaning chemicals for use in the food industry**



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## Introduction

Specifies general requirements for cleaning chemicals intended for use in the food industry. Sets minimum requirements for the safety of such cleaning chemicals, which are intended for use in food processing equipment and might come into contact with food products.

Draft African Standard for comments only — Not to be cited as African Standard



## Cleaning chemicals for use in the food industry

### 1 Scope

This African Standard specifies general requirements for cleaning chemicals intended for use in the food industry. The Standard sets minimum requirements for the safety of such cleaning chemicals, which are intended for use on food processing equipment and might come into contact with food products.

**NOTE** The Standard does not set cleaning performance standards. The user is urged to verify, by conducting suitable trials or tests either in the food processing plant or in the laboratory, that the cleaning chemicals are suitable for the proposed application. Alternatively, proven compliance with an appropriate national standard should be requested.

### 2 Normative references

The following referenced documents are indispensable for the application 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.

EN 10088-2, *Stainless steels — Part 2: Technical delivery conditions for sheet/plate and strip for general purposes*

*Globally Harmonized System of Classification and Labelling of Chemicals (GHS)*

ISO 9001, *Quality management systems — Requirements*

ISO 9002, *Quality systems — Model for quality assurance in production, installation and servicing*

ISO 11014-1, *Safety data sheet for chemical products — Part 1: Content and order of sections*

ISO 16495, *Packaging — Transport packaging for dangerous goods — Test methods*

### 3 Definitions and abbreviations

For the purpose of this standard the following definitions apply.

#### **batch**

the material from a single mix or, in the case of a continuous production process, the material from a single day's production

#### **certification body**

an impartial body, governmental or non-governmental, in which the interests of all the parties concerned with the functioning of a certification system are represented, and that has the necessary competence and authority to operate such a system

### 4 Requirements

#### 4.1 General requirements

**4.1.1** When visually examined products in powder or granular form shall remain free-flowing and free from lumps

**4.1.2** Products that are presented in solid or powder form shall be readily soluble in water of the quality and at the temperature recommended by the manufacturer.

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## 4.2 Product requirements

### 4.2.1 Raw materials

Raw materials used in the formulation of the cleaning chemicals shall be such as to be suitable for use in a food processing plant. Products shall not contain ingredients that are recognized as being potentially hazardous or toxic when the products are used in accordance with the manufacturer's recommendations, nor shall they form toxic or potentially toxic reaction products. The safety of raw materials shall be assessed and established in accordance with Annex A.

Materials known to leave residues, in concentrations that might be harmful to human beings or animals, on inanimate surfaces shall not be used in the formulation of the cleaning chemicals and materials and shall not be used in combinations that yield reaction products known to leave such harmful residues.

### 4.2.2 Perfumes and colorants

Cleaning chemicals shall not contain perfumes. They shall not leave an objectionable odour, nor impart any colour, odour or flavour to food products, when they are used in accordance with the manufacturer's recommendations.

### 4.2.3 Cleaning ability and suitability for purpose

When used in accordance with the manufacturer's recommendations, cleaning chemicals shall remove the soils for which they are claimed to be effective.

Products that are intended for personal use (on unbroken skin) shall have a pH value (at the recommended dilution for use) in the range 4 to 9.

NOTE It is recommended that the user assess cleaning ability and suitability for purpose in the food processing environment. Both visual and biological criteria can be applied. Where compliance with requirements such as those of (Hazard Analysis and Critical Control Point) HACCP system, and food safety management is necessary, objective evidence of efficacy might be required to enable claims of such compliance to be verified.

### 4.2.4 Effect on corrosion-resistant steel and other food contact surfaces

When tested in accordance with Annex B, either at the working concentration and the temperature recommended for use by the manufacturer, or at 20 °C to 25 °C, the cleaning chemicals shall not cause pitting, etching or discoloration of the test strip. Any change of mass shall not exceed 0.05 mg/100 mm<sup>2</sup> of the surface area of the test strip.

NOTE 1 Grade SS 304 stainless steel strip is specified for this test, since it is thought to be the lowest grade of corrosion-resistant steel likely to be encountered in the food processing environment.

NOTE 2 In the food processing environment, many different types and grades of rubber and plastics are used that might come into contact with both food and cleaning chemicals. The user should verify that the correct materials are specified, and that such materials are not adversely affected by cleaning chemicals or processes.

### 4.2.5 Quality requirements

The quality requirements for the manufacturer's quality system are specified in Annex B.

## 7 Packaging and labelling

### 7.1 Packaging

Products shall be so packed as to ensure their safe and secure transportation and handling. The packaging of cleaning chemicals that are classified as dangerous goods in accordance with the GHS shall comply with the relevant provisions of ISO 16495.



## 7.2 Labelling

**7.2.1** Visually assess the sample taken in accordance with Annex D and check for compliance with the labelling requirements.

**7.2.2** The labels of cleaning chemicals that are classified as dangerous goods in accordance with the GHS shall contain the United Nations' number and proper shipping name and shall comply with the relevant provisions of ISO 16495. In addition to such markings and labels as may be required in terms of legislation, labels that bear the following information in prominent, legible and indelible marking shall be firmly attached to all containers of cleaning chemicals:

- a) an indication that the product is a cleaning chemical, and its type;
- b) an indication of the purpose for which the product is claimed to be suitable;
- c) an indication that the product is suitable for use in a food processing plant;
- d) recommendations for the use of the product, including the various dilutions at which it will be effective;
- e) hazard warnings, where relevant;
- f) when so authorized by the relevant authority, certification marks that indicate compliance with this and with other relevant standards;
- g) the expiry date of the cleaning chemical;
- h) the manufacturer's name or trademark, or both;
- i) the batch identification;
- j) whether the product is required to be rinsed from food contact surfaces after use; and
- k) appropriate instructions for the storage of the product, including a warning to store away from foodstuffs.

## 8 Material safety

The manufacturer shall provide the Material Safety Data Sheet (MSDS) in accordance with ISO 11014-1 and a Technical Data Sheet (TDS)

**Annex A**  
(normative)

**Assessment of compliance with this standard**

**A.1 Safety of raw materials**

The manufacturer of the cleaning chemicals shall make available to the certification body, or to the customer, as required, sufficient evidence to establish the safety of all raw materials used in the formulation of these products, and their freedom from contaminants or trace components in quantities that can prove harmful to human beings or leave toxic residues on food or food processing equipment.

Evidence to this effect shall include one or more of the following:

- (i) certification by a recognized authority;
- (ii) material safety data sheets in accordance with ISO 11014-1;
- (iii) certificates of analysis; and
- (iv) any other relevant information.

Auditors responsible for the evaluation of material and product safety shall be qualified and experienced in chemical formulation technology.

## Annex B (normative)

### Method of test for effect on corrosion-resistant steel

#### B.1 Apparatus

Normally available laboratory glassware, together with:

Two laboratory ovens, maintained at the following temperatures: 105 °C and, where applicable, at the temperature recommended by the manufacturer for the use of the product.

#### B.2 Materials and reagents

**B.2.1 Ethanol**, 95 % pure.

**B.2.2 Acetone**, chemically pure.

**B.2.3 Distilled water**.

#### B.2.4 Test strip

One strip, of size approximately 80 mm × 25 mm × 1 mm, of a hot-rolled, annealed and polished corrosion-resistant steel that complies with standard grade X2CrNi18–9 as described in EN 10088-2.

NOTE Ensure that the edges are substantially smooth (before annealing) and polished.

#### B.3 Procedure

**B.3.1** Measure, to the nearest 0.1 mm, the length, width and thickness of the test strip.

**B.3.2** Degrease the test strip in a mixture of equal parts of ethanol and acetone. Allow the strip to air-dry, then heat it in an oven maintained at 105 °C for 30 min, allow it to cool in a desiccator, and immediately determine its mass to the nearest 0.1 mg.

**B.3.3** Prepare 1 L of an aqueous solution of the cleaning chemical at the dilution recommended by the manufacturer. Transfer 250 mL of the solution to a suitably stoppered glass bottle.

**B.3.4** Place the test strip in the bottle, ensuring that it is fully immersed in the test solution. Close the bottle with a stopper, then maintain it at the required temperature for 16 h.

**B.3.5** Remove the test strip from the bottle, rinse it thoroughly, first with distilled water, then with a mixture of equal parts of ethanol and acetone. Heat the test strip in the oven maintained at 105 °C for 30 min, allow it to cool in a desiccator, and immediately determine its mass to the nearest 0.1 mg.

**B.3.6** Calculate the change in mass ( $M$ ) in mg/100 mm<sup>2</sup> of the surface area as follows:

$$M = \frac{100(m_1 - m_2)}{2(l \times w) + 2(l \times t) + 2(w \times t)}$$

where

$M$  is the change in mass of the strip, in milligrams per 100 square millimetres;

$m_1$  is the mass of the test strip before the test, in milligrams;

$m_2$  is the mass of the test strip after the test, in milligrams;

$l$  is the length of the test strip, in millimetres;

$w$  is the width of the test strip, in millimetres;

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$t$  is the thickness of the test strip, in millimetres.

**B.3.7** Check for compliance with the requirements of 4.2.4

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**Annex C**  
(normative)**Quality requirements****C.1** Quality requirements

When assessed in accordance with 4.2.5, the quality system of a manufacturer of cleaning chemicals for use in the food industry shall comply with the requirements of C.1.1 to C.1.11 (inclusive).

**C.1.1** Responsibility for the quality system shall be delegated to an officer who has sufficient authority, and is sufficiently qualified, to ensure compliance with the relevant requirements of this standard.

**C.1.2** The responsibilities of all persons who have direct or indirect responsibility for quality shall be so defined and documented as to ensure that there is no overlap of functions or responsibilities.

**C.1.3** Quality system documentation, and the amendment and revision of such documentation (including formulations, test methods and product standards), shall be written and authorized only by duly designated officers who have written authority to perform these functions.

**C.1.4** A documented quality system shall exist and be implemented to ensure that only cleaning chemicals that comply with the relevant requirements of this standard are delivered to the food industry. Such documentation shall include, but not be limited to

- a) procedures for the manufacture of the respective products,
- b) standards for all the raw materials used,
- c) standards for the finished products,
- d) standards for the testing of raw materials, packaging, work in progress and finished products,
- e) standards for packaging, labelling and storage of the finished products, and
- f) systems to ensure that personnel involved in activities that affect the manufacture and quality of the cleaning chemicals have available only current and suitably authorized documented procedures and standards, and that such documentation can be recalled and updated when necessary.

**C.1.5** Systems shall exist and be implemented to ensure that only raw materials and packaging that comply with the relevant requirements of this standard are used in the manufacture of cleaning chemicals for the food industry.

**C.1.6** The manufacturer shall implement a system of product identification to ensure that a product in its original package can be traced back to the relevant records of manufacture and to the sources of raw materials.

**C.1.7** Products shall be manufactured in appropriate premises, using appropriate equipment and in accordance with appropriate, documented, manufacturing procedures (see C.1.4), by appropriately trained employees. Process control procedures shall be such as to ensure a consistent quality of the end product.

**C.1.8** The formulations of the cleaning chemicals (see C.1.3) shall be submitted for approval to a certification body, together with sufficient safety data that cover both raw materials and the finished product, to satisfy the certification body with respect to the safety of the product when used in accordance with the manufacturer's recommendations. Material safety data sheets shall form an

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integral part of such safety data. Formulations, once approved, shall not be altered without the approval of the certification body. The certification body shall impose such reappraisal requirements as it considers necessary to ensure the continued safety of the product.

**C.1.9** Testing of raw materials, packaging, work in progress and finished product shall be carried out by appropriately qualified and trained personnel who have access to appropriate equipment and facilities and in accordance with documented procedures. Test records shall be maintained and appropriate samples shall be retained for a period that is sufficient to comply with the requirements of the customer and the certification body or regulatory or inspection authority.

**NOTE** A sample retention time of at least six months and a record retention time of at least two years are recommended.

**C.1.10** Test equipment shall be calibrated periodically to ensure its reliability and accuracy.

Records of calibration shall be kept. The period between successive calibrations shall not exceed one year.

**C.1.11** Systems shall exist and be implemented to ensure that only cleaning chemicals that comply with the relevant quality standard(s) are dispatched to the customer.

**C.2** The quality system shall be assessed by auditors who are trained, qualified and experienced in the evaluation of quality systems in accordance with recognized quality system standards such as ISO 9001. Audits shall be carried out in accordance with the generally accepted criteria for assessing compliance with such standards.

## Annex D (normative)

### Sampling and compliance with the standard

#### D.1 Sampling

##### D.1.1 General

The following sampling procedure shall be applied in determining whether a lot, submitted for inspection and testing, complies with the relevant requirements of this standard. The samples so drawn shall be deemed to represent the lot.

##### D.1.2 Definitions

###### **defective**

a cleaning chemical that fails to comply in one or more respects with the requirements of this standard

###### **lot**

the quantity of cleaning chemical that bears the same batch identification, from one manufacturer, and that is submitted at any one time for inspection and testing

##### D.1.3 Sample for inspection

From the lot, draw at random the relevant number of containers in accordance with Table B.1.

**Table B.1 — Samples for inspection**

1	2
Lot size, containers	Sample size, containers
Up to 10	2
11 to 200	4
More than 200	6

Inspect the samples for compliance, when relevant, with the requirements for packing, marking and labelling given in clause 7.

##### D.1.4 Sample for testing

After inspection of the samples drawn in accordance with D.1.3, take at random half of the number of containers and from each of the containers take the smallest of

- a) the contents of the container, or
- b) 0,25 L in the case of liquids, or
- c) 0.25 kg in the case of solids.

Combine these samples by mixing thoroughly to make up a composite sample for testing.

#### D.2 Compliance with this standard

The lot shall be deemed to comply with the requirements of this standard if

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- a) after inspection of the containers and testing of the samples taken in accordance with D.1.3 and D.1.4, no defective is found,
- b) the manufacturer satisfies the certification body as to the safety of all materials used in the manufacture of the product and of the safety of the final product,
- c) the manufacturer satisfies the certification body as to the cleaning ability and the suitability for purpose of the cleaning chemicals when used in accordance with the manufacturer's recommendations, in accordance with 4.2.3, and
- d) the manufacturer complies with the quality system requirements of this standard, in accordance with Annex C.

### D.3 Verification

To verify a claim that a product complies with the requirements to carry a certification mark, authorized officers of the certification body will require access, as is normal practice, to relevant quality control and production records and will also require the right of access to production facilities on an unannounced basis.



**Annex E**  
(informative)

**Quality verification of cleaning chemicals for use in the food industry**

When a purchaser requires ongoing verification of the quality of cleaning chemicals for use in the food industry, it is suggested that, instead of concentrating solely on evaluation of the final product, he also direct his attention to the manufacturer's quality system. In this connection it should be noted that ISO 9001 covers the provision of an integrated quality system.

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