



SLOVENSKI STANDARD

SIST EN 12505:2002

01-september-2002

Stroji za predelavo hrane - Centrifugalni stroji za predelavo jedilnega olja in masti - Varnostne in higienske zahteve

Food processing machinery - Centrifugal machines for processing edible oils and fats - Safety and hygiene requirements

Nahrungsmittelmaschinen - Zentrifugen zur Verarbeitung von eßbaren Ölen und Fetten - Sicherheits- und Hygieneanforderungen

Machines pour les produits alimentaires - Centrifugeuses pour le traitement des huiles et des graisses alimentaires - Prescriptions de sécurité et d'hygiène

Ta slovenski standard je istoveten z: EN 12505:2000

ICS:

67.260	Tovarne in oprema za živilsko industrijo	Plants and equipment for the food industry
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en

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EUROPEAN STANDARD

EN 12505

NORME EUROPÉENNE

EUROPÄISCHE NORM

August 2000

ICS 67.260

English version

Food processing machinery - Centrifugal machines for processing edible oils and fats - Safety and hygiene requirements

Machines pour les produits alimentaires - Centrifugeuses pour le traitement des huiles et des graisses alimentaires - Prescriptions de sécurité et d'hygiène

Nahrungsmittelmaschinen - Zentrifugen zur Verarbeitung von eßbaren Ölen und Fetten - Sicherheits- und Hygieneanforderungen

This European Standard was approved by CEN on 21 April 2000.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 153 "Food processing machinery - Safety and hygiene specifications", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2001, and conflicting national standards shall be withdrawn at the latest by February 2001.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this standard.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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0 Introduction

This European Standard is a type C standard as stated in EN 1070: 1998.

The machinery concerned and the extent to which hazards are covered is indicated in the scope of this standard. In addition, machinery shall comply as appropriate with EN 292: 1991 for hazards which are not covered by this standard.

This Standard is independent of EN 12547:1999 because it deals specifically with the requirements of the processing of edible oils and fats. EN 12547:1999 is included in the Annex D: "Bibliography".

1 Scope

This European Standard covers all significant hazards as identified by risk assessment (see EN 1050), which are listed in clause 4 of this standard, relevant to centrifuges for processing edible oils and fats, when they are used as intended and under the conditions foreseen by the manufacturer.

It specifies safety and hygiene requirements for the design, manufacture, use, maintenance and cleaning of centrifugal machines.

The normal operating methods are described in 3.2.

This standard does not apply to machines using solvent extraction and ancillary machines (e.g. conveyors, hoppers, etc.).

It is not applicable to basket centrifuges.

This European Standard is applicable primarily to machines which are manufactured after the date of approval by CEN.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references; any subsequent amendments to or revisions of these publications shall apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 292-1: 1991	Safety of machinery - Basic concepts, general principles for design - Part 1: Basic terminology, methodology
EN 292-2/A1: 1995	Safety of machinery - Basic concepts, general principles for design - Part 2: Technical principles and specifications
EN 294: 1992	Safety of machinery - Safety distances to prevent danger zones being reached by the upper limbs
EN 418: 1992	Safety of machinery - Emergency stop equipment, functional aspect – Principles for design
EN 614-1: 1995	Safety of machinery - Ergonomic design principles - Part 1: Terminology and general principles.
EN 953: 1997	Safety of machinery - General requirements for the design and construction of guards (fixed, movable)
EN 954-1: 1996	Safety of machinery - Safety related parts of control system - Part 1: General principles for design
EN 1037: 1995	Safety of machinery - Prevention of unexpected start-up
EN 1050: 1996	Safety of machinery - Principles of risk assessment

EN 1070: 1998	Safety of machinery - Terminology
EN 1672-2: 1997	Food processing machinery - Basic concepts - Part 2: Hygiene requirements
EN 60204-1: 1997	Specification for general requirements - Part 1: Safety of machinery. Electrical equipment of machines
EN 60529: 1991	Classification of degree of protection provided by enclosures (code IP)
EN ISO 3744: 1995	Acoustic - Determination of sound power levels of noise sources – Engineering method employing and enveloping measurement surface in an essentially free field over a reflecting plane
EN ISO 4871:1996	Acoustic - Verification and declaration of noise emission values of machinery and equipment
EN ISO 11201: 1995	Acoustic - Noise emitted by machinery and equipment - Measure of emission sound pressure levels at the work station and at other specified positions – Engineering method in an essentially free fields over a reflecting plane
EN ISO 11688-1	Acoustic - Recommended practice for the design of low noise machinery and equipment, Part 1: Planning
prEN 1005-2: 1993	Safety of machinery - Human physical performance - Part 2: Manual handling of objects associated to machinery
prEN 1005-3: 1993	Safety of machinery - Human physical performance - Part 3: Recommended force limits for machinery operation
ISO 468: 1982	Surface roughness - Parameters, their values and general rules for specifying requirements
ISO 1940-1: 1986	Mechanical vibration - Balance quality requirements of rigid rotor - Part 1: Determination of permissible residual unbalance
IEC 60651:1979 and Amendment 1:1993	Sound level meters
IEC 60804:1985 and Amendment 1:1989 and Amendment 2:1993	Integrating-averaging sound level meters

3 Definitions and descriptions

For the purposes of this Standard, the definitions given in EN 1070: 1998 apply and also the following.

3.1 extraction and separation: Two methods of centrifugation, carried out by two different centrifugal machines: respectively decanter and disc stack centrifuges.

3.2 centrifugal machine: It is used for the extraction and separation of edible oils and fats in which, by means of centrifugal force, the incoming product ("feed") is separated into the different liquid and solid phases.

3.2.1 decanter centrifuge: It is used to extract the solid phase from the liquid (oil or oil and water) phase (see Figure 1)

The feed enters the machine through a fixed pipe (1) and is distributed on the internal surface of the bowl (2), by centrifugal force.

The scroll (3), which rotates at a slightly different speed from the bowl, conveys the solid residue to the outlet holes (4). The scraper (5), driven by an electric motor (6) removes the solid residue from the walls of the housing (7).

The normal operating method of this centrifuge is of the continuous feeding and discharging of the processed products.

The liquids pass out from the bowl through special weir holes: for oil phase (8) and for water phase (9). An electric motor (10) drives the bowl by a transmission device (11) (e.g.: pulleys, belts and hydraulic clutch). The scroll is rotated by means of a scroll driving device (12) (e.g.: pulleys, belts and gear box).

3.2.2 disc stack centrifuge: Centrifugal machine with vertical axis. It is used to separate oil from water and small quantity of residual solid (see Figures 2 and 3).

The feed enters the machine through a fixed vertical pipe (1). Inside the bowl, under the effect of the centrifugal force, the feed is separated into three layers: residual solid (2), water (3), and oil (4). The feed passes through the discs (5). The liquids pass out from the bowl through weir rings: for oil (6) and for water (7). Oil and water are collected under a fixed bowl cover (8) which acts as a support for the feed pipe (1), and for oil (9) and water (10) outlet pipes.

The normal operating method of this centrifuge is of the continuous feeding and discharging of the processed liquid products.

On the self-cleaning disc stack centrifuge (see Figure 2) the residual solid can be discharged by a hydraulic discharging device (11) which permits its ejection, by centrifugal force, whilst the machine is operating.

On the manual disc stack centrifuge (see Figure 3) the residual solid can be discharged only when the machine is at rest and after the bowl has been opened.

The electric motor (12) drives the bowl by a transmission device (13) (e.g.: a mechanical clutch and gears).

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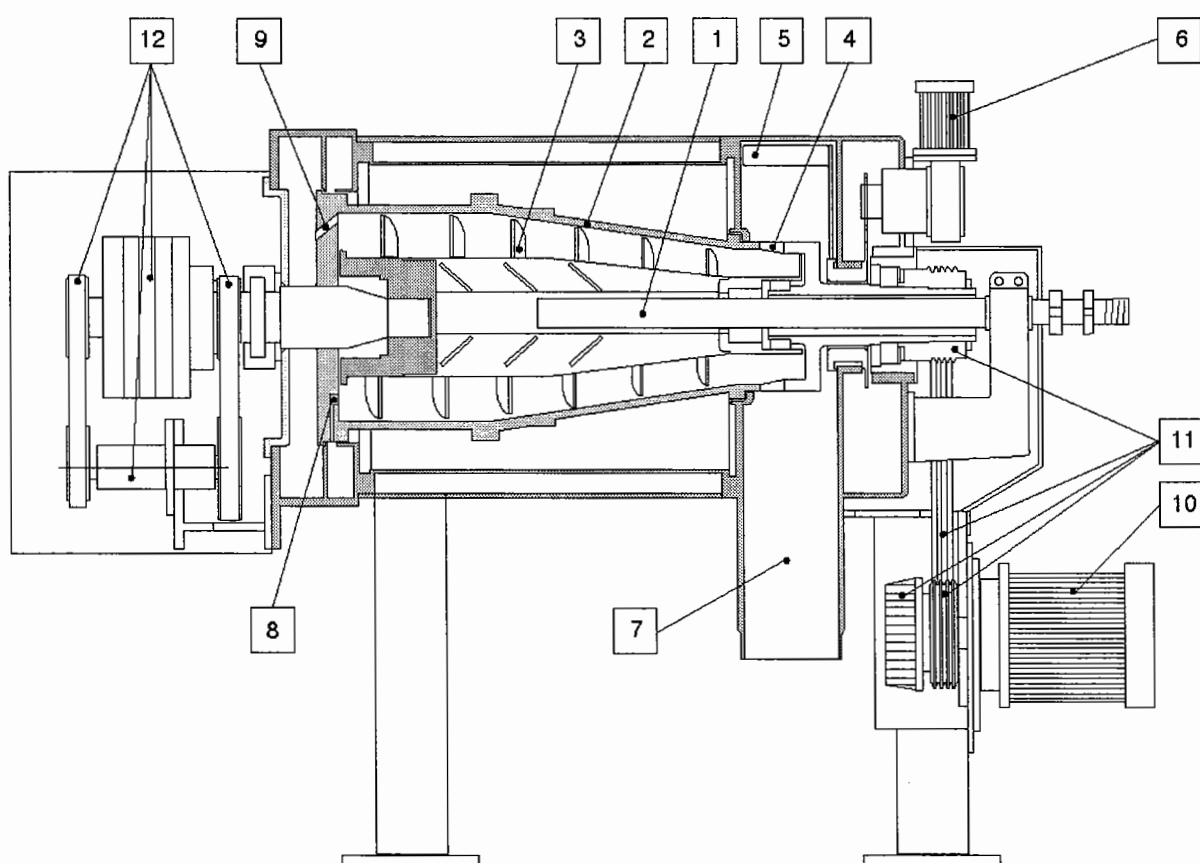


Figure 1 - Decanter centrifuge (informative)

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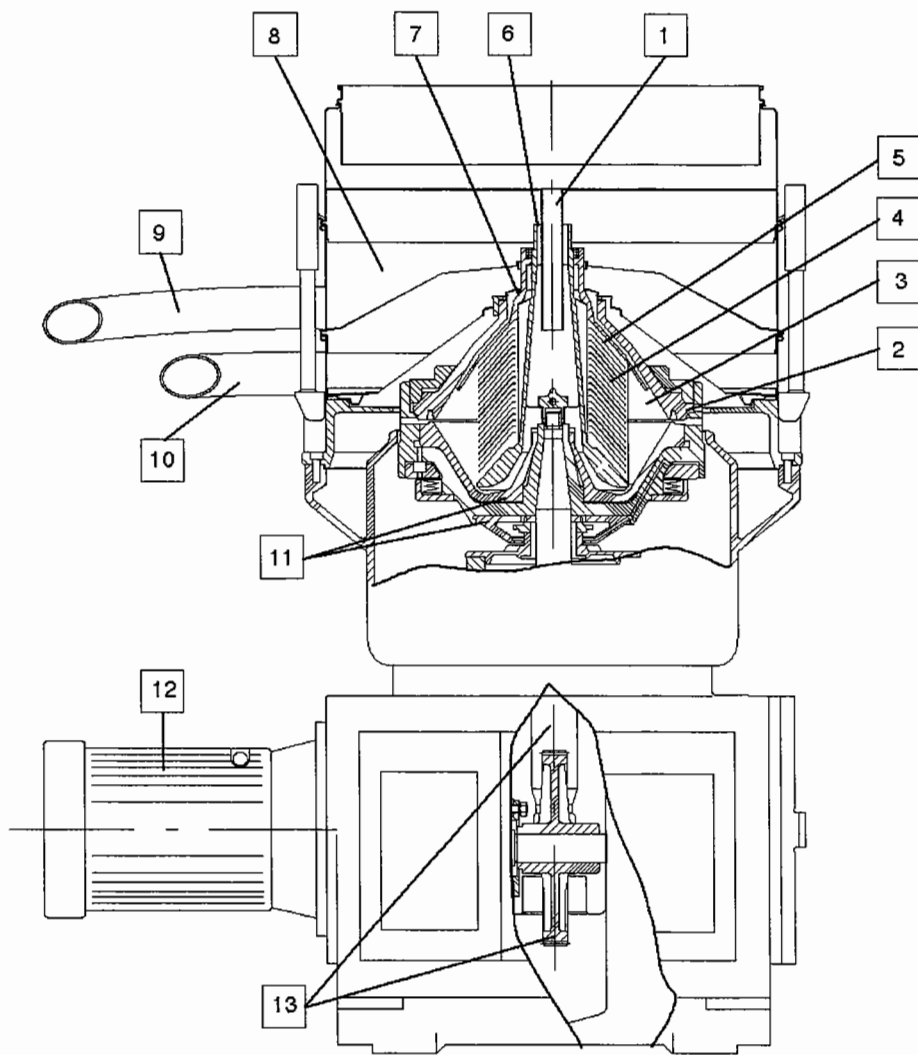


Figure 2 - Disc stack centrifuge - self cleaning discharge version (informative)

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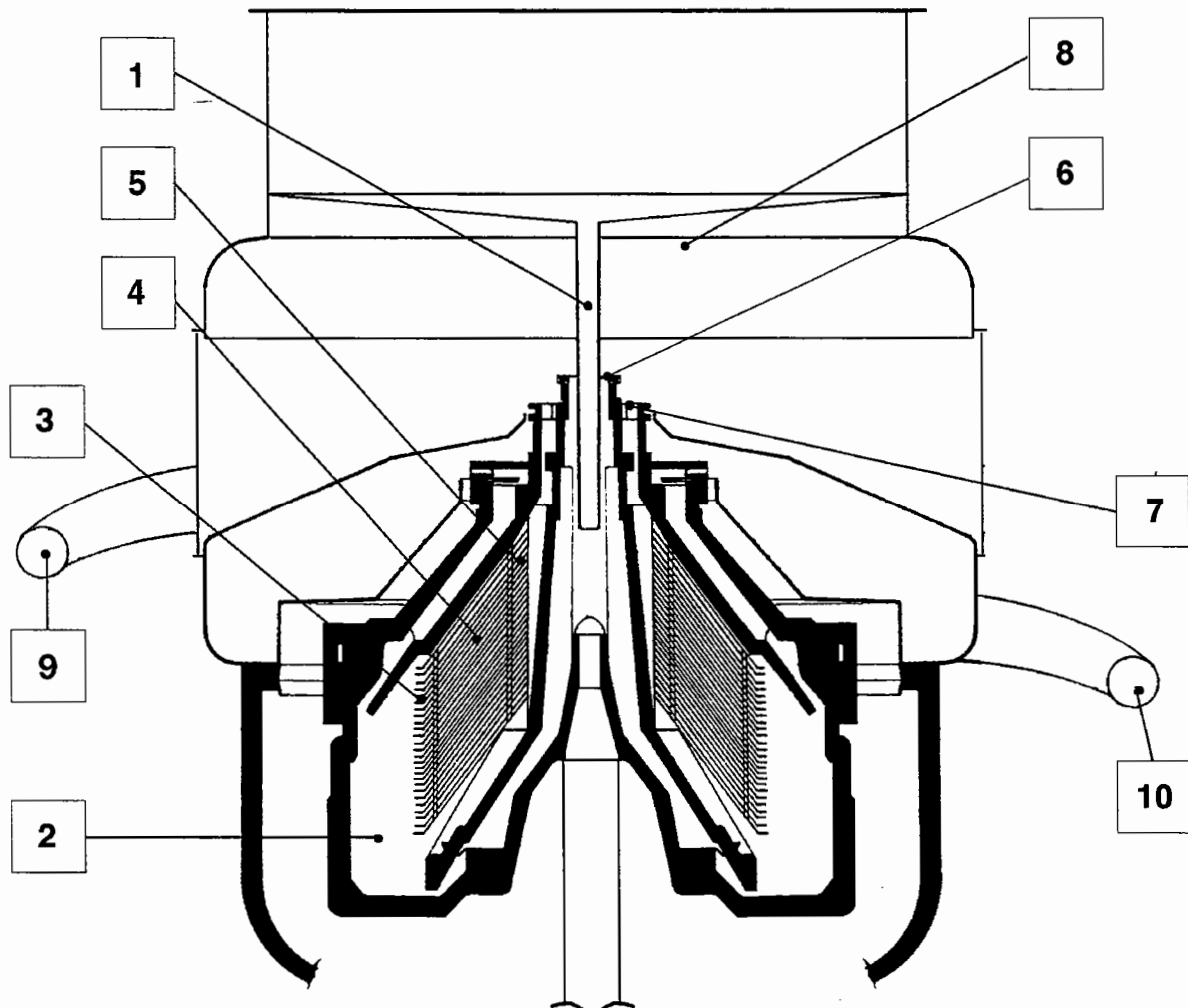


Figure 3 - Disc stack centrifuge - manual discharge version (informative)

3.3 feed: Material to be processed by the centrifugal machines.

3.4 bowl: Rotating part of hollow and asymmetric shape containing the feed.

3.5 scroll: Helicoidal-shaped rotating part of the decanter centrifuge, situated inside the bowl.

3.6 bowl cover: An element which when closed prevents contact with the working parts and accidental emissions of the feed from the bowl.

3.7 operating speed: It is the working speed of the machine and is dependent on the specific application.

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4 List of significant hazards

This clause contains all hazards identified by risk assessment as being specific and significant for centrifugal machines used for processing edible oils and fats and which require measures to reduce risk.

4.1 Mechanical hazards

The significant hazards are:

- crushing;
- shearing;
- entanglement;
- drawing-in;
- abrasion;
- ejection of machine parts;
- ejection of processed product;
- loss of stability;

4.1.1 Decanter centrifuge

The example in figure 4 shows the hazard zones (for loss of stability hazard see 4.1.4).

Zone 1

- belts and pulley;
- static sensor and rotating cam of bowl speed indicator (if provided)

Entanglement for hands and other parts of body, also of clothes; abrasion for hands or other parts of body; ejection of cover due to incorrect attachment; ejection of machine parts.

Zone 2

- belts and pulleys;
- static sensor and rotating cam of gear box speed indicator (if provided);
- gear box for reduction speed between scroll and bowl.

Entanglement for hands and other parts of body, also of clothes; abrasion for hands or other parts of body; ejection of cover due to incorrect attachment; ejection of machine parts.

Zone 3

- chain and sprocket wheels (or gears).

drawing-in; entanglement; abrasion; ejection of machine parts.

Zone 4

- scraping, rotating (low speed) blades.

Shearing; ejection of processed product.

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