



SLOVENSKI STANDARD
oSIST prEN 17877:2022
01-september-2022

Dinamične mešalne naprave in mešala - Definicije in hidravlične karakteristike

Dynamic mixers and agitators - Definitions and hydraulic characterizations

Dynamische Agitatoren - Definition und hydraulische Charakteristik

Mélangeurs et agitateurs dynamiques - Définitions et caractéristiques hydrauliques

Ta slovenski standard je istoveten z: prEN 17877

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01.040.23	Tekočinski sistemi in sestavni deli za splošno rabo (Slovarji)	Fluid systems and components for general use (Vocabularies)
23.100.99	Drugi sestavni deli hidravličnih sistemov	Other fluid power system components

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English Version

Dynamic mixers and agitators - Definitions and hydraulic characterizations

Mélangeurs et agitateurs dynamiques - Définitions et caractéristiques hydrauliques

Dynamische Agitatoren - Definition und hydraulische Charakteristik

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 458.

If this draft becomes a European Standard, 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (prEN 17877:2022) has been prepared by Technical Committee CEN/TC 458 “Industrial rotating mixing systems”, the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

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Introduction

Dynamic mixers and agitators are used mainly to set in motion one or more phases including at least one liquid and maintain mixture conditions and/or to promote mass transfer and/or heat transfer.

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1 Scope

This document defines the terms and definitions relating to the field of dynamic mixing and agitation. It covers the hydraulic characteristics of mixers and agitators. It is intended to contribute to mutual understanding of the various stakeholders in a mixing or agitation project: manufacturers, users, integrators, inspection agencies...

This document applies to mixing and agitation systems where there is at least one dominant liquid phase.

It does not apply to:

- static mixers;
- kneaders;
- submersible mixers covered by ISO 21630;
- aerators;
- pumps.

Annex A lists the definitions by alphabetic order.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1 Basic mixing operations

3.1.1

agitation

motion of one liquid using a rotational device in a tank

3.1.2

mixing

motion of one substance or more through a liquid using a rotational device in a tank

3.1.3

homogenization

blending miscible liquids

mixing two or more miscible liquids to generate one liquid phase using a mixing unit

3.1.4

dissolving

soluble solid into a liquid using a mixing unit

prEN 17877:2022 (E)**3.1.5****solid suspension**

solid particles suspended in a liquid using a mixing unit

EXAMPLE flocculation, process drinking yoghurt, food and chemical applications

3.1.6**solid dispersion**

small solid particles (powder) blended in a dominant liquid phase using a mixing unit

EXAMPLE dye in ink or cocoa in chocolate milk

3.1.7**emulsion**

mixing of two or more immiscible liquids into each other using a mixing unit

Note 1 to entry: To prevent the liquids from separating out, a third liquid called a surfactant, is added.

3.1.8**gas dispersion**

diffusion of gas bubbles into a fluid using a mixing unit

3.1.9**heat transfer**

circulation of fluids in tank to promote faster heating or cooling transmission to fluids using a mixing unit

3.1.10**fermentation**

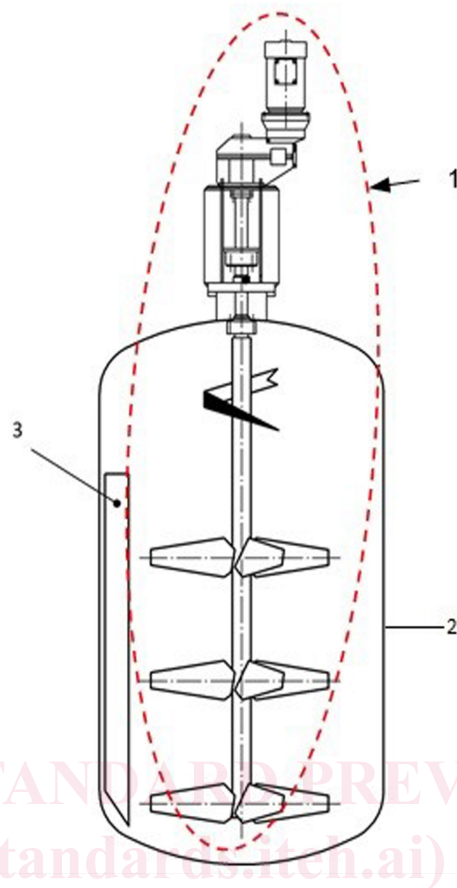
process where the bacteria is used to digest organic matter using a mixing unit which ameliorate the contact between all the components

EXAMPLE yoghurt, cheese culture and sour cream in dairy applications

3.2 Mixing parts**3.2.1****mixing unit****mixing system**

unit consisting of a mixer and a tank including all necessary accessories to provide the mixing of gas, liquid, paste or powder into the liquid continuous phase

Note 1 to entry: See Figure 1.

**Key**

- 1 mixer
- 2 tank
- 3 baffle

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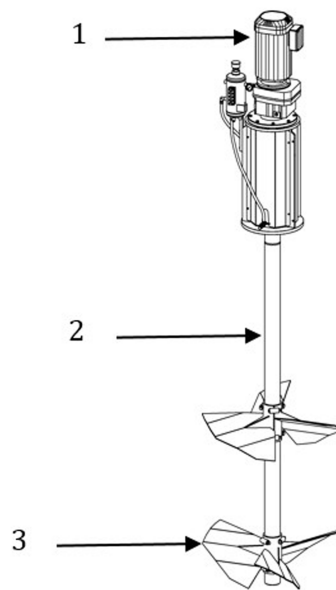
Figure 1 — Principle of a mixing unit

3.2.2**mixer****agitator**

equipment for moving at least one liquid in a delimited tank

Note 1 to entry: See Figure 2.

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**Key**

- 1 drive head
- 2 shaft
- 3 impeller

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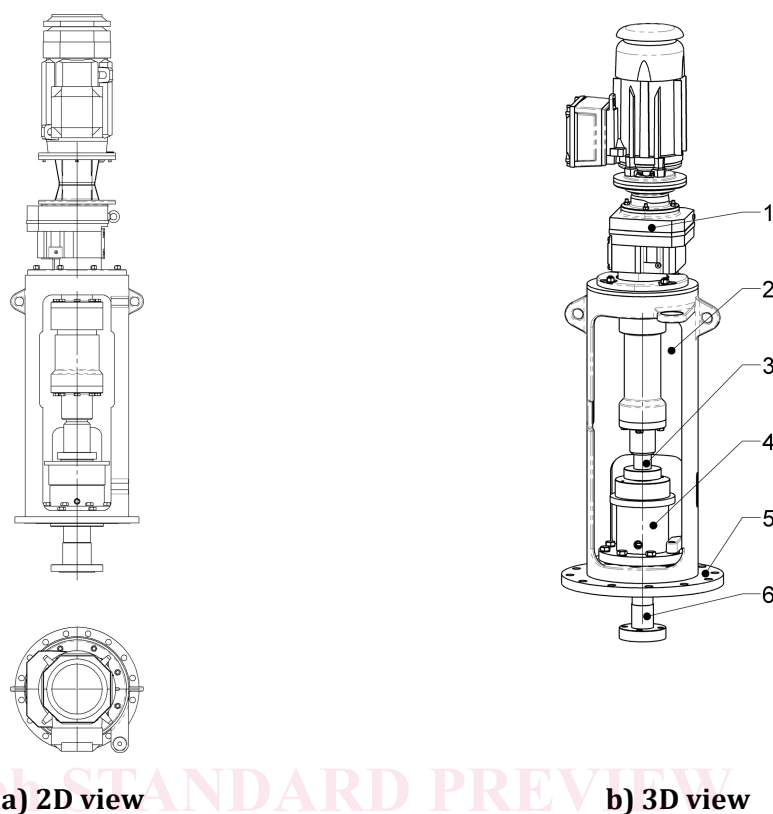
Figure 2 — Example of a mixer

3.2.3**drive head**

unit consisting of all parts outside of the vessel including at least a drive unit (3.2.4)

Note 1 to entry: If no coupling (Figure 3, key 6) the drive shaft is used as the mixer shaft.

Note 2 to entry: See Figure 3.



a) 2D view

b) 3D view

Key

- 1 drive unit
- 2 lantern
- 3 drive shaft
- 4 mixer seal
- 5 base flange (or mounting flange)
- 6 coupling between the drive shaft and the mixer shaft

Figure 3 — Example of a drive head**3.2.4****drive unit**

component(s) which rotate(s) the mixer shaft

3.2.5**lantern**

housing(s) between the drive unit and the base flange which contain(s) the mixer seal and/or a bearing and/or shaft connecting parts

Note 1 to entry: The lantern can include a bearing device.

3.2.6**drive shaft**

part of the shaft located in the drive head and designed to transfer the torque from the drive unit to the mixer shaft

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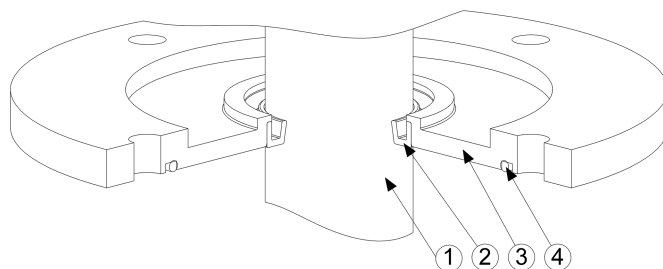
3.2.7

mixer seal

seal device that separates the inside and outside the tank and/or prevents substance entering and/or leaving the tank

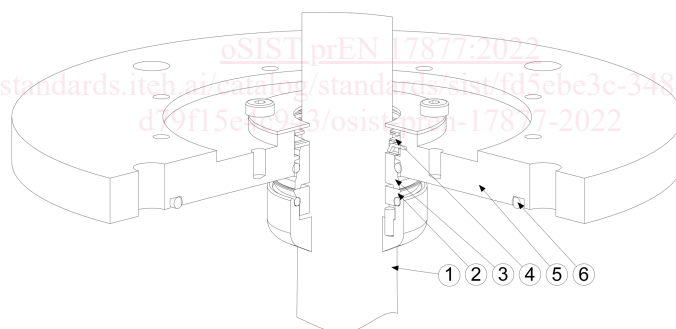
Note 1 to entry: A shaft seal can be e.g. a lip seal, a labyrinth seal, a mechanical seal, a stuffing box, an hermetic seal (e.g. magnetic coupling).

Note 2 to entry: See Figure 4.

**Key**

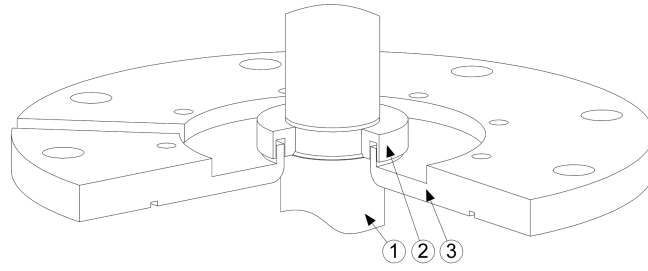
- 1 mixer shaft
- 2 seal
- 3 base flange
- 4 seal, base flange

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a) Lip seal**Key**

- 1 mixer shaft
- 2 seal, rotating part
- 3 seal, stationary part
- 4 spring
- 5 base flange
- 6 seal, base flange

b) Single mechanical seal

**Key**

- 1 mixer shaft
- 2 seal
- 3 base flange

c) Labyrinth seal**Figure 4 — Some types of seals****3.2.8****base flange****mounting flange****mixer flange**

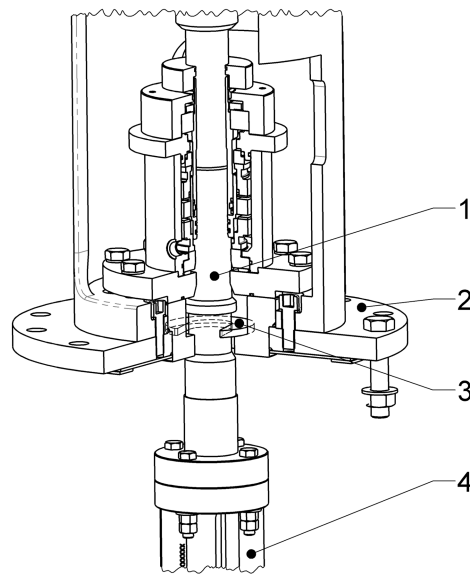
connecting plate between the mixer and the tank which holds the drive head

Note 1 to entry: See Figure 5.

3.2.9**shaft suspension piece**

device that allows an easily maintaining of mixer seal and which is preventing mixer shaft from sliding down when axial lock is released

Note 1 to entry: See Figure 5.

**Key**

- 1 drive shaft
- 2 base flange
- 3 shaft suspension piece
- 4 mixer shaft

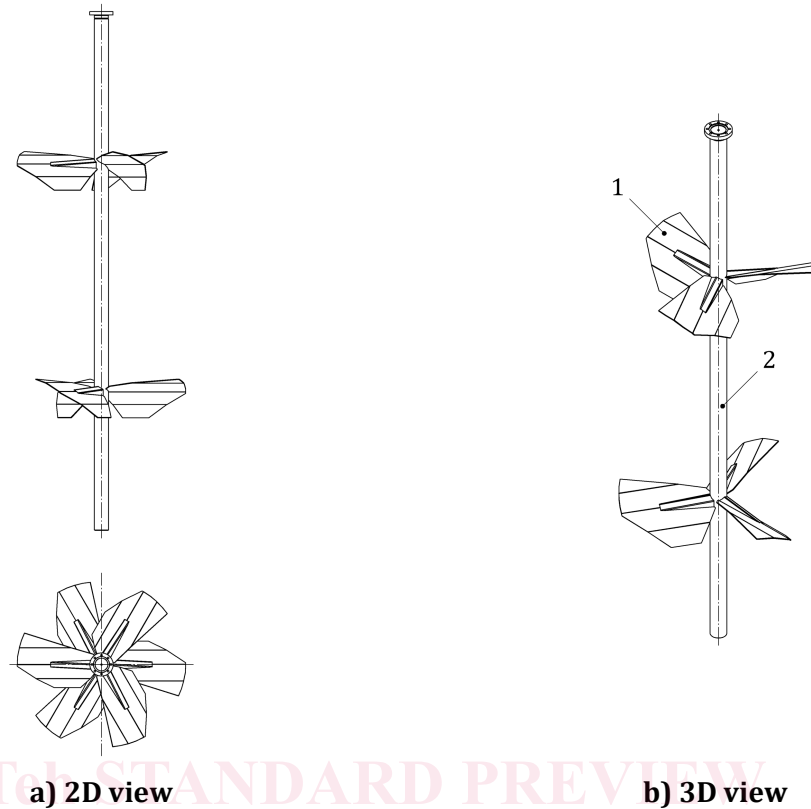
Figure 5 — shaft suspension piece

3.2.10**mixer shaft**

part of the shaft located in the tank and designed to support the impeller

Note 1 to entry: With only one single shaft, the mixer shaft is used as drive shaft (see Figure 3, key 6).

Note 2 to entry: See Figure 6.

**Key**

- 1 impeller
- 2 mixer shaft

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Figure 6 — Example of a mixer shaft with impellers

3.2.11**impeller**

mixer element that moves the mixed media

Note 1 to entry: There are different types of impellers such as propellers, anchors, ribbons, turbines. Most frequently, impellers are fitted with blades (from 2 to 6).

3.2.12**in tank bearing**

in tank device where the mixer shaft is guided, can be bushing or roller/ball bearing

Note 1 to entry: When an in tank bearing is located at least above the lowest impeller it is called an intermediate bearing (see Figure 7).

Note 2 to entry: When an in tank bearing is located at the bottom of the tank it is called a bottom bearing (see Figures 8 and 9).