



SLOVENSKI STANDARD
SIST EN 17877:2024

01-januar-2024

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: EN 17877:2023

ICS:

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

SIST EN 17877:2024

en,fr,de

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 17877

November 2023

ICS 01.040.23; 23.100.99

English Version

Dynamic mixers and agitators - Definitions and hydraulic characterizations

Mélangeurs et agitateurs dynamiques - Définitions et caractéristiques hydrauliques

Dynamische Mischer und Rührwerke - Definition und hydraulische Charakteristik

This European Standard was approved by CEN on 8 October 2023.

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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and United Kingdom.

Document Preview

[SIST EN 17877:2024](https://standards.iteh.ai/catalog/standards/sist/fd5e3c3c-348d-4dd4-abd5-d79f15e4c943/sist-en-17877-2024)

<https://standards.iteh.ai/catalog/standards/sist/fd5e3c3c-348d-4dd4-abd5-d79f15e4c943/sist-en-17877-2024>



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

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

EN 17877:2023 (E)

Contents	Page
European foreword	3
Introduction	4
1 Scope	5
2 Normative references	5
3 Terms and definitions	5
3.1 Basic mixing operations	5
3.2 Mixing parts	6
3.3 Mixer types	17
3.4 Impeller types	21
3.5 Hydraulic data	28
3.6 Mechanical data	37
4 Symbols and associated formulae	40
Annex A (informative) Alphabetical index	45
Bibliography	49

iTeh Standards
 (<https://standards.iteh.ai>)
 Document Preview

[SIST EN 17877:2024](https://standards.iteh.ai/catalog/standards/sist/fd5ebe3c-348d-4dd4-abd5-d79f15e4c943/sist-en-17877-2024)

<https://standards.iteh.ai/catalog/standards/sist/fd5ebe3c-348d-4dd4-abd5-d79f15e4c943/sist-en-17877-2024>

European foreword

This document (EN 17877:2023) has been prepared by Technical Committee CEN/TC 458 “Industrial rotating mixing systems”, the secretariat of which is held by AFNOR.

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 May 2024, and conflicting national standards shall be withdrawn at the latest by May 2024.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

[SIST EN 17877:2024](https://standards.iteh.ai/catalog/standards/sist/fd5ebe3c-348d-4dd4-abd5-d79f15e4c943/sist-en-17877-2024)

<https://standards.iteh.ai/catalog/standards/sist/fd5ebe3c-348d-4dd4-abd5-d79f15e4c943/sist-en-17877-2024>

EN 17877:2023 (E)

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.

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

[SIST EN 17877:2024](https://standards.iteh.ai/catalog/standards/sist/fd5ebc3c-348d-4dd4-abd5-d79f15e4c943/sist-en-17877-2024)

<https://standards.iteh.ai/catalog/standards/sist/fd5ebc3c-348d-4dd4-abd5-d79f15e4c943/sist-en-17877-2024>

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, etc.

This document is applicable 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 in alphabetical 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 terminology 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 a soluble solid into a liquid using a mixing unit

EN 17877:2023 (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**

shearing of larger gas bubbles to smaller ones using a mixing unit

Note to entry 1: Smaller bubbles have larger relative surface area and thereby enhancing mass transfer between the gas and liquid phases.

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**

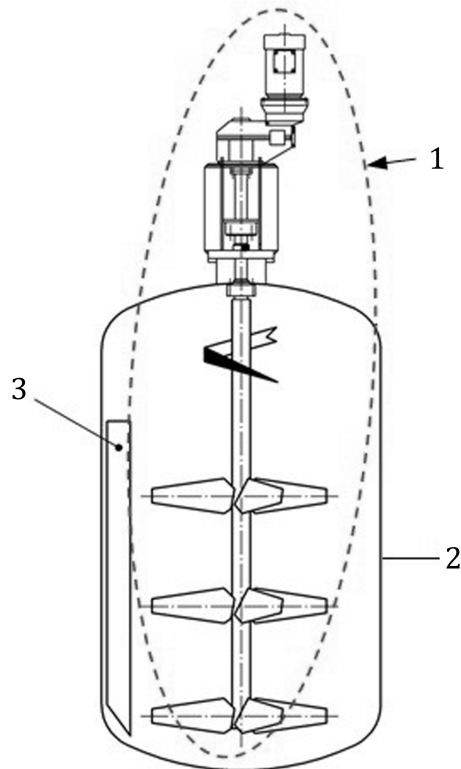
process where microorganisms are used to digest organic matter using a mixing unit which ameliorate the contact between all the components

EXAMPLE and: 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

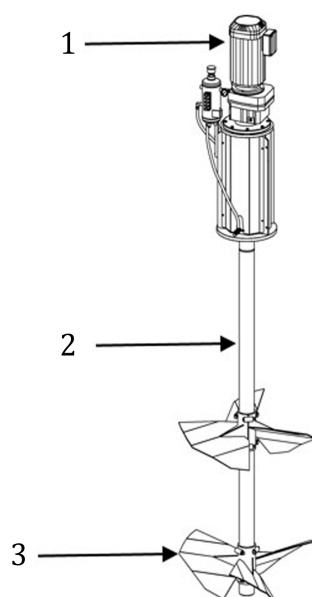
iTeh Standards
 (<https://standards.itih.ai>)
 Figure 1 — Principle of a mixing unit

3.2.2**mixer
agitator**

equipment inducing liquid motion by mechanical rotation in a delimited tank

Note 1 to entry: See Figure 2.

EN 17877:2023 (E)

**Key**

- 1 drive head
- 2 shaft
- 3 impeller

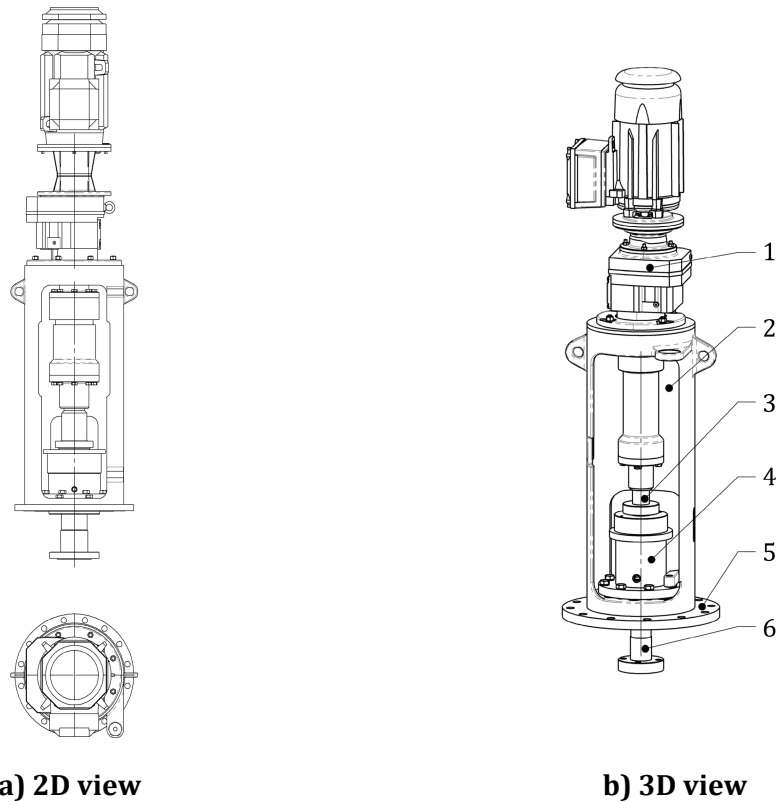
Figure 2 — Example of a mixer

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.

**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

iTeh Standards
 (https://standards.itih.ai)
 Document Preview

SIST EN 17877:2024

<https://standards.itih.ai/catalog/standards/sist-en-17877-2024> **Figure 3 — Example of a drive head** [79f15e4c943/sist-en-17877-2024](https://standards.itih.ai/catalog/standards/sist-en-17877-2024)

3.2.4**drive unit**

component(s) which rotate(s) mixer shaft

3.2.5**lantern**

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

3.2.6**drive shaft**

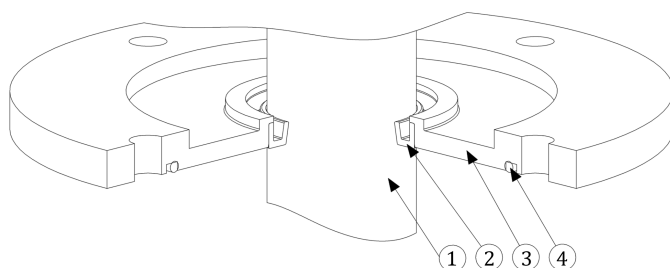
part of shaft located in drive head and designed to transfer the torque from drive unit to mixer shaft

EN 17877:2023 (E)**3.2.7****mixer seal**

seal device that separates inside tank from outside 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 Figures 4 to 6.

**Key**

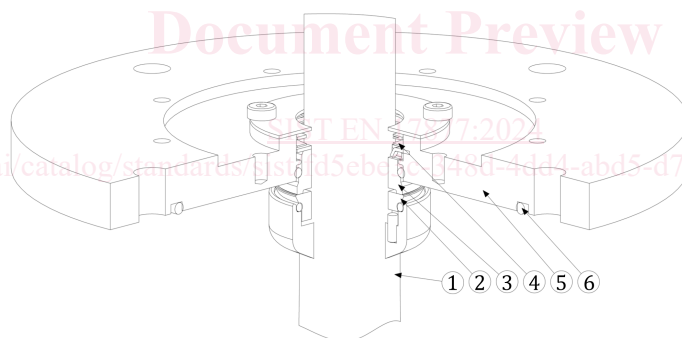
- 1 mixer shaft
- 2 seal
- 3 base flange
- 4 seal, base flange

iTeh Standards

Figure 4 — Lip seal

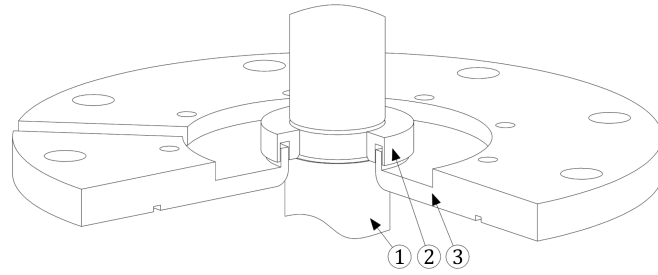
(<https://standards.iteh.ai>)

Document Preview

**Key**

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

Figure 5 — Single mechanical seal



Key

- 1 mixer shaft
- 2 seal
- 3 base flange

Figure 6 — Labyrinth seal

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 7.

3.2.9

shaft restraint system

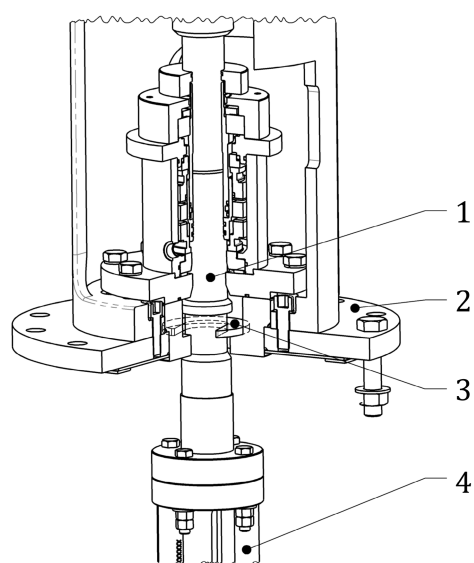
device that allows an easily maintaining of mixer seal and which is preventing mixer shaft from sliding down when drive head and/or axial lock is released

Note 1 to entry: See Figure 7.

[SIST EN 17877:2024](https://standards.iteh.ai/catalog/standards/sist/fd5ebc3c-348d-4dd4-abd5-d79f15e4c943/sist-en-17877-2024)

<https://standards.iteh.ai/catalog/standards/sist/fd5ebc3c-348d-4dd4-abd5-d79f15e4c943/sist-en-17877-2024>

EN 17877:2023 (E)

**Key**

- 1 drive shaft
- 2 base flange
- 3 shaft restraint system
- 4 mixer shaft

Figure 7 — shaft restraint system**3.2.10****mixer shaft**

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

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

Note 2 to entry: Mixer shaft can consist of several shaft steps. Some shaft steps may have no impeller installed on.

Note 3 to entry: See Figure 8.