SLOVENSKI STANDARD
SIST EN 247:2001

01-februar-2001

Prenosniki toplote - Terminologija

Heat exchangers - Terminology

Wärmeaustauscher - Terminologie

Echangeurs thermiques - Terminologie

Ta slovenski standard je istoveten z: **EN 247:1997**

ICS:

01.040.27	Prenos energije in toplote (Slovarji)	Energy and heat transfer engineering (Vocabularies)
27.060.30	Grelniki vode in prenosniki toplote	Boilers and heat exchangers

SIST EN 247:2001 **en**

EUROPEAN STANDARD **EN 247**

NORME EUROPÉENNE

EUROPÄISCHE NORM February 1997

Supersedes ENV 247:1990

ICS 01.040.27; 27.060.30

Descriptors: heat transfer, heat exchangers, vocabulary

English version

Heat exchangers - Terminology

Echangeurs thermiques - Terminologie Wärmeaustauscher - Terminologie

This European Standard was approved by CEN on 1997-01-10. 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.

The European Standards exist 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, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

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

Contents **Page**

Foreword 6

Introduction 7

1 Scope 8

2 Definitions 8
2.1 Parallel flow arrangement 8
2.2 Counterflow arrangement 8
2.3 Pure crossflow 9
2.4 Antimethodic overall flow arrangement 9
2.5 Methodic overall flow arrangement 9
2.6 Two-phase fluid 10
2.7 Single-phase fluid 10
2.8 Fluidized bed 10
2.9 Method of heat transfer 10
2.10 Number of passages (passes) 10
2.11 Tube sheet 10
2.12 General arrangement of heat transfer 10
2.13 Steady or permanent thermal conditions 10
2.14 Cyclic thermal conditions 10

3 Terminology - Main criteria 10
3.1 Physical criteria 10
3.1.1 General arrangement of heat transfer 10
3.1.2 Method of heat transfer 10
3.1.3 Arrangement of fluid flow 10
3.1.4 Thermal conditions of the heat transfer surface 10
3.1.5 Number and type of fluids 10
3.2 Design criteria 11
3.2.1 Type of design 11
3.2.2 Heat transfer 11
3.2.3 Methods to facilitate expansion 11
3.2.4 Material of heat transfer wall 11
3.2.5 Constructive solutions related to cleaning 11
3.2.6 Cleaning possibilities 11

Contents (continued) **Page**

4	Detailed terminology	11
4.1	General arrangement of heat transfer	11
4.1.1	With direct transfer	11
4.1.2	With accumulation	11
4.1.3	In fluidized bed	11
4.1.4	With cooling	11
4.1.5	With intermediate medium (with natural or forced circulation)	11
4.2	Method of heat transfer	12
4.2.1	Single-phase media in all circuits	12
4.2.2	Single-phase media versus two-phase media in related circuits	12
4.2.3	Two-phase media in all circuits	12
4.3	Diagram of fluid flow	12
4.3.1	Single pass	12
4.3.2	Multiple passes	12
4.4	Thermal conditions of heat transfer surface	13
4.4.1	Steady	13
4.4.2	Cyclic	13
4.5	Number of fluids (media)	13
4.5.1	Two fluids (media)	13
4.5.2	Three fluids (media)	13
4.5.3	N fluids (media)	
4.6	Design type	13
4.6.1	Shell and tube heat exchangers	13
4.6.2	Plate heat exchangers	14
4.6.3	Heat exchangers of stacked blocks or with crossing channels	14
4.6.4	Matrix heat exchangers	14
4.7	Heat transfer surfaces and walls	15
4.7.1	Smooth	15
4.7.2	Coated	15
4.7.3	Fabricated	15
4.7.4	With built-on elements	15
4.7.5	With safety wall (double wall)	15
4.8	Expansion possibilities	16
4.8.1	Rigid	16
4.8.2	Elastic	16
4.8.3	Free	16
4.8.4	With sealing device	16
4.9	Materials of heat transfer wall	16
4.9.1	Metallic	16
4.9.2	Non-metallic	16

Contents (continued) **Page**

4.9.3	Special	17
4.9.4	Composite	17
4.10	Constructive solutions related to cleaning	17
4.10.1	Non-dismountable	17
4.10.2	Dismountable	17
4.11	Cleaning possibilities	17
4.11.1	Mechanical means	17
4.11.2	Acoustic means	17
4.11.3	Chemical means	17

Annex A (informative) Main functions of heat exchangers in various technological fields related to this European standard 18

Annex B (informative) Examples for illustration of the terminology in clause 4 19

Figures

1	Parallel flow arrangement	8
2	Counter flow arrangement	8
3	Pure cross flow	9
4	Antimethodic overall flow arrangement	9
5	Methodic overall flow arrangement	9
B.1	Coil heat exchangers	19
B.2	Straight, single type	19
B.3	U-bent, dismountable	19
B.4	Wound or bent	20
B.5	Concentric	20
B.6	with U-tubes	20
B.7	with fixed tube plates	21
B.8	with floating head	21
B.9	with sliding head and O-ring seals	21
B.10	with sliding head and caulked seals	21
B.11	Heat exchangers of bayonet type	22
B.12	Helical	22
B.13	Spiral-shaped	22

Contents (continued)

Figures (continued) **Page**

B.14 Coil with straight tubes and bends 22
B.15 Coil with accumulator bends 22
B.16 Coil with tube sheets and accumulator boxes with plugs 23
B.17 Coil with tube sheets and accumulator boxes with covers 23
B.18 Single plates 23
B.19 Several non-dismountable plates 23
B.20 Several corrugated, non-dismountable plates 23
B.21 Dismountable shell type - lamella heat exchanger 23
B.22 Plate heat exchanger with seals 24
B.23 Spiral shaped 24
B.24 Heat exchanger of stacked blocks or with crossing channels 25

Foreword

This European Standard has been prepared by Technical Committee CEN/TC110 "Heat exchangers", the secretariat of which is held by BSI.

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 August 1997, and conflicting national standards shall be withdrawn at the latest by August 1997.

The document was implemented previously as a European Prestandard (ENV) in 1990 and no technical changes have been made.

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

Introduction

This European Standard is one of a series of European Standards dedicated to heat exchangers.

Heat exchangers are found in an extremely wide variety of production facilities and applications in all fields of industrial activity.

This is the reason why, although a classification of heat exchangers is required, it is impossible to arrive at a classification that would take into account all the elements used in actual conditions. An analysis has therefore been carried out with regard to the fundamental criteria for designing and producing heat exchangers and this analysis has been used as a basis for this terminology.

The function of the heat exchanger in the system in which it is integrated is an important factor in heat exchanger design and a list is presented in annex A to illustrate a few fundamental functions of heat exchangers in certain technological fields.

1 Scope

The scope of this European Standard is to establish heat exchanger terminology so that consistent terms are used.

For the purposes of this European Standard a heat exchanger is a device, the main function of which is to transfer heat between two fluids, with physical separation by a wall. Heat exchange between a fluid and a solid material (in the case of ovens in particular) is therefore excluded.

2 Definitions

For the purposes of this standard, the following definitions apply:

2.1 parallel flow arrangement: Arrangement in which fluids flow in parallel, in the same direction (see figure 1).

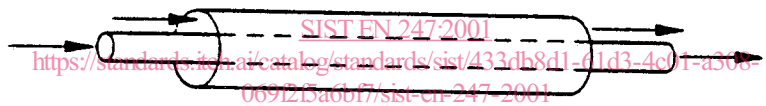

Figure 1: Parallel flow arrangement

2.2 counter flow arrangement: Arrangement in which fluids flow in parallel, in opposite directions (see figure 2).

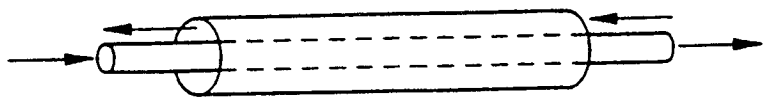

Figure 2: Counter flow arrangement

2.3 pure cross flow: Crosswise flow of the fluids (see figure 3).

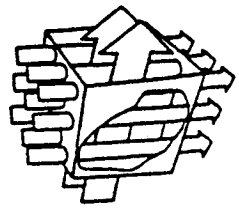

Figure 3: Pure cross flow

2.4 antimethodic overall flow arrangement: Arrangement in which fluids flow on the average, in the same direction (see figure 4).

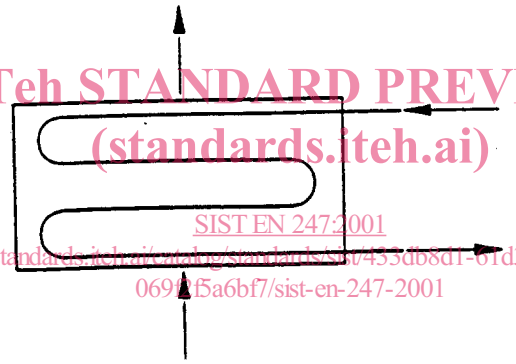

Figure 4: Antimethodic overall flow arrangement

2.5 methodic overall flow arrangement: Arrangement in which fluids flow on the average, in opposite directions (see figure 5).

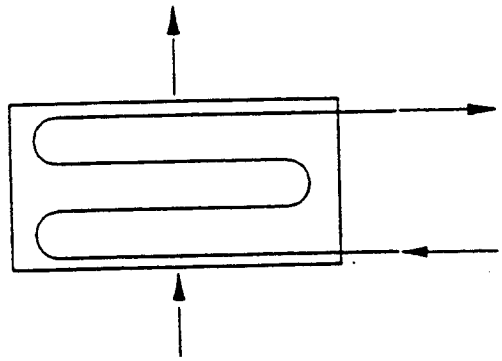

Figure 5: Methodic overall flow arrangement