



INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

# ISO RECOMMENDATION

## R 786

UNITS AND SYMBOLS FOR REFRIGERATION

1st EDITION

July 1968

(second printing, corrected in accordance with  
ISO/R 786-1968 (E)/Erratum)

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## BRIEF HISTORY

The ISO Recommendation R 786, *Units and symbols for refrigeration*, was drawn up by Technical Committee ISO/TC 86, *Refrigeration*, the Secretariat of which is held by the British Standards Institution (BSI).

Work on this question by the Technical Committee began in 1962 and led, in 1965, to the adoption of a Draft ISO Recommendation.

In November 1966, this Draft ISO Recommendation (No. 1053) was circulated to all the ISO Member Bodies for enquiry. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies :

|           |                |                |
|-----------|----------------|----------------|
| Australia | Hungary        | Switzerland    |
| Belgium   | Ireland        | Turkey         |
| Brazil    | Israel         | U.A.R.         |
| Canada    | Italy          | United Kingdom |
| Chile     | Japan          | U.S.S.R.       |
| Denmark   | Korea, Rep. of | Yugoslavia     |
| France    | Norway         |                |

Four Member Bodies opposed the approval of the Draft :

|                |        |
|----------------|--------|
| Czechoslovakia | Poland |
| Netherlands    | Sweden |

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided, in July 1968, to accept it as an ISO RECOMMENDATION.



## UNITS AND SYMBOLS FOR REFRIGERATION

### INTRODUCTION

This ISO Recommendation is a collection of the principal quantities chiefly used in the field of refrigeration, and of their symbols and units of measurement. For convenience, certain fundamental quantities and their derivatives have been included, which have already been considered in ISO Recommendation R 31.

The various quantities have been grouped in a logical order so as to facilitate their location by users.

In certain cases, when the same symbol may have more than one meaning, a second symbol has been proposed. The units are separated into two columns, the first giving units of the *Système International* (SI) and the second units of other systems which are at present very widely used. In order to obtain the values in SI units which are equivalent to those in other units, conversion factors have been introduced near the latter.

A column reserved for "Definitions and Remarks" in the tables provides in certain cases definitions or explanations supplementary to those found in ISO Recommendation R 31.

The use of metric and SI units and their multiples and sub-multiples is particularly recommended.



## 1. INDEXES FOR SPECIAL CASES

When it is necessary to define certain quantities by means of indexes, it is advisable to make use of the following indications, the meaning of which should in every case be given.

### Inferior indexes

1, 2, 3 . . . relating to different points of a system or of a cycle, or to different time intervals

|   |                                                         |
|---|---------------------------------------------------------|
| a | relating to air or to an adiabatic process              |
| e | " to effective                                          |
| f | " to an intermediate agent                              |
| i | " to "indicated" or to an isenthalpic process           |
| k | " to upper pressure or temperature                      |
| l | " to length                                             |
| m | " to mass or mechanical                                 |
| o | " to a lower pressure or temperature                    |
| p | " to pressure, or to a polytropic process               |
| s | " to a state of saturation, or to an isentropic process |
| t | " to temperature or to an isothermal process            |
| v | " to volume                                             |
| w | " to water                                              |

### Superior indexes

|   |                               |
|---|-------------------------------|
| " | relating to the gaseous phase |
| ' | " " " liquid "                |
| o | " " " solid "                 |

### Upper bar

Relating to the boundary layer, along the surface of separation between two phases, or to the mean value of a quantity (e.g. mean speed).

## 2. TABLE OF SYMBOLS AND UNITS

| Quantity                              | Symbol      | Dimensions  | SI units                   |          |
|---------------------------------------|-------------|-------------|----------------------------|----------|
|                                       |             |             | Name                       | Symbol   |
| length                                | $l$         | L           | metre                      | m        |
| area, surface                         | $A$         | $L^2$       | square metre               | $m^2$    |
| volume                                | $V$         | $L^3$       | cubic metre                | $m^3$    |
| mass                                  | $m$         | M           | kilogramme                 | kg       |
| time                                  | $t$         | T           | second                     | s        |
| frequency                             | $\nu, f$    | $T^{-1}$    | hertz                      | Hz       |
| rotational speed                      | $n$         | $T^{-1}$    | hertz                      | Hz       |
| density (mass density)                | $\rho$      | $ML^{-3}$   | kilogramme per cubic metre | $kg/m^3$ |
| specific volume                       | $\nu$       | $L^3M^{-1}$ | cubic metre per kilogramme | $m^3/kg$ |
| mass flow rate                        | $q_m$       | $MT^{-1}$   | kilogramme per second      | kg/s     |
| volume flow rate                      | $q_v$       | $L^3T^{-1}$ | cubic metre per second     | $m^3/s$  |
| thermodynamic or absolute temperature | $T, \Theta$ | $\Theta$    | kelvin                     | K        |
| customary temperature                 | $t, \theta$ | $\Theta$    |                            |          |