COUNCIL DIRECTIVE

of 27 July 1976

on the approximation of the laws of the Member States relating to alcohol tables

(76/766/EEC)

THE COUNCIL OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Economic Community, and in particular Article 100 thereof,

Having regard to the proposal from the Commission,

Having regard to the opinion of the European Parliament (¹),

Having regard to the opinion of the Economic and Social Committee (²),

Whereas, in several Member States there are laws concerning the determination of the alcoholic strength of a mixture of water and ethanol, and whereas these laws differ from one Member State to another, thus creating obstacles to trade; whereas, Community harmonization in this field and the establishment of a common definition are therefore necessary;

Whereas, in its resolution of 17 December 1973(³) on industrial policy, the Council invited the Commission to forward to it before 1 December 1974 a proposal for a Directive on alcoholometry and alcoholometers;

Whereas harmonization of the laws, regulations and administrative provisions relating to the method for determining alcoholic strength from the results of measurements taken is essential also as a complement to the Directive on the harmonization of alcoholometers and alcohol hydrometers, in order to remove all risk of ambiguity or dispute,

HAS ADOPTED THIS DIRECTIVE:

Article 1

This Directive defines the method of expressing alcoholic strength, by volume or by mass, as defined in the Annex, and gives a formula to enable tables to be drawn up for calculating alcoholic strength on the basis of the measurements taken.

Article 2

As from 1 January 1980 Member States may not question the figures for alcoholic strength derived from the alcoholometric tables drawn up on the basis of the formula shown in the Annex, and from measurements taken with alcoholometers or alcohol hydrometers bearing the EEC marks and signs or with instruments providing at least an equivalent degree of accuracy, on grounds connected with the use of these tables or instruments.

Article 3

The symbols used to indicate alcoholic strength as mentioned in Article 2 and defined in the Annex shall be as follows:

'% vol' for alcoholic strength by volume,

'% mas' for alcoholic strength by mass.

Article 4

As from 1 January 1980, Member States shall prohibit the use of alcoholic strengths which do not comply with the requirements of this Directive.

Article 5

1. Member States shall adopt and publish within a period of 24 months from the date of notification

(¹) OJ No C 76, 7. 4. 1975, p. 39.
(²) OJ No C 248, 29. 10. 1975, p. 22.
(³) OJ No C 117, 31. 12. 1973, p. 1.

of this Directive the measures necessary to conform with this Directive and shall forthwith inform the Commission thereof.

They shall apply these measures from 1 January 1980 at the latest.

2. Member States shall inform the Commission of the texts of the main provisions of national law which they adopt in the field covered by this Directive.

Article 6

This Directive is addressed to the Member States.

Done at Brussels, 27 July 1976.

For the Council

The President

M. van der STOEL

ANNEX

ALCOHOLIC STRENGTH

1. DEFINITION

The 'alcoholic strength by volume' of a mixture of water and ethanol is the ratio of the volume of pure alcohol present in the mixture at 20 °C to the total volume of the mixture at the same temperature.

The 'alcoholic strength by mass' of a mixture of water and ethanol is the ratio of the mass of alcohol present in this mixture to the total mass of the mixture.

2. EXPRESSION OF ALCOHOLIC STRENGTH

The alcoholic strength is expressed as the parts of alcohol per hundred parts of the mixture.

The relevant symbols are:

'% vol' for the alcoholic strength by volume,

'% mas' for the alcoholic strength by mass.

3. DETERMINATION OF ALCOHOLIC STRENGTH

The procedures to be carried out to determine the alcoholic strength by means of the instruments provided for in the Council Directive of 27 July 1976 on the approximation of the laws of the Member States relating to alcoholometers and alcohol hydrometers ([1]) shall be as follows:

— the reading of an alcoholometer or alcohol hydrometer, at the temperature of the mixture,

— the measurement of the temperature of the mixture.

The results shall be obtained from the international alcohol tables.

4. FORMULA FOR THE CALCULATION OF INTERNATIONAL ALCOHOL TABLES FOR MIXTURES OF WATER AND ETHANOL

The density 'ϱ', expressed in kilogrammes per cubic metre (kg/m³), of a mixture of water and ethanol at a temperature (t), expressed in degrees Celsius, is given by the following formula as a function of:

— the proportion by mass 'p', expressed as a decimal number ([2]),

— the temperature 't', expressed in degrees Celsius (IPTS-68),

— the numerical coefficients given below.

This formula is valid for temperatures in the range —20 to +40 °C.

$$\varrho = A_1 + \sum_{k=2}^{12} A_k\, p^{k-1} + \sum_{k=1}^{6} B_k\, (t - 20°\,C)^k$$

$$+ \sum_{i=1}^{n} \sum_{k=1}^{m_i} C_{i,k}\, p^k (t - 20°\,C)^i .$$

$$
\begin{aligned}
n &= 5 \\
m_1 &= 11 \\
m_2 &= 10 \\
m_3 &= 9 \\
m_4 &= 4 \\
m_5 &= 2
\end{aligned}
$$

([1]) See page 143 of this Official Journal.
([2]) *Example:* for a proportion by mass of 12%, p = 0·12.

NUMERICAL COEFFICIENTS
IN THE FORMULA

A_k
k   kg/m³

k	
1	9,982 012 300 · 10²
2	—1,929 769 495 · 10²
3	3,891 238 958 · 10²
4	—1,668 103 923 · 10³
5	1,352 215 441 · 10⁴
6	—8,829 278 388 · 10⁴
7	3,062 874 042 · 10⁵
8	—6,138 381 234 · 10⁵
9	7,470 172 998 · 10⁵
10	—5,478 461 354 · 10⁵
11	2,234 460 334 · 10⁵
12	—3,903 285 426 · 10⁴

B_k

—2,061 851 3 · 10⁻¹ kg/(m³ · °C)
—5,268 254 2 · 10⁻³ kg/(m³ · °C²)
3,613 001 3 · 10⁻⁵ kg/(m³ · °C³)
—3,895 770 2 · 10⁻⁷ kg/(m³ · °C⁴)
7,169 354 0 · 10⁻⁹ kg/(m³ · °C⁵)
—9,973 923 1 · 10⁻¹¹ kg/(m³ · °C⁶)

$C_{1,k}$
kg/(m³ · °C)

k	
1	1,693 443 461 530 087 · 10⁻¹
2	—1,046 914 743 455 169 · 10¹
3	7,196 353 469 546 523 · 10¹
4	—7,047 478 054 272 792 · 10²
5	3,924 090 430 035 045 · 10³
6	—1,210 164 659 068 747 · 10⁴
7	2,248 646 550 400 788 · 10⁴
8	—2,605 562 982 188 164 · 10⁴
9	1,852 373 922 069 467 · 10⁴
10	—7,420 201 433 430 137 · 10³
11	1,285 617 841 998 974 · 10³

$C_{2,k}$
kg/(m³ · °C²)

—1,193 013 005 057 010 · 10⁻²
2,517 399 633 803 461 · 10⁻¹
—2,170 575 700 536 993
1,353 034 988 843 029 · 10¹
—5,029 988 758 547 014 · 10¹
1,096 355 666 577 570 · 10²
—1,422 753 946 421 155 · 10²
1,080 435 942 856 230 · 10²
—4,414 153 236 817 392 · 10¹
7,442 971 530 188 783

$C_{3,k}$
k   kg/(m³ · °C³)

k	
1	—6,802 995 733 503 803 · 10⁻⁴
2	1,876 837 790 289 664 · 10⁻²
3	—2,002 561 813 734 156 · 10⁻¹
4	1,022 992 966 719 220
5	—2,895 696 483 903 638
6	4,810 060 584 300 675
7	—4,672 147 440 794 683
8	2,458 043 105 903 461
9	—5,411 227 621 436 812 · 10⁻¹

$C_{4,k}$
kg/(m³ · °C⁴)

4,075 376 675 622 027 · 10⁻⁶
—8,763 058 573 471 110 · 10⁻⁶
6,515 031 360 099 368 · 10⁻⁶
—1,515 784 836 987 210 · 10⁻⁶

$C_{5,k}$
kg/(m³ · °C⁵)

—2,788 074 354 782 409 · 10⁻⁸
1,345 612 883 493 354 · 10⁻⁸