

Official Journal

of the European Communities

ISSN 0378-6978

L 206

Volume 21

29 July 1978

English edition

Legislation

Contents

I *Acts whose publication is obligatory*

.....

II *Acts whose publication is not obligatory*

Council

78/627/EEC:

- ★ Council Directive of 19 June 1978 on the programme to accelerate the restructuring and conversion of vineyards in certain Mediterranean regions in France 1

78/628/EEC:

- ★ Council Directive of 19 June 1978 on a programme to accelerate drainage operations in the less-favoured areas of the west of Ireland 5

78/629/EEC:

- ★ Council Directive of 19 June 1978 adapting to technical progress Directive 73/362/EEC on the approximation of the laws of the Member States relating to material measures of length 8

78/630/EEC:

- ★ Council Directive of 19 June 1978 amending for the first time Directive 76/118/EEC on the approximation of the laws of the Member States relating to certain partly or wholly dehydrated preserved milk for human consumption 12

78/631/EEC:

- ★ Council Directive of 26 June 1978 on the approximation of the laws of the Member States relating to the classification, packaging and labelling of dangerous preparations (pesticides) 13

Contents (continued)

Commission

78/632/EEC:

- ★ **Commission Directive of 19 May 1978 adapting to technical progress Council Directive 74/60/EEC on the approximation of the laws of the Member States relating to the interior fittings of motor vehicles (interior parts of the passenger compartment other than the interior rear-view mirrors, layout of controls, the roof or opening roof, the backrest and rear part of the seats) 26**

78/633/EEC:

- ★ **Eighth Commission Directive of 15 June 1978 establishing Community methods of analysis for the official control of feedingstuffs 43**

II

(Acts whose publication is not obligatory)

COUNCIL

COUNCIL DIRECTIVE

of 19 June 1978

on the programme to accelerate the restructuring and conversion of vineyards in certain
Mediterranean regions in France

(78/627/EEC)

THE COUNCIL OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Economic Community, and in particular Article 43 thereof,

Having regard to the proposal from the Commission,

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

Whereas Article 39 (2) (a) of the Treaty provides that account should be taken of the social structure of agriculture and the structural and natural disparities between agricultural regions in determining the common agricultural policy;

Whereas, to achieve the objectives of the common agricultural policy set out in Article 39 (1) (a) and (b) of the Treaty, specific measures appropriate to the situation of the least-favoured agricultural areas should be adopted at Community level;

Whereas certain Mediterranean regions of the Community are in an unfavourable situation as regards agricultural incomes and suffer from under-employment both in agriculture and in other sectors;

Whereas the Languedoc-Roussillon region and the departments of Ardèche, Bouches-du-Rhône, Var and Vaucluse are among those regions;

Whereas action should be concentrated on a basic aspect of the structural development of regional agriculture which has lasting effects on agricultural incomes;

Whereas to this end some of the vineyards of the regions concerned should be encouraged to improve the quality of their production and there should be collective action to improve the basic structures of the areas under vines;

Whereas there should be incentives for the conversion of areas under vines in locations whose suitability for wine-growing is not well established and which could be made suitable for other crops especially by joint measures to irrigate the areas previously planted with vines;

Whereas it is essential to speed up the irrigation operations referred to above by means of Community aid;

Whereas it is desirable to encourage producers to convert the areas under vines referred to above by means of special aid on a progressively diminishing scale;

Whereas the conditions and limits laid down in Articles 13 and 19 of Council Directive 72/159/EEC of 17 April 1972 on the modernization of farms ⁽²⁾ are not well suited to the particular structural situation of these regions;

⁽¹⁾ OJ No C 108, 8. 5. 1978, p. 49.

⁽²⁾ OJ No L 96, 23. 4. 1972, p. 1.

Whereas these objectives should be furthered by way of a multipurpose measure covering all the areas requiring restructuring and all the areas previously planted with vines requiring irrigation in these regions and constituting a programme extending over several years;

Whereas it follows from the foregoing that the measures referred to constitute a common measure within the meaning of Article 6 of Council Regulation (EEC) No 729/70 of 21 April 1970 on the financing of the common agricultural policy ⁽¹⁾, as last amended by Regulation (EEC) No 2788/72 ⁽²⁾;

Whereas it is for the Commission, after receiving the opinion of the Standing Committee on Agricultural Structure, to approve a programme put forward by the French Republic,

HAS ADOPTED THIS DIRECTIVE:

Article 1

With a view to increasing agricultural incomes in the Languedoc-Roussillon region and the departments of Ardèche, Bouches-du-Rhône, Var and Vaucluse, hereinafter referred to as 'the regions concerned', by improving the basic structures both of the areas under vines and of the wine-growing areas to be converted, thus contributing to the modernization of farms, a common measure within the meaning of Article 6 (1) of Regulation (EEC) No 729/70, to be implemented by the French Republic, shall be introduced for the purpose of accelerating the restructuring of some of these vineyards and the conversion of others.

Article 2

1. The conditions and limits laid down in Articles 13 (2) and 19 (2) and (3) of Directive 72/159/EEC shall not apply to joint operations covered by this common measure.

2. The Community's financial contribution may be used only in the framework of a programme applying to all the areas requiring restructuring and all the areas under vines requiring conversion in the regions concerned.

Such a programme shall be presented to the Commission by the French Republic.

3. The programme shall be examined and approved after consultation with the European Agricultural Guidance and Guarantee Fund (hereinafter referred to as 'the Fund') Committee on the financial aspects, in accordance with the procedure laid down in Article 18 (2) and (3) of Directive 72/159/EEC.

Article 3

1. The programme referred to in Article 2 shall include the following information :

(a) in respect of operations to restructure areas under vines:

- the number of hectares under vines which are to be restructured under the programme,
- the location of the areas to be restructured and the timetable for the work,
- the criteria concerning the suitability of these areas for the production of good quality table wine,
- the nature of collective rules designed to ensure that the restructuring operations are effective,
- the measures for the replanting of vineyards, with indication of the recommended varieties used, as laid down in Community rules,
- the minimum conditions for improving basic structures, in particular by reparcelling and by standardizing the direction and spacing of the vine rows,
- provisions ensuring that vineyards can be created within these areas only through replanting. For the purpose of this Directive, replanting means the creation of a vineyard after the grubbing up of vines not more than four years previously on an equivalent area within each area to be restructured,
- provisions ensuring that restructuring operations will not involve an extension of wine-growing areas,
- nature and amount of the aid envisaged; estimate of the cost of this programme,
- the quantitative and qualitative objectives of these operations in the light of the existing situation;

(b) in respect of operations to convert vineyards:

⁽¹⁾ OJ No L 94, 28. 4. 1970, p. 13.

⁽²⁾ OJ No L 295, 30. 12. 1972, p. 1.

- the number of hectares previously under vines no longer to be used for wine-growing after conversion and the number which are to be irrigated under the programme,
 - location of these areas and a timetable of the work, particularly as regards the sequence of grubbing operations and of irrigation operations,
 - evidence that wine-growing is not well established in these areas and that they are suitable for other crops,
 - any incentives provided for the conversion of the areas referred to above, in the form of a single special grant; the amount of this grant will be reduced from the third year onward,
 - the nature and amount of public expenditure on irrigation operations and of the aid envisaged; an estimate of the cost of this programme,
 - the quantitative and qualitative objectives of these operations in the light of the existing situation;
- (c) the arrangements which will be made so that the Community's financial contribution towards investments relating to the processing and marketing of agricultural products, as provided for in Council Regulation (EEC) No 355/77 of 15 February 1977 on common measures to improve the conditions under which agricultural products are processed and marketed ⁽¹⁾, as amended by Regulation (EEC) No 1361/78 ⁽²⁾, can be used in the first instance to promote improvements in the quality of wine production in the regions concerned and to promote crops produced in conversion areas;
- (d) documented estimates of public expenditure in the regions concerned in the fields referred to under (a) and (b) showing the complementary nature of the Community participation.

2. Appropriate measures shall be taken by the French Republic to ensure that no public works are carried out for the irrigation of vineyards in the regions concerned. Derogations may be made in regions covered by the restructuring operations referred to in 1 (a), in accordance with the procedure laid down in Article 2 (3), provided that irrigation be restricted to a certain period of growth and be necessary for the production of a table wine of improved quality or of a 'vin délimité de qualité supérieure' (VDQS) and to obtain a normal yield.

⁽¹⁾ OJ No L 51, 23. 2. 1977, p. 1.

⁽²⁾ OJ No L 166, 23. 6. 1978, p. 9.

Article 4

1. The following expenditure incurred by the French Republic under the programme referred to in Article 2 shall be eligible for aid from the Guidance Section of the Fund:

- public expenditure on the restructuring of areas under vines, as referred to in Article 3 (1) (a) at a flat rate of 2 600 units of account per restructured hectare up to a maximum of 66 000 hectares including 44 000 hectares in the Languedoc-Roussillon region,
- expenditure on public hydraulic works, as referred to in Article 3 (1) (b) and not yet started, up to a maximum of 33 000 hectares, including 22 000 hectares in the Languedoc-Roussillon region,
- expenditure related to the special conversion grant referred to in the fourth indent of Article 3 (1) (b) provided that it does not exceed 2 000 units of account per converted hectare and is reduced by at least 10% each year from the third year onward.

However, the expenditure incurred by the French Republic in the course of 1978 for the measures taken under Article 3 (1) (a) not coming within the framework of the programme referred to in Article 2 may be reimbursed.

2. The Fund, Guidance Section, shall reimburse to the French Republic 35% of the eligible expenditure referred to in the first and second indents of paragraph 1 and 50% of the eligible expenditure referred to in the third indent of that paragraph.

However, the amount of eligible expenditure referred to in the second indent of paragraph 1 may not exceed 2 000 units of account per irrigated hectare previously planted with vines.

Article 5

1. The duration of the measure shall be five years from the date of notification of this Directive.

2. The total estimated share of the cost of the common measure chargeable to the Fund shall be 105 million units of account for the entire period.

Article 6

When the programme referred to in Article 2 (3) is being approved, the Commission shall, in agreement with the French Republic, determine the manner in which it shall be kept informed of the progress of the programme. The French Republic shall at the same time

designate the bodies responsible for technical execution of the programme.

Article 7

1. Requests for reimbursement shall relate to expenditure incurred by the French Republic during one calendar year and shall be presented to the Commission before 1 July of the following year.

2. Aid from the Fund shall be decided upon in accordance with Article 7 (1) of Regulation (EEC) No 729/70.

3. Advance payments may be granted by the Fund on the basis of the rules on financing adopted by the French Republic and in the light of the progress of the projects.

4. Detailed rules for the application of this Article shall be adopted in accordance with the procedure laid down in Article 13 of Regulation (EEC) No 729/70.

Article 8

This Directive is addressed to the French Republic.

Done at Luxembourg, 19 June 1978.

For the Council

The President

P. DALSAGER

COUNCIL DIRECTIVE

of 19 June 1978

on a programme to accelerate drainage operations in the less-favoured areas of the west of Ireland

(78/628/EEC)

THE COUNCIL OF THE EUROPEAN COMMUNITIES,

Whereas Community aid is needed to accelerate the provision of drainage networks;

Having regard to the Treaty establishing the European Economic Community, and in particular Article 43 thereof,

Whereas the conditions and limits laid down in Articles 14 and 19 of Council Directive 72/159/EEC of 17 April 1972 on the modernization of farms ⁽³⁾ are not entirely appropriate in the case of drainage to the special structural situation obtaining in the west of Ireland;

Having regard to the proposal from the Commission,

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

Whereas field drainage will increase agricultural potential and therefore enable production to be better oriented;

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

Whereas Article 39 (2) (a) of the Treaty provides that account should be taken of the social structure of agriculture and the structural and natural disparities between agricultural regions in determining the common agricultural policy;

Whereas public encouragement for drainage measures should be confined to those which concern areas showing worthwhile productivity and are carried out on rational lines, where possible by groups of farmers;

Whereas, to achieve the objectives of the common agricultural policy set out in Article 39 (1) (a) and (b) of the Treaty, measures appropriate to the production conditions of the least-favoured agricultural areas should be adopted at Community level;

Whereas aid should be provided for the purchase of the machinery needed by agricultural cooperatives for drainage work;

Whereas certain regions in the west of Ireland are in an unfavourable situation as regards agricultural incomes and suffer from under-employment both in agriculture and in other sectors;

Whereas these objectives should be furthered by a common measure combining these elements, covering all the less-favoured areas of the west of Ireland (western region) as defined in Council Directive 75/272/EEC of 28 April 1975 concerning the Community list of less-favoured farming areas within the meaning of Directive 75/268/EEC (Ireland) ⁽⁴⁾, and constituting a special programme extending over several years;

Whereas the percentage of the total working population engaged in agriculture in these regions is particularly high;

Whereas action should be concentrated on a basic aspect of the structural development of these regions which will have rapid and lasting effects on agricultural incomes;

Whereas it follows from the foregoing that the measures referred to constitute a common measure within the meaning of Article 6 of Council Regulation (EEC) No 729/70 of 21 April 1970 on the financing of the common agricultural policy ⁽⁵⁾, as last amended by Regulation (EEC) No 2788/72 ⁽⁶⁾,

Whereas agricultural production in the west of Ireland is seriously handicapped by drainage problems owing both to the lack of arterial drainage and to the scarcity of field drainage;

⁽¹⁾ OJ No C 131, 5. 6. 1978, p. 67.

⁽²⁾ Opinion delivered on 29 and 30 March 1978 (not yet published in the Official Journal).

⁽³⁾ OJ No L 96, 23. 4. 1972, p. 1.

⁽⁴⁾ OJ No L 128, 18. 5. 1975, p. 68.

⁽⁵⁾ OJ No L 94, 28. 4. 1970, p. 13.

⁽⁶⁾ OJ No L 295, 30. 12. 1972, p. 1.

HAS ADOPTED THIS DIRECTIVE:

Article 1

In order to increase agricultural incomes in less-favoured regions of the west of Ireland (western region) within the meaning of Directive 75/272/EEC by improving basic structures, thus contributing to the modernization of farms, a common measure within the meaning of Article 6 (1) of Regulation (EEC) No 729/70, to be implemented by Ireland, shall be introduced for the purpose of accelerating arterial and field drainage operations.

Article 2

1. The conditions and limits laid down in Articles 14 (2) and 19 (1) and (3) of Directive 72/159/EEC shall not apply to drainage operations forming the subject of this common measure.

2. The financial contribution of the Community shall be used only in the framework of a comprehensive programme covering all drainage operations in less-favoured regions of the west of Ireland (western region) within the meaning of Directive 75/272/EEC. This programme shall be submitted to the Commission by Ireland.

3. The programme and any adjustments thereto shall be examined and approved, after consultation with the European Agricultural Guidance and Guarantee Fund (hereinafter referred to as 'the Fund') Committee, on the financial aspects thereof, in accordance with the procedure laid down in Article 18 (2) and (3) of Directive 72/159/EEC.

Article 3

The programme referred to in Article 2 shall include in particular the following information:

(a) with respect to public arterial drainage works:

- the extent of the catchment areas to be drained under the programme,
- the number of hectares of agricultural area whose drainage will be improved and the number of hectares to be fully drained as a result of the operation,
- the location of and timetable for the above works,
- a cost-benefit analysis for each catchment area concerned,

- the estimated cost of draining the catchment areas;

(b) with respect to field drainage works:

- the number of hectares to be drained under the programme,
- provisions ensuring that only those agricultural areas which, on completion of the work, will reach an adequate level of productivity will be drained,
- details of related works required to ensure rational utilization of the drained areas,
- provisions ensuring that drainage will be carried out in such a way as to exploit the productive potential of the land concerned to the full,
- details of measures to encourage joint drainage plans,
- details of arrangements made to encourage the execution of works by agricultural cooperatives, by providing aid for the purchase of machinery for drainage in areas where such operations are indispensable,
- the nature and amount of the aid envisaged and the estimated cost of such aid;

(c) documented estimates of public expenditure in the less-favoured areas of the west of Ireland in the fields referred to under (a) and (b) showing the complementary nature of the Community contribution.

Article 4

1. Expenditure on the following operations by Ireland under the programme referred to in Article 2 shall be eligible for aid from the EAGGF Guidance Section:

- public arterial drainage work as specified in Article 3 (a), up to a maximum of 30 000 hectares in the catchment areas concerned,
- field drainage work, as specified in Article 3 (b), up to a maximum of 100 000 hectares drained;
- grants towards the purchase by agricultural cooperatives during the first two years of the programme of the machinery referred to in the sixth indent of Article 3 (b), up to a maximum of 5% of the eligible expenditure for field drainage work referred to in the second indent of this paragraph.

2. The EAGGF Guidance Section shall reimburse 50% of the eligible expenditure to Ireland. However, the amount of the EAGGF contribution to the eligible expenditure referred to in the second indent of paragraph 1 shall not exceed 250 units of account per hectare drained and the contribution to the expenditure referred to in the third indent of paragraph 1 shall not exceed 25 % of the purchase price of the machinery.

Article 5

1. The duration of the measure shall be five years.
2. Before the period referred to in paragraph 1 expires, this Directive shall be reviewed by the Council acting on a proposal from the Commission.
3. The total estimated Fund share of the cost of the common measure shall be 26 million units of account for the entire period.

Article 6

When the programme is approved in accordance with Article 2 (3), the Commission shall determine, in agreement with Ireland, the manner in which it is to be periodically informed of the progress of the programme. Ireland shall at the same time designate, where appropriate, the body responsible for the technical execution of the programme.

Article 7

1. Requests for reimbursement shall relate to expenditure incurred by Ireland during one calendar year and shall be submitted to the Commission before 1 July of the following year.
2. Aid from the Fund shall be granted in accordance with Article 7 (1) of Regulation (EEC) No 729/70.
3. Advance payments may be granted by the Fund on the basis of the rules of financing adopted by Ireland and in the light of the progress of the programme.
4. Detailed rules for the application of this Article shall be adopted under the procedure laid down in Article 13 of Regulation (EEC) No 729/70.

Article 8

This Directive is addressed to Ireland.

Done at Luxembourg, 19 June 1978.

For the Council

The President

P. DALSAGER

COUNCIL DIRECTIVE

of 19 June 1978

adapting to technical progress Directive 73/362/EEC on the approximation of the laws of the Member States relating to material measures of length

(78/629/EEC)

THE COUNCIL OF THE EUROPEAN COMMUNITIES,

HAS ADOPTED THIS DIRECTIVE:

Article 1

Having regard to the Treaty establishing the European Economic Community,

Having regard to the proposal from the Commission,

Having regard to Council Directive 71/316/EEC of 26 July 1971 on the approximation of the laws of the Member States relating to common provisions for both measuring instruments and methods of metrological control ⁽¹⁾, as amended by the Act of Accession, and in particular Articles 17, 18 and 19 thereof,

Whereas, since the preparation and adoption of Council Directive 73/362/EEC of 19 November 1973 on the approximation of the laws of the Member States relating to material measures of length ⁽²⁾, new material measures of length have been developed; whereas the said Directive should therefore be amended to take account of technical progress;

Whereas on 19 January 1978 the Commission submitted a proposed amendment to the Committee on the adaptation to technical progress of the Directives concerning the elimination of technical barriers to trade in measuring instruments, for its opinion; whereas, no opinion having been delivered, the Commission, in accordance with the procedure laid down in Article 19 (3) (b) of Directive 71/316/EEC, proposed to the Council the measures to be adopted,

In the Annex to Directive 73/362/EEC, points 3.6, 4.1, 5.1, 6.3, 7.1, 7.2, 7.3, 8, 9.1, 9.2, 9.4 and 9.5 are hereby amended in accordance with the Annex hereto.

Article 2

Member States shall adopt the laws, regulations and administrative provisions needed in order to comply with this Directive in such a manner that these provisions shall take effect one year after the date of notification of this Directive and shall forthwith inform the Commission thereof.

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

Article 3

This Directive is addressed to the Member States.

Done at Luxembourg, 19 June 1978.

For the Council

The President

P. DALSAGER

⁽¹⁾ OJ No L 202, 6. 9. 1971, p. 1.

⁽²⁾ OJ No L 335, 5. 12. 1973, p. 56.

ANNEX

- 3.6. Tape measures shall be made so that when the tape is stretched out on a flat surface its edges are practically straight and parallel.
- 4.1. Along their nominal length, measures of length shall carry clear, regular and indelible graduation and numbering, so as to enable a sure, simple and unambiguous reading to be made. However, some non-numbered scale marks, not exceeding the number of scale marks between two consecutive numbered scale marks on the measure, may extend beyond the principal scale mark at the end of the measure.
- 5.1. The nominal length of the measures shall be one of the following values: 0.5, 1, 1.5, 2, 3, 4, 5, 6, 7, 8, 9 m or a multiple of 5 m.
- 6.3. All these inscriptions shall be given visibly and legibly, starting at the beginning of the measure.

However, in agreement with the national authority concerned, certain inscriptions may appear on an integral part of the instrument. In this case, the EEC pattern approval certificate shall state where these inscriptions are to be placed.

Furthermore, where the width of the measure of length does not enable the EEC pattern approval sign to appear legibly, that sign may appear, notwithstanding the provisions of point 3.1 of Annex I to the Council Directive of 26 July 1971 on the approximation of the laws of the Member States relating to common provisions for both measuring instruments and methods of metrological control, and in accordance with point 3.5 of this Annex, in the form of the following signs, arranged in succession:

- the stylized letter ϵ ,
- the distinguishing letter(s) of the Member State which has granted EEC pattern approval,
- the last two digits of the year of EEC pattern approval,
- the reference number of the EEC pattern approval, (e.g. ϵ F 75 5345).

7. MAXIMUM PERMISSIBLE ERRORS

- 7.1. The measures of length defined in this Directive shall be divided into three classes, designated I, II and III, according to their degree of accuracy.

On EEC initial verification of measures of length, the maximum permissible error, plus or minus:

- (a) on the nominal length, and
- (b) on the distance between any two non-consecutive scale marks,

shall be expressed as a function of the length in question by a formula in the form $(a + bL)$ mm in which:

- L is the length in question, rounded up to the next whole metre above,
- a and b are coefficients fixed for each class of accuracy according to the following table:

Class of accuracy	a	b
I	0.1	0.1
II	0.3	0.2
III	0.6	0.4

7.2.

- 7.2.1. The maximum permissible error, plus or minus, on the length i of the intervals not exceeding 1 cm shall be fixed for each class of accuracy according to the following table:

Length i of the interval in question	Maximum permissible error (in mm) for class of accuracy		
	I	II	III
$i \leq 1 \text{ mm}$	0.1	0.2	0.3
$1 \text{ mm} < i \leq 1 \text{ cm}$	0.2	0.4	0.6

In the case of intervals exceeding 1 cm, the maximum permissible error shall be expressed as a function of the length of the interval by the formula $(a + bL)$ mm, where the values of the parameters a and b are equal to those given in point 7.1 and where L is the length in question, rounded up to the next whole metre above.

- 7.2.2. The maximum permissible difference between the lengths i of two consecutive intervals not exceeding 1 cm shall be fixed for each class of accuracy according to the following table:

Length i of the interval in question	Maximum permissible difference (in mm) for class of accuracy		
	I	II	III
$i \leq 1 \text{ mm}$	0.1	0.2	0.3
$1 \text{ mm} < i \leq 1 \text{ cm}$	0.2	0.4	0.6

In the case of intervals exceeding 1 cm, the maximum permissible difference between the lengths i of two consecutive intervals shall be expressed as a function of the length of the interval by the formula $(a + bL)$ mm, as defined in point 7.2.1.

- 7.3. However, for an end or composite measure of length, the maximum permissible error, plus or minus, on the length of the terminal interval bounded by a surface shall be increased:

- by 0.1 mm for measures of class I,
- by 0.2 mm for measures of class II,
- by 0.3 mm for measures of class III.

Moreover, the provisions set out in points 7.1 and 7.2.2 do not apply:

- when one of the non-consecutive scale-marks as referred to in point 7.1 (b) is formed by a surface, and
- when one of the two consecutive intervals as referred to in point 7.2.2 is a terminal interval bounded by a surface.

8. VERIFICATION MARKS

Every measure of length shall be made so that it can accommodate the verification marks laid down by the Council Directive of 26 July 1971 on the approximation of the laws of the Member States relating to common provisions for both measuring instruments and methods of metrological control. A place near the beginning of the measure shall be provided for this purpose on the measure itself or on an integral additional device.

9.1. End, line or composite tape measures made of fibreglass and plastics

Nominal length between 0.5 and 100 m.

The tractive force, of about 20 N, shall be shown on the measure.

The free ends of end and composite measures shall be provided with a band or tip resistant to wear.

These measures shall belong to class of accuracy I, II or III.

9.2. Measures made in one piece, rigid or semi-rigid, in metal or other material

Nominal length between 0.5 and 5 m.

The reference temperature may, in certain cases, be other than 20 °C.

These measures also include dipsticks used for checking the level of liquids.

The end of a rigid dipstick shall be provided with a butt or tip resistant to impact and wear. It shall not cause sparking on impact.

These measures shall belong to class of accuracy I or II.

9.4. Steel tape measures**9.4.1. End, line or composite measures on a winder.**

Nominal length between 0.5 and 10 m; the blades of measures between 5 and 10 m shall be of a cambered cross-section.

These measures may be contained in a case, one of whose dimensions may be included in the part used for measuring, particularly for measuring internal dimensions; the free end of these measures shall be provided with a fixed or sliding hook or tongue.

These measures shall belong to class of accuracy I or II.

9.4.2. End or line measures, designed for measuring lengths greater than the nominal length of the measure.

Nominal length: 5, 10, 20, 50, 100 or 200 m.

The tractive force, of about 50 N, shall be shown on the measure.

These measures shall be equipped with handles or rings at the two ends.

If the handles are included in the nominal length, they shall be constructed in such a way that their jointing does not introduce any inaccuracy of measurement.

These measures shall belong to class of accuracy I or II.

9.4.3. Line or composite measures on a winder not designed for the measuring of lengths greater than the nominal length.

Nominal length between 5 and 200 m.

The reference temperature may, in certain cases, be other than 20 °C.

The tractive force, of about 50 N, shall be shown on the measure.

The free end shall include a handle, ring or hook which shall not be included in the nominal length.

These measures shall belong to class of accuracy I or II.

9.5. Composite dip-tapes made of metal, with sinkers, used for checking the level of liquids

Nominal length between 5 and 50 m.

The reference temperature may, in certain cases, be other than 20 °C.

The tractive force, sufficient to stretch the tape correctly, must be shown on the measure.

This tractive force shall be exerted on the measure with the aid of a sinker which must bear an indication of its mass.

The principal scale mark, beginning the scale, shall be constituted by the base of a sinker of appropriate shape and of a material not liable to cause sparking on impact.

The sinker shall be attached to the tape in a fixed or detachable way so that this attachment or jointing does not introduce any inaccuracy of measurement.

The entire length of the tape shall be graduated in millimetres and the graduation shall continue on one flat side of the sinker.

The other end of the measure may be equipped with a winder.

These measures shall belong to class of accuracy I or II.

However, the maximum permissible error of the instrument in position for use with the sinker shall never be less than 0.6 mm.

COUNCIL DIRECTIVE

of 19 June 1978

amending for the first time Directive 76/118/EEC on the approximation of the laws of the Member States relating to certain partly or wholly dehydrated preserved milk for human consumption

(78/630/EEC)

THE COUNCIL OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Economic Community, and in particular Articles 43 and 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 Council Directive 76/118/EEC of 18 December 1975 on the approximation of the laws of Member States relating to certain partly or wholly dehydrated preserved milk for human consumption ⁽³⁾ lays down in Article 3 (1) that only designations referred to and defined in the Annex thereto may be used to denote the products defined therein; whereas in point 1 (c) thereof the designation 'unsweetened condensed partly-skimmed milk' is referred to and defined; whereas under this provision the only milk which may be sold by retail with this designation is partly dehydrated milk containing, by weight, between 4 and 4.5% fat and not less than 24% milk solids;

Whereas, in view of problems of understanding on the part of buyers, Directive 76/118/EEC sets out in Article 3 (2) certain designations, the use of which may be reserved in their territories by the Member States concerned;

Whereas similar difficulties have also been found in certain Member States in relation to the designation of

unsweetened condensed partly-skimmed milk which may be sold by retail; whereas it is therefore necessary to extend to those States the option provided for in Article 3 (2) of Directive 76/118/EEC, as regards retail sales of products with the above designation,

HAS ADOPTED THIS DIRECTIVE:

Article 1

The following shall be added to Article 3 (2) of Directive 76/118/EEC:

'(d) "Geëvaporeerde halfvolle melk" in Belgium and the Netherlands and "lait demi-écrémé concentré" and "lait demi-écrémé concentré non sucré" in Belgium, France and Luxembourg, to denote, in the case of sale by retail, the product defined in point 1 (c) of the Annex.'

Article 2

This Directive is addressed to the Member States.

Done at Luxembourg, 19 June 1978.

*For the Council**The President*

P. DALSAGER

⁽¹⁾ OJ No C 183, 1. 8. 1977, p. 59.

⁽²⁾ OJ No C 84, 8. 4. 1978, p. 3.

⁽³⁾ OJ No L 24, 30. 1. 1976, p. 49.

COUNCIL DIRECTIVE

of 26 June 1978

on the approximation of the laws of the Member States relating to the classification,
packaging and labelling of dangerous preparations (pesticides)

(78/631/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 there are in the Member States regulations governing dangerous substances and preparations; whereas these regulations differ, especially as regards labelling to indicate risk and classification according to the degree of danger; whereas these differences constitute a barrier to trade and directly affect the establishment and functioning of the common market;

Whereas it is therefore important to eliminate these barriers and it is necessary, in order to attain this objective, to approximate the relevant legislation existing in the Member States;

Whereas rules for dangerous substances have already been laid down in Council Directive 67/548/EEC of 27 June 1967 on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances ⁽³⁾, as last amended by Directive 76/907/EEC ⁽⁴⁾, which covers the active substances in pesticides; whereas it is necessary to introduce parallel rules for dangerous preparations composed of two or more substances;

Whereas many dangerous substances and preparations are used in plant and wood protection and pest control; whereas more use is made of preparations than of substances as such in this sector; whereas most of these preparations contain substances which are toxic to varying degrees, so that toxicological classification,

together with prescriptions regarding labelling (danger symbols, indications of risk and safety advice) and rules concerning packaging are necessary in order to preclude the risk of damage, particularly to public health, as a result of the marketing of pesticides;

Whereas this Directive applies to the classification, packaging and labelling of pesticides; whereas it will in addition be necessary to include in later Directives special provisions concerning the authorization, distribution and use of these pesticides, which will themselves contain further requirements as to labelling and possibly first aid information for doctors;

Whereas the principal objective of this Directive must be to improve the protection of the public and in particular of persons handling pesticides;

Whereas this Directive can also contribute, through its requirements as to the indication of risk, to the protection of the consumer;

Whereas dangerous preparations used as pesticides may, although conforming to the provisions of this Directive, nevertheless constitute a danger to public health or safety; whereas it is therefore advisable to provide for a procedure intended to reduce this danger,

HAS ADOPTED THIS DIRECTIVE:

Article 1

1. This Directive shall apply, without prejudice to other relevant Community provisions, to the approximation of the laws of Member States relating to:

- the classification according to danger,
- the packaging, and
- the labelling to indicate risk,

of dangerous preparations (pesticides), hereinafter referred to as 'pesticides', in the form in which they are supplied to the user and intended for use as pesticides.

⁽¹⁾ OJ No C 30, 7. 2. 1977, p. 35.

⁽²⁾ OJ No C 114, 11. 5. 1977, p. 20.

⁽³⁾ OJ No 196, 16. 8. 1967, p. 1.

⁽⁴⁾ OJ No L 360, 30. 12. 1976, p. 1.

2. This Directive shall not apply to:

- (a) medicines, narcotics and radioactive preparations;
- (b) the carriage of pesticides by rail, road, inland waterway, sea or air;
- (c) pesticides for export to third countries;
- (d) pesticides in transit subject to customs control, provided that they undergo no processing or transformation.

3. The definitions laid down in Article 2 of Directive 67/548/EEC shall apply for the purposes of this Directive.

Article 2

For the purposes of this Directive 'pesticides' shall mean preparations designed:

- 1. to destroy organisms harmful to plants or to plant products or to protect plants and plant products from such organisms; or
- 2. to improve or regulate plant production, with the exception of fertilizers and soil conditioners; or
- 3. to preserve plant products, including wood preservatives, in so far as there are no other Community provisions specifically relating to preservatives, except those products which are applied to surfaces and do not contain preserving substances which penetrate into the plant product; or
- 4. to destroy undesired plants; or
- 5. to destroy parts of plants or to prevent undesired growth; or
- 6. to render harmless or to destroy, or to give protection against, harmful organisms which do not attack plants, and undesired organisms.

Article 3

1. Pesticides shall be classified by means of the determination of the acute oral or percutaneous toxicity of the preparation, expressed in LD₅₀ values determined in the rat, or respiratory toxicity expressed in LC₅₀ values determined in the rat.

- (a) The following shall serve as reference values for oral LD₅₀ in the rat:

- (1) for solids (except bait preparations and pesticides in tablet form):
 - 5mg/kg of body weight or less: 'very toxic',
 - more than 5 but not more than 50 mg/kg of body weight: 'toxic',
 - more than 50 but not more than 500 mg/kg of body weight: 'harmful';
- (2) for liquids (including bait preparations and pesticides in tablet form):
 - 25 mg/kg of body weight or less: 'very toxic',
 - more than 25 but not more than 200 mg/kg of body weight: 'toxic',
 - more than 200 but not more than 2 000 mg/kg of body weight: 'harmful'.

- (b) For pesticides in the form of gas or liquefied gas, and for fumigants and aerosols, the following reference LC₅₀ values, determined by means of a four-hour inhalation test on rats, shall be applicable:

0.5 mg/litre of air or less: 'very toxic',

more than 0.5 but not more than 2 mg/litre of air: 'toxic',

more than 2 but not more than 20 mg/litre of air: 'harmful'.

For pesticides in powder form in which the diameter of the particles does not exceed 50 microns the values must be determined by inhalation test. However, where such pesticides are already marketed or are in the process of being authorized at the date on which this Directive is adopted, they may be classified in accordance with the provisions laid down for the liquid pesticides referred to in point (a).

- (c) For pesticides which can be absorbed through the skin, and where the percutaneous LD₅₀ value is such that it would place the pesticides in a more restrictive class than the oral LD₅₀ value or the inhalation LC₅₀ value would indicate, the following reference values, determined by the percutaneous test on rats and/or, where a Member State so requires, on rabbits, shall be applicable:

- (1) for solids (except bait preparations and pesticides in tablet form):

10 mg/kg of body weight or less: 'very toxic',

more than 10 but not more than 100 mg/kg of body weight: 'toxic',
 more than 100 but not more than 1 000 mg/kg of body weight: 'harmful';

(2) for liquids (including bait preparations and pesticides in tablet form):

50 mg/kg of body weight or less: 'very toxic',
 more than 50 but not more than 400 mg/kg of body weight: 'toxic',
 more than 400 but not more than 4 000 mg/kg of body weight: 'harmful'.

The prescribed tests shall be carried out in accordance with internationally recognized methods or with the method, if any, provided for in Directive 67/548/EEC.

2. By way of derogation from paragraph 1, a pesticide containing one active substance may be classified by means of a calculation carried out in accordance with Annexes I and III if:

- (a) on the basis of its ingredients, its classification as 'very toxic', 'toxic' or 'harmful' is obvious; or
- (b) it is shown that the composition of a pesticide closely resembles that of another pesticide which has already been classified and the toxicological data relating to the latter are sufficiently well established.

In such cases there must be valid grounds for assuming that the classification resulting from a calculation would not vary substantially from those obtainable by biological testing in accordance with paragraph 1.

3. For the classification of pesticides which contain more than one active substance and are intended solely for marketing within their territories, Member States may allow the use of the method of calculation set out in Annex II with the restrictions specified in paragraph 2.

4. If facts appear which leave the correctness of the classification open to doubt, the competent authorities may require that the calculation be replaced by toxicological tests as laid down in paragraph 1.

5. Additional toxicological data may be taken into account for the purpose of classifying a pesticide where,

- (a) there are facts which suggest that in normal use a pesticide involves a risk to human health; or

- (b) it is shown that, as regards a particular pesticide, the rat is not the most suitable animal for testing and that another species is, for example, clearly more sensitive or displays reactions closer to those of man; or

- (c) the LD₅₀ values of the pesticide, determined orally or by the percutaneous test should not be used as the main basis of classification (in certain instances, for example, aerosols, other special preparations, powders and fumigants).

Conversely, where it can be shown that a pesticide is less toxic or harmful than its ingredients seem to indicate, this fact will also be taken into account when it is classified.

Article 4

The Member States shall take all necessary measures to ensure that pesticides cannot be placed on the market unless they comply with this Directive.

Article 5

1. The Member States shall take all necessary measures to ensure that pesticides cannot be placed on the market unless their packaging satisfies the following requirements:

- (a) the packaging must be so designed and constructed that its contents cannot escape; this requirement shall not apply where special safety devices are prescribed;
- (b) the materials constituting the packaging and fastenings must not be susceptible to attack by the contents, or liable to form harmful or dangerous compounds with the contents;
- (c) packaging and fastenings must be strong and solid throughout so as to ensure that they will not come apart and will safely withstand normal handling;
- (d) containers with fastening devices must be so designed that the container can be repeatedly refastened so that the contents cannot escape.

2. The Member States may also prescribe that:

- packages must initially be closed with a seal in such a way that when the package is opened for the first time the seal is irreparably damaged;
- containers with a capacity not exceeding three litres which contain pesticides intended for domestic use must have childproof fastenings.

Article 6

1. Member States shall take all necessary measures to ensure that pesticides cannot be placed on the market unless the labelling on their packaging satisfies the following requirements.

2. All packaging must show the following clearly and indelibly:

- (a) trade name or designation of the preparation;
- (b) — in the case of pesticides not subject to authorization, the name and address of the manufacturer or any other person placing the preparation on the market,
— in the case of pesticides subject to authorization, the name and address of the holder of the authorization and the registered number of the preparation and, if different, the name and address of the person placing the preparation on the market;
- (c) the name and amount of each active substance expressed:
 - for pesticides which are solids, aerosols, volatile liquids (maximum boiling point 50 °C) or viscous liquids (lower limit 1 Pa s at 20 °C): as a percentage by weight,
 - for other liquids: as a percentage by weight and in grams per litre at 20 °C,
 - for gases: as a percentage by volume;
- (d) the name of each very toxic, toxic, harmful or corrosive substance contained in the preparation, excluding active substances, in concentrations of more than 0.2 % in the case of very toxic and toxic substances, 5 % in the case of harmful substances and 5 % in the case of corrosive substances.

In the case of solvents, account should be taken of the concentration limits laid down in Article 5 (2) of Council Directive 73/173/EEC of 4 June 1973 on the approximation of Member States' laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances (solvents) ⁽¹⁾.

The name must be as given in the nomenclature of the list contained in Annex I to Directive 67/548/EEC;

- (e) the net quantity of the preparation given in legal units of measurement;
- (f) the batch number;

(g) the symbols and indications of the dangers of the preparation as specified in Article 6 (2) (c) of Directive 67/548/EEC and in Annex V thereto;

(h) an indication of the special risks, within the meaning of this Directive, deriving from these dangers;

(i) for very toxic, toxic or harmful pesticides, the indication that the packaging must not be re-used except in the case of containers which are specifically designed for re-use, recharging or refilling by the manufacturer or distributor.

3. In the case of pesticides which are subject to authorization, the indications of special risks shall be specified by the competent authority, and in all other cases by the manufacturer or other person placing the preparation on the market. These indications must be compulsorily selected from among those contained in Annex IV to this Directive and may be supplemented if necessary by indications contained in Annex III to Directive 67/548/EEC.

4. Safety advice concerning the use of the pesticide must appear on the label or the packaging or, when this is not physically possible, on another label firmly affixed to the packaging itself. In the case of pesticides which are subject to authorization, this safety advice shall be selected by the competent authority, and in all other cases by the manufacturer or other person placing the preparation on the market. Safety advice must comply with the indications given in Annex IV to Directive 67/548/EEC and in Annex V to this Directive.

5. Subject to Community rules on the authorization of pesticides, the competent authorities may prescribe additional particulars concerning special risks and safety advice for pesticides which are subject to authorization.

6. In no case may the label or the packaging of pesticides to which this Directive applies bear such indications as 'non-toxic', 'harmless' or other similar indications.

Article 7

1. Where the particulars required by Article 6 appear on a label, that label must be firmly affixed to one or more surfaces of the packaging so that particulars can be read horizontally when the package is set down normally. The dimensions of the label must be as follows:

⁽¹⁾ OJ No L 189, 11. 7. 1973, p. 7.

Capacity of the packaging:

- less than or equal to three litres:
if possible at least 52×74 mm,
- greater than three litres but not exceeding 50 litres:
at least 74×105 mm,
- greater than 50 litres but not exceeding 500 litres:
at least 105×148 mm,
- greater than 500 litres:
at least 148×210 mm.

Each symbol must cover at least one tenth of the surface area of the label but not be less than 1 cm^2 in area. The entire surface of the label must adhere to the immediate packaging of the preparation.

2. A label shall not be required where the particulars are clearly shown on the packaging itself as specified in paragraph 1.
3. The colour and presentation of the label — or, in the case referred to in paragraph 2, of the packaging — must be such that the danger symbol and its orange-yellow background stand out clearly.
4. Member States may make the placing of pesticides on the market in their territories subject to the use of the national or official language or languages in the labelling thereof.
5. For the purpose of this Directive, labelling requirements shall be deemed to be satisfied when the outer transportation packaging bears a symbol which complies with the international regulations on the transport of dangerous substances and with Article 6 (2) (a) to (f), (h), (i) and (4).

Article 8

1. Member States may:
 - (a) permit the labelling required by Article 6 to be applied in some other appropriate manner on packaging which is either too small or otherwise unsuitable for labelling in accordance with Article 7 (1) and (2);
 - (b) by way of derogation from Articles 6 and 7, permit the packaging of pesticides other than those classified as very toxic or toxic to be labelled in some other way if such packaging contains small quantities presenting no danger to persons handling the pesticide or otherwise concerned.
2. Member States availing themselves of the options provided for in paragraph 1 shall immediately inform the Commission accordingly.

Article 9

Member States may not prohibit, restrict or impede, on grounds of classification, packaging or labelling within the meaning of this Directive, the placing on the market of pesticides which satisfy the requirements of this Directive.

Article 10

1. Where a Member State establishes on the basis of detailed evidence that a pesticide, although satisfying the requirements of this Directive, constitutes a danger to health or safety, it may, provisionally, prohibit or impose special conditions on the placing on the market of that pesticide within its territory. It shall immediately inform the other Member States and the Commission of such action and state the reasons for its decision.

2. The Commission shall consult the Member States concerned within six weeks, express its opinion without delay and take the appropriate measures.

3. If the Commission is of the opinion that technical amendments to the Directive are required, such amendments shall be adopted either by the Commission or by the Council in accordance with the procedure laid down in Article 8c of Directive 67/548/EEC. In this event, the Member State which has adopted safeguard measures may maintain them until such amendments enter into force.

Article 11

1. The following shall be drawn up in accordance with the procedure laid down in Article 8c of Directive 67/548/EEC:

- a list of active substances with indications of their conventional LD_{50} and LC_{50} values (Annex III),
- an up-to-date list of active substances for the classification of pesticides containing more than one active substance in accordance with the method of calculation laid down in Annex II.

2. The amendments necessary to adapt the Annexes to this Directive to technical progress shall be adopted in accordance with the same procedure.

Article 12

1. The Member States shall bring into force on 1 January 1981 the laws, regulations and administrative provisions necessary for them to comply with this Directive and shall forthwith inform the Commission thereof.

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

Done at Luxembourg, 26 June 1978.

Article 13

This Directive is addressed to the Member States.

For the Council

The President

K. B. ANDERSEN

ANNEX I

CLASSIFICATION BY CALCULATION OF PESTICIDES CONTAINING ONE ACTIVE SUBSTANCE

(see Article 3 (2))

Pesticides containing one active substance and one or more inert vehicles and/or adjuvants shall be classified by means of the following formula:

$$\frac{L \times 100}{C} = A$$

where:

L = oral LD₅₀ of the active substance in the rat,

C = concentration of active substance in percentage by weight,

A = value determining the classification of the pesticide in accordance with Article 3 (1) (a).

Where the active substance appears in Annex III, the LD₅₀ value to be used in the calculation shall be that given in that Annex.

ANNEX II

CLASSIFICATION BY CALCULATION OF PESTICIDES CONTAINING MORE THAN ONE ACTIVE SUBSTANCE

(see Article 3 (3))

1. For the purpose of applying the method of calculation for the classification of pesticides which contain more than one active substance, the dangerous substances used in their preparation are divided into categories and sub-categories in accordance with the list in point 5.
2. The following formula shall be used for the classification of a pesticide:

$$\Sigma (P \times I)$$

where:

P = the percentage by weight of each dangerous substance present in the pesticide;

I = the distinguishing index of the sub-category to which each substance belongs. It is assigned for every percentage unit of the substance in question present in the pesticide.

In particular, I breaks down into the following:

I₁: for classifying solid pesticides as toxic or harmful;

I₂: for classifying liquid or gaseous pesticides as toxic or harmful.

The values of the indices I_1 and I_2 are given in the table below:

TABLE OF CLASSIFICATION INDICES

Category to which the substance belongs	Pesticide classification indices			
	Solid		Liquid or gaseous	
	I_1	(= conc.%)	I_2	(= conc.%)
Category I				
I/a	500	(= 1%)	500	(= 1%)
I/b	100	(= 5%)	125	(= 4%)
I/c	15	(= 33%)	25	(= 20%)
Category II				
II/a	5	(= 100%)	10	(= 50%)
II/b	2	(= 100%)	4	(= 100%)
II/c	1	(= 100%)	2	(= 100%)
II/d	0.5	(= 100%)	1	(= 100%)

3. Pesticides containing one or more of the substances listed in point 5 are regarded as toxic if the sum of the products obtained by multiplying the percentage by weight P of the various substances present in the pesticide by the respective indices I_1 or I_2 is greater than 500, i.e.:

— for solid pesticides: $\sum (P \times I_1) > 500$;

— for liquid or gaseous pesticides: $\sum (P \times I_2) > 500$;

4. Pesticides containing one or more of the substances listed in point 5 are regarded as harmful if the sum of the products referred to in point 3 is 500 or less but greater than 25 for solid pesticides, or 500 or less but greater than 40 for liquid and gaseous pesticides, i.e.:

— for solid pesticides: $25 < \sum (P \times I_1) \leq 500$;

— for liquid and gaseous pesticides: $40 < \sum (P \times I_2) \leq 500$.

When the result of this calculation is 25 or less for a solid pesticide or 40 or less for a liquid or gaseous one, the pesticide is not classified.

5. LIST OF ACTIVE SUBSTANCES, DIVIDED INTO CLASSES AND SUBCLASSES

Toxic substances

The substances bearing the indication (NT) cannot be transferred into other classes.

CLASS I/a

No in Directive 67/548/EEC	Nomenclature according to Directive 67/548/EEC	
006-006-00-X	Hydrogen cyanide and its salts	(NT)
015-004-00-8	Aluminium phosphide	
603-015-00-6	Allyl alcohol	(NT)
006-017-00-X	Aldicarb	(NT)
613-011-00-6	Amitrole [amino-triazole BS1]	
006-008-00-0	Antu	(NT)
	Arsenic and its compounds	(NT)

No in Directive 67/548/EEC	Nomenclature according to Directive 67/548/EEC
015-056-00-1	Azinphos-ethyl (NT)
015-039-00-9	Azinphos-methyl (NT)
602-002-00-3	Methyl bromide (NT)
015-044-00-6	Carbophenothion (NT)
015-071-00-3	Chlorfenvinphos (NT)
607-059-00-7	Coumatetralyl
613-004-00-8	Crimidine (NT)
015-070-00-8	Cyanthoate (NT)
015-028-00-9	Demeton-O (NT)
015-030-00-X	Demeton-O-methyl
015-029-00-4	Demeton-S (NT)
015-031-00-5	Demeton-S-methyl
015-078-00-1	Demeton-S-methyl-sulphone
015-073-00-4	Dicrotophos [dinocetyl]
006-029-00-5	Dioxacarb
015-060-00-3	Disulfoton
609-020-00-X	DNOC
015-049-00-3	Endothion
602-051-00-X	Endrin (NT)
015-047-00-2	Ethion
015-088-00-6	Dialiphos (NT)
050-003-00-6	Fentin-acetate
050-004-00-1	Fentin-hydroxide
607-078-00-0	Fluometil (NT)
015-091-00-2	Fonofos (NT)
006-031-00-6	Formetanate
	Fluoracetamide (NT)
602-053-00-0	Isobenzan
006-009-00-6	Isolan (NT)
015-045-00-1	Mecarbam
	Mercury and its derivatives
015-094-00-9	Mephospholan (NT)
015-095-00-4	Methamidophos
015-069-00-2	Methidathion (methomyl)
015-020-00-5	Mevinphos (mocap) (NT)
015-072-00-9	Monocrotophos
614-001-00-4	Nicotine (NT)
015-046-00-7	Oxydemethon-methyl
015-096-00-X	Oxydisulfoton (NT)
613-006-00-9	Paraquat
015-034-00-1	Parathion
015-035-00-7	Parathion-methyl
015-022-00-6	Phosphamidon (NT)
	Phospholan (NT)
015-033-00-6	Phorate (NT)
006-037-00-9	Promecarb (promurit) (NT)
015-032-00-0	Prothoate (NT)
015-026-00-8	Schradan (NT)
	Sulfotep (NT)
	Thallium and its compounds
	TEPP (NT)
	Carbon disulphide (NT)
602-008-00-5	Carbon tetrachloride (tranid) (NT)
015-024-00-7	Triamephos (zinophos) (NT)
CLASS I/b	
602-048-00-3	Aldrin
006-018-00-5	Aminocarb
602-049-00-9	Dieldrin
602-052-00-5	Endosulfan
602-046-00-2	Heptachlor
	Heptachlor epoxide
604-002-00-8	Pentachlorophenol

CLASS I/c

No in Directive 67/548/EEC	Nomenclature according to Directive 67/548/EEC
607-057-00-5 015-019-00-X 609-025-00-7 607-055-00-5 613-015-00-8 607-079-00-6 605-005-00-7 015-066-00-6 015-006-00-9 015-098-00-0 607-056-00-0	Coumachlor Dichlorvos Dimetilan Dinoseb Endothal-sodium Fenazaflor Kelevan (methiocarb) Metaldehyde Omethoate Zinc phosphide Trichloronate Warfarin

CLASS II/a

	Lead acetate
--	--------------

CLASS II/b

602-044-00-1 015-084-00-4 602-012-00-7 006-010-00-1 006-028-00-X 613-005-00-3 615-001-00-7 050-002-00-0 015-059-00-8 006-016-00-4	Camphechlor Chlorpyrifos 1,2-dichloroethane Dimetan Dinobuton Diquat Methyl isothiocyanate Cyhoxatin (R) (PREP) Thiometon Vamidotion Propoxur
--	---

CLASS II/c

609-024-00-1 015-086-00-5 602-045-00-7 015-040-00-4 602-010-00-6 609-027-00-8 650-008-00-9 015-048-00-8 602-042-00-0 602-043-00-6 608-007-00-6 602-021-00-6 015-097-00-5 015-067-00-1 015-101-00-5 016-103-00-5 016-005-00-6 016-007-00-7 016-010-00-3	Binacryl Coumithoate (DD) (DDT) Diazinon 1,2-dibromoethane Dinocton Drazoxolon Fenthion HCH Lindane Ioxynil 1,2-dibrome-3-chloropropane Phenthoate Phosalone Phosmet Barium polysulphides Calcium polysulphides Potassium polysulphides Sodium polysulphides
--	---

CLASS II/d

No in Directive 67/548/EEC	Nomenclature according to Directive 67/548/EEC
015-080-00-2	Amidithion (caprol)
006-011-00-7	Carbaryl
602-047-00-8	Chlordane
607-039-00-8	2,4 D
015-051-00-4	Dimethoate
015-089-00-1	Methyl-etoate
015-057-00-7	Formothion (fungilon)
613-018-00-4	Morfamquat
006-014-00-3	Nabam
015-055-00-6	Naled
	Phosnichlor
015-100-00-X	Phoxine (RM/60)
607-041-00-9	2, 4, 5-T
	Thiram
	Triclorphon
015-054-00-0	Fenitrothion
650-007-00-3	(Chlorfenamidine)

ANNEX III

LIST OF ACTIVE SUBSTANCES WITH INDICATIONS OF THEIR CONVENTIONAL LD₅₀ AND LC₅₀ VALUES

(see the first indent of Article 11 (1))

ANNEX IV

PHRASES INDICATING THE NATURE OF THE SPECIAL RISKS ATTACHING TO PESTICIDES

(see Article 6(3))

Depending on the nature of the risks, one or more of the phrases indicating the nature of the special risks involved must be mentioned on the labels of pesticides which are considered as dangerous within the meaning of this Directive.

If two or more phrases are required they may be combined in accordance with Annex III to Directive 67/548/EEC.

Indication of danger	No in Annex III to Directive 67/548/EEC	Phrases indicating the nature of the special risks
Very toxic (T)	R 26 R 27 R 28	Very toxic by inhalation Very toxic in contact with skin Very toxic if swallowed
Toxic (T)	R 23 R 24 R 25	Toxic by inhalation Toxic in contact with skin Toxic if swallowed
Harmful (X _n)	R 20 R 21 R 22	Harmful by inhalation Harmful in contact with skin Harmful if swallowed
Irritant (X _i)	R 36 R 37 R 38	Irritating to eyes Irritating to respiratory system Irritating to skin
Corrosive (C)	R 34 R 35	Causes burns Causes severe burns
Highly flammable (F)	R 11 R 12 R 13 R 15	Highly flammable Extremely flammable Extremely flammable liquefied gas Contact with water liberates highly flammable gases
Explosive (E)	R 16	Explosive when mixed with oxidizing substances

ANNEX V

SAFETY ADVICE

(see Article 6(4))

For pesticides classified as very toxic, toxic, harmful, corrosive or irritant, the following safety advice is compulsory:

No in Annex IV to Directive 67/548/EEC	Standard phrases
S 2	Keep out of reach of children
S 20/21	When using do not eat, drink or smoke
S 13	Keep away from food, drink and animal feedingstuffs

For harmful pesticides:

S 44 | If you feel unwell, seek medical advice (show the label where possible)

For very toxic and toxic pesticides:

S 45 | In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible)

Depending on the particular nature of the risks of the pesticide, the following safety advice must also be given:

S 22	Do not breathe dust
S 23	Do not breathe gas/fumes/vapour/spray
S 27	Take off immediately all contaminated clothing
S 36	Wear suitable protective clothing
S 37	Wear suitable gloves
S 42	During fumigation/spraying wear suitable respiratory equipment

When a pesticide is classified as corrosive, the following safety advice must also be given:

S 28	After contact with skin, wash immediately with plenty of ... (to be specified by the manufacturer)
S 37	Wear suitable gloves
S 39	Wear eye/face protection

When a pesticide contains phosphoric acid esters, the following advice must also be given:

S 28	After contact with skin, wash immediately with plenty of ... (to be specified by the manufacturer)
------	--

If two or more phrases are required, they can be combined in accordance with Annex IV to Directive 67/548/EEC.

COMMISSION

COMMISSION DIRECTIVE

of 19 May 1978

adapting to technical progress Council Directive 74/60/EEC on the approximation of the laws of the Member States relating to the interior fittings of motor vehicles (interior parts of the passenger compartment other than the interior rear-view mirrors, layout of controls, the roof or opening roof, the backrest and rear part of the seats)

(78/632/EEC)

THE COMMISSION OF THE EUROPEAN COMMUNITIES,

Article 2

Having regard to the Treaty establishing the European Economic Community,

Having regard to Council Directive 70/156/EEC of 6 February 1970 on the approximation of the laws of the Member States relating to the type approval of motor vehicles and their trailers ⁽¹⁾, as amended by the Act of Accession, and in particular Articles 11, 12 and 13 thereof,

Having regard to Council Directive 74/60/EEC of 17 December 1973 on the approximation of the laws of the Member States relating to the interior fittings of motor vehicles (interior parts of the passenger compartment other than the interior rear-view mirrors, layout of controls, the roof or opening roof, the backrest and rear part of the seats) ⁽²⁾,

Whereas in view of the experience gained and of the state of the art it is now possible to match the requirements more closely to actual test conditions;

Whereas the provisions of this Directive are in accordance with the opinion of the Committee on the Adaptation to Technical Progress of the Directives aimed at the Removal of Technical Barriers to Trade in the Motor Vehicle Sector,

HAS ADOPTED THIS DIRECTIVE:

Article 1

The Annexes to Directive 74/60/EEC are amended as shown in the Annex to this Directive.

⁽¹⁾ OJ No L 42, 23. 2. 1970, p. 1.

⁽²⁾ OJ No L 38, 11. 2. 1974, p. 2.

1. With effect from 1 January 1979 no Member State may on grounds relating to the interior fittings of motor vehicles (interior parts of the passenger compartment other than the interior rear-view mirrors, layout of the controls, the roof or opening roof, the backrest and rear part of the seats):

- refuse in respect of a type of vehicle to grant EEC-type approval, to issue the document referred to in the last indent of Article 10 (1) of Directive 70/156/EEC, or to grant national type approval; or
- prohibit the entry into service of vehicles if the interior fittings (interior parts of the passenger compartment other than the interior rear-view mirrors, layout of the controls, the roof or opening roof, the backrest and rear part of the seats) of such type of vehicle or of such vehicles comply with the provisions of Directive 74/60/EEC, as amended by this Directive.

2. With effect from 1 January 1979 Member States:

- may no longer issue the document referred to in the last indent of Article 10 (1) of Directive 70/156/EEC in respect of a type of vehicle of which the interior fittings (interior parts of the passenger compartment other than the interior rear-view mirrors, layout of the controls, the roof or opening roof, the backrest and rear part of the seats) do not comply with the provisions of Directive 74/60/EEC, as amended by this Directive,
- may refuse to grant national type approval in respect of a type of vehicle of which the interior fittings (interior parts of the passenger compartment other than the interior rear-view mirrors, layout of the controls, the roof or opening roof, the backrest

and rear part of the seats) do not comply with the provisions of Directive 74/60/EEC, as amended by this Directive.

3. With effect from 1 October 1982 Member States may prohibit the entry into service of vehicles of which the interior fittings (interior parts of the passenger compartment other than the interior rear-view mirrors, layout of the controls, the roof or opening roof, the backrest and rear part of the seats) do not comply with the provisions of Directive 74/60/EEC, as amended by this Directive.

Article 3

The Member States shall bring into force the provisions necessary to comply with this Directive not later than

1 January 1979 and shall forthwith inform the Commission thereof.

Article 4

This Directive is addressed to the Member States.

Done at Brussels, 19 May 1978.

For the Commission

Étienne DAVIGNON

Member of the Commission

ANNEX

AMENDMENTS TO THE ANNEXES TO COUNCIL DIRECTIVE
74/60/EEC OF 17 DECEMBER 1973

ANNEX I

DEFINITIONS, APPLICATIONS FOR EEC APPROVAL AND SPECIFICATIONS

Point 2.6 shall read:

'belt line' shall mean the line formed by the transparent lower contour of the side windows of the vehicle;

Point 2.7 shall read:

'convertible vehicle' shall mean a vehicle where in certain configurations there is no rigid part of the vehicle body above the belt line with exception of the front roof supports and/or the roll-over bars and/or the seat-belt anchorage points;

Point 2.8 shall read:

'vehicle with opening roof' shall mean a vehicle of which only the roof or a part of it can be folded back or be open, or may slide, leaving the existing structural elements of the vehicle above the belt line;

Point 2.9 shall read:

'folding (tip-up) seat' shall mean an auxiliary seat intended for occasional use and which is normally folded out of the way;

Point 5.3 shall read:

Other interior fittings in the passenger compartment in front of the transverse plane passing through the torso reference line of the manikin placed on the rearmost seats.

Point 5.3.1 shall read:

Scope

The requirements of point 5.3.2 below shall apply to control handles, levers and knobs and to any other protruding objects not referred to in points 5.1 and 5.2 above (see also under 5.3.2.2).

Point 5.3.2 shall read:

Requirements

If the items referred to in point 5.3.1 are so placed that occupants of the vehicle can contact them, they shall meet the requirements of points 5.3.2.1 to 5.3.4. If they can be contacted by a 165 mm diameter sphere and are above the lowest H point (see Annex IV) of the front seats and forward of the transverse plane of the torso reference line of the manikin on the rearmost seat, and outside the zones defined in points 2.3.1 and 2.3.2, these requirements shall be considered to have been fulfilled if:

Point 5.3.3 shall read:

The requirements of point 5.3.2.3 shall not apply to floor-mounted hand brake control; for such controls if the height of any part in the released position is above a horizontal plane passing through the lowest H point of the front seats (see Annex IV) the control shall have a cross sectional area of at least 6.5 cm², measured in a horizontal plane, not more than 6.5 mm from the furthest projecting part (measured in the vertical direction). The radius of curvature must not be less than 3.2 mm.

After point 5.3.4 add:

5.3.4.1. Components mounted on the roof but which are not part of the roof structure, such as grab handles, lights and sun visors, etc., shall have a radius of curvature of not less than 3.2 mm and, in addition, the width of the projecting parts shall not be less than the amount of their

downward projection; alternatively, these components shall pass the energy-dissipation test in accordance with the requirements of Annex III.

Point 5.4.2.1 shall read:

That part of the inner face of the roof which is situated above or forward of the occupants shall exhibit no dangerous roughness or sharp edges, directed rearwards or downwards. The width of the projecting parts shall not be less than the amount of their downward projection and the edges shall have a radius of curvature of not less than 5 mm. In particular, the rigid roof sticks or ribs, with the exception of the header rail of the glazed surfaces and door frames, shall not project downwards more than 19 mm.

Point 5.4.2.2 shall read:

If the roof sticks or ribs do not meet the requirements of point 5.4.2.1, they must pass the energy-dissipation test in accordance with the requirements of Annex III.

To point 5.4.2 add:

5.4.2.3. The metal wires which stretch the lining of the roof and the frames of the sun visors must have a maximum diameter of 5 mm or be able to absorb the energy, as prescribed in Annex III. Non-rigid attachment elements of the frames of the sun visors shall meet the requirements of point 5.3.4.1.

Point 5.5 shall read:

Vehicles with an opening roof.

Point 5.5.1.1 shall read:

The following requirements and those of point 5.4 above shall apply to vehicles with an opening roof when the roof is in the closed position.

Point 5.5.1.2.2 shall read:

Their surfaces shall terminate in rounded edges, the radii of curvature being not less than 5 mm.

Point 5.6 shall read:

'Convertible vehicles'.

Point 5.6.1 shall read:

In the case of convertible vehicles, only the underside of the top of the roll-bar and the top of the windscreen frame in all its normal utilization positions shall comply with the requirements of point 5.4. The system of folding rods or links used to support a non-rigid roof shall, where they are situated above or forward of the occupants, exhibit no dangerous roughness or sharp edges, directed rearwards or downwards.

Delete point 5.6.2.

Point 5.7 shall read:

Rear parts of seats anchored to the vehicle.

Point 5.7.1.2.3 shall read:

In the head impact zone outside the limits prescribed in points 5.7.1.2.1 to 5.7.1.2.2 inclusive, the seat frame structure shall be padded to avoid direct contact of the head with it: and, in these zones, shall have a radius of curvature of at least 5 mm. These parts may alternatively satisfy the energy dissipating requirements specified in Annex III.

Point 5.7.2 shall read:

These requirements shall not apply to the rearmost seats, to seats facing sideways or rearwards, to back-to-back seats or to folding (tip-up) seats. If the impact zones of the seats, head-restraints and their supports contain parts covered with material softer than 50 Shore A hardness, the above requirements, with the exception of those relating to energy dissipation described in Annex III, shall apply only to the rigid parts.

Point 5.8 becomes point 5.8.1.

The new point 5.8 shall read:

Other non-specified fittings.

ANNEX II

DETERMINATION OF THE HEAD-IMPACT ZONE

Point 2.2 shall read:

All points of contact situated forward of the H point shall be determined for each dimension from the pivotal point to the top of the head capable of being measured by the measuring apparatus within the interior dimensions of the vehicle.

In the case where the headform, with the arm set at minimum length, overlaps the front seat, from the rear H point, no contact point is established for this particular operation.

Point 2.3 shall read:

With the measuring apparatus vertical, possible points of contact shall be determined by pivoting it forwards and downwards through all arcs of vertical planes as far as 90° on either side of the longitudinal vertical plane of the vehicle which passes through the H point.

ANNEX III

PROCEDURE FOR TESTING ENERGY-DISSIPATING MATERIALS

Delete the text of point 1.3.3. Put the point number into brackets.

Point 1.4.1 shall read:

At every point of impact on the surface to be tested, the direction of impact shall be the tangent to the trajectory of the headform of the measuring apparatus described in Annex II.

For the testing of the parts as referred to in points 5.3.4.1 and 5.4.2.2 of Annex I, proceed by lengthening the arm of the measuring apparatus until contact is made with the part to be considered, up to a limit of 1 000 mm between the pivot point and top of the head of the apparatus. However, any roof sticks and ribs referred to in points 5.4.2.2 which cannot be contacted remain subject to the requirements of point 5.4.2.1 of Annex I with the exception of that relating to the height of projection.

ANNEX IV

The text of this Annex shall be replaced by the following text:

**PROCEDURE FOR DETERMINING THE H POINT AND THE ACTUAL SEAT-BACK ANGLE
AND FOR VERIFYING THE RELATIVE POSITIONS OF THE R AND H POINTS AND THE
RELATIONSHIP BETWEEN THE DESIGN SEAT-BACK ANGLE AND THE ACTUAL SEAT-BACK
ANGLE**

1. DEFINITIONS

1.1. H point

The 'H point', which indicates the position of a seated occupant in the passenger compartment, is the intersection, in a longitudinal vertical plane, of the theoretical axis of rotation between the thighs and torso of a human body represented by the manikin described in point 3.

1.2. R point or seating reference point

The 'R point' or 'seating reference point' is the reference point specified by the vehicle manufacturer which:

1.2.1. has coordinates determined in relation to the vehicle structure;

1.2.2. corresponds to the theoretical position of the point of torso/thighs rotation (H point) for the lowest and most rearward normal driving position or position of use given by the vehicle manufacturer for each seating position specified by him.

1.3. Seat-back angle

'Seat-back angle' means the inclination of the seat-back in relation to the vertical.

1.4. Actual seat-back angle

'Actual seat-back angle' means the angle formed by the vertical through the H point with the torso reference line of the human body represented by the manikin described in point 3.

1.5. Design seat-back angle

'Design seat-back angle' means the angle prescribed by the vehicle manufacturer which:

1.5.1. determines the seat-back angle for the lowest and most rearward normal driving position or position of use given by the vehicle manufacturer for each seating position specified by him;

1.5.2. is formed at the R point by the vertical and the torso reference line; and

1.5.3. corresponds theoretically to the actual seat-back angle.

2. DETERMINATION OF H POINTS AND ACTUAL SEAT-BACK ANGLES

2.1. An H point and an actual seat-back angle shall be determined for each seating position specified by the vehicle manufacturer. If the seating positions in the same row can be regarded as similar (bench seat, identical seats, etc.) only one H point and one actual seat-back angle shall be determined for each row of seats, the manikin described in point 3 being seated in a place regarded as representative for the row. This place shall be:

2.1.1. in the case of the front row, the driver's seat;

2.1.2. in the case of the rear row or rows, an outer seat;

2.2. When an H point and an actual seat-back angle are being determined, the seat considered shall be placed in the lowest and most rearward normal driving position or position of use given for it by the vehicle manufacturer. The seat-back shall, if its inclination is adjustable, be locked as specified by the manufacturer, or in the absence of any such specification, in a position corresponding to an actual seat-back angle of as near as possible to 25°.

3. DESCRIPTION OF THE MANIKIN

3.1. A three-dimensional manikin of a mass and contour corresponding to those of an adult male of average height shall be used. Such a manikin is depicted in Figures 1 and 2 of the Appendix to this Annex.

- 3.2. The manikin shall comprise:
 - 3.2.1. two components, one simulating the back and the other the seat of the body, pivoting on an axis representing the axis of rotation between the torso and the thigh. The intersection of this axis with the vertical medium longitudinal plane of the seating position determines the H point;
 - 3.2.2. two components simulating the legs and pivotally attached to the component simulating the seat; and
 - 3.2.3. two components simulating the feet and connected to the legs by pivotal joints simulating ankles.
- 3.2.4. In addition, the component simulating the seat of the body shall be provided with a level enabling its transverse orientation to be verified.
- 3.3. Body-segment weights shall be attached at appropriate points corresponding to the relevant centres of gravity, so as to bring the total mass of the manikin up to $75 \text{ kg} \pm 1 \%$. Details of the mass of the various weights are given in the table in Figure 2 of the Appendix to this Annex.
- 3.4. The torso reference line of the manikin is represented by a straight line passing through the joint between the thigh and the torso and the theoretical joint between the neck and the thorax (see Figure 1 of the Appendix to this Annex).

4. SETTING UP THE MANIKIN

The three-dimensional manikin shall be set up in the following manner:

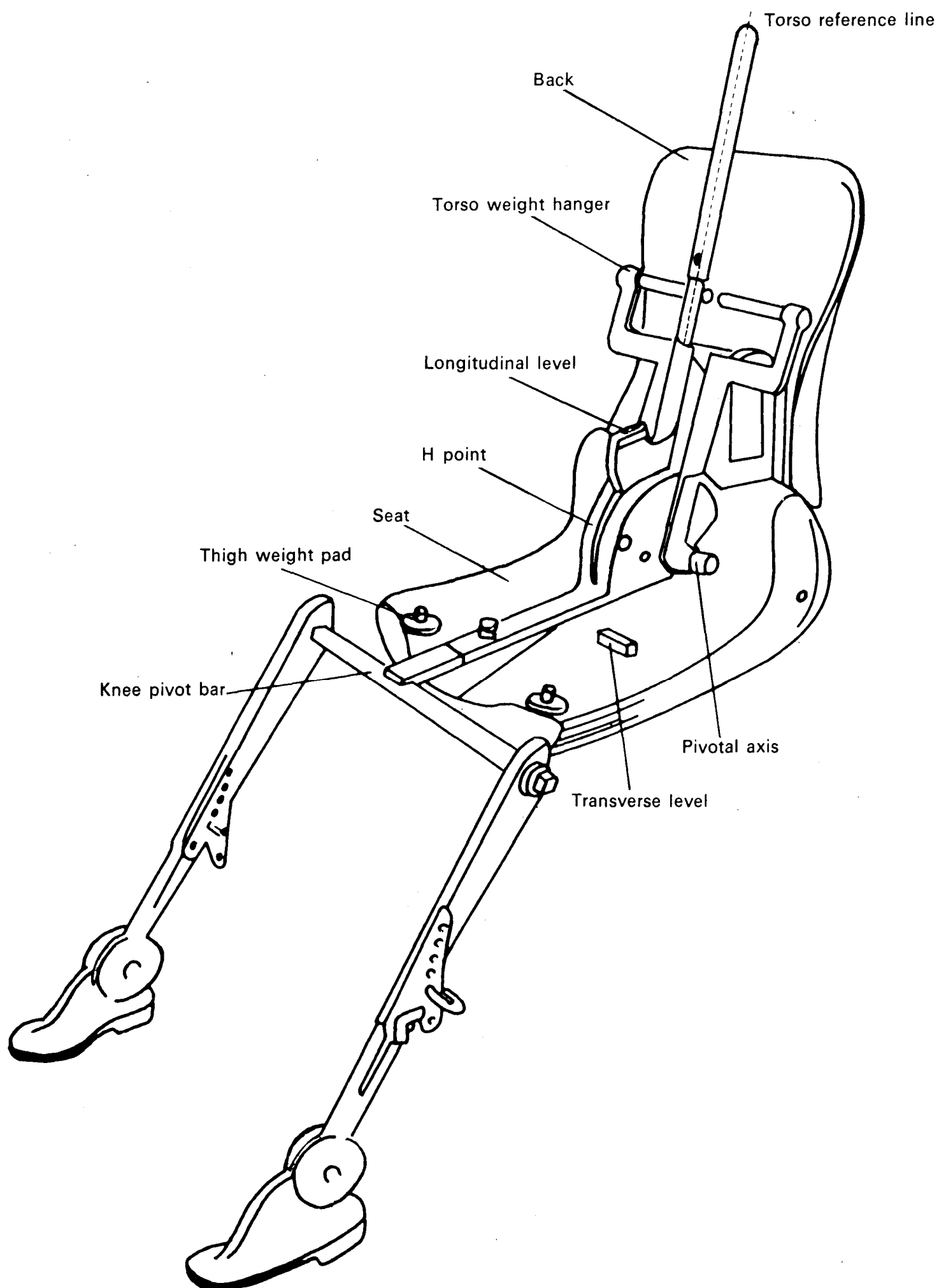
- 4.1. the vehicle shall be placed on a horizontal plane and the seats adjusted as prescribed in point 2.2;
- 4.2. the seat to be tested shall be covered with a piece of cloth to facilitate the correct setting-up of the manikin;
- 4.3. the manikin shall be placed on the seat concerned, its pivotal axis being perpendicular to the median longitudinal plane of the vehicle;
- 4.4. the feet of the manikin shall be placed as follows;
 - 4.4.1. in the front seats, in such a way that the level verifying the transverse orientation of the seat of the manikin is brought to the horizontal;
 - 4.4.2. in the rear seats, as far as possible in such a way as to be in contact with the front seats. If the feet then rest on parts of the floor which are at different levels, the foot which first comes into contact with the front seat shall serve as a reference point and the other foot shall be so arranged that the level enabling the transverse orientation of the seat of the manikin to be verified is brought to the horizontal;
 - 4.4.3. if the H point is being determined at a centre seat, the feet shall be placed one on each side of the tunnel;
- 4.5. the weights shall be placed on the legs, the level verifying the transverse orientation of the seat of the manikin shall be brought to the horizontal, and the thigh weights shall be placed on the component representing the seat of the manikin;
- 4.6. the manikin shall be moved away from the seat-back by means of the knee-pivot bar and the back of the manikin shall be pivoted forwards. The manikin shall be repositioned on the seat of the vehicle by being slid backwards on its seat until resistance is encountered, the back of the manikin then being replaced against the seat-back;
- 4.7. a horizontal load of $10 \pm 1 \text{ daN}$ shall be applied to the manikin twice. The direction and point of application of the load are shown by a black arrow in Figure 2 of the Appendix;
- 4.8. the seat weights shall be installed on the right and left sides, and the torso weights shall then be placed in position. The transverse level of the manikin shall be kept horizontal;
- 4.9. the transverse level of the manikin being kept horizontal, the back of the manikin shall be pivoted forwards until the torso weights are above the H point, so as to eliminate any friction with the seat-back;
- 4.10. the back of the manikin shall be gently moved rearwards so as to complete the setting-up operation. The transverse level of the manikin shall be horizontal. If it is not, the procedure described above shall be repeated.

5. RESULTS

- 5.1. When the manikin has been set up as described in point 4, the H point and the actual seat-back angle of the vehicle seat considered are constituted by the H point and the angle of inclination of the manikin's torso reference line.
 - 5.2. The coordinates of the H point in relation to three mutually perpendicular planes, and the actual seat-back angle, shall be measured for comparison with the data supplied by the vehicle manufacturer.
- ## 6. VERIFYING THE RELATIVE POSITIONS OF THE R AND H POINTS AND THE RELATIONSHIP BETWEEN THE DESIGN SEAT-BACK ANGLE AND THE ACTUAL SEAT-BACK ANGLE
- 6.1. The results of the measurements carried out in accordance with point 5.2 for the H point and the actual seat-back angle shall be compared with the coordinates of the R point and the design seat-back angle as given by the vehicle manufacturer.
 - 6.2. The relative positions of the R point and the H point and the relationship between the design seat-back angle and the actual seat-back angle shall be considered to be satisfactory for the seating position in question if the H point, as defined by its coordinates, lies within a longitudinal rectangle whose horizontal and vertical sides are 30 and 20 mm long respectively and whose diagonals intersect at the R point, and if the actual seat back angle is within 3° of the design seat-back angle.
 - 6.2.1. If these conditions are met, the R point and the design seat-back angle shall be used for the test and, if necessary, the manikin shall be so adjusted that the H point coincides with the R point and the actual seat-back angle coincides with the design seat-back angle.
 - 6.3. If the H point or the actual seat-back angle does not satisfy the requirements of point 6.2, the H point or the actual seat-back angle shall be determined twice more (three times in all). If the results of two of these three operations satisfy the requirements, the result of the test shall be considered to be satisfactory.
 - 6.4. If at least two of the three test results do not satisfy the requirements of point 6.2, the result of the test shall be considered to be not satisfactory.
 - 6.5. If the situation described in point 6.4 arises, or if verification is not possible because the vehicle manufacturer has failed to supply information regarding the position of the R point or regarding the design seat-back angle, the average of the results of the three tests may be used and be regarded as applicable in all cases where the R point or the design seat-back angle is referred to in this Directive.
 - 6.6. For verifying the relative positions of the R point and the H point and the relationship between the design seat-back angle and the actual seat-back angle in a series-produced vehicle, the rectangle referred to in point 6.2 shall be replaced by a square of 50 mm side and the actual seat-back angle shall not differ by more than 5° from the design seat-back angle.
-

Appendix

COMPONENTS OF THREE-DIMENSIONAL MANIKIN

*Figure 1*

DIMENSIONS AND MASS OF MANIKIN

<i>Mass of manikin</i>	<i>kg</i>
Components simulating back and seat of body	16
Mass of torso weights	31
Mass of seat weights	8
Mass of thigh weights	7
Mass of leg weights	13
Total:	75

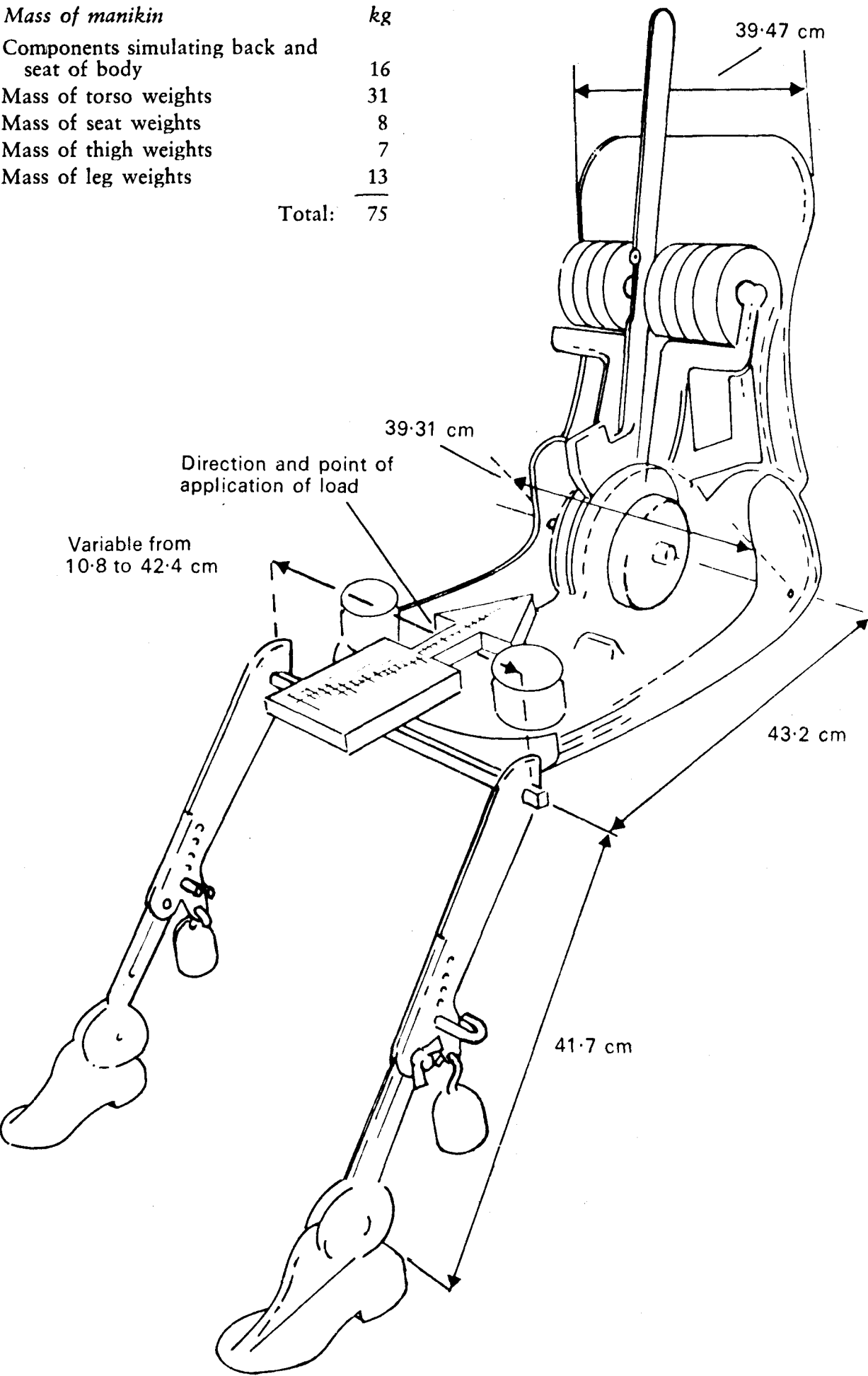


Figure 2

ANNEX V

METHOD OF MEASURING PROJECTIONS

Point 1 shall read:

To determine the amount by which an item projects in relation to the panel on which it is mounted, a 165 mm sphere shall be moved along and be kept in contact with the component under consideration, starting from the initial position of contact with the component under consideration. The projection's value is the largest of all possible variations 'y', the variation measured from the centre of the sphere perpendicular to the panel.

If the panels and components, etc., are covered with materials softer than 50 Shore A hardness, the procedure for the measuring of projections described above shall apply only after the removal of such materials.

APPENDIX TO ANNEXES I, II, III, IV AND VI

NOTES

TO ANNEX I

DEFINITIONS, APPLICATIONS FOR EEC-TYPE APPROVAL AND SPECIFICATIONS

To point 2.2:

The reference zone is outlined without rear view mirror. The energy-dissipation test is accomplished without the rear view mirror. The pendulum shall not impact the mirror mounting.

To points 2.3 and 2.3.1:

The exemption defined by these points behind the steering wheel is also valid for the head impact area of the front passenger(s).

In the case of adjustable steering wheels the zone finally exempted is reduced to the common area of the exempted zones for each of the driving positions which the steering wheel may assume.

In the case where it is possible to choose between various steering wheels the exempted zone is determined by the use of the least favourable steering wheel having the smallest diameter.

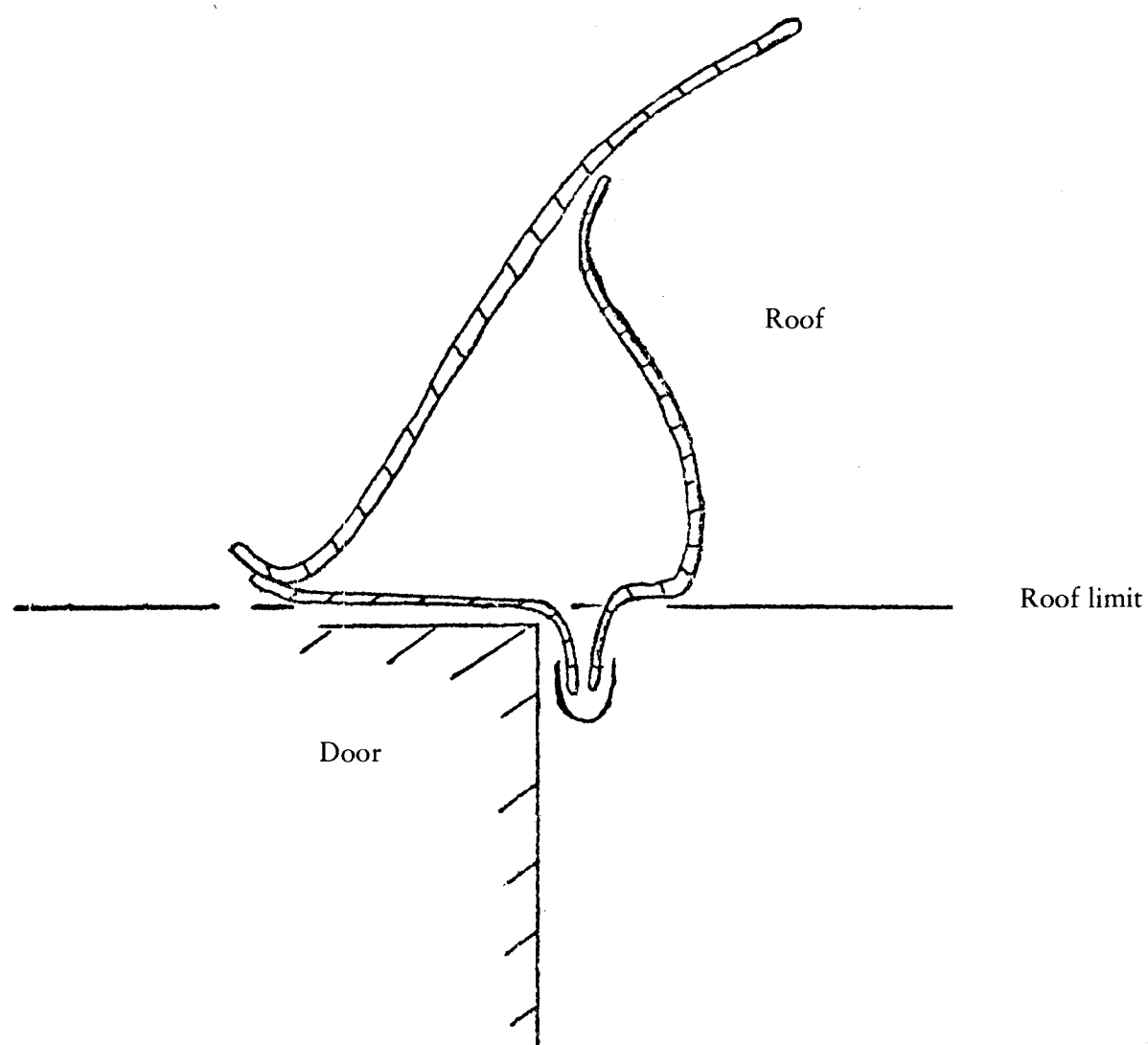
To point 2.4:

The level of the instrument panel extends over the entire width of the passenger compartment and is defined by the rearmost points of contact of a vertical line with the surface of the instrument panel when the line is moved across the width of the vehicle. Where two or more points of contact occur simultaneously then the lower point of contact shall be used to establish the level of the instrument panel. In the case of consoles, if it is not possible to determine the level of the instrument panel by reference to the points of contact of a vertical line then the level of the instrument panel shall be where a horizontal line 25.4 mm above the H point of the front seats intersects the console.

To point 2.5:

At the vehicle sides the roof shall commence at the upper edge of the door aperture. In the normal case the lateral roof limits will be represented by the contours formed by the bottom edge (lateral view) of the remaining body when the door has been opened. In the case of windows the lateral limitation of the roof will be the continuous transparent line (penetration point of the lateral window panes). At the posts the lateral roof limitation will pass through the connecting line between the transparent lines. The definition of point 2.5 is also valid for any opening for the roof, in the closed position, of a vehicle as defined in point 2.7 or 2.8.

For measuring purposes downward facing flanges shall be ignored. These will be considered as forming part of the vehicle sidewall.



To point 2.7:

A non-removable rear window is understood to be a rigid structural element.

Cars with non-removable rear windows of rigid material are considered to be cars with opening roofs as defined under point 2.8.

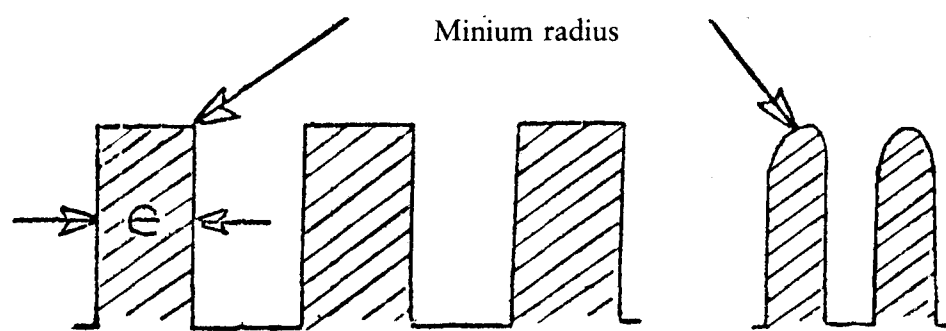
To point 5.1.1:

A sharp edge is an edge of a rigid material having a radius of curvature of less than 2.5 mm except in the case of projections of less than 3.2 mm, measured from the panel. In this case the minimum radius of curvature shall not apply provided the height of the projection is not more than half its width and its edges are blunted.

Grills are considered to comply with the regulations if they meet the minimum requirements of the following table:

(in mm)

Gap between elements	Flat elements		Rounded elements (min. radius)
	e/min.	radius min.	
0 to 10	1.5	0.25	0.50
10 to 15	2.0	0.33	0.75
15 to 20	3.0	0.50	1.25



To point 5.1.2:

During the test it is determined whether parts within the impact zone used for reinforcement may be displaced or protrude so as to increase the hazards to passengers or the severity of injuries.

To point 5.1.3:

These two concepts (level and lower edge of the instrument panel) may be distinct. However, this paragraph is included in point 5.1 (... above the level of the instrument panel ...) and, therefore, is applicable only where these two concepts are combined. In the case where the two concepts are not combined, i.e. where the bottom edge of the instrument panel is located below the level of the instrument panel, it will be considered under point 5.3.2.1 by reference to point 5.8.

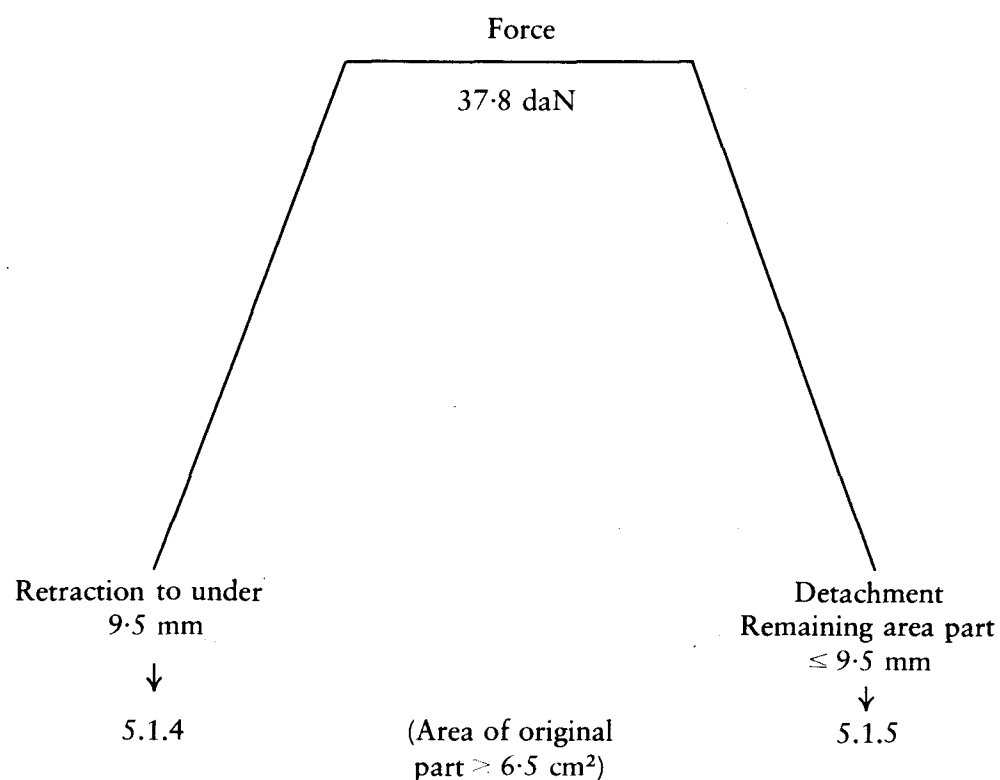
To point 5.1.4:

If a pull handle or knob has a width dimension equal to or more than 50 mm and is located in a zone such that if it were less than 50 mm in width the maximum projection would be determined using the headform measuring apparatus with point 2 of Annex V, the maximum projection shall be determined in accordance with point 1 of Annex V, i.e. by using a 165 mm diameter sphere and determining the maximum variation in height of the 'y' axis.

The cross-sectional area shall be measured in a plane parallel to the surface on which the component is mounted.

To point 5.1.5:

Points 5.1.4 and 5.1.5 complement each other; the first sentence of point 5.1.5 (i.e. a force of 37.8 daN for retraction or detachment) is applied and then point 5.1.4 in case of retraction up to a protrusion between 3.2 and 9.5 mm or, in the case of detachment, the two last sentences of point 5.1.5 (the cross-section area is measured before the force is applied). However, if, under practical circumstances point 5.1.4 must be applied (retraction to under 9.5 mm and over 3.2 mm), it could be more convenient, at the manufacturer's discretion, to verify the specifications of point 5.1.4 before applying the force of 37.8 daN specified in point 5.1.5.



To point 5.1.6:

Since in the presence of soft materials, the requirements apply only to the rigid support, the projection is measured for the rigid support only.

The Shore hardness measurement is made on samples of the test subject itself. Where, due to the condition of the material it is impossible to carry out a hardness measurement by the Shore A procedure, comparable measurements shall be used for evaluation.

To point 5.2.1:

Foot pedals, their arms and immediate pivotal mechanism but not the surrounding support metal shall be excluded from consideration.

To point 5.2.2:

The criterion to determine whether the parking brake control can be contacted is the use of:

- the simulated head specified in Annex II, if the control is located above or on the level of the instrument panel (to be tested in accordance with point 5.1 and within the impact zone);
- the knee specified in Annex VI if the control element is located below the level of the instrument panel (in this case the control lever is tested in accordance with point 5.3.2.3).

To point 5.2.3:

The technical specifications listed in point 5.2.3 apply also to shelves and those parts of consoles below the level of the instrument panel located between the front seats, provided that these are located in front of the H point. If a cavity is closed it will be treated as a glove compartment and not be subject to these specifications.

To point 5.2.3.1:

The dimensions specified refer to the surface before the addition of material of less than 50 Shore A hardness (see point 5.2.4). Energy-dissipating tests shall be conducted in the spirit of Annex III.

To point 5.2.3.2:

If a shelf becomes detached or breaks up no dangerous features must result; this applies not only to the rim but also to other edges facing into the passenger compartment as a result of the applied force.

The strongest part of the shelf shall be considered to be adjacent to a fixture. Also, 'substantially distorted' shall mean that, under the effect of the applied force, the deflection of the shelf, measured from the initial point of contact with the test cylinder, must be a fold or a deformation visible to the naked eye. Elastic deformation shall be admissible.

The length of the test cylinder shall be at least 50 mm.

To point 5.3:

'Other parts' shall include such parts as window catches, seat belt upper anchorages and other parts located in the foot space and at the door side, unless these parts have been treated previously or are exempted in the text.

To point 5.3.2:

That space between the forward bulkhead and the instrument panel which is located higher than the bottom edge of the instrument panel is not subject to the specifications of point 5.3.

To point 5.3.2.1:

The 3.2 mm radius applies to all contactable components covered by point 5.3 when considered in all positions of use.

As exceptions glove compartments shall be considered only in the closed position, seat belts will normally be considered only in the fastened position but any part which has a fixed stowage position shall also comply with the 3.2 mm radius requirement in that stowed position.

To point 5.3.2.2:

The reference surface is found by application of the device described in point 2 of Annex V with a force of 2 daN. Where this is not possible the method described in point 1 of Annex V shall be used with a force of 2 daN.

The evaluation of dangerous projections is subject to the discretion of the authority responsible for the tests.

The force of 37.8 daN is applied even if the original projection is less than 35 or 25 mm, as applicable. The projection is measured under the applied load.

The horizontal, longitudinal force of 37.8 daN is normally applied by means of a flat-ended ram of not more than 50 mm diameter, but where this is not possible an equivalent method may be used; for instance, by removing obstacles.

To point 5.3.2.3:

The furthest projecting part in the case of a gear lever is that part of the grip or knob first contacted by a vertical transverse plane moved in a longitudinal, horizontal direction. If any part of a gear lever or handbrake lies above the H point level that lever will have to be considered as if the whole of it were above the H point level.

To point 5.3.4:

Where the horizontal plane(s) passing through the H point of the lowest front and rear seats do not coincide, then a vertical plane perpendicular to the vehicle's longitudinal axis shall be determined, passing through the front seat H point. The exempted zone will then be considered separately for both the front and rear passenger compartments, relative to their respective H point and up to the vertical plane defined above.

To point 5.3.4.1:

Movable sun visors shall be considered in all positions of use. The frames of sun visors shall not be regarded as rigid supports (see point 5.3.5).

To point 5.4:

When the roof is tested to measure those protrusions and parts which can be contacted by a ball having a diameter of 165 mm, the roof lining must be removed. When evaluating the specified radii the proportions and properties attributable to the materials of the roof lining shall be taken into consideration. The roof testing area shall extend in front of and above the transverse plane limited by the torso reference line of the manikin placed on the rearmost seat.

To point 5.4.2.1 (see point 5.1.1 for definition of 'sharp edges'):

The downward projection shall be measured normal to the roof in accordance with point 1 of Annex V.

The width of the projecting part shall be measured at right angles to the line of the projection. In particular the rigid roof sticks or ribs shall not project away from the inner surface of the roof more than 19 mm.

To point 5.5:

Any roof ribs on opening roofs must meet point 5.4 if they are contactable by a 165 mm diameter sphere;

To points 5.5.1.2, 5.5.1.2.1 and 5.5.1.2.2:

The opening and operating devices when in a position of rest and with the roof closed must meet all of the specified conditions.

To point 5.5.1.2.3:

The force of 37.8 daN is applied even if the original projection is 25 mm or less. The projection is measured under the applied load.

The force of 37.8 daN applied in the direction of impact defined in Annex III as the tangent to the trajectory of the headform is normally applied by means of a flat-ended ram of not more than 50 mm diameter, but where this is not possible an equivalent method may be used; for instance, by removing obstacles.

The 'position of rest' means the position of the operating device when it is in the locked position.

To point 5.6:

The rod system of convertible tops does not represent a roll-over bar.

To point 5.6.1:

The top part of the windscreen frame starts above the transparent contour of the windscreen.

To point 5.7.1.1:

See point 5.1.1 for definition of 'sharp edge'.

To point 5.7.1.2:

In defining the head impact zone of the back of the front seats any structure necessary to support the seat back shall be considered as a component of this seat back.

To point 5.7.1.2.3:

The padding of the seat frame structure shall also avoid dangerous roughness and sharp edges likely to increase the risk of serious injuries to the occupants.

TO ANNEX II

DETERMINATION OF THE HEAD-IMPACT ZONE

To point 2.1.1.2:

The choice between the two procedures for determining height is to be left to the manufacturer.

To point 2.2:

When determining points of contact, the length of the arm of the measuring apparatus is not changed during a particular operation. Each operation starts from the vertical position.

To point 3:

The 25.4 mm dimension means the measurement from a horizontal plane passing through the H point to the horizontal tangent to the lower profile of the headform.

TO ANNEX III

PROCEDURE FOR TESTING ENERGY-DISSIPATING MATERIALS

To point 1.4:

For breakage of any component during the energy-dissipation test, see the note on point 5.1.2 in Annex I.

TO ANNEX IV

PROCEDURE FOR DETERMINING THE H POINT AND THE ACTUAL SEAT-BACK ANGLE AND FOR VERIFYING THE RELATIVE POSITIONS OF THE R AND H POINTS AND THE RELATIONSHIP BETWEEN THE DESIGN SEAT-BACK ANGLE AND THE ACTUAL SEAT-BACK ANGLE

To point 4:

For determining the H point of any seat, other seats may be removed if necessary.

TO ANNEX VI

APPARATUS AND PROCEDURE FOR APPLICATION OF POINT 5.2.1 OF ANNEX I

First sentence:

Foot-operated controls are treated as foot pedals.

EIGHT COMMISSION DIRECTIVE

of 15 June 1978

establishing Community methods of analysis for the official control of feedingstuffs

(78/633/EEC)

THE COMMISSION OF THE EUROPEAN COMMUNITIES,

HAS ADOPTED THIS DIRECTIVE:

Article 1

Having regard to the Treaty establishing the European Economic Community,

Having regard to Council Directive 70/373/EEC of 20 July 1970 on the introduction of Community methods of sampling and analysis for the official control of feedingstuffs ⁽¹⁾, as last amended by the Act of Accession, and in particular Article 2 thereof,

Whereas that Directive requires that official control of feedingstuffs be carried out using Community methods of sampling and analysis for the purpose of checking compliance with requirements arising under the provisions laid down by law, regulation or administrative action concerning the quality and composition of feedingstuffs;

Whereas Commission Directives 71/250/EEC of 15 June 1971 ⁽²⁾, 71/393/EEC of 18 November 1971 ⁽³⁾, 72/199/EEC of 27 April 1972 ⁽⁴⁾, 73/46/EEC of 5 December 1972 ⁽⁵⁾, 74/203/EEC of 25 March 1974 ⁽⁶⁾, 75/84/EEC of 20 December 1974 ⁽⁷⁾ and 76/372/EEC of 1 March 1976 ⁽⁸⁾ have already established a number of Community methods of analysis; whereas the progress of work since then makes it advisable to adopt an eighth set of methods;

Whereas the measures provided for in this Directive are in accordance with the opinion of the Standing Committee for Feedingstuffs,

1. Member States shall require that analyses for official controls of feedingstuffs, as regards their content of zinc bacitracin, flavophospholipol, iron, copper, manganese and zinc, be carried out in accordance with the methods described in the Annex to this Directive.

2. The general provisions set out in Part 1 'Introduction' of the Annex to First Directive 71/250/EEC, with the exception of the part dealing with preparation of the sample to be analyzed, shall apply to the methods described in the Annex to this Directive.

Article 2

Member States shall, on 1 January 1979, bring into force the laws, regulations or administrative provisions necessary to comply with this Directive. They shall forthwith notify the Commission thereof.

Article 3

This Directive is addressed to the Member States.

Done at Brussels, 15 June 1978.

For the Commission

Finn GUNDELACH

Vice-President

⁽¹⁾ OJ No L 170, 3. 8. 1970, p. 2.

⁽²⁾ OJ No L 155, 12. 7. 1971, p. 13.

⁽³⁾ OJ No L 279, 20. 12. 1971, p. 7.

⁽⁴⁾ OJ No L 123, 29. 5. 1972, p. 6.

⁽⁵⁾ OJ No L 83, 30. 3. 1973, p. 21.

⁽⁶⁾ OJ No L 108, 22. 4. 1974, p. 7.

⁽⁷⁾ OJ No L 32, 5. 2. 1975, p. 26.

⁽⁸⁾ OJ No L 102, 15. 4. 1976, p. 8.

ANNEX

1. DETERMINATION OF ZINC BACITRACIN BY DIFFUSION IN AN AGAR MEDIUM

1. PURPOSE AND SCOPE

The method is for the determination of zinc bacitracin in feedingstuffs, concentrates and pre-mixes. The lower limit of determination is 5 mg/kg (5 ppm) (*). The method is not valid in the presence of interfering substances, particularly large amounts of copper and ascorbic acid.

2. PRINCIPLE

The sample is extracted at pH 2 with a mixture of methanol/water/hydrochloric acid. The extract is brought to pH 6.5, concentrated (where necessary) and diluted. Its antibiotic activity is determined by measuring the diffusion of zinc bacitracin in an agar medium inoculated with *Micrococcus luteus* (Syn. *M. flavus*). Diffusion is shown by the formation of zones of inhibition of the micro-organism. The diameter of these zones is taken to be in direct proportion to the logarithm of the antibiotic concentration over the range of antibiotic concentrations employed.

3. MICRO-ORGANISM: MICROCOCCUS LUTEUS ATCC 10240

3.1. Maintenance of stock culture

Inoculate *Micrococcus luteus* on to agar slopes of culture medium (4.1). Incubate for 24 hours at 30 to 37 °C, store in a refrigerator at about 4 °C and reinoculate every two weeks onto agar slopes.

3.2. Preparation of the bacterial suspension (a)

Harvest the growth from a recently prepared agar slope (3.1) with 2 to 3 ml of sodium chloride solution (4.3). Use this suspension to inoculate 250 ml of culture medium (4.1) contained in a Roux flask and incubate for 18 to 20 hours at 30 to 37 °C. Harvest the growth in 25 ml of sodium chloride solution (4.3) and mix. Dilute the suspension to one-tenth with sodium chloride solution (4.3). The light transmission of the suspension must be about 75 %, measured at 650 nm in a 1 cm cell against sodium chloride solution (4.3).

4. CULTURE MEDIA AND REAGENTS

4.1. Culture medium (b)

Meat peptone	6.0 g
Tryptone	4.0 g
Yeast extract	3.0 g
Meat extract	1.5 g
Glucose	1.0 g
Agar	15.0 g
Water	1 000 ml
pH 6.5 to 6.6 (after sterilization)	

4.2. Assay medium (b)

Tryptone	10.0 g
Yeast extract	3.0 g
Meat extract	1.5 g
Glucose	1.0 g
Agar	20.0 g
Tween 80	1 ml
Water	1 000 ml
pH 6.5 (after sterilization)	

4.3. Sodium chloride solution 0.8 % (w/v): dissolve 8 g of sodium chloride a.p. in water and dilute to 1 000 ml; sterilize.

4.4. Mixture of methanol, pure/water/hydrochloric acid a.p. (d: 1.18 to 1.19) : 80/17.5/2.5 (v/v/v).

(*) 1 mg feedingstuff grade zinc bacitracin is equivalent to 42 international units (i.u.).

(a) Other methods may be used provided that it has been established that they give similar bacterial suspensions.

(b) Any commercial culture medium of similar composition and giving the same results may be used.

4.5. Phosphate buffer, pH 6.5

Potassium hydrogen phosphate K_2HPO_4 a.p. (22.15 g).
 Potassium dihydrogen phosphate KH_2PO_4 a.p. (27.85 g).
 Water to 1 000 ml.

4.6. Hydrochloric acid a.p. (d : 1.18 to 1.19).

4.7. Hydrochloric acid a.p. (0.1 N).

4.8. Sodium hydroxide 1 N solution a.p.

4.9. Bromocresol purple solution 0.04 % (w/v): dissolve 0.1 g of bromocresol purple in 18.5 ml of 0.01 N sodium hydroxide solution. Make up the volume to 250 ml with water and mix.

4.10. Standard substance: zinc bacitracin of known activity (in i.u.).

5. STANDARD SOLUTIONS

Weigh out a quantity of standard zinc bacitracin (4.10) corresponding to 1 050 i.u. (according to the activity indicated). Add 5 ml of 0.1 N hydrochloric acid (4.7) and leave to stand for 15 minutes. Add 30 ml of water, adjust the pH to 4.5 with phosphate buffer pH 6.5 (4.5) (about 4 ml), make up to a volume of 50 ml with water and mix well (1 ml = 21 i.u.).

From this solution prepare by successive dilution with phosphate buffer pH 6.5 (4.5) the following solutions:

S_8	0.42	i.u./ml
S_4	0.21	i.u./ml
S_2	0.105	i.u./ml
S_1	0.0525	i.u./ml

6. PREPARATION OF THE EXTRACT

6.1. Extraction

6.1.1. Concentrates, premixes and mineral feeds

Weigh out a quantity of sample of 2.0 to 5.0 g, add 30 ml of the mixture (4.4) and shake briefly. Check that the pH is about 2. Shake for 10 minutes, add 30 ml of phosphate buffer pH 6.5 (4.5) and shake for 15 minutes. Dilute with phosphate buffer (4.5) to obtain an expected zinc bacitracin content of 0.42 i.u./ml (= U_8).

6.1.2. Protein concentrates

Weigh out a quantity of sample of 10.0 g, add 50 ml of the mixture (4.4) and shake briefly. Check that the pH is about 2. Shake for 10 minutes, add 50 ml of phosphate buffer pH 6.5 (4.5) and shake for 15 minutes. Dilute with phosphate buffer (4.5) to obtain an expected zinc bacitracin content of 0.42 i.u./ml (= U_8).

6.1.3. Other feeds

Weigh out a quantity of sample of 10.0 g (20.0 g for an expected zinc bacitracin content of 5 mg/kg), add 25 ml of the mixture (4.4) and homogenize for about 10 minutes. Add 25 ml of phosphate buffer pH 6.5 (4.5), shake for 15 minutes and centrifuge. Take 20 ml of the supernatant solution and adjust the pH to 6.5 by means of 1 N sodium hydroxide solution (4.8) with the bromocresol purple solution (4.9) as indicator. Evaporate to about 4 ml in a rotary evaporator at a temperature not exceeding 35 °C. Dilute the residue with water to obtain an expected zinc bacitracin content of 0.42 i.u./ml (= U_8).

6.2. Assay solutions

From solution U_8 prepare solutions U_4 (expected content: 0.21 i.u./ml), U_2 (expected content: 0.105 i.u./ml) and U_1 (expected content: 0.0525 i.u./ml) by means of successive dilution (1 + 1) with phosphate buffer (4.5).

7. ASSAY PROCEDURE

7.1. Inoculation of the assay medium

Inoculate the assay medium (4.2) with the bacterial suspension (3.2) at about 50 °C. By preliminary trials on plates with assay medium (4.2) determine the quantity of bacterial suspension required to give the largest and clearest zones of inhibition with the various concentrations of zinc bacitracin.

7.2. Preparation of the plates

Diffusion through agar is carried out in plates with the four concentrations of the standard solution (S_8, S_4, S_2, S_1) and the four concentrations of the assay solution (U_8, U_4, U_2, U_1). These four concentrations of extract and standard must necessarily be placed in each plate. To this effect, select plates big enough to allow at least eight holes with a diameter of 10 to 13 mm and not less than 30 mm between centres to be made in the agar medium. The test may be carried out on plates consisting of a sheet of glass with a faced aluminium or plastic ring placed on top, 200 mm in diameter and 20 mm high.

Pour into the plates a quantity of the medium (4.2), inoculated as in point 7.1, to give a layer about 2 mm thick (50 ml for a plate of 200 mm diameter). Allow to set in a level position, bore the holes and place in them exactly measured volumes of assay and standard solutions (between 0.10 and 0.15 ml per hole, according to the diameter).

Apply each concentration at least four times so that each determination is subject to an evaluation of 32 zones of inhibition.

7.3. Incubation

Incubate the plates for 16 to 18 hours at 28 to 30 °C.

8. EVALUATION

Measure the diameter of the zones of inhibition to the nearest 0.1 mm. Record the mean measurements for each concentration on semi-logarithmic graph paper showing the logarithm of the concentrations in relation to the diameters of the zones of inhibition. Plot the best fit lines of both the standard solution and the extract, for example as below.

Determine the 'best fit' point for the standard lowest level (SL) using the formula:

$$(a) \text{ SL} = \frac{7 S_1 + 4 S_2 + S_4 - 2 S_8}{10}$$

Determine the 'best fit' point for the standard highest level (SH) using the formula:

$$(b) \text{ SH} = \frac{7 S_8 + 4 S_4 + S_2 - 2 S_1}{10}$$

Similarly calculate the 'best fit' points for the extract lowest level (UL) and the extract highest level (UH) by substituting U_1, U_2, U_4 and U_8 for S_1, S_4 and S_8 in the above formulae.

Record the calculated SL and SH values on the same graph paper and join them to give the 'best fit' line for the standard solution. Similarly record UL and UH and join them to give the 'best fit' line for the extract.

In the absence of any interference the lines should be parallel. For practical purposes the lines can be considered parallel if the values (SH-SL) and (UH-UL) do not differ by more than 10 % from their mean value.

If the lines are found to be non-parallel, either U_1 and S_1 or U_8 and S_8 may be discarded and SL, SH, UL and UH calculated, using the alternative formulae, to give alternative 'best fit' lines:

$$(a') \text{ SL} = \frac{5 S_1 + 2 S_2 - S_4}{6} \quad \text{or} \quad \frac{5 S_2 + 2 S_4 - S_8}{6}$$

$$(b') \text{ SH} = \frac{5 S_4 + 2 S_2 - S_1}{6} \quad \text{or} \quad \frac{5 S_8 + 2 S_4 - S_2}{6}$$

and similarly for UL and UH. The alternative best fit lines should be checked for parallelism as before. The fact that the result has been calculated from three levels should be noted on the final report.

When the lines are considered as being parallel, calculate the logarithm of the relative activity (log. A) by means of one of the following formulae.

For four levels

$$(c) \text{ log. A} = \frac{(U_1 + U_2 + U_4 + U_8 - S_1 - S_2 - S_4 - S_8) \times 0.602}{U_4 + U_8 + S_4 + S_8 - U_1 - U_2 - S_1 - S_2}$$

For three levels

$$(d) \log. A = \frac{(U_1 + U_2 + U_4 - S_1 - S_2 - S_4) \times 0.401}{U_4 + S_4 - U_1 - S_1}$$

or

$$(d') \log. A = \frac{(U_2 + U_4 + U_8 - S_2 - S_4 - S_8) \times 0.401}{U_8 + S_8 - U_2 - S_2}$$

Real activity = supposed activity $\times$ relative activity.

When the lines are considered as not being parallel, repeat the determination. If parallelism is still not achieved, calculate the logarithm of the relative activity ($\log. A$) by means of formula (c). The result obtained must however be considered as approximate and this should be noted in the final report.

9. REPEATABILITY

The difference between the results of two determinations carried out on the same sample by the same analyst should not exceed:

20 % related to the highest value for contents of zinc bacitracin from 5 and up to 25 mg/kg;

5 mg/kg, in absolute value, for contents greater than 25 and up to 50 mg/kg;

10 % related to the highest value for contents above 50 mg/kg.

2. DETERMINATION OF FLAVOPHOSPHOLIPOL BY DIFFUSION IN AN AGAR MEDIUM

1. PURPOSE AND SCOPE

The method is for the determination of flavophospholipol in feedingstuffs, concentrates and premixes. The lower limit of determination is 1 mg/kg (1 ppm).

2. PRINCIPLE

The sample is extracted with diluted methanol by heating under reflux. After centrifuging, the extract is purified (where necessary) by treatment with ion exchange resins and diluted. Its antibiotic activity is determined by measuring the diffusion of flavophospholipol in an agar medium inoculated with *Staphylococcus aureus*. Diffusion is shown by the formation of zones of inhibition of the micro-organism. The diameter of these zones is taken to be in direct proportion to the logarithm of the antibiotic concentration over the range of antibiotic concentrations employed.

3. MICRO-ORGANISM: STAPHYLOCOCCUS AUREUS ATCC 6538 P

3.1. Maintenance of stock culture

Inoculate *Staphylococcus aureus* onto agar slopes of culture medium (4.1). Incubate for 24 hours at 37 °C, store in a refrigerator at about 4 °C and reinoculate every month onto agar slopes.

3.2. Preparation of the bacterial suspension (a)

Set aside two tubes containing the stock culture (3.1) and reinoculate them weekly. Incubate for 24 hours at 37 °C and store in a refrigerator at about 4 °C.

24 hours before the assay, inoculate with this growth two to four tubes containing slopes of culture medium (4.1). Incubate for 16 to 18 hours at 37 °C. Make a suspension of the growth in the sodium chloride solution (4.3). The light transmission of the suspension must be about 40 %, measured at 578 nm in a 1 cm cell against sodium chloride solution (4.3).

(a) Other methods may be used provided that it has been established that they give similar bacterial suspensions.

4. CULTURE MEDIA AND REAGENTS

4.1. Culture medium (a)

Meat peptone	6.0 g
Tryptone	4.0 g
Yeast extract	3.0 g
Meat extract	1.5 g
Glucose	1.0 g
Agar	15.0 g
Water	1 000 ml
pH 6.5 (after sterilization)	

4.2. Assay medium

4.2.1. Base layer(b)

Meat peptone	6.0 g
Yeast extract	3.0 g
Meat extract	1.5 g
Agar	10.0 g
Water	1 000 ml
pH 6.5 (after sterilization)	

4.2.2. Seed layer

As for point 4.1, with the addition of 2.0 g of silicone anti-foaming emulsion (c).

4.3. Sodium chloride solution 0.4 % (w/v) : dissolve 4 g of sodium chloride a.p. in water and dilute to 1 000 ml; sterilize.

4.4. Methanol, pure.

4.5. Methanol 50 % (v/v): dilute 500 ml of methanol (4.4) with 500 ml of water.

4.6. Methanol 80 % (v/v): dilute 800 ml of methanol (4.4) with 200 ml of water.

4.7. Tris (hydroxymethyl) aminomethane a.p.

4.8. Potassium chloride methanolic solution 1.5 % (w/v): dissolve 1.5 g of potassium chloride a.p. in 20 ml of water, make up the volume to 100 ml with methanol (4.4).

4.9. Cation exchanger: Dowex 50 W×8, 20 to 50 mesh, Na form (cat. Serva No 41600) or equivalent.

4.10. Anion exchanger: Dowex 1×2, 50 to 100 mesh, Cl form (cat. Serva No 41010) or equivalent. Before use, keep for 12 to 14 hours in 80 % methanol (4.6).

4.11. Glass wool.

4.12. pH indicator paper (pH 6.6 to 8.1).

4.13. Ascorbic acid.

4.14. Standard substance: flavophospholipol of known activity.

5. APPARATUS

5.1. Glass tube for chromatography, internal diameter: 9 mm, length: 150 to 200 mm, fitted with a stopcock at the narrowed part of the lower end and a ground-glass joint (to connect with the dropping funnel (5.2)) at the upper end.

5.2. Dropping funnel 250 ml, fitted with a stopcock and a ground-glass joint.

5.3. 250 ml conical flask with ground-glass joint.

5.4. Reflux condenser with ground-glass joint.

6. STANDARD SOLUTIONS

Dissolve an accurately weighed quantity of the standard substance (4.14) in 50 % methanol (4.5) and dilute to give a stock solution containing 100 µg flavophospholipol per millilitre. Stored in stoppered flasks at 4 °C this solution is stable for up to two months.

(a) Any commercial culture medium of similar composition and giving the same results may be used, e.g. oxoid antibiotic medium 1 (CM 327) with an addition of oxoid agar No 3 (L 13).

(b) Any commercial culture medium of similar composition and giving the same results may be used, e.g. oxoid antibiotic medium 2 (CM 335) with an addition of oxoid agar No 3 (L 13).

(c) e.g. SE 2 from Wacker Chemie GmbH, Munich.

From this stock solution prepare by successive dilution with 50 % methanol (4.5) the following solutions:

S ₈	0.2	μg/ml
S ₄	0.1	μg/ml
S ₂	0.05	μg/ml
S ₁	0.025	μg/ml

7. PREPARATION OF THE EXTRACT

7.1. Extraction

7.1.1. Concentrates, premixes and mineral feeds

Weigh out a quantity of sample of 2.0 to 5.0 g and add about 150 mg of ascorbic acid (4.13). Homogenize with 150 ml of 50 % methanol (4.5) in a conical flask (5.3) and adjust the pH to 8.1 to 8.2 with about 400 mg of tris(hydroxymethyl)aminomethane (4.7). Check the pH with indicator paper (4.12). Allow to stand for 15 minutes, then readjust the pH to 8.1 to 8.2 with tris(hydroxymethyl)aminomethane (4.7) and boil for 10 minutes under reflux (5.4) with constant stirring. Allow to cool, centrifuge the mixture and decant the extract.

7.1.2. Other feeds

Weigh out a quantity of sample of 5.0 to 30.0 g containing at least 30 μg of flavophospholipol. Homogenize with 150 ml of 50 % methanol (4.5) in a conical flask (5.3) and adjust the pH to 8.1 to 8.2 with about 400 mg of tris(hydroxymethyl)aminomethane (4.7). Check the pH with indicator paper (4.12). Allow to stand for 15 minutes, then readjust the pH to 8.1 to 8.2 with tris(hydroxymethyl)aminomethane (4.7) and boil for 10 minutes under reflux (5.4) with constant stirring. Allow to cool, centrifuge the mixture and decant the extract.

7.2. Purification (this step may be omitted for concentrates, premixes and mineral feeds)

Mix 110 ml of the extract with 11 g of the cation exchanger (4.9), boil for one minute under reflux (5.4) with constant stirring. Separate the cation exchanger by centrifugation or filtration. Mix 100 ml of the extract with 150 ml of methanol (4.4) and store the solution for 12 to 15 hours at 4 °C. Filter off the flocculent mass while cold.

Insert a glass wool plug (4.11) at the bottom end of a glass tube (5.1), pour into the tube 5 ml of the anion exchanger (4.10) and wash the column with 100 ml of 80 % methanol (4.6). Using the funnel (5.2), transfer to the column a volume of filtrate of at least 100 ml which is expected to contain 16 μg of flavophospholipol (200 ml for a 30 g sample of feedingstuff at 1 ppm). Where necessary, before application to the column, dilute the filtrate with 80 % methanol (4.6) to obtain an expected flavophospholipol content of 16 μg/100 ml. Adjust the flow rate to about 2 ml/minute. Discard the effluent. Then wash the column with 50 ml of 80% methanol (4.6) and discard the effluent.

Elute the flavophospholipol with the methanolic solution of potassium chloride (4.8) keeping the flow rate to about 2 ml/minute. Collect 50 ml of the eluate in a graduated flask, add 30 ml of water and mix. This solution should have a flavophospholipol content of 0.2 μg/ml (= U₈).

7.3. Assay solutions

Where necessary (i.e. when the purification step has been omitted), dilute the extract obtained in point 7.1.1 with 50 % methanol (4.5) to obtain an expected flavophospholipol content of 0.2 μg/ml (= U₈).

From solution U₈ prepare solutions U₄ (expected content: 0.1 μg/ml), U₂ (expected content: 0.05 μg/ml) and U₁ (expected content: 0.025 μg/ml) by means of successive dilution (1+1) with 50 % methanol (4.5).

8. ASSAY PROCEDURE

8.1. Inoculation of the assay medium

Inoculate the assay medium (4.2.2) with the bacterial suspension (3.2) at about 50 °C. By preliminary trials on plates with assay medium (4.2.2) determine the quantity of bacterial suspension required to give the largest and clearest zones of inhibition with the various concentrations of flavophospholipol (about 30 ml/litre).

8.2. Preparation of the plates

Diffusion through agar is carried out in plates with the four concentrations of the standard solution (S₈, S₄, S₂, S₁) and the four concentrations of the assay solution (U₈, U₄, U₂, U₁). These four concentrations of extract and standard must necessarily be placed in each plate. To this

effect, select plates big enough to allow at least eight holes with a diameter of 10 to 13 mm and not less than 30 mm between centres to be made in the agar medium. The test may be carried out on plates consisting of a sheet of glass with a faced aluminium or plastic ring placed on top, 200 mm in diameter and 20 mm high.

Pour into the plates a quantity of the medium (4.2.1) to give a layer about 1.5 mm thick (45 ml for a plate of 200 mm diameter). Allow to set in a level position and then over-layer with a quantity of the medium (4.2.2) inoculated as in point 8.1 to give a layer 1 mm thick (30 ml for a plate of 200 mm diameter). Allow to set again in a level position, bore the holes and place in them exactly measured volumes of assay and standard solutions (between 0.10 and 0.15 ml per hole, according to the diameter).

Apply each concentration at least four times so that each determination is subject to an evaluation of 32 zones of inhibition.

8.3. Incubation

Incubate the plates for 16 to 18 hours at 28 to 30 °C.

9. EVALUATION

Measure the diameter of the zones of inhibition to the nearest 0.1 mm. Record the mean measurements for each concentration on semi-logarithmic graph paper showing the logarithm of the concentrations in relation to the diameters of the zones of inhibition. Plot the best fit lines of both the standard solution and the extract, for example as below.

Determine the 'best fit' point for the standard lowest level (SL) using the formula:

$$(a) SL = \frac{7 S_1 + 4 S_2 + S_4 - 2 S_8}{10}$$

$$(b) SH = \frac{7 S_8 + 4 S_4 + S_2 - 2 S_1}{10}$$

Similarly calculate the 'best fit' points for the extract lowest level (UL) and the extract highest level (UH) by substituting U_1 , U_2 , U_4 and U_8 for S_1 , S_2 , S_4 and S_8 in the above formulae.

Record the calculated SL and SH values on the same graph paper and join them to give the 'best fit' line for the standard solution. Similarly record UL and UH and join them to give the 'best fit' line for the extract.

In the absence of any interference the lines should be parallel. For practical purposes the lines can be considered parallel if the values (SH-SL) and (UH-UL) do not differ by more than 10 % from their mean value.

If the lines are found to be non-parallel, either U_1 and S_1 or U_8 and S_8 may be discarded and SL, SH, UL and UH calculated, using the alternative formulae, to give alternative 'best fit' lines:

$$(a') SL = \frac{5 S_1 + 2 S_2 - S_4}{6} \quad \text{or} \quad \frac{5 S_2 + 2 S_4 - S_8}{6}$$

$$(b') SH = \frac{5 S_4 + 2 S_2 - S_1}{6} \quad \text{or} \quad \frac{5 S_8 + 2 S_4 - S_2}{6}$$

and similarly for UL and UH. The alternative best fit lines should be checked for parallelism as before. The fact that the result has been calculated from three levels should be noted on the final report.

When the lines are considered as being parallel, calculate the logarithm of the relative activity (log. A) by means of one of the following formulae.

For four levels

$$(c) \log. A = \frac{(U_1 + U_2 + U_4 + U_8 - S_1 - S_2 - S_4 - S_8) \times 0.602}{U_4 + U_8 + S_4 + S_8 - U_1 - U_2 - S_1 - S_2}$$

For three levels

$$(d) \log. A = \frac{(U_1 + U_2 + U_4 - S_1 - S_2 - S_4) \times 0.401}{U_4 + S_4 - U_1 - S_1}$$

or

$$(d') \log. A = \frac{(U_2 + U_4 + U_8 - S_2 - S_4 - S_8) \times 0.401}{U_8 + S_8 - U_2 - S_2}$$

Real activity = supposed activity $\times$ relative activity.

When the lines are considered as not being parallel, repeat the determination. If parallelism is still not achieved, calculate the logarithm of the relative activity (log. A) by means of formula (c). The result obtained must however be considered as approximate and this should be noted in the final report.

10. REPEATABILITY

The difference between the results of two determinations carried out on the same sample by the same analyst should not exceed:

- 0.5 mg/kg, in absolute value, for contents of flavophospholipol from 1 and up to 2 mg/kg;
- 25 % related to the highest value for contents greater than 2 and up to 10 mg/kg;
- 20 % related to the highest value for contents greater than 10 and up to 25 mg/kg;
- 5 mg/kg, in absolute value, for contents greater than 25 and up to 50 mg/kg;
- 10 % related to the highest value for contents above 50 mg/kg.

3. DETERMINATION OF THE TRACE ELEMENTS IRON, COOPER, MANGANESE AND ZINC

1. PURPOSE AND SCOPE

The method makes it possible to determine the trace elements iron, copper, manganese and zinc in feedingstuffs. The lower limits of determination are:

iron (Fe): 20 mg/kg
copper (Cu): 10 mg/kg
manganese (Mn): 20 mg/kg
zinc (Zn): 20 mg/kg

2. PRINCIPLE

The sample is brought into solution in hydrochloric acid after destruction of organic matter, if any. The elements iron, copper, manganese and zinc are determined, after appropriate dilution, by atomic absorption spectrometry.

3. REAGENTS

Introductory comments

For preparation of the reagents and analytical solutions use water free from the cations to be determined, obtained either by double distilling water in a borosilicate glass or quartz still or by double treatment on ion exchange resin.

The reagents must be of at least analytical grade (a.p.). Freedom from the element to be determined must be checked in a blank experiment. If necessary, the reagents must be further purified.

In place of the standard solutions described below, commercial standard solutions may be used provided that they are guaranteed and have been checked before use.

- 3.1. Hydrochloric acid a.p. (d : 1.19).
- 3.2. Hydrochloric acid a.p. (6 N).
- 3.3. Hydrochloric acid a.p. (0.5 N).

- 3.4. Hydrofluoric acid 38 to 40 % (v/v) having an iron content of less than 1 mg Fe/litre and a residue after evaporation of less than 10 mg (as sulphate)/litre.
- 3.5. Sulphuric acid a.p. (d : 1.84).
- 3.6. Hydrogen peroxide a.p. (approximately 100 volumes of oxygen (30 % by weight)).
- 3.7. Standard iron solution (1 000 μg Fe/ml) prepared as follows: dissolve 1 g of iron wire a.p. in 200 ml of 6 N hydrochloric acid (3.2), add 16 ml of hydrogen peroxide (3.6) and make up to one litre with water.
 - 3.7.1. Working standard iron solution (100 μg Fe/ml) prepared by diluting the standard solution (3.7) 1 + 9 with water.
- 3.8. Standard copper solution (1 000 μg Cu/ml) prepared as follows: dissolve 1 g of copper in powder form (a.p.) in 25 ml of 6 N hydrochloric acid (3.2), add 5 ml of hydrogen peroxide (3.6) and make up to one litre with water.
 - 3.8.1. Working standard copper solution (10 μg Cu/ml) prepared by diluting the standard solution (3.8) 1 + 9 with water and then diluting the resulting solution 1 + 9 with water.
- 3.9. Standard manganese solution (1 000 μg Mn/ml) prepared as follows: dissolve 1 g of manganese in powder form (a.p.) in 25 ml of 6 N hydrochloric acid (3.2) and make up to one litre with water.
 - 3.9.1. Working standard manganese solution (10 μg Mn/ml) prepared by diluting the standard solution (3.9) 1 + 9 with water and then diluting the resulting solution 1 + 9 with water.
- 3.10. Standard zinc solution (1 000 μg Zn/ml) prepared as follows: dissolve 1 g of zinc in strip or leaf form (a.p.) in 25 ml of 6 N hydrochloric acid (3.2) and make up to one litre with water.
 - 3.10.1. Working standard zinc solution (10 μg Zn/ml) prepared by diluting the standard solution (3.10) 1 + 9 with water and then diluting the resulting solution 1 + 9 with water.
- 3.11. Lanthanum chloride solution prepared as follows: dissolve 12 g of lanthanum oxide in 150 ml of water, add 100 ml of 6 N hydrochloric acid (3.2) and make up to one litre with water.

4. APPARATUS

- 4.1. Muffle furnace with temperature regulation and recorder.
- 4.2. Glassware must be of resistant borosilicate type and it is recommended to use apparatus which is reserved exclusively for trace element determinations.
- 4.3. Platinum crucible and (optional) quartz crucible.
- 4.4. Atomic absorption spectrophotometer meeting the requirements of the method with regard to sensitivity and precision in the required range.

5. PROCEDURE

5.1. Samples containing organic matter

5.1.1. Ashing and preparation of the solution for analysis (*)

- (i) Place 5 to 10 g of sample weighed to the nearest 0.2 mg in a quartz or platinum crucible (4.3) (see Note (b)), dry in an oven at 105 °C and introduce the crucible into the cold muffle furnace (4.1). Close the furnace (see Note (c)) and gradually raise the temperature to 450 to 475 °C over about 90 minutes. Maintain this temperature for 4 to 16 hours (e.g. overnight) to remove carbonaceous material and then open the furnace and allow to cool (see Note (d)).

Wash the crucible out with a total of about 5 ml of hydrochloric acid (3.1) and add the latter slowly and carefully to the beaker (there may be a vigorous reaction due to CO_2

(*) Green fodder (fresh or dried) is liable to contain large amounts of vegetable silica, which may retain trace elements and must be removed. For samples of these feedingstuffs, therefore, the following modified procedure must be followed.

Carry out operation 5.1.1 (i) as far as the filtration. Wash the filter paper containing the insoluble residue twice with boiling water and place it in a platinum crucible (4.3). Ignite in the muffle furnace (4.1) at a temperature below 550 °C until all carbonaceous material has completely disappeared. Allow to cool, add a few drops of water followed by 10 to 15 ml of hydrofluoric acid (3.4) and evaporate to dryness at about 150 °C. If any silica remains in the residue, redissolve it in a few millilitres of hydrofluoric acid (3.4) and evaporate to dryness. Add five drops of sulphuric acid (3.5) and heat until no more white fumes are given off. After the addition of 5 ml of 6 N hydrochloric acid (3.2) and about 30 ml of water, heat, filter the solution into the 250 ml volumetric flask and make up to the mark with water (HCl concentration about 0.5 N). Proceed then with the determination from point 5.1.3.

formation). Add hydrochloric acid (3.1) dropwise with agitation until all effervescence has stopped. Evaporate to dryness, occasionally stirring with a glass rod.

Next add 15 ml of 6 N hydrochloric acid (3.2) to the residue followed by about 120 ml of water. Stir with the glass rod, which should be left in the beaker, and cover the beaker with a watchglass. Bring gently to the boil and maintain at boiling point until no more ash can be seen to dissolve. Filter on ash-free filter paper and collect the filtrate in a 250 ml volumetric flask. Wash the beaker and filter with 5 ml of hot 6 N hydrochloric acid (3.2) and twice with boiling water. Fill the volumetric flask up to the mark with water (HCl concentration about 0.5 N).

- (ii) If the residue in the filter appears black (carbon), put it back in the furnace and ash again at 450 to 475 °C. This ashing, which only requires a few hours (about three to five hours), is complete when the ash appears white or nearly white. Dissolve the residue with about 2 ml of hydrochloric acid (3.1), evaporate to dryness and add 5 ml of 6 N hydrochloric acid (3.2). Heat, filter the solution into the volumetric flask and make up to the mark with water (HCl concentration about 0.5 N).

Notes:

- (a) In determining trace elements it is important to be alert to the risks of contamination, particularly by zinc, copper and iron. For this reason, the equipment used in preparing the samples must be free of these metals.

To reduce the general risk of contamination, work in a dust-free atmosphere with scrupulously clean equipment and carefully washed glassware. The determination of zinc is particularly sensitive to many types of contamination, e.g. from glassware, reagents, dust, etc.
- (b) The weight of sample to be ashed is calculated from the approximate trace element content of the feedingstuff in relation to the sensitivity of the spectrophotometer used. For certain feedingstuffs low in trace elements it may be necessary to start with a 10 to 20 g sample and make up the final solution to only 100 ml.
- (c) Ashing must be carried out in a closed furnace without injection of air or oxygen.
- (d) The temperature indicated by the pyrometer must not exceed 475 °C.

5.1.2. Spectrophotometric determination

5.1.2.1. Preparation of calibration solutions

For each of the elements to be determined, prepare from the working standard solutions given in points 3.7.1, 3.8.1, 3.9.1 and 3.10.1 a range of calibration solutions, each calibration solution having an HCl concentration of about 0.5 N and (in the cases of iron, manganese and zinc) a lanthanum chloride concentration equivalent to 0.1 % La (w/v). The trace element concentrations selected must lie within the range of sensitivity of the spectrophotometer used. The tables below show, by way of example, the compositions of typical ranges of calibration solutions; depending, however, on the type and sensitivity of spectrophotometer used it may be necessary to select other concentrations.

Iron

$\mu\text{g Fe/ml}$	0	0.5	1	2	3	4	5
ml working standard solution (3.7.1) (1 ml = 100 $\mu\text{g Fe}$) + ml 6 N HCl (3.2)	0 7	0.5 7	1 7	2 7	3 7	4 7	5 7

+ 10 ml of lanthanum chloride solution (3.11) and make up to 100 ml with water.

Copper

$\mu\text{g Cu/ml}$	0	0.1	0.2	0.4	0.6	0.8	0.1
ml working standard solution (3.8.1) (1 ml = 10 $\mu\text{g Cu}$) + ml 6 N HCl (3.2)	0 8	1 8	2 8	4 8	6 8	8 8	10 8

Make up to 100 ml with water.

Manganese

$\mu\text{g Mn/ml}$	0	0.1	0.2	0.4	0.6	0.8	1.0
ml working standard solution (3.9.1) (1 ml = 10 $\mu\text{g Mn}$) + ml 6 N HCl (3.2)	0 7	1 7	2 7	4 7	6 7	8 7	10 7
+ 10 ml lanthanum chloride solution (3.11) and make up to 100 ml with water.							

Zinc

$\mu\text{g Zn/ml}$	0	0.05	0.1	0.2	0.4	0.6	0.8
ml working standard solution (3.10.1) (1 ml = 10 $\mu\text{g Zn}$) + ml 6 N HCl (3.2)	0 7	0.5 7	1 7	2 7	4 7	6 7	8 7
+ 10 ml of lanthanum chloride solution (3.11) and make up to 100 ml with water.							

5.1.2.2. Preparation of solution for analysis

For the determination of copper, the solution prepared from point 5.1.1 can normally be used directly. If necessary to bring its concentration within the range of the calibration solutions, an aliquot portion may be pipetted into a 100 ml volumetric flask and made up to the mark with 0.5 N hydrochloric acid (3.3).

For the determination of iron, manganese and zinc, pipette an aliquot portion of the solution prepared from point 5.1.1 into a 100 ml volumetric flask, add 10 ml of lanthanum chloride solution (3.11) and make up to the mark with 0.5 N hydrochloric acid (3.3) (see also point 8 'Observation').

5.1.2.3. Blank experiment

The blank experiment must include all the prescribed steps of the procedure except that the sample material is omitted.

The calibration solution '0' must not be used as the blank.

5.1.2.4. Measurement of the atomic absorption

Measure the atomic absorption of the calibration solutions and of the solution to be analyzed using an oxidizing air-acetylene flame at the following wavelengths:

Fe : 248.3 nm

Cu : 324.8 nm

Mn : 279.5 nm

Zn : 213.8 nm

Carry out each measurement four times.

5.2. Mineral feedingstuffs

If the sample contains no organic matter, prior ashing is unnecessary. Proceed as described in point 5.1.1 (i) starting from the second paragraph. Evaporation with hydrofluoric acid may be omitted.

6. CALCULATION OF RESULTS

Using a calibration curve, calculate the trace element concentration in the solution to be analyzed and express the result in milligrams of trace element per kilogram of sample (ppm).

7. REPEATABILITY

The difference between the results of two parallel determinations carried out on the same sample by the same analyst should not exceed:

— 5 mg/kg, in absolute value, for contents of the trace element concerned up to 50 mg/kg;

- 10 % of the higher result for contents of the trace element concerned from 50 and up to 100 mg/kg;
- 10 mg/kg, in absolute value, for contents of the trace element concerned from 100 and up to 200 mg/kg;
- 5 % of the higher result for contents of the trace element concerned above 200 mg/kg.

8. OBSERVATION

The presence of large quantities of phosphates may interfere with the determination of iron, manganese and zinc. Such interference must be corrected by addition of lanthanum chloride solution (3.11). If, however, in the sample the weight ratio $\frac{\text{Ca} + \text{Mg}}{\text{P}}$ is 2, addition of lanthanum chloride solution (3.11) to the solution for analysis and to the calibration solutions may be omitted.
