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COMMISSION OF THE EUROPEAN COMMUNITIES

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Brussels, 9 January 1974

PROPOSAL FOR A

COUNCIL DIRECTIVE CONCERNING THE APPROXIMATION OF THE LAWS OF THE MEMBER STATES RELATING TO REFLEX REFLECTING DEVICES FOR MOTOR VEHICLES AND THEIR TRAILERS

(submitted to the Council by the Commission)

EXPLANATORY MEMORANDUM

This proposed Directive is to form part of the Community type-approval procedure referred to in Council Directive 70/156/EEC of 6 February 1970 (1).

This proposal concerns only technical requirements for the construction and testing of reflex reflecting devices for motor vehicles and their trailers, as technical requirements for their installation are included in another proposal concerning the installation of lighting and light signalling devices (2).

In drafting its proposal, the Commission based itself on the work (3) accomplished in this field by the Economic Commission for Europe, in Geneva; as far as trade is concerned, this is bound to offer an additional advantage as a very large number of states are represented in the ECE.

Articles 1 - 6 institute the EEC type-approval procedure for reflex reflecting devices. By means of this procedure the Directive tends to permit free movement of reflex reflecting devices within the Community by prohibiting the Member States from opposing their marketing, provided they satisfy the construction and testing requirements laid down in the Annexes and bear the EEC type-approval mark, a diagram of which appears in Annex III. This procedure includes a system of reciprocal notification of any grant, refusal , withdrawal or extension of type approval.

Article 7 incorporates the present Directive in the EEC type-approval procedure.

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(1) O.J. No. L 42, 23 February 1970.

(2) COM (73)2024

(3) Regulation No. 3 "Uniform provisions for the approval of reflex reflecting devices for motor vehicles" (Doc. E/ECE/324/E/ECE/TRANS/505/Add.2.)

Since certain Member States do not operate a type-approval system it is necessary to insert some provisions in order to ensure that vehicles complying with the requirements set out in the Directive can be used in these states. (Article 8) (1)

The directive is applicable to motor vehicles with at least four wheels and a maximum design speed exceeding 25 km/h (Article 9).

Article 10 contains the procedure for adapting directive to technical progress. This procedure is set out in Article 13 of the Council Directive of 6 February 1970 relating to the type-approval of motor vehicles and trailers.

Article 11 contains two deadlines: before expiry of the first deadline the Member States shalladopt and publish the measures necessary in order to comply with the Directive. The second deadline sets the date on which all of the Member States must simultaneously implement the common rules(Article 11(1)).

Finally, the Commission must be informed in good time of all draft provisions drawn up by the Member States in the field referred to in the Directive in order to enable it to comment thereon (Article 11 (2)).

CONSULTATION OF THE EUROPEAN PARLIAMENT AND ECONOMIC AND SOCIAL COMMITTEE

Pursuant to the Rome Treaty, Article 100 (2), the opinion of these two institutions is required.

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(1) OJ No. L 73, 27 March 1972 "Documents concerning the accession to the European Communities of the Kingdom of Denmark, Ireland, and the United Kingdom of Great Britain and Northern I
Act concerning the conditions of accession and adjustments to the Treaties - Annex I, title X.

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,
Having regard to the Opinion of the Economic and Social Committee,

Whereas the technical requirements which motor vehicles must satisfy pursuant to national laws relate inter alia, to their reflex reflecting devices,

Whereas those requirements differ from one Member State to another; whereas it is therefore necessary that all Member States adopt the same requirements either in addition to or in place of their existing requirements, in order, in particular, to allow the EEC type-approval procedure which was the subject of the 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) to be applied in respect of each type of vehicle;

Whereas the common requirements for the installation of lighting and light signalling devices on motor vehicles and trailers were laid down by the Council Directive of ..... (2);
whereas common requirements for the construction of other lighting and light signalling devices will be laid down at a later date;

Whereas a harmonized type-approval procedure for reflex reflectory devices makes it possible for each Member State to check compliance with the common construction and testing requirements and to inform the other Member States of its findings by sending a copy of the type-approval certificate completed for each type of reflex reflecting device; whereas the placing of an EEC type-approval mark on all reflex reflecting devices manufactured in conformity with the approved type obviates any need for technical checks on these reflex reflecting devices in the other Member States;

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(1) O.J. No. L 42, 23 February 1970, p.1.

(2) COM(73)2024

Whereas it is desirable to follow the technical requirements adopted by the U.N. Economic Commission for Europe in its Regulation No. 3 ("Uniform provisions for the approval of reflex reflecting devices for motor vehicles") (1) which is annexed to the agreement of 20 March 1958 concerning the adoption of uniform conditions for approval and reciprocal recognition of approval for motor vehicle equipment and parts;

Whereas the approximation of national laws relating to motor vehicles includes reciprocal recognition by Member States of the tests carried out by them individually on the basis of the common requirements; whereas if the system is to function properly these requirements must be applied by all Member States from the same date;

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(1) Economic Commision for Europe document E/ECE/324) Add.2
E/ECE/TRANS/505)

HAS ADOPTED THIS DIRECTIVE:

Article 1

1. Each Member State shall approve any type of reflex reflecting devices which satisfies the construction and testing requirements laid down in Annexes 0, I, V, VI, VII, VIII, IX, X, XI and XII.

2. The Member State which has granted type approval shall take the measures required in order to verify, in so far as is necessary and if need be in co-operation with the competent authorities in the other Member States, that production models conform to the approved type. Such verification shall be limited to spot checks.

Article 2

Member States shall issue to the manufacturer, or to his authorized representative, an EEC type-approval mark which shall conform to the model shown in Annex III, for each type of reflex reflecting device which they approve pursuant to Article 1.

Member States shall take all appropriate measures to prevent the use of marks liable to create confusion between reflex reflecting devices which have been type-approved pursuant to Article 1 and other reflex reflecting devices.

Article 3

1. No Member State may prohibit the placing on the market of reflex reflecting devices on grounds relating to their construction or method of functioning if they bear the EEC type-approval mark.

2. Nevertheless, a Member State may prohibit the placing on the market of reflex reflecting devices bearing the EEC type-approval mark, which, by their design, do not conform to the approved prototype.

That State shall inform the other Member States and the Commission forthwith of the measures taken, specifying the reasons for its decision.

Article 4

The competent authorities of each Member State shall within one month send to the competent authorities of the other Member States a copy of the type approval certificates and of an extension of a type approval completed for each type of a reflex reflecting device which they approve or refuse to approve.

Article 5

1. If the Member State which has granted EEC type-approval finds that a number of reflex reflecting devices bearing the same type-approval mark do not conform to the type which it has approved, it shall take the necessary measures to ensure that production models conform to the approved type.
The competent authorities of that State shall advise those of the other Member States of the measures taken which may, where necessary, extend to withdrawal of EEC type-approval. The said authorities shall take the same measures if they are informed by the competent authorities of another Member State of such failure to conform.

2. The competent authorities of Member States shall inform each other within one month of any withdrawal of EEC type-approval, and of the reasons for such measure.

.../...

Article 6

All decisions taken pursuant to the provisions adopted in implementation of this Directive which refuse or withdraw type-approval for a reflex reflecting device or prohibit its use shall set out in detail the reasons on which they are based. A decision shall be notified to the party concerned, who shall at the same time be informed of the remedies available to him under the laws in force in the Member States and of the time limits allowed for the exercise of such remedies.

Article 7

No Member State may refuse to grant EEC type-approval or national type-approval of a vehicle on grounds relating to its reflex reflecting devices if these bear the EEC type-approval mark and are fitted in accordance with the requirements laid down in the Council Directive of .....(1) on the approximation of the laws of the Member States concerning the installation of lighting and light signalling devices on motor vehicles and trailers.

Article 8

No Member State may refuse or prohibit the sale or registration, entry into service or use of a vehicle on grounds relating to its reflex reflecting devices if these bear the EEC type-approval mark and are fitted in accordance with the requirements laid down in the Council Directive of ..... (1) on the approximation of the laws of the Member States concerning the installation of lighting and light signalling devices on motor vehicles and trailers.

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(1) COM(73)2024

.../...

Article 9

For the purposes of this Directive, "vehicle" means any motor vehicle intended for use on the road, with or without bodywork, having at least four wheels and a maximum design speed exceeding 25 km/h, and its trailers, with the exception of vehicles which run on rails, agricultural tractors and machinery and public works vehicles.

Article 10

The amendments necessary for adjusting the requirements of Annexes O-XII as well as Articles 7 and 8 so as to take account of the technical progress shall be adopted in accordance with the procedure laid down in Article 13 of the Council Directive (70/156/EEC) of 6 February 1970 on the approximation of the laws of Member States relating to the type-approval of motor vehicles and their trailers.

Article 11

1. The Member States shall adopt and publish the provisions needed in order to comply with this Directive before 1 January 1975 and shall forthwith inform the Commission thereof.
   They shall apply these provisions from 1 October 1975.

2. As soon as this Directive has been notified, the Member States shall inform the Commission, in sufficient time to enable it to submit its comments, of any draft laws, regulations or administrative provisions which they intend to adopt in the field covered by the Directive.

Article 12

This Directive is addressed to the Member States.

LIST OF ANNEXES (*)

(*) The text of the annexes is similar to that of Regulation No 3 of the Economic Commission for Europe; in particular the breakdown into items is the same; for this reason, when an item of Regulation No. 3 has no counterpart in this directive, its number is given in brackets as a token entry.

ANNEX 0

DEFINITIONS, APPLICATION FOR EEC TYPE-APPROVAL AND EEC TYPE-APPROVAL, MARKINGS, CONFORMITY IN MANUFACTURE, GENERAL SPECIFICATIONS, SPECIAL SPECIFICATIONS

(1).

2. DEFINITIONS

2.1. The definitions of the technical terms used in this annex are given in annex I.

2.2. A type of reflex reflecting device is defined by the models and descriptive literature submitted with the application for EEC type-approval. Reflex reflecting devices can be considered as belonging to a type if they have one or more "reflex reflecting optical units" which are identical with those of the standard model of that type, and if their other parts differ from those of the standard model only in ways not affecting the properties to which this annex applies.

2.3. Reflex reflecting devices are divided into two classes according to their photometric characteristics: CLASS I and CLASS III.(*)

3. APPLICATION FOR EEC TYPE-APPROVAL AND EEC TYPE-APPROVAL

(3.1.)

3.2. The application for EEC type-approval shall be submitted by the holder of the trade name or mark, or if necessary by his authorised representative, and shall be accompanied by:

a) i) drawings (three copies) in sufficient detail to permit identification of the type, showing geometrically the position in which the reflex reflecting device is to be fitted to the vehicle; and

ii) brief technical specifications of the materials of which the reflex reflecting optical unit is made;

b) Samples of the reflex reflecting device in red; the number of samples to be submitted is specified in annex V;

c) If necessary, two samples in amber and/or clear material for simultaneous or subsequent extension of the EEC type-approval to amber and/or clear devices.

(*) See following item 4.2.c.

(3.3)

3.4. When a reflex reflecting device has been type-approved after tests on a red sample it shall, by extension, also be approved as an amber and/or clear reflex reflecting device if two amber and/or clear samples are submitted and satisfy the colorimetric requirements (annex VII), in which case the other tests shall not be required. The same type-approval number shall apply.

3.5. As soon as an EEC type-approval or the extension for an EEC type-approval has been granted, the competent authorities shall notify the competent authorities of all the other Member States, by means of a certificate of which the model is shown in Annex II. The certificate shall be accompanied by a drawing, if possible actual sized, supplied by the person to whom the type-approval has been granted, in a format not longer than A4 (210x 297 mm).

4. MARKINGS

4.1. Reflex reflecting devices submitted for EEC type-approval must bear:

a) the trade name or mark

b) the word or words "TOP" inscribed horizontally on the highest part of the illuminating surface, if such an indication is necessary to determine without ambiguity the position recommended by the manufacturer.

In addition, a space of sufficient size for the EEC type-approval mark should be provided and shown in the drawings submitted with the application.

4.2. Every reflex reflecting device conforming to a type approved by the competent authority of a Member State shall, in addition to the markings referred to in item 4.1 above, bear the EEC type-approval mark in accordance with Annex III consisting of:

a) a rectangle, within which shall be placed the letter "e" followed by the distinguishing number or letter of the country which has granted the EEC type-approval (1 for Germany, 2 for France, 3 for Italy, 4 for the Netherlands, 6 for Belgium, 11 for the United Kingdom, 13 for Luxembourg, DK for Denmark, and IRL for Ireland)

b) an EEC type-approval number;

c) a roman numeral: I or III, showing the class in which the reflex reflecting device was placed when approved.

4.3. An EEC type-approval mark allocated in accordance with item 4.2 above to a particular type of reflex reflecting device shall not be allocated to any other type, except in the case of extension of the type-approval to amber and/or to clear reflecting devices.

4.3.(a) Where EEC type-approval is requested for a type of lighting and light signalling device comprising a reflex reflecting device and other lights and lamps, a single EEC type-approval mark shall be issued provided that the reflex reflecting device complies with the requirements of the present Directive and that each of the other lights and lamps forming part of the type of lighting and light signalling device for which EEC type-approval is requested complies with the specific Directive applying to it.

4.3.(b). The following provisions shall apply where a single EEC type-approval number is issued, as under Item 4.3. (a) above, for a type of lighting and light signalling device comprising a reflex reflecting device and other lights or lamps:

4.3.(b).1. in the case where, according to the specific Directive applying to it, a component must be marked with an arrow, the arrow and the category code, whether made up of numbers or not, shall appear along a clearly visible horizontal line in the right-hand part of a box, to the left-hand side of which the rectangle containing the letter "e" is located, followed by the distinguishing number or letter of the Member State which granted the EEC type-approval;

4.3.(b).2. the dimensions of the various components of this mark must not fall below the minimum dimensions specified for individual markings.

4.4. The markings must be placed on the illuminating surface, or one of the illuminating surfaces, of the reflex reflecting device and must be visible from the outside when the device is fitted on the vehicle. The markings must be clearly legible and indelible.

5. CONFORMITY IN MANUFACTURE

5.1. Every device bearing an EEC type-approval mark must conform to the type approved under that mark. The competent authority issuing the EEC type-approval mark shall retain two samples which together with the EEC type-approval certificate shall serve to establish whether reflex reflecting devices put on the market with the EEC type-approval mark satisfy this condition.

5.2. As soon as EEC type-approval of a particular type of reflex reflecting device is withdrawn, the competent authority shall notify the competent authorities of all the other Member States, by means of a type-approval certificate of which the model is shown in annex II.

(5.3.)

6. GENERAL SPECIFICATIONS

6.1. Reflex reflecting devices must be so constructed that they function satisfactorily and will continue to do so in normal use. In addition, they must not have any defect in design or manufacture which is detrimental to their efficient operation or maintenance in good condition.

6.2. The components of reflex reflecting devices must not be capable of being easily dismantled.

6.3. The optical units of reflex reflecting devices may not be replaceable.

6.4. The outer surface of reflex reflecting devices must be easy to clean. Hence it must not be a rough surface. It shall, however, have protuberances, provided cleaning remains easy.

7. SPECIAL SPECIFICATIONS (TESTS)

7.1. Reflex reflecting devices must also satisfy the conditions as to dimensions and shape, and the colorimetric, photometric, physical and mechanical requirements set forth in annexes VI, VII, VIII, IX, X, XI and XII.

7.2. Depending on the nature of the materials of which the reflex reflecting devices and, in particular, their optical units, are made the competent authorities shall authorize the laboratories to omit certain unnecessary tests, subject to the express reservation that such omission must be mentioned under "Remarks" on the EEC type-approval certificate.

ANNEX I

TERMINOLOGY RELATING TO REFLEX REFLECTING DEVICES

(See also appendixes 1 and 2 to this Annex)

I.1. REFLEX REFLECTION

Reflection in which light is reflected in directions close to the direction from which it came. This property is maintained over wide variations of the illumination angle.

I.2. REFLEX REFLECTING OPTICAL UNIT

Combination of optical components producing reflex reflection.

I.3. REFLEX REFLECTING DEVICE

Assembly ready for use and comprising one or more reflex reflecting optical units.

I.4. ILLUMINATING SURFACE

The illuminating surface of a reflex reflecting device is the total visible surface of the reflex reflecting optical units which appears continuous at the normal observation distances.

I.5. AXIS OF REFERENCE

An axis to be defined by the manufacturer of the reflex reflecting device, which serves as reference line for the illumination angles in photometric measurements and in practical use. The axis of reference usually corresponds to the axis of symmetry, if any, of the illuminating surface.

I.6. CENTRE OF REFERENCE

Orthogonal projection of the centre of gravity of the illuminating surface on the plane nearest to the observer which is tangential to that surface and perpendicular to the axis of reference of the reflex reflecting device.

I.7. ANGLE OF DIVERGENCE

Angle between the straight lines connecting the centre of reference to the centre of the receiver and to the centre of the source of illumination.

I.8 ILLUMINATION ANGLE

Angle between the axis of reference and the straight line connecting the centre of reference to the centre of the source of illumination.

I.9. ANGLE OF ROTATION

Angle through which the reflex reflecting device is rotated about its axis of reference starting from one given position.

I.10. ANGULAR DIAMETER OF THE REFLEX REFLECTING DEVICE

Angle subtended by the greatest dimension of the visible area of the illuminating surface, either at the centre of the source of illumination or at the centre of the receiver.

I.11. ILLUMINATION OF THE REFLEX REFLECTING DEVICE

Abbreviated expression used conventionally to designate the illumination measured in a plane perpendicular to the incident rays and passing through the centre of reference.

I.12. COEFFICIENT OF LUMINOUS INTENSITY (CIL)

Quotient of the luminous intensity reflected in the direction considered, divided by the illumination of the reflex reflecting device for given angles of illumination, divergence and rotation.

ANNEX I - APPENDIX 1

REFLEX REFLECTING DEVICE

Symbols and units

A = Area of the illuminating surface of the reflex reflecting device (cm^2)

C = Centre of reference

NC = Axis of reference

Rr = Receiver, observer or measuring device

Cr = Centre of receiver

ϕr = Diameter of receiver Rr if circular (cm)

Se = Source of illumination

Cs = Centre of source of illumination

ϕs = Diameter of source of illumination (cm)

De = Distance from centre Cs to centre C (m)

D'e = Distance from centre Cr to centre C (m)

Note: De and D'e are generally very nearly the same and under normal conditions of observation it shall be assumed that De = D'e.

D = Observation distance from and beyond which the illuminating surface appears to be continuous

α = Angle of divergence

β = Illumination angle. With respect to the line CsC which is always considered to be horizontal, this angle is prefixed with signs - (left), + (right), + (up) or - (down), according to the position of the source Se in relation to the axis NC, as seen when looking towards the reflex reflecting device. For any direction defined by two angles, vertical and horizontal, the vertical angle is always given first.

γ = Angular diameter of the measuring device Rr as seen from point C

δ = Angular diameter of the source Se as seen from point C

ε = Angle of rotation. This angle is positive when the rotation is clockwise as seen when looking towards the illuminating surface. If the reflex reflecting device is marked "TOP", the position thus indicated is taken as the origin.

E = Illumination of the reflex reflecting device (lux)

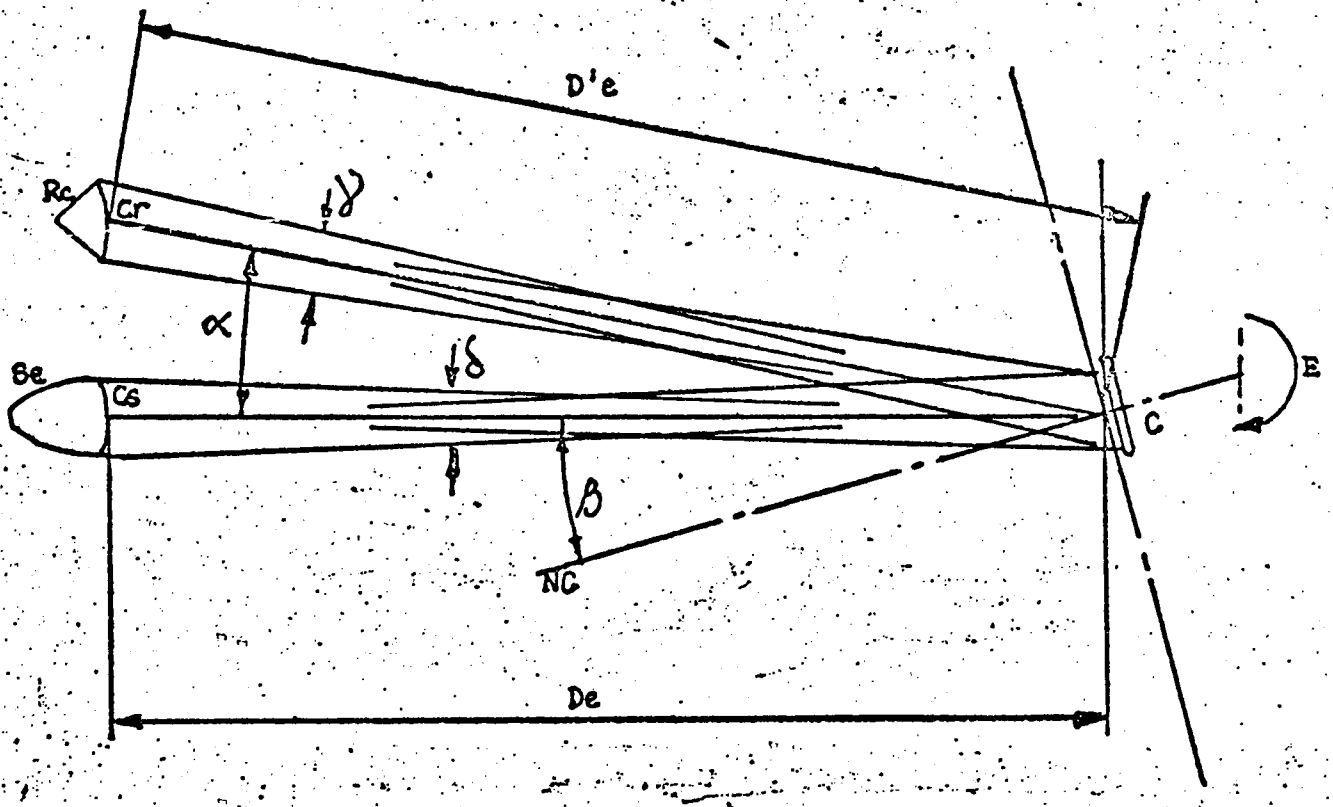
CIL = Coefficient of luminous intensity (millicandelas/lux)

Angles are expressed in degrees and minutes.

ANNEX I - APPENDIX 2

REFLEX REFLECTORS

SYMBOLS



ELEVATION

ANNEX II

MODEL FOR AN EEC TYPE-APPROVAL CERTIFICATE

(Max. format: A4 (210 x 297 mm)

Name of the competent authority

Notification concerning the grant, refusal, withdrawal of EEC type-approval or the grant, refusal, withdrawal of extension of EEC type-approval of a type of reflex reflecting device

e 4

Type-approval number .....

1. Trade name or mark .....
2. Name and address of manufacturer .....
   .....
3. If applicable, name and address of manufacturer's authorized representative .....
   .....
4. Submitted for EEC type-approval on .....
5. Test laboratory .....
6. Date and number of laboratory report .....
7. Extension of type approval: vehicle-yellow/colourless (*)
8. Date of grant/refusal/withdrawal of EEC type-approval (*)
   .....
9. Date of grant/refusal/withdrawal of extension of EEC type approval (*)
   .....

(*) Delete items not applicable.

10. Single EEC type-approval granted on the basis of Items 4.3(a) and (b) of Annex 0, for a lighting and light signalling device comprising several lights and/or lamps, and in particular

.....

.....

11. Date of refusal/withdrawal of single EEC type-approval (*)

.....

12. Done at .....

13. Date .....

14. Annexes to this certificate bearing the type-approval number above:

.....

.....

.....

15. Remarks .....

.....

.....

.....

.....

Signature

(*) Delete items not applicable.

ANNEX III

EXAMPLE OF EEC TYPE-APPROVAL MARK

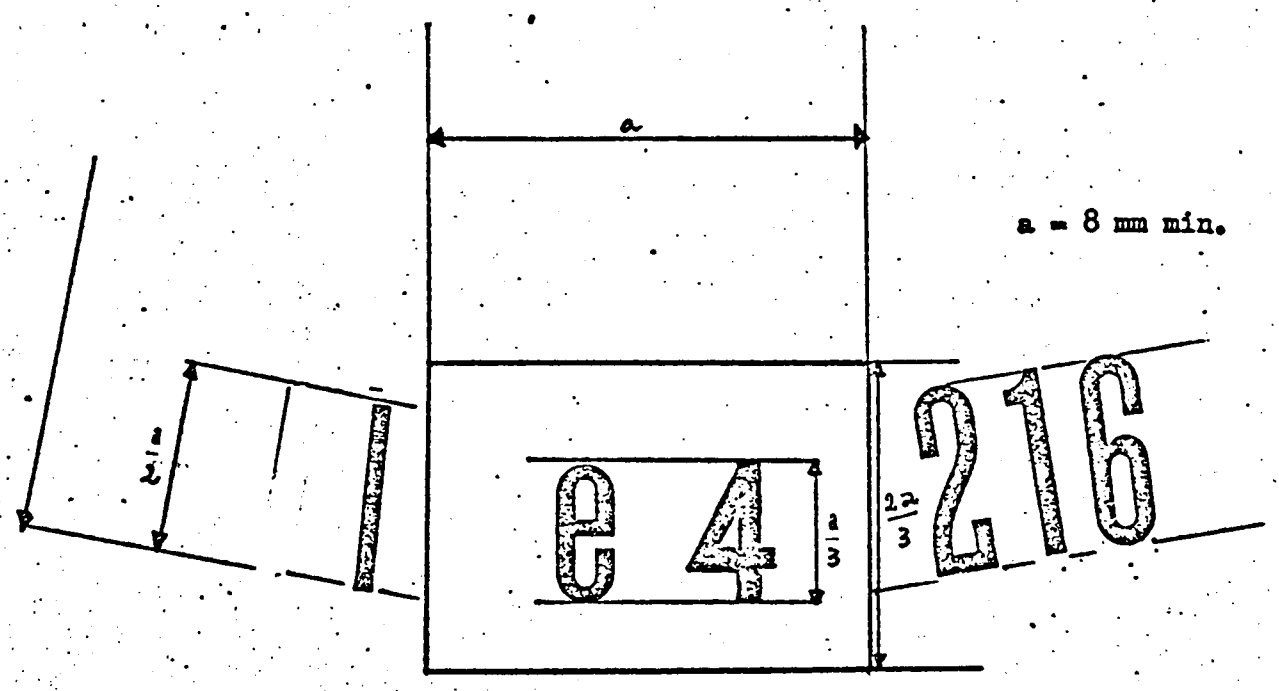


FIG. 1

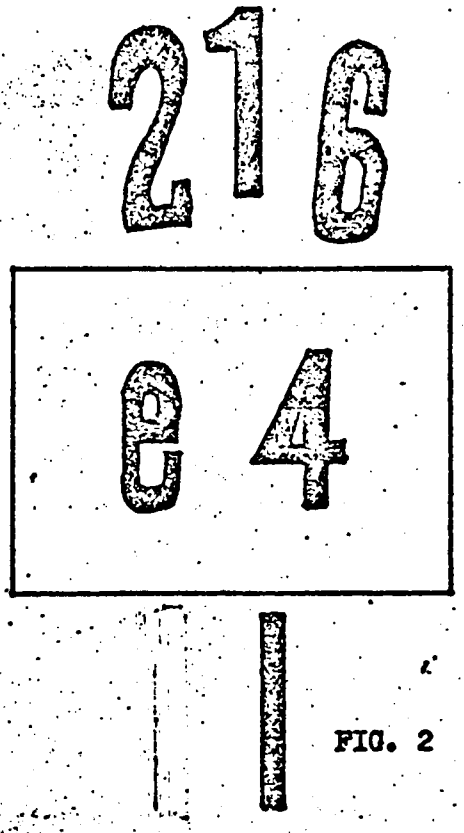


FIG. 2

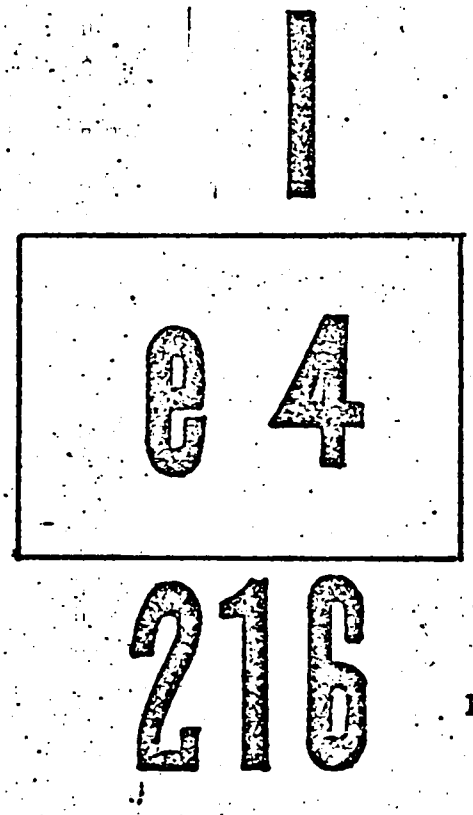


FIG. 3

The reflecting device bearing the EEC type-approval mark above is a Class I reflector type-approved in the Netherlands (4) under No. 216.

(ANNEX IV)

ANNEX V
TEST PROCEDURE

V.1. The applicant shall submit 10 samples for EEC type-approval.

V.2. After verification of the general specifications (item 6 annex 0) and the specifications of shape and dimensions (annex VI), the 10 samples shall be examined as to their colorimetric characteristics (annex VII) and CIL (annex VIII) for an angle of divergence of 20' and an illumination angle $V = H = 0^{\circ}$ or if necessary, in the position defined in items VIII.4 and VIII.4.1. The two reflex reflecting devices giving the minimum and maximum values shall then be fully tested as shown in item VIII.3. These 2 samples shall be kept by the laboratories as provided in item 5.1 of annex 0 for any further checks which may be found necessary. The other 8 samples shall be divided into 4 groups of 2:

1st Group - The 2 samples shall be subjected successively to the water penetration test (item IX.1) and then, if this test is satisfactory, to the texts for resistance to fuels and lubricants (items IX.3 and IX.4).

2nd Group - The 2 samples shall, if necessary, be subjected to the corrosion test (item IX.2) and then to the resistance test for the reverse side of the reflex reflecting device (item IX.5.) The same 2 samples shall then be subjected to the heat test (annex XI).

3rd Group - The 2 samples shall be subjected to the test for stability of the optical properties with ageing (annex X).

4th Group - The 2 samples shall be subjected to the colour-fastness test (annex XII).

V.3. After undergoing the tests referred to in item V.2 above, the reflex reflecting devices in each group must have

3.1. a colour which satisfies the conditions laid down in annex VII. This shall be verified by a qualitative method, and, in case of doubt, confirmed by a quantitative method,

3.2. a CIL which satisfies the conditions laid down in annex VIII and after the test reaches at least 60% of the value previously obtained with the same sample. The test shall be made only with an angle of divergence of 20' and an illumination angle of $V = H = 0^{\circ}$ or, if necessary, in the position specified in item VIII.4 and VIII.4.1.

ANNEX VI

SPECIFICATIONS OF SHAPE AND DIMENSIONS

VI.1. SHAPE AND DIMENSION OF REFLEX REFLECTING DEVICES IN CLASS I:

1.1. The illuminating surfaces of reflex reflecting devices in Class I must be inscribable within a circle 200 mm in diameter.

1.2. The shape of the illuminating surfaces must be simple, and not easily confused at normal observation distances, with a letter, a figure or a triangle.

1.3. The preceding item notwithstanding, a shape resembling the simply formed letters or figures O, I, U or 8 is permissible.

VI.2. SHAPE AND DIMENSIONS OF REFLEX REFLECTING DEVICES IN CLASS III (see Appendix to this Annex)

2.1. The illuminating surfaces of reflex reflecting devices in Class III must have the shape of an equilateral triangle. If the word "TOP" is inscribed in one angle, this means that that angle must form the apex of the triangle.

2.2. The illuminating surface may or may not have at its centre a triangular, non-reflecting area, the sides of which are parallel to those of the outer triangle.

2.3. The illuminating surface may or may not be continuous. In any case, the shortest distance between two adjacent reflex reflecting optical units must not exceed 15 mm.

2.4. The illuminating surface of a reflex reflecting device shall be considered to be continuous if the edges of the illuminating surfaces of adjacent separate optical units are parallel and if the said optical units are evenly distributed over the whole solid surface of the triangle.

2.5. If the illuminated area is not continuous, the number of separate reflex reflecting optical units shall not be less than four on each side of the triangle including the corner units.

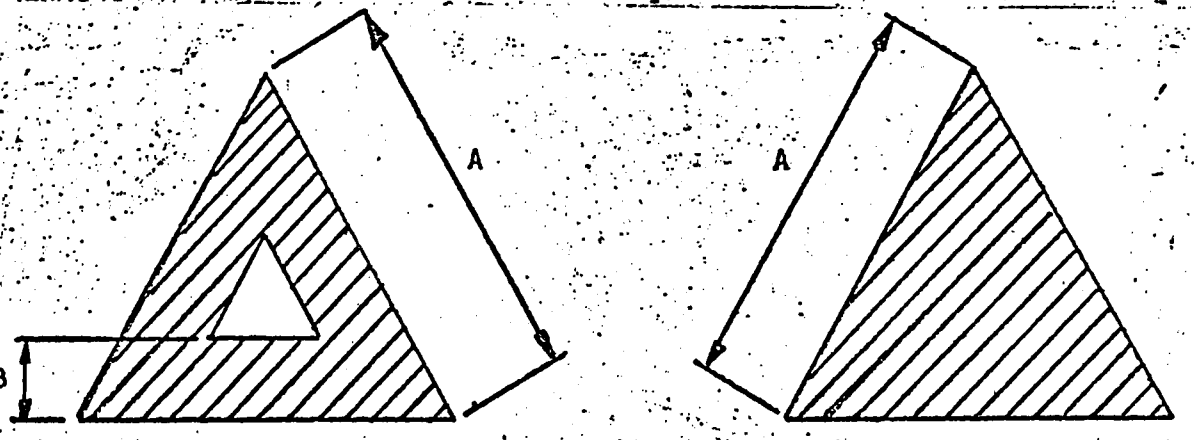
2.5.1. The separate reflex reflecting optical units shall not be replaceable unless they consist of approved reflex reflecting devices in Class I.

2.6. The outside edges of the illuminating surfaces of triangular reflex reflecting devices in Class III shall be between 150 and 200 mm long. In the case of hollow type devices, the minimum width of the sides, measured at right angles to them, shall be at least 20% of the effective length between the extremities of the illuminating surface.

VI.3. The above specifications shall be checked by inspection.

ANNEXE VI - APPENDIX

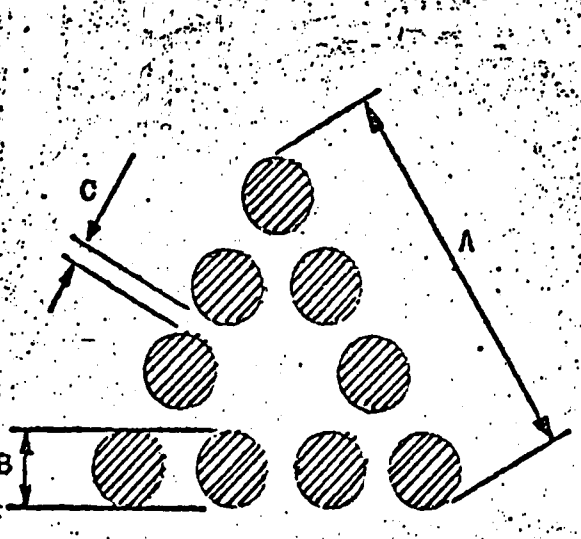
REFLEX REFLECTORS FOR TRAILERS - CLASS III

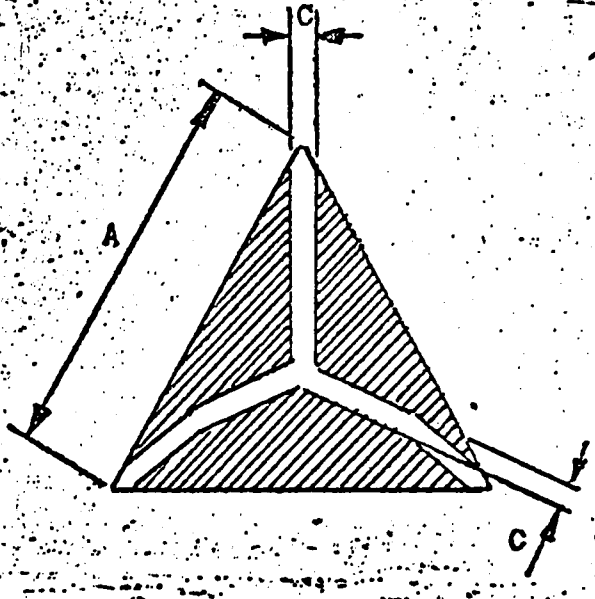


$$150 \text{ mm} \leqslant A \leqslant 200 \text{ mm}$$

$$B \geqslant \frac{A}{5}$$

$$C \leqslant 15 \text{ mm}$$





Note :These sketches are only for illustration purposes.

ANNEX VII

COLORIMETRIC SPECIFICATIONS

VII.1. These specifications shall apply only to clear, red or amber reflex reflecting devices.

1.1. Reflex reflecting devices may consist of a combined reflex reflecting optical unit and filter, which must be so designed that they cannot be separated under normal conditions of use.

1.2. The colouring of reflex reflecting optical units and filters by means of paint or varnish is not permitted.

VII.2. When the reflex reflecting device is illuminated by ICI standard illuminant A, with an angle of divergence of 1/3° and an illumination angle V = H = 0°, or, if this produces a colourless surface reflection, an angle V = ±5°, H = 0°, the trichromatic co-ordinates of the reflected luminous flux must be within the following limits:

RED:	limit towards yellow	: $y \leq 0{,}335$
	limit towards purple	: $z \geq 0{,}008$
AMBER:	limit towards yellow	: $y \geq 0{,}429$
	limit towards red	: $y \geq 0{,}398$
	limit towards white	: $z \leq 0{,}007$

2.1. In the case of red and amber, compliance with the colorimetric specifications shall be verified by a visual comparison test.

2.2. If any doubt remains after this test, compliance with the colorimetric specifications shall be verified by determining the trichromatic co-ordinates of the most doubtful sample.

VII.3. Clear reflex reflecting devices must not produce a selective reflection; that is to say, the trichromatic co-ordinates "x" and "y" of the standard illuminant "A" used to illuminate the reflex reflecting device must not undergo a change of more than 0,01 after reflection by the reflex reflecting device.

3.1. This shall be verified by the visual comparison test indicated above, the control field being illuminated by a light source of which the trichromatic co-ordinates differ by 0,01 from that of standard illuminant A.

3.2. In case of doubt, the trichromatic co-ordinates for the most selective sample shall be determined.

ANNEX VIII

PHOTOMETRIC SPECIFICATIONS

VIII.I. When applying for EEC type-approval, the applicant shall specify the axis of reference. This corresponds to the illumination angle V = H = 0° in thetable of coefficients of luminous intensity (CIL).

VIII.2. For photometric measurements, only the illuminating surface contained within a circle of 120 mm diameter for Class I shall be considered, and the illuminating surface itself shall be limited to 100 cm^2 for Class I through the surface of the reflex reflecting optical units need not necessarily attain this area. The manufacturer shall specify the perimeter of the area to be used. In the case of Class III, the whole of the illuminating surfaces shall be considered without limitation as to size.

VIII.3. The CIL values for red reflex reflecting devices must be at least equal to those in the table below, expressed in millicandelas per lux, for the angles of divergence and illumination shown:

CLASS	Angle of divergence α	Illumination angles			
		vertical V horizontal H	0° 0°	+ and - 10° 0°	+ and - 5° + and -20°
I	20' 1°30'		100 5	50 2.5	50 2.5
(II)					
III	20' 1°30'		150 7.5	75 3.75	75 3.75

CIL values lower than those shown in the last two columns of the above table are not permissible within the solid angle having the reference centre as its apex and bounded by the planes intersecting along the following lines:

(V = + and - 10°, H = 0°) (V = + and - 5°, H = + and - 20°)

VIII.4. When the CIL of a reflex reflecting device is measured for an angle β of V = H = 0°, it shall be ascertained whether any mirror effect is produced by slightly turning the device. If there is any such effect, a reading shall be taken with an angle β of V = ± 5°, H = 0°. The position adopted shall be that corresponding to the minimum CIL for one of these positions.

4.1. With an illumination angle β of V = H = 0°, or the angle specified in item VIII.4 above, and an angle of divergence of 20', reflex reflecting devices which are not marked "TOP" shall be rotated about their axes of reference to the position of minimum CIL, which must conform to the value specified in Item VIII.3. When the CIL is measured for the other angles of illumination and divergence, the reflex reflecting device shall be placed in the position corresponding to this value of ε. If the specified values are not attained, the device may be rotated about its axis of reference ± 5° from that position.

4.2. With an illumination angle β of V = H = 0°, or the angle specified in item VIII.4 above, and an angle of divergence of 20', reflex reflecting devices marked "TOP" shall be rotated about their axes ± 5°. The CIL must not fall below the prescribed value in any position assumed by the device during this rotation.

4.3. If for the direction V = H = 0°, and for ε = 0° the CIL exceeds the specified value by 50% or more, all measurements for all angles of illumination and divergence shall be made for ε = 0°.

VIII.5. For making the necessary measurements, the method recommended by ICI for the photometry of reflex reflecting devices shall be adopted.

ANNEX IX

RESISTANCE TO EXTERNAL AGENTS

IX.1. RESISTANCE TO PENETRATION OF WATER

Reflex reflecting devices, whether part of a lamp or not, shall be stripped of all removable parts and immersed for 10 minutes in water at a temperature of $25^{\circ} \pm 5^{\circ}C$, the highest point of the upper part of the illuminating surface being 20 mm below the surface of the water. This test shall be repeated after turning the reflex reflecting device through 180°, so that the illuminating surface is at the bottom and the reverse side covered by about 20 mm of water.

1.1. No water must penetrate to the reflecting surface of the reflex reflecting optical unit. If inspection clearly reveals the presence of water, the device shall be considered to have passed the test.

1.2 If inspection does not reveal the presence of water, or in case of doubt, the CIL shall be measured by the method described in item V.3.2. after lightly shaking the reflex reflecting device to remove excess water from the outside.

IX.2. RESISTANCE TO CORROSION.

Reflex reflecting devices must be so designed that they retain the prescribed photometric and colorimetric characteristics despite the humidity and corrosive influences to which they are normally exposed. The resistance of the front surface to tarnishing and that of the protecting back surface to deterioration shall be checked, particularly when an essential metal component seems liable to be attacked.

The reflex reflecting device, or the lamp if the device is combined with a light, shall be stripped of all removable parts and subjected to the action of a saline mist for a period of 50 hours, comprising 2 periods of exposure of 24 hours each, separated by an interval of 2 hours during which the sample is allowed to dry.

The saline mist shall be produced by atomising, at a temperature of $35^{\circ} \pm 2^{\circ}C$, a saline solution obtained by dissolving 20 ± 2 parts by a weight of sodium chloride in 80 parts of distilled water containing not more than 0.02% of impurities.

Immediately after completion of the test, the sample must not show signs of excessive corrosion liable to impair the efficiency of the device.

IX.3. RESISTANCE TO FUELS

The outer surface of the reflex reflecting device and, in particular, of the illuminating surface, shall be lightly wiped with a cotton cloth soaked in a mixture of petrol and benzol (proportion 90:10). After about 5 minutes, the surface shall be inspected. It must not show any visible change.

IX.4. RESISTANCE TO LUBRICATING OILS.

The outer surface of the reflex reflecting device and, in particular, the illuminating surface, shall be lightly wiped with a cotton cloth soaked in a detergent lubricating oil. After about 5 minutes, the surface shall be cleaned. The CIL shall then be measured (item V.3.2.)

IX.5. RESISTANCE OF THE ACCESSIBLE REVERSE SIDE OF MIRROR-BACKED REFLEX REFLECTING DEVICES.

The reverse side of the reflex reflecting device shall be brushed with a hard nylon brush and then covered or thoroughly wetted with a mixture of petrol and benzol (proportion 90:10) for one minute. The mixture shall then be removed and the device allowed to dry.

As soon as evaporation is completed, an abrasion test shall be made by brushing the reverse side with the same nylon brush as before.

The CIL shall then be measured (item V.3.2.) after the whole surface of the mirror-backed reverse side has been covered with Indian ink.

ANNEX X

STABILITY OF THE OPTICAL PROPERTIES OF REFLEX REFLECTING DEVICES WITH AGEING

X.1. The authority which granted EEC type-approval shall have the right to check the stability of the optical properties of a type of reflex reflecting device in service as ageing takes place.

X.2. The competent authorities of countries other than the country in which EEC type-approval was granted may carry out similar checks in their territory. If a type of reflex reflector displays a regular deficiency when in use, they shall send any parts selected for testing to the authority which granted EEC type-approval, with a request for its opinion.

X.3. In the absence of other criteria, the concept of "regular deficiency" of a type of reflex reflector when in use shall be interpreted in accordance with item 6.1. of annex 0.

ANNEX XI

RESISTANCE TO HEAT

XI.1. The reflex reflecting device shall be kept for 12 consecutive hours in a dry atmosphere at a temperature of 65 ± 2° C.

XI.2. After this test, no cracking or appreciable distortion of the reflex reflecting device and, in particular, of its optical units must be visible.

XI.3. The colorimetric and photometric characteristics shall be checked in accordance with items V.3.1. and V.3.2..

ANNEX XII

COLOUR-FASTNESS

XII.1. The authority which granted EEC type-approval shall have the right to check the colour-fastness of a type of reflex reflecting device in service.

XII.2. The competent authorities of countries other than the country in which EEC type-approval was granted may carry out similar checks in their territory. If a reflex reflector displays a regular deficiency when in use, they shall send any parts selected for testing to the authority which granted EEC type-approval, with a request for its opinion.

XII.3. In the absence of other criteria, the concept of "regular deficiency" of a reflex reflector when in use shall be interpreted in accordance with item 6.1 annex 0.

APPENDIX TO ANNEXES

CHRONOLOGICAL ORDER OF TESTS

Item	Test	Samples									
		a	b	c	d	e	f	g	h	i	j
0.6.	General specifications: inspection	x	x	x	x	x	x	x	x	x	x
VI.	Shapes and dimensions: inspection	x	x	x	x	x	x	x	x	x	x
VII.	Colorimetry: inspection	x	x	x	x	x	x	x	x	x	x
	trichromatic coordinates in case of doubt		x								
VIII.	Photometry: limited to 20' and V = H = 0°	x	x	x	x	x	x	x	x	x	x
VIII. 3.	complete			x	x						
IX.1.	Water: 10 min in normal position							x	x		
	10 min in inverted position							x	x		
	inspection							x	x		
V.3.1.	Colorimetry: inspection							x	x		
	trichromatic coordinates in case of doubt							x	x		
V.3.2.	Photometry: limited to 20' and V = H = 0°							x	x		
IX.3.	Fuels: 5 min							x	x		
	inspection							x	x		
IX.4.	Oils: 5 min							x	x		
	inspection							x	x		
V.3.1.	Colorimetry: inspection							x	x		
	trichromatic coordinates in case of doubt							x	x		
V.3.2.	Photometry: limited to 20' and V = H = 0°							x	x		
IX.2.	Corrosion: 24 hours					x	x				
	2 hours' interval					x	x				
	24 hours					x	x				
	inspection					x	x				
IX.5.	Reverse side: 1 min					x	x				
	inspection					x	x				
X.1.	Heat: 12 h at 65° ± 2°C					x	x				
	inspection for distortion					x	x				
V.3.1.	Colorimetry: inspection					x	x				
	trichromatic coordinates in case of doubt					x	x				
V.3.2.	Photometry: limited to 20' and V = H = 0°					x	x				

.../...

Item	Test	Samples									
		a	b	c	d	e	f	g	h	i	j
X.	Stability with ageing										
V.3.1.	Colorimetry: inspection or trichromatic coordinates										
V.3.2.	Photometry: limited to 20' and V = H = 0^{o}										
XII.	Colour-fastness										
V.3.1.	Colorimetry: inspection or trichromatic coordinates										
V.3.2.	Photometry: limited to 20' and V = H = 0^{o}										
0.5.1.	Deposit of samples with authorities			x	x						