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COMMISSION REGULATION (EEC) No 890/78
of 28 April 1978
laying down detailed rules for the certification of hops

(OJ L 117, 29.4.1978, p. 43)

Amended by:

	Official Journal		
	No	page	date
► <u>M1</u> Commission Regulation (EEC) No 1465/79 of 13 July 1979	L 177	35	14.7.1979
► <u>M2</u> Commission Regulation (EEC) No 3479/80 of 30 December 1980	L 363	83	31.12.1980
► <u>M3</u> Commission Regulation (EEC) No 1979/83 of 18 July 1983	L 195	34	19.7.1983
► <u>M4</u> Commission Regulation (EEC) No 2600/85 of 16 September 1985	L 248	9	17.9.1985
► <u>M5</u> Commission Regulation (EEC) No 3589/85 of 17 December 1985	L 343	19	20.12.1985
► <u>M6</u> Commission Regulation (EEC) No 3994/88 of 21 December 1988	L 354	24	22.12.1988
► <u>M7</u> Commission Regulation (EEC) No 921/89 of 10 April 1989	L 97	40	11.4.1989
► <u>M8</u> Commission Regulation (EEC) No 2265/91 of 26 July 1991	L 208	22	30.7.1991
► <u>M9</u> Commission Regulation (EEC) No 2928/93 of 25 October 1993	L 265	4	26.10.1993
► <u>M10</u> Commission Regulation (EC) No 852/94 of 15 April 1994	L 98	22	16.4.1994
► <u>M11</u> Commission Regulation (EC) No 1021/95 of 5 May 1995	L 103	20	6.5.1995
► <u>M12</u> Commission Regulation (EC) No 2125/2004 of 14 December 2004	L 368	8	15.12.2004

Amended by:

► <u>A1</u> Act of Accession of Greece	L 291	17	19.11.1979
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Corrected by:

► <u>C1</u> Corrigendum, OJ L 116, 11.5.1979, p. 32 (890/78)

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COMMISSION REGULATION (EEC) No 890/78
of 28 April 1978
laying down detailed rules for the certification of hops

THE COMMISSION OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Economic Community,

Having regard to Council Regulation (EEC) No 1696/71 of 26 July 1971 on the common organization of the market in hops ⁽¹⁾, as last amended by Regulation (EEC) No 1170/77 ⁽²⁾, and in particular Article 2 (5) thereof,

Whereas Council Regulation (EEC) No 1784/77 of 19 July 1977 ⁽³⁾ laid down general rules for the certification of hops;

Whereas, in order to ensure substantially uniform application of the certification procedure in the Member States, it is necessary to specify the products subject to certification, the operations involved and the information to be given on the various documents which accompany the said products;

Whereas, to enable control to be exercised in respect of hop cones, a declaration signed by the individual or associated producer should accompany certification; whereas this document should contain information which makes it possible to identify the hops from the moment when they are presented for certification until the certificate is issued;

Whereas, for the purposes of determining the quality characteristics which hops approved for marketing must possess, the moisture content and extraneous matter content must be taken into consideration; whereas, in view of the reputation for quality that Community hops have acquired, the existing procedures customary in commercial transactions should be taken as a basis;

Whereas the choice of method for checking the moisture content of hops should be left to the Member States; whereas the methods adopted must, however, give comparable results; whereas, in case of dispute, it is necessary to use a Community method;

Whereas, in order to take account of current commercial practice in certain Community regions, hops marketed seeded and seedless should be defined and provision made for the appropriate entry on the certificate;

Whereas, in order to ensure that users have exact information on the origin and characteristics of products put on the market, common rules should be laid down for the marking of packages and the numbering of certificates;

Whereas it should be laid down that hops prepared from hops certified unprepared may themselves be certified only if preparation is carried out within a closed operating circuit; whereas, however, if these operations take place in certification centres or warehouses the procedure for subsequent certification should be simplified;

Whereas the subsequent certification procedure should also be simplified where the packaging of a product is changed under official supervision and without processing;

Whereas the second subparagraph of Article 1 (1) of Regulation (EEC) No 1784/77 provides that products which are exempt from certification should be subject to a control procedure; whereas this control procedure must ensure both that these products cannot upset the normal marketing

⁽¹⁾ OJ No L 175, 4. 8. 1971, p. 1.

⁽²⁾ OJ No L 137, 3. 6. 1977, p. 7.

⁽³⁾ OJ No L 200, 8. 8. 1977, p. 1.

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pattern for certified products and that they are suitable for their declared use and are used only by those to whom they are consigned;

Whereas the operation of this control procedure should be entrusted to the bodies responsible for certification;

Whereas the measures provided for in this Regulation are in accordance with the opinion of the Management Committee for Hops,

HAS ADOPTED THIS REGULATION:

▼M9*Article 1*

- (a) 'unprepared hops' means hops which have undergone only preliminary drying and packaging;
- (b) 'prepared hops' means hops which have undergone final drying and final packaging;
- (c) 'seeded hops' means hops marketed with a seed content greater than 2 % of their weight;
- (d) 'seedless hops' means hops marketed with a seed content not exceeding 2 % of their weight;
- (e) 'isomerized hop extract' means an extract in which the alpha acids have been almost totally isomerized;
- (f) 'isomerized hop powder' means a powder in which the alpha acids have been almost totally isomerized;
- (g) 'new isomerized hop products' means products in which not only have the alpha acids been totally isomerized but other constituents have also undergone alteration to a greater or lesser extent (according to the stage at which and the condition under which the transformation of the alpha acids has been carried out) or have been deliberately eliminated from the final product;
- (h) 'sealing' means closure of the package under official supervision and in such a way that the means of closure will be damaged when the package is opened;
- (i) 'closed operating circuit' means a process for preparing or processing hops carried out under official supervision and in such a way that no hops or processed products can be added or removed during the operation. The closed operating circuit starts with the opening of the sealed package containing the hops or hop products to be prepared or processed and ends with the sealing of the package containing the processed hops or hop product;
- (j) 'consignment' means a number of packages of hops or hop products with the same characteristics presented at the same time for certification by the same individual or associated producer or by the same processor.

▼B*Article 2*

1. Every consignment of hop cones presented for certification shall be accompanied by a written declaration signed by the producer giving:

- the producer's name and address,
- the harvest year,
- the variety,
- the place of production,
- the land register reference or an official equivalent thereof,
- the number of packages in the consignment.

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2. This declaration shall accompany the consignment of hops throughout any processing or mixing operations and in any case until the certificate is issued.

Article 3

1. All hop cones submitted for certification shall comply with the definition laid down in Article 1 (3) (a) of Regulation (EEC) No 1696/71 and the minimum marketing requirements set out in Annex I to this Regulation.

2. Observance of the minimum marketing requirement relative to the moisture content of the hops shall be checked by one of the methods described in Annex II (B). However, the methods described in Annex II (B) (2) must be approved by the control body and must give results with a standard deviation not exceeding 2.0. In the event of dispute, observance shall be checked by the method described in Annex II (B) (1).

The Member States shall communicate to the Commission the methods which they employ.

3. Observance of minimum marketing requirements other than the moisture content shall be checked in accordance with normal commercial practice. However, in the event of any dispute, the method described in Annex II (C) shall be used.

Article 4

For the purpose of the control methods referred to in Article 3 and described in Annex II (B) (1) and in Annex II (C), samples shall be taken in the following manner:

- (a) Samples shall be taken, in each consignment, from at least one package in ten and, in any case, from at least two packages in any one consignment.
- (b) The samples shall be taken and treated in accordance with the method described in Annex II (A).

Article 5

The certificate referred to in Article 5 of Regulation (EEC) No 1784/77 shall bear the words 'seeded hops' or 'seedless hops', as appropriate.

▼M12*Article 5a*

The certificate referred to in Article 5 of Regulation (EEC) No 1784/77 shall bear at least one of the texts indicated in Annex IIa, applied by the authority empowered to carry out certifications.

▼B*Article 6*

1. The reference number of the certificate as referred to in Article 5 of Regulation (EEC) No 1784/77 shall be made up of codes designating, in accordance with Annex III, the certification centre, the Member State, the year of harvesting and the relevant consignment.

2. This number shall be the same for all the packages in any one consignment.

▼M11

3. Before 1 September 1978, Member States shall communicate to the Commission a list of the certification centres and the code for each centre.

In the case of Greece, Spain, Portugal and Austria, this information shall be communicated before the end of the fourth month following the date of accession.

▼ M12

In the case of the Czech Republic, Estonia, Cyprus, Latvia, Lithuania, Hungary, Malta, Poland, Slovenia and Slovakia, this information shall be communicated by 1 January 2005.

▼ M11

The list of these centres and their code numbers shall be published in the *Official Journal of the European Communities*. An updated list shall be published annually.

▼ B*Article 7*

The marking referred to in Article 1 (2) of Regulation (EEC) No 1784/77 shall be carried out in accordance with Annex IV, under supervision and after sealing, on the unit of packaging in which the product is to be marketed.

Article 8

1. Prepared hops produced from hops which were certified unprepared may not be certified unless preparation took place within a closed operating circuit.
2. If the hops are prepared in the certification centre or warehouse:
 - (a) the certificate shall not be issued until after preparation;
 - (b) the original unprepared hops shall be accompanied by the declaration referred to in Article 2.
3. In every case a number shall be given to the consignment of original hops before preparation. This number must appear on the certificate issued for the prepared hops.
4. In order to be certified, products prepared from hops as referred to in Article 7 of Regulation (EEC) No 1784/77 must be manufactured within a closed operating circuit.

▼ M9

5. With the exception of the substances set out in Annex V, only the certified hops and hop products referred to in Article 7 of Regulation (EEC) No 1784/77 may enter the closed operating circuit. They may enter only in the state in which they have been certified.
6. If, during the production of extracts manufactured by the use of carbon dioxide, processing in the closed operating circuit has to be interrupted for technical reasons, the representatives of the official bodies or departments referred to in Article 1 (6) of Regulation (EEC) No 1784/77 shall seal the package containing the intermediate product at the point of interruption. The seals may be broken only by the above-mentioned representatives when processing resumes.

▼ M8*Article 8a*

1. In the case of the production of hop products, officials as referred to in Article 8 (6) shall be present at all times when processing is taking place. They shall supervise the processing at every stage, i.e. from the opening of the sealed package containing the hops or hop product to be processed through to the completion of packing, sealing and labelling of the hop product. A temporary absence is permissible, as long as it can be assured by technical means that the provisions of this Regulation are respected.
2. Before changing to a different batch in a processing system the representatives referred to in Article 8 (6) shall ensure by inspection that the processing system is empty, at least to the extent necessary to ensure the elements of two different batches cannot be mixed. If hops, hop products, spent hops or any other product derived from hops remain in parts of the processing system such as blending or canning containers while hops of another batch is being processed, these parts have to be disconnected from the processing system by suitable technical means

▼M8

and under official supervision. They may be re-connected to the processing system under official supervision, only. A physical link between the processing line for concentrated hop powder and that for non-concentrated hop powder shall not be allowed while either is operating.

3. The operators of hop-processing plants shall provide the representatives referred to in Article 8 (6) as well as the representatives of the official national bodies responsible for ensuring compliance with the certification system within the meaning of Article 1 (6) of Regulation (EEC) No 1784/77 with all information related to the technical layout of the processing plant.

4. The operators of hop-processing plants shall keep exact records concerning the mass throughput of hops processed. For each batch of hops to be processed records shall be drawn up which contain details of the weights of the input product and the processed product as well as that of the waste, including spent hops, non-hop materials rejected and the presumed moisture loss. As far as the input product is concerned the records shall furthermore contain the number as referred to in Article 5 (1) (b) of Regulation (EEC) No 1784/77 for all hop consignments involved and the variety of the hops. If more than one variety is used in the same batch the respective shares of their weights must appear in the records. As regards the processed product the variety must also appear in the records, or, if the processed product is a blend, the composition by varieties. All weights may be rounded off to the nearest kilogram.

5. Records of the mass throughput shall be made under the supervision of the representatives referred to in Article 8 (6) and signed by them as soon as the processing of a batch has been completed. They shall be kept by the operator of a processing plant for at least three years.

6. Representatives of the official bodies responsible for ensuring compliance with the certification system shall carry out sample checks on the premises of the hop processing plants, regularly and without prior notice. These checks shall consist of an examination of: the work of representatives referred in Article 8 (6); the incontestability of the certified products, the certificates accompanying the hops, as well as the recorded mass throughput as referred to in paragraph 4 above. The number of checks to be carried out during a year shall not be less than five per hop-processing plant.

7. The Member States shall report to the Commission, every year before 30 June, the frequency, type and result of the supervisory measures in respect of certification which were carried out over the year preceding the said date.

8. If it is found that in the preparation of hop products components have been used which are not permitted, or that the components used do not conform to the information in the certificate as listed in Article 5 of Regulation (EEC) No 1784/77, and if this is imputable to deliberate action or serious fault on the part of the plant operator or his servants, the Member State in question shall withdraw approval as a certification centre from this processing plant. Approval may not be restored for a period of at least 12 months following the date of withdrawal. On request of the operator, approval shall be restored after two years or, in grave cases, after three years from the date of withdrawal, at the latest.

▼B*Article 9*

1. While they are in circulation, hop powders and hop extracts may not undergo a change of packaging within the meaning of Article 1 (5) of Regulation (EEC) No 1784/77, unless this is done under official supervision.

2. Where a change of packaging as referred to in the preceding paragraph is carried out without any processing of the product, the new certification procedure shall comprise only:

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- the marking of the new packaging,
- the entry on the original certificate of this marking and the change of packaging.

▼M1*Article 9a*

In the case of resale within the Community's territory, after a certified consignment has been split up, the product must be accompanied by an invoice or a commercial document drawn up by the vendor stating the number of the certificate and the name of the issuing agency. The invoice or commercial document must also bear the following information, taken from the certificate:

- (a) for hops in cones:
 - the designation of the product,
 - the gross and/or net weight,
 - the place of production,
 - the year of harvest,
 - the variety;
- (b) for hop products, the information given above together with the place and date of processing.

▼B*Article 10***▼M9**

The products referred to in Article 1 (1) (a) to (f) of Regulation (EEC) No 1784/77 shall be subject to the following checks:

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- (a) In the case of hops harvested on land owned by a brewer and used by him in the natural or processed state:
 - in respect of each crop the brewer shall before 1 November send to the control body referred to in Article 1 (6) of Regulation (EEC) No 1784/77 a declaration of the varieties grown, the quantities harvested, the places of production and the areas planted, together with the land register references or an official equivalent thereof,
 - no further checks shall be required where the hops are processed or used in their natural state in the brewery itself. In all other cases, the check shall be the same as described under (c) below, with the exception of point 5.

▼M9

- (b) In the case of isomerized hop extracts, isomerized hop powders and the new isomerized hop products listed in Annex VI, the processor shall each year, not later than 31 December, declare to the control body the quantities produced and the quantities marketed. The packaging must bear the words 'isomerized hop extract', 'isomerized hop powder', or 'new isomerized hop product' and must state the weight or volume, the original variety, the product used and the percentage of the product used.

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- (c) In the case of products derived from hops and processed under contract on behalf of a brewery, and provided that these products are to be used by the brewery itself, the certifying body shall, when the hops enter the establishment where they are to be processed, issue a document on which at least the following particulars shall be entered in the course of the processing operations:
 1. a reference identifying the contract,
 2. the recipient brewery,

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3. the processing establishment,
4. a description of the processed product,
5. the reference number of the certificate or the attestation of equivalence of the original hops,
6. the weight of the processed product.

This document shall be given a reference number, which must also appear on the packaging.

▼M10

In the case of blends of hops, the following additional indication must be included on the document and on the package:

‘Mixture of hops for own use; may not be marketed’.

▼M9

- (d) In the case of hops and hop products put up in small packets for sale to private individuals for their own use, the weight of the package may not exceed:

- 1 kg in the case of cones or powder,
- 300 g in the case of extract, powder and the new isomerized products.

A description of the product and its weight must appear on the package.

▼M11*Article 11*

Before 1 September 1978, Member States shall communicate to the Commission a list of the zones or regions of production referred to in Article 6 (1) of Regulation (EEC) No 1784/77.

In the case of Greece, Spain, Portugal and Austria, this information shall be communicated before the end of the fourth month following the date of accession.

▼M12

In the case of the Czech Republic, Estonia, Cyprus, Latvia, Lithuania, Hungary, Malta, Poland, Slovenia and Slovakia, this information shall be communicated by 1 January 2005.

▼B*Article 12*

This Regulation shall apply with effect from 1 August 1978.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

▼ **M4**

ANNEX I

MINIMUM MARKETING REQUIREMENTS FOR HOP CONES

Characteristics	Description	Maximum content (% of weight)	
		Prepared hops	Non-prepared hops
(a) Moisture	Water content	12	14
(b) Leaves and stalks	Leaf fragments from branch tendrils, branch tendrils, leaf or cone strigs; to be classed as stalk, cone strigs must be at least 2,5 cm long	6	6
(c) Hop waste	Small particles resulting from machine harvesting, varying in colour between dark green and black and ► M6 which generally do not come from the cone; the maximum contents indicated may include particles of varieties of hops other than those to be certified, amounting to up to 2 % of the weight ◀	3	4
(d) In the case of 'seedless hops', seed	Mature fruit of the cone	2	2

▼B*ANNEX II***A. SAMPLING METHOD**

The following procedure shall be used to take samples of hop cones for determining the moisture content and, where applicable, the extraneous matter content:

1. Sampling*(a) Packed hops*

A weight of hops proportional to the weight of the package shall be taken from the number of packages specified in Article 4. Enough samples should be taken to ensure that there are enough cones to be representative of the package.

(b) Hops in a loose pile

Take equal portions from 5 to 10 different places in the pile both at the surface and at various depths. Place sample in the container as soon as possible. To avoid rapid deterioration, the quantity of hops must be sufficiently large to be highly compressed when the container is closed.

The sample must weigh at least 100 g.

2. Mixture

The samples must be carefully mixed to be representative of the consignment.

3. Sub-sampling

After mixing take one or more representative samples and place them in a waterproof, airtight container such as a metal box or glass jar, except where only the extraneous matter content is to be checked.

4. Except during transport, samples must be stored in a cold place. Care should be taken to allow the samples to return to room temperature inside the container before opening for examination or analysis.

B. METHOD FOR CHECKING THE MOISTURE CONTENT OF HOPS**1. Method (i)**

Samples for moisture content should not be ground. It is important that they should be exposed to the air only for the minimum time necessary for their transfer from the container to the weighing vessel (which must have a lid).

Apparatus

Balance sensitive to 0.005 g.

Drying oven electrically heated and thermostated to 105 to 107 °C (the efficacy of the oven should be checked by the copper sulphate test).

Metal dishes 70 to 100 mm in diameter, 20 to 30 mm deep and provided with well-fitting lids.

Ordinary desiccator, suitable for accommodating the dishes and containing a desiccant such as indicator silica gel.

Method

Transfer 3 to 5 g of hops to a dish and close the lid before weighing. Weigh as quickly as possible. Remove the lid and place the dish in the oven for one hour exactly. Replace the lid, place the dish in a desiccator to cool for at least 20 minutes and then weigh the dish.

Calculation

Calculate the loss of weight as a percentage of the original weight of hops. The maximum deviation for individual estimation is 1 %.

2. Method (ii)

Method using either an electronic weighing machine which dries the hops with infra-red rays or hot air, or an electric measuring apparatus, which registers on a scale the degree of humidity of the sample taken.

▼B**C. METHOD FOR CHECKING THE EXTRANEOUS MATTER CONTENT****▼M4****1. Determination of the leaf, stalk and waste content**

Sieve five 100 gram samples using a 2 mm sieve. Collect the lupulin, waste and seeds and separate the seeds by hand. Place the samples on one side. Transfer the contents of the 2 mm sieve to a 10 mm sieve and sieve again.

The hop cones, leaves, stalks and extraneous matter are collected by hand from the sieve while cone leaves, seeds, lupulin waste and some leaves and stalks pass through. All this is sorted by hand and divided into the following groups:

1. Leaves and stalks,
2. Hops (cone leaves, hop cones and lupulin),
3. Waste,
4. Seeds.

▼M7

It is extremely difficult to separate the waste and the lupulin precisely. However, it is possible, using a sieve with a mesh size of 0,8 millimetres, to determine approximately the relative proportions of the waste and the lupulin.

When estimating the proportion of lupulin, it should be taken into account that the density of the lupulin is four times greater than that of the waste.

▼M4

The various groups are weighed and the percentage which each group represents in the weight of the original sample is determined.

▼B**2. Determination of the seed content**

Place the 25 g sample in a metal container with a lid and heat in a drying oven for two hours at 115 °C in order to neutralize the sticky resin.

Wrap the dried sample in coarse cotton cloth and rub vigorously or beat mechanically in order to detach the seeds from the hops. Separate the dried and finely fragmented hops from the seeds with a grinder or a 1 mm metal sieve.

Separate any items remaining with the seeds using either a sloping surface covered with emery paper or any other method which gives the same result, i.e. retains the stems and other matter and permits the seeds to roll off.

Weigh the seeds and determine the percentage of seeds relative to the weight of the original sample.

▼ **M12**

ANNEX II a

TEXTS REFERRED TO IN ARTICLE 5a

- *[in Spanish]* Producto certificado — Reglamento (CEE) n° 890/78,
- *[in Czech]* Ověřený produkt – Nařízení (EHS) 890/78,
- *[in Danish]* Certificeret produkt — Forordning (EØF) nr. 890/78,
- *[in German]* Zertifiziertes Erzeugnis — Verordnung (EWG) Nr. 890/78,
- *[in Estonian]* Sertifitseeritud Produkt – Määrus (EMÜ) nr 890/78,
- *[in Greek]* Πιστοποιημένο προϊόν — κανονισμός (ΕΟΚ) αριθ. 890/78,
- *[in English]* Certified product — Regulation (EEC) No 890/78,
- *[in French]* Produit certifié — Règlement (CEE) n° 890/78,
- *[in Italian]* Prodotto certificato — Regolamento (CEE) n. 890/78,
- *[in Latvian]* Sertificēts produkts – Reglaments (EEK) Nr. 890/78,
- *[in Lithuanian]* Sertifikuotas produktas – Reglamentas (EEB) Nr. 890/78,
- *[in Hungarian]* Minősített termék – 890/78/EGK rendelet,
- *[in Maltese]* Prodott Iccertifikat — Regolament (KEE) Nru 890/78,
- *[in Dutch]* Gecertificeerd product — Verordening (EEG) nr. 890/78,
- *[in Polish]* Produkt certyfikowany — Rozporządzenie (EWG) Nr 890/78,
- *[in Portuguese]* Produto certificado — Regulamento (CEE) n.º 890/78,
- *[in Slovenian]* Certificiran pridelek – Uredba (EGS) št. 890/78,
- *[in Slovak]* Certifikovaný výrobok – Nariadenie (EHS) č. 890/78,
- *[in Finnish]* Varmennettu tuote – Asetus (ETY) N:o 890/78,
- *[in Swedish]* Certifierad produkt – Förordning (EEG) nr 890/78.

▼B*ANNEX III***CODING AND COMPOSITION SEQUENCE OF CERTIFICATE
REFERENCE NUMBERS****1. Certification centre**

A number between 0 and 100 communicated by the Member States.

▼M12**2. Member States carrying out certification**

BE for Belgium
CZ for the Czech Republic
DK for Denmark
DE for Germany
EE for Estonia
EL for Greece
ES for Spain
FR for France
IE for Ireland
IT for Italy
CY for Cyprus
LV for Latvia
LT for Lithuania
LU for Luxembourg
HU for Hungary
MT for Malta
NL for the Netherlands
AT for Austria
PL for Poland
PT for Portugal
SI for Slovenia
SK for Slovakia
FI for Finland
SE for Sweden
UK for the United Kingdom

▼B**3. Year of harvesting**

The last two figures of the year of harvesting.

4. Identification of the consignment

The number given to the consignment by the certifying body (e.g. 12 B 77 170225)

▼B*ANNEX IV***MARKING OF PACKAGES**

The marking shall depend on the type of package:

- (a) Hop cones put up in bales or ballots:
 - printing on the package.
- (b) Hop powder in packets:
 - printing on the packet.
- (c) Hop powder or hop extract in metal tins:
 - printing on the box or stamping into the metal.
- (d) A sealed package containing a consignment of packets or boxes of powder or extract:
 - printing on the sealed package ► **M7** and on each packet or box of powder or extract in the sealed package ◀.

▼ **M8**

ANNEX V

Substances permitted in the standardization of hop extracts:

1. glucose syrups;
2. hot water extract prepared from hops.

▼ M9

ANNEX VI

ISOMERIZED HOP PRODUCTS ON, OR NEAR, MARKET — NOVEMBER 1992

Product	Process	Use
Isomerized pellets	Conventional Type 90 powder mixed with metallic oxide (usually magnesium), pelleted and subjected to slow, low temperature, warming up	In replacement of standard hop pellets in kettle, or as late addition in kettle
Extrudate (extruded hop powder)	Conventional powder mixed with metallic carbonates, oxides or hydroxides (or mixtures thereof), forced through an extrusion cooker (high pressure plus temperature for short period)	As for isomerized pellets
Stabilized pellets	As for isomerized pellets, but with no warming up	As for isomerized pellets
Isomerized kettle extracts (including PIKE, MIKE, IKE, IRE)	Generally conventional (usually CO ₂) extracts mixed with metallic oxides, hydroxides or carbonates (or mixtures thereof) and subjected to heating or pressure (or both). In some products, the metal ions and metallic salts are removed from the final mixture	In replacement of standard kettle extracts, or as late addition in kettle
Post-fermentation — isomerized extracts	Hop extracts purified and treated as above to give relatively pure isomerized alpha acid (generally in the form of alkali metal salts of isomerized alpha acids (usually potassium))	As final adjustment to beer bitterness levels, with no effect on other beer flavours
Post-fermentation — reduced isomerized extracts	Hop extracts purified, chemically reduced and treated as above to give relatively pure reduced isomerized products	For control of beer bitterness levels, protection against 'sunstruck' taints and enhancement of foam stability with no effect on other beer flavours