PAS 66

Official identification eartags for sheep and goats — Specification
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Foreword

This Publicly Available Specification, PAS 66, has been prepared by BSI to provide an interim specification for identification eartags for sheep and goats. It was sponsored by the Exotic Diseases Prevention and Control Division of DEFRA.

It has been developed in response to Council Regulation (EC) 21/2004 [1] which was adopted in December 2003. The requirement for the competent authority to approve eartags for sheep and goats comes into effect on 9 July 2005.

NOTE Attention is drawn to the International Committee for Animal Recording (ICAR), International Agreement on Recording Practices [2].

Acknowledgement is given to the following organizations and individuals that were consulted in the development of this specification:

- BSI Product Services;
- Department for Environment Food and Rural Affairs (DEFRA), Exotic Diseases Prevention and Control Division;
- Welsh Assembly Government (DEPC);
- Ritchey Tagg Ltd;
- Syntag;
- Dalton ID Systems Ltd;
- Keith Baker, veterinary advisor;
- BSI Technical Committee AW/90, Quality Systems for The Food Industry.

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In addition, attention is drawn to the Exotic Diseases Prevention and Control Division, DEFRA Regulation for Requirements for Identification Code Marking [3].

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 12, an inside back cover and a back cover.

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1 Scope
This PAS is not applicable to management tags or electronic components of eartags.
The security aspects considered are those concerned with tamper-evidence and safeguarding against a tag’s reusability, materials including plasticity, and printing processes including durability of print. Requirements for animal welfare considerations are also included.

2 Normative references
The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.
BS EN 20105-A02, ISO 105-A02, Textiles – Tests for colour fastness – Grey scale for assessing change in colour.

3 Terms and definitions
For the purposes of this PAS the following terms and definitions apply.
3.1 eartag
official permanent identification eartag, R tag or slaughter tag for a sheep or goat
3.2 R tag
red replacement eartag marked with the letter R in addition to the animal’s identification code
3.3 manufacturer
company that sells eartags and operates under the Great Britain Eartag Allocation System (ETAS)
3.4 newton (N)
force required to impart, to a mass of 1 kg, an acceleration of 1m/s²
4 General requirements

4.1 Materials

4.1.1 Eartags shall be manufactured from non-degradable materials for example thermoplastic elastomer, polyamides or metals.

4.1.2 The welfare of livestock shall be considered when selecting materials to be used in the construction of eartags (see 5.6).

4.2 Design and construction

4.2.1 The dimension of eartags shall be sufficient for the eartag to be visible from a distance when inserted and to accommodate the information specified in 6.1 in a manner that is easily readable.

4.2.2 Once sealed, the distance between the innermost faces of eartags shall not be less than 5 mm apart.

NOTE For guidance on the insertion of eartags into an animal’s ear see Annex A.

4.2.3 R tags shall be red in colour within the range 04 E 55 to 04 E 56 of BS 5252: 1976.

NOTE Attention is drawn to the DEFRA Regulation for Requirements for Identification Code Marking [3].

4.2.4 All other eartags shall be of a colour which cannot be mistaken for red, as agreed by the competent authority.

NOTE Attention is drawn to the DEFRA Code of Practice [4].

5 Performance requirements

5.1 Resistance to tampering

5.1.1 Resistance to tensile loading

When tested in accordance with Annex B, plastics eartags shall resist a minimum tensile load of 200 N.

NOTE Attention is drawn to the International Committee for Animal Recording (ICAR), International Agreement on Recording Practices [2].

5.1.2 Resistance to manipulation

When tested in accordance with Annex C it shall not be possible to unseal the eartag without visible evidence of tampering nor be possible to re-apply the eartag.

5.2 Resistance to low temperature impact

When tested in accordance with Annex D the material used in the main body of plastics eartags shall not split or crack.

NOTE 1 An unbroken dent of the impacted surface does not constitute failure.

NOTE 2 If the same composition of plastics material is used in the manufacture of more than one type of eartag, it is only necessary to conduct the test on one sample of the material.
5.3 Resistance to UV light

5.3.1 When tested in accordance with BS EN ISO 4892-3, the marking of plastics components of eartags shall remain legible after exposure to UV light. The exposure chamber shall be fitted with UVA 340 fluorescent tubes operating continuously for 1000 h at (50 ± 5) °C giving a cycle of 8 h UV and 4 h condensation darkness.

5.3.2 Plastics components of eartags shall meet the requirements of 5.2 after being tested in accordance with 5.3.1.

5.3.3 After artificial weathering the change in colour of R tags shall be less than delta E* of 10 CIELAB units, when measured in accordance with BS 3900-D10, or a grey scale change of less than 3 when measured in accordance with BS EN 20105 – A02.

5.4 Resistance to assembly

When tested in accordance with Annex E the plastics material used in the eartags shall not spilt, crack or deform on assembly.

5.5 Resistance to abrasion

When tested in accordance with Annex F none of the material samples of eartags shall exhibit any damage or change resulting from the test in comparison with the reference piece, e.g. erosion of the test surface or loss of legibility of any marking.

NOTE If the same composition of material is used in the manufacture of more than one type of eartag it is only necessary to conduct the test on one set of material samples.

5.6 Animal welfare

5.6.1 Eartags shall be non-harmful to the animal.

NOTE Attention is drawn to the DEFRA Welfare Assessment [5].

5.6.2 Eartags shall have smooth, rounded corners and no sharp edges or protrusions specifically on the shaft of the piercing pin.

NOTE The visible piercing point after fixing is not considered a protrusion.

5.6.3 Eartags shall be inserted with the manufacturer’s recommended applicator.

5.6.4 Manufacturers shall provide approved guidance on animal welfare, storage, application and intended use.

NOTE Attention is drawn to the DEFRA Code of Practice [4].
6 Information and marking

6.1 Information

6.1.1 Plastics type ear tags shall be permanently marked or embossed with the following information:

a) the number and date of this Publicly Available Specification, i.e. PAS 66:2005(1);

b) the name or trademark of the manufacturer, importer or distributor.

6.1.2 Metal ear tags shall be accompanied by a manufacturer’s declaration of conformity containing the following information:

a) the number and date of this Publicly Available Specification, i.e. PAS 66:2005;

b) the name or trademark of the manufacturer, importer or distributor;

c) the unique lifetime identification numbers of the ear tags forming the batch or production run.

6.2 Print size and colour

6.2.1 Characters used in the identification code marking shall be easily readable.

NOTE 1 Attention is drawn to the DEFRA Regulation for Requirements for Identification Code Marking [3].

NOTE 2 DEFRA recommends a minimum height of 5mm.

6.2.2 The identification code shall be printed in a single contrasting colour to the plastics base material upon which they are applied, or for metal ear tags marked with or without inks.

6.3 Durability and legibility of printed information

The printed identification code shall remain legible after being lightly rubbed by hand for 15 s with a piece of cloth soaked with water, again for 15 s with a piece of cloth soaked in petroleum spirit, and again for 15 s with a piece of cloth soaked in methyl ethyl ketone.

NOTE 1 Petroleum spirit is defined as the aliphatic solvent hexane with a content of aromatics of maximum 0.1 % volume, a kauri-butanol value of 29, initial boiling point of 65 °C, a dry point of 69 °C and a specific gravity 0.68 kg/l.

NOTE 2 Methyl ethyl ketone also known as butanone is a colourless, flammable ketone, CH₃COCH₂CH₃, used in lacquers, paint removers, cements and adhesives, cleaning fluids and celluloid.

6.4 Security of printed information

Identification codes shall be printed or, for metal ear tags, marked with or without inks in such a manner that they cannot be defaced or have their form altered without leaving evidence.

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(1) Marking PAS 66:2005 on or in relation to a product represents a manufacturer’s declaration of conformity, i.e. a claim by or on behalf of the manufacturer that the product meets the requirements of the standard. The accuracy of the claim is solely the claimant’s responsibility. Such a declaration is not to be confused with third-party certification of conformity.
Annex A (informative)
Applicators and insertion of eartags

A.1 For insertion of the eartag a single-action applicator should be used, whereby the eartag itself pierces the ear. The applicator should not utilize double penetration or “dagger” type techniques.

A.2 To minimize distress upon insertion of the eartag, the piercing angle of the sharp tip of the eartag should not be greater than 60° (Figure A.1).

NOTE The “piercing angle” is twice the angle that the sharpened end or the part of the piercing point makes with the centre line of insertion.

A.3 The design and use of applicators should minimize the risk of pain and distress to the animal, safeguard the animal and operator from danger and guard against the spread of disease and risk of infection. Antibacterial coatings may be incorporated into the applicator to reduce the risk of infection.

NOTE Eartag applicators should be used by competent operators. Sheep and goats should be handled quietly but firmly at all times so as to avoid unnecessary pain or distress to the animal.

A.4 Applicators should provide positive feedback to the operator on correct tag closure and should incorporate a mechanism that allows the speedy and automatic release of the eartag from the ear, in order to protect the ear from tearing.

A.5 Applicators should be designed so as not to allow incomplete union, lateral misalignment or oblique sealing of the eartag.

A.6 The eartag should be located such that it is visible at a distance.

Figure A.1 — Piercing angle of the sharp tip of an identification eartag
Annex B (normative)
Method of test for tensile strength of eartags

B.1 Principle

The eartag is affixed to a test jig simulating its application in service and attempts are made to remove the eartag forcibly by pulling it.

B.2 Test conditions

Carry out all tests at a temperature of (20 ± 5) °C and ambient humidity.

B.3 Apparatus

B.3.1 Test jig, for the support of an eartag under test, simulating, where possible, a relevant service application and allowing the application of measurable tensile forces to the eartag.

B.3.2 Tensile test machine, operating with a jaw separation rate of (500 ± 25) mm/min, and capable of generating loads of up to 1000 N.

B.4 Preparation of test specimens

Seal three eartags using the manufacturer’s recommended applicator. Condition the assembled eartags for a minimum of 1 h at (20 ± 5) °C.

B.5 Test procedure

B.5.1 General

Carry out the tensile test set out in B.5.2 on each of the three conditioned eartags in turn.

B.5.2 Tensile test

Determine the minimum diameter of the shank of the eartag. Affix one of the conditioned eartags (B.4) to the test jig (B.3.1). Apply an increasing load (B.3.2) to any relevant point of the eartag, in any appropriate direction. Record the maximum load and the effect(s) of the tensile force on the appearance and/or efficacy of the eartag.

NOTE Apply the load from a different direction for each sample tested.
Annex C (normative)
Method of test for resistance to manipulation

C.1 Principle
The eartag is tested to ensure that there is no inherent vulnerability in its design that would permit the disengagement of the sealing mechanism without leaving visible evidence of tampering on either of the parts.

C.2 Apparatus

C.2.1 Pair of hand-held adjustable grips.

C.2.2 Pair of pliers.

C.2.3 Slotted plate with screwed extractor.

C.2.4 Hot air gun, capable of heating to (80 ± 5) °C.

C.3 Preparation of test specimens

C.3.1 Using the manufacturer’s recommended applicator, seal four eartags. Number the samples 1 to 4 inclusive.

C.3.2 Apply the hot air gun to samples Nos. 1 and 2 at a working distance of (250 ± 5) mm from the joint assembly at (80 ± 5) °C, for (2 ± 0.1) min. Do not apply the hot air gun to samples Nos. 3 and 4.

C.4 Test procedure

C.4.1 Conduct the test described in C.4.2 in accordance with the following:
   a) conduct the test on samples Nos. 1 and 3 using the pair of hand-held adjustable grips and the pair of pliers;
   b) conduct the test on samples Nos. 2 and 4 using the slotted plate with screwed extractor.

C.4.2 Attempt various methods of manipulation. No one technique shall be used for more than 1 min. At the end of each attempt, examine the sample for visible evidence of tampering compared to a reference sample and record any incurred marking, indentation or elongation of parts and whether or not disengagement of eartag parts resulted.
Annex D (normative)
Method of test for resistance to impact at low temperature

D.1 Principle
A sample of plastics material taken from a weathered eartag or stock material is conditioned at low temperature and impacted by a specified impactor from a given height.

D.2 Apparatus
D.2.1 Falling weight impact machine, having the following features.
D.2.1.1 Rigid base.
D.2.1.2 Rigid specimen support plate.
D.2.1.3 Rigid superstructure, incorporating a vertical low friction means of guiding the striker (e.g. a vertical tube).
D.2.1.4 Sponge, closed cell and expanded having a thickness of (30 ± 5) mm when uncompressed and a density of (538 ± 22) kg/m$^3$.
D.2.1.5 (17.5 ± 1) mm diameter hardened metallic hemispherical striker, free from flats and other imperfections, with a total mass of (1 ± 0.1) kg.
D.2.1.6 Means of ensuring that the striker can strike the specimen at the centre of a suitable face.

D.3 Preparation of test specimens
Prepare a test specimen of plastics type that has been weathered in accordance with 5.3.1 with minimum dimensions of 40 mm length and the width of the eartag.

D.4 Test procedure
Condition the test specimen for a minimum of 60 min at ($−5 ± 2$) °C and within 20 s of removing the test specimen from the conditioning atmosphere test the specimen as follows:
Place the test specimen on the sponge (D.2.1.4) with the weathered face downward and drop the striker (D.2.1.5) onto it from a height of (300 ± 5) mm.
Remove the test specimen from the machine and examine it visually and record any damage.
Annex E (normative)
Method of test for assembly

E.1 Principle
Eartags are assembled at various temperatures to ensure there is no cracking or deformation that could affect their performance.

E.2 Preparation of test specimens

E.2.1 Condition three eartags and a suitable applicator for a minimum of 60 min at (-5 ± 2) °C.

E.2.2 Condition a further three eartags fully submerged in a container of water for a minimum of 60 min in a chamber at (30 ± 2) °C.

E.3 Test procedure
Assemble each test specimen (E.2.1 and E.2.2) in accordance with the manufacturer’s instructions within 1 min of removing it from the conditioning environment. Visually inspect each test specimen for splitting or cracking and record any changes or damages.
Annex F (normative)
Method of test for abrasion resistance

F.1 Principle
A test specimen, cut from an eartag or from stock material, is secured to a rubbing head and is mechanically rubbed horizontally over an abrasive pad. The test specimen is then examined for damage.

F.2 Apparatus and materials

F.2.1 Abrasive pad, consisting of a random nylon web impregnated with phenolic resin and aluminium oxide (150 ± 5) mm long × (100 ± 5) mm wide × (5 ± 1) mm thick.

F.2.2 Distilled or demineralized water.

F.2.3 Skin graded iodine based disinfectant.

F.2.4 Base machine, see Figure F.1. The base machine shall include the following characteristics.

a) A flat plate mounted in the horizontal plane with a framework for clamping an abrasive pad.

b) A motor driven arm to which a rubbing head is pivoted.

NOTE The machine has an automatic stop mechanism that may be pre-set to stop the arm on completion of the required number of cycles.

c) The arm reciprocates the rubbing head on a straight course along the length of the abrasive pad with approximate sinusoidal motion.

NOTE The nominal length of the stroke of the arm is 100 mm and it may be set to reciprocate at a speed of (30 ± 3) cycles/min.

d) The rubbing head is attached to the arm by a parallelogram linkage to allow free vertical movement of the head whilst maintaining its working surface in a horizontal plane. There is negligible play or friction between the head and the arm.

F.2.5 Rubbing head, fitted with clamps to secure a test specimen to its bottom face. The total mass of the head with the test specimen attached shall be (600 ± 10) g.

F.3 Preparation of test specimens
Cut three test specimens and a reference specimen, each (50 ± 1) mm × (25 ± 1) mm or equivalent area if made from a number of pieces cut from actual eartags.

F.4 Test procedure
Maintain the atmosphere of the test room at (20 ± 5) °C.

Set the base machine (F.2.4) to operate at (30 ± 3) cycles/min and to stop when 40 cycles have been completed.

Clamp a test specimen to the rubbing head (F.2.5) so that its lower face is in contact with the abrasive pad. Pour approximately 20 ml of distilled or demineralized water onto the abrasive pad. Lower the rubbing head into position and immediately start the machine.
On completion of the cycles remove the test specimen from the rubbing head, and rinse and dry the piece.

Repeat this procedure using the other two test specimens. Examine the test specimens in accordance with F.5.

Repeat this procedure using similar quantities of the disinfectant on a further three samples. Examine the test specimens in accordance with F.5.

Repeat this procedure using similar quantities of methyl ethyl ketone on a further three samples. Examine the test specimens in accordance with F.5.

F.5 Assessment

Compare each test specimen, tested in accordance with F.4, with the reference piece by viewing with normal or corrected vision, from a distance of 1 m, the surfaces illuminated by north sky light in the northern hemisphere, or south sky light in the southern hemisphere. The light shall be incident upon the surfaces at an angle of $(45 \pm 5) ^{\circ}$ and the direction of viewing shall be approximately along the perpendicular to the plane of the surface. Record any damage or change in legibility.
Bibliography


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2) Available from http://www.ojec.com
3) For DEFRA publications call the DEFRA helpline 08459 335 577 or email helpline@defra.gsi.gov.uk