PAS 44:2014

BSI Standards Publication

# Official identification eartags for cattle – Specification

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## Publication history

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# Contents



**Summary of pages**
This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 14, an inside back cover and a back cover.

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# Foreword

This PAS was developed by the Rural Payments Agency (RPA) and sponsored by the Department for Environment, Food and Rural Affairs (Defra). Its development was facilitated by the BSI Standards and it was published under the licence from The British Standards Institution. It came into effect on 30 April 2014.

*NOTE Attention is also drawn to Commission Regulation (EC) No. 911/2004 [1] and the Cattle Identification Regulations [3].*

Acknowledgement is given to the following organizations that were involved in the development of this PAS as members of the steering group:

- ALIDMA
- Dalton ID Limited
- Department for Environment, Food and Rural Affairs (Defra)
- Department of Agriculture and Rural Development Northern Ireland (DARDNI)
- Ritchey Limited
- Rural Payments Agency (RPA)
- Scottish Government
- Welsh Government
- Co-opted

Acknowledgement is also given to members of a wider review panel who were consulted in the development of this PAS.



This PAS is not to be regarded as a British Standard. It will be withdrawn upon publication of its content in, or as, a British Standard.

The PAS process enables a specification to be rapidly developed in order to fulfil an immediate need in industry. A PAS can be considered for further development as a British Standard, or constitute part of the UK input into the development of a European or International Standard.

## Supersession

This PAS supersedes PAS 44:2009, which is withdrawn.

## Relationship with other publications

This PAS is issued as part of a series of PAS for eartags which includes:

- PAS 66:2014, Official identification eartags for sheep and goats – Specification

## Use of this document

It has been assumed in the preparation of this PAS that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

This PAS represents cattle eartags which have been tested to PAS 44:2014. Eartags approved only to the 2002 version of the PAS will not be eligible for sale as eartags approved under this PAS from 1 July 2014. Eartags approved to the 2009 version will

continue to be approved due to there not being any changes to the performance requirements in this PAS. Products approved to the 2009 version should be reapproved by 1 April 2015.

This specification is not intended to restrict new developments in design and materials providing they meet the minimum requirements laid down in this PAS.

### Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is "shall".

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element. The word "should" is used to express recommendations, the word "may" is used to express permissibility and the word "can" is used to express possibility, e.g. a consequence of an action or an event.

Spelling conforms to The Shorter Oxford English Dictionary. If a word has more than one spelling, the first spelling in the dictionary is used.

### Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

**Compliance with a PAS cannot confer immunity from legal obligations.**

# 1 Scope

This PAS specifies requirements for the performance and testing of eartags used for the official identification of cattle.

This PAS is not applicable to management tags or electronic components of eartags.

The security aspects considered are those concerned with durability, tamper-evidence and safeguarding against a tag's reusability, materials including plasticity, welfare standards and printing processes including durability of print.

# 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 3900-D10, ISO 7724-3, *Methods of test for paints – Part 3: Determination of colour and colour difference: calculation*

BS EN ISO 4892-3, *Plastics – Methods of exposure to laboratory light sources – Part 3: Fluorescent UV lamps*

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 primary identification eartag**
flag type tag of a specified minimum size and colour, for which minimum size of characters are also specified, whose fitting, to either of a bovine's ears, is compulsory within certain specified time-scales

*NOTE Attention is drawn to Article 3 of Commission Regulation (EC) No. 911/2004 [1] and EU Parliament & Council Regulation (EC) No 1760/2000 [2].*

**3.2 secondary identification eartag**
tag whose fitting, to the other ear to which the primary identification eartag is fitted, is compulsory within certain specified time-scales

*NOTE 1 The secondary identification eartag may be of a range of materials, models and sizes.*

*NOTE 2 The secondary identification eartag may be the same design as the primary identification eartag or an approved alternative as covered under Article 4 of Commission Regulation (EC) No. 911/2004 [1]. The eartag may be a one-piece metal tag, or two-piece plastic tag of flag or button design.*

*NOTE* 3 *In Northern Ireland the secondary tag should be a two-piece plastic tag of flag or button design.*

**3.3 plastic type tag**
tag with flag parts made out of a plastic material, but which may have metal inserts or tips

**3.4 check digit**
digit that allows computer systems to check whether official animal identities have been correctly entered

**3.5 male part**
part of the identification eartag adapted to penetrate the ear of the animal, to fill a corresponding female part of the eartag and to provide a permanent connection between the two halves of the eartag

**3.6 female part**
part of the identification eartag hollowed or moulded to receive a corresponding male part

**3.7 oblique sealing**
sealing whereby the male part of the identification eartag has not been inserted at right angles into the female part

**3.8 flag type**
plastic identification eartag that resembles in shape a flag or a leaf

*NOTE A flag type is also known as a "leaf type".*

**3.9 button**
one of the round parts of a plastic identification eartag that resembles in appearance a button

**3.10 dagger type applicator**
applicator resembling in style a dagger or hunting knife

**3.11 newton (N)**
force required to impart, to a mass of 1 kg, an acceleration of 1 $m/s^2$

*NOTE Newton is equal to 0.2248 pounds force.*

# 4 General requirements

## 4.1 Materials

**4.1.1** Primary identification eartags shall be plastic type tags.

**4.1.2** Secondary identification eartags shall be either plastic type tags or produced from metal.

**4.1.3** The welfare of livestock shall be considered when selecting materials to be used in the construction of identification eartags.

## 4.2 Design and construction

**4.2.1** Primary identification eartags and plastic type secondary identification eartags shall consist of two parts, a male part and a female part.

*NOTE 1 Welfare considerations should be taken into account whilst designing and constructing the male part, so as to minimize trauma and distress to the animal upon insertion of the identification eartag into the ear. It is recognized that the eartag should be inserted according the manufacturer's instructions.*

*NOTE 2 Transponders may not be part of primary tags.*

**4.2.2** Secondary identification eartags shall be one-piece metal, two-piece plastic, flag or button type tags.

*NOTE Transponders may be part of secondary tags but they are not tested under this PAS.*

**4.2.3** The nominal size of the major dimensions of the parts of primary identification eartags shall be the same.

**4.2.4** Once sealed, the distance between the innermost faces of male and female parts shall be not less than 7 mm.

*NOTE For guidance on the insertion of identification eartags into the animal's ear see Annex A.*

**4.2.5** The colour of primary identification eartags shall be yellow.

*NOTE 1 10 E 55 of BS 5252F:1976 is recommended.*

*NOTE 2 Secondary identification eartags may be any single colour, except in Northern Ireland where all secondary identification eartags should be yellow.*

**4.2.6** The edges and corners of identification eartags shall be rounded so as not to injure livestock.

*NOTE The design of open end female leaves of identification eartags should allow for displaced tissue to fall away freely once the eartags are sealed.*

### 4.3 Dimensions

Primary identification eartag leaves shall be a minimum of 45 mm long and a minimum of 55 mm wide.

*NOTE There is no minimum length or width for secondary identification eartag leaves, although the eartag should be of a size to accommodate the information specified in **6.1**.*

## 5 Performance requirements

### 5.1 General

Fifty yellow plastic, or metal, identification eartags shall be supplied from which samples will be selected at random and shall meet the requirements specified in **5.2** to **5.6**.

*NOTE 1 Yellow eartags are deemed to be representative of a manufacturer's range and the most commonly used colour.*

*NOTE 2 Within Great Britain BCMS will monitor through the Ear Tag Allocation System (ETAS, see **6.1.1**) the performance of each approved tag on behalf of the competent authority. Where the performance of a tag gives cause for concern, the manufacturer/supplier will be notified and the tag's official approval may be withdrawn.*

*NOTE 3 Within Northern Ireland DARD will monitor the performance of manufacturers, suppliers and their products. Where performance gives cause for concern, the manufacturer/supplier will be notified and the official approval of their tags may be withdrawn.*

### 5.2 Resistance to artificial weathering

**5.2.1** Identification eartags shall be tested in accordance with BS EN ISO 4892-3 using an exposure chamber fitted with UVA 340 fluorescent tubes, operating continuously for 1 000 h at (50 ± 5) °C and a cycle of 8 h UV and 4 h condensation darkness. The irradiance level of the lamps shall be 0.83 W/m$^2$/nm. After exposure, plastics components shall exhibit no detrimental effect to UV light by testing in accordance with **5.3** to **5.6** and the mark shall remain legible.

**5.2.2** After artificial weathering the change in colour of the yellow eartags shall be less than delta E* of 30 CIELAB units, when measured in accordance with BS 3900-D10, or a grey scale change of less than 1 when measured in accordance with BS EN 20105-A02.

### 5.3 Resistance to tensile loading

When tested in accordance with Annex B, both before and after **5.2.1**, identification eartags shall resist a tensile load of 280 N.

### 5.4 Resistance to tampering

When tested in accordance with Annex C, both before and after **5.2.1**, it shall neither be possible to unseal the eartag without visible evidence of tampering nor be possible to re-apply the eartag securely.

### 5.5 Resistance to low temperature impact

When tested in accordance with **5.2.1** followed by Annex D, the material used in the main body of plastic identification 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 plastic 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.*

### 5.6 Resistance to abrasion

When tested in accordance with **5.2.1** followed by Annex E, none of the material samples 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.*

## 6 Information and marking

### 6.1 Information

**6.1.1** Both parts of primary identification eartags and secondary identification eartags shall be marked with the following information:

a) the logo of the competent authority which allocated the eartag, i.e. the crown insignia or the *DARDNI* logo;

b) for tags supplied in GB: the letters "UK", followed by the unique lifetime identification number consisting of a six digit herd number, followed by a six digit animal code, comprising a single check digit and a five digit animal number;

*NOTE 1 The check digit does not form a part of the official identification code.*

*NOTE 2 Where barcodes are printed on eartags, attention is drawn to the informative Annex F.*

*NOTE 3 Suppliers of official identification eartags for cattle are required to have the requisite computer hardware to enable them to be linked to the Ear Tag Allocation System (ETAS) and to abide by the rules of ETAS. ETAS is a central database for the allocation to manufacturers of unique lifetime identification numbers for identification eartags for cattle, used to ensure full traceability of* cattle. It is therefore essential that data supplied by suppliers is as accurate as possible; in serious cases poor quality information may lead to the manufacturer and/or supplier being de-listed and blocked from ETAS. ETAS is operated by the British Cattle Movement Service (BCMS), Curwen Road, Workington, Cumbria, CA14 2DD, Tel. 0845 050 1234. For more information email ETAS.sectionBCMS@ RPA.gsi.gov.uk.

for tags supplied in NI: the letters "UK" followed by the unique lifetime identification number consisting of the digit "9" followed by the herd number (3 to 6 digits in length), the individual animal code (1 to 4 digits in length) and a check digit (1 digit in length), each number group separated from the previous group by a space.

*NOTE 1 In NI the check digit does form part of the official identification number.*

*NOTE 2 NI suppliers of official identification eartags should not manufacture or supply tags unless they have been authorized by DARD. Enquiries regarding eartag authorization should be directed to DARD Implementation Support Unit, Veterinary Service, Upper Newtownards Road, Belfast, BT4 3SB, Tel. 0300 200 7840.*

**6.1.2** Plastic type identification eartags shall be permanently marked or embossed on the inner face with the name or trademark of the manufacturer, importer or distributor and with the number of this PAS, i.e. PAS 44.

*NOTE 1 This information should be marked on one leaf only of the identification eartag if the two parts carry the matching animal unique lifetime identification number.*

*NOTE 2 Secondary identification eartags may, in addition to the above information, contain management information, inscribed into a space left clear for that purpose on the leaf incorporating the female part of two-part identification eartags.*

*NOTE 3 Indication of the year of this PAS should appear in the manufacturer's or supplier's supporting documentation.*

**6.1.3** Metallic identification eartags shall be accompanied by a manufacturer's declaration of conformity containing the following information:

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

b) the unique lifetime identification numbers of the eartags forming the batch or production run.

## 6.2 Print size and colour

**6.2.1** For all identification eartags, none of the official information specified in **6.1.1** shall be less than 5 mm in height.

**6.2.2** The information specified in **6.1.1** shall be printed in a single contrasting colour to the plastic base material upon which they are applied or, for metal eartags, impressed without inks.

*NOTE PAS 44 does not impose any specific restrictions on material to be used in the production of metallic secondary identification tags. However, the tag should remain legible for the lifetime of the animal. Consequently, the manufacturer should be mindful of the performance of such materials over time, particularly with regard to wear and weathering, when determining the appropriate depth of lettering to be applied. Should a secondary metal tag type be shown to be insufficiently proof against abrasion or weathering over the life of the animal, the competent authorities may remove the tag from the list of PAS 44 approved tags.*

## 6.3 Durability and legibility of printed information

The printed character and numeric information codes and logo (see **6.1**) shall remain legible after being lightly rubbed by hand for 15 s with a piece of cloth soaked with water and again for 15 s with a piece of cloth soaked in petroleum spirit.

*NOTE 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 of 0.68 kg/l.*

### 6.4 Security of printed information

Character and numeric information codes and the logo (see **6.1**) shall be printed or, for metal eartags, impressed without inks, in such a manner that they cannot be defaced or have their form altered without leaving evidence.

# Annex A (informative) Applicators and insertion of eartags

**A.1** For insertion of the identification 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 male tip of the identification eartag should not be greater than 60° (see Figure A.1).

*NOTE The "piercing angle" is twice the angle that the sharpened end or point of the male part 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.

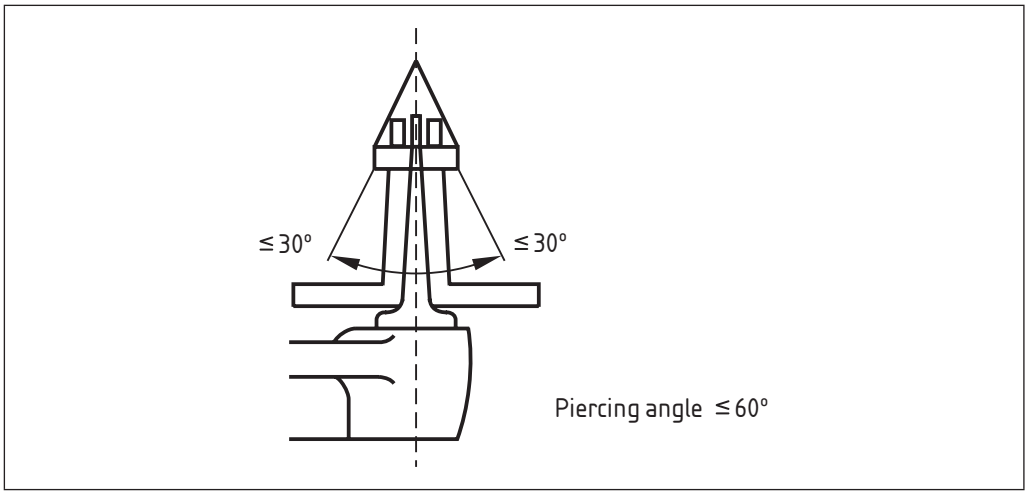
*NOTE Eartag applicators should be used by competent operators who should clean and disinfect the applicator at regular intervals. Cattle should be handled quietly but firmly at all times so as to avoid unnecessary pain or distress to the animal.*

**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 identification 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 male and female parts of the identification eartag.

**A.6** Applicators should be clearly marked with the tag manufacturer's name and the packaging or instructions should indicate the tags with which they can be used.

Figure A.1 **Piercing angle of the male 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 in both shear and axial directions.

**B.3.2** *Tensile test machine class 1*, operating at a jaw separation rate of (500 ± 25) mm/min, and capable of generating loads of up to 1 000 N.

### B.4 Preparation of test specimens

Seal three eartags using the manufacturer's recommended applicator. Condition the assembled eartags for a minimum of 16 h at (–23 ± 2) °C followed by 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

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 tampering

### C.1 Principle

The identification eartag is tested to ensure that there is no inherent vulnerability in its design that would permit the disengagement of the male part from the female part without leaving visible evidence of tampering on either of the parts.

### C.2 Apparatus

**C.2.1** *Pair of hand-held adjustable grips (e.g. pipe pliers or mole 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 identification 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 resistance to impact at low temperature

### D.1 Principle

A sample of plastics material taken from a weathered eartag 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 (500 ± 50) kg/m$^3$.

**D.2.1.5** *(17.5 ± 1) mm diameter hardened or high tensile steel 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 from each type of plastics tag that has been weathered in accordance with **5.2.2**.

### D.4 Test procedure

Condition the test specimen for a minimum of 60 min at (–23 ± 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 abrasion resistance

## E.1 Principle

A test specimen, cut from an eartag with marking, is secured to a rubbing head and is mechanically rubbed horizontally over an abrasive pad. The test piece is then examined for damage and loss of legibility of marking.

## E.2 Apparatus and materials

**E.2.1** *Abrasive pad*, consisting of a random nylon web impregnated with phenolic resin and aluminium oxide nominally 150 mm long × 100 mm wide × 5 mm thick.

*NOTE 3M "Scotchbrite" CF-HP (red) is a suitable product.*[1)]

**E.2.2** *Distilled or demineralized water.*

**E.2.3** *Skin graded iodine based disinfectant.*

**E.2.4** *Methyl ethyl ketone (MEK).*

**E.2.5** *Base machine*, see Figure E.1. The base machine shall include the following characteristics.

a) A flat glass platen 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.*

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.

**E.2.6** *Rubbing head*, fitted with clamps to secure a test specimens to its bottom face. The total mass of the head with the test specimens attached shall be (600 ± 10) g.

## E.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 with markings.

## E.4 Test procedure

Maintain the atmosphere of the test room at (+20 ± 5) °C.

Set the base machine (**E.2.5**) to operate at (30 ± 3) cycles/min and to stop when 40 cycles have been completed.

Clamp a test specimen to the rubbing head (**E.2.6**) so that its lower face with markings 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.

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1) 3M Scotchbrite is a trademark owned by 3M and is an example of a suitable product available commercially. This information is given for the convenience of users of this standard and does not constitute an endorsement by BSI of this product.

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 using a new piece of abrasive pad for each test. Examine the test specimens in accordance with **E.5**.

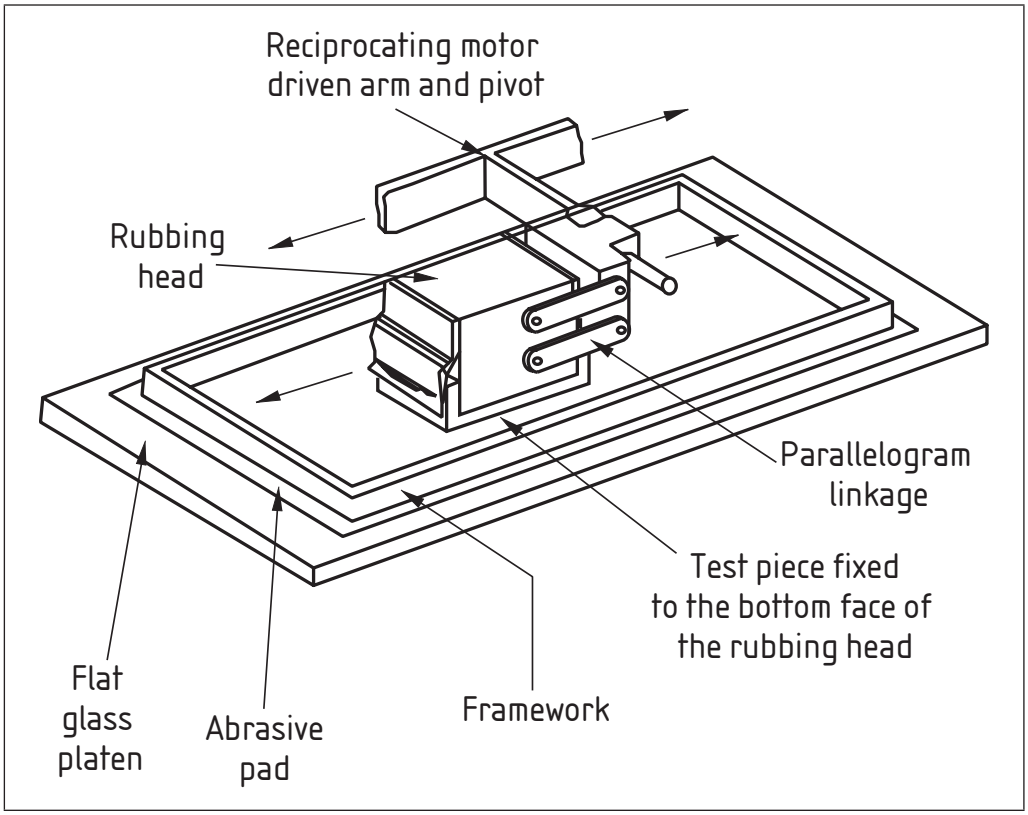
Repeat this procedure using similar quantities of disinfectant on a further three samples. Examine the test specimens in accordance with **E.5**.

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

### E.5 Assessment

Compare each test specimen, tested in accordance with **E.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 ± 5)° and the direction of viewing shall be approximately along the perpendicular to the plane of the surface. Record any damage or change in legibility.

Figure E.1 **Base machine**




## Annex F (informative) Protocols for the evaluation of barcodes (machine) readability and content

### F.1 General

*NOTE Barcodes are not a requirement of the competent authority. Consequently there is no provision within PAS 44 for their testing, neither is it intended that this informative annex provides exhaustive guidance on what would constitute an*

*acceptable barcode in terms of code, type or content. This is a matter for agreement between producer and buyer who, in the case of animals destined for export, will presumably have knowledge of the particular needs of the importer. Requirements may well vary between importers.*

When adding barcodes to a PAS 44 approved tag, the manufacturer should ensure that the addition of the barcode does not compromise those elements of the tag tested under this PAS and required by the competent authority.

Barcodes should be printed to a sufficient height and length and with a sufficient quiet zone to render them readable both before and after subjection to normal "wear and tear", as stated in Table F.1.

Table F.1 **Dimensions**

| Data | Measurements |
|---|---|
| Height | 8 mm |
| Quiet zone before & after | 4 mm |
| Length | 51 mm |

*NOTE It is suggested that barcodes are printed to the same standard as those elements of the printing required by the competent authority, as these will have been tested under this PAS for legibility and resistance to degradation and wear and tear.*

If the barcode is to include the animal identifier, it should be in the format given in Table F.2.

The linear barcode should be printed to code 128 in accordance with the relevant authorities in the majority EU countries.

Table F.2 **Content**

| Data | Number of characters |
|---|---|
| Country code | See [A)] |
| Herd number | 6 |
| Check number | 1 |
| Animal number | 5 |

[A)] The requestor may specify an all-numeric or an alpha-numeric country identifier. In the case of an all-numeric identifier, the BS EN ISO 3166-1 country code 826 should be used.

If the manufacturer chooses to test the barcode print quality, the description given in Table F.3 of an accepted testing regime may be of benefit.

After having been subjected to various treatments, linear barcode eartags should be assessed for print quality using the appropriate software. After various treatments, the data given in Table F.3 should be met.

Table F.3 **Principle**

| Characteristics | Standard |
|---|---|
| Dimension of data | P |
| Print contrast signal | 60 or above |
| Message format | P |

*NOTE The print contrast signal (PCS) for linear barcodes, is a traditional comparison of bar and space reflectance. It is measured as the ratio of the difference of space and bar*

*reflectance to space reflectance, or PCS = [R(L) – R(D)] / R(L), i.e. print contrast signal = (background reflectance – bar reflectance)/background reflectance, where PCS is print contrast signal, R is Reflectance, L is light and D is dark. The PCS grade is "pass" when PCS is at or above 60%; or else the grade is "fail".*

The protocol for the evaluation of scanning performance is as given in **F.1.1** to **F.1.5**.

**F.1.1** The tags subjected to various treatments should be scanned with the reader supplied by the tag manufacturer.

**F.1.2** Each tag from each treatment should be scanned a minimum of 100 times to give a minimum number of readings of 1 000 readings per treatment.

**F.1.3** The tags from a treatment should be scanned in sequence and after the initial tag is successfully read or scanned a maximum of four times, the second tag should be scanned until successfully read, or scanned a maximum of four times. This procedure should be repeated for each tag in the treatment group and after the last tag is scanned; the scanning recommenced (Run 2) with the first tag.

*NOTE A total of 100 runs are needed to obtain sufficient data to assess performance.*

**F.1.4** The number of scans required to successfully read each tag (e.g. one, two, three or four) in each run should be recorded.

**F.1.5** Data should be tabulated so that the percentage of tags, from each treatment group, is successfully read after the first scan, the first and second scan combined, a total of the first three scans, as shown in Table F.4.

*NOTE The scanning performance achieved for each treatment would be described in the report on the performance of a tag under laboratory conditions.*

Table F.4 **The performance of the tag assessed against the minimum performance standards**

| **Preferred performance to be achieved at scanning** | |
|---|---|
| **Scan** | **Tags successfully read %** |
| First | 95 |
| First and second | 98 |
| First, second and third | 99.7 |

# Bibliography

## Standards publications

For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 5252F:1976, *Framework for colour co-ordination for building purposes*

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## Other publications

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[3] Cattle Identification Regulations (England, Scotland & Wales as amended). London: The Stationery Office.

- England: The Cattle Identification Regulations 2007 (SI No 529) (as amended)
- Northern Ireland: The Cattle Identification (No 2) Regulations (Northern Ireland) 1998 (as amended)
- Scotland: The Cattle Identification (Scotland) Regulations 2007 (SI No 174) (as amended)
- Wales: The Cattle Identification (Wales) Regulations 2007 (SI No 842 (W.74)) (as amended)

 

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