



THE GLOBAL STANDARD
FOR LIVESTOCK DATA

Appendix C3 of Section 10 of ICAR Guidelines - Preliminary Test for External RFID Devices

Draft for Board approval

Preliminary Test for External RFID Devices

Version ~~February, 2018~~ June, 2021

Network. Guidelines. Certification.

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Change Summary

Date of Change	Nature of Change
August 2017	Changed the number of requested samples for the Preliminary Assessment from 120 ear tags +10 male components to 130 ear tags (section 1).
August 2017	Added the reference ‘or one of the tag parts’ (section 2.4).
August 2017	Removed the phrase ‘Broken or unfastened tags must not be re-usable’ and replaced with ‘None of the ear tags – neither male nor female part – must be re-usable. Male pin tips must break off and remain within the female caps (locking gap).’ Changed the execution of the axial and transverse tests at 55°C (+ 2°) from ‘immediately’ to ‘within 10 seconds’ after tags are removed from the heating/climatic chamber Added the requirement ‘At ambient conditions, axially tested tags designed to be used in pigs shall not break with the application of a force lower than 200 Newton.’ Removed the requirement ‘The number of tags unlocked without breakage or sustaining permanent damage during the transverse test is recorded, and broken or unfastened tags must not be re-usable’. (Sections 2.6.1 and 2.6.2).

Date of Change	Nature of Change
August 2017	Removed the phrase 'Broken or unfastened tags must not be re-usable' and replaced with 'None of the ear tags – neither male nor female part – must be re-usable. Male pin tips must break off and remain within the female caps (locking gap).'
	Added the requirement 'At ambient conditions, axially tested tags designed to be used in pigs shall not break with the application of a force lower than 200 Newton.'
	(Sections 2.6.1 and 2.6.2).
September 2017	Template added and styles applied.
October 2017	Version updated to October. Cross-references corrected. Updated heading numbering.
February 2018	On Saturday 10th February, changes approved by the ICAR General Assembly in Auckland, New Zealand.
<u>September 2020</u>	<u>Added 2.2 'Colour staining test'. Added recommended minimum distance range between male and female for cattle and sheep/goat in 2.4. Added 2.7 'How to bring samples into climatic chambers'.</u>
<u>June 2021</u>	<u>Minor edits. Added the requirement that 'ear tags be pre-conditioned for at least 2 hours before testing at the respective temperature. Testing has to follow within 10 seconds after getting the ear tag out of the chamber.' (Section 2.6)</u>

1 Manufacturer requirements

At the commencement of the Preliminary Assessment the manufacturer must deliver:

- a. A sample of 130 RFID devices programmed with the reference ID codes and the reference printing. The printing must be applied using the same technique and style as used (or intended to be used) in the commercially marketed devices. Note: Devices used in this phase are likely to be destroyed during testing.
- b. Two applicators or equivalent devices supplied for the application of devices to animals.

2 Testing Ear Tags

To assess the conformance of the RFID ear tags with the information given in the application form and to also detect any major failure e.g. electronic non-readability, damage of the tag at application, possible unlocking without deformation, inappropriate animal welfare design etc., the ear tags will be submitted to a Preliminary Assessment.

2.1 Ear tag design

RFID ear tags shall have smooth, rounded corners and no sharp edges or protrusions specifically on the shaft of the piercing pin. The following measurements will be taken:

- a. The weight of the complete locked ear tag.
- b. The dimensions of the front and rear plate (height, width and thickness).
- c. The pin (length and diameter).
- d. The entrance hole of the cap.

Values and observations potential impacting on animal welfare will be reported. [See Annex A. Applicators and insertion of ear tags.](#)

2.2 Colour staining test

The test consists in wiping the ear tags with white soft tissue. If colour is visible on the tissue, the test is a fail.

2.2.3 Electronic readability check

Every submitted RFID ear tag will be read with an ICAR approved handheld reader to ensure the reference ID codes transmitted meet the requirements outlined in section 4.5 of Procedure 5, Section 10 'Testing of External RFID Devices' (available [here](#)).

2.3.2.4 Locking mechanism checks

The primary purpose of these tests is to verify that the male to female locking mechanism, once correctly applied using the supplied applicator, cannot be subsequently dismantled in such a way that would allow the tag, or one of the tag parts, to be re-used. A locked ear tag should be tamperproof so tampering with the locked tag will render the tag unusable.

2.4.2.5 Application test

The application evaluation will be carried out using two groups of tags:

- a. **RFID ear tags classified as flag tags (extended front plates):**

- Group 1: 80 tags with the front and rear tag components locked together but without being inserted through ears
- Group 2: 40 tags applied and locked into ears obtained post slaughter

b. RFID ear tags not classified as flag tags:

- Group 1: 40 tags with the front and rear tag components locked together but without being inserted through ears
- Group 2: 40 tags applied and locked into ears obtained post slaughter

The performance level required for the submitted ear tags shall be:

- a. Successful locking of the front and rear tag components of all ear tags.
- b. No breakage of any tag component at locking.
- c. No deformation of any tag component after locking.
- d. No unlocking without breakage or irreparable damage to the ear tag.

The test centre will also check the rotation of the tag components on the locked tags. The following characterisation will be used:

- a. Tag components rotate freely.
- b. Tag components rotate but not freely.
- c. Tag components do not rotate.

The recommended minimum distance range between male and female should be 8-11 mm for sheep, and 10-12 mm for cattle. This is a recommendation and will not constitute a pass/fail criterion.

2.52.6 Resistance of the locking system

The ear tags must be pre-conditioned for at least 2 hours before testing at the respective temperature. Testing has to follow within 10 seconds after getting the ear tag out of the chamber.

2.5.12.6.1 Flag Tags

The 80 RFID ear tags of Group 1 will be divided into four sub-groups of 20 tags. Those four sub-groups will be subjected to increasing forces to determine the force required to cause breakage or unfastening of the ear tag. The forces will be applied at a speed rate of 500 mm/min. The force applied to cause breakage or unfastening of each ear tag will be recorded.

- a. Group 1: axial test at ambient conditions 21°C ($\pm 2^\circ$).
- b. Group 2: axial test at 55°C ($\pm 2^\circ$); the forces will be applied immediately after the tags are removed from the heating or climatic chamber.
- c. Group 3: transverse test at ambient conditions 21°C ($\pm 2^\circ$).
- d. Group 4: transverse test at 55 °C ($\pm 2^\circ$); the forces will be applied within 10 seconds after the tags are removed from the heating or climatic chamber.

Requirements

- a. None of the ear tags - neither male nor female part - must be re-usable. Male pin tips must break off and remain within the female caps (locking gap).
- b. At ambient conditions, axially tested tags designed to be used in cattle shall not break with the application of a force lower than 280 Newton.
- c. At ambient conditions, axially tested tags designed to be used in sheep and / or goats shall not break with the application of a force lower than 200 Newton.

- d. At ambient conditions, axially tested tags designed to be used in pigs shall not break with the application of a force lower than 200 Newton.

2.5.22.6.2 Ear tags not classified as flag tags

The ear tags must be pre-conditioned for at least 2 hours before testing at the respective temperature. Testing has to follow within 10 seconds after getting the ear tag out of the chamber.

The 40 RFID ear tags of Group 1 will be divided into two sub-groups of 20 tags. Those two sub-groups will be subjected to increasing forces to determine the force required to cause breakage or unfastening of the ear tag. The forces will be applied at a speed rate of 500 mm/min. The force applied to cause breakage or unfastening of each ear tag will be recorded.

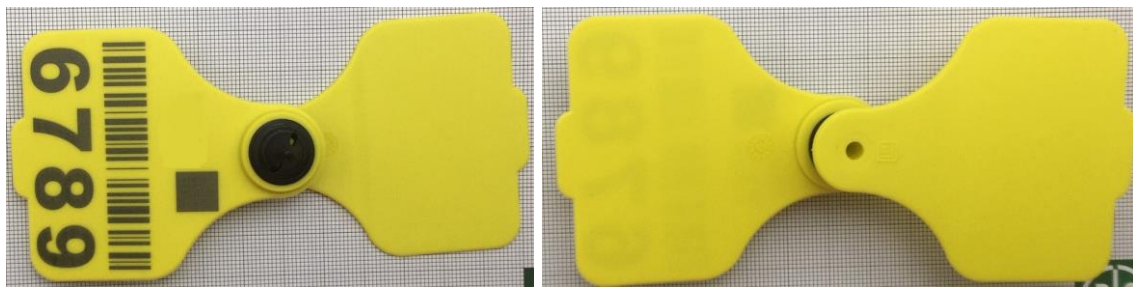
- a. Group 1: axial test at ambient conditions 21°C ($\pm 2^\circ$).
- b. Group 2: axial test at 55°C ($\pm 2^\circ$); the forces will be applied immediately after the tags are removed from the heating or climatic chamber.

Requirements

- a. None of the ear tags - neither male nor female part - must be re-usable. Male pin tips must break off and remain within the female caps (locking gap).
- b. At ambient conditions, axially tested tags designed to be used in cattle shall not break with the application of a force lower than 280 Newton.
- c. At ambient conditions, axially tested tags designed to be used in sheep and / or goats shall not break with the application of a force lower than 200 Newton.
- d. At ambient conditions, axially tested tags designed to be used in pigs shall not break with the application of a force lower than 200 Newton.

2.7 How to bring samples into climatic chambers

To avoid irradiation of the stem and pin, the samples must be closed with the applicator, then pulled apart and turned around so that male faces upwards and the female downwards, or vice versa. See pictures below:



3 Testing RFID leg tags

To assess conformance of the RFID leg tags with the information given in the application form and to also detect any major failure e.g. electronic non-readability, damage of the device at application, inappropriate animal welfare design etc., the leg tags will be submitted to a Preliminary Assessment.

3.1 Leg tag design

RFID leg tags shall have smooth, rounded corners and no sharp edges or protrusions. The following measurements will be taken:

- a. The weight of the leg tag
- b. The dimensions of the leg tag (length, width and thickness)
- c. The adjustable diameter

Values and observations potentially impacting on animal welfare will be reported.

3.2 Electronic readability check

Every submitted RFID leg tag will be read with an ICAR approved handheld reader to ensure the reference ID codes transmitted meet the requirements outlined in section 4.5 of Procedure 5, Section 10 ‘Testing of External RFID Devices’ (available [here](#)).

Annex A. Applicators and insertion of ear tags

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 who should clean and disinfect the applicator at regular intervals. Sheep and goats should be handled quietly but firmly at all times so as to avoid unnecessary pain or distress to the animal.

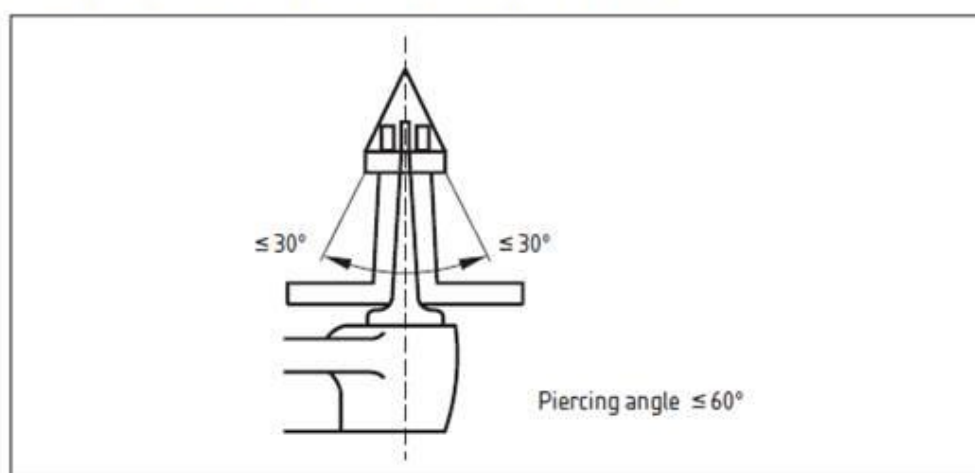
A.4 Applicators should provide positive feedback to the operator on correct tag closure and should incorporate a mechanism that allows the speedy and automatic release of the eartag from the ear, in order to protect the ear from tearing.

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.

A.7 Applicators should be clearly marked with the tag accredited distributors name and the packaging or instructions should indicate the tags with which they can be used.

Figure A.1 Piercing angle of the sharp tip of an identification eartag



Source: PAS 44:2019 'Official identification ear tags for cattle. Specification'