



THE GLOBAL STANDARD
FOR LIVESTOCK DATA

Section 10 - Appendix C3: Preliminary Test for External RFID Devices

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Network. Guidelines. Certification.

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Change Summary

Date of Change	Nature of Change
August 2017	Updated Sections 1, 5, 8.1 and 8.2
September 2017	Updated styles and format into uniform template
October 2017	Cross-references corrected.
February 2018	Changes approved by the ICAR General Assembly
September 2020	Added Section 3 Colour staining test. Added Section 8.3 Introduction of samples into the climatic chamber
June 2021	Updated Section 8
October 2022	Added Section 6 Pre-conditioning of tag applicator Updated Sections 2 and 3 Corrected grammatical errors Cross-references corrected
August 2024	Updated title page format

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 Ear tag design

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

- a. The dimensions of the front and rear plate (height, width and thickness).
- b. The pin (length and diameter).
- c. The entrance hole of the cap.
- d. The weight of the complete locked ear tag.
- e. The distance between the base of the pin and the base of the plate, i.e., the maximum possible distance between the inner side of the male and female components when the device is coupled, measured at the pin, with the two tag plates parallel with each other.

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

3 Colour staining test

This test detects the risk of potential colour staining resulting from inappropriate production processes with potential toxicity to humans and animals. The test will be done referencing ISO 105-X12. Grey scale will not be assessed but will be replaced by a visual inspection of colour staining on the cloths from the tag component under assessment. The colour staining test will be conducted on three randomly selected ear tags. If any colour residues specific to the colour of the tag material are seen on the cloth, then the ear tag has failed the preliminary assessment. The cloth used in this test will be compliant with ISO-105-F09 (Specification for Cotton Rubbing Cloth).

4 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](#)).

5 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 must be designed where neither the male nor female part can be re-usable. For one-piece (loop) tags, either the male pin or female locking cap must break such that the tag cannot be used. Tampering with a locked ear tag shall render the tag unusable.

6 Pre-conditioning of tag applicator

Devices requiring coupling for various testing procedures will be coupled in an environment of $21^{\circ}\text{C} \pm 2^{\circ}$ and a relative humidity (RH) of $50\% \pm 10\%$. Before coupling, the supplied applicator and the devices will be preconditioned to this environment for a minimum period of 24 hours.

7 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.

8 Resistance of the locking mechanism

The ear tags must be pre-conditioned for at least 2 hours before testing at the respective temperature. Testing must occur within 10 seconds after the ear tag is removed from the climatic chamber.

8.1 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 $21^{\circ}\text{C} (\pm 2^{\circ})$.
- b. Group 2: axial test at $55^{\circ}\text{C} (\pm 2^{\circ})$; 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.

8.2 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 must occur within 10 seconds after the ear tag is removed from the climatic 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.

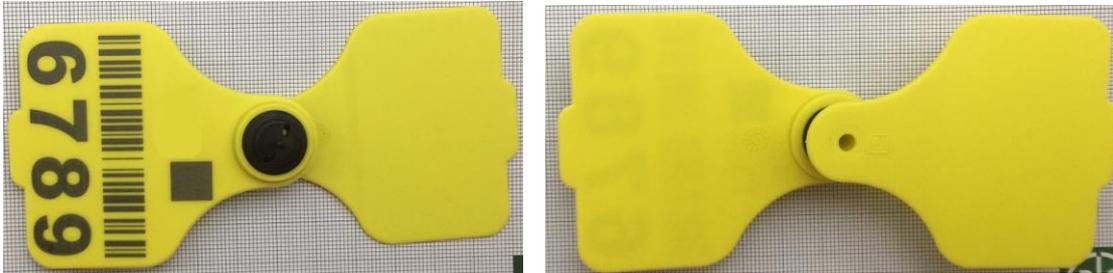
- a. Group 1: axial test at ambient conditions 21°C ($\pm 2^\circ$).
- b. Group 2: axial test at 55°C ($\pm 2^\circ$); the forces will be applied immediately after the tags are removed from the heating or climatic chamber.

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.

8.3 Introduction of samples into the climatic chamber

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:



9 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.

9.1 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.

9.2 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](#)).