



THE GLOBAL STANDARD
FOR LIVESTOCK DATA

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

Preliminary Test for External RFID Devices

Version February, 2018

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 2.3). |
| August 2017 | <p>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).’</p> <p>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</p> <p>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.’</p> <p>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’.</p> <p>(Sections 2.5.1 and 2.5.2).</p> |

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| 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 2.5.1 and 2.5.2). |
| 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. |

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.

2.2 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 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 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.

2.5 Resistance of the locking system

2.5.1 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.

2.5.2 Ear tags not classified as flag tags

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.

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](#)).