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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

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**Tyre attachment classification for radio frequency identification
(RFID) tyre tags**

轮胎用射频识别（RFID）电子标签应用分类
(English Translation)

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Table of Contents

Foreword...	3
1 Scope...	4
2 Normative references...	4
3 Terms and definitions...	4
4 Technical classification of RFID electronic tag applications...	5
5 Examples of identification marks...	8
Bibliography...	9

1 Scope

This document specifies the application of Radio Frequency Identification (RFID) electronic tags (hereinafter referred to as RFID tags) for tyres based on different technologies (embedded, patch, sticker), for users to understand their differences, goals, possible applications, and limitations.

This document includes.

- General requirements for each technology;
- Recommended identification labels for RFID tyres.

This document does not include.

- Reference materials for tyre quality and related testing projects;
- Detailed reference materials for implantation location;
- Detailed reference materials on the properties of mixed rubber compounds.

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.

ISO 20909, Radio frequency identification (RFID) tyre tags

3 Terms and definitions

For the purposes of this document, the terms and definitions defined in ISO 20909 as well as the followings apply.

3.1 RFID enabled tyre

Tyres with RFID tags installed by embedding, patching or sticking.

4.1.1 Embedding technology

Embedding technology enables RFID functionality to be used throughout the tyre life cycle, from tyre manufacturing, use, retreading, reuse, and scrapping.

Tyres are composites, made up of several different layers of materials and rubber compounds, so RFID tags can be implanted in any layer or between layers at any point in the manufacturing process. This shall be determined by the tyre manufacturer.

4.1.2.1 Overview

RFID tags are radio frequency identification devices. Their performance and functionality may be affected by the following factors (including but not limited to).

- The dielectric and conductive properties of the surrounding materials, leading to, for example.
- RFID tag detuning,
- radio transmission attenuation and/or shielding,
- induced current changes.

4.1.2.2 Location

Tyre manufacturers shall appropriately select the design, implantation location and orientation of the RFID electronic tag in the tyre to ensure that the performance requirements are met after conformance testing in accordance with ISO 20912.

Once the RFID tag is implanted in the tyre, it is no longer visible. It is recommended that the RFID enabled tyre be labeled in accordance with Chapter 5.

4.2.1 Patch technology

Patch technology enables RFID functionality to be used from the date the RFID tag is installed until the end of the tyre life cycle. Available for.

- Logistics and traceability;
- Product information defined by tyre dealers;
- Install RFID tags on finished new tyres or used tyres;
- Install RFID tags on non-RFID tyres after retreading.

The traceability of RFID enabled tyres depends on the installation date of the patch

RFID electronic tag.

4.2.2 Patch requirements

The patch type RFID electronic tag is attached to the tyre. Its location is limited to the inner cavity surface and the outer surface of the tyre (for example, the inner liner and the outer sidewall).

Since RFID electronic tags are radio frequency identification devices, the influencing factors listed in 4.1.2.1 shall be considered.

4.3.1 Sticking technology

Sticking technology enables RFID functionality to be used from the time sticker RFID tags are installed during tyre manufacturing or retreading until before tyre assembly.

Available for.

- Logistics and traceability;
- Product information defined by tyre dealers.

4.3.2 Sticking requirements

Sticker type RFID tags are attached to tyres and their location is limited to the inner/outer surface of the tyre.

Since RFID electronic tags are radio frequency identification devices, the influencing factors listed in 4.1.2.1 shall be considered.

Installers shall appropriately select the design, location, and orientation of the RFID tag to ensure proper use without violating the adhesive RFID tag manufacturer's and tyre manufacturer's guidelines.

5 Examples of identification marks

Tyre manufacturers shall mark the RFID identification in ISO 7000-3010 on the RFID tyre or on the sticker type RFID electronic tag, as shown in Figure 4.

The marks shown in Figure 4 can be used in accordance with the requirements of

ISO/IEC 29160. Manufacturers can also choose to directly mark the word "RFID" on the tyre to indicate the presence of the RFID electronic tag.

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