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Agricultural tyres for construction machines

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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ISO 18808 was prepared by Technical Committee ISO/TC 31, *Tyres, rims and valves*, Subcommittee SC 5, *Agricultural tyres and rims*.

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Introduction

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Agricultural tyres for construction machines

1 Scope

This International Standard sets the designation, dimensions, approved rim contours, load ratings and reference speeds for agricultural tyres fitted to construction machines (backhoe loaders, small dumpers, loaders, excavators, etc.) operating on building sites under loading and transport conditions.

Tyres conforming to this standard are identified either by the suffix IND in the tyre size designation; code designated tyres may alternatively be identified by the classification code R-4.

Other code designated diagonal tyres (ply rating marked series) for agricultural tractors, trailers and machines, identified by classification codes differing from R-4, as specified in ISO 18805, or with no specific classification code and/or suffix "IND" are part of ISO 4251-1 and ISO 4251-2.

Other code designated radial tyres for agricultural tractors, trailers and machines, identified by classification codes differing from R-4, as specified in ISO 18805, or with no specific classification code and/or suffix "IND", are part of ISO 8664.

Other metric designated tyres for agricultural tractors, trailers and machines, identified by classification codes differing from R-4, as specified in ISO 18805, or with no suffix "IND" in the tyre size designation are part of ISO 7867-1 and ISO 7867-2.

Tyres for forestry machines, identified by suffix LS, or classification code LS-x as specified in ISO 18805, are part of ISO 18807.

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 3877-1, *Tyres, valves and tubes — List of equivalent terms — Part 1: Tyres*

ISO 4223-1, *Definitions of some terms used in the tyre industry — Part 1: Pneumatic tyres*

ISO 4251-1, *Code designated diagonal tyres (ply rating marked series) for agricultural tractors, trailers and machines — Part 1: Tyre designation and dimensions, and approved rim contours*

ISO 4251-2, *Code designated diagonal tyres (ply rating marked series) for agricultural tractors, trailers and machines — Part 2: Tyre load ratings*

ISO 7867-1, *Metric series for agricultural, forestry machines and construction tyres — Part 1: Tyre designation, dimensions and marking, and tyre/rim coordination*

ISO 8664, *Tyres for agricultural tractors and machines — Code-designated and service-description marked radial drive-wheel tyres*

ISO 18804, *Rims for agricultural, forestry and construction machines*

ISO 18805, *Tyre classification — Agricultural, forestry and construction machines*

3 Terms and definitions

For the purposes of this document, data and definitions given in ISO 4223-1 and the following terms and definitions apply.

**3.1
haulage service (constant load)**

when a machine self-loads or receives a load from loading equipment, transports it elsewhere and returns unloaded or just travels from one site to another

**3.2
slow speed service (loading)**

**3.2.1
Cyclic loading**

cycle where the machine is used to pick up material and move it a short distance away

Note 1 to entry: Tyre loads fluctuate depending on the conditions involved when the equipment picks up the load. Transportation speeds are low, up to 10 km/h and distances are short, usually less than 76 m one way.

**3.2.2
Cyclic load and carry**

cycle where the machine, primarily intended for loader service, picks up a load, transports it elsewhere and returns unloaded

Note 1 to entry: Transportation usually occurs over unimproved surfaces at low speeds, up to 10 km/h, and rather short distances, up to 610 m one way.

4 Tyre designation and marking

4.1 General

The designation of the tyre shall be shown on its sidewall and shall include the details in [4.2](#) and [4.3](#). It may also include those details given in [4.4](#) and [4.5](#), unless otherwise indicated in [Tables 3](#) and [4](#).

4.2 Tyre size and construction code

4.2.1 General

Construction machine tyres are designated by the nominal section width, tyre construction code and nominal rim diameter code. In addition, the low section height tyres are designated, with the nominal aspect ratio or an "L" after the nominal section width or a code prior to the nominal section width.

For designation/marking/size examples, see [4.6](#).

4.2.2 Nominal section width

The nominal section width may be expressed by a code (see details in ISO 4251-1 or ISO 8664) or in millimeters (see details in ISO 7867-1).

4.2.3 Nominal aspect ratio

The nominal aspect ratio shall be expressed as a percentage and shall be a multiple of 5.

4.2.4 Tyre construction code

The tyre construction code shall be as follows:

- a dash (-) or "D" for diagonal/bias construction,
- "B" for bias belted construction,
- "R" for radial construction; in addition, the word "RADIAL" may also appear on the tyre.

4.2.5 Nominal rim diameter code

For tyres mounted on 5° tapered rims, the nominal rim diameter shall be expressed by a code comprising 2 digits (e.g. 24). For tyres mounted on 15° tapered rims, the nominal rim diameter shall be expressed by a code ending in ".5" (e.g. 22.5).

For details refer to ISO 4223-1 and ISO 18804.

4.2.6 Tyre size suffix

Suffix letters are part of the size marking when it is necessary to differentiate between service conditions.

4.2.6.1 IND

A designation differentiating between tyres designed for construction use and the similar sized agricultural or forestry tyre.

The suffix 'IND' may be replaced by symbol "R-4" in case of code designated tyres.

4.2.7 Tyre classification code (R-4)

A classification code is not part of the size marking and its use is optional. When used, the code shall be clearly separated from the size marking on the tyres. See ISO 18805 and 4.2.6.1 above.

4.3 Index of strength

The term is used to identify a given tyre with its maximum recommended load when used in a specific type of service.

Tyre strength may be part of diagonal/bias code designated tyres' markings and is expressed by a numerical code in conjunction with the letters "PR" (ply rating).

EXAMPLE 18.4-24 12PR

4.4 Service description

The service condition characteristics or service description shall be indicated as follows :

	Load index	Speed symbol
--	------------	--------------

EXAMPLE	134	A8
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4.4.1 Supplementary service description

Construction application tyres may also be marked with an additional service description, marked within a circle, to identify a special type of service (load rating and speed category) to which the tyre size is also allowed in addition to the applicable load variation with speed.

EXAMPLE



The table "Maximum tyre load at various speeds" is not applicable to the supplementary service description.

4.4.2 Load Index

The load index is a numerical code associated with the maximum load a tyre can carry at the speed indicated by its speed symbol under service conditions specified by the tyre manufacturer.

The correlation between load indices and tyre load carrying capacities shall be as given in [Table A1](#) of Annex A of ISO 4223-1.

4.4.3 Speed symbol

The speed category symbol is a symbol indicating the speed at which the tyre can carry the load corresponding to its load index under service conditions specified by the tyre manufacturer.

For construction application tyres the speed symbols in [Table 1](#) apply.

Table 1 — Correlation between speed symbol and reference speed

Speed symbol	Reference speed (km/h)
A8	40
B	50
D	65

4.5 Other service characteristics

4.5.1 Tubeless

In the case of tubeless tyres, the marking "TUBELESS" shall be shown on the tyre.

4.5.2 Preferred direction of rotation

The preferred direction of rotation may be indicated by an arrow or another clear indicator.

4.6 Examples for designation and marking of agricultural tyres for construction machines

See examples in [Table 2](#).

Table 2 — Designation and Marking

Tyre construction	Tyre Size Designation	Service Description
Radial	14.9R24 ^a	142 A8
	17.5LR24 ^a	146 A8
	340/80R18 IND	136 B
Bias Belted	520/70B34 IND	171 A8
Diagonal	16.9-28 ^a	(10PR) 148 A8 ^b
	650/45-22.5 IND	175 A 8

^a These tyres are identified either by suffix "IND", placed after the Tyre size designation (e.g. 14.9-24 IND), or by the following marking added to the tyre sidewalls: "R - 4".

^b The marking of the PR is optional

4.7 Tyre dimensions and approved rim contours

Tyre dimensional data and approved rim contours shall be as in [Annex A](#).