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Agricultural tyres for construction machines

Pneumatiques pour machines agricoles destinés à des engins de construction

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Contents

Page

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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

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

This first edition of ISO 18808 cancels and replaces ISO 13442:2004, which has been technically revised.

The main changes to ISO 13442:2004 are as follows:

— dimensions for sizes with metric designation and suffix IND added;

— list of approved rims for sizes with metric designation and suffix IND added;

— load capacities for metric sizes with speed symbol A8 added;

— load capacities for metric sizes with speed symbol D added;

— load variations as a function of speed and type of service added;

— service description for code designated sizes added;

— pictogram for maximum bead seating pressure added;

— SRI values added;

— Bibliography added;

— duplications with other ISO documents deleted;

— "miscellaneous" sizes already included in the ISO 4251 series or ISO 5383[1)] deleted;

— non-agricultural sizes derived from earth-mover tyres deleted.

1) Under preparation. Stage at the time of publication: ISO/CD 5383:2020.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Agricultural tyres for construction machines

1 Scope

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

Tyres conforming to this document are identified by the suffix IND in the tyre size designation; code designated tyres can alternatively, in place of the suffix IND, be identified by the classification code R-4.

NOTE Agricultural tyres without the suffix IND in the tyre size designation or with a classification code differing from "R-4" are not part of this document. Code designated diagonal tyres (ply rating marked series) for agricultural tractors, trailers and machines are part of ISO 4251-1 and ISO 4251-2. Code designated radial tyres for agricultural tractors, trailers and machines are part of ISO 8664. Metric designated tyres for agricultural tractors, trailers and machines are part of ISO 7867-2. Tyres for forestry machines, identified by suffix LS, or classification code LS-x are part of ISO 18807.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 4223-1:2017, *Definitions of some terms used in the tyre industry — Part 1: Pneumatic tyres*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
cyclic haulage service
cycle where a machine self-loads or receives a load from loading equipment, transports it elsewhere and returns unloaded

Note 1 to entry: Transportation speeds remain low (on unimproved surfaces) or medium, and distances are short to medium, usually less than 1 km one way, and out of public roads.

3.2
loading cycle
cycle where a machine picks up material, moves it to deposit it into a haulage vehicle or other equipment (e.g. bin, conveyor) then returns empty

Note 1 to entry: Transportation speeds are low (up to 10 km/h) and distances are short, usually less than 76 m one way.

3.3
load and carry
pick and carry
cycle where a machine picks up material, moves it a short distance to deposit it then returns empty

Note 1 to entry: Transportation speeds are low, up to 10 km/h and distances are short, usually less than 610 m one way over improved or unimproved surfaces.

3.4
drive away
condition where the machine moves from one site to another (e.g. jobsite to jobsite, jobsite to maintenance shop)

Note 1 to entry: The machine is in an empty condition.

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 4.4. The designation of diagonal code designated tyres also includes the marking of the ply rating (PR) (see 4.3). It may also include those details given in 4.5.

4.2 Tyre size and construction code

4.2.1 General

Agricultural tyres for construction machines are designated by the nominal section width and aspect ratio (if applicable), tyre construction code and nominal rim diameter code. For designation, marking or 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 millimetres (see details in ISO 7867-1).

Code designated low-section-height tyres are identified by the suffix “L” after the nominal section width.

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 or 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 two 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 IND

The suffix IND in the size designation differentiates agricultural tyres intended for construction applications from tyres intended for other agricultural application as described in other ISO documents.

EXAMPLE 440/80–24 IND.

Code designated tyres may alternatively, in place of the suffix IND, be identified by the classification code R-4.

4.2.7 Tyre classification code

A classification code is optional (except if required by 4.2.6) and is not part of the tyre size designation.

Code R-4 clearly indicates the intended construction application for agricultural tyres.

When used, the code shall be clearly separated from the tyre size designation, see ISO 18805 and 4.2.6.

4.3 Index of strength

The index of tyre strength is part of diagonal or bias code designated tyre markings and is expressed by a numerical code in conjunction with the letters “PR”.

EXAMPLES 18,4-24 12PR

19,5L-24 10PR.

4.4 Service description

4.4.1 General

The service condition characteristics shall consist of the service description (load index and speed symbol).

EXAMPLE

Load index	Speed symbol
134	A8

4.4.2 Supplementary service description

Agricultural tyres for construction application may also be marked with an additional service description, marked within a circle, to identify a special type of service (load index and speed symbol) to which the tyre size is also allowed in addition to the applicable load variation with speed (see Table 3).

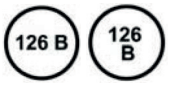
EXAMPLE 

Table 3 is not applicable to the supplementary service description.

4.4.3 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 ISO 4223-1:2017, Table A.1.

4.4.4 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.

The speed symbols in Table 1 apply for agricultural tyres for construction machines.

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 indicated in Tables A.1, A.2 and A.3.

For details on rim contours see ISO 18804

When the tyre is mounted on an alternative or approved rim, the design section width and the maximum overall width in service change as follows:

$$W_A = W + 10\ (R_A - R_M)$$

where

W_A is the design new tyre section width (or the maximum overall tyre width in service) on the alternative or approved rim;

W is the design new tyre section width S (or the maximum overall tyre width in service W_{max}) on the design rim width code as shown in Annex A;

R_A is the rim width code of the alternative or approved rim;

R_M is the design rim width code as shown in Annex A.

4.8 Tyre load carrying capacities (TLCC)

Tyre load carrying capacities (kg) and the corresponding reference inflation pressures (kPa), shall be as indicated in Annex B, Tables B.1 to B.6.

4.9 Tyre applications at service speeds others than the reference speed

For applications with low torque, including road transport, the variation of load-carrying capacity (per cent) depending on the vehicle maximum speed and the type of service is given in Table 3.

The rim or wheel manufacturer shall be consulted for confirmation of the suitability of the rim or wheel for the intended service.

Table 3 — Variation of load-carrying capacity (per cent) for tyres marked with speed category symbols A8 or D

Speed km/h	Variation of load-carrying capacity %			
	Speed category symbol A8		Speed category symbol D	
	Constant load[a]	Cyclic applications[b]	Constant load[a]	Cyclic applications[b]
Static	+130	+130	+164	+164
5	+45	+67[c]	+67	+92[c]
10	+25	+50[d]	+44	+73[d]
15	+13	+34	+30	+54
20	+9	+23	+26	+42
25	+6	+11	+22	+28
30	+4	+7	+20	+23
35	+2	+3	+18	+19
40	[0]	[0]	+15	+15
45	−4	–	+12	–
50	−9	–	+8	–

[a] Includes road transport and drive away.

[b] Cyclic means applications where tyres are used one way laden and return unladen (e.g. loaders, log stackers). It refers to cyclic haulage service, loading cycle and load and carry.

[c] One-way distance 150 m, fully loaded.

[d] One-way distance 600 m, fully loaded.