INTERNATIONAL STANDARD

ISO 4251-2

Eighth edition
2019-07

Code designated diagonal tyres (ply rating marked series) for agricultural tractors, trailers and machines —

Part 2: Tyre load ratings

Pneumatiques diagonaux à désignation dimensionnelle par code (séries à marquage équivalent nappes "ply rating") pour tracteurs, remorques et machines agricoles —

Partie 2: Capacités de charge des pneumatiques

Reference number
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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.

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).

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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 ISO/TC 31, *Tyres, rims and valves*, SC 5, *Agricultural tyres and rims*.

This eighth edition cancels and replaces the seventh edition (ISO 4251-2:2017) which has been technically revised. The main changes compared to the previous edition are as follows:

— information already contained in other International Standards was removed and replaced with normative references to those standards;

— radial tyres marked with ply rating and with reference speed of 10 km/h were deleted since obsolete and this document was restricted to code designated diagonal tyres (marked with PR) for agricultural tractors trailers and machines;

— the title of this document was revised accordingly;

— the document was aligned with other International Standards developed by SC 5 and with existing regulations;

— equivalence of tyre load carrying capacities in case of tyre marked with speed symbol A6 (corresponding to previous load carrying capacities of tyres marked with PR only) and that of tyres marked with speed symbol A8 was introduced, together with the possibility of a double marking (supplementary service description);

— load variations with speed and for specific applications were added;

— some additional PR versions were added with the corresponding markings of the service description.

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.

Code designated diagonal tyres (ply rating marked series) for agricultural tractors, trailers and machines —

Part 2:
Tyre load ratings

1 Scope

This document establishes the load ratings of the diagonal code designated (ply rating marked series) tyres for agricultural tractors, trailers and machines.

Tyre designation and dimensions, and approved rim contours are given in ISO 4251-1.

NOTE Code designated diagonal tyres (ply rating marked series) for construction applications (industrial tractors), identified by the classification code R-4, as specified in ISO 18805, or by suffix "IND" are part of ISO 13442.

Code designated diagonal tyres (ply rating marked series) for forestry machines, identified by the classification code LS, as specified in ISO 18805, are covered by 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, *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
ply rating
index of tyre strength

Note 1 to entry: It does not necessarily represent the number of cord plies in the tyre.

3.2
supplementary service description
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

Note 1 to entry: Tables A.2, A.4 and A.6 shall not apply to the supplementary service description.

Note 2 to entry: See Figure 1 for an example.

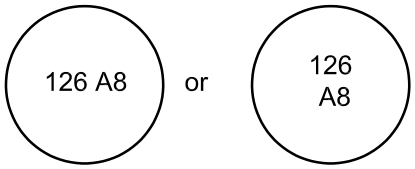


Figure 1 — Supplementary service description

3.3
cyclic loading application
condition that applies when the load on the tyre cycles between the unloaded and the fully loaded condition

Note 1 to entry: The vehicle shall be unloaded before off-field transport.

3.4
hillside combine
combine intended for service on slopes above 11° (20 %) lateral slope

Note 1 to entry: See Figure 2.

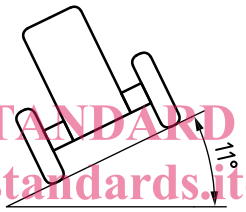


Figure 2 — Vehicle operating on a lateral slope of 11°

3.5
low torque
condition applying when the primary torque involved is that to propel the vehicle

Note 1 to entry: Vehicles pulling carts or trailers are considered to be operating in a low torque mode when operating on slopes up to 11° (20 %) lateral slope.

3.6
high and sustained torque
condition that occurs when high continuous tractive effort is applied to the drawbar or hitch

Note 1 to entry: Vehicles equipped with injectors, or any other ground engaging attachment (e.g. ploughing) or dragging objects, are considered to be operating in a high and sustained torque mode. Vehicles pulling carts or trailers are also considered to be operating in a high torque mode when operating on slopes greater than 11° (20 %) slope.

3.7
road transport
movement of a vehicle from one location to another under non-working conditions

Note 1 to entry: This movement occurs during transportation or transfer of equipment from site to site.

3.8
drive wheel tyre
tyre designed primarily for the equipment of driven axles of agricultural machinery, excluding sustained high torque services

Note 1 to entry: This is the generic term used in this document for implement drive wheel or traction tyres.

3.9
free rolling tyre
tyre designed for the equipment of non-driven (trailed) axles of agricultural machinery or trailers

Note 1 to entry: This is the generic term used in this document for implement free rolling or trailer tyres.

3.10
mixed applications tyre
tyre designed to be fitted to either driven and non-driven (trailed) axles of agricultural machinery or trailers

Note 1 to entry: This is the generic term used in this document for implement mixed application tyres.

4 Tyre markings

4.1 General

Marking of code designated tyres in diagonal construction consists of the tyre size designation, the load rating, the service description and any other additional information.

4.2 Tyre size designation and additional information

For tyre size designation and additional information, see ISO 4251-1.

4.3 Load rating

The marking of load rating comprises the ply rating (PR).

EXAMPLE 13.6 – 28 8PR

4.4 Service description

4.4.1 General

The marking of the service description consists of a load index and a speed symbol. It is optional but can be required by regional regulations.

4.4.2 Agricultural tractor drive wheel tyres

When marked with the service description, the marking on the tyre sidewalls shall be as per one of the examples below thus granting equivalent load carrying capacities at the various speeds:

EXAMPLES

— 14.9-28 8PR 130A6, or

— 14.9-28 8PR 126A8, or

— 14.9-28 8PR 130A6 (126A8), or

— 14.9-28 8PR 126A8 (130A6)

The optional supplementary service description (shown in parentheses in the above examples) is to be marked inside a circle. Only one supplementary service description, if any, is allowed on the tyre sidewalls.

4.4.3 Agricultural tractor steering wheel tyres

When marked with the service description, the marking on the tyre sidewalls shall be as per one of the examples below:

EXAMPLES

— 6.50-16 6PR 91A6, or

— 6.50-16 6PR 88A6, or

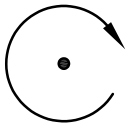
— 6.50-16 6PR 91A6 (88A8), or

— 6.50-16 6PR 88A8 (91A6)

The optional supplementary service description (shown in parentheses in the above examples) is to be marked inside a circle. Only one supplementary service description, if any, is allowed on the tyre sidewalls.

4.4.4 Agricultural implement tyres

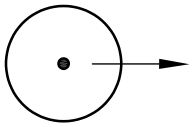
When the basic tyre load refers to the type of service (free rolling or drive wheel), the relevant service description shall be supplemented by the following symbol:



for drive wheel/traction tyre

for free rolling/trailer tyre

EXAMPLES 10.5/80-18 10PR 119 A6 

10.5/80-18 10PR 131 A6 

In case of tyres suitable for “mixed applications” (i.e. both drive and free rolling wheels), both markings apply.

5 Tyre loads

5.1 Agricultural tractor drive wheel tyres

5.1.1 General

Basic tyre loads for tyres used as singles and relevant reference inflation pressures shall be as given in Table A.1.

In the absence of the marking of the service description (load index and speed symbol), the basic tyre loads (BTL) for reference speed 30 km/h and the relevant load/speed relationship of Table A.2 column A6 apply.

When used as duals, basic tyre loads shall be reduced: multiply values in the table by 0,88.

When used as triples, basic tyre loads shall be reduced: multiply values in table by 0,82.

Tyre loads at different speeds (load/speed relationship) shall be as given in Table A.2.

5.1.2 Tyres marked with a supplementary service description

Table 1 shows, as an example, the tyre load carrying capacities at various service speeds for tyre size 13.6 - 28 8PR at 190 kPa in the case where it is marked with a supplementary service description, compared to the case where no service description is marked on the tyre.

Table 1 — Tyre size 13.6- 28 8PR at 190 kPa

Service speed	Service description			
	125 A6	122 A8	125 A6 (122 A8)	122 A8 (125 A6)
km/h	Tyre load carrying capacities kg			
15	2 145	1 995	2 145	1 995
25	1 765	1 830	1 765	1 830
30	1 650	1 665	1 650	(1 650)
40	1 485	1 500	(1 500)	1 500

Table A.2 does not apply to the supplementary service description.

Values shown in parentheses correspond to the supplementary service description.

5.1.3 Tractor drive wheel tyres on combine harvesters

On combine harvesters in cyclic loading application, except hillside combines, a load of up to 170 % of the basic tyre loads given in Table A.1 is permitted for speeds up to 10 km/h with an inflation pressure increase of approximately 30 % (consult tyre manufacturers). This load increase shall include all possible field and user modifications that increase vehicle mass. The vehicle shall be unloaded before off-field transport.

The wheel and rim manufacturers shall be consulted concerning the strength of the wheels.

For tyre load and inflation pressure recommendations for combine harvesters in transport service, the tyre manufacturer shall be consulted.

5.2 Agricultural tractor steering wheel tyres

5.2.1 General

Basic tyre loads and their corresponding reference inflation pressures shall be as given in Table A.3.

In the absence of the marking of the service description (load index and speed symbol), the basic tyre loads (BTL) for reference speed 30 km/h and the relevant load/speed relationship of Table A.4 column A6 apply.

Tyre loads at different speeds (load speed relationship) shall be as given in Table A.4,

5.2.2 Tyres marked with additional service description

Table 2 shows, as an example, the tyre load carrying capacities at various service speeds for tyre size 6.00-16 6 PR at 340 kPa in the case where it is marked with a supplementary service description, compared to the case where no service description is marked on the tyre.

Table 2 — Tyre size 6.00-16 6 PR at 340 kPa

Service speed	Service description			
	88 A6	85 A8	88 A6 (85 A8)	85 A8 (88 A6)
km/h	Tyre load carrying capacities kg			
15	800	775	800	775
20	755	715	755	715
25	645	660	645	660
30	560	570	560	(560)
40	450	515	(515)	515

Values shown in parentheses correspond to the supplementary service description.

Table A.4 does not apply to the supplementary service description.

5.2.3 Tractor steering wheel tyres on combine harvesters

On combine harvesters in cyclic loading application, except hillside combines, a load of up to 150 % of the basic tyre loads given in Table A.3 is permitted for speeds up to 10 km/h. This load increase shall include all possible field and user modifications that increase vehicle mass. The vehicle shall be unloaded before off-field transport.

The wheel and rim manufacturers shall be consulted concerning the strength of the wheel.

5.3 Agricultural implement tyres

Basic tyre loads at a maximum speed of 30 km/h and their corresponding reference inflation pressures shall be as given in Table A.5.

In the absence of the marking of the service description (load index and speed symbol), the basic tyre loads (BTL) for reference speed 30 km/h and the relevant load/speed relationship of Table A.6 column A6 apply.

When used as duals, basic tyre loads shall be reduced: multiply values in the table by 0,88.

Tyre loads at different speeds (load speed relationship) shall be as given in Table A.6.

5.4 Other tyre types

Basic tyre loads of formerly standardized tyres with nominal rim diameter codes 15.3 or 16.1 and tyres for small tractors shall be as given in Annex B.

Annex A
(normative)

Basic tyre loads (BTL) for tyres used as singles at reference inflation pressures (IP) and Tyre loads at different speeds (load/speed relationship)

Table A.1 — Agricultural drive wheel tyres (road transport, low torque)

Tyre size designation	Ply rating	Reference speed 30 km/h (Speed symbol A6)[a]		Reference speed 40 km/h (Speed symbol A8)		Inflation pressure (IP) kPa
		Load index (LI)	Basic tyre load (BTL)[b] kg	Load index (LI)	Basic tyre load (BTL)[b] kg	
8.3 - 16	4 PR	81	462	78	425	150
	6 PR	90	600	87	545	230
8.3 - 24	4 PR	92	630	88	560	160
	6 PR	100	800			230
8.3 – 36	6 PR	107	975			230
	8 PR	113	1 150			320
8.3 – 38	6 PR	108	1 000			230
	8 PR	114	1 180			320
8.3 – 42	6 PR	111	1 090			230
	8 PR	117	1 285			320
8.3 – 44	6 PR	111	1 090			230
	8 PR	117	1 285			320
9.5 – 16	4 PR	88	560	84	500	140
	6 PR	96	710	92	630	210
9.5 – 22	4 PR			92	630	140
	8 PR	106	950			280
9.5 – 24	4 PR	97	730	94	670	140
	6 PR	106	950	102	850	210
	8 PR			108	1 000	280
9.5 - 32	4 PR	102	850	98	750	140
	6 PR	110	1 060	106	950	210
	8 PR	116	1 250			280
9.5 - 36	4 PR	104	900	100	800	140
	6 PR	112	1 120	109	1 030	210
	8 PR	118	1 320			280
9.5 - 38	6 PR	113	1 150			210
	8 PR	119	1 360			280

[a] In case of tyres without the marking of the service description basic tyre load for reference speed 30 km/h applies.

[b] Basic tyre loads are maximum values and are valid for the reference speed and inflation pressures indicated.

Table A.1 *(continued)*

Tyre size designation	Ply rating	Reference speed 30 km/h (Speed symbol A6)[a]		Reference speed 40 km/h (Speed symbol A8)		Inflation pressure (IP) kPa
		Load index (LI)	Basic tyre load (BTL)[b] kg	Load index (LI)	Basic tyre load (BTL)[b] kg	
9.5 - 42	6 PR	115	1 215	111	1 090	210
	8 PR	121	1 450			280
9.5 - 44	6 PR	116	1 250			210
	8 PR	122	1 500			280
9.5 - 48	6 PR	118	1 320			210
	8 PR	123	1 550			280
11.2 - 20	6 PR	105	925			180
	8 PR	112	1 120			250
11.2 - 24	4 PR	102	850	98	750	130
	6 PR	110	1 060	106	950	180
	8 PR	116	1 250	113	1 150	240
	10 PR	120	1 400			300
11.2 - 28	4 PR	104	900	100	800	130
	6 PR	112	1 120	108	1 000	180
	8 PR	118	1 320			240
11.2 - 36	4 PR	109	1 030	105	925	130
11.2 - 38	4 PR	110	1 060	106	950	130
	6 PR	117	1 285	108	1 000	180
11.2 - 42	6 PR	119	1 360			180
	8 PR	125	1 650			250
12.4 - 16	4 PR			93	650	110
	8 PR	111	1 090	107	975	220
	12 PR	119	1 360	116	1 250	330
12.4 - 24	4 PR	106	950	102	850	110
	6 PR	115	1 215	111	1 090	170
	8 PR	120	1 400	117	1 285	230
	12 PR	128	1 800	124	1 600	330
12.4 - 28	4 PR	109	1 030	104	900	110
	6 PR	117	1 285	113	1 150	170
	8 PR	123	1 550	119	1 360	230
12.4 - 32	4 PR	111	1 090			110
	6 PR	119	1 360	115	1 215	170
	8 PR	124	1 600			230
	10 PR	128	1 800			280

[a] In case of tyres without the marking of the service description basic tyre load for reference speed 30 km/h applies.

[b] Basic tyre loads are maximum values and are valid for the reference speed and inflation pressures indicated.