

INTERNATIONAL STANDARD

ISO
4251-2

Fourth edition
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Tyres (ply rating marked series) and rims for agricultural tractors and machines —

Part 2:

Tyre load ratings

*Pneumatiques (série à marquage "ply rating") et jantes pour tracteurs
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.

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.

International Standard ISO 4251-2 was prepared by Technical Committee ISO/TC 31, *Tyres, rims and valves*, Sub-Committee SC 5, *Agricultural tyres and rims*.

This fourth edition cancels and replaces the third edition (ISO 4251-2:1987), of which it constitutes a minor revision. "Existing series" is now called "ply rating marked series" and rim codes 15.3 and 16.1 have been moved to a new, informative, annex. Clauses 2 and 3 are new, a new paragraph has been added to 4.1, and the previous maximum speed of 8 km/h has been increased to 10 km/h at several places.

ISO 4251 consists of the following parts, under the general title *Tyres (ply rating marked series) and rims for agricultural tractors and machines*:

- Part 1: *Tyre designation and dimensions*
- Part 2: *Tyre load ratings*
- Part 3: *Rims*
- Part 4: *Tyre classification and nomenclature*
- Part 5: *Log skidder tyres*

Annex A of this part of ISO 4251 is for information only.

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Tyres (ply rating marked series) and rims for agricultural tractors and machines —

Part 2:

Tyre load ratings

1 Scope

This part of ISO 4251 sets out load ratings for the ply rating marked series of tyres for agricultural tractors and machines.

Tyre designation and dimensions, rim dimensions, and tyre classification and nomenclature are given in ISO 4251-1, ISO 4251-3 and ISO 4251-4 respectively.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this part of ISO 4251. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this part of ISO 4251 are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 4223-1:1989, *Definitions of some terms used in the tyre industry — Part 1: Pneumatic tyres.*

3 Definitions

For the purposes of this part of ISO 4251, the definitions given in ISO 4223-1 and the following definitions apply.

3.1 load/inflation pressure relationship: Loads as given in the tables which are maximum values and are valid for the inflation pressures indicated.

3.2 cyclic loading application: Gradual increase of payload to maximum allowable load with unloading before off-field transport.

4 Tyre loads

4.1 Agricultural drive wheels — Tractor tyres

Basic tyre loads for a maximum speed of 30 km/h, and corresponding inflation pressures are given in

- table 1 for tyres of diagonal and radial construction with normal section height;
- table 2 for tyres of diagonal and radial construction with low section height.

On combine harvesters in cyclic loading application, except hillside combines, a load of up to 170 % of the basic tyre loads given in tables 1 and 2 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 the vehicle mass. The wheel and rim manufacturers shall be consulted concerning the strength of the wheels.

Tyre loads at different speeds (load/speed relationship) are given in table 3 for tyres of diagonal and radial construction with normal section height and tyres of diagonal and radial construction with low section height.

Loads for tyres in dual application for a maximum speed of 30 km/h, and corresponding inflation pressures are given in

- table 4 for tyres of diagonal and radial construction with normal section height;

- b) table 5 for tyres of diagonal and radial construction with low section height.

Loads for tyres of diagonal and radial construction for special cultivation work and corresponding inflation pressures are given in

- a) table 6 for a maximum speed of 30 km/h;
- b) table 7 for cultivation work at a maximum speed of 10 km/h.

4.2 Agricultural steering wheels — Tractor tyres

Basic tyre loads for a maximum speed of 30 km/h, and corresponding inflation pressures are given in

- a) table 8 for tyres of diagonal construction with normal section height;

- b) table 9 for tyres of diagonal construction with low section height.

Tyre loads at different speeds (load/speed relationship) are given in table 10 for tyres of diagonal construction with normal and low section.

4.3 Agricultural implement tyres

Basic tyre loads for a maximum speed of 30 km/h, tyre loads for other speeds and special applications and corresponding inflation pressures are specified in

- a) table 11 for tyres of diagonal construction with normal section height;
- b) table 12 for tyres of diagonal construction with low section height.

Table 1 — Agricultural drive wheels — Tractor tyres (diagonal and radial construction — normal section height) — Basic tyre loads (BTL) for a maximum speed of 30 km/h and inflation pressures (IP)

Tyre size		4 PR		6 PR		8 PR		10 PR		12 PR		14 PR	
Diagonal	Radial	BTL kg	IP kPa	BTL kg	IP kPa	BTL kg	IP kPa	BTL kg	IP kPa	BTL kg	IP kPa	BTL kg	IP kPa
8.3 — 24	8.3 R 24	625	160	810	240								
9.5 — 24	9.5 R 24	740		940		1 110							
9.5 — 32	9.5 R 32	840	140	1 065	210	1 260	280						
9.5 — 36	9.5 R 36	890		1 130		1 335							
11.2 — 24	11.2 R 24	845		1 045		1 225		1 380	300				
11.2 — 28	11.2 R 28	900	130	1 115	180	1 305	240						
12.4 — 24	12.4 R 24	945		1 200		1 415							
12.4 — 28	12.4 R 28	1 005		1 275		1 510							
12.4 — 32	12.4 R 32	1 070	110	1 355	170	1 605	230	1 800	280				
12.4 — 36	12.4 R 36	1 135		1 440		1 700							
12.4 — 38	12.4 R 38	1 165		1 480		1 750							
13.6 — 24	13.6 R 24	1 030		1 340		1 545		1 790					
13.6 — 28	13.6 R 28	1 100		1 430		1 645		1 910					
13.6 — 36	13.6 R 36	1 240	100	1 615	160	1 855	200	2 150	250				
13.6 — 38	13.6 R 38	1 275		1 660		1 910		2 215					
14.9 — 24	14.9 R 24			1 510		1 760		1 990					
14.9 — 26	14.9 R 26			1 560		1 820		2 055					
14.9 — 28	14.9 R 28			1 610	140	1 880	180	2 120	230				
14.9 — 30	14.9 R 30			1 665		1 940		2 190					
14.9 — 38	14.9 R 38			1 870		2 180		2 460					
15.5 — 38	15.5 R 38			1 765	140	2 060	180	2 320	230				
16.9 — 24	16.9 R 24			1 725		2 040		2 230					
16.9 — 26	16.9 R 26			1 780		2 105		2 305					
16.9 — 28	16.9 R 28			1 840	130	2 175	170	2 380	200				
16.9 — 30	16.9 R 30			1 900		2 245		2 455		2 730	240		
16.9 — 34	16.9 R 34			2 015		2 380		2 605					
16.9 — 38	16.9 R 38			2 130		2 520		2 760					
18.4 — 26	18.4 R 26			1 990		2 265		2 645		2 985			
18.4 — 30	18.4 R 30			2 120	110	2 415	140	2 815	180	3 180	230		
18.4 — 34	18.4 R 34			2 250		2 565		2 990		3 375		3 630	260
18.4 — 38	18.4 R 38			2 380		2 715		3 165		3 575			
20.8 — 34	20.8 R 34					2 920	130	3 285	160	3 785	200		
20.8 — 38	20.8 R 38					3 090		3 475		4 000			
23.1 — 26						2 850		3 245		3 610		3 970	200
23.1 — 30						3 035	110	3 460	140	3 850	170		
23.1 — 34						3 225		3 675		4 090			
24.5 — 32								3 950	140	4 390	170		

Table 2 — Agricultural drive wheels — Tractor tyres (diagonal and radial construction — low section height) — Basic tyre loads (BTL) for a maximum speed of 30 km/h and inflation pressures (IP)

Tyre size		10 PR		12 PR		14 PR	
Diagonal	Radial	BTL kg	IP kPa	BTL kg	IP kPa	BTL kg	IP kPa
28 L — 26		3 460	120	3 785	140	4 245	170
30.5 L — 32	30.5 L R 32			4 745	140		

Table 3 — Agricultural drive wheels — Tractor tyres — Tyre loads at different speeds (load/speed relationship)

Maximum speed ¹⁾ km/h	Maximum tyre load ²⁾
10 ³⁾	140
20	120
25	107
30	100

1) The values given for the maximum tyre loads also apply when drive wheel tractor tyres are fitted on the front axles (steering wheels).

2) Expressed as a percentage of the basic tyre loads given in tables 1 and 2. If national legislation permits speeds in excess of 30 km/h, for example up to 40 km/h, a tyre load of 90 % of the basic tyre load shall be permitted at a speed of 35 km/h, and a tyre load of 80 % of the basic tyre load shall be permitted at a speed of 40 km/h. Tyres intended for higher speeds, for example multipurpose applications (MPT), will form the subject of a future International Standard.

3) This applies to drive wheel tractor tyres fitted on front axles of front-end loaders used in intermittent service. Tyre inflation pressures have to be increased by 30 kPa for operating at these overloads.

Table 4 — Agricultural drive wheels — Tractor tyres used as duals (diagonal and radial construction — normal section height) — Load per tyre (L) for a maximum speed of 30 km/h and inflation pressures (IP)

Tyre size		4 PR		6 PR		8 PR		10 PR		12 PR		14 PR	
Diagonal	Radial	L kg	IP kPa	L kg	IP kPa	L kg	IP kPa	L kg	IP kPa	L kg	IP kPa	L kg	IP kPa
8.3 — 24	8.3 R 24	550	160	715	240								
9.5 — 24	9.5 R 24	650		825		975							
9.5 — 32	9.5 R 32	740	140	935	210	1 110	280						
9.5 — 36	9.5 R 36	785		995		1 175							
11.2 — 24	11.2 R 24	745		920		1 080		1 215	300				
11.2 — 28	11.2 R 28	790	130	980	180	1 150	240						
12.4 — 24	12.4 R 24	830		1 055		1 245							
12.4 — 28	12.4 R 28	885		1 120		1 330							
12.4 — 32	12.4 R 32	940	110	1 190	170	1 410	230	1 580	280				
12.4 — 36	12.4 R 36	1 000		1 265		1 495							
12.4 — 38	12.4 R 38	1 025		1 300		1 540							
13.6 — 24	13.6 R 24	905		1 180		1 360		1 575					
13.6 — 28	13.6 R 28	970		1 260		1 450		1 680					
13.6 — 36	13.6 R 36	1 090	100	1 420	160	1 630	200	1 890	250				
13.6 — 38	13.6 R 38	1 120		1 460		1 680		1 950					
14.9 — 24	14.9 R 24			1 330		1 550		1 750					
14.9 — 26	14.9 R 26			1 375		1 600		1 810					
14.9 — 28	14.9 R 28			1 415	140	1 650	180	1 865	230				
14.9 — 30	14.9 R 30			1 465		1 705		1 925					
14.9 — 38	14.9 R 38			1 645		1 920		2 165					
15.5 — 38	15.5 R 38			1 555	140	1 815	180	2 040	230				
16.9 — 24	16.9 R 24			1 520		1 795		1 960					
16.9 — 26	16.9 R 26			1 565		1 850		2 030					
16.9 — 28	16.9 R 28			1 620	130	1 915	170	2 095	200				
16.9 — 30	16.9 R 30			1 670		1 975		2 160		2 400	240		
16.9 — 34	16.9 R 34			1 775		2 095		2 290					
16.9 — 38	16.9 R 38			1 875		2 220		2 430					
18.4 — 26	18.4 R 26			1 750		1 995		2 330		2 625			
18.4 — 30	18.4 R 30			1 865	110	2 125	140	2 475	180	2 800	230		
18.4 — 34	18.4 R 34			1 980		2 255		2 630		2 970		3 190	260
18.4 — 38	18.4 R 38			2 095		2 390		2 785		3 145			
20.8 — 34	20.8 R 34					2 570	130	2 890	160	3 330	200		
20.8 — 38	20.8 R 38					2 720		3 060		3 520			
23.1 — 26						2 510		2 855		3 175		3 490	200
23.1 — 30						2 670	110	3 045	140	3 390	170		
23.1 — 34						2 840		3 235		3 600			
24.5 — 32								3 475	140	3 865	170		

Table 5 — Agricultural drive wheels — Tractor tyres used as duals (diagonal and radial construction — low section height) — Load per tyre (L) for a maximum speed of 30 km/h and inflation pressures (IP)

Tyre size		10 PR		12 PR		14 PR	
Diagonal	Radial	L kg	IP kPa	L kg	IP kPa	L kg	IP kPa
28 L — 26		3 045	120	3 330	140	3 735	170
30.5 L — 32	30.5 L R 32			4 000	130		

Table 6 — Agricultural drive wheels — Tractor tyres for special cultivation work (diagonal and radial construction) — Basic tyre loads (BTL) for a maximum speed of 30 km/h and inflation pressures (IP)

Tyre size		6 PR		8 PR	
Diagonal	Radial	BTL kg	IP kPa	BTL kg	IP kPa
7.2 — 36		865		1 005	
7.2 — 40		935	280	1 090	370
8.3 — 36	8.3 R 36	970		1 160	
8.3 — 42	8.3 R 42	1 055	240	1 255	320
8.3 — 44	8.3 R 44	1 080		1 290	
9.5 — 36	9.5 R 36	1 130		1 335	
9.5 — 44	9.5 R 44	1 255	210	1 485	280
9.5 — 48	9.5 R 48	1 320		1 560	

Table 7 — Agricultural drive wheels — Tractor tyres for special cultivation work (diagonal and radial construction) — Tyre loads (L) for special cultivation work at a maximum speed of 10 km/h and inflation pressures (IP)

Tyre size		6 PR		8 PR	
Diagonal	Radial	L kg	IP kPa	L kg	IP kPa
7.2 — 36		1 115		1 325	
7.2 — 40		1 180	290	1 400	390
8.3 — 36	8.3 R 36	1 290		1 535	
8.3 — 42	8.3 R 42	1 400	260	1 665	350
8.3 — 44	8.3 R 44	1 440		1 710	
9.5 — 36	9.5 R 36	1 495		1 750	
9.5 — 44	9.5 R 44	1 665	230	1 945	300
9.5 — 48	9.5 R 48	1 750		2 045	

NOTE — Special cultivation work excludes road application except field to farm transit at speeds not exceeding 25 km/h.

Table 8 — Agricultural steering wheels — Tractor tyres (diagonal construction — normal section height) — Basic tyre loads (BTL) for a maximum speed of 30 km/h and inflation pressures (IP)

Tyre size	4 PR		6 PR		8 PR		10 PR	
	BTL kg	IP kPa	BTL kg	IP kPa	BTL kg	IP kPa	BTL kg	IP kPa
4.00 — 12 4.00 — 15	250 300	340						
5.00 — 15	365	280	465	420				
5.50 — 16	425	250	525	370				
6.00 — 16	450	230	560	340	675	450		
6.50 — 16 6.50 — 20	510 600	230	615 725	310	735 865	420		
7.50 — 16 7.50 — 18 7.50 — 20	605 655 710	200	745 810 875	280	870 945 1 020	370		
9.00 — 16			900	230	1 080	310	1 245	390
10.00 — 16			965	200	1 190	280	1 325	340
11.00 — 16			1 140	200	1 320	250	1 485	310

Table 9 — Agricultural steering wheels — Tractor tyres (diagonal construction — low section height) — Basic tyre loads (BTL) for a maximum speed of 30 km/h and inflation pressures (IP)

Tyre size	Optional size marking	4 PR		6 PR		8 PR		10 PR		12 PR	
		BTL kg	IP kPa	BTL kg	IP kPa	BTL kg	IP kPa	BTL kg	IP kPa	BTL kg	IP kPa
7.5 L — 15	8.25/85 — 15	585	200	720	280	840	370				
9.5 L — 15	9.5/85 — 15			770	230	930	310				
11 L — 15	11.5/75 — 15			865	200	1 070	280	1 190	340	1 355	420

Table 10 — Agricultural steering wheels — Tractor tyres — Tyre loads at different speeds (load/speed relationship)

Maximum speed km/h	Maximum tyre load ¹⁾
Front-end loaders 10 ²⁾	200
10	150
20	135
25	115
30	100

1) Expressed as a percentage of the basic tyre loads given in tables 8 and 9. If national legislation permits speeds in excess of 30 km/h, for example up to 40 km/h, a tyre load of 90 % of the basic tyre load shall be permitted at a speed of 35 km/h, and a tyre load of 80 % of the basic tyre load shall be permitted at a speed of 40 km/h. Tyres intended for higher speeds, for example multipurpose applications (MPT), will form the subject of a future International Standard.

2) This applies to steering wheel tractor tyres of 6 PR and more fitted on front axles of front-end loaders used in agricultural intermittent service for short distances (100 m maximum). Tyre inflation pressures have to be increased by 30 kPa for operating at these overloads.

Table 11 — Agricultural implement tyres (diagonal construction — normal section height) — Basic tyre loads (BTL) for a maximum speed of 30 km/h and inflation pressures (IP)

Tyre size	2 PR		4 PR		6 PR		8 PR		10 PR	
	BTL kg	IP kPa	BTL kg	IP kPa	BTL kg	IP kPa	BTL kg	IP kPa	BTL kg	IP kPa
4.00 — 8	155	150	225	275						
4.00 — 12	210	150	300	275						
4.00 — 15			355	275						
5.00 — 15			430	225						
5.50 — 16			500	200						
5.90 — 15			480	200						
6.00 — 16			570	200	685	275				
6.40 — 15			555	200	670	275				
6.50 — 16			640	200	775	275				
7.00 — 12			555	175	680	250				
7.50 — 16			700	150	890	225	1 100	325	1 240	400
7.50 — 18			720	150	950	225				
7.50 — 20			775	150	980	225				
7.50 — 24			830	160			1 270	325		
9.00 — 16							1 315	275	1 445	325
10.00 — 15							1 425	240		
11.25 — 24							1 860	200		
11.25 — 28							1 925	200	2 245	260

NOTES

1 For speeds up to a maximum of 10 km/h, loads may be increased by 20 % with an inflation pressure increase of up to 30 % (consult tyre and rim manufacturers).

2 On agricultural trailers operated on improved surfaces at speeds up to a maximum of 30 km/h, loads may be increased by 20 % with a 30 % increase in inflation pressure where national standardization does not impose restrictions (consult tyre and rim manufacturers).

Table 12 — Agricultural implement tyres (diagonal construction — low section height) — Basic tyre loads (BTL) for a maximum speed of 30 km/h and inflation pressures (IP)

Tyre size designation	4 PR		6 PR		8 PR		10 PR		12 PR		14 PR		16 PR	
	BTL kg	IP kPa	BTL kg	IP kPa	BTL kg	IP kPa	BTL kg	IP kPa	BTL kg	IP kPa	BTL kg	IP kPa	BTL kg	IP kPa
5.5/85 — 9	815	150	1 040	230	655	500	1 935	370	2 625	370	2 910	430	3 130	490
10.0/80 — 12					1 240	310								
10.5/80 — 18					1 710	300								
12.0/75 — 18					1 880	260								
12.5/80 — 18					2 090	250								
13.0/65 — 18					1 810	240								
14.5/75 — 20					2 530	220								
15.0/70 — 18					2 260	210								
16.0/70 — 20					2 645	200	3 015	250	3 355	300	3 670	350	3 970	400
9.5 L — 15			895	190	1 100	280	1 285	280						
11 L — 15			950	170	1 130	220								
11 L — 16			995	170	1 175	220								

NOTES

- For speeds up to a maximum of 10 km/h, loads may be increased by 20 % with an inflation pressure increase of up to 30 % (consult tyre and rim manufacturers).
- On agricultural trailers operated on improved surfaces at speeds up to a maximum of 30 km/h, loads may be increased by 20 % with a 30 % increase in inflation pressure where national standardization does not impose restrictions (consult tyre and rim manufacturers).

Annex A

(informative)

Tyres on nominal rim diameter codes 15.3 and 16.1

The technical data of the former standardized tyres with nominal rim diameter codes 15.3 and 16.1 are given in tables A.1, A.2 and A.3.

Table A.1 — Agricultural steering wheels — Tractor tyres (diagonal construction — low section height) — Basic tyre loads (BTL) for a maximum speed of 30 km/h and inflation pressures (IP)

Tyre size	Optional size marking	4 PR		6 PR		8 PR		10 PR		12 PR	
		BTL kg	IP kPa	BTL kg	IP kPa	BTL kg	IP kPa	BTL kg	IP kPa	BTL kg	IP kPa
14 L — 16.1	14.0/80 — 16.1			1 295	170	1 530	230	1 745	280	1 940	340

Table A.2 — Agricultural implement tyres (diagonal construction — normal section height) — Basic tyre loads (BTL) for a maximum speed of 30 km/h and inflation pressures (IP)

Tyre size	2 PR		4 PR		6 PR		8 PR		10 PR	
	BTL kg	IP kPa	BTL kg	IP kPa	BTL kg	IP kPa	BTL kg	IP kPa	BTL kg	IP kPa
13.50 — 16.1					1 600	140	1 855	180	2 195	240

NOTES

- 1 For speeds up to a maximum of 10 km/h, loads may be increased by 20 % with an inflation pressure increase of up to 30 % (consult tyre and rim manufacturers).
- 2 On agricultural trailers operated on improved surfaces at speeds up to a maximum of 30 km/h, loads may be increased by 20 % with a 30 % increase in inflation pressure where national standardization does not impose restrictions (consult tyre and rim manufacturers).