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Narrow and wide base off-road tyres and rims —

Part 1:
Tyre designation and dimensions

Pneumatiques et jantes à base étroite et à base large pour engins de génie civil —

Partie 1: Désignation et cotes des pneumatiques

Reference number
ISO 4250-1 : 1988 (E)

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 approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 4250-1 was prepared by Technical Committee ISO/TC 31, *Tyres, rims and valves.*

This first edition and the first editions of ISO 4250-2 and ISO 4250-3 cancel and replace ISO/TR 4250 : 1980, the three parts together constituting a technical revision.

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

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Narrow and wide base off-road tyres and rims —

Part 1 :
Tyre designation and dimensions

0 Introduction

ISO 4250 provides technical details on the designation and dimensions of off-road tyres and rims, as well as load ratings for these types of tyres.

This International Standard consists of three parts:

Part 1: Tyre designations and dimensions.

Part 2: Loads and inflation pressures.

Part 3: Rims.

1 Scope

This part of ISO 4250 sets out designations and dimensions for narrow and wide base off-road tyres and recommended rims.

2 Field of application

This part of ISO 4250 applies to tyres primarily intended for off-road machines.

3 References

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

ISO 4250-3, *Narrow and wide base off-road tyres and rims — Part 3: Rims.*

4 Definitions

For definitions of terms relating to tyres, see ISO 4223-1.

5 Tyre designation

The designation of tyres shall include the details in 5.1 and 5.2; it may include those in 5.3.

5.1 Tyre size and construction code

Tyres shall be designated by a two-part size marking (nominal section width — nominal rim diameter code) except as noted in the tables. Diagonal ply construction shall not be specially marked. Radial ply construction shall be identified by the letter "R" instead of the dash, before the rim diameter in the size designation. In addition, the word "radial" may also appear on the tyre.

5.2 Index of tyre strength

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

5.3 Other markings

Other markings may be added, for example as in 5.3.1 to 5.3.4.

5.3.1 Preferred direction of rotation

The marking to indicate the preferred direction of rotation shall be an arrow.

5.3.2 Tubeless tyres

Tyres shall be marked "TUBELESS", if applicable.

5.3.3 Code system for tyre usage

Tyres may be identified by their type of service and tread design as indicated in tables 1 and 2 respectively.

Table 1 — Type of service

Service code	Type of service
C	Compactor
E	Earth-moving (dumper and tractor-scraper)
G	Grader
L	Loader

NOTE — The use of these identification codes is at the discretion of the individual tyre manufacturer.

Table 2 — Tread design

Code	Tread type
C-1	Smooth
C-2	Grooved
E-1	Rib
E-2	Traction
E-3	Rock
E-4	Rock (deep tread)
E-7	Flotation
G-1	Rib
G-2	Traction
G-3	Rock
L-2	Traction
L-3	Rock
L-4	Rock (deep tread)
L-5	Rock (extra deep tread)

NOTES

1 The use of these identification codes is at the discretion of the individual tyre manufacturer.

2 Where smooth treads are used in the "L" series, this should be denoted by the suffix "S" (for example, L-5S).

3 Code types 1, 2 and 3 are designated as normal tread depth.

5.3.4 Semi-drop centre rims

"TG" shall be used to identify tyres mounted on semi-drop centre (SDC) rims (see ISO 4250-3).

6 Tyre dimensions

Tyre dimensions shall be as listed:

Table 3 : Narrow base tyres.

Table 4 : Wide base tyres.

Table 5 : Narrow base tyres on 15° rim contours.

7 Dual spacing

Recommended minimum dual spacing shall be design section width × 1,2.

8 Recommended rims

Recommended rims are given as follows:

Table 6 : Narrow base tyres.

Table 7 : Wide base tyres.

Table 8 : Narrow base tyres on 15° contour rims.

9 Method of measurement of tyre dimensions

Before measuring, tyres shall be mounted on a measuring rim, inflated to the recommended pressure, and allowed to stand for a minimum of 24 h at normal room temperature, after which the inflation pressure shall be readjusted to the original value.

Table 3 — Tyre dimensions for narrow base tyres

Dimensions in millimetres

Tyre size designation	Measuring rim width Code	Design new tyre[1]		In-service[2]	
		Section width	Overall diameter[3]	Maximum overall width	Maximum overall diameter[3]
12.00 — 20, 21	8.50	315	1 146	340	1 184
12.00 — 24, 25	8.50	315	1 247	340	1 285
13.00 — 24, 25	10.00	351	1 301	379	1 342
14.00 — 20, 21	10.00	375	1 266	405	1 311
14.00 — 24, 25	10.00	375	1 368	405	1 414
16.00 — 20, 21	11.25	432	1 391	480	1 460
16.00 — 24, 25	11.25	432	1 493	480	1 561
18.00 — 24, 25	13.00	498	1 615	553	1 693
18.00 — 33	13.00	498	1 818	553	1 896
18.00 — 49	13.00	498	2 227	553	2 306
21.00 — 24, 25	15.00	571	1 750	634	1 839
21.00 — 35	15.00	571	2 004	634	2 093
21.00 — 49	15.00	571	2 360	634	2 449
24.00 — 25	17.00	653	1 875	725	1 974
24.00 — 29	17.00	653	1 975	725	2 074
24.00 — 35	17.00	653	2 127	725	2 226
24.00 — 43	17.00	653	2 331	725	2 430
24.00 — 49	17.00	653	2 483	725	2 582
27.00 — 33	22.00	762	2 242	846	2 354
27.00 — 49	19.50	737	2 649	818	2 761
30.00 — 33	22.00	823	2 389	914	2 513
30.00 — 51	22.00	823	2 846	914	2 970
33.00 — 51	24.00	894	2 997	992	3 133
36.00 — 51	26.00	988	3 165	1 097	3 315
40.00 — 57	29.00	1 097	3 526	1 218	3 692

1) Design new tyre dimensions quoted in the tables are used for tyre design purposes only.

2) In-service dimensions are the maximum dimensions for grown tyres in-service for use by machine manufacturers in designing for tyre clearances.

Max. overall width = design new tyre section width (S.W.) × (1 + tolerance)

Tolerances: S.W. < 380 mm: + 8 %
S.W. ⩾ 380 mm: + 11 %

Max. overall diameter = (design new tyre overall diameter — rim diameter) × (1 + tolerance) + rim diameter

Tolerances: S.W. < 380 mm: + 6 %
S.W. ⩾ 380 mm: + 8 %

NOTE — See ISO 4250-3 for rim diameter values.

3) Figures are based on tyres with normal tread depth. The machine manufacturer should recognize that tyres with deep tread and corresponding increased overall diameter may be used.

Table 4 — Tyre dimensions for wide base tyres

Dimensions in millimetres

Tyre size designation	Measuring rim width Code	Design new tyre[1]		In-service[2]	
		Section width	Overall diameter[3]	Maximum overall width	Maximum overall diameter[3]
15.5 — 25	12.00	394	1 277	437	1 328
17.5 — 25	14.00	445	1 348	494	1 405
20.5 — 25	17.00	520	1 492	577	1 561
23.5 — 25	19.50	597	1 617	663	1 696
26.5 — 25	22.00	673	1 750	747	1 839
26.5 — 29	22.00	673	1 851	747	1 940
29.5 — 25	25.00	750	1 873	833	1 972
29.5 — 29	25.00	750	1 975	833	2 074
29.5 — 35	25.00	750	2 127	833	2 226
33.25 — 29	27.00	845	2 090	938	2 198
33.25 — 35	27.00	845	2 242	938	2 350
33.5 — 33	28.00	850	2 242	944	2 354
33.5 — 39	28.00	850	2 395	944	2 507
37.25 — 35	31.00	946	2 389	1 050	2 509
37.5 — 33	32.00	952	2 389	1 057	2 513
37.5 — 39	32.00	952	2 541	1 057	2 665
37.5 — 51	32.00	952	2 846	1 057	2 970
40.5/75 — 39[4]	32.00	1 029	2 581	1 142	2 708

1) Design new tyre dimensions quoted in the tables are used for tyre design purposes only.

2) In-service dimensions are the maximum dimensions for grown tyres in-service for use by machine manufacturers in designing for tyre clearances.

Max. overall width = design new tyre section width (S.W.) × (1 + tolerance)

Tolerances: S.W. < 380 mm: + 8 %
S.W. ⩾ 380 mm: + 11 %

Max. overall diameter = (design new tyre overall diameter − rim diameter) × (1 + tolerance) + rim diameter

Tolerances: S.W. < 380 mm: + 6 %
S.W. ⩾ 380 mm: + 8 %

NOTE — See ISO 4250-3 for rim diameter values.

3) Figures are based on tyres with normal tread depth. The machine manufacturer should recognize that tyres with deep tread and corresponding increased overall diameter may be used.

4) Special size designation.

Table 5 — Dimensions for narrow base tyres mounted on 15° rim contours

Dimensions in millimetres

Tyre size designation	Measuring rim width Code	Design new tyre[1]		In-service[2]	
		Section width	Overall diameter[3]	Maximum overall width	Maximum overall diameter[3]
27 — 56.5	20.00	653	2 483	725	2 582
30 — 56.5	22.00	737	2 649	818	2 761
33 — 59.5	23.50	808	2 846	897	2 970
36 — 59.5	27.00	899	2 997	998	3 133
39 — 59.5	27.00	973	3 165	1 080	3 315

1) Design new tyre dimensions quoted in the tables are used for tyre design purposes only.

2) In-service dimensions are the maximum dimensions for grown tyres in-service for use by machine manufacturers in designing for tyre clearances.

Max. overall width = design new tyre section width (S.W.) × (1 + tolerance)

Tolerances: S.W. < 380 mm: + 8 %
≥ 380 mm: + 11 %

Max. overall diameter = (design new tyre overall diameter — rim diameter) × (1 + tolerance) + rim diameter

Tolerances: S.W. < 380 mm: + 6 %
≥ 380 mm: + 8 %

NOTE — See ISO 4250-3 for rim diameter values.

3) Figures are based on tyres with normal tread depth. The machine manufacturer should recognize that tyres with deep tread and corresponding increased overall diameter may be used.

Table 6 indicates recommended rims for narrow base tyres.

Table 6 — Recommended rims for diagonal and radial narrow base tyres for earth-moving service, mobile cranes, shovels, mining cars, loaders and dozers

Tyre size designation	Recommended rims
12.00 — 20	8.5, 8.50V, 8.5V5°
12.00 — 21	8.50/1.3
12.00 — 24	8.5, 8.50V, 8.5V5°
12.00 — 25	8.50/1.3
13.00 — 24	10.00W
13.00 — 25	10.00/1.5
14.00 — 20	10.00W
14.00 — 21	10.00/1.5
14.00 — 24	10.00W
14.00 — 25	10.00/1.5
16.00 — 20	11.25/2.0
16.00 — 21	11.25/2.0
16.00 — 24	11.25/2.0
16.00 — 25	11.25/2.0
18.00 — 24	13.00/2.5
18.00 — 25	13.00/2.5
18.00 — 33	13.00/2.5
18.00 — 49	13.00/2.75
21.00 — 24	15.00/3.0
21.00 — 25	15.00/3.0
21.00 — 35	15.00/3.0
21.00 — 49	15.00/3.0
24.00 — 25	17.00/3.5
24.00 — 29	17.00/3.5
24.00 — 35	17.00/3.5
24.00 — 43	17.00/3.5
24.00 — 49	17.00/3.5
27.00 — 33	22.00/4.0
27.00 — 49	19.50/4.0
30.00 — 33	22.00/4.5
30.00 — 51	22.00/4.5
33.00 — 51	24.00/5.0
36.00 — 51	26.00/5.0
40.00 — 57	29.00/6.0

NOTE — The tyre and rim/wheel manufacturers should be consulted for confirmation of the suitability of the tyre/wheel assembly for the intended service.

Table 7 indicates recommended rims for wide base tyres.

Table 7 — Recommended rims for diagonal and radial wide base tyres for earth-moving, mining and logging service, mobile cranes, shovels, mining cars, loaders and dozers

Tyre size designation	Recommended rims
15.5 — 25	12.00/1.3 12.00/1.3 SDC
17.5 — 25	14.00/1.5 14.00/1.3 SDC
20.5 — 25	17.00/2.0 17.00/1.7[1]
23.5 — 25	19.50/2.5
26.5 — 25	22.00/3.0
26.5 — 29	22.00/3.0
29.5 — 25	25.00/3.5
29.5 — 29	25.00/3.5
29.5 — 35	25.00/3.5
33.25 — 29	27.00/3.5
33.25 — 35	27.00/3.5
33.5 — 33	28.00/4.0
33.5 — 39	28.00/4.0
37.25 — 35	31.00/4.0
37.5 — 33	32.00/4.5
37.5 — 39	32.00/4.5
37.5 — 51	32.00/4.5
40.5/75 — 39[2]	32.00/4.5

1) Maximum 16 P.R. or one star (★).

2) Special size designation.

NOTE — The tyre and rim/wheel manufacturers should be consulted for confirmation of the suitability of the tyre/wheel assembly for the intended service.

Table 8 indicates recommended rims for narrow base tyres mounted on 15° contours.

Table 8 — Recommended rims for diagonal and radial narrow base tyres mounted on 15° contours

Tyre size designation	Recommended rims
27 — 56.5	20.0
30 — 56.5	22.0
33 — 59.5	23.5
36 — 59.5	27.0
39 — 59.5	27.0

NOTE — The tyre and rim/wheel manufacturers should be consulted for confirmation of the suitability of the tyre/wheel assembly for the intended service.