
Industrial tyres and rims —

Part 1:

**Pneumatic tyres (metric series) on 5
degrees tapered or flat base rims —
Designation, dimensions and marking**

*Pneumatiques et jantes industriels pour matériel de manutention —
Partie 1: Pneumatiques (série millimétrique) montés sur jantes
coniques à 5 degrés ou à base plate — Désignation, cotes et marquage*

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

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Contents

Page

Foreword.....	iv
1 Scope.....	1
2 Normative references.....	1
3 Terms and definitions.....	1
4 Tyre designations.....	1
4.1 Dimensional and constructional characteristics.....	1
4.1.1 General.....	1
4.1.2 Nominal section width.....	2
4.1.3 Nominal aspect ratio.....	2
4.1.4 Tyre construction code.....	2
4.1.5 Nominal rim diameter code.....	2
4.2 Service description.....	2
4.2.1 General.....	2
4.2.2 Load index.....	3
4.2.3 Speed symbol.....	4
4.3 Other service characteristics.....	5
5 Marking.....	5
5.1 General marking.....	5
5.2 Maximum speed marking.....	5
6 Tyre dimensions.....	6
6.1 General.....	6
6.2 Calculation of design tyre dimensions.....	6
6.2.1 Nominal aspect ratio, A_R	6
6.2.2 Theoretical rim width, R_{th}	6
6.2.3 Design tyre section width, S	6
6.2.4 Design tyre section height, H	6
6.2.5 Design tyre overall diameter, D_0	6
6.3 Calculation of maximum overall tyre dimensions in service.....	6
6.3.1 General.....	6
6.3.2 Maximum overall width in service, W_{max}	7
6.3.3 Maximum overall diameter in service, $D_{0,max}$	7
7 Design tyre dimensions.....	7
8 Tyre size combinations.....	8
9 Method of measurement of tyre dimensions.....	9
Annex A (informative) Tyre size designation.....	10
Bibliography.....	14

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 7, *Industrial tyres and rims*.

This third edition cancels and replaces the second edition (ISO 3739-1:2007), which has been technically revised.

The main changes are as follows:

- tyre sizes with rim diameter codes larger than 15 have been added.

A list of all parts in the ISO 3739 series can be found on the ISO website.

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.

Industrial tyres and rims —

Part 1:

Pneumatic tyres (metric series) on 5 degrees tapered or flat base rims — Designation, dimensions and marking

1 Scope

This document specifies the main requirements of the metric series of pneumatic tyres primarily intended for industrial vehicles, including designations, dimensions and markings. The tyres are based on the following parameters:

- speeds not exceeding 50 km/h;
- use on 5° tapered or flat base rims.

The conversion of code-designated industrial tyres into metric-designated tyres is outside the scope of this document.

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 3739-3, *Industrial tyres and rims — Part 3: Rims*

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 80000-1:—¹⁾, *Quantities and units — Part 1: General*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 3877-1 and ISO 4223-1 apply.

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

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

4 Tyre designations

4.1 Dimensional and constructional characteristics

4.1.1 General

The characteristics shall be indicated as follows:

1) Under preparation. Stage at the time of publication: ISO/DIS 80000-1.

4.2.2 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 2](#).

Table 2 — Correlation between load index (LI) and tyre load-carrying capacity (TLCC)

LI	TLCC kg	LI	TLCC kg	LI	TLCC kg	LI	TLCC kg	LI	TLCC kg
0	45	56	224	112	1 120	168	5 600	224	28 000
1	46,2	57	230	113	1 150	169	5 800	225	29 000
2	47,5	58	236	114	1 180	170	6 000	226	30 000
3	48,7	59	243	115	1 215	171	6 150	227	30 750
4	50	60	250	116	1 250	172	6 300	228	31 500
5	51,5	61	257	117	1 285	173	6 500	229	32 500
6	53	62	265	118	1 320	174	6 700	230	33 500
7	54,5	63	272	119	1 360	175	6 900	231	34 500
8	56	64	280	120	1 400	176	7 100	232	35 500
9	58	65	290	121	1 450	177	7 300	233	36 500
10	60	66	300	122	1 500	178	7 500	234	37 500
11	61,5	67	307	123	1 550	179	7 750	235	38 750
12	63	68	315	124	1 600	180	8 000	236	40 000
13	65	69	325	125	1 650	181	8 250	237	41 250
14	67	70	335	126	1 700	182	8 500	238	42 500
15	69	71	345	127	1 750	183	8 750	239	43 750
16	71	72	355	128	1 800	184	9 000	240	45 000
17	73	73	365	129	1 850	185	9 250	241	46 250
18	75	74	375	130	1 900	186	9 500	242	47 500
19	77,5	75	387	131	1 950	187	9 750	243	48 750
20	80	76	400	132	2 000	188	10 000	244	50 000
21	82,5	77	412	133	2 060	189	10 300	245	51 500
22	85	78	425	134	2 120	190	10 600	246	53 000
23	87,5	79	437	135	2 180	191	10 900	247	54 500
24	90	80	450	136	2 240	192	11 200	248	56 000
25	92,5	81	462	137	2 300	193	11 500	249	58 000
26	95	82	475	138	2 360	194	11 800	250	60 000
27	97,5	83	487	139	2 430	195	12 150	251	61 500
28	100	84	500	140	2 500	196	12 500	252	63 000
29	103	85	515	141	2 575	197	12 850	253	65 000
30	106	86	530	142	2 650	198	13 200	254	67 000
31	109	87	545	143	2 725	199	13 600	255	69 000
32	112	88	560	144	2 800	200	14 000	256	71 000
33	115	89	580	145	2 900	201	14 500	257	73 000
34	118	90	600	146	3 000	202	15 000	258	75 000
35	121	91	615	147	3 075	203	15 500	259	77 500
36	125	92	630	148	3 150	204	16 000	260	80 000

Table 2 (continued)

LI	TLCC kg	LI	TLCC kg	LI	TLCC kg	LI	TLCC kg	LI	TLCC kg
37	128	93	650	149	3 250	205	16 500	261	82 500
38	132	94	670	150	3 350	206	17 000	262	85 000
39	136	95	690	151	3 450	207	17 500	263	87 500
40	140	96	710	152	3 550	208	18 000	264	90 000
41	145	97	730	153	3 650	209	18 500	265	92 500
42	150	98	750	154	3 750	210	19 000	266	95 000
43	155	99	775	155	3 875	211	19 500	267	97 500
44	160	100	800	156	4 000	212	20 000	268	100 000
45	165	101	825	157	4 125	213	20 600	269	103 000
46	170	102	850	158	4 250	214	21 200	270	106 000
47	175	103	875	159	4 375	215	21 800	271	109 000
48	180	104	900	160	4 500	216	22 400	272	112 000
49	185	105	925	161	4 625	217	23 000	273	115 000
50	190	106	950	162	4 750	218	23 600	274	118 000
51	195	107	975	163	4 875	219	24 300	275	121 500
52	200	108	1 000	164	5 000	220	25 000	276	125 000
53	206	109	1 030	165	5 150	221	25 750	277	128 500
54	212	110	1 060	166	5 300	222	26 500	278	132 000
55	218	111	1 090	167	5 450	223	27 250	279	136 000

4.2.3 Speed symbol

The speed symbol shall be as given in [Table 3](#). The speed symbol or speed category indicates the reference speed defined as the speed at which the tyre can carry the load corresponding to its load index under the specified service conditions.

The reference speed for tyre load identification of industrial tyres shall be 25 km/h, i.e. speed symbol A5.

Table 3 — Correlation between speed symbol and speed category

Speed symbol	Speed category km/h
A2	10
A3	15
A4	20
A5 ^a	25 ^a
A6	30
A7	35
A8	40
B	50

^a Reference speed for industrial tyres related to load capacity.

4.3 Other service characteristics

4.3.1 The word “TUBELESS” shall be used to characterize tyres that do not require a tube.

4.3.2 Specific indications (if required) may be added to show, for example, the preferred direction of rotation, indicated by an arrow.

5 Marking

5.1 General marking

The marking shall consist of:

- a) the designation of the dimensional and constructional characteristics;
- b) the designation of the service description (load index and speed symbol);
- c) the designation of other service characteristics.

The location of the marking of the service description (load index and speed symbol) shall be distinct but in the vicinity of the marking of the dimensional and constructional characteristics.

No location is specified for the markings related to other service characteristics (see [4.3.1](#) and [4.3.2](#)).

EXAMPLE

180/65R9	marking of dimensional and constructional characteristics
116 A5	marking of load index and speed symbol (distinct location but in the vicinity of the preceding marking)
TUBELESS	location left to the discretion of the tyre manufacturer

The characteristics of a tyre with the above markings are as follows:

180	nominal section width equal to 180 mm;
65	nominal aspect ratio equal to 65;
R	radial ply construction;
9	nominal rim diameter code, corresponding to 229 mm;
116	load index (LI) corresponding to a tyre load of 1 250 kg;
A5	A5 speed symbol corresponding to a reference speed of 25 km/h;
TUBELESS	tyre that does not require a tube.

5.2 Maximum speed marking

If the maximum speed of a tyre is less than 50 km/h (see ISO 3739-2:2021, Table 3), its actual maximum speed shall be marked on the tyre, e.g. “40 km/h max.” or “max. 40 km/h”.

6 Tyre dimensions

6.1 General

The formulae-derived values for design tyre dimensions shall be rounded to the nearest millimetre. Rounding of values shall conform to ISO 80000-1:—, Annex B, B.3, Rule B.

6.2 Calculation of design tyre dimensions

6.2.1 Nominal aspect ratio, A_R

The nominal aspect ratio (H/S) shall be expressed as a percentage and shall be a multiple of 5.

6.2.2 Theoretical rim width, R_{th}

The theoretical rim width, R_{th} , is equal to the product of the nominal section width, S_N , and the rim/section ratio, K_1 :

$$R_{th} = K_1 \times S_N$$

For industrial tyres mounted on 5° tapered or flat base rims, $K_1 = 0,7$ applies to tyres with nominal aspect ratios, A_R , from 60 to 95 inclusive, and $K_1 = 0,8$ applies to tyres with nominal aspect ratios, A_R , from 50 to 55.

6.2.3 Design tyre section width, S

The design tyre section width, S , is the nominal section width, S_N , transferred from the theoretical rim, R_{th} , to the measuring rim, R_m :

$$S = S_N + 0,4(R_m - R_{th})$$

where R_m and R_{th} are expressed in millimetres.

6.2.4 Design tyre section height, H

The design tyre section height, H , is equal to the product of the nominal section width, S_N , and the nominal aspect ratio, A_R , divided by 100:

$$H = S_N \times A_R \times 1/100$$

6.2.5 Design tyre overall diameter, D_0

The design tyre overall diameter, D_0 , is the sum of the nominal rim diameter, D_r , plus twice the design tyre section height, H :

$$D_0 = D_r + 2H$$

For the values of D_r to be used, see [Table 1](#).

6.3 Calculation of maximum overall tyre dimensions in service

6.3.1 General

This calculation is for use by vehicle manufacturers when designing for tyre clearance.

These dimensions shall be calculated with the coefficients appropriate to the design tyre section width and design tyre section height (see [Table 4](#)).

6.3.2 Maximum overall width in service, W_{max}

The maximum overall width in service, W_{max} , is equal to the product of the design tyre section width, S , and the appropriate coefficient, a (see [Table 4](#)):

$$W_{max} = S \times a$$

6.3.3 Maximum overall diameter in service, $D_{0,max}$

The maximum overall diameter in service, $D_{0,max}$, is equal to the nominal rim diameter, $D_{0,max}$, plus twice the product of the design tyre section height, H , and the appropriate coefficient, b (see [Table 4](#)):

$$D_{0,max} = D_r + (2H \times b)$$

Table 4 — Coefficients for calculation of maximum overall tyre dimensions in service

Tyre construction	Construction code	Nominal aspect ratio A_R (%)	Coefficients	
			a	b
Diagonal	“—” or “D”	50 to 95	1,08	1,04
Radial	“R”		1,05	

7 Design tyre dimensions

The relevant dimensions for the recommended metric series of industrial tyre nominal tyre section width, measuring rim width, design tyre section width and design tyre section height for tyres of nominal aspect ratios, A_R , of 60 to 95 are shown in [Table 5](#), and of 50 to 55 are shown in [Table 6](#).

Table 5 — Tyre dimensional guidelines for tyres 60 to 95 series, inclusive

Nominal section width S_N mm	Measuring rim width code ^a	Design tyre dimensions								
		Section width S	mm							
			Section height, H , at nominal aspect ratios, A_R (%)							
			95	90	85	80	75	70	65	60
100	2,5	98	95	90	85	80	75	70	65	60
110	3,25	112	105	99	94	88	83	77	72	66
125	3,25	123	119	113	106	100	94	88	81	75
140	4,0	141	133	126	119	112	105	98	91	84
150	4,33	152	143	135	128	120	113	105	98	90
160	4,0	156	152	144	136	128	120	112	104	96
180	5,0	180	171	162	153	144	135	126	117	108
200	5,0	195	190	180	170	160	150	140	130	120
205	5,5	203	195	185	174	164	154	144	133	123
225	6,5	228	214	203	191	180	169	158	146	135
250	8,0	246	238	225	213	200	188	175	163	150
280	8,0	283	266	252	238	224	210	196	182	168

^a Coefficient $K_1 = 0,7$.