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Passenger car tyres and rims —

Part 1: Tyres (metric series)

Pneumatiques et jantes pour voitures particulières —

Partie 1: Pneumatiques (série millimétrique)

Reference number
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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

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Contents

Page

Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

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.

ISO 4000-1 was prepared by Technical Committee ISO/TC 31, *Tyres, rims and valves*, Subcommittee SC 3, *Passenger car tyres and rims*.

This eighth edition cancels and replaces the seventh edition (ISO 4000-1:2001), which has been technically revised. It also incorporates the Amendment ISO 4000-1:2001/Amd.1:2004.

ISO 4000 consists of the following parts, under the general title *Passenger car tyres and rims*:

— *Part 1: Tyres (metric series)*

— *Part 2: Rims*

Passenger car tyres and rims —

Part 1:
Tyres (metric series)

1 Scope

This part of ISO 4000 specifies the designation, dimensions and load ratings of metric-series tyres primarily intended for passenger cars.

2 Normative references

The following referenced documents are indispensable for the application 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 3877-1, *Tyres, valves and tubes — List of equivalent terms — Part 1: Tyres*

ISO 4000-2:2007, *Passenger car tyres and rims — Part 2: Rims*

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 apply. For other terms used in this field, together with their equivalents in other languages, see ISO 3877-1.

4 Designation

4.1 Size and construction

4.1.1 Characteristics

The tyre characteristics shall be designated as follows:

Nominal section width / Nominal aspect ratio Tyre construction code Nominal rim-diameter code

4.1.2 Nominal section width

The nominal section width of the tyre shall be indicated in millimetres, and this part of the designation shall end in either the numeral of zero or five, so that in any single series of tyres with the same nominal aspect ratio, the values shall all end in 0 or they shall all end in 5.

For sizes mounted on 5° tapered (code-designated) rims, the nominal section width designation shall end in 5.

4.1.3 Nominal aspect ratio

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

4.1.4 Tyre construction code

The tyre construction code shall be as follows:

— B for bias-belted construction;

— D for diagonal construction;

— R for radial ply construction.

In the case of tyres designed for vehicles having a maximum speed capability exceeding 240 km/h, the code-letters ZR may be indicated with the dimensional and constructional characteristics for radial ply tyres instead of the tyre construction code R (see 4.2).

The code-letters ZR shall be used in the dimensional and constructional characteristics associated with the speed symbol Y and the load index, both placed within parentheses, to identify performance up to 300 km/h for tyres suitable for speeds exceeding 300 km/h.

EXAMPLE **235/45 ZR 17 (97Y)**

For maximum speed capability and load capacity of the tyre over 300 km/h, consult the manufacturer.

Use of any other code-letter (for example, in the case of a new construction type) should first be submitted to ISO for acceptance.

4.1.5 Nominal rim-diameter code

For tyres mounted on 5° tapered (code-designated) rims, the code shall be as given in Table 1.

Table 1 — Nominal rim-diameter code

Nominal rim-diameter code	Nominal rim diameter, D_r mm
10	254
12	305
13	330
14	356
15	381
16	406
17	432
18	457
19	483
20	508
21	533
22	559
23	584
24	610
25	635
26	660
28	711
30	762

In the case of tyres requiring new-concept rims, for safety reasons, especially concerning mounting, the code-number shall be equal to the nominal rim diameter (D_r) expressed as a whole number in millimetres.

4.2 Service description

4.2.1 General

The service description shall be as follows:

Load index Speed symbol

In the special case of tyres designed for vehicles having a maximum speed capability exceeding 300 km/h, the service description need not be indicated. However, the tyre manufacturer shall be consulted as to the maximum speed capability and load capacity of such tyres.

4.2.2 Load index

The maximum tyre-load-carrying capacity corresponding to the service conditions specified by the tyre manufacturer shall be indicated by a load index taken from Table 2, per tyre for a single mounting.

4.2.3 Speed categories

A speed category is assigned to a tyre according to the maximum speed for which its use is rated. The speed for each category shall be indicated by a letter-symbol, in accordance with Table 3.

4.3 Other service characteristics

4.3.1 The word “TUBELESS” shall appear on tyres without tubes.

4.3.2 The words “REINFORCED” or “EXTRA LOAD” shall appear on tyres designed for loads and inflation pressures higher than the standard version.

4.3.3 The letters “LL”, close to the tyre size designation, or the word “LIGHT LOAD” shall appear on the sidewalls of tyres designed for loads lower than the standard version.

4.3.4 The letter “T”, immediately preceding the tyre size designation, shall be used to characterize high-pressure, special, temporary-use spare tyres.

4.3.5 Specific indications, if required, may be added to indicate:

— the type of vehicle for which the tyre is primarily designed, using the symbol “P” (see 4.3.6),

— temporary use of certain spare tyres, using indications such as “TEMPORARY USE ONLY”,

— bias-belted construction, with the words “BIAS-BELTED”,

— radial ply construction, with the word “RADIAL”,

— the direction of mounting,

— the direction of rotation,

— the type of tread pattern, and

— other characteristics.

4.3.6 The optional marking “P” may be used where there could be ambiguity regarding the tyre type. It should be positioned such that confusion cannot result from its proximity to any other service condition marking.

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
50	190	70	335	90	600	110	1 060
51	195	71	345	91	615	111	1 090
52	200	72	355	92	630	112	1 120
53	206	73	365	93	650	113	1 150
54	212	74	375	94	670	114	1 180
55	218	75	387	95	690	115	1 215
56	224	76	400	96	710	116	1 250
57	230	77	412	97	730	117	1 285
58	236	78	425	98	750	118	1 320
59	243	79	437	99	775	119	1 360
60	250	80	450	100	800	120	1 400
61	257	81	462	101	825	—	—
62	265	82	475	102	850	—	—
63	272	83	487	103	875	—	—
64	280	84	500	104	900	—	—
65	290	85	515	105	925	—	—
66	300	86	530	106	950	—	—
67	307	87	545	107	975	—	—
68	315	88	560	108	1 000	—	—
69	325	89	580	109	1 030	—	—

The maximum tyre load capacity corresponding to the load index shall apply for speeds up to and including 210 km/h.

For tyres in the speed category V (between 210 km/h and 240 km/h), the maximum load capacity per tyre shall be reduced to 100 % at 210 km/h, 97 % at 220 km/h, 94 % at 230 km/h and 91 % at 240 km/h; linear interpolation is permitted.

In the case of speed categories W and Y, the maximum load capacity per tyre corresponding to the load index shall apply for speeds up to and including 240 km/h for W and 270 km/h for Y.

For tyres in the speed category W (between 240 km/h and 270 km/h), the maximum load capacity per tyre shall be reduced to 100 % at 240 km/h, 95 % at 250 km/h, 90 % at 260 km/h and 85 % at 270 km/h; linear interpolation is permitted.

For tyres in the speed category Y (between 270 km/h and 300 km/h), the maximum load capacity per tyre shall be reduced to 100 % at 270 km/h, 95 % at 280 km/h, 90 % at 290 km/h and 85 % at 300 km/h; linear interpolation is permitted.

See 4.2.3 and Table 3 for speed categories and their symbols.

For speeds of over 300 km/h or ZR-marked tyres or both, consult the tyre manufacturer for the maximum tyre load capacity permitted in relation to the maximum speed allowed for the tyre.

For vehicles with a design maximum speed capability of up to 60 km/h, the maximum load capacity corresponding to the load index may be exceeded, as shown below. However, an increase in the reference inflation pressure is necessary and should be determined in consultation with the tyre manufacturer. In the absence of such agreement, the following pressure increases are recommended:

— for 60 km/h, a 10 % load increase with a 10 kPa inflation pressure increase;

— for 50 km/h, a 15 % load increase with a 20 kPa inflation pressure increase;

— for 40 km/h, a 25 % load increase with a 30 kPa inflation pressure increase;

— for 30 km/h, a 35 % load increase with a 40 kPa inflation pressure increase;

— for 25 km/h, a 42 % load increase with a 50 kPa inflation pressure increase.

Table 3 — Speed category symbols

Symbol	Category km/h
J	100
K	110
L	120
M	130
N	140
P	150
Q	160
R	170
S	180
T	190
U	200
H	210
V	240
W	270
Y [a]	300
NOTE This list is not exhaustive, and other categories and symbols might be added later.	
[a] Radial ply tyres designed for speeds exceeding 300 km/h shall be identified by the code-letters ZR with the dimensional and constructional characteristics in place of the tyre construction code. Consult the tyre manufacturer for the maximum speed capability.	

5 Marking

The marking shall include designations of:

a) size and construction;

b) service condition characteristics (see 4.1.4 and 4.2 for special cases);

c) any other service characteristics.

The location of the marking of the load and speed characteristics shall be distinct, but near the marking of the size and construction.

No location is specified for the markings related to other service characteristics (see 4.3).

EXAMPLE A tubeless tyre having a nominal section width of 165 mm, a nominal aspect ratio of 80, a radial ply construction and a nominal rim-diameter code of 15, whose service description consists of a load index (LI) of 87 corresponding to a tyre load-carrying capacity of 545 kg, and which falls into the speed category H (210 km/h) is marked:

165/80 R 15 87 H
TUBELESS

NOTE See Annex D for other existing size markings.

6 Tyre dimensions

6.1 Rounding values

Except in the cases given in 6.2.1 and 6.2.2, round the formula-derived values for tyre dimensions to the nearest millimetre (see ISO 31-0).

6.2 Calculation of design tyre dimensions

6.2.1 Theoretical rim width, R_{th}

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

where

S_N is the nominal section width;

K_1 is the rim/section width ratio.

For tyres mounted on 5° rims (code-designated) with nominal rim diameter expressed by a two-figure code:

— K_1 = 0,7 where the tyres have a nominal aspect ratio of 50 to 95;

— K_1 = 0,85 where this ratio is 20 to 45.

NOTE K_1 values for other tyre and rim types will be defined in a future revision.

6.2.2 Measuring rim width, R_m

$$R_m = K_2 \times S_N$$

rounded to the nearest standardized rim, where

K_2 is the rim/section width ratio coefficient.

For tyres mounted on 5° drop-centre rims with a nominal diameter expressed by a two-figure code:

— K_2 = 0,7 for nominal aspect ratios 95 to 75;

— K_2 = 0,75 for nominal aspect ratios 70 to 60;

— K_2 = 0,8 for nominal aspect ratios 55 and 50;

— K_2 = 0,85 for nominal aspect ratio 45;

— K_2 = 0,9 for nominal aspect ratios 40 to 30;

— K_2 = 0,92 for nominal aspect ratios 20 and 25.

NOTE Other values of K_2 for other tyre and rim types will be defined in a future revision.

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, so that:

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

with R_m and R_{th} expressed in millimetres.

6.2.4 Design tyre section height, H

The design tyre section height, H, is calculated by the following equation:

$$H = S_N \frac{H/S}{100}$$

6.2.5 Design tyre overall diameter, D_o

The design tyre overall diameter, D_o, is calculated by the following equation:

$$D_o = D_r + 2H$$

For those tyres having a nominal rim-diameter code, use the corresponding value of D_r given in Table 1.

6.2.6 Guidelines

See Annex A for general guidelines on the tyre design dimensions for the metric series of passenger car tyres mounted on 5° rims (code-designated).

6.3 Calculation of maximum overall (grown) tyre dimensions in service tyres mounted on their measuring rims

The calculation of maximum overall (grown) tyre dimensions in service for types mounted on their measuring rims is for use by vehicle manufacturers in designing for tyre clearance.

Calculate these dimensions with the coefficient appropriate to the design tyre section width and design tyre section height (see Table 4).

Table 4 — Coefficients for calculation of tyre dimensions

Dimensions in millimetres

Structure	Construction code	Nominal aspect ratio, H/S	Coefficient			
			a [a]	b	c	d
Diagonal	D	All	1,1	1,08	—	—
Bias-belted	B				—	—
Radial ply	R	⩽ 65	1,04 [b]	1,04	0,96	0,97
		70	1,04 [c]			
		⩾ 75	1,06			

[a] The maximum overall section width may be exceeded by the thickness of a special protective rib on one sidewall.

[b] As of 1992-01-01.

[c] As of 1995-01-01.

6.3.1 Maximum overall (grown) width in service, W_{max}

The maximum overall (grown) width in service, W_{max}, is equal to the greater of the following values:

— the product of the design tyre section width, S, and the appropriate coefficient, a (see Table 4):

$$W_{max} = Sa$$

— the addition of 8 mm to the design tyre section width, S:

$$W_{max} = S + 8$$

6.3.2 Maximum overall (grown) diameter in service, $D_{o\ max}$

$$D_{o\ max} = D_r + 2Hb$$

See Table 4 for the value of coefficient b.

6.4 Calculation of minimum tyre dimensions for radial ply tyres mounted on their measuring rims

6.4.1 Minimum tyre section width, S_{min}

$$S_{min} = Sc$$

See Table 4 for the value of coefficient c.

6.4.2 Minimum tyre overall diameter, $D_{o\ min}$

$$D_{o\ min} = D_r + 2Hd$$

See Table 4 for the value of coefficient d.

6.5 Range of approved rims

The range of approved rim widths for the nominal aspect ratio 35 and above is calculated as the product of the nominal section width, S_N, and the coefficients shown in Table 5. Round the values obtained to the nearest standardized rim width (see ISO 4000-2:2007, Table 2, Dimension A). For tyre sizes with a nominal aspect ratio of 30 and below, the range of approved rim widths is the measuring rim width code ± 0,5.

The maximum overall (grown) width in service, W_{max}, and the minimum tyre section width, S_{min}, will change by 40 % of the change in rim width, expressed in millimetres.

Table 5 — Approved rim widths for passenger car tyres as a function of nominal aspect ratio

Dimensions in millimetres

Nominal aspect ratio H/S	Coefficients for calculation of approved rim width	
	min.	max.
$70 \leqslant H/S \leqslant 95$	0,65	0,85
$50 \leqslant H/S \leqslant 65$	0,7	0,9
$H/S = 45$	0,8	0,95
$35 \leqslant H/S \leqslant 40$	0,85	1

7 Tyre dimension presentation

Tyre dimensions shall be shown in tables such as Table 6, which is an example for tyres mounted on 5° rims (code-designated) and with nominal rim diameter expressed by a two-figure code (see 4.1.5).

Table 6 — Example of tyre dimension table

Tyre size designation [a]	Measuring rim code [b]	Design dimensions		Maximum dimensions in service (grown)	
		Section width S	Overall diameter D_o	Overall width W_{max}	Overall diameter $D_{o\,max}$ [c]
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....

[a] See 4.1.

[b] The measuring rim width, R_m, is expressed by a code. See 6.2.2 for calculation of R_m and ISO 4000-2 for standardized rims.

[c] For special service tyres, the values given may be exceeded by 1 %.

8 Tyre dimension measurement procedure

a) Prior to measurement, mount the tyre on an approved rim, inflated to the recommended pressure given in Table 7, and allow it to stand for a minimum of 24 h at normal room temperature.

b) Readjust the inflation pressure to the original value.

c) Caliper the section width and the overall width of the tyre at six points approximately equally spaced around the tyre circumference. Record the average of these measurements as section width and overall width.

d) Determine the tyre overall diameter by measuring its maximum circumference and dividing this by π (where π = 3,141 6).

Table 7 — Recommended pressures for measurement of tyre dimensions

Tyre	Pressure kPa
Standard load and P-type LIGHT LOAD version	180
Extra load/reinforced version	220
T-type temporary-use spare tyre	420

9 Inflation pressures

Operating cold inflation pressures should be agreed between tyre and vehicle manufacturers, taking into account not only tyre load-carrying capacity (see Annex C), but also operating conditions such as maximum speed, camber angle and the position of the tyre on the vehicle, as well as service conditions and the construction and characteristics of the vehicle.

Unless otherwise specified by the tyre manufacturer, it is recommended that the cold inflation pressure of radial ply tyres be limited in normal application to 350 kPa for all standard load version sizes on code designated rims, irrespective of the speed category (see Table 2).

For normal road applications, the specified inflation pressure may not be less than 140 kPa for vehicle operating speeds $\leqslant$ 160 km/h and 180 kPa in the case of operating speeds over 160 km/h. For special applications, consult the tyre manufacturer.

NOTE Cold inflation pressure is the pressure of the tyre at ambient temperature, and does not include pressure build-up due to tyre usage.

10 Load capacities

Load capacities for passenger car tyres are given in Annex B.

NOTE For sizes not included in Annex B, consult the national standardization organization.

See Annex C for tyre load-carrying capacity at various inflation pressures.

11 Choice of tyre sizes

In selecting tyres for a vehicle, the vehicle maximum load on the tyre shall not be greater than the applicable maximum load-carrying capacity of the tyre. Vehicle maximum load on the tyre is the load on an individual tyre that is determined by distributing to each axle its share of the maximum loaded vehicle weight and dividing by the number of tyres on the axle.

The vehicle normal load on the tyre shall not be greater than 88 % of the maximum load-carrying capacity of the tyre. Vehicle normal load on the tyre is the load on an individual tyre that is determined by distributing (in accordance with Table 8) to each axle its share of the curb weight, accessory weight and normal occupant weight and dividing by the number of tyres on the axle. These, and other relevant weights, are defined below.

The vehicle manufacturer may specify an inflation pressure less than that corresponding to the maximum tyre load. In this case, the load on the tyre (at the corresponding vehicle loading condition) shall not exceed the tyre load capacity at the specified inflation pressure.

Maximum loaded vehicle weight is the sum of

a) curb weight,

b) accessory weight,

c) vehicle capacity weight, and

d) production option weight.

Curb weight is the weight of a motor vehicle with standard equipment, including the maximum capacity of fuel, oil and coolant, and, if so equipped, of air conditioning and the additional weight of an optional engine.

Accessory weight is the combined weight (in excess of those standard items that may be replaced) of automatic transmission, power steering, power brakes, power windows, power seats, radio and heater, to the extent that these items are available as factory-installed equipment (whether installed or not).

Normal occupant weight is equivalent to 68 kg multiplied by the number of occupants, as specified in Table 8. When local regulation includes a luggage weight, a weight of 7 kg per occupant, located in the luggage compartment, shall be used. Occupant distribution is the distribution of occupants in a vehicle as specified in Table 8.

Table 8 — Occupant loading and distribution for vehicle normal load for various designated seating capacities

Designated seating capacity, number of occupants	Vehicle normal load, number of occupants	Occupant distribution in a normally loaded vehicle
2 to 4	2	2 in front
5 and above	3	2 in front, 1 in second seat

Vehicle capacity weight is the rated cargo and luggage load plus 68 kg multiplied by the vehicle designated seating capacity.

Production option weight is the combined weight of those installed regular production options, weighing over 2,3 kg in excess of those standard items they replace, not previously considered in curb weight or accessory weight, and including heavy duty brakes, ride levellers, roof rack, heavy duty battery and special trim.

12 Camber angle

Vehicle camber angles, especially under severe driving conditions, have an influence on tyre performance: the static camber angle on a passenger car cannot exceed the values for the different tyre sizes given in Table 9.

Table 9 — Maximum camber angle for different aspect ratios

Aspect ratio	Maximum camber angle
45	3°
40	3°
35	2°
30	2°
25	2°
20	2°

Annex A
(normative)

Guideline values for metric-series tyres

Guidelines for design dimensions for metric-series tyres mounted on 5° rims (code-designated), with a nominal rim diameter expressed by a two-figure code, are given in Tables A.1 to A.9 as a function of the nominal aspect ratio.

Table A.1 — Nominal aspect ratio (H/S) of 95 to 75 (K_1 = 0,7; K_2 = 0,7)

Nominal section width S_N	Measuring rim width R_m		Design tyre dimensions mm						Approved rim width codes	
			Section width	Section height, H, at H/S (%) of						
mm	code	mm	S	95	90	85	80	75	min.	max.
95	2.5	63,5	94	90	86	81	76	71	2.5	3.0
105	3.0	76	106	100	95	89	84	79	2.5	3.5
115	3.0	76	113	109	104	98	92	86	3.0	4.0
125	3.5	89	126	119	113	106	100	94	3.0	4.0
135	3.5	89	133	128	122	115	108	101	3.5	4.5
145	4.0	101,5	145	138	131	123	116	109	3.5	5.0
155	4.5	114,5	157	147	140	132	124	116	4.0	5.0
165	4.5	114,5	165	157	149	140	132	124	4.0	5.5
175	5.0	127	177	166	158	149	140	131	4.5	6.0
185	5.0	127	184	176	167	157	148	139	4.5	6.0
195	5.5	139,5	196	185	176	166	156	146	5.0	6.5
205	5.5	139,5	203	195	185	174	164	154	5.0	7.0
215	6.0	152,5	216	204	194	183	172	161	5.5	7.0
225	6.0	152,5	223	—	203	191	180	169	6.0	7.5
235	6.5	165	235	—	—	200	188	176	6.0	8.0
245	7.0	178	248	—	—	208	196	184	6.5	8.0
255	7.0	178	255	—	—	—	204	191	6.5	8.5
265	7.5	190,5	267	—	—	—	—	199	7.0	9.0
275	7.5	190,5	274	—	—	—	—	206	7.0	9.0
285	8.0	203	286	—	—	—	—	214	7.5	9.5
295	8.0	203	294	—	—	—	—	221	7.5	10.0
305	8.5	216	306	—	—	—	—	229	8.0	10.0
315	8.5	216	313	—	—	—	—	236	8.0	10.5
Rims outside the approved range in use from previous designs are not approved for new designs.										

Table A.2 — Nominal aspect ratio (H/S) of 70 (K_1 = 0,7; K_2 = 0,75)

Nominal section width S_N	Measuring rim width R_m		Design tyre dimensions mm		Approved rim width codes	
			Section width	Section height		
mm	code	mm	S	H	min.	max.
95	3.0	76	99	67	2.5	3.0
105	3.0	76	106	74	2.5	3.5
115	3.5	89	118	81	3.0	4.0
125	3.5	89	126	88	3.0	4.0
135	4.0	101,5	138	95	3.5	4.5
145	4.5	114,5	150	102	3.5	5.0
155	4.5	114,5	157	109	4.0	5.0
165	5.0	127	170	116	4.0	5.5
175	5.0	127	177	123	4.5	6.0
185	5.5	139,5	189	130	4.5	6.0
195	6.0	152,5	201	137	5.0	6.5
205	6.0	152,5	209	144	5.0	7.0
215	6.5	165	221	151	5.5	7.0
225	6.5	165	228	158	6.0	7.5
235	7.0	178	240	165	6.0	8.0
245	7.0	178	248	172	6.5	8.0
255	7.5	190,5	260	179	6.5	8.5
265	8.0	203	272	186	7.0	9.0
275	8.0	203	279	193	7.0	9.0
285	8.5	216	292	200	7.5	9.5
Rims outside the approved range which are in use from previous designs are not approved for new designs.						

Table A.3 — Nominal aspect ratio (H/S) of 65 and 60 (K_1 = 0,7; K_2 = 0,75)

Nominal section width S_N	Measuring rim width R_m		Design tyre dimensions mm			Approved rim width codes	
			Section width	Section height, H, at H/S (%) of			
mm	code	mm	S	65	60	min.	max.
105	3.0	76	106	68	—	3.0	3.5
115	3.5	89	118	75	69	3.0	4.0
125	3.5	89	126	81	75	3.5	4.5
135	4.0	101,5	138	88	81	3.5	5.0
145	4.5	114,5	150	94	87	4.0	5.0
155	4.5	114,5	157	101	93	4.5	5.5
165	5.0	127	170	107	99	4.5	6.0
175	5.0	127	177	114	105	5.0	6.0
185	5.5	139,5	189	120	111	5.0	6.5
195	6.0	152,5	201	127	117	5.5	7.0
205	6.0	152,5	209	133	123	5.5	7.5
215	6.5	165	221	140	129	6.0	7.5
225	6.5	165	228	146	135	6.0	8.0
235	7.0	178	240	153	141	6.5	8.5
245	7.0	178	248	159	147	7.0	8.5
255	7.5	190,5	260	166	153	7.0	9.0
265	8.0	203	272	172	159	7.5	9.5
275	8.0	203	279	179	165	7.5	9.5
285	8.5	216	292	185	171	8.0	10.0
295	8.5	216	299	192	177	8.0	10.5
305	9.0	228,5	311	198	183	8.5	11.0
315	9.5	241,5	323	205	189	8.5	11.0
325	9.5	241,5	331	—	195	9.0	11.5
335	10.0	254	343	—	201	9.0	12.0
345	10.0	254	350	—	207	9.5	12.0
Rims outside the approved range in use from previous designs are not approved for new designs.							

Table A.4 — Nominal aspect ratio (H/S) of 55 and 50 (K_1 = 0,7; K_2 = 0,8)

Nominal section width S_N	Measuring rim width R_m		Design tyre dimensions mm			Approved rim width codes	
			Section width	Section height, H, at H/S (%) of			
mm	code	mm	S	55	50	min.	max.
125	4.0	101,5	131	69	63	3.5	4.5
135	4.5	114,5	143	74	68	3.5	5.0
145	4.5	114,5	150	80	73	4.0	5.0
155	5.0	127	162	85	78	4.5	5.5
165	5.0	127	170	91	83	4.5	6.0
175	5.5	139,5	182	96	88	5.0	6.0
185	6.0	152,5	194	102	93	5.0	6.5
195	6.0	152,5	201	107	98	5.5	7.0
205	6.5	165	214	113	103	5.5	7.5
215	7.0	178	226	118	108	6.0	7.5
225	7.0	178	233	124	113	6.0	8.0
235	7.5	190,5	245	129	118	6.5	8.5
245	7.5	190,5	253	135	123	7.0	8.5
255	8.0	203	265	140	128	7.0	9.0
265	8.5	216	277	146	133	7.5	9.5
275	8.5	216	284	151	138	7.5	9.5
285	9.0	228,5	297	157	143	8.0	10.0
295	9.5	241,5	309	162	148	8.0	10.5
305	9.5	241,5	316	168	153	8.5	11.0
315	10.0	254	328	173	158	8.5	11.0
325	10.0	254	336	179	163	9.0	11.5
335	10.5	266,5	348	184	168	9.0	12.0
345	11.0	279,5	360	190	173	9.5	12.0
Rims outside the approved range in use from previous designs are not approved for new designs.							

Table A.5 — Nominal aspect ratio (H/S) of 45 (K_1 = 0,85; K_2 = 0,85)

Nominal section width S_N mm	Measuring rim width R_m code	Measuring rim width R_m mm	Design tyre dimensions mm Section width S	Design tyre dimensions mm Section height H	Approved rim width codes min.	Approved rim width codes max.
155	5.0	127	153	70	5.0	6.0
165	5.5	139,5	165	74	5.0	6.0
175	6.0	152,5	177	79	5.5	6.5
185	6.0	152,5	183	83	6.0	7.0
195	6.5	165	195	88	6.0	7.5
205	7.0	178	207	92	6.5	7.5
215	7.0	178	213	97	7.0	8.0
225	7.5	190,5	225	101	7.0	8.5
235	8.0	203	236	106	7.5	9.0
245	8.0	203	243	110	7.5	9.0
255	8.5	216	255	115	8.0	9.5
265	9.0	228,5	266	119	8.5	10.0
275	9.0	228,5	273	124	8.5	10.5
285	9.5	241,5	285	128	9.0	10.5
295	10.0	254	296	133	9.5	11.0
305	10.0	254	303	137	9.5	11.5
315	10.5	266,5	315	142	10.0	12.0
325	11	279,5	326	146	10.0	12.0
335	11	279,5	333	151	10.5	12.5
345	11.5	292	345	155	11.0	13.0
355	12	305	356	160	11.0	13.5
365	12	305	363	164	11.5	13.5
Rims outside the approved range in use from previous designs are not approved for new designs.						

Table A.6 — Nominal aspect ratio (H/S) of 40 and 35 (K_1 = 0,85; K_2 = 0,9)

Nominal section width S_N	Measuring rim width R_m		Design tyre dimensions mm			Approved rim width codes	
			Section width	Section height, H, at H/S (%) of			
mm	code	mm	S	40	35	min.	max.
165	6.0	152,5	170	66	—	5.5	6.5
175	6.0	152,5	177	70	—	6.0	7.0
185	6.5	165	188	74	65	6.0	7.5
195	7.0	178	200	78	68	6.5	7.5
205	7.5	190,5	212	82	72	7.0	8.0
215	7.5	190,5	218	86	75	7.0	8.5
225	8.0	203	230	90	79	7.5	9.0
235	8.5	216	242	94	82	8.0	9.5
245	8.5	216	248	98	86	8.0	9.5
255	9.0	228,5	260	102	89	8.5	10.0
265	9.5	241,5	272	106	93	9.0	10.5
275	9.5	241,5	278	110	96	9.0	11.0
285	10.0	254	290	114	100	9.5	11.0
295	10.5	266,5	301	118	103	10.0	11.5
305	11.0	279,5	313	122	107	10.0	12.0
315	11.0	279,5	320	126	110	10.5	12.5
325	11.5	292	331	130	114	11.0	13.0
335	12.0	305	343	134	117	11.0	13.0
345	12.0	305	350	138	121	11.5	13.5
355	12.5	317,5	361	142	124	12.0	14.0
365	13.0	330	373	146	128	12.0	14.5
375	13.5	343	385	—	131	12.5	15.0
385	13.5	343	391	—	135	13.0	15.0
395	14.0	355,5	403	—	138	13.0	15.5
Rims outside the approved range in use from previous designs are not approved for new designs.							

Table A.7 — Nominal aspect ratio (H/S) of 30 (K_1 = 0,85; K_2 = 0,9)

Nominal section width S_N	Measuring rim width R_m		Design tyre dimensions mm		Approved rim width codes	
			Section width	Section height		
mm	code	mm	S	H	min.	max.
185	6.5	165	188	56	6.0	7.0
195	7.0	178	200	59	6.5	7.5
205	7.5	190,5	212	62	7.0	8.0
215	7.5	190,5	218	65	7.0	8.0
225	8.0	203	230	68	7.5	8.5
235	8.5	216	242	71	8.0	9.0
245	8.5	216	248	74	8.0	9.0
255	9.0	228,5	260	77	8.5	9.5
265	9.5	241,5	272	80	9.0	10.0
275	9.5	241,5	278	83	9.0	10.0
285	10.0	254	290	86	9.5	10.5
295	10.5	266,5	301	89	10.0	11.0
305	11.0	279,5	313	92	10.5	11.5
315	11.0	279,5	320	95	10.5	11.5
325	11.5	292	331	98	11.0	12.0
335	12.0	305	343	101	11.5	12.5
345	12.0	305	350	104	11.5	12.5
355	12.5	317,5	361	107	12.0	13.0
365	13.0	330	373	110	12.5	13.5
375	13.5	343	385	113	13.0	14.0
385	13.5	343	391	116	13.0	14.0
395	14.0	355,5	403	119	13.5	14.5
Rims outside the approved range in use from previous designs are not approved for new designs.						

Table A.8 — Nominal aspect ratio (H/S) of 25 (K_1 = 0,85; K_2 = 0,92)

Nominal section width S_N	Measuring rim width R_m		Design tyre dimensions mm		Approved rim width codes	
			Section width S	Section height H		
mm	code	mm			min.	max.
305	11.0	279	313	76	10.5	11.5
315	11.5	292	325	79	11.0	12.0
325	12.0	305	336	81	11.5	12.5
335	12.0	305	343	84	11.5	12.5
345	12.5	318	355	86	12.0	13.0
355	13.0	330	366	89	12.5	13.5
365	13.0	330	373	91	12.5	13.5
375	13.5	343	385	94	13.0	14.0
385	14.0	356	396	96	13.5	14.5
395	14.5	368	408	99	14.0	15.0
405	14.5	368	415	101	14.0	15.0
415	15.0	381	428	104	14.5	15.5
425	15.5	394	438	106	15.0	16.0
435	16.0	406	450	109	15.5	16.5
445	16.0	406	456	111	15.5	16.5
455	16.5	419	468	114	16.0	17.0
465	17.0	432	480	116	16.5	17.5
475	17.0	432	486	119	16.5	17.5
485	17.5	445	498	121	17.0	18.0
Rims outside the approved range in use from previous designs are not approved for new designs.						

Table A.9 — Nominal aspect ratio (H/S) of 20 (K_1 = 0,85; K_2 = 0,92)

Nominal section width S_N	Measuring rim width R_m		Design tyre dimensions mm		Approved rim width codes	
			Section width S	Section height H		
mm	code	mm			min.	max.
385	14.0	356	396	77	13.5	14.5
395	14.5	368	408	79	14.0	15.0
405	14.5	368	415	81	14.0	15.0
415	15.0	381	428	83	14.5	15.5
425	15.5	394	438	85	15.0	16.0
435	16.0	406	450	87	15.5	16.5
445	16.0	406	456	89	15.5	16.5
455	16.5	419	468	91	16.0	17.0
465	17.0	432	480	93	16.5	17.5
475	17.0	432	486	95	16.5	17.5
485	17.5	445	498	97	17.0	18.0
495	18.0	457	510	99	17.5	18.5
505	18.5	470	521	101	18.0	19.0
515	18.5	470	528	103	18.0	19.0
525	19.0	483	539	105	18.5	19.5
535	19.5	495	551	107	19.0	20.0
545	19.5	495	558	109	19.0	20.0
555	20.0	508	569	111	19,5	20.5
565	20.5	521	581	113	20.0	21.0
575	21.0	533	593	115	20.5	21.5
585	21.0	533	599	117	20.5	21.5
595	21.5	546	611	119	21.0	22.0
605	22.0	559	623	121	21.5	22.5
Rims outside the approved range in use from previous designs are not approved for new designs.						

Annex B
(normative)

Load capacity indices for passenger car tyres

Table B.1 gives equivalences, based on overall diameter, for tyres in standard load version. Load-carrying capacity indices are given for to a basic inflation pressure of 240 kPa. The load indices given are preferred values for international use. Sizes given in parentheses are those for tyres equivalent in overall diameter with higher load capacity indices.

Table B.2 gives tyre load capacity indices, grouped by nominal rim diameter and nominal aspect ratio, for a basic pressure of 240 kPa for the standard load version, and 280 kPa for the REINFORCED or EXTRA LOAD version.

For future revisions of the values in Table B.2, it is recommended that all values be increased by the same amount.

Table B.3 gives the load capacity indices for T-type temporary spare tyres, with a reference pressure of 420 kPa.

Table B.4 gives the load capacity indices for P-type LIGHT LOAD tyres with a reference pressure of 240 kPa.

Table B.1 — Standard load version equivalences

70 series	65 series	60 series	55 series	50 series	Load capacity index
—	155/65 R 12	165/60 R 12	—	—	71
145/70 R 12	145/65 R 13	155/60 R 13	—	—	69
155/70 R 12	155/65 R 13	165/60 R 13	175/55 R 13	—	73
165/70 R 12	165/65 R 13	175/60 R 13	185/55 R 13	185/50 R 14	77
175/70 R 12	175/65 R 13	185/60 R 13	195/55 R 13	195/50 R 14	80
—	185/65 R 13	195/60 R 13	—	205/50 R 14	84
—	195/65 R 13	205/60 R 13	—	—	87
—	205/65 R 13	215/60 R 13	—	—	89
—	215/65 R 13	225/60 R 13	—	—	92
155/70 R 13	155/65 R 14	165/60 R 14	175/55 R 14	—	75
165/70 R 13	165/65 R 14	175/60 R 14	185/55 R 14	185/50 R 15	79
175/70 R 13	175/65 R 14	185/60 R 14	195/55 R 14	195/50 R 15	82
—	—	—	205/55 R 14	205/50 R 15	85
185/70 R 13	185/65 R 14	195/60 R 14	—	—	86
—	—	—	(215/55 R 14)	(215/50 R 15)	(88)
195/70 R 13	195/65 R 14	205/60 R 14	—	—	89
—	—	—	(225/55 R 14)	(225/50 R 15)	(91)
205/70 R 13	205/65 R 14	215/60 R 14	—	—	91
—	—	—	(235/55 R 14)	(235/50 R 15)	(93)
215/70 R 13	215/65 R 14	225/60 R 14	—	—	94

Table B.1 (*continued*)

70 series	65 series	60 series	55 series	50 series	Load index
155/70 R 14	155/65 R 15	165/60 R 15	175/55 R 15	—	77
165/70 R 14	165/65 R 15	175/60 R 15	185/55 R 15	185/50R 16	81
175/70 R 14	175/65 R 15	185/60 R 15	195/55 R 15	195/50R 16	84
—	—	—	205/55 R 15	205/50R 16	87
185/70 R 14	185/65 R 15	195/60 R 15	—	—	88
—	—	—	(215/55 R 15)	(215/50 R 16)	(90)
195/70 R 14	195/65 R 15	205/60 R 15	—	—	91
—	—	—	(225/55 R 15)	(225/50 R 16)	(92)
205/70 R 14	205/65 R 15	215/60 R 15	—	—	94
—	—	—	(235/55 R 15)	(235/50 R 16)	(95)
215/70 R 14	215/65 R 15	225/60 R 15	—	—	96
—	—	(235/60 R 15)	(245/55 R 15)	(245/50 R 16)	(98)
225/70 R 14	225/65 R 15	—	—	—	99
—	—	(245/60 R 15)	(255/55 R 15)	(255/50 R 16)	(100)
—	—	—	205/55 R 16	205/50 R 17	89
185/70 R 15	185/65 R 16	195/60 R 16	—	—	89
—	—	—	(215/55 R 16)	(215/50 R 17)	(91)
195/70 R 15	195/65 R 16	205/60 R 16	—	—	92
—	—	—	(225/55 R 16)	(225/50 R 17)	(94)
205/70 R 15	205/65 R 16	215/60 R 16	—	—	95
—	—	—	(235/55 R 16)	(235/50 R 17)	(96)
215/70 R 15	215/65 R 16	225/60 R 16	—	—	98
—	—	—	(245/55 R 16)	(245/50 R 17)	(99)
225/70 R 15	225/65 R 16	235/60 R 16	—	—	100
235/70 R 15	235/65 R 16	—	—	—	103

Table B.2 — Load capacity indices

Nominal section	80 series	75 series	70 series	65 series	60 series	55 series	50 series	45 series	40 series	35 series	30 series
Nominal rim-diameter code 10											
145	69		63								
155	73		67								
165			72								
Nominal rim-diameter code 12											
135	68		65								
145	74		69	67							
155	77		73	71	68						
165			77		71						
175			80	78							
Nominal rim-diameter code 13											
125	65										
135	70		68								
145	75		71	69							
155	79		75	73	69						
165	83		79	77	73	70					
175	86		82	80	77	73	72				
185	90		86	84	80	77		72			
195			89	87	84	80		75			
205			91	89	87			78	74		
215			94	92	89		84	81	77		
225					92		86	84	80		
235					94		89	87	83		
245							91	89	85		
255								92	88		
265								94	90		
275								97	93		
285								99	95		
Nominal rim-diameter code 14											
135			69								
145			73	70							
155	81		77	75		69					
165	85		81	79	75	72					
175	88	86	84	82	79	75					
185	91	89	88	86	82	79	77	74			
195	95	92	91	89	86	82	80	77			
205	98	95	94	91	89	85	84	80	76		
215		98	96	94	91	88		83	79		

Table B.2 (*continued*)

Nominal section	80 series	75 series	70 series	65 series	60 series	55 series	50 series	45 series	40 series	35 series	30 series
225		101	99		94	91		86	82		
235			101		96	93		88	84		
245			103		99	96	93	91	87		
255					101	98	95	93	89		
265					103	100	98	96	92		
275					105			98	94		
285								100	96		
Nominal rim-diameter code 15											
145			75								
155	83		78	77							
165	87		82	81	77						
175	90		86	84	81	77	75				
185	93		89	88	84	81	79	75			
195	96	94	92	91	88	84	82	78			
205		97	95	94	91	87	85	81	77		
215	101	100	98	96	94	90	88	84	80		
225	105	102	100	99	96	92	91	87	83	79	
235		105	103	100	98	95	93	90	86	81	
245		108	105	102	100	98	95	92	88	84	
255		110	108	106	102	100	97	95	91	86	
265		112	110		105		99	97	93	89	
275					107	104	101	99	95	91	
285							104	101	98	93	
295							105	104	100	95	
305								106	102	97	
315								108	104	99	
325								110	106	101	
335								112	108	103	
345								114	110	105	
Nominal rim-diameter code 16											
155	85										
175	91										
185				89			81	77			
195	97			92	89		84	80			
205	100		97	95	92	89	87	83	79		
215	103	101	99	98	95	91	90	86	82		
225		104	102	100	98	94	92	89	85	80	
235	109	106	105	103	100	96	95	91	87	83	
245		109	107			99	98	94	90	86	

Table B.2 (*continued*)

Nominal section	80 series	75 series	70 series	65 series	60 series	55 series	50 series	45 series	40 series	35 series	30 series
255				109	103		100	96	92	88	
265			112				101	98	95	90	
275			114				103	101	97	92	
285								103	99	95	
295								105	101	97	
305								107	103	99	
315								109	105	100	
325								111	107	102	
335								113	109	104	
345								115	111	106	
Nominal rim-diameter code 17											
185								78			
195								81			
205							89	84	80		
215							91	87	83		
225					99		94	90	86	82	
235						97	96	93	90	84	
245					103		99	95	91	87	
255						102	100	98	94	89	
265					108			100	96	92	87
275					110			102	98	94	89
285								104	100	96	91
295								107	102	98	93
305								109	104	100	95
315								111	106	102	97
325								113	109	104	99
335								115	110	106	101
345								116	112	108	102
355								118		109	104
365								120		111	106
375											108
385											109
Nominal rim-diameter code 18											
185								79			
195								83			
205						91		86	82		
215								89	85		
225								91	88	83	
235					103			94	91	86	

Table B.2 (*continued*)

Nominal section	80 series	75 series	70 series	65 series	60 series	55 series	50 series	45 series	40 series	35 series	30 series
245					104			96	93	88	
255					109			99	95	90	
265								101	97	93	88
275								103	99	95	90
285								105	101	97	93
295								108	103	99	94
305								110	106	101	96
315								112	108	103	98
325								114	110	105	100
335								116	112	107	102
345								118	114	109	104
355								119		111	106
365								121		112	107
375											109
385											110
Nominal rim-diameter code 19											
185								81			
195								84			
205								87	83		
215								90	86		
225								92	89	84	
235								95	92	87	
245								98	94	89	
255								100	96	92	
265								102	98	94	89
275								104	101	96	92
285								107	103	99	94
295								109	105	100	96
305								111	107	102	98
315								113	109	104	100
325								115	111	106	101
335								117	113	108	103
345								119	115	110	105
355								121		112	107
365								122		114	109
375											110
385											112

Table B.2 (*continued*)

Nominal section	80 series	75 series	70 series	65 series	60 series	55 series	50 series	45 series	40 series	35 series	30 series
Nominal rim-diameter code 20											
185								82			
195								85			
205								88	84		
215								91	87		
225								94	90	86	
235								96	93	88	
245								99	95	91	
255								101	97	93	
265								104	100	95	90
275								106	102	98	93
285								108	104	100	95
295								110	106	102	97
305								112	108	104	99
315								114	110	106	101
325								116	112	108	103
335								118	114	110	104
345								120	116	111	106
355								122		113	108
365								123		115	110
375											112
385											113
Load capacity indices for reinforced/extra load versions are determined by adding 4 points to standard load LIs.											

Table B.3 — Load capacity indices for T-type light load tyres with reference pressure 420 kPa

Tyre designation	Load index	Tyre designation	Load index
T 135/60_[a]16	92	T 125/80_[a]15	95
T 105/70_[a]14	84	T 135/80_[a]15	100
T 115/70_[a]14	88	T 115/80_[a]16	92
T 125/70_[a]14	93	T 125/80_[a]16	97
T 135/70_[a]14	97	T 135/80_[a]16	101
T 105/70_[a]15	85	T 145/80_[a]16	105
T 115/70_[a]15	90	T 155/80_[a]16	109
T 125/70_[a]15	95	T 135/80_[a]17	103
T 135/70_[a]15	99	T 135/80_[a]18	104
T 105/70_[a]16	87	T 125/85_[a]15	97
T 115/70_[a]16	92	T 105/90_[a]12	80
T 125/70_[a]16	96	T 115/90_[a]12	86
T 135/70_[a]16	100	T 125/90_[a]12	90
T 125/70_[a]17	98	T 125/90_[a]15	96
T 135/70_[a]17	102	T 135/90_[a]15	100
T 145/70_[a]17	106	T 125/90_[a]16	98
T 155/70_[a]17	110	T 135/90_[a]16	102
T 125/70_[a]18	99	T 145/90_[a]16	106
T 105/80_[a]13	82	T 155/90_[a]16	110
T 125/80_[a]13	92	T 165/90_[a]17	115
T 135/80_[a]14	97	T 105/95_[a]17	90

[a] D, B or R to be inserted here, depending on the tyre structure.

Table B.4 — Load capacity indices for P-type LIGHT LOAD (LL) tyres with reference pressure of 240 kPa

Tyre designation	Load index	Tyre designation	Load index
30 SERIES		P245/40R18	90
P335/30R18	95	P255/40R19	91
		P265/40R18	92
35 SERIES		P275/40R17	93
		P275/40R18	94
P245/35R18	80	P285/40R17	95
P275/35R20	89	P295/40R20	101
P285/35R17	88		
P285/35R18	89	**45 SERIES**	
P315/35R17	93		
P335/35R17	97	P225/45R17	84
		P235/45R17	87
40 SERIES		P245/45R16	88
		P245/45R17	89
P205/40R16	75	P255/45R17	92
P225/40R18	83	P265/45R16	92
P245/40R17	86	P295/45R18	101
P245/40R18	88	P305/45R17	102
P245/40R20	90	P315/45R17	104