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Bicycle tyres and rims —

Part 1: Tyre designations and dimensions

Pneumatiques et jantes pour cycles —

Partie 1: Désignation et cotes des pneumatiques

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Contents

Page

Foreword

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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 document 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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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 10, *Cycle, moped, motorcycle tyres and rims*.

This seventh edition cancels and replaces the sixth edition (ISO 5775-1:2014), which has been technically revised.

The main changes are as follows:

— new definitions have been added for clarification in Clause 3;

— the symbols and abbreviated terms have been revised in 3.2;

— new requirements have been added for clarification in Clause 4.

A list of all parts in the ISO 5775 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.

Bicycle tyres and rims —

Part 1:
Tyre designations and dimensions

1 Scope

This document specifies the designations and dimensions for the following pneumatic bicycle tyres:

— clincher tyres mounted on straight side or crotchet type rims;

— tubeless tyres;

— tubeless-ready tyres;

— tube-type tyres;

— "beaded edge" tyres mounted on hooked bead rims.

This document does not apply to tubular sew-up tyres and non-pneumatic tyres.

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*

ISO 5775-2:2021, *Bicycle tyres and rims — Part 2: Rims*

3 Terms, definitions, symbols and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 4223-1, ISO 5775-2 and the following 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/

3.1.1
clincher tyre
tyre that has beads that lock onto the rim bead seat and/or rim hook when the tyre is inflated

3.1.1.1
tubeless tyre
TL
clincher tyre (3.1.1) that is functional without an inner tube or sealant to maintain inflation pressure

3.1.1.2
tubeless-ready tyre
TLR
clincher tyre (3.1.1) that is functional without an inner tube but requires sealant to maintain inflation pressure

3.1.1.3
tube-type tyre
clincher tyre (3.1.1) that is only functional with an inner tube to maintain inflation pressure

3.1.2
tubular sew-up tyre
completely enclosed tyre with or without an inner tube that is either glued or taped onto the rim

Note 1 to entry: All clincher tyre types defined in 3.1.1.1 to 3.1.1.3 may also be referred to as "open tubular tyre" if the tread is glued or vulcanized onto a non-vulcanized casing

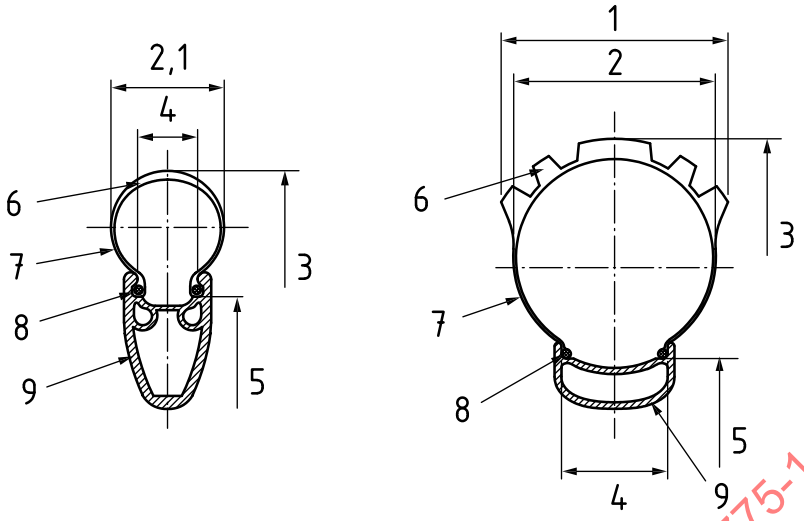
3.2 Symbols and abbreviated terms

D_{design}	design overall diameter
$D_{O,max}$	maximum overall diameter
R_{design}	design rim width
R_m	measuring rim width
S	design section width
S_{min}	minimum section width
S_N	nominal section width
H_{design}	design section height
W	overall width
W_{max}	maximum overall width
C	crotchet type rim
SS	straight-side type rim
TC	tubeless crotchet type rim
TSS	tubeless straight-side type rim

4 Clincher tyres mounted on straight side or crotchet type rims

4.1 Tyre nomenclature

Tyre nomenclature is shown in Figure 1.



Key

1 overall width (W)
2 section width (S)
3 overall diameter (D_O)
4 measuring rim width (R_m)
5 specified rim diameter (D)
6 tread
7 sidewall
8 bead
9 rim

Figure 1 — Sections of a cycle tyre showing components and nomenclature

4.2 Tyre size designation and marking

4.2.1 General

Clincher tyres shall be marked with the nominal size designation in accordance with 4.2.2. The other markings shall conform to 4.2.3 to 4.2.5.

4.2.2 Nominal size designation

4.2.2.1 General

The nominal size designation shall be indicated clearly visible on the side, even when the tyre is mounted as follows:

Nominal section width – Nominal rim diameter code

4.2.2.2 Nominal section width

The nominal section width is the designated inflated section width, the tyre is designed to measure on the design rim at maximum pressure. It shall be expressed in millimetres, as an integer number.

4.2.2.3 Nominal rim diameter code

The nominal rim diameter code reflects the nominal bead seat diameter of the rim, that the tyre is designed for. It shall be expressed in millimetres.

NOTE Nominal rim diameter codes are in ISO 5775-2:2021, Table 2.

4.2.3 Overall size designation

4.2.3.1 General

If the tyre size is characterized by a corresponding overall size designation, the overall size shall be designated as follows:

Overall diameter code × Overall width code

4.2.3.2 Overall diameter code

The overall diameter shall be expressed as code. Refer to Table 1 for the overall diameter code that corresponds to the nominal rim diameter code of the tyre.

Table 1 — Correspondence of nominal rim diameter code and overall diameter code

Nominal rim diameter code	Overall diameter code
203	12,5
254	14
305	16
349	16
355	18
406	20
507	24
559	26
584	27,5
622	29 [a]

[a] For nominal section width 50 and below, overall diameter code 28 is accepted.

4.2.3.3 Overall width code

The overall width shall be expressed as code. Refer to Table 2 for the correspondence of overall width code to the overall width expressed in millimetres.

Table 2 — Overall width code

Overall width mm	Overall width code
18	0,70
19	0,75
20	0,80
21	0,85
22	0,85
23	0,90
24	0,95
25	1,00

Table 2 *(continued)*

Overall width mm	Overall width code
26	1,00
27	1,05
28	1,10
29	1,15
30	1,20
31	1,20
32	1,25
33	1,30
34	1,35
35	1,40
36	1,40
37	1,45
38	1,50
39	1,55
40	1,55
41	1,60
42	1,65
43	1,70
44	1,75
45	1,75
46	1,80
47	1,85
48	1,90
49	1,95
50	2,00
51	2,00
52	2,00
53	2,10
54	2,10
55	2,20
56	2,20
57	2,20
58	2,30
59	2,30
60	2,40
61	2,40
62	2,40
63	2,50
64	2,50
65	2,60
66	2,60
67	2,60
68	2,70

Table 2 *(continued)*

Overall width mm	Overall width code
69	2,70
70	2,80
71	2,80
75	3,00
76	3,00
80	3,10
85	3,30
90	3,50
95	3,70
100	3,90
102	4,00
105	4,10
110	4,30
115	4,50
120	4,70
122	4,80
125	4,90
127	5,00
130	5,10
132	5,20

4.2.4 Old size marking

To help customers in those countries where other systems of marking were used, the old size marking may be separated by parentheses or "/" before or after the tyre size designation.

It is suggested that characters smaller than those used for the nominal size designation specified in 4.2.2 be adopted. See Annex A for correspondence between "nominal size designation" and "old size marking". Sizes not included in Annex A shall bear the nominal size designation.

4.2.5 Other service characteristics

4.2.5.1 Tubeless marking

Tubeless tyres shall be marked with "TUBELESS" or "TL" clearly visible on the side, even when the tyre is mounted.

Tubeless-ready tyres shall be marked with "TUBELESS READY" or "TLR" clearly visible on the side, even when the tyre is mounted.

Tube-type tyres may be marked with "TUBE TYPE" clearly visible on the side, even when the tyre is mounted.

4.2.5.2 Directional arrow

In the case of a preferred direction of rotation of the tyre, an arrow may be shown clearly visible on the side, even when the tyre is mounted, to indicate that direction.

4.2.5.3 Marking of tyres designed for crotchet-type rims only

Tyres designed for crotchet-type rims only may be marked with “MOUNT ONLY ON HOOKED RIMS” or “MOUNT ONLY ON CROTCHET-TYPE RIMS”.

4.2.5.4 Pressure designation

The maximum inflation pressure shall be marked in kilopascals in multiples of 10. It may be marked in addition in bar and pound per square inch (PSI), where the PSI value shall be calculated by multiplying the kilopascal value by 0,145 and rounding the result down to the closest integer.

An additional maximum pressure for use on straight side type rims (SS/TSS) may be indicated. See Table 3 for recommended maximum pressures for straight side type rims.

Table 3 — Maximum pressure for straight side type rims (SS/TSS)

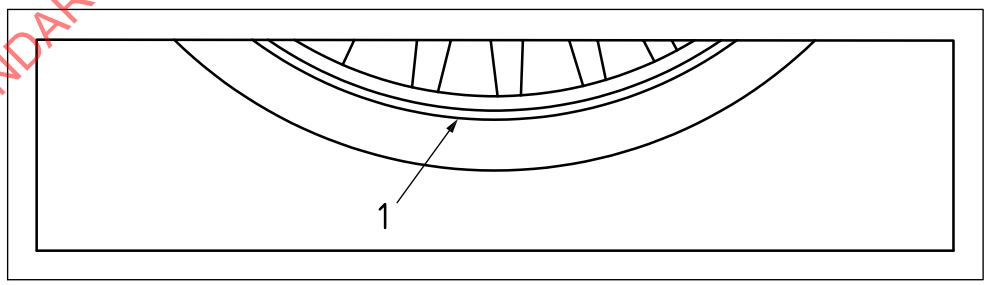
Nominal tyre section width S_N mm	Straight side type rim maximum pressure in service kPa
18 to 24	550
25 to 29	500
30 to 34	450
35 to 39	400
40 to 44	350
45 to 54	300
55 to 64	250
65 to 74	200
75 to 84	150

It is recommended that the deflection of the tyre in use does not exceed 30 % of the tyre section height at the minimum inflation pressure, if it is specified on the tyre.

See the examples in 4.2.6.

4.2.5.5 Rim line

A visible and concentric rim line indicator can be added to the tyre sidewall to show when the beads are fully seated (see Figure 2). If the rim line is not concentric with the rim edge, the bead is not fully seated.



Key

1 rim line

Figure 2 — Rim line

4.2.5.6 Additional indications

Other markings may be added to indicate the following:

a) minimum inflation pressure;

b) recommended inflation pressure;

c) design rim;

d) recommended rim width range;

e) other characteristics.

4.2.6 Examples

A tyre with the tyre size designation 25-622 and a maximum inflation pressure of 850 kPa may be marked:

25-622 max. 850 kPa

Optionally, an alternative size marking and/or alternative inflation pressure indications may be added, for example:

25-622 max. 850 kPa / 8,5 bar / 123 PSI

25-622 max. 850 kPa (C/TC); max. 500 kPa (SS/TSS)

A tyre with the size designation 60-622 and a maximum inflation pressure of 300 kPa may be marked:

60-622 max. 300 kPa

Alternative markings:

60-622 (29 × 2,40) max. 300 kPa / 3,0 bar / 43 PSI

4.3 Tyre dimensions

4.3.1 General

See Figure 1 for a graphical representation of tyre dimensions and nomenclature.

4.3.2 Design tyre dimensions

4.3.2.1 Design rim width, R_{design}

Each tyre size designation has a design rim width specified based on the nominal section width as shown in Table 4.

Table 4 — Design rim width

Nominal tyre section width, S_N mm	**Design rim width, R_{design}** mm
18 to 21	15
22 to 24	17
25 to 28	19
29 to 34	21
35 to 46	23
47 to 57	25

Table 4 *(continued)*

Nominal tyre section width, S_N mm	Design rim width, R_{design} mm
58 to 65	30
66 to 71	35
72 to 83	45
84 to 95	55
96 to 113	76
114 to 132	94

4.3.2.2 Design overall diameter, D_{design}

The design overall diameter of a tyre may be calculated as shown by Formula (1):

$$D_{design} = D_R + 2 \times H_{design} \quad (1)$$

where

D_R is the nominal rim diameter, expressed in mm;

$$H_{design} = \sqrt{\left(\frac{S_N}{2}\right)^2 - \left(\frac{R_m}{2}\right)^2} + \frac{S_N}{2} + G_f + X_{corr,tread}$$

G_f = 6,0 mm.

NOTE G_f is the theoretical flange height and is a constant to ensure constant D_0 for all types of rims.

The value of $X_{corr,tread}$ is given dependent on the nominal section width in Table 5.

Table 5 — Dependence of tread correction factor $X_{corr,tread}$ on nominal section width

Nominal section width mm	$X_{corr,tread}$ mm
18 to 49	2,0
50 to132	3,0

4.3.2.3 Design section width, S

For a tyre mounted on the design rim, the design section width S equals the nominal section width S_N.

The design section width S for a tyre mounted on a measuring rim different from the design rim shall be calculated as shown by Formula (2):

$$S = S_N + 0,4 \times (R_m - R_{design}) \quad (2)$$

4.3.3 Tyre measurement method

4.3.3.1 General

Tyre measurement shall be performed on a rim conforming to 4.3.3.2 at a pressure conforming to 4.3.3.3 and using the procedure in 4.3.3.4.

4.3.3.2 Measuring rim

The measuring rim shall have the specified design rim width shown in Table 4 for verification of compliance with the requirements in 4.3.4.

NOTE Acceptable rim widths are in Table 7.

The measuring rim (the rim used when evaluating the section width of any tyre) shall conform to ISO 5775-2.

4.3.3.3 Tyre conditioning prior to measurement

Inflate the tyre to the maximum pressure, as specified on the tyre sidewall and allow it to stand for a minimum of 24 h at room temperature.

Measure the inflation pressure.

Do not proceed with the measurement in cases where the inflation pressure is more than 10 % lower than the original value.

If needed, readjust the inflation pressure to the original value.

If a tyre is designated “tubeless” or “tubeless-ready”, it may be measured without an inner tube.

4.3.3.4 Tyre measurement procedure

Measure the section width (excluding elevations due to labelling (markings), decorations and protective bands) and the overall width of the tyre [including labelling (marking), decorations, protective bands or ribs, and rim protector] with a calliper at minimum four points approximately equally spaced around the tyre circumference. Record the average of these measurements as section width and overall width.

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

4.3.4 Dimensional specifications

4.3.4.1 Width specifications

Section width and overall width measured in accordance with 4.3.3 shall be within the limits given in Table 6. The limits are calculated based on Formulae (3) and (4):

Minimum section width:

$$S_{\min} = \begin{cases} S - a \cdot S_N & \text{for } S_N < 70\ \text{mm} \\ S - 4\ mm & \text{for } S_N \geq 70\ \text{mm} \end{cases} \quad (3)$$

Maximum overall width:

$$W_{\max} = \begin{cases} S + a \cdot S_N & \text{for } S_N < 70\ \text{mm} \\ S + 4\ mm & \text{for } S_N \geq 70\ \text{mm} \end{cases} \quad (4)$$

where

$$a = \begin{cases} 0{,}06 & \text{for } S_N \leq 34\ \text{mm} \\ 0{,}05 & \text{for } S_N > 34\ \text{mm} \end{cases}$$

The values for the minimum section width and the maximum overall width shall be rounded to the nearest integer.

Table 6 — Tolerances on tyre width

Nominal section width, S_N	Minimum section width, S_{min}	Maximum overall width, W_{max}
15 to 24	S - 1 mm	S + 1 mm
25 to 49	S - 2 mm	S + 2 mm
50 to 69	S - 3 mm	S + 3 mm
≥ 70	S - 4 mm	S + 4 mm

4.3.4.2 Maximum overall diameter

The overall diameter of a tyre shall measure less than the maximum overall diameter $D_{0,max}$. The maximum overall diameter $D_{0,max}$ for a given nominal rim diameter code (D) and nominal section width (S) shall be determined by using the formula below, rounded to the nearest integer:

$$D_{0,max} = \begin{cases} D + 2{,}15 \cdot S + 12 & \text{for } S < 66\,\text{mm} \\ 130 \cdot \ln(S) + D - 392 & \text{for } S \geq 66\,\text{mm} \end{cases} \quad (5)$$

4.4 Recommended rim widths in use

Table 7 shows the acceptable rim widths that may be used in service for a given tyre's nominal section width.

NOTE 1 When mounting a tyre on a rim that differs from the design rim width, the section width can differ from the design. This section width difference can be estimated by multiplying the difference in rim widths by 0,4.

NOTE 2 Rim dimensions and bead seat characteristics are given in ISO 5775-2.

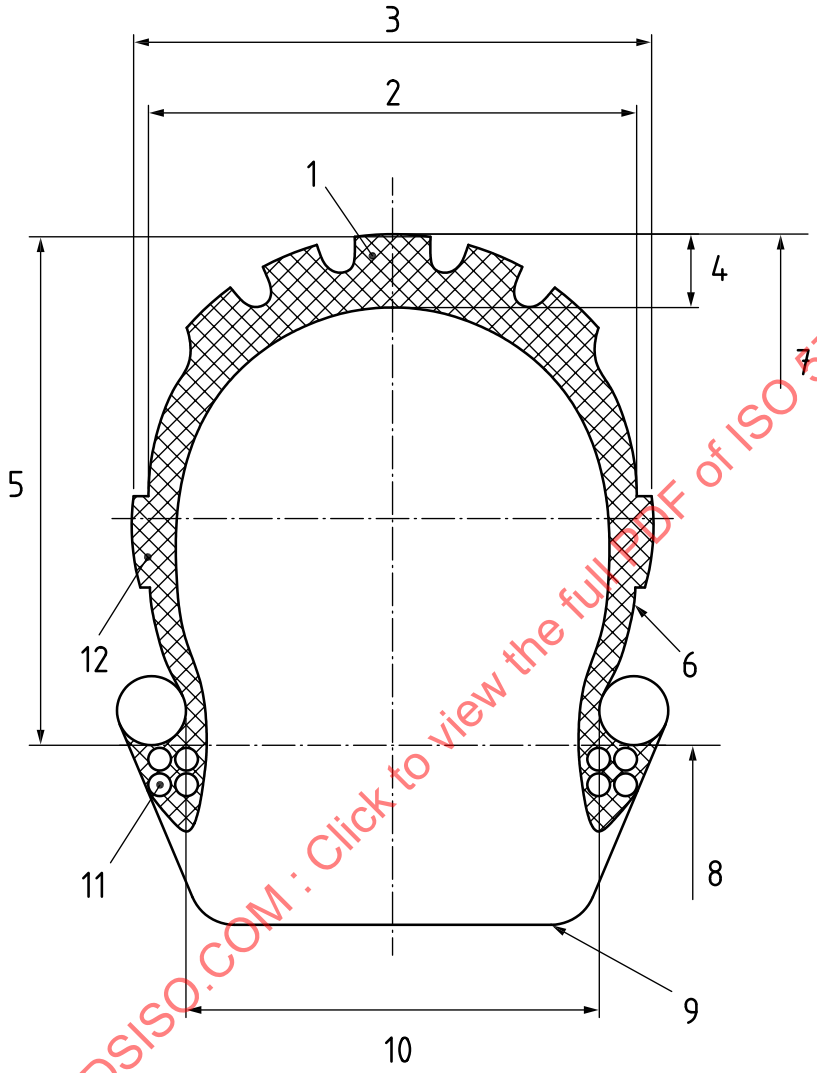
Table 7 — Recommended rim widths

Nominal tyre section width (mm)		Nominal rim width (mm)																			
from	to	13 to 14	15	16	17	18 to 20	21 to 22	23	24	25	26 to 27	28 to 30	31 to 35	36 to 40	41 to 43	44 to 53	54 to 58	59 to 64	65 to 71	72 to 89	90 to 100
18	19	X	X																		
20	21	X	X	X	X																
22	24	X	X	X	X	X															
25	27	X	X	X	X	X	X														
28	28		X	X	X	X	X	X													
29	34			X	X	X	X	X	X	X											
35	46				X	X	X	X	X	X	X										
47	57				X	X	X	X	X	X	X	X									
58	65						X	X	X	X	X	X	X								
66	71									X	X	X	X	X	X						
72	83												X	X	X	X					
84	95														X	X	X	X			
96	113																	X	X	X	
114	132																			X	X

5 “Beaded edge” tyres mounted on hooked bead (HB) rims

5.1 General

Tyre nomenclature is shown in Figure 3.



Key

1	tread	7	overall diameter (D_o)
2	section width (S)	8	specified rim diameter (D)
3	maximum overall width (W)	9	rim
4	crown thickness	10	measuring rim width (R_m)
5	section height (H)	11	steel bead wire
6	sidewall	12	sidewall engraving or decorative pattern

Figure 3 — Typical section of a cycle tyre showing components and nomenclature

5.2 Tyre designation

5.2.1 General

The tyre designation for hooked bead (HB) rims shall be shown on the sidewall of the tyre and shall include the markings given in 5.2.3 to 5.2.4.

5.2.2 Tyre size designation

5.2.2.1 General

The characteristics shall be indicated as follows:

Overall diameter code × Nominal section width code

5.2.2.2 Overall diameter code

The overall diameter code shall be in whole even numbers.

5.2.2.3 Symbol "×"

The symbol "×" shall be included between the code corresponding to the overall diameter and the code corresponding to the nominal section.

5.2.2.4 Nominal section width code

The nominal section width code shall be expressed in hundredths or thousandths, ending in 5 (e.g. 1,375).

5.2.3 Preferred direction of rotation

In the case of a preferred direction of rotation of the tyre, an arrow shall be used to indicate that direction.

5.2.4 Example

A tyre having overall diameter code 20 and nominal section width code 1,375 shall be marked as follows:

20 × 1,375

5.3 Tyre dimensions

5.3.1 General

See Figure 3 for tread and tyre dimensions.

5.3.2 "Design tyre" dimensions

5.3.2.1 Measuring rim width, R_m, and design dimensions

Table 8 gives the measuring rim width, R_m, the design tyre section width, S, and the design tyre section height, H, for a given nominal section width code.

Table 8 — "Beaded edge" tyres mounted on hooked bead (HB) rims — Measuring rim width and design dimensions

Dimensions in millimetres

Nominal section width code	Measuring rim width R_m	Design tyre	
		Section width S	Section height[a] H
1,25	20	32	28
1,375	20	35	31
1,75	25	44	39
2,125	27	54	48

[a] The design section height is equal to 0,88 × design section width rounded to whole numbers.

5.3.2.2 Design tyre overall diameter, D_o

The design tyre overall diameter, D_o, is equal to the sum of the nominal outside rim diameter, D_2, plus twice the design section height, H, as shown by Formula (6):

$$D_o = D_2 + 2H \tag{6}$$

See ISO 5775-2 for existing values of nominal outside rim diameter.

5.3.3 Calculation of maximum tyre dimensions in service

5.3.3.1 General

This calculation shall be for use by vehicle manufacturers in designing for tyre clearance.

5.3.3.2 Maximum overall width in service, W_{max}

The maximum overall width service, W_{max}, is equal to the design tyre section width, S, plus 3 mm as shown by Formula (7):

$$W_{max} = S + 3 \tag{7}$$

This includes protective ribs, lettering, embellishments, manufacturing tolerances, and growth due to service.

5.3.3.3 Maximum overall diameter in service, $D_{o,max}$

The maximum overall diameter in service, $D_{o,max}$, is equal to the nominal outside rim diameter, D_2, plus twice the design tyre section height, H, plus 6 mm as shown by Formula (8):

$$D_{o,max} = D_2 + 2H + 6 \tag{8}$$

This includes manufacturing tolerances and growth due to service.

5.3.4 Determination of nominal overall diameter code

The nominal overall diameter code expresses the value of the design tyre overall diameter, D_o, as is in 5.3.2.2, multiplied by 0,04 and rounded to the nearest even number. (For example, if D_o = 450, nominal overall diameter code = 18.)

5.3.5 Values

Table 9 shows the dimensions for measuring rim width, measuring rim overall diameter, design section width, design overall diameter, maximum overall width in service, and maximum overall diameter in service according to 5.3.2 and 5.3.3 for sizes of interest.

Table 9 — "Beaded edge" tyres mounted on hooked bead (HB) rims — Measuring rim, design tyre and in service dimensions

Dimensions in millimetres

Tyre size designation	Measuring rim		Design tyre		In-service	
	Width	Overall diameter	Section width	Overall diameter	Maximum overall width	Maximum overall diameter
20 × 1,25	20	458,8	32	515	35	521
24 × 1,25		560,4		616		622
26 × 1,25		611,2		667		673
20 × 1,375	20	458,8	35	521	38	527
24 × 1,375		560,4		622		628
26 × 1,375		611,2		673		679
16 × 1,75	25	320,7	44	399	47	405
18 × 1,75		371,5		449		455
20 × 1,75		422,3		500		506
22 × 1,75		473,1		551		557
24 × 1,75		523,9		602		608
26 × 1,75		574,7		653		659
16 × 2,125	27	320,7	54	417	57	423
20 × 2,125		422,3		518		524
24 × 2,125		523,9		620		626
26 × 2,125		574,7		671		677

5.4 Tyre dimension measurement method

Before measuring, tyres shall be mounted on the measuring rim, inflated to the recommended inflation 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.

5.5 Tyres that can be mounted on both hooked bead (HB) and straight side rims

5.5.1 Tyre designation

Tyres of special construction can be designed in such a way as to permit their mounting both on hooked bead (HB) and straight side rims of similar diameters. In this case, the tyre shall be marked with the tyre designations of both categories, the designations being separated by a solidus, for example:

20 × 1,375 / 47 – 406

5.5.2 Maximum tyre dimensions in service

The maximum tyre dimensions in service of the tyre shall conform to those of each tyre designation when fitted on the proper rim.