INTERNATIONAL STANDARD

ISO 4223-1

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Definitions of some terms used in the tyre industry —

Part 1:

Pneumatic tyres

Définitions de certains termes utilisés dans l'industrie du pneumatique — Partie 1: Pneumatiques



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

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 part of ISO 4223 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 4223-1 was prepared by Technical Committee ISO/TC 31, Tyres, rims and valves.

This fourth edition cancels and replaces the third edition (ISO 4223-1:1989), which has been technically revised.

ISO 4223 consists of the following parts, under the general title Definitions of some terms used in the tyre industry:

- Part 1: Pneumatic tyres
- Part 2: Solid tyres

Annex A forms a normative part of this part of ISO 4223.

Definitions of some terms used in the tyre industry —

Part 1:

Pneumatic tyres

1 Scope

This part of ISO 4223 defines a number of significant terms related to pneumatic tyres used in the tyre industry, together with corresponding codes, symbols and values.

NOTE For other terms used in this field and their equivalents in other languages, see ISO 3877-1 to ISO 3877-4. For terms and definitions relating to wheels/rims, see ISO 3911.

2 Normative reference

The following normative document contains provisions which, through reference in this text, constitute provisions of this part of ISO 4223. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 4223 are encouraged to investigate the possibility of applying the most recent edition of the normative document indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 4251-4:1992, Tyres (ply rating marked series) and rims for agricultural tractors and machines — Part 4: Tyre classification and nomenclature.

3 General terms and definitions

3.1 Category of use

3.1.1

normal

tyre for normal use

3.1.2

special

tyre intended for mixed use, both on or off road or for other special service

3.1.3

snow tyre

tyre whose tread pattern, tread compound and structure are primarily designed to achieve in snow conditions a performance better than that of a normal tyre with regard to its ability to initiate or maintain vehicle motion

3.1.4

temporary-use spare tyre

tyre different from the one intended to be fitted to a vehicle for normal driving conditions and intended only for temporary use under restricted driving conditions

3.1.5

T-type temporary-use spare tyre

temporary-use spare tyre designed for use at an inflation pressure higher than those established for standard and reinforced tyres

3.1.6

reinforced

EXTRA LOAD

description of a passenger car tyre designed for loads and an inflation pressure higher than those of the standard version

3.2 Service description

3.2.1

service description

tyre identification, additional to the **tyre size designation**, which consists of a load index (or two load indices in the case of single/dual fitments) and a speed symbol

3.2.1.1

load index

LI

numerical code associated with the maximum load a tyre can carry (except for loads at speeds above 210 km/h for passenger cars and motorcycle tyres) at the speed indicated by its speed symbol under service conditions specified by the tyre manufacturer

See Annex A, Table A.1.

3.2.1.2

speed symbol

maximum speed at which the tyre can carry a load corresponding to its load index (except for speeds above 210 km/h for passenger car and motorcycle tyres) under service conditions specified by the tyre manufacturer

See Annex A, Table A.2.

3.3 Other general terms and definitions

3.3.1

cold inflation pressure

internal pressure of the tyre at ambient temperature and not including any pressure build-up due to tyre usage

NOTE It is expressed in kilopascals (kPa).

3.3.2

grown tyre

tyre that has undergone expansion due to use in service

3.3.3

new tyre

tyre that has been neither used nor subjected to a retreading operation

NOTE Retreading is a generic term for used tyre reconditioning that extends the useful life of the tyre; it can cover the replacement of the tread rubber only or replacement of tread and sidewall rubbers.

3.3.4

rolling circumference

 C_r

distance the centre of the tyre (axle) moves in one revolution of the tyre under specified conditions

3.3.5

rolling resistance

 F_r

loss of energy (or energy consumed) per unit of distance

NOTE The SI unit conventionally used for the rolling resistance is the newton metre per metre (Nm/m). This is equivalent to the drag force in newtons (N).

3.3.6

tyre contact area

 A_{C}

area of the flat surface contained within the virtual perimeter of the tyre footprint

NOTE It is expressed in square metres (m²).

3.3.7

tyre ground pressure

 $F/A_{\mathbf{C}}$

average unit load transmitted by the tyre through its contact area to the road surface, expressed, in kilonewtons per square metre (kN/m²), as the ratio between the vertical force, F, in static conditions on the axis of the wheel, and the tyre contact area, $A_{\rm C}$, and measured with the tyre inflated at the cold inflation pressure recommended for the intended type of service

3.3.8

virtual perimeter

(tyre footprint) convex polygonal curve circumscribing the smallest area containing all points of contact between the tyre and ground

4 Structure

4.1

structure

(tyre) technical characteristics of the tyre's carcass

EXAMPLES Diagonal (bias-ply), bias-belted, radial.

4.1.1

diagonal

bias-ply

cross-ply

structure in which the ply cords extend to the bead and are laid at alternate angles of substantially less than 90° to the centreline of the tread

4.1.2

bias-belted

structure of diagonal (bias-ply) type in which the carcass is restricted by a belt comprising two or more layers of substantially inextensible cord material

4.1.3

radial

structure in which the ply cords extend to the beads and are laid substantially at 90° to the centreline of the tread, the carcass being stabilized by an essentially inextensible circumferential belt

5 Main components

5.1

bead

part of the tyre shaped to fit the rim and having a core made of one or several essentially inextensible strands with the plies wrapped around the core

5.2

sidewall

part of the tyre, excluding the tread, visible when the tyre, fitted to a rim, is viewed from the side

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5.3

sidewall rubber

rubber layer on the sidewall of the tyre and over the carcass, which may include ornamental or protective ribs and fitting lines

5.4

tread

part of a pneumatic tyre that normally comes in contact with the ground

5.5

cord

textile or non-textile strands (threads) used in various components of the tyre carcass, plies, belts, breakers, etc.

5.6

ply

layer of rubber-coated parallel cords

5.7

inner liner

layer of rubber on the inside of the carcass used especially in tubeless tyres to minimize air loss

5.8

carcass

part of a tyre other than the tread and the sidewall rubber which, when inflated, bears the load

5.9

breaker (diagonal)

intermediate ply not extending to the bead

5.10

belt

bracing ply

layer of material underneath the tread, laid substantially in the direction of the tread centreline, that restricts the carcass circumferentially

5.11

lower sidewall

area below the line of maximum section width of the tyre, visible when the tyre, fitted to a rim, is viewed from the side

5.12

tread groove

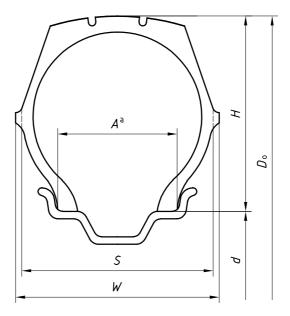
space between the adjacent ribs or blocks in the tread pattern

5.13

tread wear indicators

projections within the tread grooves designed to give a visual indication of the degree of wear of the tread

6 Dimensions (see Figure 1)



a Specified rim width.

Figure 1 — Dimensions

6.1

section width

S

linear distance between the outside of the sidewalls of an inflated tyre excluding elevations due to labelling (markings), decorations, or protective bands or ribs

6.2

overall width

W

linear distance between the outside of the sidewalls of an inflated tyre including elevations due to labelling (markings), decorations, or protective bands or ribs

6.3

maximum overall tyre width in service

overall width plus

- a) manufacturing tolerances, and
- b) tolerance for service growth

6.4

section height

Н

half the difference between the overall diameter and the nominal rim diameter

6.5

overall diameter

 D_{o}

diameter of an inflated tyre at the outermost surface of the tread

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6.6

static maximum overall tyre diameter in service

 D_{os}

overall diameter plus

- a) manufacturing tolerances, and
- b) tolerance for service growth

6.7

dynamic maximum overall tyre diameter in service

 D_{od}

overall diameter plus

- a) manufacturing tolerances,
- b) tolerance for service growth, and
- c) allowance for dimensional changes due to centrifugal force

NOTE This definition applies only to motorcycle tyres; the allowance in c) is to be taken into account by the motorcycle manufacturer when designing for tyre clearances.

6.8

nominal aspect ratio

H/S

hundred times the ratio of the nominal section height to the nominal section width of the tyre on its theoretical rim

6.9

nominal rim diameter

 D_{r}

conventional number corresponding to the diameter of the rim expressed either as a size code (number less than 100) or in millimetres (number greater than 100), but not as both

See Annex A, Tables A.3 and A.4.

7 Terms, definitions and symbols of designation

7.1

tyre size designation

designation identifying the characteristics of a tyre, as follows:

- the nominal section width [normally expressed in millimetres (mm)];
- the nominal aspect ratio, where applicable;
- the nominal rim diameter

EXAMPLE 165/80R15, 24.00-25.

7.1.1

additional tyre designation

letter or symbol that may also be part of the tyre size designation, identifying, for example, the type of tyre

7.1.1.1

T

letter placed immediately in front of the section width to identify a T-type temporary-use spare tyre

7.1.1.2

P

letter (optional) placed immediately in front of the section width to identify a passenger car tyre

7.1.1.3

IN

letters (optional) placed immediately in front of the section width to identify an industrial tyre

7.1.1.4

IMP

IMPLEMENT

designation identifying implement tyres

NOTE As an alternative to marking with agricultural implement tyre code I, in accordance with ISO 4251-4:1992.

8 Tyre testing

8.1

bead separation

breakdown of bond between components in the bead area

8.2

belt separation

parting of rubber compound between belt layers or between belts and plies

8.3

chunking

breaking away of pieces of rubber from the tread

8.4

cord separation

parting of the cords from their rubber coating

8.5

cracking

any parting within the tread, sidewall or innerliner of the tyre extending to cord material

8.6

inner line separation

parting of innerliner from cord material in the carcass

8.7

ply separation

parting of adjacent plies

8.8

test rim

rim on which a tyre is fitted for testing

8.9

tread separation

pulling away of the tread from the carcass

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Annex A

(normative)

Loads, speeds and rim diameters

Table A.1 — Load indices (LI) and corresponding loads

| Li | | | | | | | _ | | | | | | | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|------|----|-----|-----|-------|---|-----|-------|-----|--------|---|-----|--------|-----|---------|
| 1 | LI | kg | LI | kg | LI | kg | | LI | kg | LI | kg | | LI | kg | LI | kg |
| 2 | 0 | 45 | 40 | 140 | 80 | 450 | | 120 | 1 400 | 160 | 4 500 | | 200 | 14 000 | 240 | 45 000 |
| 3 | 1 | 46,2 | 41 | 145 | 81 | 462 | | 121 | 1 450 | 161 | 4 625 | | 201 | 14 500 | 241 | 46 250 |
| 4 | 2 | 47,5 | 42 | 150 | 82 | 475 | | 122 | 1 500 | 162 | 4 750 | | 202 | 15 000 | 242 | 47 500 |
| 5 51,5 45 165 85 515 125 1650 166 5150 205 1650 2245 51500 6 53 48 170 86 530 126 1700 166 5300 206 1700 246 5300 7 54,5 47 175 88 560 48 1800 88 560 128 5600 207 17500 247 54,500 9 58 49 185 89 580 129 1850 169 5800 209 18500 248 5800 10 60 550 190 90 600 130 1900 177 6500 211 19500 251 6190 11 61,5 51 195 91 615 611 191 191 610 113 1950 177 6100 211 19500 251 61000 251 6100 <td>3</td> <td>48,7</td> <td>43</td> <td>155</td> <td>83</td> <td>487</td> <td></td> <td>123</td> <td>1 550</td> <td>163</td> <td>4 875</td> <td></td> <td>203</td> <td>15 500</td> <td>243</td> <td>48 750</td> | 3 | 48,7 | 43 | 155 | 83 | 487 | | 123 | 1 550 | 163 | 4 875 | | 203 | 15 500 | 243 | 48 750 |
| 6 63 46 170 86 530 126 1700 166 5 300 206 17 000 246 5 300 7 54,5 47 175 87 545 127 1750 167 5 450 207 17 500 247 54 500 8 66 48 180 88 560 128 1800 208 18 800 249 1850 249 58 000 249 58 000 249 58 000 249 58 000 249 58 000 249 58 000 249 58 000 249 58 000 249 58 000 249 58 000 250 60 000 250 60 000 250 60 000 250 60 000 250 60 000 250 60 000 252 63 000 252 63 000 252 63 000 252 63 000 252 63 000 252 63 000 252 63 000 252 63 000 252 63 000 252 | 4 | 50 | 44 | 160 | 84 | 500 | | 124 | 1 600 | 164 | 5 000 | | 204 | 16 000 | 244 | 50 000 |
| 7 54,5 47 175 87 545 127 1750 167 5450 207 17500 248 5600 8 56 48 186 88 560 128 1800 168 5600 208 18 000 248 56 000 9 58 49 185 89 580 129 1850 169 580 209 18 000 209 18 000 209 18 000 250 60 000 201 19 000 250 60 000 11 19 000 250 60 000 211 19 000 250 60 000 21 19 000 250 60 000 21 19 000 250 60 000 21 19 000 252 63 00 212 20 000 251 61 500 252 63 00 213 20 00 253 65 000 214 21 20 20 253 65 000 218 28 000 253 65 000 218 28 000 253< | 5 | 51,5 | 45 | 165 | 85 | 515 | | 125 | 1 650 | 165 | 5 150 | | 205 | 16 500 | 245 | 51 500 |
| 8 56 48 180 88 560 128 1800 168 5600 208 18000 248 5600 9 58 49 185 89 580 129 1850 169 5800 209 18500 249 58000 10 60 50 190 90 600 130 1900 270 6000 210 1900 251 6000 251 6000 251 6000 251 6000 251 6000 251 6000 251 6000 251 6000 251 6000 251 6000 251 6000 251 6000 253 6500 213 2000 213 2000 253 6500 224 174 670 214 2120 000 253 6500 213 2000 215 210 200 253 65000 253 65000 213 210 000 253 65000 <td>6</td> <td>53</td> <td>46</td> <td>170</td> <td>86</td> <td>530</td> <td></td> <td>126</td> <td>1 700</td> <td>166</td> <td>5 300</td> <td></td> <td>206</td> <td>17 000</td> <td>246</td> <td>53 000</td> | 6 | 53 | 46 | 170 | 86 | 530 | | 126 | 1 700 | 166 | 5 300 | | 206 | 17 000 | 246 | 53 000 |
| 9 | 7 | 54,5 | 47 | 175 | 87 | 545 | | 127 | 1 750 | 167 | 5 450 | | 207 | 17 500 | 247 | 54 500 |
| 10 | 8 | 56 | 48 | 180 | 88 | 560 | | 128 | 1 800 | 168 | 5 600 | L | 208 | 18 000 | 248 | 56 000 |
| 11 | 9 | 58 | 49 | 185 | 89 | 580 | | 129 | 1 850 | 169 | 5 800 | | 209 | 18 500 | 249 | 58 000 |
| 12 63 52 200 92 630 132 2000 172 6300 212 2000 252 6300 253 650 253 650 253 6500 213 2060 253 6500 256 6500 255 218 95 690 134 2120 174 6700 214 21200 254 67000 255 69000 135 2180 175 6900 215 21800 255 69000 137 230 77 730 136 2240 176 7100 216 2240 256 71000 255 71000 257 73000 218 23600 250 71000 218 23600 250 71000 258 75000 258 75000 258 75000 259 77500 258 75000 259 277500 259 77500 259 77500 259 77500 259 77500 259 77500 | 10 | 60 | 50 | 190 | 90 | 600 | | 130 | 1 900 | 170 | 6 000 | | 210 | 19 000 | 250 | 60 000 |
| 13 | 11 | 61,5 | 51 | 195 | 91 | 615 | | 131 | 1 950 | 171 | 6 150 | | 211 | 19 500 | 251 | 61 500 |
| 14 67 54 212 94 670 134 2120 174 6700 214 21200 254 67000 15 69 55 218 95 690 135 2180 175 6900 215 21800 255 6900 16 71 56 224 96 710 136 2240 176 7100 216 22400 256 71000 17 73 57 230 97 730 138 2300 177 7300 217 23000 257 73000 20 80 60 250 100 800 140 2500 178 7500 218 23 000 258 75 000 21 82,5 61 257 101 825 141 2 575 181 8 500 221 25 750 261 82 500 22 85 62 265 102 850 1 | 12 | 63 | 52 | 200 | 92 | 630 | | 132 | 2 000 | 172 | 6 300 | | 212 | 20 000 | 252 | 63 000 |
| 15 69 55 218 95 690 135 2180 175 6 900 215 21800 255 69000 16 71 56 224 96 710 136 2 240 176 7 100 216 22 400 256 71 000 17 73 57 230 97 730 137 2 300 177 7 300 217 23 000 257 7 3 000 19 77,5 59 243 99 775 139 2 430 179 7 750 219 24 300 259 77 500 20 80 60 250 100 800 140 2 500 180 8 000 220 25 000 260 80 000 21 82,5 62 265 102 850 142 2 575 181 8 250 221 25 750 261 82 500 226 28 500 222 26 500 226 85 000 | 13 | 65 | 53 | 206 | 93 | 650 | | 133 | 2 060 | 173 | 6 500 | | 213 | 20 600 | 253 | 65 000 |
| 16 71 56 224 96 710 136 2 240 176 7 100 216 22 400 256 71 000 17 73 57 230 97 730 137 2 300 177 7 300 217 23 000 257 73 000 19 77,5 59 243 99 775 139 2 430 179 7 750 219 24 300 259 77 500 20 80 60 250 100 800 140 2 500 180 180 180 140 2 500 180 180 24 90 22 25 500 260 80 220 25 500 260 80 142 2 650 181 8 250 221 25 750 261 825 141 2 575 182 8 500 222 2 6 500 260 86 200 144 2 650 182 8 500 222 2 6 500 262 8 7 500 <td>14</td> <td>67</td> <td>54</td> <td>212</td> <td>94</td> <td>670</td> <td></td> <td>134</td> <td>2 120</td> <td>174</td> <td>6 700</td> <td></td> <td>214</td> <td>21 200</td> <td>254</td> <td>67 000</td> | 14 | 67 | 54 | 212 | 94 | 670 | | 134 | 2 120 | 174 | 6 700 | | 214 | 21 200 | 254 | 67 000 |
| 17 73 57 230 97 730 137 2300 177 7300 217 2300 257 7300 18 75 58 236 98 750 138 2360 177 7500 218 23600 250 100 800 140 2500 180 800 220 80 60 250 100 800 140 2500 180 8000 221 2300 222 2500 221 2430 257 101 825 141 2575 181 8500 221 25750 260 260 8000 222 2500 222 2650 222 2650 142 2650 182 8500 222 2650 222 2650 222 2650 222 2650 222 2650 222 2650 222 2650 222 2600 222 2600 222 2600 222 2600 222 2500< | 15 | 69 | 55 | 218 | 95 | 690 | | 135 | 2 180 | 175 | 6 900 | | 215 | 21 800 | 255 | 69 000 |
| 18 75 58 236 98 750 138 2360 178 7 500 218 23 600 258 7 500 259 7 500 259 7 500 259 7 500 259 7 500 259 100 800 140 2 500 180 8 000 220 25 000 26 80 8 000 220 25 000 220 25 000 26 80 8 000 220 25 000 220 25 000 26 85 000 220 25 000 220 25 000 26 85 000 26 85 000 142 2 6 50 182 8 500 221 25 750 26 85 000 222 26 500 222 26 500 222 26 500 222 26 500 222 26 500 222 26 500 222 26 500 222 26 500 222 26 500 222 26 500 222 26 500 222 26 500 222 26 500 222 26 500 222 27 550 223 27 550 226 28 500 </td <td>16</td> <td>71</td> <td>56</td> <td>224</td> <td>96</td> <td>710</td> <td></td> <td>136</td> <td>2 240</td> <td>176</td> <td>7 100</td> <td></td> <td>216</td> <td>22 400</td> <td>256</td> <td>71 000</td> | 16 | 71 | 56 | 224 | 96 | 710 | | 136 | 2 240 | 176 | 7 100 | | 216 | 22 400 | 256 | 71 000 |
| 19 77,5 59 243 99 775 139 2430 179 7750 219 24 300 259 77 500 20 80 60 250 100 800 140 2 500 180 8 00 220 25 000 260 80 000 21 82,5 62 265 102 850 141 2 575 181 8 250 221 25 750 261 82 500 22 85 62 265 102 850 142 2 650 182 8 500 222 26 500 262 35 000 24 90 64 280 104 900 144 2 800 184 9 000 224 28 000 264 9 000 25 92,5 66 300 106 950 146 3 000 186 9 500 225 29 000 265 92 500 28 100 68 315 108 <td< td=""><td>17</td><td>73</td><td>57</td><td>230</td><td>97</td><td>730</td><td></td><td>137</td><td>2 300</td><td>177</td><td>7 300</td><td></td><td>217</td><td>23 000</td><td>257</td><td>73 000</td></td<> | 17 | 73 | 57 | 230 | 97 | 730 | | 137 | 2 300 | 177 | 7 300 | | 217 | 23 000 | 257 | 73 000 |
| 20 80 60 250 100 800 140 2500 180 8 000 220 25 000 260 80 000 21 82,5 61 257 101 825 141 2 575 181 8 250 221 25 750 261 82 500 22 85 62 265 102 850 142 2 650 182 8 500 221 25 750 261 82 500 24 90 64 280 104 900 144 2 800 184 9 000 224 28 000 266 300 106 950 144 2 800 185 9 250 225 29 000 224 28 000 224 28 000 266 95 000 226 95 66 300 106 950 146 3 000 186 9 500 225 29 000 266 95 000 226 30 000 266 95 000 29 103 68 | 18 | 75 | 58 | 236 | 98 | 750 | | 138 | 2 360 | 178 | 7 500 | | 218 | 23 600 | 258 | 75 000 |
| 21 82,5 61 257 101 825 141 2575 181 8 250 221 25 750 261 8 2500 22 85 62 265 102 850 142 2 650 182 8 500 222 26 500 262 8 500 24 90 64 280 104 900 144 2 800 184 9 000 224 28 000 264 9 000 264 9 000 224 28 000 264 9 000 265 9 250 225 29 000 265 9 250 226 9 250 226 9 250 226 30 000 264 9 000 265 9 250 226 30 000 266 9 250 226 30 000 266 9 250 227 97,5 67 307 107 975 147 3 075 187 9 750 227 30 750 266 9 500 29 103 69 325 109 | 19 | 77,5 | 59 | 243 | 99 | 775 | | 139 | 2 430 | 179 | 7 750 | L | 219 | 24 300 | 259 | 77 500 |
| 22 85 62 265 102 850 142 2650 182 8 500 222 26 500 262 85 00 23 87,5 63 272 103 875 143 2 725 183 8 750 223 27 250 263 8 7 500 24 90 64 280 104 900 144 2 800 184 9 000 224 28 000 264 90 000 26 95 66 300 106 950 146 3 000 186 9 500 226 30 000 266 92 500 28 100 68 315 108 1 000 148 3 150 227 30 750 267 97 500 29 103 69 325 109 1 030 148 3 150 188 10 000 228 31 500 268 100 000 31 109 71 345 111 1 090 151 | 20 | 80 | 60 | 250 | 100 | 800 | | 140 | 2 500 | 180 | 8 000 | L | 220 | 25 000 | 260 | 80 000 |
| 23 87,5 63 272 103 875 143 2 725 183 8 750 223 27 250 263 8 7 500 24 90 65 290 105 925 145 2 900 185 9 250 224 28 000 264 90 000 266 92 500 266 300 106 950 146 3 000 186 9 500 226 30 000 266 92 500 28 100 68 315 108 1 000 148 3 150 188 10 000 228 31 500 266 95 000 29 103 69 325 109 1 030 149 3 250 188 10 000 228 31 500 268 100 000 31 109 70 335 111 1 090 151 3 450 190 10 600 230 33 500 271 109 000 32 112 72 355 112 | 21 | 82,5 | 61 | 257 | 101 | 825 | | 141 | 2 575 | 181 | 8 250 | L | 221 | 25 750 | 261 | 82 500 |
| 24 90 64 280 104 900 144 2800 184 9000 224 28000 264 9000 26 95 66 300 106 950 146 3000 185 9250 225 29000 266 95 000 27 97,5 67 307 107 975 147 3075 187 9750 227 30750 266 95 000 28 100 68 315 108 1000 148 3 150 188 10 000 228 31 500 266 95 000 30 106 70 335 110 1060 150 3 350 188 10 000 228 31 500 266 95 000 31 109 71 345 111 1090 151 3 450 190 10 600 230 33 500 270 106 000 271 109 000 32 112 72 | 22 | 85 | 62 | 265 | 102 | 850 | | 142 | 2 650 | 182 | 8 500 | | 222 | 26 500 | 262 | 85 000 |
| 25 92,5 65 290 105 925 145 2 900 185 9 250 225 29 000 266 95 000 27 97,5 67 307 107 975 147 3 075 187 9 750 227 30 750 266 95 000 28 100 68 315 108 1 000 148 3 150 228 31 500 268 100 000 29 103 69 325 109 1 030 149 3 250 189 10 300 229 32 500 268 100 000 31 109 71 345 111 1 090 150 3 350 190 10 600 230 33 500 270 106 000 32 112 72 355 112 1 120 152 3 550 192 11 200 231 34 500 271 109 000 34 118 74 375 114 1 180 <t< td=""><td>23</td><td>87,5</td><td>63</td><td>272</td><td>103</td><td>875</td><td></td><td>143</td><td>2 725</td><td>183</td><td>8 750</td><td>L</td><td>223</td><td>27 250</td><td>263</td><td>87 500</td></t<> | 23 | 87,5 | 63 | 272 | 103 | 875 | | 143 | 2 725 | 183 | 8 750 | L | 223 | 27 250 | 263 | 87 500 |
| 26 95 66 300 106 950 146 3 000 186 9 500 226 30 000 266 95 000 27 97,5 67 307 107 975 147 3 075 187 9 750 227 30 750 267 97 500 28 100 68 315 108 1 000 148 3 150 188 10 000 228 31 500 268 100 000 30 106 70 335 110 1 060 150 3 350 190 10 600 230 33 500 270 106 000 31 109 71 345 111 1 090 151 3 450 191 10 900 231 34 500 271 109 000 32 112 73 365 113 1 150 153 3 650 193 11 500 231 34 500 272 112 000 35 121 75 387 <td< td=""><td>24</td><td>90</td><td>64</td><td>280</td><td>104</td><td>900</td><td></td><td>144</td><td>2 800</td><td>184</td><td>9 000</td><td>L</td><td>224</td><td>28 000</td><td>264</td><td>90 000</td></td<> | 24 | 90 | 64 | 280 | 104 | 900 | | 144 | 2 800 | 184 | 9 000 | L | 224 | 28 000 | 264 | 90 000 |
| 27 97,5 67 307 107 975 147 3 075 187 9 750 227 30 750 267 97 500 28 100 68 315 108 1 000 148 3 150 188 10 000 228 31 500 268 100 000 29 103 69 325 109 1 030 150 150 3 350 190 10 600 230 33 500 270 106 000 31 109 71 345 111 1 090 151 3 450 191 10 900 231 34 500 271 109 000 32 112 72 355 112 1 120 152 3 550 192 11 200 232 35 500 271 109 000 34 118 74 375 114 1 180 154 3 750 194 11 800 234 37 500 274 118 000 35 121 75 | 25 | 92,5 | 65 | 290 | 105 | 925 | | 145 | 2 900 | 185 | 9 250 | | 225 | 29 000 | 265 | 92 500 |
| 28 100 68 315 108 1 000 148 3 150 188 10 000 228 31 500 268 100 000 29 103 69 325 109 1 030 149 3 250 189 10 300 229 32 500 269 103 000 31 109 71 345 111 1 090 151 3 450 191 10 900 231 34 500 271 109 000 32 112 72 355 112 1 120 1 120 152 3 550 192 11 200 232 35 500 271 109 000 34 118 74 375 114 1 180 154 3 750 192 11 800 234 37 500 273 115 000 35 121 75 387 115 1 215 155 3 875 195 12 150 235 38 750 275 121 000 36 125 76 400 116 1 250 156 4 000 196 12 500 236 40 000 276 125 000 38 132 78 425 118 1 320 158 4 250 198 | 26 | 95 | 66 | 300 | 106 | 950 | | 146 | 3 000 | 186 | 9 500 | L | 226 | 30 000 | 266 | 95 000 |
| 29 103 69 325 109 1 030 149 3 250 189 10 300 229 32 500 269 103 000 30 106 70 335 110 1 060 150 3 350 190 10 600 230 33 500 270 106 000 31 109 71 345 111 1 090 151 3 450 191 10 900 231 34 500 271 109 000 33 115 73 365 113 1 150 153 3 650 193 11 500 232 35 500 272 112 000 35 121 75 387 114 1 180 154 3 750 194 11 800 234 37 500 274 118 000 36 125 76 400 116 1 250 156 4 000 196 12 500 236 40 000 276 125 000 37 128 77 412 117 1 285 157 4 125 198 13 200 238 42 500 < | 27 | 97,5 | 67 | 307 | 107 | 975 | | 147 | 3 075 | 187 | 9 750 | | 227 | 30 750 | 267 | 97 500 |
| 30 106 70 335 110 1 060 150 3 350 190 10 600 230 33 500 270 106 000 31 109 71 345 111 1 090 151 3 450 191 10 900 231 34 500 271 109 000 32 112 72 355 112 1 120 152 3 550 192 11 200 232 35 500 272 112 000 34 118 74 375 114 1 180 154 3 750 193 11 500 233 36 500 273 115 000 35 121 75 387 115 1 215 155 3 875 195 12 150 235 38 750 275 121 000 36 125 76 400 116 1 250 156 4 000 196 12 500 236 40 000 276 125 000 38 132 78 425 118 1 320 158 4 250 198 13 200 238 42 500 278 132 000 | 28 | 100 | 68 | 315 | 108 | 1 000 | | 148 | 3 150 | 188 | 10 000 | L | 228 | 31 500 | 268 | 100 000 |
| 31 109 71 345 111 1 090 151 3 450 191 10 900 231 34 500 271 109 000 32 112 72 355 112 1 120 152 3 550 192 11 200 232 35 500 272 112 000 34 118 74 375 114 1 180 154 3 750 194 11 800 234 37 500 274 118 000 35 121 75 387 115 1 215 155 3 875 195 12 150 236 40 000 276 125 000 37 128 77 412 117 1 285 157 4 125 198 13 200 238 42 500 277 128 500 38 132 78 425 118 1 320 158 4 250 198 13 200 238 42 500 278 132 000 | 29 | 103 | 69 | 325 | 109 | 1 030 | | 149 | 3 250 | 189 | 10 300 | | 229 | 32 500 | 269 | 103 000 |
| 32 112 72 355 112 1 120 152 3 550 192 11 200 232 35 500 272 112 000 33 115 73 365 113 1 150 153 3 650 193 11 500 233 36 500 273 115 000 34 118 74 375 114 1 180 154 3 750 194 11 800 234 37 500 274 118 000 35 121 75 387 115 1 215 155 3 875 195 12 150 235 38 750 275 121 000 36 125 76 400 116 1 250 156 4 000 196 12 500 236 40 000 276 125 000 37 128 77 412 117 1 285 157 4 125 197 12 850 237 41 250 277 128 500 38 132 78 425 118 1 320 158 4 250 198 13 200 238 42 500 278 132 000 | 30 | 106 | 70 | 335 | 110 | 1 060 | | 150 | 3 350 | 190 | 10 600 | | 230 | 33 500 | 270 | 106 000 |
| 33 115 73 365 113 1 150 153 3 650 193 11 500 233 36 500 273 115 000 34 118 74 375 114 1 180 154 3 750 194 11 800 234 37 500 274 118 000 35 121 75 387 115 1 215 155 3 875 195 12 150 235 38 750 275 121 000 36 125 76 400 116 1 250 156 4 000 196 12 500 236 40 000 276 125 000 37 128 77 412 117 1 285 157 4 125 197 12 850 237 41 250 277 128 500 38 132 78 425 118 1 320 158 4 250 198 13 200 238 42 500 278 132 000 | 31 | 109 | 71 | 345 | 111 | 1 090 | | 151 | 3 450 | 191 | 10 900 | | 231 | 34 500 | 271 | 109 000 |
| 34 118 74 375 114 1 180 154 3 750 194 11 800 234 37 500 274 118 000 35 121 75 387 115 1 215 155 3 875 195 12 150 235 38 750 275 121 000 36 125 76 400 116 1 250 156 4 000 196 12 500 236 40 000 276 125 000 37 128 77 412 117 1 285 157 4 125 197 12 850 237 41 250 277 128 500 38 132 78 425 118 1 320 158 4 250 198 13 200 238 42 500 278 132 000 | 32 | 112 | 72 | 355 | 112 | 1 120 | | 152 | 3 550 | 192 | 11 200 | | 232 | 35 500 | 272 | 112 000 |
| 35 121 75 387 115 1 215 155 3 875 195 12 150 235 38 750 275 121 000 36 125 76 400 116 1 250 156 4 000 196 12 500 236 40 000 276 125 000 37 128 77 412 117 1 285 157 4 125 197 12 850 237 41 250 277 128 500 38 132 78 425 118 1 320 158 4 250 198 13 200 238 42 500 278 132 000 | 33 | 115 | 73 | 365 | 113 | 1 150 | | 153 | 3 650 | 193 | 11 500 | | 233 | 36 500 | 273 | 115 000 |
| 36 125 76 400 116 1 250 156 4 000 196 12 500 236 40 000 276 125 000 37 128 77 412 117 1 285 157 4 125 197 12 850 237 41 250 277 128 500 38 132 78 425 118 1 320 158 4 250 198 13 200 238 42 500 278 132 000 | 34 | 118 | 74 | 375 | 114 | 1 180 | | 154 | 3 750 | 194 | 11 800 | | 234 | 37 500 | 274 | 118 000 |
| 37 128 77 412 117 1 285 157 4 125 197 12 850 237 41 250 277 128 500 38 132 78 425 118 1 320 158 4 250 198 13 200 238 42 500 278 132 000 | 35 | 121 | 75 | 387 | 115 | 1 215 | | 155 | 3 875 | 195 | 12 150 | | 235 | 38 750 | 275 | 121 000 |
| 38 132 78 425 118 1 320 158 4 250 198 13 200 238 42 500 278 132 000 | 36 | 125 | 76 | 400 | 116 | 1 250 | | 156 | 4 000 | 196 | 12 500 | | 236 | 40 000 | 276 | 125 000 |
| | 37 | 128 | 77 | 412 | 117 | 1 285 | | 157 | 4 125 | 197 | 12 850 | | 237 | 41 250 | 277 | 128 500 |
| 39 136 79 437 119 1360 159 4375 199 13600 239 43750 279 136000 | 38 | 132 | 78 | 425 | 118 | 1 320 | | 158 | 4 250 | 198 | 13 200 | | 238 | 42 500 | 278 | 132 000 |
| | 39 | 136 | 79 | 437 | 119 | 1 360 | | 159 | 4 375 | 199 | 13 600 | L | 239 | 43 750 | 279 | 136 000 |

Table A.2 — Speed symbols and corresponding speeds

| Symbol | Speed category km/h |
|--------|------------------------|
| A1 | 5 |
| A2 | 10 |
| A3 | 15 |
| A4 | 20 |
| A5 | 25 |
| A6 | 30 |
| A7 | 35 |
| A8 | 40 |
| В | 50 |
| С | 60 |
| D | 65 |
| Е | 70 |
| F | 80 |
| G | 90 |
| J | 100 |
| К | 110 |
| L | 120 |
| M | 130 |
| N | 140 |
| Р | 150 |
| Q | 160 |
| R | 170 |
| S | 180 |
| Т | 190 |
| U | 200 |
| Н | 210 |
| V | 240 |
| W | 270 |
| Y | 300 |

Table A.3 — Nominal rim diameters

| Nominal rim diameter $D_{ m r}$ | | | | | | | |
|---------------------------------|-----------------|--|--|--|--|--|--|
| code | mm ^a | | | | | | |
| 5 degree rims | | | | | | | |
| 4 | 102 | | | | | | |
| 5 | 127 | | | | | | |
| 6 | 152 | | | | | | |
| 7 | 178 | | | | | | |
| 8 | 203 | | | | | | |
| 9 | 229 | | | | | | |
| 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 | | | | | | |
| 27 | 686 | | | | | | |
| 28 | 711 | | | | | | |
| 29 | 737 | | | | | | |
| 30 | 762 | | | | | | |
| 31 | 787 | | | | | | |
| 32 | 813 | | | | | | |
| 33 | 838 | | | | | | |
| 34 | 864 | | | | | | |
| 35 | 889 | | | | | | |
| 36 | 914 | | | | | | |
| 37 | 940 | | | | | | |
| 38 | 965 | | | | | | |
| 39 | 991 | | | | | | |
| | | | | | | | |

| Nominal rim diameter $D_{ m r}$ | | | | | | | |
|----------------------------------|------------------------------------|--|--|--|--|--|--|
| code | mm ^a | | | | | | |
| 5 degree rims | | | | | | | |
| 40 | 1 016 | | | | | | |
| 41 | 1 041 | | | | | | |
| 42 | 1 067 | | | | | | |
| 43 | 1 092 | | | | | | |
| 44 | 1 118 | | | | | | |
| 45 | 1 143 | | | | | | |
| 46 | 1 168 | | | | | | |
| 47 | 1 194 | | | | | | |
| 48 | 1 219 | | | | | | |
| 49 | 1 245 | | | | | | |
| 50 | 1 270 | | | | | | |
| 51 | 1 295 | | | | | | |
| 52 | 1 321 | | | | | | |
| 54 | 1 372 | | | | | | |
| 57 | 1 448 | | | | | | |
| 15 degr | ee rims | | | | | | |
| 17.5 | 445 | | | | | | |
| 19.5 | 495 | | | | | | |
| 20.5 | 521 | | | | | | |
| 22.5 | 572 | | | | | | |
| 24.5 | 622 | | | | | | |
| 26.5 | 673 | | | | | | |
| a Those are theoretical values t | a be used only for the coloulation | | | | | | |

^a These are theoretical values to be used only for the calculation of the tyre overall diameters.

Table A.4 — Specified rim diameters recommended for use in ISO standards

| Nominal rim diameter $D_{ m r}$ | Specified rim diameter ^a (Recommended) D | | | | | | |
|---------------------------------|------------------------------------------------------|--|--|--|--|--|--|
| code | mm | | | | | | |
| 5 degree rims | | | | | | | |
| 4 | 100,8 | | | | | | |
| 5 | 126,2 | | | | | | |
| 6 | 151,6 | | | | | | |
| 7 | 177,0 | | | | | | |
| 8 | 202,4 | | | | | | |
| 9 | 227,8 | | | | | | |
| 10 | 253,2 | | | | | | |
| 12 | 304,0 | | | | | | |
| 13 | 329,4 | | | | | | |
| 14 | 354,8 | | | | | | |
| 15 | 380,2 | | | | | | |
| 16 | 405,6 | | | | | | |
| 17 | 436,6 | | | | | | |
| 18 | 462,0 | | | | | | |
| 19 | 487,4 | | | | | | |
| 20 | 512,8 | | | | | | |
| 21 | 533,4 | | | | | | |
| 22 | 563,6 | | | | | | |
| 23 | 584,2 | | | | | | |
| 24 | 614,4 | | | | | | |
| 25 | 635,0 | | | | | | |
| 26 | 665,2 | | | | | | |
| 27 | 685,8 | | | | | | |
| 28 | 716,0 | | | | | | |
| 29 | 736,6 | | | | | | |
| 30 | 766,8 | | | | | | |
| 31 | 787,4 | | | | | | |
| 32 | 817,6 | | | | | | |
| 33 | 838,2 | | | | | | |
| 34 | 868,4 | | | | | | |
| 35 | 889,0 | | | | | | |
| 36 | 919,2 | | | | | | |
| 37 | 939,8 | | | | | | |
| 38 | 970,0 | | | | | | |

| Specified rim diameter ^a (Recommended) | | | | |
|---------------------------------------------------|--|--|--|--|
| mm | | | | |
| 990,6 | | | | |
| ee rims | | | | |
| 1 020,8 | | | | |
| 1 041,4 | | | | |
| 1 071,6 | | | | |
| 1 092,2 | | | | |
| 1 122,4 | | | | |
| 1 143,0 | | | | |
| 1 173,2 | | | | |
| 1 193,8 | | | | |
| 1 224,0 | | | | |
| 1 244,6 | | | | |
| 1 274,8 | | | | |
| 1 295,4 | | | | |
| 1 325,6 | | | | |
| 1 376,4 | | | | |
| 1 447,8 | | | | |
| ree rims | | | | |
| 444, 5 | | | | |
| 495,3 | | | | |
| 520,7 | | | | |
| 571,5 | | | | |
| 622,3 | | | | |
| 673,1 | | | | |
| | | | | |

In case of existing rims with common nominal rim diameter codes but different rim diameters, affecting interchangeability, an International Standard for size designations for the relevant tyres and rims shall include special additional designations.

These values are defined as follows.

5 degree

16 and below diameter: diameter \times 25,4 - 0,8 diameter \times 25,4 + 4,8 17 to 20 diameter: Over 20 — even: diameter \times 25,4 + 4,8 Over 20 — odd: diameter × 25,4 15 degree

All diameters: diameter × 25,4

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Bibliography

- [1] ISO 3877 (all parts), Tyres, valves and tubes List of equivalent terms
- [2] ISO 3911, Wheels and rims for pneumatic tyres Vocabulary, designation and marking

