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DRAFT TANZANIA STANDARD

Pneumatic tyres for passenger cars – Specification (Rev TZS 618:1999)

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Pneumatic tyres for passenger cars – Specification

0 Foreword

This Tanzania Standard has been prepared in order to give the necessary specifications and requirements for test of pneumatic tyres. It provides important information to be observed for improvement of motor vehicle safety in the country.

In reporting the results of a test made in accordance with this Tanzania Standard, if the final value observed or calculated is to be rounded off unless otherwise explained, it shall be done in accordance with TZS 4:1979 (see clause 3).

In the preparation of this Tanzania Standard, assistance was derived from:

a) BS AU 50 (Part 1): subsection 1 1b: 1996: ISO 4000 –1995 *Tyres and wheels – car tyres – Specification for metric series tyres;* published by the British Standards Institution.

b) IS 10914 (Part 30: 1991 *Automotive vehicles – pneumatic tyres – Diagonal ply – specification- passenger car tyres;* published by the Bureau of Indian Standards.

c) Some company standards form our local industries.

1 Scope

This Tanzania Standard specifies tyre dimensions designation and marking requirements; and load ratings. It also gives laboratory test requirements for bead unseating resistance, strength, endurance and high- speed performance for tyres primarily intended for passengers.

2 Application

This Tanzania Standard applies to new pneumatic tyres for use on passenger cars. It does not apply to any tyre which has been reconditioned; or to any tyre which has been altered so as to render impossible its use, or its repair for use, as motor vehicle equipment.

3 References

This Tanzania Standard makes reference to the following Tanzania standards:

a) TZS 4: 1979, *Rounding off numerical values*
b) TZS 427: 1989, *Tyre reconditioning – Specification*

4 Terminology

For the purpose of this Tanzania Standard, the definitions given in TZS 427: 1989 (see clause 3) and the following, shall apply:

4.1 carcass: The tyres structure, except tread and sidewall rubber.

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4.2 chunking: The breaking away of pieces of the tread or sidewall.

4.3 cracking: The parting with the tread, sidewall or innerliner of the tyre extending to cord material.

4.4 CT: A pneumatic tyre with inverted flange tyre and rim system in which the rim is designed with rim flanges pointed radically inward and the tyre is designed to fit on the underside of the rim in a manner that enclosed the rim flanges inside the air cavity of the tyre.

4.5 groove: the space between two adjacent tread ribs.

4.6 innerliner: the layer(s) forming the inside surface of a tubeless tyre that contains the inflating medium within the tyre.

4.7 innerliner separation: the parting of the innerliner form the cord material in the carcass.

4.8 load rating: (index) the maximum load of a tyre rated to carry for a given inflation pressure.

4.9 ply rating: An index of casing strength, and does not necessarily represent the number of cord plies in a tyre. With modern cords such as rayon, nylon and even steel cords, which are much stronger than the cotton or canvas cords which were originally used; the ply rating indicated on the tyre in usually higher than the actual number of plies used in tyre construction.

4.10 maximum permissible inflation pressure: The maximum cold inflation pressure to which a tyre may be inflated. It does not include any pressure build-up due to tyre usage.

4.11 maximum load rating: The load rating at the maximum inflation pressure for that tyre.

4.12 open splice: Any parting at any junction of the tread, sidewall, or innerliner that extends to cord material.

4.13 overall width: The linear distance between the exteriors of the sidewalls of an inflated tyre, including elevations due to labeling, decorations or protective bands or ribs.

4.14 rim: The metal support for a tyre or a tyre and tube assembly upon which the tyre beads are seated.

4.15 test rim: With reference to a tyre to be tested, any rim that is listed as appropriate for use with that tyre in any standard tyre-and-rim matching information.

4.16 tread rib: A tread section running circumferentially around a tyre.

5 Tyre designation

5.1 Size and construction

Each tyre shall have one size designation in metric, except that equivalent inch size designations may be used.

The characteristics shall be indicated as follows.

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Nominal Section Width	/ / /	Nominal aspect ratio	Tyre construction code	Nominal rimdiameter code

5.1.1 *Nominal section width*

The nominal section width of the tyre shall be indicated in millimetres, ending either in 0 or 5, so that in any one series of tyres with the same nominal aspect ratio, the values shall all end with 0 or end with 5. An equivalent marking in inch is permitted.

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

5.1.2 *Nominal aspect ratio*

The nominal aspect ratio shall be expressed as a percentage and shall be a multiple of 5.

5.1.3 *Type construction code*

The tyre construction code shall be as follows:

B for bias-belted construction
D / for diagonal construction
R for radial ply construction

NOTE - Radial tyre designated for some existing vehicle with maximum speed capabilities in excess of 210 km/ h or 240 km/h may be designated and marked differently. See Annex C.

In the case of tyres designed for vehicles having a maximum speed capability in excess of 240 km/h, the code letters "*ZR*" may be indicated in the dimensional and constructional characteristics for radial ply tryes in pace of the tyre construction code "*R*".

For speeds in excess of 300km/h, the tyres shall be marked with the code-letters "*ZR*".

5.1.4 *Nominal rim diameter code*

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

For 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 of millimetres.

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Table 1 – Nominal rim diameter code

Nominal rim diameter code	Nominal rim diameter
10	254
12	305
13	330
14	356
15	381
16	406
17	432
18	457
19	483

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5.2 Service description

The service description shall be indicated as follows:

Load index speed symbol

For the special case of tyres designed for vehicles having a maximum speed capability more than 300 km/h, the indication of the service description is not required. For the maximum speed capability and the lead capacity of the tyres, the tyre manufacturer concerned shall be consulted.

5.2.1 *Load Index*

The maximum tyre load capacity corresponding to the service conditions specified by the tyre manufacturer shall be indicated by a load index taken form Table 2. This indication is understood to be per tyre for a single mounting. Guidelines for load capacities for passenger car tyres are given in Annex B.

5.2.2 *Speed symbol*

The speed category is assigned to a tyre to denote the maximum speed for which use of the tyre is rated.

The speed symbol shall be indicated by a letter taken form Table 3 corresponding to the speed category.

Maximum inflation pressure

Operating cold inflation pressures should be agreed between tyre and vehicle manufacturers taking into account not only the tyre load carrying capacity, but also the operating conditions, the maximum speed, the position of the tyre on the vehicle, service conditions and construction and characteristics of the vehicle.

Unless otherwise specified by the tyre manufacturer, it is recommended to limit the cold inflation pressure of the radial ply tyres in normal application to 350 kPa for all standard load version sizes on code designated rims irrespective of the speed symbol.

Other choices of pressure specifications may be 240, 280, 290, 300, 330, 340 and 390 kPa. The marking shall be followed in parenthesis by the equivalent inflation pressure in psi, rounded to the next higher whole number. The vice versa marking is also permitted.

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5.3 Other service characteristics

5.3.1 The word “TUBELESS” shall appear on the tyres that can be used without a tube.

5.3.2 The letter “T” immediately in front of the tyre size designation shall be used to characterize high pressure special temporary use spare tyres.

5.3.3 A tread wear indicator shall be incorporated, that will provide a visual indication that the tyre has worn to a tread depth of 1.6 mm.

5.3.4 The generic name of each cord material used in the plies (both sidewall and tread area) of the tyre shall be marked.

5.3.5 Ply rating or number of plies in the sidewall and the number of plies in the tread area, if different.

5. 3. 6 Each tyre shall be labelled with the name of the manufacturer, or brand name recognized quality mark/safety mark to show that the tyre conforms to respective national standards. The tyre may also be marked with any other identification assigned to the manufacturer.

5.3.7 Specific indications, if required may be added to indicate

a) the type of vehicle for which the tyre is primarily designed, using the symbol, “P”. This symbol may be used where there may be ambiguity regarding the tyre type. Where this optional marking is used, it should be so positioned that confusion cannot result from its proximity to any other service condition marking;

b) the temporary use of certain spare tyres using indications such as “TEMPORARY USE ONLY”;

c) the bias-belted construction with the words “BIAS- BELTED”;

d) the radial ply construction with the word “RADIAL”;

e) the direction of mounting;

f) the direction of rotation

g) the type of tread pattern and any other characteristics.

5.3.8 Tyre covered under this specification shall not be more than 8 years from the date of manufacture.

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Table 2 – Correlation between load index *LI* and tyre load-carrying capacity *TLCC*

LI	*TLCC* kg	*LI*	*TLC*	*TLCC* kg	*LI*	*TLCC*	*TLCC* kg
50	190	70	335	90	600	110	1060
51	195	71	345	91	615	111	1090
52	200	72	355	92	630	112	1120
53	206	73	365	93	650	113	1150
54	212	74	375	94	670	114	1180
55	218	75	387	95	690	115	1215
56	224	76	400	96	710	116	1250
57	230	77	412	97	730	117	1285
58	236	78	425	98	750	118	1320
59	243	79	437	99	775	119	1360
60	250	80	450	100	800	120	1400
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	1000		
69	325	89	580	109	1030		

NOTES

1) The load capacity corresponding to the load index applies for speeds up to and including 210 km/h.

For speed symbol *V* tyres (between 210 km/h and 240 km/h), the maximum load capacity per tyre is to be reduced to the value corresponding to the following percentages:

100% at 210 km/h, 97% at 220 km/h, 94% at 230 km/h, 91% at 240 km/h. Between these speeds, linear interpolation is permitted.

2) In the case of speed symbols *W* and *Y*, the maximum load capacity per tyre corresponding to the load index applies for speeds up to and including 240 km/h for *W* and 270 km/h for *Y*.

For speed symbol *W* tyres between 240 km/h and 270 km/h, the maximum load capacity per tyre is to be reduced to the value corresponding to the following percentages:

100% at 240 km/h, 95% at 250 km/h, 90% at 260 km/h, 85% at 270 km/h. Between these speeds, linear interpolation is permitted.

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

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Table 3 - Correlation between speed symbol and speed category

Speed symbol	Speed 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	300

Radial ply tyres designed for operation at speeds in excess of 300 km/h are to be identified by means of code-letters *ZR* in the "dimensional and constructional" characteristics in place of the tyre construction code. For these tyres, consult the tyre manufacturers concerned for the maximum speed capability.

6 Marking

Each tyre shall conform to each of the following marking requirements:

a) the designation of the size and construction as in 5.1;
b) the designation of service condition characteristics as in 5.2;
c) the designation of other service characteristics as in 5.3.

The location of the marking of the load and speed characteristics shall be distinct, but near the marking of the size and construction. In no cases shall the information be positioned on the tyre so that it is obstructed by the flange or any rim designated for use with that tyre.

6.1 Example 1

A tyre having
a) a size contraction of:

i) nominal section width 165 mm;
ii) nominal aspect ratio 80;
iii) radial ply construction;
iv) nominal rim diameter code 15.

b) service description of;

h) load index *LI* 87, corresponding to a tyre load-carrying capacity of 545 kg. – speed symbol *H*, corresponding to a speed category of 210 km/h.

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c) other service characteristics:

i) *TUBELESS*: tyre to be used without a tube; shall be marked as follows:

165.80 R 15 87 *H*
TUBELESS

NOTE – See Annex D for other existing size markings.

6. 2 Example 2

A tyre marked 225/45 *ZR* 16 has the following characteristics:

a) nominal section width 225 mm;
b) nominal aspect ratio 45;
c) radial ply construction tyre designed for operations at speeds in excess of 240 km/h (code letters "*ZR*");
d) nominal rim diameter code corresponding to 406 mm (code 16).

NOTE – See Annex C for special cases of radial tyres designed for speeds in excess of 210 km/h.

7 Tyre dimensions

Except for the cases in 7.1.1 and 7.1.2, the formula derived values for tyre dimensions are to be rounded off to the nearest millimeter. For rounding off, see TZS 4 1979 (see clause 3).

NOTE – Dimensions are expressed in millimetres.

7.1 Calculation of "design tyre" dimensions

7.1.1 *Theoretical rim width,* R_{th}

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

$$R_{th} = K_1 S_N$$

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

K_1 = 0.7 for tyres having nominal aspect ratio (*H/S*) from 50 to 95 inclusive;
K_1 = 0.85 for tyres having nominal aspect ratio (*H/S*) from 30 to 45 inclusive;

7.1.2 *Measuring rim width,* R_m

The measuring rim width, R_m, is equal to the product of the nominal section width, S_N and the rim/section width ration coefficient, K_2:

$$R_m = K_2 S_N$$

Rounded to the nearest standardized rim.

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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 (*H/S*) 95 to 75 inclusive;
K_2 = 0.75 nominal aspect ratios (*H/S*) 70 to 60 inclusive;
K_2 = 0.8 or nominal aspect ratios (*H/S*) 55 to 50;
K_2 = 0.85 for nominal aspect ratio (*H/S*) 45;
K_2 = 0.9 for nominal aspect ratios (*H/S*) 40 to 30 inclusive.

7.1.3 *Design tyre section width, S*

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

$$S = S_N + 0.4\,(R_m - R_{th})$$

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

7.1.4 *Design tyre section height, H*

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

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

NOTE –*H/S* = nominal aspect ratio.

7.1.5 *Design tyre overall diameter, D_o*

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

$$D_o = D_r + 2H$$

For those tyres using a nominal rim diameter code, the corresponding value of D_r given in Table 1 is to be used.

***7.1.6** Guidelines*

Guidelines for "tyre design dimensions" for the metric series of passenger car tyres mounted on 5° rims (code-designated) are given in Annex A. Table 5 presents a guide relating to the determination of the appropriate rim widths for a given tyre.

7.2 Calculation of "maximum overall (grown) tyre dimension in service" for tyres mounted on their measuring rims

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

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

7.2.1 *Maximum overall (grown) width in service, W_{max}.*

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

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

$$W_{max} = S_a$$

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

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

Table 4 – Coefficients for calculation of the tyre dimensions

Structure	Tyre construction code	Nominal aspect ratio *H/S*	Coefficients			
			a	*b*	*c*	*d*
Diagonal	*D*	All	1.1	1.08	-	-
Bias-belted	*B*				-	-
Radial ply	*R*	≤ 65	1.04	1.04	0.96	0.97
		70	1.04			
		≥ 75	1.06			

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

7.2.2 Maximum overall (grown) diameter in service, $D_{o\ max}$, is equal to the nominal rim diameter, D_r, plus twice the product of the design tyre section height H, and the appropriate coefficient b, (see Table 4).

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

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

7.3.1 *Minimum tyre section width, S min*

The minimum tyre section width, S_{min}, is equal to the product of the design tyre section width, S, and the coefficient c (see Table 4).

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$$S_{min} = S_c$$

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

The minimum tyre overall diameter, $D_{o\,min}$, is equal to the nominal rim diameter, D_r, plus twice the product of the design tyre section height, H, and the coefficient d (see Table 4).

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

7.4 Range of approved rims

7.4.1 The range of approved rim widths is calculated as the product of the nominal section width, S_N, and the coefficients shown in Table 5. The values obtained shall be rounded to the nearest standardized rim width.

7.4.2 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

Nominal aspect ratio *H/S*	Coefficients for calculation of approved rim width	
	min	max.
70 ≤ 95	0.65	0.85
50 ≤ 65	0.7	0.9
H/S = 45	0.8	0.95
35 = H/S ≤ 40	0.85	1
H/S = 30	0.9	1

8 Tyre dimension presentation

Tyre dimensions shall be shown in tables. An example for tyres mounted on 5° rims (code-designated) and nominal rim diameter expressed by a two-figure code is given in Table 6.

Table 6 – Example of tyre dimension table

Tyre size designation	Measuring rim code	Design dimensions		Maximum dimensions in service (grown)	
		Section width mm	Overall diameter $D_{o\,mm}$	Overall width W_{max} mm	Overall diameter $D_{o\,max}$ mm

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9 Test requirements

9.1 Test sample

The test sample shall constitute

9.1.1 one tyre for physical dimensions, resistance to bead unseating, and strength in sequence;

9.1.2 another tyre for endurance test; and

9.1.3 a third tyre for high-speed performance.

9.2 Physical dimensions measurement

The tyre physical dimensions shall be determined under uniform ambient conditions anis follows:

9.2.1 The sample shall be mounted on a recommended test rim for that tyre size designation and inflated to the applicable pressures recommended in Table 7. Then the tyre shall be conditioned at ambient room temperature for a minimum of 24 h and the pressure re-adjusted to the original value.

9.2.2 The section width and overall are callipered at six points approximately equally spaced around the tyre circumference. The average of the measurements as the section width and overall width, respectively; is recorded.

9.2.3 The tyre overall diameter is determined by measuring the maximum circumference of the tyre and dividing this dimension by π = 3.1416.

The actual section width and overall width for each tyre measured in accordance with this procedure shall not exceed the section width specified in the submission made by the manufacturer or in any standard tyre and rim matching information; for its size designation and type, by more than 7%.

Table 7– Recommended pressures for measurement of tyre dimensions

Tyre	Pressure (kPa)
Standard load version	180
Extra load/reinforced version	230
"Type" temporary-use spare tyre	420

9.3 Tubeless tyre bead unseating resistance

9.3.1 *Preparation of tyre-wheel assembly*

The tyre is washed, dried at the beads and mount without lubrication or adhesives on a clean, painted test rim. The tyre is then inflated to the applicable pressure specified in Table 8 at

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ambient room temperature. The tyre-wheel assembly is mount on a fixture against the tyre side wall as required by the geometry of the fixture.

9.3.2 *Test procedure*

a) Load is applied through the block to the tyre outer sidewall at the specified distance for the applicable wheel size at a rate of 50 mm per minute, with the load arm substantially parallel to the tyre and rim assembly at the time of engagement.

b) The load is increased until the bead unseats or the applicable specified value is reached (see Table 8). The applied force required to unseat the tyre bead at the point of contact shall be not less than the specified one.

c) The test is repeated at at least four places equally spaced around the tyre circumference.

Table 8 – Specified values for bead unseating test

Max. inflation pressure (kPa)	Section width (mm)	Load rating (kg)	Applied force required to unseat the (bead kN) min
Other than 420	$S_N < 155$ $155 \geq S_N < 205$ $S_N \geq 205$	- - -	6.7 8.9 11
420	- - -	< 400 $400 \geq LR > 650$ $LR \geq 650$	6.7 8.9 11

9.4 Tyre strength

9.4.1 *Requirement*

Each tyre shall need the requirements for maximum breaking energy specifed in Table 9 when tested according to 9.4.3.

9.4.2 *Preparation of tyre*

The tyre is mount on a test rim and inflated to the applicable pressure specified in Table 11. It is then conditioned at room temperature for at least 3 h and the pressure is readjusted to the original value.

9.4.3 *Test procedure*

A 20 mm diameter cylindrical steel plunger is forced, with a hemispherical end perpendicularly into the tread rib as near to the centre line as possible, avoiding penetration into the tread groove, at the rate of 50 mm per minute.

The force and penetration at five test points equally spaced around the circumference of the tyre are recorded. If the tyre fails to break before the plunger is stopped by reaching the rim,

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the force is recorded and the values are used in computing the breaking energy for each test point by means of the following formula:

$$W = \frac{F \times P}{2000}$$

where

W = energy in J
F = force in N
P = penetration in mm

The breaking energy for the tyre is determined by computing the average of the five values obtained above.

Table 9 – Minimum breaking energy (Joules) – tyre strength tests

A) For bias ply tryes with designated section width of 155 mm and above. Maximum permissible inflation pressure.

Cord material	220.48 (kPa)	248.04 (kPa)	275.6 (kPa)	240 (kPa)	280 (kPa)	300 (kPa)	340 (kPa)
Rayon	11368.5	1773.8	22737	11368	22737	11368.5	22737
Nylon or polyester	17914	26891	35828	17914	35828	17914	35828

B) For bias ply tyres with designated section width below 155 mm. Maximum permissible inflation pressure

Cord material	220.48 (kPa)	248.04 (kPa)	275.6 (kPa)	240 (kPa)	280 (kPa)	300 (kPa)	340 (kPa)
Rayon	6890	12918.75	17225	6890	17225	6890	17225
Nylon or polyester	13435.5	20153.2	26871	13435.5	26871	13435.5	26871

C) For radial ply tyres. Maximum permissible inflation pressure

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Size designation below 160 mm	Tyre other than *CT*								CT tyres			
	psi			kPa					kPa			
	32	36	40	240	280	300	340	350	290	330	350	390
	2205	3305	4405	2205	4405	2205	4405	2205	2205	4405	2205	4405
160 mm or above	290	4405	5905	2905	5905	2905	5905	2905	2905	5905	2905	5905

D) For tyres with 413.4 kPa maximum permissible inflation pressure and maximum load rating of 399 kg and above

Cord material	Breaking energy (J)
Rayon	186.45
Nylon or polyester	293.8

E) For tyres with 413 kPa maximum permissible inflation pressure and 399 kg maximum load rating and below

Code material	Breaking energy (J)
Rayon	1130
Nylon or polyester	220.35

9.5 Tyre endurance

9.5.1 *Requirement*

When the tyre has been subjected to the laboratory endurance test specified in 9.5.3, using a test rim that undergoes no permanent deformation and allows no loss of air through the potion that it comprises of the tyres rim pressure chamber;

a) there shall be no visual evidence of tread sidewall, ply cord, innerliner or bead separation, chunking, broken cords, cracking or open splices and

b) the tyre pressure at the end of the test shall be not less than the initial pressure specified in Table 11.

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9.5.2 *Preparation of tyre*

The tyre is mount on a test rim and inflated to the pressure specified in Table 11.

The tyre assembly is conditioned to 38 ± 2°C for at least 3 h then the pressure is readjusted to the initial value immediately before testing.

9.5.3 *Test procedure*

The tyre – wheel assembly is mount on a test axle and pressed against a flat-faced steel test wheel, with the applicable test load specified in Table 10 for the tyre size, designation type, and max. permissible inflation pressure.

During the test, the air surrounding the test area shall be kept at 38 ± 2°C.

The test is then conducted at 80 km/h without pressure adjustment or other interruptions as follows:

The loads for the following periods are specified percentage of the maximum load rating marked on that tyre sidewall.

Table 10 – Percentage of maximum load rating

4h 6h 24h	85% 90% 100%

Immediately after the tyre is run the required time, the inflation pressure is measured. The tyre is then allowed to cool for one hour, deflated, removed from the test rim and inspected for the conditions specified in 9.5.1 (a).

Table 11 – Test inflation pressures

Test type max, inflation pressure	Tyre other than *CT* kPa					*CT* tyres kPa			
	240	280	300	340	350	290	330	350	390
Bead unseating, tyre strength and tyre endurance	180	220	180	220	180	230	270	230	270
High speed performance	220	260	220	260	220	270	310	270	310

9.6 High-speed performance

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9.6 1 *Requirements*

When the tyre has been subjected to the laboratory high-speed performance test specified in 9.6.3 using a test rim that undergoes no permanent deformation and allows no loss of air through the portion that it comprises of a tyre-rim pressure chamber, the tyre shall meet the requirements set forth in 9.5.1 (a) and (b).

9.6.2 Preparation *of tyre*

As described in 9.5.2.

9.6.3 *Test procedure*

The tyre and wheel assembly is mount in accordance with 9.5.3 and pressed against the test wheel with a load of 88% of the tyre's maximum load rating as marked on the tyre sidewall; then is run for two hours at 80 km/h. The tyre is allowed to cool to 38 ± 2°C and the pressure is readjusted to the applicable pressure specified in Table 11.

Then without readjusting inflation pressure, the tyre is tested at 120 km/h for 30 minutes, 130 km/h for 30 minutes and 140 km/h for 30 minutes.

Immediately after running the tyre the required time, the inflation pressure is measured and inspected for the conditions specified in 9.5.1 (a).

10 Non – conforming tyres

No tyre that is designed and manufactured for use on passenger cars, that does not conform to the requirements of this standard shall be sold, offered for sale, introduced or delivered for introduction into, or imported into the United Republic of Tanzania for any purpose.

Annex A

(normative)

Guidelines for design tyre dimensions (metric series) mounted on 5° rims (code-designated) with nominal rim diameter expressed by a two-figure code are given in tables A.1 to A. 7 as a function of nominal aspect ratio.

Table A.1 – *H/S* of 95 to 75 inclusive (K_1 = 0,7; K_2 = 0,7)

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Nominal section width SN mm	Measuring rim width (R_m) code	mm	Design tyre dimensions, mm: Section width S	Section height, H, nominal aspect rations, H/S (%) of 95	90	85	80	75	Approved rim width codes 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	157	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	7.0	203	286					214	7.5	9.5
295	8.0	203	294					221	7.5	10.0
305	8.0	216	306					229	8.0	10.0
315	8.5	216	313					236	8.0	10.5

Table A.2 - ***H/S* of *70* (K_1 = *0,7*; K_2 = *0,75*)**

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Nominal section width S_N mm	Measuring rim width (R_m) Code	mm	Design tyre dimensions, mm Section width S	Section height H	Approved rim width codes 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

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Table A.3 - H/S of 65 and 60 (K_1 = 0,7; K_2 = 0.75)

Nominal section width S_N mm	Measuring rim width (R_m) Code	mm	Design tyre dimensions, mm: Section width S	Section height, H, at nominal aspect ratios, H/S (%) of 65	60	Approved rim width codes 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

Table A.4 - *H/S* of 55 and 50 (K_1 = 0,7; K_2 = 0,8)

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Nominal section width	Measuring rim width		Design tyre dimensions, mm			Approved rim width codes	
S_N	(R_m)		Section width	Section height, H, at nominal aspect ratios, 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

Table A.5 – *H/S* of 45 (K_1 = 0,85; K_2 = 0,85)

FOR SI

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Nominal section width	Measuring rim width		Design tyre dimensions, mm		Approved rim width codes	
			Section width	Section height		
S_N	(R_m)					
mm	code	mm	S	H	min.	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

FOR STAKEH

Table A.6 - *H/S* of 40 and 35 (K_1 = 0,85; K_2 = 0,9)

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Nominal section width	Measuring rim width		Design tyre dimensions, mm			Approved rim width codes	
S_N	(R_m)		Section width	Section height, H, at nominal aspect ratios, 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

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Table A 7 - *H/S* of 30 (K_1 = 0,85; K_2 = 0,9)

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Nominal section width	Measuring rim width		Design tyre dimensions, mm		Approved rim width codes	
			Section width	Section height		
S_N	(R_m)					
mm	code	mm	S	H	min.	max.
185	6.5	165	188	56	6.5	7.5
195	7.0	178	200	59	7.0	7.5
205	7.5	190,5	212	62	7.5	8.0
215	7.5	190,5	218	65	7.5	8.5
225	8.0	203	230	68	8.0	9.0
235	8.5	216	242	71	8.5	9.5
245	8.5	216	248	74	8.5	9.5
255	9.0	228,5	260	77	9.0	10.0
265	9.5	241,5	272	80	9.5	10.5
275	9.5	241,5	278	83	9.5	11.0
285	10.0	254	290	86	10.0	11.0
295	10.5	266,5	301	89	10.5	11.5
305	11.0	279,5	313	92	11.0	12.0
315	11.0	279,5	320	95	11.0	12.5
325	11.5	292	331	98	11.5	13.0
335	12.0	305	343	101	12.0	13.0
345	12.0	305	350	104	12.0	13.5
355	12.5	317,5	361	107	12.5	14.0
365	13.0	330	373	110	13.0	14.5
375	13.5	343	385	113	13.5	15.0
385	13.5	343	391	116	13.5	15.0
395	14.0	355,5	403	119	14.0	15.5

FOR S

Annex B

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(normative)

Load capacity indices for passenger car tyres

Tables B.1 to B.4 show equivalences, based on overall diameter, for tyres in standard load version.

Load-carrying capacity indices are referred to a basic inflation pressure of 240 kPa. Load indices given are preferred values for international use. Sizes given in parentheses are those for tyres equivalent in overall diameter which have higher load capacity indices.

Table B.5 gives tyres load capacity indices, grouped by nominal rim diameter and nominal aspect ratio, referred to a basic pressure of 240 kPa for the standard load version.

NOTE – For future revisions of the values in Table B.5, it is recommended that all values be increased by the same amount.

Table B.6 gives the load capacity indices for T-type temporary spare tyres, with a reference pressure of 420 kPa.

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Table B.1

70 series	65 series	60 series	55 series	50 series	Load 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

Table B.2

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70 series	65 series	60 series	55 series	50 series	Load index
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	(215/55 R 14)	(215/50 R 15)	86 (88)
195/70 R 13	195/65 R 14	205/60 R 14	(225/55 R 14)	(225/50 R 15)	89 (91)
205/70 R 13	205/65 R 14	215/60 R 14	(235/55 R 14)	(235/50 R 15)	91 (93)
215/70 R 13	215/65 R 14	225/60 R 14			94

Table B.3

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	185/50 R 16	81
175/70 R 14	175/65 R 15	185/60 R 15	195/55 R 15	195/50 R 16	84
			205/55 R 15	205/50 R 16	87
185/70 R 14	185/65 R 15	195/60 R 15	(215/55 R 15)	(215/50 R 16)	88 (90)
195/70 R 14	195/65 R 15	205/60 R 15	(225/55 R 15)	(225/50 R 16)	91 (92)
205/70 R 14	205/65 R 15	215/60 R 15	(235/55 R 15)	(235/50 R 16)	94 (95)
215/70 R 14	215/65 R 15	225/60 R 15 (235/60 R 15)	(245/55 R 15)	(245/50 R 16)	96 (98)
225/70 R 14	225/65 R 15	(245/60 R 15)	(255/55 R 15)	(255/50 R 16)	99 (100)

Table B.4

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70 series	65 series	60 series	55 series	50 series	Load index
			205/55 R 16	205/50 R 17	89
185/70 R 15	185/65 R 16	195/60 R 16	(215/55 R 16)	(215/50 R 17)	89 (91)
195/70 R 15	195/65 R 16	205/60 R 16	(225/55 R 16)	(225/50 R 17)	92 (94)
205/70 R 15	205/65 R 16	215/60 R 16	(235/55 R 16)	(235/50 R 17)	95 (96)
215/70 R 15	215/65 R 16	225/60 R 16	(245/55 R 16)	(245/50 R 17)	98 (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.5

Nominal section	80 series	75 series	70 series	65 series	60 series	55 series	50 series
a) Nominal rim diameter code: 10							
145	69		63				
155	73		67				
165			72				
b) Nominal rim diameter code: 12							
135	68		65				
145	74		69	67			
155	77		73	71	68		
165			77		71		
175			80	78			
c) Nominal rim diameter code: 13							
125	65						
135	70		68				
145	75		71	69			

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Nominal section	80 series	75 series	70 series	65 series	60 series	55 series	50 series
c) Nominal rim diameter code: 13 *(continued)*							
155	79		75	73	69		
165	83		79	77	73	70	
175	86		82	80	77	73	
185	90		86	84	80	77	
195			89	87	84	80	
205			91	89	87		
215			94	92	89		84
225					92		86
235					94		89
245							91
d) Nominal rim diameter code: 14							
135			69				
145			73				
155	81		77	75			
165	85		81	79	75	72	
175	88	86	84	82	79	75	
185	91	89	88	86	82	79	77
195	95	92	91	89	86	82	80
205	98	95	94	91	89	85	84
215		98	96	94	91	88	
225		101	99		94	91	
235			101		96	93	
245			103		99	96	93
255					101	98	95
265					103	100	98
275					105		

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Nominal section	80 series	75 series	70 series	65 series	60 series	55 series	50 series
e) 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
195	96	94	92	91	88	84	82
205		97	95	94	91	87	85
215	101	100	98	96	94	90	88
225	105	102	100	99	96	92	91
235		105	103	100	98	95	93
245			105	102	100	98	95
255		110	108	106	102	100	97
265		112	110		105		99
275					107	104	101
285							104
295							105
f) Nominal rim diameter code: 16							
155	85						
175	91						
185				89			81
195				92	89		84
205	100		97	95	92	89	87
215	103	101	99	98	95	91	90
225		104	102	100	98	94	92
235	109	106	105	103	100	96	95
245		109	107			99	98
255				109	103		100

FOR S

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Nominal section	80 series	75 series	70 series	65 series	60 series	55 series	50 series
f) Nominal rim diameter code: 16 (*continued*)							
265			112				101
275			114				103
g) Nominal rim diameter code: 17							
205							89
215							91
225							94
235						97	96
245					103		99
255						102	100
265					108		
275					110		
h) Nominal rim diameter code: 18							
205						91	
245					104		
265					109		

Table B.6

Tyre designation	Load index	Tyre designation	Load index
T 105/70 *) 14	84	T 105/80 *) 13	82
T 115/70 *) 14	88	T 135/80 *) 14	97
T 125/70 *) 14	93	T 135/80 *) 15	100
T 135/70 *) 14	97	T 125/80 *) 16	97
T 105/70 *) 15	85	T 135/80 *) 16	101
T 115/70 *) 15	90	T 145/80 *) 16	105
T 125/70 *) 15	95	T 135/80 *) 17	103
T 135/70 *) 15	99	T 105/90 *) 12	80
T 105/70 *) 16	87	T 115/90 *) 12	86
T 115/70 *) 16	92	T 125/90 *) 12	90
T 125/70 *) 16	96	T 125/90 *) 15	96
T 135/70 *) 16	100	T 135/90 *) 15	100
T 125/70 *) 17	98	T 125/90 *) 16	98
T 145/70 *) 17	106	T 135/90 *) 16	102
T 155/70 *) 17	110		

*) To be replaced by D, B or R, depending on actual tyre structure.

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Annex C

(informative)

Marking of radial tyres designed for vehicle with maximum speeds above 210 km/h

The code letters "*VR*" may be used within the dimensional and constructional characteristics in place of the tyre construction code for radial ply tyres designed for equipment on some existing vehicles with maximum speeds above 210 km/h.

Example

215 /60 VR 15

This precludes the marking of service description. For the maximum speed capability and the load capacity of the tyres, the tyre manufacturer concerned shall be consulted.

C.2 The code letters "ZR" may be used within the dimensional and constructional characteristics in place of the tyre construction code for radial ply tyres designed to equip some existing vehicles with maximum speeds above 240 km/h.

Example

205/50 ZR 16

This precludes the marking of service description. For the maximum speed capability and the load capacity of the tyres, the tyre manufacturer concerned shall be consulted.

C.3 The code letters "ZR" may be used within the dimensional and constructional characteristics, in place of the tyre construction code (see 5.1.3) and in conjunction with "W" speed symbol and load index to identify tyre performances up to 270 km/h.

Example

195/50 ZR 15 82W

C.4 The code-letters "ZR" may be used in the dimensional and constructional characteristics (see 5.1.3) associated with the speed code Y and the load index to identify tyre performances up to 300 km/h.

Example

195/50 ZR 15 82Y

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