
Specification for Pneumatic Tyres for Passenger Vehicles



SAINT LUCIA NATIONAL STANDARD

SLNS 41: 2001

SPECIFICATION FOR PNEUMATIC TYRES FOR PASSENGER VEHICLES

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GENERAL STATEMENT

The Saint Lucia Bureau of Standards was established under the Standards Act No.14 of 1990 and started operations on 01 April 1991. A broad-based 15-member Standards Council directs the affairs of the Bureau.

The Standards Act gives the Bureau the responsibility to develop and promote standards and codes of practice for products and services for the protection of the health and safety of consumers and the environment as well as for industrial development in order to promote the enhancement of the economy of Saint Lucia. The Bureau develops standards through consultations with relevant interest groups. In accordance with the provisions of the Standards Act, public comment is invited on all draft standards before they are declared as Saint Lucia National Standards.

The Bureau also administers the Metrology Act No. 17 of 2000. This legislation gives the Bureau the responsibility to regulate all weights and measures and to manage and co-ordinate the metrication of Saint Lucia.

The Bureau operates a Product Certification Scheme applicable to all products for which national standards exist. If a product satisfies all the requirements for certification, a licence to carry the **St. Lucia Standard Mark** is issued to the manufacturer of the product. The presence of the mark on a product indicates that the product conforms to all the requirements of a specific national standard and assures consistent quality of the product to the consumer.

The Bureau is a member body of the International Organization for Standardization (ISO), an affiliate member of the International Electrochemical Commission (IEC) and a member of the CARICOM Regional Organization for Standards and Quality (CROSQ) and the Pan American Standards Commission (COPANT). The Bureau is the local agent for several foreign standards bodies such as the British Standards Institution (BSI) and the American Standards for Testing and Measurement (ASTM). The Bureau also serves as the enquiry point for the World Trade Organization (WTO) on matters pertaining to the Technical Barriers to Trade (TBT) Agreement.

In accordance with good practice for the adoption and application of standards, Saint Lucia National Standards are subject to review every three years. Suggestions for improvements are always welcomed.

**SPECIFICATION FOR PNEUMATIC TYRES FOR PASSENGER
VEHICLES****AMENDMENTS ISSUED SINCE LAST PUBLICATION**

| Amendment no. | Date of issue | Text(s) affected |
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ATTACHMENT PAGE FOR SLBS AMENDMENT SHEET

SAINT LUCIA NATIONAL STANDARD

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SPECIFICATION FOR PNEUMATIC TYRES FOR PASSENGER VEHICLES

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Foreword

Major stakeholders of the local transportation industry and the general public are getting more conscious and concerned about the potential safety hazards created by tyres of inferior quality. The prevailing open market system enables the importation of large quantities of both new and used tyres into Saint Lucia. In the absence of quality control mechanisms or government trade restrictions, the used tyres compete with other established tyre products, namely new, regrooved and retreaded tyres. Therefore, consumers purchase tyres based on their perception of what constitutes a good quality tyre product. The risk involved here is that tyres may contain defects that are not easily detected by untrained consumers and hence become a safety hazard to road users.

This standard, therefore, was developed in response to these concerns. It specifies the quality requirements for both new and used tyres for passenger vehicles. It specifically addresses the concerns related to used tyres by incorporating a section with detailed inspection and selection criteria. The specifications of this standard are in harmony with ISO 40001-1: 1995, and the industry accepted standard on tyres, the Federal Motor Vehicle Safety Standards standard, FMVSS 109, established in the United States.

This standard is based on the metric series of tyres and rims. However, cognizance was taken of the fact that both the metric and imperial system of units are being used in the tyre industry and by standardization bodies to express their requirements. Both units are accommodated in this standard where necessary.

In preparing this standard considerable assistance was derived from:

- a) ISO 4000 – 1.1995 (E) Passenger car tyres and rims – Part 1: Tyres (metric series;
- b) National Highway Traffic Safety Administration, Department of Transport: 49 CFR ch: V (10-1-94 Edition) – standard No. 109. New pneumatic tyres;
- c) Grenada Bureau of Standards: GDS 26: 1997 Specification for new and used pneumatic tyres;
- d) Trinidad & Tobago Standard: TTS 266: 1993 Specification for Pneumatic Passenger Car Tyres; and
- e) Jamaica Bureau of Standards: JS 244: 1995 Jamaica Standard Specification for pneumatic tyres for passenger cars.

1 Scope

This standard specifies tyre designation, labelling and laboratory test and performance requirements for physical dimensions, strength, endurance, bead unseating resistance and high speed performance for new and used pneumatic tyres intended for passenger vehicles with rim code diameters from 254 mm (10 in) to 483 mm (19 in).

2 Terms and definitions

For the purpose of this standard the following terms and definitions shall apply:

2.1 beads

that part of the tyre made of steel wires, wrapped or reinforced by ply cords that are shaped to fit the rim.

2.2 bead separation

a breakdown of bond between components in the bead area.

2.3 bias ply tyre; diagonal ply tyre

a pneumatic tyre in which the ply cords that extend to the beads are laid at alternate angles substantially less than 90^0 to the centerline of the tread.

2.4 breaker (diagonal)

intermediate ply between carcass and tread

2.5 carcass

the tyre structure, except for tread and sidewall rubber.

2.6 chunking

the breaking away of pieces of the tread or sidewall

2.7 cord

the strands forming the plies in the tyre.

2.8 cord separation

cords parting away from adjacent rubber compounds.

2.9 cracking

any parting within the tread, sidewall or inner liner of the tyre extending to the cord material.

2.10 groove

the space between adjacent tread ribs.

2.11 inner liner

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

2.12 inner liner separation

the parting of the inner liner from cord material in carcass.

2.13 load index

numerical code associated with the maximum load a tyre can carry at the speed indicated by its speed symbol under service conditions specified by the tyre manufacturer.

2.14 load rating

the maximum load a tyre is rated to carry for a given inflation pressure.

2.15 maximum overall tyre width in service

overall width as defined in 2.22 plus

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

2.16 maximum permissible inflation pressure

the maximum cold inflation pressure to which a tyre may be inflated under the requirements of this standard.

2.17 maximum load rating

the load rating at the maximum permissible inflation pressure for the tyre.

2.18 new tyre

tyre which has been neither used nor subjected to a retreading operation.

2.19 nominal aspect ration, H/S

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

2.20 open splice

any parting at any junction of tread, sidewall or inner liner that extends to the cord material.

2.21 overall diameter

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

2.22 overall width

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

2.23 ply

a layer of rubber-coated parallel cords.

2.24 ply separation

a parting of rubber compound between adjacent plies.

2.25 ply rating

an index of the casing strength and therefore the load carrying capacity of a pneumatic tyre. A tyre of a given ply rating is deemed to have the casing strength equivalent to that which the tyre would possess if the casing were constructed from that given number of rubber-coated first quality cotton material.

2.26 pneumatic tyre

a mechanical device made of rubber chemicals, fabric and steel or other materials, which when mounted on an automotive wheel, provides the traction and contains the gas or fluid that sustains the load.

2.27 radial belt; radial bracing ply

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layer of material underneath the tread, laid substantially in the direction of the tread center-line that restricts the carcass circumferentially.

2.28 radial ply tyre

a pneumatic tyre in which the ply cords which extend to the treads are laid at substantially at 90° to the center-line of the tread.

2.29 rim

a circular metal support for a tyre, or a tyre and tube assembly upon which the tyre beads are seated.

2.30 section height, H

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

2.31 section width

the linear distance between the exterior of the sidewalls of an inflated tyre, excluding the elevations due to labelling, decorations or protective bands.

2.32 service condition characteristics

service designation consisting mainly of the load index and speed symbol.

2.33 sidewall

that portion of a tyre between the tread and the bead.

2.34 sidewall rubber

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

2.35 sidewall separation

the parting of the rubber compound from the cord material in the sidewall.

2.36 speed symbol

symbol indicating the speed at which the tyre can carry a load corresponding to its load index under service conditions specified by the tyre manufacturer.

2.37 test rim

with reference to a tyre to be tested, any rim that is listed as appropriate for use with that tyre in accordance with 5.1. For the purposes of this standard, each rim listing shall include dimensional specifications and a diagram of the rim.

2.38 tread

that portion of a tyre which comes into contact with the road.

2.39 tread groove

the space between two adjacent tread ribs.

2.40 tread separation

pulling away of the tread from the tyre carcass.

2.41 tread wear indicator

a projection within a tread groove designed to give a visual indication of the degree of wear of the tread.

3 Tyre designation

3.1 Dimensional and constructional characteristics

3.1.1 The characteristics shall be indicated as follows:

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

NOTE The order shall be maintained.

3.2 Nominal section width

3.2.1 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 all end with '5'.

3.3 Nominal aspect ratio

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

NOTE When the Nominal Aspect Ratio is 82 for radial ply tyre and 95 and 88 for diagonal ply tyres, these numbers may be omitted.

3.4 Tyre construction code

3.4.1 The tyre construction code shall be as follows:

B for bias-belted construction;

D for diagonal construction;

R for radial ply construction.

NOTE The use of another code letter (for example, in the case of a new construction type) shall first be remitted to the Saint Lucia Bureau of Standards for acceptance and inclusion in this list.

3.5 Nominal rim diameter code

3.5.1 For tyres mounted on existing rims, the code shall be as given in Table A.1.

3.5.2 For tyres requiring new concept rims, due to safety reasons especially concerning mounting, the code number shall be equal to the nominal rim diameter, expressed in a whole number of millimetres.

3.6 Service condition characteristics

3.6.1 The service condition characteristics or service description shall be indicated as follows:

Load index Speed symbol

3.6.1.1 Load index

The tyre load capacity corresponding to the service conditions specified by the tyre manufacturer shall be indicated by a load index taken from Table A.2. This indication is understood to be for a single mounting.

3.6.1.2 Speed symbol

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

3.7 Other service characteristics

3.7.1 The word ‘TUBELESS’ shall be used to characterize tyres that can be used without a tube.

3.7.2 The maximum permissible inflation pressure which shall be indicated in psi or kPa.

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

- a) the type of vehicle for which the tyre is primarily designed, by using a symbol ‘P’;
- b) the temporary use of certain spare tyres using indications such as ‘TEMPORARY USE’ and/or symbol ‘T’;
- c) the direction of mounting;
- d) the direction of rotation;
- e) the type of tread pattern;
- f) other characteristics

NOTE Where any one of these optional markings is used it shall be positioned so that confusion shall not result from its proximity to any other service condition marking.

4 Inspection and selection of used tyres

4.1 Inspection

4.1.1 Used tyre inspection shall be made by a trained inspector certified by the Saint Lucia Bureau of Standards. Each used tyre shall be cleaned and inspected outside then inside in order to detect all evident damage. The inspection shall include placing the used tyre on a mechanical spreader under adequate lighting (3200 lux) and distortion of the natural contour sufficient for visual inspection.

4.1.2 Each inspected tyre shall be certified to indicate whether it is acceptable or not acceptable for use on motor vehicles.

4.2 Selection criteria for used tyres

4.2.1 A used tyre shall not be acceptable for motor vehicle use unless it has a minimum tread depth of 4.0 mm and bears the following permanently moulded on it at the time of original manufacture:

- a) The DOT symbol or other markings indicating that the tyre was originally manufactured to comply with **FMVSS 109 – New pneumatic tyres** or other recognized international bodies or practices;
- b) The size designation of the tyre;
- c) The load range or maximum permissible load;
- d) Sufficient information to allow the tyre to be clearly identified as bias, bias belted or radial ply.

4.2.2 A used tyre containing any of the following weaknesses or damage shall not be accepted for motor vehicle use:

- a) exposed cords due to tread wear or sidewall scuffing;
- b) radial or groove cracks extending to the cords;
- c) tread separation;
- d) weather cracking extending to cords;
- e) broken, damaged, kinked or exposed bead wires;
- f) any visual evidence of belt damage;
- g) ply separation;
- h) porous liners or defective or opened splices in liners extending to cords;
- i) loose cords on the liner ply;
- j) damage to the inner or bead sealing areas on tyres identified as tubeless;
- k) evidence of having been run under-inflated or overloaded;
- l) casing break-up (flex break);
- m) generally weakened condition due to age, moisture, or exposed to oil or other chemical attack;
- n) injuries to the plies in the bead area;

- o) sidewall separation; or
- p) nail, hole or other damage of sufficient sizes and numbers that cannot be repaired using acceptable commercial practice.

5 Requirements

5.1 General

5.1.1 The importer of tyres shall ensure that a listing of the tyres and the rims that shall be used with each tyre he/she imports is provided to the public.

5.1.2 Each rim listing shall include dimensional specifications and a diagram of the rim.

5.1.3 Each tyre shall conform to each of the following:

- a) It shall meet the requirements specified in 5.2 for its tyre size designation, type and maximum permissible inflation pressure;
- b) Its maximum permissible inflation pressure shall be either 240 kPa, 280 kPa, 300kPa, 340 kPa, 32 psi, 36 psi, 40 psi or 60 psi;
- c) It shall incorporate a tread wear indicator that will provide a visual indication when the tyre has worn to a tread depth of 1.6.mm.
- d) It shall, before being subjected to either the endurance test procedure specified in 6.6.2 or the high speed performance procedure specified in 6.7.1, exhibit no visual evidence of tread, sidewall, ply cord, inner liner or bead separation, chunking, broken cords, cracking or open splices.
- e) It shall meet the requirements of 5.5 and 5.6 when on a test wheel described in 6.6.2 either alone or simultaneously with up to five other tyres.

5.2 Physical dimensions

5.2.1 The actual section width and overall width of each tyre measured in accordance with 6.3, shall not exceed the section width and overall width specified in 5.1 by more than:

- a) seven percent (7%) for tyres with a maximum permissible inflation pressure of 32, 36, or 40 psi or 240, 280, 300 kPa;
- b) seven percent (7%) or 0.4 inches, whichever is the larger, for tyres with a maximum permissible inflation pressure of 60 psi, or 340 kPa;

5.3 Tubeless tyre resistance to bead unseating

5.3.1 When tested in accordance with 6.4, the applied force required to unseat the tyre bead at the point of contact shall not be less than;

- a) 6675 N for tyres with a designated section width of less than 155 mm;
- b) 8900 N for tyres with a designated section width of 155 mm or greater but less than 205 mm; or
- c) 11 120 N for tyres with a designated section width of 205 mm or greater.

5.4 Tyre strength

5.4.1 When tested in accordance with 6.5, each tyre shall meet the requirements for minimum breaking energy specified in Table A.4A, A.4B & A.4C.

5.5 Tyre endurance

5.5.1 When the tyre has been subjected to the laboratory endurance test specified in 6.6 using a test rim that undergoes no permanent deformation and allows no loss of air through the portion that is comprised of the tyre-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 6.6.1.

5.6 High speed performance

5.6.1 When the tyre has been subjected to the laboratory high speed performance test specified in 6.7 using a test rim that undergoes no permanent deformation and allows no loss of air through the portion that is comprised of the tyre-rim pressure chamber, the tyre shall meet all requirements set forth in 5.5.1 (a) and (b).

6 Test procedures

6.1 Test rims

6.1.1 Tyres shall be tested on test rims specified for their size designation determined in 5.1.

6.2 Test samples

6.2.1 For each test sample use:

- a) one tyre for physical dimensions, resistance to bead unseating and tyre strength in sequence;
- b) another tyre for tyre endurance; and
- c) a third tyre for high speed performance test.

6.3 Physical dimensions

6.3.1 The physical dimensions of tyres shall be determined under uniform ambient conditions as follows:

- a) Mount the tyre on a test rim and inflate it to the applicable pressure specified in Table A.5;
- b) Condition it at ambient room temperature for at least 24 hours;
- c) Readjust pressure to that specified in 6.3.1 (a);
- d) Caliper the section width and overall width at six points approximately, spaced equally around the tyre circumference;
- e) Record the average of the measurements as the section width and overall width respectively; and
- f) Determine the tyre outer diameter by measuring the maximum circumference of the tyre and dividing this dimension by 3.1416.

6.4 Tubeless tyre bead unseating resistance

6.4.1 Preparation of tyre wheel assembly

Wash the tyre, dry it at the beads and mount it without lubrication or adhesives on a clean painted test rim.

6.4.1.1 Inflate it to the applicable pressure specified in Table A.5 at ambient room temperature.

6.4.1.2 Mount the wheel and tyre in the fixture as shown in Figure A.1 and force the standard block as shown in Figure A.2 against the tyre sidewall as required by the geometry of the fixture. However, in testing a tyre that has an inflation pressure of 60 psi, only use the bead unseating block in Figure A.2.

6.4.2 Test procedure

Apply a load through the block to the outer sidewall of the tyre at the distance specified in Figure A.1 for the applicable wheel size at the rate of $50 \text{ mm} \pm 10 \text{ mm}$ per minute, with the load arm substantially parallel to the tyre and rim assembly at the time of engagement.

6.4.2.1 Increase the load until the bead unseats or the applicable value specified in 5.3.1 is reached.

6.4.2.2 Repeat the test at not less than four places which shall be equally spaced around the tyre circumference.

6.5 Tyre strength

6.5.1 Preparation of tyre

Mount tyre on a test rim and inflate it to the applicable pressure specified in Table A.5.

6.5.1.1 Condition it at room temperature for at least 3 hours.

6.5.1.2 Re-adjust its pressure to the specified in 6.5.1.

6.5.2 Test procedure

Force a 19 mm \pm 2 mm diameter cylindrical steel plunger with a hemispherical end perpendicularly into the tread rib as near to the center-line as possible, avoiding penetration into the tread groove, at the rate of 50 mm \pm 10 mm per minute.

6.5.2.1 Record the force and penetration at five test points equally spaced around the circumference of the tyre. If the tyre fails to break before the plunger is stopped by reaching the rim, record the force and penetration as the rim is reached, and use these values in 6.5.2.2. In the latter case, if the calculated value is less than the minimum breaking energy, the minimum breaking energy is deemed to have been achieved at that point.

6.5.2.2 Compute the breaking energy value of W (in Nm) for each test point by means of the following formula:

$$W = \frac{F \times P}{2}$$

where:

F is the force (N); and
P is the penetration (m)

6.5.2.3 Determine the breaking energy value for the tyre by computing the average of the five values obtained in accordance with 6.5.2.2.

6.6 Tyre endurance

6.6.1 Preparation of tyre

Mount a new tyre on a test rim and inflate it to the applicable pressure specified in Table A.5.

6.6.1.1 Condition the tyre assembly to 38°C \pm 3°C for not less than 3 hours.

6.6.1.2 Readjust tyre pressure to that specified in 6.6.1 immediately before testing.

6.6.2 Test procedures

Mount the tyre and wheel assembly on a test axle and press it against a flat-faced steel test wheel 1708 mm in diameter and at least as wide as the section width of the tyre to be tested.

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Alternatively an approved equivalent test wheel may be used with the applicable test load as specified in Tables 4A, 4B, and 4C (pages 20 -21) for the tyre's size designation, type and maximum permissible inflation pressure.

6.6.2.1 During the test, the ambient temperature shall be $38^{\circ}\text{C} \pm 3^{\circ}\text{C}$.

6.6.2.2 Conduct the test at 80 kilometres per hour test wheel speed in accordance with the following schedule without pressure adjustment or other interruptions. The loads for the following periods are the specified percentage of the maximum load rating marked on the tyre sidewall:

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

6.6.2.3 Immediately after running the tyre for the required time, measure its inflation pressure. Allow the tyre to cool for one hour. Then deflate the tyre, remove it from the test rim and inspect it for the conditions specified in 5.5.1 (a).

6.7 High speed performance

6.7.1 After preparing the tyre in accordance with 6.6.1, mount the tyre and wheel assembly in accordance with 6.6.2.1 and press it against the test wheel with the load of 88 percent of the tyre's maximum load rating or load index as marked on the tyre sidewall.

6.7.2 Break in the tyre by running it for 2 hours at 80 km per hour.

6.7.3 Allow it to cool to $38^{\circ}\text{C} \pm 3^{\circ}\text{C}$ and re-adjust the inflation pressure to the applicable pressure specified in Table A.5.

6.7.4 Without further re-adjusting the inflation pressure, continue test without interruption at test wheel speeds of 120 km per hour for 30 minutes, 130 km per hour for 30 minutes, and 140 km per hour for 30 minutes.

6.7.5 Immediately after running the tyre for the required time, measure its inflation pressure. Allow the tyre to cool for one hour. Then deflate the tyre, remove it from the test rim, and inspect it for the conditions specified in 5.5.1 (a).

7 Sampling and testing to determine compliance

7.1 Test certificate

7.1.1 When requested by the purchaser (for information on purchasing requirements see Annex A, page 18), the manufacturer or supplier shall supply a certificate satisfactory to the Saint Lucia Bureau of Standards showing results of tests carried out to determine compliance of the new or used tyres with this specification.

7.1.2 Sample size

For the purpose of issuing a test certificate, the size of the sample for testing shall be representative of the lot under consideration.

7.1.3 Sampling for testing

Each test sample shall consist of the tyres specified in 6.2.1.

7.1.4. Absence of testing facilities

Where the supplier does not have the facilities for testing, he/she shall be responsible for arranging that the tests be done elsewhere.

7.2 Compliance

7.2.1 Where the samples taken in accordance with 6.2.1 and tested in accordance with 5.0, and they satisfy all other requirements of this standard, the lot shall be deemed to comply with this St Lucia National Standard.

8 Labelling**8.1 Labelling requirements**

8.1.1 Each tyre shall have permanently moulded into or onto either sidewall, in letters and numerals not less than 2.0 mm high, the relevant labelling information in accordance with **SLNS 1: Pt. 1: 1993 Requirements for Labelling of Commodities- General Requirements** and in particular the following information:

- a) the designation of the dimensional and constructional characteristics as applicable;
- b) the designation of the load and speed characteristics;
- c) the designation of other service characteristics as applicable;
- d) maximum permissible inflation pressure;
- e) the words 'tubeless' or 'tube type' as applicable;
- f) the word 'radial' if the tyre is a radial ply tyre;
- g) the generic name of each cord material used in the plies (both sidewall and tread area) of the tyre; and
- h) actual ply rating in the sidewall and the actual ply rating in the tread area if different;

EXAMPLE:

| | |
|-------------------|------------------------------------------------------------------------------------------------------|
| P175 / 70 R 14 | Marking of dimensional and constructional characteristics. |
| 84 H | Marking of load index and speed symbol (distinct location but in the vicinity of preceding marking). |
| Maximum inflation | Location left to the discretion of the manufacturer. |
| TUBELESS | Location left to the discretion of the manufacturer |
| Polyester | Location left to the discretion of the manufacturer |

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2 ply

Location left to the discretion of the manufacturer

8.1.2 The characteristics of a tyre with the above markings shall be as follows:

P: tyre designed for passenger vehicle;

175: nominal section width equal to 175 mm;

70: nominal aspect ratio equal to 70;

R: radial ply construction;

14: nominal rim diameter code corresponding to 356mm

84: load index corresponding to a tyre load of 500 kg;

H: speed symbol corresponding to a speed category of 210 km/h;

Maximum inflation pressure 240kPa: the maximum permissible inflation pressure.

TUBELESS: tyre to be used without a tube.

Polyester: type of cord material used.

2 ply: the number of plies in the sidewall and tread area

8.1.3 On at least one sidewall, the information shall be positioned in an area between the maximum section width and bead of the tyre. However, in no case shall the information be positioned on the tyre so that it is obstructed by the flange of any rim designated for use with that tyre in this standard.

8.1.4 The location of the marking of the load and speed characteristics shall be distinct but in the vicinity of the marking of dimensional and constructional characteristics.

8.1.5 No location is specified for the markings related to other service characteristics (see 3.7, 3.7.2 and 3.7.3).

8.1.6 If the maximum inflation pressure of a tyre is 60 psi, the tyre shall have permanently moulded into or onto either sidewall in letters and numerals, the words 'Inflate to 60 psi'.

8.1.7 On either sidewall the words shall be positioned in an area between the tyre shoulder and the bead of the tyre. However, in no case shall the words be positioned on the tyre so that they are obstructed by the flange of any rim designated for use with that tyre in this standard.

9 Non-conforming tyres

9.1 Tyres designed for use on passenger vehicles which do not conform to all requirements of this standard shall not be sold, offered for sale, introduced or delivered for introduction in national commerce or imported into Saint Lucia for any purpose.

9.2 Disposal

9.2.1 All non-conforming tyres shall be isolated and disposed of by a method, including re-export at the importer's expense, approved by the Saint Lucia Bureau of Standards and in the presence of an officer of the Saint Lucia Bureau of Standards.

9.3 Reporting

9.3.1 The Bureau's representative witnessing the disposal of non-conforming tyres shall prepare a report containing the following information:

- a) name and address of the manufacturer or owner of the non-conforming tyres;
- b) a list of the serial numbers of the tyres disposed of;
- c) the number of tyres disposed of;
- d) the date of disposal;
- e) the method of disposal.

A copy of the report shall be sent to the manufacturer or owner of the non-conforming tyres and the original kept by the Saint Lucia Bureau of Standards.

Annex A
(informative)
Information to be supplied by purchaser

A.1 The following information shall be given by the purchaser to the manufacturer at the time of order or enquiry:

- a) the number of this Saint Lucia standard;
- b) the designation of the dimensional and constructional characteristics;
- c) the designation of the load and speed characteristics;
- d) the designation of the other service characteristics;
- e) the quantity;
- f) whether or not the purchaser requires a test certificate; and
- g) whether or not the purchaser wishes to inspect the product at the manufacturer's premises.

Table A.1 -Rim code diameter

| Code | Nominal rim diameter (mm) | Nominal rim diameter (in) |
|------|------------------------------|------------------------------|
| 10 | 254 | 10 |
| 12 | 305 | 12 |
| 13 | 330 | 13 |
| 14 | 356 | 14 |
| 15 | 381 | 15 |
| 16 | 406 | 16 |
| 17 | 432 | 17 |
| 18 | 457 | 18 |
| 19 | 483 | 19 |

Table A.2 - Correlation between load index (li) and tyre load-carrying capacity (tlcc)

| LI | TLCC (kg) | LI | TLCC (kg) |
|----|-----------|-----|-----------|
| 50 | 190 | 90 | 600 |
| 51 | 195 | 91 | 615 |
| 52 | 200 | 92 | 630 |
| 53 | 206 | 93 | 650 |
| 54 | 212 | 94 | 670 |
| 55 | 218 | 95 | 690 |
| 56 | 224 | 96 | 710 |
| 57 | 230 | 97 | 730 |
| 58 | 236 | 98 | 750 |
| 59 | 243 | 99 | 775 |
| 60 | 250 | 100 | 800 |
| 61 | 257 | 101 | 825 |
| 62 | 265 | 102 | 850 |
| 63 | 272 | 103 | 875 |
| 64 | 280 | 104 | 900 |
| 65 | 290 | 105 | 925 |
| 66 | 300 | 106 | 950 |
| 67 | 307 | 107 | 975 |
| 68 | 315 | 108 | 1000 |
| 69 | 325 | 109 | 1030 |
| 70 | 335 | 110 | 1060 |
| 71 | 345 | 111 | 1090 |
| 72 | 355 | 112 | 1120 |
| 73 | 365 | 113 | 1150 |
| 74 | 375 | 114 | 1180 |
| 75 | 387 | 115 | 1215 |
| 76 | 400 | 116 | 1250 |
| 77 | 412 | 117 | 1285 |
| 78 | 425 | 118 | 1320 |
| 79 | 437 | 119 | 1360 |
| 80 | 450 | 120 | 1400 |
| 81 | 462 | | |
| 82 | 475 | | |
| 83 | 487 | | |
| 84 | 500 | | |
| 84 | 515 | | |
| 86 | 530 | | |
| 87 | 545 | | |
| 88 | 560 | | |
| 89 | 580 | | |

Table A.3 - Correlation between speed symbol and speed category

| Speed symbol | Speed category (km/h) | Speed category (mph) |
|--------------|----------------------------|---------------------------|
| J | 100 | 62 |
| K | 110 | 68 |
| L | 120 | 75 |
| M | 130 | 81 |
| N | 140 | 87 |
| P | 150 | 93 |
| Q | 160 | 99 |
| R | 170 | 106 |
| S | 180 | 112 |
| T | 190 | 118 |
| U | 200 | 124 |
| H | 210 | 130 |
| Y | 240 | 149 |
| Z | greater than 240 | greater than 149 |

Table A.4A - Minimum breaking energy values for radial ply tyres

| Designation section width (mm) | Minimum breaking energy values (N.m) | | | | | |
|--------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------------------------|
| | Maximum Permissible Inflation Pressure of 240 kPa | Maximum Permissible Inflation Pressure of 280 kPa | Maximum Permissible Inflation Pressure of 300 kPa | Maximum Permissible Inflation Pressure of 32 psi | Maximum Permissible Inflation Pressure of 36 psi | Maximum Permissible Inflation Pressure of 40 psi |
| Below 160 | 220 | 441 | 220 | 220 | 330 | 441 |
| 160 and above | 294 | 588 | 294 | 294 | 441 | 588 |

NOTE: Values under psi and values under kPa units are two internationally accepted parallel systems.

Table A.4B -Minimum breaking energy values for bias tyres

| Designate section width (mm) | Minimum breaking energy values (n.m) | | | | | | | |
|------------------------------|--------------------------------------|---------------------------------------------------|---------------------------------------------------|---------------------------------------------------|---------------------------------------------------|--------------------------------------------------|--------------------------------------------------|--------------------------------------------------|
| | Cord Material | Maximum Permissible Inflation Pressure of 240 kPa | Maximum Permissible Inflation Pressure of 280 kPa | Maximum Permissible Inflation Pressure of 300 kPa | Maximum Permissible Inflation Pressure of 340 kPa | Maximum Permissible Inflation Pressure of 32 psi | Maximum Permissible Inflation Pressure of 36 psi | Maximum Permissible Inflation Pressure of 40 psi |
| Below 155 | Rayon | 113 | 282 | 113 | 282 | 113 | 212 | 282 |
| | Nylon or Polyester | 220 | 441 | 220 | 441 | 220 | 330 | 441 |
| 155 and above | Rayon | 186 | 373 | 186 | 373 | 186 | 291 | 373 |
| | Nylon or polyester | 294 | 588 | 294 | 588 | 294 | 441 | 588 |

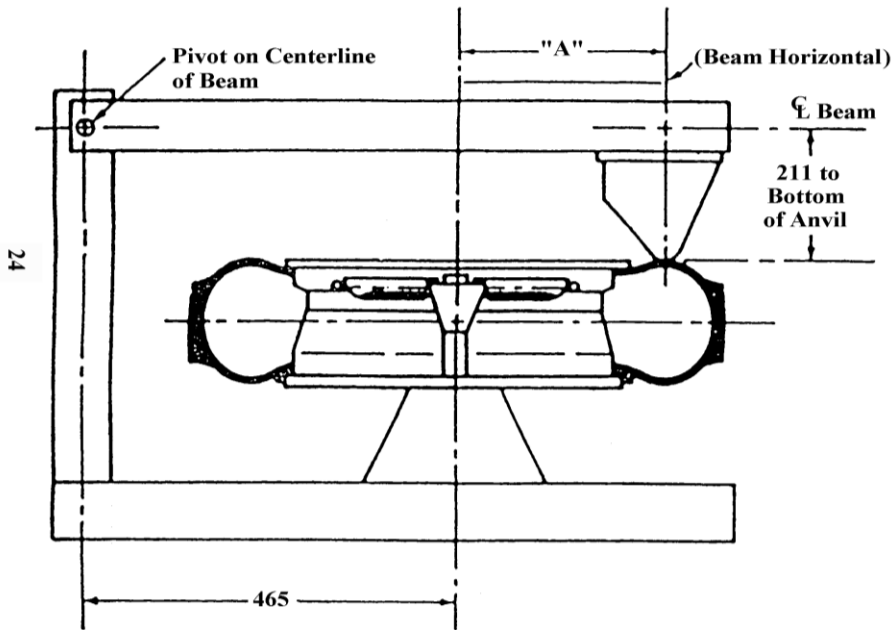
NOTE Values under psi units and values under kPa units are two internationally accepted parallel systems.

Table A.4C - Minimum breaking energy values for tyres with 60 psi maximum permissible inflation pressure

| Maximum load rating | Cord material | Minimum breaking energy values (N.m) |
|----------------------------|--------------------|--------------------------------------|
| Below 400 kg (880 lbs) | Rayon | 186 |
| | Nylon or Polyester | 294 |
| 400 kg (800 lbs) and above | Rayon | 113 |
| | Nylon or polyester | 220 |

Table A.5 - Test inflation pressures

| Maximum permissible inflation pressure | 240 kPa | 280 kPa | 300 kPa | 340 kPa | 32 psi | 36 psi | 40 psi | 60 psi |
|--------------------------------------------------------------------------------------------------------|---------|---------|---------|---------|--------|--------|--------|--------|
| Pressure to be used in tests for physical dimensions, bead unseating, tyre strength and tyre endurance | 180 kPa | 220 kPa | 180 kPa | 220 kPa | 24 psi | 28 psi | 32 psi | 52 psi |
| Pressure to be used in test for high speed performance | 220 kPa | 260 kPa | 220 kPa | 260 kPa | 30 psi | 34 psi | 38 psi | 58 psi |



| WHEEL SIZE | DIMENSIONS "A" (in mm) FOR TYRES WITH MAXIMUM INFLATION PRESSURE | |
|------------|------------------------------------------------------------------|-------------------------|
| | OTHER THAN 60 lb./in. ² | 60 lb./in. ² |
| 17 in. | 305 | . |
| 16 in. | 292 | 251 |
| 15 in. | 279 | 239 |
| 14 in. | 267 | 226 |
| 13 in. | 254 | 213 |
| 12 in. | 241 | . |
| 11 in. | 229 | . |
| 10 in. | 216 | . |
| 320 mm | 216 | . |
| 340 mm | 229 | . |
| 345 mm | 235 | . |
| 365 mm | 248 | . |
| 370 mm | 254 | . |
| 390 mm | 279 | . |
| 415 mm | 292 | . |

Figure A.1 – Bead unseating fixture (Dimensions in mm)

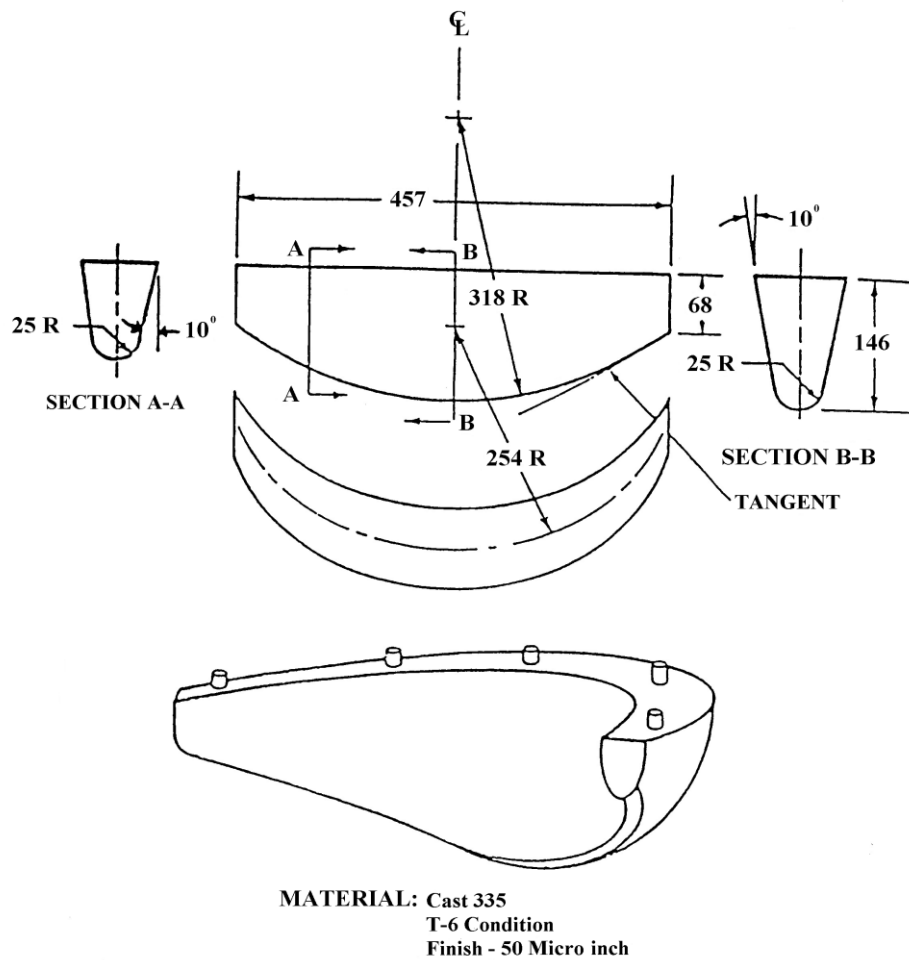


Figure A.2 – Diagram of bead unseating block (Dimensions in mm)

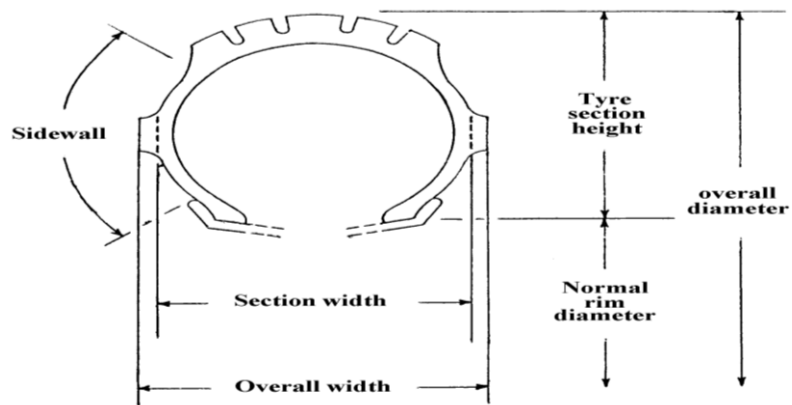


Figure A.3 – Typical tyre section (diagrammatic only)

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