資料　9

Tyre UN Regulations for ASEAN MRA

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JAPAN AUTOMOBILE STANDARDS INTERNATIONALIZATION CENTER

JATMA

The Japan Automobile Tyre Manufacturers Association

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Contents

1. Tyre is one of the Important Vehicle Parts

Pneumatic tyre is one of the most important vehicle parts to realize vehicle dynamic behavior.

Supporting the load

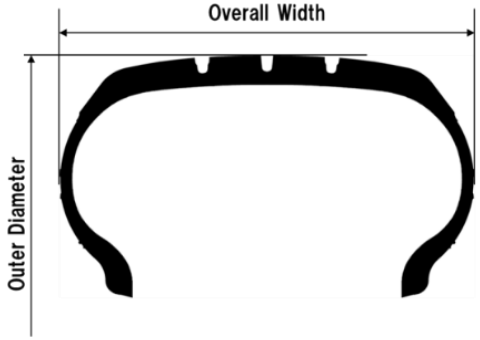
Absorbing the vibration

Transmitting the tractio

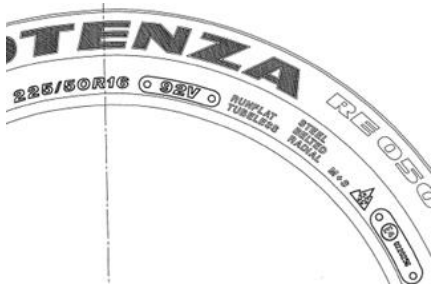
Changing & keeping the direction

Tyres are made of composite materials

In order to keep vehicle safety, Safety Regulations related to tyre have been developed under the 1958 Agreement.



Dimension



Marking

High speed & Endurance test

2. Background of Tyre Safety Regulations

(1) The difference of Performance requirements between UN Regulation and FMVSS

	☆ : if applicable	Passenger car tyres		Light truck tyres		Heavy duty vehicles tyres		Motorcycle tyres	
		UN R30	FMVSS 139	UN R54	FMVSS 139/119	UN R54	FMVSS 119	UN R75	FMVSS 119
General	Marking	●	●	●	●	●	●	●	●
	Dimensions	●	●	●	● only 139	●		●	
	Treadwear Indicator	●	●		●		●		●
Safety	High speed test	●	●	● Q≦	●			●	
	Endurance test		●	● ≦P	● only 139	●	●		●
	Low inflation pressure test		●		● only 139				
	Flat tyre running mode	☆							
	Strength test		●		●		●		●
	Bead Unseating		●		●				
	Dynamic growth							☆	

The performance requirements of UN Regulation is different from FMVSS.

2. Background of Tyre Safety Regulations

(2) The difference of Performance requirements for radial tyres among UN Reg, ISO and FMVSS

☆ : if applicable		Passenger car tyres			
		UN R30	ISO10191	ISO16992	FMVSS139
General	Marking	●	●		●
	Dimensions	●	●		●
	Treadwear Indicator	●	●		●
Safety	High speed test	● Max test speed is specified by Speed Symbol	● Max test speed is specified by Speed Symbol		● Max test speed is 160km/h
	Endurance test		●		●
	Low inflation pressure test		●		●
	Flat tyre running mode	☆		●	
	Strength test		● (see next page)		●
	Bead Unseating (tubeless tyres)		● (see next page)		●

There are differences between ISO10191 and FMVSS139.
High speed test condition of ISO10191 is specified by Speed Symbol (same as UN R30) and more stringent than FMVSS139 (Max speed is 160km/h).

2. Background of Tyre Safety Regulations

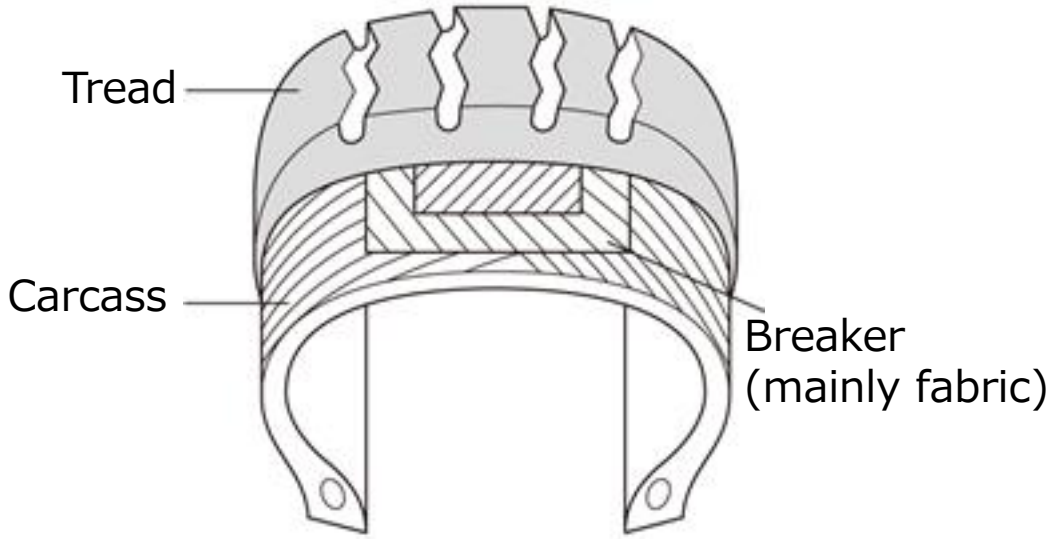
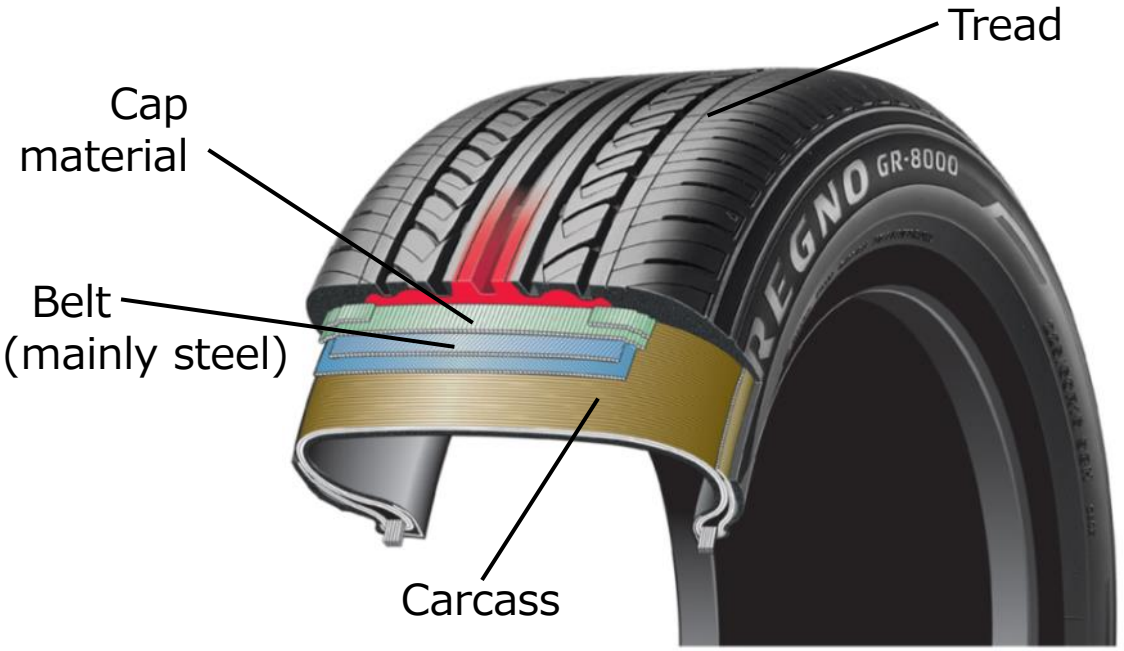
(3) Recent amendment of ISO10191 standard

<table>
<tr><th colspan="2">Performance requirement</th><th>Old
ISO10191:2010 (third edition)</th><th>New
ISO10191:2021 (fourth edition)</th></tr>
<tr><td rowspan="3">ISO10191</td><td>Bead Unseating test</td><td>Bead Unseating test is required for not only Bias tyes but also Radial Tyres</td><td>Requirement of Bead Unseating test is removed from Radial Tyres</td></tr>
<tr><td>Tyre Strength test</td><td>Tyre Strength test is required for not only Bias tyes but also Radial Tyres</td><td>Requirement of Tyre Strength test is removed from Radial Tyres</td></tr>
<tr><td>High speed test</td><td>Max test speed is specified by Speed symbol</td><td>Max test speed is :
<table><tr><th>Speed symbol ≦ S</th><th>Max test speed is 160km/h</th></tr><tr><td>T ≦ Speed symbol</td><td>Max test speed is specified by Speed symbol</td></tr></table></td></tr>
</table>

ISO10191:2021 cancelled Bead Unseating test and Tyre Strength test from Radial Tyres because 1) Bead Unseating test and Tyre Strength test were developed for Bias tyres
2) Radial tyres are robust enough

3. Why Bead Unseating and Tyre Strength Tests are Removed

Comparison of Construction

Bias tyre	Radial tyre
	

Radial tyres has advantage for safety because :

- Radial tyres are much stiff and robust due to steel belt and cap material
- Radial tyres are superior for vehicle behavior (handling, stability, comfort at high speed), high speed capability, wear resistance, heat up and air retention

Radial tyres are robust enough for Bead Unseating and Tyre Strength test

4. Evidence of Each Performance Level of Radial Tyres

ISO TC31/SC3 decided to cancel Bead Unseating test and Tyre Strength test from Radial tyres in ISO10191.

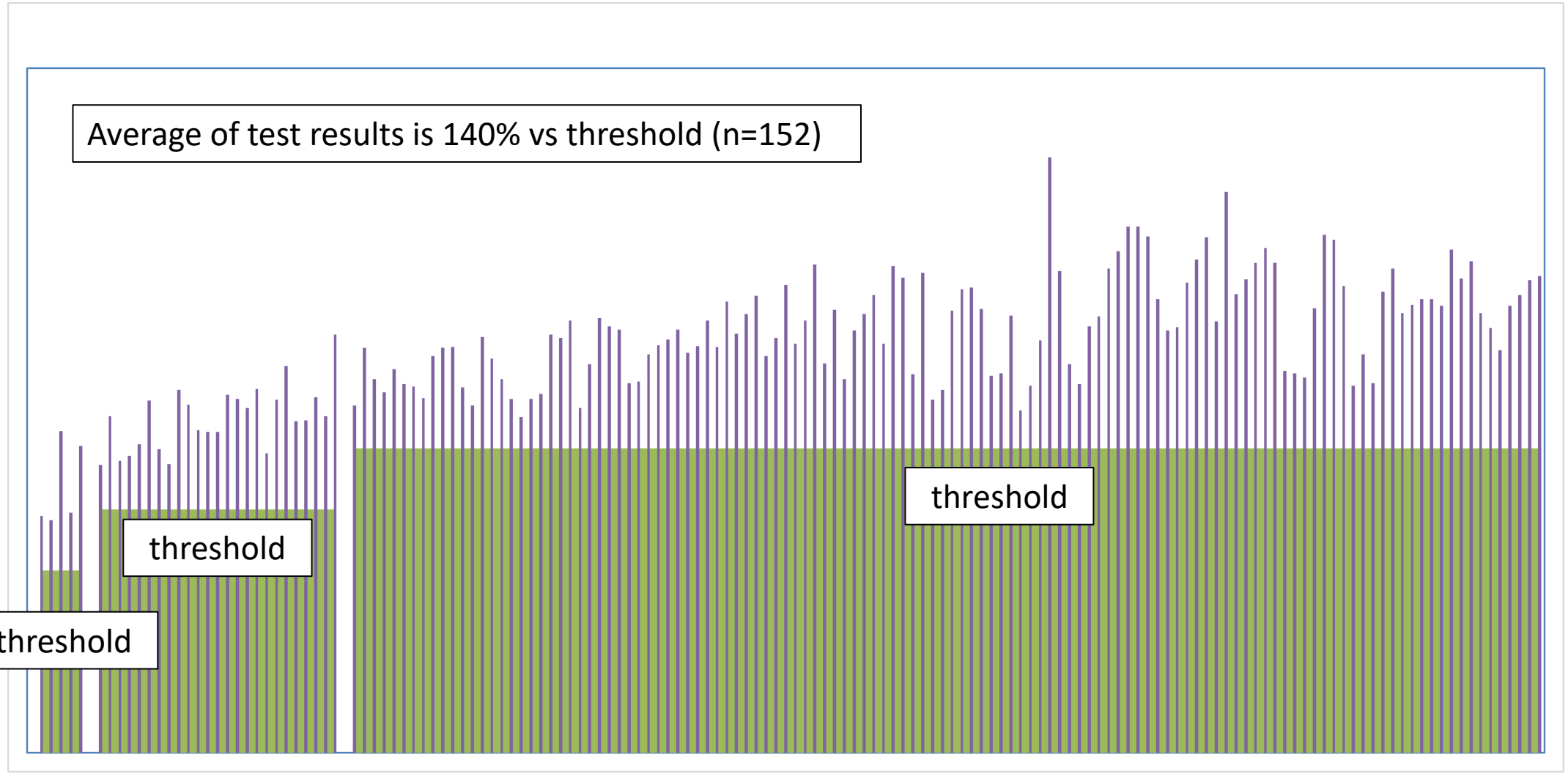
The discussion and test data in ISO Meeting is closed within ISO members and therefore, we cannot show such data in JASIC Public-Private Forum.

Instead of ISO official data, JATMA collected the actual performance level of radial tyres from our member companies.

Tyre Performance	Bead Unseating test	Tyre Strength test
PC radial tyres	Yes	Yes
LT radial tyres	Yes	Yes
TB radial tyres		Yes

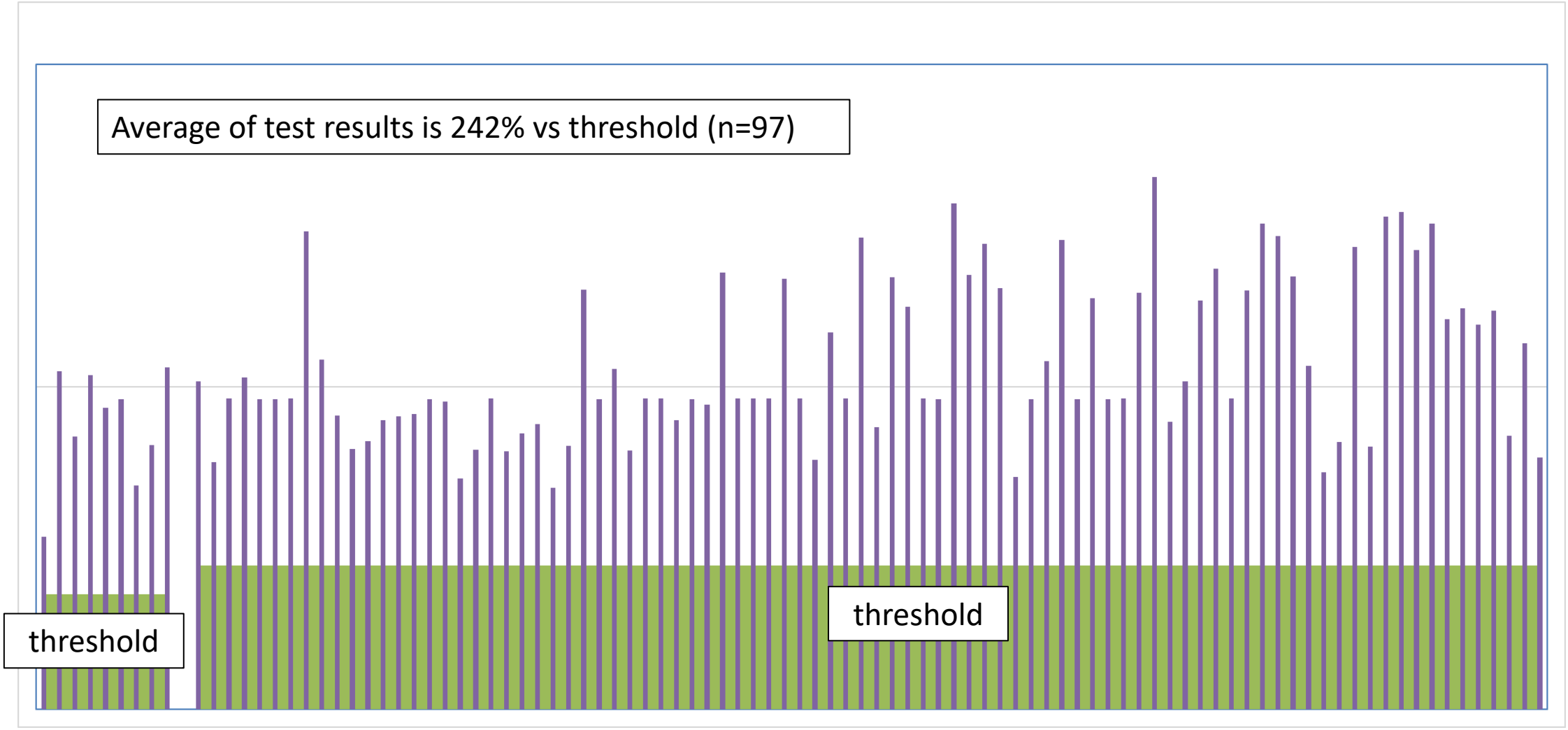
4. Evidence of Each Performance Level of Radial Tyres

(1) Bead Unseating test of PC radial tyres



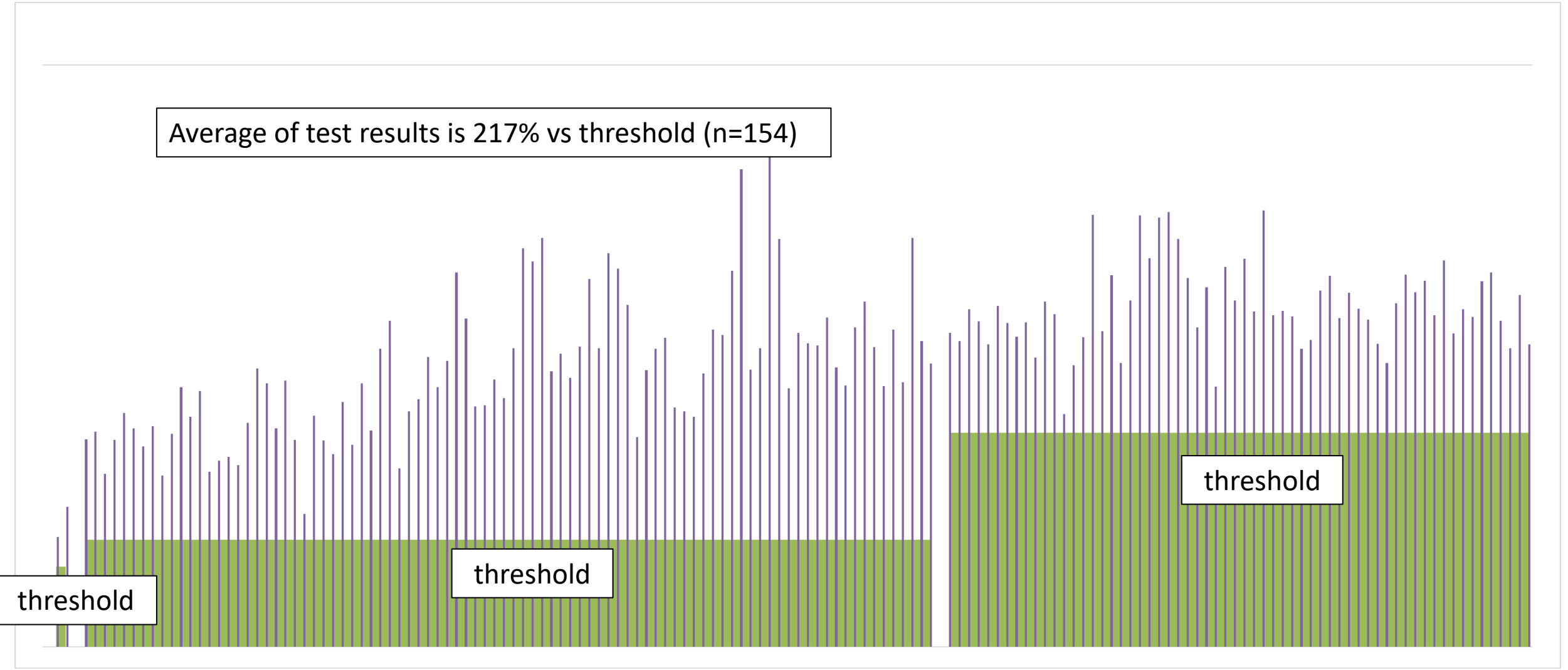
4. Evidence of Each Performance Level of Radial Tyres

(2) Bead Unseating test of LT radial tyres



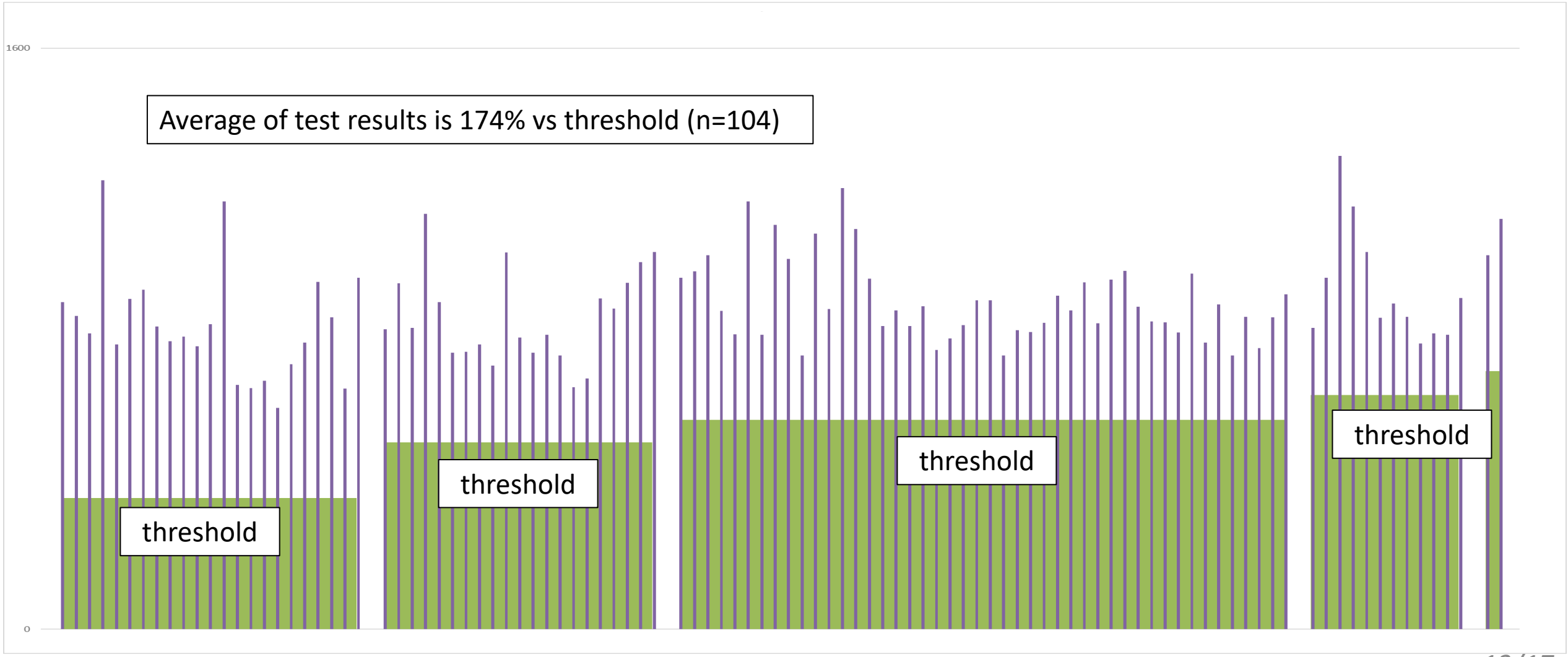
4. Evidence of Each Performance Level of Radial Tyres

(3) Tyre Strength test of PC radial tyres



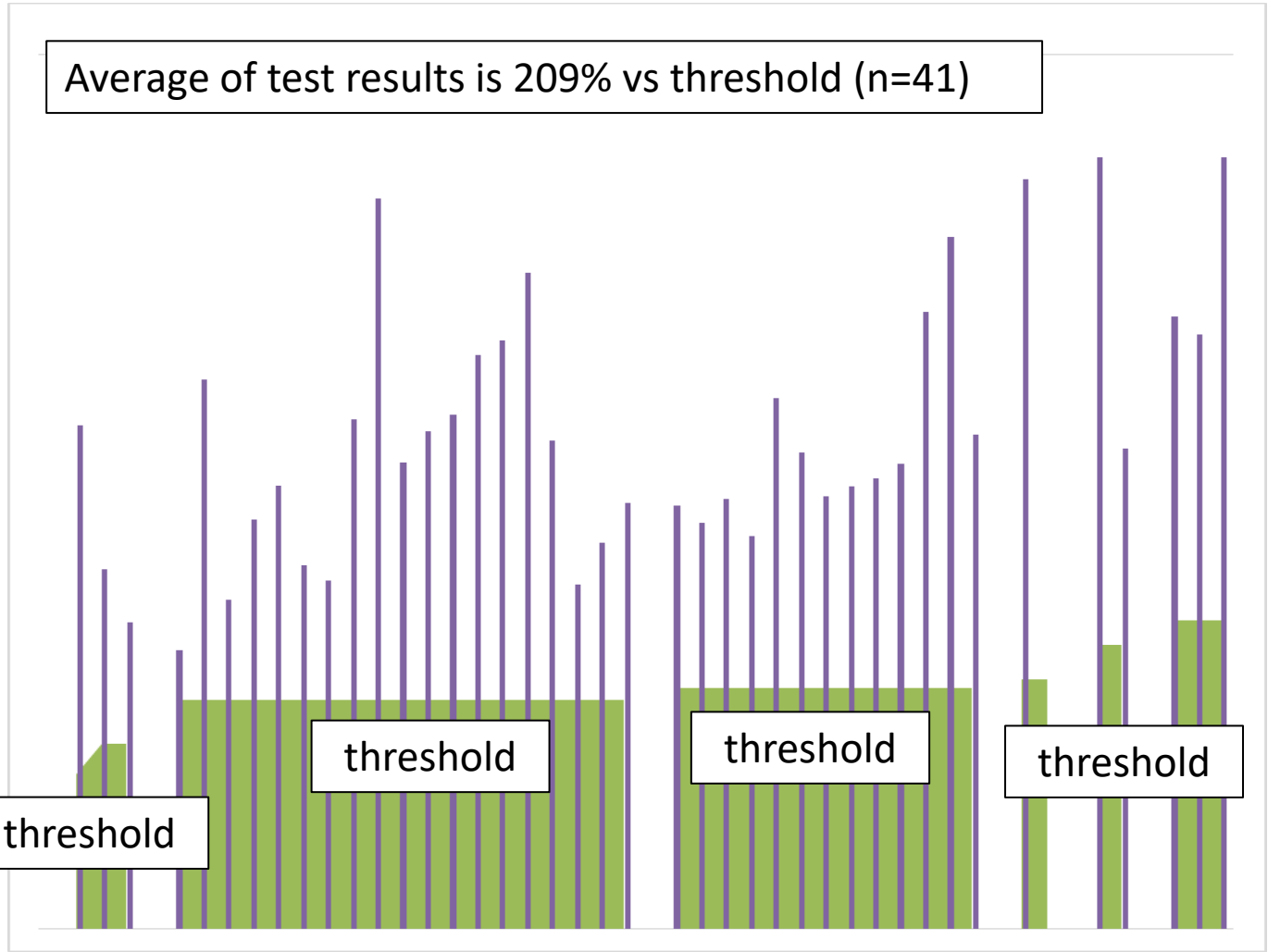
4. Evidence of Each Performance Level of Radial Tyres

(4) Tyre Strength test of LT radial tyres



4. Evidence of Each Performance Level of Radial Tyres

(5) Tyre Strength test of TB radial tyres



4. Evidence of Each Performance Level of Radial Tyres

(6) Summary of each performance level of Radial tyre

Tyre Performance	Bead Unseating test	Tyre Strength test
PC radial tyres	140% vs threshold (n=152)	217% vs threshold (n=154)
LT radial tyres	242% vs threshold (n=97)	174% vs threshold (n=104)
TB radial tyres		209% vs threshold (n=41)

All radial tyres have a enough margin for Bead Unseating test and Tyre Strength test.
Therefore, ISO decided to eliminate both requirement from radial tyres.

4. Evidence of Each Performance Level of Radial Tyres

(7) Endurance test level of Radial tyre

We also believe that Endurance test for PC radial tyres are not necessary because high speed test is stringent enough.

(However it is difficult to confirm real performance level of endurance test because of test procedure (see below).)

Step	Duration	Test load	Test speed	Judgement criteria
1	4 h	85% vs Load Index	81km/h	No failure after 3 step
2	6 h	90% vs Load Index		
3	24 h	100% vs Load Index		
There is no official procedure after 3 steps to confirm the real performance level				

5. Summary

Recently, Bead Unseating test and Tyre Strength test for PC radial tyres were removed from ISO10191:2021.

JATMA assessed the real performance level of radial tyes and the test results of both Bead Unseating test and Tyre Strength test of radial tyres show enough margin vs threshold.

Due to this evidence, JATMA believes that UN Regulation for tyres (UN R30/R54/R75) which is nominated for “ASEAN Mutual Recognition of Arrangement(ASEAN MRA)” are stringent enough for radial tyres.

In the 1958 Agreement Countries adopting UN Regulations for tyres, there is no concern in terms of safety.

Thank you!

APPENDIX

Appendix : High Speed Test Conditions

UN R30

1st test (for all tyres)

	Test speed	All tyres except SS=Y	SS=Y
Initial test speed (ITS)	SS -40km/h (drum dia.:1.7m)		
1st step	O → ITS	10 min	10 min
2nd step	ITS	10 min	20 min
3rd step	ITS +10km/h	10 min	10 min
4th step	ITS +20km/h	10 min	10 min
5th step	ITS +30km/h	20 min	10 min

2nd test (for tyres suitable for speeds in excess of 300 km/h)

	Test speed	Tyre suitable for speeds in excess of 300km/h
Max speed	Specified by tyre manufacturer – 10km/h (drum dia. : 1.7m)	
Test step	O → Max speed	10 min
	Max speed	5 min

ISO10191

1st test (For Speed symbol ≦ S)

	Test speed	Duration
Break in	80km/h	60 min
1st step	140km/h	30 min
2nd step	150km/h	30 min
3rd step	160km/h	30 min

1st test (For Speed symbol T ≦)

	Test speed	All tyres except SS=Y	SS=Y
Initial test speed (ITS)	SS -40km/h (drum dia.:1.7m)		
1st step	O → ITS	10 min	10 min
2nd step	ITS	10 min	20 min
3rd step	ITS +10km/h	10 min	10 min
4th step	ITS +20km/h	10 min	10 min
5th step	ITS +30km/h	20 min	10 min

2nd test (for tyres suitable for speeds in excess of 300 km/h)

	Test speed	Tyre suitable for speeds in excess of 300km/h
Max speed	Specified by tyre manufacturer – 10km/h (drum dia. : 1.7m)	
Test step	O → Max speed	10 min
	Max speed	5 min

FMVSS139

For all tyres

(drum dia.:1.7m)	Test speed	Duration
Break in	80km/h	60 min
1st step	140km/h	30 min
2nd step	150km/h	30 min
3rd step	160km/h	30 min