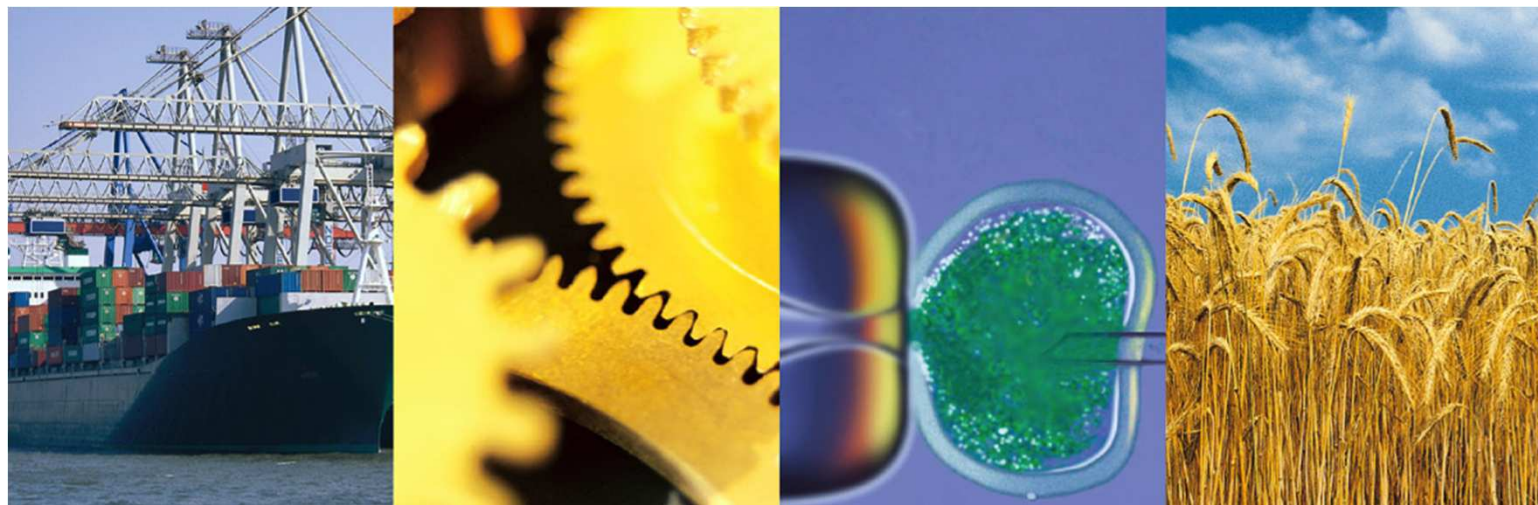


ISO 15222:2011- Overview



Presented by Georges DIMITRI (ISO TC31/SC4-WG9 Chairman)
for ISO/TC31 – Tyres, Rims and Valves

Geneva, 12 September 2011

ISO 15222 : Truck and bus tyres

Method for measuring relative wet grip performance - Loaded new tyres

PROGRESSION

- New Project Approved mid-2007
- Committee Draft Approved Quarter 3/2009
- DIS Ballot Approved Unanimously September 2010
- Publication: Expected End of August 2011

ISO 15222 : Truck and bus tyres -- Method for measuring relative wet grip performance -- Loaded new tyres

■ SCOPE

- Specifies the method for measuring relative wet grip braking performance index to a “reference tyre” under loaded conditions for new tyres.
- Applies to all truck and bus tyres (C2 & C3 tyre categories) on a defined wet-paved surface and conditions.
- Method designed to reduce variability – Use of a reference tyre is necessary to limit variability of testing method procedures

ISO 15222 METHOD WET GRIP Truck & Buses

■ Principle of the Test Method

- **Relative performance test procedure**

- A candidate tyre is compared to a reference tyre using either a:
 - standard vehicle
 - or an analytical vehicle (trailer)

- **Reference Tyre sizes**

- 3 specified ASTM reference tyre sizes:
 - 315/70R22.5 ➔ *LARGE C3 tyre category*
 - 245/70R19.5 ➔ *NARROW C3 tyre category*
 - 225/75 R16 C ➔ *ALL C2 tyre category*

Reference tyres → 3 ASTM produced by Michelin

SRTT for C3 tyres → 2 Families	
C3 NARROW FAMILY $S_{\text{Nominal}} < 285 \text{ mm}$	C3 WIDE FAMILY $S_{\text{Nominal}} \geq 285 \text{ mm}$
ASTM F 2871 SRTT 245/70R19.5	ASTM F 2870 SRTT 315/70R22.5
SRTT for C2 tyres → (Rim Codes ≤ 17) ASTM F 2872 SRTT 225/75 R 16 C	
$S_{\text{Nominal}} = \text{Tyre Nominal Section width}$	

ISO 15222 TECHNICAL SPECIFICATIONS

- The test is performed under loaded conditions on wet asphalt.
- Two options can be used Similar to ISO23671(C1 category tyres) :

- Truck Vehicle test

The Average Deceleration (AD) is measured

Wet Grip Index "G" = $AD(\text{Candidate tyre}) / AD(\text{Reference tyre})$

- Trailer (or analytical vehicle) test

The Peak Braking Force Coefficient is measured

Wet Grip Index "G" = $pbfc(\text{Candidate tyre}) / pbfc(\text{Reference tyre})$

- Boundary conditions windows (in terms of Track surface, Wet temperature, Load...) were introduced to let the test be feasible and repeatable.

ISO 15222 METHOD WET GRIP Truck & Buses

■ APPROVED TESTING OPTIONS

a) Using a standard truck



b) Using a Trailer or Analytical Vehicle



Analytical Vehicle

ISO 15222 TECHNICAL SPECIFICATIONS



Braking distance → Av.
Deceleration

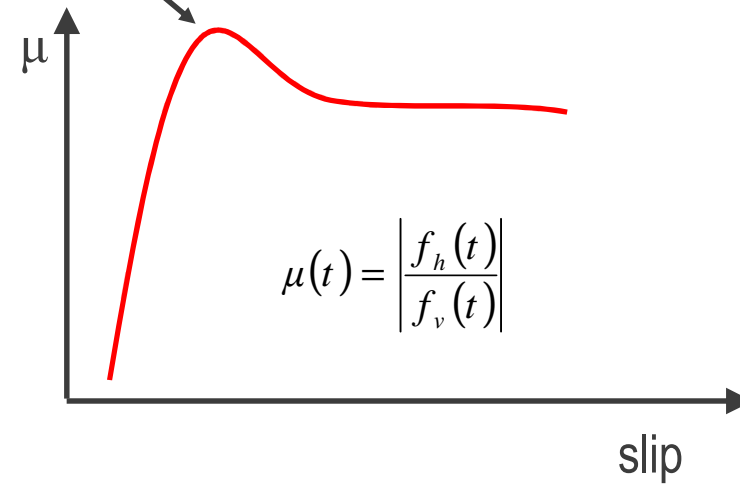
$$AD = \left| \frac{S_f^2 - S_i^2}{2d} \right|$$

Where d (m) is the distance covered between the initial speed S_i (m·s⁻¹) and the final speed S_f (m·s⁻¹).

ADR – 2011-08



Peak braking force coefficient



$\mu(t)$ = dynamic tyre braking force coefficient in real time,

$f_h(t)$ = dynamic braking force in real time, N

$f_v(t)$ = dynamic vertical load in real time, N

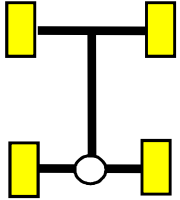
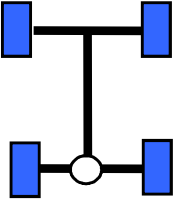
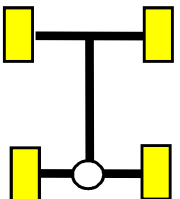
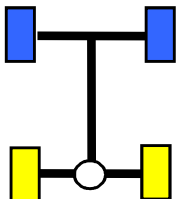
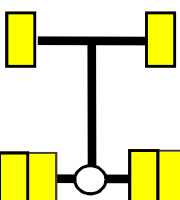
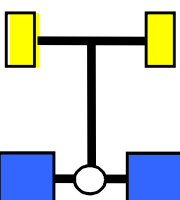


ISO 15222 TECHNICAL SPECIFICATIONS

■ TYRE CONFIGURATIONS

3 CONFIGURATIONS

- C1 : standard configuration to be used every time it is possible
- C2 & C3 : permitted when C1 is not possible (wide single, ...)
A correction factor is used to take into account the load transfer and the braking force share between the 2 axles

	Reference case	Candidate case
C1		
C2		
C3		







 Reference tyre  Candidate tyre

ISO 15222 TECHNICAL SPECIFICATIONS

■ USE OF A CONTROL TYRE (same as for C1 category tyres in R117)

For the 3 reference tyres, allows the use of one control tyre to deal with the fitment of different tyre sizes

Principle (Test/Reference) = (Test/Control) x (Control/Reference)

	Référence Tyre	Control Tyre	Test Tyre
Direct			
Indirect		 X 	

What is the same between ISO 15222 vs. ISO 23671

(Wet test procedure in R117 for C1 tyres)

Parameter	Trailer Method	Vehicle Method
BPN	50 ₊₁₀ (after temperature correction & measured 5 times every 10 m)	
Wet Temp.	5 ↔ 35 C° for all tyres <i>Temperature variation during the test shall not exceed 10 °C.</i>	
Load	75+/- 5% of LI	Others: 60-100% of LI (<i>60 ↔ 90% for C1</i>)
Brake force	Peak should be achieved 0.2 ↔ 1 sec	ABS
INDEX	Obtained from at least 6 pbfc (peak braking force coefficient)	Obtained from AD (Average Deceleration) from at least 6 repetitions (3 for SRTT are enough)

What is different than the current ISO 23671*

(Wet test procedure in R117 for C1 tyres)

Parameter	Trailer Method	Vehicle Method
Water depth	0.5-2.0mm ⇔ <i>(0.5-1.5 mm for C1)</i>	0.5-2.0mm ⇔ <i>(0.5-1.5 mm for C1)</i>
Speed	50km/h +/- 2km/h (65km/h for C1)	60-20km/h, ABS-brake with clutch-off <i>(for C1 80-20km/h, ABS-brake with clutch-off)</i>
Inflation Pressure	Constant deflection: Vertical load at 75+/-5% of LI (C1: 180kPa for normal & 220kPa for reinforced)	Constant deflection: Vertical load range 75 ⇔ 100%LI Constant pressure for vertical load range 60-75% LI <i>(220 kPa for C1)</i>
Equipment	Trailer / Analytical vehicle (for C1 lower load capability needed)	Standard full truck 4x2 model commercial vehicle, with 2 axles and equipped with ABS <i>(C1: M1 vehicle, with min speed of 90km/h & ABS)</i>

* ISO 23 671 Passenger cars : Method for measuring relative wet grip performance — Loaded tyres

ISO 15222:2011- Overview

THANK YOU

Presented for ISO/TC31 – Tyres, Rims and Valves

by

Georges DIMITRI - ISO TC31/SC4-WG9 Chairman

Geneva, 12 September 2011