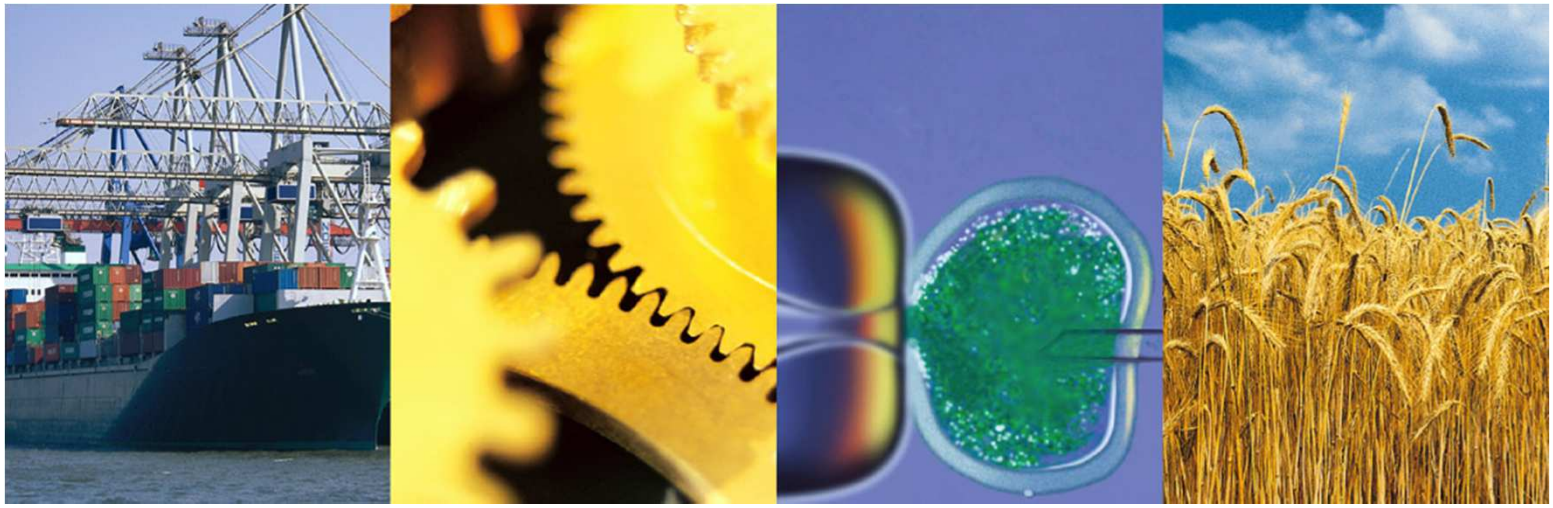
Informal document **GRRF-71-06**
(71st GRRF, 13-15 September 2011,
agenda item 6(d))

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 $S_{Nominal}$ < 285 mm	**C3 WIDE FAMILY** $S_{Nominal}$ ≥ 285 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**	
$S_{Nominal}$ = *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(Candidate tyre) / AD(Reference tyre)
  - Trailer (or analytical vehicle) test

    The Peak Braking Force Coefficient is measured
    Wet Grip Index “G”= pbfc(Candidate tyre) / pbfc(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 Vehicule

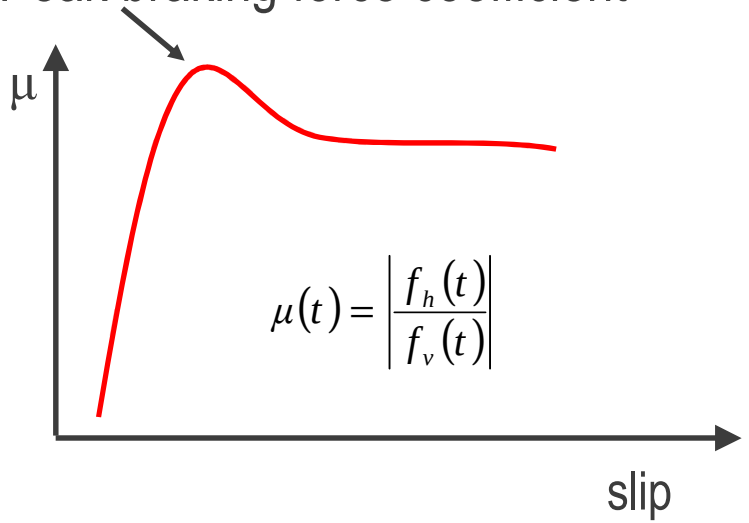
ISO 15222 TECHNICAL SPECIFICATIONS

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 *Si* (m·s-1) and the final speed *Sf* (m·s-1).

Peak braking force coefficient



μ(t) = dynamic tyre braking force coefficient in real time,
fh(t) = dynamic braking force in real time, N
fv(t) = dynamic vertical load in real time, N

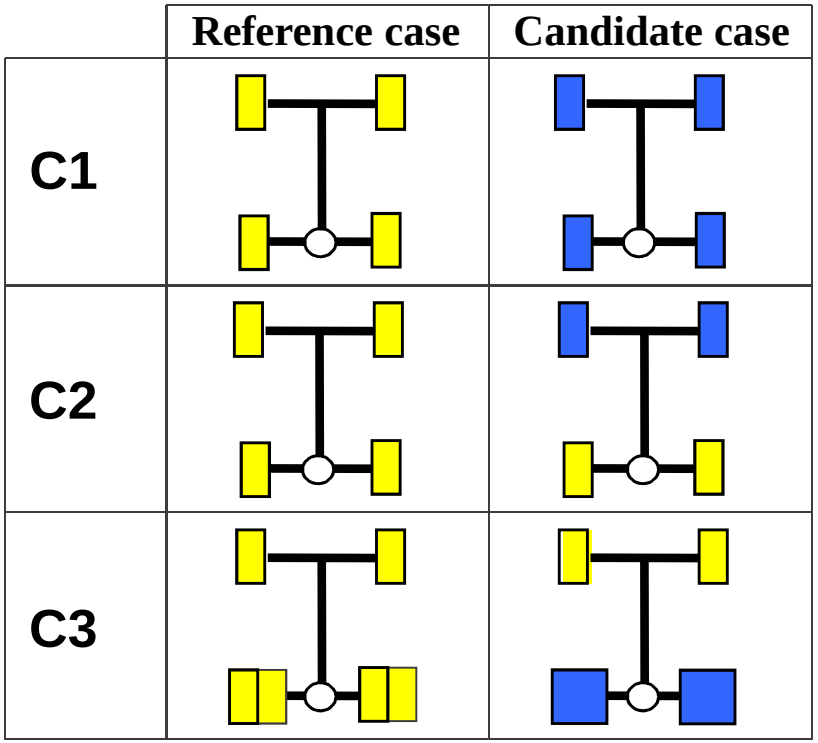
ISO 15222 TECHNICAL SPECIFICATIONS

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



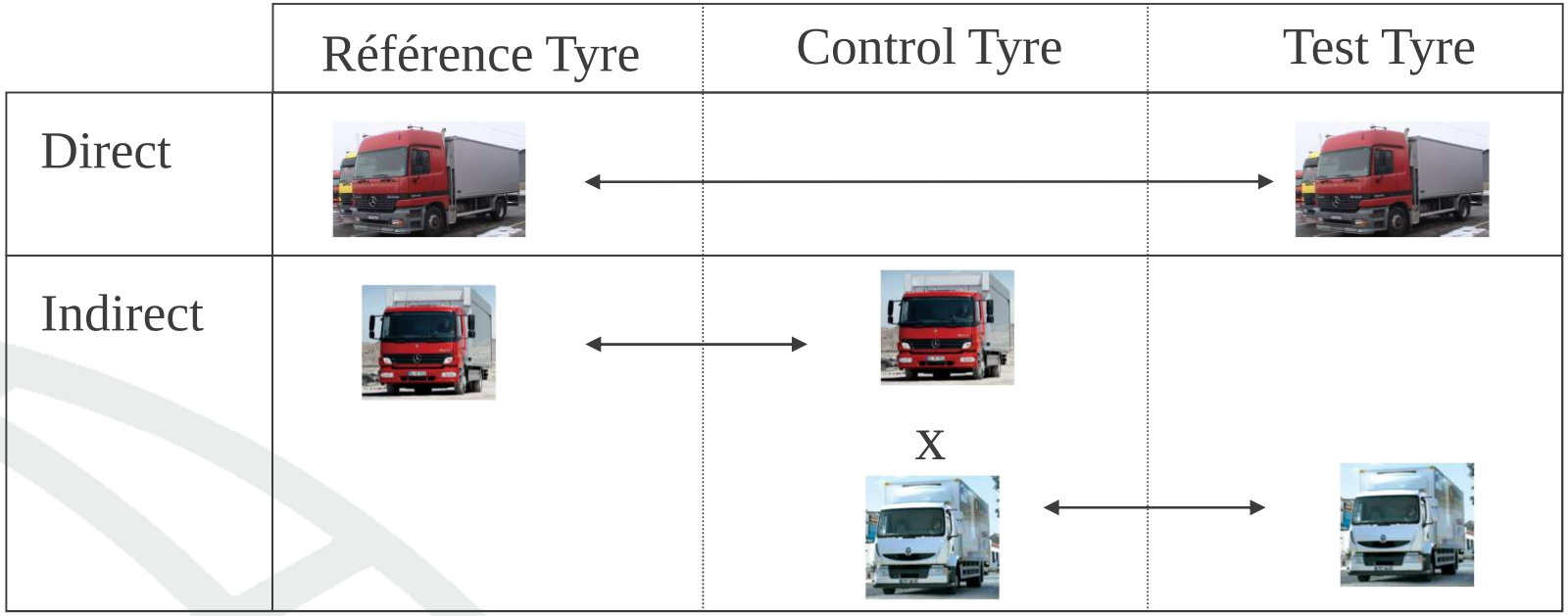
Reference tyre **Candidate tyre**

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)



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 *Temperature variation during the test shall not exceed 10 °C.*	
Load	75+/- 5% of LI	Others: 60-100% of LI (*60 ⇔90% for C1*)
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** (**A**verage **D**eceleration) 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 ⇔ *(0.5-1.5 mm for C1)*	0.5-2.0mm ⇔ *(0.5-1.5 mm for C1)*
Speed	50km/h +/- 2km/h (65km/h for C1)	60-20km/h, ABS-brake with clutch-off *(for C1 80-20km/h, ABS-brake with clutch-off)*
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 (220 kPa for C1)
Equipment	Trailer / Analytical vehicle (for C1 lower load capability needed)	Standard full truck 4x2 model commercial vehicle, with 2 axles and equipped with ABS *(C1: M1 vehicle, with min speed of 90km/h & ABS)*

*** 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