



GRBP 70th session
Document GRBP-70-19
Agenda items 6 and 14

NEW TRACTION DEFINITION





CURRENT TRACTION DEFINITION (reminder)

[...]
2.12. “**Traction tyre**” means a tyre in class C2 or C3 bearing the **inscription TRACTION** and intended to be fitted primarily to the drive axle(s) of a vehicle to maximize force transmission in various circumstances.

6.5.1. The tyre shall have a tread pattern with **minimum two circumferential ribs**, each containing a **minimum of 30 block-like elements**, separated by grooves and/or sipe elements, the **depth of which has to be minimum of one half** of the tread depth.

The use of an **alternative option of a physical test** will only apply at a later stage following a further amendment to the Regulation including a reference to an appropriate test methods and limit values.

(CURRENT) DEFINITION OF TRACTION IS BASED ON 1 GEOMETRICAL PATTERN PARAMETER

→ 2012 : ETRTO TRACTION TASK FORCE WAS FIRSTLY LOOKING FOR A TEST METHOD(S) AS ALTERNATIVE OPTION

TEST TRIALS (2013-2015)

- 3 full Round Robin Tests
- 8 types of patterns, 12 tyre candidates
- 34 soil types tested by Companies during 2 years
 - summer and winter campaigns
 - 21 EU tracks + 13 JPN tracks
 - Sand, Clay, Loose soil, Gravel, Concrete, Metallic plates,...
 - Wet and Dry tracks, Snow,...



**TEST REPRODUCIBILITY IS VERY LOW ESPECIALLY FOR SOFT SOILS.
AN ALTERNATIVE FOR NEW DEFINITION USING A UNIQUE OR A COMBINATION OF TEST(S)
WAS NOT POSSIBLE**



ETRTO GUIDELINES for NEW APPROACH (2016)

- Have a more objective correlation with performance
- Use objective but simple measurements
- Interest of a transversal void/fill ratio introduction
- More precise definition of pattern traction elements
- Take into account non rib patterns
- Take into account future possible technologies and designs

→ 2016 : ETRTO TRACTION TASK FORCE WAS THEN LOOKING FOR A NEW APPROACH

→ CHANGE FROM CURRENT PURE GEOMETRICAL APPROACH TO A MORE MECHANICAL APPROACH

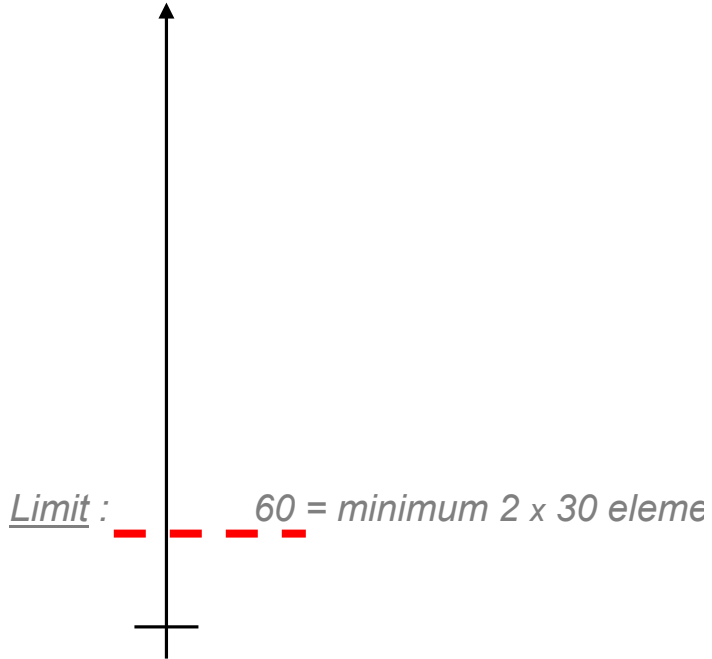


Image source :
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INTRODUCTION OF PATTERN "DEFORMATION POTENTIAL" CONCEPT

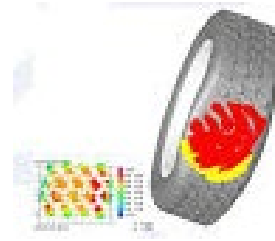
CURRENT DEFINITION (only 1 factor)

Total amount of elements (TE)



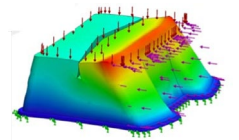
NEW DEFINITION PROPOSAL (3 factors)

Total amount of elements (TE)



Introduction
of new concept of
Deformation Potential
(deeper block and more
voids lead to more
deformation)

Deformation Potential (DP) =
 $\text{void/fill ratio} \times \text{tread depth}^3$



3 PARAMETERS : TOTAL AMOUNT of ELEMENTS & VOID/FILL RATIO & TREAD DEPTH.
NEW APPROACH IS MORE MECHANICAL ORIENTED ...

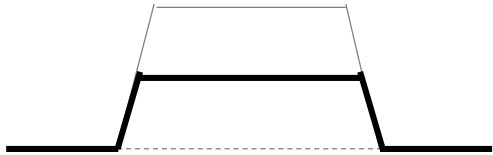


MORE FLEXIBILITY BUT MORE SEVERE CONDITION FOR BLOCK SEPARATION FEATURES

CURRENT DEFINITION



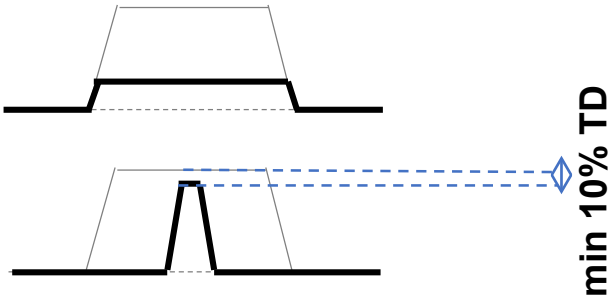
*Elements separated
by grooves/sipes having
their depth
min 50% of tread depth*



NEW DEFINITION



*Elements separated
by grooves/sipes having
their depth **in average**
min 70% of tread depth AND
everywhere **min 10%** of tread depth*



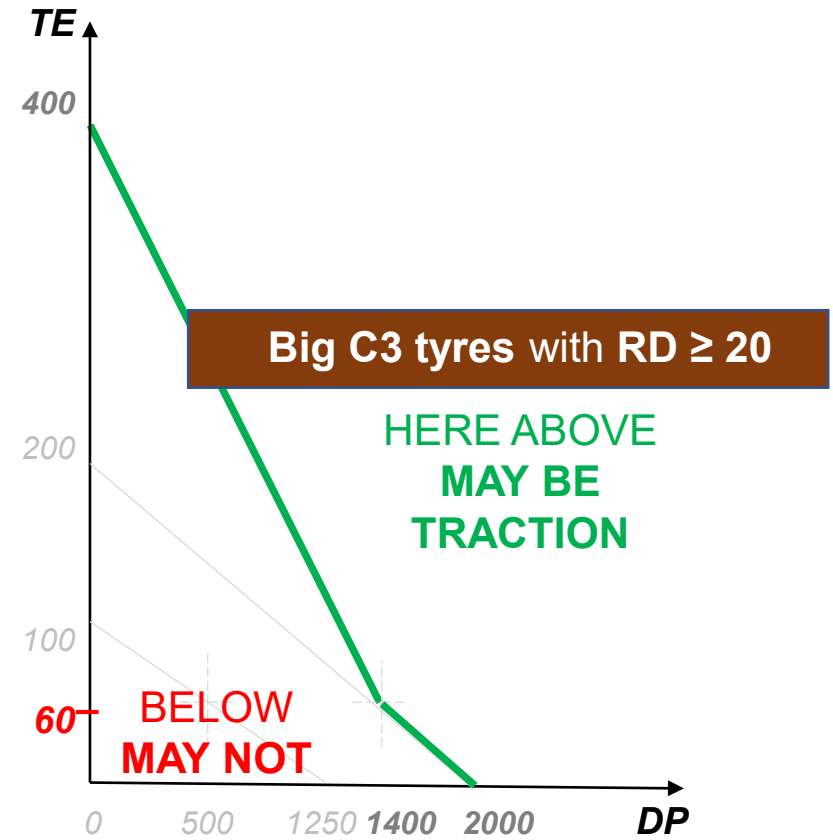
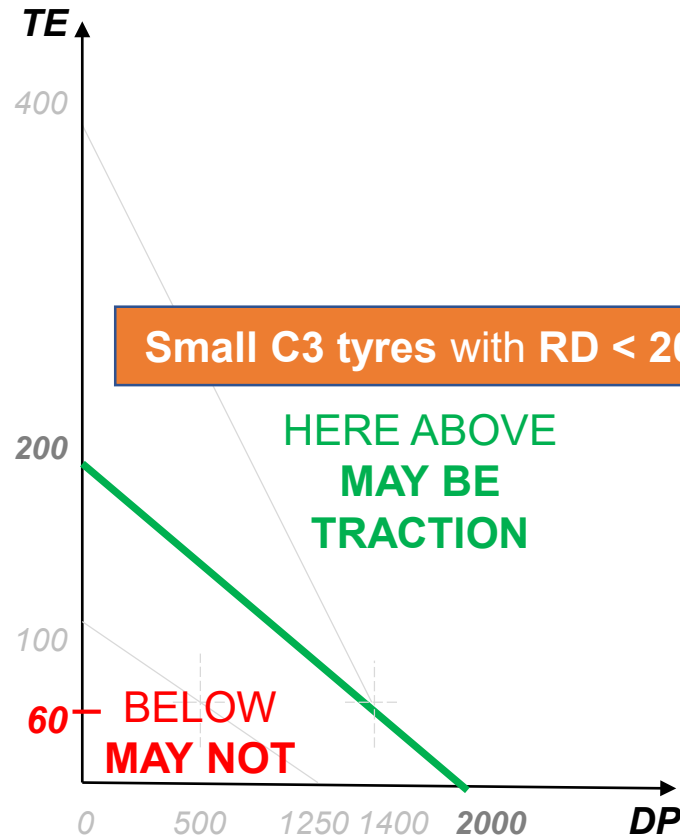
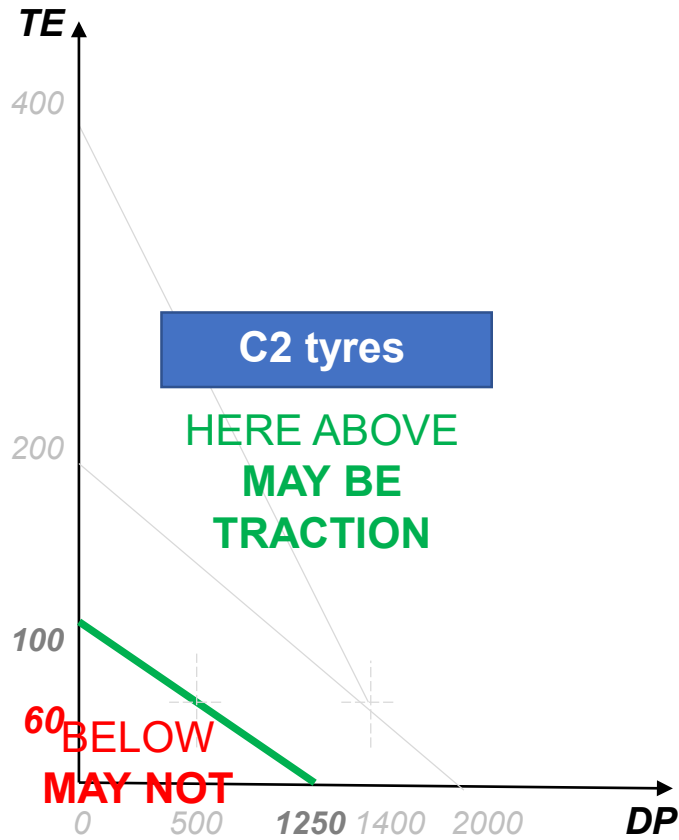
**Stronger requirements concerning the separating grooves/sipes
from 50% to 70% and never below 10%**

**NEW APPROACH IS MORE MECHANICAL ORIENTED ... and MORE SEVERE (for longer Traction sustainability)
BUT STILL CLEAR, RELIABLE and without need of specific testing.**



NEW TRACTION DEFINITION

NEW LIMIT PROPOSALS



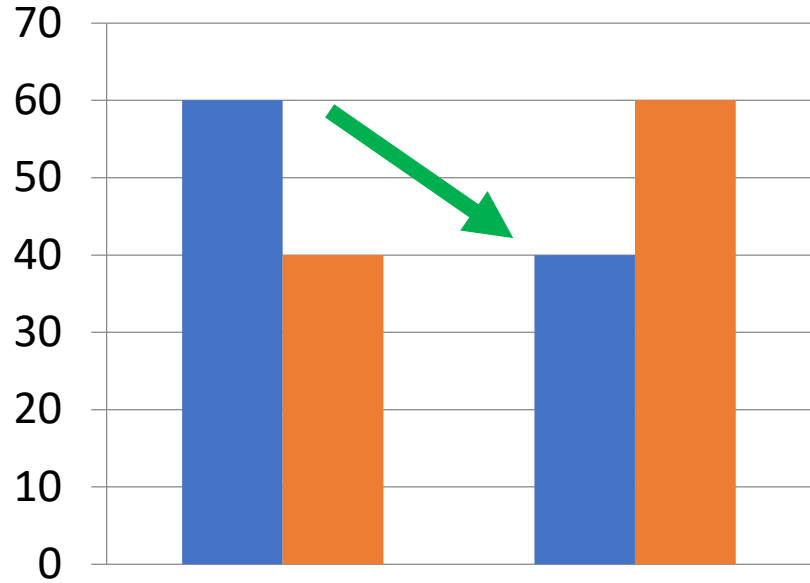
NEW TRACTION LIMITS
C2 - SMALL C3 - BIG C3

TE : Total amount of Elements in tread pattern
DP : Pattern Deformation Potential = $VR \cdot TD^3$
RD : Nominal Rim Diameter code



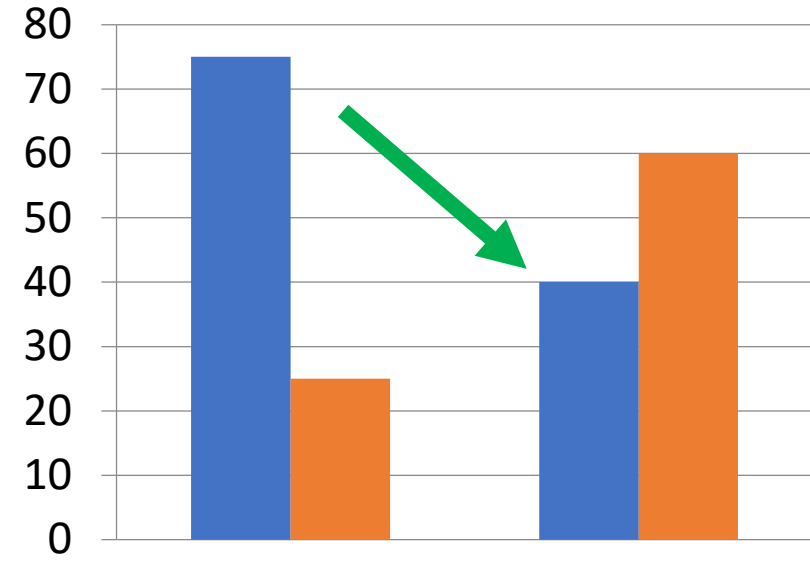
SYNTHESIS : IMPACT on the MARKET DISTRIBUTIONS

C2 TYRES



■ May be
■ May NOT be

C3 TYRES



■ May be
■ May NOT be

60% might be
Traction marked -
40% may not be

40% may be -
60% may
no more be

75% might be
Traction marked -
25% may not be

40% may be -
60% may
no more be

WITH NEW TRACTION DEFINITION

SEGREGATION WILL BETTER CORRESPOND TO MARKET REALITY AND TO REGULATION INTENTION



CONCLUSION

- ETRTO considers that current TRACTION definition is not well segregating real Traction tyres from non-Traction ones.
- It has not been possible to define a unique test method and a unique threshold to propose a physical test method.
- ETRTO proposes a more mechanical approach for the new Traction definition.
- This new Traction definition proposal provides a more accurate segregation, better corresponding to market reality.
- Sufficient transitional provisions will be precised in a Working Document for next GRBP session if this proposal is accepted.



Thank you !