ETRTO
The European Tyre and Rim Technical Organisation

INTERNATIONAL BIPAVER

ETRMA
EUROPEAN TYRE & RUBBER manufacturers' association

Labelling for retreaded C3 (Commercial vehicle) tyres

The Tire Cologne, Global Retreading Conference 24 May 2022

Outlines

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2. Retread label feasibility assessment
3. Tyre and Retread industry technical impact assessment for RR
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5. Conclusions

1. Introduction and rationale

Tyre and Retread Industry support the intention of European Commission of establishing a labelling for C3 retreaded tyres, assuming that suitable measurement methods can be defined.

Tyre and Retread Industry studied sustainable schemes allowing to label the C3 retreaded tyres, these retreaded commercial vehicle tyres having an important market share.

- ETRTO/ETRMA Study
- Retyre project

1. Introduction and rationale

Needs for a suitable labelling for C3 retreaded tyres:

- Provide relevant information to end users and public authorities,
- Promote circular economy,
- Positive contribution to the EU CO2 targets, while preserving safety,
- Economical and technical feasibility (considering that SME's are representing important part of the retread business)

2. Retread label feasibility assessment

The label feasibility assessment for C3 retreaded tyres has been made after intensive studies by tyre Industry(*) for the 3 following performances:

a. Wet Grip

b. External noise

c. Rolling resistance

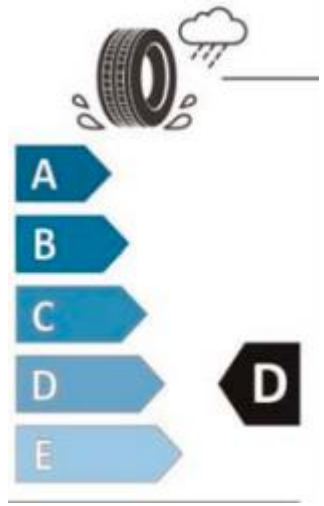
** Studies performed in 2015-2018 , 400 tyres tested, ≥400k€*

2. Retread label feasibility assessment

Wet Grip:

- The **casing design** and **manufacturing process** have a **low impact** on the wet grip performance of the C3 retreaded tyre.

- The **tread** has a **high impact** on the wet grip performance of the C3 retreaded tyre.
  - Possible to use the same label classes as for the new tyre
  - Possible to use the same measure and label than identical new tyre tread.



2. Retread label feasibility assessment

External Noise:

- The **casing design** and **manufacturing process** have a **low impact** on the external noise performance of the C3 retreaded tyre.

- The **tread** has a **high impact** on the external noise performance of the C3 retreaded tyre.
  - Possible to use the same label classes as for the new tyre
  - Possible to use the same measure and label than identical new tread.

2. Retread label feasibility assessment

Rolling Resistance:

- The **casing design** and **manufacturing process** have a **high impact** on the rolling resistance performance of the C3 retreaded tyre.
- The **tread** has a **high impact** on the rolling resistance performance of the C3 retreaded tyre.
- **Not possible** to use the same label classes as for the new tyre for C3 retreaded tyre performance

3. Tyre and Retread industry technical impact assessment for RR

- The study made by ETRTO and BIPAVER has pointed out 3 major parameters that have an impact on the RR retread labeling:

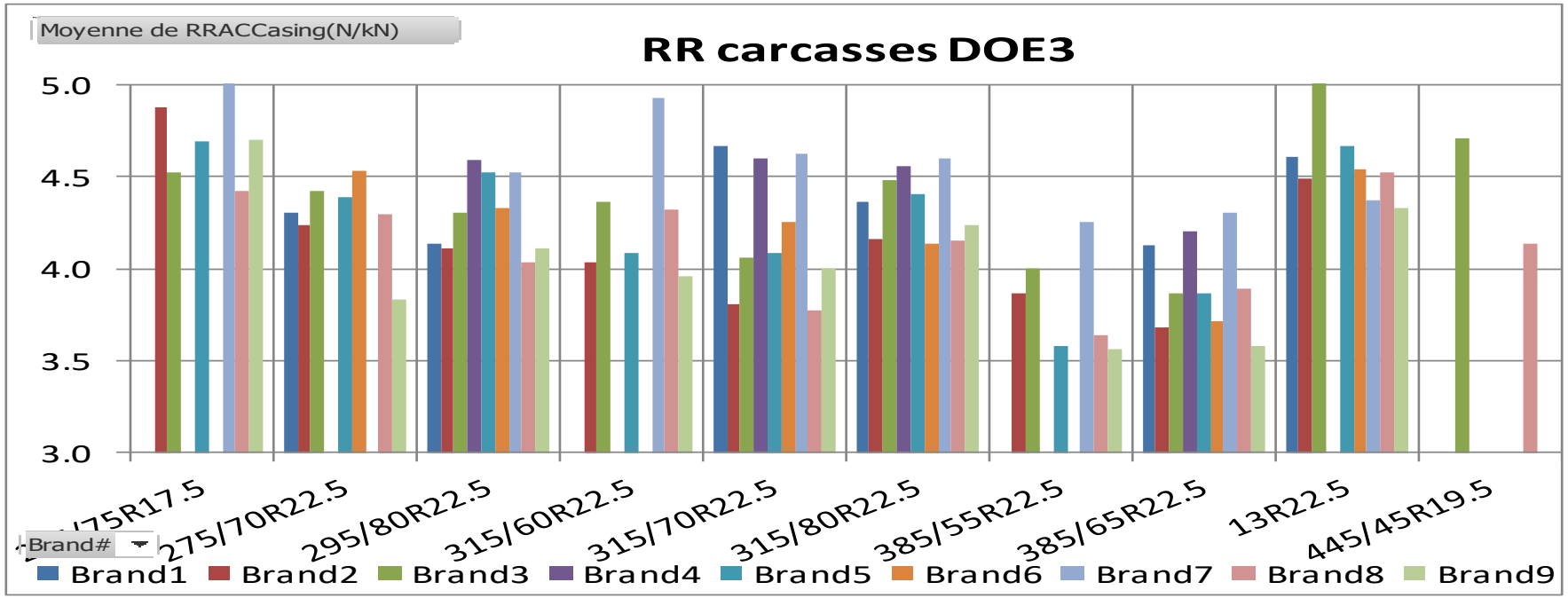
    a. **Casing**

    b. **Manufacturing process**

    c. **Tread**

3. Tyre and Retread industry technical impact assessment for RR

Casing Impact:



ETRTO study 2018

Casing brand is the major variation source for casing RR

Casing impact Standard Deviation on RR = 0.35 N/kN

3. Tyre and Retread industry technical impact assessment for RR

Manufacturing process impact:

- Buffing Radius, Curing temperature and Cushion gauge can have a high impact on the rolling resistance performance

Manufacturing process impact Standard Deviation on RR = 0.28 N/kN

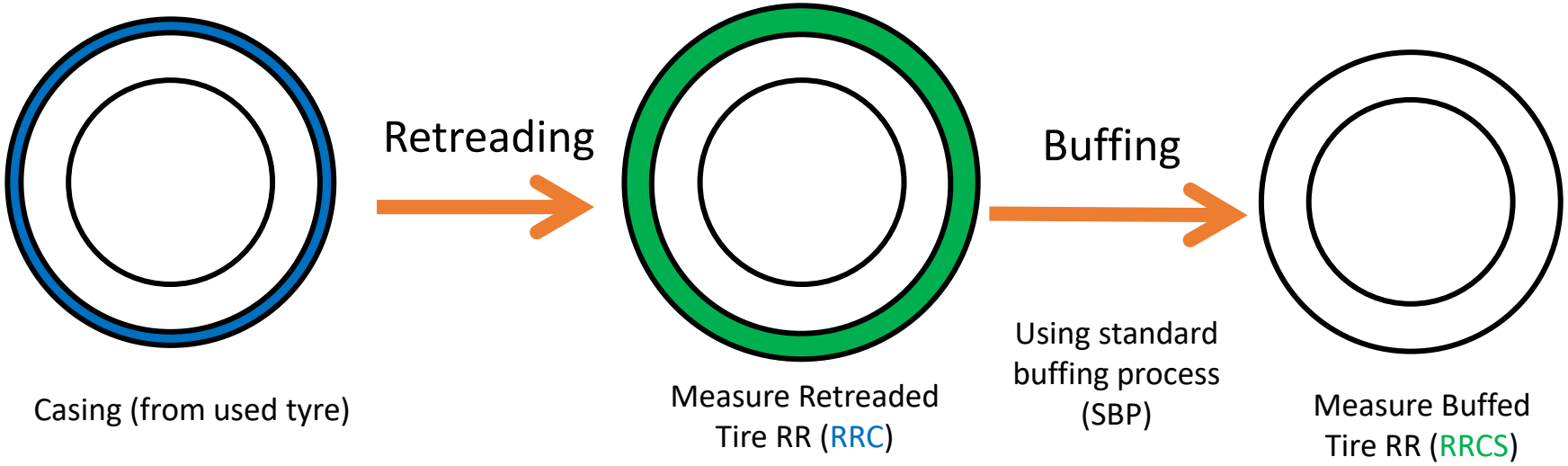
- Total casing + process variation coming from external factors is:
  - $\sigma_{total} = \sqrt[2]{\sigma_{casing}{}^2 + \sigma_{process}{}^2}$ = $(0.35^2+0.28^2)^{0.5}$ = **0.45 N/kN**

Therefore a bandwidth of 3 times the external variation of 1.5N/kN and a bandwidth tolerance of 0.7 N/kN is technically needed

3. Tyre and Retread industry technical impact assessment for RR

Tread impact:

- Rolling Resistance measurement concept: Tread + Process



Tread & Process RR : RRTP = RRC – RRCS

Valid for this type of pattern, material, using this type of process and independent of casing

Acronym	Definition
SBP	Standard Buffing Process
RRTP	RR of Tread and Process
RRC	RR of Retreaded Tyre
RRCS	RR of Casing buffed using SBP

4. Tyre and Retread Industry labeling proposal for C3 retreaded tyres

- **Wet Grip** and **Noise** labeling scheme for C3 retreaded tyres will be equivalent to the new tyre labeling
- The **Rolling Resistance** labelling of a C3 retreaded tyre is either:
  - measured with a representative casing or
  - calculated by adding:
    - **Rolling Resistance of the added tread and related process**

      +

    - **Rolling Resistance of the average of the casing size (or group of sizes) coming from retreader measurements or from European casing data base**
  - Retread labeling is not exactly the same as the one of new tyre

  → Rolling Resistance classes "**RA, RB, RC, RD**"

- **Scope** considering the **top 10 tyre sizes**

Label for new tyre		Label for retreaded tyre	
A	<= 4	RA	<= 4.5
B	4.1 ~ 5	RB	4.5~6
C	5.1 ~ 6		
D	6.1 ~ 7	RC	6.1~7.5
E	>= 7.1		
		RD	>= 7.6
Verification tol: 0.3		Verification tol: 0.7	

Retread process variability, band width is **1.5 N/kN**
Verification tolerance is **0.7 N/kN**.

5. Conclusions

Tyre and Retread Industry technical study and feasibility assessment has delivered a labelling proposal for Commercial retreaded tyres for Wet Grip, External noise and Rolling Resistance, with the aim to determine an appropriate label, band width and verification tolerance.

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Thank you for your attention