



Informal document GRBP-73-22
Agenda item 5 (d)

Tyre Industry preliminary Wet Grip on Worn tyre assessment on C2 and C3 tyres

GRBP session 73, January 2021



1. Background
2. Hydroplaning phenomenon
3. Tyre Industry preliminary assessment on C2 and C3 tyres
4. Conclusions

1. background



- GRBP IWG WGWT was requested by EC to extend its scope to C2 and C3 tyres (Documents GRBP-72-02 and GRBP-73-02)
- During the 72nd GRBP session, tyre industry preliminary considerations were provided to GRBP by the Informal Document GRBP-72-26-Rev.1
- Aim of this document is to provide GRBP the technical evidence of Tyre Industry experience.

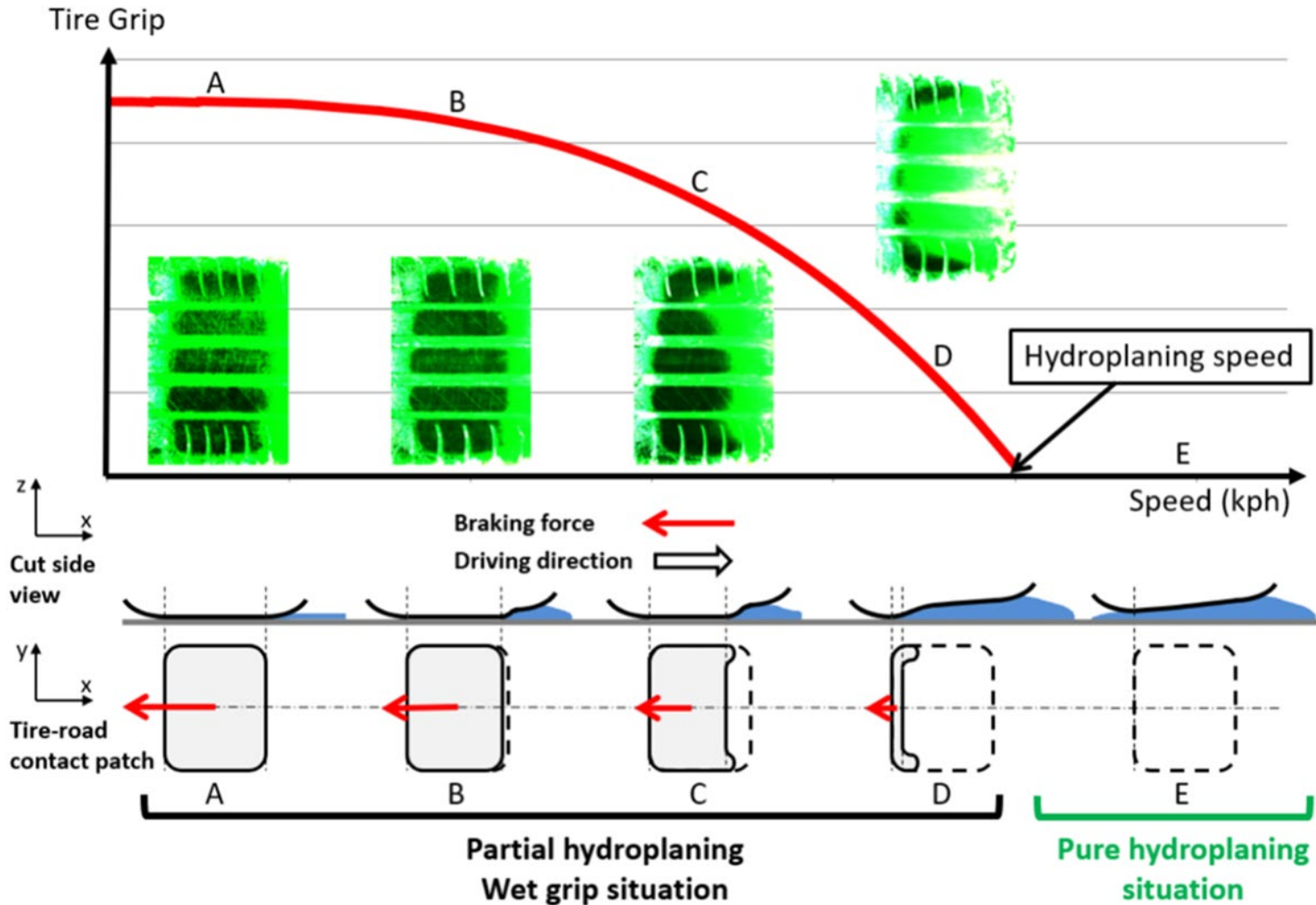
1. background



ETRTO comments made during 72nd GRBP

- C1: the initial purpose from France: C1 wet grip condition test in new state are not sufficient. Tyres have also to be tested in the worn state because wet grip (braking) **tyre ranking in the worn state can be different than ranking in the new state**, due in particular to the hydroplaning mechanism important in the worn state
- C2 and C3: due to the higher ground pressure and lower speed in field conditions the mechanism is different than for C1, and **C2 and C3 tyres are less or not subject to hydroplaning** in the regulatory test (C2 and C3 wet grip test from 60 kph to 20 kph while for C1 it is from 80 kph to 20 kph). Due to less hydroplaning contribution in the wet grip test of worn C2 and C3 tyres, the wet grip performance loss according to the test conditions between new and worn state for C2 and C3 is much lower compared to C1.
- **Industry experience** is that there is **no significant difference** in wet grip (braking) performance ranking between new and worn state for C2 and C3. Because of this, the testing of new tyres is sufficient to ensure the wet grip performance in worn state.

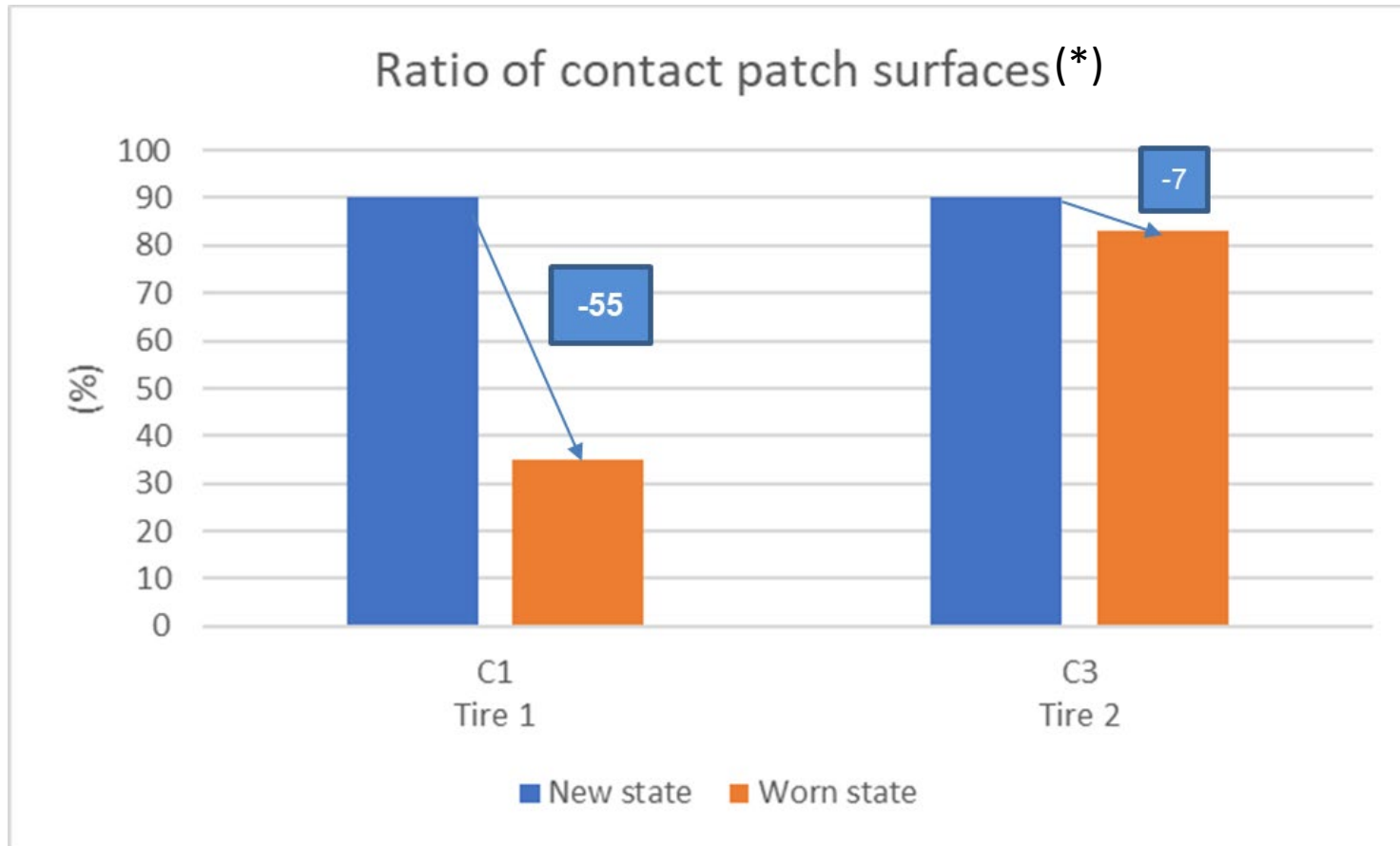
2. Hydroplaning phenomenon



2. Hydroplaning phenomenon



C2 and C3 tyres: due to the higher ground pressure and lower speed in field conditions the mechanism is different than for C1, and **C2 and C3 tyres are less or not subject to hydroplaning**



(*) Contact patch surface at 90 km/h compared to contact patch surface at 30 km/h

3. Tyre Industry preliminary assessment on C2 and C3 tyres

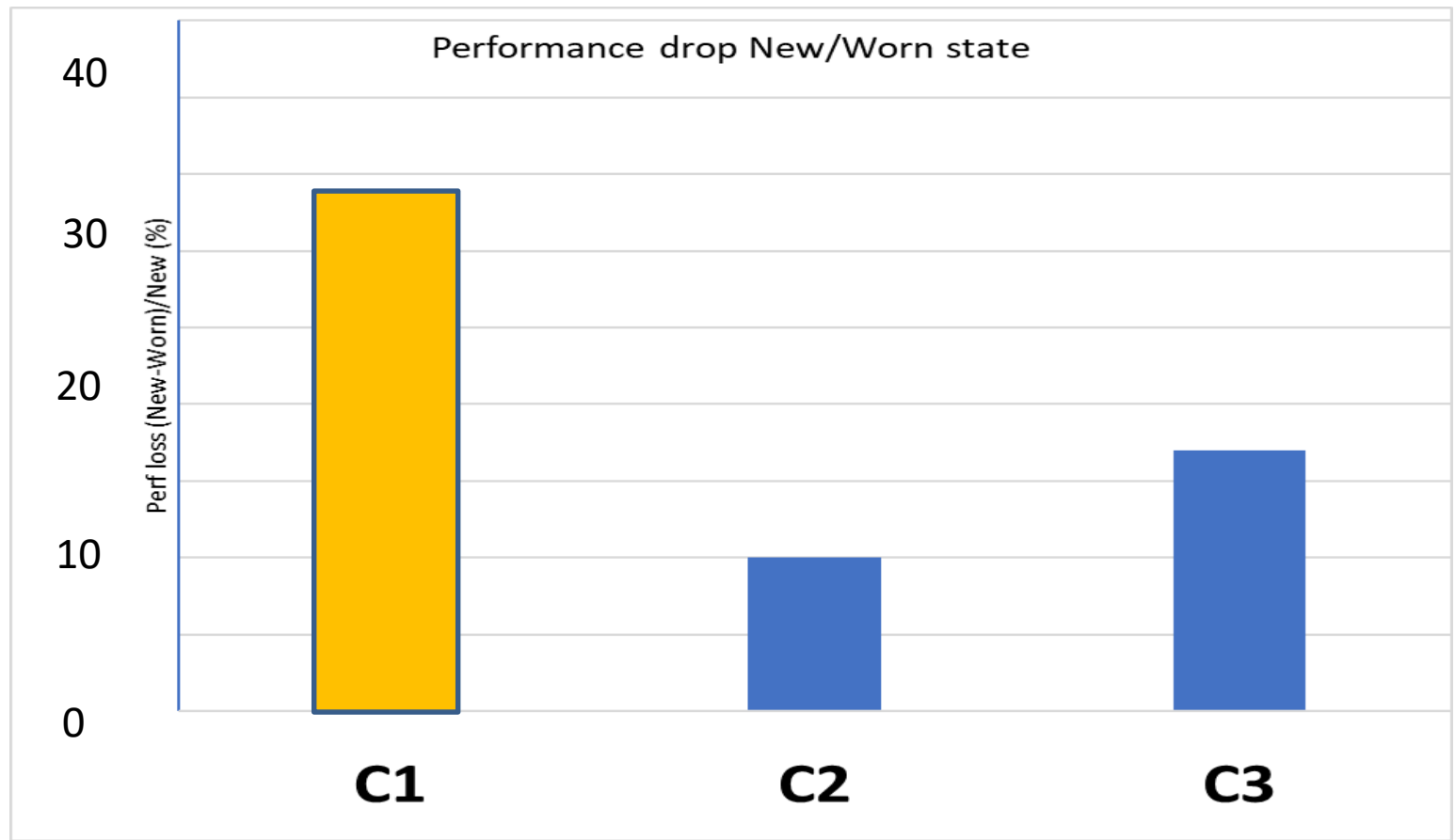


- Tyre Industry assessed the possible scope extension of the IWG WGWT to C2 and C3 by generating preliminary data.
 - a) Comparison of average Wet Grip performance drop C1, C2 and C3
 - b) Comparison of New / Worn ranking assessment for C1, C2 and C3



3. Tyre Industry preliminary assessment on C2 and C3 tyres

a. Comparison of average wet grip performance drop C1 (ref GRB-69-08), C2 and C3 (*)



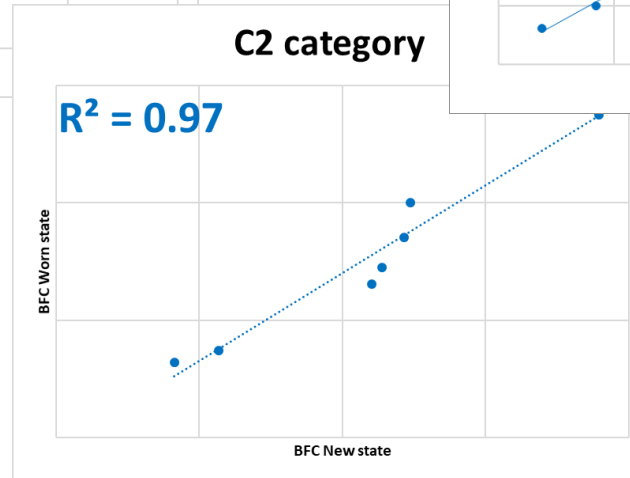
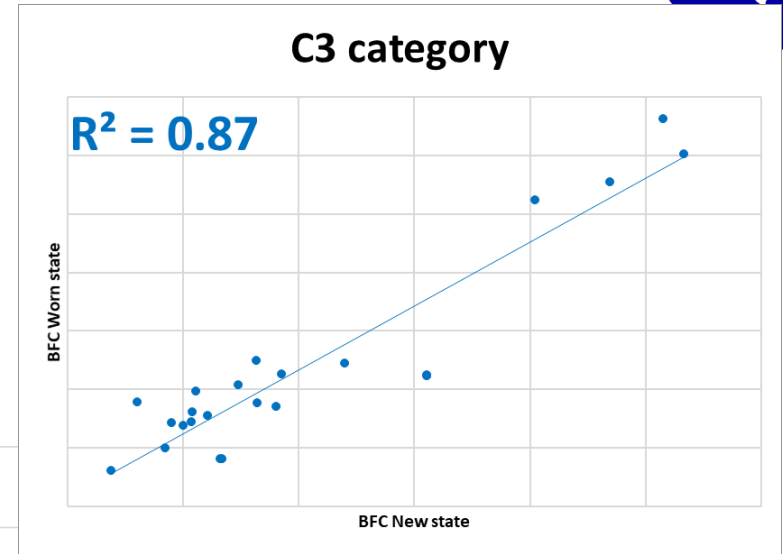
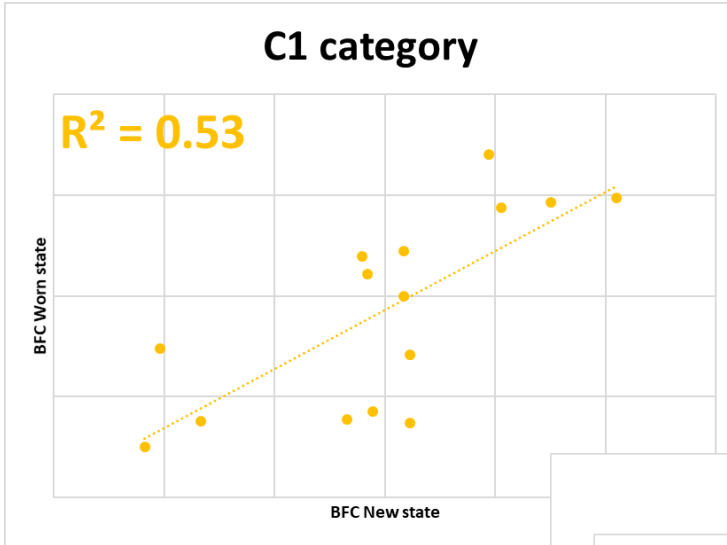
The wet grip performance drop for C2 and C3 is significantly lower than C1

(*)C2 and C3: ETRTO data based on deceleration test method



3. Tyre Industry preliminary assessment on C2 and C3 tyres

b. Comparison of New / Worn ranking assessment for C1 (GRB-69-08, C2 and C3 (*)



The correlation factor R^2 for C2 and C3 is significantly higher than C1 → strong wet grip performance correlation between new and worn stage

(*)C2 and C3: ETRTO data based on deceleration test method

4. Conclusions



The Tyre Industry assumptions/experience, as mentioned in GRBP 72nd session were confirmed for C2 and C3 tyres in this study:

- The Wet Grip performance drop for C2 and C3 is significantly lower than for C1.
- No significant difference in Wet Grip performance ranking between New and Worn tyre for C2 and C3 tyres (as found for C1 tyres)

The Wet grip performance of new C2 and C3 tyres is representative for wet grip performance in worn state.