

Examination of C2 test conditions for Indoor drum test method

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Concept of development

- C2 test method is being developed based on the C1 test method, because driving mode of C1 test method is based on WLTC, and the scope of WLTC includes also vehicles of GVW \leq 3.5t (C2 tyres with LI approximately \leq 107).
- Study whether the test conditions for C1 tyres can be applied to C2.

Study of test conditions

- Items can be applied by test conditions for C1 tyres:
 - Test machine: external drum (drum diameter \geq 3m)
 - Input force: WLTP based
 - Surface: definition of surface roughness
 - Temperature: 25 °C for Normal, 20 °C for Snow
- Items being studied according to characteristics of C2 tyres:
 - Load
 - Inflation pressure
 - Running distance
- Note: Same reference tyres should apply to both indoor and vehicle test methods

2. Load condition and Inflation pressure

Load condition

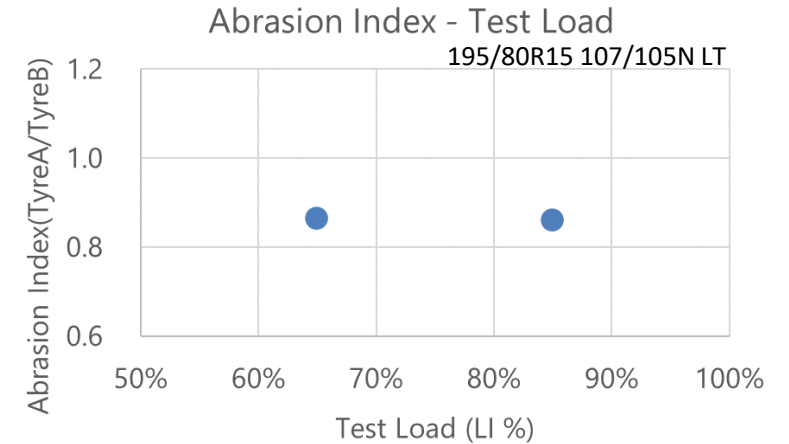
Test load was studied under the following two conditions.

- 85% load of LI : RRC measurement conditions (same approach as C1)

- 65% load of LI : Typical usage condition in the market

The test results were consistent across load conditions.

Based on actual market conditions, we propose 65% load.



Inflation pressure condition

The inflation pressure was studied under the following two conditions.

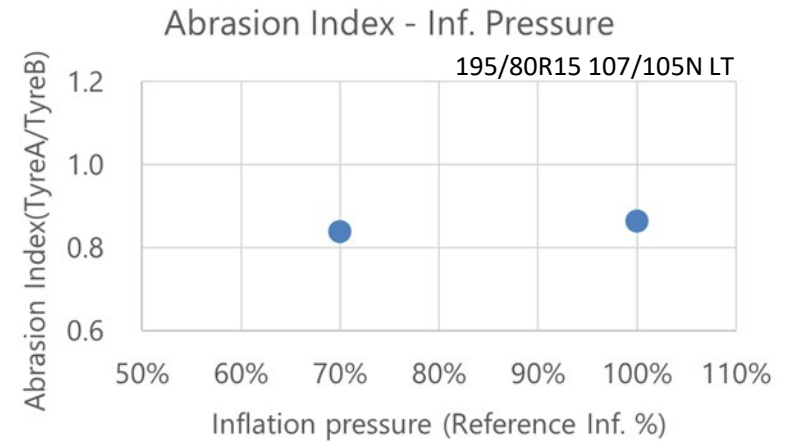
- 100% of the inflation pressure marked on the sidewall

- 70% of the inflation pressure marked on the sidewall :

- to take into account the contact patch on drum (same approach as C1)

The test results were consistent across load conditions.

To achieve a contact patch similar to on actual roads, we propose 70% IP.

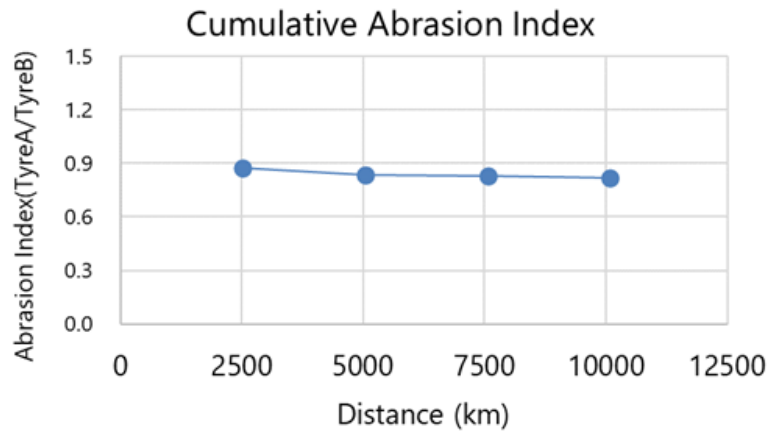


3. Verification using several tyre sizes

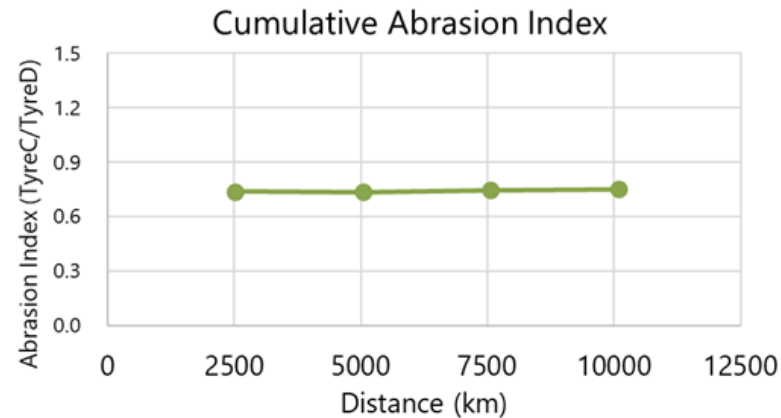
We evaluated three representative tyre sizes from the Japanese market.

The inflation pressures of indication on tyre sidewall for these three levels are typical in Japan.

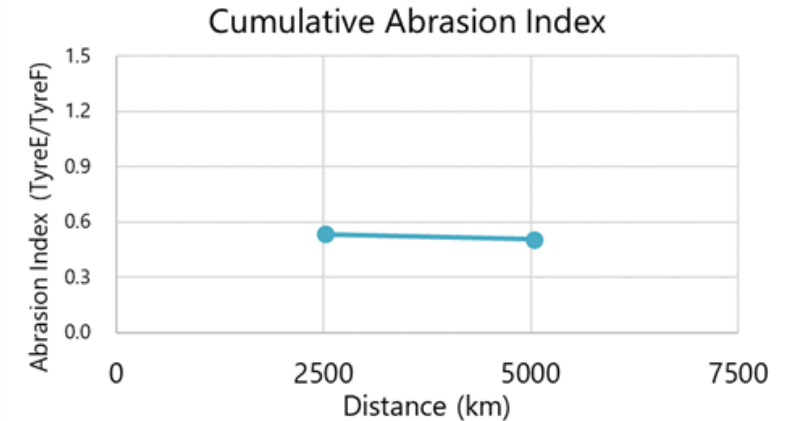
195/80R15 107/105N LT
Ref inflation pressure 450kPa



175/75R15 103/101N LT
Ref inflation pressure 600kPa



145/80R12 80/78N LT
Ref inflation pressure 350kPa



From these test results, C2 tyres can also be evaluated 5,000 km distance.

Based on the results of the verification test, we propose the test conditions for C2 $LI \leq 107$.

- ✓ Load : 65% load of tyre LI
- ✓ Inflation pressure : 70% of the inflation pressure marked on the sidewall
- ✓ Running distance : 5,000km
- ✓ Other test procedures are the same as C1.

Open points

Verification test using reference tyre (SRTT)

Test condition proposal for $LI > 107$