

Wet grip in worn state tyre

Test plan proposal for the standardization of water depth measurement

IWG WGWT
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JAPAN AUTOMOBILE STANDARDS INTERNATIONALIZATION CENTER

Step 1 : Standardization of water depth measurement in static condition

- Proceeded in the test course with external watering equipment
- Evaluation validity with existing measuring instruments
- Standardization(measurement point, acceptable range of variation)

Setting of water depth criteria



Step 2 : Levelling between external watering and self watering

- Proceeded in the test course with both external watering and self watering equipment
- Predicts the water depth at which the wet μ of the self-watering method matches that of the external watering method on the same track surface, based on the standardized external watering method.
- From the difference, estimation of the amount of water absorbed in the test track surface voids. Validation of the test water depths in the flow provisions.

Against the depth criteria in Step 1, validity of the self watering method (flow rate provision) test depth .



Step 3 : Investigation of water depth correction method

Investigated by the results of Step 2
(Track surface roughness measurements and Wet μ Dependence on water depth at each test center))

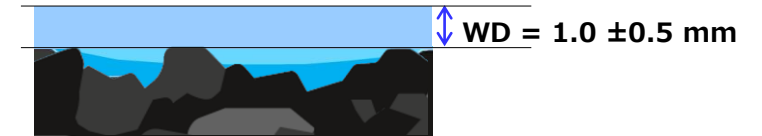
Characteristic measurements of each test center for self watering and study of water depth correction methods.

Water depth definition in R117

Annex 5
4.1.3.

Test procedures for measuring wet grip
Conditioning of the test track and wetting condition

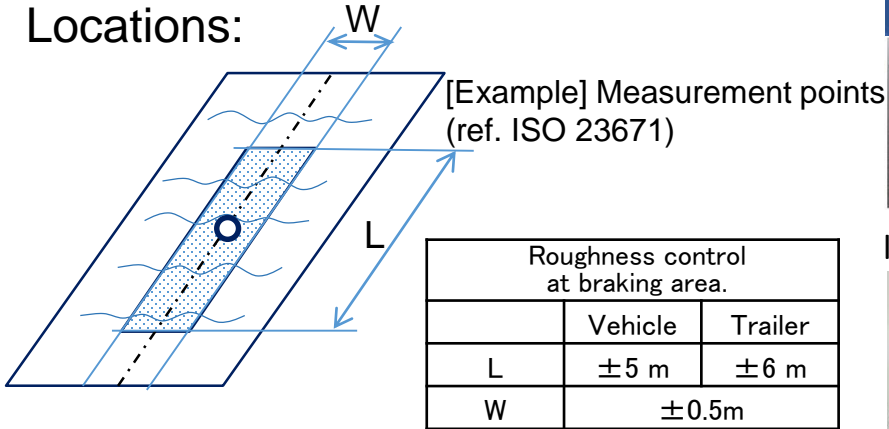
The test track surface shall be watered at least half an hour prior to testing in order to equalize the surface temperature and water temperature. External watering should be supplied continuously throughout testing. For the whole testing area, the water depth shall be 1.0 ± 0.5 mm, measured from the peak of the pavement.



[Evaluation at external watering test center]

Water depth measurement.

Locations:



Roughness control at braking area.		
	Vehicle	Trailer
L	± 5 m	± 6 m
W	± 0.5 m	



IDIADA Aqualog



Measure and evaluate water depth by available instruments at external watering test track.



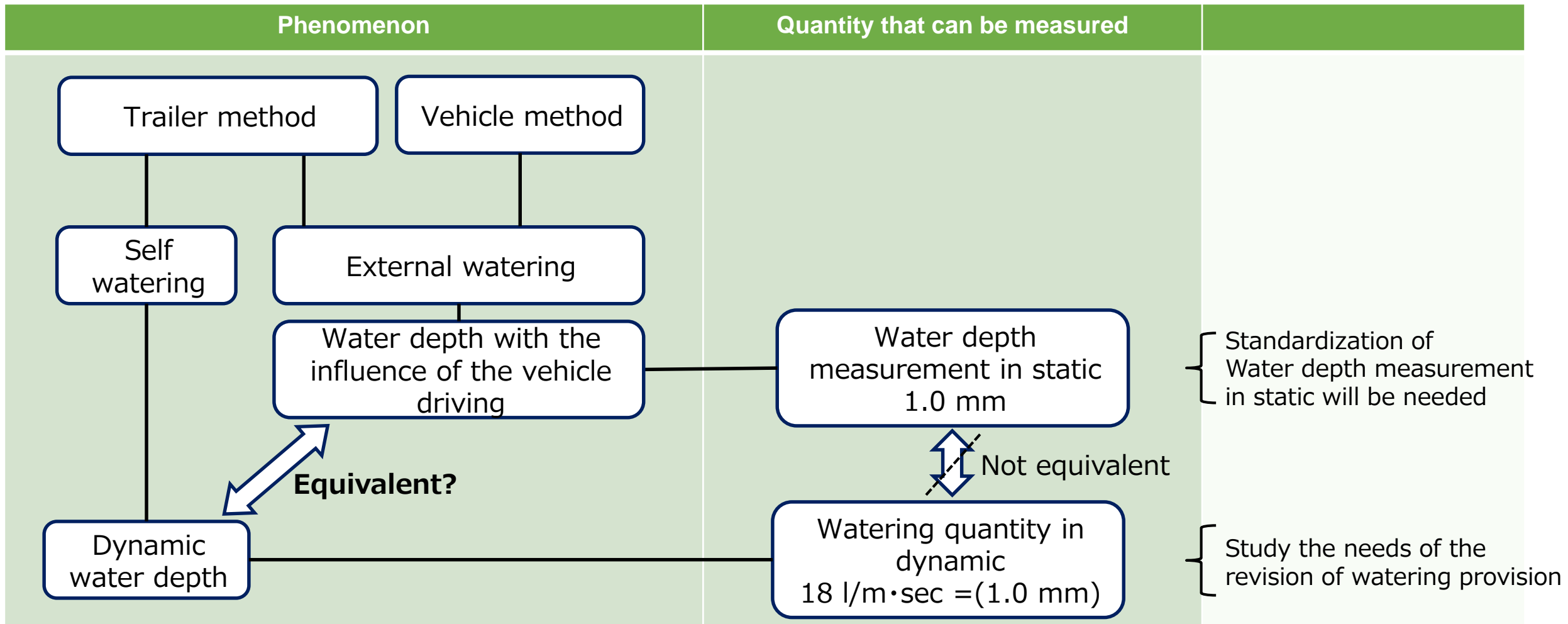
Water depth measurement standardization for external watering.



Set water depth reference condition.

Challenges:

- Measurement location and points
- Variation limit
- Fluctuation by water flow, wind, ripple from test vehicle need to evaluated.



- Verify that the water depth under the influence of vehicle driving (external watering) is equivalent to the water depth under dynamic conditions (self-watering).

Water depth comparison between External (by depth) - Self watering (by water flow) system.

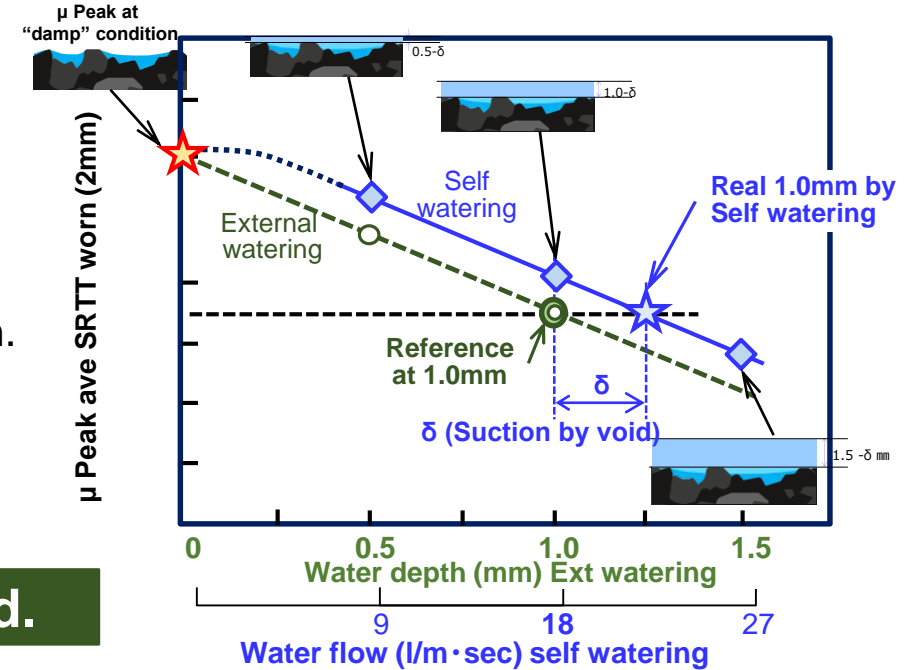
(Evaluation at External - Self watering direct comparison on the same test track.)
 [Candidate test center: equipped both watering systems for trailer method]

Trailer wet μ test at external watering condition.
 (Standardized condition at Step1)
 ➤ Water depth : 0 (damp), 0.5, 1.0mm

Trailer wet μ test by self watering.
 (as R117 test procedure)
 ➤ Water depth : 0 (damp), 0.5, 1.0, upto1.5 mm

wet μ
 must be the same
 if there is no suction.

δ (suction by void) can be estimated.



Challenges:

- Self watering logic validity (1mm = 18 l/m·sec)
- Correlation with track surface roughness (MTD, MPD)
- How to cancel the influence from ripples.

(4.2.4. Wetting conditions
 The quantity of water applied at 65 km/h shall be 18 l/s per meter of width of wetted surface in case of a water depth of 1.0 mm.)