External - Self watering water depth comparison test procedure proposal

IWG WGWT

7th April 2023

JAPAN AUTOMOBILE STANDARDS INTERNATIONALIZATION CENTER

Step 2 : Water depth measurement study for self-watering system

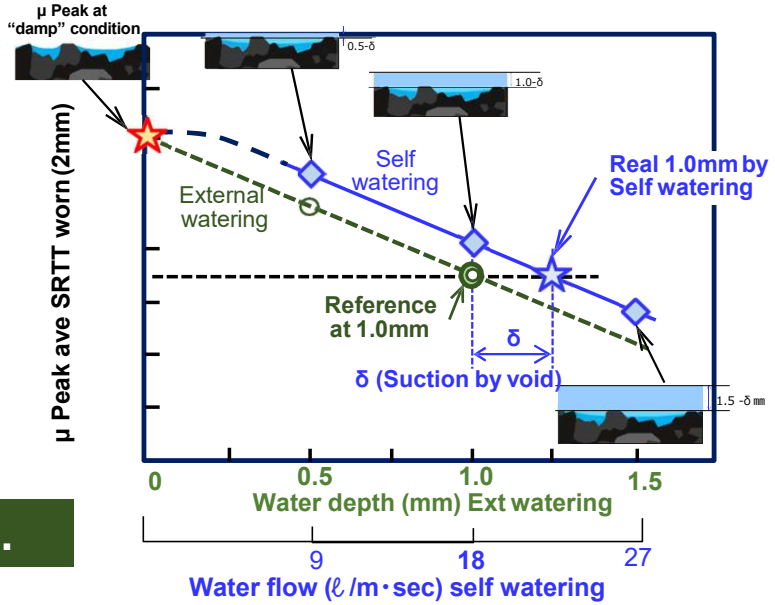
Water depth comparison between External (by depth) - Self watering (by water flow) system.

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

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

Trailer wetμ 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.)

External - Self watering water depth comparison test procedure

1. Test preparation (As per ETRTO proposal)

- Test track property measurement
  MTD & External water depth
  same procedure for water depth test campaign.

	test date			measurements track											
TRAILER		total braking distance (m)		1	2	3	4	5	6	7	8	9	10	11	12
			waterdepth (mm)												
			MTD	X		X		X		X		X		X	

- Water depth :12 positions
- MTD : 6 positions

- sampling: total relevant braking distance (around the peak μ) divided by 12, with maximum distance of 1 m
- In case the water depth measurement is not measurable in the tyre track, an additional set of measuring points is needed. A clear mapping of the measurement points shall be established.

2. Test condition

Follow R117 -03 test conditions.

- Test tyre : - Molded SRTT16 worn
  - SRTT16 New (only for 0 & 1.0mm water depth condition)
- Test temp.

Choose 1 test wet surface temp. condition (from IWG WGWT small group 24th Nov. 2022)

Low : 5 - 14°C
Mid : 15 - 24°C
High : 25 - 35°C

* the ambient and the wetted surface temperature must be less than 10 °C.

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3. Test sequence

- Test sequence : SRTT Worn - SRTT New
- Repeat the sequence x 2 times

Sequence	1 →	2 →	3 →	4 →	5 →	6 →	7 →	8 →	9
Test tyre	Worn	New	Worn	Worn	New	Worn	Worn	New	Worn
Water depth	1.0mm	1.0mm	0.5mm	0 mm [*1] (damp)	0 mm [*1] (damp)	0.5mm [*4] (adjust as Ext.)	1.0mm [*3] (adjust as Ext.)	1.0mm [*3] (adjust as Ext.)	1.5mm
Self						X	X	X	X
External	X	X	(X) [*2]	X	X				

[*1] “0mm” water depth, measured by water depth instrument, the condition that instrument indicates “0” by minimum water flow.
[*2] If the external watering depth is adjustable.
[*3] Self watering water depth (water flow) should be adjusted as measured external water depth.
e.g.) If actual measured water depth of External watering system is 1.1mm
→ water flow of Self watering system should be 19.8ℓ/m・sec = 18 x (1.1/1.0)ℓ/m・sec
[*4] For Self watering 0.5mm condition, in case if external 0.5mm condition from [*2] is not available, water flow should be 9ℓ/m・sec . (Half of 18ℓ/m・sec .)