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TÜV SÜD – Tire Test 2021

235/65 R17 108H XL – LASSA COMPETUS WINTER 2+

TÜV TIRE TEST MARK acc. to PPP 90006B:2018

Test Period: March – April 2021

Report No. 713209800-TM

TÜV SÜD Product Service GmbH

TIRE DETAILS

DIMENSION: 235/65 R17 108H/V XL

TIRE BRANDS / PATTERNS IN THE TEST:

CANDIDATE TIRE:



LASSA
COMPETUS WINTER 2+
DOT L5L8 7CNP 0921

COMPETITOR TIRES:



FALKEN
EUROWINTER HS01 SUV
DOT AHL8 FMFR 3020



KUMHO
WINTERCRAFT WS71 SUV
DOT 1H2 5AYCTB 3420



SEMPERIT
MASTER-GRIP 2 SUV
DOT 6Y81 DTPE 4220



TOYO
SNOWPROX S954 SUV
DOT CXL8 42H 4619

- **All Lassa Competus Winter 2+ test samples were provided for the tests by the customer.**
- **All other test samples were purchased in the normal market by TÜV SÜD.**
- **TÜV SÜD randomly selected the tires for the individual tests.**

TEST DETAILS

Test Locations

- Snow: Arctic Falls Plantskolan (S)
- Wet & Dry: EUPG Aprilia (I)
- WGI: ATP Papenburg (D)
- Rolling Resistance & High Speed Test Advanced: TÜV SÜD PS Garching (D)
- Rolling Noise: Neubiberg (D)

Test Vehicles

- Audi Q5 40TDI, Audi Q5 50TDI, VW Tiguan 2.0TDI, VW Touareg 3.0TDI

Procedure and Evaluation

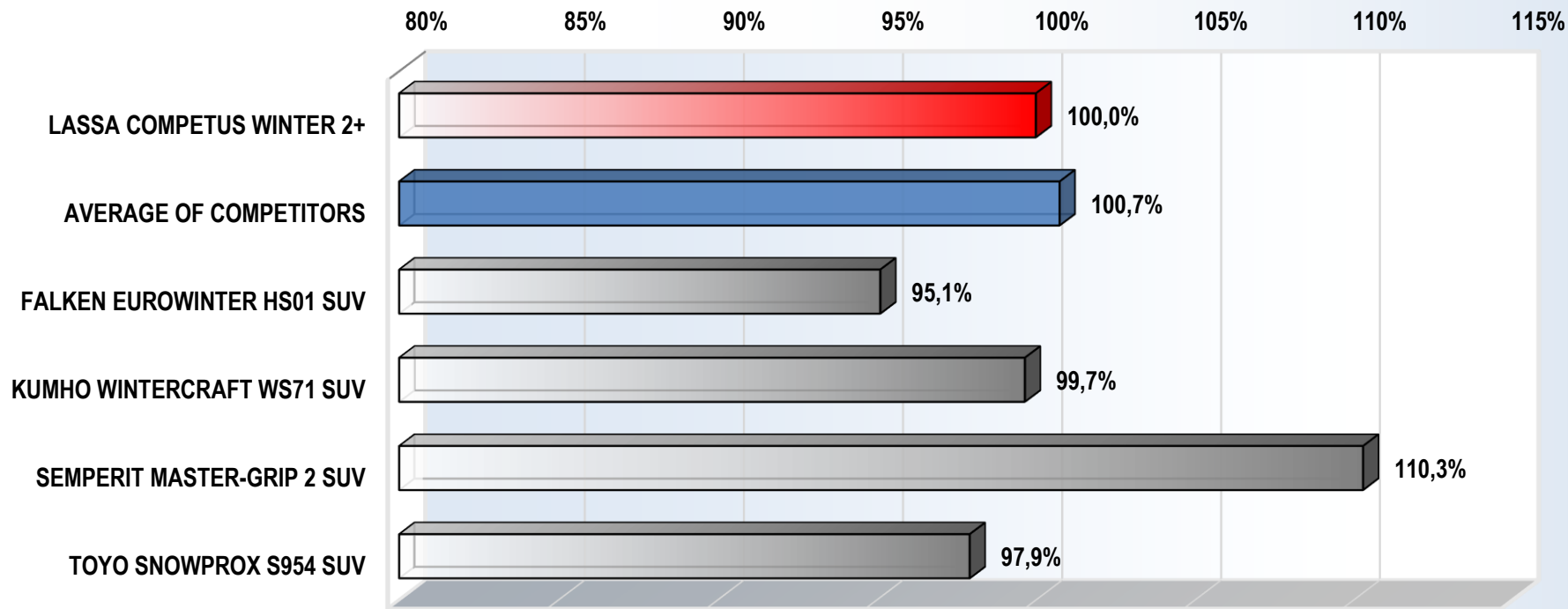
- In most tests, the reference/control tire is tested repeatedly in the progress of the test to detect and consider changes of the ambient test parameters and correct its performance by linear interpolation.
- Generally, all tires in a test are primarily evaluated in relation to the reference/control tire.
- The performance is expressed as a percentage value, calculated on the basis of the measured and corrected test data.
- In this present evaluation, the performance of each tire is assessed relative to Lassa Competus Winter 2+ (≙ 100%).
- In all evaluations, a percentage >100% means better and <100% means worse.

TEST RESULTS

ACCELERATION ON SNOW

- Acceleration on compressed snow with activated ETC (double execution)
- Result: Ø Acceleration time [s] from 10 to 40 km/h → Mean acceleration [m/s²]

ACCELERATION ON SNOW PERFORMANCE * [%]

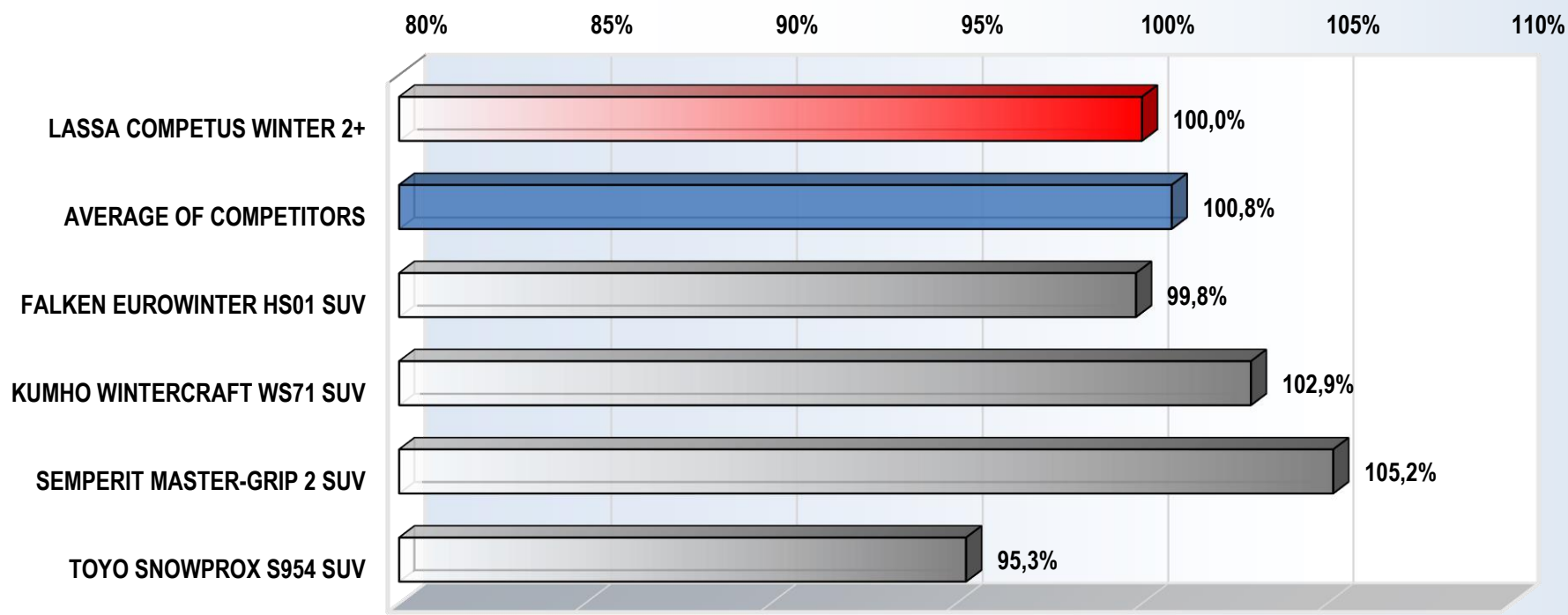


*) The calculation of the percentage performance is based on the mean acceleration values resulting from the measured acceleration times.

TEST RESULTS

- **BRAKING ON SNOW**
  - **ABS-braking on compressed snow (double execution)**
  - **Result: Ø Stopping distance [m] from 40 to 5 km/h → Mean deceleration [m/s²]**

SNOW BRAKING PERFORMANCE * [%]



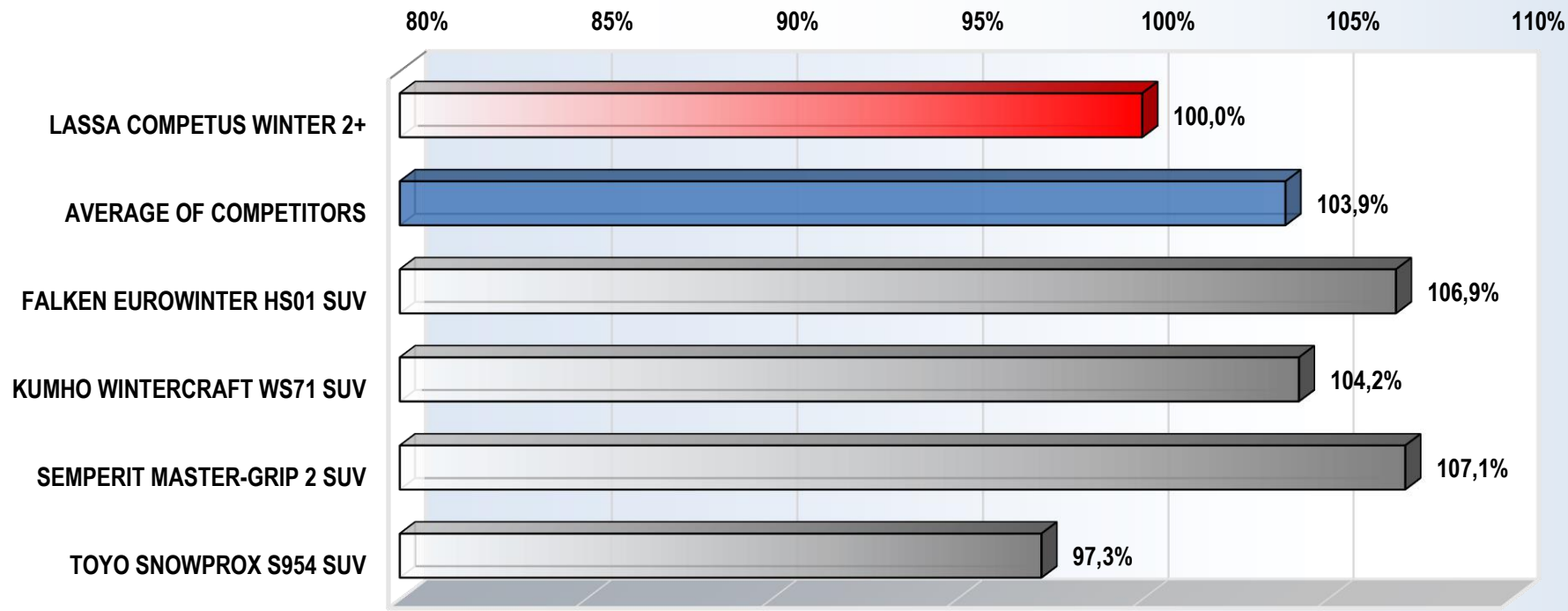
*) The calculation of the percentage performance is based on the mean deceleration values resulting from the measured braking distances.

TEST RESULTS

LATERAL SNOW GRIP

- Circular state driving on a snow circle at the grip limit (double execution)
- Result: Ø Lap time [s] → Lateral acceleration [m/s²]

LATERAL SNOW GRIP PERFORMANCE * [%]

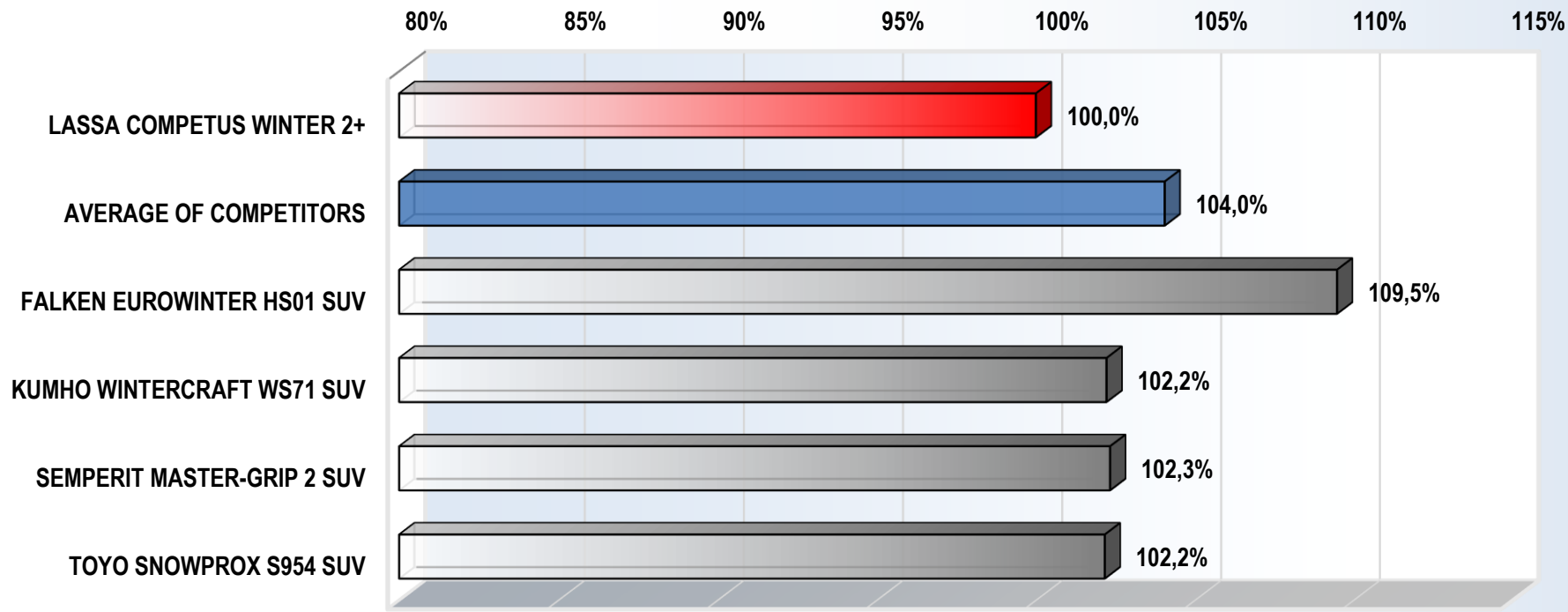


*) The calculation of the percentage performance is based on the mean lateral acceleration values resulting from the measured lap times.

TEST RESULTS

- **AQUAPLANING STRAIGHT-LINE**
  - **Water depth: ~ 9 mm**
  - **Result: Ø Aquaplaning speed [km/h] at 15% slip difference**

AQUAPLANING STRAIGHT-LINE PERFORMANCE * [%]



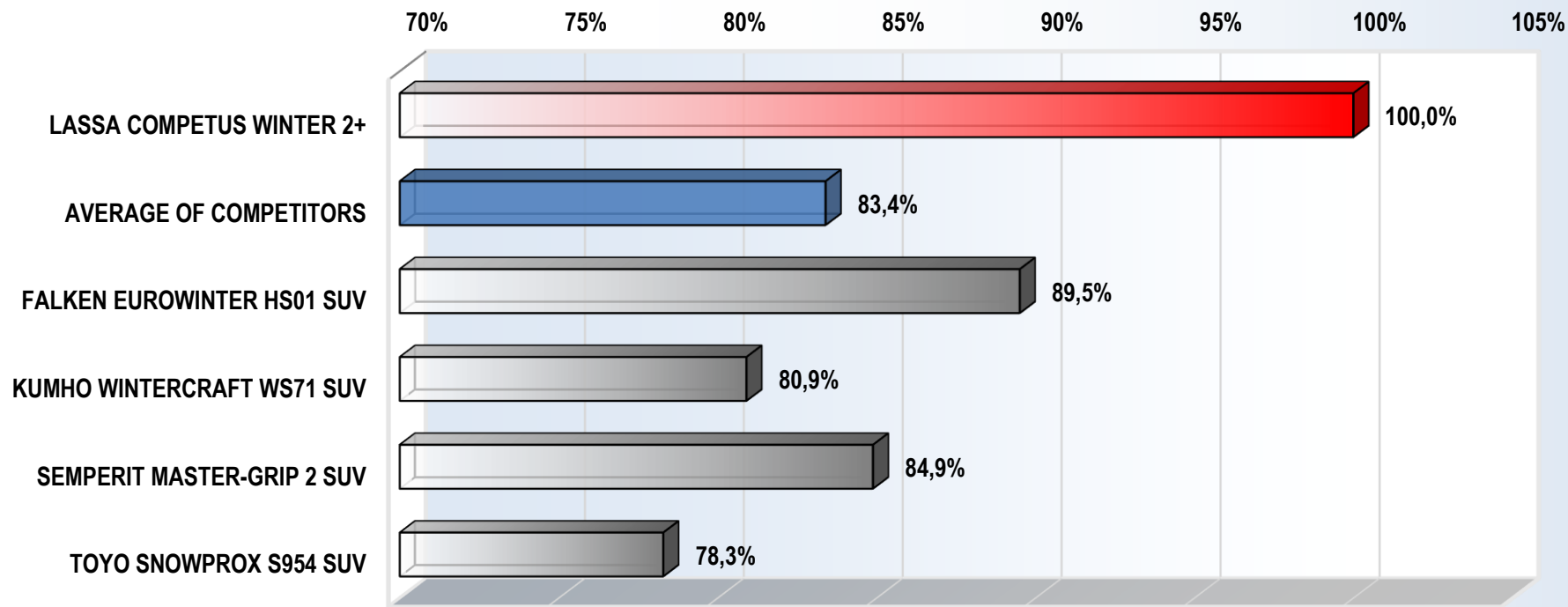
*) The calculation of the percentage performance is based on the measured aquaplaning speed.

TEST RESULTS

WET BRAKING

- ABS-braking on wet asphalt surface
- Result: Ø Stopping distance [m] from 80 to 20 km/h → Mean deceleration [m/s²]

WET BRAKING PERFORMANCE * [%]



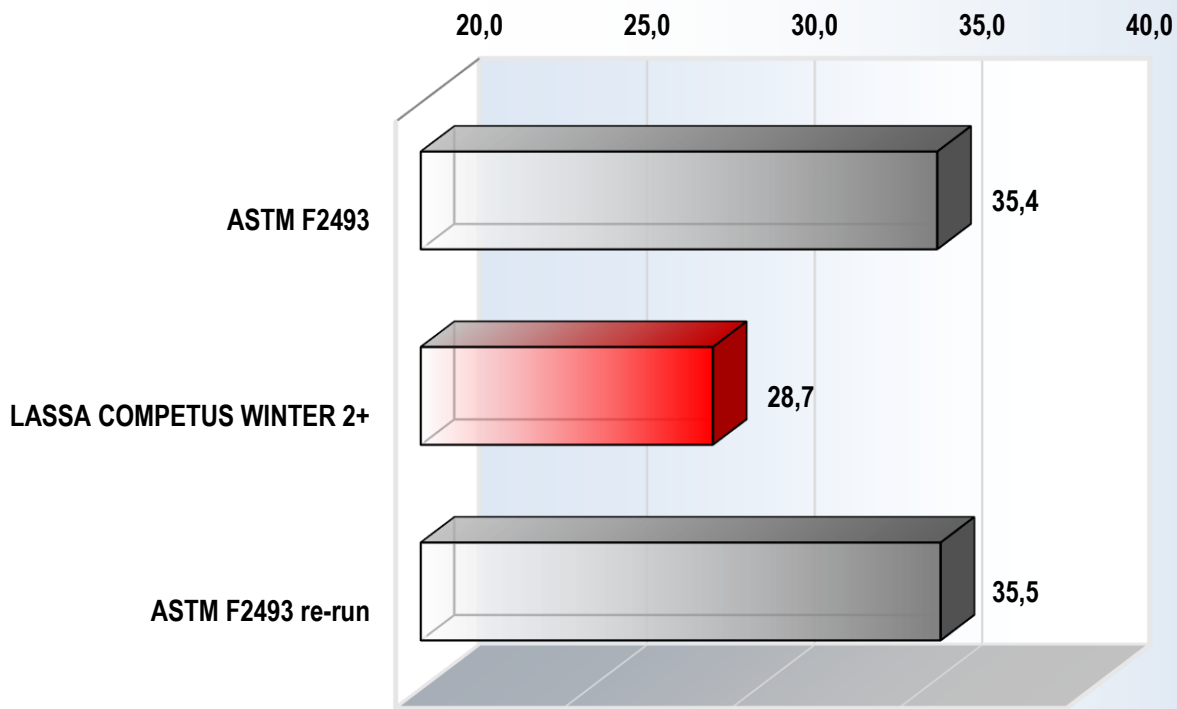
*) The calculation of the percentage performance is based on the mean deceleration values resulting from the measured braking distances.

TEST RESULTS

WET BRAKING (WET GRIP INDEX acc. to ECE R117 Annex 5)

- ABS-braking on wet asphalt surface acc. to ECE R117 Annex 5
- Result: Ø Stopping distance [m] from 80 to 20 km/h → Mean deceleration [m/s²] → Wet Grip Index G

WET BRAKING DISTANCE [m]



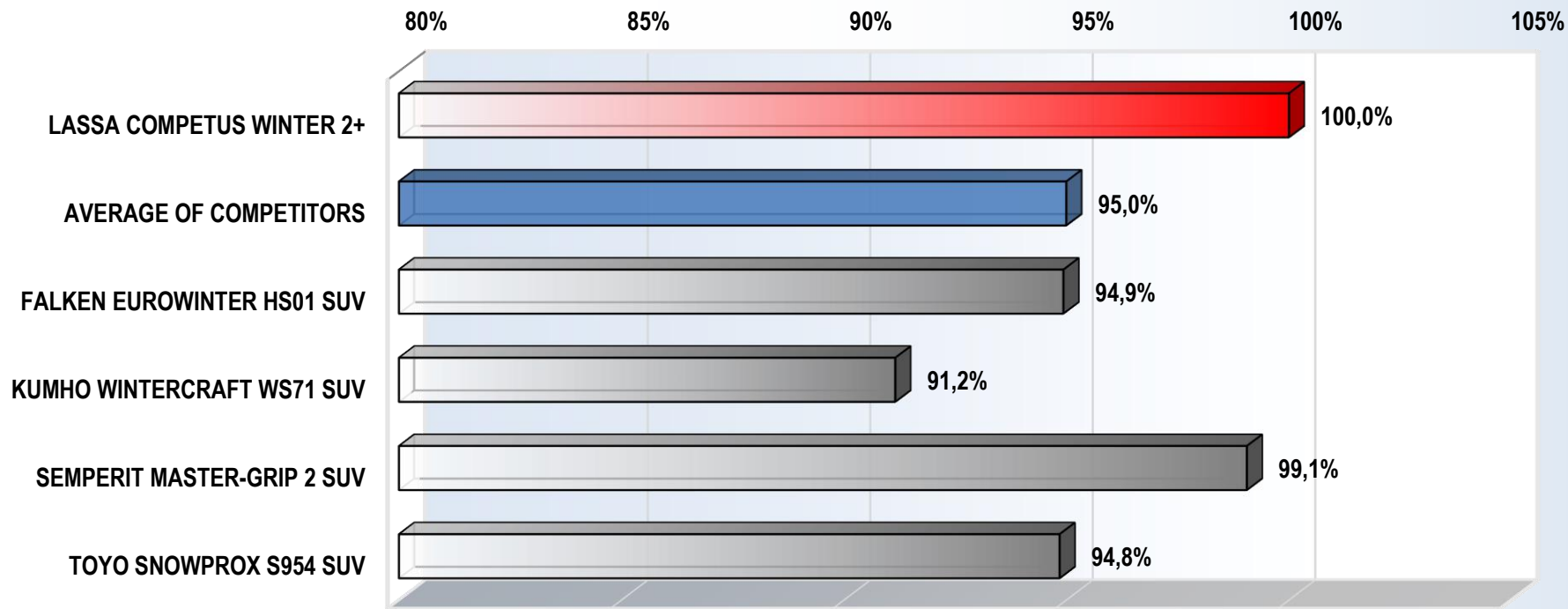
TIRE BRAND	T_A /T_S [°C]		WET GRIP INDEX (G)
ASTM F2493 16"	2,5	7,5	-
LASSA COMPETUS WINTER 2+	2,6	7,7	1,52
ASTM F2493 16" rerun	3,5	7,8	-

TEST RESULTS

LATERAL WET GRIP

- Circular state driving on a wet asphalt circle at the grip limit
- Result: Ø Lap time [s] → Lateral acceleration [m/s²]

LATERAL WET GRIP PERFORMANCE * [%]

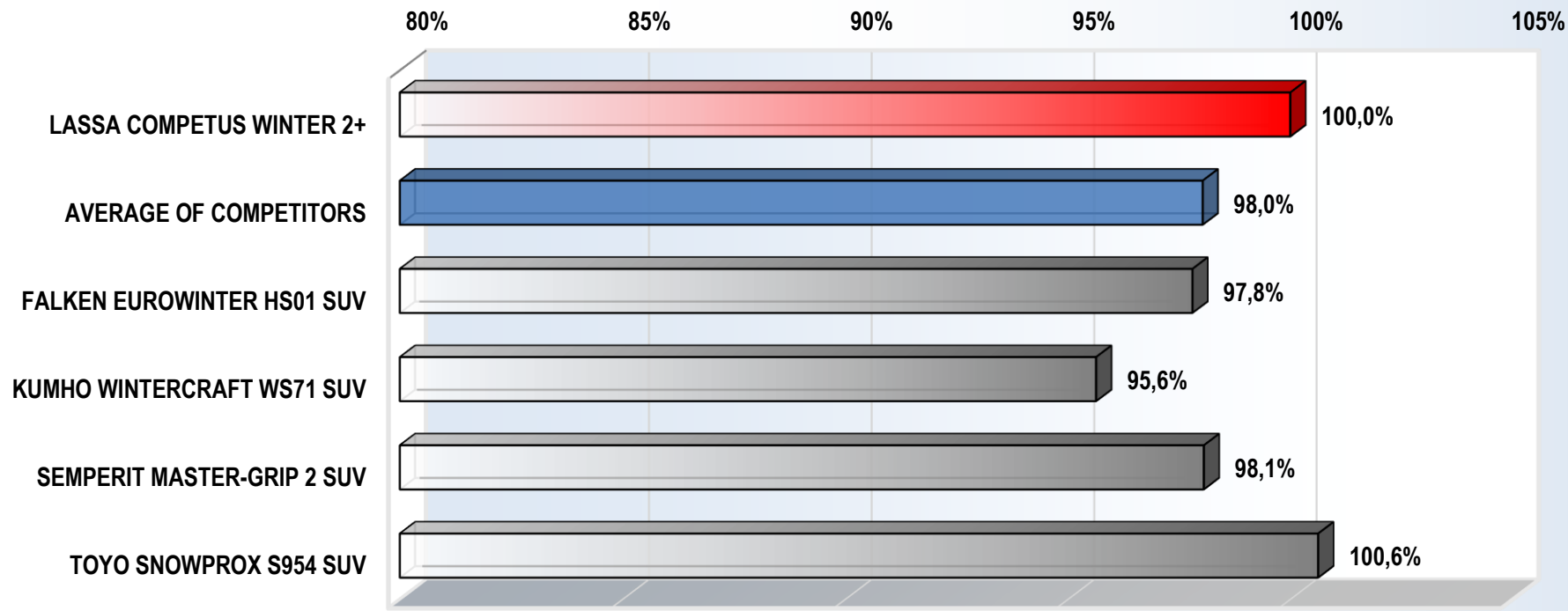


*) The calculation of the percentage performance is based on the mean lateral acceleration values resulting from the measured lap times.

TEST RESULTS

- **DRY BRAKING**
  - **ABS-braking on dry asphalt surface**
  - **Result: Ø Stopping distance [m] from 100 to 0 km/h → Mean deceleration [m/s²]**

DRY BRAKING PERFORMANCE * [%]

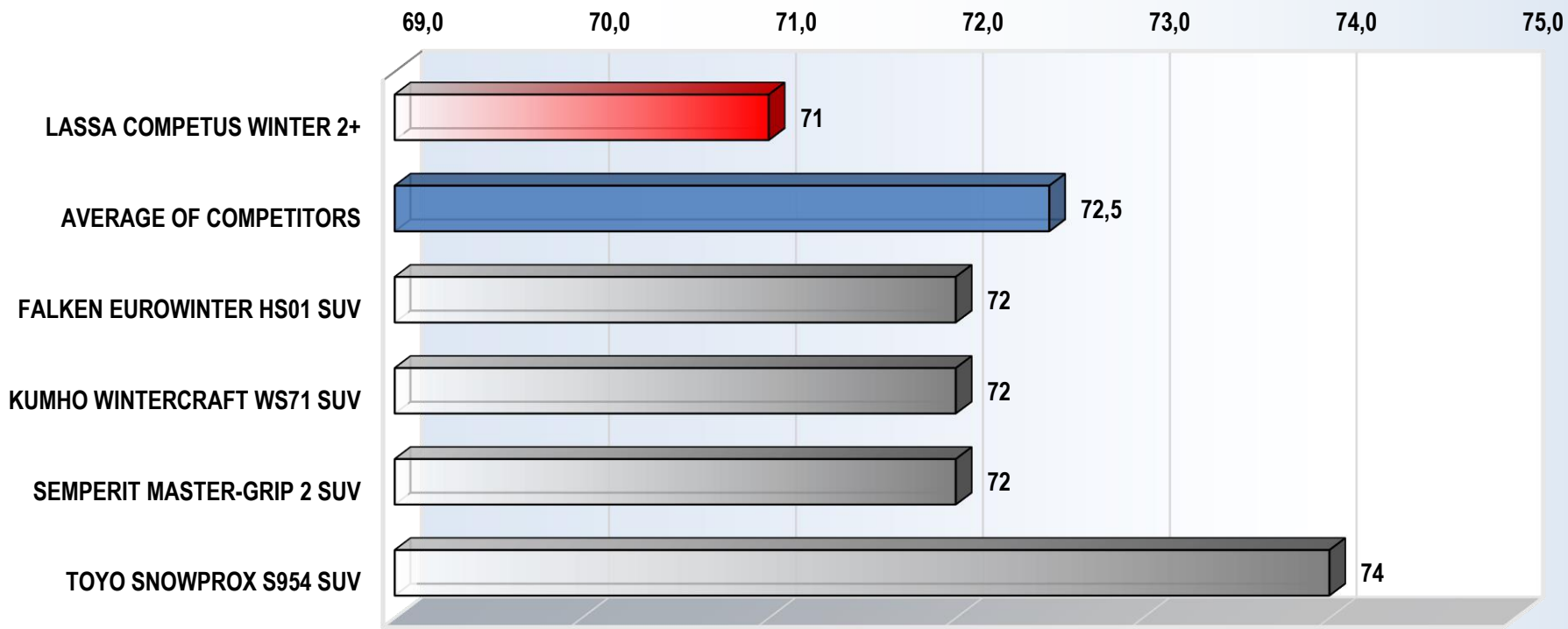


*) The calculation of the percentage performance is based on the mean deceleration values resulting from the measured braking distances.

TEST RESULTS

- **ROLLING NOISE**
  - Acc. to ECE R117 Annex 3
  - Result: Rolling Noise Level [dB(A)] EC Label Value

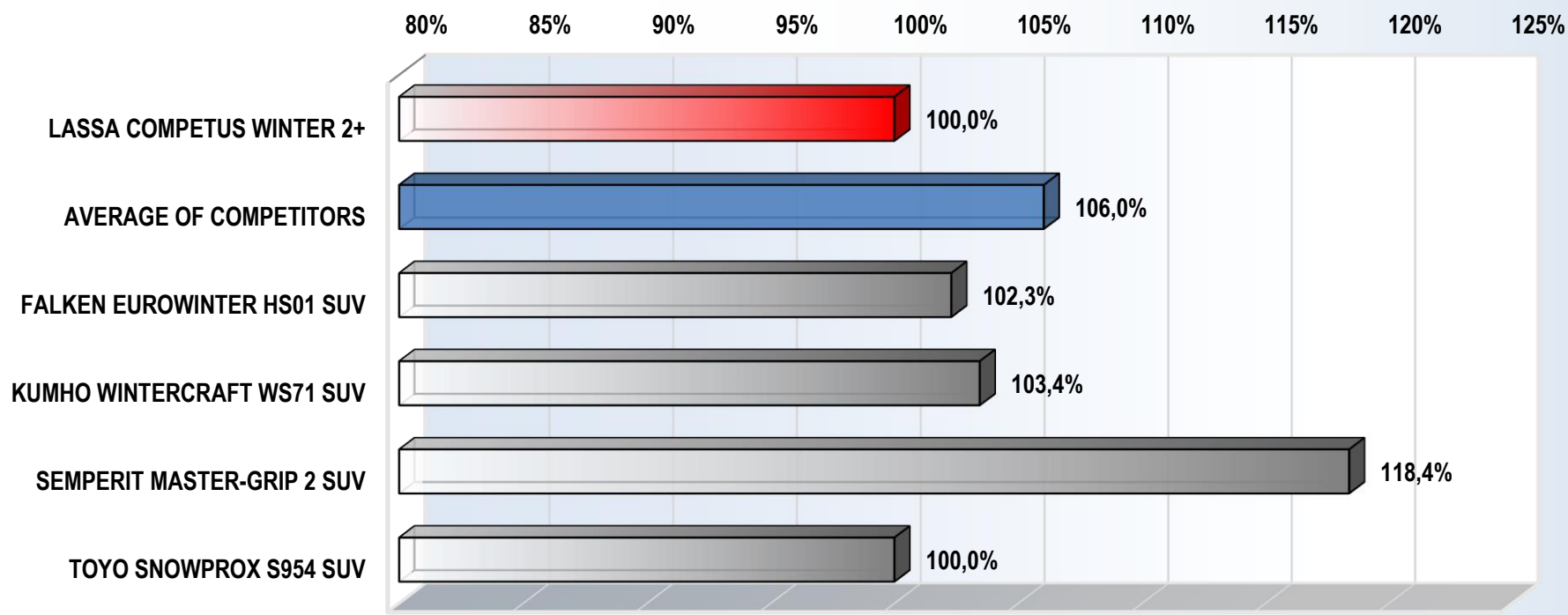
ROLLING NOISE (ECE TYPE APPROVAL VALUE) [dB(A)]



TEST RESULTS

- **ROLLING RESISTANCE**
  - Acc. to ECE R117 Annex 6
  - Result: Rolling Resistance Coefficient (c_R) EC Label Value [kg/t]

ROLLING RESISTANCE PERFORMANCE * [%]

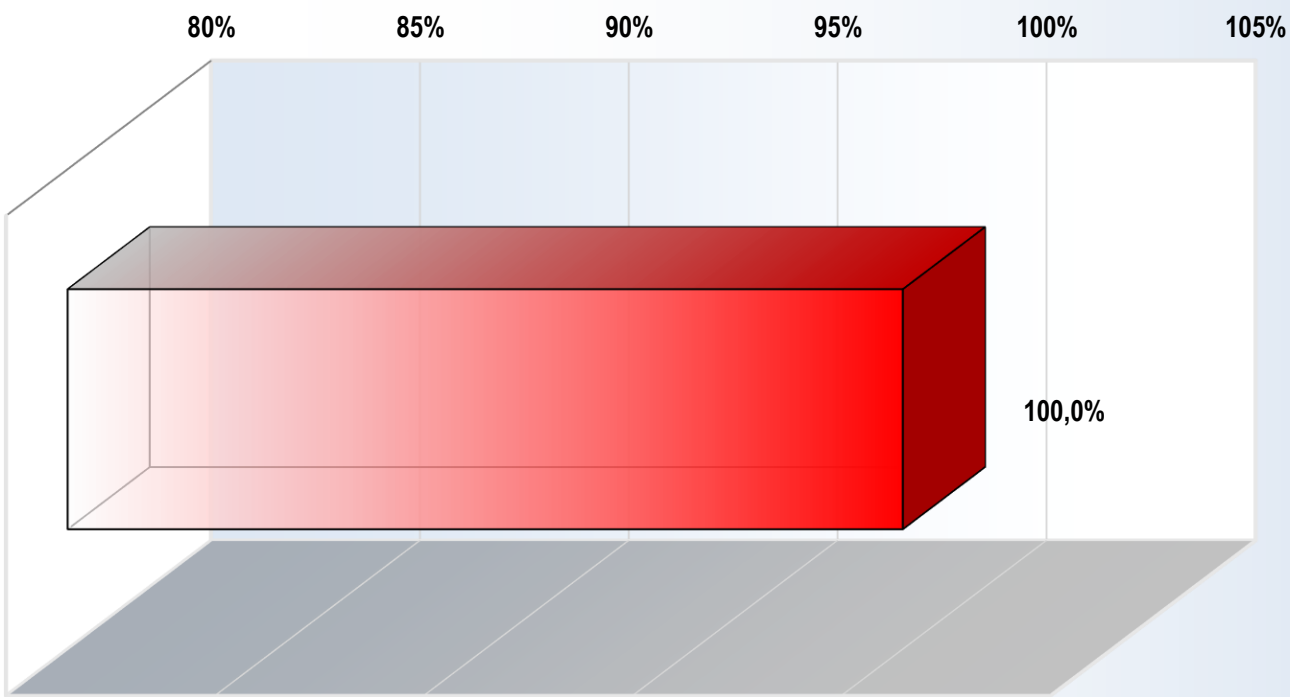


*) The calculation of the percentage performance is based on the reciprocal values of the measured rolling resistance forces.

TEST RESULTS

- **HIGH SPEED TEST ADVANCED**
  - **Acc. to ECE R30 + extension at 2° camber at v_{max} for max. 60 min**
  - **Result: Total running time without visible failure → max. 120 min = 100%**

HIGH SPEED PERFORMANCE * [%]



*) The calculation of the percentage performance is based on the total running time without defect.

TEST SUMMARY

Percentage >100% means better, percentage <100% means worse	Weighting factor	Limit single criterion	LASSA COMPETUS WINTER 2+	TÜV MARK REFERENCE COLLECTIVE	LASSA COMPETUS WINTER 2+	FALKEN EUROWINTER HS01 SUV	KUMHO WINTERCRAFT WS71 SUV	SEMPERIT MASTER-GRIP 2 SUV	TOYO SNOWPROX S954
ACCELERATION ON SNOW Ø Run 1 & 2	0,100	95%	99%	100%	100,0%	95,1%	99,7%	110,3%	97,9%
BRAKING ON SNOW Ø Run 1 & 2	0,100	95%	99%	100%	100,0%	99,8%	102,9%	105,2%	95,3%
LATERAL SNOW GRIP Ø Run 1 & 2	0,100	95%	96%	100%	100,0%	106,9%	104,2%	107,1%	97,3%
AQUAPLANING STRAIGHT-LINE	0,100	95%	96%	100%	100,0%	109,5%	102,2%	102,3%	102,2%
WET BRAKING	0,150	100%	118%	TÜV-MARK INDEX	100,0%	89,5%	80,9%	84,9%	78,3%
WET GRIP INDEX (ECE R117 Annex 5)					1,52	-	-	-	-
LATERAL WET GRIP	0,125	95%	105%	100%	100,0%	94,9%	91,2%	99,1%	94,8%
DRY BRAKING	0,125	95%	102%	100%	100,0%	97,8%	95,6%	98,1%	100,6%
ROLLING NOISE (ECE R117 Annex 3)	0,050	95%	100%	TÜV-MARK INDEX	71 dB(A)	72 dB(A)	72 dB(A)	72 dB(A)	74 dB(A)
ROLLING RESISTANCE (ECE R117 Annex 6)	0,050	95%	98%	TÜV-MARK INDEX	100,0%	102,3%	103,4%	118,4%	100,0%
HIGH SPEED TEST ADVANCED	0,100	95%	110%	TÜV-MARK INDEX	100,0%	-	-	-	-
TOTAL RESULT (weighted)	∑ 1,000	100%	104%	100,0%	Limits are reached. TÜV MARK passed				