TÜV SÜD
Tire Test 2024

HANKOOK
ION FLEXCLIMATE EV

235/45 R18 98W XL

ABSTRACT of BENCHMARK TEST
basing on Report No. 713312678-AS-BM

Add value.
Inspire trust.

Report No. 713312678-AS-BM02

TÜV SÜD PS – TIRE TEST 2024
TIRE DETAILS

CANDIDATE TIRE	COMPETITOR TIRES (in testing order)			

HANKOOK
ION FLEXCLIMATE EV
235/45 R18 98W XL
DOT 12XN9 5L HB 4423

GOODYEAR
VECTOR 4SEASONS GEN-3
235/45 R18 98Y XL
DOT 1H3H0 JN1R 4023

MICHELIN
CROSSCLIMATE 2
235/45 R18 98Y XL
DOT 1H1 EL 097X 2422 - 4623

PIRELLI
CINTURATO ALL SEASON SF2
235/45 R18 98Y XL
DOT 193 WB132L 0923 - 1723

VREDESTEIN
QUATRAC PRO EV
235/45 R18 98W XL
DOT 023 FUE827 2723 - 2923

- All Hankook iON FlexClimate EV 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.

TÜV SÜD PS – TIRE TEST 2024
TEST DETAILS

TEST LOCATIONS

- Wet & dry: ATP Papenburg (D)
- Snow: Technotrack Ivalo (FIN)

TEST VEHICLES

- Tesla Model 3 Performance, VW T6 2.0TDI

PROCEDURE & 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 Hankook iON FlexClimate EV (≙ 100%).
- In all evaluations, a percentage >100% means better and <100% means worse.
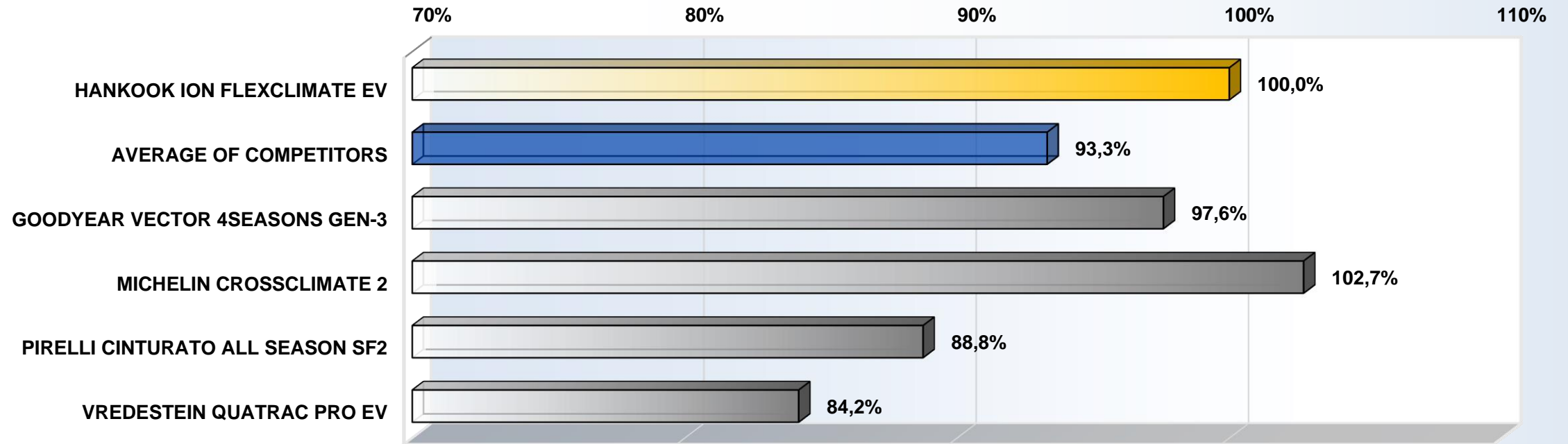
TÜV SÜD PS – TIRE TEST 2024
TEST RESULTS

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 * [%]

Tire	Performance
HANKOOK ION FLEXCLIMATE EV	100,0%
AVERAGE OF COMPETITORS	93,3%
GOODYEAR VECTOR 4SEASONS GEN-3	97,6%
MICHELIN CROSSCLIMATE 2	102,7%
PIRELLI CINTURATO ALL SEASON SF2	88,8%
VREDESTEIN QUATRAC PRO EV	84,2%

*) The calculation of the percentage performance is based on the mean acceleration values resulting from the measured acceleration times.
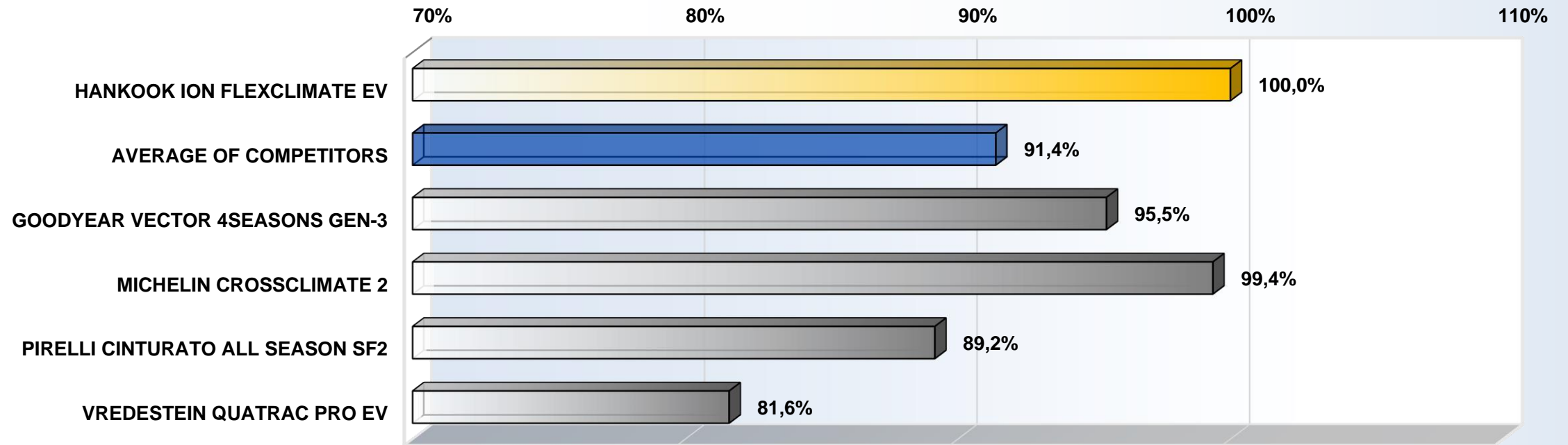
TÜV SÜD PS – TIRE TEST 2024
TEST RESULTS

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]

BRAKING ON SNOW PERFORMANCE * [%]

Tire	Performance
HANKOOK ION FLEXCLIMATE EV	100,0%
AVERAGE OF COMPETITORS	91,4%
GOODYEAR VECTOR 4SEASONS GEN-3	95,5%
MICHELIN CROSSCLIMATE 2	99,4%
PIRELLI CINTURATO ALL SEASON SF2	89,2%
VREDESTEIN QUATRAC PRO EV	81,6%

*) The calculation of the percentage performance is based on the mean deceleration values resulting from the measured braking distances.
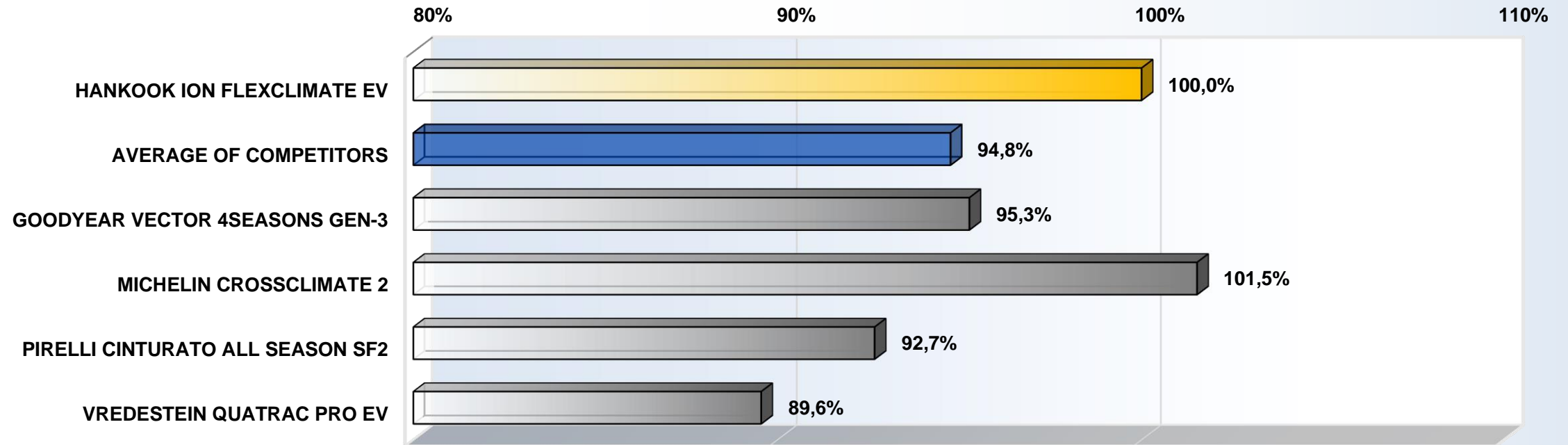
TÜV SÜD PS – TIRE TEST 2024
TEST RESULTS

HANDLING ON SNOW

- Subjective assessment and lap time on a snow handling circuit (track length: 1090 m) (double execution)
- Result: Ø Rating (min. 1, max. 10) and Ø lap time [s] → average speed [km/h]; total result from speed and rating scores (2:1)

HANDLING ON SNOW PERFORMANCE * [%]

Tire	Performance
HANKOOK ION FLEXCLIMATE EV	100,0%
AVERAGE OF COMPETITORS	94,8%
GOODYEAR VECTOR 4SEASONS GEN-3	95,3%
MICHELIN CROSSCLIMATE 2	101,5%
PIRELLI CINTURATO ALL SEASON SF2	92,7%
VREDESTEIN QUATRAC PRO EV	89,6%

*) The calculation of the percentage performance is based on the speed and the rating scores (at the ratio 2:1).
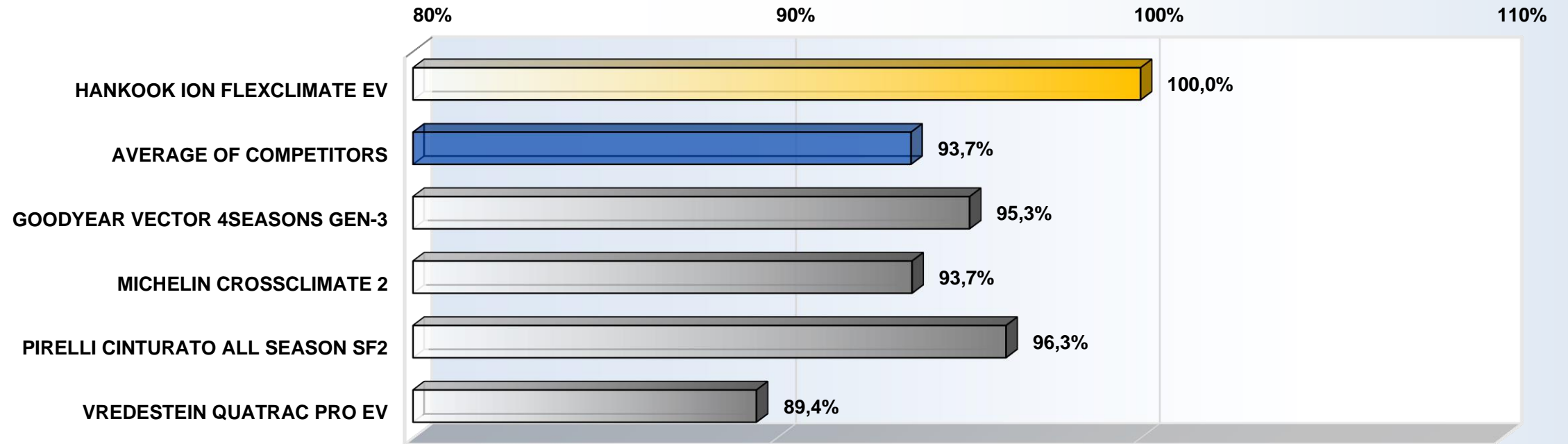
TÜV SÜD PS – TIRE TEST 2024
TEST RESULTS

AQUAPLANING STRAIGHT-LINE

- Objective measurement of longitudinal aquaplaning performance; water depth ~ 9 mm
- Result: Aquaplaning speed [km/h] at 15% slip

AQUAPLANING STRAIGHT-LINE PERFORMANCE * [%]

Tire	Performance
HANKOOK ION FLEXCLIMATE EV	100,0%
AVERAGE OF COMPETITORS	93,7%
GOODYEAR VECTOR 4SEASONS GEN-3	95,3%
MICHELIN CROSSCLIMATE 2	93,7%
PIRELLI CINTURATO ALL SEASON SF2	96,3%
VREDESTEIN QUATRAC PRO EV	89,4%

*) The calculation of the percentage performance is based on the measured aquaplaning speeds.
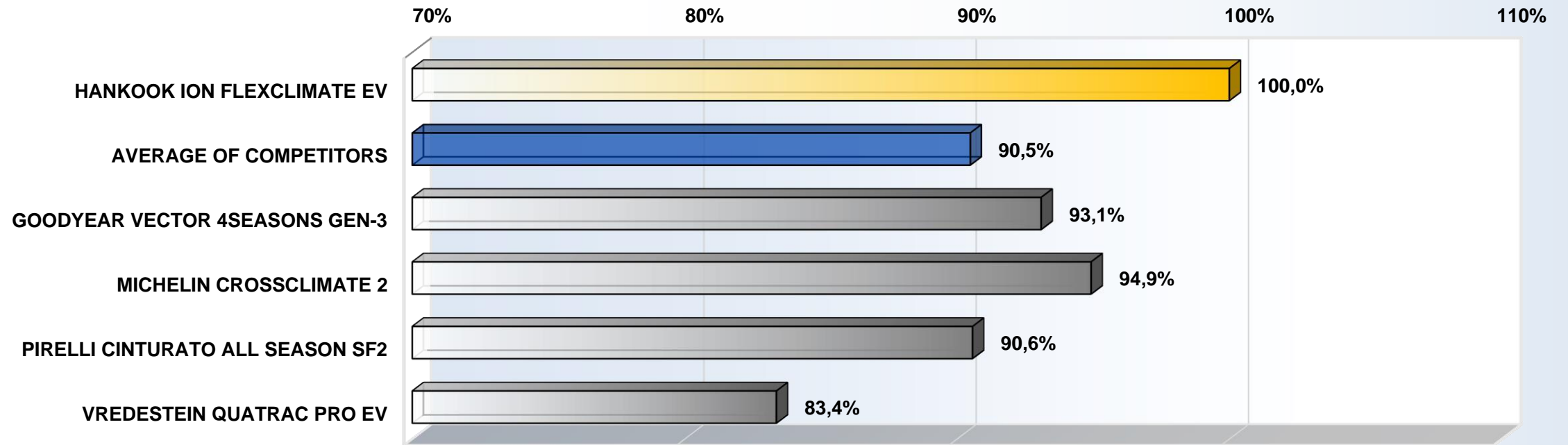
TÜV SÜD PS – TIRE TEST 2024
TEST RESULTS

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 * [%]

	Performance
HANKOOK ION FLEXCLIMATE EV	100,0%
AVERAGE OF COMPETITORS	90,5%
GOODYEAR VECTOR 4SEASONS GEN-3	93,1%
MICHELIN CROSSCLIMATE 2	94,9%
PIRELLI CINTURATO ALL SEASON SF2	90,6%
VREDESTEIN QUATRAC PRO EV	83,4%

*) The calculation of the percentage performance is based on the mean deceleration values resulting from the measured braking distances.
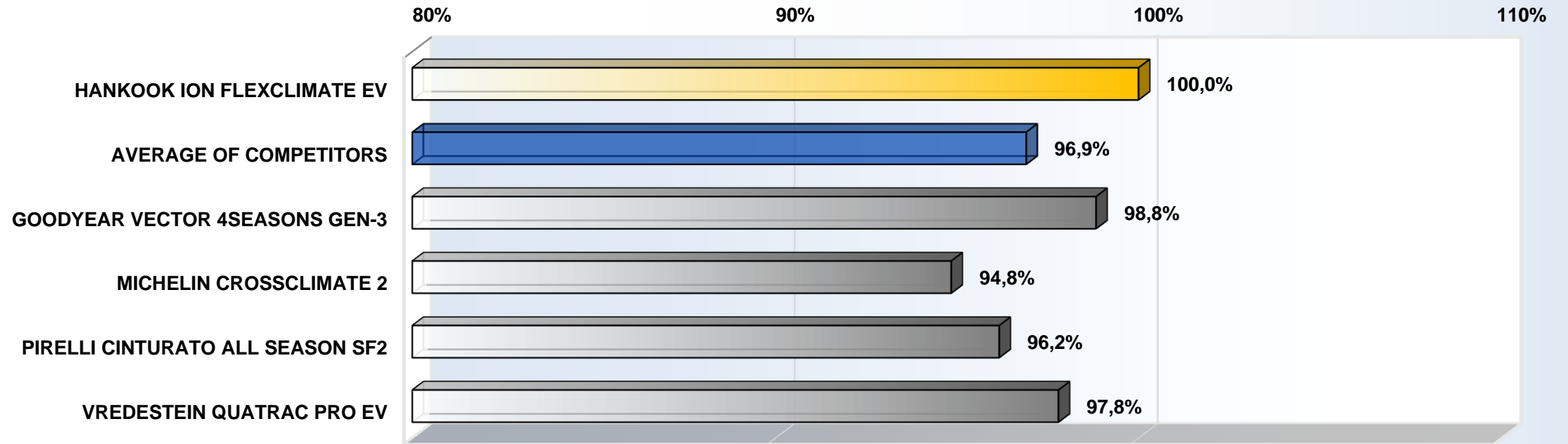
TÜV SÜD PS – TIRE TEST 2024
TEST RESULTS

LATERAL WET GRIP

- Circular state driving in wet circle at the grip limit (circle radius: 42 m)
- Result: Ø Lap time [s] → Mean lateral acceleration [m/s²]

LATERAL WET GRIP PERFORMANCE * [%]

Tire	Performance
HANKOOK ION FLEXCLIMATE EV	100,0%
AVERAGE OF COMPETITORS	96,9%
GOODYEAR VECTOR 4SEASONS GEN-3	98,8%
MICHELIN CROSSCLIMATE 2	94,8%
PIRELLI CINTURATO ALL SEASON SF2	96,2%
VREDESTEIN QUATRAC PRO EV	97,8%

*) The calculation of the percentage performance is based on the mean lateral acceleration values resulting from the measured lap times.
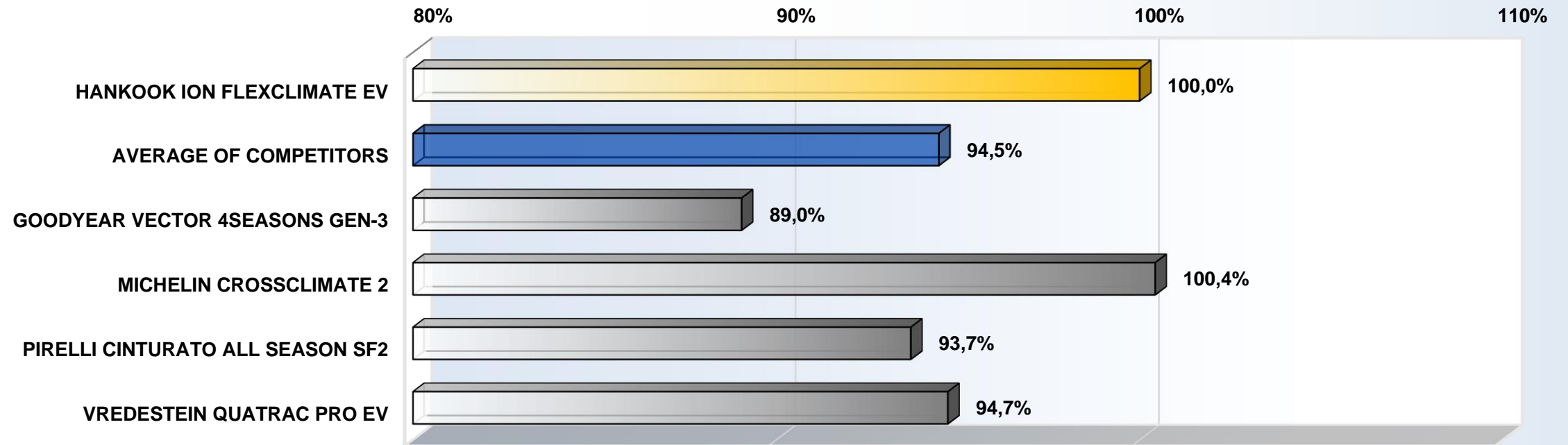
TÜV SÜD PS – TIRE TEST 2024
TEST RESULTS

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 * [%]

Tire	Performance
HANKOOK ION FLEXCLIMATE EV	100,0%
AVERAGE OF COMPETITORS	94,5%
GOODYEAR VECTOR 4SEASONS GEN-3	89,0%
MICHELIN CROSSCLIMATE 2	100,4%
PIRELLI CINTURATO ALL SEASON SF2	93,7%
VREDESTEIN QUATRAC PRO EV	94,7%

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

TÜV SÜD PS – TIRE TEST 2024
SUMMARY OF RESULTS

Percentage > 100% means better, percentage < 100% means worse.	HANKOOK ION FLEXCLIMATE EV	GOODYEAR VECTOR 4SEASONS GEN-3	MICHELIN CROSSCLIMATE 2	PIRELLI CINTURATO ALL SEASON SF2	VREDESTEIN QUATRAC PRO EV
ACCELERATION ON SNOW	100,0%	97,6%	102,7%	88,8%	84,2%
BRAKING ON SNOW	100,0%	95,5%	99,4%	89,2%	81,6%
HANDLING ON SNOW	100,0%	95,3%	101,5%	92,7%	89,6%
AQUAPLANING STRAIGHT-LINE	100,0%	95,3%	93,7%	96,3%	89,4%
WET BRAKING	100,0%	93,1%	94,9%	90,6%	83,4%
LATERAL WET GRIP	100,0%	98,8%	94,8%	96,2%	97,8%
DRY BRAKING	100,0%	89,0%	100,4%	93,7%	94,7%