TÜV SÜD
Tire Test 2024

HANKOOK ION EVO AS

235/40 R19 96W XL

BENCHMARK TEST

**Add value.
Inspire trust.**

Report No. 713312726

TÜV SÜD PS – TIRE TEST 2024
TIRE DETAILS

CANDIDATE TIRE	COMPETITOR TIRES (in testing order)		
HANKOOK **ION EVO AS** **235/40 R19 96W XL** **DOT 1T757 5A HB 4623**	**BRIDGESTONE** **TURANZA EV** **235/40 R19 96W XL** **DOT 1W2 189F76 1823**	**GOODYEAR** **ELECTRICDRIVE GT** **235/40 R19 96W XL** **DOT 1M618 KR1R 2822**	**PIRELLI** **P ZERO AS PLUS ELECT** **235/40 R19 96V XL** **DOT 1UN FC064P 2723**

- All Hankook iON evo AS 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)
- Rolling resistance: TÜV SÜD Product Service Garching (D)

TEST VEHICLES

- Tesla Model 3 Performance, VW T6 2.0TDI
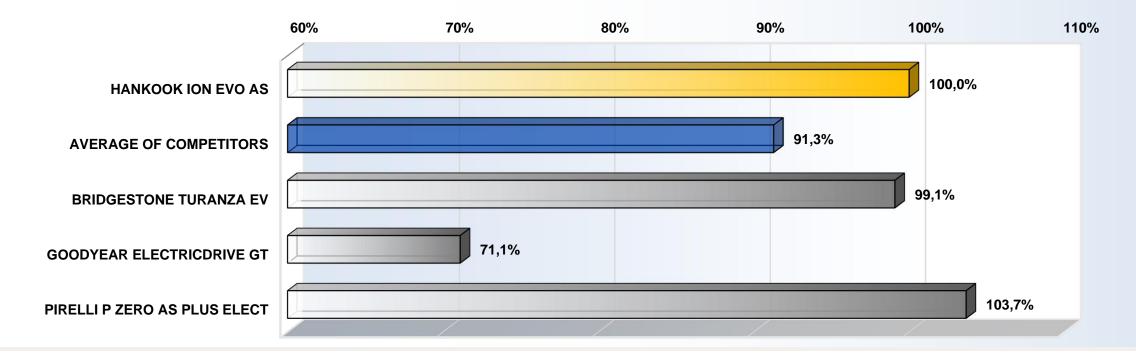
PROCEDURE & EVALUATION

- 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 evo AS (≙ 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 * [%]

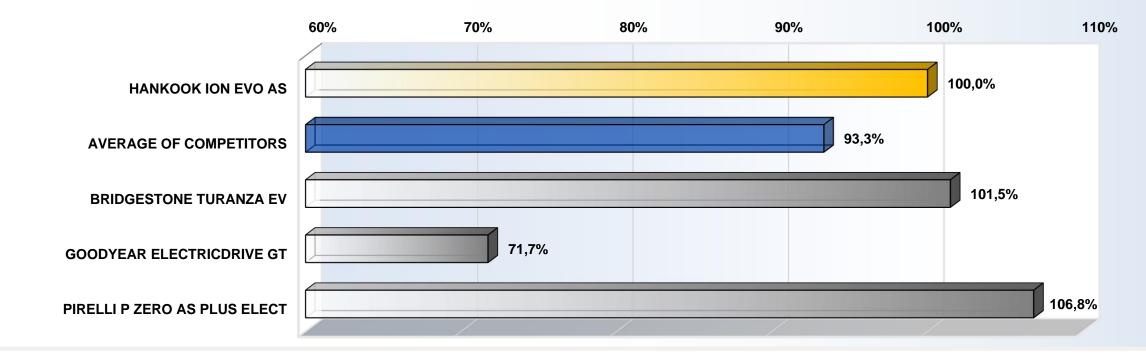| Tire	Performance
HANKOOK ION EVO AS	100,0%
AVERAGE OF COMPETITORS	91,3%
BRIDGESTONE TURANZA EV	99,1%
GOODYEAR ELECTRICDRIVE GT	71,1%
PIRELLI P ZERO AS PLUS ELECT	103,7%

Chart axis: 60%, 70%, 80%, 90%, 100%, 110%

*) 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 * [%]

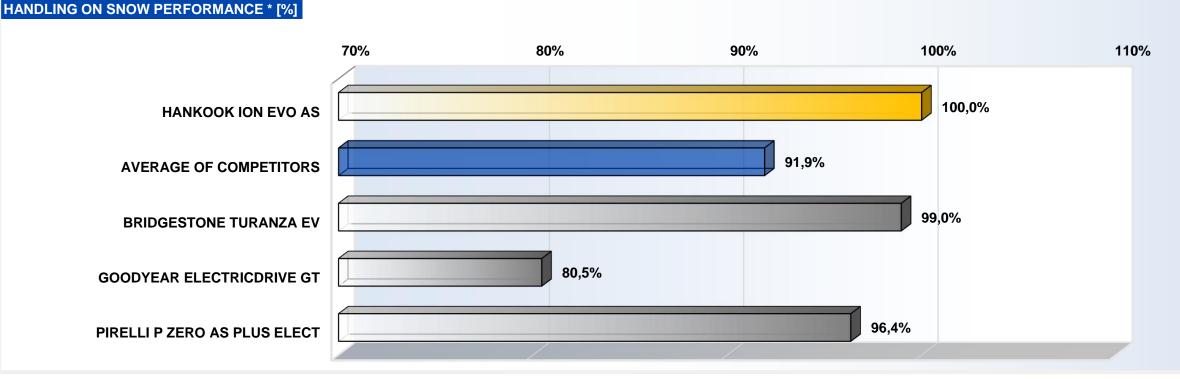| Tire	Performance
HANKOOK ION EVO AS	100,0%
AVERAGE OF COMPETITORS	93,3%
BRIDGESTONE TURANZA EV	101,5%
GOODYEAR ELECTRICDRIVE GT	71,7%
PIRELLI P ZERO AS PLUS ELECT	106,8%

*) 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 EVO AS	100,0%
AVERAGE OF COMPETITORS	91,9%
BRIDGESTONE TURANZA EV	99,0%
GOODYEAR ELECTRICDRIVE GT	80,5%
PIRELLI P ZERO AS PLUS ELECT	96,4%

*) 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
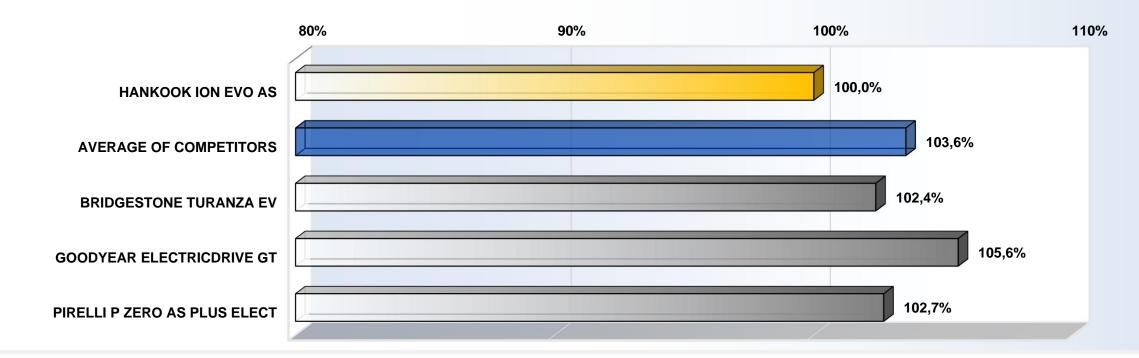## TEST RESULTS

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 * [%]

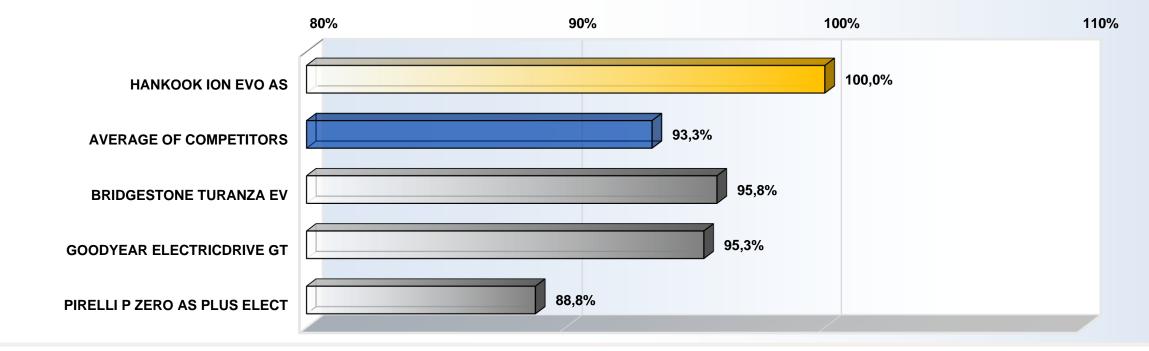| Tire	Performance
HANKOOK ION EVO AS	100,0%
AVERAGE OF COMPETITORS	103,6%
BRIDGESTONE TURANZA EV	102,4%
GOODYEAR ELECTRICDRIVE GT	105,6%
PIRELLI P ZERO AS PLUS ELECT	102,7%

Scale: 80% — 90% — 100% — 110%

*) 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 * [%]

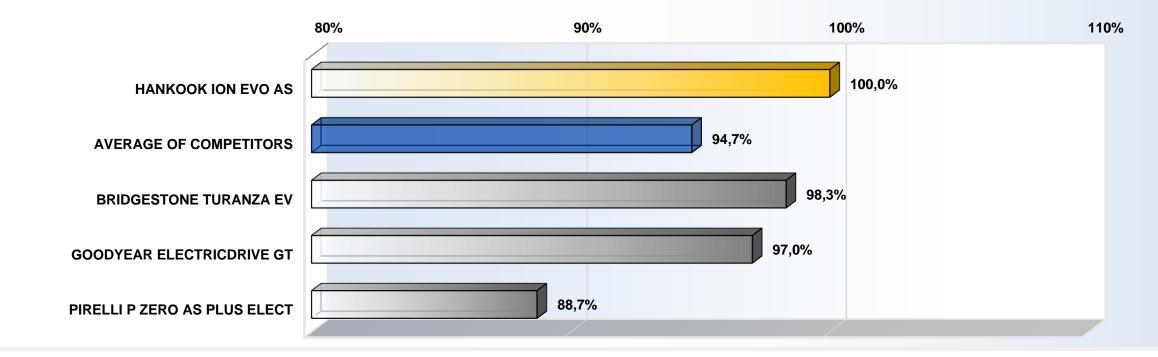| Tire	Performance [%]
HANKOOK ION EVO AS	100,0%
AVERAGE OF COMPETITORS	93,3%
BRIDGESTONE TURANZA EV	95,8%
GOODYEAR ELECTRICDRIVE GT	95,3%
PIRELLI P ZERO AS PLUS ELECT	88,8%

*) 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 EVO AS	100,0%
AVERAGE OF COMPETITORS	94,7%
BRIDGESTONE TURANZA EV	98,3%
GOODYEAR ELECTRICDRIVE GT	97,0%
PIRELLI P ZERO AS PLUS ELECT	88,7%

*) 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
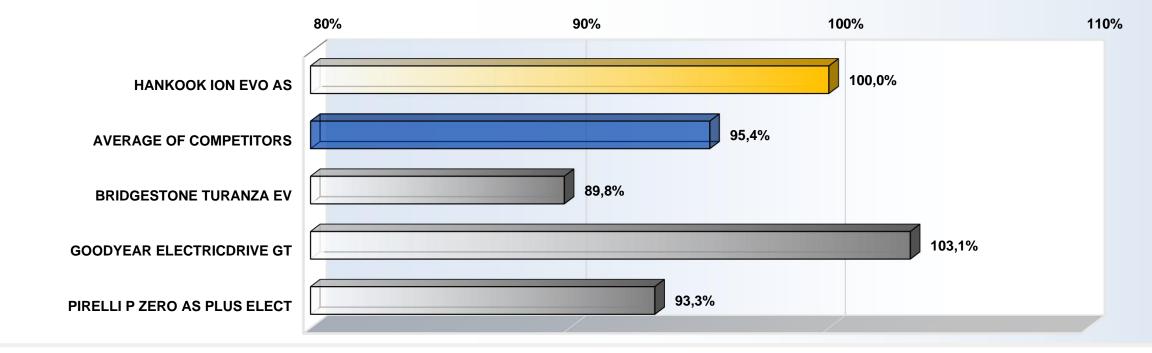
DRY BRAKING

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

DRY BRAKING PERFORMANCE * [%]

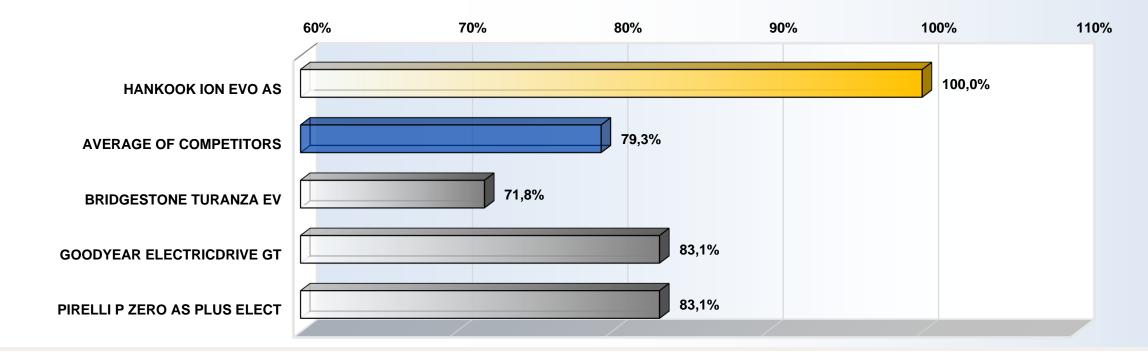| Tire	Performance
HANKOOK ION EVO AS	100,0%
AVERAGE OF COMPETITORS	95,4%
BRIDGESTONE TURANZA EV	89,8%
GOODYEAR ELECTRICDRIVE GT	103,1%
PIRELLI P ZERO AS PLUS ELECT	93,3%

*) 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

ROLLING RESISTANCE

- Acc. to ECE R117 Annex 6
- Result: Rolling resistance coefficient (c_R) EC label value [kg/t]

ROLLING RESISTANCE PERFORMANCE * [%]

Tire	Performance
HANKOOK ION EVO AS	100,0%
AVERAGE OF COMPETITORS	79,3%
BRIDGESTONE TURANZA EV	71,8%
GOODYEAR ELECTRICDRIVE GT	83,1%
PIRELLI P ZERO AS PLUS ELECT	83,1%

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

TÜV SÜD PS – TIRE TEST 2024
SUMMARY OF RESULTS

Percentage > 100% means better, percentage < 100% means worse.	HANKOOK ION EVO AS	BRIDGESTONE TURANZA EV	GOODYEAR ELECTRICDRIVE GT	PIRELLI P ZERO AS PLUS ELECT
ACCELERATION ON SNOW	100,0%	99,1%	71,1%	103,7%
BRAKING ON SNOW	100,0%	101,5%	71,7%	106,8%
HANDLING ON SNOW	100,0%	99,0%	80,5%	96,4%
AQUAPLANING STRAIGHT-LINE	100,0%	102,4%	105,6%	102,7%
WET BRAKING	100,0%	95,8%	95,3%	88,8%
LATERAL WET GRIP	100,0%	98,3%	97,0%	88,7%
DRY BRAKING	100,0%	89,8%	103,1%	93,3%
ROLLING RESISTANCE (ECE R117 Annex 6)	100,0%	71,8%	83,1%	83,1%