HANKOOK
driving emotion

FINALIST
2018

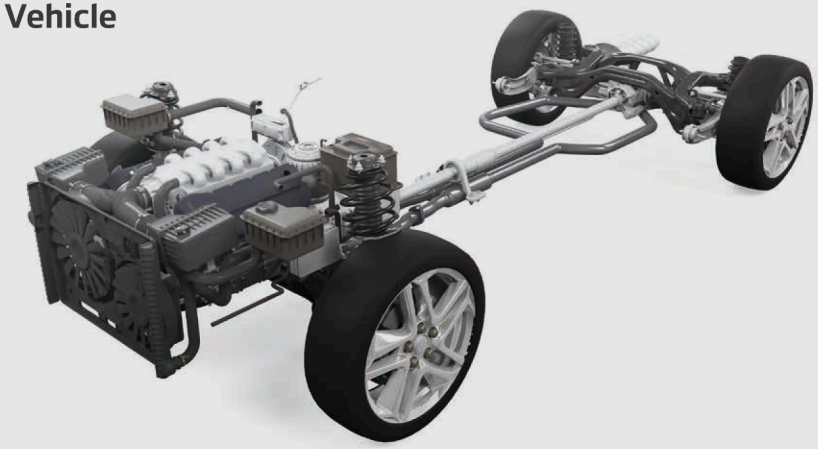
KINERGY AS ev

Only One Electric Mobility Technology for EV

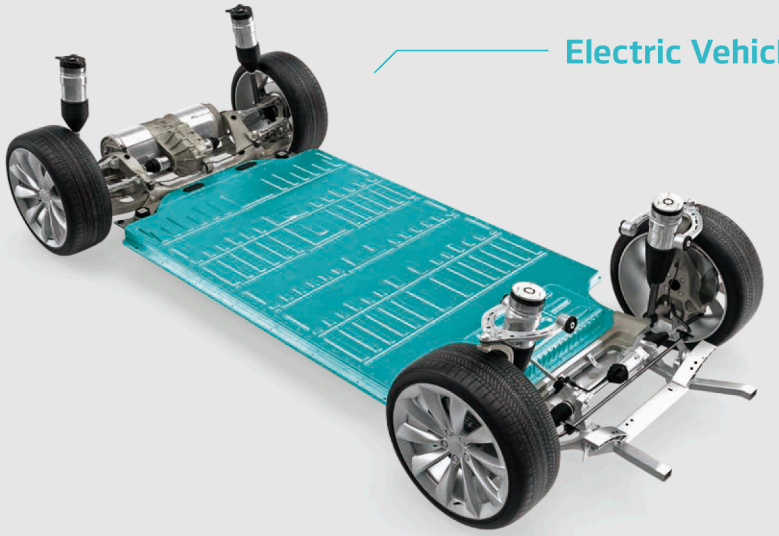
CONTENTS

Why it's essential to have a tire specialized for electric vehicles

Gasoline & Diesel Vehicle



Electric Vehicle



VS

Ultra Low Noise

Wet Grip

Stability

Durability

Anti Static

New High-tech

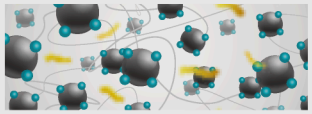
Hankook Electric Mobility Technology

1 Ultra Low Noise

- Silent Foam
- Ultra Low Noise Pattern

2 Wet Grip

- Aqua Pine Technology
  Natural oil mixed Compound
  exclusive for Eletric Vehicle



3 Stability

- Aramid reinforcement belt
  provides improved handling &
  high-speed driving performance

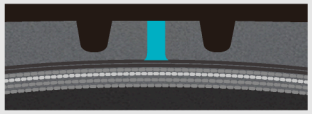
HEM
HANKOOK ELECTRIC MOBILITY
NEW HIGH-TECH

4 Durability

- Reinforced structure supports heavy-load of electric vehicle
- Aramid reinforcement belt,
  Prevention of contact-surface torsion
  and improvement of stiffness

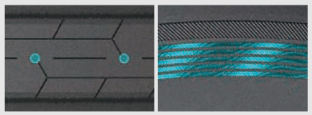
5 Anti Static

- Prevents static discharge by
  grounding the unintended
  electric current



6 Specialized Design for EV

- Interlocking Block Design
- Aerodynamic Sidewall Design

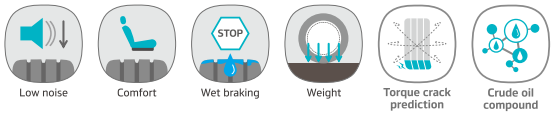


KINERGY AS ev

Electric Mobility Technology

Hankook Tire leads the future mobility trend with tires made specifically for electric vehicles.

Performance & Technology Icon

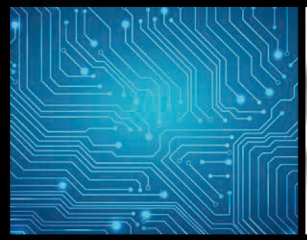


Aqua Pine

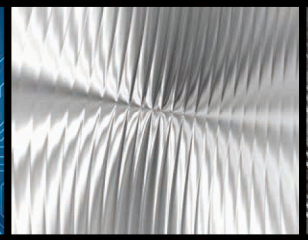
Technical Profile

Speed Symbol: W
Tread Width: 205~235
Series: 40~55
Rim: 16~19

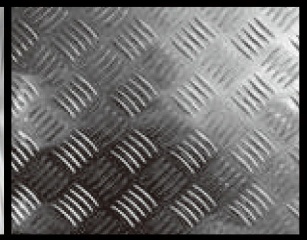
NEW HIGH-TECH & E-BALANCE DESIGN FOR ELECTRIC MOBILITY



EV DNA

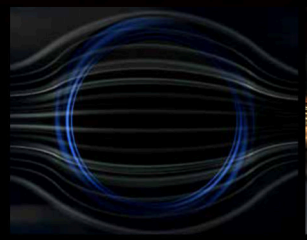


Cutting Edge

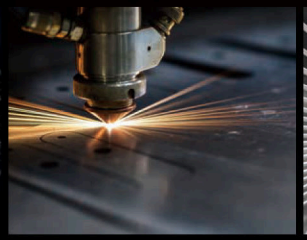


Delicate Geomatric Pattern

NEW HIGH-TECH & E-BALANCE DESIGN FOR ELECTRIC MOBILITY



Intelligent Aerodynamic Design



Laser Carved

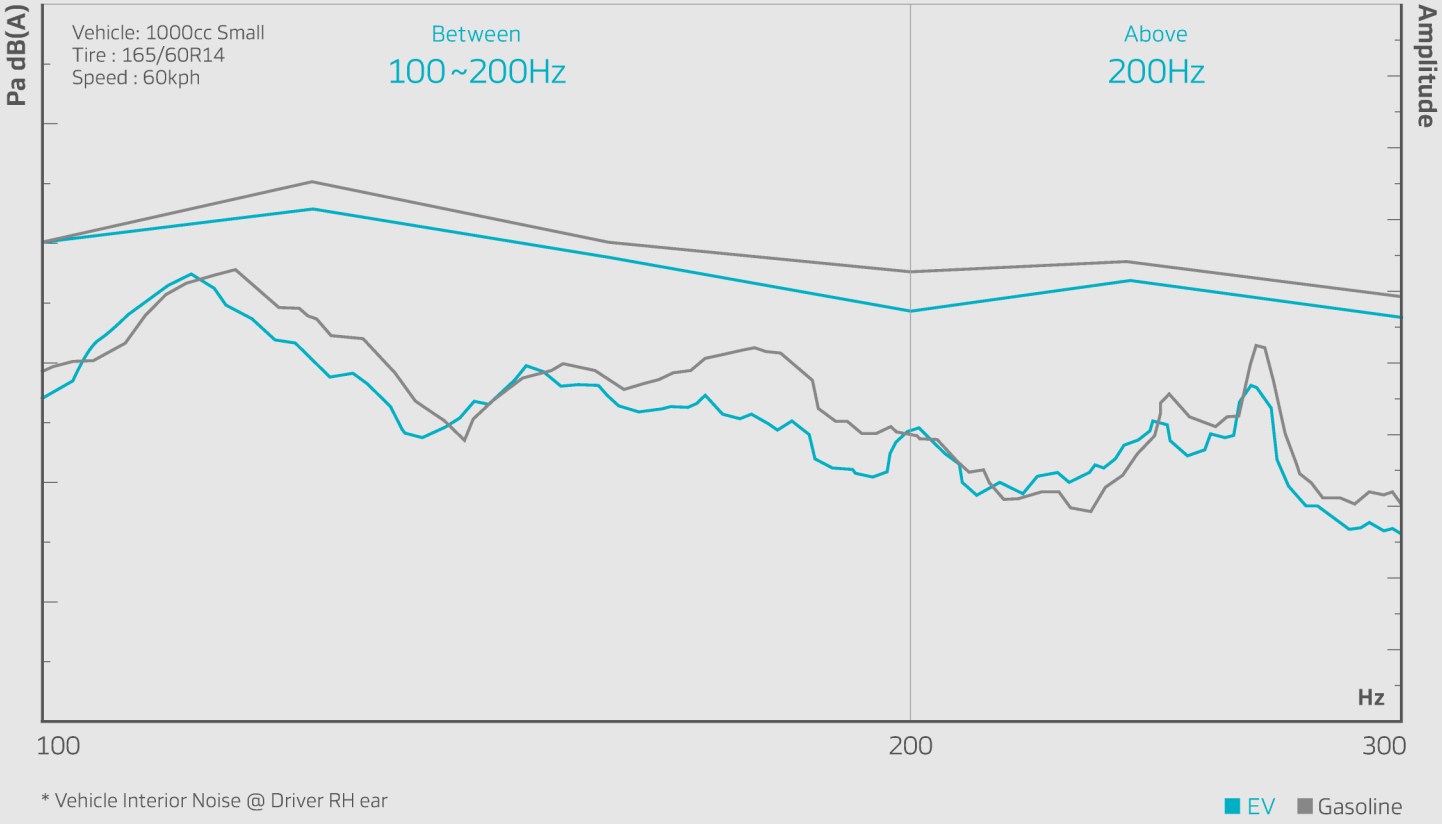
Sophisticated

The Electric Vehicle's engine-less design magnifies noise from the tire and road surface

The low-noise performance of tires is important in providing an improved driving experience.

A Secured the tire's low-noise performance to maintain the comfortable performance of the EV driver

We focused on reducing the frequencies that most humans are sensitive towards, which range between 100 and 200Hz.



* Vehicle Interior Noise @ Driver RH ear

Sound Absorber sound absorber

Noise from the road surface is effectively reduced up to -9.2dB, by applying our sound absorber technology.
Our sound absorber has previously been reserved to our original equipment partnerships with vehicle manufacturers, but is now available to the market on the Kinergy AS EV.

B Silent Foam

Through the new technology of sound absorber, Hankook Tire provides driving conditions of “silence” and “comfortable driving.”

How are the noises absorbed?

Sound Absorber is a new technology that increases ride comfort by reducing cabin noise while driving. This is achieved by adhering a unique polyurethane foam on the surface of the inside of the tire.

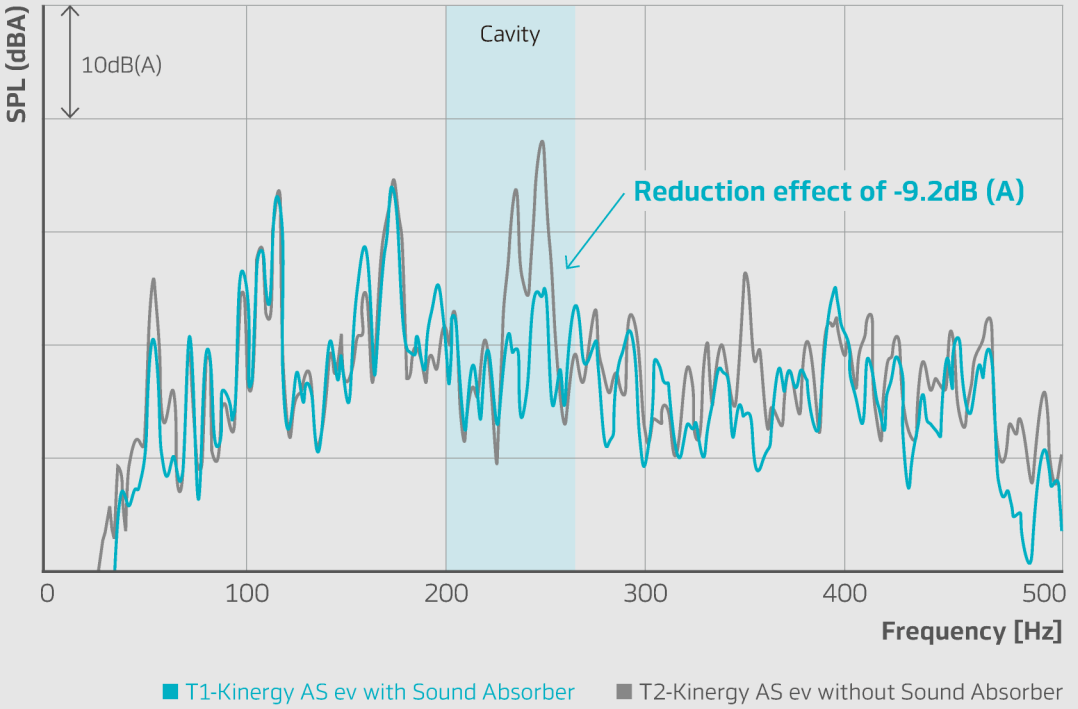
Sound Absorber sound absorber

C Test result of Sound Absorber

Road Noise (resonance)

- Sound Absorber has an effect of maintaining the major performances while improving the road noises that arise from a specific range of audio frequencies.
- When it was tested (205/55R16) while driving, the resonance noise was reduced up to -9.2dB.
- The reduction in resonance noise is affected by various testing conditions such as tires, vehicles, driving speed, and road conditions.

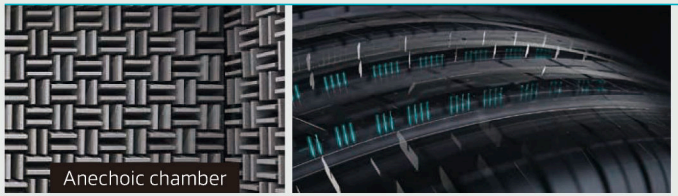
Test results of the Kinergy AS EV implemented with Sound Absorber, in an anechoic chamber



Ultra low noise of the rib and kerf design

The noises at specific frequencies that arise from rotations are offset and reduced through the optimized arrangement of pitches.

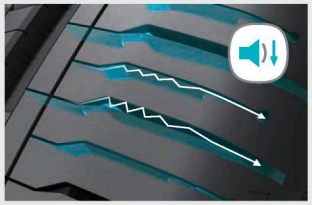
D Noise-reducing grooves applied with the principle of Anechoic Chamber



The groove resonance and pattern noise are dispersed by the application of the 3D-wedge structure based on the principles of anechoic chamber.

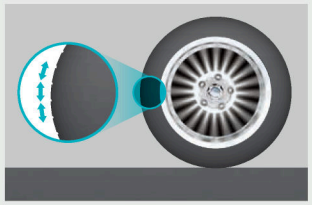
E Reducing pumping noise by shoulder groove

The lateral groove structure that bends and gets wider towards the shoulder cause the lateral groove to contact the ground gradually, which reduces the air pumping noise.



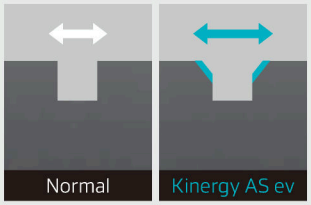
F Optimized pitch design for noise

Through the optimized arrangements of 3 types of pitches (A and B types), the pattern noise is dispersed while securing consistent noise performance before and after throughout the life of the tread.



G Chamfer Groove

By applying Chamfer to the main grooves, the overloading of weight on one side during braking is eased, and the handling performance and the road noise are reduced.



Specialized block design for EV

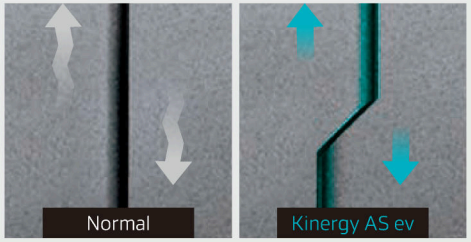
The block design that embodies an electric circuit gives an identity for EV and provide a driving experience of higher quality in various conditions.

H Ultra Stiff Rib Block

The wide, powerful rib shoulder blocks enhance the handling performance when cornering and prevent abnormal wear (heel & toe).

I Interlocking Block

The intersecting arrangement of the Micro Convex Edge minimizes the deformation of blocks and improves the torsion stiffness.

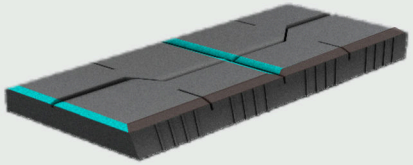


J Dimple Cooling System

Improves the release of the heat accumulated on the side tread within tires from high speed driving.

K Bevel Edge Lateral Groove

Minimizes the deformation of the blocks during braking and provides the best braking power by maintaining the contact surface.



Intelligent Aerodynamic Sidewall Design

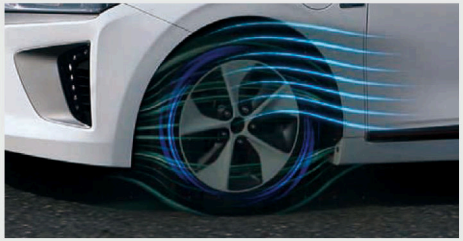
Through Non-Protorsion curved profile design and the side Micro-manufactured using lasers, it provides a specialized side wall design that take aerodynamic characteristics of EV.

L Aerodynamic Sidewall Structure

Non-Protorsion profile design brings smooth flow of air.

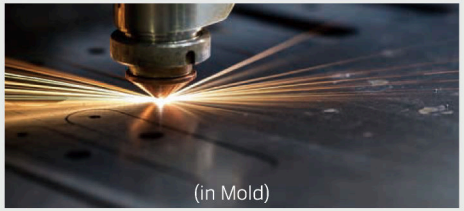
M Aerodynamic Shape

The air resistance is improved by applying the principles of turbulence promoter on the surface of sidewall.



N Ultra Fine Laser Fabrication

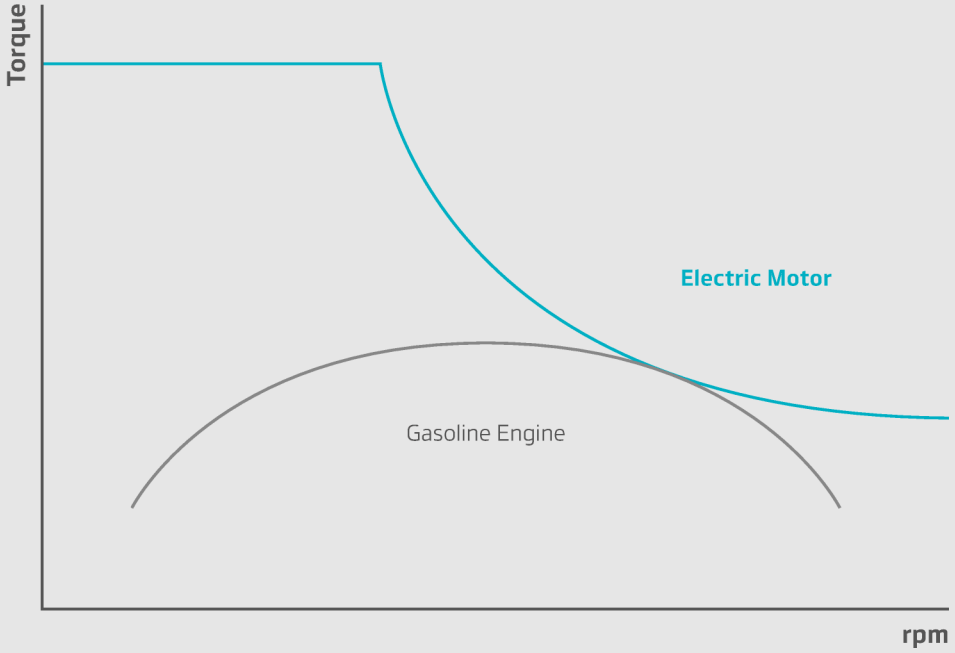
Ultra fine manufactured laser has contributed to the enhanced aerodynamic characteristics and has built the trendy appearance and image as a premium EV product.

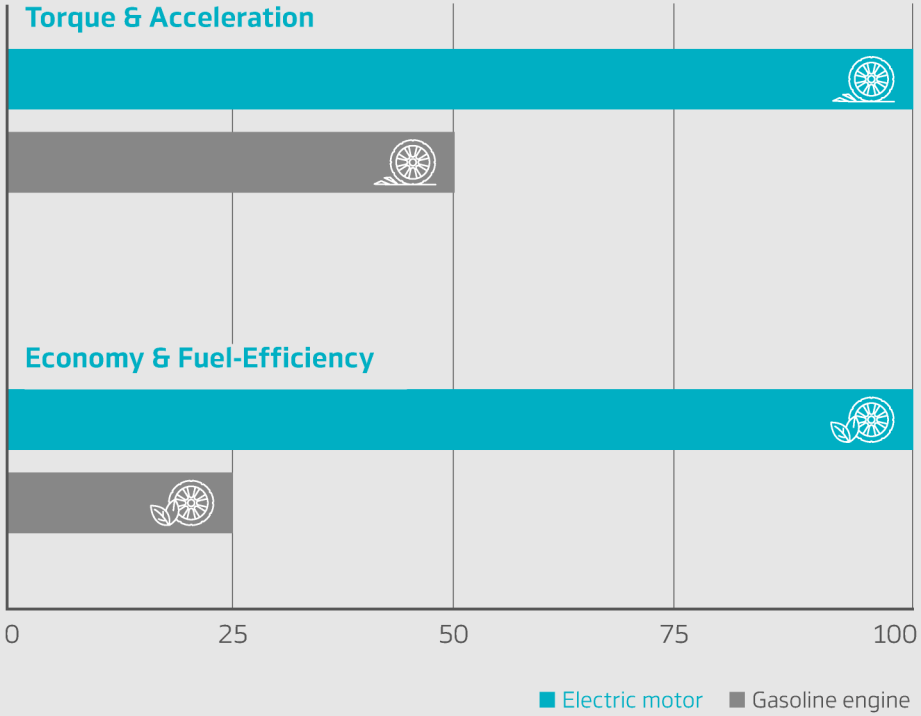


High-performance of electric motors, perfectly fulfilled via driving

The electric motor can provide powerful acceleration. Rapid acceleration can result in slippage and abnormal abrasion.
The Kinergy AS ev was designed to minimize this effect and provide confident traction.

0 Prevention of the tread from stripping that may arise due the maximum torque sustained from the start of the vehicle, and assurance of strong grip force

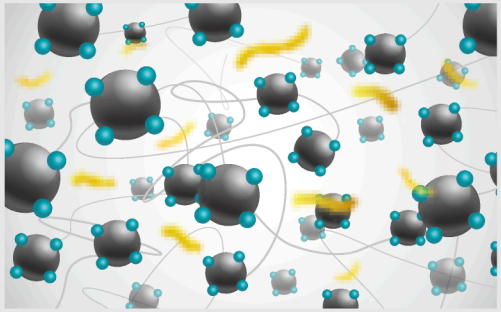




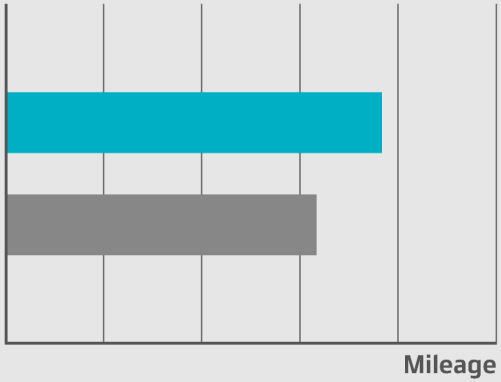
Aqua Pine compound that provides the best grip on wet surface

Aqua Pine

P Aqua Pine Compound

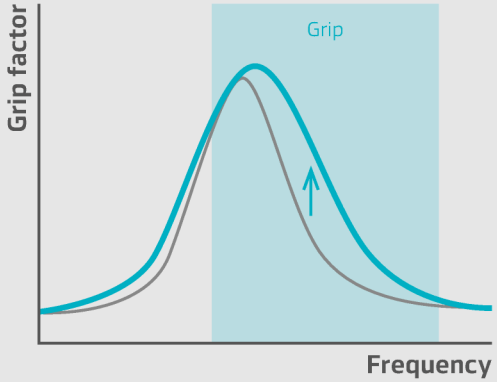


Aqua Pine is a mixture of resin extracted from conifers and environmentally friendly raw materials, such as vegetable oil. Hankook Tire is proud to present this newly upgraded silica compound.

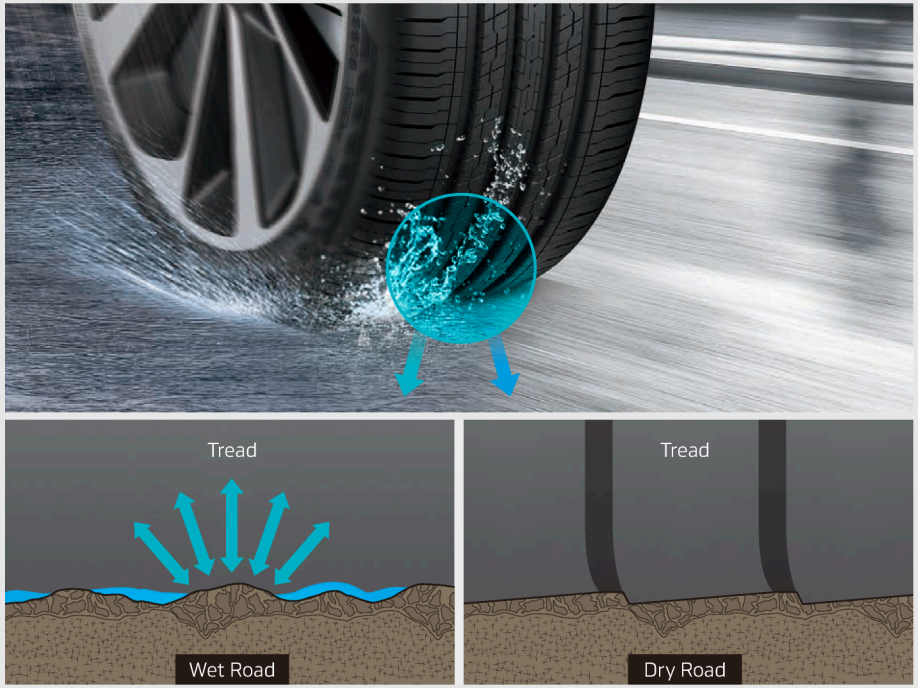


The new compound provides improved tread-wear performance versus existing EV tires.

■ Aqua pine ■ Conventional compound



The technology of the high-concentration of silica and newly added substances maximizes the grip force under different surface conditions and ranges.



Performance on all types of surfaces from wet to dry has been improved through the use of environmentally friendly raw materials.

Highest driving quality brought to life with an Aramid reinforcement belt

Aramid reinforcement belt is applied with the best material that is available for tires today,
to allow an exquisite handling by maintaining the optimized shape of contact surface.

Q Aramid - Strongest fiber on Earth

Para-Aramid, the strongest polymer material

Aramid, a super-fiber that closely resembles the theoretical property of matter in terms of chemical structure, is a high-performance materials in which most of its production on Earth is used in high-technology industries such as military, aircraft, aerospace, and marine. It has 5 times more strength than iron steel.
Also, except for in 99% sulfur substance, it has the chemical resistance that can withstand all chemical substances without dissolving or decomposing, and the stability that prevent melting at high temperatures and only carbonize at temperature over 500°C.

* Aramid fiber image by KOLON Industries

Technology for handling

R Aramid Hybrid Cord

Prevents the increase diameter of the tire due to the centrifugal force while driving, and minimizes the tread deformation due to lateral force from changing directions. Provides a neutral handling and motion performance under various driving conditions. It improves the handling stability and high-speed driving performance, and contributes to the minimization of abnormal and one-sided wear as well as the improvement of heavy-load capacity.

Aramid in Tire

Wet and dry condition

All sizes were applied to the optimized ground contact pressure and XL (extra load)

Optimum surface contact is maintained under various driving conditions, such as acceleration, turning, and deceleration of electric vehicles.
It also secures the improved heavy-load capacity for the load index of XL (extra load) in SL (standard load).

S Application of an increased allowable load of XL (extra load)

	Standard Load	Extra Load
Load Index	91	95
Allowable load	615kg 1,355lbs	690kg 1,521lbs 75kg 165lbs

· 215/50R17 size as reference

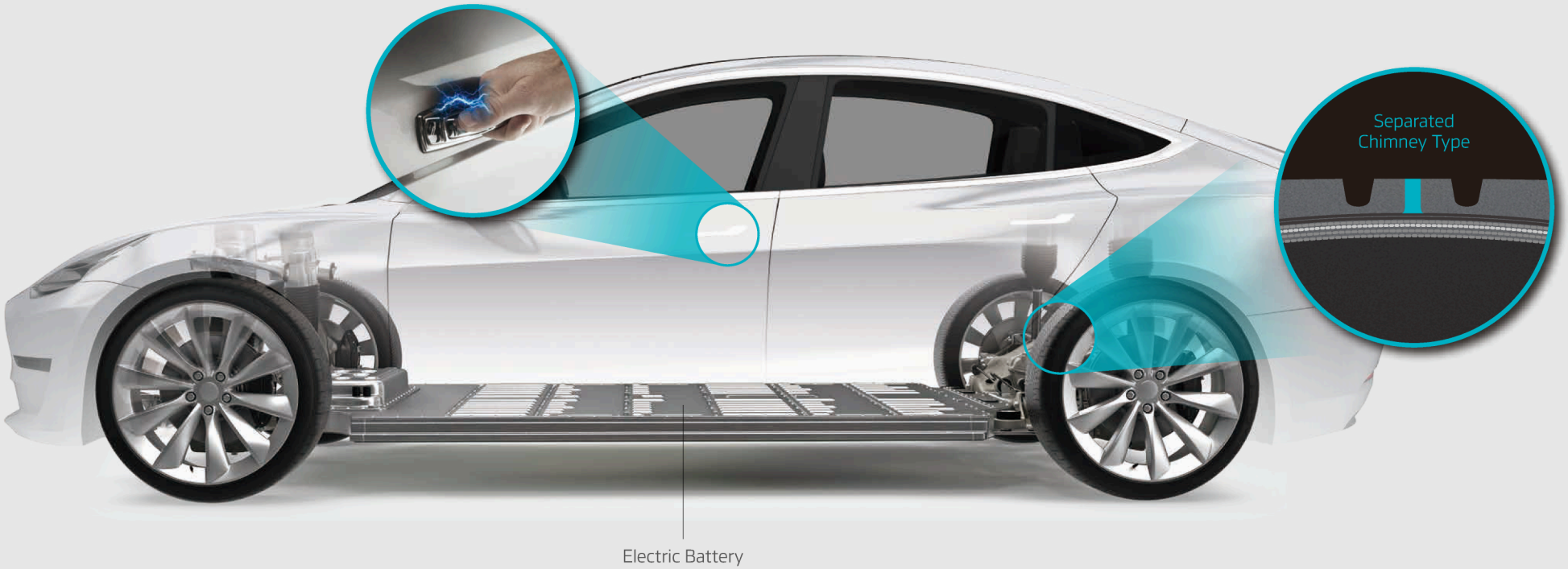
· 300kg/661lbs difference when applied to all four tires
(75kg/165lbs difference by each tire)

Anti Static

Static charge is released by ground contact through the use of a specialized chimney-like structure in the tread, which allows for optimum electrical resistance.

T Chimney rubber structure

Contributes to the safe and pleasant EV driving by preventing the build-up of static charge, which is a prevalent issue in electric vehicles with high-capacity batteries that require charging.



Tire Structure

Tread Compound

Aqua Pine is comprised of raw materials, such as conifer resin and vegetable oil, which is mixed together with advanced technologies to increase durability, stability, and wet performance.

Application of High Strength Steel Belt Wire

Using high-strength belts that perfectly absorb external shock, durability of the tire and riding comfort have been improved.

Aramid Hybrid Reinforcement Belt

Tire strength has been increased to respond to high level of initial output and initial acceleration.

Dual Layer Fiber Stiffener

With the dual structure of carcass fiber stiffener, the tire hardness is structurally assured.

Folded Belt Edge Tape

Endurance of the belt has been enhanced.

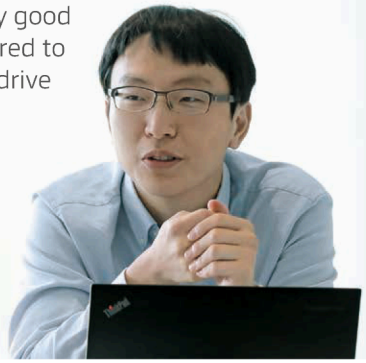
Strong Jointless Bead Wire

By increasing the binding force between the wheel and the joint, even with high initial acceleration.

KINERGY AS ev User Review

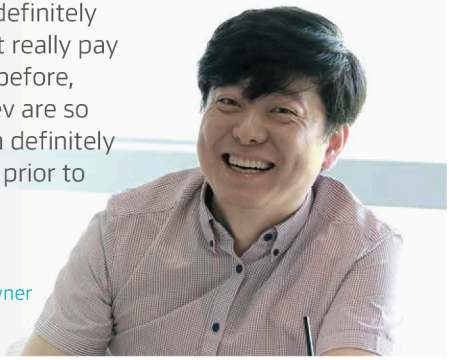
Its performance is very good on wet surface compared to the original, and I can drive with ease.

Hee-won Jeong
The first user of Ionic EV,
Physician



The interior noise has definitely decreased a lot. I didn't really pay attention to the noise before, but these Kinergy AS ev are so much quieter that I can definitely tell it was much louder prior to changing them.

Yong-won Han
Ionic EV, Private academy owner



The grip on wet surface is so great that I can drive without a single worry. I am very satisfied with the grip, braking, and handling.

Chang-ho Lee
Ionic EV, Physician

The back pain I used to have from long drives has disappeared. Both the braking and Cornering are felt great I should find some flaws in them, but it's not easy.

Joo-yeon Jeong
Ionic EV, Businessman

I am completely stunned with its combination of silence, traction, and comfort. I love these tires!

Woo-cheol Jeong
Ionic EV, Researcher

Noise is considerably reduced, and there is an innovative change in the driving quality with the smooth filtering of the surface impact it is what I'm most satisfied with.

Min-sik Kim
Bolt EV, Financial specialist

Ultra Low Noise | **Wet Grip** | **Stability** | **Durability** | **Anti Static** | **New High-tech**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driving emotion