



อุตสาหกรรมยางล้อไทยควรปรับตัวอย่างไร กับการมาของรถไฟฟ้า

13th NSTDA Annual Conference
การประชุมประจำปี NSTDA
NSTDA Annual Conference
การประชุมประจำปี NSTDA



Hybrid Vehicles

BMW i8



Front Tire Size

P215/45YR20

Rear Tire Size

P245/40YR20

Audi A3 e-tron Sportback

Tire size of P225/45HR17



Toyota Prius Prime



Tire size of P195/65SR15

Hyundai Ioniq



Tire size of P195/65HR15

Ford C-Max

Tire size of P225/50VR17



Lexus CT200h



Tire size of P215/45VR17

Honda CR-Z



Tire size of P195/55VR16



MODELS	TYPE	TIRE SIZE
BMW i8	Hybrid Vehicles	P215/45YR20
Audi A3 e-tron Sportback	Hybrid Vehicles	P225/45HR17
Toyota Prius Prime	Hybrid Vehicles	P195/65SR15
Hyundai Ioniq	Hybrid Vehicles	P195/65HR15
Ford C-Max	Hybrid Vehicles	P225/50VR17
Lexus CT200h	Hybrid Vehicles	P215/45VR17
Honda CR-Z	Hybrid Vehicles	P195/55VR16

ELECTRIC VEHICLES



TESLA MODEL X



Tire size of 255/45 R20

TESLA MODEL S



Tire size of P245/45YR19

TESLA MODEL 3



Tire size of 235/35 R20

Honda Clarity



- Diameters: 15.0" - 17.0"
- Width (mm): 205 - 235
- Tire aspect ratio (%): 50 - 70
- Smallest tire size: 205/70R15
- Largest tire size: 235/50R17

Ford Focus Electric



Tire size of P225/50HR17

Mercedes-Benz B-class Electric Drive



Tire size of P225/50HR17

Hyundai Tucson Fuel Cell



Tire size of P225/60R17

Kia Soul EV



Tire size of P205/60HR16

Toyota Mirai



Tire size of P215/55R17

Volkswagen e-Golf



Tire size of P205/55HR16

BMW i3

Tire size of P155/70R19



Chevrolet Bolt EV

Tire size of P215/50R17



Fiat 500E



Tire size of P185/55R15

Mitsubishi i-MiEV



Tire size of P145/65HR15

Nissan Leaf

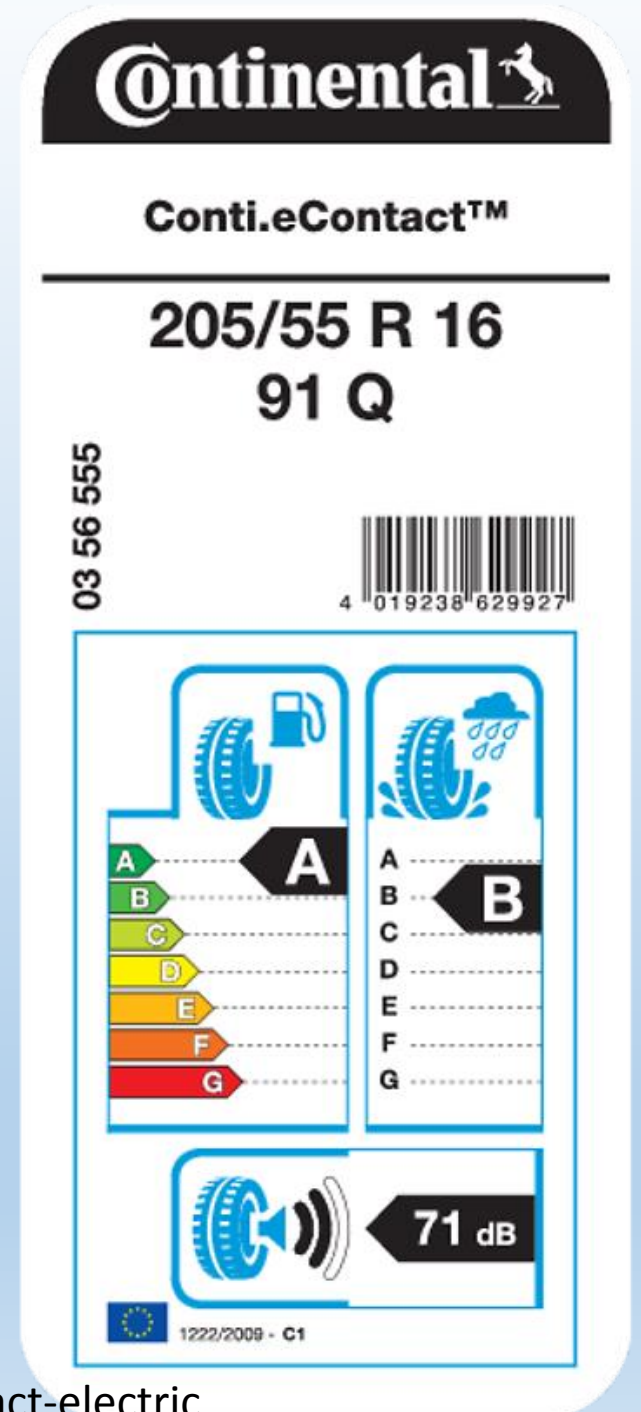


Tire size of P205/55HR16

MODELS	TYPE	TIRE SIZE
TESLA MODEL X	ELECTRIC VEHICLES	P255/45R20
TESLA MODEL S	ELECTRIC VEHICLES	P245/45YR19
TESLA MODEL 3	ELECTRIC VEHICLES	P235/35R20
Honda Clarity	ELECTRIC VEHICLES	P205/70R15
Ford Focus Electric	ELECTRIC VEHICLES	P225/50HR17
Mercedes-Benz B-class Electric Drive	ELECTRIC VEHICLES	P225/50HR17
Hyundai Tucson Fuel Cell	ELECTRIC VEHICLES	P225/60R17
Kia Soul EV	ELECTRIC VEHICLES	P205/60HR16
Toyota Mirai	ELECTRIC VEHICLES	P215/55R17
Nissan Leaf	ELECTRIC VEHICLES	P205/55HR16
BMW i3	ELECTRIC VEHICLES	P155/70R19
Chevrolet Bolt EV	ELECTRIC VEHICLES	P215/50R17
Fiat 500E	ELECTRIC VEHICLES	P185/55R15
Mitsubishi i-MiEV	ELECTRIC VEHICLES	P145/65HR15
Volkswagen e-Golf	ELECTRIC VEHICLES	P205/55HR16

EU Tyre Label

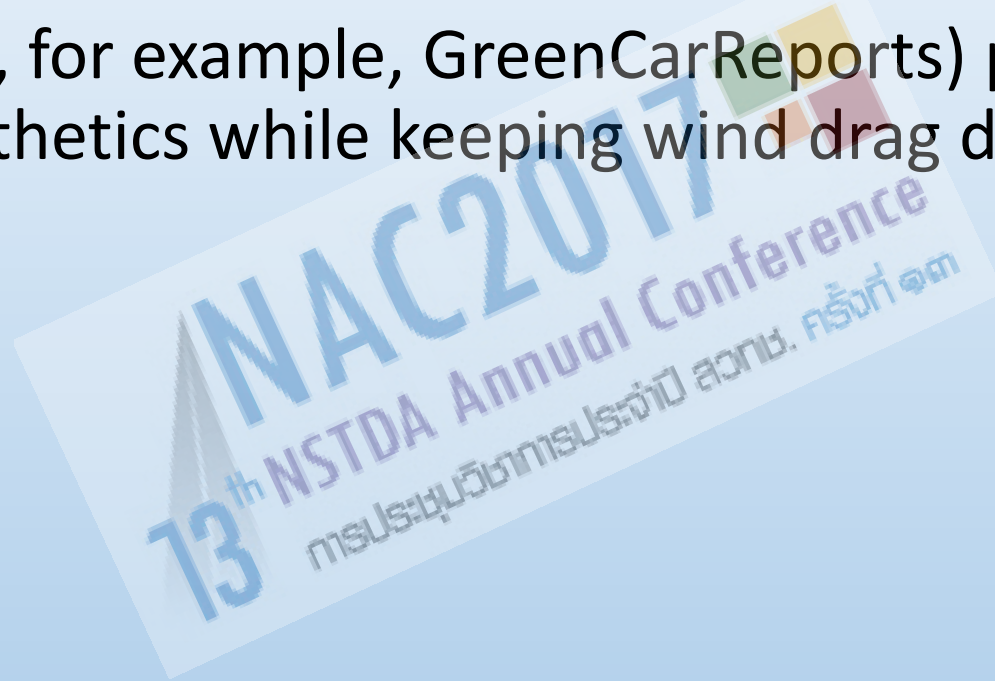
- EU Tyre Label values vary by the tyre size. The label values for additional tyre sizes are shown in the product range below to find the EU Tyre Label values for your size.



There are many factors that affect the rolling resistance of wheels but these are the main ones for our purposes:

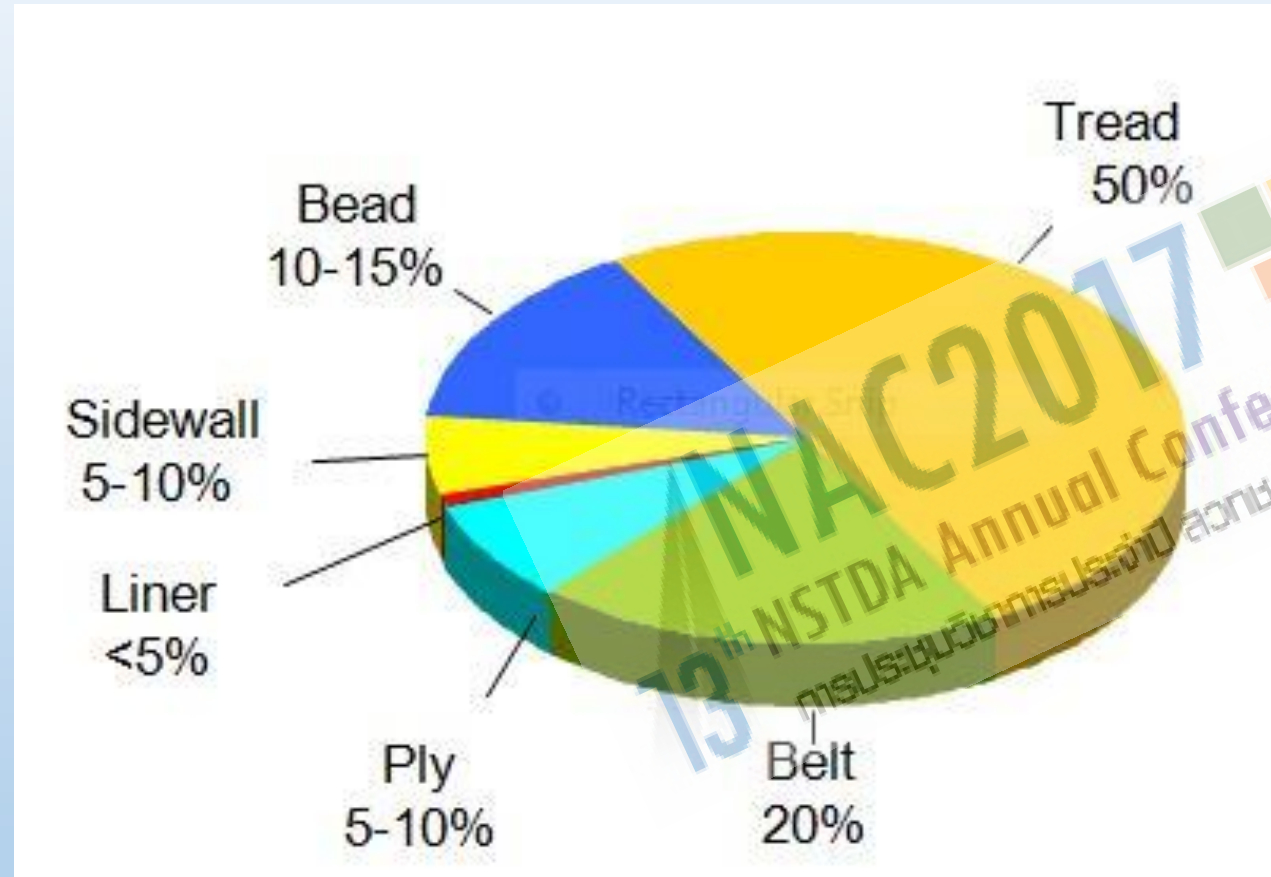
- Wheel radius: The lower the radius the smaller the area exposed to wind drag, plus also the wheel weight is typically reduced.
- Wheel width: As radius.
- Tyre resistance: The design and materials used in the tyre affect how much rolling resistance it has – this can be reduced significantly but there is a compromise with low resistance resulting in low grip and therefore potentially reduced safety.

- Electric cars are typically seen with small wheels and tyres because of the first two factors – however this does impact the look of them. In recent years there has been a move towards taller but narrow wheels (see, for example, GreenCarReports) presumably as a way to improve aesthetics while keeping wind drag down



	TOTAL	TIRE SHARE
Rolling Resistance	16%	16%
Air Resistance	36%	4,5%
Internal Friction	32%	-
Inertial Resistance (acceleration / braking)	16%	0,4%
Total	100%	20,9%

Rolling Resistance effect on a tyre



Michelin Energy Saver Plus

SIZE

175/65 R14

185/55 R15

185/65 R15

195/60 R15

195/65 R15

205/55 R16



Michelin Energy Saver Plus



Continental

The Future in Motion



Product Range

125/80	R	13	65	M
145/80	R	13	75	M
205/55	R	16	91	Q

Continental

Reduced rolling resistance for highest mileage.

The Conti.eContact features a completely new design which offers optimised rolling resistance and reduced fuel consumption

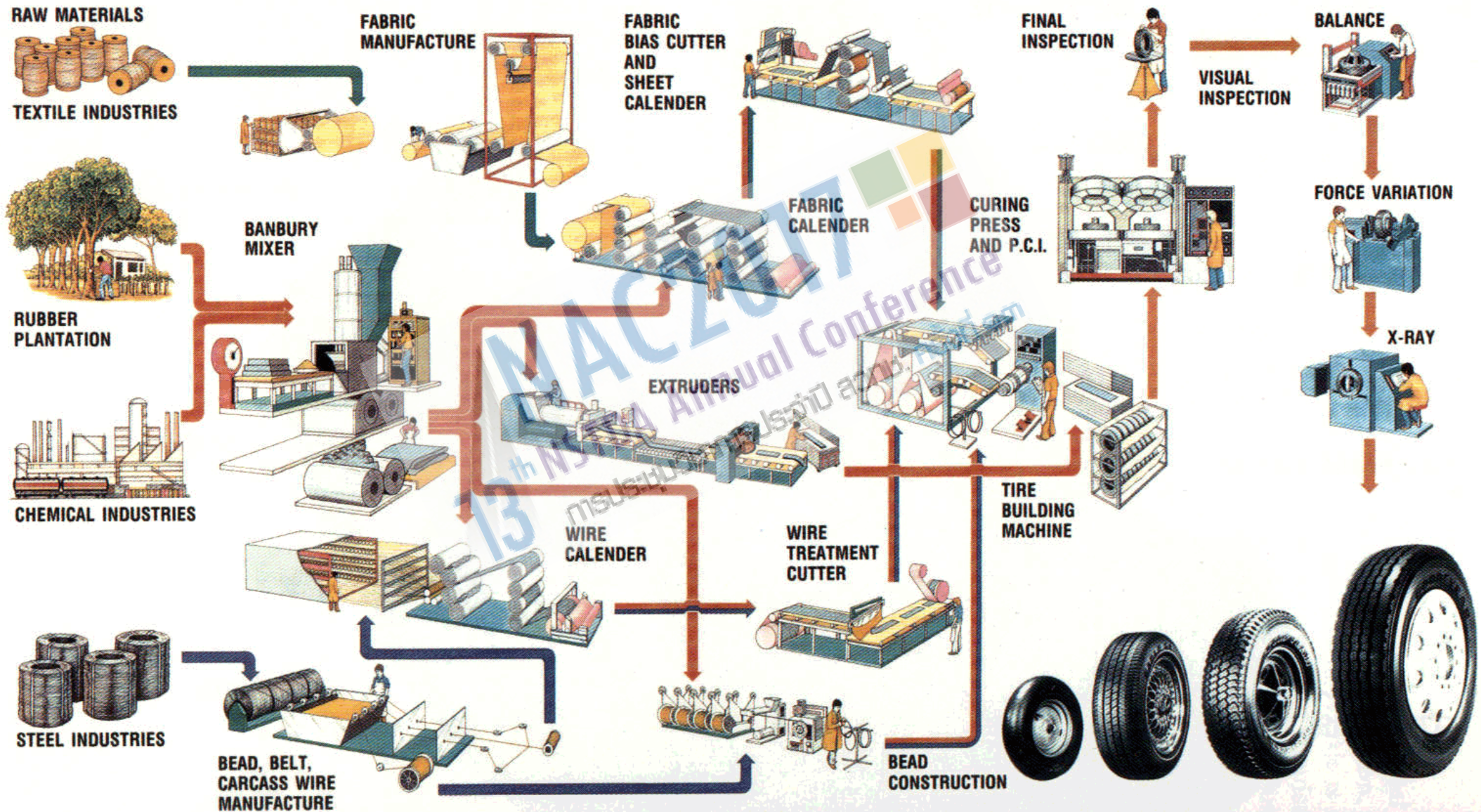


Aerodynamic sidewall design.

The sidewall's aerodynamically optimised design reduces fuel consumption.



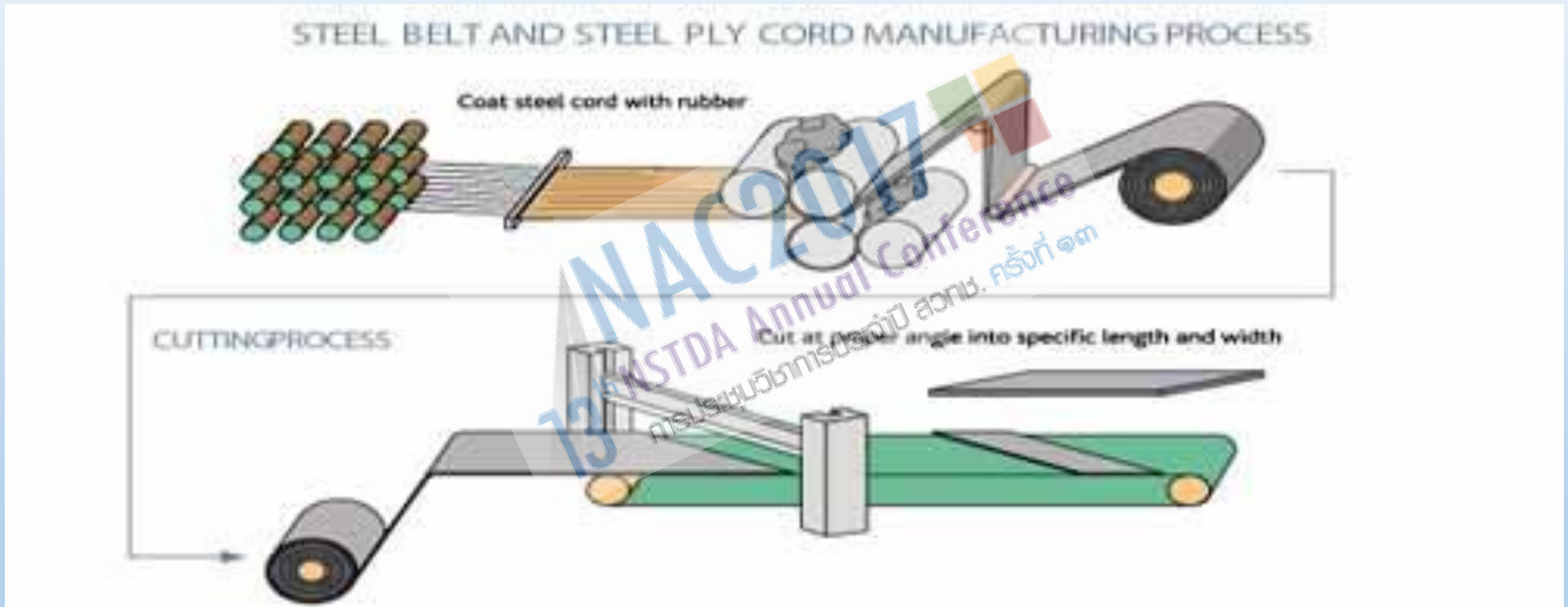
Tyre Manufacturing Process



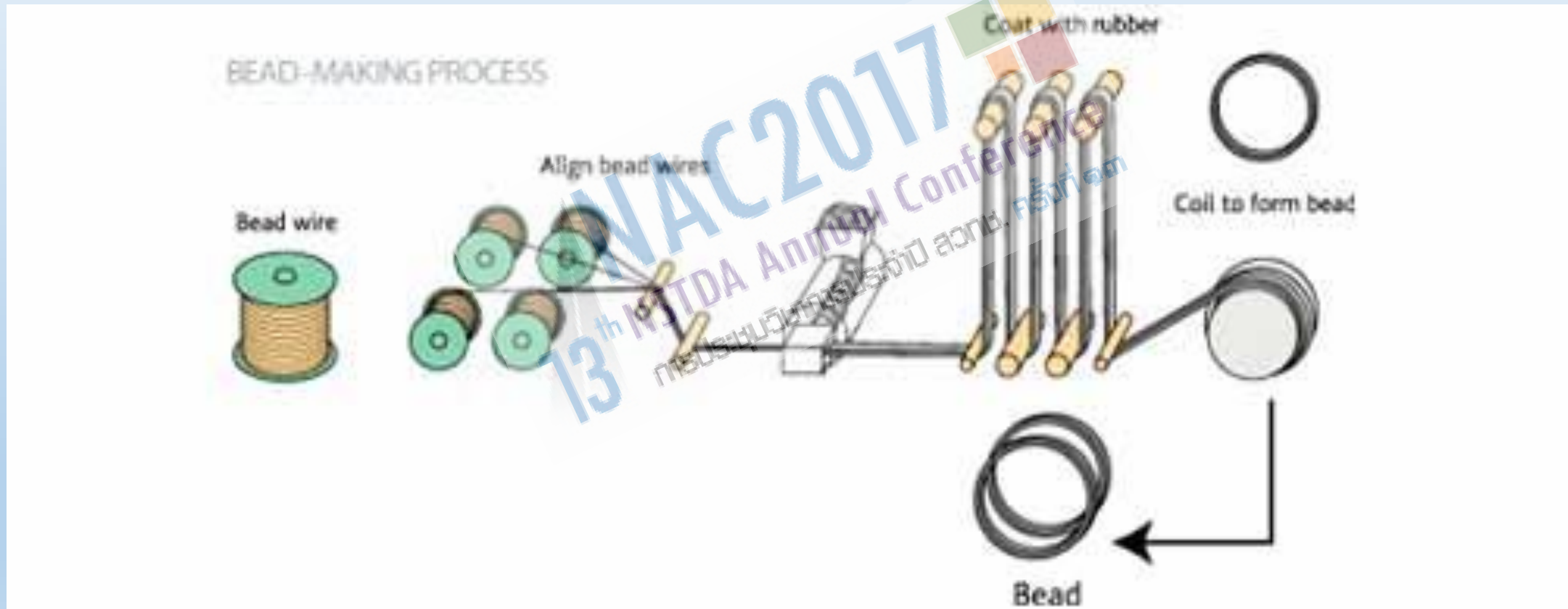
1. Mixing Process.



2. Steel Belt and Steel Ply Cord Manufacturing Process.



3. Bead Making Process.



4. Tread Extruding Process.



5. Tyre Building



6. Vulcanizing

Green tyres are vulcanized in curing presses. The high steam pressure conducted into the curing pad inside the curing press presses the elastic green tyre against the tread pattern and side texts inside the moulds, giving the tyre its final appearance



Mixing Process

Rolling Resistance compound

- Material
 - New polymer
 - Fiber rubber
 - New carbon for rolling resistance
 - Silica
- Machine
 - Intermeshing machine
 - New generation of banbury, new design rotors
 - Automated mixing process

COMPONENT PROCESS

- Material
 - Light weight material such as :
aramid, carbon fiber, Kevlar, composite fiber, composite material, etc.
- Machine
 - Automated machine such as :
Robots, AGVs (automated guiding vehicles), automated cranes
 - Niche and vary process machine such as :
machine can be flexible and produce smaller amounts

Research and Development

- Compound Design
 - New compound for rolling resistance and wet grip
 - New compound for new material composite
- Tyre Design
 - New tread pattern design
 - New tyre construction design
 - New sizes of tyres
- Testing
 - Rolling resistance testing
 - Wet grip testing
 - Noise testing



TWEEL TIRE

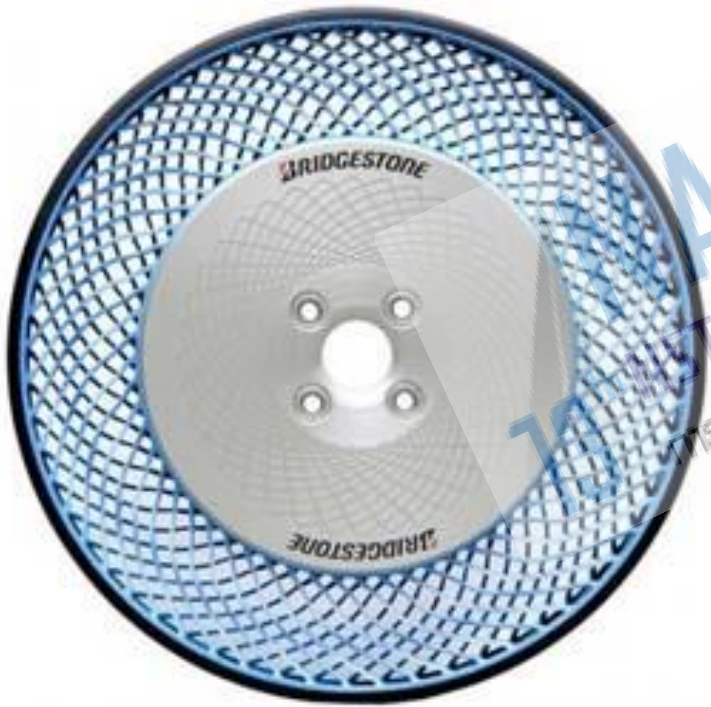


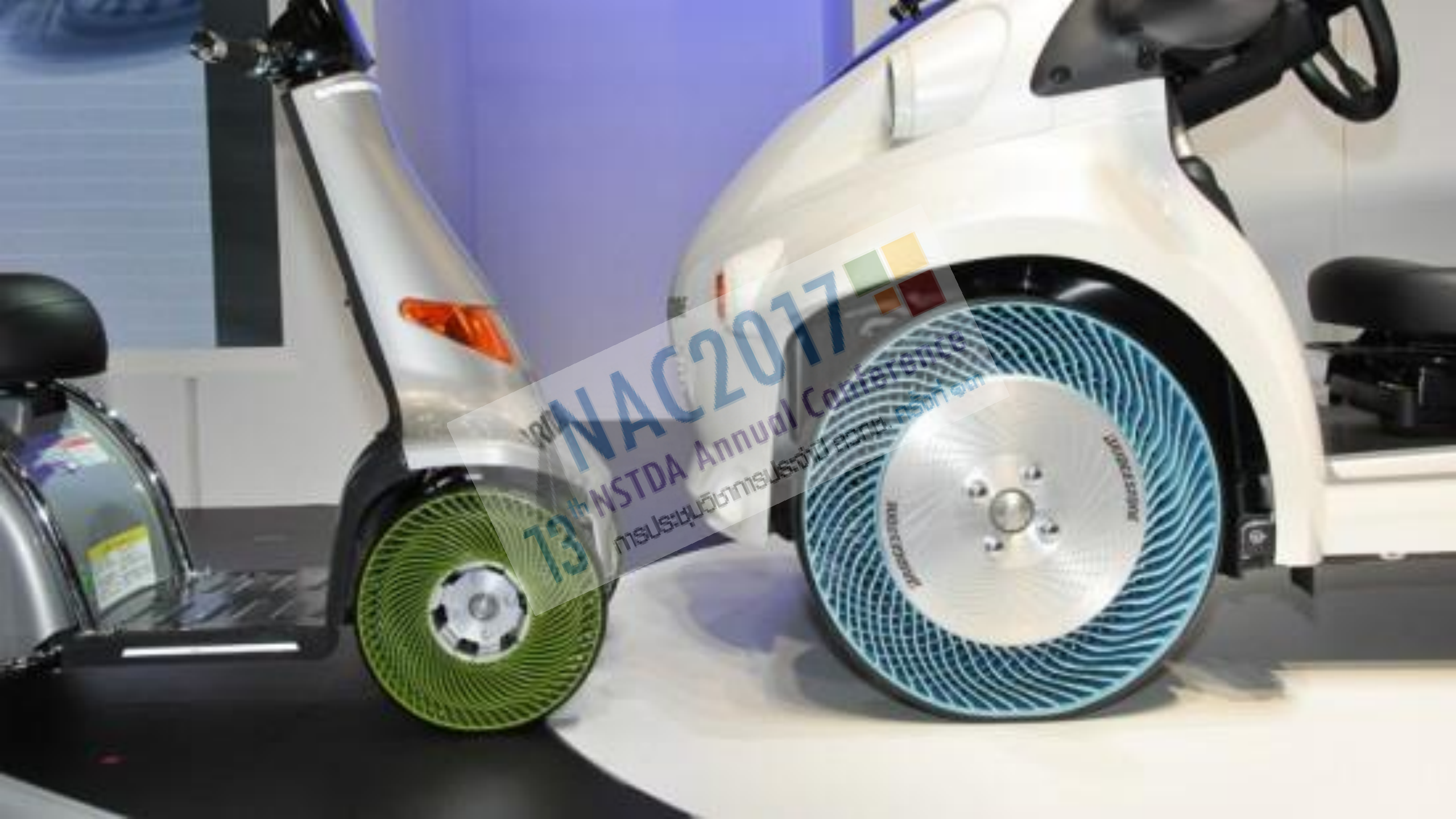
MSPN	Mower Deck	Wheel Offset	Max Load	Max Speed	Section Width	O.D.	Rolling Circum.	Rev/ Mile	Static Loaded Radius (700 lbs)	Contact Area (in²)	Tread Depth (32nds)	Undertread (32nds)	Weight (lbs.)
34682	54" / 60"	-0.75"	750 lbs.	16 mph	10.7"	23.4"	70.4"	900	11.0"	41.5	12	4	47.7
42568	72"	-2.2"	750 lbs.	16 mph	10.7"	23.4"	70.4"	900	11.0"	41.5	12	4	48.2

NOTE: Product measurements are subject to change and are listed here for your convenience. Please see your MICHELIN representative for up-to-date data.



Bridgestone reveals second generation air-free concept tyre





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Hankook Tire



Goodyear BH-03



The Goodyear Eagle-360



DRONE



23:58:20

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THANK YOU

