

# Electrification Strategy Briefing

TSE Prime: 5991

NHK Spring Co., Ltd.

September 9, 2024



# 1

1. Electrification Strategy
2. Overview of Atsugi Plant



**Overall**

**Inverter  
Converter**

**Battery**

**EV-shift to explore NHK Spring's future  
To discover and develop essential components**

**Powertrain:  
e-Axle**

**Chassis**

**TMS  
Thermal  
Management  
System**

**ECU  
Electric  
Control Unit**



# Products Related to Electrification

**Heat management  
Leaf springs for  
holding**  
Springs press  
semiconductor devices on a  
heat sink.



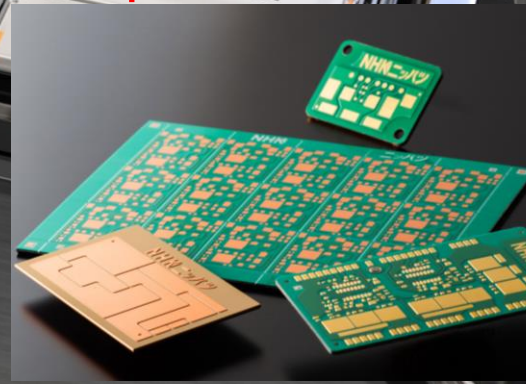
**Motor**

**Battery**

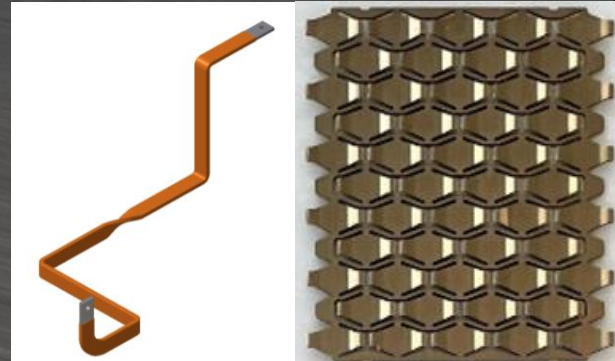
**Inverter**



**Motor cores**  
Core of driving motor for  
EVs.  
Magnetic iron core of  
motor rotor/stator.



**Integrated Metal  
Substrates for  
inverter**  
Key parts for heat  
dissipation.  
To support electrification of  
vehicles.



**Products for  
large currents**  
Products taking  
advantage of precision  
springs for EVs.



# Strengths

Analysis, trial production, evaluation/verification, and mass-production

Support R&D

Trust and proven track record

Mass-production of motor cores since 2010  
Mass-production of IMS since 1986

One Quality & One Standard

One quality

General component manufacturer

Prior investment in new plants and manufacturing equipment and financial strength

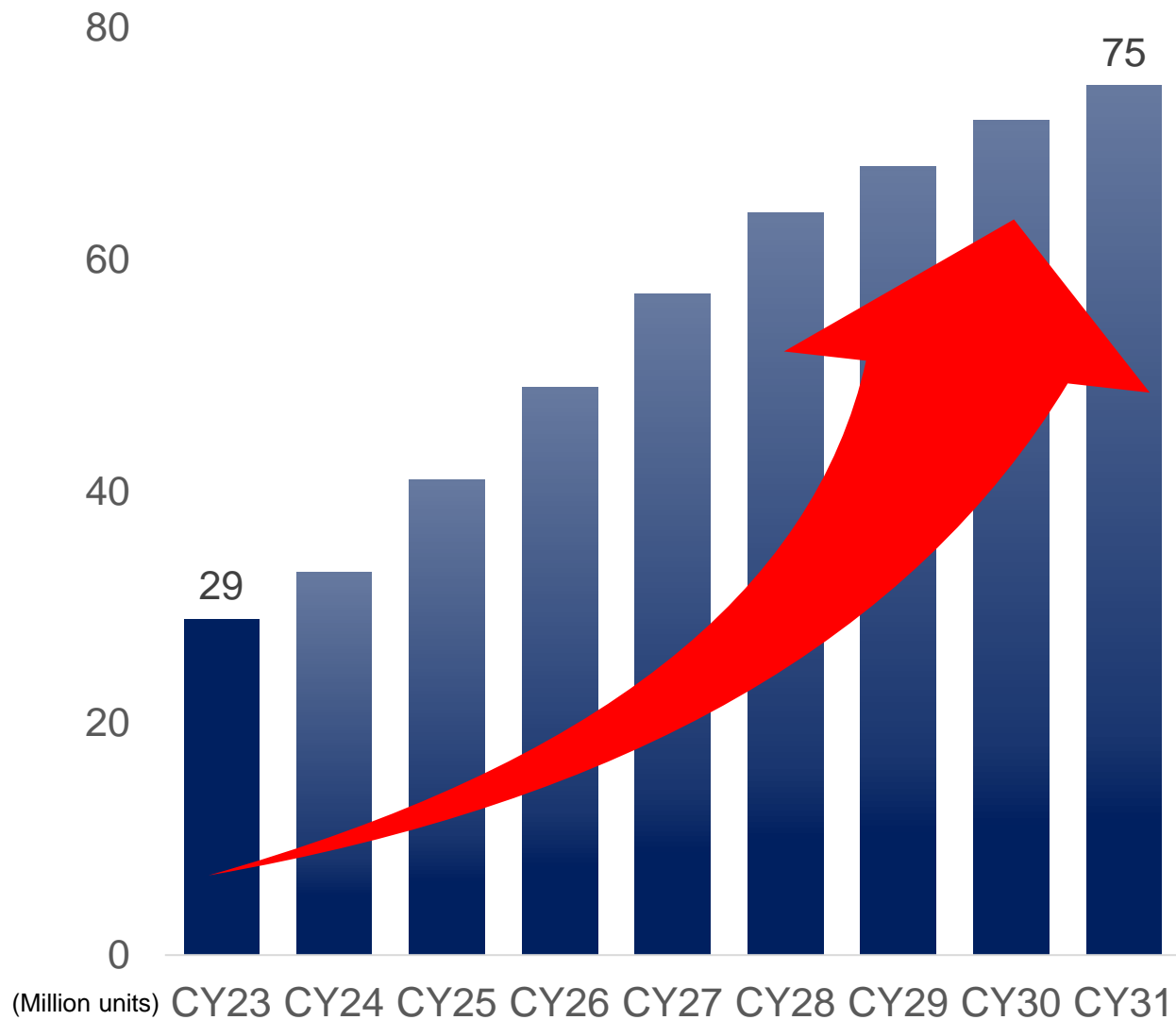
Japan, China, North and Central America, Malaysia, Thailand, India, Indonesia, and Europe

Global manufacturing sites

Core competence

Mold technology and in-house mold production capacity based on precision parts  
Bonding technology and original high heat-dissipation insulation layer

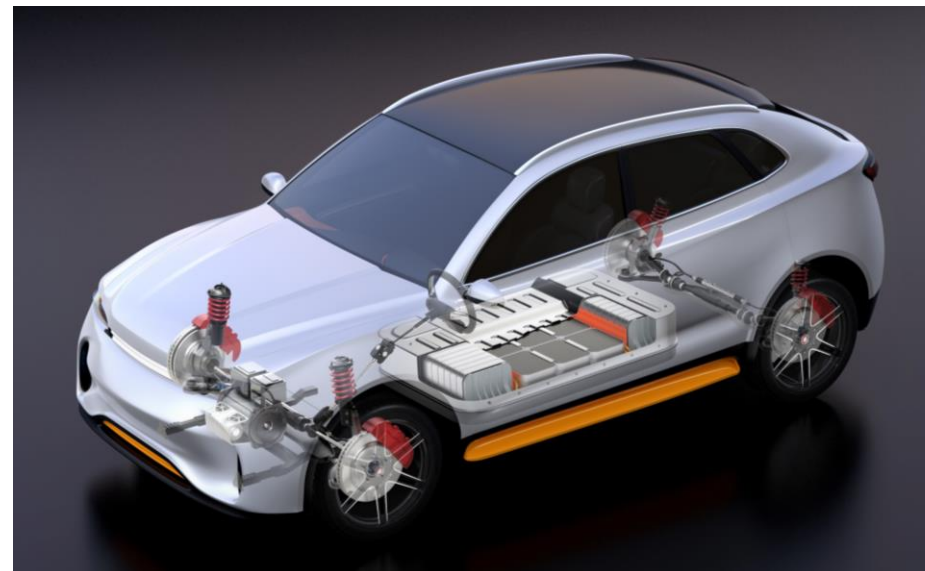
# xEV Market



xEV industry  
Increase in global production  
volume

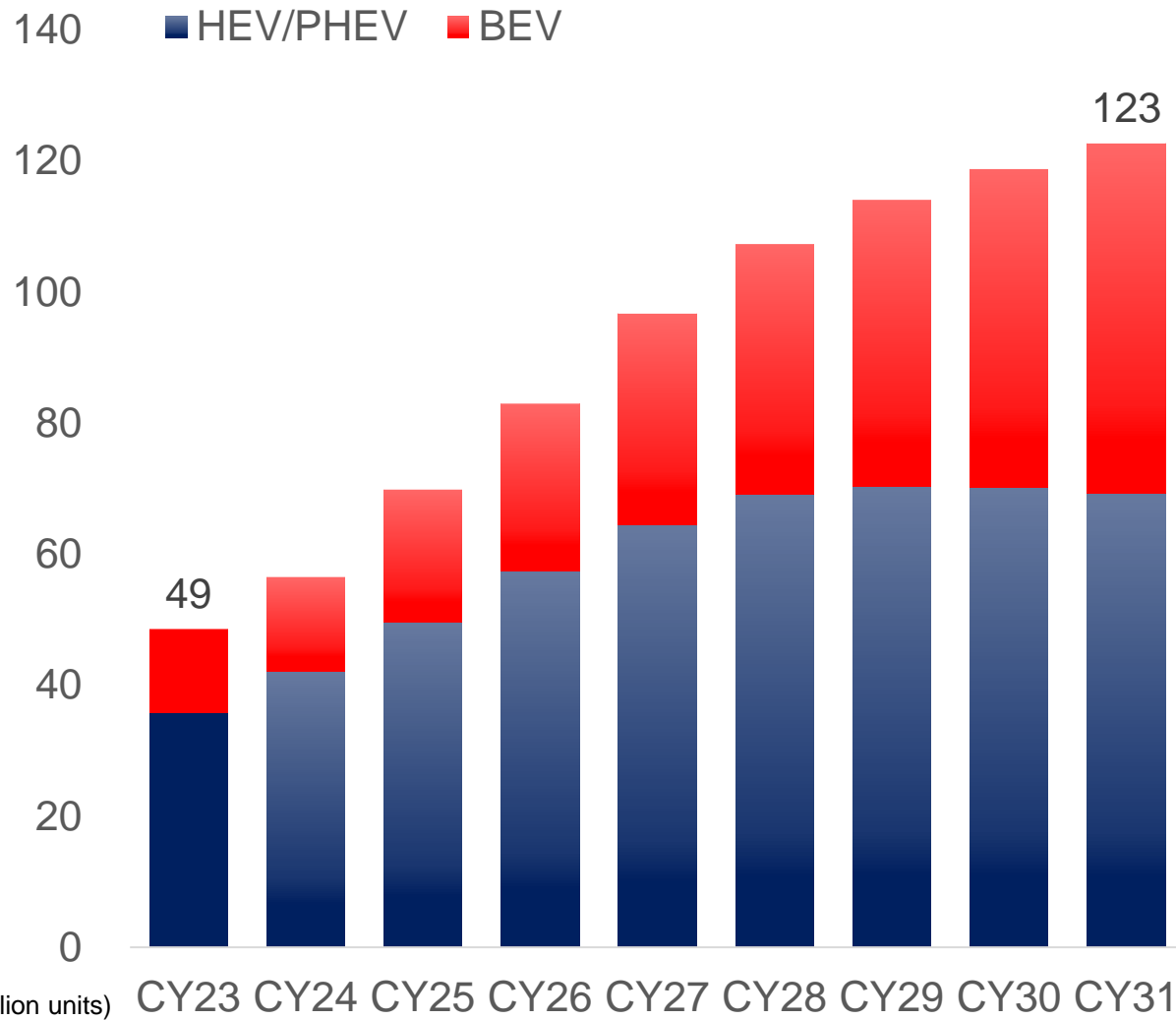
## 2.6-fold increase

(Compared to 2023)





# xEV Market (Number of motors)



A slowdown of the EV-shift increases the HEV/PHEV ratio  
No change in motor production volume

Effect factors: environmental restrictions, presidential election in the U.S., and battery resources and costs



# Capital Expenditures Motor Cores



**2024**  
Expansion of mass-production capacity  
Additional four lines in Building-6 of Atsugi Plant

**2024**  
Enhancement of development and prototyping lines



**2025**  
Additional new plant in Mexico

**2026**  
Enhancement of production capacity  
Planning to deploy 18 lines

**2027**  
Establishment of prototyping system (planned)



# Capital Expenditures Integrated Metal Substrates



**2026**  
New building of  
Komagane Plant  
starts operation

**2027**  
Added capacity at  
Malaysia Plant

**2026**  
Added capacity at  
Komagane Plant  
and Malaysia Plant

**2027**  
Production  
capacity  
626,900 m<sup>2</sup>

**2024**  
New building of  
Malaysia Plant  
starts operation

**2026**  
Production  
capacity  
482,800 m<sup>2</sup>

**2024**  
Production  
capacity  
332,500 m<sup>2</sup>

**2023**  
Production  
capacity  
278,400 m<sup>2</sup>

# Long-term Sales Target Motor Cores

Growth period

Expansion period

Maturity period

**Infrastructure development**  
Building a foundation for business expansion and production technology

**Expansion**  
Expansion of Motor Core business in three global locations  
Creating originality

**Establish originality**  
Aiming for industry standardization  
→ Game change

500  
400  
300  
200  
100  
0

120

200

300

500

100 million yen FY2023 (Actual results)

FY2026 (Target)

FY2030 (Target)

FY2035 (Target)



# Long-term Sales Target IMS

Growth period

Expansion period

## Develop foundation

High heat-dissipation key parts for customers' specifications

## Expansion

Establishing own global business environment  
Expand Komagane and Malaysia Plants

## Create technology unique to NHK Spring

Create NHK Spring's original next-generation substrates

400

300

200

100

0

85

180

390

(100 million yen)

FY2023 (Actual results)

FY2026 (Target)

FY2030 (Target)

# 2

1. Electrification Strategy
- 2. Overview of Atsugi Plant**

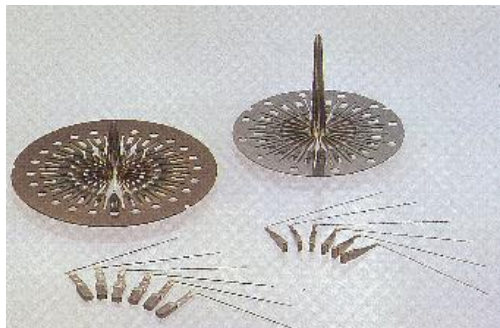


# Outline of Atsugi Plant



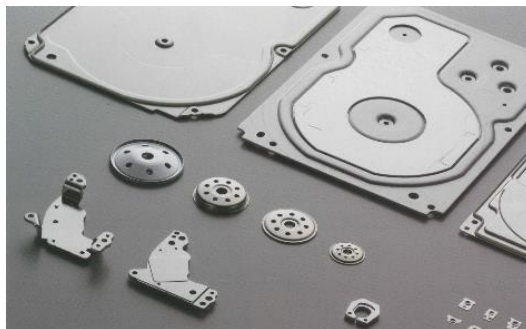
<b>Start of operation</b>	<b>1970</b>
<b>Site area</b>	<b>32,273 m<sup>2</sup></b>
<b>Building area</b>	<b>13,311 m<sup>2</sup></b>
<b>Total floor area</b>	<b>25,028 m<sup>2</sup></b>
<b>Employees</b>	<b>284</b> (As of end of March 2024)
<b>Buildings</b>	Eight buildings in total Production bldg.: 5 Mold bldg.: 1 Office bldg.: 1 Welfare bldg.: 1

# History of Products and Technologies



Parts for dot printers

**1980**  
Era of processing technology starts



Mechanism parts for HDDs

**2000**  
Era of IT starts  
Continues to seek higher levels

**1990**  
Proceeds to ultra-precision machining



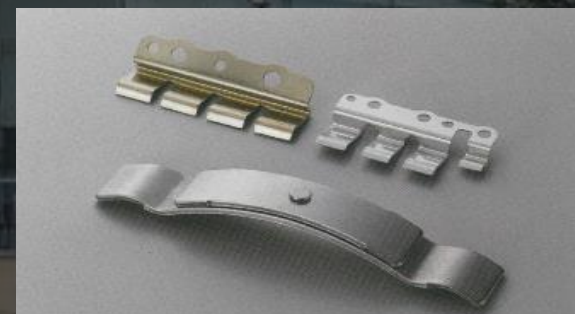
Suspensions for HDDs



Motor cores

**2020**  
Era of zero-emissions starts

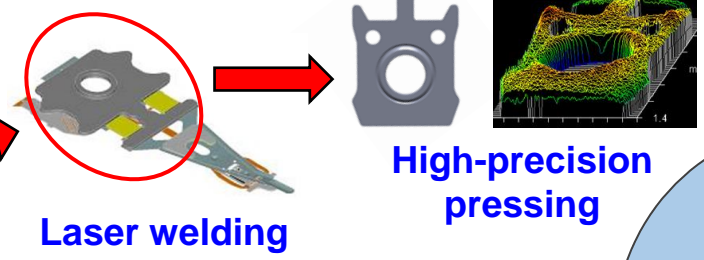
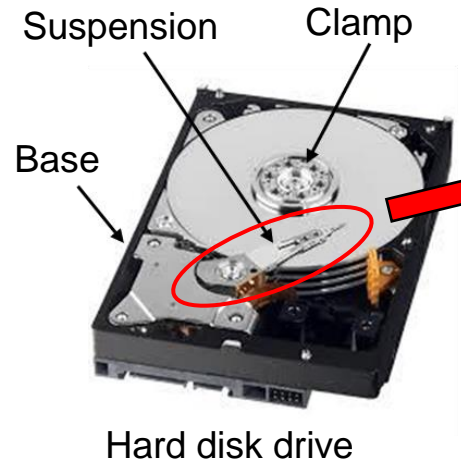
**2010**  
Era of considering the environment



Leaf springs for HEVs/EVs

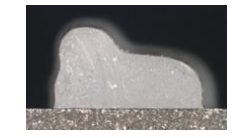
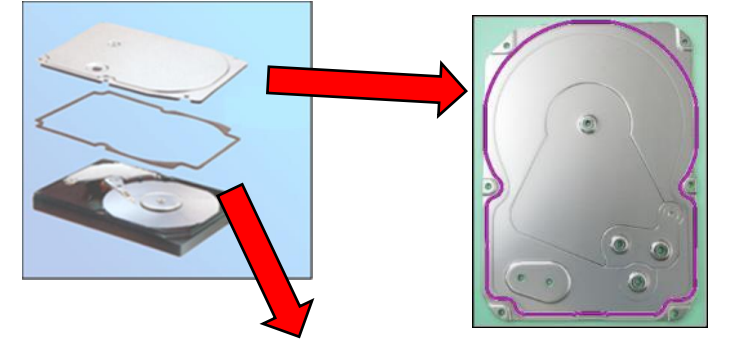


# History of Products and Technologies



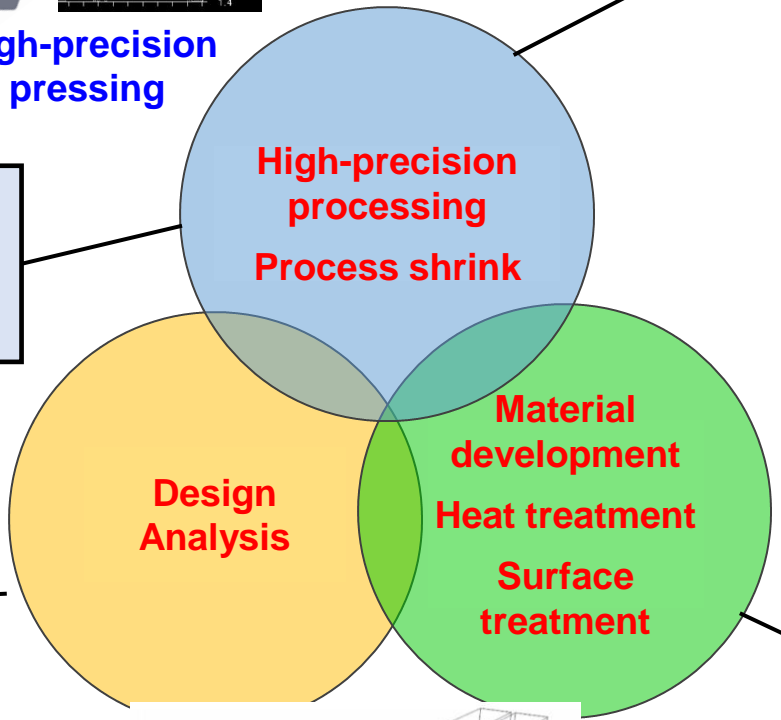
Bonding technology that welds, brazes, and joins tiny objects precisely

Technology of various machining processes such as high-precision bending, punching, and cutting

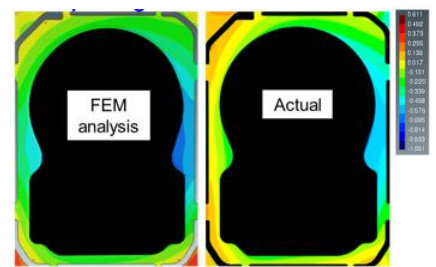
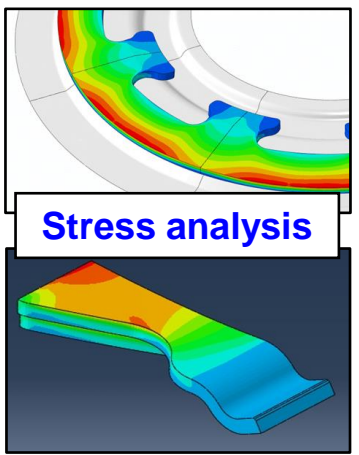


High-precision pressing

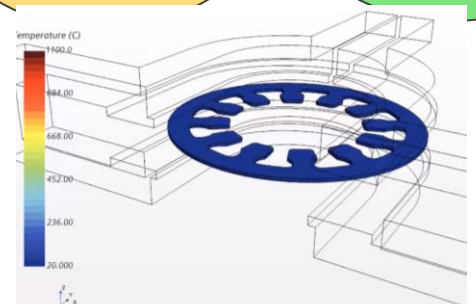
Gaskets for covers



Design/analysis technology of functional products that satisfy specified mechanical/electrical characteristics and reliability

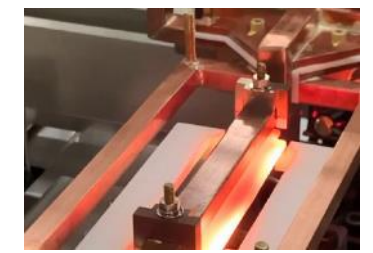


Processing analysis



High frequency heating analysis

Technology of developing best materials/treatments for products of high-performance/functioning

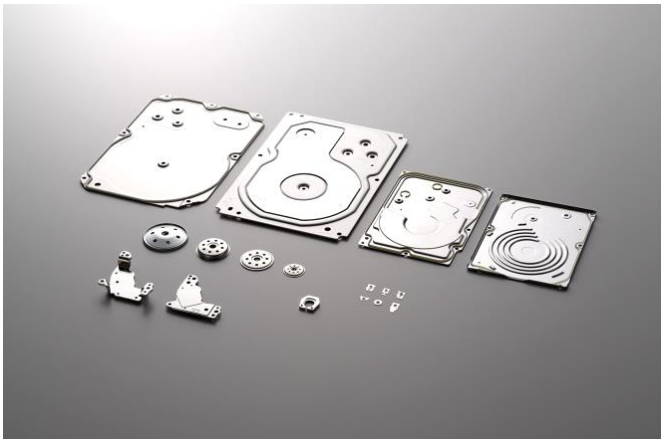


High frequency heating/quenching molding

# Production Items



**Plate springs/thin leaf springs**



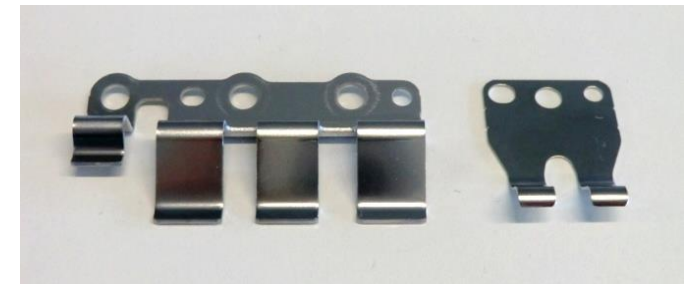
**Mechanical parts for HDDs**



**Motor core**



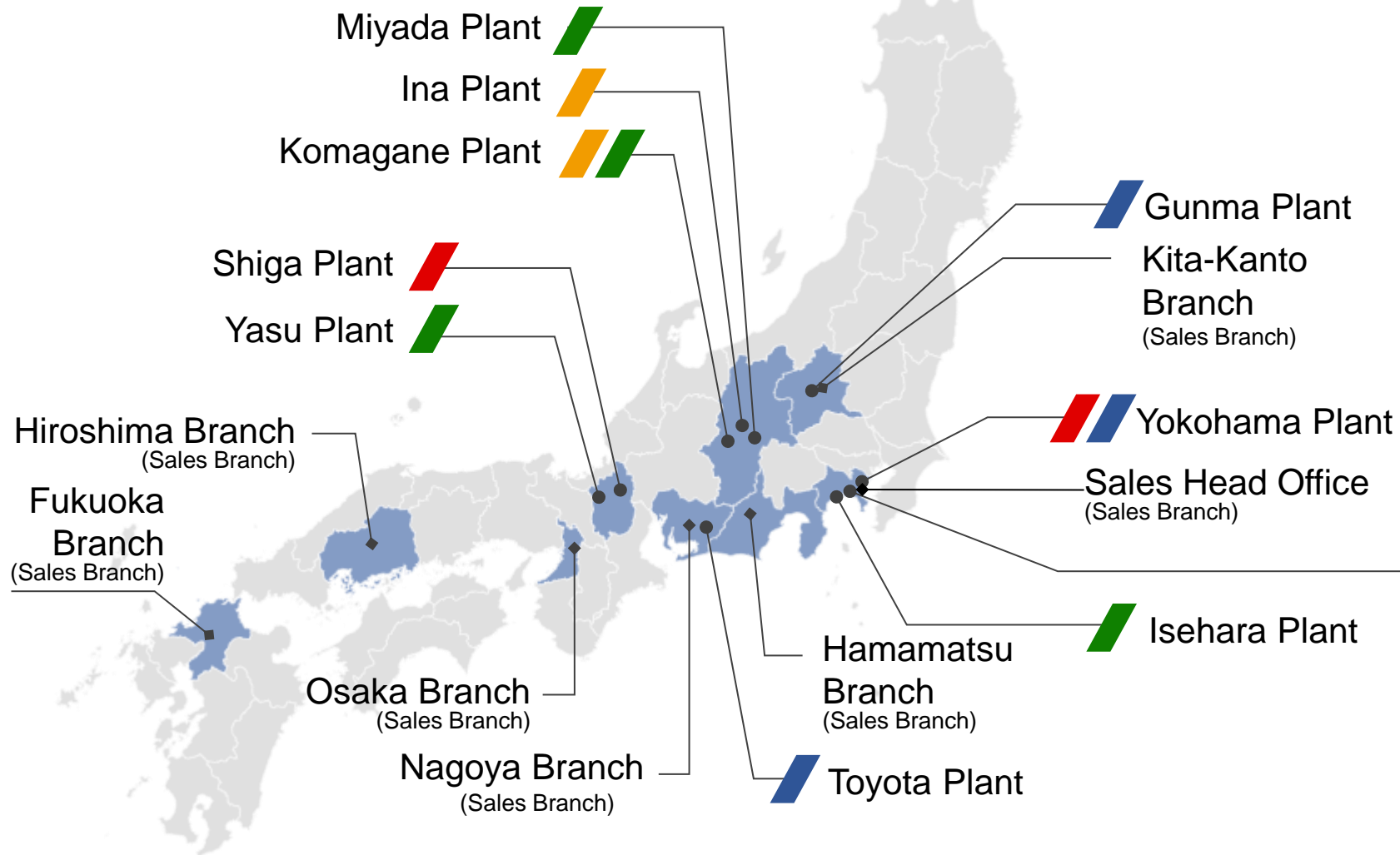
**Leaf springs for holding**



**Grid springs**



# Motor Core Domestic Production Sites

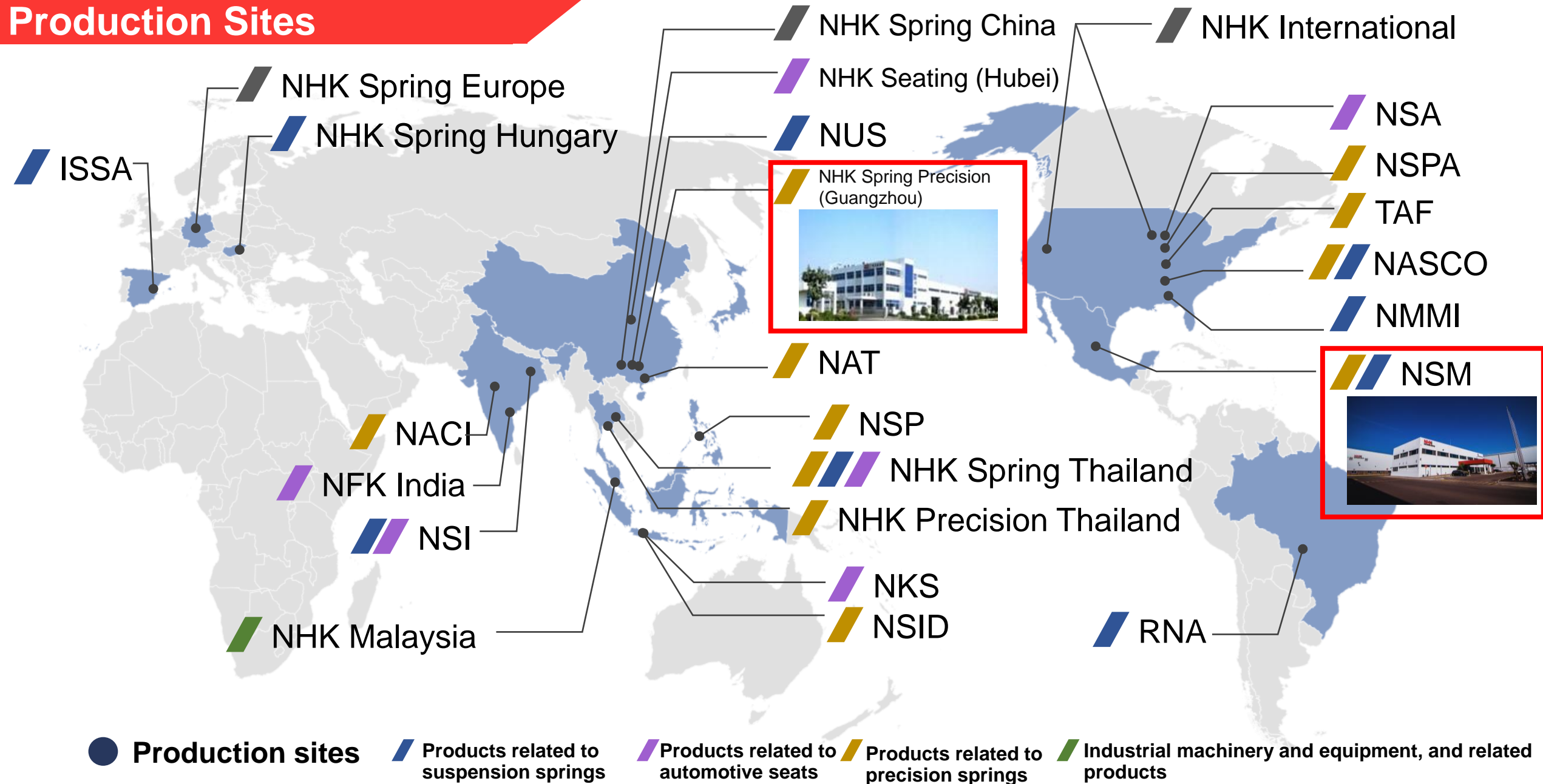


**The only motor core production plant among NHK Spring's domestic sites**

**Atsugi Plant**

- **Production sites**
- / **Products related to suspension springs**
- / **Products related to automotive seats**
- / **Products related to precision springs**
- / **Industrial machinery and equipment, and related products**







# Motor Core Overseas Production Sites



● Production sites    
 / Products related to suspension springs    
 / Products related to automotive seats    
 / Products related to precision springs    
 / Industrial machinery and equipment, and related products

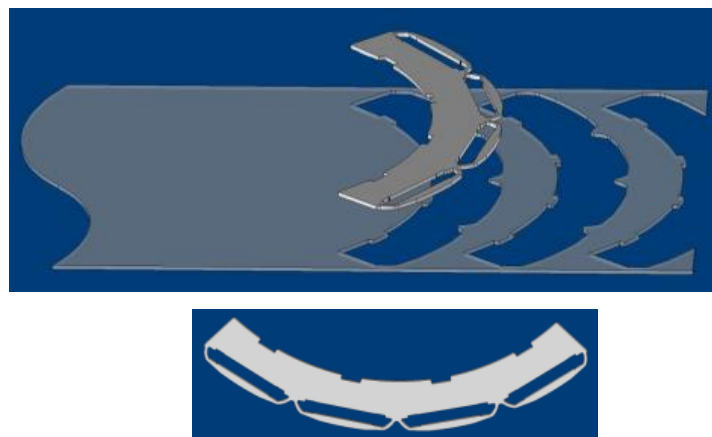


# Capacity of Motor Core Production Sites

Production sites	Atsugi Plant (Japan)	Partners (Japan)	NSM (Mexico)	NSPG (China)	NHK Thailand (Thai)	NASCO (USA)
Motor core mass-production	 <input type="radio"/>	 <input type="radio"/>	 <input type="radio"/>	 <input type="radio"/>	 Under consideration	 Have experience
Motor core trial production	<input type="radio"/>	<input type="radio"/>	Planning			
Products and technology development	<input type="radio"/>					
Mold design	<input type="radio"/>	<input type="radio"/>	Planning		<input type="radio"/>	
Mold production	<input type="radio"/>	<input type="radio"/>			<input type="radio"/>	
Mold maintenance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Have experience

# Original Technologies of Motor Cores

- The split technique used for stator cores is applied to rotors
- Established the world's first technique for driving motors, achieving significant cost reductions



One-piece type

Material cost

Processing cost

Split type

Material cost

Processing cost

A ring-shaped rotor is divided into four blocks to form this split-type rotor core. These blocks are brick-stuck and then 16 points on the inner circumference are laser-welded.

This is NHK Spring's original motor core technique. (Patented)

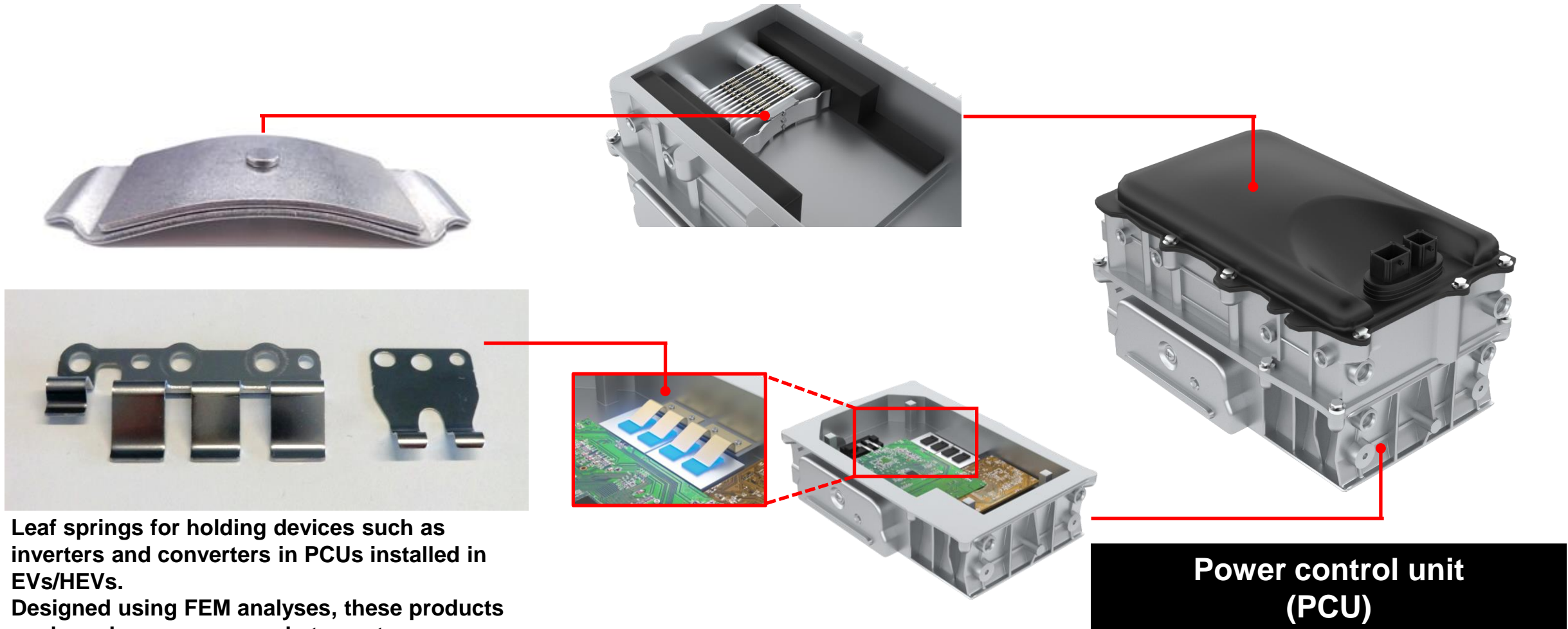
Material cost: - 50%

Product cost: - 15%



# Leaf Springs

## Leaf springs for holding PCUs and converters of electric/hybrid vehicles



Leaf springs for holding devices such as inverters and converters in PCUs installed in EVs/HEVs.  
Designed using FEM analyses, these products are based on our proposals to customers regarding spring shapes that hold devices in PCUs more efficiently.

**DCDC converter**

**Power control unit (PCU)**



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