

Products Guide



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..... Automotive Products



..... Data Communications Products



..... Industrial Equipment and Lifestyle Products

Suspension Spring Division

The Suspension Spring Division produces automotive suspension springs with a focus on lighter weight, greater comfort, and improved handling stability of vehicles.



Seating Division

The Seating Division produces seats and seat-related products with a focus on safety and comfort. We provide everything from seat frames to complete seating systems.



Precision Spring and Components Division

The Precision Spring and Components Division provides a wide variety of products for a broad range of fields. These include wire springs, thin leaf springs, and other precision springs as well as machined and mechanical components.



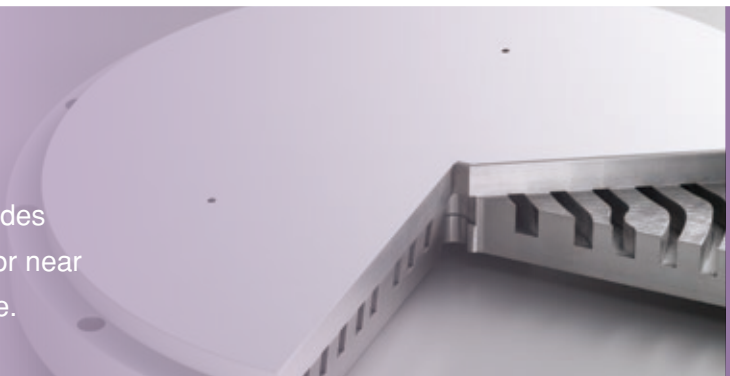
DDS Division

The DDS (Disk Drive Suspension) Division specializes in the development, design, and production of suspensions for hard disk drives (HDDs), a key component for the high-capacity data storage device.



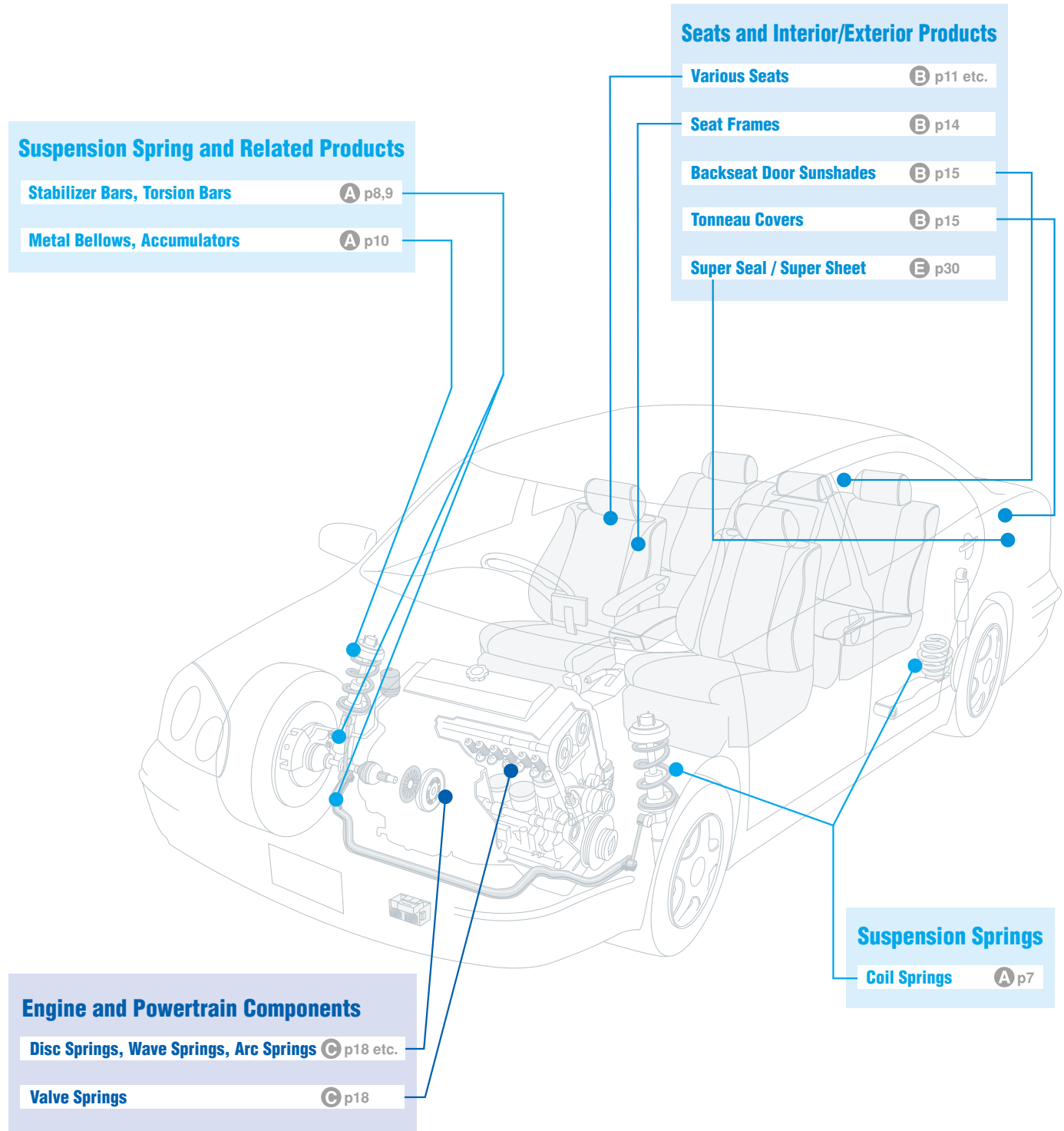
Industrial Machinery and Equipment Division

The Industrial Machinery and Equipment Division is composed of six departments. Each of these departments provides essential products and ranks at or near the top of its field in market share.





With our cutting-edge manufacturing capabilities, NHK Spring delivers products that make our automobile-driven society more safe, environmentally friendly, comfortable, and sophisticated.



A Suspension Spring Division

B Seating Division

C Precision Spring and Components Division

D DDS Division

E Industrial Machinery and Equipment Division

IT and NHK Spring Group Products



NHK Spring supports a high-tech information society for the next generation through ultra-precision manufacturing technology.

HDD-Related Products

Top Covers **C** p17 etc.

VCM Yoke Components **C** p17 etc.

Disk Clamps **C** p17 etc.

Base Plates **C** p17 etc.

Suspensions **D** p23

Data Communications and Semiconductor Manufacturing and Inspection Equipment-Related Products

Microcontactor Units **C** p22

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Lock Hinges **C** p20

Security-Related Products

VISCS **E** p33

Security-Related Products

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A Suspension Spring Division

B Seating Division

C Precision Spring and Components Division

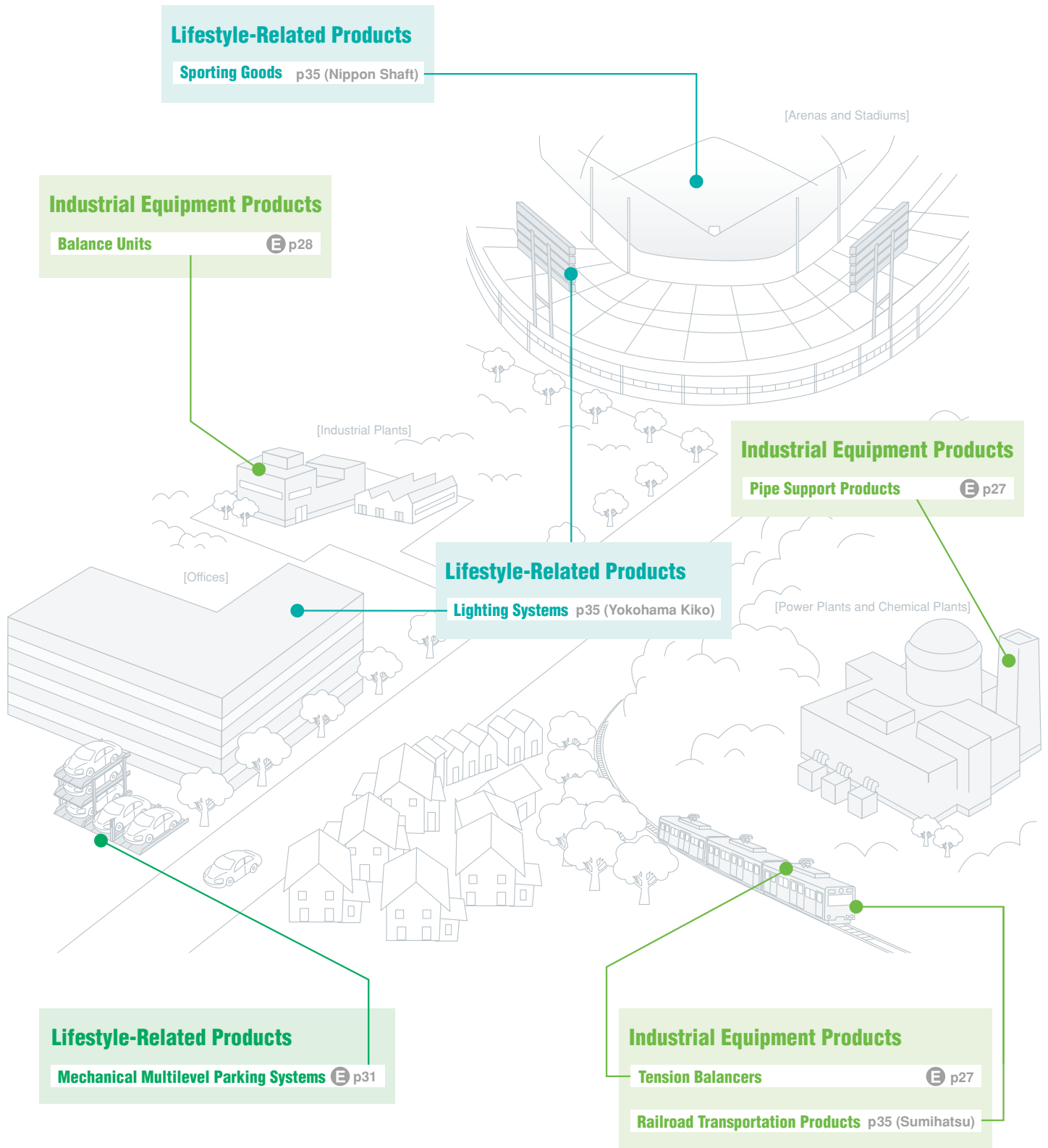
D DDS Division

E Industrial Machinery and Equipment Division

Everyday Living and NHK Spring Group Products



With proven technology born from a flexible mindset, NHK Spring Group products offer safety and convenience in a wide range of industrial and lifestyle applications to meet the ever-changing needs of people's daily lives.



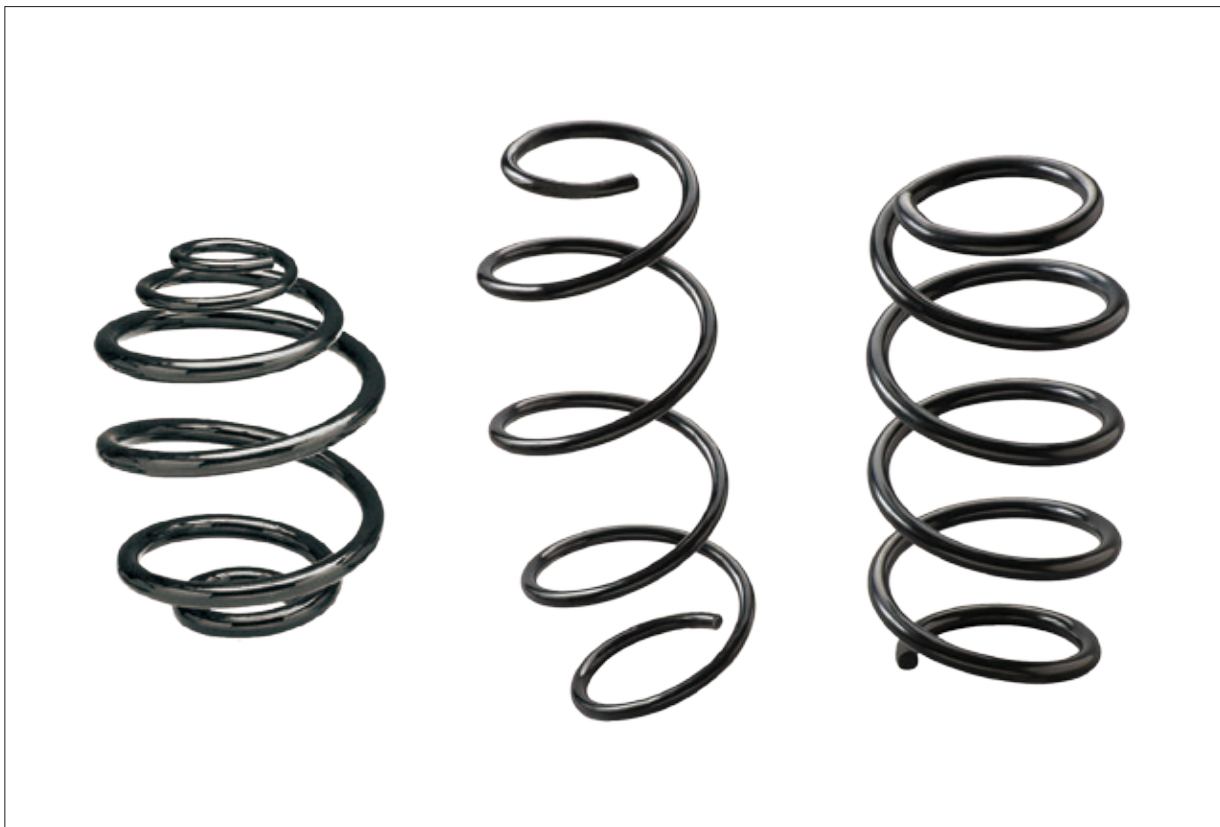
A Suspension Spring Division

B Seating Division

C Precision Spring and Components Division

D DDS Division

E Industrial Machinery and Equipment Division



Coil Springs

Lightweight, comfort



《Product Overview and Uses》

Coil springs are our most widely used springs, commonly found in passenger cars and minivans. They absorb vibration and shock from the road to provide a more comfortable ride.

《Product Features》

Lightweight, sturdy design uses fewer resources and helps improve fuel efficiency while at the same time providing greater comfort by controlling the axial load.

《Installation Example》



《Products and Related Items》



L-shaped spring
(Spring to control axial load)



Leaf Springs

Lightweight, comfort



《Product Overview and Uses》

Leaf shaped springs are used for suspension spring systems of commercial vehicles. These leaf springs combine a more comfortable ride with improved handling stability.

《Product Features》

The result of years of R&D in materials, shapes, and production processes, NHK's leaf springs are both strong and lightweight and can stand up to the most adverse road conditions.

《Products and Related Items》



GFRP leaf springs

- Multi-leaf springs
- Super leaf springs
- Berlin eye tapered leaf springs
- Tapered leaf springs for trunnions



Stabilizer Bars

Stable handling, lightweight



《Product Overview and Uses》

Stabilizer bars are needed to prevent automobiles from tipping over while cornering and changing lanes. They provide improved handling stability.

《Product Features》

Solid stabilizer bars use spring steel, while tubular stabilizer bars developed by NHK Spring use high-grade seam-welded piping. Tubular stabilizer bars are 20% to 50% lighter than solid stabilizer bars thanks to the use of thin and thick piping according to specifications such as the strength requirements.

《Products and Related Items》

- Solid stabilizer bars
- Solid stabilizer bars used with links
- Torsion stabilizer bars



Tubular stabilizer bar



Stabilizer links

《Installation Example》





Torsion Bars

Space saving, stable handling, lightweight



《Product Overview and Uses》

These springs utilize the natural tension of bent metal rods to return to their original shape. They are used for truck tilt cab suspensions and front suspensions for some trucks.

《Product Features》

NHK Spring's torsion bars require less space to install.



Stabilinkers

Stable handling, lightweight



《Product Overview and Uses》

This air suspension for trucks also functions as a stabilizer that reduces the link and rolls from front and rear forces, contributing to better drivability and reduced weight of the air suspension.

《Product Features》

Weldings fuse the ring and torsion parts while pipe material is used for a lighter weight torsion.

TOPICS

A Key Factor in the Spread of Private Car Ownership

The Subaru 360 was the first widely available personal automobile in Japan. But developing the suspension springs for this car was not easy. Since there was not enough room for coil springs, torsion bars were used instead. NHK Spring's engineers poured all of their technical expertise into each bar to create a spring that would not break easily. Our springs have made great contributions to the rise of the automobile in Japan, including the triple leaf springs used in Japan's first fully domestically produced car, the Crown.



The Subaru 360, produced using NHK Spring's torsion bars



Metal bellows

Space-saving, high durability



《Product Overview and Uses》

Compact precision bellows with a small pitch are made using hydraulic pressure automatic molding machines developed by NHK Spring.

《Product Features》

Compact, small pitch S-shaped and U-shaped bellows with enlarged surface area that was not possible in conventional U-shaped bellows.

《Manufacturing capability》

- Material SUS304, SUS316L
- Thickness 0.10mm to 0.40mm
- Molding technology
- Small pitch U-shaped bellows molding (mainly used for heat exchange), S-shaped bellows molding

《Products and Related Items》

- Heat exchanger for artificial heart and lungs
- Accumulators



Accumulators

Low fuel consumption, comfort



《Product Overview and Uses》

Metal bellows are used as a separation layer between the nitrogen gas inside the accumulator and the fluid. The sealing structure and sealing parts are all welded and don't use high-polymer materials. So it will not permeate or leak, making it a maintenance free product.

《Product Features》

Accumulator operates when the pipe (hydraulic) pressure raises above the gas pressure inside the accumulator. The accumulator uses the pressure and expansion of the gas inside to absorb the change (pulsing) in hydraulic pressure.

《Effect》

- Recycle pulsing (vibration) ·Reduce surge pressure
- Reduce noise ·Supply stable pressure

《Products and Related Items》

- Brake fluid accumulator (injects accumulated brake fluids instantly to easily gain the pressure needed during braking)
- Hydraulic control device for automobiles
- Diesel engine fuel injection pump
- Hydraulic cylinder for ascending/descending of forklifts (absorbing vibration of forks)
- Engines for ships (absorbing surge pressure during fuel injection)

《Cross-section》





Suspension Seats

Lightweight, thin



《Product Overview and Uses》

Seats with integrated suspensions whose backs and seat cushion can move together. Even more lightweight and thinner than conventional magnetic suspension seats.

《Product Features》

Vibrations are absorbed and mitigated through the use of NHK Spring's original urethane foam and torsion bar. The vibration absorption is equal to that of conventional seats. These suspension seats can also be used in small trucks.

Thin Automotive Suspension Seats

Our thin automotive suspension seats received the MONODZUKURI Nippon Conference Chairman's Manufacturing Prize in the 2016 'CHO' MONODZUKURI Innovative Parts and Components Awards as well as the JSDE Eiji Mutoh Excellent Design Award.





Sport Sedan Seats

Safety



《Product Overview and Uses》

Highly comfortable and safe seat.

《Product Features》

With high collision safety characteristics and optimum design, sports sedan seats reduce passenger whiplash from rear-end collisions.



Light Minivan Seats

Comfort, multi-purpose



《Product Overview and Uses》

Highly comfortable front and rear seats for light minivans.

《Product Features》

Front seat that realizes functionality and comfort at the same time. Space-saving, comfortable rear seats that can be used in multiple ways by re-arranging their positions.

NHK Spring's Automotive Seats

NHK Spring utilizes a fully integrated production line, from design to final assembly, to produce automotive seats that demand superior safety and comfort. Each aspect of our seats, from design and comfort to strength and durability, undergoes a unique, rigorous testing process from the prototype stage to ensure the best product possible. Careful consideration is given to every aspect of the production process — design and development, manufacturing technology, functional analysis, and more — to create seats that go beyond the ordinary.



Automotive seat assembly line



Premium Sedan Seats

Comfort, multi-purpose



《Product Overview and Uses》

High-quality seats made with great attention to detail resulting in superior and esthetics comfort.

《Product Features》

The seat realizes elegant ride comfort through the use of our original high-quality urethane foam that has superior vibration absorption characteristic. A premium item equipped with air conditioning, etc. to ensure comfort.



One Motor Power Seats

Lightweight, resource-saving



《Product Overview and Uses》

A single motor can move the power seat forward and back, lift it up and down, and recline.

《Product Features》

Cost reduction, lighter weight, and resource-saving (reducing the use of Neodymium) is made possible by reducing the number of motors and wire harnesses.

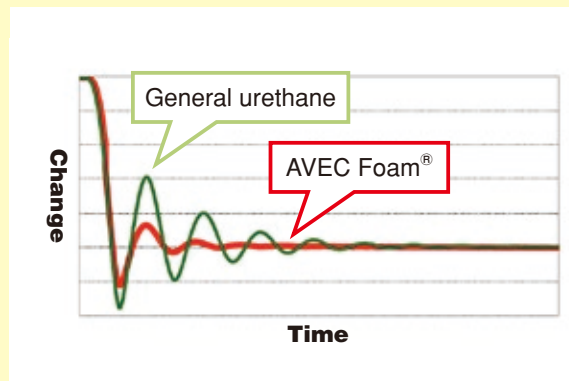
NHK Spring's Original Urethane Foam AVEC Foam[®] (Anti Vibration Elastic Comfort Foam)

《Product Overview and Uses》

NHK Spring's original high performance urethane foam that has industry leading quality and productivity.

《Product Features》

Urethane foam developed by NHK Spring that has superior vibration absorption and durability responding to various customer needs with wide range of variations.



Comparison of vibration damping performance with general urethane



Front Seat Frames

Safety, lightweight



《Product Overview and Uses》

Front seat frame is an important component that affects comfort, safety, weight, and cost of the seat. We offer high performance front seat frames that meet the needs of our customers.

《Product Features》

Use of high tensile strength steel material and optimum design allows it to be safe and lightweight at the same time.



Rear Seat Frames

Safety, lightweight



《Product Overview and Uses》

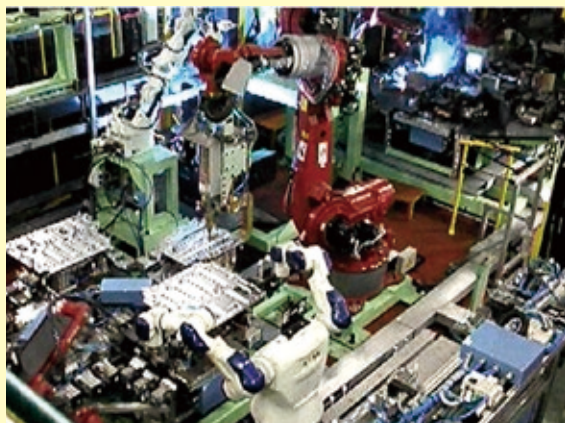
We offer various types of rear seat frames that are lightweight, safe, and can be arranged in various ways.

《Product Features》

We manufacture seat frames on an automated line to offer high-quality and short lead times.

Promoting automation and introduction of new technologies

NHK Spring promotes automation and actively implements new technology in the seat manufacturing process. Dramatic improvements in productivity and space saving are made possible through the development of welding machines for seat frames and the introduction of cutting-edge robots.





Backseat Door Sunshades

Comfort



《Product Overview and Uses》

Comfortable car interior is realized through roller sunshades built into the backdoor for shielding against UV rays and light.

《Product Features》

The use of high-quality screens and our original winding mechanism enables both durability and ease of use.



Tonneau Covers

Improving exterior quality



《Product Overview and Uses》

Useful for theft prevention and protecting privacy with roller cover blind for the trunk.

《Product Features》

We offer various types of products for luxury cars to light vehicles to respond to customer needs.





HDD Mechanical Components

High precision, lightweight, low cost



《Product Overview and Uses》

NHK Spring employs ultra-precision stamping and cutting technology to create high-precision components for numerous applications.

《Product Features》

NHK uses advanced die fabrication and precision machining technology to achieve micron-level precision through stamping processes. This allows for even greater cost reductions than traditional fabrication and precision machining.



《Products and Related Items》

- HDD mechanical components (base plates, top covers, disk clamps, VCM yoke components, etc.)



Separate Catalog:

- Mechanical Parts for HDD



Wire Springs

High precision, multi-purpose



《Product Overview and Uses》

NHK Spring offers helical compression springs, helical extension springs, helical torsion springs, wire springs, and more for a wide variety of applications.

《Product Features》

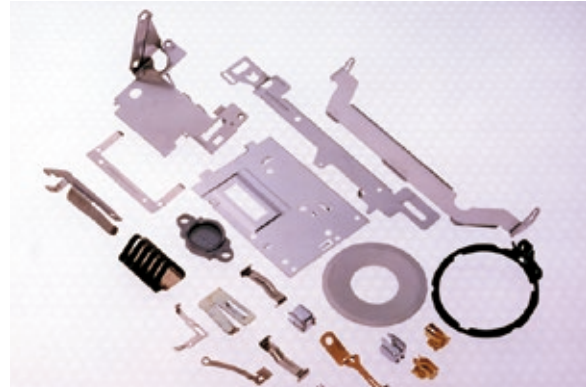
Extensive R&D from every angle — materials, design, and machining methods — has given our wire springs the strength, durability, and wide applicability to meet any need. Among our creations are some of the world's smallest micro springs.

《Products and Related Items》



Lock up clutch damper

- Formed wire
- Valve springs
- Arc springs
- CVT springs
- Seat assembly springs
- Catheter support springs
- Micro springs



Thin Leaf Springs

High precision, multi-purpose



《Product Overview and Uses》

These springs are made from thin leaves of material. They can be formed into any shape for an endless variety of applications.

《Product Features》

The manufacturing process is meticulously tailored according to the material, shape, and required strength of the spring. The springs can be made from a range of materials including carbon alloys, copper alloys, and stainless steel.

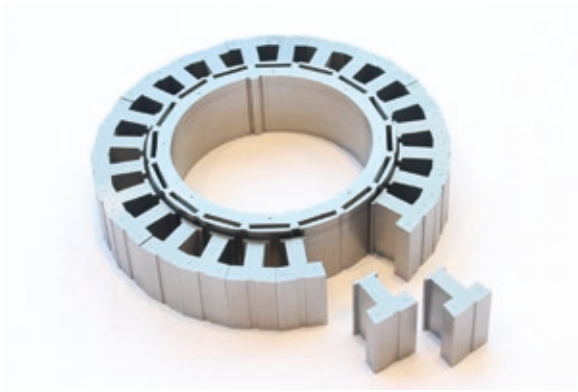
《Products and Related Items》



Disc springs / Wave springs



Camera brackets for automobiles



Motor Cores

High precision



《Product Overview and Uses》

Drive motor core for electric and hybrid vehicles. Rotor and stator are core parts of motor.

《Product Features》

Product layered with magnetic steel sheet which requires high-precision pressing technology to fulfill dimensional tolerance and other specifications depending on the size of the product.



Suspension Springs for Inverters

High precision, multi-purpose



《Product Overview and Uses》

Springs to suspend semiconductors from cooling units in motor control inverters for electric and hybrid vehicles. Various shapes such as multi-leaf springs, thin leaf springs, disc springs and wave springs are offered depending on its use. It can also be used for suspending battery cells and fuel cells stacks.

《Product Features》

Springs that can disperse pressure to a wider area and apply constant pressure even with changes in target size. Springs with unique shapes to fit limited available space, and other various types are available to respond to a wide range of needs.



Lock Hinges

Space-saving, high performance, comfort



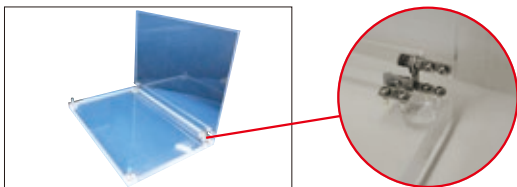
《Product Overview and Uses》

NHK Spring's lock hinges are used in vehicle glove box doors as well as angle adjustment systems for laptop computers, LCD monitors, and TV screens. There are friction-type lock hinges, which use thin springs, and coil spring-type lock hinges, which use wire springs.

《Product Features》

Friction-type lock hinges are perfect for small spaces while the coil spring-type lock hinges are suitable when extra power is necessary. Both feature seamless angle adjustment and smooth control.

《Installation Example》



One-Touch Nuts

High performance, convenience



《Product Overview and Uses》

One-touch nuts can be inserted and tightened with a single touch, making bolt tightening much more efficient.

《Product Features》

Available in one-way types for tightening in a single direction and two-way types for tightening and removal.

《Products and Related Items》



"Taorensen" furniture anti-tipping support rods



Movable Handrail Balance Units

High performance, safety



《Product Overview and Uses》

These are mechanisms used in movable handrails to assist the disabled and the elderly.

《Product Features》

Our spring-assisted balance units are designed to operate with a light touch and remain in position, not suddenly drop down, when the hand is removed from the rail. The units do not use oil or gas and thus are ideal for worry-free, leak-free operation.



Chain Tensioners

High dependability



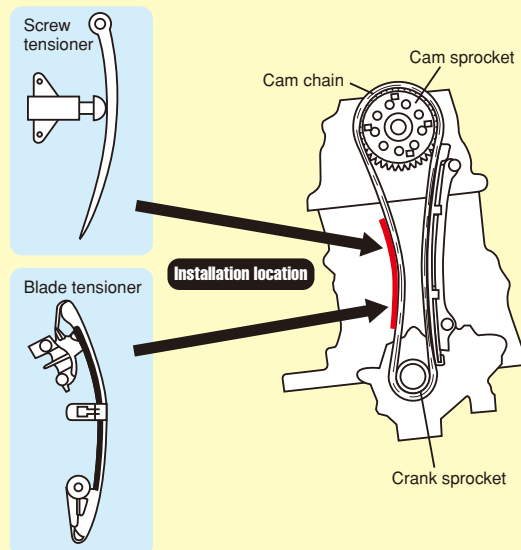
《Product Overview and Uses》

These automatic tension adjustment devices are used to maintain a constant level of tension in chains between the engine's crank shaft and cam shaft.

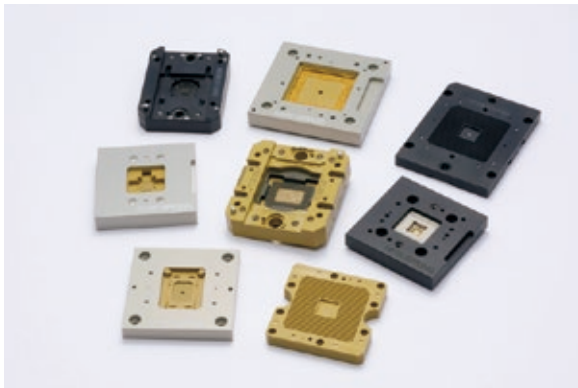
《Product Features》

Torsion springs move the tensioner forward at low temperatures to prevent the belt from becoming too loose. At high temperatures, when belt tension increases, the tensioner moves back to prevent tension from rising too high.

What is a Tensioner?



Tensioners are devices that prevent automobile and motorcycle engine chains from becoming loose by absorbing changes in the length of the chain that occur when the temperature changes.



Microcontactor Units

High precision, high dependability



《Product Overview and Uses》

Probe and unit that contacts semiconductor's electrodes and controls weight using the characteristics of springs.

《Product Features》

Fully utilizes the NHK-developed micro springs that are the smallest class in the world and highly advanced fabrication technology.

《Products and Related Items》



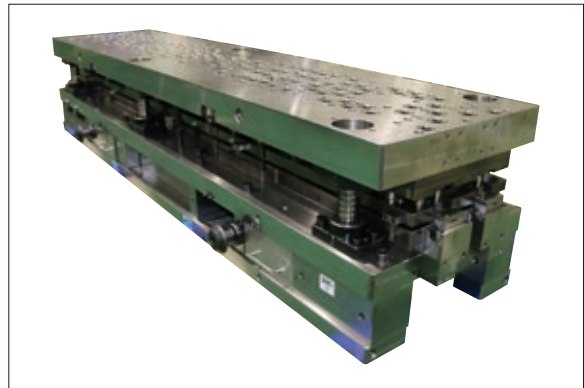
Micro spring



Micro springs seen with the naked eye

SC Separate Catalog:

- MICROCONTACTOR



Precision Dies and Molds

High precision

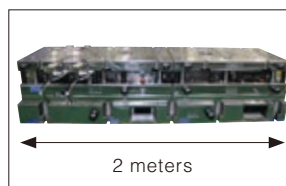


《Product Overview and Uses》

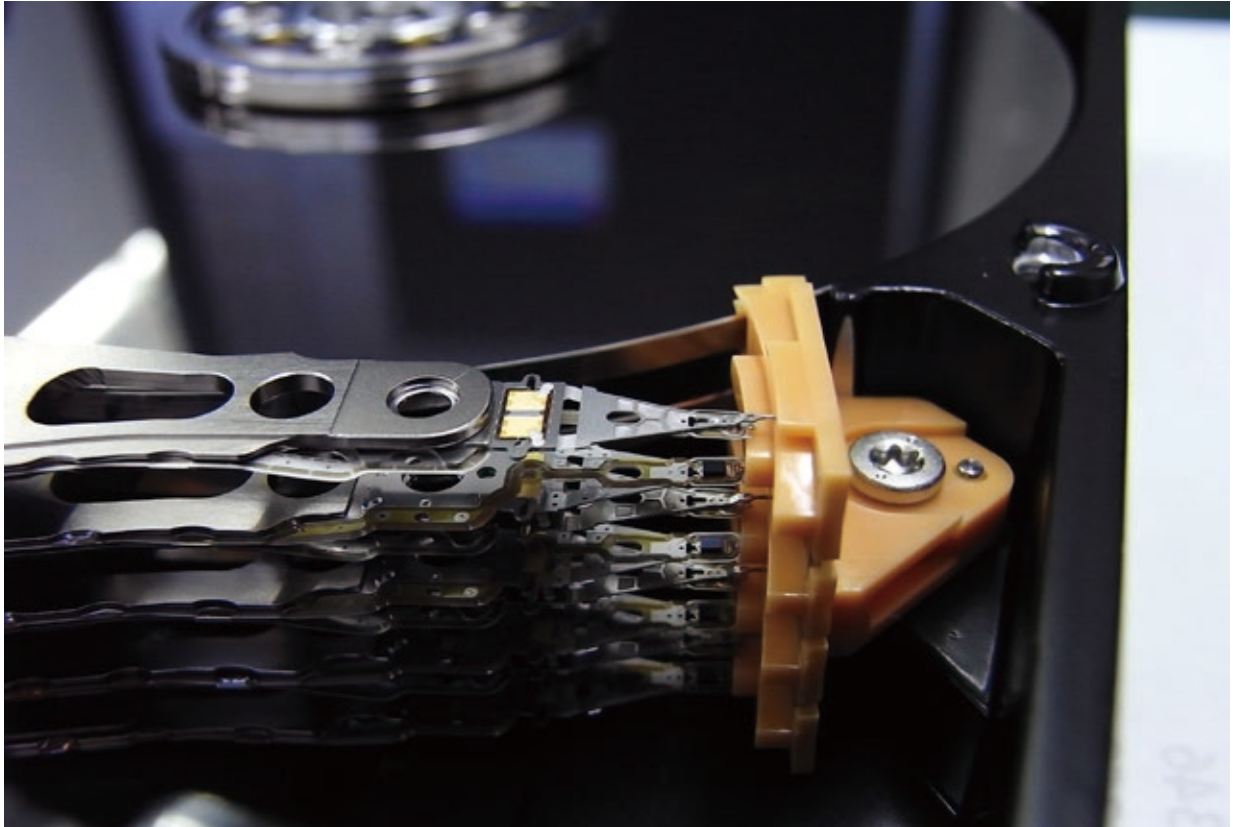
NHK Spring designs and produces high-precision dies and molds for presses, progressive stamping, injection molding, and other uses.

《Product Features》

Using advanced design and processing technology, NHK Spring not only produces dies and molds for its own products, but also supplies die, mold, and punch components to a number of die and mold manufacturers.



Molds



HDD Suspensions

High precision, high dependability



《Product Overview and Uses》

HDD suspensions not only support the magnetic head that reads and writes data, but also keep the head floating accurately in a designated position of a 0.05 micrometer-wide recording track at a constant height of only 0.01 micrometers above the disk which is spinning at 5,400 to 15,000 rpm.

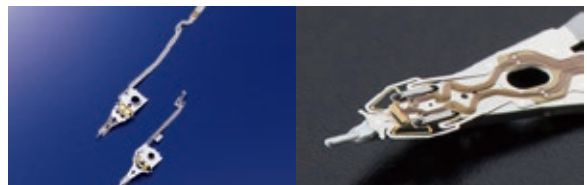
《Product Features》

As a worldwide pioneer in the mass production of CLA suspensions with ultra-small actuators built-in, NHK Spring is responding to the ever-growing needs for greater capacity and speed in HDDs. NHK Spring is also pioneering mass production of DSA suspension for large capacity HDDs that have actuators built into the center.

《Products and Related Items》



HDD suspension product lineup



DSA for large capacity HDDs
(Dual Stage Actuator)
suspension

CLA for ultra large capacity
HDDs
(Co-Located Actuator)
suspension

Global Top-class Maker

Hard disk drives (HDDs) are used to record various types of data in computers, consumer electronics, cloud computing, and other types of devices. Special springs used in HDDs are the suspension for these HDDs. NHK Spring is one of the few manufacturers able to respond to the needs of customers through the manufacture of HDD suspensions.

Technology Trusted the World Over

NHK Spring's ultra-precision processing technology is also put to effective use in its HDD mechanical components. Among our product offerings are airtight, vibration-resistant top covers and base plates, disk clamps for holding the disk in place at high rotation speeds and VCM yoke components to ensure precise read/write positioning of the magnetic head. As HDDs continue to get smaller, faster, and higher in storage capacity, NHK Spring's HDD-related products are the ones the world depends on.

Top Covers

High dependability **Low gas emission**

Components with a high degree of flatness that keep the case airtight.

[Features] Clean and highly corrosion resistant.



VCM Yoke Components

High dependability

Actuator components that determine the data read/write positioning of the magnetic head.

[Features] Clean, high dimensional accuracy, and high degree of flatness.



Disk Clamps

High dependability

Rings that hold the disk in place. The part that comes into contact with the disk is finished to a high degree of flatness.

[Features] Clean, also function as suppression springs.



Suspensions

High dependability

The suspension is made from special springs that support magnetic heads. [Features] Foils molded with a high-precision press, precision circuit boards, and an attachment material put together using a laser are being uniquely developed for vibration resistance.





Semiconductor Process Components

High performance, high functionality



《Product Overview and Uses》

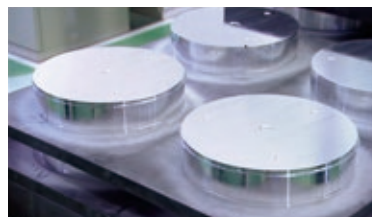
NHK Spring offers high-performance products used in semiconductor manufacturing equipment, including heater units, cooling units, and integrated electrostatic chucks that combine all of these elements.

《Product Features》

Our products incorporate NHK's exclusive brazing and diffusion technologies as well as a range of other advanced bonding and ceramic manufacturing, design, and analysis technologies.

SC Separate Catalog:

- Semiconductor Process Components





Advanced Bonding Technology Products

High performance, high functionality



《Product Overview and Uses》

A technology to allow materials of completely different natures to be bonded together. Product with complex shape can be handled with combination of welding and processing.

《Product Features》

Capable of bonding complex components and different metals together, facilitating the production of cooling plates with internal flow channels, branch pipes, laminated heat exchanger cores, and honeycomb lattice structures.

《Products and Related Items》



- Friction stir welding

Cold spray

SC Separate Catalog:

- Advanced Bonding Technology



Ceramic Springs

High performance, high functionality



《Product Overview and Uses》

We have realized the world's first silicon nitride springs by fusing NHK's unique ceramics technology and advanced spring technology cultivated as a dedicated spring manufacturer.

《Product Features》

Superior heat resistance enables durability in high temperatures to the same level as at room temperature. These ceramic springs also provide superior corrosion resistance, non-magnetic characteristics, electrical insulation, and rust resistance, enabling a wide range of applications even under special conditions.

SC Separate Catalog:

- Ceramic Springs



Pipe Support Products

Vibration proof, improved efficiency



《Product Overview and Uses》

These products are used to protect pipes from vibration and noise in industrial plants and hydraulic/pneumatic devices.



《Product Features》

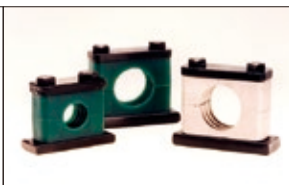
Our pipe support products are used for support and vibration absorption of small-size piping for earthquake-proofing plants as well as during heat transmission in piping equipment.

《Products and Related Items》

- Pipe clamp
- Hydraulic vibration absorber
- Spring hanger
- Mechanical snappers



Spring hanger



Plastic clamps & aluminum clamps

SC Separate Catalog:

- Pipe Clamps



Tension Balancers

Compact, maintenance free



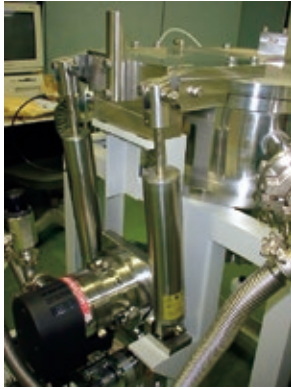
《Product Overview and Uses》

Tension balancers maintain a constant level of tension in overhead wires that supply power to railroad pantographs by absorbing changes in the length of the wires.

《Product Features》

These tension balancers include spring style (NS) balancers using high-strength spring steel and gas spring style (GS) balancers using metal bellows. The tension balancers are much more compact and require much less maintenance than conventional pulley style (WTB) balancers.





Balance Units

Improved efficiency, durability, safety



《Product Overview and Uses》

Balance units allow heavy lids to be opened and closed with a light touch.

《Product Features》

Open/close angle can be set anywhere from flat to 180 degrees and these units can maintain balance at any given position. The economical spring mechanism reduces wear over time and allows for long operating life.

《Products and Related Items》

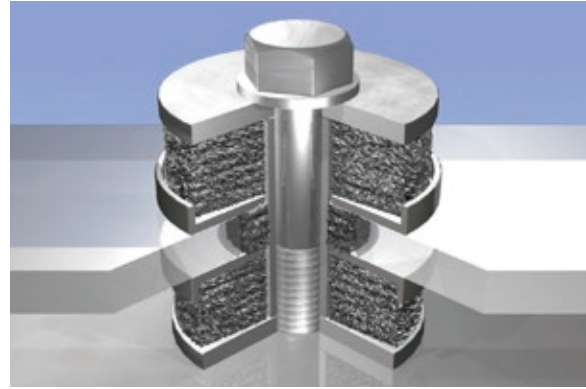


SP lifters



Separate Catalog:

- SP Lifters



SM Damper

Vibration damping, noise prevention



《Product Overview and Uses》

SM dampers are used to mitigate pipe vibrations and noise in marine vessels and plants.

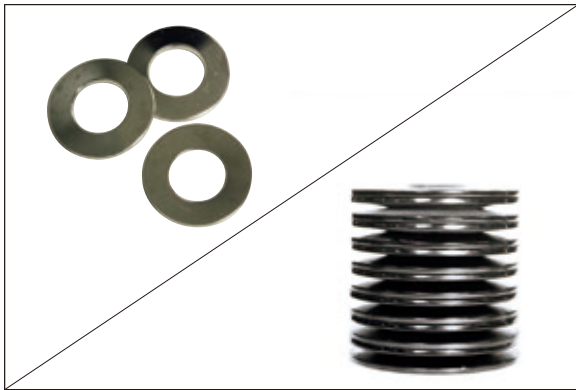
《Product Features》

SM dampers are molded from the wire material used for springs using a braiding press to convert vibrations to resistance to heat and energy and offer self-damping of vibrations through the interaction of the internal wires.



Separate Catalog:

- SM Damper



Special Disc Springs

Space saving, high precision, high performance, high efficiency, maintenance free



《Product Overview and Uses》

These springs are formed from a disc with a hole in the center, shaped into a cone resembling a dish with no base. The special disc springs can support large weights in a relatively small space.

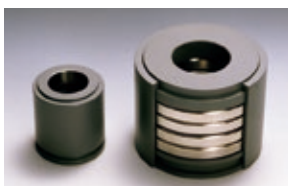
《Product Features》

Wide variety of properties can be produced by stacking these springs vertically or horizontally. TERA, which uses special materials, is offered in various types including compact, high-durability, high-load and other types and are used by many manufacturing equipment manufacturers in and outside Japan.

《Products and Related Items》



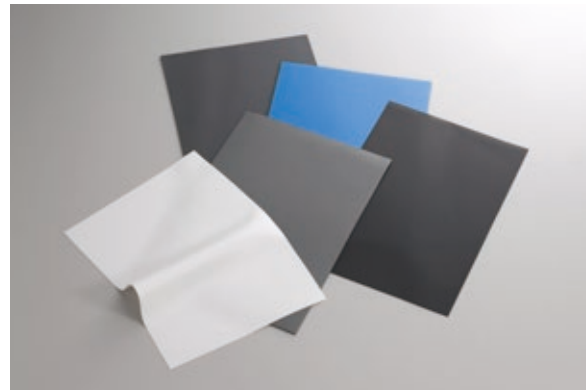
Conventional disc springs and TERA (compact type)



F/HOLDER



- Separate Catalog:**
- Disc Springs
 - FPK Disc Springs
 - F/HOLDER



Nippalay

High performance, vibration proof, soundproof



《Product Overview and Uses》

Nippalay is used in a wide range of applications, from shock-absorbent and vibration-proof packing material for home and office appliances to clean room seals.

《Product Features》

Composed of uniform microcells with a layer of skin on each side, Nippalay provides excellent thickness precision and superior performance.



Separate Catalog:

- Nippalay



Super Seal / Super Sheet

Waterproof, durability



《Product Overview and Uses》

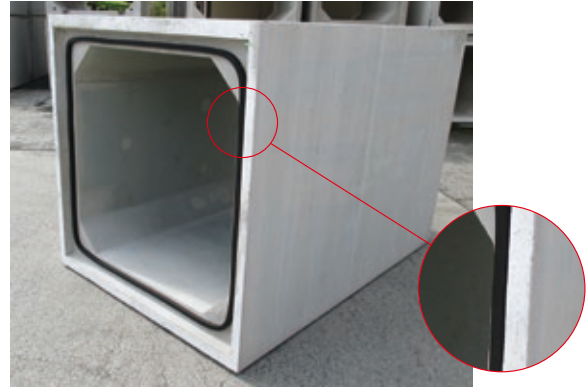
These waterproof seal materials are made of special urethane foam and are used to make products waterproof, airtight, vibration resistant, and shock absorbent. Applications are found in a wide variety of industries including automotive, electronics, construction, and civil engineering.

《Product Features》

Highly flexible and elastic, with stable waterproofing even at low compression. Highly durable and environmentally safe.

SC Separate Catalog:

- Super Seal / Super Sheet



Insuron

High waterproof properties, lightweight, rough end surface conformability



《Product Overview and Uses》

Water expansion type of open-celled polyurethane sheet formed using special production techniques. It is used for waterproofing exterior wall panel joints, openings such as ventilation louvers, waterproofing PC and concrete joints such as box culverts, assembled manholes, flood control basins and retaining walls.

《Product Features》

Is waterproof even under high water pressure conditions by absorbing water and expanding. Excellent conditions conformability to assembled or uneven surfaces significantly increases ability to apply paste due to improved flexibility and lightweight properties as compared to conventional products (butyl rubber and water expansion rubber). Low temperature dependence eliminates concerns of hardening or sagging.

SC Separate Catalog:

- Insuron



Mechanical Multilevel Parking Systems

Space saving



《Product Overview and Uses》

These systems allow for more effective use of parking space. NHK Spring offers a multitude of options to choose from to meet all types of economic and land use requirements.

《Product Features》

Available in SD types with vertical and horizontal pallet movement and UD types with vertical pallet movement.

《Products and Related Items》



SD Park

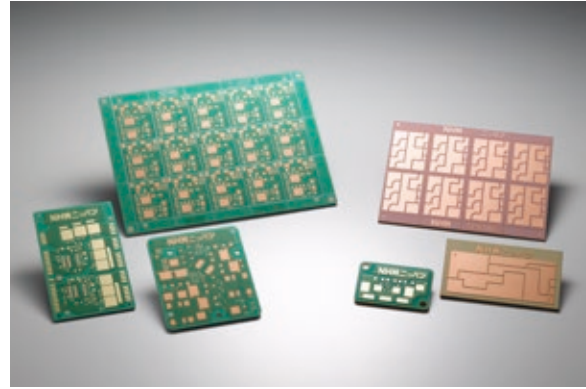


UD Park



Separate Catalog:

- General Parking System Catalog



Metal Base Printed Wiring Boards

Heat dissipating, high dependability



《Product Overview and Uses》

Circuit board using aluminum, copper, and steel as base. It protects electronic devices from heat and improves reliability and miniaturization of devices. Use for LEDs, inverters, and small motors.

《Product Features》

Combination of highly thermal conductive, insulated material and metal base material which excel in heat radiation performance and mechanical strength. We engage in integrated production from laminated plate and can flexibly respond to various combinations of insulated and metal materials.

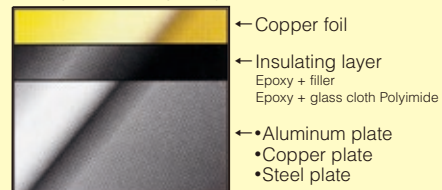


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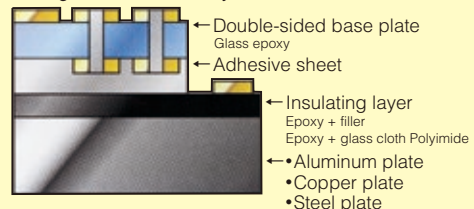
- Metal Base Printed Wiring Boards

Structure of a Metal Base Printed Wiring Board

■ Single Side, Single Layer



■ Single Side, Double Layer





“Trustgram” Anti-Counterfeit Label

High reliability, easy to use



《Product Overview and Uses》

These stickers offer brand protection for home appliances, computer supplies, automotive components, and clothing products.

《Product Features》

Trustgram is a completely new security device that records diffractive images on a material with special optical properties. A card-sized Handy Viewer allows anyone to easily verify its authenticity.

《Products and Related Items》



Trustgram (optical hologram)

SC Separate Catalog:

- Brand Protection -DIOVIS-



Product Logistics Management and Authentication System

Traceability



《Product Overview and Uses》

System that can manage logistics routes and authentication through the Internet by entering the number on registered labels that have unique codes applied to them.

《Product Features》

Not only can it be traceable using labels printed with individual ID or QR code*, it can also have authentication function by adding Trustgram.

*“QR code” is registered trademark of Denso Wave.



SC Separate Catalog:

- Product logistics and authentication system



VISCS

High security, high reliability



《Product Overview and Uses》

VISCS is the world's first machine-readable hologram system. It uses a special sensor to read data formed on holograms. The VISCS mark is difficult to counterfeit or reproduce, ensuring the security of the system.

《Product Features》

A soil-resistant, damage-resistant hologram surface enables reliable data detection. Adheres to media using a special detach-destroy method, making transfer difficult. A compact sensor allows the system to be built into a variety of devices.

《Products and Related Items》



- VISCS terminal



"ALTATTEX" Anti-Counterfeit Fabric Labels

High reliability, easy to use



《Product Overview and Uses》

These labels are designed to guarantee the authenticity of fabrics and are used in apparel, bags, shoes, and similar products.

《Product Features》

By printing a security ink with a special optical characteristic to the fiber label, it allows authenticity to be determined by using a simple filter. Security ink has limited availability and has difficult manufacturing process, making reproduction extremely difficult.



Separate Catalog:

- Brand Protection -ALTATTEX-



Multipositionally Readable Non-Contact Tag

High reliability



《Product Overview and Uses》

Our original technology made it possible to avoid the interference effect that occurs when the non-contact tag touches each other making it possible to use the overlapping application for the tags.

《Product Features》

The less than 1mm spacing made collective reading possible even in stacks. It is based on the ISO 15693 compliance so stack-reading is possible with general market readers as well.

Domestic Group Companies — Main Products

NHK Spring has built partnerships with over 20 domestic Group companies in each of its core businesses — suspension springs, seating, precision springs, and industrial machinery. Our Group companies' products are meeting with success in a variety of other fields as well.

■ Sporting Goods (Nippon Shaft)

Nippon Shaft is one of the leading developers and producers of golf club shafts in the world, along with metal baseball bats and other sporting goods. Their famous lightweight steel shafts for golf are used by top professional players worldwide.



Shaft "N.S.PRO" brand



Many pro golfers use Nippon Shaft's lightweight steel shafts



NHK Group companies not only produce essential parts that support a variety of industries, but also create many of the familiar products we use in our everyday lives.

■ Screws and Bolts (Topura)

<http://www.topura.co.jp/eng/>



■ Lighting Systems (Yokohama Kiko)



■ Brake disc (NHK Precision)

<http://www.nisseiko.co.jp/eng/>



■ Spring Washers (Tokuhatu)

<http://www.tokuhatsu.co.jp/en/>



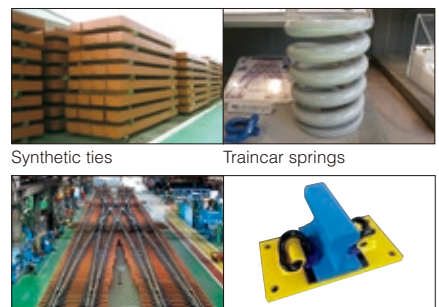
■ Marine Products (NHK MEC)

<http://www.nhkmeccom/en/>



■ Railroad Transportation Products (Sumihatsu)

<http://www.sumihatsu.com/en/>



Synthetic ties

Traincar springs

Branchers

Rail fastening device

Domestic Group Companies (24)

● NHK Sales Co., Ltd.

Other

Main Activities : Sales and import/export of automotive components, automotive springs, industrial machinery and components, precision springs and hybrid function components, fasteners, materials, data devices, machined components, and industrial equipment and components

● NHK Transport Co., Ltd.

Other

Main Activities : Motor truck transport, cargo transport and handling, warehousing, packaging, machinery installation, overseas import/export handling

● Nipatsu Service Co., Ltd.

Other

Main Activities : Sales of petroleum, petroleum products, chemical products, automotive components and automotive products; sales of chemical products and pressurized gas; total building management, security service, construction of ancillary facilities; accident and life insurance; real estate, construction business, cleaning

● G.L.G. Co., Ltd.

Other

Main Activities : Operation of golf driving ranges

● NHK Spring Production Company

Automotive suspension springs Industry and life related

Main Activities : Manufacture and sales of automobiles and automotive related items

● Sumihatsu Co., Ltd.

Automotive suspension springs Industry and life related

Main Activities : Manufacture and sales of leaf springs, clip bands, coil springs, balancers, automotive torsion bars, turnouts and crossings, rail clips, and synthetic rail ties

● Horikiri, Inc.

Automotive suspension springs

Main Activities : Manufacture and sales of springs of all types

● NHK Spring Kyushu Co., Ltd.

Automotive suspension springs

Main Activities : Manufacture and sales of automotive suspension and stabilizer bars

● Tohoku Nipatsu Co., Ltd.

Automotive suspension springs Automotive seats Precision springs and components

Main Activities : Manufacture and sales of coil springs, precision springs, wire springs, and automotive seat components

● Ites Co., Ltd.

Automotive seats

Main Activities : Manufacture of automotive seats and interior components

● Faurecia-NHK Co., Ltd.

Automotive seats

Main Activities : Development and sales of automotive seats

● Faurecia-NHK Kyushu Co., Ltd.

Automotive seats

Main Activities : Manufacture and sales of automotive seats

● NHK Seating Mizushima Co., Ltd.

Automotive seats

Main Activities : Manufacture and sales of automotive seats

● Sindai Co., Ltd.

Automotive seats Industry and life related

Main Activities : Design, manufacture and sales of automotive components, metal parts for furniture, industrial machinery and jigs for automotive components

● Uniflex Co., Ltd.

Precision springs and components

Main Activities : Design, manufacture and sales of automotive components and industrial machinery

● Ayase Seimitsu Co., Ltd.

Precision springs and components

Main Activities : Manufacture and sales of precision springs

● Tokuhatsu Co., Ltd.

Precision springs and components

Main Activities : Manufacture and sales of spring washers, snap rings, thin leaf springs, and clutch plates

● NHK Precision Co., Ltd.

Precision springs and components

Main Activities : Manufacture and sales of screw tools, automotive components, data processing equipment components, and precision industrial components

● NHK Parking Systems Co., Ltd.

Industry and life related

Main Activities : Planning, design, manufacture, sales, installation, leasing, maintenance, and renovation of automatic multi-level parking garage systems; manufacture, sales and design of parking garage ancillary equipment

● NHK MEC Corporation

Industry and life related

Main Activities : Manufacture and sales of marine and industrial mechanical remote control boxes, control cables, electronic remote control systems, steering systems and foot pedals

● Nippon Shaft Co., Ltd.

Industry and life related

Main Activities : Manufacture and sales of golf shafts and metal baseball bats

● Topura Co., Ltd.

Precision springs and components

Main Activities : Manufacture and sales of automotive screws, bolts, and general springs

● Yokohama Kiko Co., Ltd.

Industry and life related

Main Activities : Development, manufacture and sales of a variety of lighting systems

● Nipatsu Harmony Co., Ltd.

Other

Main Activities : Cleaning and greening of building interiors and exteriors, sorting and collection of general waste, auxiliary manufacturing

Legend

Automotive suspension springs

Leaf springs, coil springs, stabilizer, torsion bars, bellows, and accumulators

Automotive seats

Automotive seats and interior components

Precision springs and components

Valve springs, microcontactor units, lock hinges, screws, and bolts

HDD-related parts

Suspension and HDD mechanical components

Industry and life related

Brazing products, ceramic products, pipe support products, polyurethane products, metal base printed wiring boards, parking systems, security-related products, sporting goods, lighting systems, and marine products

Other

R&D, regional headquarters and business and management support, transport service, parts of all types, sales and import/export of equipment, various services, and golf driving ranges

Overseas Group Companies (36)

North and Central South America

● NHK International Corporation

Other

Main Activities : R&D of suspension springs and engineering services, sales and support of HDD components

● New Mather Metals, Inc.

Automotive suspension springs

Main Activities : Manufacture and sales of stabilizer bars

● NHK of America Suspension Components Inc.

Automotive suspension springs Precision springs and components

Main Activities : Manufacture and sales of coil springs, trunk lid torsion bars, drive motor cores for electric vehicles, disc springs for transmissions and sales of stabilizer links

● NHK Seating of America Inc.

Automotive seats

Main Activities : Manufacture and sales of automotive seats and interior feature parts

● NHK Spring Precision of America Inc.

Precision springs and components

Main Activities : Manufacture and sales of automotive engine valve springs and AT springs

● Topura America Fastener, Inc.

Precision springs and components

Main Activities : Manufacture and sales of various screws

● NHK Spring Mexico, S.A.DE C.V.

Automotive suspension springs

Main Activities : Manufacture and sales of automotive coil spring and motor cores

● Rassini-NHK Autopeças Ltda.

Automotive suspension springs

Main Activities : Manufacture and sales of leaf springs and coil springs

Asia

● NHK Spring (Thailand) Co., Ltd.

Automotive suspension springs Automotive seats Precision springs and components HDD-related parts

Main Activities : Manufacture and sales of automotive suspension springs, seats, interior components, precision springs, and HDD components

● NHK Precision (Thailand) Co., Ltd.

Precision springs and components

Main Activities : Manufacture and sales of brake discs, etc.

● Autrans (Thailand) Co., Ltd.

Other

Main Activities : Automotive and motorcycle component logistics

● NHK Manufacturing (Malaysia) SDN. BHD.

Industry and life related

Main Activities : Manufacture and sales of printed wiring boards

● NHK Spring Philippines, Inc.

Precision springs and components HDD-related parts

Main Activities : Manufacturing of HDD parts, appearance inspection, and blanking of chemical products

● NHK Spring (China) Co., Ltd.

Other

Main Activities : Investment support in China and support for integration, management, business expansion, etc. for group businesses in China

● NHK-Uni Spring (Guangzhou) Co., Ltd.

Automotive suspension springs

Main Activities : Manufacture and sales of coil springs and stabilizer bars

● FNK China Co., Ltd.

Automotive seats

Main Activities : Development and sales of automotive seats and components

● NHK Seating (Hubei) Co., Ltd.

Automotive seats

Main Activities : Manufacture and sales of automotive seats

● NHK Seating (Chongqing) Co., Ltd.

Automotive seats

Main Activities : Design, manufacture and sales of automotive and related components and after service

● Chongqing Qingling NHK Seat Co., Ltd.

Automotive seats

Main Activities : Manufacture and sales of automotive seats, interior components, and automotive parts

● NHK Seating (Zhengzhou) Co., Ltd.

Automotive seats

Main Activities : Manufacture and sales of automotive seats

● Faurecia NHK (Xiangyang) Automotive Seating Co., Ltd.

Automotive seats

Main Activities : Manufacture and sales of automotive seats

● NHK Spring Precision (Guangzhou) Co., Ltd.

Precision springs and components HDD-related parts

Main Activities : Manufacture and sales of valve springs, helical springs, disc springs and HDD components

● NHK Spring (Hong Kong) Co., Ltd.

HDD-related parts

Main Activities : Sales support of HDD suspension

● NAT Peripheral (Hong Kong) Co., Ltd.

HDD-related parts

Main Activities : Manufacture and sales of HDD suspensions

● NAT Peripheral (Dong Guan) Co., Ltd.

HDD-related parts

Main Activities : Manufacture and sales of HDD suspensions

● NHK Spring (Taiwan) Co., Ltd.

Precision springs and components

Main Activities : Sales of microcontactor products

● Uni Auto Parts Manufacture Co., Ltd.

Automotive suspension springs Automotive seats

Main Activities : Manufacture and sales of leaf springs, coil springs, automotive seats, and interior components

● NHK Spring India Ltd.

Automotive suspension springs

Main Activities : Manufacture and sales of coil springs and stabilizer bars

● NHK Automotive Components India Private Limited

Precision springs and components

Main Activities : Manufacture and sales of precision springs and components

● NHK F. Krishina India Automotive Seating Private Limited

Automotive seats

Main Activities : Manufacture and sales of automotive seats

● P.T.NHK F. KBU INDONESIA AUTOMOTIVE SEATING

Automotive seats

Main Activities : Manufacture and sales of automotive seats

● PT. NHK KBU Seating Co., Ltd.

Automotive seats

Main Activities : Manufacture and sales of automotive seats

● PT. NHK Spring Indonesia

Precision springs and components

Main Activities : Manufacture and sales of chain tensioners

Europe

● NHK Spring Europe B.V.

Other

Main Activities : Business management, sales, and technical service in Europe

● NHK Spring Hungary Kft.

Automotive suspension springs

Main Activities : Manufacture and sales of coil springs and stabilizer bars

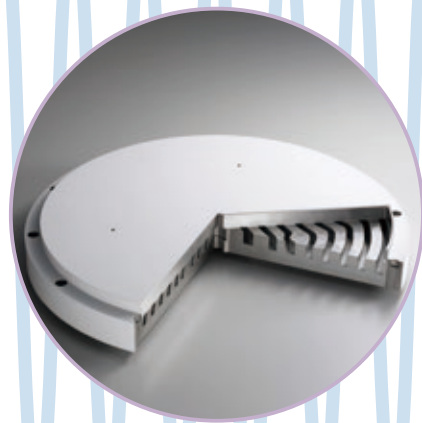
● Ibérica de Suspensiones, S.L.

Automotive suspension springs

Main Activities : Manufacture and sales of coil springs and stabilizer bars

NHK Spring Head Office and Sales Offices (As of February 2018)

Office	Address	Contact Info
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<http://www.nhkspg.co.jp/eng/>