



We provide optimal NVH solutions to solve vibration and noise problems

Anti-Vibration & Noise Reduction Products

Att. No.386E • 09-2024



A variety of anti-vibration and noise reduction products are in demand due to lighter equipment, vehicle electrification, and improved driving performance

1. Equipment weight reduction

- ▶ softer and more durable mounts are required

2. Vehicle electrification

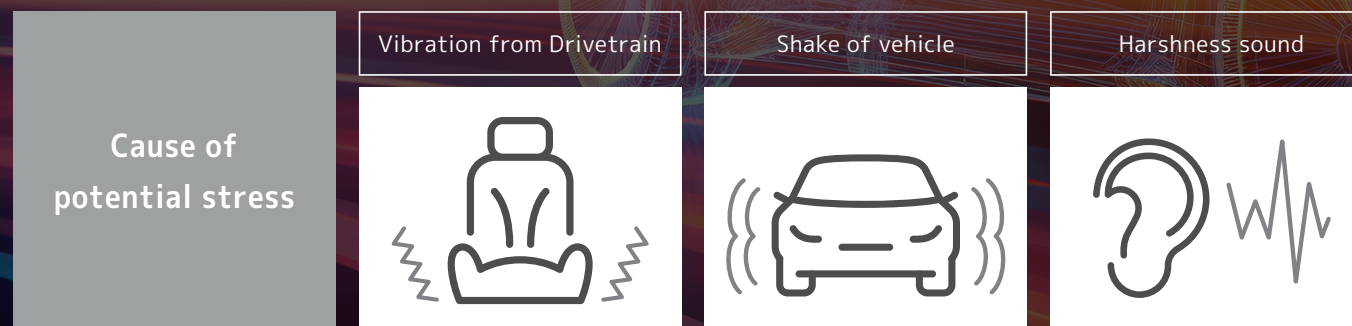
 Demand for high levels of anti-vibration and noise reduction in the interior and exterior of the vehicle

- ▶ Problems of small noise and vibrations not noticeable in internal combustion engines
- ▶ Complicated problems of vibration and noise due to higher output of electric devices and changes in component composition
- ▶ Uncomfortable noise and vibration caused by automatic operation and driving support functions

3. Improved driving performance

 Mobility cabin evolves into a comfortable moving space

For a comfortable moving space, the following potential stresses should be eliminated



Ensure anti-vibration performance and reliability

Wide range of products and mass production results

NOK have a wide range of anti-vibration rubber products line-up for engine, drive train and chassis, etc..

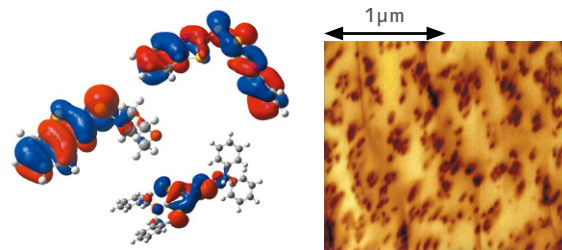
NOK develop and supply anti-vibration products and rubber material to all Japanese automobile manufacturers and non-automobile manufacturers.



▶ We provide optimal NVH[※] solutions to solve vibration and noise problems

3 key technologies for Anti-Vibration & Noise Reduction Products

1 High performance rubber development technology



Molecular orbital calculation

Images

We have various materials line-up including high damping rubber.

2 Optimal product design technology



We design low-stiffness products by optimizing the rubber material and shape.

3 Vibration and noise evaluation and analysis technology



We have analysis and evaluation technology based on many achievements and experiences.

Extensive rubber materials line-up

General Properties of rubber Materials

Evaluation point :Poor 1-5 Good

	Damping performance	allowable temperature range (°C) ^{※1}	Mechanical strength	Ozone resistance	Oil resistance ^{※2}
NR	Small	-55 ~ +80	4	2	1
NBR	Medium	-35 ~ +110	3	2	3
EPDM	Medium	-45 ~ +140	3	4	1
CR	Medium	-35 ~ +120	3	4	2
HNBR	Medium	-30 ~ +120	3	3	4
ACM	Medium	-20 ~ +140	2	4	4
FKM	Medium	-10 ~ +230	3	4	5
IIR	Large	-40 ~ +120	3	4	1
HDR	Maximum	-20 ~ +120	3	4	1

※1 The allowable temperature range is based on the following standards.

High temperature side: The maximum temperature at which tensile strength change rate within $\pm 30\%$, the elongation change rate within -50% , and the hardness change within ± 15 point, after 70 hours of air heating aging test.

[This maximum temperature applies the heat-resistant reference temperature for material evaluation specified in ASTM D2000 Line Call Outs.]

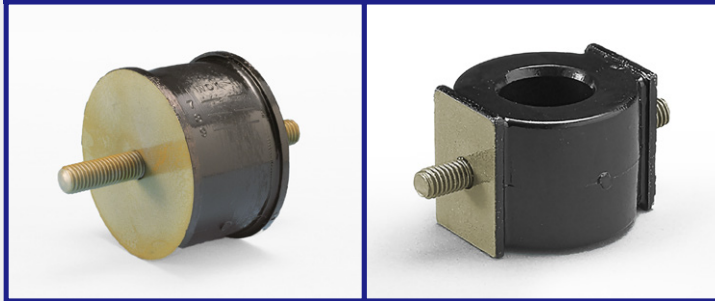
Low temperature side: The TR10 value. [This indicates the recovery in the low temperature range specified in ASTM D1329, and indicates the temperature at which 10% of the pre-applied strain is recovered.]

※2 The oil resistance does not include flame-retardant hydraulic fluids such as phosphate esters, water and glycol. For details, please contact NOK.

Optimum products to satisfy customer requirements

using catalog products and individually designed products

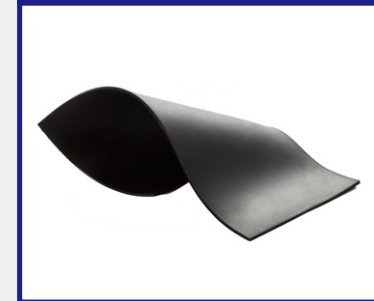
General-purpose Mount



Grommet Mount



Rubber sheet



Gear Damper



Damper Pulley



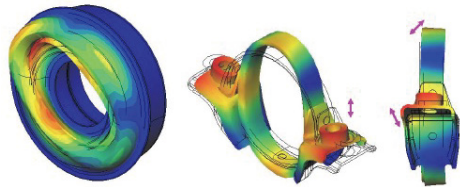
Bushing



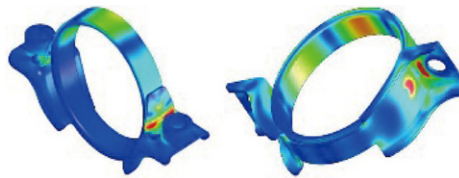
Solve potential problems with various analyses

Analysis and evaluation technologies based on our technical experience for automotive applications allow us to solve solutions to potential problems.

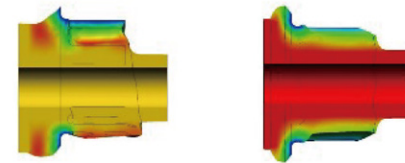
Eigenvalue analysis



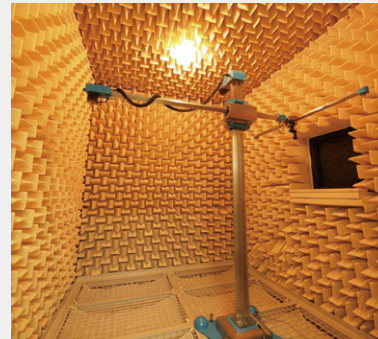
FEM analysis



Stiffness analysis property prediction



Road simulator



Acoustic Measurement Room



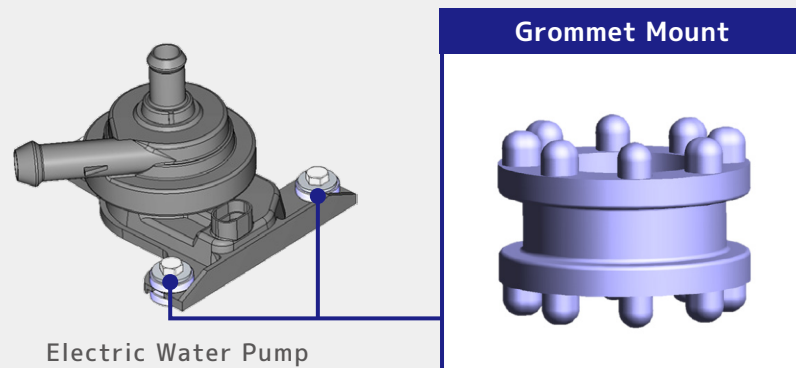
Chassis Dynamo

NOK anti-Vibration products

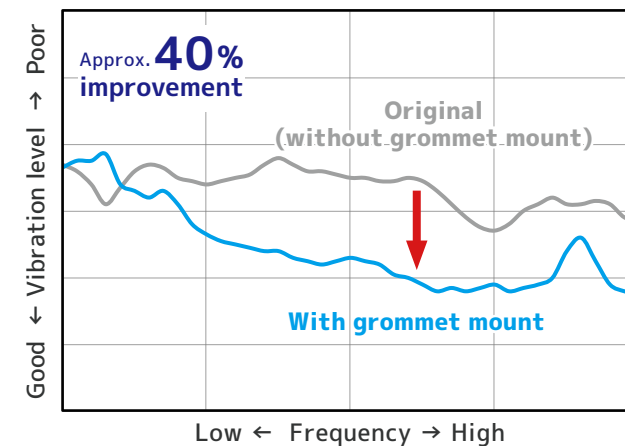
① Grommet Mount (for Electric Water Pump)

Functions and effects of Grommet Mount

- Since electric water pumps generate large vibrations, low-stiffness mounts are required.
- The low-stiffness grommet mount with optimized geometry is suitable for vibration isolation in lightweight equipment and space saving.
- In test, vibration levels were reduced by up to 40% by using grommet mounts.



Vibration measurement results

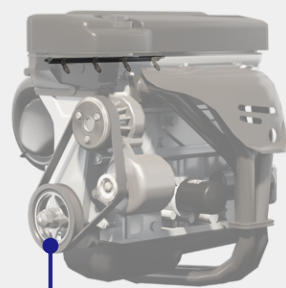


NOK anti-Vibration products

② Damper pulley (for Engine crankshaft)

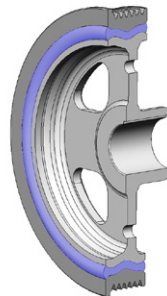
Function and effect of damper pulley

- Reduction of twisting and bending vibration of the crankshaft, reducing engine vibration and noise by installing the tip of the engine crankshaft.
- Transmit power to engine accessories via a V belt
- In test, vibration levels were reduced by up to 70% by using Damper pulley.

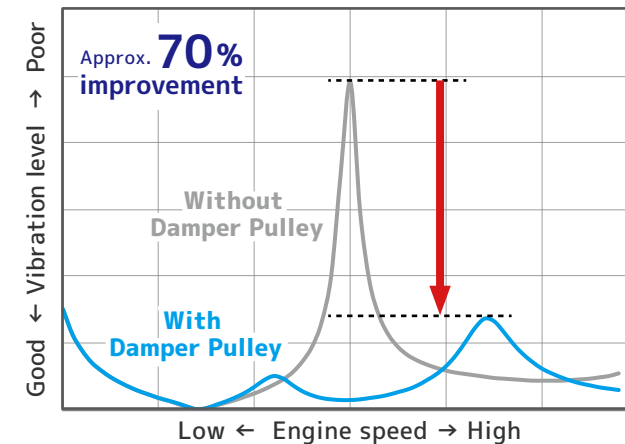


Engine

Damper pulley



Vibration measurement results

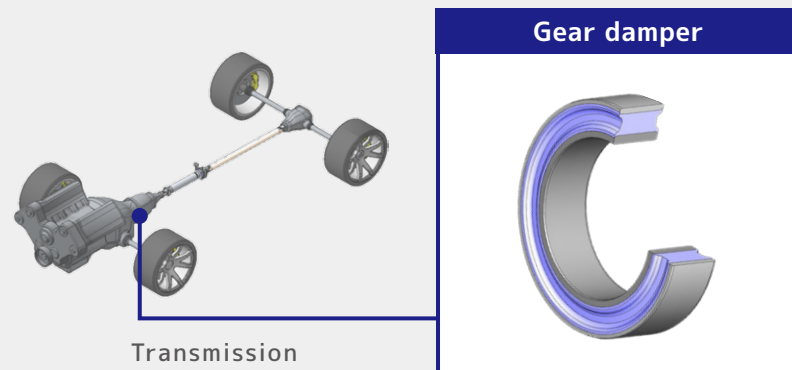


NOK anti-Vibration products

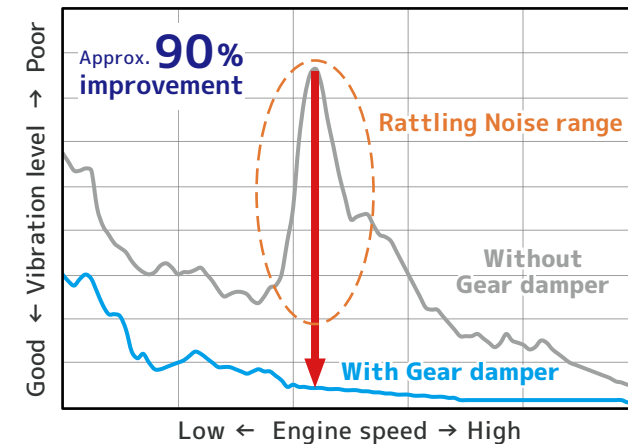
③ Gear damper (for transmission)

Function and effect of gear damper

- Since electric water pumps generate large vibrations, low-stiffness mounts are required.
- The low-stiffness grommet mount with optimized geometry is suitable for vibration isolation in lightweight equipment and space saving.
- In test, vibration levels were reduced by up to 40% by using grommet mounts.



Vibration measurement results



Support

NOK supports your development

Dependable



NOK's products are backed by repeated research on the materials used and mechanical designs. They are highly dependable and have been used for many years in a wide variety of machines.

Technology development



NOK's self-contained development system covers the entire process from product design to product inspection. We actively integrate R&D and production technologies to create unique, cutting-edge technologies and products.

Material technology



Material technology is one of NOK's core technologies. We have been working on the material compounding and chemical analysis technologies needed to develop rubber and adhesives used in seal products.

Global development



NOK has established production bases around the world, including Japan, China, and elsewhere in Asia, and have built a stable supply system to meet our customers' needs.

For consultations and inquiries, feel free to **contact us using [this form](#)**.



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