

What INOAC can do for the automotive industry

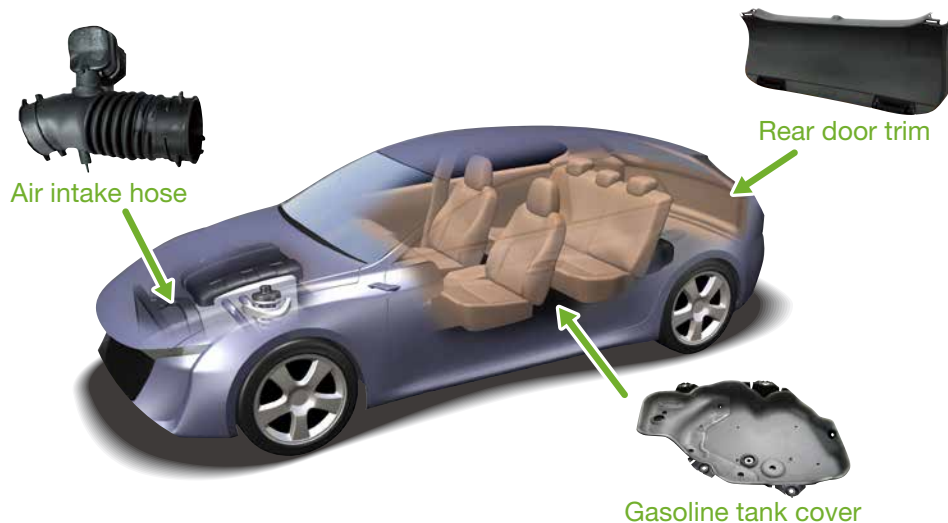
The history of the automotive industry in Japan stretches back over 100 years, but it has been facing a major turning point in recent years.

Since the financial crisis following the bankruptcy of the Lehman Brothers, the global economy has faced multiple crises, and the trade war between the US and China has intensified this year. All of this has continued to greatly affect Japan's automotive industry.

A crucial challenge that automotive-related companies must take on in order to pave the way for the future of Japan's economy is to flexibly respond to external factors, such as changing economic environments, and strive to achieve sustainable growth across the entire automotive industry. Aside from economic issues, the automotive industry must also contend with environmental issues as represented by CO₂ emission regulations.

As a manufacturing company with a division dedicated to automotive products, we at INOAC believe it is our duty to be aware of how much our activities affect the earth's environment, and at the same time, find a way to progress that is more in harmony with the environment.

We promote the development of automotive components that are compatible with environmental regulations, such as those concerning CO₂ emissions and exhaust gas. Featured here are some of our products that are being used commercially.



Examples of environmentally compatible products 1

Product name “Gasoline tank cover” to reduce volatile fuel

Theme Compatibility with exhaust gas regulations **Keyword** Thermal insulation

Gasoline-fueled vehicles inevitably leak gasoline vapor, which is raised as one of the causes of environmental pollution. Therefore, Japan and other countries are carrying out measures (evaporative emission regulations) to reduce the amount of gasoline vapor that escapes from the tank. To tackle this issue, we developed a tank cover that prevents vapor leaking from the gasoline tank.

Characteristics

What is a gasoline tank cover?

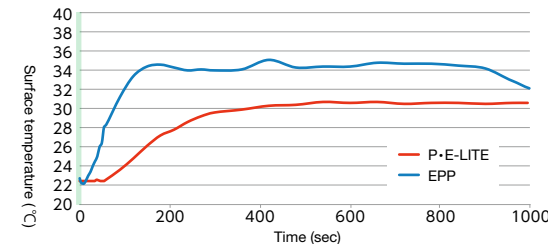
It is a cover that insulates the gasoline tank to prevent the tank temperature from rising.



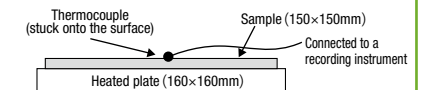
Thermal insulation

Our product uses P-E-LITE (foamed polyethylene), which demonstrates greater thermal insulation compared to the more commonly used polypropylene foam beads (EPP).

Measurement of surface temperature



Measurement method: The assessment sample (material) was placed on a 60°C plate and the surface temperature of the assessment sample was measured.

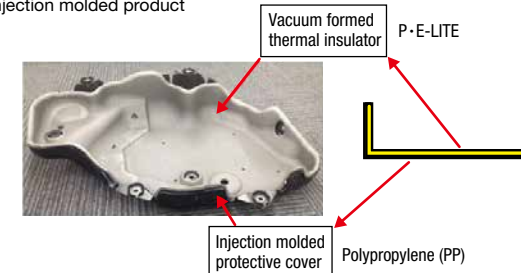


*Representative values measured by our company

Form superiority

The cover can be vacuum formed or bent to fit the shape of the tank for a better finish.

Vacuum formed + injection molded product



Examples of environmentally compatible products 2

Product name "Rear door trim" made lighter with large-scale injection molds

Theme Compatibility with CO₂ emission regulations **Keyword** Lightweight

Improvements to resin foaming technologies have enabled us to produce lighter rear door trims, which are large-scale injection molded articles. We have succeeded in making them lighter than the previously used polypropylene-molded articles while maintaining the same strength and precision.

Characteristics

Achieving both lightness and rigidity with large-scale injection molding technologies

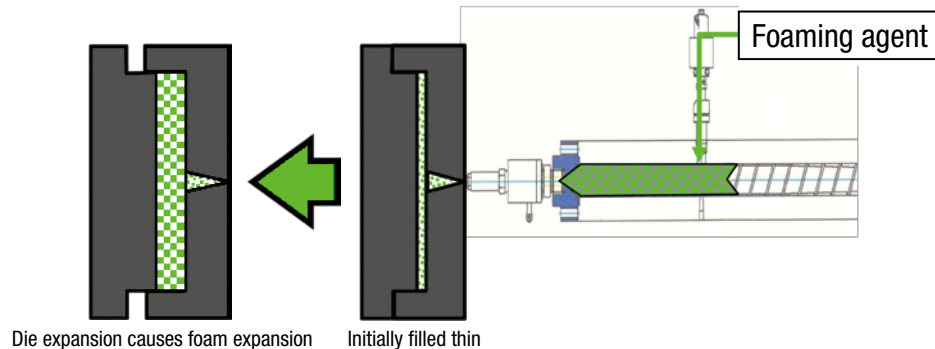
After the foamed resin is injected, the core back process* is applied to the die to expand the gas inside. This causes the foam to line the surface of the die, making it thicker and lighter.

This makes it possible to create a structure comprised of solid surface layers and a foam layer (in the middle). It furthermore increases the thickness of the plate, thereby ensuring lightness and rigidity.



*Core back

A method used during foam injection molding, where the volume of the die cavity is increased to expand the foam bubbles and create a high magnification foam-molded article.



Examples of environmentally compatible products 3

Product name "Air intake hose" made lighter with Thermoplastic Olefinic Elastomer

Theme Compatibility with CO₂ emission regulations **Keyword** Lightweight

The intake hose requires a level of flexibility that can withstand the engine's vibrations at engine room temperature. Vulcanized rubber (EPDM) has commonly been used, but we are currently making a switch-over to thermoplastic polyolefin elastomer to make the product more lightweight.

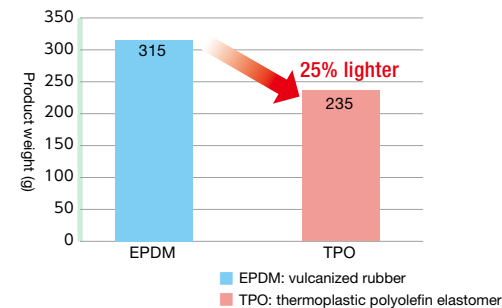
Characteristics

About the air intake hose

An intake hose that carries air from outside to the engine.



Effect on weight



*Representative values measured by our company

Thermoplastic polyolefin elastomer (TPO)

A material produced by physically mixing a polymer with plasticity and a polymer with elasticity.

The material can be used for regular injection molding and is also recyclable.

Keeping down manufacturing energy

Producing vulcanized rubber requires a vulcanization reaction to occur within the die, necessitating high temperatures and a lengthy molding cycle. However, thermoplastic polyolefin elastomer is formed by cooling plasticized material inside the die. The die temperature during the molding process therefore remains low, which keeps down manufacturing energy and CO₂ emissions during the manufacturing process.