

## Prevention of Pollution



### FY2019 Materiality Targets and Results

○: As planned △: Delayed

Details of Main Initiatives	FY2019 Targets	Indicators	FY2019 Results	Self-Evaluation
Properly manage hazardous substances in products	Properly manage hazardous substances	Reflection in in-house management system	Continued correct management including legal movements	○
Curtail emissions of VOCs in production activities	35g/m <sup>2</sup> or less of VOC* emissions per painting area in production activities *: VOC stands for Volatile organic compounds	VOC emissions	36.5g/m <sup>2</sup>	△

#### Basic Approach

It is possible that the air pollutants and chemical substances emitted due to business activities will have an impact on human health and biodiversity.

In order to contribute to the realization of a sustainable society, MITSUBISHI MOTORS considers the prevention of pollution to be one of the material issues for the Company. In the stage of product development, along with promoting the development of fuel economy improving technologies and electric vehicle technologies, we strive to manage to hazardous substances. In production processes, we are endeavoring to reduce air pollutants emitted from out plants by voluntarily enacting activity standards that are stricter than legal requirements. In order to reduce the impact on the environment from air pollutants and chemical substances, we engage in the prevention of pollution throughout all of our business activities.

#### Purifying Exhaust Gas while Driving

Vehicles powered by gasoline and diesel engines inevitably emit combustion gases from the engine while driving.

In addition to developing and popularizing electric vehicles, which emit little exhaust while driving, we are endeavoring to develop and encourage the use of gasoline and diesel vehicles that have emissions containing fewer hazardous substances.

#### Improving Gasoline Engine Vehicles

Since the 1960s, emissions of carbon monoxide, hydrocarbons, and nitrogen oxides (NOx) have been steadily restricted by regulations.

MITSUBISHI MOTORS has taken various measures since such regulations were first introduced. We currently comply with these regulations by applying electronically controlled fuel injectors and advanced catalyst technologies to the combustion control system.



## Improving Diesel Engine Vehicles

For diesel engine vehicles, carbon monoxide, hydrocarbons, NOx, and particulate matter have been regulated in some countries, such as Japan, United States and European countries, since the 1970s.

Since such regulations were first introduced, we have taken measures including improving the combustion technology. To comply with these regulations, we have developed and produced clean diesel engines by systemizing technology such as VG turbochargers, controlling combustion with a common rail fuel injection system, introducing after-treatment using NOx trap catalysts, and diesel particulate filters.

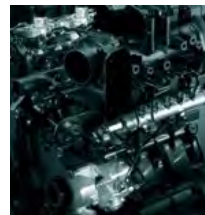
### VG Turbocharger

The VG turbocharger helps to improve fuel economy and suppress emissions of particulate matter through optimum supercharging across the engine's operating range.



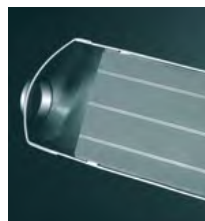
### Common Rail Fuel Injection System

Particulate matter and NOx can be generated due to incomplete combustion. In MITSUBISHI MOTORS vehicles, this is suppressed using a high-pressure fuel pump, common rail accumulator that stores highly pressurized fuel, and electronically controlled fuel injectors.



### Diesel Particulate Filter (DPF)

This substantially reduces particulate matter.



## TOPICS

### The Clean Diesel Engine on the ECLIPSE CROSS



The ECLIPSE CROSS, which launched in June 2019, is equipped with a clean diesel engine. Its 2.2-liter common-rail DI-D\*1 clean diesel turbo engine achieves a balance between environmental and driving performance.

A urea SCR\*2 system is used to purify the diesel engine's emissions. Nitrous oxides (NOx) are stably purified by AdBlue®\*3, an aqueous urea solution.

\*1 Abbreviation of direct-injection diesel

\*2 Abbreviation of selective catalytic reduction

\*3 AdBlue® is a registered trademark of Verband der Automobilindustrie (VDA).



## Reduction of Hazardous Substances

In accordance with the reduction targets of the Japan Automobile Manufacturers Association, Inc. (JAMA) and EU end-of-life vehicles directive, MITSUBISHI MOTORS is working to reduce the use of four substances (lead, mercury, cadmium, and hexavalent chromium). We have established internal technical standards to voluntarily reduce hazardous substances. We are also taking measures to comply with regulations on the use of hazardous substances in each country in compliance with the REACH regulation\* concerning substances. At present, in addition to four substances and other heavy metals, the use of VOCs (volatile organic compounds), bromine-based flame retardants and various other substances is regulated. Regulations similar to European ones are being enforced in developing countries in Asia as well.

We are working to voluntarily reduce hazardous substances by setting internal technical standards.

\*REACH stands for "Registration, Evaluation, Authorisation and Restriction of Chemicals." Enacted on June 1, 2007, the REACH regulation is a general system to register, evaluate, authorize and restrict the use of substances

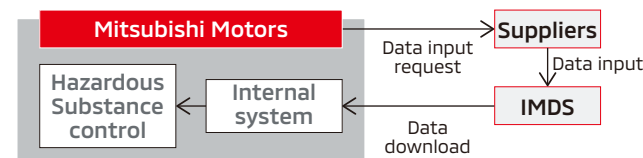
### Material Data Control by the International Material Data System (IMDS)

Data on the hazardous substances contained in vehicle parts delivered by suppliers are collected by the International Material Data System (IMDS), an international system for collecting such data. Together with overseas plants such as Mitsubishi Motors (Thailand)

Co., Ltd. (MMTh), we utilize the collected data under a globally centralized internal system for reducing hazardous substances.

In cooperation with suppliers, we are complying with the REACH regulation, a general system for the registration, evaluation, authorization, and restriction of substances used in the EU.

### Flow of Data Collection through IMDS



## Reduction of In-Cabin VOCs

To provide customers with a healthy and safe cabin space, MITSUBISHI MOTORS works to reduce volatile organic compounds (VOCs) inside the cabin.

VOCs are organic compounds that are easily volatilized at room temperature such as formaldehyde and toluene. These compounds are thought to cause sick building syndrome, and may irritate the eyes, nose, and throat. In an automobile cabin, they are mainly generated by adhesives and paint used in interior parts.

JAMA established voluntary guidelines for reducing vehicle cabin VOC concentration levels applicable to new model passenger cars marketed starting from the 2007 fiscal year.

Please see the JAMA website for details regarding the Voluntary Guidelines.

[WEB](http://www.jama-english.jp/release/release/2005/050214.html) <http://www.jama-english.jp/release/release/2005/050214.html>

### Progress

We are working to reduce in-cabin VOCs by developing materials with low VOC emissions and technologies to reduce VOCs generated inside the cabin.

### Example of Measures to Reduce VOCs

Carpet	Reduced aldehydes in pile adhesives
Seat	Reduced organic solvents in fabric adhesives
Ornaments	Reduced VOCs by using spun-dyed high-gloss interior parts
Air-conditioner	Reduces VOCs with clean air filter with deodorizing function



## Preventing Air Pollution

### Reduction of VOC Emissions from Production Processes

MITSUBISHI MOTORS is applying the waterborne 3WET paint method\*1 to its painting process to reduce VOC emissions. In Japan, we use this method at the Mizushima Plant and the Okazaki Plant. Overseas, the system is used on the No. 3 paint line at Mitsubishi Motors (Thailand) Co., Ltd. (MMTh). MMTh also plans to use this approach at a new paint plant it is constructing.

We are also upgrading our robotic and other painting systems, reducing the amount of paint used by adjusting production lots and increasing the amount of used thinner we recover. Through these moves, we are reducing VOC emissions from vehicle production.

\*1 With this method, water-soluble paints are used for the middle and top coats. Solvent-based paint is used only for the clear overcoat.



Deodorizing equipment for electrodeposition drying furnaces to reduce VOC emissions (Okazaki Plant)

### Management of Air Pollutants

We follow laws and regulations to manage the concentrations and amounts of such air pollutants as Nitrogen oxides (NOx), Sulfur oxides (SOx) and soot emitted in production processes. (For details, see the ESG Data on page 97.)

To lower NOx emissions, we introduce low-NOx-content boilers and burners when upgrading or installing new equipment. To reduce Sox emissions, we are transitioning to the use of lower-sulfur boiler fuels, such as kerosene or natural gas

## Management of Chemical Substances

### Appropriate Management of Chemical Substances

When using chemical substances, we employ a system of examining substance toxicity before introducing them. We examine their physical properties and the details of usage plans, as well as legal requirements, conduct risk assessments, judge whether they can be used and educate workers. In fiscal 2019, augmenting the functionality our conventional system, we updated our chemical substance management system by introducing systematic risk assessment of chemical substances and centralized management of the most recent Safety Data Sheet (SDS) information. We are using this system to manage chemical substances appropriately.

### Appropriate Management of Hazardous Waste

MITSUBISHI MOTORS manages hazardous waste to avoid importing or exporting hazardous waste that is restricted by the Basel Convention on the Control of Transboundary Movements of Hazardous and Their Disposal\*2.

We also transport and treat waste produced in Japan appropriately, based on various legal requirements.

\*2 This convention stipulates international frameworks and procedures related to restrictions on the movement of certain types of waste across national boundaries.

### Appropriate Management of Waste Containing PCBs

Harmful polychlorinated biphenyls (PCBs) are contained as insulation oil in transformers and condensers that were manufactured a long time ago. Based on the Act on Special Measures concerning Promotion of Proper Treatment of PCB Waste, we promote the correct processing of equipment that uses low-concentration PCB and waste that contains PCB, and we plan for disposal by the processing deadline.