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Mitsubishi Motors develops Green Plastic: a bamboo-fiber reinforced plant-based resin for use in automobile interiors

- Cutting CO2 emissions throughout the vehicle lifecycle -

Tokyo, February 14, 2006 - Mitsubishi Motors Corporation, with cooperation from the Aichi Industrial Technology Institute (Kariya, Aichi Prefecture), has developed an automotive interior material which uses a plant-based resin, polybutylene succinate (PBS), combined with bamboo fiber. Parts made from the material will be used in the interior of a new-concept minicar, to be launched in Japan in fiscal 2007. Mitsubishi Motors has dubbed its independently developed plant-based resin technology, including this PBS-bamboo fiber resin, "Green Plastics". Mitsubishi Motors will continue to promote the development of environmentally friendly materials, directed toward increased practical applications. In an effort to help stop global warming, slow the depletion of our oil reserves, and protect our forests, Mitsubishi Motors plans to substitute plant-based resins and quick-growing plant fibers for materials such as petroleum-based resins and wood hardboards used in car interiors. The use of these renewable plant-based resources, in principle, will add no CO2 to the atmosphere. Mitsubishi Motors began developing the materials in conjunction with the Aichi Industrial Technology Institute in 2004.PBS, the main component of the material, is a plant-based resin composed mainly of succinic acid and 1,4-butanediol. The succinic acid for the material will be created through the fermentation of sugar extracted from sugar cane or corn. The new material combines bamboo fiber with PBS in order to increase its rigidity. Bamboo grows to its full height in just a few years, compared with the tens of years required for traditional timber, and as such may be called a potentially sustainable resource. Bamboo is available and can be grown in a wide variety of areas including Japan, China, and Southeast Asia. The use of Green Plastics may lead to further breakthroughs in the use of bamboo.According to tests, this PBS/bamboo-fiber prototype achieves an estimated 50% cut in lifecycle CO2 emissions over polypropylene, a widely used petroleum-based plastic. VOC (volatile organic compounds) levels are also reduced drastically over processed wood hardboards (roughly 85% in testing).In addition to Green Plastic, Mitsubishi Motors is undertaking development of environmental technologies including the MIEV (Mitsubishi In-wheel motor Electric Vehicle)concept, and technologies contributing to comfortable interior environment such as Oeko-Tex Standard 100 certified seating material, the Bio-clear Filter, and deodorant rooflining. Mitsubishi aims to build cars appropriate to this, the "century of the environment".

The introduction of this e-coating technology results in several advantages:

- Lowers VOC emissions that occur during basecoat painting at Mazda's plants in Japan by 32 tons per year, a reduction of 50 per cent.
- Reduces CO2 emissions during paint manufacture by 8.8 tons per year.
- Reduces by 10 per cent the volume of basecoat materials that are necessary compared to previously utilised painting methods.
- Improves rust protection through a more uniform thickness of paint film on the vehicle inner bodies.

Outline of the new e-coating technology

The electrodeposition painting process involves vehicle bodies being immersed in a paint tank, with an electrical current passing through the steel parts causing the paint to adhere to the metal surfaces.

Using an electrical charge facilitates an excellent paint-to-metal bond, and is generally used to help prevent corrosion on all body surfaces. However, with conventional paints, discrepancies in paint film thickness can result between the inside and outside body surfaces because it is difficult for electrical currents to reach all interior parts and form an even paint film on interior surfaces.

The newly developed e-coating has modified paint characteristics that raise the paint's electrical resistance, enabling the electrical current to reach inner surfaces more easily and reducing the amount of electricity used during painting. This provides sufficient paint thickness on inside surfaces and increases rust protection.

Optimal paint thickness is usually achieved on vehicle body outer surfaces because the electrical current flows more easily to exteriors than to internal areas. Prior to the introduction of the new e-coating system, excess paint accumulated on outer surfaces during conventional painting. With e-coating, the thickness is better regulated, allowing for a reduction in the total amount of paint necessary.