

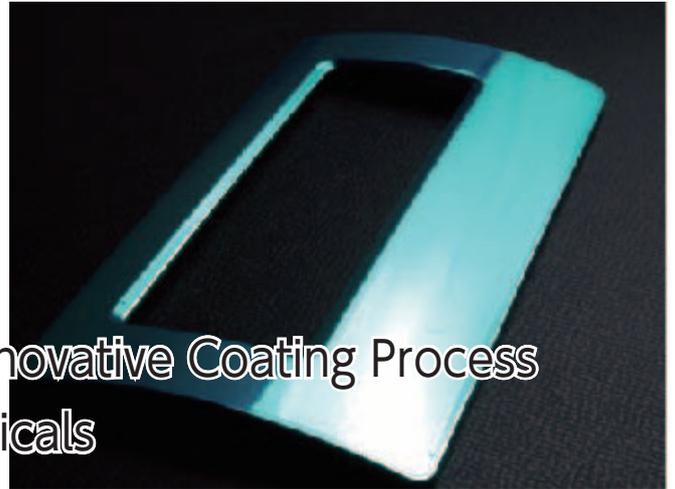


December 2011

KAMI ELECTRONICS IND CO., LTD.

• Development of Fundamental Technologies for Risk Reduction of Hazardous Chemical Substances/Research and Development of Innovative Coating Devices (FY2007–FY2008)

From Tohoku to the World! Innovative Coating Process Reduces Use of Harmful Chemicals



Industrial products such as automobile dashboard components, digital cameras and mobile phones require an excellent design and quality to satisfy consumer preferences. One processing technique that contributes to a product's functionality is coating application. Coatings, such as the paint that gives a product its color, require the inclusion of organic solvents that provide a good finish when diluted.

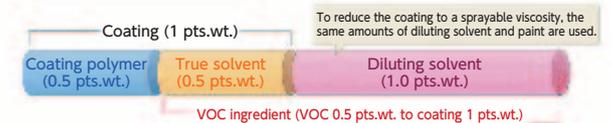
Organic solvents, however, contain substances that are toxic to the human body and ecosystem, and they can also contribute to air pollution problems such as photochemical smog. In Japan, chemical substances that pose a high risk to the human body and environment, such as volatile organic compounds (VOCs), are highly regulated to ensure their use is managed appropriately and that emissions are reduced.

Taking into account the needs of society, Kami Electronic Industry, a leader in component coating techniques headquartered in Miyazaki Prefecture, is committed to developing innovative coating processes that do not use VOCs. With the support of NEDO and the cooperation of the National Institute of Advanced Industrial Science and Technology (AIST) and the Industrial Technology Institute, Miyagi Prefectural Government (ITIM), the company has developed a coating method that is capable of diluting and spraying paint by using supercritical carbon dioxide (CO₂) instead of organic solvents, thereby reducing the amount of VOC used to one-third of that in conventional methods. Kami Electronic Industry is now using this method in its plants. Several leading automobile interior component manufacturers have also incorporated it into their coating systems as well.

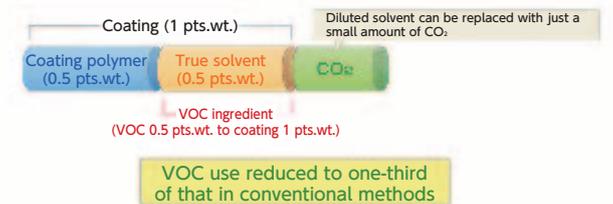


Coating robot

Conventional method (organic solvent coating)



Proposed method (CO₂ device)



Reduction effects of VOC used in supercritical CO₂ coating method



Coated automobile interior component

Q. Why did this project start?

The appropriate management of manufacture, use and disposal of chemical substances has become mainstream around the world. Reducing risks is especially important for chemical substances that have the danger of adversely affecting human health or ecosystems. In Japan, PRTR (Pollutant Release and Transfer Register) based on the "Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof" and revisions to the "Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc." (Chemical Control Law) have helped reduce the risk of harmful chemical substances. The revised Air Pollution Control Law came into effect from 2006, emissions restrictions were also imposed on volatile organic compounds (VOC). With this background in mind, the project was started with the aim of encouraging self-imposed restrictions that had been previously conducted amongst businesses, and managing chemical substances through development of technology for the low-priced collection, detoxification and substitution of harmful chemical substances in order to reduce their risks.

Q. What was the aim of the project?

The objective of this project is to reduce the use and emissions of harmful chemical substances, especially VOC that pollutes the atmosphere and is the chief cause of photochemical smog and other pollution. According to the results of simulations run by the Ministry of the Environment, VOC emissions in FY2000 were 1,465,000t, with a 30% reduction in VOC emissions required by FY2010 compared to FY2000 figures to achieve the targets set for photochemical oxidants and SPM. To achieve this, the objectives of the project were set as 1) developing new technology that limits, collects and detoxifies harmful chemical substances when they are emitted from factories or other buildings (as smoke, waste water or other emissions), 2) developing new technology that reduces, eliminates or provides substitutes for the use of harmful chemical substances during the manufacturing process or within products at factories, and 3) developing software and systems that reduce the risk of harmful chemical substances.

Q. What is the role of NEDO?

Development of technologies that reduce the risk of harmful chemical substances is an issue of a national scale and it needs to be addressed by society urgently. The result of this leads to a healthy, safe and secure lifestyle for the Japanese people that is at one with the environment. Collecting and detoxifying chemical substances, as well as products that contain these, once they have been released into the environment is extremely difficult for the industrial sector alone to achieve. As there are no technical measures available and the fact that costs would be incurred, delays could be expected for any form of voluntary management. NEDO stepped in to provide support for the development of technology that ensures comprehensive management from the use through to disposal of chemical substances, as well as the reduction and elimination of the use of harmful chemical substances. By providing support, NEDO was able to utilize its knowledge on the risks of harmful chemical substances and its positive records with regards to technical development to advance the project.