

Recycle

Effectively Utilizing Limited Resources by Improving Recyclability

POINT

- (1) We are developing and producing easily recyclable vehicles based on the actual disposal conditions for end-of-life vehicles.
- (2) In 2006 we achieved an ASR*³ recycling rate of 75%, the highest among automakers that year.
- (3) Starting in April of 2007, ahead of schedule, we have prohibited the use of hexavalent chromium in all vehicles currently being produced.

Recycling Activities

Subaru has established the Automotive Recycle System of Subaru (ARSS*²) as part of active efforts to recycle and properly dispose of end-of-life vehicles (ELVs*¹), according to the Japanese End-of-Life Vehicles Recycling Law (hereinafter referred to as the ELVs Recycling Law) which came into force on January 1, 2005. The recycling ratio of ASR*³ in fiscal 2006 was 75.0%, marking a top position among automobile manufacturers and satisfying the Japanese legal standard required for fiscal 2015 (The recycling ratio of ASR: 70% or higher). We will continue efforts to keep the recyclability of Subaru automobiles at a constantly high level, as well as aim at further efficiency improvements and low-cost recycling in order to minimize the recycling fee paid by our customers.

Efforts in the Design Stage

Emphasis on Design Allowing Easy Recycling

Design Considering Recycling for Efficient Use of Resources

(1) Recycling Market Research

The Recycling Design Project Team members continuously visit dismantlers, shredding companies, and waste disposers in various parts of Japan to exchange views on the current and future market trends for actual ELV treatment. The results are used to determine the principles for designing automobiles with due consideration for recycling and extract specific subjects for future research.

(2) Efforts to Improve Recyclability

[Advances in Wire Harness Dismantling]

Because a large amount of copper is used in a wire harness, if the wire harnesses can be removed before the ELVs are shredded, the collection and separation of iron and copper will be en-



Advances in wire harness dismantling

hanced and their value in terms of resource recycling will increase. Subaru is conducting studies for a harness layout and automobile structure that make it possible to effectively collect more iron and copper and in a shorter time.

[Easier Material Identification]

It is most important that the material of each part can be recognized easily when we recycle. Subaru started to identify the type of material on plastic parts in 1973 even before guidelines for the industry were established. Material identifications had been attached on the rear side of each part before. However, the position was changed, as we believed we could avoid such wasteful actions as dismantling a part to confirm the material type. Subaru has changed the identification positions on all car models, including the Legacy, the Impreza and the Stella since 2001.



Now the material type can be seen without dismantling the bumpers.

An example of the material indication: "PP" means polypropylene

[Using Materials that are Easy to Recycle]

We are using olefin resin, which is extremely easy to recycle, as the resin material for the interiors and exteriors of most new and remodeled vehicles. In particular, we are using integrated materials dedicated for use with bumpers for bumpers and integrated materials dedicated for use with interiors for interior parts.

Using Integrated Materials for Interior Parts: Olefin Resin in the Stella



*1 ELV: End of Life Vehicles

*2 ARSS: Automotive Recycle System of SUBARU

*3 ASR: Automobile Shredder Residue: Residue after scrapped metals for recycling removed from shredded car body

(3) Efforts to Improve Proper Disposal

ELVs Recycling Law also regulates the proper disposal of substances with environmental impact, particularly fluorocarbons (refrigerants for air conditioners) and airbags. Concerning future vehicle development, Subaru recognizes the essential need to produce vehicles that can be disposed of more easily.

[Reduction of Fluorocarbons Used in Air Conditioners]

Subaru uses a substitute fluorocarbon, HFC134a, for refrigerants in air conditioners, which does no harm to the ozone layer, but which is still believed to accelerate global warming. We are conducting active countermeasures to reduce the amount of HFC134a and also research into substitute refrigerants other than fluorocarbons.

[Advances in Airbag Disposal]

Airbags and pretensioner belts contribute significantly to reducing the shock to drivers and passengers in automobile accidents. On the other hand, the vast majority of automobiles are put out of service with unused airbags. Because automobile manufacturers are asked to dispose of airbags and similar products under the ELVs Recycling Law, we are conducting research into the optimal structure for airbags, including related components, that will make it safer and easier to activate them in automobiles and subsequently dispose of them.

Reducing Environmentally Hazardous Substances

Achieved the Target for Reducing Use of Hexavalent Chromium Earlier than Planned

We have been working to reduce the amounts of four environmentally hazardous substances (lead, mercury, cadmium and hexavalent chromium) under the voluntary action program of the Japan Automobile Manufacturers Association (JAMA). We achieved the targets for lead, mercury and cadmium, and then in April 2007, earlier than planned, we managed to prohibit the use of hexavalent chromium in all newly produced vehicles. Moreover, we adopted lead-free soldering methods for several parts including airbag sensors, antennas, speakers and navigation systems, and are currently working to gradually expand the rate these methods are used with other parts.

Reduction Targets and JAMA's Voluntary Action Program for New Models

Substance	Target (period achieved)	Details of Reduction Efforts:
Lead	Since Jan. of 2006	Reduce the amount per vehicle produced to less than 1/10 the 1996 levels
Mercury	Since Jan. of 2005	Use prohibited except in a few applications (e.g., minute amounts in discharge headlights and in the liquid crystal panels of GPS systems)
Hexavalent chromium	Starting in Jan. of 2008	Use prohibited
Cadmium	Since Jan. of 2007	Use prohibited

Reducing VOCs in Vehicle Interiors

Achieved the Target for Reducing the Use of Harmful Volatile Organic Compounds

In order to reduce the use of VOCs*4 such as formaldehyde and toluene, which can cause nose and throat irritation, we are revising whether to make changes to the components and adhesive agents used in vehicle interiors. In the Stella, we achieved the goals set by JAMA*5 ahead of schedule by reducing the concentration of the 13 substances defined by the Ministry of Health and Welfare in Japan to levels below the figures set in the guidelines for interior concentration. In the future, we will continue our efforts to reduce the levels of such substances to below the figures set in the guidelines in all new vehicles slated for release.

*4 VOC stands for Volatile Organic Compounds, such as formaldehyde and toluene, which easily become volatile at room temperature. Such substances are thought to be the cause of sick building syndrome.

*5 Voluntary target: to reduce interior concentration of the 13 substances identified by the Ministry of Health, Labour and Welfare to levels equivalent to or lower than the figures stipulated in the guidelines for new vehicle models (produced and sold in Japan in 2007 and afterward) under the Voluntary Approach in Reducing Cabin VOC Concentration Levels initiated by JAMA.

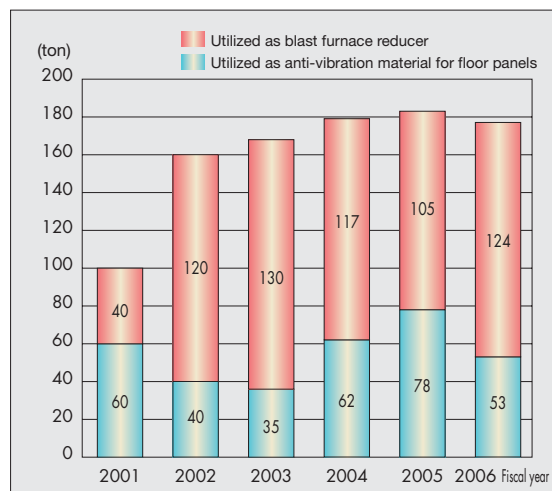
Sales and Service Activities

Recycling Waste Materials (Paint Sludge)

Establish Recycling Technology to Reduce Waste Materials (Paint Sludge) into Recyclable Materials

We found a way to recycle paint sludge from the paint factory. We are recycling paint sludge as anti-vibration materials for vehicle floor panels and as blast furnace reducer. We are also considering recycling it for other uses.

Amount of Paint Sludge Recycled



Utilizing Other Industrial Wastes

Actively Utilize Recycled Materials Generated by other than Automobiles

Subaru will actively utilize recycled materials generated by industries other than the automobile industry.

