

A New Story About Earth (vol.2)

Steel to Protect Life and Preserve the Earth (p3)

Mr. Automobile, who has been working day in day out to make yet better automobiles, has a big headache.

For automobiles, safety is important, first and foremost.

But, by increasing thickness of steel to protect the life of the driver, steel becomes sturdier but heavier.

Heavier steel means more gasoline for an automobile to run.

It also means wasteful use of resources and more exhaust emissions.

CO₂ (carbon dioxide) in emissions further aggravates global warming.

Oh, what shall I do?

Mr. Automobile, racking his brains, has had three sleepless nights.

At present, movements are mounting worldwide to reduce CO₂ discharge. Of the world total CO₂ discharge, vehicles account for about 30%, a large share of which represents automobiles.

Safety and environmental preservation—can't we find a good balance between them.

Mr. Automobile's headache is everyone's headache in the automobile industry.

Yes, weight reduction must be the answer.

Then, let's switch to aluminum and plastics.

But, both aluminum and plastics have proved much too lacking in strength, compared to steel.

Moreover, they are both difficult to recycle, which make them too costly overall.

Mr. Automobile started dragging his feet, mumbling.

Amazingly light but amazingly strong...steel!

He doesn't know whether such steel exists.

But, he headed toward steelworks which seemed his last hope.

Upon arrival, he mentioned a kind of steel which he was looking for.

Then, the reply came unexpectedly promptly and easily.

Oh, you mean "HI-TEN (high tensile strength steels)" for automotive use?

What? Then, there has been such a thing after all. Mr. Automobile was

really flabbergasted.

HI-TEN, very thin but very strong, is a truly new steel developed by Nippon Steel.

It is available in a great variety. Steel sheet with strength many times that of aluminum. Steel sheet, which is strong but very formable into various shapes and, when impacted, changes properties to alleviate the shock. There are many others.

With such light weight and strength, HI-TEN offers both safety and fuel economy.

Being steel, HI-TEN can be easily recycled.

On top of that, it is wonderfully formable.

We can design smart automobiles.

Mr. Automobile, no longer tired from sleepless nights, was excited about the development of new models he wanted to start.

With HI-TEN, we can better protect life in automobiles and can do better, environmentally, too.

Mr. Automobile was seen off by Nippon Steel people waving and cheering. Hooray! Mr. Automobile, hooray!

A stop for a tip of information

Q. What is a steel which is strong and soft?

Today's automobiles must be more light-weight and safer. But, light and strong are not enough. Because steel is used for doors, bumpers and various other places of an automobile, it needs to be formable into various shapes. Steel, therefore, is required to be "soft" enough to be bent easily and welded. The answer is "strong and soft" HI-TEN.

Q. Why can HI-TEN protect life and good environmentally?

Light and strong HI-TEN has now been extensively used in the automobile industry. It has become indispensable. Lighter-weight body consumes less fuel gas. Less strain on engines results in less exhaust emissions. On top of this, full safety provision. HI-TEN certainly is a strong steel to protect life.

Steel House Chosen in China (P13)

Today, as always, people are baking bricks.

Bricks are needed for putting up their houses.

This can't be helped, perhaps.
But, the sky is dark with smoldering smoke.
And after brick-making material has been dug out, the land lies deserted
and barren.
Less that much land space for farms and rice puddies.

Today, as always, trees are being felled down in woods.
To use as lumber for houses and firewood.
Precious woods which could have been an absorber of carbon dioxide, a
major offender in global warming.

What will become of our homeland?

Hello! Here we are in China.
This country is now changing dramatically.

For instance, the "Home Owners Promotion Program."
Until now, people have generally lived in the state-owned housing.
But, now, people are beginning to be encouraged to own houses.
Of the world population of 6300 million, China accounts for 1300 million.
Naturally, it will be a gargantuan task to house so many people.
But, to be home owners are fond dreams for Chinese people.

Yet, setting up houses involve unwelcome changes in the natural
environment.

Less and less arable land and wooded areas,
worsening air pollution...
If nature continues to be abused for people's houses,
the habitat of animals will dwindle down.

Isn't there a way to provide housing for people,
while at the same time preserving the natural environment?

In such a predicament, China's attention was drawn to a new
construction method in Japan.
Nippon Steel's "Nittetsu Super Frame" method.

This came as a surprise to Chinese people.

The Nittetsu Super Frame uses steel in stead of wood.

That is, steel frame.

Even in Japan, houses by this method are being built in growing numbers.

Steel Frame is strong and durable.

It can withstand earthquakes, typhoons, fires—and wood-eating termites.

Naturally, being steel, recycling is OK.

On top of this, this method can provide space as large as 72m², without supporting posts in it.

With excellent heat-insulating techniques, Steel Frame can be made cool in summer and warm in winter.

No more bricks. No more wasteful use of wood.

In this way, we can preserve beautiful nature!

Using this Nittetsu Super Frame method, a housing construction project of over 30,000 houses a year will soon start.

Today, magnificent nature of China seems somewhat restful.

A stop for a tip of information

Q. Is a steel frame house like a thermos?

The Nittetsu Super Frame method builds a house completely enveloped with insulating materials on the outside. As this house is like a thermos, heat inside is difficult to escape. Very comfortable, cool in summer and warm in winter. In the tests conducted in a cold region of Hokkaido, the northernmost part of Japan, the Nittetsu Super Frame house showed room temperatures of 20°C±5°C in heated rooms and, in rooms not directly heated, 17~18°C, not much different from heated rooms. What makes this possible is a combination of steel's feature of good heat conduction with the thermos-like structure. Steels used in the frame conducts the warmth of heating throughout the house, and with little heat escaping, the inside of the house stays warm.

The King of Recycles (P23)

Father is enjoying his ritual of beer drinking tonight.

Opens the tab of a beer can.

Pop! Gulping. Ah!

I don't understand, but he seems very, very content.

Then, he quashes the can, one-handed.

These days, people can drink beer and beverages any time, any where throughout Japan, thanks to “cans.”

But, extraordinary quantities of used cans occur every day.

Not to let used cans go to waste, but to use them as resources.

How is the state of recycling?

For instance, take aluminum cans, one of the beverage cans. Aluminum cans are light and soft and, for this reason, in wide use. Unfortunately, however, aluminum cans run up electricity bills both in making and in recycling.

Steel cans, on the other hand, are strong and resistant to heat and, for this reason, in wide use for coffee and soup cans, which need heating at high temperatures.

Moreover, there are also steel cans as thin as aluminum cans and used for beer cans.

Perhaps, the can Father crushed one-handedly was a steel can.

Steel cans have long been used in volume for juice and carbonated beverages.

Used steel cans are recycled into cans again or automotive bodies, home appliances, structural materials and just about anything made of steel, many times over.

It, therefore, conserves energy needed for manufacture and generates less carbon dioxide, compared to aluminum.

Steel cans' recycling ratio is over 80%.

Of all the containers, steel cans are the unrivaled king of recycles.

No doubt, this is also because people cooperated in recycling steel cans by classifying wastes and being mindful of throwing used cans into waste-baskets.

And Nippon Steel has newly developed steel as thin as 0.18mm.

From our wishes for more use of steel cans and for conservation of valued resources.

We will continue to do our best to achieve more advances in steel cans,

which are environmentally good.

Now, with canned beer, let's exchange toasts!

A stop for a tip of information

Q. To what extent are steel cans recycled?

Of the total steel can consumption, 82.9% is recycled by steelmakers as resources (data for 2001). The reason is the "ease" of recycling. From among the recyclable wastes collected at the recycle centers in many places across the country, steel cans are selected out by magnets, unaided by men. This recycling system, however efficient, must start from "classifying" at individual homes.

Q. What is an ecological container for beverages?

Steel cans. There is no question about it. Steel needs less energy to make than aluminum and generates less CO₂. Attracted by magnets, steel cans are recycled with great ease. Steel cans collected as recyclable wastes are melted at steelworks located in many parts of the country and come out again, in the form of useful materials, such as schools, buildings, bridges, trains, rails, automobiles, washers, refrigerators, steel cans, etc. Containers of juice and other beverages used total 23 billion cans a year, of which about 80% represents steel cans. Recently, steel cans have begun to be used for beer. Ecologically reasonable steel cans will be in wider use in future.

Nothing Goes to Waste in Steelworks (P33)

Well, everyone, howdy?

I'm Dust. Call me Dusty.

This fella next to me is Sludge or Sludgy, if you like.

We both come out when they make steel.

I'm feeling blue. You ask me why?

Because everyone is getting recycled and go out nice and shiny.

We are sort of left over, way behind others.

I'm made up mostly of iron oxide, just like iron ore, but simply because I also contain zinc and other what they call impurities, I do not seem worthwhile for recycling.

Like others, I too want to be useful,

but I know they are going to dump me.

In the production processes at steelworks, 90% of the substances generated there is being recycled.

But, dust and sludge have been difficult.

In fact, dust and sludge were reused as part of the charges into the blast furnace to make iron,

but zinc and other impurities contained tend to stick together within the furnace and, consequently, had to be used only in limited quantities.

Moreover, dust and sludge are generated in huge quantities of the order of several hundreds of thousands of tons a year.

Dumping cannot go on forever.

Save us!

Please don't dump us as waste!

While Dusty and Sludgy cried for help, a large shovel scooped them up and dumped them.

No! No! Still, their desperate cries echoed.

But, then, they found them not buried deep in the ground but turning round and round and round.

Yes, they were being processed by the revolutionary recycling technology developed by Nippon Steel.

It was the world's first technology to remove impurities contained in dust and sludge and reuse the resulting pure iron content as a material for the blast furnace.

In this way, any amount of dust and sludge can be recycled, and zinc extracted can be reused.

Nippon Steel's steelworks have drastically reduced a disposal by dumping or reclamation, leading to saving of resources and energy.

We, Nippon Steel, aim at achieving steelworks where nothing goes to waste.

Our activity is to use up conventional wastes as usable resources.

Look! Dusty and Sludgy are now reborn as new steel.

Tear-drenched Dusty and Sludgy are smiling, with shining faces.

A stop for a tip of information

Q. How is steel made?

There are abundant iron reserves on the earth. But, since iron rusts and contains impurities, iron content needs to be extracted. In the blast furnace, rusted iron is charged into temperatures as high as 1,300°C to remove oxygen (reduction) using coal and coke to turn out molten iron (hot metal). As impurities are still fused in the hot metal, steel in this phase is still brittle. So, impurities are removed in the basic oxygen steelmaking furnace, using oxygen, to make steel (molten steel) having toughness and workability. In the basic oxygen furnace, used scrap is an important raw material. Steel is solidified into rectangular shape weighing about 20 to 30 tons and subsequently worked into various forms to serve various needs of society.

Q. What are by-products and generated products of steelworks?

Nippon Steel produces about 28 million tons of steel a year. In the process, by-products are also generated, amounting to 15 million tons, of which 90% is slag. Nearly the entire amount of slag is recycled as materials for cement, etc. The remaining 10% is “dust & sludge” whose main component is iron. So, dust & sludge is mostly recycled, but zinc and other constituents with high water content (about 1%) used to be hard to recycle. With the development of the new recycling technology, Nippon Steel has made a big step toward the goal of zero-disposal.

The Heart of an Eco-car (P43)

Yahoo!

I'm a quick-eared rabbit “Brid.”

When I sense anything about ecology, my ears prickle, faster than anybody.

Now, do you know a “hybrid car”?

In English, “hybrid” means an offspring of different varieties and breeds.

A hybrid car runs on power from the gasoline engine and the electric motor. Ecological, isn't it.

Wait, I'll drive it around here.

Shoo...

The hybrid car has arrived quietly and sedately.

To the curiously gathering people, the quick-eared rabbit has begun his lecture complacently.

This is the engine, here is the motor.

Depending on the situation, this car runs, automatically switching back and forth between the engine and the motor.

This way, we can greatly economize on fuel gas and cut down exhaust emissions to about a half.

Isn't it fabulous?

This is because of the high-performance motor.

And the secret lies in a new steel called "Electric Steel Sheet" used in the heart of the motor.

"Electric Steel Sheet" can efficiently convert electric energy into power to drive a car.

It's a wonderfully energy-saving steel.

Now, look at the quick-eared Brid brimming with pride.

Twenty-first century,

the earth is overflowing with running cars.

Cars are running on gasoline and other fossil resources.

Exhaust gases contain CO₂, aggravating global warming.

Wouldn't it be wonderful if more and more cars could be changed to economical hybrid cars?

Someone mumbled, and others nodded in agreement.

Nippon Steel's Electric Sheet Steels have been adopted for many hybrid cars.

For the sake of environmental preservation, clean air, and prevention of global warming, we must work harder for more hybrid cars.

Yes, I must hurry and start on a one-man campaign.

Flustered, quick-eared Brid ran away.

Oh, in his hurry, he has left behind his pride, the hybrid car.

A stop for a tip of information

Q. How does a motor revolve?

When copper wire is wound around a piece of iron and charged with

electricity, the iron becomes an electromagnet. In nature, an electromagnet is the same as a magnet, the N-pole and S-pole occurring at either end of the iron. When the same poles of magnets, such as N-poles or S-poles, get close to each other, they repulse each other. When the different poles of magnets, such as the N-pole and the S-pole, get close to each other, they attract each other. The motor revolves utilizing such repulsion and attraction forces.

Q. What are good electrical sheet steels?

Iron, in nature, can convert magnetic force into electricity and electricity into magnetic force. Electrical sheet steels work to convert electricity into forces efficiently and to transform voltage in transmission of electricity to homes. Good electrical sheet steels, having finely grain-oriented microstructures and little impurities, can transmit electricity turned magnetic force as if speeding through a flat runway, with very little loss of force. On the other hand, bad electrical sheet steels have poorly oriented microstructures, and, consequently, magnetic force is transmitted as if negotiating a bumpy off-road, losing force in the process. Using good electrical sheet steels is minimizing energy losses, contributing to energy saving.

Environmental Consultation (p53)

Here is a small village of animals in the remotest recesses of towns inhabited by human beings.

One day, animals have gathered at a meeting place.

They seem to be opening an emergency meeting.

Bear, village chief, said:

“Well, folks, men’s towns are growing fast recently, and we are beginning to find alarming threats to the natural environment where we live.

If anyone has experienced a trouble, please speak up.”

First, Penguin, a worried mother:

“I want them to recycle all of their used products. If they throw away plastic containers and electric appliances, I cannot let my children go out and play around.”

Then, Seal, timid-eyed and trembling:

“Are men really careful about the disposal of hazardous matters?

If they continue to pollute and contaminate the sky, the land and the sea, we face the question of life and death.”

Panda, an irate father, banged on the table:

“Nature is our home. I want the restful and livable environment of a while ago back!”

Things after things are produced by men.

Now is the time for us to prevent the development of men from destructing nature further.

Nippon Steel is a producer. Environmental issues born of producers’ activities must somehow be resolved by producers’ own endeavors.

So thinking, Nippon Steel has an idea.

Yes, we can provide consultation about environmental problems.

Until now, Nippon Steel has tackled environmental problems aggressively and energetically.

We have produced eco-products in which provision for recycling, energy-saving and environmental needs have been pursued.

We have aimed to achieve “steelworks where nothing goes to waste” and recycled matters generated in the processes of steel manufacture.

Just like a good housekeeping wife.

Unlike wasteful others, she wouldn’t throw away leaves of a Japanese radish or outer leaves of a cabbage and make a good meal out of them.

We have also developed technologies so that we receive at our steelworks difficult-to-recycle plastics and efficiently recycle it and recover and recycle sludge contaminating the sea and rivers.

From now on, Nippon Steel wants to use its experiences and technologies for the benefit of many other producers and people.

Our steelworks scattered across the country can be helpful in environmental preservation.

The planet earth where we live.

Men proliferate on this earth, seemingly taking charge only temporarily, but must keep this precious charge as intact as possible for posterities.

This responsibility rests with us now living in the 21st century.

To this end, Nippon Steel can respond to many needs:

To convert wastes into resources.

To remove harmful substances.

To clean water, air and soil.

and many others.

Yes, Bear, the worried headman, should go to Nippon Steel for consultation.