

NISSAN

NISSAN DESIGN NEWSLETTER

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**The Unique History of Nissan Design
From Watercolor Paintings to Advanced Computer Modeling, the Passion For
Innovative Design Remains The Same**

The Beginning

From small roots, great trees can grow. It was February 1954 when Nissan Design officially began. With just seven people and headed by an engineer, Nissan Design has grown today to an internationally acclaimed global force of 900 designers, modelers, computer technicians and others located in major design centers in Japan, the United States and Europe.

Prior to officially forming the new group, there were people in charge of vehicle design within Nissan, but the number and the area were fairly limited, as people's interest in design was very low. As cars became more important in Japanese society in the 1950s, design took on an expanded role, thus the creation of Nissan Design. The first design manager, Shozo Sato, was an engineer – not a designer by training. Mr. Sato had caught the attention of company executives, however, for his great skill with watercolor illustration and they appointed him to lead the fledgling division. He brought an artist's eye, and passion, to Nissan Design – a tradition that continues today.



This photo was taken in the mid-1950s, as the prototype of Nissan's design division was in its infancy. The group was led by division head Shozo Sato (third from left).

From Start-up to
Award Winners
in Just Two
Years

Just two years after its humble beginnings, Nissan's enhanced design effort bore its first fruit. In August 1956, the Datsun 112, successor to the 110, the first new postwar passenger car produced in Japan from 1955, won the second Mainichi Industrial Design Competition*.



* Mainichi Industrial Design Competition: Founded in 1955, this prize is awarded to a designer or a group of designers which produces a great work and greatly contributes to the industry during the year. It is now called *the Mainichi Design Award*.

Ever since, the Nissan Design has been blazing its own unique path, learning from and collaborating with industry leaders in the U.S. and Europe along the way.

The following pages focus on two key aspects of the Nissan Design journey – the evolution of drawing and modeling techniques from the 1950s to today.

As Nissan designers trained and traded tips with designers in other countries, drawing techniques gradually changed, evolving from ordinary painting in the beginning to drawings suitable for expressing characteristics of the shape and material feeling, to today's computer-based digital graphics.

Watercolor Drawing

In the beginning, most design work utilized watercolor drawing, a painting-like drawing technique using watercolor paints on a type of drawing paper called Watson Paper. Since Mr. Sato, the head of Design Division, was good at it, this technique was used until around 1959.

Based on this watercolor drawing and freehand orthographic drawing Mr. Sato made on quarter-size chassis layouts (blueprint), quarter-scale (or one-eighth scale) clay models were made. Colored pencils were sometimes used in lieu of watercolors.



Sketch for Datsun 112 (watercolor)

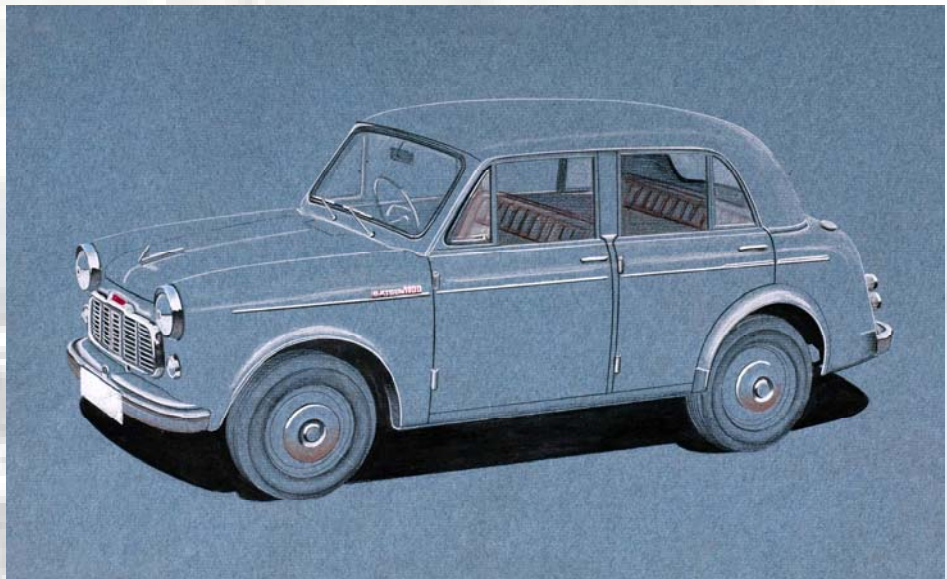


Sketch for Nissan Junior (colored pencil)

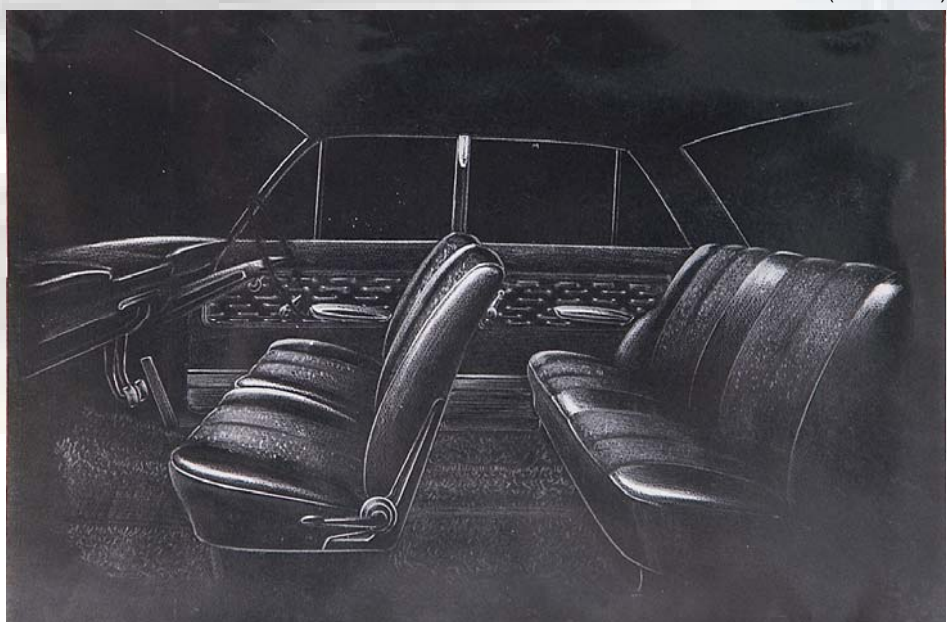
An Evolution to the Highlight Drawing Technique

In 1959, a new management team came in to replace Mr. Sato and the primary use of watercolor paintings evolved to a new “highlight” drawing technique. This technique is used to express characteristics of the shape by emphasizing lighter areas with colored pencils, pastels, or markers on Canson Paper (black, blue, and sepia).

This technique was introduced in Japan in 1956 when the Art Center College of Design, a well-known design school in Pasadena, California, held a workshop in the country. Soon Japanese auto designers were employing it. As the quality of art media improved, the designers gained new freedom of artistic expression. The highlight drawing technique often exaggerated design features, deviating from three-dimensional reality, creating excitement but also creating challenges in bringing the vision down to earth.



Sketch for Datsun 210 (drawn later)



Sketch for Skyline C10 interior

A Taste of Italy

In 1960s, Japanese auto makers took a highly unusual step of looking outside their own departments for design collaboration, turning to Carrozzeria, an Italian design company, to learn the most current, state-of-the-art design techniques. Nissan commissioned the design of the Datsun Bluebird 410 in 1960 and Cedric 130 in 1962 to Pininfarina, an internationally acclaimed Italian company known at the time for its work with Ferrari, Alfa Romeo and Lancia.

After the early 1960s, outside design projects were not commissioned again until 1978, when designs for the Sunny B11, Violet/Auster/Stanza T11 were commissioned to another Italian company, Italdesign. Though their designs were not chosen, they were asked again to design the first-generation March released in 1982 and their design was chosen this time. Their style was unique, completely different from the sketches being drawn in Japan at the time and significantly inspired Nissan's own designers.



Sketch for Cedric 130



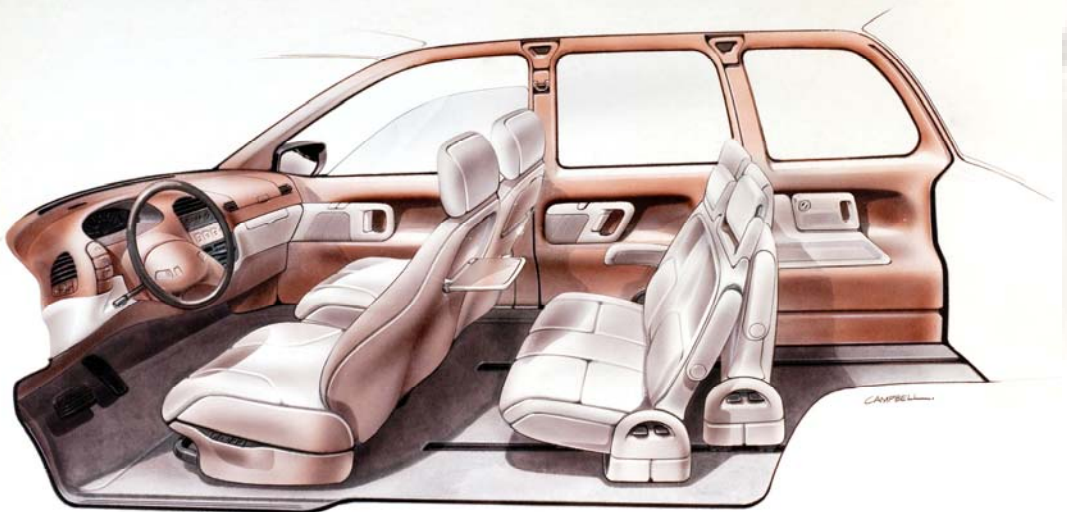
Sketch for Micra K10

Reflection Drawing Technique (Handwriting)

A Nissan designer returning from study abroad introduced an innovative technique called Reflection Drawing in the early 1970s. This was a drawing technique using dry markers and a new type of pastels that is still used today. After reflections on the surface of the body are drawn with dry markers, details of the surface are drawn with pastels. Even reflections from the sky are rendered and many designers have steadily improved on the technique. While highlight drawing is appropriate to express characteristics of the shape, reflection drawing is suitable to demonstrate the feeling of materials used in the car, such as iron plates, glass and seat cloth, which enables to express the design in a more realistic way.



Sketch for 1st Terrano



Sketch for 1st Quest

Full-Size Rendering

Nissan Design International (now Nissan Design America), Nissan's San Diego, California-based design studio, introduced the full-size rendering technique from the late 1970s to the beginning of the 1980s. This was also called the "Overlay Method."

After outlines and key lines are drawn with stretchable paper tape, a full-scale pattern is cut out from thick tracing paper. It is put on a wall and stereoscopic effect is given by airbrush. New pieces of paper can be overlaid for changes and corrections, allowing effective, attractive renderings. When working with a design in quarter-scale clay model, this technique is helpful in blowing the image up to full size without building an actual full-scale clay model. Today, this technique is rarely used because it requires time and advanced skills and because digital methods make full-scale clay models much easier.



Full-size rendering for 300ZX Z32



Rendering by airbrush



Designers meeting for 300ZX Z32

Reflection Drawing Technique (Digital)

The dawn of the new century saw an explosion of computer drawing techniques. Sketches today are often drawn directly on the computer, like hand drawing, using commercially available drawing software and computer tablets. This “electronic” or “digital” sketching is ideal in that a variety of design ideas can be more easily developed with the sketch data they have drawn. In recent years, the quality of the sketches have become increasingly better due to the software evolution and improved techniques of the designers.



Sketch for GT-R R35



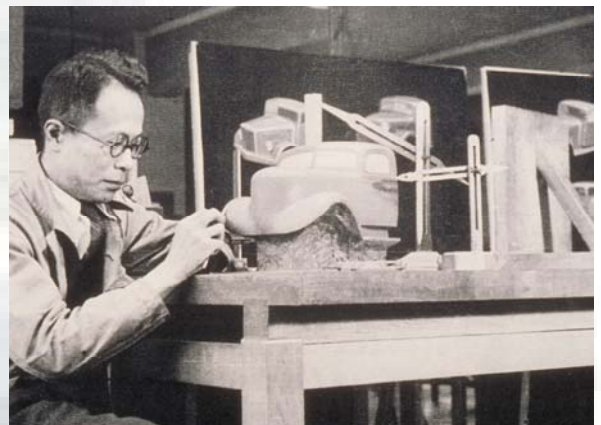
Sketch for Cube Z12

**The Transition
of Modeling
Techniques**

Like drawing techniques, modeling techniques have evolved as designers share technology from around the design world. Modeling designs in industrial clay introduced from the U.S. has a very long history, and as the materials and tools have improved and special equipment has been introduced, work efficiency and precision in designing have risen markedly. In particular, the digital revolution has significantly influenced the transition of the modeling techniques, and now clay model-based designing is shifting to digital data-centered modeling.

Introduction of Industrial Clay and Manual-handling Design Development

It is said that clay modeling first started when aqueous clay began being used in modeling work in the U.S. in 1919. Compared to the wood modeling that had been utilized until that time, the use of clay was an epoch-making idea since it can change shapes over and over by adding or removing. In 1927, "fat clay" was introduced. Nissan used original fat clay – a mixture of sculptural clay, wax and sulfur powder – until around 1960.



Modeling at Tsurumi studio in 1950s

Industrial clay, which is very suitable for car design use, was introduced from the U.S. in the early 1960s and it has been used ever since. With continuous quality improvement, the domestic (Japanese) production of industrial clay has started.



Work in Ogikubo modeling room in 1951



A one-fifth fat clay model for Datsun 110



Tools for measuring models and drawing lines

Nissan Design's first modeling team was formed in the late 1950s and by 1958 modelers were recognized as specialist personnel. The modeling division was established in 1964.

At this time, cutting, measurement and diagrammatic drawing were done manually. Based on a sketch drawn by a designer, a one-fifth scale model was made and then diagrammatic drawing was done. Finally, the vehicle's body structure was considered with a full-scale drawing made by a body designer, based on the diagrammatic drawing.

A Modeling Turning Point

In the mid 1960s, many of the techniques that set a precedent for machines with improved efficiency or digitalized development were introduced. A so-called "layout machine" that can measure the dimensions of the vehicle with three axes, X-Y-Z, arrived in 1966. Measurement work became extremely efficient, as measurement previously had been done in each axis individually. Also, in addition to scale models, full-size models started to be made in this period. This was one of the reasons why such machines were necessary for designing.



Early analog layout machine

Computer-aided design (CAD) systems began to appear in the late 1960s, and one of Nissan's first practical uses was in developing the Sylvia S10 (released in 1975) in 1971. In cutting the clays, efficiency and design quality improved as designers began using variously shaped curve rulers and templates in addition to conventional modeling tools like scrapers and steel plates.



Modeling using DI-NOC Film



Line-drawing by hand

In a seminar in Japan in 1974, Ross Martin, a former top modeler at Ford, introduced modeling techniques using true sweeps and "DI-NOC Film" to easily check the surface condition of the model before painting, and Nissan adopted these techniques after that.



Early CAD system

Introduction of Large Machinery and the Transition to Digital Data-Centered Development

In 1981, Nissan's design studios at Tsurumi in Yokohama City and Ogikubo in Tokyo were integrated into the Nissan Technical Center at Atsugi, in Kanagawa Prefecture. The development facilities received substantial upgrades.

One of the biggest changes was the introduction of the large automatic cutting machine. With the better accuracy afforded by evolving CAD systems, data reproduction once done entirely by hand was automated using this machine. A machine for automated measurement of vehicles was also introduced.



Early large measurement machine

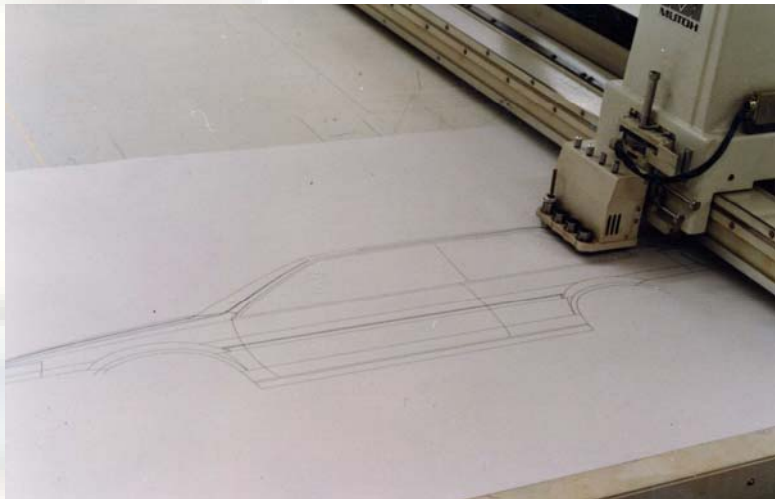
In the 2000s, a simplified automatic cutting machine was introduced. Since it can also be used in the shop floor, work efficiency was further improved. Virtual reality technology was improved as well, so



Early large automatic cutting machine

that design could be considered from various angles in a full-size image or inspected with a vehicle moved virtually, without making an actual model. In addition, a new vehicle measuring machines enabling non-contact measurements was introduced.

In this way, the conventional clay model-based design has now shifted to digital data-centered design development. Usually, design development is done three to four years prior to the launch, so it is difficult as designers need to forecast the future social trends and customer needs.



Automatic line-drawing



Simplified automatic cutting machine



Digital modeling on computer

However, this change in designing method made it possible to reduce the design development cost as well as to shorten the period of the overall vehicle development process. Accordingly, design development can be started closer to the start of sales and precision in designing can be improved.



Power-wall system

The Future of
Design
Technique

As mentioned, digital data is now mainly used in design development and the role of the clay model has changed to verify the data. However, no matter how advanced the digital technology, such as virtual reality, may be in the future, cars will continue to be used in the real world. It will not change. Digital data is reproduced three-dimensionally and designers and modelers form attractive shapes and designs with their senses of eyes and hands. Human sensibility continues to be essential to producing emotional designs.

