

CASE STUDY

ESTECH Corporation
Engineering Solutions and Technologies
Yokohama

Japan

Automotive

LAN-XI, PULSE, Test for I-deas, Transducers

A pioneer in structural analysis and simulation technology, ESTECH provides engineering consulting services to clients who are faced with technical issues, mostly, in automotive design. 2009 is a big year for ESTECH Corporation as it celebrates its 20th anniversary and the opening of its new R&D test facility.

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20 Years of Success and a New Facility

On 1 September 2009, ESTECH Corporation (in Japanese, Kabushiki Kaisha ESTECH) Engineering Solutions & Technologies opened the doors of its new testing facility, and at the same time celebrated 20 years since its inception in 1989. Situated less than 20 km from Yokohama and 40 km from the centre of Tokyo, the two storey, 670 m² test facility includes a 6.5 m × 8.5 m × 4.4 m hemi-anechoic chamber, an excitation test room measuring 9.1 m × 13.2 m and an associ-

ated test preparation room measuring 10.9 m × 10.3 m. The excitation test room, which can be flexibly partitioned, contains two structural beds which are isolated from external vibration. Two cranes, able to handle 2.8 tonnes, are available for moving heavy structures such as engines, tractor cabins and bulky components.

Making measurements with PULSE in the hemi-anechoic chamber



The hemi-anechoic chamber, with less than 7 dBA background noise is a box-in-box construction and so that a vehicle can be run inside, there is air conditioning in the ceiling, temperature control and exhaust extraction. The doors to the chamber are 3.5 m high allowing king-sized products and components to be wheeled in. Three of the measurement areas are totally secure, ensuring complete customer confidentiality. The land and premises cost 5 million US dollars, and it is mainly equipped with Brüel & Kjær products including four PULSE D-frames, one LAN-XI D-frame, Test for I-deas software and a range of transducers.

The Company



ESTECH was established as a joint venture of Nissan Motor Co., Ltd. and the former SDRC (Structural Dynamics Research Corporation), and commenced engineering consulting services based on the product development technology of Nissan and the software and analysis expertise of the former SDRC, a pioneer in MCAE (Mechanical Computer Aided Engineering). In 2001, ESTECH was bought by Mechanical Dynamics, Inc., Michigan and in 2002 Mechanical Dynamics were purchased by MSC Software Corp., California.

ESTECH is an engineering consulting company with strong technical expertise in computer-aided engineering (CAE), which conducts prognostic evaluation of vibration, noise, mechanics, heat and other aspects of mechanical product performance, and technologies relating to tests undertaken by its laboratories. Consulting services provided by ESTECH have received accolades from major manufacturers in the automobile, electrical and precision machinery industries.

So, it was not surprising that ISID (IT Solution Innovator), also a pioneer in the CAE field in Japan, acquired ESTECH in 2006. The addition of ESTECH as a wholly-owned subsidiary of ISID could only strengthen and enhance the CAE solutions provided by the parent company. Today ESTECH boasts 60 employees and has a capital of 250 million Yen.

Physical Test-driven CAE

Test preparatory room with car lift



ESTECH's solutions integrate physical and virtual prototyping and testing on noise, vibration, motion, strength, rigidity and thermal phenomena, and CAE is largely used to meet customer challenges. ESTECH's mission is to correlate mathematical modelling with physical test and thus constantly improve the quality of the mathematical modelling.

Following a Masters Degree from Purdue University, Indiana, USA, Mr. Toshiro Abe joined Nissan as Research Engineer working on projects such as noise reduction of a 4-cylinder engine. He was a founder member of ESTECH and in 2001 became the President of ESTECH.

Mr. Toshiro Abe, President
of ESTECH

Abe-san says, "The actual phenomena are not simple and, therefore, we have to do physical testing. The more physical testing we do, the more we learn about how to build simple but accurate computer models. Accordingly, physical testing is an essential companion to CAE". This ability to perform physical test and CAE at the same time makes ESTECH unique in Japan.

ESTECH's projects can range from a single task to full-vehicle development projects. However, the majority involve full vehicles or body-in-white where different parameters such as body, chassis, powertrain, tyres, etc., are tested. For modal analysis on a full vehicle, the powertrain is normally disconnected as this makes it easier to identify noise sources. ESTECH also has many projects that are related to hybrid and electric vehicles and Continuously Variable Transmissions (CVTs). Abe-san says, "We have been working with electric vehicle technology for about 10 years and expect this to increase in the future."



Artificial Excitation room
with mold platens



ESTECH also benchmarks competitors' products for customers. The data for these benchmark tests ranges from CAD, drawings, or more usually a complete vehicle. However, most benchmark testing is done using classical modal analysis using a shaker or impact hammer as the stiffness and damping of the test object needs to be ascertained. ESTECH also has access to a proving ground where they can test drive vehicles and collect real data.

ESTECH's clients include all the major Japanese manufacturers of cars, trucks, vans, motorcycles and construction machinery. ESTECH works closely with its clients' engineers and the project specifications can be made by the customer or through joint discussion with ESTECH to decide on the methodology. All raw test data is securely retained by ESTECH but remains the property of the client.

Why Invest Five Million US Dollars?

"ESTECH's capabilities are a key component of its business model," says Abe-san. "The volume of projects is increasing so we needed more storage, preparation and testing space. Security requirements are also much tighter than in past years." He continues, "Therefore, we decided to expand. It's a big commitment but I also have a strong belief in our future – a view that is held by my colleagues and parent company". By investing in a new facility ESTECH is ensuring a secure future and the expectation of increased volume necessitates additional test capability. At the moment ESTECH works mainly for Japanese clients but would like to expand its business globally.

A Business Partner

"ESTECH's partnership with Brüel & Kjær goes back to 1989," says Abe-san, "but my personal relationship with Brüel & Kjær dates back to the time I was working for Nissan". ESTECH are currently working on a plan to migrate from Test for I-deas to PULSE LabShop and Reflex, which they are currently evaluating. So why does ESTECH prefer to work with Brüel & Kjær products? Abe-san explains, "Brüel & Kjær is synonymous with high quality, reliability, has a good reputation and offers outstanding support". He continues, "Brüel & Kjær products are certainly not the cheapest but the value we get from the investment is higher than the cost. We regard Brüel & Kjær as a partner and not a supplier and we enjoy a totally open relationship".

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