CORPORATE **PROFILE**
2023

ZUKEN

The Partner For Success

Ring of Scenery – a contemporary sculpture at the front entrance of the Global Headquarters and R&D Center in Yokohama, Japan. It symbolizes the engagement between Zuken and customers.

Message from the Chairman

Advances in electronics have transformed our day-to-day lives and made us more affluent. Thanks to the tireless efforts of manufacturing companies, the never-ending progress generates one innovative product after another. Since our company was founded, Zuken has provided software support to manufacturers developing such electronic products.

Cutting-edge technologies are offering us experiences that we could not have even imagined in the past. Manufacturing companies are not only creating products these days, but they are also using technology to generate intangible value and influence.

As the role of manufacturing shifts to creating not simply products, but products that provide unprecedented experiences for the user and society overall, the role of our company is also expanding beyond the domain of electronics. To be more useful to the world, we will continue to pursue outstanding products and services without being restrained by past frameworks.

Chairman and CEO Makato Kaneko

Our Value

A Trusted Partner for Product Development

* MBSE: Model-Based Systems Engineering; MBD: Model-Based Development

Zuken steps forward, smoothly linking conceptual design to detailed design

Message from the President

The Game Changer

Innovative technologies such as autonomous driving, electric vehicles, artificial intelligence, and quantum computing are changing industrial structures and the competitive landscape of products and services that incorporate these innovations. These technologies will also have a significant impact on society. As the pace of change rapidly accelerates, we can safely say that this is an age when corporations need to actively change to survive and grow in the current market environment.

The term digital transformation (DX) was coined nearly twenty years ago. Why is a term that has been around for such a long time heard so frequently these days? The reason may be that most industries and all corporations without exception have been caught up in the wave and have started to realize the need for DX. With regard to Zuken's main customer base in the manufacturing industry, they are aiming for change that not only optimizes their engineering processes, but they are also promoting DX to put their technological assets to effective use and to connect with new value creation. Zuken has started to propose the Model-Based Systems Engineering (MBSE) technique to customers who are taking up the challenge of disruptive change to fundamentally transform their engineering processes. This is quite different than streamlining their processes as an extension of the past. We are convinced that MBSE—an engineering IT platform connecting information digitally from from end to end of the product life-cycle—will become a game changer for future product development.

Zuken will continue to enhance the value of engineering IT to support customers taking on the challenges emerging in this time of accelerated transformation. We will reinforce our technical capability and our ability to make proposals so that we continue to be chosen as a trusted partner for product development.

President and COO Jinya Katsube

Our Business

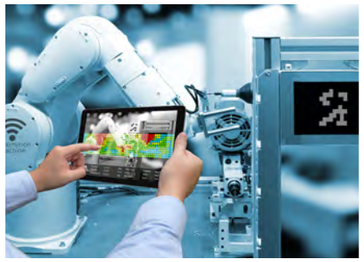
Zuken's Ever-Expanding Business Domains

Company Taking an Evolutionary Leap as a Digital Engineering Innovator

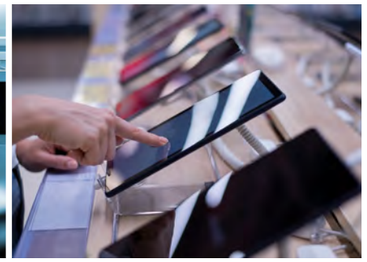
Since our establishment, Zuken's core business has been to provide electrical and electronic design solutions that support the development of electronic products.

Today, the significant advances we are seeing in such areas as communications technology, artificial intelligence, and computing capabilities are transforming manufacturing processes themselves. Zuken aims to provide an even wider range of engineering solutions that go beyond the simple electronics field in order to help manufacturing customers develop a more holistic view of various technical domains and realize innovative product development more effectively and swiftly.

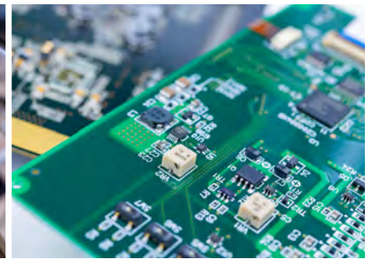
Main Industries Served by Zuken



Industrial Machinery



Consumer Electronics



Electronic Components

Medical Devices

Mobility,
Special-Purpose Vehicles

Rail Transport

Aerospace

Products and Solutions

Electronic Design Automation (EDA)

Printed Circuit Board Design Solutions to Serve as a Platform for Electronic Product Development

Printed circuit board (PCB) electronic circuits equipped with semiconductors and other electronic components underpin the advanced functions of electronic products. We provide the software required to automate and optimize the design and manufacturing of their electrical and electronic systems.
By creating a design and verification environment driven by 3D technology, our latest electronics design platform, the CR-8000 series, is able to support the advanced design processes required for developing cutting-edge electronic products.

Electrical Control and Wiring Design

Electrical Engineering Solutions That Help Boost the Operational Efficiency and Superior Quality of Industrial Equipment Development

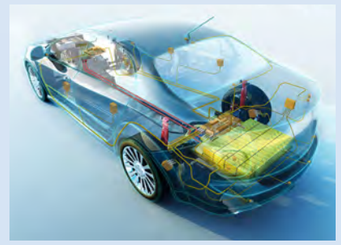
All industrial and electronic equipment have complex cables and harnesses inside them that link and control each part electrically. Our E3.series helps reduce operational errors and respin that frequently happen in such electrical engineering processes. The E3.series improves operational efficiency and product quality by automatically generating drawings and bills of materials (BOM). We are also expanding the potential application of our solutions by devising 3D wiring plan tools and by developing specialist applications for wiring in factories and plants.

Engineering Data Management (EDM)

Product Lifecycle Management That Only Zuken, with Its Rich Electrical and Electronic (E/E) Design Expertise, Can Provide

We provide product data/lifecycle management (PDM/PLM) products that offer unparalleled perfection and are most suited to the development of electronic products, such as the central management of electronic component information and design deliverables management that links and stores information on parts, circuits, and circuit boards. Due to such issues as the global division of development processes, the need to comply with laws and regulations, and dealing with increasing development variants, the use of EDM will become increasingly important to those seeking to address the ever more challenging parameters of product development in order to create competitive products.

Automotive Electrical and Electronic (E/E) Systems Engineering



E/E Systems Design Solutions for Ever-Advancing Automobile Manufacturing

Automotive development is becoming increasingly sophisticated and complex as automobiles employ a large number of state-of-the-art electronics systems. Zuken offers E/E systems design environments that are central to the development of those automobiles. In order to accommodate rapidly changing product development needs from connected, autonomous, sharing, electric (CASE) trends and issues, such as the building of supplier ecosystems in the global market, we are committed to devising a next-generation engineering platform that can support the creation of ever-evolving cars by enhancing functions such as the examination of E/E architecture in the conceptual design phase and the automatic generation of drawings in subsequent processes that reflect the design aims.

Model-Based Systems Engineering (MBSE)

Cutting-Edge Product Development Methodology for a Connected World

Today all kinds of products are starting to offer innovative functions by leveraging communications through the internet. This requires the development of functions based on the complex and advanced interworking of multiple systems. When developing such products, Zuken encourages customers to introduce MBSE which enables them to gain a comprehensive view of the overall systems at the product concept stage and create optimal solutions. In addition to introducing the GENESYS modeling tool for MBSE and conducting training, Zuken is extremely adept at applying the merits of MBSE to the electrical design process and, as such, we are able to create unrivaled solutions that offer unique tools and services to facilitate the successful development of products in a connected world.

Our History

A Steady Accumulation of Value

Founded in 1976, Zuken's story mirrors the growth of the electronics industry. Zuken has provided behind-the-scenes support for the development of a multitude of electronic devices that have made society a better place, and as the use of electronics has spread, so have Zuken's solutions and businesses. All around the world, customers take on the challenge of creating new technologies. Zuken continues to accept this challenge.

Create 2000 at its launch

Zuken opened the floodgates with Japan's first CAD/CAM system for PCB design in 1978.

Contributed to the miniaturization of electronic devices

Our CAD/CAM technology established an unshakable position amid growing demand for smaller, thinner, and lighter electronic devices.

R&D offices established in Germany, the U.K., and the U.S.

We have cultivated a global R&D and business network.

Joint development of AI-enabled solutions by the UK and the Japan R&D teams

Strengthening global product development while expanding our domain.

1980

Net Sales

1990
Sales surpass ¥10 billion

2000

2008
Sales surpass ¥20 billion

2010

2020

2023
¥35 billion

1970s

Dec. 1976 Zukei Shori Gijutsu Kenkyusho Inc. established in Isogo-ku, Yokohama.

Jun. 1978 Japan's first full-scale CAD/CAM system Create 2000, for the design of printed circuit boards, developed.

1980s

Nov. 1983 Zuken America Inc. (now Zuken USA Inc.) established in California, United States.

Jan. 1988 CR-3000 (PWS), a printed circuit board CAE/CAD/CAM network workstation, developed.

1990s

Oct. 1991 Registered on the Second Section of the Tokyo Stock Exchange as the first electronic design automation (EDA) corporation.

Jan. 1992 Zuken Europe GmbH (now Zuken GmbH) established in Germany.

Jan. 1992 Zuken Korea Inc. established in South Korea.

Aug. 1992 Zuken Singapore Pte. Ltd. established in Singapore.

Apr. 1994 EDA vertical integration solution CR-5000 developed.

Jun. 1994 Zuken acquired Racal-Redac Ltd. of the United Kingdom.

Sep. 1994 Moved to the First Section of the Tokyo Stock Exchange.

May. 1996 ePLM DS-1, a Product data management solution specialized for the electronics design, developed.

2000s

Mar. 2000 Zuken acquired all shares of INCASES Engineering GmbH.

Mar. 2002 Began providing wire harness design software for the automotive industry.

Jun. 2002 Zuken (Shanghai) Technical Center Co., Ltd. established in China.

Feb. 2004 ePLM DS-2, a Product lifecycle management soutin focusing on E&E process, released.

Aug. 2005 Zuken Taiwan Inc. established in Taiwan.

May 2006 Zuken acquired Germany's CIM-TEAM (now Zuken E3 GmbH).

Jun. 2007 V54EE, a mechanical CAD system specially designed for the electronics industry, released.

Jun. 2009 Enterprise PLM PreSight released.

2010s

May 2010 Zuken acquired a 14% share in Lattice Technology Co., Ltd.

Jun. 2011 Visual BOM, a new generation engineering platform that merges bill of materials technology with the ultra lightweight 3D format XVL, released.

Oct. 2011 CR-8000, including Design Force, launched the next-generation electronics design platform. This completed Zuken's system level electronics design environment.

Sep. 2013 Zuken SOZO Center established in Silicon Valley, United States.

Aug. 2014 Global Automotive and Transportation Competence Center established in Erlangen, Germany.

Dec. 2014 Zuken and Toyo Business Engineering (now Business Engineering Corporation) concluded an agreement on a capital and business alliance.

Feb. 2015 DiverSync Corporation established.

Mar. 2015 Zuken India Private Limited established in India.

Jul. 2015 Zuken took over YDC Corporation's CADVANCE business (CAD and PDM operations).

Apr. 2016 Zuken split off its PreSight Division to establish Zuken PreSight Inc.

Dec. 2017 Zuken acquired Alfatech Inc. (now Zuken Alfatech Inc.)

Aug. 2019 Zuken acquired Vitech Corporation (now Zuken Vitech Inc.) of the United States.

Sep. 2019 Zuken and Ghelia Inc. concluded an agreement on a capital and business alliance.

Oct. 2019 Zuken Modelinx Inc. established.

2020s

Nov. 2021 Business Engineering Corporation became an equity-method affiliate following an additional investment by ZUKEN.

Apr. 2022 Stock listing was moved to the Prime Market because of the restructuring of the Tokyo Stock Exchange into new market segments.

The Evolution of Electronic Products

Personal computers

Portable audio players

Home game consoles

CD players

Mobile phones

LCD televisions

DVD players

Laptop computers

Domestic robots

Smartphones

Mass-produced electric vehicles

Wearable devices

Automated driving technology

VR/AR

Global Network

Challenges in Global Markets Accelerate Our Growth

Headquarters　Regional headquarters　Business locations　Main R&D offices　Sales offices

Japan & Asia

Our head office is in Yokohama, the city where Zuken was founded. The head office oversees product and business development in Japan and worldwide.
The operating environment faced by manufacturing industries is increasingly global and borderless. Companies look to Asia as not only a manufacturing base, but as an important center for product development. We have therefore established subsidiaries in China, South Korea, Taiwan, Singapore, and India. We have built a system for accurately identifying the needs of customers in each region to offer the best possible solutions.

Japan
- Global Headquarters/ R&D Center (Yokohama)
- Center Minami Building (Yokohama)
- Shin-Yokohama Building (Yokohama)
- Kansai Branch (Osaka)
- Nagoya Branch (Nagoya)

South Korea
- Zuken Korea Inc.

Singapore
- Zuken Singapore Pte. Ltd.

Taiwan
- Zuken Taiwan Inc.

China
- Zuken Shanghai Technical Center
- Zuken Inc.Shenzhen Representative Office

India
- Zuken India Private Limited

Americas

North America has many innovative companies that greatly influence manufacturing worldwide, and is also an important business development base for Zuken. In this market Zuken provides many leading U.S. high-tech companies with advanced solutions. In addition, to develop products and businesses for global markets, the Zuken SOZO Center promotes strategic partnerships with companies that own innovative technologies.

USA
- Zuken USA Inc.(American Headquarters)
- Zuken SOZO Center(Zuken Inc., US branch)
- Zuken Vitech Inc.

Europe

Zuken has a strong business foundation in Europe, a region that is home to many leading companies in global markets such as industrial machinery and automotive products. We complement our European sales network with bases that carry out core technology development. Our Global Automotive and Transportation Competence Center in Germany is part of Zuken's organization for developing next-generation automotive electronic and electrical design solutions for global markets.

UK
- Zuken Ltd. (Zuken Technology Center)/ Zuken Group Ltd. / Zuken UK Ltd.

Germany
- Zuken GmbH (European Headquarters)
- Zuken E3 GmbH (Laemmerweg)
- Zuken E3 GmbH (Sedanstr.)
- Zuken GmbH (EMC Technology Center)
- Zuken E3 GmbH Office Nord
- Zuken E3 GmbH (Global Automotive and Transportation Competence Center)

Poland
- Zuken E3 GmbH Sp.z o.o

Switzerland
- Zuken E3 GmbH, Zweigniederlassung

France
- Zuken S.A.

Italy
- Zuken S.r.l.

Netherlands
- Zuken GmbH, Sales Office Benelux

Distribution of Personnel

(As of the End of March 2023)

Japan* (Zuken Inc.) 431

Global 400

*Excluding domestic affiliated companies and employees stationed overseas.

Sustainability

We can create a sustainable future with the power of our engineering IT

Sustainability Management Vision

Our business objective is to improve the efficiency of engineering processes in the manufacturing industry by leveraging IT. Such improvement can contribute significantly to the reduction of the burden placed on the global environment not only in terms of design and manufacturing efficiency but also by improving the efficiency in procurement and services operations across the entire supply chain. In addition, our technology is indispensable for manufacturers striving to develop products that are energy-saving, smaller, and lighter. The popularization of such products will help drive the realization of a sustainable society.

Going forward, we aim to be a company that can contribute toward building a sustainable future by incorporating the perspective of "realizing a sustainable society" more clearly into our management and growth strategy planning and by further expanding the range of products and solutions that we offer.

Future Business Risks and Opportunities

■ Environment

We are engaged in efforts to reduce CO2 emissions by adopting LED lighting for our office buildings and switching to HEV for company vehicles, but there is a limit to what a company alone can do to reduce environmental burdens.

Meanwhile, looking at the CO2 reduction potential of the five digital fields—EV/autonomous driving, IT and remote services, energy management, smart agriculture and forestry, and social infrastructure monitoring—if socially implemented toward the realization of carbon neutrality, there are many areas where our engineering IT can help and which will provide us with business opportunities.

In light of the risks associated with environmental issues, we must ensure the protection of the lives and safety of employees and the continuity of business operations against natural disasters. The products and services we provide to our customers are directly linked to product development and manufacturing—the core operations of a manufacturing business. It is important that we create a system where even if our offices were to become temporarily unusable due to a natural disaster of some kind, it will have a minimal impact on our operations. We will continue to proactively improve our internal programs so that remote work, which is effective as a countermeasure against disasters and infectious diseases, can be implemented without compromising operational efficiency.

■ Social

The decline in the working-age population will have a grave negative impact on companies like Zuken that handle software, a product of the human brain. On the other hand, engineering IT—the software product that we develop—makes significant contributions to labor saving measures, technology transfer, and the utilization of technical know-how that will allow companies to respond to the challenges of an ever-shrinking labor force. Digital transformation (DX) is necessary for tackling them, and its core technology is engineering IT. In this sense, we will be playing an ever-larger role in the manufacturing industry DX.

For the manufacturing industry as a whole, we contribute to the development and reskilling of digital human resources by leveraging the engineering IT knowledge that the Group possesses to the manufacturing sector. In terms of securing and making the most of human resources, we will expedite the hiring of women along with empowering them. To achieve this, we will create work environments and systems where female employees can work productively and have a fulfilling career at Zuken. From the perspective of diversity, we will increase the ratio of female employees in the company overall as well as their number in management positions.

Furthermore, to vitalize the manufacturing industry overall, we will continue to provide support for activities and projects to help find solutions to various social issues through manufacturing.

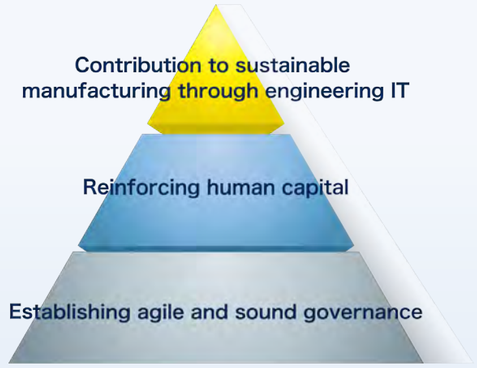
■ Governance

Our vision for sustainability is a management and growth strategy. We must put in place a governance system allowing management to appropriately review and implement strategies and to examine and verify results.

We moved to the prime market in April 2022. Work is underway to establish a governance system that is consistent with the requirements of the stock market, and the new corporate governance code includes various environmental and social requests as demanded by companies in the prime market. We will create a system to implement and verify sustainability-related policies and measures as management priorities.

Materiality

In identifying materiality, we have anticipated the impact that long-term megatrends in the macro-economy will have on our group' s business and defined business challenges based on various ESG evaluation criteria along with the requests and expectations of our stakeholders. We then evaluated the "importance to Zuken" and its "importance to our stakeholders" in terms of risks and opportunities for each of the challenges and identified the following four materialities.



Contribution to sustainable manufacturing through engineering IT

We will strengthen our investment in development of solutions that make product development smarter (intelligent) and more efficient, and contribute to solving issues surrounding manufacturing, such as technology transfer, human resource shortages, and reduction of environmental impact. We will also utilize our engineering IT expertise to expand services that support the development and reskilling of digital human resources within our customer companies.

Reinforcing human capital

In order to reinforce human capital —a source of strength in our software business—we will create a work environment where diverse teams can work to their full potential and each member can develop their career over the long term.

Establishing agile and sound governance

We will respond with speed and flexibility to a business environment undergoing a great many changes and strengthen our management structure to ensure that we can carry out business activities that are legal, appropriate, and sound.

ESG Initiatives

Environment

Efforts to Reduce CO2 Emissions

We have taken steps to reduce CO2 emissions, such as introducing a system for remote working, switching to LED lighting for company buildings, and using HEVs for company-owned vehicles, thereby reducing CO2 emissions by 29.9% compared to FY2013. Going forward, we will continue to monitor changes in CO2 emissions over time and promote energy conservation measures so as to ensure that the burden our business activities place on the environment do not increase.

Remote Working System

In preparation against potential climate-change driven natural disasters such as heavy rains and tornadoes, we have introduced a remote working system to help protect the lives and ensure the safety of our employees, and also to ensure the continuity of our business. We have created an environment that allows our employees to work both from the office and from their home office depending on the situation.

Social

Promotion of Women's Empowerment

We believe that the existence of diverse perspectives and values throughout the company leads to corporate growth, and assigning the right person to the right positions regardless of gender or nationality is a best practice. Based on the concept of the right person for the right job, we actively promote the hiring of women and their promotion to manager-level positions.
We provide extensive support for women dependent on their current stage of life to enable them to develop long term careers. Some examples: to support a balance between work and childcare, we have introduced various systems for employees to take leave along with a system for shorter working hours. The reduced working hours is available for employees with children in the 3rd grade of elementary school or younger, which is longer than the legally stipulated period. We are also actively leveraging remote work to help create a comfortable working environment for women.

Development of Digital Talent

To upskill and reskill our employees, we provide IT and digital training utilizing external sources while promoting the development of digital talent demanded in our growth strategy. We have introduced a reward system for employees who acquire IT qualifications as a way to encourage our employees to continually improve their IT skills.

Next Generation Project, Support for Engineers

Our aim is to contribute to the development of the manufacturing environment, and in service of this, we will actively support the next generation of manufacturing and the educational development of manufacturing human resources in order to foster a manufacturing culture that aims for a good and prosperous society through technology and innovation.

For details on our ESG and other initiatives as well as their progress, please visit our sustainability website.
https://ir.zuken.co.jp/en/policy/sustainability/

Financial Information

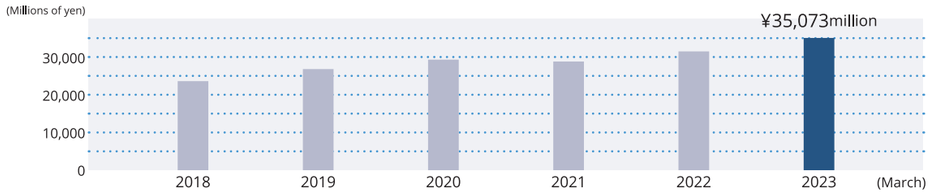
A Solid Financial Foundation

For the manufacturing industry, product development is an important, fundamental operation that determines future growth.

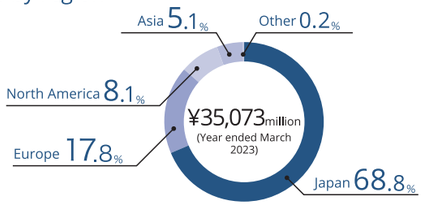
Zuken provides solutions required for competitive product development. For us to support our customers' strategic product development and give them long-term confidence in our solutions, we must have solid financial foundations ourselves.

In the world of information technology, where technological innovation is intense, we must invest flexibly in order to continue providing cutting-edge technology in a timely manner. For this reason, since our founding, we have established and maintained a solid financial foundation as one of our most important management strategies.

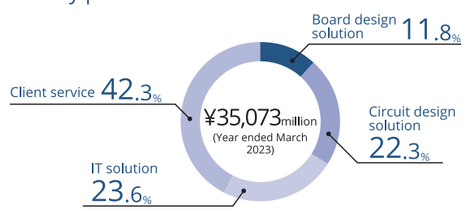
Net sales



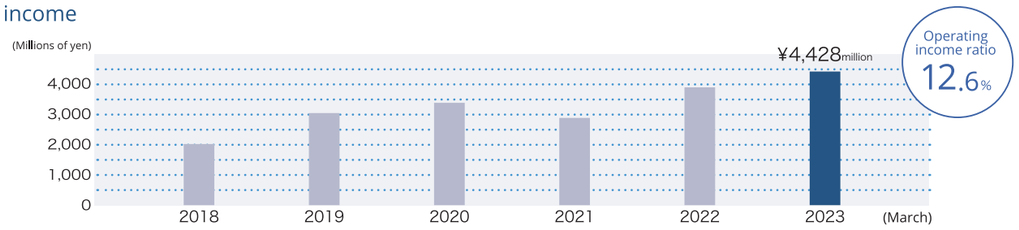
Sales by region



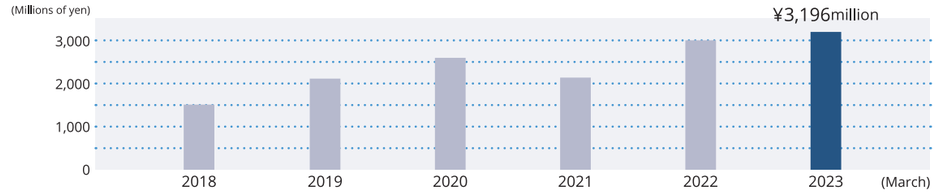
Sales by product



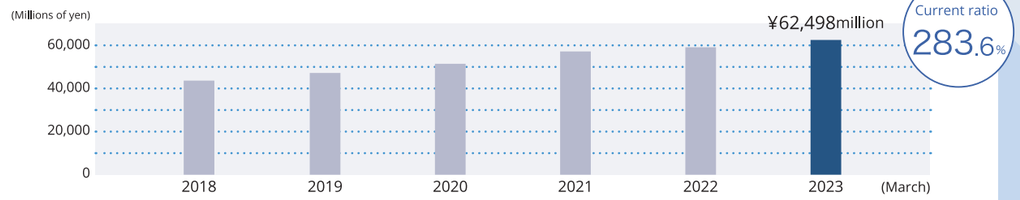
Operating income



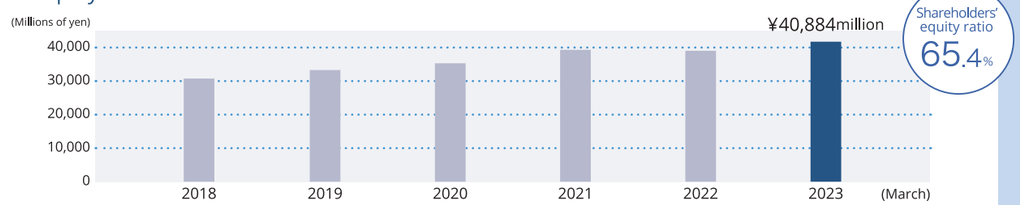
Profit attributable to owners of parent



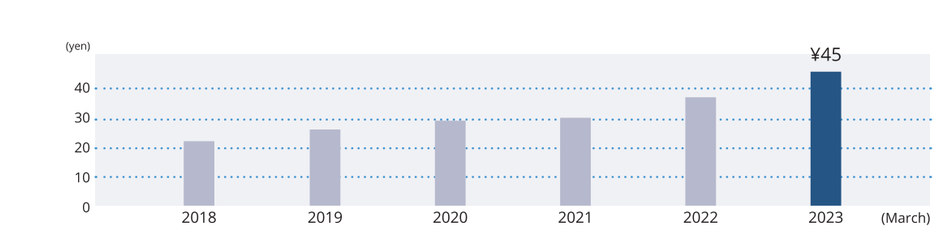
Total assets



Shareholders' equity



Dividends



Group Companies In Japan

Zuken Tec Inc.

Zuken Tec provides consulting, on-site manager and engineer dispatch, as well as contracting services that support a broad range of design and development operations, including CAD installation, startup, and operation.

Zuken NetWave Inc.

Zuken NetWave sells and supports state-of-the-art hardware and software for corporate networks, which are indispensable for today's business activities.
These networks also include security and storage solutions.

Zuken Elmic Inc.

Zuken Elmic focuses on communication as the key element in technologies. It develops, sells, and provides support for middleware IP libraries, software, and related hardware for the embedded systems that support the security, industrial, and invehicle network fields.

Zuken PreSight Inc.

Zuken PreSight develops and markets creative products that support the manufacturing industry, including product lifecycle management (PLM) systems based on technology that coordinates lightweight 3D data and bill of materials (BOM).
It also provides knowledge management solutions with a unique concept that reduces user burden.

Zuken Alfatech Inc.

Zuken Alfatech provides a variety of solutions and services primarily to customers in the mechatronics industry, including development, sales, and support for electrical CAD. It sells and customizes 2D/3D general-purpose mechanical CAD and CAE systems.
As a new business area, Zuken Alfatech is also developing 3D modeling applications for the construction field, which is a domain with excellent potential.

Zuken Modelinx Inc.

Zuken Modelinx provides comprehensive and expert services centered on development support for companies aiming to introduce and operate methods such as MBD (modelbased design) and MBSE (model-based systems engineering) in product development.

Business Engineering Corporation

Business Engineering Corporation provides manufacturing customers with abundant IT solutions, including ERP consulting, development, and implementation services and SCM (Supply Chain Management) package systems development and sales services, to support their operational reforms.

Making environmentally friendly coating technology affordable

The start-up company INORCOAT relies on Zuken's E3.series for the development of environmentally friendly nanotechnology coating systems. INORCOAT's first system was recently put into operation at the Portuguese National Bank for the coating of dies for euro coins. However, the possible applications go far beyond dies and printing plates. E3.series offers the possibility of reliably adapting the electrotechnical equipment of the plants to specific areas of application and configurations.

Environmentally friendly technologies are in high demand these days – reduction of CO2 emissions, avoidance of environmental toxins, and conservation of natural resources are just some of the keywords we are hearing in the media almost every day. Unfortunately, environmental sustainability comes at a price. In many cases, alternative technologies are available, but many of them continue to be too expensive to be able to fully replace – or to substitute – established processes that are becoming increasingly questionable from an environmental point of view.

A good example of environmentally harmful technologies is galvanic chrome plating – a process that is not only used to add lustre to Daddy's motorcycle but also to increase resistance to wear in industrial applications: cylinder liners of combustion engines, for example, are galvanically chrome plated. In mechanical engineering, the process is used to finish casings, pistons, moulds, and gauging tools, and even in the food industry, pipes, cooling, and drying cylinders as well as screws are hard chrome plated.

However, galvanic chrome plating has a serious disadvantage: it is highly harmful to the environment and should have been banned in the EU already in 2017. This deadline was extended until 2024, probably in no small part due to the lack of availability of an economical substitute technology, but sooner or later it will have to be replaced by alternative processes. These are in fact available with plasma coating technology – also known as PVD (physical vapour deposition) in technical jargon – but they are currently too expensive and inefficient for many industrial applications.

Making environmentally friendly substitution technologies economically viable

It was this shortcoming that Romain Waidelich set out to remedy with his start-up company INORCOAT. His vision is "to simplify the complex plasma coating or PVD process and make it more understandable and accessible to the customer."

Romain Waidelich, founder of INORCOAT

As a process engineer with many years of experience in the process industry (pharmaceuticals, food) and the automotive supply sector, Romain Waidelich has been involved with PVD technology as an alternative to electroplating for many years. Out of this long-standing involvement he came to the conclusion that the technology could benefit from a fresh approach: "Many commercially available systems were developed primarily from a scientific point of view and are therefore very expensive for an industrial kind of deployment."

In other words, through consistent optimization, it ought to be possible to significantly reduce the cost of PVD coating processes. "We looked at the available equipment and analyzed it under the aspects of: Could it be done easier and better without compromising the quality of the result in the long term? We concluded that with a consistent approach to implementation, a savings potential of up to 50% can be achieved", Romain Waidelich reveals.

Market entry through the minting process of coins

This idea led Romain Waidelich to become a self-employed entrepreneur in 2019 and to the founding of the company INORCOAT in 2020. As part of a public call for tenders issued by the Portuguese National Mint and Printing Institute INCM, a PVD coating machine was developed for the minting dies of Portuguese Euro coins.

The reason for this not immediately obvious cooperation is quickly found: coins have to be produced in large quantities in consistent quality with high demands on detailing and design. To reduce wear, the dies are therefore hard-chrome plated – in the past by electroplating and in the future by a PVD process with innovative coatings. New 1-euro coins and medals minted in Portugal are already being produced with the help of PVD technology from INORCOAT.

Today, INORCOAT offers four basic configurations with the MS 700, MS 1000, MS 1400 and MS 2000 product series, produced in an elaborate design that matches the sophistication of their technology. Each of these four types can be individually configured and adapted to customer-specific requirements because the field of application for INORCOAT machines is by no means limited to coin embossing dies or printing plates for central banks, where the focus is on hardness and wear resistance, but also for a wide range of industrial applications.

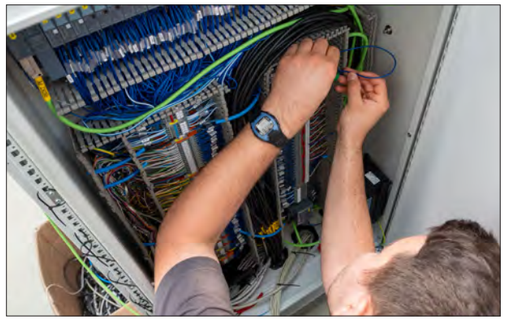
A new MS 2000 machine from INORCOAT

Reliable data for the supply chain with E3.series

To create the data for the electrical design of the PVD systems, INORCOAT relies on Zuken's E3.series. "The electronic and electrotechnical systems are, in a way, the heart of a PVD system," says company owner Romain Waidelich. "We are working in the range of 100 kW and therefore have to meet stringent requirements for EMC certification. Comprehensive and reliable documentation such as E3.series provides us is therefore very important."

Another critical aspect is cost containment and quality management: "As a lean organization, we rely on a flexible cooperation with suppliers," explains Romain Waidelich. "We, therefore, find it important to keep control cabinet and cabling development in-house as a core competence. With E3.series we have the capability to configure our systems in a modular approach from a library of certified components and to produce accurate data for quotation and commissioning at the push of a button."

In this way, the company sees itself well equipped to explore new applications in the process industry, mechanical engineering, and aviation. Even design options such as the use of color – even on coins – are feasible. The cooperation with the Portuguese National Bank has apparently got "the coin" rolling. It will be interesting to see what happens next.



The electronic and electrotechnical equipment of the PVD systems is one of the core competences of INORCOAT. E3.series from Zuken is used for electrical documentation and control cabinet and cabling design.

Close Up 02

Zuken’s Software Recreates Experienced Designer's Verification Points in 3D

The first of its kind in the industry,* this EMC verification tool integrates electrical and mechanical design data for system-wide detection of EMC problems, allowing design expertise to be passed onto future generations.

As electronics technology rapidly evolves, manufacturers are competing to develop new products that incorporate cutting-edge technologies. At the same time, designing and developing high-quality products that can be used safely and securely by a broad user base requires the experience and knowledge of skilled engineers, including measures to prevent noise emissions from electronic equipment. Zuken has developed an industry-first EMC verification tool equipped with new functions designed to support the development of increasingly sophisticated electronic products by helping to address noise that affects product performance, thereby contributing to increased efficiency and standardization of design processes.

*In electronic design automation (EDA) software for printed circuit boards (PCBs) as of May 23, 2023

Printed circuit board design—a key factor in electronic product development

In recent years, the advancement of electronic technologies such as semiconductors and electronic components, sensors, as well as communication technologies such as 5G has made electronic products more powerful and compact than ever before. This includes not only everyday electrical appliances but electronic devices used across all industries, including automotive and industrial machinery. Furthermore, electronic control technology such as autonomous driving is advancing rapidly, and the key to success is the ability to incorporate high-performance, large-scale functions in small, confined spaces. The advanced functions incorporated into products are made possible by the high integration of semiconductors and high density of printed circuit boards on which electronic circuits are embedded, making the design of printed circuit boards—the heart of electronic products—increasingly challenging.

EMC measures that draw on designers' accumulated experience and knowledge

Electronic products always include a housing, inside which the printed circuit board is incorporated. To make products more compact, the electronic circuits on the printed circuit boards must be tightly packed into a small space, which increases the risk of mutual interference. Since the unwanted electromagnetic noise generated by this interference can cause malfunctions or decrease performance in electronic products, EMC measures are considered important for high-quality manufacturing.

In order to achieve effective EMC measures, the wiring patterns of electronic circuits on printed circuit boards and the placement of semiconductors and electronic components must be optimized in consideration of EMI (emissions: the noise generated by the electronic equipment itself), EMS (immunity: to ensure that the device is not affected by noise emitted by other devices), and the physical structure of the electronic device in question.

These EMC measures are the result of the expertise that manufacturers have accumulated over many years of experience, and are currently reliant on the respective knowledge and experience of electrical and mechanical engineers.

If EMC measures are not studied sufficiently at the design stage, noise problems can arise during the prototyping stage of later processes, requiring designers to go back to the initial PCB or mechanical design phase and modify the design in order to correct the noise problem. This causes significant delays in the design process, prolonging the development period, and incurring unnecessary costs.

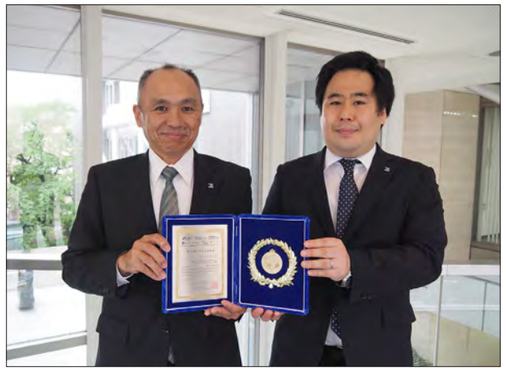
Solving EMC problems at the design stage

Zuken has a long-standing track record of providing tools to support EMC measures in order to address challenges such as shortening product development lead times. In May 2023, Zuken developed the “3D EMC Adviser,” a tool capable of detecting potential EMC problems throughout the entire electrical system by incorporating product housing information (mechanical design data) at the PCB design stage, just as in the prototyping stage.

These EMC verification rules can be configured to incorporate each company's unique design know-how, such as the knowledge and experience of the company's expert designers, into the formalized knowledge and rules. In addition, these rules are intuitively expressed in 3D, enabling even inexperienced designers to identify problematic areas.

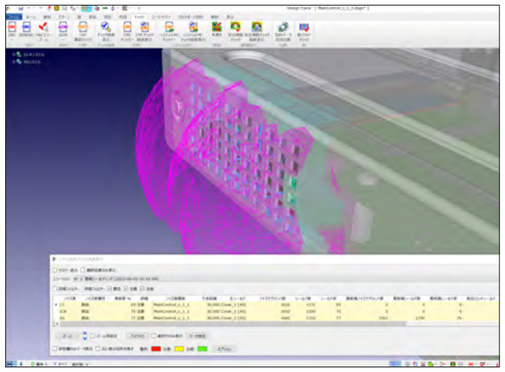
3D EMC Adviser is an industry-first tool that enables EMC verification in a 3D space during PCB design based on the fusion of electrical and mechanical design data. Zuken’s new software contributes to standardization of EMC verification, a process which has traditionally been dependent on the knowledge and experience of expert designers, and allows the technical expertise of today’s engineers to be passed on to the designers of tomorrow.

Talent shortages and the aging of skilled designers are an increasingly pressing challenge facing design and development departments in the manufacturing industry. As an engineering IT company, Zuken is committed to supporting sustainable manufacturing by delivering solutions that enable our customers to convert their know-how and technological assets into data that can be utilized in their product development.

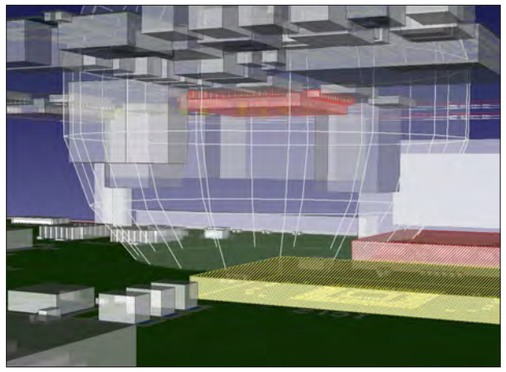


Zuken's 3D EMC Adviser has been met with high acclaim in the industry, receiving the JPCA Incentive Award at the 19th JPCA Awards.
(From left: Zuken’s product development project team members Seiji Nomura [SE Department], and Takuma Matsumoto [R&D Division])

Example of 3D EMC Adviser noise check



Check that PCB is adequately shielded from noise sources within the product housing unit in which it is incorporated.



Check for potential interference within the product housing unit due to the proximity of noise sources (components and wiring) to noise-sensitive circuits.

ZUKEN

The Partner For Success

Company Name	Zuken Inc.
Foundation	December 17, 1976
Head Office Location	2-25-1, Edahigashi, Tsuzuki-ku, Yokohama, 224-8585 Japan
Paid-in Capital	JPY 10,117,065,000
Number of Employees	437 (consolidated: 1,538 ; as of the end of March 2023)
Stock Listing	Tokyo Stock Exchange, Prime Market
Business Areas	Research and development of a wide variety of software solutions that support the optimization of product design and engineering operations for manufacturing industries, and marketing of software solutions with expert consulting services.
Directors and Auditors	Makoto Kaneko, Chairman and CEO Jinya Katsube, President and COO Yoshikazu Soma, Executive Vice President Takashi Sano, Director* Yoichi Arai, Director* Fusao Wada, Full-time Audit & Supervisory Board Member Takashi Handa, Audit & Supervisory Board Member* Yoshinobu Maeba, Audit & Supervisory Board Member* * Outside Directors / Outside Audit & Supervisory Board Members.
Executive Officers	Kazuhiro Kariya, Senior Managing Executive Officer Yasuo Ueno, Senior Managing Executive Officer Takeo Osawa, Executive Officer Koichi Saotome, Executive Officer Hiroyuki Fujiwara, Executive Office Isao Nara, Executive Office