

Contributing Organizations  
to  
GTSJ



Gas Turbine Society of Japan

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Aikoku Alpha Co.,Ltd.	... C1	JAPAN PATENT OFFICE	... C22
ANSYS Japan K.K.		Japan Ultra-high Temperature Materials Research Center	
AYY associates (advanced business events Japan office)		JAPANESE AERO ENGINES CORPORATION	... C23
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Daigas Gas and Power Solution Co.,Ltd.		KAWASAKI NAVAL ENGINE SERVICE,LTD.	
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ENEOS Corporation		MARUWA ELECTRONIC INC.	... C28
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Hoden Seimitsu Kako Kenkyusho Co.,Ltd.	... C12	MITSUI & CO. PROJECT SOLUTIONS, LTD.	
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IHI Inspection & Instrumentation Co.,Ltd.	... C16	UNIT POWER GENERATION DEPT.	
IHI Jet Service Co.,Ltd.	... C17	Osaka Gas Co.,Ltd.	
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Siemens Energy K.K.	... C41	Department of Mechanical Engineering and Science	... U9
Sumiju Precision Forging Co., Ltd.		Kyushu University, Department of Aeronautics and Astronautics	... U10
SUMITOMO PRECISION PRODUCTS CO.,LTD.		Kyushu University, Thermal Science and Energy Laboratory	... U11
Suzuki Seiki Industry Co.,Ltd.	... C42	Osaka Metropolitan University, Aerospace Fluid Dynamics Laboratory	... U12
TAIYO OIL CO.,LTD. SHIKOKU OPERATIONS		Osaka Metropolitan University, Aerospace Propulsion Laboratory	... U13
THE CHUGOKU ELECTRIC POWER CO.,INC.		Ritsumeikan University, Thermal-Fluid Engineering Laboratory	
The Institute of Applied Energy(IAE)		Department of Mechanical Engineering	... U14
THE OKINAWA ELECTRIC POWER CO.,INC.		Saga University, Fluid Engineering Laboratory	
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Tohoku Electric Power Engineering & Construction Co., Inc		Shimane University, Next Generation Tatara Co-Creation Centre	... U16
Tokio Marine dR Co., Ltd.		Takushoku University, Gas Turbine Combustion Laboratory	
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Tokyo Gas Engineering Solutions Corporation	... C44	The University of Tokyo,	
TOMINAGA & CO.,LTD.	... C45	Advanced Aeropropulsion Laboratory	... U18
TOSHIBA CORPORATION	... C46	The University of Tokyo, Jet Propulsion Laboratory	... U19
Toshiba Plant Systems & Services Corporation	... C47	The University of Tokyo, Teramoto-Okamoto Lab	... U20
TOYO CONTROLS CO.,LTD.	... C48	The University of Tokyo, Tsue-Nakaya Combustion Laboratory,	... U21
Toyo Tanso Co.,Ltd.	... C49	Tokyo Metropolitan University,	
Toyota Energy Solutions Inc.		Combustion and Propulsion Laboratory	... U22
TOYOTA MOTOR CORPORATION	... C50	Tokyo University of Agriculture and Technology,	
Turbo Systems United Co.,Ltd.	... C51	Thermal Fluids Engineering Laboratory	... U23
UEMURA KOUKI Co.,Ltd.		Tokyo University of Science, Arai Solid Mechanics Laboratory	... U24
Woodward Japan LLC	... C52	Waseda University,	
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		Waseda University,	
		Yamamoto Multi-Physics CFD Laboratory	... U27
		Yamaguchi University, Energy Control Engineering Lab.	... U28

## 〈Universities〉

Cranfield University, England, UK	
Centre for Propulsion and Thermal Power Engineering	... U1
Daido university,	
Department of Mechanical Engineering Machiya Laboratory	... U2
Hosei University, Fluid Engineering Laboratory	... U3
Iwate University, Aerospace Propulsion Research Lab	... U4
Kanazawa Institute of Technology, College of Engineering,	
Combustion and Atomization Lab.	... U5
Kansai University, Thermal Engineering Laboratory	... U6
Kyoto University, Advanced Imaging Lab.	
Department of Mechanical Engineering and Science	... U7
Kyoto University, Thermal Engineering Lab.	
Department of Mechanical Engineering and Science	... U8

# Corporations

C1

## Aikoku Alpha Corporation AP Division



<http://www.aikoku.co.jp/en/>

We use 5-axis machining center to make structural components for the aerospace industry as well as other complex and sophisticated components.  
One of the first companies to introduce a 5-axis machining center in 1975, we have been steadily accumulating expertise in this technology since then.  
We now produce a significant portion of the world's machined impellers while confidently guaranteeing that they are of the finest quality available.  
We will continue to push our machining technology to new heights as we focus steadfastly on the further developing the potential of simultaneous 5-axis machining.

C2



<https://www.bub-agema.de/>



Founded in 1995 in Aachen, Germany, **B&B-AGEMA** brings over 30 years of excellence to the power generation industry. Our specialists possess extensive experience in the design of gas turbines ranging from 3 kW to 300 MW, as well as steam turbines up to 1000 MW.

**B&B-AGEMA** has a proven track record of successful collaborations with major OEMs worldwide. Today, we are deeply involved in pioneering hydrogen technology, including innovative combustion solutions for both stationary gas turbines and aero engines. With specialized expertise in high-efficiency cooling configurations and a dedicated team of world-class engineers, we develop the technology solutions needed for an efficient and sustainable future.

**We are engineering your visions.**

Contact: [info@bub-agema.de](mailto:info@bub-agema.de)

C3

# cadence®

## Cadence Design Systems, Japan

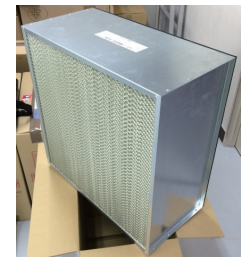
Cadence is an industry leader in computational fluid dynamics (CFD), mesh generation, multiphysics simulation, and optimization. Fidelity CFD enables advanced simulation, design, and optimization of fluid flow and heat transfer, helping reduce development costs while delivering superior quality and performance. It is especially highly regarded by product developers, designers, and researchers in the gas turbine industry.

<https://www.cadence.com>

C4



## Cambridge Filter Corporation



- Cambridge Filter Corporation historically descended from Cambridge Filter Corporation USA, have been offering the highest performance filters to leading edge and advanced technology facilities in USA;

Such as NASA and Lawrence Livermore National Laboratory.

- The highest performance and longest life Cambridge air filters for gas turbine intakes are received high evaluation of well cost performance and supplied to power plants in Japan.
- We provide our top quality "Cambridge Brand" to clients throughout the world.
- If you have any inquiries, please feel free to contact with us via following website.

<https://cambridgefilter.com>

# CRE Co.,Ltd

<http://www.cre-nagoya.com/>



C5

★Product and Service Features

• Focused on gaining customer trust, CRE offers engineering support in the areas of aircraft structural design, structural analysis, electrical and electronic design, software development, device design, productivity-focused process design, and quality assurance.  
• CRE prepares and edits a variety of manuals. We also perform contracted projects associated with documentation, such as electronic conversions of documents and translations of technical documents and manuals.

★ Forte

• CRE has been involved in nearly all of major development projects in the Japanese aerospace industry, while building upon the strong relationships with aircraft manufacturers.  
• CRE has experience in design and development of almost all major components of aircraft.  
• Our skilled engineers, with 30 years of experience in aircraft design and development, are assigned to key roles in projects in order to manage the projects and provide training and guidance to younger engineers.



C6

DAIHATSU INFINEARTH MFG.CO.,LTD.



TX-series

Our company was established at Osaka in 1907, where is one of the most popular spot in Japan as Umeda Sky Building now. In May 2025, DAIHATSU DIESEL MFG.CO.,LTD was reborn as DAIHATSU INFINEARTH MFG.CO.,LTD. The new company name “DAIHATSU INFINEARTH” is a coined word that combines “Infinity” and “Earth” and expresses our strong will to pursue technological innovation and provide infinite new possibilities for the global environment.

We have contributed to the safety and security of people's lives both on land and at sea by supporting the stability of marine logistics through marine engines, and by securing both permanent and emergency power sources through land-based engines. We started to develop Gas-Turbine Engines as “Pure Made in Japan” in 1976 and 5-years later, the first memorial Gas-Turbine engine was delivered. Our turbines are used for back-up system to public facilities such as Pump Stations, Hospitals, Banks and Data-Center. Daihatsu Gas-Turbines receive high evaluation by quality and performance from many clients.



[www.d-infi.com/en](http://www.d-infi.com/en)

3rd Floor (Reception), 4th Floor (Office), Kawakyu Center Building, 12-11, Nishinakajima  
2-chome, Yodogawa-ku, Osaka 532-0011, Japan Phone: +81-6-6454-2390 FAX: +81-6-6454-2682  
Environmental Energy Center

DAIICHI SYSTEM ENGINEERING CO., LTD. **DSE** 第一システムエンジニアリング

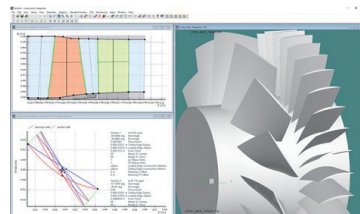
C7

■ Turbomachinery Development Integrated Support System:  
Agile Engineering Design System ■

“Agile Engineering Design System” is an integrated solution tool which includes both Computer-Aided Engineering (CAE) and Computer-Aided Manufacturing (CAM) for turbomachinery.

It covers the entire design and manufacturing process for turbomachinery (from 1D/Preliminary sizing through 3D/Final design), with full fluid dynamics, structural and vibration analysis. It also provides an accurate and efficient tool path while minimizing the overall manufacturing time.

We also provide turbomachinery design review as well as manufacturing and performance tests.



〒460-0008  
6F Nittochi Nagoya Building,  
2-1-1 Sakae Naka-ku, Nagoya, Aichi  
Tel: 052-857-1715 Fax: 052-857-1711  
<http://www.dse-corp.co.jp/>

**EKK**  
EAGLE INDUSTRY CO.,LTD.

C8

EAGLE INDUSTRY is the Sealing Solution Company.

We engineer, manufacture and supply the seals for Jet Engine,  
Gas Turbine to prevent the leakage of Air and Oil, which contributes  
The efficiency of the Engine.

Our Brush Seal and Metal Static Seal (Actiseal-C,E,W) are used on  
The Ground Gas Turbine in many application.

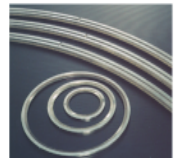
Jet Engine Customer uses our Segmented Carbon Seal for both military  
application and commercial application.

SHIBA PARK BLDG, B-14F, 2-4-1 SHIBAKOEN MINATO-KU, TOKYO  
105-8587, JAPAN

<http://www.ekkeagle.com/jp/>



Segmented Carbon Seal



Brush Seal



Actiseal-C,E,W

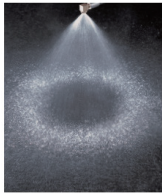
## Everloy

C9



Everloy Group, manufactured by Kyoritsu Gokin, has supplied a wide range of customized spray nozzles for combustion and intake-air cooling applications.

We provide nozzle development and evaluation testing for next-generation fuels, including hydrogen and ammonia.



Hollow-cone pattern



Full-cone pattern



Cross-shaped pattern



<https://www.everloy-spray-nozzles.com/en/>

## Fuji Electric *Innovating Energy Technology*

C10

Fuji Electric Co., Ltd. <https://www.fujielectric.com/>

Fuji has engaged in the thermal power plant business through the planning, design, procurement, construction, commissioning and after sales service, ever since we delivered the first steam turbine generator unit in 1959.

Fuji has promised to realize the plant design by Client requirement and high-efficiency and availability for several kind of thermal power plants of coal-fired power plant, combined power plant and co-generation power plant etc..

Fuji is a leading company in the geothermal power generation industry and has supplied geothermal power generating facilities worldwide. Geothermal energy is the renewable energy and its utilization will grow to reduce CO<sub>2</sub> emission.

# ELECTRIFY TO THRIVE AND DECARBONIZE

C11



GE VERNOVA

[www.gevernova.com/jp](http://www.gevernova.com/jp)

## HOUDEN SEIMITSU KAKO KENKYUSHO., LTD

C12

- Over our long history of more than 60 years, HSK have acquired many special processing technologies, including electrical discharge machining. Currently, we have been supplying many customers with parts used in industrial gas turbines and aircraft engines by taking advantage of our diverse processing technologies. In terms of quality assurance, we have acquired ISO and Nadcap certifications and have established a system to supply highly reliable products.
- For other industries, HSK offer advanced technologies to meet a wide range of materials and needs, such as servo presses for high-precision processing and mold manufacturing using special steels.



Head Office: Innotech Building 11F, 3-17-6 Shinyokohama, Kohoku-ku, Yokohama-shi, Kanagawa, 222-8580, Japan  
Okayama Office : 100-2 Tsurui, Akaiwa-shi, Okayama, 709-0718, Japan  
TEL : +81-86-995-3100, <https://www.hsk.co.jp/>

## Honda R&D Co., Ltd.

### Research Center of Excellence

C13

<https://global.honda/products/aeroengine.html>

Our research center has been striving to offer our customers the best-in-class aircraft gas turbine engines that are compact, light weight, highly-performed and environmentally sustainable especially for business jets. HF120 Engine, jointly developed with GE Aviation, received Type Certification from the U.S. Federal Aviation Administration in Dec, 2013, and a total of more than 250 aircrafts are in operation in North America, Latin America, Europe, Asia and Middle East. Our research center not only offers reliable products and the best services to our customers but also introduces competitive and innovative engine technologies into aviation industry.



GE Honda HF120 Turbofan Engine

## IHI Castings Co., Ltd.(ICC)

C14

<https://www.ihico.jp/icc/>

IHI Castings Co., Ltd.(ICC) manufactures heat-resistant alloy precision castings used for aircraft jet engines, industrial gas turbines, space equipment, turbocharger for vehicles and ships, general industrial equipment and such. Since its establishment as Ishikawajima Precision Casting Co., Ltd. in 1977, we have been manufacturing and providing precision casting materials. Also, to address the growing demands, we have enhanced the production capacities of Soma and Matsumoto Plants by promoting efficiency of production lines. We will put more effort into new techniques including powder metallurgy and additive manufacturing along with precision casting, and continue to offer excellent products of near-net-shape and net-shape materials.

## I H I Corporation

<https://www.ihico.jp>

Aero Engine, Space and Defense Business Area

IHI participates in international collaborative engine programs for regional, medium, large and super large sized commercial aircrafts, and designs, develops and manufactures modules and component

parts for those engines. In addition, IHI applies the comprehensive engineering capabilities to implement engine maintenance operation and parts repairs.

IHI also participates in the research and development of engine for the genuine domestically-produced aircrafts operated by the Ministry of Defense. Besides, IHI develops and manufactures

main propulsion and power generators on naval vessels by applying aero-derivative gas turbines.

IHI is in charge of the maintenance and repair of these gas turbines, contributing to the stable operations of the Ministry of Defense.



C15

## IHI Inspection & Instrumentation Co., Ltd.

C16

<https://www.iic-hq.co.jp/>

IHI Inspection & Instrumentation Co., Ltd. (IIC) is a fully owned subsidiary of IHI. In 1974, the quality management and inspection functions of IHI were spun off to establish IIC. Therefore, from the outset, IIC has been employed many top-level experts in various fields such as sophisticated inspection technology, material and chemical analysis, strain and vibration measurements, stress and fatigue diagnostics and conduct of advanced tests using huge wind tunnels, vibration stands or other facilities. Moreover, we have an organization for developing and manufacturing state-of-the-art inspection instruments and equipment.

## IHI Jet Service Co., Ltd.(IJS)

C17

<https://www.ihi.co.jp/ijs/>

IJS provides services and maintenances of Gas Turbines Equipment developed and manufactured by IHI group, supports to design and manufacture of Aero-engines and Space Equipment, and maintenances of Industrial Plants.

Based upon high-quality technology which IJS has developed and know-how which IJS has accumulated through these business, IJS also develops and manufactures Gas Turbine Generator and Aircraft Rinse System.

We continue to make an effort to create customer's delight through our assured technology and our thoughtful service, and contribute to realization of wealthy and happy society.

## INC Engineering Co., Ltd.

C19

<https://www.ihi.co.jp/inc/laneng>



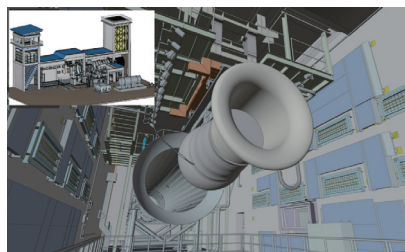
INC Engineering Co., Ltd (INC) was established as an affiliate of IHI group handling soundproofing and anti-vibration business. The present INC is an engineering company engaged in activities across multiple fields such as "the design, manufacture, and installation of test operation facilities for aircraft engines and aircraft conversion type gas turbine engines", "the design, manufacture and installation of soundproofing and vibration isolation equipment", "consulting on preventive measures against noise and vibration", and "various test facilities and environmental protection equipment". Utilizing our fundamental technologies and a wide range of specialized technologies (acoustics, machinery, structures, thermal, fluids, and architecture), we will respond to the diverse needs of our customers by providing valuable solutions and innovative products even in fields other than the IHI group.

April 1977 Established as Ishikawajima Noise Control Co., Ltd in Shinjuku Mitsui Building.

July 1982 Head office moved to Shinjuku Ryuseido Okubo Building.

April 1997 Company name changed to "INC Engineering Co., Ltd." on 20<sup>th</sup> anniversary.

April 2023 25<sup>th</sup> anniversary of Mizuho office since 1998.



**IHI**  
Realize your dreams

**NIGATA**

C18

## IHI Power Systems Co., Ltd.

<https://www.ihi.co.jp/ips/>

IHI Power Systems(IPS) has been providing products using highly efficient and reliable engines and gas turbines.

In the area of power system plant business, we provide a wide variety of power generating products including gas turbines, diesel engines, and gas engines with simple-cycle, combined-cycle and co-generation application.

In addition, IPS provides remote monitoring, engine & gas turbine maintenance, and other services throughout the various product lifecycles.

In the marine power system business, IPS supplies a full range of diesel engines and Z-PELLER® Azimuth Thruster.

14-5,Sotokanda 2-Chome,Chiyoda-ku,Tokyo,101-0021 Japan

TEL: +81-3-4366-1200 FAX: +81-3-4366-1300

## Japan Aerospace Exploration Agency

C20

Aviation Technology Directorate

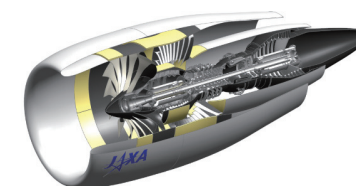
<http://www.aero.jaxa.jp/eng/>



The Aviation Technology Directorate of Japan Aerospace Exploration Agency (JAXA) has conducted R&D programs of aero-engines, represented by three key words, "Environment", "Safety", and "Frontier".

A recent R&D program is En-Core (Environmentally Compatible Core Engine Technology Research) project. Two major targets of this project are "ultra-low NOx lean premixed combustor" and "high-temperature, high-efficiency turbine". Another project, aFJR (advanced Fan Jet Research), focused on low-pressure components such as fans and low-pressure turbines, pursuing high efficiency and light weight of these components.

As well as the projects, the research programs in JAXA have been conducted for future propulsion systems. They are regarding de-carbonization, compact and high-powered core system, low NOx and noise emission, and resilient propulsion.



# Japan Internal Combustion Engine Federation (JICEF)

**JICEF** C21

NIT Tsukiji-Building 2F 203,  
14-3, Tsukiji 2-chome, Chuo-ku,  
Tokyo 104-0045 Japan  
TEL +81-3-6457-9789  
FAX +81-3-6457-9787  
e-mail: [jicef\\_office@jicef.org](mailto:jicef_office@jicef.org)  
<https://www.jicef.org/>



Japan Internal Combustion Engine Federation (JICEF) was founded in 1954, which is the Secretariat of Japanese National Member Association (NMA) for CIMAC (International Council on Combustion Engines), and also the Secretariat of JICESC, Japan Internal Combustion Engine Standard Committee for ISO, which consists of national committees for ISO/TC70 (Technical Committee on Internal Combustion Engines in ISO, International Organization for Standardization) and ISO/TC192 (Technical Committee on Gas Turbines in ISO).

JICEF is having very active and important roles for communications, coordination of opinions for common interests, promotion of mutual friendship etc. among manufacturers, users and neutral experts on reciprocating internal combustion engines and gas turbines.

# Japan Patent Office



JCN 2000012090003

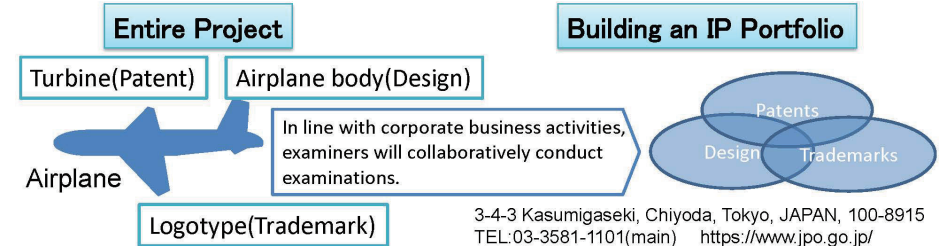
C22

We are dedicated to providing excellent services.

1. Circuit Examination through Interview  
-JPO examiners will reach users to conduct interview for patent applications.



2. Collective Examination for IP portfolio supporting Business Strategy  
-A team of JPO examiners will conduct cross-sectionally examinations of multiple IP applications (patent, design, trademark), which will be developed into businesses inside and outside Japan.



# Japanese Aero Engines Corporation



<http://www.jaec.or.jp/>

C23

The Japanese Aero Engines Corporation was established to coordinate and manage the overall progress of multi-national collaboration programs in 1981 under the direction of the Ministry of International Trade and Industry (presently known as the Ministry of Economy, Trade and Industry) with the IHI Corporation, Kawasaki Heavy Industries, Ltd., and Mitsubishi Heavy Industries, Ltd. It is the Japanese business entity contributing to the success of international collaboration projects to develop and produce engines for civil aircraft such as V2500 and PW1100G-JM.

# Kanadevia

Technology for people and planet

<https://www.kanadevia.com/>

C24

Kanadevia Corporation was founded in 1881 originated from Shipbuilding, now being diversified to Waste to Energy system, Desalination system and other infrastructure related businesses including power plant business, with approx.13,000 employee throughout the world. In the gas-fired power plant business, Kanadevia is able to offer not only turn-key service of construction but operation and maintenance services, supported by its own IPP business for more than 15years. Currently built and operate 2 units of 110MW GE-based GTCC plants in Ibaraki prefecture, Japan. This all inclusive service brings customer promised and stable project earnings in long term basis.

C25

## Kansai Electric Heat Corp.

<http://www.kansaidennetsu.co.jp/>



We design and manufacture the electric heater for generating the hot-air. Our heater is compatible with high temp. (max. discharge hot air temp. 1000 °C) and high air pressure ( pressure resistance 5Mpa).

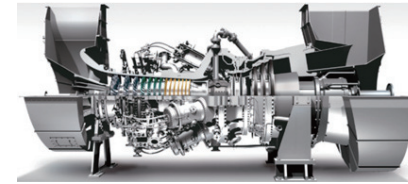
Our heater for generating the hot-air are widely used in various research institutes for heat resistance, durability, and bench testing of heat exchangers, combustors, compressors, output turbines, compression turbines, etc.

As an example, our heater is also used by JAXA Japan Aerospace Exploration Agency. It is Being used for creating a high-temp., high-pressure simulated environment inside the engine For conducting combustor performance tests in sector form at a jet engine combustor technology development facility aimed at developing an aircraft engine with cleaner exhaust gas.

C26

 **Kawasaki**  
Powering your potential

## Kawasaki Heavy Industries, Ltd.



The origin of Kawasaki's gas turbine business is dating back to 1943, the success of first test flight of type "Ne-0" engine which is developed by Kawasaki. Nowadays, Kawasaki supplies helicopter engines to Japan self-defense force. Also, Kawasaki has been participated several international development programs for commercial aircraft engines. Furthermore, in order to utilize the technology developed through manufacturing of jet engines, Kawasaki started to manufacture the industrial gas turbine named "Kawasaki Gas Turbine". Kawasaki has wide range of line up from 150kW to 34,000kW and it has been installed all over the world.

14-5, Kaigan 1-chome, Minato-ku, Tokyo 105-8315, Japan  
<https://global.kawasaki.com/en/>

Our Challenge, Shape the future!  
**KIGUCHI TECHNICS INC.**



C27

This project was supported by the Ministry of Economy, Trade and Industry (METI) and the New Energy and Industrial Technology Development Organization (NEDO) under the Supply Chain Resilience Fund Program.

Matsue Facility (Hokuryo-cho, Matsue-shi, Shimane)

As one of Japan's largest testing service providers, we operate a Nadcap- and ISO/IEC 17025-accredited independent materials testing laboratory.

Our fully integrated in-house capabilities cover the entire process from specimen machining and visual and dimensional inspection to mechanical strength and fatigue testing, ensuring a high level of traceability and quality assurance.

Selected under Japan's national initiative to strengthen aerospace supply chain resilience, we are establishing ultrasonic inspection capabilities for large aerospace forgings made from titanium and nickel-based alloys at our Matsue facility.

Operations are scheduled to begin in 2027 as we continue supporting the highest standards of reliability in the aerospace industry.

**KIGUCHI TECHNICS INC.**

114-15 Enoshima-cho, Yasugi-shi, Shimane 692-0057  
TEL : +81-854-22-2619 / FAX : +81-854-23-0869  
<https://kiguchitech.co.jp/>

## Maruwa Electronic Inc.

C28

<http://www.maruwa-denki.co.jp/>

Maruwa Electronic Inc. (MEI) has gone forward infinite and unique development for a high speed rotation apparatus and combustion chamber. Our product and service are essential to the design and material integrity for new design, performance and reliability improvement.

High frequency drive with active magnet bearing solution that is MEI's core technology surely meets the coming turbomachinery application and supports the environmental impact.



C29

Metal Technology Co. Ltd. (MTC) was founded in 1960 and has developed into an expert in providing *metal solutions* to our customers. To meet the needs of many industries including gas turbine and aerospace industries MTC provides integrated manufacturing solutions and services through HIP treatment, Vacuum Heat treatment, Diffusion Bonding, Machining, Brazing, Welding and Additive Manufacturing. In recent years, we have also adopted Near Net Shape (NNS), environmentally friendly technology that reduces the amount of material used and improves durability and product life. In addition to our six plants in Japan, we also have subsidiaries in China and Sweden to support customers globally.



Near Net Shape WYE Part



The world's largest HIP unit. (Giga-HIP)



Contact: [info@kinzoku.co.jp](mailto:info@kinzoku.co.jp) Our website:



## MITSUBISHI HEAVY INDUSTRIES AERO ENGINES

C30

<https://www.mhi.com/jp/group/mhiael/>

Mitsubishi Heavy Industries Aero Engines, Ltd. (MHIAEL) is one of the Mitsubishi Heavy Industries, Ltd. (MHI) group companies established to strengthen its aircraft engine business to address the significantly growing commercial aviation demands. MHIAEL was established on October 1, 2014.



Our broad business portfolio currently includes the joint development and production of engines for commercial aircrafts and civil helicopters. Maintenance, repair and overhaul services for commercial engines, which we are currently serving many airline operators worldwide, is also contributing in broadening our business portfolio.

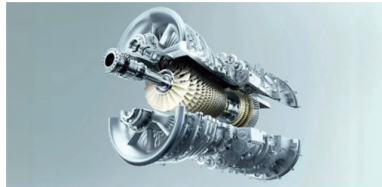
Specialized in the hot section engineering including combustor and turbine of aircraft jet engines, our distinctive technology and expertise in development, design, and manufacturing allows us to possess significantly important position in joint development and production of (Original Equipment Manufacturers). the world's most advanced and sustainable jet engines with engine OEMs

We will make use of our highest quality and unique "skills," which are our advantage, to sensitively meet customer needs and provide air travel passengers with safety and security, and thereby provide products and services that can contribute to international society.

C31



[power.mhi.com](http://power.mhi.com)



Mitsubishi Power, a power solutions brand of Mitsubishi Heavy Industries, Ltd. (MHI), offers high efficiency gas turbines that are widely adopted at GTCC power plants around the world. Leveraging decades of proven engineering expertise, these gas turbines deliver high reliability that supports stable power supply, superior thermal efficiency that helps reduce power generation costs, and flexible output control to respond to fluctuations in demand.

At the core of GTCC systems, Mitsubishi Power's gas turbines are provided for utility power, industrial, and aero-derivative applications, covering a broad output range from 570 MW class to 30 MW class. Through innovative power generation technologies and solutions, Mitsubishi Power contributes globally to the decarbonization of energy while ensuring a stable and reliable power supply, working toward the realization of a sustainable future.

Learn more about Mitsubishi Power's industry leading gas turbine technologies:

<https://power.mhi.com/products/gasturbines/index.html>

## MITSUI E&S Co., Ltd.

C32



<http://www.mes.co.jp/>

MITSUI E&S Co., Ltd. succeeded the gas turbine business of Mitsui E&S Machinery Co., Ltd., which was an operating company in the machinery business, following a reorganization of the Mitsui E&S Group in April 2023.

Mitsui's industrial gas turbine development has started from 1950, and the first machine was delivered in 1954. We keep proposing good systems to meet customer's various requests.

-SB Series (Mitsui's gas turbines): 1MW~24MW

-MSC Series (Packaging Solar Turbines' gas turbines): 3MW~15MW

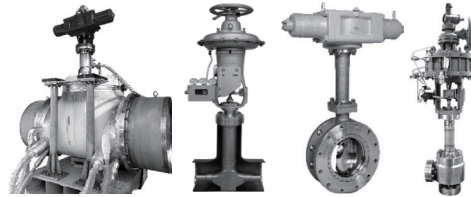
## Nakakita Seisakusho Co., Ltd.

C33

<https://www.nakakita-s.co.jp/>

Since foundation in 1930, we have been engaged in research and development of fluid control system with a central focus on valves, and aspiring to be a company, which can make best proposals to customers ahead of the needs of the times.

We're producing valves for gas turbine as an overall manufacturer. Products line-up you can use at the wide process, including high/low-temperature and high-pressure line. We can supply high quality control valves (pneumatic/hydraulic/servo/electric-motor operated), butterfly, self-operated and safety valves, which has been verified by our high-accuracy inspection facilities including precise Cv measurement and are applicable to customer's various requests.



## Nippon Muki Co., Ltd.

C34

<https://www.nipponmuki.co.jp/>

We make new clean value and help to control the clean environment as leading company of air filter.

Air filter protects air compressor from dust and prevents for drop of the generation efficiency. We started the sales to Gas Turbine (GT) customer from 1993. Now many GT customer in Japan are using and satisfying our products.

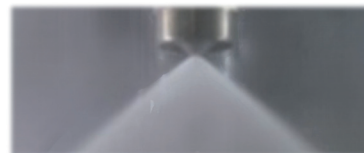
Air filter for GT are requested as high efficiency and long life. Because we have a lot of filter lineup, technical knowledge, and experiences, we can propose the best filter based on the customer's environment and request. Please feel free to contact us.

## Nippon Nozzle Seiki Co.,Ltd

C35

We manufacture fluid equipment specializing in gas turbine and marine engine fuel nozzles. In addition to OEM production, we can offer fuel nozzle design services with a fully integrated in-house manufacturing system covering design, machining, welding, test and inspection.

Our company is equipped with comprehensive flow testing facilities for air, oil, and water, enabling precise measurement across a wide range of flow rates. With an emphasis on flow management, we support flow rate tuning and oil nozzle spray angle adjustment to deliver optimal solutions that meet customer specifications.



Kansai Div.: 1-1 Minatomachi, Befucho, Kakogawa, Hyogo 675-0136, Japan  
TEL +81 (0)79-435-6032  
<https://www.nippon-nozzle.com/>

## NTN corporation

C36

<https://www.ntnglobal.com>



NTN has manufactured and supplied a wide range of bearings and driveshafts to meet customer needs across a variety of applications and industries since its establishment.

We design, manufacture, and provide bearings globally for main shaft of gas turbine engine. Especially, in aerospace application, we have supplier approvals from major jet engine manufacturers in the world. Our firm adherence to quality has earned high reputation and reliance.



Headquartered in Osaka, Japan, we have plants specialized in aerospace bearings in Kuwana, Japan and Argonay, France.

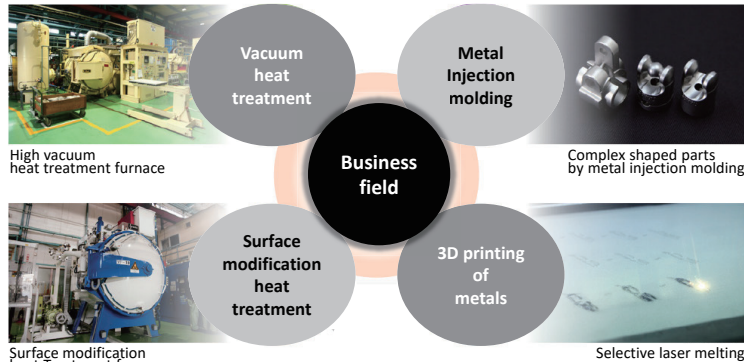
# Osaka Yakin Kogyo Co., Ltd.

<http://www.osakayakin.co.jp>



C37

Based on technology cultivated for over 80 years, we offer vacuum heat treating, vacuum brazing and surface modification for heat-resisting alloys used for gas turbine. We also produce complex shaped parts by metal injection molding and 3D printing of metals.

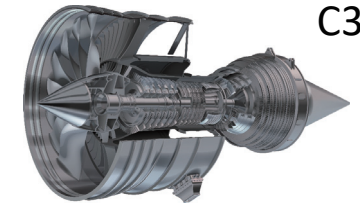


It proposed a metal thermal processing technology to the total.

■ Head Office : 4-4-28 Zuiko Higashiyodogawa-ku Osaka 533-0005 Japan Tel. +81-6-6328-1345  
■ Miki Factory : 25 Tomoe Besshocho Miki Hyogo 673-0443 Japan Tel. +81-794-86-1345

Mail : [info@osakayakin.co.jp](mailto:info@osakayakin.co.jp)

# PROTERIAL



C38

PROTERIAL, Ltd. took a new step forward in January 2023 by changing its company name from Hitachi Metals, Ltd. to PROTERIAL, Ltd. The new name, PROTERIAL, is derived from "PRO" and "MATERIAL." "PRO" represents three core values: Professional, Progressive and Proactive, expressing our commitment to exceeding expectations, continuously taking on challenges, and maintaining an ownership-driven mindset. "MATERIAL" signifies the high-performance materials created through proprietary technologies supported by these three "PRO" values. By delivering high-quality, high-performance materials, we will continue to contribute to the aerospace industry. We are deeply involved in a wide range of gas turbine applications, beginning with turbine disks. Looking ahead, we will continue to make proactive and well-planned investments to meet our customers' expectations, striving to become a high-performance materials company that supports a sustainable society.

Aerospace & Energy Materials Segment  
Specialty Steel Business Unit, Aero & Industrial Alloy SBU  
Toyosu Prime Square 5-6-36 Toyosu, Koto-ku, Tokyo 135-0061, Japan  
TEL: +81-50-3664-9504 FAX: +81-294-87-7140  
<https://www.proterial.com>



# Rolls-Royce Japan Co., Ltd.

C39

Rolls-Royce is a force for progress; powering, protecting and connecting people everywhere. Our products and service packages help our customers meet the growing need for power across multiple industries; enable governments to equip their armed forces with the power required to protect their citizens; and connect people, societies, cultures and economies together.

Rolls-Royce's ties with Japan go back over 120 years, and we opened our first in-country office in 1964. Through our multi-year transformation programme, we are building a high-performing, competitive, resilient and growing Rolls-Royce. We are building the financial capacity and agility to allow us to successfully develop and deliver the products that will support our customers through the energy transition.

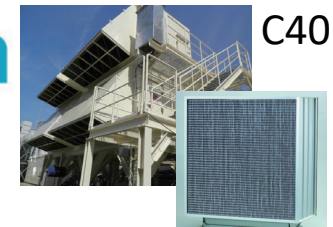
**Rolls-Royce Japan Co., Ltd.**  
31st Floor Kasumigaseki Bldg.  
3-2-5 Kasumigaseki, Chiyoda-ku, Tokyo  
TEL: +81 (0)3 3592 0966  
<https://www.rolls-royce.com>



# SHINWA CORPORATION

## Shinwa Corporation

<http://www.shinwatec.co.jp/en/index.html>



C40

We and main factory as Japan Air Filter corporation are engineering / trading company specializing in air filtration products and related equipment so we are taking the part of traction of this industry.

We are supporting our customer to improvement GT performance such as GT out put, Heat Rate Value by good performance of our Air filter products.

Please let us know your concern issue of GT performance or intake Filter system.

1-32-2 Honcho Nakano-ku, Tokyo, Japan  
[info@shinwatec.co.jp](mailto:info@shinwatec.co.jp)

C41

## Siemens Energy K.K.



sekk\_inquiry.jp@siemens-energy.com  
<https://www.siemens-energy.com/jp/ja/home.html>

Siemens Energy is a global gas turbine manufacturer with a broad lineup of products ranging from small, multi-MW industrial applications to large, 600 MW class applications.

We are a leading company in reducing environmental impact with good flexibility with green fuels mainly hydrogen and ammonia.

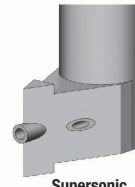
We offer total solutions that are optimal for customers who are committed to energy conservation and decarbonization, from centralized power generation to distributed power generation, by offering a complete lineup including Electrolyzer, compressors, grid technology and Long duration energy storage, in addition to our track record and knowledge as an OEM of gas turbines, steam turbines, generators, and plant control system and EPC in power generation.

C42

# You can order from one

**1 Design** → **2 Processing** → **3 Assembly**

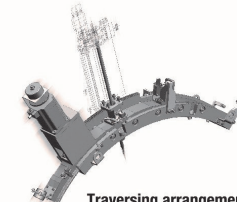
## LINE UP



Supersonic



Porous

Total temperature tube  
Total pressure tube

Traversing arrangement



Wind tunnel test part



**Suzuki Seiki Industry Co., Ltd.**

4-6-5, Higashiogu, Arakawa-ku, Tokyo, 116-0012, Japan  
 tel.03-3800-3331 <http://www.k-suzukiseiki.co.jp/>



## Tohoku Electric Power Co., Inc.

C43

Since the installation of the No. 3 unit at the Higashi-Niigata Thermal Power Station in 1984, which was Japan's first large-scale commercial combined cycle power generation facility, Tohoku Electric Power has consistently adopted the latest gas turbine equipment and technology.

The Joetsu Thermal Power Station, which began commercial operation in 2022, introduced the latest model of gas turbines and achieved the thermal efficiency of over 63%, the highest in the world at that time. This has enabled the reduction of approximately 30% in fossil fuel consumption and CO<sub>2</sub> emissions compared to conventional plants, contributing to CO<sub>2</sub> reduction through the high efficiency of thermal power sources.



Joetsu Thermal Power Station

C44



**TOKYO GAS  
ENGINEERING SOLUTIONS**

<https://www.tokyogas-es.co.jp/en/>

Energy Advance Co., Ltd. and Tokyo Gas Engineering Co., Ltd. merged on April 1, 2015 and started a new chapter in their history as Tokyo Gas Engineering Solutions Corporation.

We are a provider of comprehensive energy solutions to make your facilities more energy efficient using renewable energy. Our approach include smart energy networks with concept of “local production local consumption of heat and electricity” based on cogeneration system. We also help customers meet engineering requirements of LNG receiving terminals and city gas distribution network.

Our mission is to contribute to sustainable, safe and stable society through engineering solutions.



TOMINAGA & Co.,Ltd. was founded in 1939, and our Gas Turbine business has more than 30 years of history.

EthosEnergy, whom Tominaga has served as distributor, is a joint venture between Wood Group GTS and TurboCare of Siemens group. EthosEnergy is a leading independent service provider of rotating equipment services and solutions to the power, oil & gas and industrial markets.

Globally, their services include power plant engineering, procurement and construction; facility operations & maintenance; design, manufacture & application of engineered components, upgrades & re-rates; repair, overhaul & optimization of gas & steam turbines, generators, pumps, compressors and other high-speed rotating equipment.

Their products and service will provide the maximum cost merit for customers. It is not only brought by low initial cost but also their high-standard technologies which make turbines operation optimized truly. They state, "Delivering 15% life cycle value improvement on your power generation and mechanical drive assets", with their proven and valued technology.

Tominaga Co.,Ltd (<http://www.english.tomco.co.jp>)  
Tel: +81-3-3639-5315 Fax: +81-3-3639-5360

<https://www.global.toshiba/ww/top.html>

Toshiba's energy solutions business segment is a leading supplier of integrated energy solutions.

With our long experience and expertise in wide range of power generating and transmitting systems and energy management technology, we deliver innovative, reliable and efficient energy solutions across the globe.

We always seek what is required in energy industry, and what are the new values that we can create, sharing our insights with our customers and partners to become a company that design the future of energy.

# EPCC x VALUE™

## Adding Value to Infrastructure

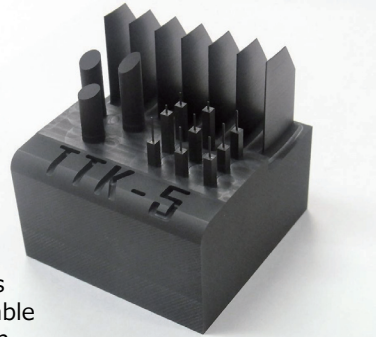
**Toshiba Plant Systems & Services Corporation**

<https://www.toshiba-tpsc.co.jp/english/>



<https://www.toyocontrols.co.jp/>  
<https://www.maxmachinery.com/>

Toyo Controls & Max Machinery have been offering for over 30 years application such as hydraulic fluids and jet fuels for aviation hydraulic components/servo flow control valve test stands and gas turbine combustor test stands as well as automotive gasoline & diesel engine fuel metering test stands, marine engine, small engine test and chemical materials in MAX's liquid high temperature precision positive displacement flow measurement technology based on the highest levels of precision, craftsmanship and performance & long term durability & safety. MAX 4-Radial piston/ Helical rotor/Rotor gear types PD flowmeters for flow range (0.005mL/min to 540L/min) are know for exceptional accuracy (within  $\pm 0.2\%$  of rdg, high resolution and fast time constant output), wide range (1000:1 over), Bi-Directional flow, low-high temperature operating (-54°C~225°C), high pressure (3000psi/6000psi/7250psi) and ability to measure fluid of any viscosity (0.5~500,000cps). Our standards stringent the performance of our products is unparalled.



**TTK-5: Graphite for Ultra-Fine EDM of Turbine Blades**

TTK-5 is a graphite grade designed for ultra-fine EDM electrodes used in turbine blade machining. It enables precision machining and micromachining, allowing stable processing of ultra-fine features down to  $\varnothing 0.0019$  inch. Compared to metal electrodes, TTK-5 offers excellent machinability, contributing to reduced machining time. No burrs are generated during machining, eliminating the need for deburring and allowing immediate use in EDM. Graphite electrodes also exhibit low thermal deformation, maintaining dimensional accuracy during EDM. TTK-5 is suitable for EDM processing of turbine blade grooves and cooling holes where high precision and stability are crucial.

Page URL: <https://www.toyotanso.com/us/en/>  
Inquiry Form: <https://www.toyotanso.com/Products/contact.form.html>

**TOYOTA**

<http://www.toyota-global.com/>

Toyota started development of the automotive gas turbine in 1964. The idea of “the gas turbine hybridization” was succeeded to the PRIUS. The technologies developed since have been utilized for the automotive turbocharges and other products of Toyota Turbine and Systems Inc. We continue to pursue R&D for various applications of the gas turbine, including potential for use in future mobility. I would appreciate any advice members and supporting members of the Gas Turbine Society of Japan may provide.

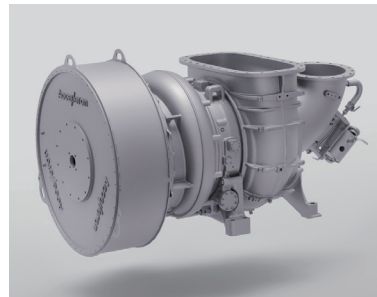


**Turbo Systems United Co., Ltd.**

An Accelleron and IHI joint venture

<https://www.turbo.co.jp>

Turbo Systems United Co., Ltd. (TSU) is a joint venture between Accelleron and IHI, established on October 1, 1998. Leveraging the combined expertise of two global leaders, TSU delivers high-performance turbochargers for large diesel and gas engines to the Japanese market, along with reliable, high-quality after-sales support.



We provide engine manufacturers with advanced application engineering services, supporting them from the early stages of engine development through the entire life cycle of the turbocharger. In parallel, we support customers operating ships, generators, locomotives, and construction machinery through our extensive global service network, helping to ensure safe, efficient, and reliable operations.



**WOODWARD**

MicroNet  
Controller



GS Series  
Electric Gas Metering Valve



LESV-II



ELA Series  
Electric Actuator



Since 1870, Woodward Inc. has been developing Aero and Industrial Control Systems for the Gas Turbine market. Woodward supplies reliable products and services to customers worldwide.

Woodward’s market-leading portfolio contains controllers, metering valves, linear actuators for application in heavy frame turbines, aero-derivative engines, as well as Small and Micro gas turbines. Visit our website to find the optimum solution for your gas turbine.

WBG West 19F, 2-6-1 Nakase Mihama-ku, Chiba-shi, Chiba 261-7119 Japan  
Tel: 043-213-2191  
<https://www.woodward.com/industrial/>



C53

Yanmar Power Solutions Co., Ltd.  
Yanmar Energy System Co., Ltd.

<https://www.yanmar.com>



Since its founding, Yanmar has strived to improve people's lives based on the pioneering spirit that has been passed down through generations. In addressing challenges, we have pursued technologies that "achieve maximum prosperity with minimum resources."

Since commencing research on gas turbines in 1972, our company has consistently pursued in-house development and commercialization. As a result, we have developed 14 models of gas turbine emergency power generators ranging from 250kVA to 3000kVA, which have earned high praise in many facilities throughout Japan for their rapid startup and high reliability.

## YDK Technologies Co., Ltd.

C54

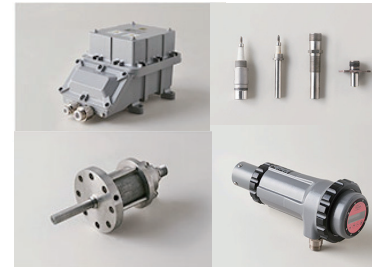
URL: <https://www.ydktechs.co.jp/en/>

YDK Technologies contribute toward the realization of a thriving society to support the safety and security of the people by high-various sensing technologies through global activities in the four area of Defense, Environmental measurement, Aviation & Combustion and Maritime navigation.

In the aerospace business, we design, develop and manufacture various sensors for position/pressure/temperature/speed, fuel control vales equipment, ignition excitors and electrical/optical harnesses which are excellent in harsh environment and come from our many experiences and long history.



Position sensor(LVDT), Pressure Sensor, Ignition Unit, Electrical harness for Aerospace



Explosion Ignition System and Flame Scanner for Industry

In our combustion business, we serve customers through providing equipments and services around combustion system such as gas turbines and boilers for example, high energy-explosion proof ignitions, flame detectors and MRO with special technologies and experiences.



YDK Technologies

# Universities

## Cranfield University, England, UK Centre for Propulsion and Thermal Power Engineering



U1

<https://www.cranfield.ac.uk/centres/centre-for-propulsion-and-thermal-power-engineering>

Cranfield University is a leading provider of postgraduate level engineering education, research and technology support to individuals and organisations. At the forefront of aerospace technology for over 60 years, we deliver multi-disciplinary solutions to the complex challenges facing the aviation industry. Thermal power and propulsion engineering is at the very core of Cranfield's research innovation and education. Key focal areas:

1. Industry-scale experimental facilities, including those suitable for hydrogen research.
2. Research on gas turbine propulsion & power systems and its integration with the vehicle, diagnostics, prognostics, life, low emissions combustion, thermal management, AI/ML applications, electrification, supercritical CO<sub>2</sub> power systems, SAF and hydrogen fuels, novel cycles, etc.
3. Industry-facing short courses on gas turbine performance, components, hydrogen for aviation and power generation, condition monitoring, systems design and integration, gas turbine digital twins, etc. ([Search Cranfield University](#))
4. Postgraduate education on aero and space propulsion, as well as power for land, off-shore and marine applications (<https://www.cranfield.ac.uk/courses/taught/thermal-power-and-propulsion>).

### Contact:

Dr Yiguang Li,

Reader in Gas turbine Performance and Diagnostics  
Cranfield, Bedford MK43 0AL, United Kingdom  
Email: [i.y.li@cranfield.ac.uk](mailto:i.y.li@cranfield.ac.uk)



## Hosei University Fluid Engineering Laboratory Department of Mechanical Engineering

U3

Professor Hoshio Tsujita

<https://mech.ws.hosei.ac.jp/tsujita-lab/index.html>

The research subjects in the fluid engineering laboratory at Hosei University are emphasized on the reduction of secondary flows related to passage vortex, horseshoe vortex, tip leakage vortex and so on, and on the improvement of performance characteristics of turbomachines. The recent research programs for axial turbines are the improvement of aerodynamic performance of highly loaded turbine cascade with high turning angle by the reduction of the loss due to the tip leakage flow, by using both the experimental and the numerical methods. The feasibility study for the application of transpiration cooling to the axial turbine is also conducted by the numerical method. Those for the turbocharger are devoted to the controls of the rotating stall and the surge in the centrifugal compressor and to the clarification of the influences of nozzle vane on the circumferential uniformity of flow field at the inlet of radial turbine impeller.

## Daido university

Department of Mechanical Engineering

Machiya Laboratory <https://www.daido-it.ac.jp/dept/mechanic/>



U2

It is established that the mechanical performance of CFRTP fluctuates significantly under varying temperature and humidity. Our facility enables precise tensile characterization across a temperature spectrum of -50° C to 80° C. In addition to our contribution to international standardization for superconducting materials in cryogenic environments (liquid nitrogen), we are currently establishing methodologies for tensile testing of ice to address critical issues in aircraft icing. We are also developing extensometers that can be used at low temperatures.



Constant temperature and humidity chamber



Detail of load frame with load frame

## Iwate University

Mechanical, Intelligent Systems and Aerospace Engineering

Department of Department of Science and Engineering

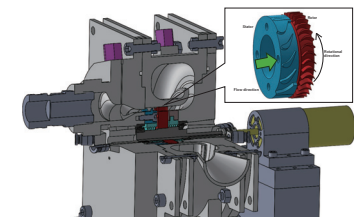
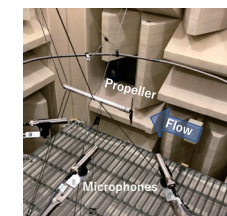
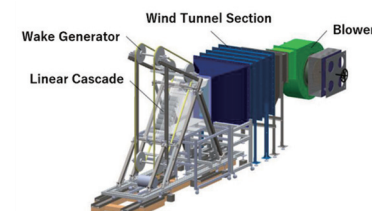
Professor Takanori Shibata

Assistant Professor Hiroaki Sumikawa



U4

The research topics include the aerodynamic performance enhancement of turbine blades under incoming wake flow conditions, aerodynamic noise reduction in propellers and cooling fans, aerodynamic optimization of turbine blades, design optimization of lattice-structured heat exchangers using additive manufacturing, and cycle innovations in power generation technologies. The laboratory is equipped with various experimental facilities, including an environmental wind tunnel, a linear cascade test apparatus, an anechoic chamber, and a rotating test rig. Much of the research has been conducted through collaborative projects with industry partners and consortium research efforts.



<https://shibaken.mech.iwate-u.ac.jp/>

# Kanazawa Institute of Technology

U5

Combustion and Atomization Lab.

Department of Aeronautics and Astronautics

College of Engineering



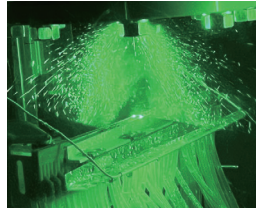
## Optimization of Environmentally Adaptive Aerospace Engines

Our laboratory conducts research on advanced combustion and atomization technologies to enhance the performance and environmental adaptability of aerospace propulsion systems.

**Innovative Combustor Design:** We develop virtual combustor models using highly flexible PSR network modeling techniques to investigate optimal reaction histories and provide feedback for conceptual combustor design.

**Development of Atomization and Spray Technologies:** We experimentally investigate liquid-fuel spray characteristics to improve injector designs for better combustibility, ignition performance, and exhaust emission characteristics in engine combustors.

**Hybrid Rocket Engines:** We study active control techniques at the solid-fuel interface of hybrid rocket engines to improve thrust performance and controllability.



Nagayoshi Hiromitsu (Ph.D., Prof.)

<https://kitnet.jp/laboratories/lab00224/index.html>

# Kansai University

## Thermal Engineering Laboratory, Department of Mechanical Engineering

U6

[http://www.kansai-u.ac.jp/English/academics/fac\\_eng.html](http://www.kansai-u.ac.jp/English/academics/fac_eng.html)

Fundamental researches on film cooling, impingement jet cooling, endwall heat transfer, and ribbed and pin-fin channels, are being performed by Large Eddy Simulations (LES) validated by wind tunnel test. We are developing an in-house LES program with a SGS model developed in Japan, which can simulate our low-speed wind tunnel tests of complex turbulent flows and heat transfer in gas turbines. Our goals are (1) to clarify the basic mechanism of complex heat transfer in gas turbines, (2) to control flow and heat transfer to minimize entropy generation, and (3) to develop advanced cooling technologies for coolant flow reduction.

# Kyoto University

U7

Advanced Imaging Lab.

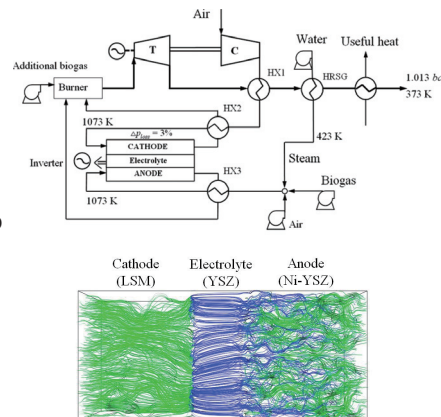
<http://www.ail.me.kyoto-u.ac.jp/>

Department of Mechanical Engineering and Science

Prof. Hiroshi IWAI Assist. Prof. Masashi KISHIMOTO



We are currently studying transport phenomena in solid oxide fuel cells (SOFCs), solid oxide electrolyzers (SOEs) and reformers. In particular, to improve the performance and durability of SOFCs and SOEs, microstructure of porous electrodes are investigated by using a focused ion beam and scanning electron microscope (FIB-SEM). Numerical simulations are also conducted for the thermofluid and electrochemical fields. In view of energy carrier, studies on ammonia are ongoing with special emphasis on decomposition/reforming reactions. Previously, we also made performance analyses for hybrid systems consisting of micro-GT and SOFC fed with biogas.



# Kyoto University

U8

MHI Innovative Combustion Dynamics Lab.  
Department of Mechanical Engineering and Science

Program-Specific Prof. Naoto HORIBE  
Program-Specific Assoc. Prof. Toshihiko SAITO  
Program-Specific Assist. Prof. Yuki MURAKAMI

Prof. (Joint Appointment) Ryoichi KUROSE  
Prof. (Joint Appointment) Jun HAYASHI

<https://mhi-icdl.me.t.kyoto-u.ac.jp/>

Established in 2026 as a joint research project between Mitsubishi Heavy Industries and Kyoto University, we work toward realizing carbon-neutral combustion technologies, with a primary focus on gas turbines. By integrating sophisticated measurements from high-fidelity combustion testing that replicates real-world phenomena with advanced numerical simulations, we aim to elucidate complex phenomena and develop innovative combustion concepts. Through these research activities, we provide comprehensive education in the fundamentals and applications of combustion, thermo-fluid, and energy engineering. Our mission is to continuously nurture the next generation of researchers and engineers who will drive Japan's technological growth and contribute to the future of mechanical engineering.



Model burner

# Kyoto University

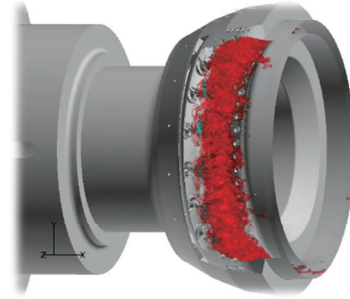
Thermal Science and Engineering Lab.  
Department of Mechanical  
Engineering and Science  
Professor Ryoichi Kurose



U9

[http://www.tse.me.kyoto-u.ac.jp/index\\_e.php](http://www.tse.me.kyoto-u.ac.jp/index_e.php)

Thermal Science and Engineering Lab (TSEL): The principal objectives of the TSEL are to understand the physical aspects of thermodynamic, heat transport and radiative properties of fluid and solid matters on the basis of thermodynamics, thermal conductology, fluid dynamics, spectroscopy and electrostatics, and to elucidate the complex phenomena including them, from nanoscale to macroscale. In addition, based on such basic researches, applied researches on the developments and advancements of technologies of numerical simulations and measurements to support "industrial innovations" are conducted.



Large-eddy simulation of turbulent spray combustion field of full annular combustor for aircraft engine (In Proc. of GTC2015)

# Kyushu University

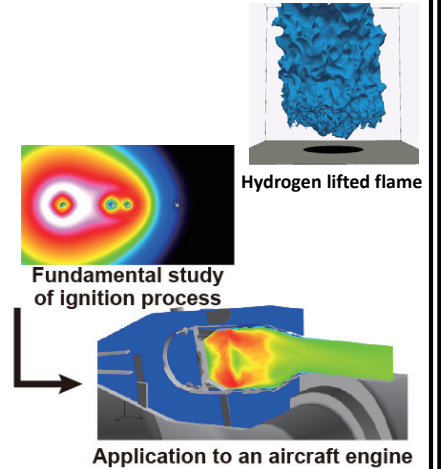
Thermal Science and Energy Laboratory  
Department of Advanced  
Environmental Science and Engineering

Professor Hiroaki Watanabe  
Associate Professor Reo Kai  
[http://tse.kyushu-u.ac.jp/intex\\_e.html](http://tse.kyushu-u.ac.jp/intex_e.html)

In our laboratory, combustion, and heat and mass transport phenomena are the major topic based on thermodynamics, fluid dynamics, and thermochemistry to realize clean and low-carbon energy technologies. A complex physics in which the turbulence and the chemistry interact with each other is investigated to clarify the characteristics, to construct the mathematical models, and to perform the numerical simulation of such multiscale and multiphysics phenomena among gas, solid, and liquid three phases. In addition, the proposed models are applied to industrial applications to contribute to the society by means of the massively parallel large-scale computing.



U10



Hydrogen lifted flame

Fundamental study of ignition process

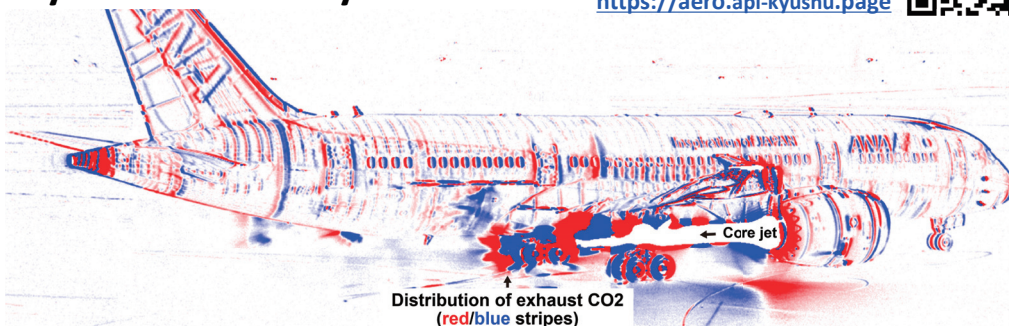
Application to an aircraft engine

# AEROSPACE PROPULSION LABORATORY U11

## Department of Aeronautics and Astronautics

### Kyushu University

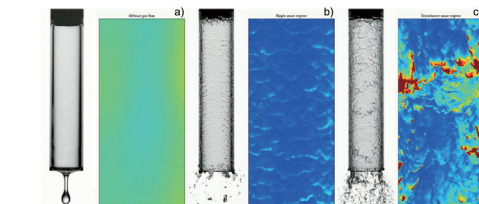
<https://aero.apl-kyushu.page>



Direct imaging of CO<sub>2</sub> emissions from an operating aircraft

Our group clarifies the nature of **multiphase thermo-fluid dynamics in gas/steam turbines and rocket engines** by imaging and modeling techniques.

Associate Professor : Chihiro INOUE



Liquid film fragmentation sheared by a turbulent gas flow

# Osaka Metropolitan University U12



U12

## Professor Daisuke SASAKI

Aerospace Fluid Dynamics Laboratory  
Department of Aerospace Engineering

<https://www.omu.ac.jp/eng/sasaki/>

Our research is mainly focused on the development of numerical methods for fluid mechanics and also design optimization system for aerospace applications.

- Cartesian-mesh CFD development and analysis of various aerospace applications (Fig. 1)  
Flexible membrane wing, rotor blade, heat pipe, turbine, supersonic/hypersonic vehicles, solid rocket motor, etc.
- Aerodynamic/aeroacoustic simulation of an acoustic liner for noise and drag reduction under grazing flow (Fig. 2)
- Uncertainty quantification of geometric variations for aerodynamic performance (Fig. 3)
- Development of efficient robust aerodynamic design optimization system
- Aerodynamic shape optimization with unsteady CFD



Fig. 1 Flow simulation around a turbine blade based on Cartesian mesh



Fig. 2 Instantaneous vorticity contours of acoustic liner (3 resonators) under grazing flow by aeroacoustic simulation

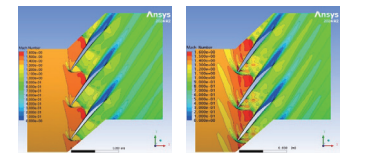


Fig. 3 Comparison of flowfields of nominal (left) and artificially deteriorated blade (right)

# Osaka Metropolitan University

U13

**Lecturer Shinichiro OGAWA**  
Aerospace Propulsion Laboratory  
Department of Aerospace Engineering



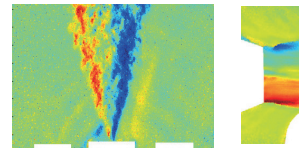
Information (Website) <https://www.omu.ac.jp/eng/ogawa/>



Biofuel



Micro-jet engine



(a) Torch (b) Jet engine Exhaust gas measurement

## Research Areas

Our research group focuses on three main areas.

1. Development and utilization of novel biofuels
2. Measurement techniques for torch-jet gases (hydrogen-fueled) and jet engine exhaust gases using Tunable Diode Laser Absorption Spectroscopy (TDLAS) and Background-Oriented Schlieren (BOS)
3. Numerical analysis of internal flow fields in aerospace propulsion systems, including solid rocket motors and scramjet engine

A key feature of our laboratory is the integrated approach that combines experimental and numerical methods, enabling a deeper understanding of complex combustion and flow phenomena.

# Saga University

U15

Fluid Engineering Laboratory  
Department of Mechanical Engineering  
Professor Yoichi Kinoue



Research topics of this laboratory focus on turbomachinery. There are four main topics as follows: 1. Design and internal flow of diagonal flow fan, 2. Design and internal flow of half-ducted axial propeller fan, 3. Renewable energy utilization by axial reaction ducted-turbine for tidal energy conversion, 4. Renewable energy utilization by axial impulse turbine for wave energy conversion.

<https://sites.google.com/view/sagauniversityfel>

# Thermal-Fluid Engineering Laboratory

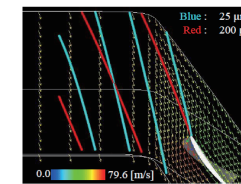
U14

Department of Mechanical Engineering  
**RITSUMEIKAN UNIVERSITY**  
Associate Professor Koji Fukudome

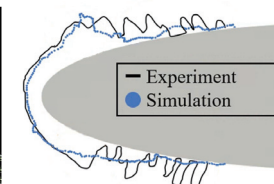
Our laboratory investigates multiphysics flow phenomena using a combination of computational simulations and newly initiated experimental studies. Our research spans the development of advanced simulation methodologies to the fundamental elucidation, prediction, and control of thermal-fluid engineering systems.

【Ongoing projects】

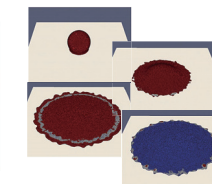
- **Aircraft icing** prediction by developing a coupling scheme of grid- and particle-based methods.
- Prediction and suppression of the **erosion** and **deposition** phenomena in jet-engine components.
- Prediction and optimization of the **oil cooling system** of an electric motor.
- **Turbulent convection simulation** and the heat-transfer enhancement.



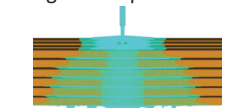
(a) Ice-crystal trajectory in a compressor



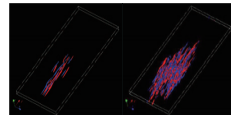
(b) Aircraft icing simulation



(c) Droplet impinge and solidification



(d) Oil-cooling flow



(e) Turbulent spot growth in Couette flow

# Next Generation Tataru Co-Creation Centre

U16

Shimane University

<https://tataru.shimane-u.ac.jp/>

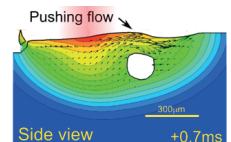
Contact: Prof. Junji Shinjo  
jshinjo@riko.shimane-u.ac.jp

Next Generation Tataru Co-Creation Centre (NEXTA), Shimane University was founded in 2018 to conduct world-leading metallurgical research. Currently, the main targets of research are heat-resistant superalloys for gas turbines and amorphous steel for high efficiency motors.

We have various experimental equipment such as an electro-thermal mechanical testing (ETMT) machine, scanning electron microscopes (SEM) and transmission electron microscopes (TEM), including a unique magnetic-free TEM, to investigate the metal microstructures and mechanical properties. Simulation techniques can be also used such as macro-/meso-scale metal processing simulation and molecular dynamics (MD) simulation.

Collaborations with companies are actively conducted and scientific joint research projects are also conducted with domestic and overseas universities, including Oxford University in UK.

We aim to contribute to gas turbine research and development, and we welcome joint research.



Additive Manufacturing (AM) simulation

# Takushoku University

## Gas Turbine Combustion Laboratory

### Department of Mechanical System Engineering



U17

<https://feng.takushoku-u.ac.jp/course/ms/lab/okurata.html>  
<https://graduate.takushoku-u.ac.jp/engineering/kyouin/kurata/index.html>  
<https://researchmap.jp/read0004858?lang=en>

Professor Kurata has been engaged in research on micro gas turbine combustion for a long time at AIST. Therefore, Takushoku University will develop research activities that make use of this experience. However, Takushoku University does not have a large facility that can burn a full-size gas turbine combustor. Therefore, in the laboratory, students will learn the basics and applications of continuous combustion through flame holdings and exhaust gas measurement of the coaxial premix burners. In addition, we will elucidate the properties of X-shaped flames and lead them to journal submissions. In addition, there is a JB130 model jet engine bench, and through this operation, students will become familiar with gas turbine combustion.

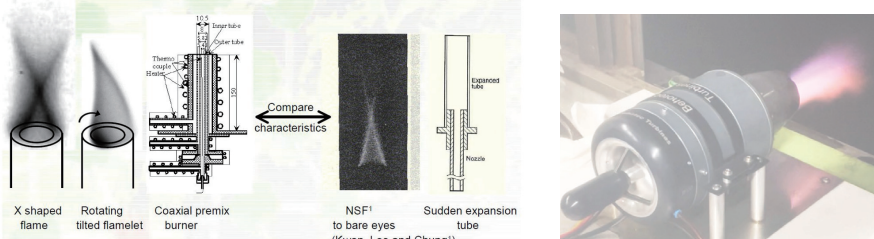


Fig. X shaped flame on the coaxial premix burner

Fig. Model jet engine bench

# Advanced Aero propulsion Laboratory (AAL)

## The University of Tokyo

U18

<http://www.aeroeng-lab.t.u-tokyo.ac.jp/>



社会連携講座 東京大学 IHI  
 将来航空推進システム技術創成  
 Advanced Aero propulsion Laboratory

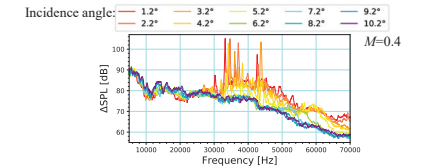
AAL is a collaborative laboratory between the University of Tokyo and IHI Corporation. The laboratory aims to develop innovative technologies for future aero-propulsion, and to develop human resources in this field.

The present research projects intend to create advanced and fundamental technologies for developing a safe, highly environmentally compatible, and innovative aero-propulsion system.

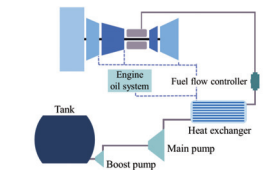
Current research topics:

- Environmental compatibility: compressor noise, fundamentals of compressor flutter, inlet distortion due to BLI (boundary layer ingestion), open-rotor aerodynamics,
- Energy management: electrified propulsion, fundamentals of hydrogen propulsion,
- Material & manufacturing technology: bird strike effect on CFRP fan.

Member:  
 Project Professor: Takehiro Himeno  
 Senior Researcher: Toshinori Watanabe  
 Project Assistant Professor: Naoyasu Kojima  
 Akihiro Hattori  
 Academic Support Staff: Ayumi Mamada



Compressor Noise Spectrum for Various Incidence Angles



Example of Fuel System for Hydrogen Propulsion

# Advanced Jet Propulsion Laboratory

## The University of Tokyo

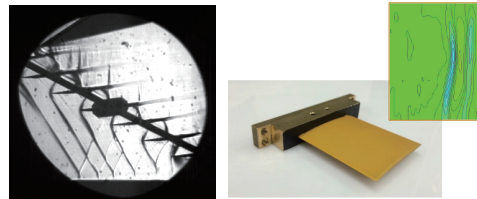


U19

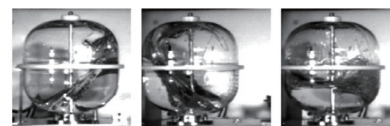
Our website

Advanced Jet Propulsion Laboratory in the University of Tokyo (AJPL UTokyo) executes fundamental researches in the area of thermo-fluid dynamics in jet engine and rocket systems through experimental, computational, and theoretical approaches. The recent research programs include flow-induced vibration of transonic fan, inlet distortion effect on fan performance, humid air flow in compressor, broadband fan noise, two-phase flow phenomena in liquid rocket system, sloshing, liquid atomization, and bio-fluid mechanics. The laboratory is widely opened to the global collaboration with institutes and industries.

Professor: Takehiro Himeno



Transonic Cascade Flow PSP Blade and Obtained Pressure



Violent Sloshing, Experiment and CFD

# The University of Tokyo

## Dept. of Aeronautics & Astronautics, Teramoto-Okamoto Lab.

U20

<http://www.thermo.t.u-tokyo.ac.jp>

Our research interest is to understand basic flow physics of variety of flowfields related to aerospace propulsion and turbomachinery. Current research topic includes high-resolution large-eddy simulation of tip clearance flow, acoustics from supersonic impinging jet, turbulence of cryogenic supercritical flows, shock wave / turbulent boundary layer interaction, cycle analysis and design study of new concept rotating machines such as wave rotor Tesla pumps. Faculty members: Associate Professor Susumu Teramoto, Associate Professor Koji Okamoto, Assistant Professor Kazuo Yamaguchi

Our laboratory specializes in the fundamental and applied research of combustion phenomena within aerospace propulsion systems and internal combustion engines. Our research focuses on basic thermal fluid science including thermodynamics, fluid dynamics, reactive chemistry, and the development of next-generation, environmentally sustainable technologies by investigating exhaust gas emissions. To achieve this, we combine high-speed experimental measurements with large-scale, high-performance computing (HPC) simulations, to provide novel insights into complex reactive flow phenomena such as combustion instabilities. In close collaboration with industry partners and the Japan Aerospace Exploration Agency (JAXA), our research topics cover high-speed propulsion (Jet, Ramjet, Scramjet) space propulsion (Rocketry), ignition dynamics, fire safety, and the atmospheric impact of alternative fuels.

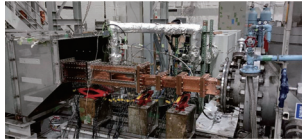


Fig. 1.: Experimental setup of scramjet combustion chamber in the high-enthalpy wind tunnel of the University of Tokyo.

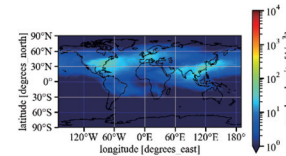


Fig. 2.: Prediction of number density of ice crystals formed in contrails, assuming every airplane uses hydrogen as fuel.

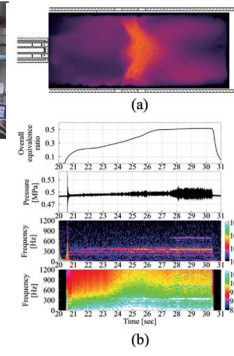
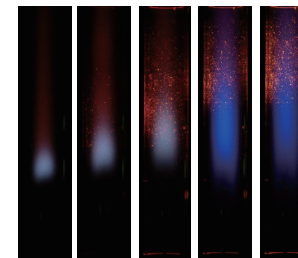


Fig. 3.: Time averaged OH\* chemiluminescence image during 28.0-28.1 s (a), time histories of equivalence ratio, pressure, wavelet scalogram of pressure, and MDM spectrum of pressure and OH\* (b), for hydrogen gas turbine combustion.

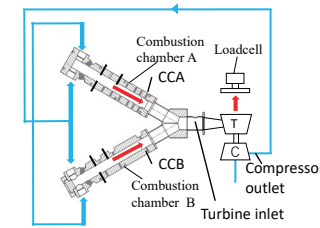
Our research is mainly focused on the development of gas turbine applications and hybrid rocket propulsion. The laboratory has an engine test cell for 60 kW gas turbine and 3 kN rocket engines.

**Research topics:**

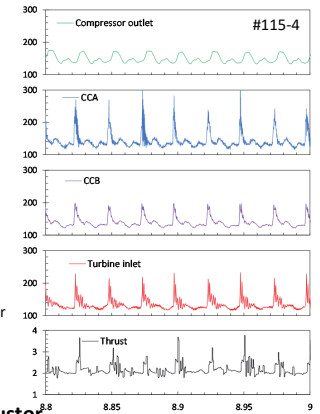
- Dry-Low NOx Combustor for Hydrogen fuel
- Pressure-gain combustion for Gas Turbine
- Swirling-Oxidizer-Flow-Type (SOFT) Hybrid Rocket Engine



Lifted-flame of Hydrogen



Gas Turbine with a Pulse Combustor



Tokyo University of Agriculture and Technology  
Thermal Fluids Engineering Lab.  
(Prof. Akira Murata)  
Department of Mechanical Systems Engineering

<https://www.amurata.org/>

We carry out the researches on various heat/thermal problems as follows:

- 1) Effective cooling of gas turbine elements for higher thermal efficiency and CO<sub>2</sub> reduction (film cooling of airfoil trailing edge, internal cooling enhancement of turbine blades by using dimpled surface, and effusion cooling of combustor liner wall)
- 2) Cooling performance analysis of air-cooling heat sink for electric aircraft
- 3) Development of high performance heat exchanger for environment-friendly energy conservation (heat transfer enhancement by using vortex generators and dimples)
- 4) High performance heat transport device utilizing phase change applicable to heat spreader for electronic/electric device cooling (parallel tube heat transport device with spontaneously induced internal flow)

Laboratory of Solid Mechanics and Thermal Integrity U24

Department of Mechanical Engineering, Tokyo University of Science  
Arai Solid Mechanics Laboratory  
<https://www.rs.tus.ac.jp/marai/>  
E-mail: [marai@rs.tus.ac.jp](mailto:marai@rs.tus.ac.jp)

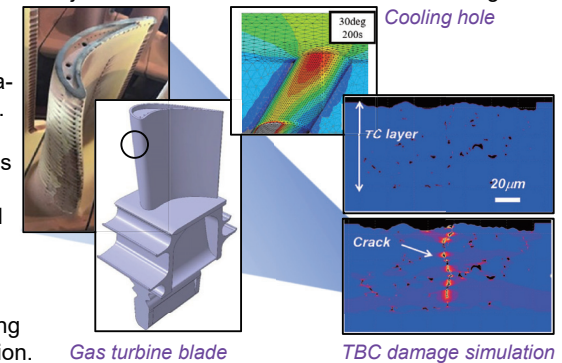


**Research Focus**

Our laboratory conducts mechanics-based numerical and experimental research on the durability and reliability of gas turbine components. A particular focus is placed on **thermal barrier coating (TBC) systems** and **film-cooled turbine blades** subjected to severe thermomechanical loading.

**Selected Recent Achievements**

- ✓ Development of a damage-coupled inelastic constitutive equation for plasma-sprayed TBC and its FE implementation.
- ✓ Three-dimensional thermomechanical fatigue analysis around film cooling holes in TBC-coated turbine substrate.
- ✓ Prediction of crack initiation location and life under in-phase and out-of-phase loading.
- ✓ Numerical investigation of honeycomb-assisted film cooling concepts considering manufacturability by laser metal deposition.



Gas turbine blade

TBC damage simulation

# Waseda University



U25

Aerospace Transportation Systems Lab. (Prof. Tetsuya Sato)  
Department of Applied Mechanics and Aerospace Engineering

<https://sem-sato.w.waseda.jp/>



SATO laboratory mainly conducts R&D of the hypersonic precooled turbojet engine to apply for hypersonic cruisers and spaceplanes in cooperation with JAXA. We are currently involved in preliminary studies such as an engine system unsteady simulation, study of supersonic inlet buzz, study of the cryogenic two-phase flow, study of the frost formation on the precooler and system analysis of Boundary layer ingestion (BLI). We have proposed a Mach 5 flight experiment of a small scale ramjet vehicle using a sounding rocket called "HIMICO": High Mach Integrated Control Experiment.



Precooled Turbojet Engine (Courtesy of JAXA)



High Mach Integrated Control Experiment Vehicle (HIMICO)

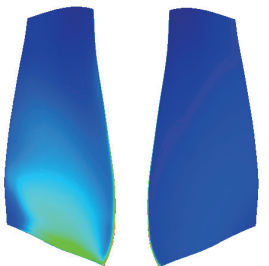
# Waseda University

Department of Modern Mechanical Engineering  
Yamamoto Multi-Physics CFD Laboratory  
<https://souzou.w.waseda.jp/en/>

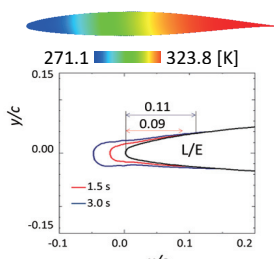
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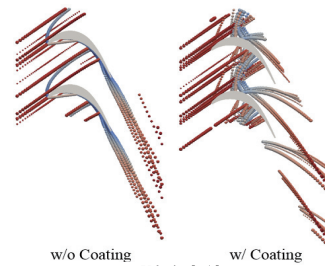
Multi-physics CFD (Computational Fluid Dynamics) simulation would be one of key technologies in research and development of various machines in near future. We are challenging to develop multi-physics CFD codes to reproduce a lot of multi-physics phenomena such as icing, sand erosion, particle deposition and so on, which can often observed in a jet engine. The developed codes have successfully be applied to fans, compressors and turbines. The numerical results provides us useful knowledge and insights that it is too difficult to obtain by experiments.



Pressure S. Suction S. Ice Thickness of Fan Blade



Blade Temp. and Ice Shape in Ice Crystal Icing



Particle Trajectory in LPT

<https://www.f.waseda.jp/nobumichi-fuji/index.html>

# Waseda University



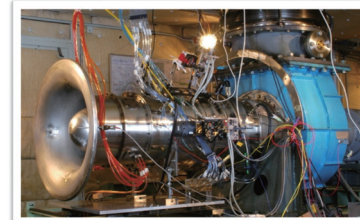
U26

**Fluid Mechanics and Turbomachinery Lab.**  
**Department of Applied Mechanics and Aerospace Engineering**

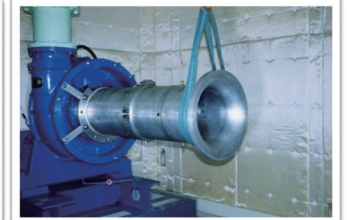
**Professor Yutaka OHTA**

**Assistant Professor Nobumichi FUJISAWA**

Unsteady flow-induced vibration and noise generated in turbomachinery systems such as rotating stall, surge, rotating instability, inlet distortion, off-designed operation and aero-acoustic noise are main targets of our research. In order to achieve high-efficient fluid machinery systems, we are conducting large-scale experiments with detailed measurements of flow field and high-precision numerical analyses of unsteady turbulent flows. Our research covers various types of rotating machinery, such as axial-flow compressors and turbines for aircraft engines, centrifugal and radial-flow compressors and turbines for turbochargers and also cross-flow and propeller type fans for ventilating systems.



Single-Stage Axial-Flow Compressor



Centrifugal Compressor

# Waseda University

Department of Modern Mechanical Engineering  
Yamamoto Multi-Physics CFD Laboratory  
<https://souzou.w.waseda.jp/en/>

U28



Multi-physics CFD (Computational Fluid Dynamics) simulation would be one of key technologies in research and development of various machines in near future. We are challenging to develop multi-physics CFD codes to reproduce a lot of multi-physics phenomena such as icing, sand erosion, particle deposition and so on, which can often observed in a jet engine. The developed codes have successfully be applied to fans, compressors and turbines. The numerical results provides us useful knowledge and insights that it is too difficult to obtain by experiments.



# Yamaguchi University

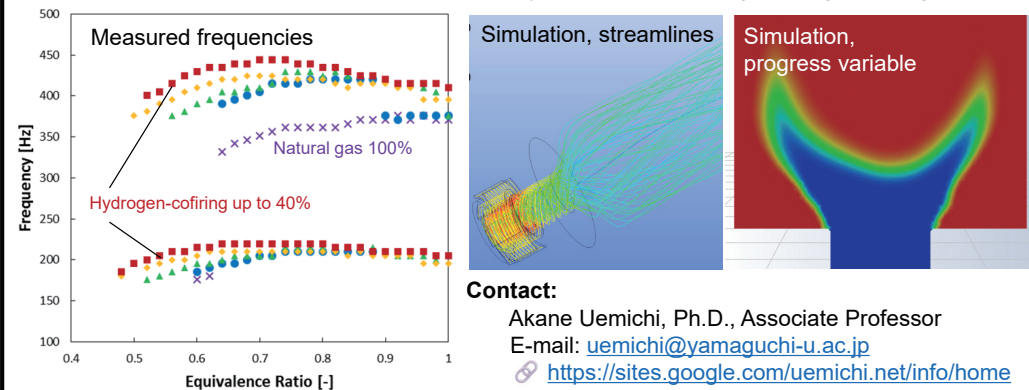
## Energy Control Engineering Lab.



U28

### Combustion oscillation generated under hydrogen-cofiring

Our research interest is in significant oscillations due to combustion instability, which are considered flow-induced vibration phenomena. To investigate these mechanisms, we experimentally measure frequency shifts in hydrogen co-firing, collaborating closely with various partners across academia and industry to solve critical engineering challenges.



**Contact:**

Akane Uemichi, Ph.D., Associate Professor

E-mail: [uemichi@yamaguchi-u.ac.jp](mailto:uemichi@yamaguchi-u.ac.jp)

<https://sites.google.com/uemichi.net/info/home>