Contributing Organizations to GTSJ

Gas Turbine Society of Japan

〈Corporations〉

〈Universities〉

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.

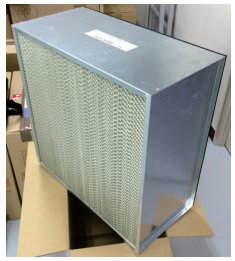
C2

http://www.bub-agema.de/

B&B-AGEMA company provides expert design services for gas turbines, steam turbines and other type of turbo machines. The company provides also expert simulation services on combustion, fluid flow and heat transfer topics related to all type of power plant and industrial plant components. Its thermal design expertise includes stationary and transient Finite Element Analyses and life-time predictions.
B&B-AGEMA is deeply involved in Hydrogen technology developments including innovative combustion concepts for stationary gas turbines and aero engines. The company has special experiences in design and simulation of comprehensive cooling configurations for gas turbine parts. B&B-AGEMA was founded 30 years ago in 1995. Our headquarter is located in Aachen, Germany. Our team of experienced experts and young engineers is dedicated to develop technology solutions for an efficient and sustainable tomorrow.

C3

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

C4

CRE Co.,Ltd

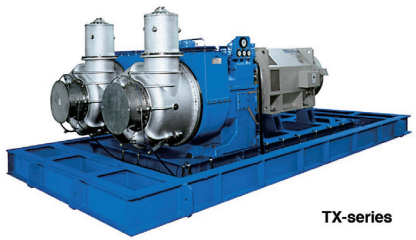
http://www.cre-nagoya.com/

★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.

C5

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.

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

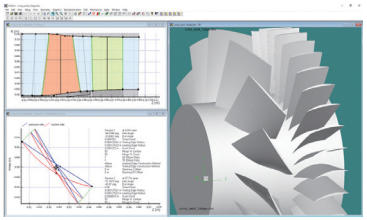
www.d-infi.com/en

C6

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

■ 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/

C7

EKK

EAGLE INDUSTRY CO.,LTD.

EAGLE INDUSTRY is the Sealing Solution Company.

We engineer, manufacture and supply the seals for Jet Engine,
Gus 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.

Segmented Carbon Seal

Brush Seal

Actiseal-C,E,W

SHIBA PARK BLDG, B-14F, 2-4-1 SHIBAKOEN MINATO-KU, TOKYO
105-8587, JAPAN
http://www.ekkeagle.com/jp/

C8

EVERLOY

EVERLOY SPRAY NOZZLE

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

Everloy has started spray nozzle business since 1957 and achieved a lot of success in various applications such as combustion, inlet air cooling and others.

With the growing variety of fuels, in the context of decarbonization, we provide technical support ranging from analyzing/evaluating your current solution to designing customized nozzles optimal to your application.

Contact us to find your new solution.

overseas_sales@everloy.co.jp

C9

Fuji Electric

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 requirements 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_2 emission.

C10

RUNNING THE WORLD ON SMARTER ENERGY EVERY DAY

GE VERNOVA

www.gevernova.com/jp

C11

HSK HOUDEN SEIMITSU KAKO KENKYUSHO., LTD

- 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/

C12

Honda R&D Co., Ltd.

Innovative Research Excellence, Power Unit & Energy

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)

C13

https://www.ihi.co.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

C14

https://www.ihi.co.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.

IHI Inspection & Instrumentation Co., Ltd.

C15

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)

C16

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.

C17

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

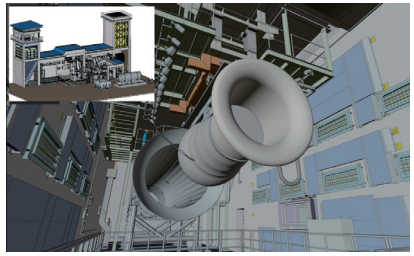
C18

INC Engineering Co., Ltd.

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 20th anniversary.
April 2023 25th anniversary of Mizuho office since 1998.



C19

Japan Aerospace Exploration Agency

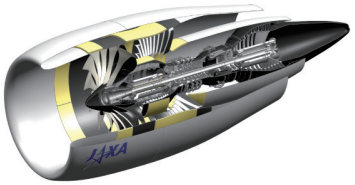
Aviation Technology Directorate

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”. Anther 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.



C20

Japan Internal Combustion Engine Federation（JICEF）

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
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.

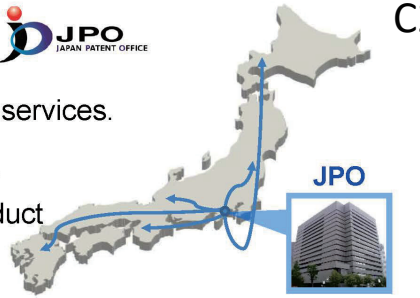
C21

Japan Patent Office

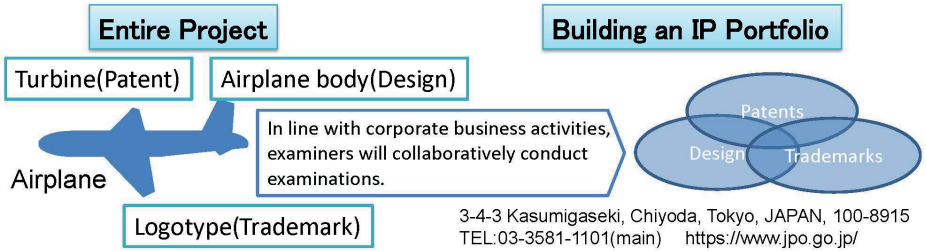
JCN 2000012090003

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.



3-4-3 Kasumigaseki, Chiyoda, Tokyo, JAPAN, 100-8915
TEL:03-3581-1101(main) https://www.jpo.go.jp/

C22

Japanese Aero Engines Corporation

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

The Japanese Aero Engines Corporation was established to coordinate and manage the overall progress of multi-national collaboration programs in1981 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.

C23

Kanadevia

Technology for people and planet

https://www.kanadevia.com/

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.

C24

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 ℃) and high air pressure (pressure resistance 5Mpa).

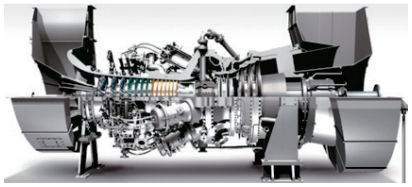
Our heater for generating the hot-airs are widely used in various research institutes for heat resistance, durability, and bench testing of heat exchangers, combustors, compressors, output turbines, compression turbines, etc.

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.

C25

Kawasaki
Powering your potential

Kawasaki Heavy Industries, Ltd.

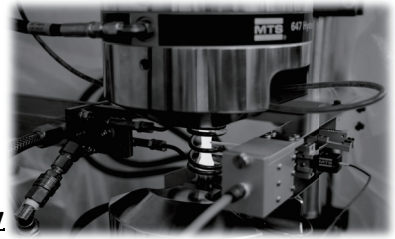


The origin of Kawasaki's gas turbine business is dating back to 1943, the success of first test flight of type "Ne-0" engine which is developed by Kawasaki. Nowadays, Kawasaki supplies helicopter engines to Japan self-defense force.
Also, Kawasaki has been participated several international development 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/

C26

KIGUCHI TECHNICS INC.



Japan's Top Independent Materials Testing Laboratory

KIGUCHI TECHNICS began its business in the special steel industry, and has grown as an independent materials testing laboratory specializing in metals. With the recent expanding demand in the aerospace industry, we actively leverage our expertise and skills in elevated temperature testing to ensure the reliability and safety of the aviation industry. Additionally, we proactively engage in testing related to the energy industry, offering our advanced quality and technical capabilities.

Our Services

- Sectioning & Machining, Mechanical Testing, Non-destructive Testing for Metals and Composites
- Sales and Design of Special Jigs
- Design of Test Equipment, etc.

Head Office
114-15 Enoshima-cho, Yasugi-shi, Shimane
TEL: (0854) 22-2619
FAX: (0854) 23-0869
HP: https://kiguchitech.co.jp/en

C27

Maruwa Electronic Inc.

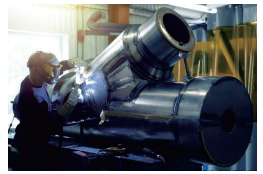
http://www.maruwa-denki.co.jp/

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.

C28

MTC
Metal Technology Co. Ltd.

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)

Nadcap

Contact: info@kinzoku.co.jp **Our website:**

C29

MITSUBISHI HEAVY INDUSTRIES AERO ENGINES

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.

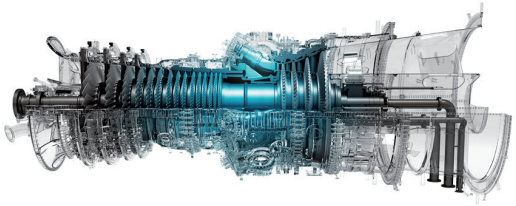
Specialized in the hot section engineering including combustor and turbine of aircraft jet engines, our distinctive technology and expertise in development, design, and manufacturing allows us to possess significantly important position in joint development and production of (Original Equipment Manufacturers).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

C30

MITSUBISHI POWER

power.mhi.com



Mitsubishi Power, a power solutions brand of Mitsubishi Heavy Industries, Ltd. (MHI), is developing power generation technologies that reduced environmental impact, including CO_2 emissions.
We are developing gas turbines for utility power, industrial use and aero-derivative, which can be applied in a wide range of power output from 30 MW to 1,330 MW.
We are also developing and validating combustion technologies enabling 100% hydrogen firing and 100% ammonia firing that will be applicable to existing gas turbines.
Mitsubishi Power is creating a future that works for people and the planet by developing innovative power generation technologies and solutions to enable the decarbonization of energy and deliver reliable power everywhere.

Learn more about Mitsubishi Power industry leading technologies at
https://power.mhi.com/products/gasturbines/index.html
https://power.mhi.com/special/hydrogen

C31

MITSUI E&S Co., Ltd.

MITSUI E&S

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.

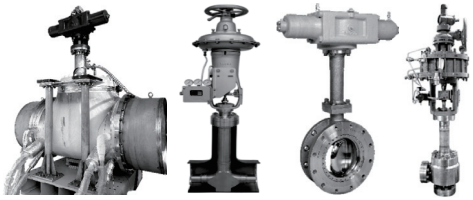
-SB Series (Mitsui's gas turbines): 1MW~24MW
-MSC Series (Packaging Solar Turbines' gas turbines): 3MW~15MW

C32

Nakakita Seisakusho Co., Ltd.

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.

C33

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.

NTN corporation

C34

https://www.ntnglobal.com

NTN Make the world NAMERAKA

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.

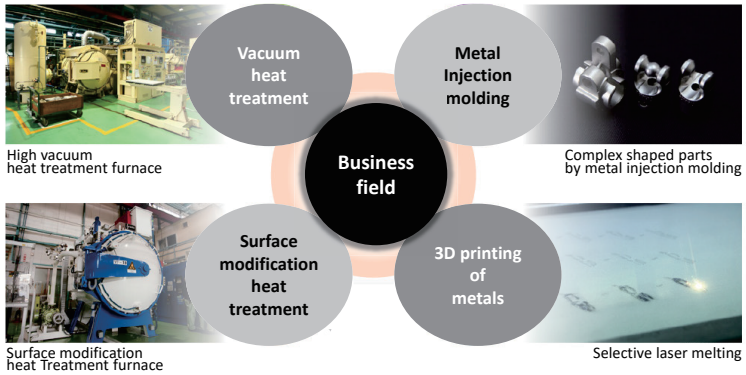
Headquartered in Osaka, Japan, we have plants specialized in aerospace bearings in Kuwana, Japan and Argonay, France.

Osaka Yakin Kogyo Co., Ltd.

C35

http://www.osakayakin.co.jp

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

Rolls-Royce Japan Co., Ltd.

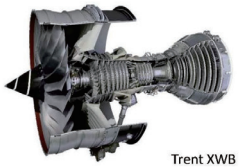
C36

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.

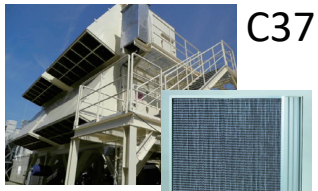
Rolls-Royce Japan Co., Ltd.
31st Floor Kasumigaseki Bldg.
3-2-5 Kasumigaseki, Chiyoda-ku, Tokyo
TEL: +81 (0)3 3592 0966
https://www.rolls-royce.com


UltraFan


Trent XWB

C37

SHINWA CORPORATION



Shinwa Corporation

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

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

C38

Siemens Energy K.K.

SIEMENS energy

sekk_inquiry.jp@siemens-energy.com
https://www.siemens-energy.com/global/en/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 various fuels such as hydrogen and cracked ammonia gas.

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.

C39

SKY Aerospace Institute

SKY Aerospace Institute

https://www.skyaero.jp, https://www.el-tech.co.jp

SKY Aerospace Research Institute is a private research organization established in 2012 at EL-Technology Corporation.
The institute is working with universities, research institutes, manufacturers, users, and others to contribute to the sustainable development of the global aviation industry using technology originating in Japan.
The current theme of the Institute is "a small supersonic business jet capable of supersonic flight over land," and the planning and study of this project is being conducted in cooperation with academic societies, policy advocacy organizations, and others.

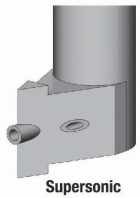
Features of SSJP-1 are as follows:
・New concept supersonic business jet with a Mach number of 1.4 and a range of 2100 nautical miles
・Low boom, low acquisition, and operating cost
・Existing turbofan engine + small fuselage
・Subsonic BJ users are the target

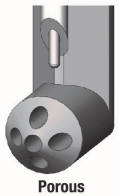
C40

You can order from one

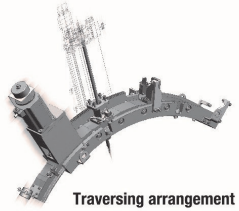
1 Design 2 Processing 3 Assembly

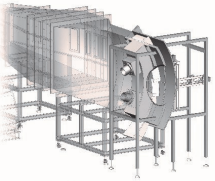
LINE UP


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/

C41

Tohoku Electric Power Co., Inc.

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 CO2 emissions compared to conventional plants, contributing to CO2 reduction through the high efficiency of thermal power sources.

C42

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 cogenenration 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.

C43

EthosEnergy

富永物産株式会社

http://www.ethosenergy.com

TOMINAGA & Co.,Ltd. was founded in 1939, and we have distributed Gas Turbine engines, parts and related services to the market for 50 years.

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.jp)
Tel: +81-3-3639-5315 Fax: +81-3-3639-5360

C44

TOSHIBA

Toshiba Energy Systems & Solutions Corporation

https://www.global.toshiba/ww/company/energy.html

Toshiba group has four business cores, energy, social infrastructure, electronic devices and digital solutions.
Toshiba Energy Systems & Solutions Corporation is responsible for energy business.

We are 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.

Toshiba Plant Systems & Services Corporation

C45

https://www.toshiba-tpsc.co.jp/

Toshiba Plant Systems & Services is a comprehensive engineering constructor that globally carries out integrated operations ranging from planning and engineering to procurement, construction and field services. Using our solid technological capabilities as a foundation, we aim to offer technologies and quality that accurately respond to the voices of our customers. By doing so, we seek to achieve further growth and development as a company that is widely trusted and chosen by people in Japan and overseas.

Toyo Controls Co.,Ltd

C46

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 (0.05mL/min to 540L/min) are know for exceptional accuracy (within±0.2% of rdg,high resolution and fast time constant output),wide range(1000:1 over), Bi-Directional flow, low-high temperature operating(-40℃~225℃), 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 unpararelled.

Toyo Tanso USA, Inc.

C47

URL : https://ttu.com/ e-mail: sales@ttu.com

TOYO TANSO
Inspiration for Innovation

Precision EDM material for Turbine Blade, Graphite : *TTK-5*

- *Enable micromachining* — No bent even with ultra-fine pin such as Φ0.0019 inch
- *Reducing Machining Time* — Compared to metal, it has good workability and speed up machining
- *No Burrs* — Since no burrs are generated during cutting, it can be used for EDM immediately after machining
- *No Deformation* — Graphite electrodes do not deform due to cutting resistance or heat during EDM like metal, so accurate EDM processing is feasible

For Turbine Blade Grooves and Holes,TTK-5 is suitable as an electrode material for EDM processing

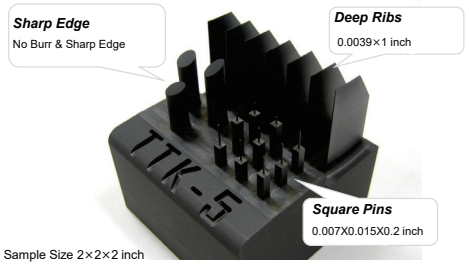


Photo provided by ROKU-ROKU Co.,Ltd
(Machined by HC-658)

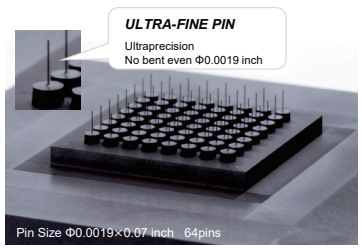


Photo provided by Makino Milling Machine Co., Ltd
(Machined by V33i-Graphite)

Toyota Motor Corporation

C48

TOYOTA

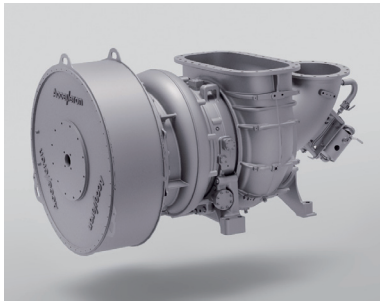
http://www.toyota-global.com/

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.

C49

Turbo Systems United Co.,Ltd.

An Accelleron and IHI joint venture



Turbo Systems United Co., Ltd. (TSU) is a joint venture between Accelleron and IHI, established on October 1, 1998.
For many years, we have been selling turbochargers for large diesel and gas engines produced by Accelleron and IHI, as well as providing after-sales service to the Japanese market.

We support engine manufacturers with a wide range of high-level application engineering services from the engine development stage to the end of the turbocharger's life, and we support our customers who operate ships, generators, locomotives, and construction machinery with our worldwide service network.

https://www.turbo.co.jp

C50

Woodward Japan Ltd.

https://www.woodward.com/applications/industrial-turbine

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 world-wide. Woodward's market-leading portfolio contains controllers, metering valves, geometric actuators, and fuel nozzles 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.

Woodward Japan Ltd.
WBG Marive West 19F, 2-6-1 Nakase,
Mihama-ku, Chiba-shi, Chiba 261-71119 Japan

Woodward Gas Fuel Valves
(Hydraulic / Electric drive)

<- Electric Geometric Actuator

C51

YANMAR

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

https://www.yanmar.com/global/

A stable power supply is essential for our electricity-dependent society—especially in telecommunications, medical care, manufacturing and logistics, where resilience to outages and disasters is demanded.

At Yanmar, our fifteen gas turbine generators (250–3000 kVA) combine rapid start-up and high durability, earning high praise as emergency and backup power sources.

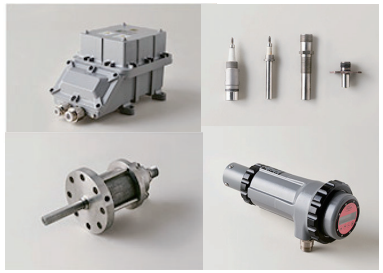
We will continue to support energy security and resilient infrastructure with our reliable, responsive power generation technology.

C52

YDK Technologies Co., Ltd.

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 exciters and electrical/optical harnesses which are excellent in harsh environment and come from our many experiences and long history.



Explosion Ignition System and Flame Scanner for Industry

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

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, suitable for gaseous and liquid hydrogen research.
2. Research on power plant performance and its integration with the vehicle, diagnostics, prognostics, lifing, low emissions combustion, thermal management, AI applications, electrification, supercritical CO2 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, sustainability and the environment, etc.
4. Postgraduate education on aero and space propulsion, as well as power for sustainable land, off-shore and marine applications (https://www.cranfield.ac.uk/courses/taught/thermal-power-and-propulsion).

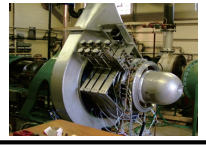
Contact:

Dr Yiguang Li,

Reader in Gas turbine Performance and Diagnostics

Cranfield, Bedford MK43 0AL, United Kingdom

Email: i.y.li@cranfield.ac.uk



Hosei University
Fluid Engineering Laboratory
Department of Mechanical Engineering

U2

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 redial turbine impeller.

Iwate University

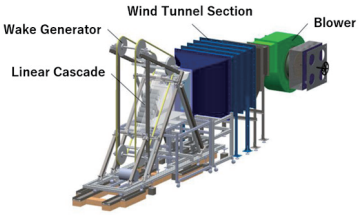
U3

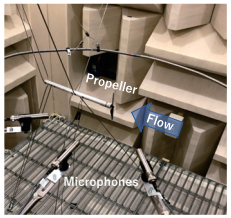
Mechanical, Intelligent Systems and Aerospace Engineering
Department of Department of Science and Engineering

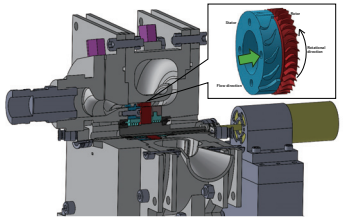
Professor Takanori Shibata
Assistant Professor Hiroaki Sumikawa

National University Corporation
IWATE UNIVERSITY

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/

Kansai University
Thermal Engineering Laboratory,
Department of Mechanical Engineering

U4

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

U5

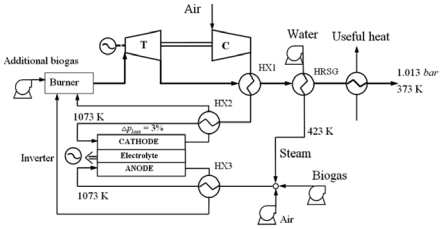
Advanced Imaging Lab.

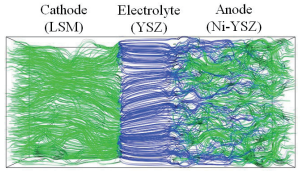
http://www.ail.me.kyoto-u.ac.jp/

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 electordes 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

U6

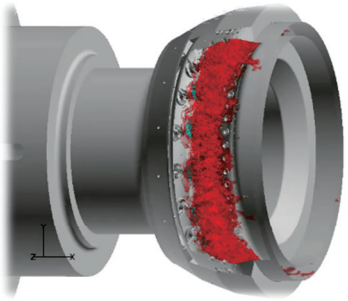
Thermal Science and Engineering Lab.

Department of Mechanical Engineering and Science

Professor Ryoichi Kurose

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 electrodynamics, 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)

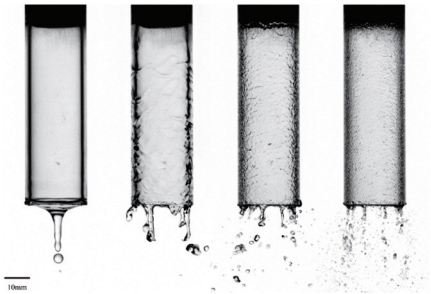
AEROSPACE PROPULSION LABORATORY

U7

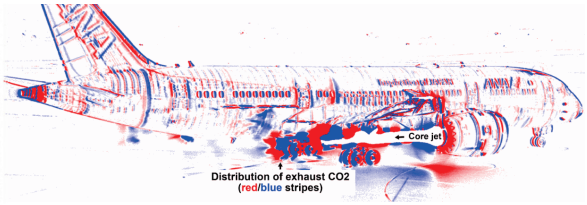
Department of Aeronautics and Astronautics

Kyushu University

https://aero.apl-kyushu.page



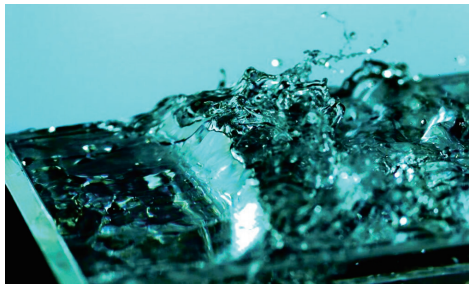
Liquid film fragmentation sheared by a turbulent gas flow



Direct imaging of CO_2 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
Assistant Professor : Zhenying WANG



Evaporation of 3D wavy liquid film entrained by a turbulent gas flow

Kyushu University

U8

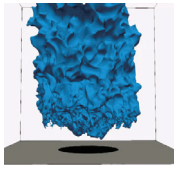
Thermal Science and Energy Laboratory

Department of Advanced Environmental Science and Engineering

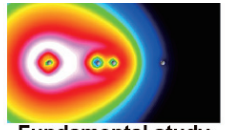
Professor Hiroaki Watanabe
Associate Professor Reo Kai

http://tse.kyushu-u.ac.jp/intex_e.html

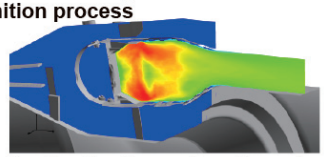
In our laboratory, combustion, and heat and mass transport phenomena are the major topic based on thermodynamics, fluid dynamics, and thermochemistry to realize clean and low-carbon energy technologies. A complex physics in which the turbulence and the chemistry interact with each other is investigated 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.



Hydrogen lifted flame



Fundamental study of ignition process



Application to an aircraft engine

Osaka Metropolitan University

U9

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)
  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

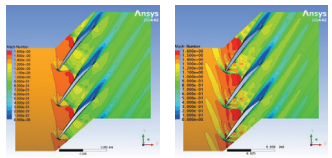


Fig. 3 Comparison of flowfields of nominal (left) and artificially deteriorated blade (right)

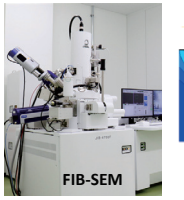
Next Generation Tatara Co-Creation Centre Shimane University

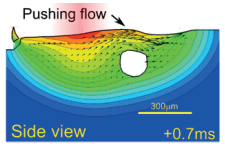
U10

https://tatara.shimane-u.ac.jp/

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

Next Generation Tatara 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

Teikyo University

U11

Advanced Comprehensive Research Organization
Laboratory of Fluid-Structural Simulation and Design

Professor Tadashi Tanuma https://www.teikyo.jp/acro/

Our laboratory's objective is to promote pioneering, cross-sectoral and comprehensive research and education in Teikyo University through strategic-innovation-oriented collaborative research programs with manufacturing companies, universities and research institutes. We are giving special emphasis to design innovations for industry.

Our scopes of research and development are
1. Energy Machinery Systems: Research and education to enhance steam turbine efficiency and operability with the development of high-performance blade and exhaust diffuser design methodology using large-scale aerodynamic and structural interaction analysis.
2. Applied Fluid and Structural Dynamics: CFD studies of nasal airway flow with Continuous Positive Airway Pressure (CPAP) mask for patients with sleep apnea, CFD studies of nasal and pharynx airway flow for oral surgery, Development of mechanical model of lungs for thoracic surgery.
3. Design education for sustainable industrial development

If you would be interested in more detail,
please contact Tadashi Tanuma (t-tanuma@med.teikyo-u.ac.jp).

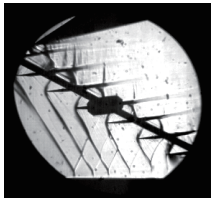
Advanced Jet Propulsion Laboratory The University of Tokyo

U12

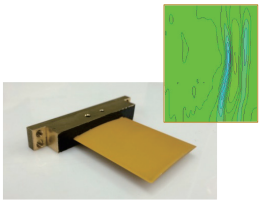
Our website

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.

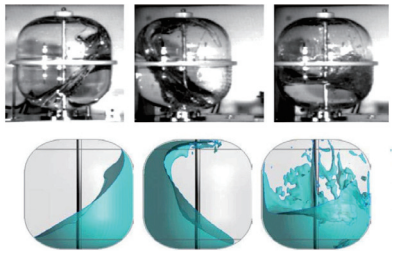
Professor: Takehiro Himeno



Transonic Cascade Flow



PSP Blade and Obtained Pressure



Violent Sloshing, Experiment and CFD

The University of Tokyo
Dept. of Aeronautics & Astronautics, Teramoto-Okamoto Lab.

U13

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

Advanced Aeropropulsion Laboratory (AAL)
The University of Tokyo

U14

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

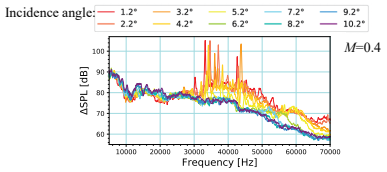
社会連携講座 東京大学 IHI
将来航空推進システム技術創成
Advanced Aeropropulsion Laboratory

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.

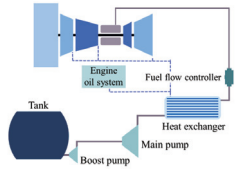
Member:
Project Professor: Takehiro Himeno
Senior Researcher: Toshinori Watanabe
Project Assistant Professor: Akihiro Hattori
Academic Support Staff: Ayumi Mamada

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.



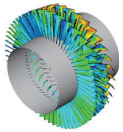
Compressor Noise Spectrum for Various Incidence Angles



Example of Fuel System for Hydrogen Propulsion

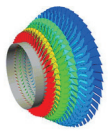
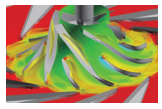
U15

Tohoku University
Professor Satoru Yamamoto
Associate Professor Takashi Furusawa
Assistant Professor Hironori Miyazawa
Laboratory of Mathematical Modeling and Computation
Department of Computer and Mathematical Sciences



TOHOKU UNIVERSITY

We are studying mathematical modeling and the computation using supercomputers. One of our primary projects is **multi-physics computational fluid dynamics (MCFD)**, creating mathematical models governing complex physics associated with flow dynamics together with nonequilibrium condensation. We've developed the in-house MCFD application: **Numerical Turbine (NT)** which can simulate unsteady wet-steam and moist-air flows in gas- and steam-turbines. NT has achieved unsteady whole annulus multi-stage simulations of transonic compressor and steam turbine. NT is currently expanding toward **Digital Twin NT**. **Supercritical-fluids Simulator (SFS)** is another MCFD application. SFS can simulate flows of arbitrary substance under supercritical state together with phase transition to gas and liquid. We are simulating supercritical water, CO_2 and hydrocarbon flows. Currently SFS is applied to the simulation of supercritical CO_2 flows in radial compressor considering nonequilbrium condensation.

https://www.caero.mech.tohoku.ac.jp/

Tokyo Metropolitan University
Combustion and Propulsion Laboratory

U16

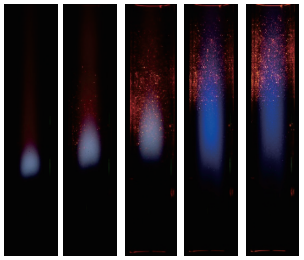
https://comb.fpark.tmu.ac.jp/index.htm

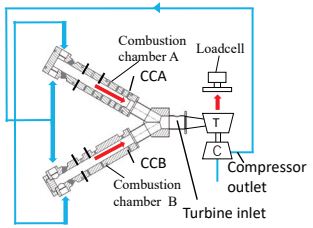
TOKYO METROPOLITAN UNIVERSITY

Takashi SAKURAI (Ph.D., Assoc.Prof.)

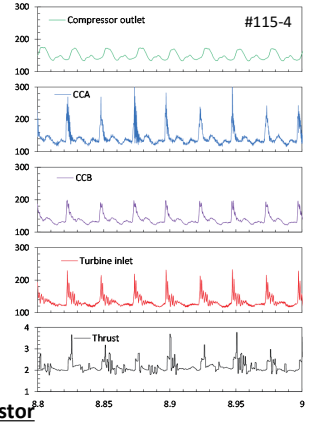
Our research is mainly focused on the development of gas turbine applications and hybrid rocket propulsion. The laboratory has an engine test cell for 60 kW gas turbine and 3 kN rocket engines.

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



U17

Tokyo Metropolitan University
Dept. of Mechanical Systems Engineering
Professor Koji KAKEHI

https://www.comp.tmu.ac.jp/superalloys/

TOKYO METROPOLITAN UNIVERSITY
東京都立大学

Materials and Manufacturing Processes—

- The major research project is to evaluate the properties and reliabilities of heat-resisting alloys used for gas turbine for airplanes and power plants. The study intends the alloys actually used for present engine of airplane and alloy designated for future engine, and has a purpose to analyze the damage mechanism under various mechanical loads. The aircraft engine and the turbine rotor blade of the power generation gas turbine are received flue gases that exceed 1500° C and rotate at high speed. To improve fuel efficiency and reduce emissions from gas turbine, Turbine Entry Temperatures (TETs) of the aero engine have risen to 1700° C. But engine designers are looking for TET of 1800° C in order to increase engine efficiency. Materials developments in all turbine components, combustors, blades, and discs, are critical to achieving this. The Ni based superalloys are used for the turbine parts used under such a severe environment. The excellent Ni based superalloys in the creep property are put to practical use in the aircraft engines. We focus on understanding the fundamental mechanisms determining the mechanical properties of Ni based superalloys.
- **Metal Additive Manufacturing**, also known as metal 3D printing is the technology that produces three-dimensional parts layer by layer and offers the design freedom with the ability to manufacture parts from a wide range of materials. Additive manufacturing for the heat-resistant alloys are also being researched.

U18

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

https://www.mmlab.mech.tuat.ac.jp/

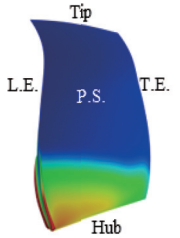
We carry out the researches on various heat/thermal problems as follows:
1) Effective cooling of gas turbine elements for higher thermal efficiency and CO_2 reduction (film cooling of airfoil trailing edge, internal cooling enhancement of turbine blades by using dimpled surface, and effusion cooling 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)

U19

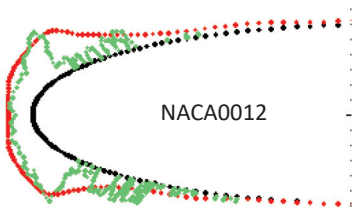
Tokyo University of Science
Department of Mechanical Engineering
Yamamoto CFD Laboratory

https://www.rs.kagu.tus.ac.jp/yamamoto/index.html

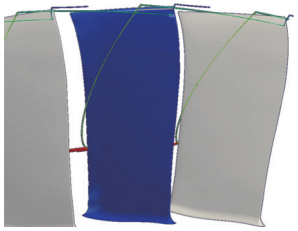
Multi-physics CFD (Computational Fluid Dynamics) simulation would be one of the key technologies in the research and development of various machines in the near future. We have been challenged to develop multi-physics CFD codes to reproduce a lot of multi-physics phenomena such as icing, sand erosion,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



(a) Ice Layer Accreted on Fan Blade



(b) Predicted Ice Shape under SLD Icing Condition


(c) Particle Trajectory in Rotor Passage

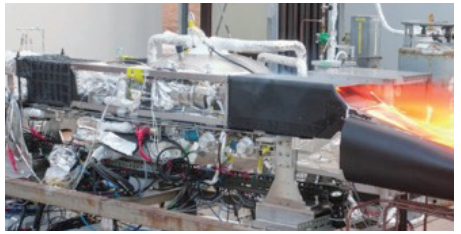
U20

Waseda University

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)

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

U21

Waseda University

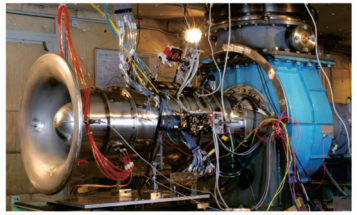
Fluid Mechanics and Turbomachinery Lab.

Department of Applied Mechanics and Aerospace Engineering

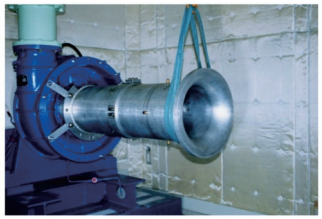
Professor Yutaka OHTA

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 turbo-chargers and also cross-flow and propeller type fans for ventilating systems.



Single-Stage Axial-Flow Compressor



Centrifugal Compressor