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 **JAPAN AEROSPACE INDUSTRY FORUM**  
SPECIAL ZONE TO CREATE ASIA'S No.1  
AEROSPACE INDUSTRIAL CLUSTER



CONTENTS

contents

Chubu Aerospace Industrial Technology Center (C-ASTEC)	Special Zone to Create Asia's No. 1 Aerospace Industrial Cluster
p.02	p.03 p.04
DISPLAY EXHIBITION TAKASAGO ELECTRIC, INC.	DISPLAY EXHIBITION TAMAGAWA SEIKI CO.,LTD.
p.05	p.06 p.07
DISPLAY EXHIBITION TOHMEI Ind., TOHMEI ENGINEERING Co., PNC Co., IBARAKI Ind.	BROCHURE EXHIBITION CHUO ENGINEERING CO.,LTD.
p.08	p.09 p.10
	BROCHURE EXHIBITION SANKO MFG CO.,LTD.
	p.10

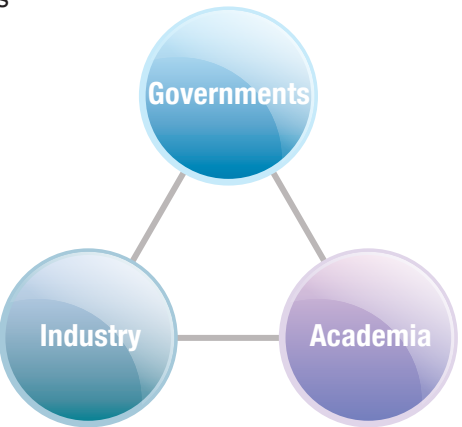
CAPABILITY MAP

	TAKASAGO ELECTRIC, INC. (P.05)				
	TAMAGAWA SEIKI CO., LTD. (P.06)				
	TEKNIA CO., LTD. (P.07)				
	TOHMEI Ind., TOHMEI ENGINEERING Co., PNC Co., IBARAKI Ind. (P.08)				
	CHUO ENGINEERING CO., LTD. (P.09)				
	SANKO MFG CO., LTD. (P.10)				
Aircraft parts		●	●	●	●
Airframe sub-assembly				●	
Composites processing				●	
Engineering /Designing	●	●		●	●
Jigs/Tools /Equipment	●	●	●	●	●
Sheet-metal forming /Machining	●	●	●		●
Surface treatment /Heat treatment		●			●
Test/Assurance	●	●		●	

C-ASTEC  
Chubu Aerospace Industrial Technology Center

We are committed to various projects related to the advancement of the aerospace industry and technology through collaboration between industry, academia, and governmental organizations. We aim to form a global aerospace industrial cluster in the Chubu area, to achieve the integration of the aerospace industry with other active industries, and to contribute to the development of the monozukuri (manufacturing) industry of the Chubu area through our projects.

- 1 Research and Study
- Conducting research and study in aerospace-related research facilities, etc.
  - Conducting research in aerospace –related industries and technology, etc.
- 2 Collecting and providing information / Development and enlightenment
- Collecting and providing information and material related to the aerospace industry
  - Planning and holding forums, symposiums, and seminars
  - Matching technological seeds with needs
  - Regularly distributing information, etc
- 3 Technological assistance
- Dispatching technology/management advisers
  - Providing assistance to projects for advancing strategic infrastructure (supporting industry projects), etc.
- 4 Human resource development
- Holding human resource development lectures, etc.
  - Special Zone to Create Asia's No.1 Aerospace Industrial Cluster Training course
- 5 Cooperation and exchange with related organizations, both domestic and overseas
- Holding exhibition, etc., and exhibiting products at exhibitions
  - Offering assistance in opening marketing channels
  - Supporting aerospace-related projects
  - Cooperation and exchange with domestic and overseas aerospace-related organizations, etc.



# Special Zone to Create Asia's No.1 Aerospace Industrial Cluster

Source: "Special Zone to Create Asia's No.1 Aerospace Industrial Cluster; Brochure", Promotion Council for Special Zone to Create Asia's No.1 Aerospace Industrial Cluster.

The Aichi/Gifu/Mie region is designated as a Comprehensive Special Zone for International Competitiveness Development called the "Special Zone to Create Asia's No.1 Aerospace Industrial Cluster".

The region aims to build Asia's largest and strongest aerospace industrial cluster. To achieve the goal, we will expand the base of the aerospace industry by bringing in enterprises of all sizes, establish an industrial hierarchy with integrators at its pinnacle, and build an integrated system that includes R&D, design, manufacturing, and maintenance.

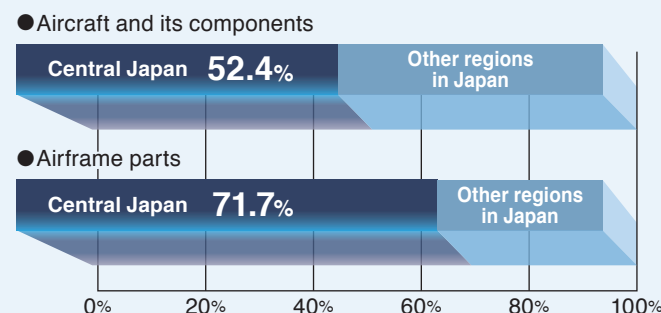
## Aichi/Gifu/Mie Region; Taking the Lead in Japan's Aerospace Industry

Central Japan – consisting of Aichi, Gifu, Mie, Toyama, and Ishikawa Prefectures – accounts for about 50% of the domestic production value of aircraft and their components, and about 70% of the production of airframe parts. Aichi, Gifu and Mie, in particular, stand out as the only stronghold of the aerospace industry in Japan. Three major aircraft manufacturers (MHI, KHI, FHI) operate plants here. Carbon composite firms, such as TORAY, develop and manufacture materials that help reduce aircraft weight and increase fuel efficiency. A number of parts suppliers and machine tool suppliers are also located here.

The Industry-Academia-Government collaboration is also actively promoted, with many organizations involved in research and development as well as human resource development, exemplified by JAXA\* "Nagoya Flight Research Center" and Nagoya University's Department of Aerospace Engineering.

\*JAXA: Japan Aerospace Exploration Agency, which is responsible for the space use and development as well as aviation research and development in Japan.

### Current locations of aerospace-industry-related enterprises



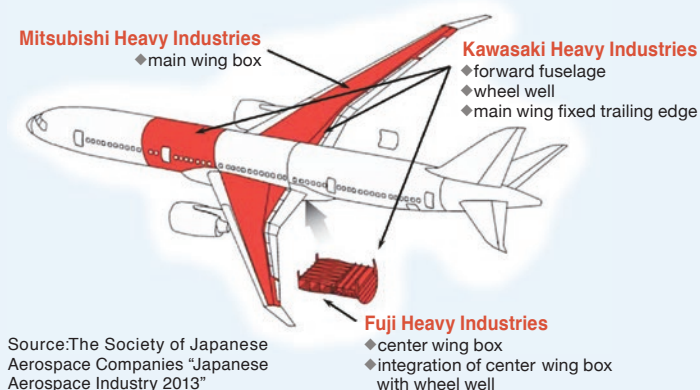
Source: Chubu Bureau of Economy, Trade and Industry "Annual Economic Review of Tokai Hokuriku Areas, 2012 Edition (actual data in 2011)"  
Aircraft and its components: Aircraft, airframe parts, auxiliary devices, generators, and others  
Airframe parts: Of all components, only the airframe parts

## Development of the "Boeing 787" and "MRJ" Projects

Two epoch-making projects in Japan's aerospace industry are in progress in this region as we speak; the production of Boeing's 787 and the development of the Mitsubishi Regional Jet, or MRJ.

The Boeing 787 is a cutting-edge mid-size jet liner. Because 50% of its airframe structure is made with carbon fiber composites, high environmental performance and fuel efficiency were achieved. The 787 also features a long cruising distance and a larger, more comfortable cabin environment rivaling larger aircraft. Major airframe manufacturers in this region produce 35% of the airframe parts, and a large number of small- to medium-size businesses are involved in parts production.

### Japanese manufacturers contributions to the Boeing 787



Source: The Society of Japanese Aerospace Companies "Japanese Aerospace Industry 2013"

## Industrial Cluster

### Main Efforts Aiming to Form the Aerospace Industrial Cluster

#### ■ Expansion and consolidation of production function

- Creating an environment which encourages businesses to build plants and invest in infrastructure through financial support, tax incentives, and easing of regulations e.g. easing of green space restrictions at industrial location
- Building efficient production/supply systems for small- and mid-size businesses in the industry
- Establishing the "Dreamlifter Operations Center" in Central Japan International Airport (Centrair) etc.

#### ■ Support for developing next generation aircraft

- Flight proving test by using the jet flight test bed (jet FTB) "Hisho" at JAXA Nagoya Flight Research Center
- Establishing the National Composite Center etc.

#### ■ Expansion of the industry base; developing and securing human resources

- Assisting businesses in entering into the aerospace industry and acquiring the aircraft parts manufacturing certification (JISQ9100, Nadcap)
- Assisting small- to mid-size businesses in opening new marketing channels through international events
- Training engineers in highly advanced processes and techniques required in the aerospace industry
- Training by Nagoya University to develop leadership who can participate in collaborative development projects in the global aerospace industry etc.

#### ■ Building the network for Industry-Academia-Government collaboration

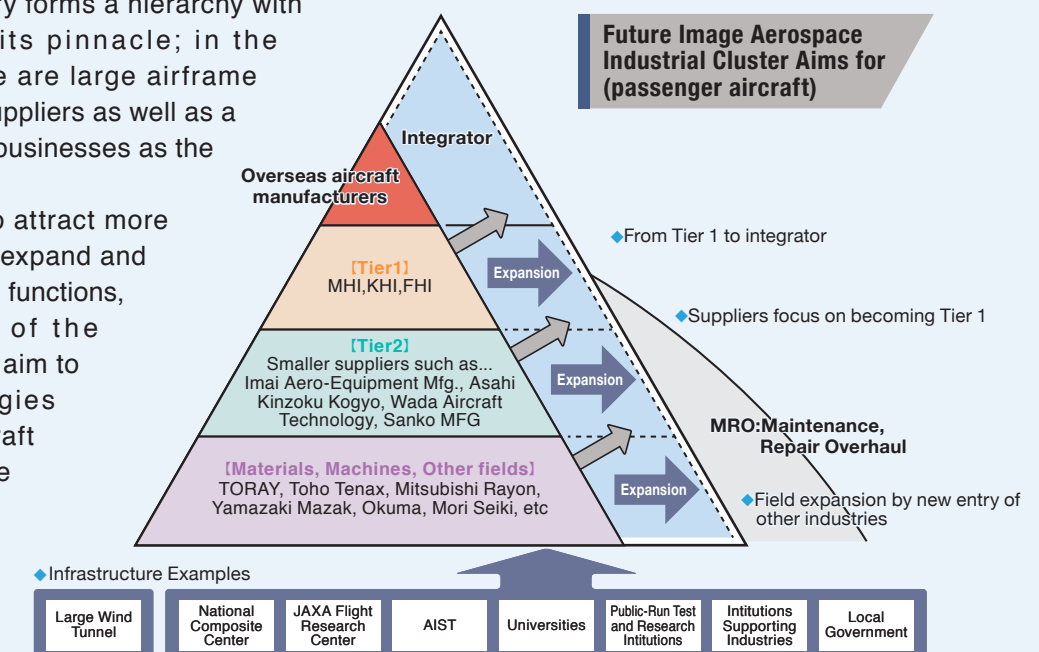
Chubu Aerospace industrial Technology Center (Established in 1993 for the purpose of conducting and planning research projects which integrate the aerospace industry in central Japan and its research function as well as driving technological sophistication in other industries)

Aerospace Industry Forum (Established in 2008 for the purpose of actively promoting cooperation amongst aerospace industry enterprises and encouraging newcomers from other industries into the aerospace field)

## Future Image Aerospace Industrial Cluster Aims for

Today, the aerospace industry forms a hierarchy with overseas integrators at its pinnacle; in the Aichi/Gifu/Mie region, there are large airframe manufacturers as the tier 1 suppliers as well as a number of small- to mid-size businesses as the tier 2 suppliers.

It is the goal of this region to attract more industry-related businesses, expand and consolidate aircraft production functions, and expand the bottom of the industrial hierarchy. We also aim to gain integration technologies required as a complete aircraft integrator and become the major player in the global aerospace industry.





# TAKASAGO ELECTRIC, INC.

<b>Contact</b>	<b>Address</b>	66 Kakitsubata, Narumi-cho, Midori-ku, Nagoya, Aichi, 458-8522 Japan
	<b>TEL</b>	+81-52-891-2301
	<b>URL</b>	http://www.takasago-fluidics.com
	<b>E-mail</b>	info@takasago-elec.co.jp
<b>Company Profile</b>	<b>Founded</b>	1 July 1959
	<b>Representative</b>	Naoya Asai, President
	<b>Capital</b>	JPY 90 million (USD 0.90 million)
	<b>Sales</b>	JPY 2,022 million (USD 20.22 million)
	<b>Employees</b>	209 (as of 1 October 2013)
	<b>Major Customers</b>	Beckman Coulter, Inc., GE Healthcare, Bio-Sciences AB, Hitachi High-Technologies Corporation, HORIBA, Ltd., Shimadzu Corporation.
	<b>Certification</b>	ISO9001, JISQ9100 (plans to obtain in June 2014), Sony Green Partner



## OUTLINE of Business

Design, manufacturing and sales of fluidic control components, with solenoid valves and pumps as core products. These products are used in a variety of fields such as medical, environmental, aerospace, etc.

We have contributed to the development of its main adopted field of analyzers from the perspective of fluid mechanics by offering an expertise accumulated over many years and solution-oriented product proposals.

## Our Strengths

- Experiences on quality control and modification control from doing business in medical and diagnostic industry.
- Integrated production system from designing, machining, assembling to testing, enables us to manufacture high quality products in a short time period.
- Specialize in customization and produce a wide variety of products.
- Miniaturized valves and pumps contribute to light-weighting and downsizing of various instruments.
- High in-house production ratio.
- Able to process, to assemble, and to test products within the factory.
- Earthquake proofed factory.
- Overseas contacts: office in Boston, the U.S. and office and factory in Suzhou, China



# TAMAGAWA SEIKI CO.,LTD.

<b>Contact</b>	<b>Head Office:</b>	
	<b>Address</b>	1879 Ohyasumi, Iida, Nagano, 395-0068 Japan
	<b>Nagoya:</b>	
	<b>Address</b>	5-10 Hakkochō, Kasugai, Aichi, 486-0916 Japan
<b>Company Profile</b>	<b>TEL</b>	+81-568-35-3533
	<b>URL</b>	http://www.tamagawa-seiki.com/english/index.html
	<b>E-mail</b>	kokyaku@tamagawa-seiki.com
	<b>Founded</b>	March 1938
	<b>Representative</b>	Norifumi Hagimoto, President
	<b>Capital</b>	JPY 100 million (USD 1 million)
	<b>Sales</b>	JPY 33.7 billion (USD 337 million)
	<b>Employees</b>	650
	<b>Major Customers</b>	Mitsubishi Heavy Industries; Kawasaki Heavy Industries; Fuji Heavy Industries; Mitsubishi Electric; NEC; Toshiba; Hitachi; Matsushita Electric Industrial; TOYOTA; HONDA; ABB Automation Technology Products AB; Honeywell Inc.; Rockwell Collins Ministry of Defense; Japan Aerospace Exploration Agency etc.
	<b>Certification</b>	JISQ9100, JISQ17025(ISO/IEC17025), ISO14001, ISO/TS16949



## OUTLINE of Business

- **Aerospace & Defense Equipment Parts and MRO**
- **Servo Components**  
: Mechatronics fields of robots, NC machine tools, space-related technology, etc.
- **Consumer and Industrial Equipment**  
: Not only the frontier industry, but also underground and ocean-bottom technology

## Our Strengths

Since its foundation, Tamagawa Seiki has taken up the challenge of angular precision for control equipment, such as high-precision sensors, motors and gyros, and successfully delivered such equipment to its customers.

We are now one of the few makers in the world with the capability to develop and manufacture both two-dimensional and three-dimensional (spatial) position/angle sensors.

We have applied leading-edge high-precision sensor technology to our "Motion System," whose fields of application are extending even to the space industry.



Sensors and Motors for aircraft

# TEKNIA CO., LTD.



<b>Contact</b>	<b>Address</b>	3-459 Ematsu, Nakagawa-ku, Nagoya, Aichi, 454-0954 Japan
	<b>TEL</b>	+81-52-303-3347
	<b>URL</b>	http://www.teknia.co.jp
	<b>E-mail</b>	kawachi@teknia.co.jp
<b>Company Profile</b>	<b>Founded</b>	1912
	<b>Representative</b>	Hiroshige Takahashi
	<b>Capital</b>	JPY 65 million (USD 0.65 million)
	<b>Sales</b>	JPY 600 million (USD 6 million)
	<b>Employees</b>	50
	<b>Major Customers</b>	Yamazaki Mazak Corporation, Okuma Corporation, MORI SEIKI CO., LTD., SINFONIA TECHNOLOGY CO., LTD., NGK SPARK PLUG CO., LTD., TAKAOKA ELECTRIC MFG. CO., LTD.
	<b>Certification</b>	ISO9001:2008, JISQ9100:2004

## OUTLINE of Business

Parts for machine tools, industrial machine, and aerospace

## Our Strengths

TEKNIA has a highly sophisticated machining technology backed by company's one hundred year history. Recently we put much emphasis on cost reduction utilizing effectively our Thai plant.

### 1. High-leveled machining technology

Variety of machining tools and skilled craftsmen with high technology (lathe, NC lathe, multi lathe, milling, drilling, grinding in the machining center)

### 2. Handling materials and sizes

Difficult-to-cut materials • high hardness steel(4340), stainless steel (15-5ph), titanium (6Al4V)  
 Sizes...φ50~φ800mm, □50~600mm (processable material sizes)

### 3. Own process, tools, and equipment planning

Our policy is to create our own tools and equipment, in the process planning, seeking for the fastest, and the most efficient manufacturing.

So far, as the third-tier supplier, we have been supplying machined parts in aircraft equipment (esp. in motor, generator, gear box, hydraulic unit, etc.)



# TOHMEI TOHMEI Group

## TOHMEI Ind., TOHMEI ENGINEERING Co., PNC Co., IBARAKI Ind.

<b>Contact</b>	<b>Address</b>	2-11 Shinkatanaike, Chita, Aichi, 478-0069 Japan
	<b>TEL</b>	+81-562-54-1881
	<b>URL</b>	http://www.tohmei.com
	<b>E-mail</b>	koji_nishimura@tohmei.com
<b>Company Profile</b>	<b>Founded</b>	September 1973
	<b>Representative</b>	Akira Ninomiya, President
	<b>Capital</b>	JPY 88 million (USD 0.88 million)
	<b>Sales</b>	JPY 7.0 billion (USD 70 million)
	<b>Employees</b>	1,350 (as of September 2013)
	<b>Major Customers</b>	MHI, KHI, FHI, NIPPI, JAXA, Ministry of Defense, Central Japan Railway Co., Tokai Rubber Ind., Nachi Fujikoshi Corp, Toyota Central R&D Labs.
	<b>Certification</b>	JIS Q 9100, Nadcap (Chemical Process), JIS Q 9001, JIS Q 27001, JIS Q 14001



## OUTLINE of Business

- Aircraft Structural Assembly
- Aircraft Maintenance and Inspection
- Tools, Jigs, Fixtures and Mechanical devices (electrical, hydraulic, pneumatic servo-control technology) design and manufacturing
- Advanced Composites Manufacturing
- Manufacturing Special shipping containers for Aircrafts and Space equipments.



Paint Shop



HTV Structure

## Our Strengths

### ■ AEROSPACE INDUSTRY

TOHMEI GROUP assembles and Paint major aircraft structures for some of the world's leading aircraft manufactures. Over the past 30 years, we have partnered with and supplied our customers with Wing structures, Spanwise beam, HTV(HIIB Rocket transfer Vehicles) and other aircraft structures for their commercial jets.

### ■ INSPECTION AND TEST EQUIPMENT

We propose and fabricate a full array of devices that put our electrical, hydraulic, and pneumatic servo-control technology to full use.

### ■ INTEGRATED PRODUCTION SYSTEM

TOHMEI GROUP serves Designing, Stress analysis, Parts Fabricating, Assembling and Painting within the GROUP to provide the highest quality, reliable delivery time and target cost for our customer.

Design: TOHMEI ENGINEERING Co.

Fabricating: PNC Co., IBARAKI Ind.

Assembling & Painting: TOHMEI Ind.,



Collision Test Device



Autoclave



## CHUO ENGINEERING CO., LTD.

### Contact

<b>Head Office:</b>	
<b>Address</b>	Kojimachi Park House Bldg, 4-5-7 Kojimachi, Chiyoda-ku, Tokyo, 102-0083 Japan
<b>Nagoya:</b>	
<b>Address</b>	Kanayama Sogo Bldg, 1-12-14 Kanayama, Naka-ku, Nagoya, Aichi, 460-0022 Japan
<b>TEL</b>	+81-52-611-2919
<b>URL</b>	<a href="http://www.chuo-eng.co.jp">http://www.chuo-eng.co.jp</a>
<b>E-mail</b>	<a href="mailto:aerospace@chuo-eng.co.jp">aerospace@chuo-eng.co.jp</a>

### Company Profile

<b>Founded</b>	September 1955
<b>Representative</b>	Yoshihiro SAITA, President
<b>Capital</b>	JPY 116 million (USD 1.16 million, Capital reserve is included)
<b>Sales</b>	JPY 4,022 million (USD 40.22 million, fiscal 2012)
<b>Employees</b>	506 (as of April 2013)
<b>Major Customers</b>	Mitsubishi Heavy Industries, Ltd., Mitsubishi Aircraft, Ltd., Kawasaki Heavy Industries, Ltd., and so on.
<b>Certification</b>	ISO9001 JIS Q 9100

### OUTLINE of Business

Design, analysis and tests in development of aerospace products.

### Our Strengths

We have worked towards the expansion and enrichment of aerospace engineering for over 50 years. We currently employ over 300 people working within the aerospace field on many different projects. Our business is focused primarily on the design and analysis of Aircraft, Aerospace Engines, and Aerospace Equipment. The presentation of our specialized services extends to the development of many different aircraft and space projects across Japan.

#### Aerospace

The design and analysis of Aircraft, Aerospace Engines, and Aerospace Equipment is our businesses primary focus.

#### Design Part:

- Airframes, Systems, Interiors
- Layout and Detail Design
- Design for Manufacturing
- Production and Maintenance Tools

#### Analysis Part:

- Various Type of Analysis
- Fatigue and Damage Tolerance
- FEM Modeling and Analysis
- Fluid and Thermal Analysis



**Design Tools:** CATIA V4/V5, PRO-E, UNIGRAPHICS, and so on.  
**Analysis Tools:** NASTRAN, PATRAN, FEMAP, FLUENT, and so on.

## SANKO MFG CO., LTD.



### Contact

<b>Address</b>	3-9 Yasumatsu, Shippo-cho, Ama, Aichi, 497-0011 Japan
<b>TEL</b>	+81-52-442-0569
<b>URL</b>	<a href="http://www.sankomfg.co.jp">http://www.sankomfg.co.jp</a>
<b>E-mail</b>	<a href="mailto:info@sankomfg.co.jp">info@sankomfg.co.jp</a>

### Company Profile

<b>Founded</b>	March 1956
<b>Representative</b>	Kiyoshi Okumura
<b>Capital</b>	JPY 30 million (USD 0.3 million)
<b>Sales</b>	JPY 590 million (USD 5.9 million)
<b>Employees</b>	54
<b>Major Customers</b>	Mitsubishi Heavy Industries, Ltd. Aichi Tokei Denki Co., Ltd. Daicel Chemical Industries, Ltd.
<b>Certification</b>	JIS Q 9100

### OUTLINE of Business

Manufacturing parts of aerospace equipments, such as parts for rocket, civil aircraft engine and hydraulic equipment.

### Our Strengths

More than 40 years of experience in manufacturing parts such as for rocket, engine and hydraulic equipment has resulted in our skills to process difficult-machining materials such as Inconel, Haynes and Waspaloy, by using machinery such as lathe, 5-axis machining center and electrical discharge machine. Main products are parts for H-IIA/B rocket main/second engines, parts for commercial aircraft engines and parts for flight control hydraulic equipments.

Additionally, we do machining of helicopter parts, such as parts for gear box and tail rotor shaft.



