



*R-DEC Co., Ltd.*  
**COMPANY & PRODUCTS INFORMATION**



**R-DEC Co., Ltd.**

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

**Contributing to the Future of Japan, and the World,  
as the established R&D Vacuum Systems supplier**

**that supports cutting-edge research**

Since its establishment in 1988 in Tsukuba, Japan, R-DEC has worked together with researchers and scientists as the company for development of research equipment, and specialized trading company of scientific instruments, in the R&D field. In the half-century since research institutes were established in Tsukuba, we have seen many world-renowned research and development achievements blossom here.

**“Dedicated to supporting researchers and scientists and meeting their needs at a high level, with the best quality”**

Our passion has remained unchanged since the company started. We hope to continue to be a company that responds to the needs of researchers and engineers who create the future of Japan, and the world, by developing our own products based on our specialty of ultra-high vacuum technology, developing custom-made products to meet the detailed needs of researchers, and providing component products from the world's leading manufacturers.



Chairman & Representative Director  
**TOMOAKI SASAKI**



**What is R-DEC?**

Our company name R-DEC came from “Research,” “Development,” “Equipment” and “Technology.” We develop, manufacture, and sell scientific equipment based on our advanced vacuum technology, mainly for R&D institutions.



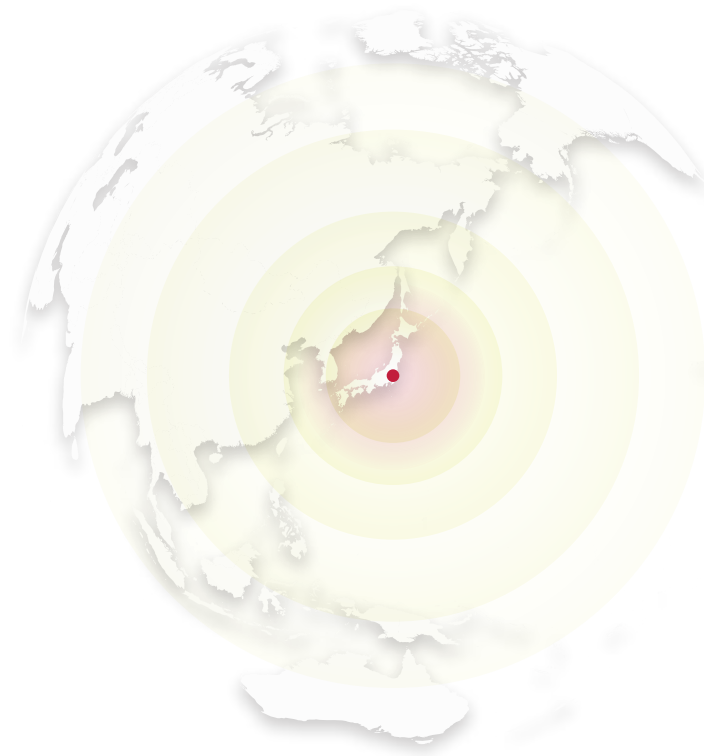
# About R-DEC

## From Tsukuba to the Future of Advanced Research

### 01

#### Tsukuba: Science City to the World

Tsukuba City, Ibaraki Prefecture, where we are based, is one of the leading research and academic cities in Japan. Tsukuba City has a concentration of about one hundred fifty private research institutions and companies, including national research and educational institutions. In this unique environment, we constantly refine our technological capabilities through collaboration with researchers and scientists. This allows us to provide even better products based on the latest trends in the world, and our extensive business experience in the global market.



### 02

#### Ultra High Vacuum Technology Supporting R&D

R-DEC's strength lies in its ultra-high vacuum technology that meets the needs of world-class researchers and scientists. With this technology at its core, the company develops highly unique research equipment, including various vacuum systems and film deposition-related equipment. We contribute to a wide range of research and development both in Japan and overseas, including national research institutes, private research institutes and university laboratories.

### 03

#### Custom-made Systems from Researcher's Passion

In the field of research and development, highly original research equipment is indispensable. Even if researchers are conducting similar research, the content of these investigations for each person, and the equipment needed, is also different. In order to realize the research equipment that researchers truly require, we develop custom-made equipment that is unique in the world while thoroughly maintaining confidentiality.



### 04

#### Integrated System of Development, Manufacture & Sales

AVC and ELC, which are companies in the R-DEC group, are responsible for mechanical and electrical design, as well as software for systems utilizing ultra-high vacuum technology. Our integrated system of product development, manufacturing, and sales, in cooperation with the two group companies, enables us to make proposals that meet the needs of researchers and engineers.

### 05

#### Consumer Products Using Original Technology

Recently, we have been actively engaged in the development of products for general consumers, applying our advanced technological capabilities, cultivated through the development of research equipment in the R&D field. As a first step, we have developed the patented Amida Filter, a fan-mounted air purifying filter that is effective against pollen and odor. We are beginning to support people's daily lives with our reliable technologies.



AmidaFilter™



# PRODUCTS

In addition to our original products based on vacuum technology, we provide custom-made products that meet the needs of researchers, a wide variety of component products from leading manufacturers in Japan and abroad, and a variety of physical and chemical instruments that support the forefront of research and development. We look forward to serving you.

## Reflection High-Energy Electron Diffraction

# RHEED



Received Industrial Award from the Surface Science Society of Japan



Reflection High-Energy Electron Diffraction (RHEED) has become an indispensable tool for crystallization analysis with the development of thin film crystal growth technology. An electron beam of 10 to 30 keV is incident on the sample surface at a shallow angle of a few degrees. The electron beam diffracted by the crystal lattice due to the wave nature of the electrons is projected onto an opposing screen, and the structure of the crystal surface can be examined.

### Features

- High intensity electron beam spot
- Uses magnetic shielding for stable measurement.
- High safety and durability
- Parameters memory and recall functions enables the system to reproduce the diffraction pattern even after resetting the power supply.
- LCD display on the remote control enables confirmation of parameters instantly.
- Supporting plug-in function of k-Space's image/video analysis system (kSA400)
- Digital controlled power supply provides high stability

### Screen (Option)



Screen & Holder



Screen & Holder with a shutter



Viewport Shutter



Viewport





### Thermal Desorption Spectroscopy System for Hydrogen Analysis

## HTDS-003

It is a high-sensitivity system for analyzing hydrogen content in steel. The most suitable application is for the material evaluation of hydrogen embrittlement and evaluation of hydrogen storage alloys. High-sensitivity (0.01 wt.ppm/5g) analysis is possible with simple touch panel operation.

#### Features

- A mass spectrometer is used as the detector. Real-time measurement is possible.
- Touch panel operation and self-developed software for calculating hydrogen content are standard features.
- Capable of measuring sample up to  $\Phi 20 \times 50$  mm
- Built-in Hydrogen standard leak system with gas pressure control

### UHV High Precision Cryogenic Four to Six Axis Manipulator

## i-GONIO

Developed in collaboration with the National Institute of Advanced Industrial Science and Technology (AIST) as a high-precision head which has fine angular resolution, and cooling capability down to cryogenic regions. It is the most suitable sample stage for angle-resolved photoelectron spectroscopy, etc., which require low temperature and three-dimensional angle control of samples.



#### Features

- Collaborated with the National Institute of Advanced Industrial Science and Technology (AIST)
- Achieves both low sample temperature and three-dimensionally accurate angle control
- A total of five models which all support sample transfer
- Up to six-axis manipulation in combination with our other products.



### High Vacuum Degassing System

## ABP series

This degassing system can reduce outgassing by heat-treating metal materials, such as vacuum components, in a high vacuum environment. It achieves a pressure of less than E-4 Pa during heating, enabling heat treatment in a clean vacuum environment.

#### Features

- Two types of processing temperatures: 450°C or 600°C
- Fully automatic operation from atmosphere, to vacuum, to heat treatment completion
- Easy process parameter setting with touch panel
- Multiple small and large workpieces can be treated simultaneously.

## DRYFORCE

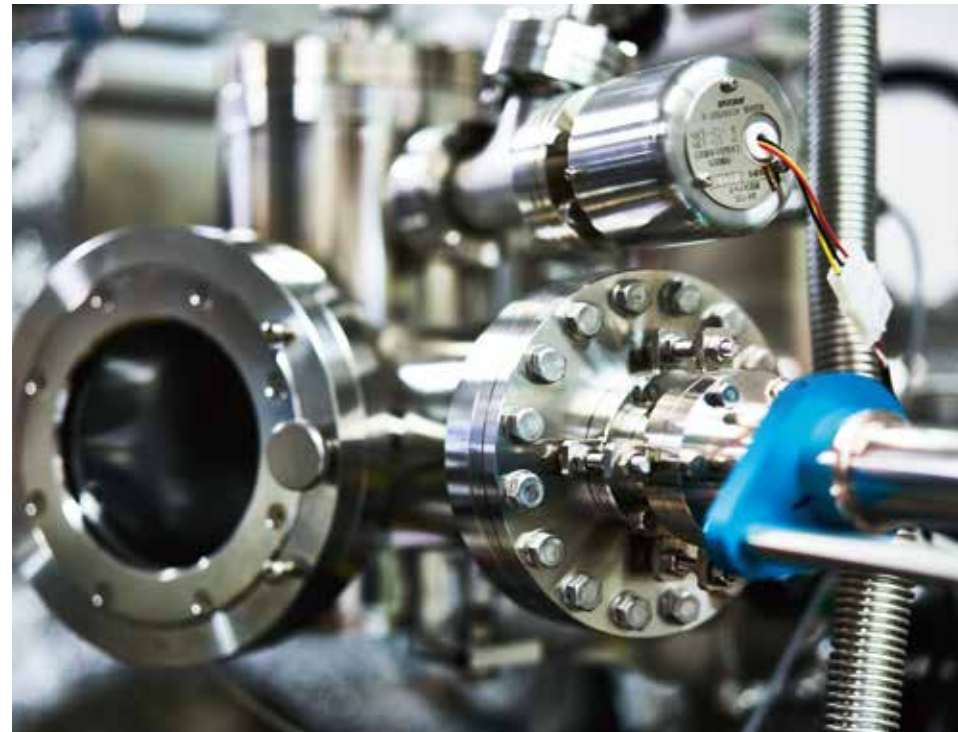
A clean pumping unit is a combination of a turbo molecular pump and a dry roots pump. Easy operation with a five-inch touch panel, with highly visible large letters and bright colors.



#### Features

- Easy to move with large casters
- AUTO/MANUAL can be switched by touch panel
- Space-saving slim type is also available.
- Dry roots pump with no risk of performance degradation

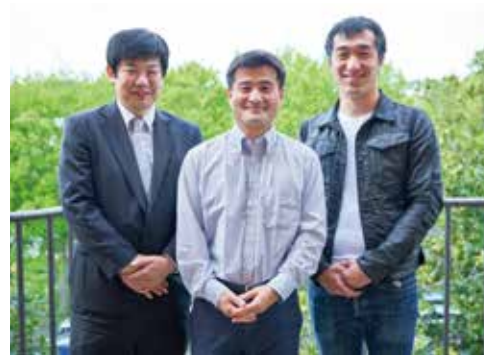
# Custom-made Products



**We support research and development leading to the future with our creative equipment.**

In order to provide researchers with the equipment they truly need, we offer custom-made vacuum equipment and deposition-related equipment for research and development. We will propose the most suitable specifications and designs, taking advantage of our strengths in technology and development based on ultrahigh vacuum technology, and our product capabilities as a trading company specializing in physical and chemical equipment. We also provide prompt support for maintenance and any problems that may occur. We will support your research and development by providing highly creative test equipment and measuring instruments. Please feel free to contact us.

## Customer Review



We purchased a custom-made crystal growth system from R-DEC for the development of thin-film solar cells and had been using it for ten years. There is a limit to what can be achieved with existing equipment, so customization of equipment is essential for highly original research. In the case of this equipment, in addition to the large electron gun, R-DEC proposed a design based on our needs, such as the ability to individually control the deposition rate of multiple materials simultaneously, and we worked together with R-DEC to create it. With high stability in vacuum conditions, it is very useful equipment for investigating the properties of new materials, and some of the results have led to joint research with companies. Since its introduction, it has brought us many excellent results and has become indispensable equipment in our laboratory.

Prof. Takashi Suemasu  
Suemasu & Toko Lab., University of Tsukuba

## PRODUCT EXAMPLE



### MBE System for R&D

The most suitable system for research development of thin films for semiconductors or solar cells. R-DEC UHV technology makes it possible to form thin films under an ultra-clean environment.



### Three Source Sputtering System

This sputtering system makes it easy and fast to deposit high-quality thin films. Single source deposition or simultaneous deposition of the three sources is possible.



### Recipe Controlled Automatic Evaporation System

This automatic evaporation system enables depositing high melting point metal, semi-conductor, and oxides up to an eight-inch substrate. After mounting the substrate, automatic deposition of multi-layers can be possible by using the recipe control software.



### Gas Collection System

This system was developed to collect gas brought back from Ryugu by Hayabusa2 from JAXA (Japan Aerospace Exploration Agency). It was collaborated with Fujikin.



### Slow Pumping System

This system minimizes the particle movement at the time of pumping and N2 purge. It also prevents field emissions which are the main cause of the degradation of superconducting cavities.

Joint patent with KEK and Fujikin is pending.



### Transfer Vessel

The vessel enables sample transportation while maintaining UHV condition. The design is compact and upgradable, depending on the application.



# Components



**AVC**  
AVC Co., Ltd.

**LINE UP**

- UHV Manipulator
- Sputtering Source
- Ion gun
- UHV Evaporator
- Compact Cell (Source)
- Turbo Pump Unit, etc.



AMP Series 3-Axis XYZ Stage



ALM Series Linear Motion Z Stage



AXY Series XY Stage



AMF 275 Series Magnetically Coupled Linear and Rotary Sample Transfer Rod



AMF133 Series Magnetically Coupled Linear and Rotary Sample Transfer Rod



ARS Series Rotary Stage



AMWS Series 2-Axis Wobble Stick



ARM Series Rotary Feedthrough



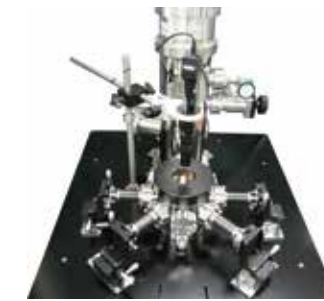
AAD Series Replacement Hatch with a Window



ALLC Series Load Lock Chamber



UHV Degas Treated Vacuum Chamber



Cryogenic Prober



UHV Single-Cell Evaporator, AEV-11



UHV Triple-Cell Evaporator, AEV-3



Wide Area Single Source Evaporator, AEV-HR-1



ACC Series Compact Cell (Source)



ASG Series Sputtering Gun



Ion Gun, ACIG-3



Sample Heating Stage



LN2 Cooling Stage



ATU-003 Series Pumping Unit

**VAT**  
VAT Ltd.



**LINE UP**

- Gate Valve
- Butterfly Valve control system
- Angle Valve, etc.

**CANON ANELVA**  
CANON ANELVA CORPORATION



**LINE UP**

- Transducer Vacuum Gauge
- Helium Leak Detector
- Quadrupole Mass Spectrometer

**EDWARDS**  
Edwards Vacuum



**LINE UP**

- Turbomolecular Pump
- Dry Pump
- Rotary Pump
- Vacuum Gauge, etc.

**KASHIYAMA**  
Kashiyama Industries, Ltd.



**LINE UP**

- NeoDry Series Handy & Air Cooled Dry Pump

**MKS**  
MKS Instruments, Inc.



**LINE UP**

- Baratron Capacitance Manometer
- Mass Flow Controllers & Meters
- Vacuum Gauge
- Quadrupole Mass Spectrometer, etc.

**PFEIFFER**  
Pfeiffer Vacuum



**LINE UP**

- Turbo Pumping Station
- Vacuum Gauge
- Turbopump with Hybrid Bearing
- Helium Leak Detector

**INFICON**  
INFICON Co.,Ltd



**LINE UP**

- Thin Film Deposition Controller
- Thin Film Rate/Thickness Monitor

**SHIMADZU**  
Shimadzu Corporation



**LINE UP**

- Turbo Molecular Pump, etc.



## ANEST IWATA

ANEST IWATA Corporation



Dry Vacuum Pump (Scroll Meister)

Oil-free Scroll Air Compressor



Oil-free High Vacuum Pumping Unit

### LINE UP

- Dry Vacuum Pump (Scroll Meister)
- Oil-free Scroll Air Compressor
- Oil-free High Vacuum Pumping Unit, etc.

## SAES GETTERS

SAES Getters S.p.A.



Non Evaporable Getter (NEG) Pump



### LINE UP

- Non Evaporable Getter (NEG) Pump
- Alkali Metals Dispensers

## HORIBA STEC

HORIBA STEC, Co., Ltd.



Compact Process Gas Monitor

Capacitance Manometer



Mass Flow Controller

Pictures Courtesy of HORIBA STEC, Co., Ltd.

### LINE UP

- Mass Flow Controller
- Liquid Source Vaporization Control System
- Gas Monitor, and Vacuum Monitoring, etc.

## BRUKER

Bruker Japan K.K.



FT-IR Compact Spectrometer



FT-IR Spectrometer

### LINE UP

- FT-IR Spectrometer
- FT-NIR Spectrometer
- FT-Raman Spectrometer

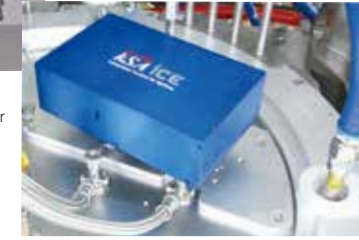
## K-SPACE

k-Space Associates, Inc.



In Situ 2D Curvature and Thin-Film Stress Monitoring

Wafer and Thin-Film Temperature Monitor



In Situ Metrology Tool for MOCVD

### LINE UP

- Analytical RHEED system
- Wafer and Thin-Film Temperature Monitor
- In-Situ 2D Curvature and Thin-Film Stress Monitor
- Integrated In-Situ Metrology Tool for MOCVD

## PSP

PSP Vacuum Technology Ltd



Ion Source for Sample Cleaning



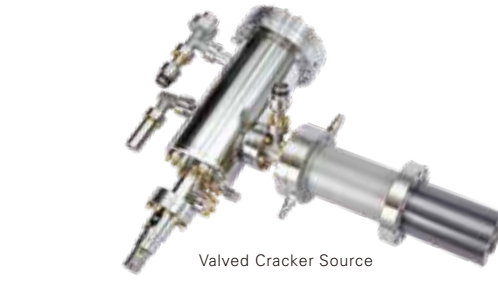
X-ray Source for XPS

### LINE UP

- Ion Source for Sample Cleaning
- X-ray Source for XPS

## VEECO

Veeco Instruments Inc.



Valved Cracker Source



Effusion Cell

### LINE UP

- Effusion Cell
- Valved Cracker Source
- RF Plasma Source

## VTI

Vacuum Technology Incorporated



### LINE UP

- Calibrated Leak Standard



# For the Future of Advanced Research from Tsukuba



## Company Overview



### Company Name

R-DEC Co., Ltd.

### Head Office Location

1-16-10 Ninomiya, Tsukuba, Ibaraki 305-0051

### Tokyo Office Location

Hongo Kobayashi Buid. 5F, 3-15-4 Hongo  
Bunkyo-ku, Tokyo 113-0033

### Foundation

June 1st, 1988

### Number of Employees

35 (consolidated: 70)

### Capital

JPY 32,450,000

### Board Member

Chairman & Representative Director Tomoaki Sasaki  
President & Representative Director Takahiro Yamaguchi

### Correspondent Bank

Tsukuba Namiki Branch, Jyoy Bank  
Tsuchiura Branch, Resona Bank  
Tsukuba Branch, Mitsui Sumitomo Bank

### [ Corporate History ]

- 1988 R-DEC Co., Ltd. was founded at Umezono, Tsukuba, Ibaraki  
The company was established to provide the vacuum systems and technology to the R&D field.
- 1996 R-DEC head office was relocated to 1-16-10 Ninomiya, Tsukuba
- 1997 AVC Co., Ltd. was established.
- 2002 RHEED was designed and developed in-house and sales started.  
Online shop launched
- 2003 ELC Co., Ltd. was established as the software developer and control equipment manufacturer
- 2005 k-Space – R-DEC became a distributor of k-Space products
- 2006 Veeco – R-DEC became the sole representative of Veeco components.
- 2007 Process Integration Center (PIC) was established in Koya, Tsukuba as a demonstration facility of k-Space products.
- 2009 Thermal Desorption Spectroscopy System for Hydrogen Analysis was developed with NIMS and obtained a joint patent. The system was commercialized and sales started.
- 2017 R-DEC KOREA was established as a result of business partnership with SY SCIENCE CO. in Korea.
- 2018 Tokyo Branch was opened at 3-Chome Hongo, Bunkyo-ku, Tokyo.

### Business Description

We provide products that are necessary for researchers and engineers, in their pursuit of cutting-edge science and technology, that will create the future.

We are selling vacuum-related products, measuring instruments and components from more than one hundred suppliers, including overseas leading suppliers' measuring instruments, and components used for semiconductor development and manufacturing.

Our self-developed products, such as thin-film deposition equipment, analysis equipment, and vacuum transfer equipment, which utilize vacuum technology we have cultivated since our establishment, aim to improve efficiency and ease-of-use by combining them with automatic control software. We can also flexibly respond to needs for custom-made products.

### Customers

National research institutes, inter-university research institutes, university laboratories, public research institutes, private companies, overseas universities and research institutes, etc. We have customers in Japan, China, Korea, Taiwan, the United States, Germany, Canada, Singapore, Czech Republic, Italy, Poland, India and Australia.