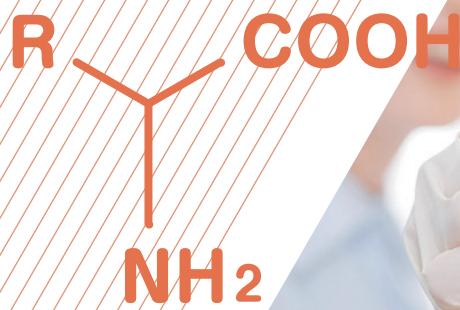




NIPPON RIKA

Lead The Future of Amino Acids

We support people's lives with the potential of amino acids.



Nippon Rika Co., Ltd.

At Nippon Rika Co., Ltd.,  
we are passionate about developing products and services  
that drive innovation and sustainability.





# Production System

## Our Strengths



Established

**1939**

Global Support



**Amino Acids & Derivatives**

Electrolysis Technology



High-Purity Purification



Jet Mill Grinding



## Plant Specifications

 **33,000 m<sup>2</sup>**  
Plant Area

 **+ Explosion-Proof GMP Plant**

 **82,000 L**  
Total Reactor Capacity

 **71**  
Ashikaga Plant Staff

 **400 m<sup>3</sup>/day**  
Wastewater Treatment

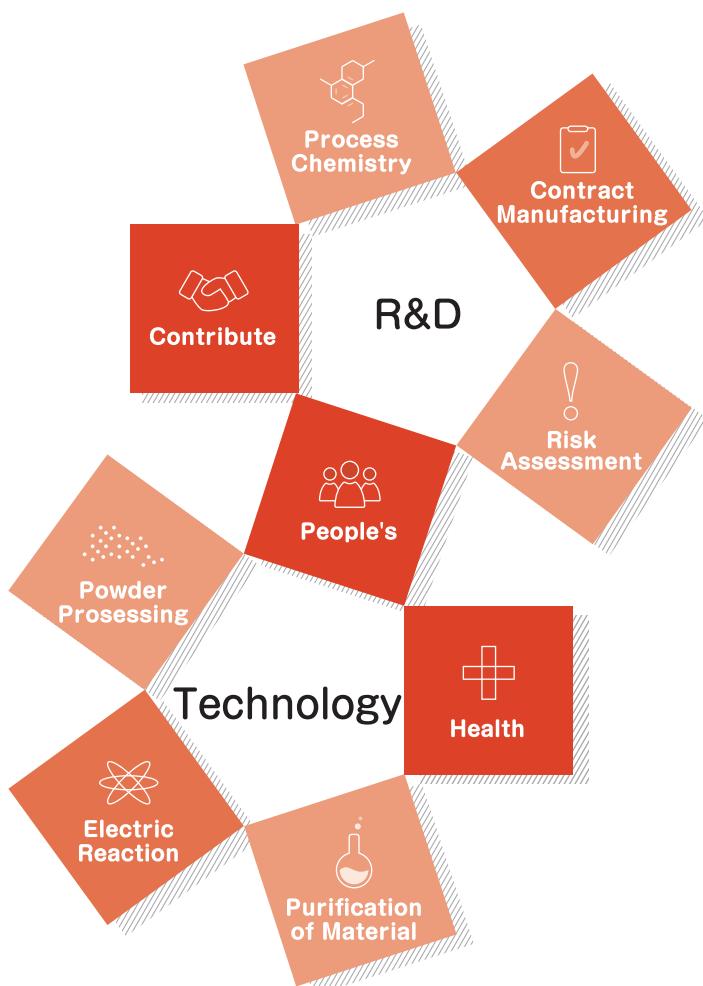
## Global Compliance



### National Drug Regulatory Authorities and Certification Bodies

- PMDA (Pharmaceuticals and Medical Devices Agency, Japan)
- NMPA (China National Medical Products Administration)
- FDA (U.S. Food and Drug Administration)
- EDQM (European Directorate for Drug Quality)

## R&D Mission and Facts



20~30

Process Steps /Year

30~60

Analytical Methods /Year

5

Safety Risk Assessment /Year

Through our innovative R&D approach,  
we bring the best science to our customers.

## R&D Facilities and Equipment



### Process Chemistry Lab

- 0.01-10L Glass Reactor
- Up to 2L/Up to 5L
- 100g Scale Electrolysis Apparatus
- Rotary Evaporators
- Two Vacuum Shelf Dryers
- 0.1L Pressure Filter
- Up to 0.1L Organic Synthesis Apparatus
- Two Small Centrifuges
- (for Crystal Separation)

### Kilo Lab

- 50L GL Reactor
- 100L GL Reactor
- $\Phi 330\text{mm}$  Magnetic Nutsche
- 10L/20L Glass Filter Bottles
- Kilogram-Scale Prototype
- Electrolysis Apparatus

### Physical and Chemical Testing

- Particle Size Distribution Analyzer
- UV-VIS Spectrophotometer
- FT-IR
- Whiteness Analyzer
- Karl Fischer Moisture Analyzer
- Amino Acid Analyzer
- TOC Analyzer
- HPLC
- GC (Headspace Sampler)
- LC-MS
- Atomic Absorption Spectrophotometer
- Automatic Titrator
- Ion Meter
- Kjeldahl Distillation Apparatus
- Automatic Melting Point Apparatus

### Microbiological Testing

- Autoclave
- Dry Heat Sterilizer
- Safety Cabinet
- Microplate Reader
- Clean Bench

### Others

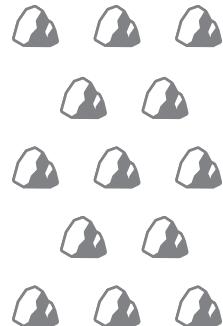
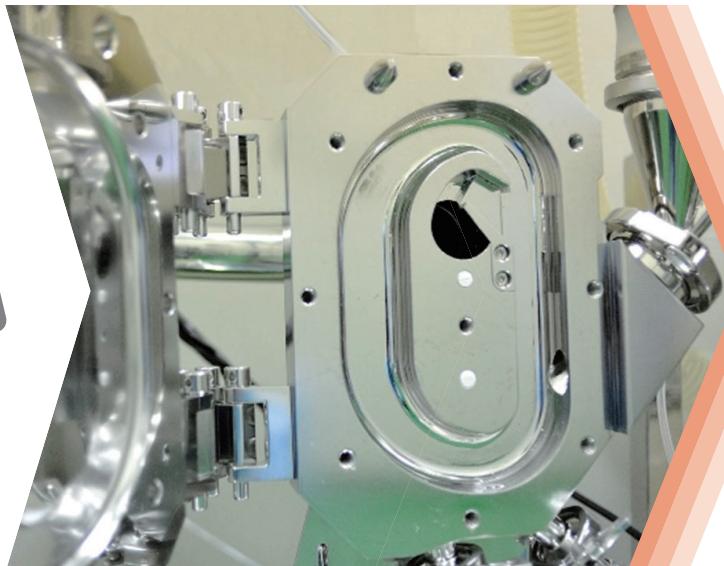
- Stability Tester

## Jet Mill Grinders



High-speed jet airflow causes crystals to collide and pulverize.

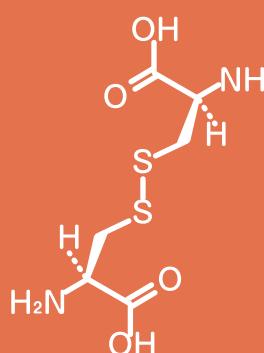
Since the temperature rise is minimal, it is also suitable for pulverizing heat-sensitive materials.



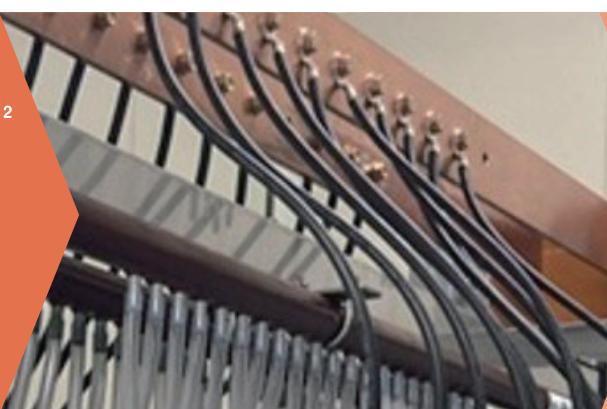
## Electrolyzer



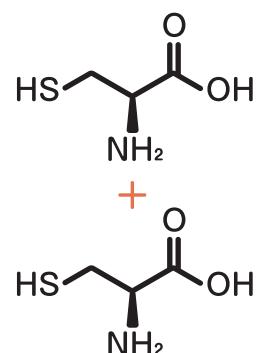
We have the technology to convert cystine to cysteine through electrolysis.



Cystine



Electrolysis



Cysteine

## Pilot Plant

11

**Reactors  
in Total**

5400L Capacity

10

**Glass-Lined  
Reactors**

(50 to 600L)

1

**Stainless Steel  
Reactor**

(500L)

2

**Filter Dryers**

(400L)

1

**Electrolyzer**

1

**Vacuum Distillation  
Apparatus**

(100L, 100Pa)

## Commercial Production Capacity

SUS Reactor

GL Reactor

15 500 to 1000L



6 1000 to 2000L



11 2000 to 3000L



8 3000 to 4000L



1 4000 to 5000L



3 5000L or more



# Core Technology

Amino Acids  
(especially cysteine and tyrosine)

Amino Group

Acetylation, Formylation,  
Cbz Derivatization, Boc Derivatization

Carboxyl Group

Esterification (methyl, ethyl, etc.),  
Reduction (alcohol conversion)

Side Chain

Alkylation, Methylcarboxylation, Amidation

Others

Racemization  
Electrolytic reduction (cystine to cysteine)  
Electrolytic desalination (hydrochloride-free)  
High-purity purification  
(increased content, trace metal removal)

Others

(Reactions)

Esterification, amidation, acylation, sulfonation,  
 $\text{NaBH}_4$  reduction, acid chloride formation

(Techniques)

Crystallization, distillation, and air-flow pulverization (microparticulation)





NIPPON RIKA

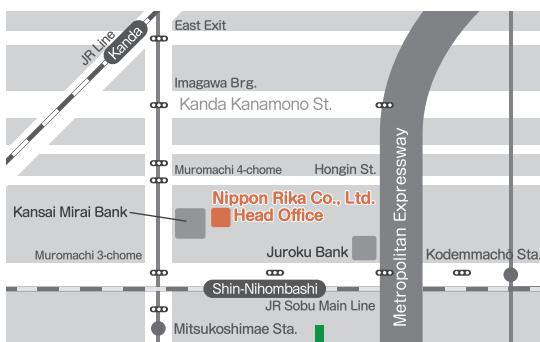
NIPPON RIKA CO., LTD.



[www.nipponrika.co.jp/en/](http://www.nipponrika.co.jp/en/)



## Head Office



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### Sales Department

TEL: 03-3241-3557 FAX: 03-3242-3345

### General Affairs & Human Resources Group

TEL: 03-3241-3682 FAX: 03-3241-5774

## Ashikaga Plant



610, Yanada-cho,  
Ashikaga City, Tochigi Prefecture 326-0321

### ISO 14001 Certified Plant

### Registered Business Location

Nippon Rika Co., Ltd. Ashikaga Plant

## Registered Scope

Manufacture of amino acids (pharmaceuticals, quasi-drugs, food additives, cosmetics, etc.) and chemical products  
Contract manufacturing of amino acid derivatives, peptides, pharmaceutical intermediates, and investigational new drugs