

SANTOKU CORPORATION

<COMPANY PROFILE>

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Phone	+81-78-431-0531 (main number)
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Website	http://www.santoku-corp.co.jp/english/
Number of employees	236 persons
Capital	¥1,500,000,000.-
Incorporated in	1949
President	Chikara Okada

<BUSINESS>

Manufacture and sales of rare earth metals, alloys and compounds (Samarium cobalt alloys and neodymium iron alloys for permanent magnets, hydrogen-absorbing alloys for nickel-metal hydride battery anodes, lithium cobalt oxide for lithium-ion battery cathodes, ultralight magnesium lithium alloys, alloys for magnetic refrigeration, etc.)

<TECHNOLOGY>

World's highest level of technology

Exploiting the infinite potential of rare earth elements



Lithium cobalt oxide being processed



Magnetic characteristic evaluation

Santoku Corporation is one of the few comprehensive manufacturers of rare earth elements in the world, handling all processes from raw material processing to the completion of high-purity compounds and alloys. It is engaged in the industrial production of rare earth metals, and also possesses excellent technology for the production of thin pieces of neodymium magnetic alloys via the Strip Casting (SC) Process, for the nano-tech synthesis of compound powder, for refining via molten salt electrolysis, and for fusion casting.

Regarding the fusion casting of rare earth elements in particular, Santoku independently developed its patented technology, the SC Process, which has become the world's standard manufacturing method. The company successfully started industrial production of neodymium magnetic alloys, which have the strongest magnetic force of all permanent magnets, and has received high evaluation from users worldwide.

The resource limit problem of rare earth elements was highlighted by the “rare earth crisis” in 2010. To break dependence on China, Santoku recycles the waste materials of rare earth magnets generated within Japan. The waste materials are made into oxides in the Kobe and Miki Plants, and then reduced to rare earth metals via molten salt electrolysis (Santoku is the only company in Japan that uses this method). The recycled materials are used in the Akashi Plant to produce thin pieces via the SC Process.

Rare earth elements, discovered over a period of more than 100 years, have specific scientific characteristics. By applying them to common products such as hybrid vehicle motors, home electric appliances, cameras and cell phones, as well as to next-generation energy-related fields that seek to realize a low-carbon society, Santoku Corporation is always striving to make greater contributions to society.



Neodymium magnetic alloys

【Behind the scenes of development】

Santoku Corporation began research for the industrial production of rare earth elements in 1948, trying to produce flint for lighters. While scientists around the world took notice of the unknown potential of rare earth elements and continued research, Santoku also was engaged in the industrial production of rare earth elements mainly via separation refining and metal refining. The company has always offered high-performance materials that meet the demand of the times, such as materials for permanent rare earth magnets, as well as materials for batteries (nickel-metal hydride battery, lithium-ion battery and lithium primary battery).

【Unique features】

The main feature of Santoku Corporation is its excellent skills of technical development, which bring out the physical properties of rare earth elements and their alloys to the utmost limit. The company holds over 200 patents both in Japan and around the world, and various “world’s first” and “Japan’s only” technologies. Santoku leads the world by providing cutting-edge materials with higher performance and value through, for example, Japan’s only high-quality rare earth production method using molten salt electrolysis and the “SC Process” fusion casting method which has now become the world’s standard.

【Future development】

Rare earth elements have been gathering attention as materials that “support the future” because they contribute to energy saving and global environment conservation. For example, hybrid vehicles were made possible by the development of highly efficient permanent magnet motors and safe and clean nickel-metal hydride batteries, both of which are made from rare earth elements. For the future, the company needs to develop new applications to contribute to the low-carbon society, such as the application of hydrogen-absorbing alloys to hydrogen storage methods to be used in the upcoming hydrogen economy. Santoku is tackling many projects to meet various demands from environmental, energy-related, next-generation and other industries.

<TOPICS>



As light as plastic!

The world's lightest* alloy, SanMaLia (magnesium lithium alloy)

Santoku Corporation has long dealt with special alloys and metals, such as rare earth metals for magnets and lithium foil, and thereby developed its unique technology. Using this, the company established a manufacturing method of the world's lightest alloy, a magnesium lithium alloy named SanMaLia, and improved its strength and anti-corrosion quality so that it could be used for personal computer cases and other items. In light of this accomplishment, Santoku received the Technology Award from the Japan Magnesium Association in 2015. Even after the product was put into practical use, the company continued its efforts to further enhance its quality, and succeeded in a substantial improvement of its flame-resistant properties.

*As of March 2017



Signed a comprehensive cooperation agreement with the Muroran Institute of Technology

To develop new applications of rare earth elements

In November 2014, Santoku Corporation and the Muroran Institute of Technology made a comprehensive cooperation agreement with the purpose of building new academia-industry cooperation models, such as research exchange via joint development and the creation of an endowed chair. In cooperation with Japan's only research organization specialized in the effective application of rare earth metals, "Muroran Materia" (Research Center for Environmentally Friendly Materials Engineering, Muroran Institute of Technology), Santoku is advancing research toward

the future while seeking the potential for industrial application of rare earth elements.

<HISTORY>

- 1937 Founded as Santoku Kinzoku Co., Ltd.
- 1949 Santoku Kinzoku Kogyo Co., Ltd. was established
- 1964 Established an extrusion manufacturing method for pyrophoric alloys and expanded into overseas markets
- 1985 Increased production of neodymium metal using the electrolytic process and began its sale as a magnetic alloy material
- 1990 Began the mass production and sale of hydrogen-absorbing alloys for nickel-metal hydride batteries
- 1999 Santoku America, Inc. was established
- 2000 Changed the corporate name from Santoku Kinzoku Kogyo Co., Ltd. to Santoku Corporation; obtained ISO9001 certification
- 2001 Invested capital in Baotou Santoku Battery Materials Co., Ltd.
- 2011 Established China Minmetals Santoku (Ganzhou) Rare Earth Material Co., Ltd. and began production
- 2015 Received the Japan Magnesium Association Technology Award for the world's lightest alloy, SanMaLia