

Jan. 31, 2025

Taiyo Nippon Sanso Corporation

RASIRC, Inc.

Notice Regarding the Sale of BRUTE® Peroxide in JAPAN, Enables Supply of Hydrogen Peroxide with Low Water Concentration

Taiyo Nippon Sanso Corporation (Head Office: Shinagawa-ku, Tokyo; President: Kenji Nagata, hereinafter “TNSC”), a Japanese industrial gas business company in the Nippon Sanso Holdings Group, and RASIRC, Inc. (Head Office: California, USA; CEO: Jeffrey Spiegelman) (*1), a group company of TNSC, have been supplying highly concentrated hydrogen peroxide gas delivery systems (Peroxidizer®) since 2013. We are pleased to announce that TNSC has begun selling BRUTE® Peroxide, a canister-type source that offers easier handling and a lower entry-point for the use of hydrogen peroxide, as a new addition to the BRUTE suite of chemicals.

*1 RASIRC, Inc. provides new materials and vaporizers for semiconductor manufacturing processes that are increasingly miniaturized using its advanced membrane separation technology.



External view of a BRUTE® Peroxide canister

1. BRUTE® Peroxide Summary

BRUTE® Peroxide is a canister-type hydrogen peroxide source. RASIRC’s proprietary adsorbent technology enables the safe handling and stable delivery of highly concentrated hydrogen peroxide vapor for semiconductor fabrication processes. The characteristics of the product are the following three points.

- ① The conventional bubbling method of using a hydrogen peroxide solution can only supply up to a few hundred ppm of hydrogen peroxide, owing to limitations posed by Raoult's Law. However, BRUTE[®] Peroxide can supply hydrogen peroxide at more than 100 times higher concentration.
- ② The canister-type source offers users easy handling, a low initial cost, and the immediate use of hydrogen peroxide within customer tools, which makes it suitable for research and development as well as low-volume production processes.
- ③ BRUTE[®] Peroxide as a new hydrogen peroxide supply source in a stainless canister that is easy to handle and has a lower water content.

2. BRUTE[®] Peroxide Specifications

Item	Specification	Remark
Canister	φ 101.6 mm H 296.9 mm	Special inner coating
Filling weight	235 g	Weight ratio of Hydrogen peroxide and Solid adsorbent = 1:1
Supply concentration (*2)	H ₂ O ₂ : 2,248 ppm H ₂ O: 1,128 ppm (Conc. ratio: H ₂ O ₂ :H ₂ O=2:1)	Experimental data @ canister temp./25 °C, canister press. /760 torr, carrier gas flow/1,000 sccm (Ref.: Peroxidizer [®] conc. ratio H ₂ O ₂ :H ₂ O = 1:4)

*2 The actual supply concentration is affected by the carrier gas flow rate, canister temperature / pressure, pipe length, etc.

3. Background

Water (H₂O), oxygen (O₂), and ozone (O₃) are commonly used chemicals in the semiconductor manufacturing process. In recent years, hydrogen peroxide (H₂O₂) has attracted wide interest as a promising new reactant because of its ability to deposit high quality films at low temperatures, compared with the aforementioned conventional alternatives.

Peroxidizer[®] has received a process-of-record from a major device manufacturer that can supply hydrogen peroxide at a high flow rate and concentration for mass production processes. Moreover, we have received requests from users to minimize the amount of water carried along with hydrogen peroxide. Therefore, RASIRC has developed and sold BRUTE[®] Peroxide as a new hydrogen peroxide supply source in a stainless canister that is easy to handle and has a lower water content. TNSC also has recently begun selling BRUTE[®] Peroxide in Japan.

4. Future Plans

We plan to expand the sales of BRUTE[®] Peroxide to research and development applications as well as low-volume production process requirements, mainly targeting advanced semiconductor segments, such as logic and memory. In addition, coupled with Peroxidizer[®], we plan to expand the range of applications of hydrogen peroxide to optical devices and biomedical segments, where we have observed a significant increase in the number of inquiries.

Reference: Research paper data

Robust low-temperature (350 °C) ferroelectric Hf_{0.5}Zr_{0.5}O₂ fabricated using anhydrous H₂O₂ as the ALD oxidant | Applied Physics Letters | AIP Publishing

5. Inquiry

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【Company Profile】

Taiyo Nippon Sanso Corporation

Business Activities: Manufacture and sale of various industrial gases such as oxygen, nitrogen and argon, LP gas, medical gas, and special gases and fusing equipment and materials, various gas-related equipment, air separation equipment, assembly, processing, and inspection of electronic components, and equipment maintenance. Assembly, processing, and inspection of electronic components, and equipment maintenance

Founded: October 30, 1910

Established: February 4, 2020

Capital: 1.5 billion yen

Owner: Nippon Sanso Holdings Corporation (Investment ratio: 100%)

Sales revenue: 414.3 billion yen (Japan Segment Revenue for the Fiscal Year Ending March 31, 2024 Nippon Sanso Holdings Corporation.)