

March 30, 2026

**Contributing to the Launch of the World's First Food Freezing Equipment Certification System
Participation in a Consortium Led by The Institute for Advancement and Promotion of Food
Freezing Technology**

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, participated as a consortium member in the Freezing Equipment Performance Evaluation Project led by The Institute for Advancement and Promotion of Food Freezing Technology (Representative Director: Toru Suzuki; hereinafter “FF Tech”). As the only manufacturer of liquefied gas-type freezers among the initial participating companies, TNSC supported the development of performance evaluation standards and contributed to the launch, on March 9, 2026, of the world’s first Freezing Equipment Performance Certification System and Freezing Power Certification System.

1. Overview and Background of the Project

This is a world’s first initiative aimed at improving the quality of frozen foods and promoting food freezing technology by establishing scientifically based performance evaluation standards for freezing equipment and creating a certification system to eliminate mismatches between freezing equipment manufacturers and users. Meanwhile, with the growing demand for frozen foods, a wide variety of freezing equipment has emerged; however, no fair and standardized performance evaluation criteria currently exist. As a result, users cannot objectively compare equipment performance, leading to a gap between their expectations and the actual performance after installation. This has highlighted the need across the industry for the establishment of transparent and reliable performance evaluation standards.

2. Key Features of the Freezing Equipment Performance Certification System

Feature 1: Establishment of “Unified Evaluation Standards” Based on Scientific Evidence

To enable fair comparison of freezing equipment performance, this system uses standardized test packages (Tylose Gel) with uniform properties and high reproducibility as freezing samples, rather than actual food products. Since results can vary significantly depending on factors such as composition, moisture content, shape, and initial temperature, standardized test packages are used as “simulated foods” to conduct measured evaluations under consistent conditions.

The following two indicators are used to evaluate freezing quality and speed:

- MIG Time (Maximum Ice Growth Time)

The time required to pass through the temperature range (0°C to -5°C) that directly affects the size of ice crystals formed during freezing

- FR Time (Freezing Time)

The time required to pass through the temperature range (10°C to -15°C) from the start of freezing to completion

Feature 2: Evaluation under Actual Operating Conditions and Visualization of “In-Chamber Variations”

Measurement tests are conducted with the manufacturer-specified standard loading capacity (recommended processing volume) inside the chamber, rather than under no-load or low-load conditions. In addition, temperatures are measured at various points within the chamber, and, based on these results, the average and standard deviation of freezing time across the entire chamber are calculated. This enables visualization of variations in freezing speed depending on location within the chamber—factors that have previously been difficult to observe—and provides information directly linked to quality reproducibility in actual operations.

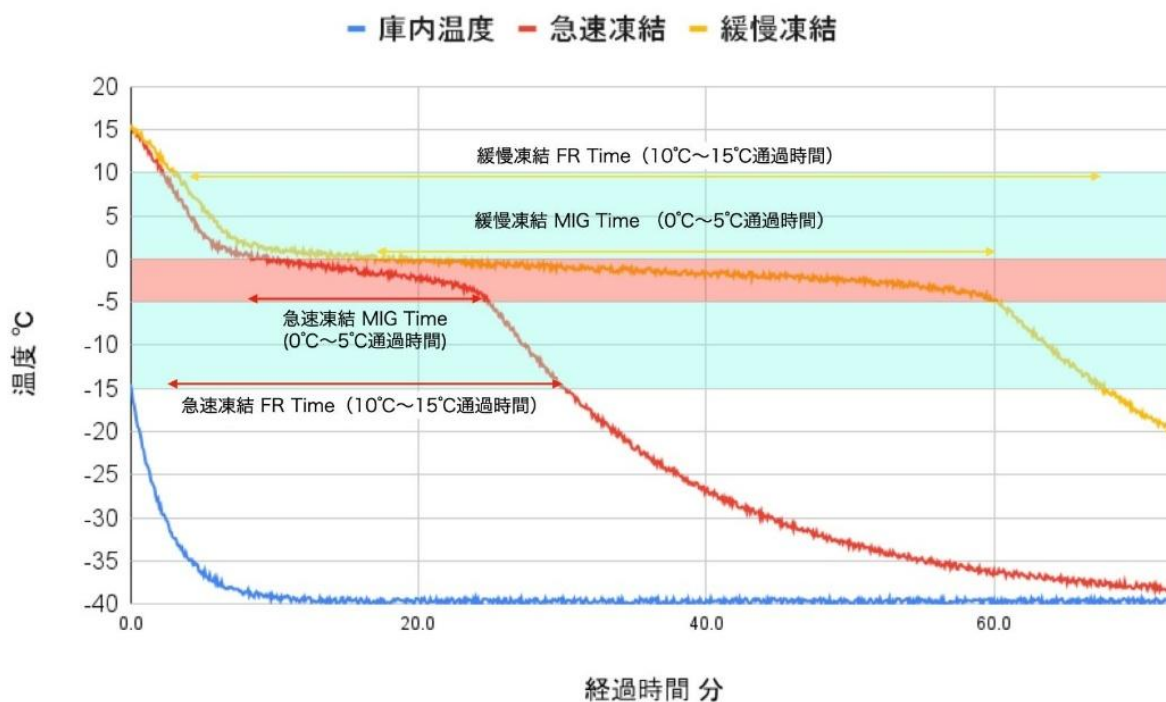


Figure: Temperature changes over time for the chamber and freezing samples

Feature 3: Fair Governance by a Third-Party Committee

A “Third-Party Committee,” chaired by Professor Manabu Watanabe of Tokyo University of Marine Science and Technology and composed of five experts from universities and public research institutions, has been established. The committee ensures fair and transparent operation, from verifying the scientific validity of evaluation procedures to overseeing the entire framework.

3. Freezing Power Certification System as a Freezing Equipment Performance Indicator

The Freezing Equipment Performance Certification System ensures that performance is measured fairly. In contrast, the Freezing Power Certification System is designed to present these measurement results to users at a glance. Its key feature is that even users without specialized knowledge can easily compare and understand performance. Based on the MIG Time (time required to pass through 0°C to -5°C) obtained from the certification system, freezing performance is clearly visualized using a five-level star rating.

4. Future Outlook

With the certification system now in operation as of March 9, 2026, TNSC will proceed with obtaining certification for its liquefied gas-type freezers.

The certification initially applies to batch-type freezing equipment. Going forward, performance evaluation standards for continuous-type freezing equipment are planned to be developed. TNSC will continue to contribute as a consortium member to the development of the system. Through the establishment of this system, TNSC aims to provide users with clear criteria for equipment selection and contribute to the sustainable growth of the frozen food industry.

Reference: Application to and Details of the Freezing Equipment Performance Certification System

For the latest information on application procedures, evaluation details, and required documents for the “Freezing Equipment Performance Certification System,” please visit the official website of The Institute for Advancement and Promotion of Food Freezing Technology (FF Tech).

- FF Tech Website: <https://www.fftech.jp/certification>