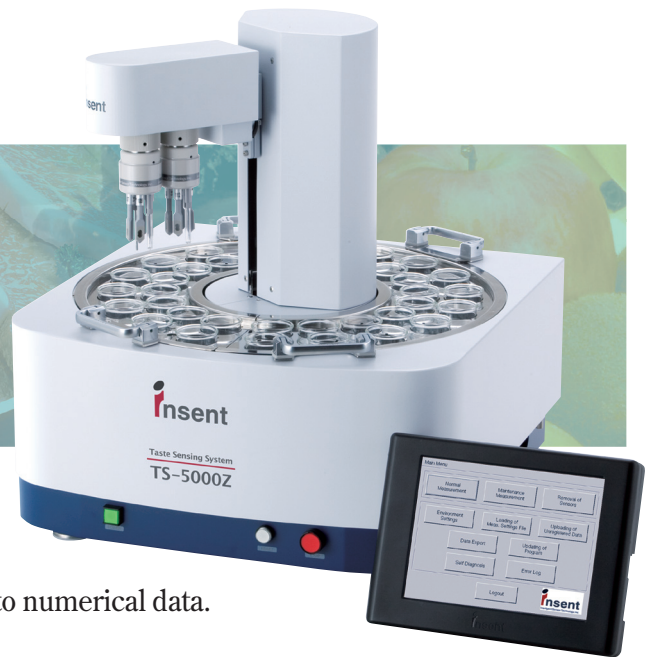


# Taste Sensing System TS-5000Z



The Taste Sensing System TS-5000Z, which employs the same mechanism as that of the human tongue, converts the taste of various substances such as food and drugs into numerical data.

Using unique aftertaste measurement technology, even aspects such as “richness” and “sharpness,” which could not be measured by conventional chemical instruments, can be expressed.

Moreover, the proprietary analysis application makes obtaining analysis results easy.

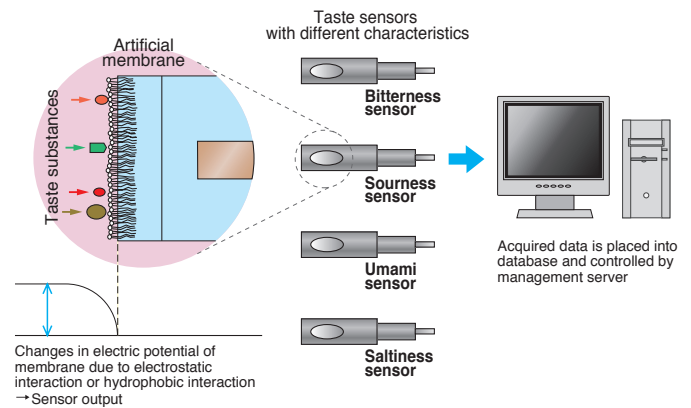
As a support tool for sensory evaluation, the TS-5000Z is a powerful tool for use in a variety of fields such as quality control, product development, marketing, and sales, where objective evaluation of taste is required.

## Taste Sensors Model Taste Reception Mechanisms of Living Organisms

The surface of the tongue of living organisms is formed of a lipid bilayer with its own specific electric potential. This electric potential varies according to the electrostatic interaction or hydrophobic interaction between various taste substances and the lipid. The amount of change is perceived by the human brain as taste information, an activity referred to as taste judgment.

Our taste sensors imitate this taste reception mechanism of living organisms. Our taste sensors consist of an artificial lipid membrane (similar to that of the human tongue) that causes electrostatic or hydrophobic interactions with various taste substances, allowing them to sense “taste.”

## Reaction principle of taste sensors

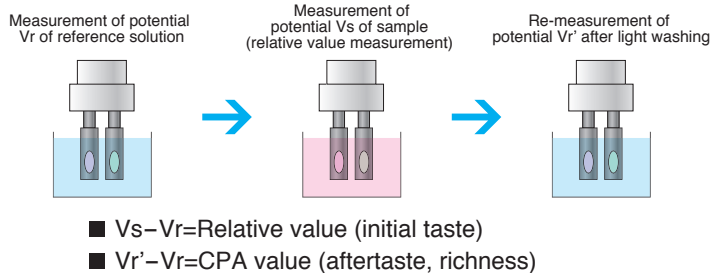


## Measurement Method

The taste sensors evaluate two types of taste, namely initial taste, which is the taste perceived when food first enters the mouth, and aftertaste, which is the persistent taste that remains in the mouth after the food has been swallowed. Using the potential of a reference solution\* as zero, the difference in potential with the sample liquid is measured as the initial taste. The sensors are then lightly washed and the difference in potential with the reference solution is measured as the aftertaste.

\*Reference solution: Almost completely tasteless solution containing 30 mM KCl and 0.3 mM tartaric acid. The Taste Sensing System uses it as a substitute for human saliva.

## Measurement method of taste sensors



## Taste information

**Initial taste:** Sourness, bitterness, astringency, umami, saltiness, sweetness  
**Aftertaste:** Aftertaste from bitterness, aftertaste from astringency, umami richness

The taste information is an indication of taste obtained from the results measured by the taste sensors. The evaluation of many different tastes is possible by changing the settings of sensors.

## Management System through Networks

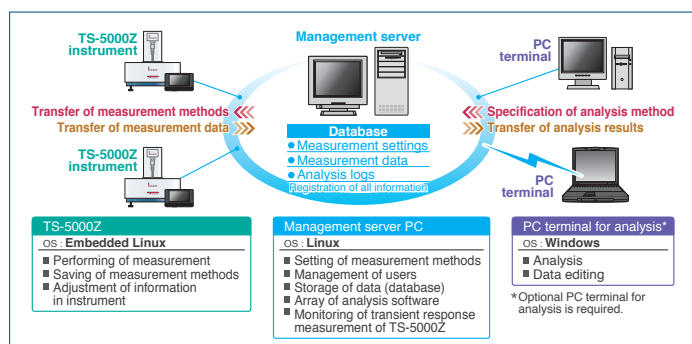
The TS-5000Z instruments and PC terminals form a network via a management server.

Users can make various settings, such as measurement methods, from the management server.

When the measurement methods are transferred to a TS-5000Z instrument, the instrument performs measurements according to these methods, and the measurement data are saved to the database on the management server.

Analysis of measurement data is performed from a PC terminal, by accessing the database on the management server via the network. The analysis results and graphs can be saved as files and edited on the PC terminal.

The taste sensing system network is formed in this way with the management server as its core.



## Easy Operation via Touch Panel

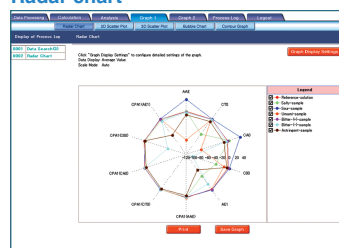
The touch panel provided with the TS-5000Z instrument employs embedded Linux for the OS. By setting the measurement methods beforehand on the management server, measurements can be performed simply through the touch panel. This saves space, since no PC and peripherals such as a keyboard and mouse are required.



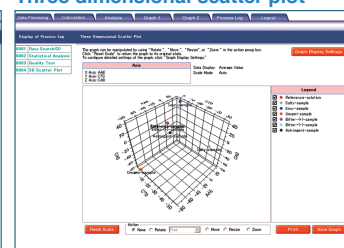
## Various Graphing Functions

The analysis application provides eight graphing functions. By using different graphs according to the purpose, measurement results can be displayed in an easy-to-understand manner. These graphing functions can also be used for presentation materials.

### Radar chart

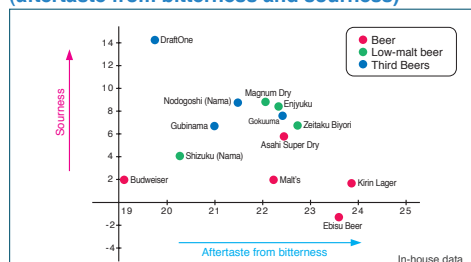


### Three dimensional scatter plot

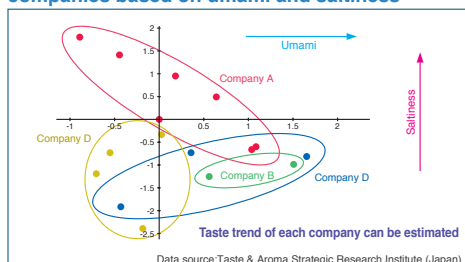


## Food Sample Examples

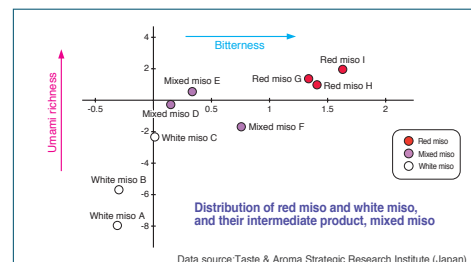
### Beer map (aftertaste from bitterness and sourness)



### Taste trends for instant soups of various companies based on umami and saltiness



### Miso classification



### Other Measurement Examples

Wine, Beer, Tea, Coffee, Soup, Soy sauce, Beef, Rice, Drug (To measure solid foods, mixing the foods with pure water is necessary.)

## Specifications of Taste Sensing System TS-5000Z

Name	Item	Specifications
Instrument	Number of measurement samples	14 samples max. (depends on measurement procedure)
	Measurement sample volume	35 to 70 ml (depends on the nature of measurement sample)
	Dimensions (W x D x H) / Weight	470 mm x 530 mm x 510 mm / 26 kg
Touch panel	CPU / Memory capacity	SH7727 / 64 MB
	OS (embedded)	SuperH Linux
	Simple Web server	thttpd
Taste sensor	Response mechanism	Membrane potential measurement
	Sensor type	Artificial lipid membrane
	Measurement object	Drinks, solids, drugs, etc. (in case of solids, preliminary liquefaction is required)
Ceramic reference electrode	Liquid junction	Single junction through ceramic
Temperature sensor	Response mechanism	Impedance measurement using platinum resistance thermometer (Pt1000)
Management server PC	CPU / Hard disk / Memory capacity	Pentium 4, 2.0 GHz or higher / 160 GB or more / 1 GB or more
	OS	Red Hat Enterprise Linux ES 3
	DBMS	PostgreSQL8
	Web server	apache2 + Tomcat
Analysis application	Analysis functions	Data search, data processing function, correction processing (5 types), statistical analysis, multiple regression analysis, principal component analysis, graphing tools (8 types), macro function, etc.

\*Windows PC for analysis application is required for analysis PC. For details, please refer to your distributor.

**insent** Intelligent Sensor Technology, Inc.

5-1-1 Onna, Atsugi-shi, Kanagawa-Pref., Japan 243-0032

Tel : 046-296-6609 Fax : 046-225-7933

E-mail : taste.sensor@insent.co.jp URL : <http://www.insent.co.jp/english/index.htm>

**Prof. Toko's Laboratory**

URL : <http://ultrabio.ed.kyushu-u.ac.jp/tope.htm>

● The specifications and appearance of this product are subject to change without notice for product improvement purposes.

● No part of this document may be reproduced without prior consent from Intelligent Sensor Technology, Inc.

CAT.NO 0004-E-A-1 Produced May 1, 2008 ddc