



CEAM-SVAH

CEAM SENSOR VIRTUAL MASS HYSTERESIS



**PATENT
TECHNOLOGY**

Patent No. 20202400000378-2024



System & Smart Sensor Division



OBSERVATION

Although it is well known that any heated or cooled product has its own specific thermal inertia linked to its mass and its thermal transmission capacity, to give a practical example: a whole frozen tuna defrosts more slowly than a small shrimp and the same applies to any other product whether food or medicinal. But especially in the case of refrigeration standards in any field, both drugs and food, they do not take them into account in the slightest and in order to guarantee correct conservation of the products, simply requiring the monitoring of the fridges containing these products, often carried out with archaic and completely inadequate systems to achieve the real purpose, generating large unjustified waste in cases where, for example, a fridge is left open for a sufficiently long time for the control probe to detect a variation up to quickly reaching the room temperature, but which in many cases does not have generated no or even irrelevant variation at a regulatory level in most of the products frozen inside, thanks to their thermal inertia.

But on a formal level, not being able to demonstrate this condition, these products must all be thrown away, with a very pleasant and useless waste. Further confirmation of what has been described occurs by observing that in some cases to "cheat" the monitoring system, we often find very imaginative and dangerous do-it-yourself solutions, such as probes inserted into jars filled with antifreeze liquids, which simply generate a out of control delay of the measurement, and if on the one hand they reduce the problem, the actual result on the actual conservation of the products is unknown and therefore very dangerous.



The IDEA

When in light of what has been described above, the idea was to seriously address the issue with a method that was not out of control and dangerous like the jar no, but which was a scientific solution that could really reduce unnecessary waste but sense to generate risks for the correct conservation of products.



OUR SOLUTION

Thus was born the C-SVMH Cws Sensor Virtual Mass Hysteresis technology (Patent No. 20202400000378 - 2024).

The idea is to exploit the inertial thermal capacity of the products by detecting it with a specific scientifically validated procedure and using special sensors capable of measuring the real heating or defrosting curve, generating an exactly corresponding virtual profile, the one that is fashionable today call Gemello Digitale (Digital Twin), which will then be used by the CEAM CWS platform for correct monitoring also for regulatory purposes.

In practice, the platform, faced with a single real control sensor traditionally installed in the air inside the compartment of a fridge, will be able to generate other thermal profiles depending on the various types of products contained therein, virtually differentiating the thermal trend and with the possibility of organizing them into different classes of products with homogeneous behaviour, at least in the event of problems with the fridge, depending on the defrosting time, the products belonging to the classes whose virtual profile has not undergone changes such as to be eliminated can be saved from the required regulatory tolerance.

While only products that have actually undergone such a change as to have gone out of tolerance and therefore become potentially dangerous can be easily identified and therefore disposed of, thus drastically reducing waste and risks.



EXAMPLE OF SENSOR WITH BALLAST FOR RANDOM THERMAL DELAY



STATE OF ART

In the images on the left, the first two photos above show two example probes equipped with dangerous random thermal ballasts.

The first one at the top is equipped with a plastic jar filled with antifreeze liquids, in the second example a very thick metal cylinder has been applied under the probe, making the probe practically insensitive to thermal variations.



In both, although the attempt to mask the real thermal trend is ingenious in its simplicity, in these cases, as already well explained, the level of delay in the measurements is completely unknown and random, therefore the repercussions on the thermal quality of conservation are equally unknown. of the products, introducing enormous risks to the health of those who will have to take those products, whether it be drugs but also food products, especially those at high risk such as all easily perishable ones, or in the case of already frozen food products which could undergo thawing and refreezing without anyone noticing anything, becoming in many cases even poisonous.



Today, thanks to the C-SVMH solution patented by CEAM, there is no longer any need to take risks, but it is finally possible to carry out a scientifically safe check in



MANAGEMENT SYSTEM CERTIFICATE

Certificate no: 58354-2025-AG-ITA-SINGERT Initial certification date: 02 July 2020 Valid: 11 October 2021 - 02 July 2024
 Empty date of last certification cycle: 02 October 2021
 Date of last recertification: 15 September 2021

This is to certify that the management system of
CEAM CONTROL EQUIPMENT S.r.l - Sede Legale ed Operativa
 Via Val d'Orme, 291 - 50053 Empoli (FI) - Italy

has been found to conform to the Quality Management System standard:
ISO 9001:2015

This certificate is valid for the following scope:
 Design, production, installation and assistance of thermocouples, furnaces assembly of components for control equipments and system process regulations. Calibration service for temperature, pressure, humidity, electric resistance, voltage, current transducers and relatives industrial instruments and combustion analyzer (IAF: 19)

Issue and date: Viterbo (MS), 11 October 2021



For the issuing office:
 DNV - Business Assurance
 Via Zangari Park, 14 - 20073 Viterbo (MS) - Italy

Luca Belloni
 Luca Belloni
 Management Representative

Lack of fulfillment of conditions as set out in the Certification Agreement suspends the Certificate validity.
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