

The Range

Preparation

Dynamic - Static
Static HD



Dishwashing

Dishwashers
Washing system

Cooking

N900 - PD700
Snack 600
Industrial machines



Laundry equipment

Ovens

ActivePlus and Plus
FCF



Distribution

Self-Service ActiveSelf
Fit-System

Refrigeration

Refrigerated appliances



... and much more

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Control of
ActivePlus
ovens



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factor (F)

The methodology

Safety and quality

HACCP
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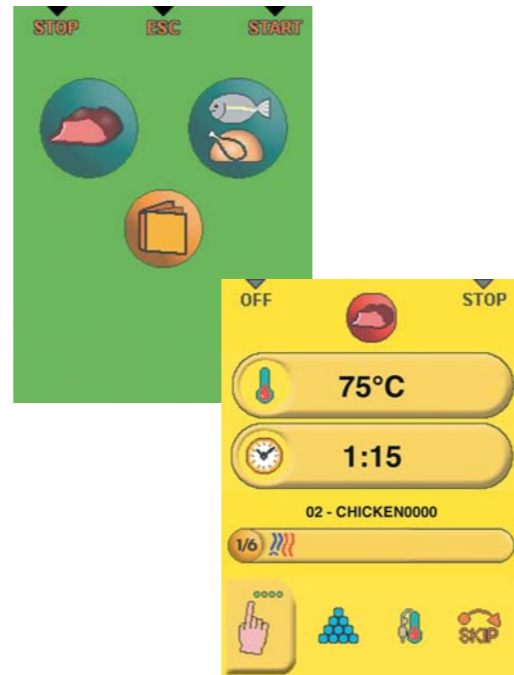


ActivePlus: operation of FoodSafe Control



Using **ActivePlus** and **FoodSafe Control** is **EXTREMELY EASY**: operators don't need to be experts in HACCP standards. It's enough to insert the six-sensor probe in the food, set the parameters and select the food category from two alternatives: 🐟 high risk and 🐔 standard risk foods. **ActivePlus** will start cooking automatically. During cooking, the **FoodSafe Control** display indicates the process status. ● Red light: microbiological safety conditions have not been met. ● Green light: process safety has been reached. If the food has not undergone microbiologically safe cooking, **ActivePlus** acoustically and visually signals the sanitary failure of the process. It is then possible to reselect the category of food and continue cooking with the previously selected parameters until safe conditions are reached. From there on, **ActivePlus** controls and carries the cooking process through to conclusion.

ActivePlus has a memory storage capacity of up to **2,000 events** and is equipped for connection to a special printer. The results can therefore be viewed immediately on the LCD **display** or **printed** classified by day or by individual operations. In both cases the variable factors which guided the cooking process can be viewed: time, core temperature and pasteurization factor, and also the personalized recipe name.



The pasteurization factor (F)

The **pasteurization factor** is an internationally recognized parameter used to evaluate the reduction of bacteria content. It is the value of the food's core temperature and the cooking temperature, as well as the combination of the two. The monitoring of this value is completely handled by the **FoodSafe Control** software, without the need for the operator to be aware of its logic and values. Close cooperation between **Zanussi Professional** and the Department of Food Sciences of the University of Udine allowed for the development of the **FoodSafe Control** software. One of its cornerstones consists of the pasteurization factor. The **pasteurization factor (f)** indicates the time necessary to destroy microorganisms by thermal effect. Microbiology has proven that microorganisms can be destroyed by heat in a predictable manner. Their resistance to heat is in any case affected by numerous factors, including:

- **species and strain**
- **rate of proliferation**
- **the environment in which heating or storage takes place**
- **the speed of temperature increase.**

Of great interest:

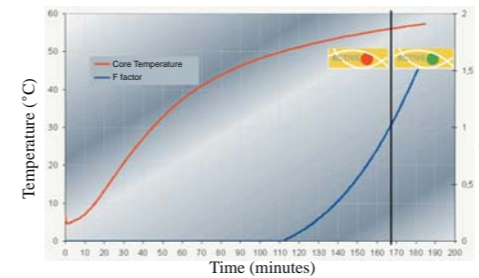
- **The FoodSafe Control**
- **The pasteurization factor (F)**
- **The new six-sensors probe**
- **Compliance with HACCP recommendations**

The methodology

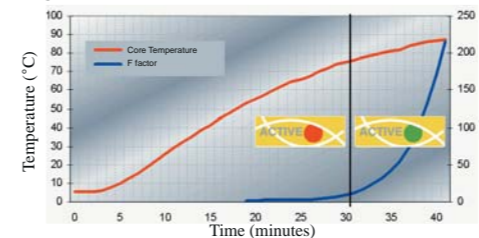
In order to determine the breaking point in the balance between the destruction and the survival of a given type of microorganism, numerous tests are needed, from which it is possible to determine the corresponding survival curve.

At this point in the analysis it is necessary to develop the proper methodologies for monitoring the microorganism destruction

Standard risk food: roast-beef



High risk food: chicken



"...time-temperature monitoring enables to optimize the process..."

process. Basically, it is possible to proceed in two ways. First of all, one can measure the consistency of the microorganism population before and after the thermal process. Of course, this process requires rather uncommon capabilities and technologies, and very long analysis times. At any rate the best alternative is an **integrated time and temperature monitoring of the process**. This methodology is based on the principle of microbiology, which states that lethal effects obtained at different temperatures during the same thermal process are cumulative.

Safety and quality

As a result, an integrated time and temperature monitoring makes it possible to **optimize the process**, obtaining a satisfactory level of food sanitation at temperatures which are lower than those set forth by HACCP recommendations. This fact is extremely important in order to maintain the original organic characteristics of the food and to guarantee high quality flavour (in short, to avoid overcooking).

To ensure correct temperature measurement, **ActivePlus** uses a rod-shaped probe with **six thermal sensors** of high precision (five-tenths of a degree centigrade). **FoodSafe Control** considers only the lowest of the six temperatures measured, the least favourable for the destruction of microorganisms, and thus the one that ensures the highest degree of food sanitation.

"...ActivePlus uses a new probe with six thermal sensors of high precision..."



ActivePlus: compliance with HACCP recommendations

Collective dining as a whole, and therefore gastronomy on the same level with large industrial kitchen appliances, is always more and more interested in guaranteeing adequate levels of hygiene in all phases of food handling, preparation and distribution. Topics which are commonly discussed include:

- Hygiene on the premises;
- Hygiene in production, to include the cooking process, where **ActivePlus** uses **FoodSafe Control** to guarantee safety from a microbiological standpoint;
- Hygiene in distribution;
- Hygiene and health of staff.

The principle of this commitment lies in the desire to reduce the risk of bacterial contamination to such levels so as to guarantee safety to the final consumer: all of this has been formalized in CEE directive 93/43 which lists the now familiar **HACCP (Hazard Analysis and Control of Critical Points)** recommendations. The basic concept of the HACCP approach consists of identifying dangers to foodstuffs in the food chain, determining control points and defining preventive measures to be taken at the control points.

ActivePlus safety

Article 3, sub-section 2 of CEE directive 93/43 establishes “the following principles on which the HACCP (Hazard Analysis and Control of Critical Points) is based:

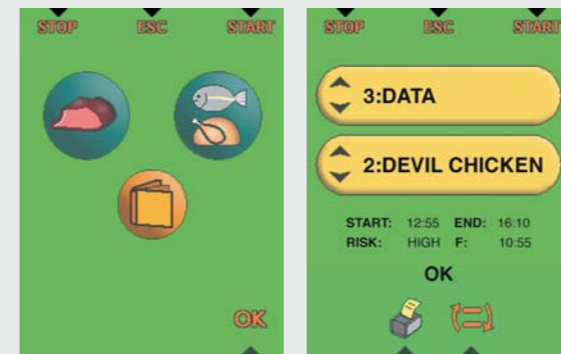
1. analysis of potential food risks in the activities of a food business;
2. identification, during said activities, of the points in which food risks may occur;
3. decisions to be taken concerning the points thus identified which may be harmful to food safety: ‘critical points’;
4. identification and application of control and surveillance procedures of said critical points (...)”

Since the fourth point, which deals with evaluation, refers to the hygienic system as a whole, it is not possible to include it in an analysis of how **ActivePlus** meets **HACCP** recommendations. This is because **FoodSafe Control** deals with the second of the three main areas of food protection (hygiene to avoid food contamination; heat to eliminate bacteria or halt their growth; cold to halt bacterial growth) with exclusive reference to the cooking phases.



HACCP:

1. Risk analysis
2. Critical control points
3. Verification



1. Risk analysis

To start with, it is best to mention some risk factors concerning food during the cooking phase:

- chicken, for example, runs a greater risk than does red meat, because it is more subject to salmonella poisoning;
- ground meat and boneless meat rolls may require a more thorough inspection than steaks or whole pieces of meat, as they are contaminated on the inside and not just on the outside;
- multiple phase preparation can multiply tasks and increases the risk of contamination.

In light of these complexities countless tests were run at the **Department of Food Sciences of the University of Udine**. This led to the development of a control system and an intuitive graphic interface for selecting the risk level based on the type of food to be cooked. Thanks to the wide experience thus gained and to the development of specific software, it was possible to classify the various foods and bacterial risks into just two categories, standard risk and high risk cooking. The advantages of this lengthy study are quite clear: very easy management of complicated safety conditions, without the need for specialized labour.

2. Critical control points

An analysis of the causes of food poisoning which have been observed systematically show weaknesses in cooking operations in two areas:

- improper temperature control
- insufficient food heating.

These causes automatically become critical points which must be systematically controlled to ensure a safe cooking process from a microbiological standpoint. For this reason **ActivePlus** puts together a **new probe with six thermal sensors**, 15 mm apart, capable of a precision on the order of five-tenths of a degree centigrade and extremely reliable. The six temperatures are measured every eight seconds. The **FoodSafe Control** system takes into account only the lowest temperature so as to guarantee the highest degree of safety and a correct insertion of the probe, even when cooking foods with reduced thickness (20 mm), with bone (the temperature rises more rapidly in muscle tissue) or when fat deposits are present (which can melt and change the probe's position). Once a precise and reliable temperature monitoring have been ensured, thermal exchange and uniform cooking performance satisfy the need for an adequate heating of the food.

3. Verification

Numerous measures have been taken to guarantee the correct operation of **ActivePlus**, such as:

- the creation of thermal calibration procedures for the probe, based also on altitude;
- the existence of limit values to ensure the correct operation of **FoodSafe Control**;
- automatic diagnosis and, if necessary, de-activation of the probe should one of the 6 sensors be damaged or malfunction;
- “smart” management of sudden losses of electrical current.

Frequently Asked Questions (FAQ)



What is FoodSafe Control for?

FoodSafe Control automatically ensures that safe conditions are reached from a microbiological standpoint during the cooking process, and it records the results in accordance with the recommendations set forth in the European directive HACCP (CE93/43).



"...aan oven can monitor and guarantee that the conditions that guarantee safe cooking are met..."

Safe conditions in the cooking process, what does that mean?

Foods always contain a certain number of microorganisms. A safe cooking process, starting of course by using safe food, must be able to bring that number down to acceptable levels so that there is no danger to the consumer.

How can safety in the cooking process be guaranteed?

The **FoodSafe Control** does not relieve the cook of the responsibility of observing normal food treatment practices, according to correct hygienic uses, both during the preparation phase (handling, storage and working) and during cooking. Indeed the oven can only monitor and guarantee that the conditions that guarantee safe cooking are met. The key variables of course are the minimum core temperature and the cooking time, but also the way in which these are combined (pasteurization factor or F factor). The product core temperature (which determines the destruction of the microorganisms) is measured with a high degree of precision by the new **ActivePlus** six-sensor probe: when dealing with safety the precision of temperature measurement is absolutely necessary in order to complete the destruction of the microbes.



"...some foods have a high risk of contamination, like fish for example..."



What is the pasteurization factor (F)?

The **pasteurization factor** is an internationally recognized parameter used to evaluate the reduction of bacteria content. It is the value of the food's core temperature and the cooking temperature, as well as the combination of the two. The monitoring of this value is completely handled by the **FoodSafe Control** software, without the need for the operator to be aware of its logic and values.

Why are there two risk categories, high and standard?

All foods contain a certain number of microorganisms. The factors that determine which risk category the food belongs to are the intrinsic tendency to contamination (such as fish, poultry and pork) and the need to undergo handling and working (with a resulting increase in the risk of contamination). A cut of beef prime rib, for example, does not normally undergo any particular handling, nor does it have an intrinsic tendency to contamination: it can therefore be considered at standard risk. This lowers the necessary safety levels (and the minimum temperature to be reached at the product core) thereby avoiding useless overcooking.

What does the operator have to do to use FoodSafe Control?

The operator does not need to have any specific knowledge of **HACCP** recommendations (CE93/43). It is enough to insert the probe in the food, set the cooking parameters and select the food's risk category. If the established parameters are sufficient to reach safe conditions, then the green indicator light of the **FoodSafe Control** will come on before the end of the cooking cycle, which ends according to the values determined by the operator. Should the parameters be

insufficient, at the end of the cooking cycle the light stays red and an acoustic alarm rings. The button of the previously selected risk category also begins to flash, and all of these warnings indicate that safe conditions have not been reached. Pushing the flashing button again will allow the **ActivePlus** to start cooking again until safe conditions are reached.

