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## High Performing Advanced Material Platform for Active and Intelligent Food Packaging: Cronogard

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Cronogard is an innovative product designed to significantly extend the shelf-life of packaged food. The cronogard technology, developed and patented by NICE FILLER SRL-Italy, is a family of products used in packaging that reduces the formation of biofilm on packaging surfaces.

Food packaging is the packaging industry's largest area of activity and with the \$900 billion per year worldwide industry is on the front lines. On the other side, according to the US Environmental Protection Agency (EPA), food and food packaging materials make up almost half of all municipal solid waste. The largest fraction of these waste materials come from fossil fuels and are non-degradable, thus representing a serious global environmental issue.

The shelf life of the packaging and food waste are two important challenges that the entire food industry supply chain is facing. More novel eco-friendly packaging solutions are needed because current environmentally friendly materials have poor shelf-life protection properties. According to the UN's Food and Agriculture Organization, extending shelf life is the most effective way to reduce food waste. Safer packaging is also needed to safeguard consumers and their changing consumption habits. The demand for smaller portions and packed and ready-to-eat food is increasing. Longer shelf life means less contaminated, safer food. The demand for more eco-friendly and sustainable films and coatings for effective food packaging has, therefore, generated considerable interest in recent years.

The [Cronogard](#) project (coordinated by NICE FILLER SRL-[Italy](#)) was awarded funding in the autumn of 2017 for €1,576,238 to introduce on the market of food packaging an innovative, advanced-material technology platform (Cronogard) based on an organic-inorganic filler, edible and biocompatible, characterized by a lamellar structure able to intercalate with ionic bonds molecules (antimicrobial, antioxidant, antibacterial), capable of maintaining the quality of food and to extend its shelf-life.

“We transformed a laboratory proof of concept into a series of industrialised products that are ready for the market,” notes coordinator Célia Gavaud. “Starting from lab tests on substances capable of extending shelf life in a natural way, we worked hard on application techniques and finally delivered products that can be directly used in packaging manufacturers’ processing lines without needing special machinery or changes to the consolidated processes.”

Traditional polymeric materials for packaging food protect it from attack by external agents but are not very effective at preventing the development of biofilm. The project’s innovation reduces the formation of biofilm by as much as 50 % on packaging surfaces. The protective and antibacterial activity inhibits the agents responsible for decay from forming inside the package. It is based on a compostable, recyclable filler developed to work with both plastics and cellulose, greatly enhancing these materials’ protective properties.

Cronogard is entering the market 3 family of products:

1-filler: cronogard filler is a family of additives, each of which produced for a specific food. Cronogard filler is in powder form.

2-coating: The cronogard coating is applied using polymeric film-coating techniques or by printing onto paper or cardboard.

3-masterbatch: The filler can be extruded into the first thin layer of the packaging’s polymeric structure. In this case, the masterbatch already includes the food-specific additive.

Now more than ever solutions such as Cronogard are needed to relieve the environmental. Cronogard can increase the shelf-life of foodstuff between 20 to 200% (depending on the type of food concerned), significantly helping reduce food waste.