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GEA QUALITY

GEA has always been committed to the quality of its products and guarantees continuous improvement in terms of the effectiveness, efficiency and durability of its traps, attractants and pest control products.

• “CLEAN” ADHESIVES

All adhesives used in the manufacture of GEA products are mixtures classified as non-hazardous and do not contain:

- substances listed as SVHC in concentrations greater than 0.1% (w/w)
- endocrine disruptors
- nanomaterials

Each batch is delivered by the suppliers along with a corresponding certificate of analysis. Depending on the results of the risk analysis carried out on the adhesives by GEA, viscosity and softening point are rechecked internally by means of a Brookfield viscometer and a Ring and Ball apparatus respectively on a number of batches per year in order to compare the values with those communicated by the supplier in the certificate.

The adhesive mixtures used by GEA have been selected and fine-tuned over the years. In addition, SPME-GC/MS analyses have been carried out to verify the type of emission strictly linked to the adhesive substrate and to avoid the presence of emission peaks that are not acceptable for the target insects.

In fact, the adhesive must be considered as a mechanical trapping system, but also as a source of chemical emissions that shall in no way affect the capture of the target pest.

• ALLERGEN-FREE FLAVOURINGS

All flavourings used by GEA are food flavourings.

Before they are used in adhesive mixtures or dispensers, their effectiveness is tested by the Research Department in order to check their ability to attract the target pest. Moreover, they are analysed by the Quality and Regulatory Department in terms of quality, persistence, stability and safety of the finished mixture, especially with regard to allergens.

The selected flavourings are free from sources of allergens or substances that may cause food intolerances such as walnuts, hazelnuts, peanuts, shellfish, cereals containing gluten, etc.

Any necessary changes to the composition are developed with suppliers until optimal results are achieved.

In addition to internal effectiveness tests, external effectiveness and emission tests can be added if required to verify emission curves through the SPME-GC/MS method.

• BACKING BOARDS, PACKAGING AND ENVIRONMENTAL MEASURES

All GEA product cases are made of recycled cardboard.

For backing boards for traps and panels only, higher-quality boards (GC1 and GC2) are preferred over recycled boards. These perfectly meet the cardboard requirements of our production lines and allow



for a high-quality result without causing defects, such as bending or staining due to absorption of the adhesive mixtures.

For its inVerde line, GEA is converting the cardboard it uses to FSC-certified cardboard, thus ensuring that it comes from responsibly managed forests and providing environmental, social and economic benefits.






For any customised product, including those of the professional line, customers can ask us to use FSC cardboard, as all the paper-making companies cooperating with GEA have this type of certification.

Moreover, for all its product lines, GEA is aligning itself with the Italian Legislative Decree No. 116 of 3rd September 2020, which implements EU Directive 2018/851 on waste and EU Directive 2018/852 on packaging and packaging waste. As such, it uses correct product labelling to provide the end customer with all the information needed to dispose of the product correctly.



Among the packaging used, in addition to the very common cardboard cases, cartons and cardboard displays that are recycled in the paper collection, GEA uses many different types of flowpacks, most of which are recycled in the plastic collection.

For flowpacks and other packaging materials that are currently not recyclable and must therefore be disposed of separately, GEA is currently analysing alternative solutions with suppliers.

GEA has recently informed all customers of the disposal methods of all packaging materials used, as listed in the table below:

Packaging	Type of packaging	Material identification	Material family and type of collection
Cardboard case	Case: outer packaging		Paper / separate collection
Cardboard display	Display		Paper / separate collection
Polypropylene flowpack	Flowpack: interior packaging		Plastic / separate collection
Paper leaflet	Leaflet		Paper / separate collection
PET+PEOH flowpack	Flowpack: interior packaging		Plastic / separate collection



Low-density polyethylene heat-shrink film	Heat-shrink film: interior packaging		Plastic / separate collection
Triplex laminated pouches (paper, aluminium, PE) for pheromones	Bag: interior packaging	-	Undifferentiated collection
Flowpack in triplex laminated material (PET-ALU-PE)	Flowpack: interior packaging	No. 90 C/LDPE 	Plastic / aluminium / separate collection

• PHEROMONE DISPENSERS

GEA has always relied on insecticide-free methods for monitoring and controlling insect pests. The use of specific pheromones is therefore preferred, which are released into the air using carriers so as to attract the insect to glue or drop traps.

The wide range of pheromones used allows the customer to purchase dispensers that emit the pheromone bouquet of a specific insect, targeting only a specific insect or several target insect species. Pheromone dispensers are undoubtedly among the products on which the R&D team has focused most, as they are the main devices for monitoring product-relevant arthropod pests when placed in traps.

There are different types of dispensers made of different materials on the market. These include, for example, para rubber, polyethylene, silicone, EPDM, laminated fabrics, etc.

The choice of the technical characteristics of a pheromone dispenser, such as material, colour, shape and size, depends on a number of factors: the type of trap to be used, the insect being monitored, the quantity of active pheromone to be used, whether or not it needs to be detected by a metal detector, but above all, the release of the pheromone and thus the durability of the product itself.

The R&D team's ultimate goal is to optimise the dispenser's output and thus increase its effectiveness in the field.

To this end, in recent years, the team has implemented one of the most popular dispensers used by its customers: the pheromone dispenser in para rubber, with its characteristic "cap" shape.

The team's efforts led to the replacement of the previous solution with a more innovative version: the new "Phero-si" inPEST pheromone dispenser, made from a specially developed silicone mixture.

In order to guarantee better quality and safety of the product, a silicone mixture suitable for contact with foodstuffs has been selected in compliance with current regulations (EEC 1935/2004/EC, BfR (ex BGVV); Recommendation XV "Silikone" (Germany); Regulation 21 CFR 177.2600 of the Food and Drug Administration (FDA) of the USA), and suppliers who are able to guarantee a high-quality standard of the production process, both in terms of moulding and post-curing and finishing of the dispenser, have been chosen.

In addition, GEA S.r.l. implemented the in-house production process for pheromone activation, revising the current procedure with technical improvements specifically designed for the new dispenser.



The new dispenser has a distinctive cylindrical shape, which is easier to handle, with greater weight and a larger dispensing surface. The choice of the new silicone moulding has also made it possible to:

- use a mixture more suitable for food contact,
- improve the emission of the pheromones introduced in the dispenser,
- increase effectiveness in the field by promptly detecting even low presence of pests and guaranteeing more catches of the targets,
- ensure better pheromone release over time compared to dispenser made of para rubber,
- create “Phero-si MD” inPEST, a version of the dispenser fully detectable by metal detectors, by adding ferrite to the silicone mixture. This technical aspect is becoming more and more important in food companies and is required by the main certification standards (BRC, IFS, etc.).

In order to evaluate the effectiveness of the new “Phero-si” inPEST dispensers, they were tested, both with regard to emission, through an SPME-GC/MS analysis, and in the field, by comparison with the previous version in para rubber. The product showed optimal performance.



A comparison between the previous version of inPEST dispensers (left) and the new “Phero-si” inPEST dispensers (right). Black dispensers are the metal detectable variant, “Phero-si MD”.

• LABORATORY EFFICACY TESTS

Over the years, GEA has developed countless products for both rodents and insects, using different materials (paper, taut plastic, corrugated plastic, wood, etc.).

Each product is first developed and the raw materials tested in our own laboratory.

The products undergo accelerated stability tests and long-term stability tests. The first consists of putting the product under thermal stress in an oven to exclude any leaks or other defects. The second consists of storing the product in the quality archive for its entire expected life and carrying out intermediate verification checks, with the test being interrupted in the event of detection of defects that do not allow it to continue until expiry.

The parameters checked in the stability of an adhesive trap are the following:

- appearance,
- persistence of the flavour (if present in the adhesive),
- glue tackiness (measured using Rolling Ball Tack Tester),
- product weight,
- change in weight of the product compared to the initial weight.

Stability checks including the control of pheromone concentration are commissioned to an external testing laboratory with which suitable methods of analysis have been developed and validated.



The adhesive traps are also tested using a dynamometer, carrying out both detachment tests to check whether the adhesive is able to capture the target pest and peeling tests to check whether the removal of the protective silicone paper is easy.

In addition to performing these laboratory tests on new products, GEA also conducts them on traps claimed by customers or on samples submitted to quality control.

- **FIELD EFFICACY TESTS**

GEA carries out its own in-house efficacy tests in the Research Department, which has an extensive list of bred pests:

Blattodea

Blatta orientalis

Blattella germanica

Periplaneta americana

Supella longipalpa

Coleoptera

Anobidae

*Lasioderma serricorne***

Stegobium paniceum

Bostrichidae

Rhyzopertha dominica

Cleridae

Necrobia rufipes

Crisomelidae

Tonchio

Curculionidae

Sitophilus oryzae/zeamais

Sitophilus granarius

Dermestidae

Dermestes maculatus

Laemophloeidae

Cryptolestes spp.

Silvanidae

Oryzaephilus surinamensis

Tenebrionidae

Tribolium castaneum



Tribolium confusum

Diptera

Drosophila spp.

Musca domestica

Lepidoptera

Corcyra cephalonica

Ephestia kuehniella

Plodia interpunctella

Tineola bisselliella

Both screening and comprehensive tests are carried out.

If the target pest is not available in the breeding facility or if the required protocol exceeds the number of replicates that can be obtained internally, GEA outsources the test to Italian and European laboratories with which it has established optimal collaboration over the years.

Each trap or panel developed is tested for its intended use. Traps or panels are placed in test chambers where target insects are released and catches under different conditions are recorded.

The pest is tested under conditions that simulate reality (e.g. presence of food in the test room if testing a food moth trap, or clothes if testing a clothes moth trap).

Products are generally tested at the beginning and at 2 to 3 months (depending on how long they will last once opened) as well as at their expiry date (usually 3 years for most of our products).

The U.V. lamp panels are tested under lamp to check both the trapping efficiency and the adhesive capacity, in order to ensure that they are stable under lamp for 60 days (without either “vitrifying” or leaking).

• REGISTERED PRODUCTS

With regard to the regulatory framework for products, GEA produces both monitoring devices and biocides. To date, GEA has registered three biocides under its name:

- a trap for food moths (GEA biocide for food moths **ANTI-MITES ALIMENTAIRES-GEA_P04031D**, authorisation no. FR-2014-0003);
- a metal-detectable silicone string for the implementation of the sexual confusion technique on food moths (**TWIST-TIE MD2inPEST®** P-01162 (blue) and P-01156 (grey); authorisation no. FR-2020-0028), subsequently notified in Italy as well as Spain;
- an attractive drop for clothes moths for use on different trap formats (**PHEROMONE DROP FOR CLOTHES MOTHS S-02054TB**, authorisation no. BC-DT054892-16).

All three products were authorised with simplified authorisations, which guarantees their safety as they had to meet precise requirements to be authorised (not to be classified as dangerous according to the CLP Regulation, not to contain SVHC in quantities greater than 0.1%, not to contain endocrine disruptors and not to contain nanomaterials).

GEA also supports its customers in the development of new customised biocidal products and assists them with registration.



- **CONTINUOUS EXCHANGE OF INFORMATION ON REGULATIONS, STANDARDS AND LAWS IN FORCE**

GEA always pays close attention to current regulations and the limits imposed by law on emissions of certain substances, the limits of exposure to them in the workplace and the correct indications to display on product labels.

Continuous consultation and in-depth knowledge of regulations such as REACH (Reg. 1907/2006 EC), CLP (Reg. 1272/2008 EC), BPR (Reg. 528/2012 EC), etc. enables GEA to assist its clients and develop projects in an informed and knowledgeable manner.

This ongoing information is shared with clients whenever advice or additional information is requested on a particular topic.

When graphically designing a new reference on their product label, many customers want to check that the information is correct. GEA provides this information in a spirit of continuous collaboration.

In fact, sharing knowledge and discussing any doubts about the product's regulatory framework allows us to jointly achieve an optimal result that takes into account all possible aspects.