avanSAFE DETECTOR

Additive to produce metal detectable plastics and rubbers

IFS Food

HACCP Hazard Analysis Critical Control Point

BRC FOOD CERTIFICATED

avanzare
inventing the future

EU/USA- Patented (additive and technology)

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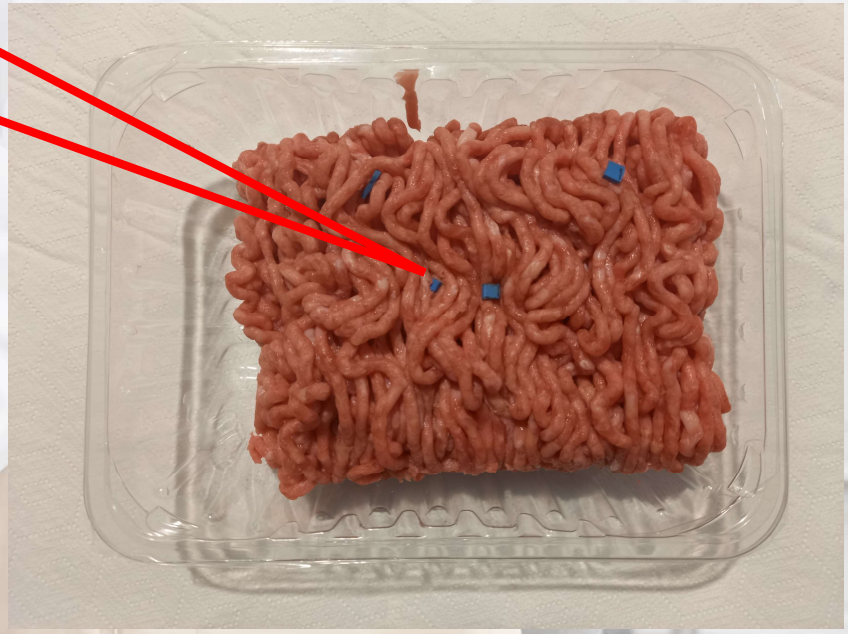
avanSAFE DETECTOR is a stainless alloy in very think powder form, designed to impart detectability, by metallic, magnetic or X-ray systems, to different plastics, rubber and other polymers

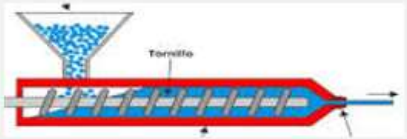
Specifically designed to detect small pieces and plastic contamination from utensils and food items



How does it work?

avanSAFE DETECTOR

powder



Extrusion and mix with colour and raw polymer

Pellet for injection

injection

Specimen in contact with food.

Broken piece caused by usage entering the food..

Processing contaminated meat

Packaging.

Delivery at the customer without **avanSAFE**

with **avanSAFE, food chain safe**

avanSAFE DETECTOR.

- **Suitable for food-contact applications (EU regulations 10/2011)**
- Detectable by metallic, magnetic, and X-ray detection systems.
- **Suitable for any colour formulation.**
- Odourless and non-migratory.
- Low dosage compared with other food grade solution available on the market.
- Valid for induction heating technology

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Recommended dosage and USES: (avanSAFE DETECTOR)

Due to its high versatility; it has a wide application range and can be adjusted to be detected by different systems. Dosage will be defined based on final customer requirements. Common dosage: 3-20%

- For a minimum level of detection of plastic fragments with at least a measure equal to or greater than 7 mm required by FDA as a minimum size that can cause choking of people with fatal consequences. **Typical dosage (3-5 %).**
- High removal of plastic fragments (impurity) in food of the highest quality. **Typical dosage (10-14 %).**

avanSAFE DETECTOR formats

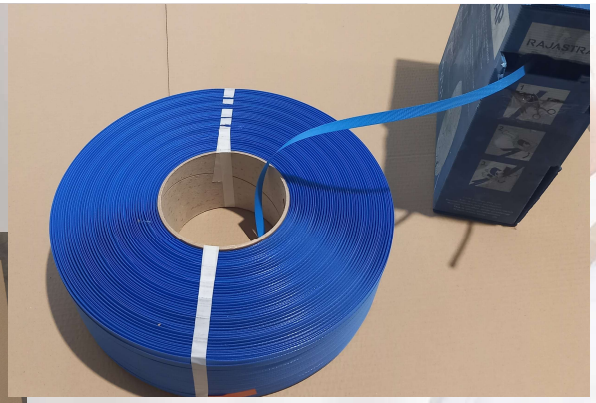
	Form	%
avanSAFE DETECTOR.	powder	**pure**
avanSAFE DETECTOR EMA/MB	MB (EMA)	**70**

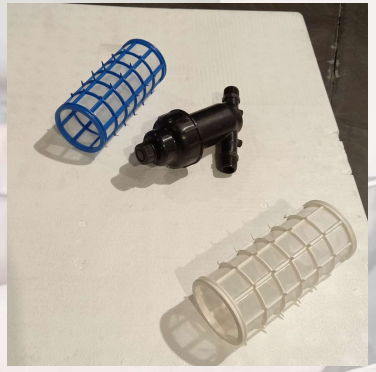
Alternative MB are available (EVA, PA, TPU, etc. under request, approx. 50-80 % load)

Easy to Color:

- Plastic/ rubber with load less than 20 % are easily colourable.

USES.





Any type of rubber or plastic instrument or tool used in food production processes susceptible to enter in contact with food.

Evaluation test.

For a comparative trial we have selected a Phantom metal detector from the company Fortress www.fortresstechnology.com calibrated with a detection threshold of:

- Pure Stainless Steel ball size AISI- 316:	2,5 mm	(vol- 8,18 mm^3)
- Pure Non Ferrous material:	2 mm	(vol- 4,18 mm^3)
- Pure Ferrous ball:	1.5 mm	(vol- 1,76 mm^3)

For each type of metal the overall mass required to be detected is different.

Ferrous > **avanSAFE DETECTOR** alloy > Non Ferrous > Stainless Steel

plastic contamination inside

The additive was added at different % of addition and introduced in a PE mixture for the trial.
The detection thresholds in all cases are.

Plastic size introduced in the food (detected yes or no)							
		3*3*1.5 mm	4*4*1.5 mm	5*5*1.5 mm	6*6*1.5 mm	7*7*1.5 mm	7*3*1,5 mm
avanSAFE DETECTOR dosage in PP sample.	3 %	NO	NO	NO	NO	YES	YES
	5%	NO	NO	NO	NO	YES	YES
	7%	NO	NO	YES	YES	YES	YES
	10%	NO	YES	YES	YES	YES	YES
	14 %	YES	YES	YES	YES	YES	YES

Table: dosage required to be detected with a standard magnetic detection, the dosage must be adjusted with customers trials.

Detection ranges, (for preliminary tests)

Approximation to the dosage required to make a product detectable:

- Value 1: Calculation of the volume of the reference sphere used for calibration that we will use as an example.

In our case, a non-ferrous sphere of 1.5 mm diameter -> 1.76 mm3

- Value 2: Correlation between volume of the piece to be detected and required dosage:

By dividing the volume of the sphere between the volume of the piece to be detected, we will obtain the minimum required dosage of avanSAFE Detector to make it detectable under these circumstances.

***Example*:**

A: Required dosage of avanSAFE

B: Volume of the calibration non-ferrous sphere 1.5 mm diameter -> 1.76 mm3

C: Size of the piece to detect 3*3*1.5 mm -> 13 mm3

$$A \geq \frac{B}{C}$$

In this case, at least 13.5% dosage of **avanSAFE DETECTOR** is required to make pieces of a size of 3*3*1.5 mm (equivalent to 1,76 mm3 of ferrous metal) detectable using as a reference a non-ferrous sphere of 1.5 mm diameter for the calibration.

If you use a Stainless Steel as a reference, the amount of additive must be 50 % less than the NON ferrous ball.

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