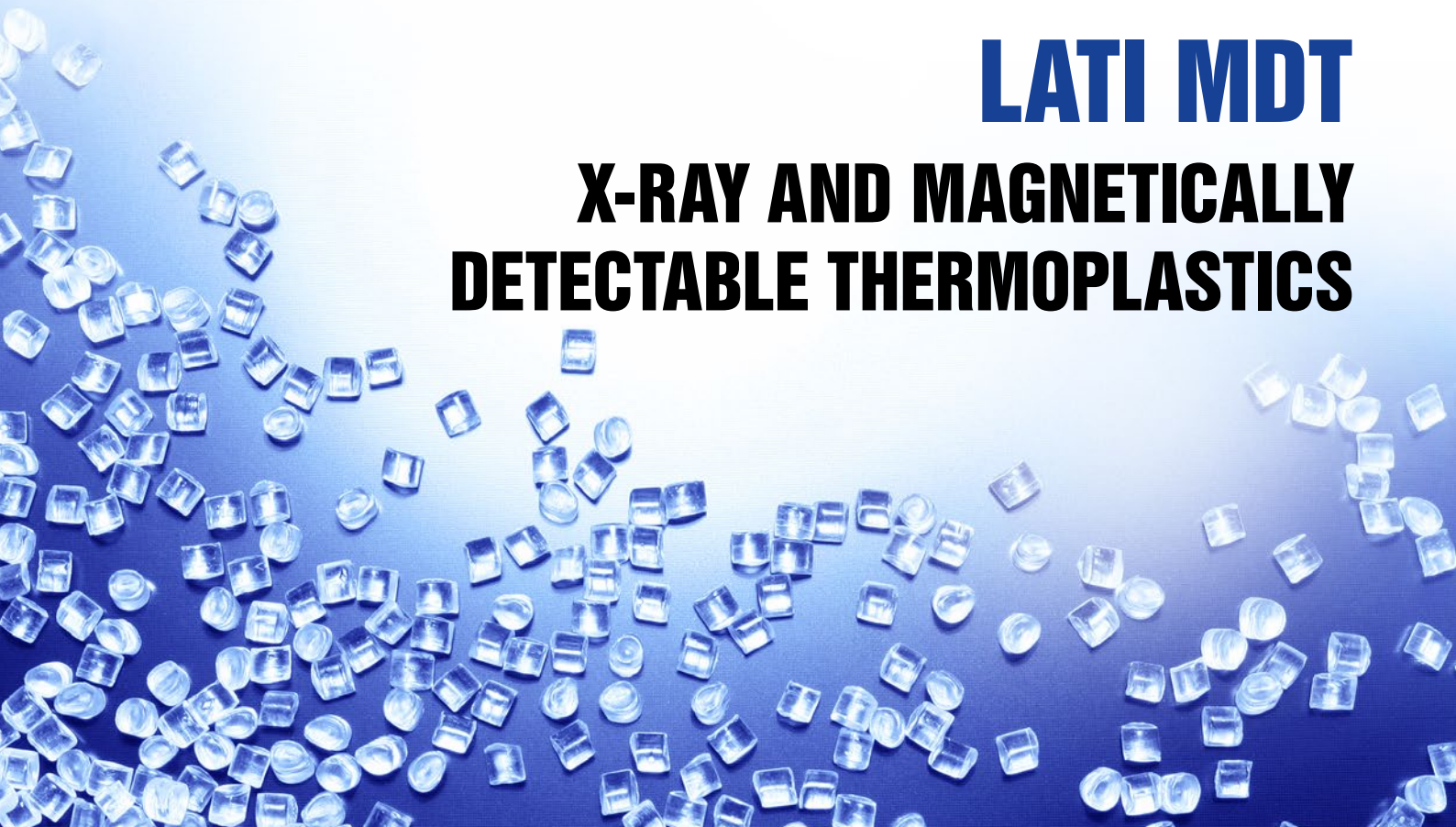




**LATI MDT**

**X-RAY AND MAGNETICALLY  
DETECTABLE THERMOPLASTICS**



## ABOUT LATI

LATI was founded in Italy in 1945. Since its establishment, the company has risen to a position of absolute prestige in the field of engineering thermoplastic compounds, in Italy and worldwide.

Today, LATI is:

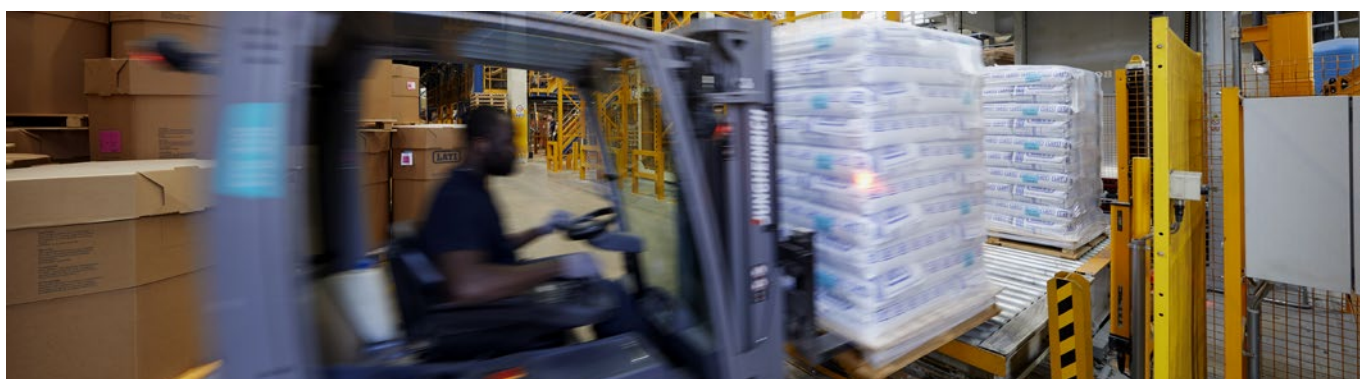
- the independent company with the widest range of compounds in Europe;
- one of the world's most qualified suppliers of self-extinguishing compounds;
- a partner for the development of special high-performance products tailored to the needs of the individual customer.

The company has two plants in Italy with a potential output of 38,000 tons per year.

LATI products are used in the main application sectors, from automotive to precision mechanics, household appliances to electronics, and medical devices to biobased systems.

LATI distributes its engineering compounds across the major international markets through its ubiquitous sales network.

LATI's vocation is to satisfy its partners by providing a service with a high technical content, ranging from the preparation of compounds to technical support for the development of final projects, always respecting the customer's needs and offering maximum flexibility.



LATI is able to support its customers from the earliest design stages, in the choice of the most suitable materials, and in the creation of new products. The company can even offer valuable assistance on board the machine, to ensure correct processing.

### • Co-design service

Thermal, mechanical and fluid dynamics simulations are carried out by highly experienced engineers, operating directly on the geometries provided by the customer and using mechanical and rheological characterisation methods that take into account the conditions of use.

### • Injection moulding assistance

Obtaining maximum thermal, mechanical and dimensional performance from a material can take a number of attempts and require lengthy process-tuning procedures. To address these needs, LATI has engineers with thirty years' experience in the field of injection moulding, presses and moulds.

### • Research & development

Offering a tailor-made product based on the customer's needs is of paramount importance to LATI.

Each grade is optimised to provide the most appropriate answer to the application requirements, even if the formulation needed differs significantly from those already present in our range.

### • Regulations and standards

Specific regulatory support is also available for each LATI compound.

Our team of experts is at the complete disposal of customers to ensure assistance for material certification procedures at globally accredited laboratories and organisations.

LATI issues internal certificates of conformity complying with the rules applicable in each market.

The values reported are based on tests performed on injection moulded laboratory samples, conditioned to standard, and represent data within the characteristic ranges of properties of uncoloured materials, unless otherwise indicated. Since these values are susceptible to variations, they do not represent a sufficient base to design any type of manufactured item and should not be used to establish any specification values. The properties of the moulded items can be influenced by many factors, like, but not limited to the presence of pigments, the project type, processing, post-treatment and environmental conditions and the use of regrind material in the moulding stage. Where the data are explicitly indicated as being interim, the ranges of the properties should be considered to be broader. This information and technical assistance are provided for the purpose of information only and are subject to change without notice. The client must always make sure they have the most updated version of the technical specifications.

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## FOOD SAFETY

The issue of **food safety** is recognised by all governments, especially in Europe and North America.

The European Union has the strictest food safety standards in the world, thanks largely to the laws enforced by its member states, which are very attentive to the issue of consumer protection.

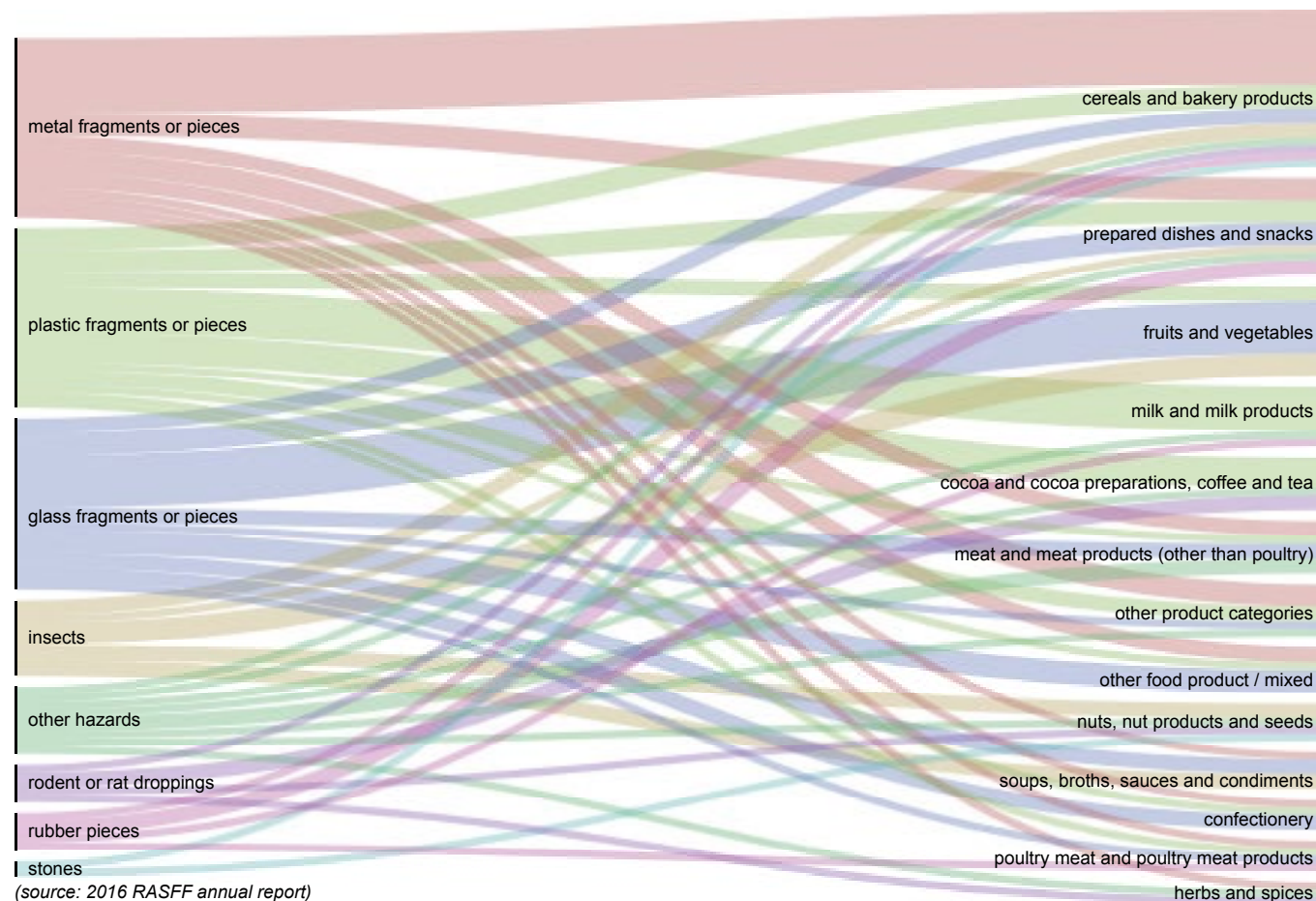
The Rapid Alert System for Food and Feed (**RASFF**) centrally collects all notices regarding the quality of food and feed. It regularly issues alerts and publishes

reports on any known contamination of products circulating in the market.

RASFF reports show that **plastic parts** are a major **source** of contamination, with **residue** from them that can be found in the most diverse food products.

When a contaminated product reaches the market, it constitutes a **consumer health and safety hazard**.

Such situations often lead to **class actions** by consumer organisations, and can therefore considerably damage the companies involved, also in terms of their corporate image:



### Pieces of plastic in children's omelet

Pieces of plastic in children's omelet in 8 schools in the east zone. Pieces of transparent plastic were found in omelet served to children in eight schools. The children were found to have "plastic chips" in their mouths, according

## NEWS48 - HEALTH

### Pieces of plastic in yoghurt: packages recalled from the supermarket

Pieces of plastic may have ended up in yoghurt. The Minister of Health reported the recall of some yoghurt products by the supermarket chain Italia because of the possible presence of plastic fragments deriving from the container. The products affected are all batches and sell by dates of whole banana and strawberry flavour yoghurt in 120 gram containers with chocolate sprinkles.



## HEALTH & CULTURE

### Food alert, pieces of plastic in peanut butter contain plastic!

The notice shared by the federal office of food safety is very clear and leaves no room for doubt.

The supermarket chain has announced a voluntary recall of peanut butter as a precaution because it could contain pieces of plastic. Risks to health cannot be ruled out. The countries affected are Canada and Europe. During an in-house control, pieces of plastic were found in two packs.



### Pieces of plastic in crisps, suffocation risk!

The piece of plastic found in a bag of crisps in the middle of the night, a person suffering from insomnia wanted some crisps and opened a perfectly sealed package.

The person started eating one after another.

But at a certain point in their mouth they found,



## NEWS - HEALTH

### RECALL OF THOUSANDS OF BARS CONTAINING PLASTIC!



All this explains why the majority of **large retail chains** have adopted unified quality and safety control systems that are applied to every level of the food processing industry, such as the British Global Standard for Food Safety (**BRC**) and the International Food Standard (**IFS**).

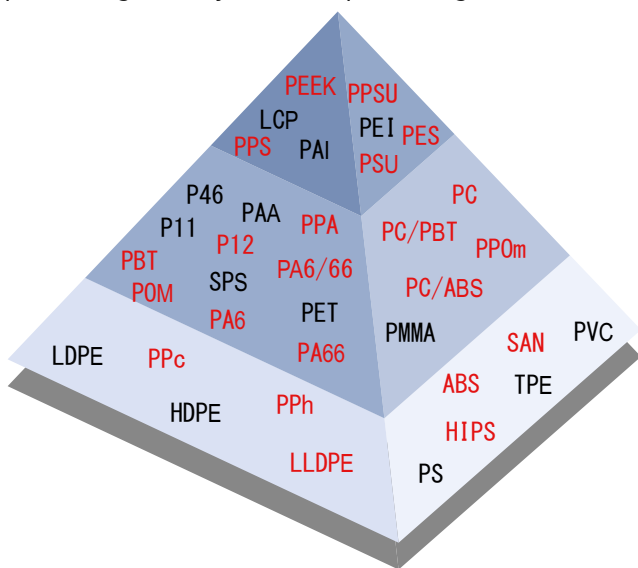
These systems include methods aimed at identifying any contamination present, not only through visual

inspection but also with instruments such as **metal detectors and X-rays**.



## PLASTIC CONTAMINANTS

Many components of kneading machines, packaging machines and conveyor belts are made of **engineering polymers** which, as a result of possible **wear or breakage problems**, can contaminate ingredients, doughs and finished food products generally with scrap and fragments.



A further problem with this residue is linked to the fact that **plastics**, in their natural state, **cannot be detected** using standard instruments (metal detectors and X-rays). As a result, the identification of plastic contaminants is usually entrusted solely to **visual inspection** methods, which are often ineffective, especially when plastic fragments are small or difficult to spot.

## LATI MDT DETECTABLE THERMOPLASTICS

In order to meet the growing demand for safe and reliable polymers for the food processing industry, LATI has developed a **full range of plastic compounds detectable with metal detectors, X-rays, or both**.

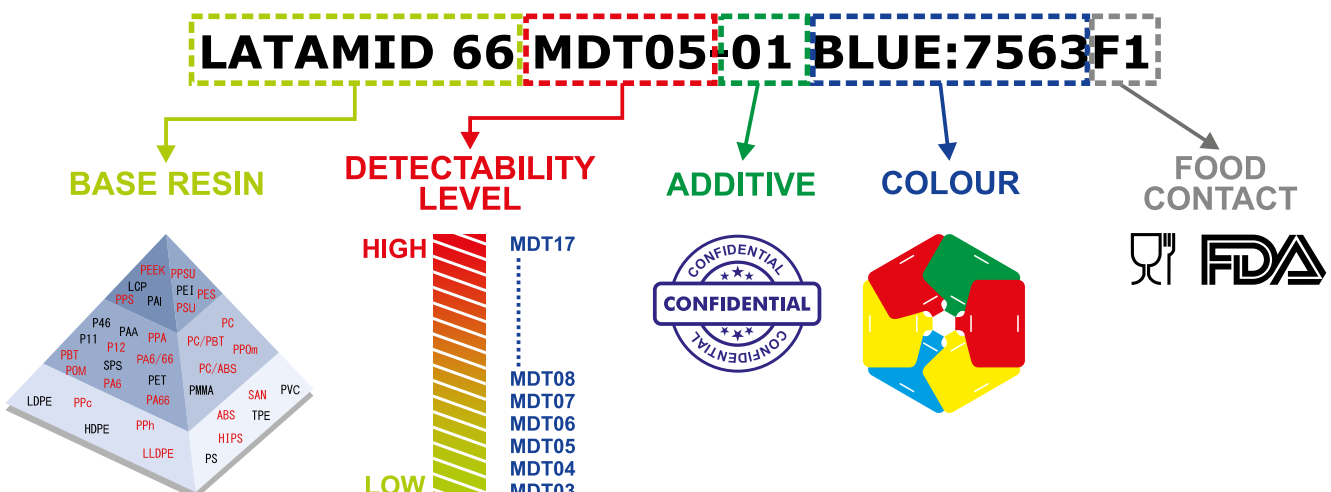
**LATI MDT** compounds can be formulated from **any thermoplastic base**, from standard polymers to high-performance resins, and are therefore able to cover a wide range of applications, both in terms of temperatures of use and the characteristics of the different working environments.

They are **homogeneous compounds**, supplied ready to be processed; they therefore require no additives or masterbatches.

Although there are already **over 40 grades available**, LATI is continuously researching and creating new ones to meet the most diverse design and market requirements.

Each compound includes a **mixture of additives** that are dispersed homogeneously and therefore do not generate dust during usage; it is these additives that make the compound **detectable with metal detectors or X-rays, or both**. They can be dosed as required to achieve the desired degree of detectability.

Choosing the most suitable grade for each application is easy because the detectability level is always indicated in the product name along with the base resin and other important features:



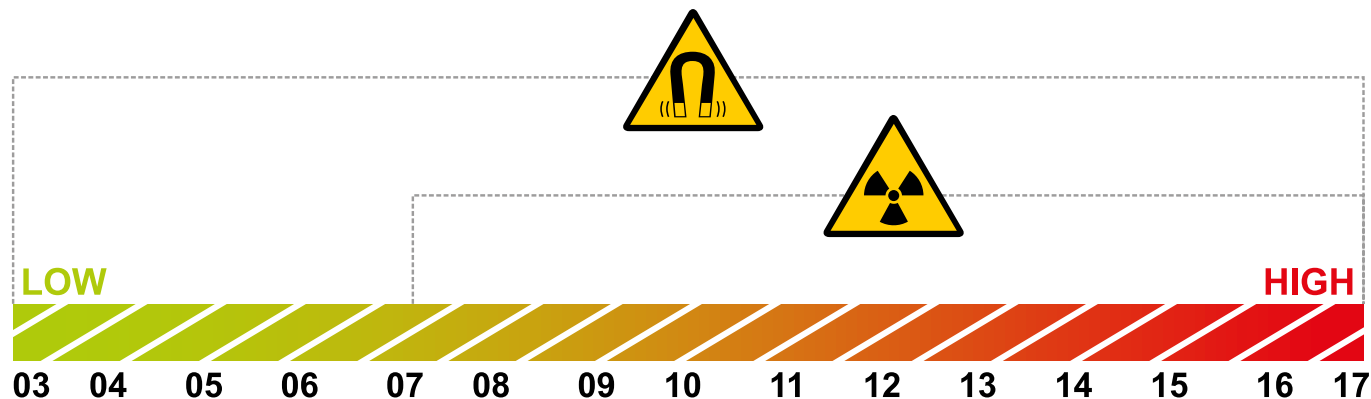
## DETECTABILITY LEVELS

The possible detectability levels cover a very wide range. Entry-level compounds (**MDT03 - MDT04**) have **fairly good detectability levels** with an excellent price/performance ratio.

**MDT05** is the standard detectability level for most

applications, whereas from level **MDT07** upwards, the compounds can also be detected using X-ray systems.

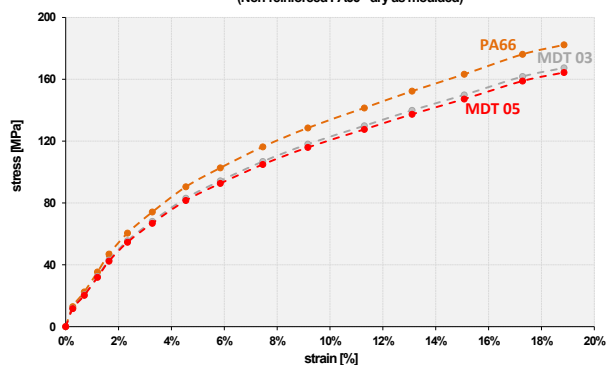
What is more, the detectability of compounds can be increased still further (up to level **MDT16** or **MDT17**) when it is necessary to individuate extremely small particles or to ensure extraordinary magnetic performance.



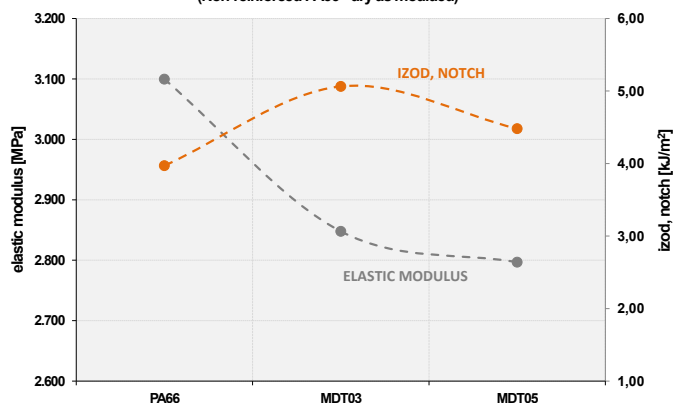
## MECHANICAL PERFORMANCE

MDT compounds are specially designed and formulated to **minimally alter the characteristics of base polymers**, especially their mechanical and shrinkage properties. Consequently, they can be used to directly replace single polymers without the need for mould modifications. All this means that MDT compounds ensure performance levels entirely in line with those of the base resins on which they are formulated.

TENSILE STRESS-STRAIN CURVES  
(Non-reinforced PA66 - dry as moulded)



RIGIDITY AND IMPACT RESISTANCE MODULUS  
(Non-reinforced PA66 - dry as moulded)



## COLOURABILITY

As the level of detectability increases, and with it the MDT grade, the natural colour of the products tends to be darker, limiting the colourability of moulded parts.

The LATI range already includes several standard products in blue, which is generally the colour most in demand in the majority of food processing and handling applications. Since there are no foods of this colour, it facilitates the optical/visual detection of contaminants.

However, LATI has also developed new MDT grades that can easily be coloured in a variety of shades



## FOOD CONTACT

Given the main application field of MDT compounds, all grades are developed in accordance with the main regulations on food contact materials.

MDT compounds are entirely made up of suitable raw materials that comply with the European regulation (**REGULATION No. 1935/2004**) and, in many cases, also with the American regulation (**21 CFR 177.2600 - FDA**).

The suitability of some materials is already certified by accredited laboratories that offer completely independent certification procedures.



## APPLICATIONS

After a careful analysis of the project, often supported by the LATI co-design service, it is



Excellent dimensional stability



Optimum price/performance ratio



High chemical resistance



Resistance to high temperatures



Radio opacity



Detectable by X-rays too



Resistance to low temperatures



Resistance to UV rays and weather agents



Flexibility



Easy calendaring and extrudability



Resistance to scratch and abrasion



Anti-static properties

Typical fields of application include:

### Bucket conveyors or elevators

Bucket conveyors or elevators are used to handle brittle or breakable granular products such as pasta, legumes, dried fruits, candies, frozen food, pet food



and granules of any kind.

These systems are available in different sizes and with various layouts, in order to meet the requirements any vertical or horizontal handling system.

The materials most frequently used for manufacturing the buckets are:

**ABS** (acrylonitrile-butadiene-styrene)



**LASTILAC MR MDT05-01 NAT.:0199F1**

**PP** (polypropylene)



**LATENE 11 MDT05-01 BLU:7564F1**



## Crates for fruits and vegetables

Plastics are increasingly being used in the production of crates and packaging for fruits and vegetables.



The use of resins such as polypropylene makes it possible to obtain products that are certifiable according to any standard, recyclable, resistant to chemical agents, and easily **sanitised**.

**PPc** (polypropylene copolymer)



**LATENE EP 4 UV MDT05-01 BLUE:7564F1**

**PPc** (polypropylene copolymer)



**LATENE EP 30 UV MDT09-01 BLUE:7564F1**

## Hoses and conveyor belts

LATI has developed different versions of MDT polyurethane-based grades of variable hardness which can be detected by metal detectors and, in some cases, by X-ray systems too.



**PUR** (polyurethane)



**LASTANE 50 MDT05-01 BLUE:7532F1**

**PUR HF** (high-flexibility polyurethane)



**LASTANE 30 MDT07-01 BLUE:7563F1**

**PUR HT** (rigid polyurethane)



**LASTANE 52 MDT07-01 BL:7563F1**

## Cable ties

In cable ties, the material used must ensure high flexibility and, at the same time, optimum tear strength.



For this sector, too, LATI has developed numerous MDT grades, also featuring a high melt flow index, that can be used to fill several cavities simultaneously during the injection moulding process:

**PA6** (polyamide 6)



**LATAMID 6 MDT04-01 BLU:7566F1**

**PPc** (high-fluidity polypropylene copolymer)



**LATENE EP 30 MDT05-03 RD:5354F1**

## Ovens and high-temperature applications

LATI also offers a range of detectable compounds, based on high-temperature resins, that boast



continuous thermal resistance up to 200°C.

These products can therefore be used in the manufacture of items subject to high thermal stress, such as ovens or pasteurizers (dry heat or steam technology).

**PPS** (polyphenylene sulphide)



**LARTON MDT03-01 G/40 BLACK:3425F1**

**PEEK** (polyetheretherketone)

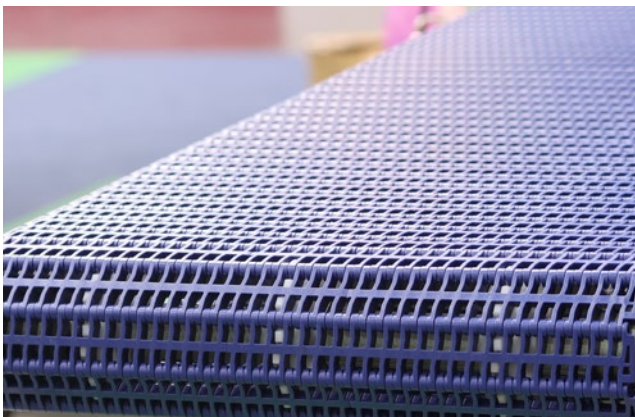


**LARPEEK 10 MDT05-01 BLACK:3425F1**

## Rigid modules for conveyor belts

Among their typical applications, MDT compounds are used, in place of conventional polymers, in injection-moulded or extruded modular food handling systems.

Their essential characteristics, in this case, are



rigidity, impact resistance, a low friction coefficient and chemical inertia.

To ensure these, LATI has developed POM grades that ensure good detectability while complying with the above project requirements.

**POM** (polyoximethylene)



**LATAN 13 MDT05-01 BLUE:7417F1**

**POM** (polyoximethylene)



**LATAN 13 MDT07-01 BL:F1**

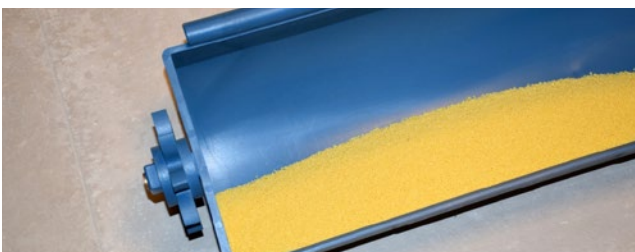
**POM** (high-viscosity polyoximethylene)



**LATAN 3 MDT05-01 BLUE:F1**

## Anti-static conveyor systems

Since many items made of MDT compounds, such as conveying buckets, are used in handling systems, they tend to accumulate electrostatic charge, which



causes problems such as the adhesion of certain foodstuffs like dry pasta and couscous.

For this reason, LATI has developed specific grades that, as well as having all the typical properties of MDT compounds (including suitability for food contact), also make it possible to obtain perfectly anti-static parts.

**PA6 mod** (modified polyamide 6)



**LATAMID 63 MDT13-01 BLUE:F1**

**PEEK** (polyetheretherketone)



**LARPEEK 10 MDT13-01 BLACK:3425F1**



## 3D printing filaments

Thanks to the R&D support provided by the LATI3Dlab, LATI is now able to offer new MDT grades specifically designed for the production of 3D printing filaments based on the resins most



frequently used for this technology, such as ABS and PETg. The availability of these grades makes it possible to produce single pieces or small batches without the need for expensive injection moulds.

**ABS** (*acrylonitrile-butadiene-styrene*)



**LASTILAC AM MDT05-01 NT:0199F1**

**PETg** (*polyethylene terephthalate glycol*)



**LATER G AM MDT05-01 BLUE:7564F1**

## Structural parts

For several applications that are particularly critical from a mechanical viewpoint such as supports or meat hooks, LATI has developed structural MDT grades which combine detectability with high



performance in terms of stiffness, breaking load, or impact resistance, even at cold.

**PA6mod + CF** (*modified and glassfibre-reinforced polyamide 6*)



**LATAMID 6 MDT05-01 G/40 BLUE:7563F1**

**PA6 + CF** (*glassfibre-reinforced polyamide 6*)



**LATAMID 6 MDT07-01 G/25 BLUE:7564F1**

**PPc + CF** (*glassfibre-reinforced polypropylene copolymer*)



**LATENE EP 4 MDT05-01 G/30 BLUE:7564F1**

## Thin films

Among the grades specifically developed for processes other than injection moulding, an MDT



version of a modified LDPE stands out in particular, as it allows calendering or blow-moulding of thin films suitable for the manufacturing of aprons, gloves or foils for the handling of wet and/or acid food.

**LDPE mod**

(*modified low-density polyethylene*)



**LATENE LD 1 MDT05-01 BL:7563MF1**

## Rigid and semi-rigid pipes

The majority of plastic pipes carrying drinking water are now manufactured using chemically inert resins such as HDPE, PP and PVC.



However, once these pipes have been buried underground or embedded into walls, it becomes impossible to identify any sections affected by failures or leaks.

This is a typical problem and the only way to solve it is to dig into the ground or demolish the wall in order to locate the source of the leak or failure. To overcome this problem, LATI has developed an extrudable HDPE grade suitable for drinking water pipes detectable by metal detectors.

**HDPE** (*high-density polyethylene*)



**LATENE HD 2 UV MDT09-01 BL:F1**

## Accessories

Every tool and instrument used in food processing lines can become a potential source of contamination.



Pens, dustpans, adhesive tape dispensers, pegs (to name but few) can now be re-designed based on MDT compounds that ensure the traceability of every single item in the case of accidental breaks.

**PP** (*polypropylene*)



**LATENE 11 MDT05-01 BLUE:7564F1**

## Tools and housings

Properties such as magnetic detectability and structural sturdiness do not have to be mutually



exclusive.

Safe, reliable and impact-resistant supports and housings can be obtained by careful dosing of detectable fillers and mechanical reinforcements.

**PA66 + GF**

(*glassfibre-reinforced polyamide 66*)



**LATAMID 66 MDT05-01 G/10 BLUE:7563F1**

## An application example:

*Detectability of MDT compounds*



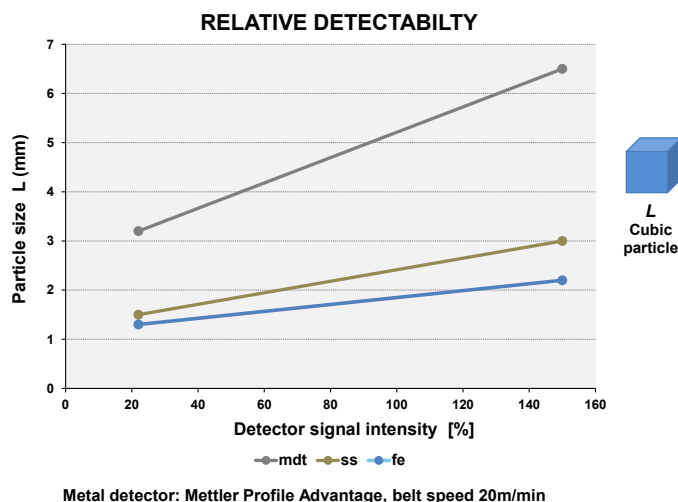
The **sensitivity** of detection instruments can vary considerably depending on the engineering features of the metal detector and on the processing line settings, such as the speed of the monitored conveyor belt for example.

Moreover, the detectability of contaminants also depends on the **geometrical features** of the particles.

In addition to the volume of foreign particles, their size, thickness and shape factor also play a crucial role in determining whether they are likely to be detected in the processing line.

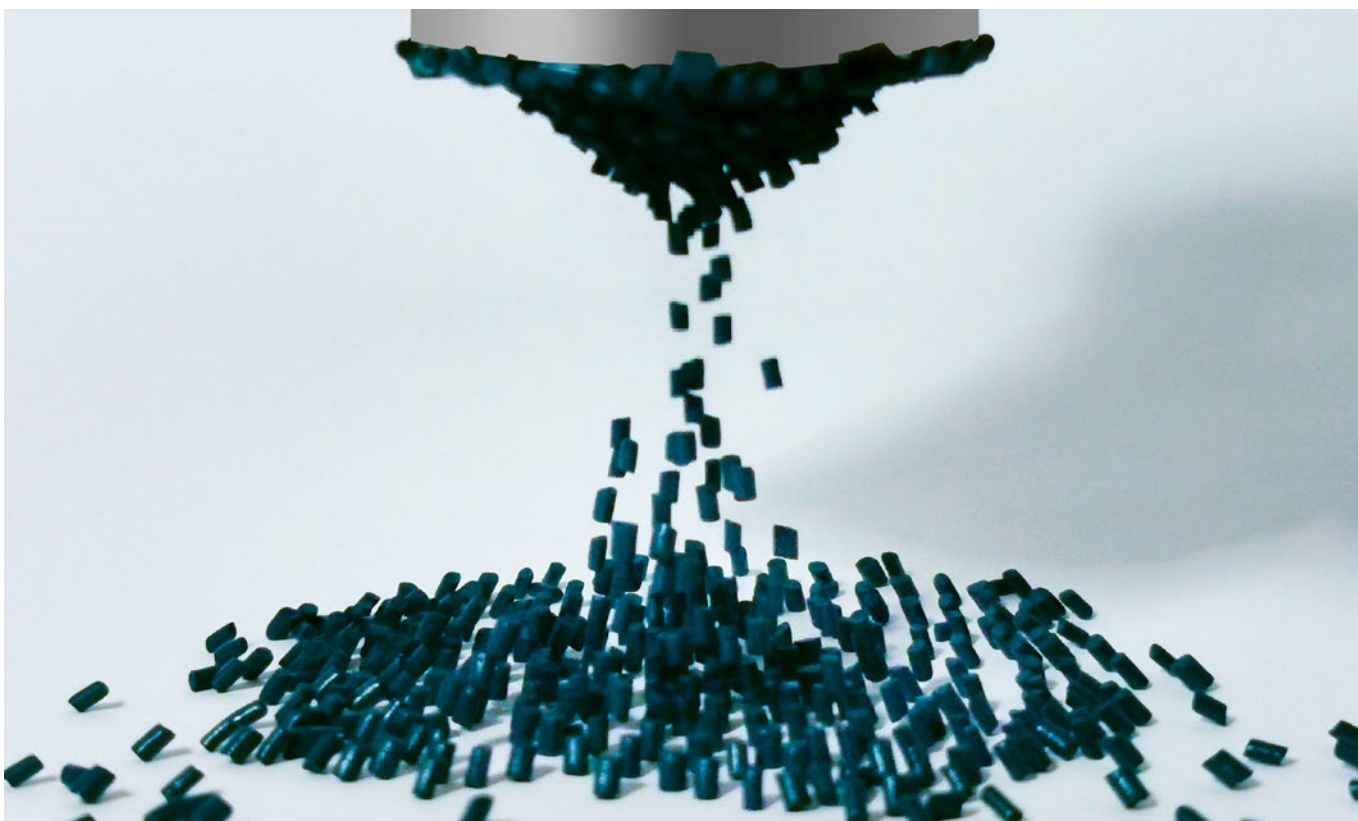
Other important aspects to consider are the **concentration** of the contaminants and, as a result, their dispersion and **orientation**.

The following diagram shows the intensity of the energy produced by the detector when detecting foreign particles.



Supposing that the particles have a cubic shape with side length  $L$  (mm), and that they are made of a compound of average detectability, such as LATENE EP4-UV MDT05, it is possible to observe that the signal generated by the detector depends on the geometric features of the foreign particle, yet it remains comparable with the signal generated by metal residues.

For this reason, LATI recommends that materials always be tested under real operating conditions.





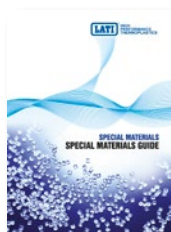


## Products guide

Engineering thermoplastics  
flame retardant  
high performance

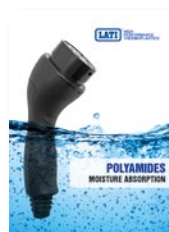


## Quick guide to LATI compounds



## Special materials

Special materials guide



## Polyamides

Moisture absorption



## Latilub

Engineering polymers  
featuring low coefficient  
of friction and high wear  
resistance



## Metal replacement

Hi-performance compounds,  
with high mechanical  
properties



## Laticonther

Thermally conductive  
thermoplastic compounds



## LATI Compounds

For water & food contact



## LATI MDT

X-ray and magnetically  
detectable thermoplastics



## Latiohm

Electrically conductive  
compounds

