



**Marking of material
allowing unambiguous
identification of any
material dissemination
in the environment**

Applications

- **Clean rooms**
- **Space missions**
- **Medical prostheses**
- **Preventive maintenance**



Contact

Technology Transfer Office

- ✉ otri@inta.es
- ☎ 91 520 11 53
- 🌐 www.inta.es



Spanish Version



ISOTOPICALLY LABELLED MATERIALS

The Metallic Materials Area of the National Institute of Aerospace Technology (INTA) investigates the labelling of materials, through strategies for the incorporation of isotopes of natural elements, and the traceability of the diffusion of these materials in their environment.

Description

This technology proposes the modification of specific positions of natural elements (H, C, N, O,...) that form the polymeric chains, by one of its stable isotopes (in the case of H, e.g. Deuterium).

The labelling is carried out based on a strategy, developed internally at INTA, which guarantees the best relationship between the amount of isotope precursor added and detectability for each specific material.

This technology allows the materials to be unequivocally identifiable, by means of known techniques and, therefore, any potential diffusion of the material in its environment can be traced.

Isotopes have, a priori, the same chemical properties as their natural analogues, but adding mass to the nucleus. This increase in molecular weight, which the marking entails, is associated with the modification of some of the physical properties of the material that are favorable for certain applications.

It is important to point out that the technique described does not introduce any additives in the compounds to facilitate detection. That is, from the chemical point of view, the marked material is exactly the same material that is found naturally.

Competitive advantages

It allows tracing any diffusion of a body in its environment. This has application in the following situations:

- Controlled environments where contamination needs to be monitored and contaminants need to be identified (e.g. avoiding false positives in measurements in remote environments),
- Discriminate with total reliability which is the source of a contamination (relevant for use in clean rooms),
- Identification of wear of a material (e.g. prosthesis).

Situation

Patented technology. Validated and demonstrated for PET (TRL 8, space mission launch pending).

Looking for collaboration for the development of a demonstrator in other materials and real conditions, and subsequent transfer.

