

TAGGANT TYPES AND PREVIOUS USES

Two different kinds of taggants are commonly discussed. Detection taggants are materials added to explosives that can be sensed (pre-blast) by an associated detection instrument. Identification taggants are additives designed to survive an explosive blast, to be recoverable at the bomb scene, and to provide pertinent information, such as last legal purchaser, to aid law enforcement personnel in identifying the perpetrator.

Detection Taggants

A number of technologies exist to detect *untagged* explosive materials, including dual-energy x-ray, x-ray computed tomography, thermal neutron activation, vapor/particle detection, and use of canines.⁹ Detection taggant schemes may improve the specificity and efficiency of these detection technologies or make new methods possible.

Taggant options include addition of volatile chemicals, radioisotopes, or electromagnetic taggants. In countries ratifying the International Civil Aviation Organization's "Convention on the Marking of Plastic Explosives for the Purpose of Detection," plastic explosives are currently being tagged, or "marked," with one of four volatile chemicals.¹⁰

Identification Taggants

Identification taggants can encode information in a variety of ways and can be added at various points in the production and distribution process. Microscopic plastic particles are the most well known form of identification taggant. The color sequence of the colored layers that compose the particles is used for identification. Another approach uses polymeric microbeads of various sizes and colors. Other approaches use rare-earth elements in a synthetic matrix blended with fluorescent pigments and iron powder, isotopic methods, and immunoassay techniques.

⁹ National Research Council. 1993. Detection of Explosives for Commercial Aviation Security. Washington, D.C.: National Academy Press.

¹⁰ The United States has chosen to use 2,3-dimethyl-2,3-dinitrobutane (DMNB).