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### Prevention of fires from energetic materials.

The UNSW Safety team are issuing this safety alert as a reminder about the possible spontaneous oxidation of energetic materials (such as reactive metals) in air:

An incident occurred where thin film metal flakes removed during routine maintenance of a physical vapour deposition system spontaneously reacted with air and became an ignition source, resulting in a small fire in a waste bin

The incident investigation found that:

A very small metallic flake removed from a vapour deposition system during routine maintenance had been tapped from the tip of a vacuum cleaner into a domestic waste bin



that there had been a small fire in the bin which was already extinguished

The most likely cause of the fire was identified to be either:

Material oxidation (or nitridation) of finely divided titanium particles resulting in spontaneous ignition of vapours emanating from the isopropanol wetted wipes, or

Exothermic reaction between high purity titanium and high purity aluminium resulting in an ignition

Where reactive metals (such as titanium, aluminium, nickel, but possibly also others) are in use, the possibility of spontaneous reaction of reactive metals with nitrogen or oxygen in air should be considered in the Risk Management Form and controls implemented and documented in the Safe Work Procedure. Print the Sn

Consider how these materials and waste products need to be handled and stored, especially in relation to material compatibility. Waste materials can still carry the risk of the original material

