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The Use of Insulating Tape with Electric Detonators

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Introduction

Recently published research[1] has suggested a link between the premature initiation of electric detonators and the use of insulation tape (as used by electricians and most shotfirers). This bulletin outlines this problem and suggest sensible steps to take to avoid such incidents.

Background Information

Electric detonators are designed to minimise the risk of premature detonation by electro-static discharge. For example, most modern detonators include an insulation sleeve around the fusehead, to minimise the risk of a spark jumping from the casing to the fusehead.

In addition, all detonators approved for sale in the UK are also subject to a series of static electricity discharge tests to ensure enhanced safety in use.

Research carried out in the USA has examined a number of accidental initiations that had no obvious cause. Common factors in these incidents, were that plastic insulating tape was being used to attach an electric detonator to either detonating cord or shock tube. The research concluded that the only possible cause of these incidents, was that static electricity had built up on the insulating tape and had been discharged into the detonator, jumping from the case to the fusehead. It is thought that such discharges, could either fire the fusehead or may contain enough energy to initiate the surrounding material.

When two materials are separated, any electrical charge is normally split between the two sections equally. However, as this process is essentially a random one, there is a chance that the charge may not be evenly split and this will result in one section having a positive charge and the other one a negative charge. On very rare occasions this random process can lead to a considerable static charge being generated.

The wrapping of insulation tape around a detonator is one occasion when static electricity can be generated and there is also a possibility that a very high electro-static discharge could take place. Unfortunately, if electric detonators are being used, there is also a slight chance that the detonator could be prematurely initiated.

Steps to Minimise the Risk

Although the chances of getting both sufficient static electricity and a discharge route via an electric detonator are very small, it is a risk that operators should consider.

A simple step is to replace insulation tape with a product less likely to generate static electricity – such as a cloth based tape.

It is worth noting that the practice of attaching a detonator to either shock tube or detonating cord, by using the lead wires to wrap around the detonator, can also produce an electrostatic discharge and should therefore be avoided.

Key Points

- When attaching an electric detonator to shock-tube, detonating cord or a primer only ever use a cloth-based tape.

Reference

1 : ‘Unusual Incidents Caused by ESD’ by J.G.Stuart, published by ISEE in 2005 ISEE Conference Proceedings.

If in doubt contact your local **exchem explosives engineer** for advice or
exchem technical services on 01773 832253