

# Safety Alert

## The Hazards of Electric Matches

May 2017

### Background

An electric match is a small pyrotechnic device commonly used to light the fuse of a display firework.

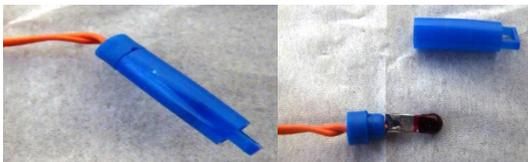
Electric matches are usually considered a low hazard explosive. However, they are extremely sensitive to friction, impact and electrostatic discharge. When they are in close proximity to the fuse of a firework, an accidental initiation of the electric match can lead to serious consequences.

Recently in Canada, a worker was seriously injured when an electric match accidentally functioned when they were inserting it into the fuse of a 155mm aerial shell. The fireworks fuse was ignited and the shell fired from the mortar.

### Issues

It was common practice at the display site to remove the hard plastic shroud that covers the match head prior to inserting the electric match into the fireworks fuse. It was difficult to insert the match head into the fuse since the open end of the fuse was too small to accept the shroud of the electric match.

However, without the shroud in place, the risk of accidental initiation of the match head from friction or impact is greatly increased.



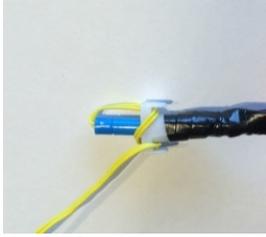
Picture 1 – electric match with shroud and without shroud (Canadian Explosives Research Laboratory)

The shroud does not inhibit the effect of the small flame that is generated when the electric match is functioned. In fact, the flame is more effective in igniting the black powder match inside the fireworks fuse with the shroud in place since the flame is directed in a more narrow but forward pattern. See images below that demonstrate the effectiveness of the shroud. Images on the right are with the shroud in place.



Picture 2 – Left side: shroud is removed, Right side: shroud in place (Author, *Encyclopedic Dictionary of Pyrotechnics*. Colorado: Journal of Pyrotechnics Inc, 2012. 370. Print)

Most fireworks fuses are now assembled with a t-connector at the end of the fuse which is designed for the insertion of the electric match with the shroud in place (See picture 3).



Picture 3 – Electric match, t-connector and fuse assembly (Canadian Pyro Ltd.)

## Recommendations

Read and understand all safety instructions that must be included with the product. Never remove the hard plastic shroud from the match head. If there are no safety instructions, do not use the product and contact your vendor and the Explosives Regulatory Division.

Only authorized explosives are allowed to be imported, sold, stored or used in Canada. Check the List of Authorized Explosives<sup>1</sup> to ensure the electric matches you are using are authorized and you are purchasing them from a licensed seller.

# ERD-SA18-02

For further information, please use the **Contact Us** button.

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<sup>1</sup> List of Authorized Explosives - <https://eservices.nrcan-rncan.gc.ca/web/elms-esml/products-produits>