

## Electric Match Lead Splatters

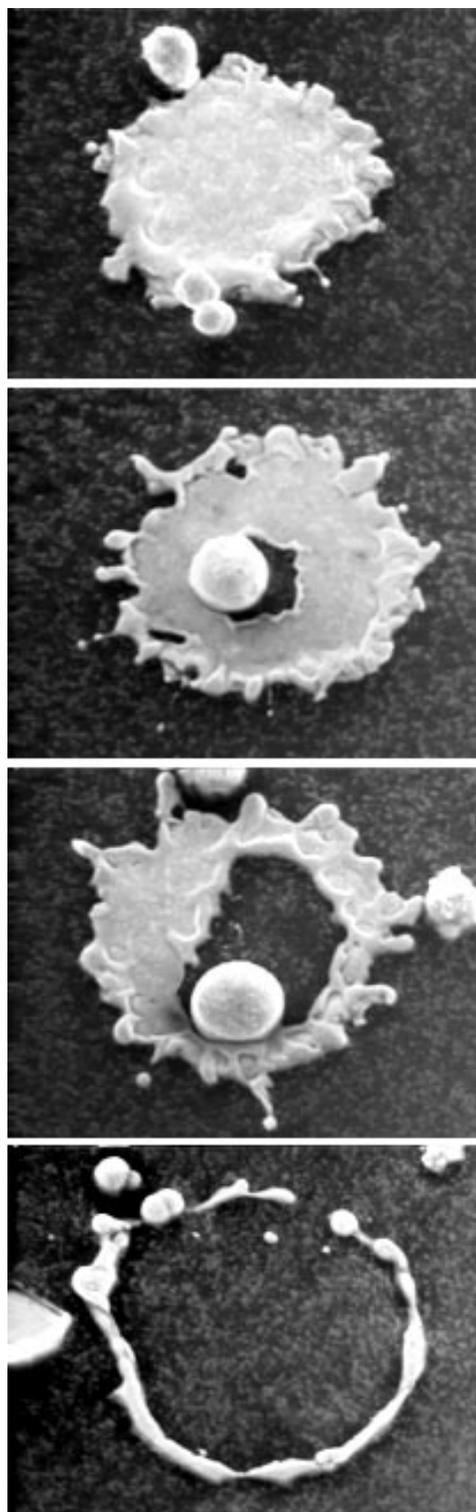
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A study of performance characteristics of some common electric matches had been conducted.<sup>[1]</sup> During the course of that study, a series of electron micrographs were made of the residues produced upon firing the electric matches. Those electric matches using lead mononitroresorcinate as a significant ingredient of their composition produced some interesting, albeit incredibly tiny, splatters of molten lead metal. In the thought that it might prove interesting to users of electric matches, four of these micrographs are shown in the accompanying figure.

Each of the splatters is approximately 50 micrometers (approximately 0.002 inch) in diameter. It is speculated that the primary factor for the different shapes of the splatters may be the velocity with which the particles of molten lead hit the collecting surface. It seems likely that the lowest velocity particles produce splatters without a central void spot, such as in the top micrograph of the figure.

It is thought that particles with a mid range of velocity produce a void spot that increases in diameter with increasing impact velocity, such as in the middle two micrographs. In addition, the impact of these mid velocity molten lead particles is generally associated with a tiny spherical ball of lead. This is suspected as being produced when some of the lead splashes up from the surface, with surface tension then forming the material into a spherical particle, which comes to rest again on the surface somewhere near the center of the splatter.

It is thought that the highest velocity particles may produce a ring of lead (very large void spot) as in the bottom micrograph. It was not established whether one or more spherical balls of lead was associated with these splatters that then came to rest some distance away.



### Reference

- 1) K. L. and B. J. Kosanke, "Studies of Electric Match Sensitiveness", *Journal of Pyrotechnics*, No. 15, 2002; also in *Selected Pyrotechnic Publications of K. L. and B. J. Kosanke, Part 6 (2001 and 2002)*, Journal of Pyrotechnics, 2005.