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Ferraz Shawmut: still making fuse history

Exactly when a fuse first appeared in the field of electricity is still not known. What we do know for sure is that in the 1860s platinum wires were used to protect undersea cables. On the other hand, the appearance of the first enclosed fuse designed to melt has been the object of some discussion. History books tell us that it all began with a patent taken out by Thomas Edison in 1880. But it has also been suggested that the great English physicist Sir Joseph Swan played a major role in early development of the fuse.

It is interesting to note that for Swan, the fuse, in the form of a sheet of lead, provided no protection against overloading or short-circuits but simply shielded the filaments in the first incandescent lamps.

At the end of the 19th century, a great leap forward was made in fuse design when W.M.Mordy, chief engineer at the Brush Electrical Engineering Company, patented the first fuse cartridge filled with a material to extinguish the electrical arc generated when the device melted. That in fact was the hurdle the first fuses in history faced: when they melted, it was not possible to prevent an arc occurring between the two melted parts.

Since then, the physical principles behind the fuse have never changed and the technology has been tried and proven. Within an enclosure, generally made of a refractory ceramic material, a metal fuse element melts when the electrical current flowing through it continuously rises – this is an overload – or when it is subjected to a sudden increase due to a short-circuit on the line it is protecting. The fuse element inside the enclosure is encased within a sand-based material that extinguishes the electrical arc generated when it melts.

All over the world today you will find ever smaller fuses, with ever higher performances, both electrical and mechanical, to protect circuits of every type, from residential, automobile and industrial applications to the vast high power networks of power distribution. They guarantee safe, continuous power supply at the highest levels of quality.

Today's fuses, often complex in construction, are the result of enormous efforts made in design and in manufacturing standards. The concrete manifestation of this is that they operate up to perfectly defined limits and meet widely recognized international safety standards.

The fact that new materials and technologies are constantly being developed means that fuse design is also in constant progress. For instance, modeling fuse behavior by computer enables designers of distribution panels and current-interrupting devices to better meet the increasingly precise demands of today's specifications.

It's hard to avoid Ferraz Shawmut coming to mind in this context. As the Electrical Protection division of the Carbone Lorraine group, Ferraz Shawmut is the world's reference in fuses to protect electrical circuits and equipment. With the world's widest range and an unmatched international presence, the company is active in all applications and on all markets.

To develop new product lines and adapt existing ones, Ferraz Shawmut has organized its efforts around the major standards. In North America, where UL standards dominate, research and development teams at Newburyport, Massachusetts, take advantage of the company's UL and CSA certified test center built around a high power test station with two 68 MVA generators. In Europe, where IEC standards are the rule, the Saint Bonnet de Mure test center near Lyons is the heart of a system to validate new technologies and products, whether fuses, fuse-holders, or fused switch-disconnectors. There technicians and engineers make good use of three power test stations at 3, 20 and 400 MVA. The European testing facilities are COFRAC certified.

These exceptional tools enable Ferraz Shawmut to guarantee the electrical performances of the protection devices it makes for all its customers. There can be no compromise on the quality of stated performances in the field of electrical safety. Ferraz Shawmut has taken that principle to be its own.

Market demands are always taken into account. Obviously only a global group like Ferraz Shawmut, with a geographically far-flung sales organization dedicated in each country either to serving users and distributors on the parts market or to supplying OEMs and major installers on the initial equipment market, can get fast, exhaustive feedback on the changes each market requires.