



Héry, 22nd June 2010



A Message from **Laurent DOUHAISENET**

Plant & Industrial Manufacturing Director

"While adhering to the commitments undertaken by Davey Bickford as part of the Global Compact, we continue to conduct various activities in contexts that remain sensitive. From the safety of people and property to the protection of the environment; both in the design and development and in the production and sales of our initiation systems.

As we did in the previous year, again in 2009 we focused our attention on reducing the impact of industrial activities on the environment.

We remain committed to doing this on a daily basis and we re-affirm our desire to engage in a corporate citizen initiative.

We therefore propose two current illustrations of our initiative and the progress we are making :

1. The treatment of effluent at our production site in Héry (France).
2. The removal or reduction in the amount of lead contained in pyrotechnic initiators marketed by Davey Bickford."

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The relevant GLOBAL COMPACT Principles

8/ Companies are invited to undertake initiatives to promote greater environmental responsibility

TREATING EFFLUENT FROM OUR PRIMARY EXPLOSIVE MANUFACTURING PROCESSES

During 2009, Davey Bickford commissioned a new facility to treat the effluent from its primary explosive manufacturing processes.

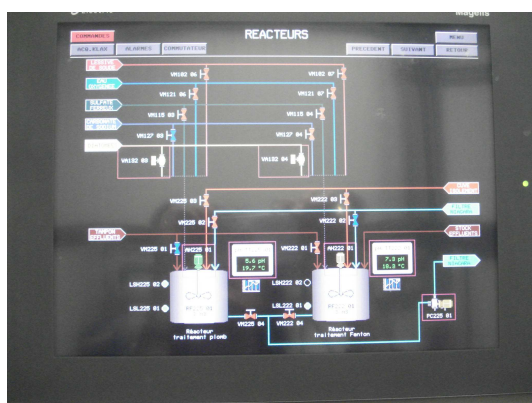
This modern and fully automated facility has two main objectives:

- **To bring up to standard the former plant used to treat water** from the manufacture of primary explosives containing lead. This plant has been automated and made compliant with environmental standards :

- Automating the collection and transfer of effluent.
- Centrally managing treatment phases that are overseen by means of one single control screen.
- Impounding storage tanks.
- Automating pH and temperature controls.
- Discharging effluent directly into the waste water network once the Laboratory has validated the quality of the effluent.

- Developing a new process to be applied to the treatment of effluent from new lead-free primary explosive manufacturing processes (manufacturing processes having experienced remarkable developments over these last two years).

This process, known as the **FENTON** process, allows any organic molecules present (particularly in aromatic nitration cycles) to be destroyed and any residual pollution content in the discharged effluent to be substantially reduced. Applied in addition to the traditional lead removal treatment process, it allows the lead content to be further lowered, substantially reducing the chemical oxygen demand (COD) and bleaching the effluent.



Treatment Control Panel
Displaying the status of the reactors



Tanks for the preparation and storage of reagents

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This facility makes it possible to adhere to pollutant concentrations required by :

- A Prefect's Order dated April 2002.
- An Order dated July 2009 authorising the discharge of waste water from industrial operations into the commune of Héry's collecting system.

Subsequent to the **FENTON** treatment the properties of the effluent are as follows:

- pH of between 6.5 and 8.5 inclusive
- Suspended matter : $\leq 20\text{mg/l}$
- COD $\leq 600\text{mg of O}_2/\text{l}$
- Lead $\leq 0.5\text{mg/l}$

The effluent is totally biodegradable and its characteristics are below the threshold limit values set by the Prefect's Order.



General view of the new treatment plant

In 2009, 180,000 litres of effluent were treated by the new plant which commenced operations in August.

COST OF THE PROJECT

This project, which was conducted in two phases between 2008 and 2009, represented an **investment of €304k** for Davey Bickford. A proportion of this was funded by the Agence de l'Eau (the French State-owned Water Agency).



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The relevant GLOBAL COMPACT Principles

9/ Companies are invited to encourage the development and diffusion of environmentally friendly technologies.

REMOVING LEAD FROM OUR PYROTECHNICS

From our squibs used in fireworks

We are in the process of removing **90%** of the lead contained in our squibs over the course of 2010. In all our new developments, **only** lead-free compositions are now being proposed.

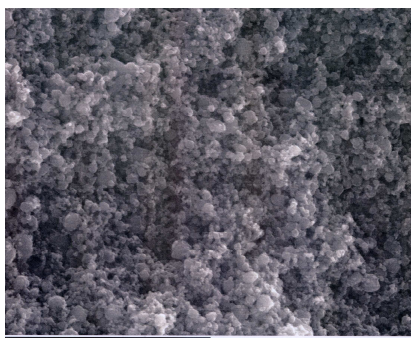
Examples of lead-free primary explosives



From our detonators for use in Mines and Quarries

Delay Compositions

A substantial Research & Development effort has been put into successfully completing programmes to reduce the lead content in delay compositions in detonators used to initiate rock breaking charges in mines and quarries. Following an initial stage in 2007 when approximately **50% of the lead was removed**, present efforts are currently allowing us to envisage future delay compositions free of any lead or heavy metals by 2011-2012.



An example of a lead-free composition.
Scanning electron microscope photo



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Primary Explosives

Today, it has been possible to replace certain lead-based primary explosives with substances that are totally lead-free.

Our teams are actively working on this matter and daily progress is being made. So it is that new programmes are under way to reduce the quantities of leaded substances by using innovative pyrotechnic architectures (electronic detonators free of chemical time-delays, for example).



An electronic detonator

Overall Assessment

Since 2001, we have already reduced the quantity of lead used in our productions fivefold (all products included). Our objective, in the coming three years, is to achieve thresholds of a dozen of milligrams.