SEIXAL MUNICIPAL ECOMUSEUM

VALE DE MILHAÇOS GUNPOWDER FACTORY

The Gunpowder Circuit through the Vale de Milhaços Gunpowder Factory focuses on the buildings, infrastructures, machinery and other objects that document this industrial activity and the technologies applied in producing gunpowder in the period between 1896 and 2001.
This cultural heritage has been preserved in situ with its incorporation into the Seixal Municipal Ecomuseum beginning in 2001.
In 2012, the site was classified as a Monument of Public Interest.
In 2015, the Seixal Council's Municipal Master Plan stipulated the museologic utilisation of the cultural heritage from the former Vale de Milhaços Gunpowder Factory and, to this end, endowing the 13.4ha extent of the Gunpowder Circuit with the Area of Special Usage – Equipment for Collective Utilisation category.

CONTACTS

SEIXAL MUNICIPAL ECOMUSEUM

CENTRAL SERVICES
MUNDET UNIT

Praça 1º de Maio, nº 1
2840-485 Seixal – Portugal
Phone: + 351 201976112

seixal
câmara municipal
ecomuseu

VALE DE MILHAÇOS GUNPOWDER FACTORY
Avenida da Fábrica da Pólvora, nº 146
2855-382 Corroios – Seixal - Portugal

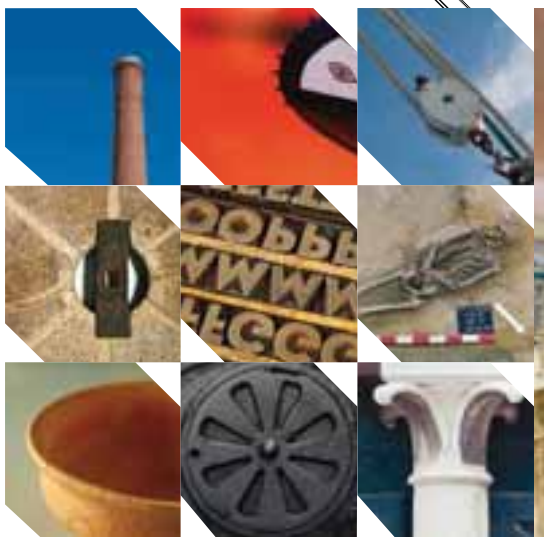
Access restricted to heritage management and research actions and projects or those associated to the Seixal Municipal Ecomuseum Education Service Initiatives Program.

CENTRE OF DOCUMENTATION AND INFORMATION

Reading and consultation room;
document copying.
Email: Ecomuseu.cdi@cm-seixal.pt

EDUCATION SERVICE
information and booking visits, tours and other activities. In-person service following prior reservation.
Email: ecomuseu.se@cm-seixal.pt

The private sector interest in setting up a gunpowder factory in Vale de Milhaços dates back to 1894, then a rural location in the parish of Amora, today belonging to the parish of Corroios in the council of Seixal.
The first company to be founded was that of Libânio Augusto de Oliveira (1894-1896), followed by Francisco Carneiro & Comandita (1896-1898), the Companhia Africana de Pólvora S.A.R.L. (1898-1920), Camelo & Rodrigues (1921-1922) and finally the Sociedade Africana de Pólvora Lda. (1922-2002).
The production of gunpowder in Vale de Milhaços began in 1896 before a serious accident in the following year partially destroyed the factory and caused the death of various workers.
In 1898, the Companhia Africana de Pólvora was founded with the objective of operating and improving the gunpowder manufacturing industry, both guaranteeing greater security and boosting the production capacity to serve mines and quarries, hunting and specialist usages, including the needs of colonial commerce.



Of the industrial factory built in 1898, the Vale de Milhaços gunpowder circuit features over two dozen of the buildings, among which stand out, in construction and functional terms:
-The central set for the production of thermal and mechanical steam energy with the adjoining metal workshop;
-The carbonisation workshops (wood distillation) for the production of one of the raw materials, charcoal;
-The raw material processing and gunpowder production workshops, set off by tree-lined areas for reasons of safety in case of any accident;
-The raw material warehouses (potassium nitrate/saltpetre, charcoal, sulphur) and other products;
-The magazines (gunpowder warehouses);
-The office and some other support buildings.

With a longitudinal layout, there is a safety barrier between the central buildings for producing energy and the gunpowder factory workshops, which proceeded via a discontinuous process.
In the workshops, there is also a separation between the compartments for machines and the mechanical energy transmission systems connected by aerial cables to the central buildings.
Accompanying the layout of the workshops, a *Décauville* type railway line served for the transport of products in drays moved by the workers over the course of about one kilometre.

VALE DE MILHAÇOS GUNPOWDER FACTORY

Gunpowder Circuit

12 **Mixing workshop and transmission house**

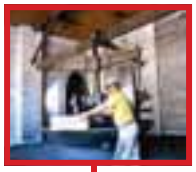
13 **Sieving workshop and transmission house**

14 **Gunpowder waste magazine**

15 **Gunpowder pellet workshop**

16 **Incorporating press workshop**

The load arriving from the mill, forming a pile of layers of gunpowder separated alternatively by copper and canvas sheets, was then placed on the dish in the *Fried.Krupp Grusonwerk* hydraulic mechanical press.
Through a piston action, driven by a hydraulic pump, with a rising movement taking the dish to the top of the press, the gunpowder would be compressed. This would then be broken down into pieces.



11 **Milling workshops and transmission houses**

The loads of raw materials were placed onto the beds of the *Fried. Krupp Grusonwerk* mechanical mills, which would undertake the mixing and blending of the materials through adhesion. Water was added throughout the mixing process to ensure a more homogeneous material less sensitive to attrition.

17 **Granulating workshops and transmission houses**

The pieces of gunpowder were broken up by the actions of the mechanical granulator cylinders before being put through successive sieves to ensure the granular size desired.

18 **Fine-grained gunpowder sieving and glazing workshops and transmission houses**

The production of both fine-and coarse-grained gunpowders requires sieving in machines capable of removing any eventual remaining impurities. Following the introduction of the gunpowder into the mechanical sieving cylinders, graphite would be added to make the product more resistant and brilliant.

19 **Coarse-grained gunpowder sieving and glazing workshops and transmission houses**

20 **Gunpowder steam drying workshop (in ruins)**

A system of coiled pipes stretches out over the inner walls of this workshop that received the steam generated by the boilers and that was fed by the aerial tube held up by the small pillars. Due to the action of the warmth conveyed by the steam, the gunpowder would soon lose its excess humidity. This workshop was destroyed in an act of vandalism in 2003.

20-A **A Solar drying patio**

Gunpowder drying would also involve the material being laid out in trays and exposed to the open air for several hours.

22 **Thermal and mechanical steam energy production workshop**

Two steam generation boilers are installed, one belonging to the *Pierre Dumora* brand, and supplied in 1898 and the other from *João Peres* brand, dating to 1911. They are cylindrical and horizontal with inner furnaces (*Cornish* type). The 1911 boiler is conserved in an operational status requiring only the work of a stoker. This boiler has an 11.45 m^3 capacity and is able to reach a maximum service temperature of 170 °C. The combustion is wood-powered.
The steam produced in the boiler drives the operation of the *Joseph Farcot* steam engine with its about 123 hp potential capable of driving the flywheel up to a maximum speed of 75 rotations per minute. This is also operationally conserved requiring only the work of an operator. In an adjoining compartment to the south, there is the engine independent pump, known colloquially as the donkey pump, supplied by the *Empresa Industrial Portuguesa* brand and believed to predate 1898.

22-A **Well**

When the factory was functioning, the water consumption for the production of steam would amount to 20,000L per day and sourced from this well. Currently, the system draws on the municipal water supply, stored in an aerial tank.

22-B **Metal workshop**

Standing out among the installed equipment is the *Chemnitzer* brand mechanical lathe.

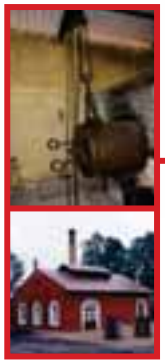
22-C **Refrigeration tank**

Located to the north of the machine house, this refrigeration system incorporates the water circulating in the condenser, which is cooled when issued through the nozzles and comes into contact with the air. This commonly contained 25,000 litres of water.

7 8 9 **Charcoal and packaging warehouses for potassium nitrate and sulphur**

10 **Charcoal and potassium nitrate grinding workshops**

These two raw materials were reduced to dust in the mechanical grinders before sieving and cleaning in the mechanical rotating sieves. These workshops prepared the materials for supplying the milling workshop.



1 **Gatekeeper's house**

2 **Sewing workshop and warehouse**

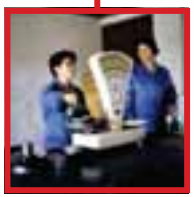
3 **Office and laboratory**

5 **Jute warehouse**

6 **Carbonisation workshop**

Through to the early 1990s, the dual carbonisation furnace served for the production of charcoal from eucalyptus and willow wood. Following its restoration in 2000, the workshop was converted into an exhibition area.

26 **Weighing and packing workshops**



The gunpowder would be weighed and packed into different packages in keeping with the different types and quantities of product.

23 24 25 **Gunpowder and fuse magazines**

Key

- Aerial cables for transmitting mechanical energy
- *Décauville* type railway line
- Steam tube
- Valley – watercourse