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Lead glass, or **crystal**, is a type of glass rich in **lead** (up to 40%) not to be confused with the mineral of the same name. Its high lead content gives it many technical as well as aesthetic benefits that have contributed to make it the highest form of glass.

The addition of lead makes it possible to **reduce the temperature** during work while it increases its **period of malleability**. When the material is cold, lead also facilitates **cut** and **polishing**, resulting a very fine work. Thanks to its **particular sound** and its **brilliance** due to the increase of its refractive index, crystal has become a luxurious material very popular in the field of decorative arts.

The term "crystal" originates from ***cristallo***, in reference to the mineral, used by Venetian glassmakers at the end of the 15th century to characterize particularly fine and transparent glass objects thanks to pure silica and the addition of a component that remains unknown. **Murano glass** is the most famous type.

The British glass merchant **George Ravenscroft** (1632-1683), who wanted to compete with the *cristallo*, used flint from the Oxfordshire River in 1674 instead of the gray flint of London to get closer to the flint of the Italian river Po - crystal being mainly composed of silica, provided by a white sand which must be as pure as possible. The way Ravenscroft was then led to add lead is now contest. Some say he did it deliberately: in order to keep his research secret, he misled the English chemist **Sir Robert Plot** - the addition of lead oxide (red) giving a pale pink hue. Others think he had the idea after seeing the Venetians add to their mixture the same lead oxide to color their glass.

Noting the strong dispersion caused by lead oxide and the resulting brilliancy, Ravenscroft made a request in **1674** to King Charles II to file a patent and became the only producer of lead glass in England. He commercialized "his" discovery « **flint glass** ». Twenty years after the expiry of its patent in **1681**, lead glass was made by about a hundred English glass manufacturers. If Ravenscroft did not invent this technique, he improved it and contributed greatly to its diffusion.

The **United States** for their part attempted to develop flint glass production, but were blocked by the United Kingdom embargo on lead oxide. The flint glass industry in the United States will not be developed until around 1819 with the discovery of lead oxide deposits.

The **Bohemian crystal** is the type of leaded glass that really brought, in the 18th century, the **art of the table** which will be synonymous with elegance and propriety over the ages. Bohemia considerabily contributed to the development of an artificial crystal, hard and very clear, which quickly exceeded the Venetian production. However, with the immigration of these workers and their know-how in North-West Europe, the Bohemian crystal was supplanted, at the end of the century, by the English crystal, at the origin of the one we know today.

In France, the **Saint-Louis** glass manufactureris the oldest crystal factory in France and belongs today to the Hermès group. At the beginning, the **glassworks of Münzthal** was founded in **Moselle** in **1586** and was the first to manufacture crystal in **1767**, year it took the name of **Royal Glassworks of Saint Louis** (*French: Verrerie Royale de Saint-Louis*).From then it had a flourishing activity, encouraged by the king himself. In **1781**, the **Royal Glassworks** succeeded to discovery the secret of the composition of the crystal which England held the secret since its "discovery" by George Ravenscroft in 1627. The crystal factory continues to produce glass before exclusively use crystal from 1825. It inaugurates an era of growth and innovations. 1834 is the year of creation of the famous **Trianon service**, the ultimate in art of the table refinement.

At the same time, the **Manufacture of Queen's crystals** (*French : Manufacture des Cristaux de la Reine*), now **Château de la Verrerie**, was also contributing to the development of crystal. In **1786**, the royal family built in **Creusot** the factory which was located until then in the park of Saint-Cloud in Sèvres. After the French Revolution, the activity progressed rapidly thanks to the talent of Benjamin Ladouèpe-Dufougerias, the lustre maker of the Emperor, and became the **Imperial and Royal Manufacture** (*french : Manufacture impériale et royale*). It was finally for sale several times until Baccarat and Saint-Louis glassworks bought it in **1832** and closed it immediately. Despite this short history, it was at **Le Creusot** that, during these four decades, the evolution of French glass took place, especially in the field of **optical glass**. Indeed, the research around lead glass in optics was multiplying thanks to its high refractive intensity which makes it particularly interesting and fertile in this field. As for the art of the table, crystal became, in the second half of the 19th century, the symbol of French manners.

North-east of France, which saw the birth of the **Cristallerie de Saint-Louis** mentioned above, was however the main place in the history of French crystal. Alsace and Lorraine, in particular, became privileged territories thanks to their natural resources (sand, sandstone, wood, water). This is where the world-famous **Baccarat** crystal factory is located. Created at the initiative of **Monsignor de Montmorency-Laval**, Bishop of Metz, in **1764**, Baccarat was initially a simple glassworks. In **1816**, the glassworks became a crystal factory thanks a Franco-Belgian industrialist who became responsible for it. The crystal factory was quickly noticed, so much so Louis XVIII inaugurated in **1823** a cycle of royal orders. In **1828** occured the famous visit of Charles X, first king to go to the factory, during which the **ewer cut in clear crystal** was offered to him. It wears the French and Navarre coat of arms created in gold and polychrome enamels.

Dedicated to luxury objects and to a process that is both technical and artistic, Baccarat won several **gold medals** at the **Salon**, before receiving a gold medal at the **Paris World Fair of 1855**. It participated in the **International Exhibition of the East of France in Nancy** in **1909** where it presented one of its most known pieces, the vase ***Three Graces***. It has benefited from exceptional orders, such as the **service for the ceremonial tables of the Elysée Palace in 1899**, still used today, or the **Tsar candelabrum for Nicolas II**, while continuing to seduce and attract the privates.

Apart from the crystal glassworks, the company **Escalier de cristal**, very famous under the Bourbon Restoration, period during which crystal was very fashionable, was founded by **Marie Desarnaud** probably in **1802**. It was the first society to offer decorative objects (clocks, candelabras, ornamental vases) which combines cut crystal and gilded bronze. Thanks to the quality of its productions, it received the **Gold Medal** at the **1819 Exhibition of French Industry Products** with the **Duchesse de Berry's washstand**, executed on a drawing by **Nicolas Henri Jacob** (1782-1871).

At the turn of the 19th and the 20th century, glass, then glass paste (*French:pâte de verre*), are at the center of **Art Nouveau** style research and creations. In particular, the **Nancy School** (*French : Ecole de Nancy*), created in 1901 under the **Emile Gallé** (1846-1904) initiative who became the president, made glass one of his favorite materials, with also ironwork, steel, wood but also crystal, Emile Gallé in particular. He opened in 1894 his crystal glassworks located in Nancy - where the glass is however rather practiced than crystal. He filed in 1898 two patents for "a kind of decoration and patina on crystal" and "a kind of marquetry of glasses and crystals". In 1910, at the **Palais Galliera**, is inaugurated the Exhibition of French modern and artistic glass and crystal, first exhibition ever devoted to these areas. If glass remained the favorite material for Art Nouveau artists, the crystal will eventually attract the greatest names of the time, as **Lalique** in 1945 when its founder, René Lalique, died, or from 1968 the **French Company of Daum crystal** (*French : Compagnie Française du Daum crystal*),founded in 1878 in Nancy, Lorraine, which brings up to date the paste of glass and the crystal paste. Crystal remains today a very popular material synonymous with excellence, luxury and the art of living in the French way.

See also

Baccarat — Rock crystal — Murano — Émile Gallé — The Escalier de Cristal — Charles X style — Art Nouveau

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