PENTA

Crafted with soul

History

For thousands of years - ever since human beings have started melting, blowing, casting or pressing glass - new formulas to improve the qualities of this material have been experimented.
Otto Schott's extensive research led him to discover that adding boron made the glass more resistant to thermal expansion: borosilicate glass only expands by 1/3 compared to soda-lime glass and doesn't shatter at high temperatures. This discovery gave life to Duram, a type of glass used to make thermometers and laboratory equipment. More or less at the same time, Bessie Littleton cooked an excellent pie in a Nonex (non-expansion) glass pan produced in her husband's company. Shortly afterwards, Pyrex dishes were invading the world.
Borosilicate glass even made it possible to go one step beyond: a 5m-diameter glass was molten to make the biggest telescope that had ever existed.
Even later, borosilicate glass made its way into the artistic sphere of lampworking: the majority of glass types used by artists needs to be worked at uniform temperatures, otherwise it will crack and then break. Borosilicate glass tolerates large differences in temperature more than other types of artistic glass so the artist can combine several components to create large-scale compositions and experiment with bolder shapes.

Characteristics

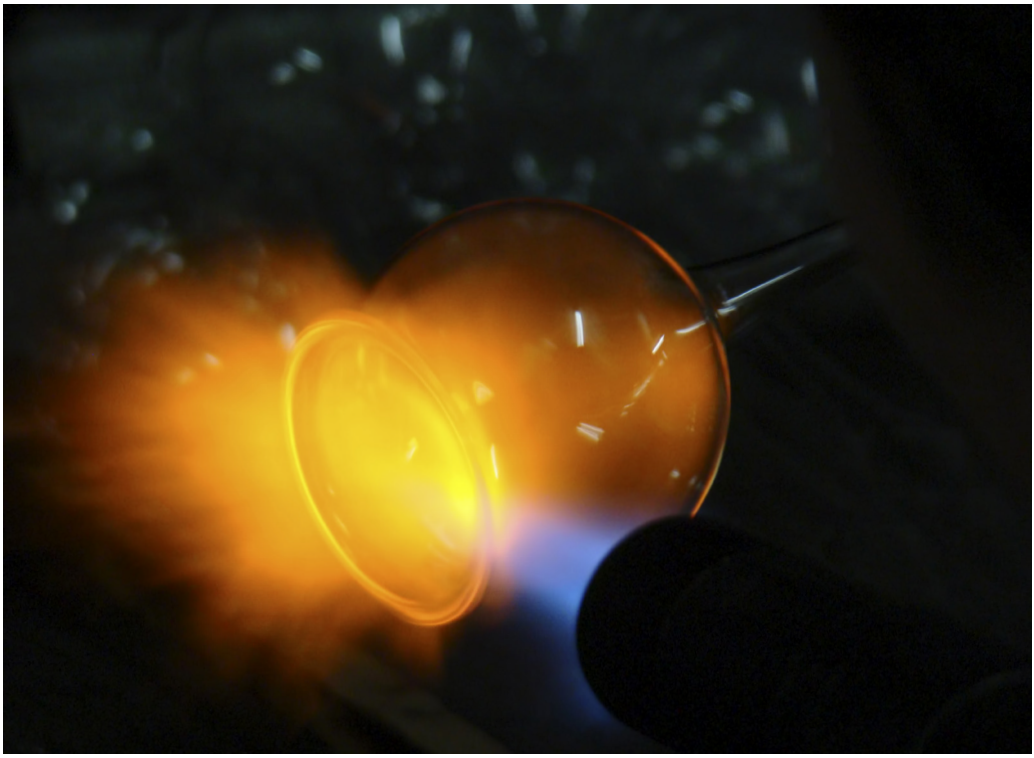
• Borosilicate glass is subject to less thermal stress and can resist intense temperature differences without breaking.

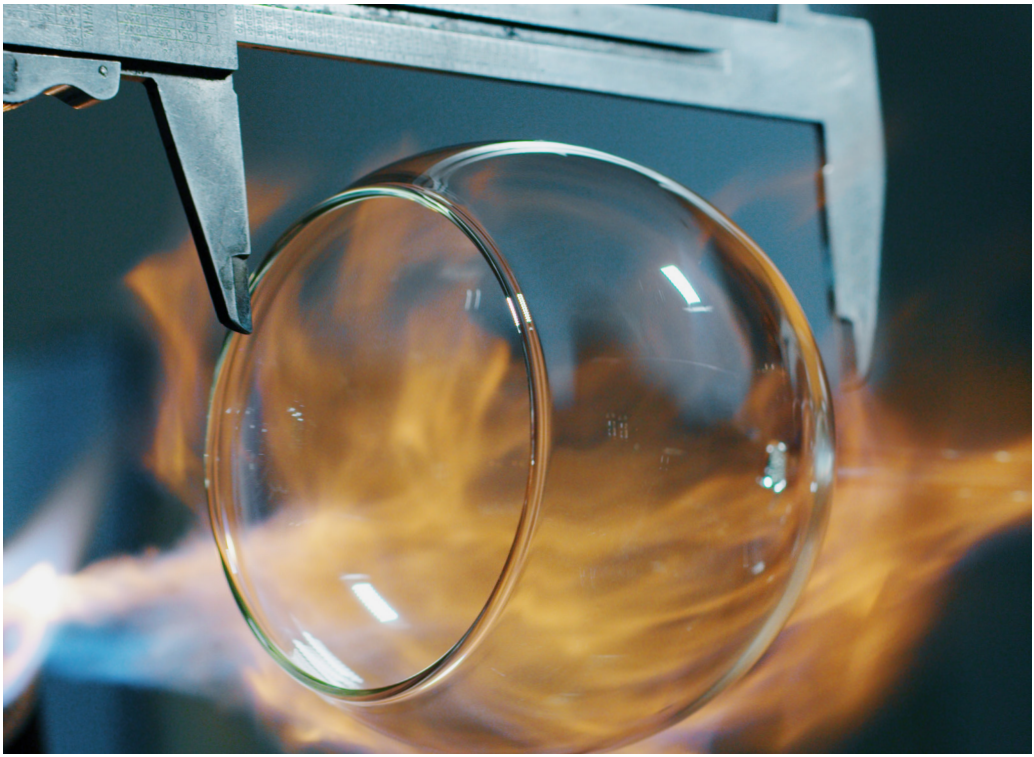
• This glass family resists very high maximum temperatures up to about 500°C (932°F).

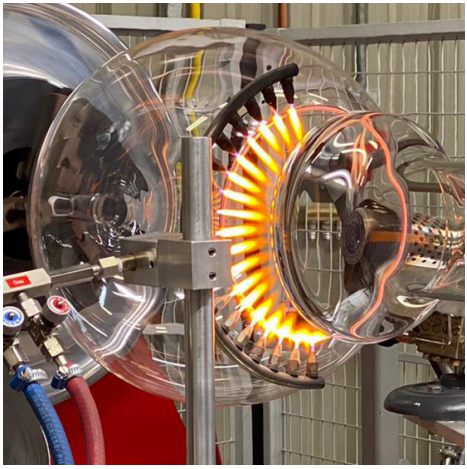
• It shows an extremely high chemical resistance in corrosive environments.

• Visually, borosilicate glass is crown glass with low dispersion and relatively low refractive indexes.

• Borosilicate glass needs higher temperatures to reach the melting point and be in the ideal condition to be worked. This requires the use of more powerful burners (cannelli in the technical lingo) and a consequent higher consumption of gas and oxygen with higher costs.



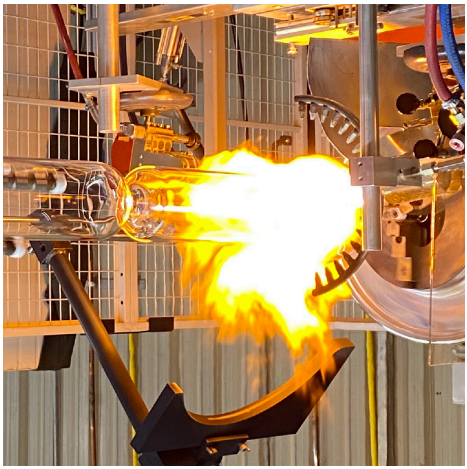




Manufacturing process

CUT
The borosilicate glass is distributed as a raw material in the form of various tubes. The first operation in the manufacturing process is the cut, which is usually performed by means of thermal shock.

BURNING
The cut tube is then burnt on the edges. This operation is rigorously performed by hand and with the help of specific flames to make the edges more resistant and give them a better finish, both functionally and aesthetically.



Manufacturing process

WELDING AND BLOWING
This type of glass is almost always worked on mechanical lathes. From the melting point, the glass blower can weld together tubes of different diameters and blow the glass into particular graphite moulds to guarantee the necessary forbearance measures needed in the series production of objects for lighting, laboratories, home appliances, etc.

METALLIZATION
The higher melting point of borosilicate glass makes it difficult – though not impossible – to use pigments to colour the glass paste. This feature offers us the opportunity to create elegant and precious finishes using the process of metallization or “sputtering”, which consists in placing a very thin layer of metal on the glass surface.
The various hues, the degree of coverage, and the shine are obtained thanks to the skilful dosage of times and materials, which has been matured with experience over time. The quality of the process makes it possible to explore new finishes and obtain unique pieces, which are the result of competence and skill. Each treatment on our glass has a strong manual component which is unrepeatable and embellishes the collection making it as distinctive as a work of art.

Characteristics of our glasses

WELDING
Many of our lamps take advantage of the possibility to weld different elements to create objects with more complex shapes. For example, in the Glo lamp, the seams between the glass tube and sphere and between the sphere and internal diffuser, are the most delicate points, which make it truly incomparable. This workmanship is fully entrusted to the know-how of the master glassmaker, so any deviations or waves on the edges only bear witness to the hand-crafted nature of these objects. However, our quality control only admits one of these imperfections at a time.

BUBBLES INSIDE THE GLASS
Sometimes air gets trapped inside the glass during the melting process. A careful quality control will only accept one bubble in the most visible part of the lamp.

PROCESSING STRIPES
Borosilicate glass is worked on the lathe. The shape is defined with a graphite mould that shapes the glass while it is heated. This rather long process may cause stripes to appear on the surface, but if they are on the visible part of the lamp, it will be discarded.

Our glass components may feature variations in color and texture or slight imperfections resulting from the production process. These distinctive characteristics are typical of handmade products and reflect the uniqueness of each piece.

Characteristics of our glasses

SCRATCHES
Borosilicate glass is highly resistant to scratches on the surface, but the very thin layer of oxides that is applied to give the glass its metallic appearance is not equally resistant. Therefore, metallized glass is moved and handled with extreme care to reduce possible scratches to an absolute minimum. Quality control will accept no more than 2 scratches no larger than 1mm in the most visible part of the lamp.

STARDUST
During the delicate metallization process, oxides may not deposit themselves in a uniform manner on the surface which creates a romantic “stardust” effect. Quality control will make sure that this phenomenon is not too visible nor widespread.

IMPURITIES INSIDE THE SANDBLASTED GLASS CUP-DIFFUSER
Glass may present small impurities which could be due undissolved material. If these small dots are visible even after sandblasting the glass, no more than one will be admitted on the lamp’s visible surface.

DEFORMATIONS
Deformations may occur due to the manual manufacturing method of the glass. Only one per piece is tollerated and only if it is in a non-visible area of the lamp.

INTERNAL STAINS
Our glass is carefully cleaned before welding the 3 pieces together. However, one or two stains inside the glass may escape our scrutiny. But we always make sure they are not in the foreground.