

# GLASS AS A MATERIAL FOR BODY JEWELRY

## TYPES OF GLASS USED IN PIERCING JEWELRY

In the 1990's borosilicate glass was the only glass type being used for modern piercing jewelry. In the new millennium various other glass types have been introduced as well, including soda-lime, quartz, and barium crystal. Different glass types have different working characteristics; some are better for fusing and kiln forming, while others are easier to work on a torch or blow-pipe. Generally there is a wider color palette in the soda-lime glass types, but the borosilicate color selection has been expanding over the last ten years. Color selection is the main reason for manufacturers to use different glass types. All glass types share certain characteristics that make them a good material for piercing jewelry; non-organic, smooth surface, odorless, autoclavable, light weight, and easy to clean.

Hard and soft glass are not scientific terms and can be confusing. "Hard" and "soft" glass are trade terms originally used by glass workers to describe the viscosity and flow of different glass types. Glass does not have a specific "melting point" or definite temperature where it changes from a solid to a liquid the way metal does. Rather glass has a "softening range" where it gradually begins to become more malleable as it heats up. Soft glass has a relatively low softening point and longer working time. Soda-lime, barium crystal, and lead crystal are all "soft" glass but have very different chemical compositions. Hard glass has a high softening point and a high viscosity with a very short working time. Borosilicate, quartz, and aluminosilicate are "hard" glasses. In order to be more precise specific glass types will be referred to by their chemical composition, and not by their viscosity and workability.

|              | Coefficient of Expansion | Strain Point °C | Anneal Point °C | Softening Point °C |
|--------------|--------------------------|-----------------|-----------------|--------------------|
| SODA-LIME    | 92                       | 472             | 515             | 700                |
| BOROSILICATE | 33                       | 505             | 550             | 780                |
| QUARTZ       | 5.5                      | 1120            | 1215            | 1683               |
| LEAD         | 89                       | 390             | 435             | 630                |

Viscosity/ Thermal Properties

## VISCOSITY OF GLASS

The basic glass types used for body jewelry are: soda-lime, borosilicate, fused quartz, barium crystal, lead crystal, and obsidian. Read on for descriptions of these general categories.

**SODA-LIME GLASS**- the most common glass type, used widely in food and beverage containers, windows, and art glass. It contains three major compounds in varying proportions, but usually silica (about 60-75 percent), soda (12-18 percent), and lime (5-12 percent). Soda-lime glass is available in a wide range of transparent and opaque colors. While soda-lime glass has less resistance to thermal shock than borosilicate glass, it can be annealed without problems.

**BOROSILICATE GLASS**- any silicate glass having at least 5% boron oxide. Widely used for bake wear and laboratory equipment because of its resistance to thermal shock and good chemical stability. While borosilicate is not physically stronger than soda-lime glass, it has a greater resistance to scratching which helps prevent the formation of crack initiation sites and therefore generally has greater longevity. Borosilicate rod is extruded out of large furnaces, giving superior consistency in sizing.

Pyrex® has been widely used synonymously for borosilicate glass, which can be misleading because the Pyrex® brand name sells both soda-lime and borosilicate glass products. The proper designation should be Pyrex 7740®, which refers to the borosilicate glass. In recent years the quality of Pyrex® has declined and most body jewelry manufacturers use other borosilicate brand name glass types such as Simax® and Schott Duran®.

**QUARTZ GLASS**- a clear vitreous solid, formed by melting/ purifying quartz sand. This glass can withstand extremely high temperatures. Quartz glass contains 99.98% SiO<sub>2</sub>. Although difficult to work this glass because of its high softening point, quartz is one of the chemically purest glass types with good bio-compatibility characteristics.

**BARIUM CRYSTAL**- a high quality art glass famous for its crystal clear transparency. Similar to soda-lime glass in composition, the addition of barium increases the refractive index in the glass making it more brilliant. Barium crystal is rarely used in manufacturing body jewelry, and there is only a hand full of factories who manufacture this glass world wide.

**LEAD CRYSTAL**- glass that contains a high percentage of lead oxide (minimum 20% of the batch, generally more than 30%). The lead increases density and the refractive index of the glass. Lead crystal is not acceptable for body jewelry. See more in the discussion of the new California lead law.

**OBSIDIAN**- a volcanic mineral that was the first form of natural glass used by humans. It is usually black, but can also be very dark red or green. Obsidian has been carved into piercing jewelry by Meso American civilization for millennia. Some body jewelry is being marketed as “obsidian”, which is actually man made soda-lime glass. If a glass labeled obsidian is not black or dark red/ green then it probably isn't obsidian.