



# DOUBLE HELIX

## GLASSWORKS

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### Glossary

#### Terms related to reducing

- **Reduction Glasses**– are exposed to a reducing flame to create a metallic luster.
- **Reducing Theory**- the process of exposing a silver or other metal glass to a reducing flame to develop the metallic luster. The glass is heated, cooled, and then placed in a reducing flame. Chemically, the exposure to a flame deficient in oxygen, forces the silver to give up its oxygen to the flame, leaving behind a thin layer of metallic silver.
- **Reducing Process**- Use a neutral or slightly oxidizing flame until ready for the reducing process. Then, cool the glass while setting a reduction flame. Briefly and repeatedly expose the glass to the reduction flame. (5-10 seconds). Allow the glass to cool for a few seconds between exposures.
- **Reducing flame** – created either by increasing the propane or other fuel in your torch or decreasing the oxygen. The candles should appear stretched.
- **Cool reduction flame** – usually the area at the tip of a reduction flame, farthest from the face of the torch.
- **Brush flame** – a short, low velocity reduction flame.
- **Neutral flame** - is neither reducing nor oxidizing. There is an even balance of fuel and oxygen. Though a neutral flame is ideal, it is often simpler to adjust the torch to “slightly oxidizing”
- **Oxidizing flame**- contains more oxygen than fuel. It will often display hollow areas inside the flame, where excess oxygen displaces fuel.
- **Luster** – the layer of silver or other metal that is developed to the surface of the glass.
- **Pearlescence**- the process of encasing the metallic luster in a clear or transparent layer of glass.
- **Muddy** – usually the result of a reducing glass being over reduced. Over reducing can happen when a slightly reducing flame is mistaken for a neutral flame or during the reduction process when reduced for too long, too hot or too close to the face of the torch.

## Terms related to striking;

- **Striking Glasses** - are heated, cooled and struck to develop color.
- **Striking Color Theory**- the silver or other metals in the glass, when cooled, and then reheated, form crystals inside the glass. As these crystals grow, they cause the glass to transmit and reflect different wavelengths of light, which appear as different colors.
- **Striking Process**- The three steps required to develop multiple colors in striking glasses. They are reset, cool, and strike (RCS).
- **Strike**: the last step in a three part process for striking glasses. The glass is struck by gently heating in the furthest reaches of a neutral flame. The striking temperature is higher than the cooling temperature, but not as hot as the reset temperature. The glass may be hot enough to move under pressure, but does not flow in response to gravity.
- **Kiln Striking** – glasses that need to be reset and cooled but struck in the kiln. Flame striking will result in over striking.
- **Reset** – When the glass is heated above a certain temperature, the metals re-dissolve, yielding a clear glass. This erases the thermal history of the glass, allowing intentional metal crystal growth.
- **Full Reset** - the mass of glass is heated until the entirety of the glass is fully transparent.
- **Partial Reset** -only the surface of the glass has been reset.
- **Crystal growth** - When silver or other metal glass is cooled, then reheated, crystals form inside the glass. As these crystals grow, they cause the glass to transmit and reflect different wavelengths of light.
- **Nucleation** – can either be the aggregate that silver or metals form in the glass from which the crystal growth begins or additional materials can be added to act as attachment points for crystal growth.
- **Homogeneously Nucleated** -In homogeneously nucleated glasses, the metal itself forms aggregates that act as nucleation centers.
- **Heterogeneously nucleated** -In heterogeneously nucleated glasses, additional materials have been distributed throughout the glass. These materials act as nuclei, “seed” locations for crystal growth.
- **Color Transmission** – the size of the grown crystals correspond to different color transmissions.
- **Over Striking** - the development of oversized or disorderly metal crystals tends to produce dull, muddied tones.

- **Thermal History** – The heat history of the glass. Resetting erases the heat history.

## Other Terms

- **Cooling** – both reduction and striking colors require a cooling period before reducing or striking. Without a cooling period, reduction colors will be muddy or lusterless. In striking colors the cooling cycle is a critical step in achieving repeatable color outcomes. If the reset glass is not allowed to cool before striking, the process does not yield the desired crystal growth.
- **Compatibility** - the ability of two or more different glasses to seal together without causing so much stress between them that they break apart.
- **Neutral Glasses**- Neutral Glasses do not require special treatment or flames.
- **Technical Glasses** – do not require the full reduction or striking process but they do have other specific working characteristics.
- **Reactive** – some glasses have a chemical reaction with other glasses. For example, Aether reacts with silver glasses resulting in a green tint.
- **Test Batch**- a glass color that we are exploring. It will be labeled in the format XX-###
- **Production Color**- a glass color that has passed the testing phase and has been named. All of our colors use names from the Greco Roman pantheon.
- **Orphan Rod**- Orphan rods was either separated from the rest of its batch and we no longer know where it belongs or there was too little quantity of it to make a product. You can take some home by checking the box in your order.
- **Garage Sale**- a bundle of deeply discounted glass made mostly of redundant test batches and odd lots with a mix of; neutral, reduction, striking, dual colors and neutrals in first, second or third quality rods or frit.