

Plasma Light Sculpture Owner's Guide

Based on the Plasma Globe Owner's Guide by Specialty Toys Direct

Congratulations on your new plasma light sculpture! We are excited to provide you with this rare and unique experience. The following is a take-home fact sheet that includes instructions on the safe and proper care of your plasma light sculpture.

Setting up Your Plasma Light Sculpture

We are thrilled that you have chosen a Plasma Light Sculpture for your home or office. To ensure that you have the best experience possible, please take note of the following instructions for unpacking and setting up your new art piece.

First and foremost, please keep the box and all of its contents. Once you have unpacked your Plasma Light Sculpture, choose a suitable location that is away from direct sunlight and preferably has dim lighting. When setting it up, remember to keep it away from any metal objects or surfaces, as these can cause shock hazards when the sculpture is powered on. While the low-amperage current of the Plasma Light Sculpture is not dangerous, it can still be unpleasant, like a shock of static electricity.

Operating the sculpture is easy: simply plug it in and turn it on. **Please follow the provided instructions with the sculpture as they will be specific to your purchase.** To prolong the life of the electronics and gases in the sculpture, we recommend only leaving it turned on when people are around to enjoy it. Additionally, avoid leaving the Plasma Light Sculpture at full power for extended periods of time. All electronics wear out over time, so turning it off when not in use will ensure that you get the most out of your new art piece's life.

Interacting with your Plasma Light Sculpture

Your plasma light sculpture is capable of producing an impressive light display in a dim lit room, but to fully appreciate its unique features, it's best to position it in a darkened space, free from direct light. Once you have identified the perfect location for your sculpture, sit back, relax, and revel in the stunning light show that it will create.

One of the most fascinating aspects of plasma light sculptures is the way they respond to touch. The possibilities are endless, and you are encouraged to experiment with different techniques. Try placing your entire palm or just your fingertips on the surface, or hovering your hand just above the glass. See what happens when you touch different parts of the sculpture and how it reacts to your hand movements, or quite appreciative.

A History of Plasma Globes, the predecessor to Plasma Light Sculpture!

Looking for some background information on your plasma light sculpture? Look no further! We're happy to give you a brief overview of plasma globes and how they work. Before you dive into experimenting with your new sculpture, let's take a moment to understand the science behind it. And don't forget to hold onto this manual - it may come in handy in the future!

Who Invented the Plasma Globe?

The plasma globe was initially invented by Nikola Tesla in the late 19th century based on his work with high frequency currents and gas discharge lamps. However, it wasn't until 1971 that Bill Parker, a physics student at MIT, made significant advancements to the technology, resulting in the modern plasma globe we know today. Parker built upon Tesla's principles and developed techniques to create various colors and effects that are visible in modern plasma globes. Other's who have contributed creatively to the field around the same time were the late Larry Albright, and plasma artist and inventor Wayne Stratman. The plasma globe consists of a glass sphere filled with an inert gas, like neon or argon, at low pressure. When a high voltage is applied to the sphere, it ionizes the gas, creating a plasma that emits a bright glow and mesmerizing visual effects.

What Is Plasma, And What Does It Have to Do With Plasma Globes?

Plasma globes are named after the "plasma" they contain, which is the fourth state of matter. When a gas becomes electrically charged or ionized, the electrons begin to break off from the atoms and move around freely, creating plasma. Unlike a typical gas, plasma is electrically conductive and responds strongly to the effects of electromagnetic fields. The high-voltage current from the power supply charges the gas in the plasma globe, causing it to ionize and turn into plasma. The high-frequency current from the power supply creates an oscillating electromagnetic field that interacts with the plasma, causing the electrons and ions to move around and exciting the surrounding atoms. The energy emitted by the atoms is released as light, which creates the mesmerizing visual effects seen in plasma globes. The color of the light emitted depends on the gases present inside the globe.

What's Involved In Creating Different Plasma Effects?

Creating different plasma effects is a complex process that involves precise combinations of rare gases, specific pressures, and careful matching of the gas mixture to the globe volume and power supply characteristics. The pressure of the gas mixture used determines the shape of the plasma arcs, with higher pressure resulting in thinner and sharper arcs, while lower pressure produces wider and softer arcs. Low pressure can create a unique aurora borealis-like effect. Different rare gases used in the plasma globe have their unique properties and colors. By combining different rare gases, the color, shape, and motion of the plasma effect can be controlled. Rare gases are chosen for their low chemical reactivity to prevent degradation of the plasma effect and to ensure the gas mixture remains stable over time.

Before filling the plasma globe with the precise gas mixture, it is baked in an oven to remove any water vapor, then evacuated to 0.001 Torr to achieve a vacuum of 99.999%. The globe is then permanently sealed to prevent gas from getting in or out. The electrode's inside is coated with conductive silver paint to evenly distribute electricity and hide internal wiring, and the wires and housing are run up into the central stem. The glass globe is secured to the base, and the power supply and circuit-board are mounted and wired to the electrode. The base is then sealed, and the globe undergoes rigorous testing to ensure the quality of the plasma effect and the electronics' durability before being sent out to customers.

The behavior of a plasma arc is heavily influenced by the size and geometry of the vessel in which it is contained. In a plasma arc, the gas is ionized by a high-voltage electrical discharge, creating a conductive channel through which the current flows. The vessel's size and shape can affect the plasma arc in several ways. For example, a smaller vessel can lead to a more focused and intense plasma arc, while a larger vessel may produce a more diffuse and less intense plasma. The shape of the vessel can also affect the shape of the plasma arc, with different geometries producing different patterns of plasma behavior.

Overall, the size and geometry of the vessel, as well as the properties of the gas used, play a significant role in determining the behavior and characteristics of a plasma arc. These factors can be carefully adjusted to create specific patterns and effects, making plasma arc technology a versatile tool in a range of fields, from industrial applications to artistic expression.

Safety Tips for Plasma Light Sculpture

Please look over the following warnings. Some of them are not immediately obvious, but they are important for you to understand. For your own safety, and to ensure the life of the plasma light sculpture, it is very important that you read them thoroughly.

Safety Tips:

- **Plasma light sculptures emit high-frequency radio waves which may cause interference of those with medical devices such as pacemakers, defibrillators, hearing aids etc, who may experience discomfort** when near or touching the plasma light sculpture. It is advised to place a warning that recommends a minimum 3ft distance of comfortable viewing. **Turn off the device and create distance.** Should someone experience discomfort, they and seek medical attention if the sensation does not subside.
- **Keep your plasma light sculpture away from any metal objects or metal surfaces!** Do not touch any grounded metal while your hand is on an energized plasma light sculpture! If you do, you will get a very startling shock. The plasma light sculpture has a low-amperage current, so the shock is not dangerous. It's more like a shock of static electricity; it will probably be unpleasant, so we suggest you avoid it.

- **Remove any rings or other metallic jewelry from your hands before handling a live plasma light sculpture.** Do not touch your plasma light sculpture with metallic objects. Touching your plasma light sculpture with a metal object may cause an electrical arc to form at the glass surface, which could cause small skin burns and may be a fire hazard. Because the human nervous system is not sensitive to high frequency currents, you may not be aware that you are receiving a skin burn until after it has happened.
- **Keep your plasma light sculpture away from liquids of any kind.** If water or any other liquid is spilled on your plasma light sculpture, turn it off immediately. Do not handle the plasma light sculpture with wet hands, as this could cause you to get shocked.

Protecting your Plasma Sculpture and Electrical Devices

- **Do not leave your plasma light sculpture unattended.**
- **Plasma light sculptures emit high-frequency radio waves which may cause interference in nearby electrical devices** such as telephones, wireless remote-control devices, AM radios, answering machines, computer monitors, or television sets. If this happens, move the device away or turn off the device.
- Plasma light sculptures can interfere with each other if two or more sculptures are operating within 2-3 feet of each other. The plasma light sculptures may become damaged through this interference. If you have more than one plasma light sculpture, keep them at a safe distance from each other, at least 3 feet apart.
- **USB cable devices should not be operated near energized plasma light sculptures,** and touching an energized plasma light sculpture and a USB cable at the same time may cause damage to a device connected to the USB cable.
- **Always unplug your plasma light sculpture before cleaning the glass.** Do not use abrasive cleaners to clean your plasma light sculpture, as this could permanently damage the glass. Small scratches to the glass can be sealed with clear nail polish thinned with lacquer thinner.
- **Do not turn your plasma light sculpture on and off continuously,** or connect it to a power source that is turned on and off continuously. Doing so may cause the electronics to overheat and become permanently damaged.
- **Keep the plasma light sculpture in a well-ventilated area, and do not leave it turned on at full power for an extended period of time.** Only run the sculpture at the highest power setting when there is someone there to appreciate the plasma image.