TEKCOPLUS GSTK-94

TEKCOPLUS GSTK-94 Handheld Gemological Spectroscope Instruction Manual

Model: GSTK-94

1. Introduction

The TEKCOPLUS GSTK-94 Handheld Gemological Spectroscope is a precision instrument designed for the identification and analysis of gemstones. This compact and portable device allows users to examine the absorption spectrum of a stone, which is crucial for distinguishing natural gemstones from synthetics and treated stones. Its durable aluminum construction and high-quality optics ensure reliable performance for gemological analysis.

This manual provides detailed instructions on the components, setup, operation, and maintenance of your spectroscope to ensure accurate and effective use.

2. Product Components

The TEKCOPLUS GSTK-94 spectroscope is designed for ease of use and portability. Familiarize yourself with its main parts:

- **Lens:** The objective end through which light enters the spectroscope.
- **Body:** The main housing of the spectroscope, made from durable aluminum.
- **Eyepiece:** The end through which the user views the spectrum.

Figure 2.1: Labeled diagram of the spectroscope components. The image highlights the lens at one end, the main body, and the eyepiece at the other end, providing a clear visual guide to the device's structure.

Figure 2.2: The spectroscope shown alongside its protective leather carry pouch, emphasizing its portability and the included accessory for safe transport.

Figure 2.3: The spectroscope and its leather pouch neatly packaged within the standard product box, illustrating how the item is received.

3. Setup and Getting Started

The TEKCOPLUS GSTK-94 spectroscope requires minimal setup. It is ready for use directly out of the box.

1. Unpack the spectroscope from its protective packaging and leather pouch.
2. Ensure the lens and eyepiece are clean and free from dust or smudges. Use a soft, lint-free cloth if cleaning is necessary.
3. No batteries or external power source are required for the spectroscope itself, as it operates by analyzing transmitted or reflected light.

Figure 3.1: A hand holding the compact spectroscope, demonstrating its small and portable size, ready for immediate use.

4. Operating Instructions

Using the spectroscope involves observing the light spectrum that passes through or reflects off a gemstone. This allows for the identification of specific absorption lines, which act as a 'fingerprint' for different gem materials.

4.1. Observing Transmitted Light (for transparent gemstones)

1. Place the gemstone on a light source (e.g., a strong white light, fiber optic light source).
2. Hold the spectroscope with the lens end close to the gemstone, ensuring light from the stone enters the lens.
3. Look through the eyepiece. You should see a continuous spectrum of colors (rainbow).
4. Observe for any dark lines or bands interrupting this continuous spectrum. These are absorption lines.
5. Compare the observed absorption spectrum with known spectra for various gemstones to identify the stone.

4.2. Observing Reflected Light (for opaque or mounted gemstones)

1. Illuminate the gemstone with a strong white light source.
2. Hold the spectroscope with the lens end close to the gemstone, allowing reflected light to enter the lens.

3. Look through the eyepiece and observe the spectrum for absorption lines.

Important Note: Each gemstone has a unique absorption spectrum. The presence, position, and intensity of dark lines indicate the chemical composition and elements present in the stone, aiding in its identification. For example, the presence of specific lines can help identify 'diamond stimulants' like YAG and Cubic Zirconia by detecting elements like iron and chromium.

Figure 4.1: This image demonstrates the wide applications of the spectroscope, showing how it helps distinguish naturally colored diamonds from irradiated ones and natural stones from synthetics based on selective absorption of wavelengths.

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Video 4.1: An official product video demonstrating the features and basic operation of the Pocket Gemological Spectroscope. This video provides a visual guide to understanding the device's parts, its compact nature, durable construction, and how it aids in distinguishing gemstones.

5. Maintenance

Proper maintenance ensures the longevity and accuracy of your spectroscope.

- **Cleaning:** Use a soft, lint-free cloth to gently wipe the lens and eyepiece. Avoid abrasive materials or harsh chemicals that could scratch the optical surfaces.
- **Storage:** Always store the spectroscope in its provided leather carry pouch when not in use. This protects it from dust, scratches, and minor impacts.
- **Handling:** Handle the spectroscope with care to prevent dropping or impact, which could damage the internal grating or optical alignment.

6. Troubleshooting

If you encounter issues with your spectroscope, consider the following:

- **No Clear Spectrum:** Ensure the gemstone is adequately illuminated and that the spectroscope's lens is positioned correctly to capture the light. Check for any obstructions or dirt on the lens or eyepiece.
- **Faint Spectrum:** Increase the intensity of the light source used to illuminate the gemstone. Some gemstones may require a very strong light to reveal their absorption lines clearly.
- **Difficulty Identifying Lines:** Practice with known gemstones to familiarize yourself with typical absorption spectra. Consult gemological charts or reference materials for comparison.

7. Specifications

Detailed specifications for the TEKCOPLUS GSTK-94 Handheld Gemological Spectroscope:

Feature	Specification
Model Number	GSTK-94
Brand	TEKCOPLUS
Length	55 mm (2.17 inches)
Diameter	15 mm (0.59 inches)
Material	Aluminum
Item Weight	0.04 Kilograms
Power Source	Not applicable (passive optical device)
Recommended Uses	Gemstone Identification, Gemological Analysis

Figure 7.1: A visual representation of the spectroscope's dimensions, indicating its length of 55mm and diameter of 18mm at its widest point.

Figure 7.2: A summary of the spectroscope's features, including its length, diameter, durable aluminum material, and ease of use for providing a brilliant spectrum.

8. Warranty and Support

For warranty information and customer support, please refer to the contact details provided with your purchase or visit the official TEKCOPLUS website. Keep your proof of purchase for any warranty claims.