

QUANTUM TUBE

USER MANUAL



QUANTUM
TECHNOLOGY GROUP

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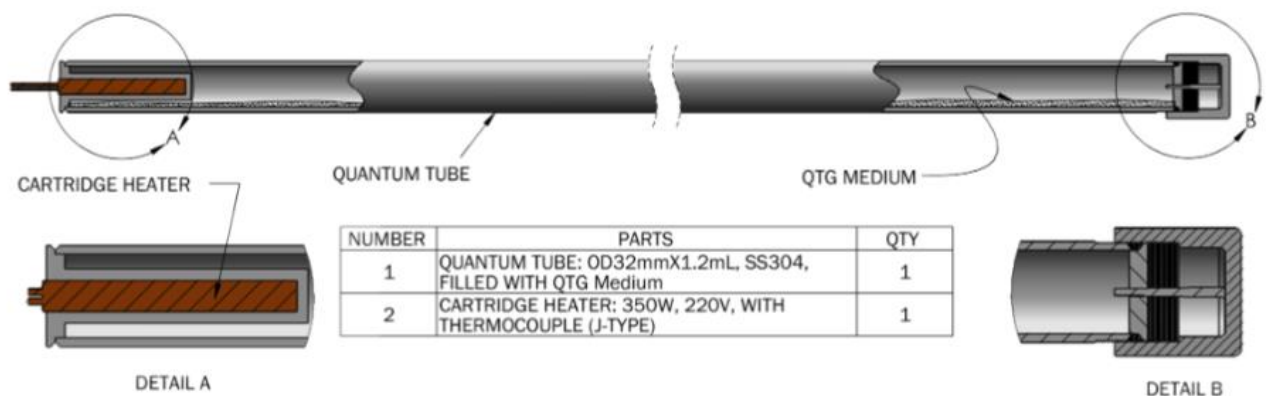
1) Overview

The most direct and effective method to examine the heat transfer performance of QTG Medium is testing of the Quantum Tube. The Quantum Tube is designed for end-users to experience and study the superb thermal performance of QTG Medium. This Quantum Tube can also be used for teaching and experimenting. It can easily be operated by connecting to external electric power supply and positioning the Quantum Tube at an angle $\geq \pm 0^\circ$, where the cartridge heater should be located at the lower end.

The kit consists of:

- 1 pc Stainless Steel 304 Pipe (OD 32mm, ID 26mm, 1200mm Length)
- QTG Medium – Pre-filled in the Quantum Tube
- 1 pc Cartridge Heater (350W/220V)

2) Schematic Diagram



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3) QTG Medium

QTG Medium comprises of several specially-designed, multi-scale, inorganic particles with various electric and magnetic properties. Its suspension in deionized water in a volume fraction of 1% forms a revolutionary kind of heat transfer fluid that differs significantly from all the others. Filling in the closed cavity of metallic and non-metallic thermal transfer devices, it ensures dynamic corrosion inhibition, and induces strong coupling among transport processes, thus providing those devices isothermal heat transfer.

The value proposition of QTG Medium is to provide thermal products with a significant thermal efficiency, reduced energy loss, minimized production cost and lowered carbon emissions.

In addition, QTG Medium does not contain hazardous dichromate and other dangerous substances, in compliance of international environmental standards (refer to the third-party test report for more information).

4) Objective

1. To examine the thermal performance of QTG Medium
2. To demonstrate the heat transfer mode of QTG Medium
3. To understand the unique properties of QTG Medium
4. To integrate QTG Medium into your products
5. To minimize the production cost and lower the carbon emissions

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5) Methodology

1. Position the Quantum Tube with an elevation angle of $\geq 0.1^\circ$.
2. Cartridge Heater's lead shall be connected to a 220V power supply. Connect the thermocouple (J type) of the cartridge heater to any thermometer. Quantum Tube's surface temperature can be monitored by affixing external temperature probe at any location of interest.
3. Switch on the power supply and proceed to test.

6) Disposal

1. Waste disposal of QTG Medium:

Dispose in accordance with all applicable federal, state, and local regulations. Wash contaminated clothing and glassware before reuse. Container disposal: Clean out containers prior to disposal.

2. Disposal of Quantum Tube components:

Remove all existing fluid inside the Quantum Tube, and thoroughly rinse with deionized water. Stainless steel vessels should not be re-used for other purposes. Discard it if needed.

7) Disclaimer

The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Quantum Technology Group (Singapore) Pte Ltd shall not be held liable for any damage resulting from handling or from contact with the above product.

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