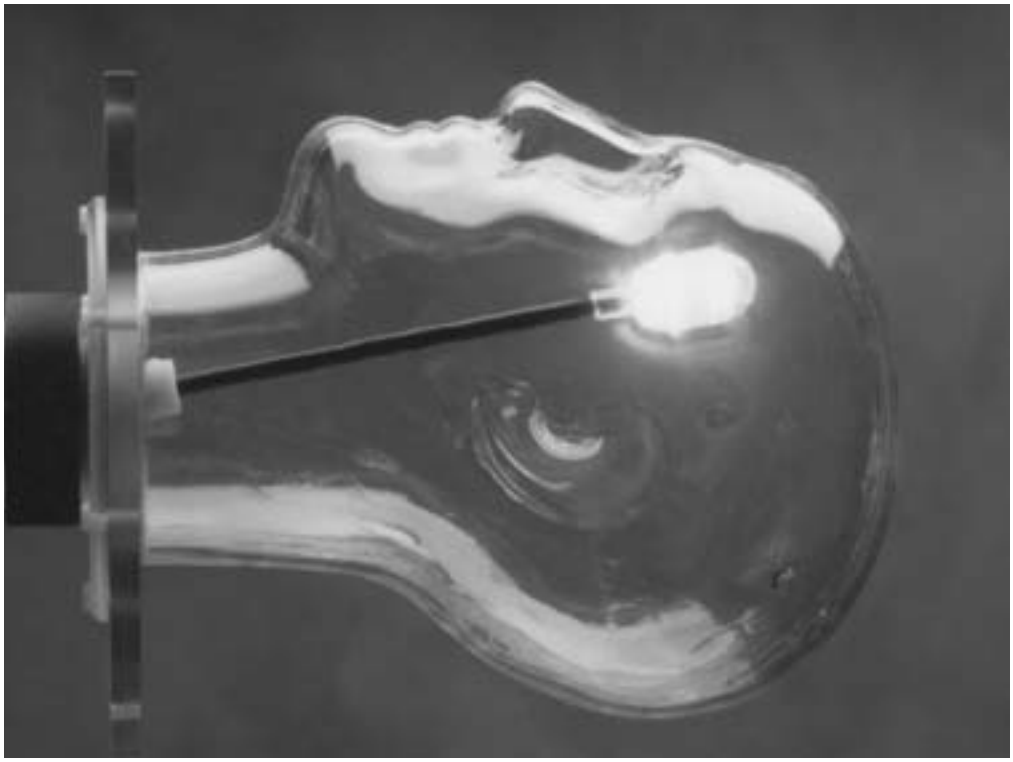
part number
TLP250



RSVP Phantom™ Head

The RSVP Phantom™ Head was developed to provide stereotactic localization and dose verification for radiosurgery machines. Charles W. Coffey, II, Ph.D., medical physicst with Vanderbilt University Medical center, established teh design criteria that The Phantom Laboratory used in constructing the RSVP Phantom™. The phantom may be used for a variety of radiosurgury applications, including periodic quality assurance evaluations and acceptance testing. In addition the phantom may be used to perform re-evaluations after equipment or software upgrades.

The phantom's design provides full simulation of the localization and irradiation sequences. The anatomically accurate head form is filled with water to simulate the radiation absorption and scatter of human soft tissue. The heavy-duty outer shell of the RSVP Phantom™ is designed to accommodate the anchoring screws needed for proper positioning of the head frame. An internal container called a tumor vessel can be positioned anywhere within the head form by manipulating an external position rod. This vessel may be filled with either a radiation-sensitive gel for alignment evaluations or with radiation dosimeters for quantitative dose measurements.

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The Phantom Laboratory

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Stereotactic Localization
The phantom provides an accurate evaluation of stereotactic localization. To perform an evaluation dose sensitive gels, non light sensitive film, TLDs, or small ion chambers are used. The tumor vessel or chamber is positioned within the phantom's head form and the radiosurgery head frame is attached to the phantom. Standard protocols are followed to locate the x, y and z coordinates of the patient's tumor through computed tomography or magnetic resonance imaging. The phantom is then mounted in the radiosurgery system and irradiated. Once the irradiation has been completed the tumor vessel is removed from the phantom head form and dose or dose profile is evaluated.

Phantom Construction
The shell of the RSVP Phantom™ is formed from ¼" cellulose acetate butyrate sheet, a transparent material chosen for its strength and low water absorption. The shell is mounted on a polycarbonate end plate. The tumor port and cover plate assembly are attached with nylon screws to the end plate. The cover plate is removable for internal access. Before phantoms are shipped to customers all of their seams are tested to ensure a water-tight seal. The Phantom Laboratory provides a wooden storage case for each RSVP Phantom™.

Tumor Assembly
Three tumor vessels are included with the RSVP Phantom™, but only one vessel may be used in the phantom at a time. Each of the vessels has an inside length of 4cm and inside diameter of 2cm, and a radius of 1cm at each end. The two ends of the tumor vessel are threaded together at the center to allow easy access into the vessel. The user may position the tumor vessel anywhere within the head form by manipulating the phantom's external position rod. After the desired position is reached, the cylinder is locked into place by hand-tightening a lock nut on the rotation ball and a lock bolt on the position rod.

Optional Equipment
The optional TLP211 plug holder, which is mounted into the tumor vessel, is designed to hold 5mm plugs for TLDs.

The optional TLP212 and TLP213 film holders, which are mounted into the tumor vessel, hold dosimetry film securly in place.

Specially ordered commercially available chambers and scintillation detectors may also be used in the RSVP Phantom™. Contact The Phantom Laboratory for current information on these devices.

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