

**Purpose:** To present a phantom specifically designed for daily quality assurance measurements of the radiation beam characteristics of the tomotherapy Hi-Art machine over a large angular range of the beam.

**Materials and Method:** The phantom is made out of solid water carved in the shape of two co-axial hemi-cylinders with two different radii, and the same depth. The radii are chosen to be 5.0 and 10.0 cm. The depth of the phantom is chosen to be 6.0 cm. The two hemi-cylinders are supported on top of a 16.0 cm high stand also made out of solid water. A hole along the phantom's central axis accommodates a PTW ion chamber which is connected to an electrometer for current or charge reading. A delivery plan utilizing the synchrony between the MLC and the gantry rotational speed is specifically designed to run while the phantom is placed at the machine isocenter. The electrometer reading can be manually or automatically entered into a computer program that will calculate the instantaneous or average rotational output and energy consistency of the machine.

**Results:** When collecting the current from the electrometer, six output reading segments (each segment covers 120 degrees) at two different depths, can be collected in six minutes. If the electrometer is setup to collect charge, six output readings will be collected; each reading is the cumulative charge from 120 degrees of the rotational beam.

**Conclusion:** Using this phantom, daily quality assurance of the Hi-Art Tomotherapy machine can include measurements of the consistency of rotational output, rotational beam energy, gantry rotational speed, and MLC synchrony with the gantry speed all packed within on six-minute procedure.