

## BIPM's SERVICE FOR THE FILLING AND TESTING OF IODINE CELLS

Iodine cells are widely used in stabilized lasers and in spectroscopy. The BIPM has over 30 years of experience in the construction, filling and testing of cells of different designs and offers this service to National Metrology Institutes and other bodies.

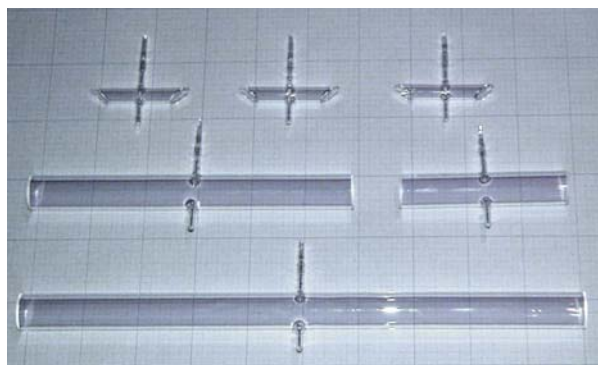


The filling of iodine cells is a technically challenging and difficult process. The BIPM approach builds on the long experience of staff within its former laser section now called the Time Frequency and Gravimetry section. We have a track record of the construction of over 500 cells of different sizes and of the sophisticated systems for verifying the performance and properties of cells once they are filled.

### *CLEANING AND FILLING*

Empty quartz or Pyrex cells, with Brewster or quasi-parallel windows, are specially made for us. The BIPM process ensures the cleanliness of cells by a routine that involves several cleaning and baking stages. The cells are filled with saturated vapour using pure iodine of 99.999% purity. Only the isotope  $^{127}\text{I}_2$  is used at the moment.

We have experience in filling cells of many sizes - the shortest so far being 50 mm and the largest 1800 mm with body's diameters at the customer's demand. Side arms can be provided for the conventional use of temperature-regulated enclosures that control the iodine vapour pressure. Cells are sealed with a graduated seal terminating in a Pyrex tip.



### *TESTING*

Even small amounts of impurities in a cell can adversely affect the performance of stabilized lasers as it leads to pressure broadening and a shift of the saturated absorption features. After filling it is therefore important to check the integrity of the filled cells.

The BIPM has three methods at its disposal: testing of cells either in a 633 nm laser standard, or in a 532 nm laser standard and by fluorescence techniques. All tests measure indirectly the impurity concentration in the cells.



#### *DISPATCH AND ORDERS*

All cells are delivered in specially constructed protective boxes that can be sent by air mail.

The delivery time for orders that require the filling, testing, and mailing of standard cells, i.e. 10 cm long cells equipped with Brewster windows, is normally 12 weeks after receipt of the order. Prices are available on application. Quotes are also available for non-standard sizes.

#### *CONTACT*

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