

INSTRUMENTAL

Development and Evaluation of the ITL Puff Duplicator: Cathy McBride

The ITL puff duplicator has an essentially similar basis of operation as the GR&DC system. The flow signal obtained during human puff recording is determined from the differential pressure across an orifice plate and is used for the duplication process.

For duplication, holders, transducers, and stepper motors are selected and matched for their particular characteristics. The duplicator functions as a 4-port duplication system, each port operating independently from a common smoking record.

The puff duplicator was evaluated using five criteria within set limits, and where appropriate, those are indicated in parenthesis:

- (i) Reproducibility of puff volumes (5% of actual vol.)
- (ii) Reproducibility of puff duration (0.1 s of actual time)
- (iii) Reproducibility of smoke deliveries (made under conditions of low, medium, and high velocities)
- (iv) Comparison of original and duplicated butt length.
- (v) Comparison of original and duplicated butt nicotine content.

It was concluded from the data derived using these criteria that the ITL puff duplicator can be used to simulate the human smoking process.

G. Read

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