

**ABSTRACT FORM**

*Below please type name, address and  
phone number of principal author.*

**NOTE:** The abstract must contain a meaningful summary of the material to be presented. It must include the objectives of the research effort, the methods used, and the results obtained. The Editorial Committee reviews and accepts papers based on the abstract. Very short or vague abstracts will not be accepted.

**SMOKE DUPLICATOR.**  
C. McBride, Imperial Tobacco Ltd., P.O. Box 6500, Montreal, Quebec,  
H3C 3L6, Canada.

Our company as other companies recognizes the need to learn more about smokers. To assess accurately human smoking behaviour, it is necessary to have a tool which can reliably reproduce recorded human profiles. This presentation describes a computer controlled four port smoking machine which can record and duplicate human puff profiles. Recording of profiles is based on the digital conversion of analog flow signals generated via an orifice plate mouthpiece attached at one end to the cigarette being smoked and at the other to a flow transducer. The digital flow signals are stored on floppy disks. In duplication the recorded flow signals serve as master signals. The computer controller activates four synchronous stepping motors thereby initiating an airflow through cigarettes attached to the four ports of the smoking machine. The airflow through each of the four ports is measured using individual flow transducers. Each flow signal is compared to the original flow signal approximately 30 times/second. Based on this comparison, the speed of the motors is adjusted such that the airflow through any individual port matches as closely as possible the master signal. Thus each port is controlled by its own feedback loop and the master signal as read from the floppy disk. Initial tests have indicated that the smoke duplicator is capable of duplicating puff volumes to within 5% and duration to within 0.1s of those originally recorded. Differences in smoke deliveries between ports at high, medium and low flowrates were within 1 mg for (PMWNF) Tar, 0.5 mg. for water and 0.1 mg. for nicotine. Differences between replicate smokings were within 2 mg. for tar, 0.5 mg. for water and 0.1 mg. for nicotine. These differences were not found to be statistically significant.

1. The abstract should not be less than 180 words or more than 225 words. It should be included in the space designated above in form suitable for direct photocopying by the printer (if typewritten, use a carbon ribbon).
2. Please note:
  - (a) Title all in capitals
  - (b) Location and postal/zip code follows author's name, if multiple authors are at different locations.
  - (c) Presenting author is underlined.
3. Mail original and 4 copies of the abstract to: E. Glock, Dept. of Research & Development, American Tobacco Company, P.O. Box 899, Hopewell, Virginia 23860, U.S.A.
4. Abstracts should be received no later than June 12, 1985.
5. Projection requirements: only 2" x 2" slides will be accommodated.
6. Maximum talk time of 15 minutes, with 5 minutes for discussion.

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