

TECHNICAL EXCHANGE MEETING

GR&DC - 22ND MAY, 1981

GR-DC machine parameters study?

Test Methods

Theme The exchange of experience in the methodologies and procedures used to define quality parameters of importance to consumers.

Major Points Arising

There is a major problem in measuring tar deliveries of cigarettes yielding 3 mg/cigarette or less. Coefficient of variation of up to 50% are associated with tar readings of this low level. Fluorimetric and colorimetric methods appear promising for the accurate determination of very low tar levels; however, the use of such methods is restricted since most companies are forced to use government defined standard methods for tar determination.

Because of the importance of tar determinations, it was decided that each operating company should examine its tar analyses method in an attempt to improve the accuracy of its analysis within the restrictions set by the appropriate standard method. Each company should inform the other companies of improvements it has introduced in its analytical method.

There is increasing awareness that humans do not smoke the same way as smoking machines. There was a clear need defined to establish the human smoking parameters of low tar smokers and to determine if there is a change in the relative tar ranking of low tar cigarettes when smoked on a smoking machine using the mean human smoking parameters instead of the parameters normally used. Canada have agreed to establish the human smoking parameters of smokers of low tar cigarettes.

There is an increased need to know the delivery of the major constituents on a puff by puff basis if we are to better appreciate the consumer perception

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of the cigarette. The availability of equipment to do this for tar and nicotine would be of great advantage.

A problem area was identified in disseminating information about method investigation which was either unsuccessful, or, if successful, led to method modification. Such information was not considered appropriate for formal reports. But an alternate information medium did not exist. It was not considered practical to obtain standard BAT methods; however, it was agreed that the laboratories would exchange their standard methods with each other and disseminate information regarding method modification as it became available. This would be done through:

Mr. H. Dymond	GR&DC
Dr. R. Matulis	B. & W., U.S.
Dr. P. Dunn	I.T.L., Canada
Dr. E. Kausch	B.A.T., Germany
Dr. A. Sepulveda	Souza Cruz, Brazil
Mr. T. Wilson	Wills, Australia

It was agreed that an index of references to methods and method modification should be prepared and put on the INTERBAT system.

A future meeting of analysts to review method development should be considered.

The meeting believed that there was considerable value in determining the consumer perception of different cigarette parameters. There is evidence that smokers of low tar cigarettes are more sensitive to quality parameters.

An initial screening was considered necessary to determine which parameters should be investigated first for consumer perception. The list of parameters suggested covered pressure drop, filter ventilation, firmness, end stain, puff number, ash, end stability, shorts and filter hardness. The effect of ambient temperature and humidity on the consumer perception of the cigarette should also be studied.

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It was felt that work on oil/water partition should continue. Little need was seen for developing the chromatographic technique further but there was general support for improving the method of processing the resultant data.

The meeting agreed that Operation Cross-Check should continue twice a year. The tar deliveries of the two cigarettes used in this project should be changed to values of about 5 and 15 mg/cigarette. At this stage GR&DC are in a position to obtain readily cigarettes of 8 and 15 mg/cigarette. The measurement of ventilation for the lower tar cigarette should be introduced. A target date for receipt of results should be sent with the samples.

The method of measuring firmness by PFI requires attention owing to instability of the results obtained over a period of time.

The precision of our oven moisture determination was considered inadequate. A two-pronged attack should be undertaken to improve the precision of the existing method and to find a reliable rapid method for measuring "true" water in tobacco.

There was a need identified for an improved quick method for determining the amount of expanded tobacco in a blend.

There was a need identified for methods to determine Ridomil, the metabolites of Ridomil and pyrethroides.

A review was required of our methods for determining added flavours from opposition cigarettes and for determining the level of known flavours in our own production of low tar and other cigarettes.

There was a need to develop a method for determining aflatoxins on cocoa. This need was highlighted in a paper presented by B.A.T., Hamburg, outlining the requirements they see for method development.

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Summary of Recommendations for Further Work

1. Examination of methods for measuring tar below 3 mg/cigarette.
2. Establish tar deliveries under the smoking parameters used by low tar smokers.
3. Dissemination of information on analytical methods and their modification.
4. The consumer perception of different cigarette parameters should be established.
5. No chromatographic method development of the oil/water partition method was needed but improvement in methods of processing data was required.
6. The value of Operation Cross-Check was verified.
7. There was a need for a rapid method of determining expanded tobacco levels.
8. There was a need for analytical methods for Ridomil, Ridomil metabolites and pyrethroides.
9. There was a need to review our methods of identifying flavours added to tobacco.

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TECHNICAL EXCHANGE MEETING

GR&DC - 21st May, 1981

Social Aspects of Smoking

Theme The better understanding of, and the means of countering, the problems of ambient smoke.

I. Social, Health and Psychological Studies

1. Social perception of smoking is complex, with sidestream being one factor of many - but particularly important to low tar dissonant smokers.
2. It is felt that sidestream may become more important due to increasing awareness of the health problems, rather than due to the irritation problem.
3. There was the need identified of developing panel techniques to assess irritation of sidestream, particularly the eyes.
4. The biological implications related to sidestream should be investigated.
5. The possibility of data interpretation based on panel tests conducted at GR&DC (Charter Associates) being relevant in other countries should be validated.

II. Required Analyses and Techniques

1. Techniques for collection of sidestream directly from c'garettes is well advanced. It is felt that analyses should include, apart from tar, nicotine, CO, NO, specific health/irritation implicated components such as ammonia, formaldehyde, nicotine, nitrosamines.

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2. There was much interest expressed in the effect of aging on sidestream smoke within rooms, particularly in regard to smell, secondary reaction products and particle size. However, the practical difficulties of assessing these effects were acknowledged.
3. OWP techniques have been used to highlight the differences between mainstream and sidestream smoke, but no further applications were suggested.
4. Modelling of sidestream smoke has been initiated at GR&DC and its further development was endorsed.
5. It was unanimously agreed that investigation into the mechanisms of the effect of paper fillers on sidestream be undertaken.

III. Product Design

1. Two practical approaches to sidestream reduction were discussed
 - (a) special papers
 - (b) low porosity paper in combination with low tobacco weight

The former alternative appears to be more promising in that much higher reductions in sidestream can be achieved, while maintaining traditional dimensions. The application of expanded tobacco and/or tobacco substitutes in conjunction with low porosity paper to yield more modest sidestream reduction are worth further investigation.

2. The concept of changing sidestream aroma by addition of flavours or manipulating blends was discussed with the latter offering more promise of success with further investigation.

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3. Before any design is put on the market, it is important to demonstrate that it does not exacerbate any other social problem associated with smoking, i.e. messy ash.
4. Other approaches to reduce the annoyance to non-smokers, such as ashtrays with closeable tops, should be investigated.
5. The concept of the self-extinguishing cigarette was also discussed. Although the techniques of producing such a product have been long available, the marketability of such a cigarette should be thoroughly investigated.

IV Marketing

1. The need to market a reduced sidestream cigarette was generally accepted. However, the problems of marketing such a product were seen to be :
 - (a) perceived as a rearguard action in the light of recent papers implicating the health risk of sidestream smoke
 - (b) focussing attention on sidestream smoke in general.
2. Little or no mention of sidestream should be made during the marketing of such a product. Any advantage of such a product should be discovered by the consumer or social action group independent of industry comment.
3. In the broader context of the social aspects of smoking to both smokers and non-smokers, marketing expertise coupled with R&D should consider strategies to counter the negative aspects of the product.

P. J. DUNN

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TECHNICAL EXCHANGE MEETING

GR&DC, 20TH MAY, 1981

CIGARETTE MODELLING

1. POTENTIAL OF DESIGN MODELS

1.1 Application of Models

1.1.1 To achieve desired smoke deliveries for new products and by modifying existing products.

1.1.2 To achieve a fundamental understanding of the processes that contribute to a given objective, for example the minimisation of CO or NO deliveries.

1.1.3 To explain smoke deliveries

(a) for quality control, in finding out the reasons for deviations, and determining the influences on quality parameters;

(b) for non-standard smoking conditions, by contributing to the understanding of smokers' judgements, smoking behaviour, and by taking account of human smoking patterns;

(c) of competitors' brands, by determining the design policies of competitors and by being informed about the intrinsic potential of their brands in the delivery league tables.

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1.1.4 To predict the effect of changes of cigarette parameters on properties which may be relevant to the consumer.

1.2 Advantages of Models

It was unanimously agreed that design models

- reduce costs;
- reduce the time for product development;
- yield alternative approaches for achieving given product properties.

2. PRESENT STATUS WITH REGARD TO MODELS

All the major B.A.T companies (with the exception of Brazil) and ten other B.A.T companies use design models. Brazil intends to introduce models.

Most of the models are used only for support in reaching the desired smoke deliveries (1.1.1 above).

GR&DC is developing models which yield more powerful tools for

- reducing gas phase deliveries;
- including human smoking patterns;
- understanding the physical properties of the tobacco bed and bulk tobacco;
- reducing substances which may be relevant to smoking and health aspects.

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3. FUTURE NEEDS

Australia: (a) Model of physical properties of tobacco.
(b) To collect information on the effect of the making machine on cigarette characteristics.

Brazil: Standard-smoking design model, with some interest in non-standard smoking effects.

Canada: (a) Model to include the effect of paper additives and tobacco grade properties.
(b) Interest in the GR&DC models, including human smoking aspects.

Germany: Special interest in the models being developed at GR&DC:
(a) puff-by-puff delivery model;
(b) the advanced combustion model;
(c) tobacco rod models (physical properties).

U.S.A.: (a) Model of physical properties of tobacco.
(b) Trends and predictions from GR&DC puff-by-puff and combustion models.

4. RECOMMENDATIONS

4.1 The GR&DC programme of model development should be encouraged, to facilitate the Applications quoted above (1.1), and to enhance the level of the Applications.

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4.2 Exchange of information between GR&DC and the operating companies should continue, with regard to the special needs and special experience of the companies.

4.3 Properties of tobacco and cigarettes relevant to consumers should be included in the models.

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