



Photo: British American Tobacco

Product Technology Study Group

One of the main purposes of CORESTA is “to promote international cooperation in scientific research relative to tobacco”. The second article in this series on CORESTA Study Groups focuses on the Product Technology Study Group.

The activities of CORESTA’s four Study Groups – Smoke Science, Product Technology, Agronomy and Phytopathology – are guided primarily by the rapidly changing regulatory environment. In particular, the EU’s Tobacco Product Directive, the Framework Convention for Tobacco Control and the US Food and Drug Administration are recognised as leaders in shaping the regulatory environment of the future, to which the industry as a whole must respond. The coordinated work of the Study Groups has been central to this response, often leading to the development of CORESTA Recommended Methods (CRMs) that have served as the basis of standards prepared by the International Organisation for Standardisation (ISO). The Product Technology Study Group in particular can help the industry as a whole re-

spond to the changing environment (for example, by prioritising harmonised approaches to selected analytes in tobacco), and perhaps also help regulators make decisions informed by scientific evidence.

The current remit of the Product Technology Study Group includes developing test methods for the determination of product properties. This is CORESTA’s largest Study Group, with 300 participants across 90 organisations from 30 countries around the world. In the past it has also reviewed practices related to tobacco processing, product manufacturing and environmental protection. At present, there are five Sub-Groups in the Product Technology Study Group: Agrochemicals Analysis (AA), Physical Test Methods (PTM), Routine Analytical Chemistry (RAC), Cigar Smoking Methods (CSM) and

Smokeless Tobacco (ST). Sub-Groups are long-term collaborative initiatives established as a response to CORESTA’s Scientific Commission identifying a need for particular projects to be undertaken for the benefit of the industry as a whole. They are created when an initiative has multiple related objectives, and it is anticipated that the work will be considerable and evolve over time.

Agrochemical Analysis Sub-Group (AA SG)

The AA SG was established in 1972 to enable testing of tobacco to ensure regulatory compliance with agreed levels of pesticide residues (for example, organochlorine) in leaf. Many countries have import restrictions; for example, on levels of metals

and pesticide residues. The AA SG is involved in the development of analytical methods and guidelines to support the global movement of tobacco leaf, providing leaf suppliers with an assurance that their crop will reach its destinations without being delayed by such restrictions.

The AA SG also reports to CORESTA's Agricultural Chemicals Advisory Committee (ACAC), providing data to monitor residue levels globally. In support of this, the CORESTA Guide No. 5 (TG5) was published, providing a framework for creating high-quality analytical methods in agrochemical residue testing.

Currently, the AA SG is creating a series of Technical Notes to complement TG5 by providing the information necessary for specific analytes (or group of compounds) to be analysed successfully. This will include acid herbicides, dinitroanilines, dithiocarbamates, methamidophos and pyrethroids.

As tobacco is normally stored for up to a year between purchase and use, the AA SG has also organised a degradation study to evaluate how the concentration of selected agrochemical residues present in tobacco change over time depending on their storage conditions. A report on this work is due for publication by the end of 2011.

Physical Test Methods Sub-Group (PTM SG)

A number of important physical parameters are monitored both on-line and off-line during cigarette manufacture. The PTM SG has been heavily involved in writing CRMs for such measurements; for example in relation to cigarette ventilation, which has been used by ISO as the basis for their standards.

The PTM SG also provides a forum in which suppliers work closely with the industry in response to new or amended regulation. A recent example is the impending EU LIP (lower ignition propensity) regulation (November 2011), where the foresight of the PTM SG prioritised the development of diffusivity-measuring equipment and an associated CRM. This is in response to the

hypothesis of a potential correlation between diffusivity of carbon dioxide through the cigarette paper and LIP. A working group was established to investigate the diffusivity of carbon dioxide into nitrogen through cigarette papers.

Routine Analytical Chemistry Sub-Group (RAC SG)

The RAC SG is particularly active and has been involved in the testing of input materials for the quality control and assurance of product to ensure regulatory compliance.

The RAC SG has also made a strong contribution to development of the ISO smoking standards that are used by the tobacco industry and its regulators worldwide. Indeed, the six ISO standards associated with routine smoking for tar, nicotine and carbon monoxide (TNCO; ISO 3308, 3402, 4387, 8454, 10315 and 10362-1) all originated from work done by the RAC SG.

In addition, the CORESTA Monitor Test Piece – a reference cigarette that enables the correct configuration of smoking machines in laboratories – was developed by the RAC SG and is globally accepted as such. It is included in most of the collaborative TNCO studies internationally, which are acknowledged by accreditation bodies as producing very valuable evidence to demonstrate the robustness of analytical methods.

Cigar Smoking Methods Sub-Group (CSM SG)

The design of cigars is less constrained than that of cigarettes. As a result, cigars are commercially available in a wide range of lengths and diameters. They can also be handmade, which can impact on the variability of the data produced, and can take much longer to smoke than cigarettes.

The CSM SG was set up to develop CRMs for machine-smoking of cigars. It has developed and published CRMs covering smoking, conditioning, tar, nicotine, water, and most recently, CO analyses of cigars.

Smokeless Tobacco Sub-Group (ST SG)

Smokeless tobacco is a well-established but complex category. The form of smokeless products varies widely – from ground loose nasal to a twist of oral chewing tobacco. Many small manufacturers are involved in the production of smokeless products, and increased regulatory interest has resulted in the need for robust analytical methods to give confidence in regulatory compliance.

The ST SG was formed in 2008 in response to increased interest in this product category, leading to a number of smokeless product manufacturers joining and participating in CORESTA's activities.

One of the initial objectives for the ST SG was to reduce ambiguity around the naming of smokeless tobacco products and their ancillary components, in particular the differences between American and European nomenclature. As a result, a glossary of definitions and images of Western- and Asian-style smokeless tobacco products has been published on the CORESTA website library. Smokeless tobaccos also provide a challenge to analysts from a sampling perspective because of their wide range of particle size. The ST SG is presently involved in developing CRMs for sampling smokeless products from the market and sample handling in the laboratory prior to analyses.

Four CORESTA smokeless reference products have been developed by the ST SG: a Swedish-style snus, an American-style loose moist snuff, as well as an American-style loose dry snuff and an American-style loose-leaf chewing tobacco. A chemical characterisation of these products has been carried out and a Technical Report summarising these reference products is being prepared for publication on the CORESTA website during 2011.

Achievements

Three key achievements of the Product Technology Study Group are summarised:

Organising and leading 'Collaborative Studies'. Participation in collaborative studies gives laboratories an excellent indication of their performance, and accreditation bodies encourage such involvement. Collaborative studies organised through CORESTA often involve between 15 and 30 laboratories. Regulatory bodies, as well as tobacco manufacturers and materials/instrument suppliers, often participate.

The development and continued review of standardised test methods. When this article went to press, there were 57 CRMs available on the CORESTA website (www.coresta.org). Of these, 44 were developed by the Product Technology Study Group. More importantly, 26 CRMs from this Study Group have in turn been adopted as standards by ISO, reinforcing the credibility of CORESTA-led studies.

Development of reference materials. Reference materials are fundamental to supporting both routine testing and research work. Most CORESTA member companies are involved in such research, so the availability of reference materials aids harmonisation of these activities in the wider tobacco industry. In addition, reference materials are invaluable for demonstrating the robustness of testing methods and for supporting accreditation.

As discussed above, CORESTA has developed the CORESTA Monitor Test-Piece, and more recently, four smokeless reference products. CORESTA is now involved in the design of a LIP Monitor Test-Piece.

In summary, by covering a wide range of tobacco products - from cigars to smokeless products - the members of the Product Technology Study Group recognise the crucial long-term benefits of CORESTA's work. As tobacco product regulation becomes more stringent, the Study Group continues to provide particular support for those areas that they see as necessary for the future of our industry.

In the next article of the series, the focus will be on plant production, beginning with the activities of the Agronomy Study Group.

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