



# AUTOMATED TOBACCO ANALYSIS

## APPLICATIONS OF CONTINUOUS-FLOW ANALYZERS FOR TOBACCO LEAF AND SMOKE ANALYSIS

In laboratories around the world the AutoAnalyzer, the pioneer of automated analysis, delivers fast, more accurate results, thus improving productivity and cost-effectiveness, and QuAAtro provides high-speed analysis to the largest laboratories.

- ☐ Fast, accurate and reproducible results
- ☐ Proven methods, many recognised by ISO and Coresta
- ☐ Low manpower requirement
- ☐ Simple maintenance and operation
- ☐ Low reagent costs
- ☐ Results calculated and printed out automatically
- ☐ Automatic quality control.

### METHODS

Most methods are automated versions of standard manual methods.

40 to 90 samples can be analysed per hour, and several parameters can be measured from the same sample at the same time.



### FOR TOBACCO LEAF AND FINISHED PRODUCTS

Ammonia

Chloride

Nicotine

Nitrate

Phosphate

Reducing sugars

Total nitrogen

Total sugars

Urea

Volatile acidity

Volatile bases

### FOR SMOKE CONDENSATE

Cyanide

Formaldehyde

Nicotine

# SAMPLE PREPARATION

## LEAF AND FINISHED PRODUCTS

The sample is ground, and a known quantity (typically 1g) is accurately weighed into a bottle. A given volume of extracting solution (typically 100 ml) is added. The sample is shaken, then filtered. Water, 5% acetic acid and 0.01 N sulfuric acid are common extracting solutions.

## SMOKE

The condensate is dissolved in a known volume of extracting solution which depends on the parameters being measured.



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*With permission of British American Tobacco*

## ISO AND CORESTA STANDARD METHODS

### FOUR ISO-APPROVED METHODS ARE AVAILABLE

- ▢ ISO / DIS 15152 (Coresta no. 35): Total Alkaloids (measures nicotine by the CNCl / sulphanilic acid method)
- ▢ ISO / DIS 15153 (Coresta no. 37): Reducing Substances (measures sugars by the ferricyanide method)
- ▢ ISO / DIS 15154 (Coresta no. 38): Reducing Carbohydrates (measures sugars by the PAHBH method)
- ▢ ISO / DIS 15517 (Coresta no. 36): Nitrate (hydrazine / NEDD method)

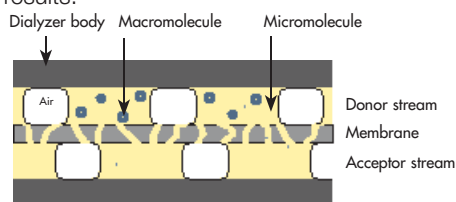
# ADVANTAGES

## RELIABILITY

Many AutoAnalyzers more than 15 years old are in daily use. The high precision glass coils used in the manifold are chemically inert and help the user to check the flow at a glance.

## ACCURACY

Interference from sample color is eliminated by dialyzers with a pore size of 2 nm which separate interfering material such as suspended solids, humic acids, proteins and colored compounds which could lead to false results.



Principle of dialysis

## SAFETY

The cyanogen reagent used or generated for nicotine analysis is completely contained within the analyzer and automatically neutralized after the test.

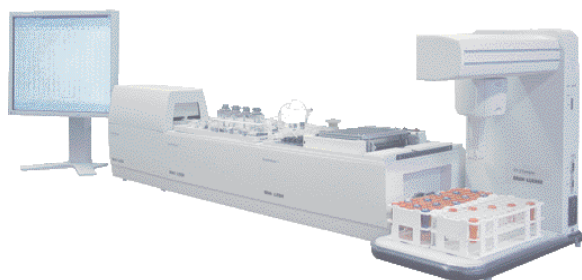
## AUTOMATIC MOISTURE CORRECTION

Sample moisture can be entered manually or by automatic download. Results are then reported on a dry-weight or original moisture basis.

## SATISFIED USERS ALL AROUND THE WORLD

- British American Tobacco central research laboratory, Southampton, England, and other labs world-wide
- P T H M Sampoerna, Surabaya, Indonesia
- Tekel (State Tobacco Monopoly), Istanbul, Turkey
- China National Tobacco Quality Supervision and Test Center
- China Tobacco about 60 other systems
- Philip Morris, Melbourne, Australia
- Rothmans, Kuala Lumpur, Malaysia
- Korea Ginseng and Tobacco Research Institute
- Japan Tobacco, Saitama
- P T Djarum, Jakarta, Indonesia
- P T Nojorono, Kudus, Indonesia
- Fortune Tobacco, Manila, Philippines
- Monopoli di Stato, Italy
- Sterling Tobacco, Philippines
- Michaelides, Greece

# INSTRUMENTS



## AUTOANALYZER

With more than 11,000 systems sold, the AutoAnalyzer has a superb record of reliability and long life.

The AutoAnalyzer 3 is fully computer-controlled and is module-for-module compatible with AAll systems to enable users to update to the latest techniques.



## QUATTRO

A high-speed analyser with ultra-low reagent consumption, QuAatro is ideal for laboratories with very high workloads.

Up to 4 parameters can be analyzed at the same time in each console.

# TYPICAL SYSTEM CONFIGURATIONS

## ANALYZER FOR MEDIUM WORKLOADS

4-channel AutoAnalyzer

**Parameters**

Nicotine, reducing sugars, total sugars, nitrate

**Sampling rate**

40 - 60/h

**Typical workload**

50 - 200 samples per day

## ECONOMICAL SYSTEM FOR ROUTINE QC WORK

2-channel AutoAnalyzer with two Multitest manifolds

**Parameters**

Nicotine, reducing sugars, total sugars, nitrate

**Sampling rate**

40 - 60/h

**Typical workload**

30 - 100 samples per day  
Morning: reducing sugar and nicotine  
Afternoon: total sugar and nitrate.

## FLEXIBLE MULTI-PURPOSE ANALYZER

3-channel AutoAnalyzer with Multi-test manifolds and flame photometer

**Parameters**

Potassium, nitrate, ammonia, nicotine, chloride, total and reducing sugars

**Sampling rate**

40 - 60/h

**Typical workload**

30 - 100 samples per day

Any combination of tests is possible.

## FLEXIBLE ECONOMICAL ANALYZER FOR SMALL LABS

1-channel EcoAnalyzer with Multitest manifold

**Parameters**

Nitrate, nicotine, ammonia, chloride, total nitrogen (Kjeldahl)

Upgrade to a random-access sampler and a second channel to double the workload. Add a flame photometer to measure potassium, or a distillation bath to measure volatile bases

## HIGH-SPEED ANALYZER FOR BUSY LABORATORIES

4-channel QuAAtro

**Parameters**

Nicotine, reducing sugars, total sugars, nitrate (and/or ammonia, chloride, phosphate)

**Sampling rate**

60 - 90 /h

**Typical workload**

100 - 400 samples per day

## MULTITEST METHODS

Specially developed for tobacco analysis, these Bran+Luebbe multitest methods enable you to measure several different parameters with one analytical cartridge or manifold. When changing from one test to another only the reagents and the colorimeter filter need to be changed.

Multitest methods are ideal for laboratories with small to medium workloads, or where some tests are required only occasionally, as there is no need to invest in a separate manifold for each chemistry.

The MT24 and MT26 multitest methods for tobacco analysis incorporate a dialyser to eliminate interference from colored samples. MT25 is used with an on-line distillation unit to give fully automatic analysis.

Ranges can be varied by changing sample pump tubes.

| MT24            | MT25             | MT26    | G247            |
|-----------------|------------------|---------|-----------------|
| Nitrate         | Volatile Bases   | Nitrate | Reducing sugars |
| Total Alkaloids | Volatile Acidity | TKN     | Total sugars    |
| Ammonia         |                  |         |                 |
| Chloride        |                  |         |                 |
| TKN             |                  |         |                 |