

MULTISPEC +

FTIR + UV/Visible spectrometry




**The solution for the qualitative
and quantitative control of
pharmaceutical compounding:
cytotoxics, monoclonal antibodies,
analgesics, antibiotics...**





MULTISPEC +

Multispec⁺ is a spectrometric analyser dedicated to the control of cytotoxic drugs, monoclonal antibodies as well as various drugs compounded at the hospital pharmacy level (antibiotics, pain killers, eye drops...). Multispec⁺ acquires the spectral data of the samples in a fully automated cycle. The spectral range covers the UV, visible and mid-infrared range. The sample analysis is a two step process where the unknown sample is first identified (molecule and solvent) then the concentration of the identified molecule is quantified. Multispec⁺ can be interfaced with the information system of the pharmacy in order to upload data from the prescription database and download analytical data.

System components

 **iS10** FTIR spectrometer from Thermo Fischer Scientific. Transmittance flow-cell with a path length of 20 µm. Nicolet EZ Omnic FTIR software included.

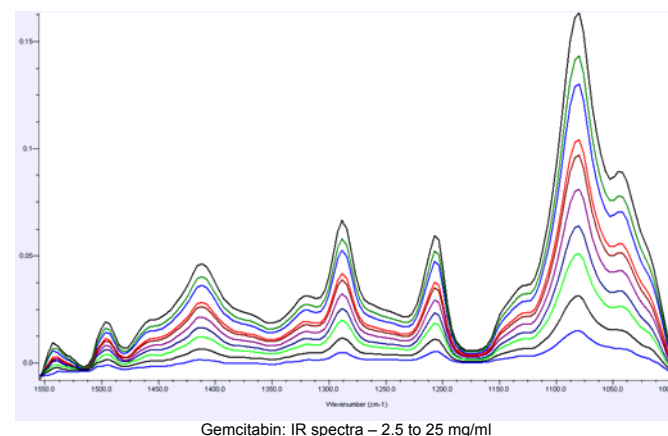
 Diode array UV/Visible spectrometer, range 190 - 900 nm, equipped with a 0.2 mm flow-cell.

 Dedicated autosampler, Microprep, for the safe transfer of samples from sealed vials to the measure cells. Carrousel with 40 vial positions. Automatic sample identification with onboard barcode reader. Sample dilution capability.



Fields of application

- ✓ Cytotoxics.
- ✓ Monoclonal antibodies.
- ✓ Pain killers.
- ✓ Antibiotics.
- ✓ Eye drops.
- ✓ Other hospital preparations.



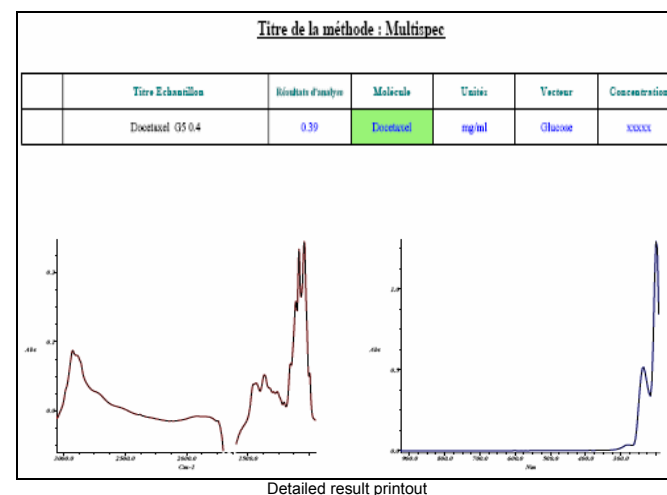
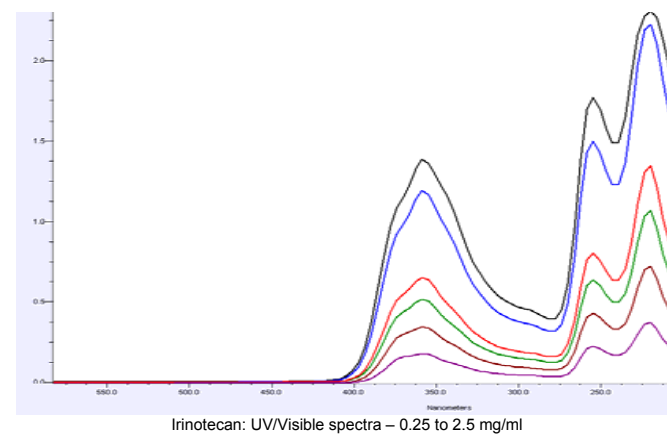
Software

Multispec Analysis

Is the application software for the routine operation of the system and the configuration of the analytical protocols:

- ✓ Access control with login and password.
- ✓ Selection and adjustment of quantification calibrations and identification libraries.
- ✓ Standardisation of the measure flow cells.
- ✓ Routine analysis.
- ✓ Reanalysis function.

- ✓ Result printing and export (text, Microsoft Access or Excel format).



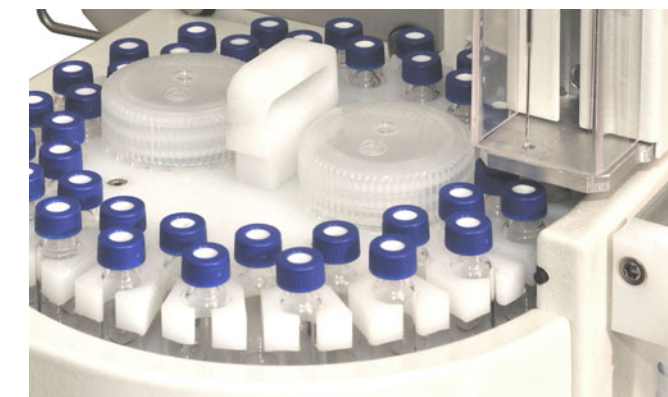
Multispec Quantification

- ✓ Adjustment of calibration parameters (slope and bias).
- ✓ Development and edition of identification libraries.



- ✓ Development of quantification calibrations in MLR or PLS mode.
- ✓ Calibration development toolbox for the selection of the optimal spectral band, cross-validation, number of factors, correlation and variance...

- ✓ Display of spectra in graphic mode.



Identification libraries

The identification of molecules and solvents is based on a spectral library included in the software package. It includes more than 50 molecules diluted with either NaCl or glucose (cytotoxics, monoclonal antibodies). It can be easily edited and enriched with new spectra. Specific libraries dedicated to other classes of molecules can be developed by the users.

Quantification calibrations

The concentration assessment is worked out by quantification calibrations delivered with the software package. These calibrations cover the major part of the usually prescribed molecules.

Worklist editor

This utility is designed to enable the separation of the sample identification step from the actual processing step. It can be installed on any PC accessible by the command PC of Multispec⁺ via the laboratory LAN. The operator can check at all time the progress of the analysis process.

Analysis control utility

L	M	N	O	P	Q	R	S
Conc théorique	Conc analysée	%Err	%Res	ID-DCI	ID-Vecteur	Conformité	Visa
1.09	1.14	4.6	99.3	OK	OK	Conforme	Phi
0.775	0.706	-8.9	99.8	OK	OK	En attente	
0.359	0.364	1.4	99.5	OK	OK	En attente	
0.349	0.381	9.2	99.4	OK	OK	Conforme	Phi
0.32	0.31	-3.1	99.2	OK	OK	En attente	
0.2	0.19	-5	OK *	Cetuximab *	OK	Conforme	Phi
0.84	0.96	14.3	98.4	OK	OK	Non Conforme	Phi
14.48	14.28	-1.4	99.8	OK	OK	En attente	
0.375	0.384	2.4	99.5	OK	OK	En attente	
0.32	0.31	-3.1	99	OK	OK	Conforme	Phi
0.32	0.30	-2.2	98.7	OK	OK	En attente	
0.526	0.556	5.7	99.8	OK	OK	En attente	

This utility is an Excel-based spreadsheet designed to confront the prescription data, uploaded from the laboratory information system with the analytical results worked out by Multispec⁺.

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Key features

- ✓ Specificity and selectivity of the infrared / UV+Visible coupling (Microdom patent).
- ✓ Linear response without dilution for the usually prescribed concentrations.
- ✓ Identification of the solvent (G5%, NaCl, Ringer lactate...).



- ✓ High throughput: 75 seconds per sample.
- ✓ Simplicity: routine operation can be performed by non-specialized staff.
- ✓ No carryover: automatic rinsing of the sampling probe, injection port, flow cells and capillaries.
- ✓ Reduced sample volume: 1 ml per sample.
- ✓ Operator safety: sampling through the vial septum, securised fluid circuit and waste container.
- ✓ Low operating costs: no reagent, limited waste volume, few disposables.
- ✓ Upgradeable and transferable molecule identification library.
- ✓ Transferable quantification calibration for all molecules.
- ✓ Quick and simple development of new calibrations (Microdom hotline support).
- ✓ Reprocessing of sample spectra (IR+UV/Visible).
- ✓ Analysis reports for runs or individual samples. Identification of molecules and solvents, quantification of molecules, graphic presentation of sample spectra.
- ✓ Automatic barcode identification of sample vials.
- ✓ Automatic export of analysis results to the Excel-based control utility.
- ✓ Easy maintenance and servicing: self-diagnostics, maintenance software, simple fluid circuit. Remote software control and maintenance.
- ✓ Compact and robust system, designed for a high throughput in a demanding environment.

Specifications



- ✓ Automatic dynamic alignment of the interferometer provides continual data optimization while scanning.
 - ✓ Pinned-in-place optics.
 - ✓ Beam splitter: Ge/KBr (spectral range 7400 cm^{-1} - 375 cm^{-1}).
 - ✓ Mid-IR source: high energy Everglo™, air cooling.
 - ✓ Detector: high performance stabilised DTGS.
 - ✓ Linearity: 0 - 3 OD.
 - ✓ Max. resolution: 0.8 cm^{-1} .



- ✓ Diode array spectrophotometer.
- ✓ Spectral range: 190 - 900 nm.
- ✓ Precision: ± 1 nm.
- ✓ Repeatability: ± 0.1 nm.
- ✓ Linearity: 0 - 3 DO.



- ✓ Sample volume: 1 ml.
- ✓ Sample rack: 40 vials.
- ✓ 2 positions for diluent vials.
- ✓ Dilution factors: $\frac{1}{2}$ to $\frac{1}{10}$.
- ✓ Automatic identification with onboard barcode scanner.
- ✓ Sampling through the vial septum.
- ✓ Syringe: 2.5 ml with 3 ml sampling loop.
- ✓ Rinsing station for the rinsing of both the inner and outer wall of the sampling probe.
- ✓ Automatic rinsing of the injection port.
- ✓ Online 75 μm filter.
- ✓ Overpressure check-valve (5 bars max.).
- ✓ Background solution requirement: 3 ml/sample.

Electrical specifications

110-240 V - 3.15A - 385 VA

Dimensions and weight

L x H x D – 86 x 69 x 69 cm (excl. PC)

Weight: 85 kg