

XRF - ANALYZERS

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Molecular Technology GmbH and MetExpert - Analyser



For more than 10 years, MolTech has been successfully developing, producing and selling components for the laser, X-ray and laboratory equipment markets. Our engineers develop and produce leading edge solutions for countless applications and also create customized and tailor-made products. The close contact we maintain with our customers as well as the high flexibility of our production line makes a rapid conversion of new ideas to final products possible. You can find details on our range of products at our homepage:

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MolTech presents the MetExpert series of XRF-analysers We have the solution for each kind of metal analysis

MetExpert stands for latest x-ray analysis technology, it unites the most modern parts of XRFA technology with intelligent software solutions. The MetExpert series offers a large analysis spectrum that can be optimized depending on application requirements. MetExpert analyses objects in liquid, solid, gaseous or powdered state.

The efficiency of our MetExpert analyzers will definitely convince you.

Application fields:

metal processing industries, metal recycling, production control, quality check of incoming goods, aircraft construction, ship building, environmental analyses, food analyses, criminology, archaeology, jewelers, museums and in many other areas requiring rapid, accurate dependable analysis results with ease of operation.

Key features:

- * no radioisotopes
- * non-destructive measurement
- * double safety system
- * simple operation
- * durable design
- * portable or stationary available
- * battery and line operation possible
- * fast customer support
- * exact measurements with high resolution in seconds
- * simultaneous measurements of different metals in one test run
- * newest software (based on the most modern algorithms)
- * small-area X-ray beam
- * Peltier-cooled Si-pin detector
- * high security for the user
- * low level operating costs
- * best cost effectiveness
- * user-specific additional accessories
- * customizable data base for standard alloys
- * customizable software

MetExpert- series

MetExpert-Z
MetExpert-Z case
MetExpert-ECO
MetExpert-ENGINE
MetExpert-GOLD

metal and alloy analysis
portable metal analysis
environment monitoring
wear monitoring of machines
analysis of precious metals

Our analysers can be supplied as stationary or portable variants

MetExpert - Z



MetExpert-Z was developed for a high-quality analysis of test samples. MetExpert qualitatively and quantitatively analyses the chemical composition of solids as well as solutions. MetExpert is able to identify more than 70 elements regarding quality and quantity.



Elements identified	> 70 from Ca
Elements identified in one test run	up to 21
Concentration range	0,1 - 100%
Compact fine focus x-ray tube	40 W
Measurement time	10-100 sec / full spectrum
Energy resolution at 5.9 keV	250 eV
	up to 130eV available
Min. measurable energy	750 eV
Detector	thermostated, Peltier-cooled Si-pin
Power supply	230V / 50 Hz or 110V/ 60 Hz

The MS Windows based unique software of MetExpert automatically controls all functions of the spectrometer. Thousands of measurements, including spectra, can be saved to hard disk and printed-out later or moved to another PC for further processing.

In addition to the analyse display function showing the measured element concentrations, the MetExpert offers 2 more useful options:

- * For material identification, the measured results are compared with a material database and the name of the material found is displayed.
- * When sorting, the device checks if the actual measurement matches with an earlier made reference measurement within determined tolerance data.

The removable detector unit allows measurement of large objects or hard to access parts.

Applications:

XRF is used in many fields for analysis of main and secondary elements in practically all materials. This applies to analysis in scientific research, precise identification of alloys, quality monitoring in metal industry, material control and others.



For more technical details please contact our sales consultants

MetExpert - Z case

The portable variant



Using the mobile XRF-spectrometer, "MetExpert-case", large-sized test objects can be non-destructively investigated without expensive, time consuming sample preparations. The portable MetExpert has the same high level of performance as the stationary device for both qualitative and quantitative analysis of chemical composition of solids as well as solutions.

MetExpert is able to identify more than 70 elements for quality and quantity.



Elements identified	> 70 (Z = 20 to 94)
Elements identified in one test run	up to 21
Concentration range	0,1 - 100%
Compact fine focus x-ray tube	40 W
Measurement time	10-100 sec / complete spectrum
Energy resolution at 5.9 keV	250 eV
	up to 130eV available
Min. measurable energy	750 eV
Detector	thermostated, Peltier-cooled Si-pin
Power supply	12V DC,
	230V / 50Hz or 110V / 60Hz
Battery life time	2 hours measuring time
Weight	3 kg (detector unit)
	8 kg (spectrometer)
Dimensions	480 x 360 x 170 mm

The MS Windows based unique software of MetExpert automatically controls all functions of the spectrometer. Thousands of measurements, including spectra, can be saved to hard disk and printed-out later or moved to another laboratory PC for further processing.

Analogous to the laboratory variant the MetExpert-case offers 2 more options besides the analyse function of showing the measured element concentrations:

- * For material identification, the measured results are compared with a material database and the name of the material found is displayed.
- * When sorting, the device checks if the actual measurement matches with an earlier made reference measurement within determined tolerance data.

The built-in "batch analysis"-function allows a series of measurements without need to open the case. The measurement routine starts after pressing a button, all results are saved for later processing and the device prepares for the next measurement run.

The removable detector unit allows measurement of large objects or hard to access parts.

Applications:

The mobile MetExpert can be operated for approximately 2 hours on the built-in battery. It is suitable for mobile work "in the field" as well as in the laboratory. Possible application ranges from: waste separation and check of stored materials, material identification in case of accidents or at the customs, quality maintenance in production facilities, material check at buildings and industrial plants.

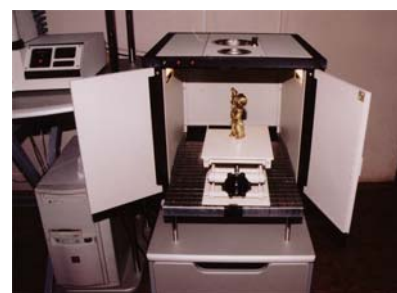


For more technical details please contact our sales consultants

MetExpert-GOLD



In earlier days, the purity of gold was commonly determined by using a time consuming and hazardous fire assay method. Other newer instrumental techniques, like AAS or plasma spectrometry have been used in more modern times. However, these devices are highly expensive and sample preparation takes more time than for XRF. Furthermore, with the single exception of XRF, all other methods are destructive and involve the use of strong acids, high temperature and the production of toxic fumes. Because personal safety and costs are important factors, MetExpert-GOLD is the right choice for checking precious metals. The MetExpert-GOLD allows non-destructive determination of precious and non-precious metals in high-quality alloys within seconds with high accuracy and ease of use.



Elements identified

Au, Ag, Pt, Pd, Rh, In, Ir, Fe, Ni, Cu, Zn, Cd, Pb
and upgradeable according to user needs

Concentration range

0.1 - 100%

Source of radiation

compact fine focus x-ray tube

X-ray beam diameter

1 mm

Measurement time

10 - 900 sec/ full spectrum

Energy resolution at 5.9 keV

250 eV standard/ up to 130 eV available

Detector

thermostated, Peltier-cooled Si-pin

Power supply

230V / 50 Hz or 110V / 60 Hz

Accuracy

Precious metal	Concentration, %	ASD at $\Delta(P)=0,95\%$
Alloys on the basis of gold (Au)		
Gold	from 35,0 to 75,0	1,2
	more than 75,0	0,6
Silver	from 0,9 to 10,0	0,7
	from 10,0 to 30,0	1,0
Palladium	from 3,0 to 20,0	1,0
Platinum	from 8,5 to 9,5	1,0
Alloys on the basis of silver (Ag)		
Silver	from 10,0 to 88,0	1,3
	from 88,0 to 96,5	0,4
	more than 96,5	0,2
Alloys on the basis of platinum (Pt)		
Platinum	more than 70,0	1,4
Rhodium	from 5,0 to 30,0	1,0
Iridium	from 5,0 to 20,0	1,5
Palladium	from 5,0 to 20,0	0,5
Alloys on the basis of palladium (Pd)		
Palladium	from 45,0 to 85,0	0,6
	more than 75,0	0,3
Silver	from 10,0 to 45,0	0,6



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MetExpert-ENGINE



The determination of wear metals is the heart of engine oil analysis. Microscopically small wear particles are detected and defined. From this information and other interacting data, conclusions regarding their emergence can be drawn. Wear metals occur as corrosion products by water or acids in the oil or as abrasive wear by friction or local welding of rough surfaces. The wear particles found in the oil can be traced by their composition to specific machine elements and parts that are in contact with the lubricant. MetExpert-Engine determines early possible signs of wear and their cause. The evaluation of the wear metals with MetExpert is based on the data library, that resulted from thousands of examined samples.



Elements identified
Lower limits of detection at the filter
Lower limits of detection in lubricating oil
Source of radiation
Measurement time
Time of full analysis
Energy resolution at 5.9 keV
Detector
Power supply

from S to Bi including Fe, Ni, Mn, V, W, Mo, Co, Sn, Ag, Cu, Zn, Cd, Pb etc.
0,001 mg
0.1 mg/t
compact fine focus x-ray tube
10 - 100 sec / full spectrum up to 20 elements
> 3 min
250 eV standard/up to 130 eV available
thermostated, Peltier-cooled Si-pin
230V / 50 Hz or 110V / 60 Hz

The MS Windows based unique software of MetExpert-ENGINE automatically controls all functions of the spectrometer. Thousands of measurements, including spectra, can be saved to hard disk and printed-out later or moved to another PC for further processing.

Besides the analyse function of showing the measured element concentrations the MetExpert offers more options: The results of the analysis for each specific machine are saved together with other data in the database and compared with earlier measurements. As result the dynamics of wear is shown. The software is building a prognosis and maintenance recommendations on basis of the extensive statistics.

Fields of application:

- ✳ monitoring of wear condition of engines and machinery
- ✳ automobile, aircraft, shipbuilding and metalworking industries
- ✳ preventive diagnostics for railway trains
- ✳ monitoring of truck engines and gears
- ✳ oil industry, lubricant production
- ✳ monitoring of turbines, wind power stations etc.

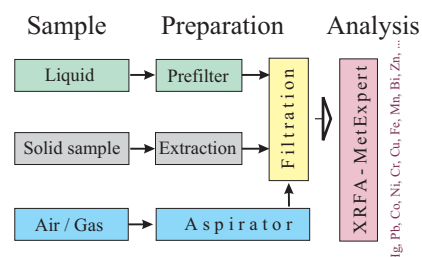


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MetExpert-ECO



The MetExpert-ECO was designed for identification of metals and metal ions in liquid, gaseous and solid substances, aerosols and suspensions. The sensitiveness in the ppm region enables the trace analysis of practically all relevant elements in air, soil, water, food, chemical and pharmaceutical products etc. This makes MetExpert-ECO to be the most important analytical instrument for environment monitoring, quality control, consumer protection, soil redevelopment, for investigations in the lab as well as in the field. For many applications metrologically proved methodological instructions were developed.



Elements identified

Elements identified in one test run

Lower limits of detection of elements at the filter (in dependence on the elements)

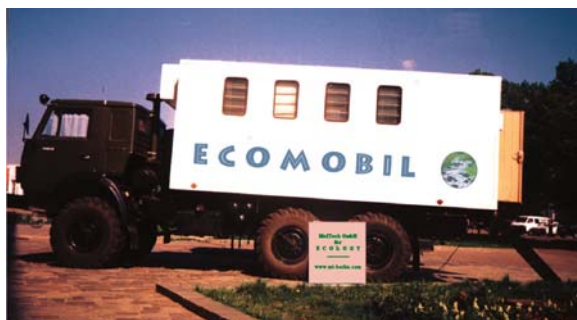
Relative exactness of the analyses (in dependence on the elements and the concentration)

from S to Bi
up to 20
0,002 - 5 mg
0,1 - 10,0 %

Metrological data on detection regions of the single elements according to analytical methods :

Element	In water (mg/l)	In air (mg/m ³)	In soil (mg/kg)
Chromium	0,01 - 1,0	0,0005 - 1,0	3,0 - 10,0
Iron	0,005 - 1,0	0,005 - 1,0	-
Bismuth	0,005 - 1,0	0,0005 - 1,0	-
Manganese	0,005 - 1,0	0,0005 - 1,0	300 - 1500
Cobalt	0,005 - 1,0	0,0005 - 1,0	2,0 - 10,0
Nickel	0,005 - 1,0	0,0001 - 1,0	2,0 - 8,0
Copper	0,005 - 1,0	0,0005 - 1,0	1,5 - 6,0
Lead	0,005 - 1,0	0,0001 - 1,0	3,0 - 10,0
Zinc	0,005 - 1,0	0,005 - 1,0	10,0 - 40,0
Mercury	0,005 - 0,1	-	1,0 - 4,0

For analyses in the field a mobile variant of MetExpert-ECO was developed. It can be supplied as separate device or as an integrated device complex in an ECOMOBILE. Vehicle and device types can be selected according to actual requirements.



For more technical details please contact our sales consultants

MetExpert - catalog

D-801-00	MetExpert, 220V/50 Hz or 110V/60Hz XRF-spectrometer, detection unit with cable 1.5 m Software MetExpert-S for acquiring and processing of data PC-processor module Intel PIII or higher, HDD 10 GB or more, CDD, FDD, USB-port, Windows 98 or higher Holder for small objects and solutions (incl. plastic container for powders and liquids) Fe/Cd calibration disc, users manual	<input type="checkbox"/>
D-811-01	MetExpert-Z case, = 12 V, 220V/50 Hz or 110V/60Hz XRF-spectrometer, installed in aluminium case, detection unit with cable 1.5 m, rechargeable battery Software MetExpert-S for acquiring and processing of data Notebook, HDD 10 GB or more, FDD, USB-port, mouse pad/external mouse, Windows 98 or higher Holder for small objects and solutions (incl. plastic container for powders and liquids) Fe/Cd calibration disc, users manual	<input type="checkbox"/>
D-802-00	MetExpert-GOLD, 220V/50 Hz or 110V/60Hz XRF-spectrometer, detection unit with cable 1.5 m, equipment for positioning of small objects Software MetExpert-P for acquiring and processing of data PC-processor module Intel PIII or higher, HDD 10 GB or more, CDD, FDD, USB-port, Windows 98 or higher Fe/Cd calibration disc, users manual	<input type="checkbox"/>
D-812-00	MetExpert-GOLD, 220V/50 Hz or 110V/60Hz XRF-spectrometer, detection unit with cable 1.5 m Software MetExpert-P for acquiring and processing of data Notebook, HDD 10 GB or more, FDD, USB-port, mouse pad/external mouse, Windows 98 or higher Holder for small objects Fe/Cd calibration disc, users manual	<input type="checkbox"/>
D-803-00	MetExpert-ECO, 220V/50 Hz or 110V/60Hz XRF-spectrometer, detection unit with cable 1.5 m Equipment for sample preparation (filtration unit and vacuum pump with valves) Software MetExpert-E for acquiring and processing of data PC-processor module Intel PIII or higher, HDD 10 GB or more, CDD, FDD, USB-port, Windows 98 or higher Starter kit of neutral and ion-exchange filters (20 pcs ea.) Fe/Cd calibration disc, users manual	<input type="checkbox"/>
D-813-00	MetExpert-ECO, mobile variant, = 12 V, 220V/50 Hz or 110V/60Hz XRF-spectrometer, detection unit with cable 1.5 m Equipment for sample preparation (filtration unit and vacuum pump with valves) Software MetExpert-E for acquiring and processing of data Notebook, HDD 10 GB or more, FDD, USB-port, mouse pad/external mouse Windows 98 or higher Starter kit of neutral filters (50 pcs) Fe/Cd calibration disc, users manual	<input type="checkbox"/>
D-823-00	MetExpert-ECO / ECOMOBIL To be defined after consultation	<input type="checkbox"/>
D-804-00	MetExpert-ENGINE, 220V/50 Hz or 110V/60Hz XRF-spectrometer, detection unit with cable 1.5 m Equipment for sample preparation (shaker, filtration unit and vacuum pump) Software MetExpert-G for acquiring and processing of data PC-processor module Intel PIII or higher, HDD 10 GB or more, CDD, FDD, USB-port, Windows 98 or higher Starter kit of neutral filters (50 pcs) Fe/Cd calibration disc, users manual	<input type="checkbox"/>
D-814-00	MetExpert-ENGINE, mobile variant, = 12 V, 220V/50 Hz or 110V/60Hz XRF-spectrometer, detection unit with cable 1.5 m Equipment for sample preparation (shaker, filtration unit and vacuum pump) Software MetExpert-G for acquiring and processing of data Notebook, HDD 10 GB or more, FDD, USB-port, mouse pad/external mouse, Windows 98 or higher Starter kit of neutral filters (50 pcs) Fe/Cd calibration disc, users manual	<input type="checkbox"/>
D-805-00	MetExpert-Archivarius Software package for desktop PC for collecting, processing and storing of data from one or a number of MetExpert-case portable devices Data transfer kit: 2 USB network adapters and 5 m connection cables	<input type="checkbox"/>

Consumables

D-801-01	Disposable container for liquids or powders (for use with holder for small objects) - 10 pcs set.	<input type="checkbox"/>
D-803-01	Neutral filter for filtering of solid particles from suspensions and aerosols - 50 pcs set	<input type="checkbox"/>
D-803-02	Ion-exchange filters for absorption of ions from solutions - 50 pcs set	<input type="checkbox"/>
D-804-01	Neutral filter for filtering of solid particles from oil samples - 50 pcs set	<input type="checkbox"/>

Usable accessories and components

D-802-01	MetExpert work top - compact solution for placing XRFA and all components	<input type="checkbox"/>
D-802-02	Measure box with additional X-ray protection and positioning equipment for precise measurements	<input type="checkbox"/>
K-001-00	Flat 17" TFT monitor	<input type="checkbox"/>
K-002-00	Colour printer, A4, bubble jet, USB/parallel	<input type="checkbox"/>
K-003-00	3 ports USB-Hub	<input type="checkbox"/>
K-004-00	USB - network adapter	<input type="checkbox"/>
K-005-00	USB modem for analog telephone network	<input type="checkbox"/>

Other components upon request

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