JEOL

Scientific / Metrology Instruments

Mass Spectrometer Dedicated to Dioxin Analysis

Solutions for Innovation

JMS-800D UltraFOCUS

Highly Advanced Dioxins / POPs Analysis System

JEOL Ltd.

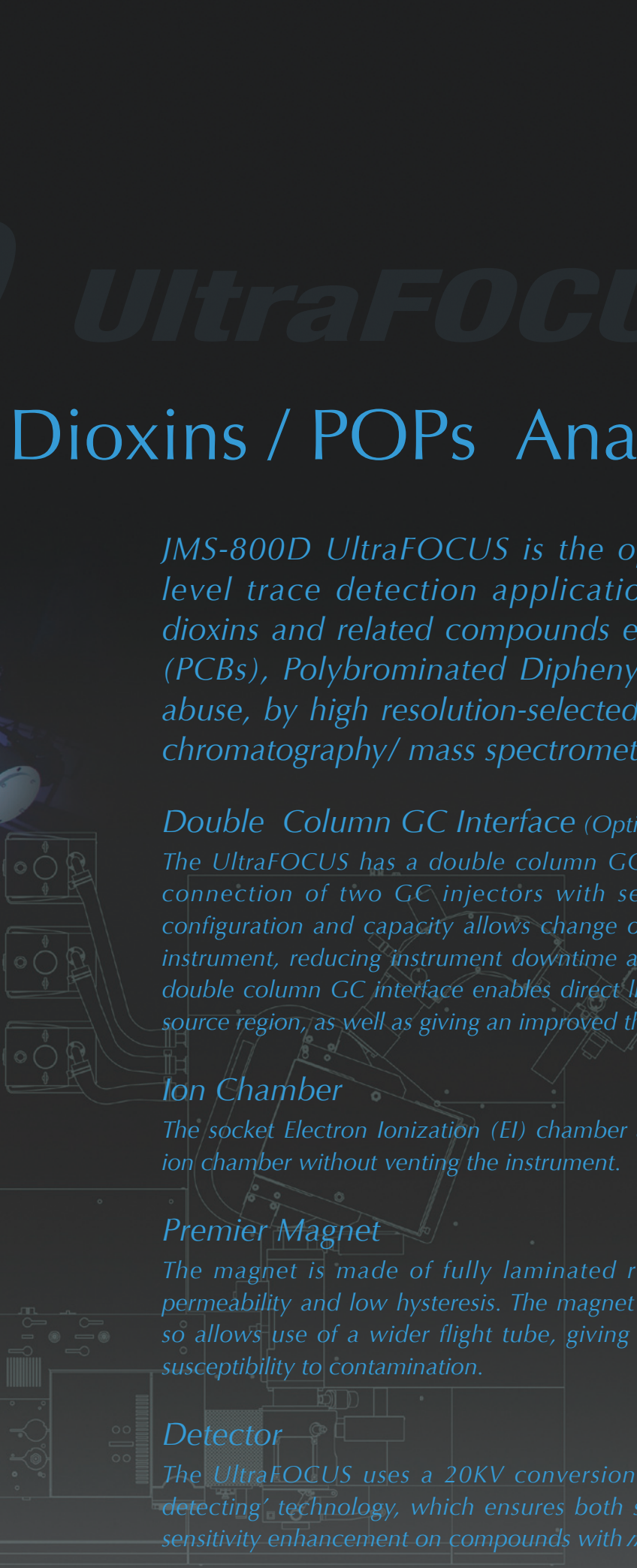
JMS-800D

Highly Advanced

UltraFOCUS

Dioxins / POPs Analysis System

JMS-800D UltraFOCUS is the optimal choice for ultra low-level trace detection applications, such as monitoring for dioxins and related compounds e.g. Polychlorinated Biphenyls (PCBs), Polybrominated Diphenyl Ethers (PBDEs) or drugs of abuse, by high resolution-selected ion monitoring (HRSIM) gas chromatography/ mass spectrometry(GC/MS).



Double Column GC Interface *(Option)*

The UltraFOCUS has a double column GC interface to allow the simultaneous connection of two GC injectors with separate GC columns. The pumping configuration and capacity allows change of the GC column without venting the instrument, reducing instrument downtime and increasing productivity. The unique double column GC interface enables direct line of sight GC column setting into the source region, as well as giving an improved thermal variation profile.

Ion Chamber

The socket Electron Ionization (EI) chamber allows rapid and convenient change of ion chamber without venting the instrument.

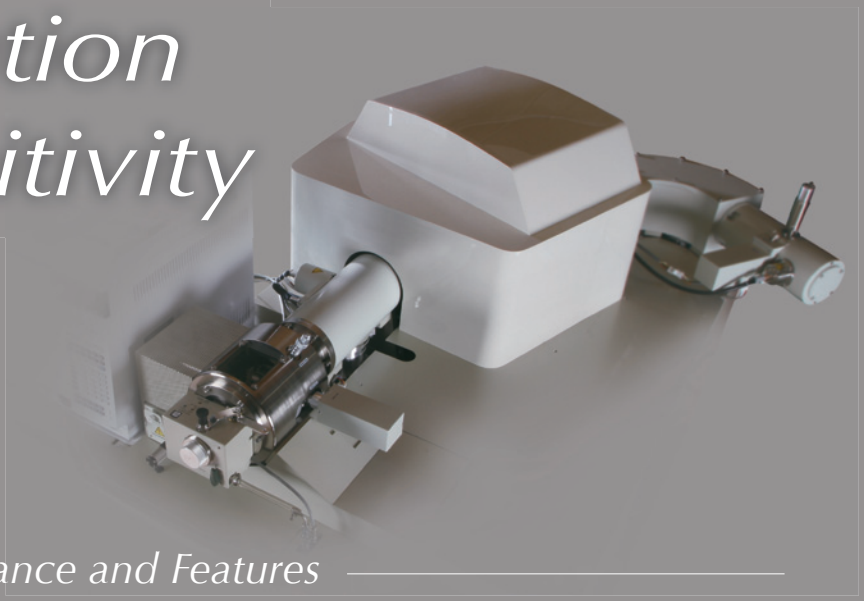
Premier Magnet

The magnet is made of fully laminated rolled grain-oriented steel with high permeability and low hysteresis. The magnet design features an extra-wide gap and so allows use of a wider flight tube, giving higher transmission and reducing any susceptibility to contamination.

Detector

The UltraFOCUS uses a 20KV conversion dynode photomultiplier with 'point detecting' technology, which ensures both stable longevity of the instrument and sensitivity enhancement on compounds with m/z >500.

High Resolution High Sensitivity



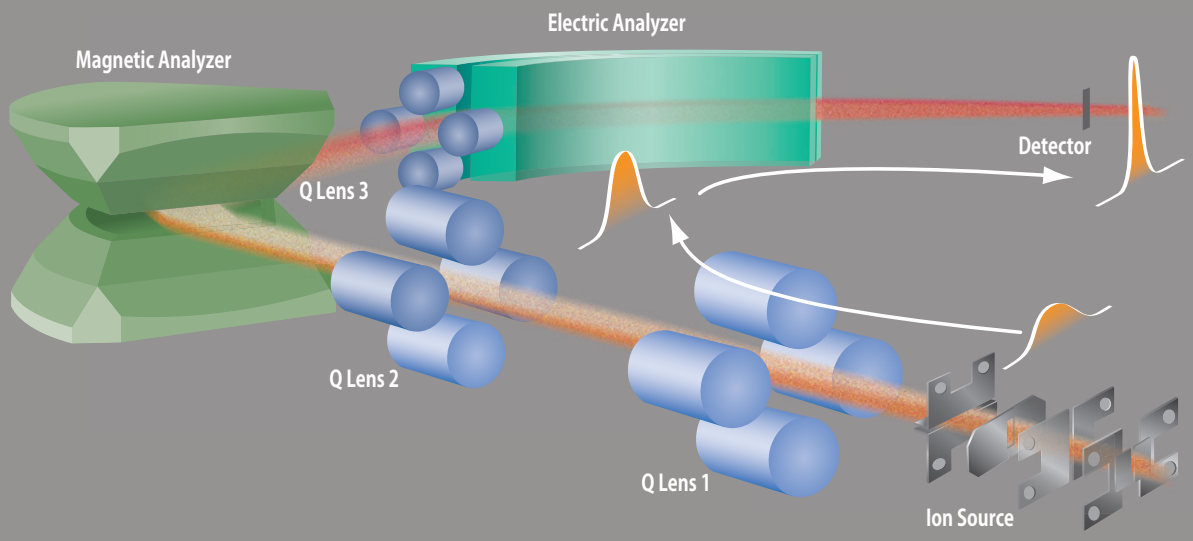
The UltraFOCUS High Performance and Features

■ Ultra High Sensitivity	S/N 200 or more on 100fg 2,3,7,8-TCDD (R=10,000, HRSIM)
■ Ultra High Resolving Power	80,000 (10%Valley)
■ Highest Acceleration Voltage	10kV
■ Wide Mass Range	1-12,000u
■ Socket Type Ion Chamber	The Ion chamber is removable without venting for filament exchange and easy maintenance.
■ Standard Sample Inlet System with Automatic On/Off Function	The software controls on/off switching of the inlet valve of the reservoir for the standard compound (PFK). This reduces contamination of the ion source and maintains stable sensitivity for a long time.
■ Fully Computer-Controlled System	Incorporating easy operation functions for both automatic tuning of the ion source along with other optics, and automatic resolution optimization of slit conditions. Control of the mass spectrometer by the data system prevents mis-operation and enables inexperienced operators to obtain optimum analysis results with ease.
■ Focus Tuning	Automated tuning for ion source lenses and Q poles is performed by one click of the mouse.
■ Resolving Power Setting	The mass resolving power is automatically adjustable by entering the target resolution numerically.
■ Dioxin Analysis Program (DioK) ※ Option	The dedicated automatic quantitation program is based on the EPA method, JIS standard and EN protocol. The DioK software provides high efficiency in data processing work.
■ Auto Sampler ※ Option	150 positions

Ion Optics

The UltraFOCUS incorporates the unique QQHQC geometry ion optics designed to give maximum sensitivity using just a few slits in all modes of high and low resolution. The QQHQC design has two static quadrupole lenses positioned before the magnetic sector and one before the electric sector. The first two quadrupole lenses effect is to give a high dispersion to magnification ratio, allowing high resolutions to be obtained with a wider source slit and hence higher sensitivity.

Ion optics of The UltraFOCUS



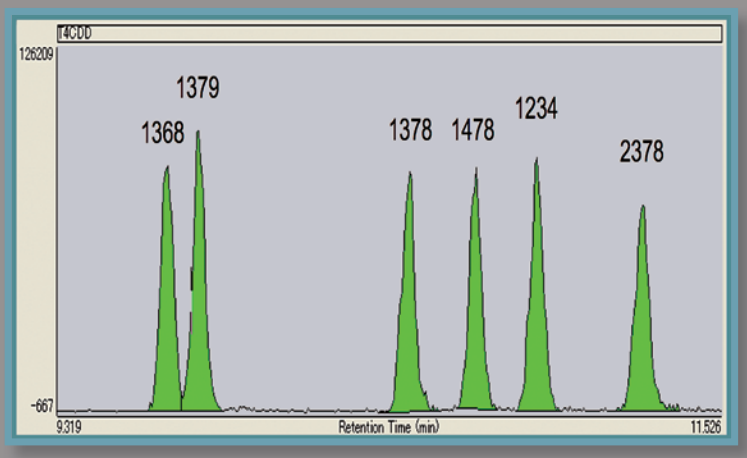
Sensitivity

To achieve the highest sensitivity, high resolution-selected ion monitoring (HRSIM) acquisition mode is used.

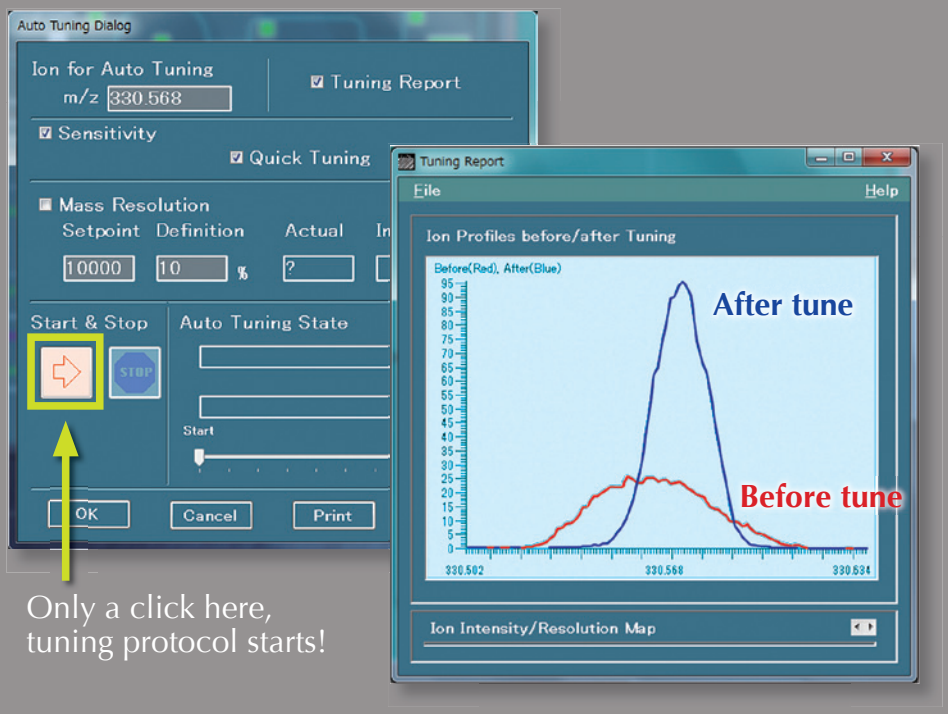
In this mode, 100fg of 2,3,7,8-TCDD will give a signal-to-noise ratio of >200:1 at *m/z* 321.8936u on raw data at 10,000 resolution (10% Valley). In this case, noise is taken to be equivalent to 4 standard deviations (± 4σ).

The instrument sensitivity is demonstrated by a 1µL injection of 100fg TCDDs giving S/N ; far beyond 200:1.

The UltraFOCUS therefore makes it possible to detect even a few femtograms dioxins in blood or other biological samples.



"The Age is Changing to Full Computer Control"



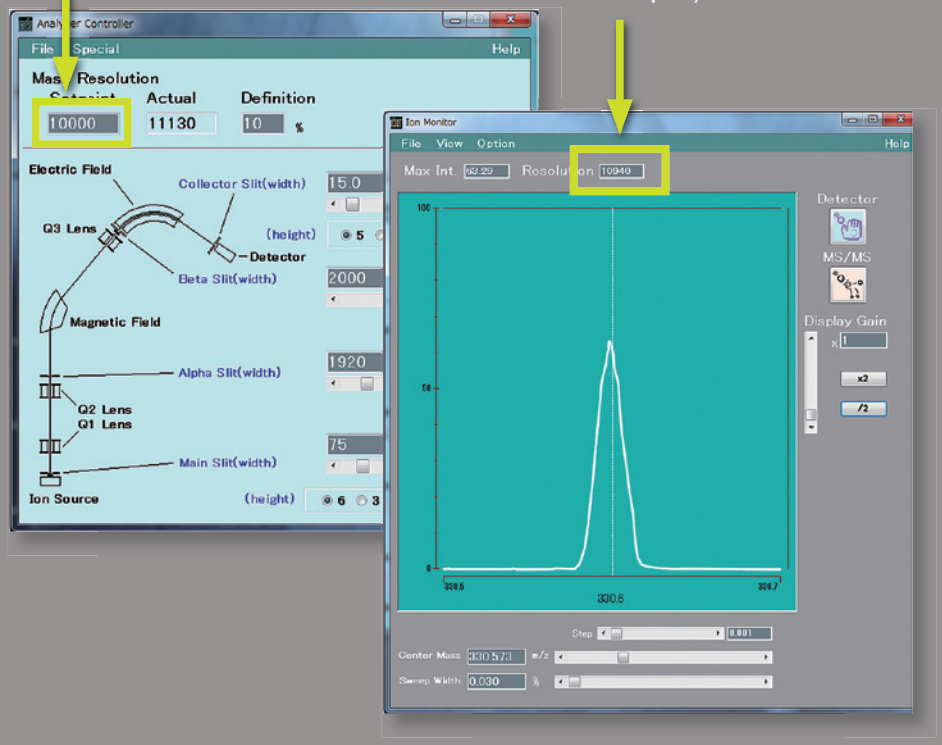
Only a click here,
tuning protocol starts!

Optimizing Sensitivity

The UltraFOCUS has a high precision auto-tuning function. The auto-optimum tuning mode adjusts all lenses to obtain the highest sensitivity.

Only input the resolution

Actual resolving power
is displayed in real time



Adjusting Resolving Power

The UltraFOCUS has a full computer control function for automatically optimization of the required resolution. When the desired resolution is entered, slits are automatically adjusted and the required resolving power is obtained. In the real-time monitor, it is easy to confirm that the required resolution has been obtained. The peak monitor displays the *m/z* peak shape and intensity at the same time.

User-Friendly

DioK-The Dioxin Quantitative Analysis Software

- The Dioxin Quantitative Analysis Software (DioK) operates under Microsoft Windows 7 system.
- DioK is a quick and convenient program which is dedicated to the quantitative analysis of Dioxins and Dioxin like compounds.
- DioK Software is base on US EPA 1613, 23, 8290/ JIS K0311,0312/EN1948. Many new functions have been included, and different printing modes are now available.
- The UltraFOCUS also comes with the latest DioK V4.0 software which provides processing functions :

  Automatic assignment, Quantitative Analysis (Patent No. JP11344482) includes PCDDs and PCDFs 210 isomers analysis capability,

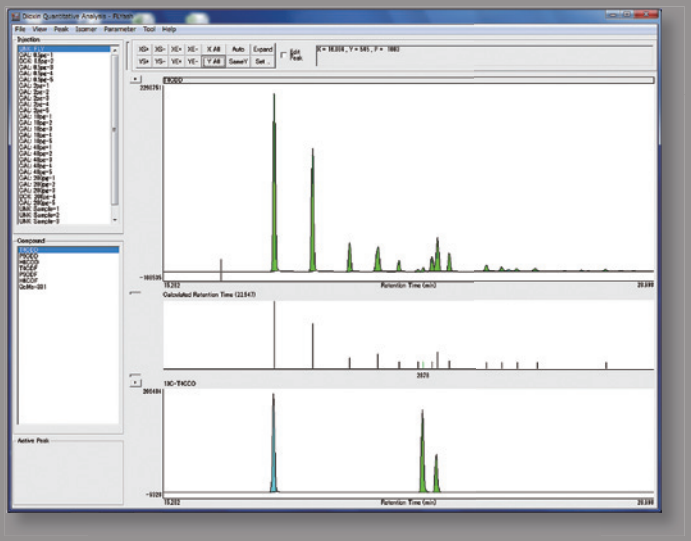
  Report table combined PCDDs/DFs and PCBs (Patent No.JP2001129), PCB isomers analysis.

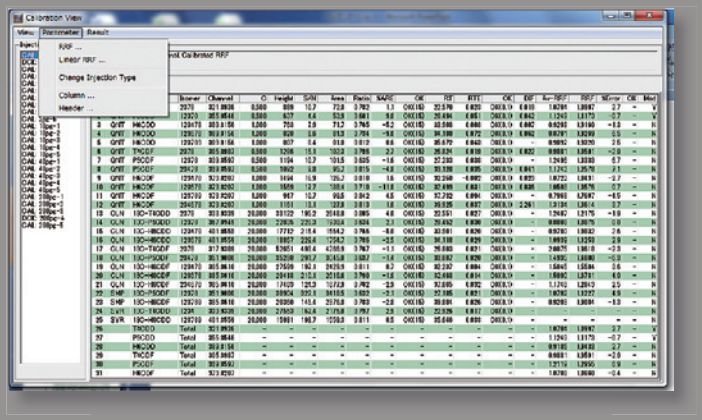
Assignment of dioxin peaks

Upper section : Native TCDDs mass chromatogram

Middle section : Reference isomers pattern

Lower section : Labeled 13C-TCDDs mass chromatogram

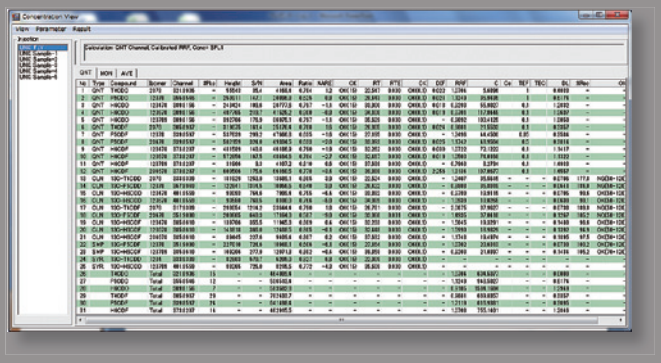




Automatic quantitative determination

The percentage recovery and the concentration values are calculated automatically after relative response factor (RRF) is obtained from calibration curve data, and the dioxin level is calculated.

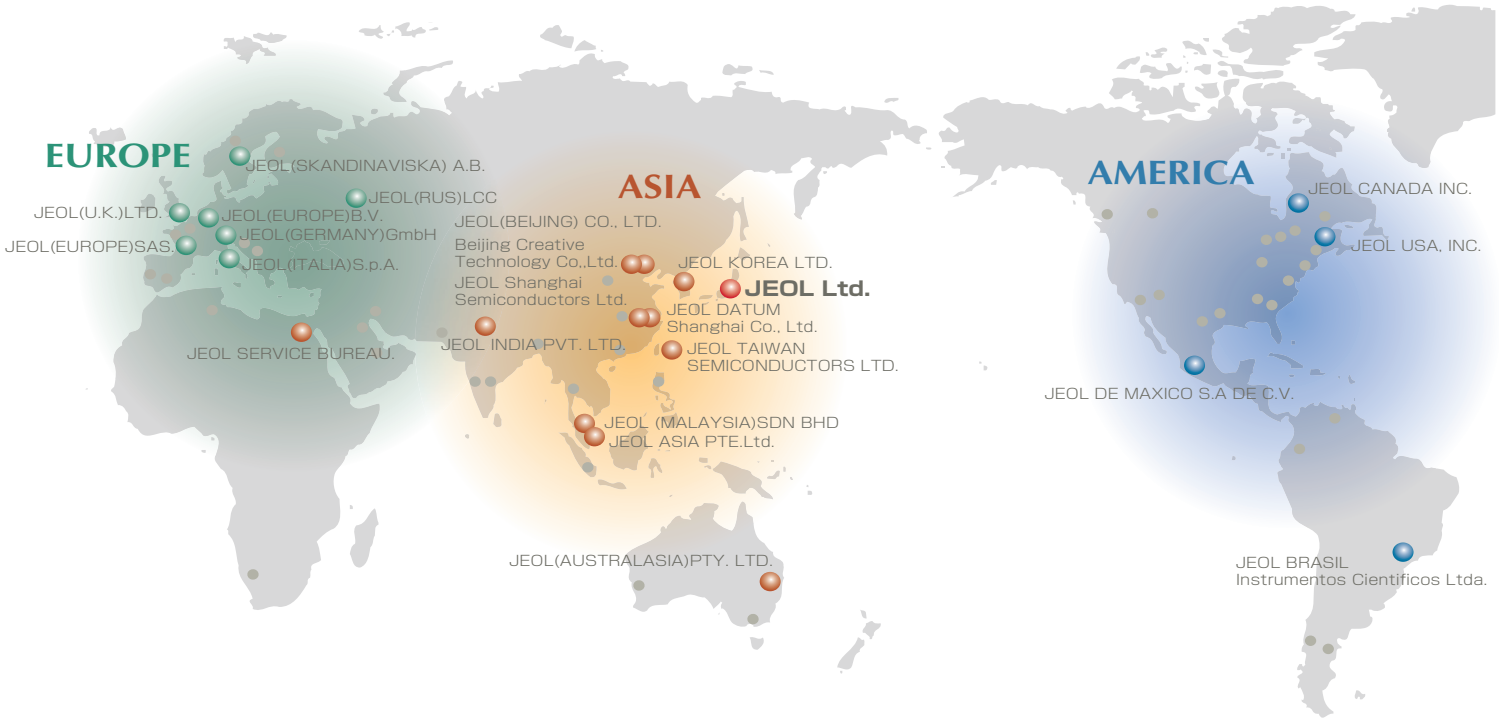
Finally, sum toxicity equivalents (TEQ) values are reported.



World Wide Service and Support

At JEOL, our goal is the customer's delight. To satisfy our customers, JEOL has made great efforts to produce a robust, high performance instrument in the UltraFOCUS
At the same time, JEOL has established skilled back-up teams for you. JEOL has 20 subsidiary companies and additional service support centers all over the world to maximize the up-time of your instrument.
Furthermore, our experts are available to provide you with technical information ranging from basic mass spectrometry to advanced technical solutions required for operation, and maintenance, at international training centers around the world.
JEOL will continue to provide you with technical information, qualified repairs, consumable parts and attachments on a long-term basis.

World Wide Support Network



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*Specifications subject to change without notice.

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