



## **BS-490 Chemistry Analyzer**

**mindray**  
healthcare within reach

# BS-490 Chemistry Analyzer

## Robust hardware

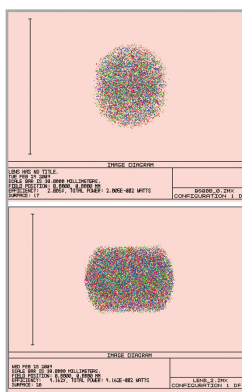
### Enhanced Liquid System

- Precise sample and reagent aspiration
- Built in air bubble elimination prior to washing
- High pressure interior probe wash
- Carry-over <0.05%



### Economy Usage

- Light-Spot Flatting Technology facilitates lower reaction volume
- 24 hour non-stop refrigeration at 2-10°C
- Minimum sample volume: 1.5 µl
- Reagent volume: 10 ~ 350 µl
- States Cuvette Volume:120~360µl



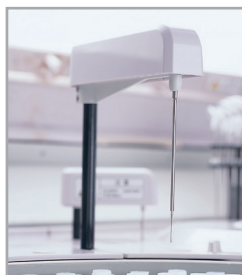
### Easy to perform maintenance

- Front loaded reagent compartment for easier access
- Easy access for routine maintenance and troubleshooting
- Built in Step-by-Step maintenance guide



### Intelligent Probe System functions and smart protection

- Supports methods with up to 4 reagents
- Vertical and horizontal collision protection
- Automatic System Recovery
- Liquid level detection, clot detection



Tailor made

## Advanced software



BS-490

for your lab



### User-friendly Interface

- Real-time analytical and carousel status monitoring
- Bi-directional LIS interface transmission



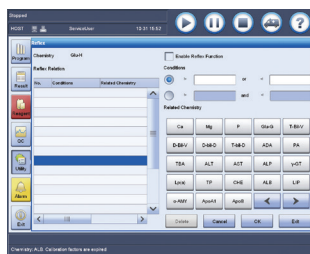
### Real-time QC Status Monitoring

- Levy-Jennings chart and Twin-Plot chart
- QC Out-of-Range real-time alarm
- Customizable periodic QC reminder



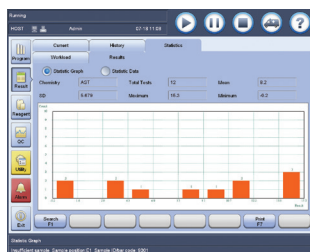
### Traceable Test Results

- Historic data recall from reagent/ calibrator/ control archive
- Intuitive software, intuitive software design, easy historical results



### Reflex Function

- User-defined customizable reflexive assays
- Multiple reflexive criteria may apply to a single assay
- A single reflexive criteria may apply up to 20 assays



### Test Summary

- Test summary reports & sample rerun available on all assays and Quality Assurance
- Facilitate computation of total test costs
- Error Log Export function -facilitate error report to engineers
- Results Archive can be transferred to engineers for evaluation

## Accurate, Reliable Results

To ensure accuracy, reliability and correlation of diagnostic data, Mindray utilizes the International Standard in result reporting. To assure ease of report retrieving, Mindray establishes the Mindray Clinical Chemistry Measurement System for result traceability.



### Standard reference system

- Adopt JCTLM reference system
- IFCC primary method for enzyme, ID/MS method for substrate
- NIST, IRMM reference materials



JCTLM, Joint Committee On Traceability In Laboratory Medicine

NIST, National Institute of Standards and Technology, USA

IRMM, Institute for Reference Materials and Measurements, EU

IFCC, International Federation of Clinical Chemistry and Laboratory Medicine

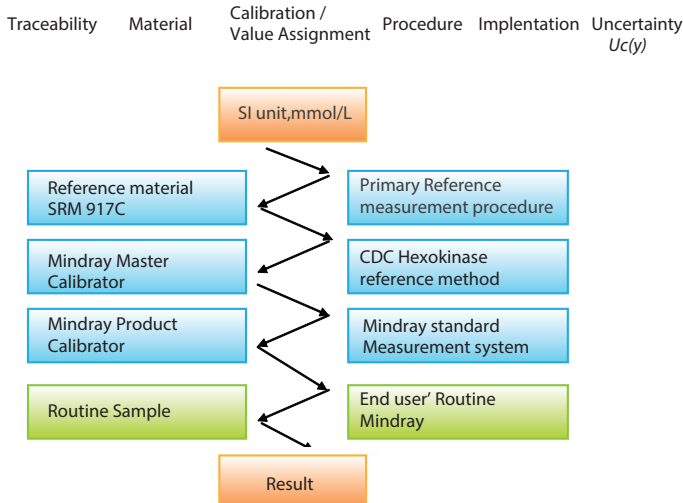
### Complete traceability process

- Complete calibration hierarchy and traceability chain based on ISO standard (EN/ISO17511) from reference system to routine measurement system

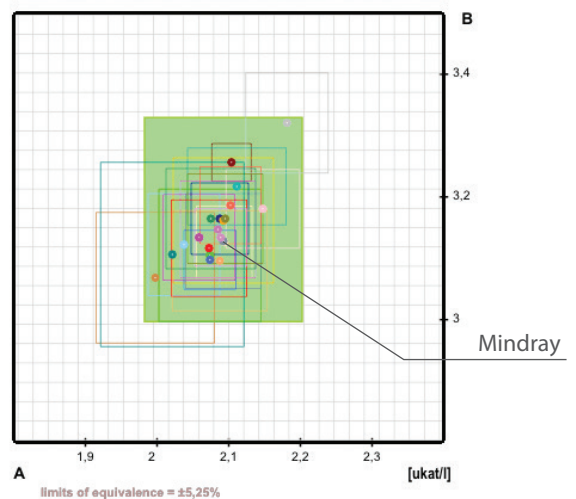
### Proficiency testing for reference measurement

- Participate RELA (External quality control for reference laboratory) to verify the accuracy of the value assignment procedure.

#### Traceability chain of Mindray measurement system (Glu)



ALT



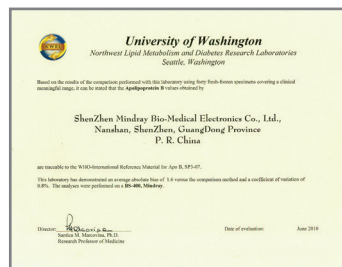
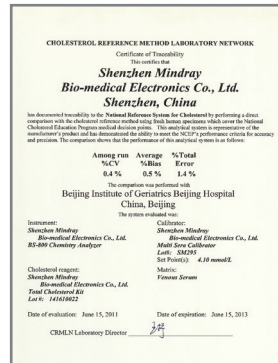
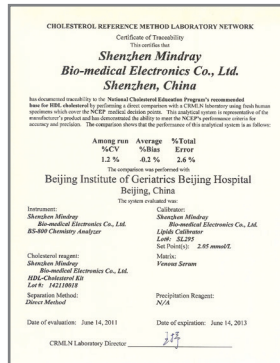
## International standardization certification

- International Standardization certificates of Cholesterol and HbA1c from CRMLN and NGSP.

More information refers to website (<http://www.cdc.gov>).

CRMLN (Cholesterol Reference Method of Laboratory Network)

NGSP(National glycosylated hemoglobin standardization program)



## Matched calibrators and controls

- Dedicated calibrators with traceability and specific target value
- Convenient design of multi items of calibrators and controls combined into one vial
- Long shelf life of lyophilized powder

## Dedicated, high-quality reagents

- Diagnostic function test panels

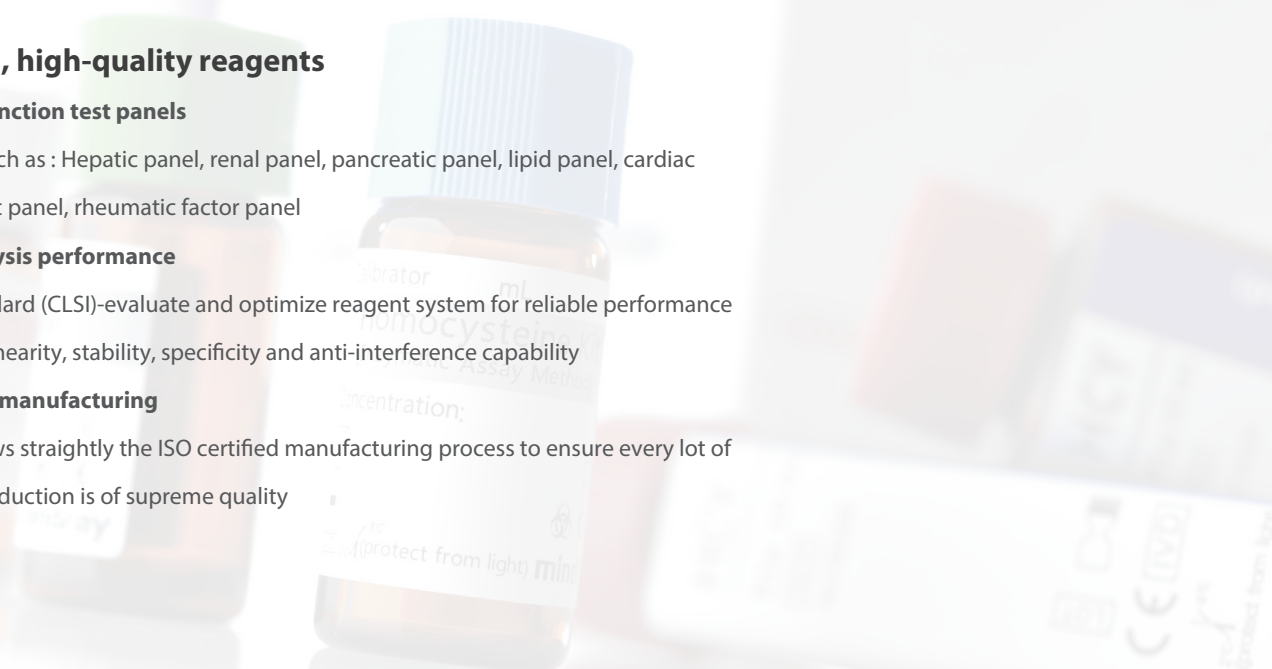
Test panels such as : Hepatic panel, renal panel, pancreatic panel, lipid panel, cardiac panel, diabetic panel, rheumatic factor panel

- Reliable analysis performance

EP series standard (CLSI)-evaluate and optimize reagent system for reliable performance in precision, linearity, stability, specificity and anti-interference capability

- ISO standard manufacturing

Mindray follows straightly the ISO certified manufacturing process to ensure every lot of reagent in production is of supreme quality





# Reagent Menu

## Hepatic Panel

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Alanine Aminotransferase (ALT)  
Aspartate Aminotransferase (AST)  
Alkaline Phosphatase (ALP)  
 $\gamma$ -GlutamylTransferase ( $\gamma$ -GT)  
Direct Bilirubin (D-Bil) DSA Method  
Direct Bilirubin (D-Bil)VOX Method  
Total Bilirubin (T-Bil) DSA Method  
Total Bilirubin (T-Bil)VOX Method  
Total Protein (TP)  
Albumin (ALB)  
Total Bile Acids (TBA)  
Prealbumin (PA)  
Cholinesterase (CHE)  
 $\alpha$ -L-fucosidase (AFU)  
5'-nucleotidase (5'-NT)

## Renal Panel

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Urea (UREA)  
Creatinine (CREA) Modified Jaffé Method  
Creatinine (CREA)Sarcosine Oxidase Method  
Uric Acid (UA)  
Carbon dioxide (CO<sub>2</sub>)  
Microalbumin  
 $\beta$ 2-Microglobulin ( $\beta$ 2-MG)  
Cystatin C (CysC)  
Retinol binding protein( RBP)

## Cardiac panel

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Creatine Kinase (CK)  
Creatine Kinase-MB (CK-MB)  
Lactate Dehydrogenase (LDH)  
 $\alpha$ -Hydroxybutyrate Dehydrogenase( $\alpha$ -HBDH)  
High sensitive C-reaction protein( HS-CRP)  
Homocysteine (HCY)  
Myoglobin(MYO)  
D-Dimer(D-Dimer)

## Inorganic & Anemia

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Iron (Fe)  
Ferritin (FER)  
Transferrin (TRF)  
Calcium (Ca)  
Magnesium (Mg)  
Phosphate Inorganic (P)  
Unsaturated iron binding capacity (UIBC)  
Glucose-6-phosphate dehydrogenase (G6PD)

## Lipid Panel

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Total Cholesterol (TC)  
Triglycerides (TG)  
HDL-Cholesterol (HDL-C)  
LDL-Cholesterol (LDL-C)  
Apolipoprotein A1 (ApoA1)  
Apolipoprotein B (ApoB)  
Lipoprotein(a) [Lp(a)]

## Immune Panel

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Immunoglobulin A (IgA)  
Immunoglobulin G (IgG)  
Immunoglobulin M (IgM)  
Immunoglobulin E (IgE)  
Complement C3 (C3)  
Complement C4 (C4)

## Diabetes Panel

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Glucose (Glu) GOD-POD Method  
Glucose (Glu) HK Method  
Hemoglobin A1c (HbA1c)  
Fructosamine (FUN)  
 $\beta$ -Hydroxybutyrate( $\beta$ -HB)

## Rheumatism Panel

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C-reactive protein (CRP)  
Rheumatoid Factor (RF)  
Antibodies Against Streptolysin O (ASO)

## Pancreatitis Panel

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$\alpha$ -Amylase ( $\alpha$ -AMY)  
Lipase (LIP)

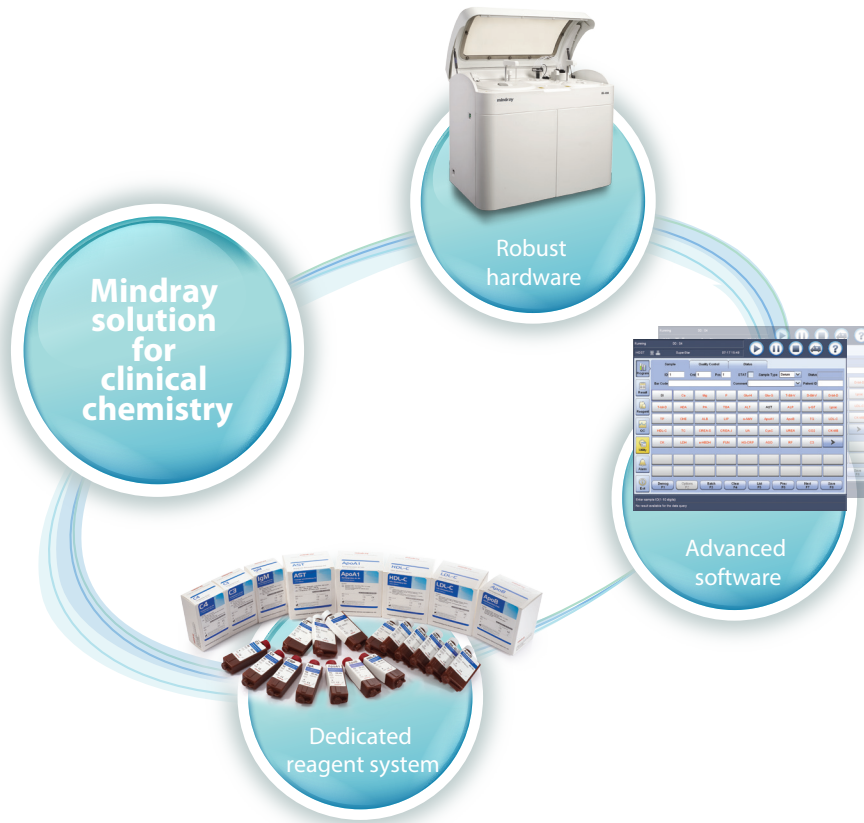
## Lung Panel

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Adenosine Deaminase (ADA)  
Angiotensin Converting Enzyme(ACE)



## Mindray solution for clinical chemistry



Mindray can now provide 60 parameters of dedicated reagents (more than 8 others are coming), covering hepatic, renal, cardiac, lipids, diabetes, pancreatitis, inorganic ions and immunoassays, etc., together with original calibrators with metrological traceability as well as controls for BS-490 chemistry analyzer.



# BS-490 Chemistry Analyzer

## Technical Specifications

### System function

Fully automated, discrete, random access,  
STAT, urine and homogeneous immunoassays; STAT sample priority  
Throughput: 400 photometric tests/hour, up to 240 tests/hour for ISE  
Measuring principles: Absorbance Photometry, Turbidimetry  
Methodology: End-point, Fixed-time, Kinetic, ISE (Optional)  
Single/Dual/Triple/Quadruple reagent chemistries,  
Monochromatic/Bichromatic  
Programming: User defined profiles and calculation

### Sample Handling

Sample tray: 90 positions for primary or secondary tubes and sample cups  
Sample volume: 1.5~45  $\mu$ l, step by 0.1  $\mu$ l  
Sample probe: Liquid level detection, clot detection and collision protection  
Probe cleaning: Interior and exterior automatic probe washing  
carry-over < 0.05%  
Automatic sample dilution, Pre-dilution and post-dilution  
Dilution with ratio up to 1: 150  
Dilution vessel: Quartz cuvette

### Internal bar code reader

Sample/Reagent barcode reading  
including Codabar, ITF (Interleaved Two of Five), code128, code39,  
UPC/EAN, Code93; Bi-directional LIS Interface transmission

### ISE Module (optional)

Optional selection of  $K^+$ ,  $Na^+$ ,  $Cl^-$   
Throughput: Up to 240 tests per hour

### Reagent Handling

Reagent tray: 80 positions in refrigerated compartment (2~10°C)  
Reagent volume: 10~350  $\mu$ l  
Reagent probe: Liquid level detection, collision protection and  
inventory check  
Probe cleaning: Interior and exterior automatic probe washing

### Reaction System

Reaction rotor: Rotating tray, 90 cuvettes with automatic washing  
Cuvette: Optical length 5mm  
Reaction volume: 120~360  $\mu$ l  
Operating temperature: 37°C  
Temperature fluctuation:  $\pm$ 0.1°C  
Mixing system: 2 independent mixers

### Optical System

Light Source: Halogen-tungsten lamp  
Photometer: Reversed optics, grating photometry  
Wavelength: 340nm, 380nm, 412nm, 450nm, 505nm, 546nm,  
570nm, 605nm, 660nm, 700nm, 740nm, 800nm  
Absorbance range: 0~3.3Abs (10mm conversion)  
Resolution: 0.0001Abs

### Control and Calibration

Calibration mode: Linear (one-point, two-point and multi-point), Logit  
-Log 4P, Logit-Log 5P, Spline, exponential, Polynomial,  
Parabola  
Control rules: Westgard multi-rule, Levy-Jennings, Cumulative sum  
check, twin plot

### Operation Unit

Operation system: Windows 8  
Interface: RS-232, Network Port, USB/ parallel port

### Working Conditions

Power Supply: 200~240V, 50/60Hz, 1500VA  
or 110~130V, 60Hz, 1500VA  
Temperature: 15~30°C  
Humidity: 35~85%  
Water consumption:  $\leq$ 20L/hour, De-ionized water  
Dimension: 1180mm x 710mm x 1150mm (W x D x H)  
Weight: 300 Kg

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