510(k) SUBSTANTIAL EQUIVALENCE DETERMINATION
DECISION SUMMARY
ASSAY ONLY TEMPLATE

A. 510(k) Number:

k060325

B. Purpose for Submission:

Notification of intent to manufacture and market the device: ABX PENTRA AST CP it's associated controls and calibrators for use on the ABX PENTRA 400

C. Measurand:

Aspartate Aminotransferase (AST)

D. Type of Test:

Colorimetric

E. Applicant:

Horiba ABX

F. Proprietary and Established Names:

Trade/Proprietary Name:	ABX PENTRA AST CP
Common or Usual Name:	AST – Aspartate aminotransferase
Trade/Proprietary Name:	ABX PENTRA N Control
Common or Usual Name:	N Control
Trade/Proprietary Name:	ABX PENTRA P Control
Common or Usual Name:	P Control
Trade/Proprietary Name:	ABX PENTRA Multical
Common or Usual Name:	Multical

G. Regulatory Information:

1. Regulation section:

21 CFR 862.1100: Aspartate aminotransferase (AST/SGOT) Test System
21 CFR 862.1660: Quality control material (assayed and unassayed)

21 CFR 862.1150: Calibrator

2. Classification:

   Class II - ABX PENTRA AST CP, ABX PENTRA N MultiCal

   Class I, reserved - ABX PENTRA N Control, ABX PENTRA P Control

3. Product code:

   ABX PENTRA AST CP - CIT
   Calibrator – JIX
   Control - JJY

4. Panel:

   75, Chemistry

H. Intended Use:

1. Intended use(s):

   See Indications for use below

2. Indication(s) for use:

   Hepatic Enzymes reagents, with associated calibrators and controls, are intended for use on ABX PENTRA 400 Clinical Chemistry Analyzer to measure a variety of analytes.

   ABX PENTRA AST CP reagent with associated calibrators and controls are for quantitative in vitro diagnostic determination of aspartate aminotransferase in human serum and plasma based on a UV test using L-aspartate and 2-oxoglutarate. Aspartate aminotransferase measurements are used in the diagnosis and treatment of certain types of liver and heart diseases.

   The ABX PENTRA Multical is a calibrator for use in the calibration of quantitative Horiba ABX methods on Horiba ABX clinical chemistry analyzers.

   The ABX PENTRA N Control is for use in quality control by monitoring accuracy and precision.

   The ABX PENTRA P Control is for use in quality control by monitoring accuracy and precision.

3. Special conditions for use statement(s):

For prescription use only

4. Special instrument requirements:

   For use on the Horiba ABX Pentra 400

I. Device Description:

ABX PENTRA AST CP is intended for use on the ABX PENTRA 400 for the quantitative in-vitro determination of AST – Aspartate aminotransferase using human serum and plasma. The controls and calibrators are intended for use in association with the above reagent.

ABX PENTRA AST CP is a liquid based Bi-reagent cassette ready for use on the Horiba Pentra ABX analyzer. Each cassette consists of two reagents (Reagent 1 – 56ml & Reagent 2 – 14ml).

The **ABX PENTRA N MultiCal** is a 3 level serum based calibrator for use in the calibration of quantitative Horiba ABX PENTRA AST CP method on Horiba ABX clinical chemistry analyzers as specified on the vials.

The **ABX PENTRA N & P Controls** are serum based liquids for use in quality control by monitoring accuracy and precision for the quantitative ABX PENTRA AST method as specified in the enclosed package insert.

The **ABX PENTRA N MultiCal** and **ABX PENTRA N & P Controls** are prepared from the blood of donors tested individually and shown to be free from HBsAG and antibodies to HCV and HIV by FDA approved methods.

J. Substantial Equivalence Information:

1. Predicate device name(s):

   Roche Reagent for AST
   ABX PENTRA N MultiCal and ABX PENTRA N & P Controls

2. Predicate 510(k) number(s):

   k801118
   k052007

3. Comparison with predicate:

   AST was added to the controls and calibrator cleared in k052007.

	Predicate device (k801118):	Device :
Device Name	**AST**	**ABX Pentra AST CP**
Manufactured by	Roche, USA	HORIBA ABX, France
Instrument	COBAS MIRA chemistry system	ABX PENTRA 400
Analytes	Aspartate aminotransferase	Aspartate aminotransferase
Method :	Optimized UV test according to IFCC modified method without pyridoxal phosphate	Optimized UV test according to IFCC modified method without pyridoxal phosphate
Specimen :	Serum Plasma	Serum Plasma
Component reagent matrices	Single-reagent bottles, lyophilized: REAGENT : L-Aspartate, alpha-Ketoglutarate, Malate dehydrogenase, NADH, Lactate dehydrogenase, Buffers, stabilizers and fillers	Bi-reagent cassette, ready to use: REAGENT 1 : TRIS (pH 7.8), L-Aspartate, MDH, LDH, Sodium azide REAGENT 2 : 2-Oxoglutarate, NADH, Sodium azide
Format	Lyophilized	Liquid
Packaging	Single-reagent bottles REAGENT : 20 x 5.5 ml	Bi-reagent cassette : REAGENT 1 : 56 ml REAGENT 2 : 14 ml
Controls	Commercially available quality control (not included)	Recommended quality control material (not included): ABX Pentra N Control (Normal control) ABX Pentra P Control (Pathologic control)

K. Standard/Guidance Document Referenced (if applicable):

The following standards & FDA guidance documents have been used to support this submission:

Guidance for Industry and FDA Staff: "Format for Traditional & Abbreviated 510(k)s" : August 12, 2005

"In vitro diagnostics devices: Guidance for the preparation of 510(k) submissions Jan 1997"

"Guidance for Industry and FDA Staff Bundling Multiple Devices or Multiple Indications in a Single Submission, November 2003"

CLSI (NCCLS):

EP05-A2 – Evaluation of Precision Performance of Quantitative Measurement Methods; Approved Guideline-Second Edition

EP06-A - Evaluation of the Linearity of Quantitative Measurement Procedures: A Statistical Approach; Approved Guideline

EP09-A2 – Method Comparison and Bias Estimation Using Patient Samples; Approved Guideline -Second Edition

EP21-A - Estimation of Total Analytical Error for Clinical Laboratory Methods; Approved Guideline

L. Test Principle:

ABX PENTRA AST CP - Optimized UV-test method NADH – NAD

M. Performance Characteristics (if/when applicable):

1. Analytical performance:

a. Precision/Reproducibility:

ABX PENTRA AST CP

Within Run Precision:

Based upon the Valtec guideline (Vassault et al., Ann. Biol. Clin., 1986, (44), 686-745); 2 controls and 3 specimens of low, medium and high concentrations were tested 20 times in a single run for each sample.

Sample	N	Mean	%CV	SD
Control N	20	42.21	2.71	1.15
Control P	20	123.45	1.43	1.77
Sample 1	20	21.76	2.32	0.51
Sample 2	20	38.36	2.01	0.77
Sample 3	20	145.42	1.08	1.58

Between run and Total Precision

Based upon the NCCLS (CLSI) EP-5A, two specimens of low & high levels and 2 controls were tested in duplicate for 20 days, two series per day.

Sample	N	Mean	%CV	SD
Control N	80	41.58	3.15	1.31
Control P	80	126.33	2.5	3.16
Sample 1	80	42.87	3.62	1.55
Sample 2	80	348.17	4.97	17.32

b. Linearity/assay reportable range:

Linearity studies across the measuring range of the assay were performed via protocols based upon CLSI EP6-A. The studies demonstrated linearity of the assays and the linear regression statistics listed below. In addition, post dilution studies were performed to validate the automated dilution function and range.

ABX PENTRA AST CP
The measuring range of the assay is 4 – 600 U/L; Post dilution up to 1800 U/L.

Linear regression statistics: $y = 1.0133x + 1.2633$ $r^2 = 0.9998$

c. Traceability, Stability, Expected values (controls, calibrators, or methods):

ABX PENTRA AST CP

Reagent Shelf-life: Real time stability of the reagent stored at 2-8°C has been evaluated on 3 different lots. Results support a real time stability of at least 24 months.

Reagent Stability on board: Reagent stability on-board has been evaluated by testing accuracy and linearity periodically. From the results, the reagent stability on-board (refrigerated area) after opening is 55 days.

ABX PENTRA N Control & **ABX PENTRA P Control** traceability

The values of the ABX PENTRA Controls are assigned from the ABX PENTRA calibrator, reagents and analyzers. The target value is determined by the median of results from 150 measurements/parameter. Confidence range is determined as the calculated range in percent which is based on the experimental results from the previous target value trials. The range declared in the target value sheet is equal to the assigned value +/- 3 standard deviations (3 SD).

ABX Pentra Multical traceability

ABX Pentra Multical is prepared from reference materials. Commercial calibrators are standardized by means of a Master Lot which is stored at -80°C. Two controls are used to ensure that the calibration values of the Master Lot, as well as the entire measurement system (calibrator, reagent, and analyzer), remain stable during the storage period. The target value is determined by the median of results from 150 measurements/parameter.

ABX PENTRA N Control, ABX PENTRA P Control, and ABX PENTRA Multical

Protocols and acceptance criteria for open and closed stability of the controls and calibrators were described and found to be acceptable.

d. Detection limit:

ABX PENTRA AST CP

Minimum Detection Limit (MDL) was calculated from 30 measurements of saline water (0.9 g/l) using the Valtec guideline (Vassault et *al*., Ann. Biol. Clin., 1986, (44), 686-745).. The claimed MDL value is 4 U/l.

e. Analytical specificity:

ABX PENTRA AST CP

Hemoglobin up to 95 mg/dl, total bilirubin up to 24.7 mg/dl (415 mmol/L), direct bilirubin up to 20.3mg/dl (362 mmol/L) and triglycerides (as Intralipid ®, representative of lipemia) up to 4.6 mmol/l (402.5 mg/dl) do not interfere with AST determination by this test.

Study materials: Substances were added to pooled Human serum at two different AST activities (normal and high). The base serum with each substance was then serially diluted with the same base serum that was added saline instead of substance to adjust AST activity.

Method : Based upon the Valtec guideline (Vassault et *al*., Ann. Biol. Clin., 1986, (44), 686-745)

f. Assay cut-off:

Not applicable

2. Comparison studies:

a. Method comparison with predicate device:

A total of 103 samples were compared with the Roche Direct AST Bilirubin reagent (predicate) on the Roche MIRA Plus. Regression statistics were as follows:
$y = 0.9654x + 4.0431$, $r^2 = 0.9963$

Additional studies were performed to provide complementary data covering the low end of the AST assay range.
Sample range 3.6 – 9.6 U/L, n=10, $y=0.8821x=1.3841$, $r^2=0.9183$.

b. Matrix comparison:

To demonstrate equivalence of AST in serum and Plasma Heparin-Lithium samples, comparison study was performed. 43 samples were evaluated on ABX Pentra 400 analyzer using ABX Pentra AST CP reagent. $Y = 0.9927x + 0.4334$ $r^2 = 0.9979$. The results show that there is no significant difference between serum specimens and Heparin-Lithium Plasma.

3. Clinical studies:

a. Clinical Sensitivity:

Not applicable

b. Clinical specificity:

Not applicable

c. Other clinical supportive data (when a. and b. are not applicable):

Not applicable

4. Clinical cut-off:

Not applicable

5. Expected values/Reference range:

Women: < 31 U/l
Men: < 35 U/l

Reference:
IFCC Primary Reference Procedures for the measurement of Catalytic Activity Concentrations of Enzymes at 37°C. Part 5, Clin. Chem. Lab. Med. 2002; 40(7): 725-733.

N. Proposed Labeling:

The labeling is sufficient and it satisfies the requirements of 21 CFR Part 809.10.

O. Conclusion:

The submitted information in this premarket notification is complete and supports a substantial equivalence decision.