

# ABX Pentra Iron CP

**REF** A11A01637  
**REAGENT 1** 60 mL  
**REAGENT 2** 20 mL



**IVD** **CE** Rx Only

■ ABX Pentra 400

**HORIBA ABX SAS**  
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FRANCE

**Diagnostic reagent for quantitative *in vitro* determination of Iron in serum or plasma by colorimetry.**

## Application Release

### Serum, plasma: Iron

World wide except the USA: 5.xx  
For the USA only: 2.xx

## Intended Use

**ABX Pentra Iron CP** reagent is intended for the quantitative *in vitro* diagnostic determination of iron (non-heme) in human serum and plasma based on a photometric test (Ferene method). Iron (non-heme) measurements are used in the diagnosis and treatment of diseases such as iron deficiency anemia and hemochromatosis.

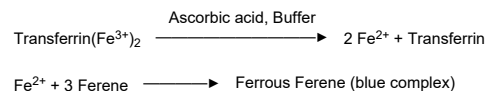
## Clinical Interest (1, 2)

Iron exists in the body as a component of hemoglobin and myoglobin as well as bound to transferrin for the transport in plasma and stored in ferritin. Increased iron concentrations occur in hemochromatosis and liver damage. Decreased iron levels can be caused by anemia due to malabsorption as consequence of gastrointestinal diseases or by blood loss as a result of gastrointestinal lesions or heavy menstrual bleeding. For the estimation of the body iron status the measurement of transferrin and ferritin can provide more detailed information.

## Method (3, 4)

Photometric test using Ferene.  
Iron bound to transferrin is released in an acidic medium as ferric iron and is then reduced to ferrous iron in the

presence of ascorbic acid. Ferrous iron forms a blue complex with Ferene. The absorbance at 595 nm is directly proportional to the iron concentration.



## Reagents <sup>a</sup>

**ABX Pentra Iron CP** is ready-to-use.

### Reagent 1 (R1):

|                       |            |
|-----------------------|------------|
| Acetate buffer pH 4.5 | 1 mol/L    |
| Thiourea              | 120 mmol/L |

### Reagent 2 (R2):

|               |            |
|---------------|------------|
| Ascorbic acid | 240 mmol/L |
| Ferene        | 3 mmol/L   |
| Thiourea      | 120 mmol/L |

**ABX Pentra Iron CP** should be used according to this notice. The manufacturer cannot guarantee its performance if used otherwise.

## Handling

1. Remove both caps of the cassette.
2. If present, remove foam by using a plastic pipette.
3. Position a protective cap ref. GBM0969 on Reagent 1 and on Reagent 2.

<sup>a</sup>Modification: § "Reagents": modification.

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- Place the cassette into the refrigerated ABX Pentra 400 reagent compartment.

## Calibrator

For calibration, use:

- ABX Pentra Multical** (A11A01652) (not included)  
10 x 3 mL (lyophilisate)

## Control <sup>b</sup>

For internal quality control, use:

- ABX Pentra N MultiControl** (1300054414) (not included)  
10 x 5 mL (lyophilisate)
- ABX Pentra P MultiControl** (1300054415) (not included)  
10 x 5 mL (lyophilisate)

Each control should be assayed daily and/or after a calibration.

The frequency of controls and the confidence intervals should correspond to laboratory guidelines and country-specific directives. You should follow federal, state and local guidelines for testing quality control materials. The results must be within the range of the defined confidence limits. Each laboratory should establish a procedure to follow if the results exceed these confidence limits.

## Materials Required but not Provided <sup>b</sup>

- Automated clinical chemistry analyzer: ABX Pentra 400
- Calibrator: **ABX Pentra Multical** (A11A01652)
- Controls:
  - ABX Pentra N MultiControl** (1300054414)
  - ABX Pentra P MultiControl** (1300054415)
- Cleaning solutions:
  - ABX Pentra Clean-Chem CP** (A11A01755), 30 mL or
  - ABX Pentra Clean-Chem 99 CP** (A11A01789), 4 x 99 mL
- Standard laboratory equipment.

## Specimen <sup>c</sup>

This device intended testing population is general population.

## Specimen types

- Serum.
- Plasma in lithium heparin (Do not freeze).

Anticoagulants other than those listed have not been tested by HORIBA Medical and are therefore not recommended for use with this assay.

Separate serum at the latest 2 hours after blood collection to minimize hemolysis.

Centrifuge the heparinized blood for at least 15 minutes at 2000 to 3000 g (5).

## Stability (6)

- At 20-25°C: 7 days
- At 4-8°C: 3 weeks
- At -20°C: 1 year

## Reference Range (7) <sup>d</sup>

Each laboratory should establish its own reference ranges. The values given here are used as guidelines only.

|                                   | µg/dL    | µmol/L     |
|-----------------------------------|----------|------------|
| <b>Children:</b>                  |          |            |
| 2 weeks                           | 63 - 201 | 11 - 36    |
| 6 months                          | 28 - 135 | 5 - 24     |
| 12 months                         | 35 - 155 | 6 - 28     |
| 2 -12 years                       | 22 - 135 | 4 - 24     |
| <b>Women:</b>                     |          |            |
| 25 years                          | 37 - 165 | 6.6 - 29.5 |
| 40 years                          | 23 - 134 | 4.1 - 24.0 |
| 60 years                          | 39 - 149 | 7.0 - 26.7 |
| <b>Pregnant women:</b>            |          |            |
| 12 <sup>th</sup> gestational week | 42 - 177 | 7.6 - 31.6 |
| At term                           | 25 - 137 | 4.5 - 24.5 |
| 6 weeks postpartum                | 16 - 150 | 2.9 - 26.9 |
| <b>Men:</b>                       |          |            |
| 25 years                          | 40 - 155 | 7.2 - 27.7 |
| 40 years                          | 35 - 168 | 6.3 - 30.1 |
| 60 years                          | 40 - 120 | 7.2 - 21.5 |

Clinical sensitivity and specificity, positive predictive value and negative predictive value are not commonly reported

<sup>b</sup>Modification: control removed.

<sup>c</sup>Modification: modification of "Specimen".

<sup>d</sup>Modification: information added.

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for this analyte. This is largely attributed to the fact that this analyte is not sole indicator for the intended purpose and patient treatment decision making. To arrive at a diagnosis and a course of treatment, results from others routine clinical chemistry tests should be used in conjunction with other diagnostic information and the attending health-care professional's evaluation of the patient's condition.

## Storage and Stability <sup>e</sup>

### Stability before opening:

Stable up to the expiry date on the label if stored at 2-8°C. Store protected from light.

### Stability after opening:

Refer to the paragraph "Performance on ABX Pentra 400".

Do not freeze.

## Waste Management

Please refer to local legal requirements.

## General Precautions <sup>f</sup>

- This reagent is for professional *in vitro* diagnostic use only.  
For laboratory use.
- For prescription use only.
- This reagent is classified as hazardous in compliance with regulation (EC) N°.1272/2008.
- **Reagent 1: Danger**  
**H315:** Causes skin irritation.  
**H318:** Causes serious eye damage.  
**P264:** Wash hands thoroughly after handling.  
**P280:** Wear protective gloves/protective clothing/eye protection/face protection.  
**P310:** Immediately call a POISON CENTER or doctor/physician.  
**P302 + P352:** IF ON SKIN: Wash with plenty of soap and water.  
**P305 + P351 + P338:** IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
 Contains: Acetic acid, Dodecan-1-ol, ethoxylated and Alcohols, C9-11-iso-, C10-rich, ethoxylated.

- Use only disposable material to avoid iron contamination. Rinse glass material with diluted HCl and copious distilled water.
- In very rare cases, samples of patients with gammopathy might give false results (8).
- Observe the standard laboratory precautions for use.
- The reagent cassettes are disposable and should be disposed of in accordance with the local legal requirements.
- Please refer to the SDS associated with the reagent.
- Do not use the product if there is visible evidence of biological, chemical or physical deterioration.
- Do not use the product if the recommended storage conditions, including temperature, are not followed.
- User must be trained by a HORIBA Medical representative before attempting to operate the device.
- It is the user's responsibility to verify that this document is applicable to the reagent used.
- For technical assistance, you can call +33 (0)4 67 14 15 16.
- Any serious incident that has occurred in relation to the device shall be reported to the manufacturer and the competent authority of the country in which the user and/or the patient is established.

## Performance on ABX Pentra 400

### Lot to Lot Variability <sup>g</sup>

The recovery of samples (serum and plasma) done during QC release of three consecutive lots of reagent shows that the lot to lot variability is within specification:

| Sample value | Specification |
|--------------|---------------|
| < 15 µmol/L  | +/- 2 µmol/L  |
| > 15 µmol/L  | +/- 10%       |

### Serum, plasma

The performance data listed below have been obtained on the ABX Pentra 400 analyzer.

**Number of tests:** 282 tests

### On Board Reagent Stability

Once opened, the reagent cassette placed in the refrigerated ABX Pentra 400 compartment is stable for 90 days.

<sup>e</sup>Modification: modification of storage and stability.

<sup>f</sup>Modification: general precautions modification.

<sup>g</sup>Modification: chapter added.

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**Sample volume:** 22 µL/test

## Detection Limit <sup>h</sup>

The detection limit is determined according to CLSI (NCCLS), EP17-A2 protocol (9) and equals 2.22 µmol/L (12.39 µg/dL).

## Limit of Quantitation <sup>i</sup>

The limit of quantitation is determined according to CLSI (NCCLS), EP17-A2 protocol (9) and equals 2.60 µmol/L (15 µg/dL).

## Accuracy and Precision

### Repeatability (within-run precision)

Repeatability according to the recommendations found in the Valtec protocol (10) with samples tested 20 times:

- 2 controls
- 3 specimens (low / medium / high levels)

|                    | Mean value<br>µmol/L | Mean value<br>µg/dL | CV % |
|--------------------|----------------------|---------------------|------|
| Control specimen 1 | 20.67                | 115.36              | 1.89 |
| Control specimen 2 | 34.04                | 189.92              | 1.50 |
| Specimen 1         | 9.03                 | 50.41               | 2.56 |
| Specimen 2         | 17.19                | 95.91               | 2.32 |
| Specimen 3         | 121.91               | 680.26              | 0.32 |

### Reproducibility (total precision)

Reproducibility according to the recommendations found in the CLSI (NCCLS), EP5-A2 protocol (11) with samples tested in duplicate for 20 days (2 series per day):

- 2 controls
- 2 specimens (medium / high levels)

|                    | Mean value<br>µmol/L | Mean value<br>µg/dL | CV % |
|--------------------|----------------------|---------------------|------|
| Control specimen 1 | 20.94                | 116.83              | 3.0  |
| Control specimen 2 | 34.24                | 191.05              | 2.6  |

|            | Mean value<br>µmol/L | Mean value<br>µg/dL | CV % |
|------------|----------------------|---------------------|------|
| Specimen 1 | 13.33                | 74.40               | 3.6  |
| Specimen 2 | 91.58                | 510.99              | 1.8  |

## Measuring Range <sup>j</sup>

The assay confirmed a measuring range from 2.60 µmol/L (15 µg/dL) to 180 µmol/L (1004.4 µg/dL). The measuring range is extended up to 900 µmol/L (5020 µg/dL) with the automatic post-dilution. The reagent linearity has been assessed up to 180 µmol/L (1004.4 µg/dL) according to the recommendations found in the CLSI (NCCLS), EP06-Ed2 protocol (12).

## Correlation <sup>k</sup>

Patient samples: Serum  
 Number of patient samples: 122  
 Specimens are correlated with a commercial reagent taken as reference according to the recommendations found in the CLSI (NCCLS), EP09c protocol (13).  
 Values ranged from 2.76 µmol/L (15.40 µg/dL) to 179.90 µmol/L (1003.84 µg/dL).  
 The equation for the allometric line obtained using Passing-Bablok regression procedure (14) is:  
 $Y = 1.154 X + 0.4598$  (µmol/L)  
 $Y = 1.154 X + 2.57$  (µg/dL)  
 with a correlation coefficient  $r^2 = 0.997$ .

## Interferences <sup>l</sup>

**Haemoglobin:** No significant influence is observed up to 104 µmol/L (180 mg/dL).  
**Triglycerides:** No significant influence is observed up to a triglyceride concentration of 4.98 mmol/L (435.7 mg/dL).  
**Total Bilirubin:** No significant influence is observed up to 321 µmol/L (18.8 mg/dL).  
**Direct Bilirubin:** No significant influence is observed up to 289 µmol/L (16.9 mg/dL).  
 An interference was observed with patient samples treated with calcium heparinate.

*Other limitations are given by Young as a list of drugs and preanalytical variables known to affect this methodology (15, 16).*

## Calibration Stability

The reagent is calibrated on Day 0. The calibration stability is checked by testing 2 control specimens.

<sup>h</sup>Modification: modification of detection limit.

<sup>i</sup>Modification: data added.

<sup>j</sup>Modification: modification of measuring range.

<sup>k</sup>Modification: modification of correlation.

<sup>l</sup>Modification: modification of interferences.

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The calibration stability is 10 days.

*Note: A recalibration is recommended when reagent lots change, and when quality control results fall outside the range established.*

## Conversion Factor

$\mu\text{mol/L} \times 5.58 = \mu\text{g/dL}$

$\mu\text{mol/L} \times 0.0558 = \text{mg/L}$

## Reference

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16. Young DS. Effects of Preanalytical Variables on Clinical Laboratory Tests. 2<sup>nd</sup> Edition, Washington, DC, AACC Press (1997) **3**: 120-132.

