



Lead (B) TT

M235

0.1 - 5 mg/L Pb

4-(2-Pyridylazo)-resorcine

Instrument specific information

The test can be performed on the following devices. In addition, the required cuvette and the absorption range of the photometer are indicated.

| Instrument Type | Cuvette | λ | Measuring Range |
|---------------------------------|---------|-----------|-----------------|
| SpectroDirect, XD 7000, XD 7500 | ø 16 mm | 515 nm | 0.1 - 5 mg/L Pb |

Material

Required material (partly optional):

| Reagents | Packaging Unit | Part Number |
|--|----------------|-------------|
| Lead Spectroquant 1.14833.0001 tube test ^{o)} | 25 pc. | 420754 |

Application List

- Waste Water Treatment
- Galvanization

Preparation

1. Before performing the test, you must read through the original instructions and safety advice that is delivered with the test kit (MSDS are available on the home-page of www.merckmillipore.com).
2. With the test process described, only Pb²⁺ ions are determined. To determine colloidal, undissolved and complex-bound lead, digestion is first required.
3. The pH value of the sample must be between 3 and 6.



Notes

1. This method is adapted from MERCK.
2. Spectroquant® is a registered trademark of the company MERCK KGaA.
3. Appropriate safety precautions and good laboratory technique should be used during the whole procedure.
4. Sample volume should always be metered by using a 5ml volumetric pipette (class A).
5. Because the reaction depends on temperature, the sample temperature must be between 10 °C and 40 °C.
6. The reagents are to be stored in closed containers at a temperature of +15 °C – +25 °C.



Determination of Lead (Pb²⁺) in hard to very hard water

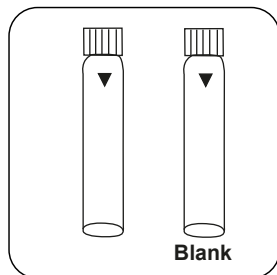
Select the method on the device.

For this method, a ZERO measurement does not have to be carried out every time on the following devices: XD 7000, XD 7500

Skip steps with Blank.

Method B

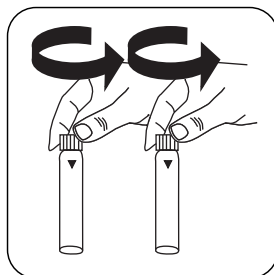
Use Method B for the determination of lead in hard to very hard water containing Ca²⁺ particles of 70 mg/L up to 500 mg/L (approx. 10-70° dH).



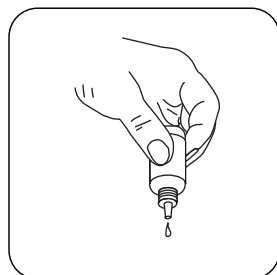
Prepare two **reaction vials**.
Mark one as a blank.



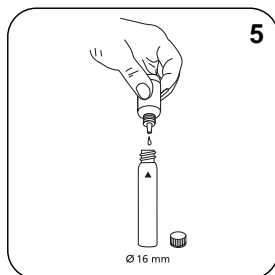
Note! Reagent tubes contain Potassium cyanide! Adhere strictly to the specified dosage sequence!



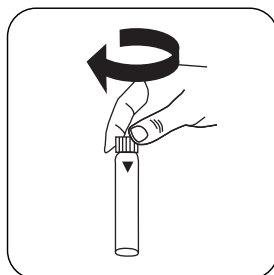
Open two **reaction vials** .



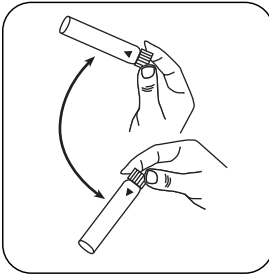
Hold cuvettes vertically and add equal drops by pressing slowly.



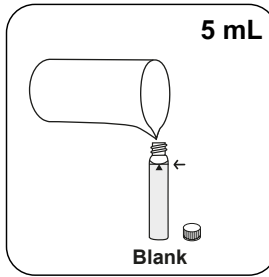
Add **5 drops Reagenz Pb-1K solution** to each vial.



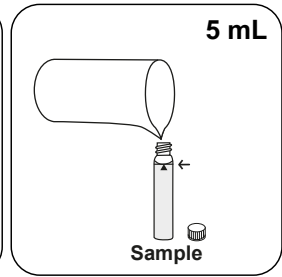
Close vial(s).



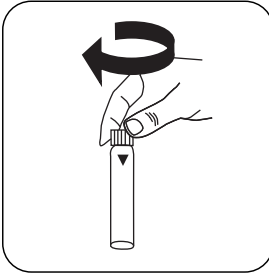
Invert several times to mix the contents.



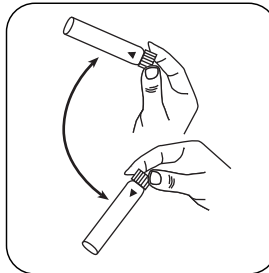
Put **5 mL deionised water** in the blank.



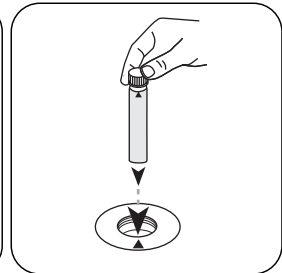
Put **5 mL sample** in the sample vial.



Close vial(s).



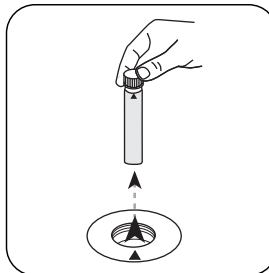
Invert several times to mix the contents.



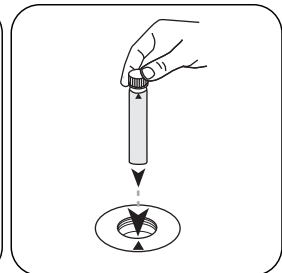
Place **blank** in the sample chamber. • Pay attention to the positioning.



Press the **ZERO** button.



Remove **vial** from the sample chamber.

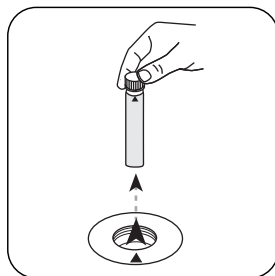


Place **sample vial** in the sample chamber. • Pay attention to the positioning.

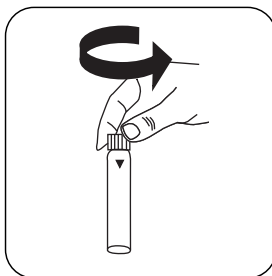


Test

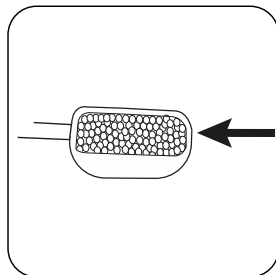
Press the **TEST** (XD:
START) button.



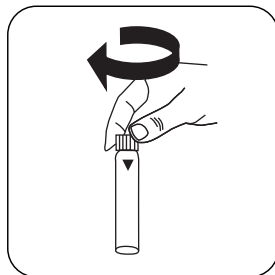
Remove **vial** from the
sample chamber.



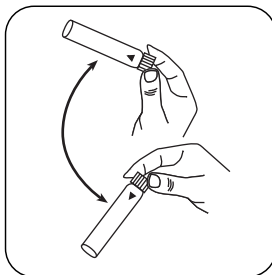
Open the sample vial.



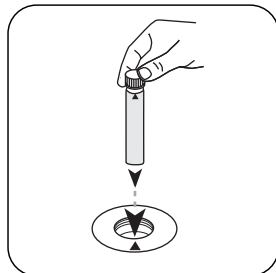
Add **one level microspoon**
Reagent Pb-2K.



Close vial(s).



Swirl around to dissolve the
powder.



Place **sample vial** in the
sample chamber. • Pay
attention to the positioning.

Test

Press the **TEST** (XD:
START) button.

The result in mg/L Lead in hard to very hard waters (procedure B) appears on the display.

Lead content in mg/L = measured value A - measured value B

Chemical Method

4-(2-Pyridylazo-)-resorcine

Appendix

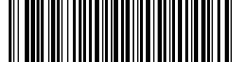
Calibration function for 3rd-party photometers

Conc. = $a + b \cdot \text{Abs} + c \cdot \text{Abs}^2 + d \cdot \text{Abs}^3 + e \cdot \text{Abs}^4 + f \cdot \text{Abs}^5$

| | ø 16 mm |
|---|--------------------------|
| a | $-3.23149 \cdot 10^{-2}$ |
| b | $4.63126 \cdot 10^{+0}$ |
| c | |
| d | |
| e | |
| f | |

Interferences

| Interference | from / [mg/L] |
|--|---------------|
| Ag | 100 |
| Al | 1000 |
| Ca | 500 |
| Cd ²⁺ | 100 |
| Cr ³⁺ | 10 |
| Cr ₂ O ₇ ²⁻ | 50 |
| Cu ²⁺ | 100 |
| F ⁻ | 1000 |
| Fe ³⁺ | 2 |
| Hg ²⁺ | 50 |
| Mg | 250 |
| Mn ²⁺ | 0,1 |
| NH ₄ ⁺ | 1000 |
| Ni ²⁺ | 100 |
| NO ₂ ⁻ | 100 |
| PO ₄ ³⁻ | 1000 |



| Interference | from / [mg/L] |
|---------------------------------|----------------------|
| Zn | 100 |
| EDTA | 0,1 |
| Surfactants | 1000 |
| Na-Ac | 0,2 |
| NaNO ₃ | 0.4 |
| Na ₂ SO ₄ | 0.02 |

Bibliography

Shvoeva, O.P., Dedkova, V.P. & Savvin, S.B. Journal of Analytical Chemistry (2001) 56: 1080

⁴⁾ Spectroquant® is a Merck KGaA Trademark