Phosphate total HR TT 318

1.5 - 20 mg/l P[b)]

Phosphomolybdenum Blue

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	690 nm	1.5 - 20 mg/l P[b)]

Material

Required material (partly optional):

Reagents	Packaging Unit	Part Number
Phosphate-total HR/24	24 pc.	2420700

Application List

- Waste Water Treatment
- Drinking Water Treatment
- Raw Water Treatment

Preperation

1. Strongly buffered samples or samples with extreme pH values should be adjusted to between pH 6 and pH 7 before the analysis (use 1 mol/l Sulphuric acid or 1 mol/l Sodium hydroxide).
2. Ortho-Phosphate ions react with the reagent to form an intense blue colour. Phosphate, which is found in organic and condensed, inorganic (meta-, pyro- and polyphosphate) forms, must therefore be converted into ortho-phosphate ions prior to analysis. The pretreatment of the sample with acid and heat creates the conditions for the hydrolysis of the condensed, inorganic forms. Organically bound phosphate can be converted into ortho-phosphate ions by heating with acid and Persulphate. The amount of organically bound phosphate can be calculated:
mg/l organic Phosphate = mg/l Phosphate, total - mg/l Phosphate, can be hydrolysed in acid.

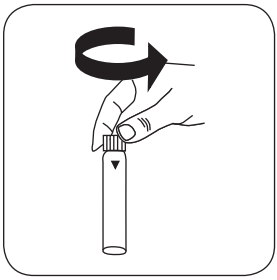
Notes

1. If a test is performed without digestion, only ortho-phosphates are recorded.

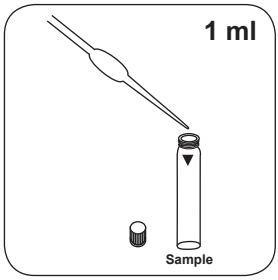
Implementation of the provision Phosphate, total HR with Vial Test

Select the method on the device

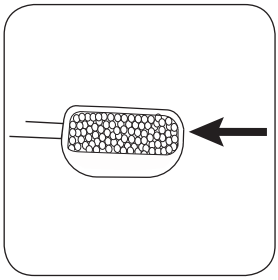
For this method, no ZERO measurements are to be carried out with the following devices: XD 7000, XD 7500



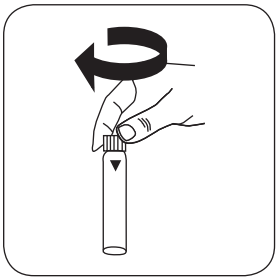
Open **digestion vial** .



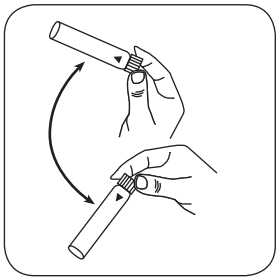
Put **1 ml sample** in the sample vial.



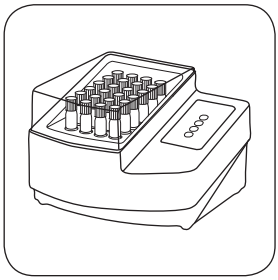
Add **a level measuring scoop No. 4 (white) Phosphate-103** .



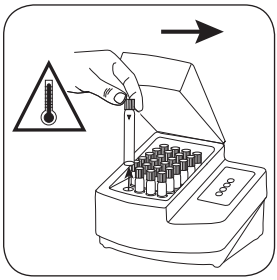
Close vial(s).



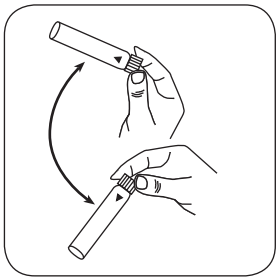
Invert several times to mix the contents.



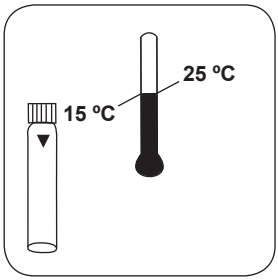
Seal the vials in the pre-heated thermoreactor for **30 minutes at 100 °C** .



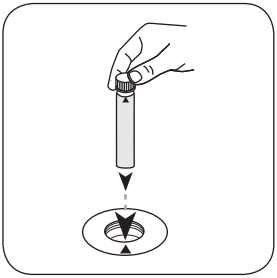
Remove the vial from the thermoreactor. **Note: vial will be hot!)**



Invert several times to mix the contents.

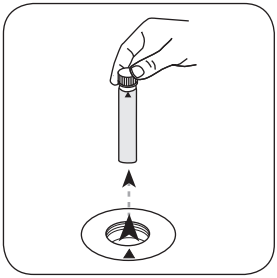


Allow the vial(s) to cool to room temperature.



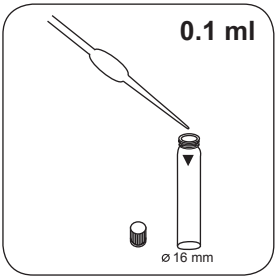
Place the supplied Zero vial (red sticker) in the sample chamber. • Pay attention to the positioning.

Press the **ZERO** button.

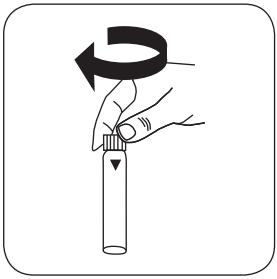


Remove **vial** from the sample chamber.

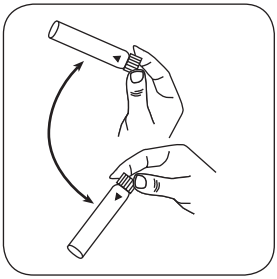
For devices that require **no ZERO measurement** , **start here**.



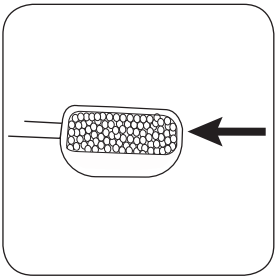
Add **0.1 ml (2 drops) Phosphate-101** of the digested sample.



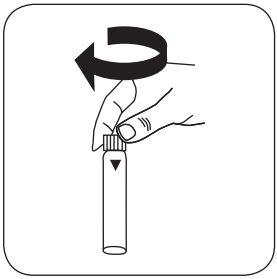
Close vial(s).



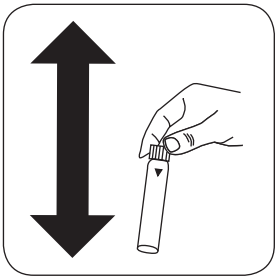
Invert several times to mix the contents.



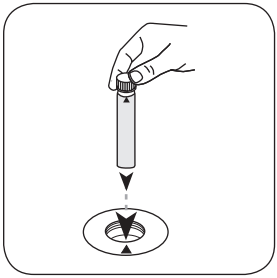
Add **a level measuring scoop No. 4 (white) Phosphate-102** .



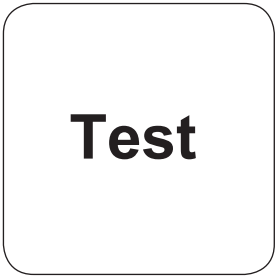
Close vial(s).



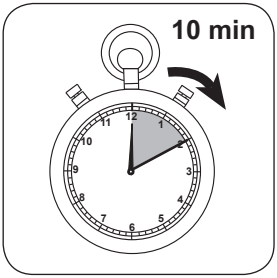
Dissolve the contents by shaking.



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



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



Wait for **10 minute(s) reaction time**.

Once the reaction period is finished, the measurement takes place automatically.

The result in mg/l total Phosphate appears on the display.

Analyses

The following table identifies the output values can be converted into other citation forms.

Unit	Cite form	Scale Factor
mg/l	P	1
mg/l	PO_4^{3-}	3.066177
mg/l	P_2O_5	2.29137

Chemical Method

Phosphomolybdenum Blue

Appendix

Interferences

Interference	from / [mg/l]
Cu^{2+}	5
Ni^{2+}	25
Pb^{2+}	25
Fe^{2+}	250
Fe^{3+}	250
Hg^{2+}	250
Al^{3+}	1000
Cr^{3+}	1000
Cd^{2+}	1000
Mn^{2+}	1000
NH_4^+	1000
Zn^{2+}	1000
Hardness total	446,5 (2500°dH)
NO_2^-	5
CrO_4^{2-}	30
p-PO_4	30

According to

DIN ISO 15923-1 D49
Standard Method 4500-P E
US EPA 365.2

[a] determination of free, combined and total | [b] Reactor is necessary for COD (150 °C), TOC (120 °C) and total

-chromium, - phosphate, -nitrogen, (100 °C) | [c)] MultiDirect: Adapter is necessary for Vacu-vials® (Order code 19 20 75) | [d)] Spectroquant® is a Merck KGaA Trademark | [e)] alternative reagent, used instead of DPD No.1/No.3 in case of turbidity in the water sample caused by high concentration of calcium and/or high conductivity | [f)] additionally required for determination of bromine, chlorine dioxide and ozone in the presence of chlorine | [g)] Reagent recovers most insoluble iron oxides without digestion | [h)] additionally required for samples with hardness values above 300 mg/l $CaCO_3$ | [i)] high range by dilution | [#] including stirring rod, 10 cm