Manganese HR VARIO PP 243
0.1 - 18 mg/l Mn Mn2
Periodate Oxidation

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
MD 100, MD 600, MD 610, MD 640, MultiDirect	ø 24 mm	530 nm	0.1 - 18 mg/l Mn
SpectroDirect, XD 7000, XD 7500	ø 24 mm	525 nm	0.1 - 18 mg/l Mn

Material

Required material (partly optional):

Reagents	Packaging Unit	Part Number
VARIO Manganese HR, Set High Range F10	1 Set	535100

Application List

- Galvanization
- Drinking Water Treatment
- Raw Water Treatment

Preperation

1. Strongly buffered water samples or extreme pH values may exceed the buffering capacity of the reagents and pH values to be adjusted.
   If samples were acidified for storing, the pH value must be adjusted between 4 and 5 with 5 mol/l (5 N) Sodium hydroxide before the test. A pH value of 5 must not be exceeded, since this can lead to precipitation of manganese.

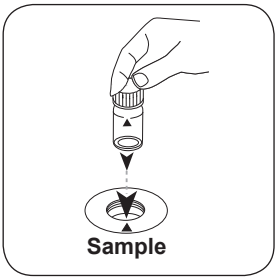
Implementation of the provision Manganese HR with Vario Powder Packs

Select the method on the device

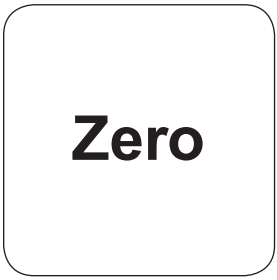
For this method, no ZERO measurements are to be carried out with the following devices: XD 7000, XD 7500

Fill 24 mm vial with **10 ml sample**.

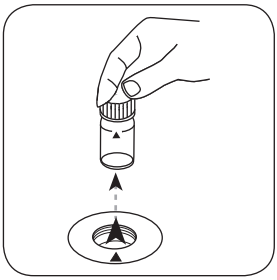
Close vial(s).



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

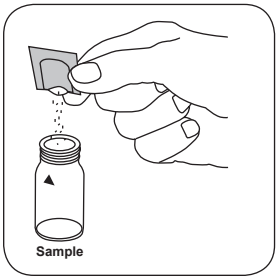


Press the **ZERO** button.



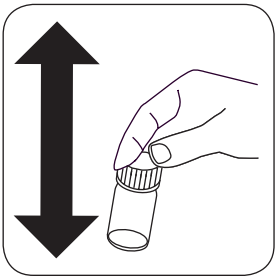
Remove the vial from the sample chamber.

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

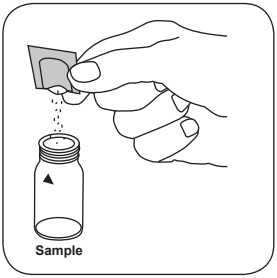


Add **Vario Manganese Citrate Buffer F10 powder pack**.

Close vial(s).

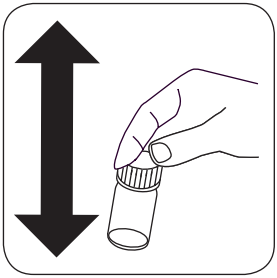


Mix the contents by shaking.

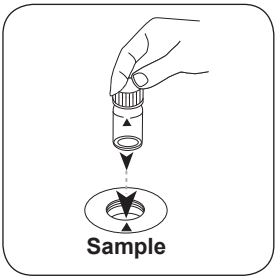


Add **Vario Sodium Periodate F10 powder pack**.

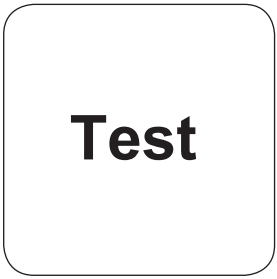
Close vial(s).



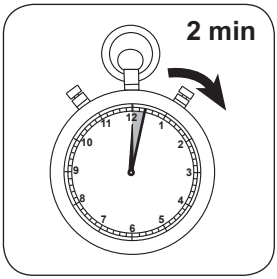
Mix the contents by shaking.



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



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



Wait for **2 minute(s) reaction time**.

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

The result in mg/l Manganese 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	Mn	1
mg/l	MnO_4	2.17
mg/l	$KMnO_4$	2.88

Chemical Method

Periodate Oxidation

Appendix

Interferences

Interference	from / [mg/l]
Ca	700
Cl^-	70000
Fe	5
Mg	100000

According to

40 CFR 136 (US EPA approved HACH)

[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