



Manganese LR PP

M242

0.01 - 0.7 mg/L Mn

Mn1

PAN

## 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	$\lambda$	Measuring Range
MD 100, MD 600, MD 610, MD 640, MultiDirect	ø 24 mm	560 nm	0.01 - 0.7 mg/L Mn
XD 7000, XD 7500	ø 24 mm	558 nm	0.01 - 0.7 mg/L Mn

## Material

Required material (partly optional):

Reagents	Packaging Unit	Part Number
VARIO Manganese Reagent, Set Low Range F10	1 pc.	535090
Vario Rochelle Salt Solution, 30 ml <sup>h)</sup>	30 mL	530640

## Application List

- Galvanization
- Drinking Water Treatment
- Raw Water Treatment

## Preparation

1. All lab glassware must first be rinsed with diluted nitric acid and then rinsed with deionised water.

## Notes

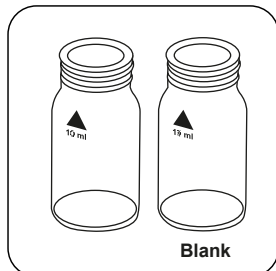
1. If water samples contain more than 300 mg/L CaCO<sub>3</sub> hardness, then after adding the Vario Ascorbic Acid powder pack, add an additional 10 drops of Rochelle Salt Solution.
2. After addition of the reagent solution "Alkaline-Cyanide" a cloudy or turbid solution may form in some water samples. Adding the PAN indicator solution should resolve the turbidity.
3. If the sample contains large amounts of iron (from 5 mg/L) a reaction period of 10 minutes must be adhered to.



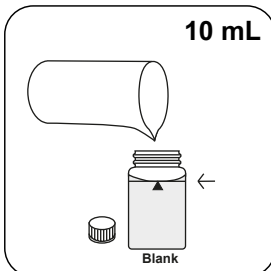


## Determination of Manganese LR with Vario Powder Packs

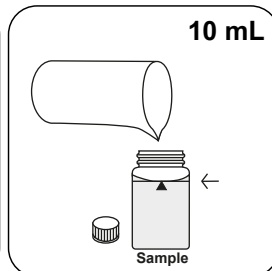
Select the method on the device.



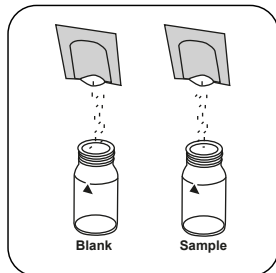
Prepare two clean 24 mm vials. Mark one as a blank.



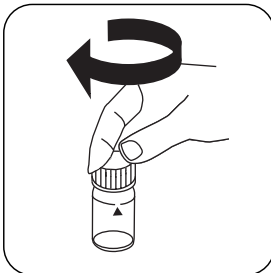
Put **10 mL deionised water** in the blank.



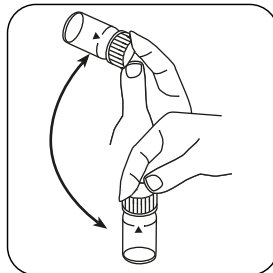
Put **10 mL sample** in the sample vial.



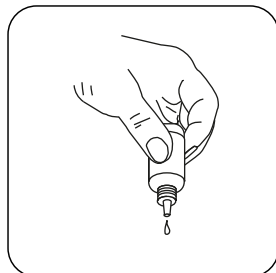
Add a **Vario Ascorbic Acid powder pack** in each vial.



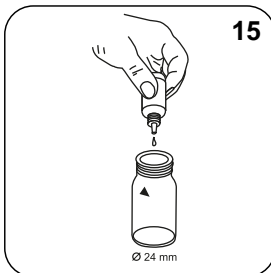
Close vial(s).



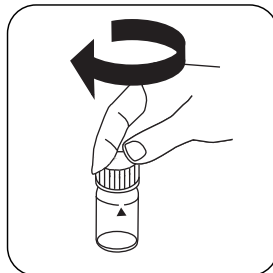
Invert several times to mix the contents.



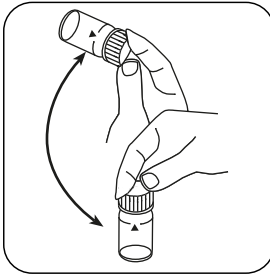
Hold cuvettes vertically and add equal drops by pressing slowly.



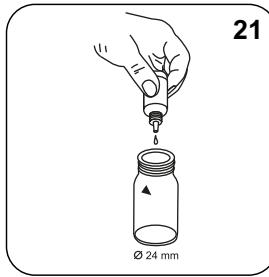
Add **15 drops Alkaline-Cyanide Reagent**.



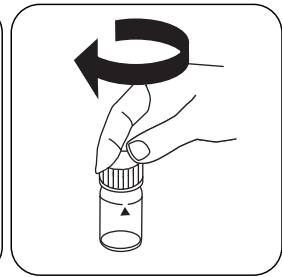
Close vial(s).



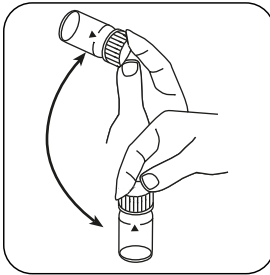
Invert several times to mix the contents.



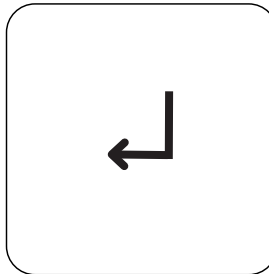
Add **21 drops PAN Indikator**.



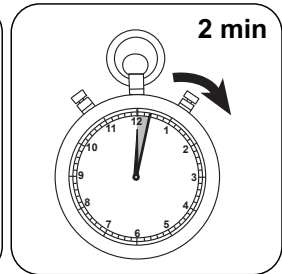
Close vial(s).



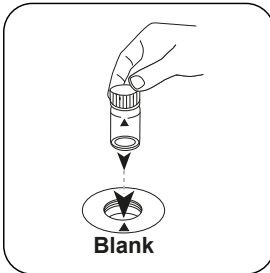
Invert several times to mix the contents.



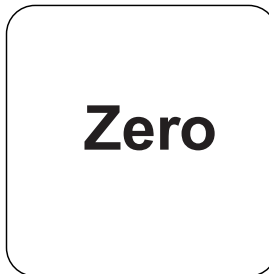
Press the **ENTER** button.



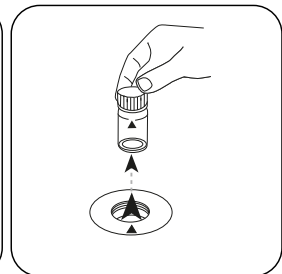
Wait for **2 minute(s) reaction time**.



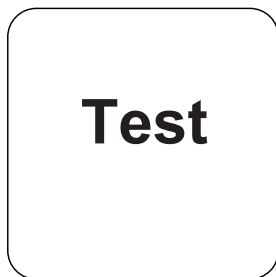
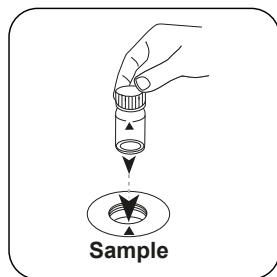
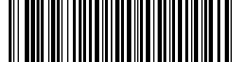
Place **blank** in the sample chamber. • Pay attention to the positioning.



Press the **ZERO** button.



Remove the vial from the sample chamber.



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

The result in mg/L Manganese appears on the display.

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

## 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 <sub>4</sub>	2.17
mg/l	KMnO <sub>4</sub>	2.88

## Chemical Method

PAN

## Appendix

### Calibration function for 3rd-party photometers

Conc. = a + b•Abs + c•Abs<sup>2</sup> + d•Abs<sup>3</sup> + e•Abs<sup>4</sup> + f•Abs<sup>5</sup>

	∅ 24 mm	□ 10 mm
a	-3.05268 • 10 <sup>-2</sup>	-3.05268 • 10 <sup>-2</sup>
b	7.28484 • 10 <sup>-1</sup>	1.56624 • 10 <sup>+0</sup>
c		
d		
e		
f		

### Bibliography

Goto, K., et al., Talanta, 24, 652-3 (1977)

<sup>h)</sup> additionally required for samples with hardness values above 300 mg/l CaCO<sub>3</sub>