



## Chromium PP

M125

0.02 - 2 mg/L Cr<sup>b)</sup>

Diphenylcarbazide

### 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 600, MD 610, MD 640, MultiDirect | ø 16 mm | 530 nm    | 0.02 - 2 mg/L Cr <sup>b)</sup> |
| SpectroDirect, XD 7000, XD 7500     | ø 16 mm | 542 nm    | 0.02 - 2 mg/L Cr <sup>b)</sup> |

### Material

Required material (partly optional):

| Reagents                 | Packaging Unit   | Part Number |
|--------------------------|------------------|-------------|
| Persulfat Reagent für CR | Powder / 100 pc. | 537300      |
| Chromium Hexavalent      | Powder / 100 pc. | 537310      |

The following accessories are required.

| Accessories          | Packaging Unit | Part Number |
|----------------------|----------------|-------------|
| Thermoreactor RD 125 | 1 pc.          | 2418940     |

### Application List

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

### Preparation

1. The pH value of the sample should be between 3 and 9.

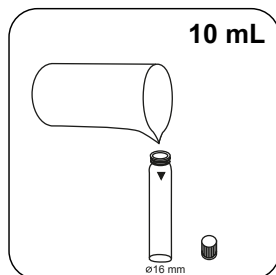


## Notes

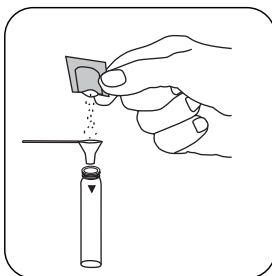
1. Implementation of the first part determines concentration of total chromium. In the second part, the concentration of Chromium (VI) is measured. The concentration of Chromium (III) is the result of the difference.



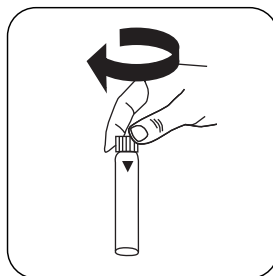
## Digestion Chromium with powder packs



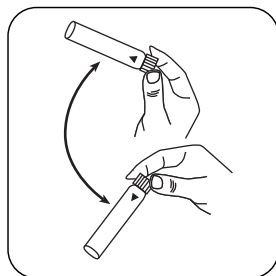
Fill 16 mm vial with **10 mL** sample.



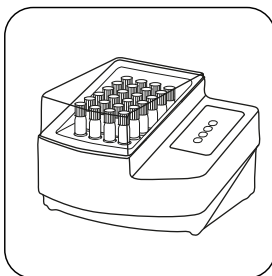
Add **PERSULFT.RGT FOR CR** powder pack.



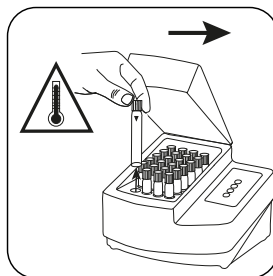
Close vial(s).



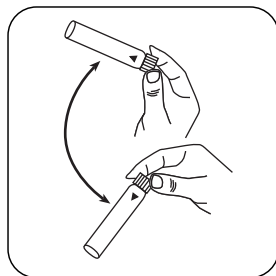
Invert several times to mix the contents.



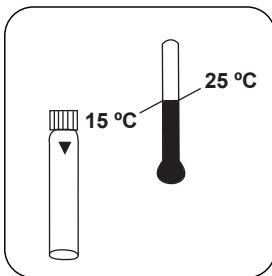
Seal the vials in the pre-heated thermoreactor for **120 minutes at 100 °C**.



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.





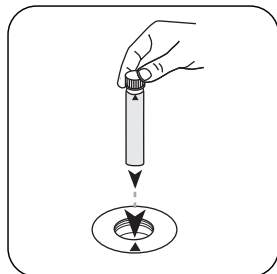
## Determination of Chromium differentiated, with powder packs

Select the method on the device.

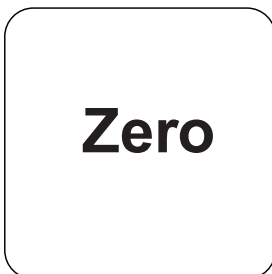
In addition, choose the test: differentiated

For testing of **Chromium, differentiated**, carry out the described **digestion**.

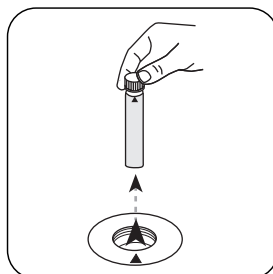
For this method, a ZERO measurement does not have to be carried out every time on the following devices: XD 7000, XD 7500



Place pre-treated vial in the sample chamber. • Pay attention to the positioning.

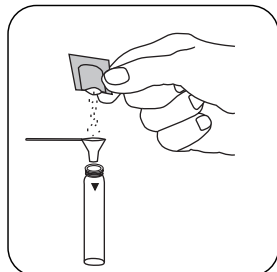


Press the **ZERO** button.

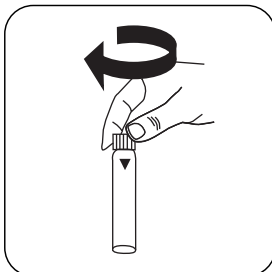


Remove **vial** from the sample chamber.

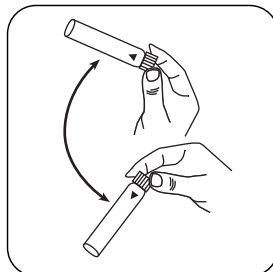
For devices that require **no ZERO measurement**, start here.



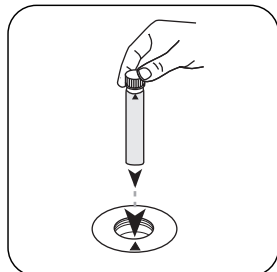
Add **CHROMIUM HEXA-VALENT powder pack**.



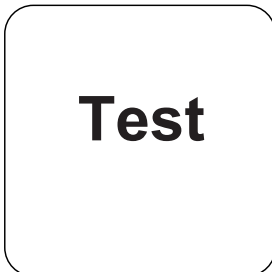
Close vial(s).



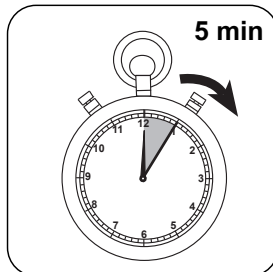
Invert several times to mix the contents.



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

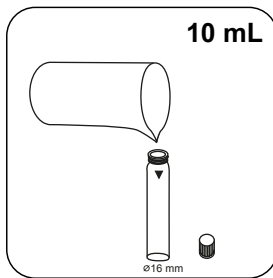


Press the **TEST** (XD: **START**) button.

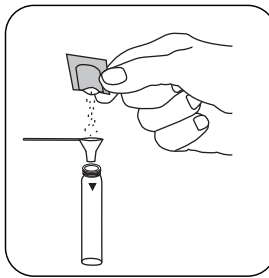


Wait for **5 minute(s) reaction time**.

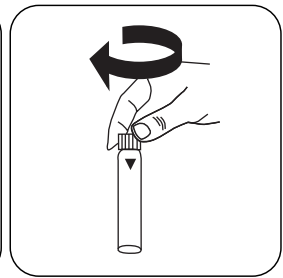
Once the reaction period is finished, the measurement takes place automatically.



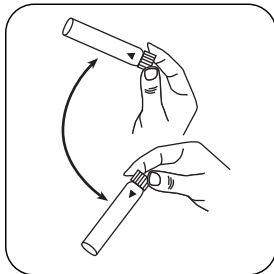
Fill a **second vial** with **10 mL sample**.



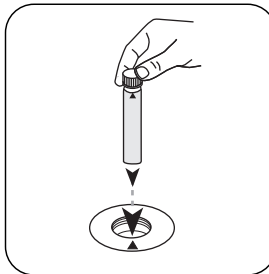
Add **CHROMIUM HEXA-VALENT** powder pack.



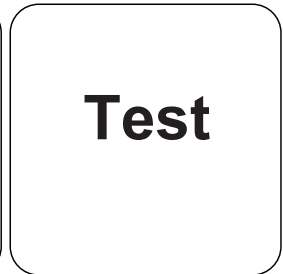
Close vial(s).



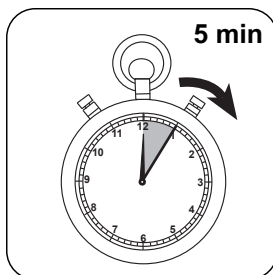
Invert several times to mix the contents.



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



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



Wait for **5 minute(s) reaction time**.

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

The result in mg/L Cr(VI); Cr(III); Cr Total Chromium appears on the display.

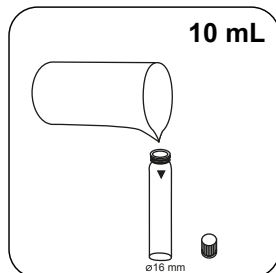


## Determination of Chromium(VI), with powder packs

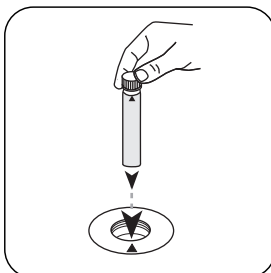
Select the method on the device.

In addition, choose the test: Cr(VI)

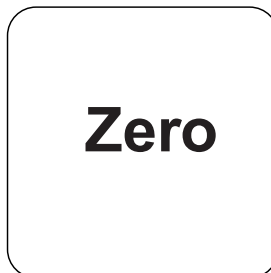
For this method, a ZERO measurement does not have to be carried out every time on the following devices: XD 7000, XD 7500



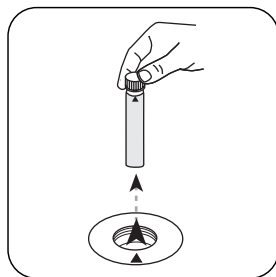
Fill 16 mm vial with **10 mL sample**.



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

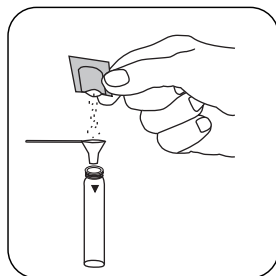


Press the **ZERO** button.

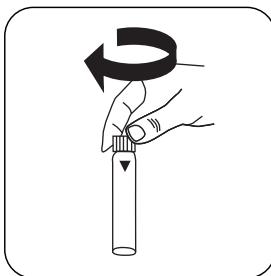


Remove **vial** from the sample chamber.

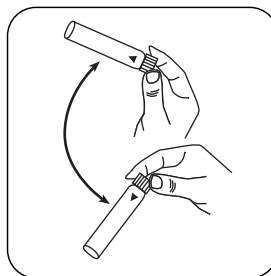
For devices that require **no ZERO measurement**, **start here**.



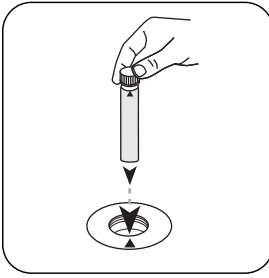
Add **CHROMIUM HEXA-VALENT powder pack**.



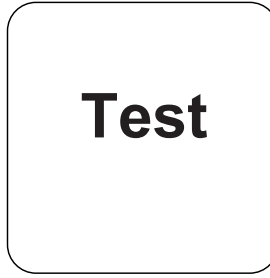
Close vial(s).



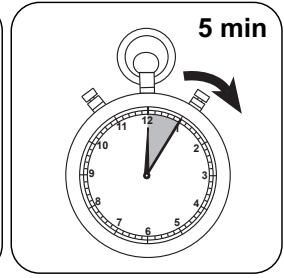
Invert several times to mix the contents.



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



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



Wait for **5 minute(s) reaction time**.

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

The result in mg/L Cr(VI) appears on the display.





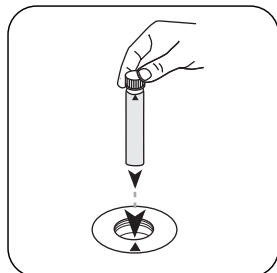
## Determination of Chromium total (Cr(III) + Cr(VI)), with powder packs

Select the method on the device.

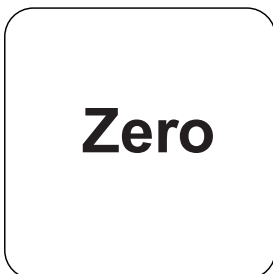
In addition, choose the test: Cr(III + VI)

For testing of **Chromium, total (Cr(III)+ Cr(VI))**, carry out the described **digestion**.

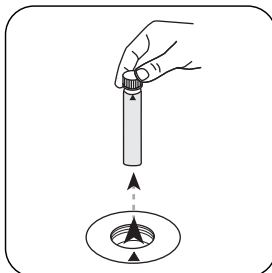
For this method, a ZERO measurement does not have to be carried out every time on the following devices: XD 7000, XD 7500



Place pre-treated vial in the sample chamber. • Pay attention to the positioning.

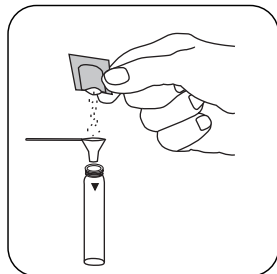


Press the **ZERO** button.

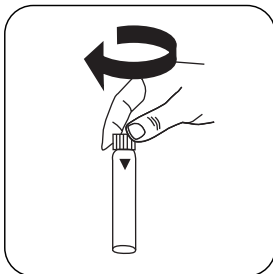


Remove **vial** from the sample chamber.

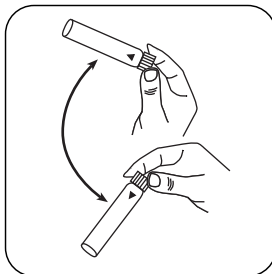
For devices that require **no ZERO measurement**, start here.



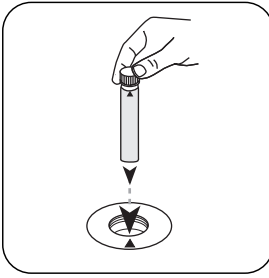
Add **CHROMIUM HEXA-VALENT** powder pack.



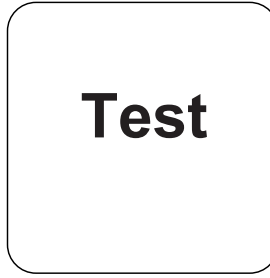
Close vial(s).



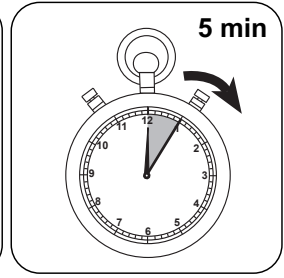
Invert several times to mix the contents.



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



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



Wait for **5 minute(s) reaction time**.

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

The result in mg/L total Chromium appears on the display.



## Chemical Method

Diphenylcarbazide

## Appendix

### Calibration function for 3rd-party photometers

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

|   | ø 16 mm                  |
|---|--------------------------|
| a | $-2.66512 \cdot 10^{-2}$ |
| b | $8.73906 \cdot 10^{-1}$  |
| c | $9.34973 \cdot 10^{-2}$  |
| d |                          |
| e |                          |
| f |                          |

## Interferences

### Persistent Interferences

1. For information about interferences through metals and reductive or oxidizing agents, especially in strongly polluted water, see DIN 38 405 – D 24 and Standard Methods of Water and Wastewater, 20th Edition; 1998.

### According to

DIN 3805 - D24

### Derived from

DIN 18412

US EPA 218.6

<sup>b)</sup> Reactor is necessary for COD (150 °C), TOC (120 °C) and total -chromium, - phosphate, -nitrogen, (100 °C)