

**Fluoride L****M170****0.05 - 2 mg/L F<sup>-</sup>****F****SPADNS**

## 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, Spec- troDirect, XD 7000, XD 7500	ø 24 mm	580 nm	0.05 - 2 mg/L F <sup>-</sup>

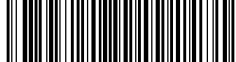
## Material

Required material (partly optional):

Reagents	Packaging Unit	Part Number
SPADNS Reagent Solution 250 mL	250 mL	467481
SPADNS Reagent Solution 500 mL	500 mL	467482
Calibration Standard Fluoride 1 mg/L	30 mL	205630

## Application List

- Drinking Water Treatment
- Raw Water Treatment



## Preparation

1. A user calibration (see photometer manual) must be carried out before the measurement.
2. The same batch of SPADNS reagent solution must be used for both the user calibration and test (see photometer description). The user calibration process needs to be performed for each new batch of SPADNS reagent solution (see Standard methods 20th, 1998, APHA, AWWA, WEF 4500 F D., S. 4-82).
3. For the user calibration and test, the zeroing and test must be carried out with the same vial, since the vials may have small tolerances.
4. The calibration solution and the water samples to be tested should have the same temperature ( $\pm 1$  °C).
5. The test result is highly dependent on exact sample and reagent volumes. Sample and reagent volumes should always be measured using a 10 ml or 2 ml volumetric pipette (class A).
6. Seawater and waste water samples must be distilled.
7. It is better practice to use special vials with a larger volume.

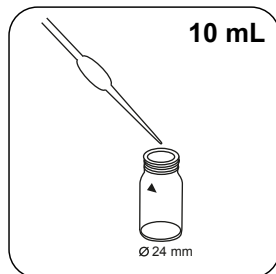


## Determination of Fluoride with liquid reagent

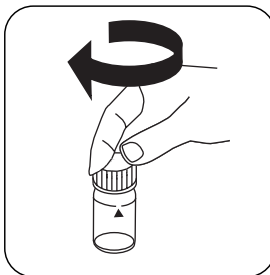
Select the method on the device.

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

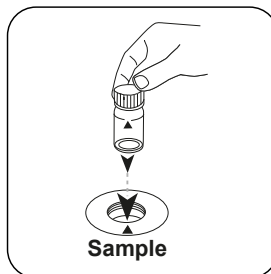
**Pay attention to the notes!**



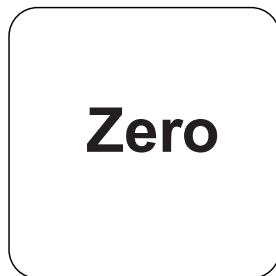
Add **exactly 10 mL sample** to the 24 mm vial.



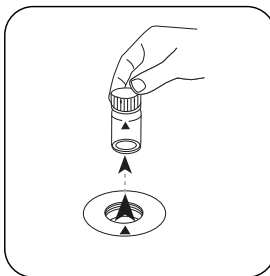
Close vial(s).



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

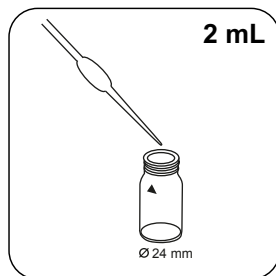


Press the **ZERO** button.

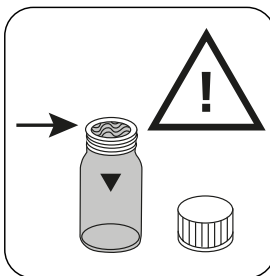


Remove the vial from the sample chamber.

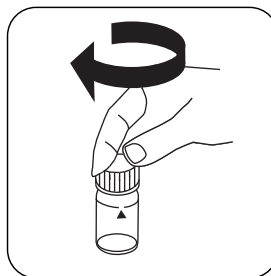
For devices that require **no ZERO measurement**, **start here**.



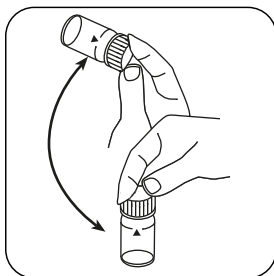
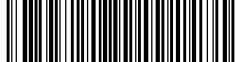
Add **exactly 2 mL SPADNS reagent solution** to the 24 mm vial.



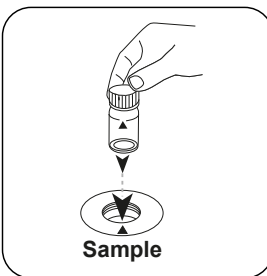
**Note: Vial is filled to the top!**



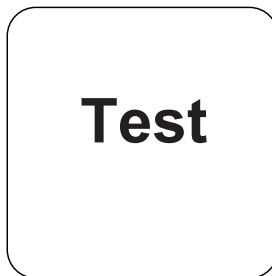
Close vial(s).



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.

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



## Chemical Method

SPADNS

## 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 24 mm	□ 10 mm
a	$8.44253 \cdot 10^{+0}$	$8.44253 \cdot 10^{+0}$
b	$-1.41844 \cdot 10^{+1}$	$-3.04965 \cdot 10^{+1}$
c	$9.24803 \cdot 10^{+0}$	$4.2749 \cdot 10^{+1}$
d	$-2.3046 \cdot 10^{+0}$	$-2.2904 \cdot 10^{+1}$
e		
f		

## Interferences

### Persistent Interferences

1. The accuracy decreases above a level of 1.2 mg/L Fluoride Although the results are sufficiently accurate for most applications, even more exact results can be achieved by a 1:1 dilution of the sample before use and by the subsequent multiplication of the result by 2.

Interference	from / [mg/L]
Cl <sub>2</sub>	5

### Bibliography

Standard Methods 20th, 1992, APHA, AWWA, WEF 4500 F D, S. 4-82

### According to

US EPA 13A  
 APHA Method 4500 F D