



# Hardness, Iron and pH Test Kit

HA-62B (183702)

DOC326.98.00011

## Test preparation

**CAUTION:** Review the Safety Data Sheets (MSDS/SDS) for the chemicals that are used. Use the recommended personal protective equipment.

- Put the color disc on the center pin in the color comparator box (numbers to the front).
- Use sunlight or a lamp as a light source to find the color match with the color comparator box.
- Rinse the tubes with sample before the test. Rinse the tubes with deionized water after the test.
- If the color match is between two segments, use the value that is in the middle of the two segments.
- If the color disc becomes wet internally, pull apart the flat plastic sides to open the color disc. Remove the thin inner disc. Dry all parts with a soft cloth. Assemble when fully dry.
- To verify the test accuracy, use a standard solution (buffer solution for pH test) as the sample.

## Hardness:

- Hold the dropper vertically above the sample. Do not let the dropper touch the bottle during the titration.
- To record the hardness result as mg/L, multiply the gpg (grains per gallon) value by 17.1.

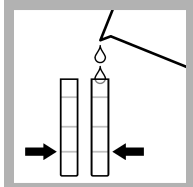
## Iron:

- Use the indoor light color disc when the light source is fluorescent light. Use the outdoor light color disc when the light source is sunlight.
- Undissolved reagent does not have an effect on test accuracy.
- If the sample contains rust or precipitated iron, fully mix the sample and then fill the tubes. Wait 2–5 minutes after the FerroVer reagent is added. Dissolved iron develops a color immediately.
- If high iron levels are possible (30 mg/L), dilute the sample as follows. Use a 3-mL syringe to add 2.5 mL of sample to each tube. Dilute the sample to the 5-mL mark with deionized water. Use the diluted sample in the test procedure and multiply the result by 2. To make a larger dilution, add 1 mL of sample to each tube. Dilute the sample to the 5-mL mark with deionized water. Use the diluted sample in the test procedure and multiply the result by 5.

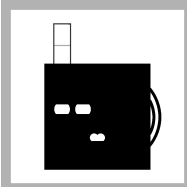
## pH:

- More than 1 mg/L chlorine interferes with the pH test. To remove chlorine from the sample, add 1 drop of 0.1 N sodium thiosulfate solution to 25 mL of sample and mix. Use this dechlorinated sample in the test procedure. The sodium thiosulfate removes a maximum of 10 mg/L chlorine from the sample.

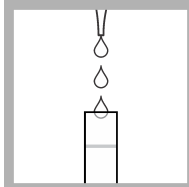
## Test procedure—pH (4–10 pH units)



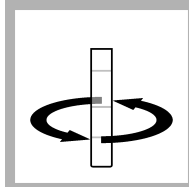
1. Fill two tubes to the first line (5 mL) with sample.



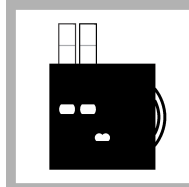
2. Put one tube into the left opening of the color comparator box.



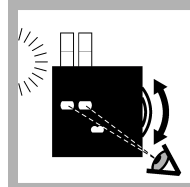
3. Add 6 drops of wide range pH indicator solution to the second tube.



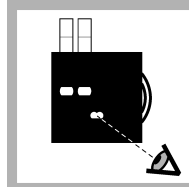
4. Swirl to mix.



5. Put the second tube into the color comparator box.



6. Hold the color comparator box in front of a light source. Turn the color disc to find the color match.



7. Read the result in pH units in the scale window.

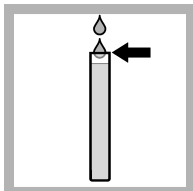
## Replacement items

Description	Unit	Item no.
FerroVer® Iron Reagent Powder Pillows, 5 mL	100/pkg	92799
Hardness 1 Buffer Solution	100 mL MDB	42432
Hardness 2 Indicator Solution	100 mL MDB	42532
Hardness 3 Titrant Solution	100 mL MDB	42632
Wide range pH indicator solution	100 mL MDB	2329332
Color disc, iron, indoor light, 0–7 mg/L	each	9261000
Color disc, iron, outdoor light, 0–7 mg/L	each	9263700
Color disc, pH, wide range	each	990100
Bottle, square, glass, 29 mL	6/pkg	43906
Measuring tube, plastic, 5.83 mL	each	43800
Color comparator box	each	173200
Glass viewing tubes, 18 mm	6/pkg	173006
Stoppers for 18-mm glass tubes and AccuVac Ampuls	6/pkg	173106

## Optional items

Description	Unit	Item no.
pH 7.0 buffer solution, colorless	500 mL	1222249
Sodium thiosulfate, 0.1 N	100 mL MDB	32332
Standard solution, hardness (20 gpg) and iron (2 mg/L)	500 mL	47949
Syringe, Luer-Lok® Tip, 3 mL	each	4321300
Water, deionized	500 mL	27249

### Test procedure—Hardness (0–20 gpg CaCO<sub>3</sub>)



1. Fill the measuring tube with sample.



2. Pour the sample into the mixing bottle.



3. Add three drops of the Hardness 1 Buffer Solution.



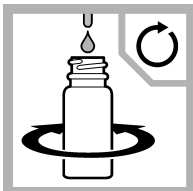
4. Turn the bottle left and right to mix.



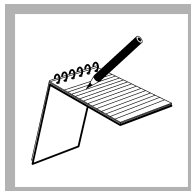
5. Add one drop of the Hardness 2 Indicator Solution. A pink color develops.



6. Turn the bottle left and right to mix.

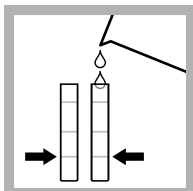


7. Add the Hardness 3 Titrant Solution by drops. Mix after each drop. Count the drops until the color changes from pink to blue.

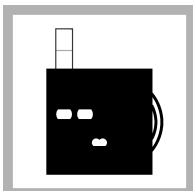


8. Record the number of drops. The number of drops of the titrant solution is the result in gpg.

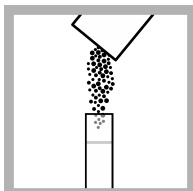
### Test procedure—Iron (0–7 mg/L Fe)



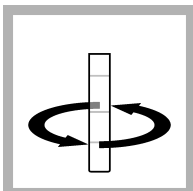
1. Fill two tubes to the first line (5 mL) with sample.



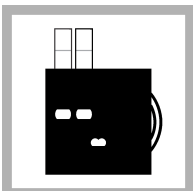
2. Put one tube into the left opening of the color comparator box.



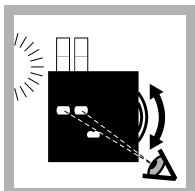
3. Add one FerroVer Iron Reagent Powder Pillow to the second tube.



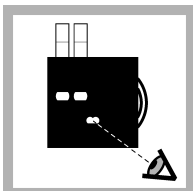
4. Swirl to mix. An orange color develops.



5. Put the second tube into the color comparator box.



6. Hold the color comparator box in front of a light source. Turn the color disc to find the color match.



7. Read the result in mg/L in the scale window.

