

Program ID #60

**Silica HR**

0 - 75 mg/L

The Orion AQUAfast IV Powder Chemistries are intended for use with the Orion AQ4000 Advanced Colorimeter. For detailed setup and measurement procedures for the Orion AQ4000, consult your colorimeter manual.

**NOTE:** The Orion AQ4000 must be zeroed using a vial filled with sample. If the sample is colored, use actual sample. Use the 24 mm glass vials from Orion AC2V24.

**Safety Information**

Read MSDS before performing this test procedure. Wear safety glasses and gloves. Material Safety Data Sheets are available on request or see website.

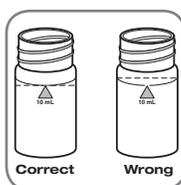
**AQUAfast IV Zero**

Figure 1

1. Turn the colorimeter on by pressing the **power** key.
2. Press **prgm** and select program 60. Press **yes** key.
3. Fill a clean, dry 24 mm vial with 10 mL of sample. **See Fig 1.**
4. Screw the cap onto the vial and wipe the exterior of the vial to ensure it is clean and dry.
5. Insert the zero vial into the Orion AQ4000 sample chamber. No adapters are required. Align the ▲ on the vial to the ▲ on the colorimeter. Cover the vial with the vial cover.
6. Press the **zero** key. The “zero” icon will light up on the upper right hand corner.
7. “WAIT” is then displayed. The result is displayed as “0.000” A4P Si H for silica.
8. The colorimeter is now zeroed and ready for measurements.

**NOTE:** For best results, pipette samples and zero using the sample before each measurement. The Orion AQ4000 must be zeroed before each method.

**Test Procedure**

Figure 2



Figure 3

1. Using program 60, use the 24 mm vial with 10 mL of sample from the zero procedure. **See Fig 1.**
2. Take one Silica HR Molybdate Powder Pack, tap down gently and tear open in the direction of the text. Add the contents to the sample vial. **See Fig 2.** Screw the cap onto the vial tightly and invert to mix. **See Fig 3.**
3. Remove the cap and add the Silica HR Acid Rgt Powder Pack. **See Fig 2.** Screw the cap onto the vial tightly and invert to mix. **See Fig 3.** A yellow color will form if silica or phosphate is present.
4. Allow a 10 minute reaction time to take place. To use the timer, press the **timer** key. Press ▲ or ▼ key to set up 10:00 MIN/SEC. Press the **yes** key.
5. After the 10 minute reaction time, remove the cap and add the contents of the Silica HR Citric Acid Powder Pack. **See Fig 2.** Screw the cap onto the vial tightly and invert to mix. **See Fig 3.** The yellow color due to phosphate will disappear.



Figure 4

6. Immediately place the prepared sample into the AQ4000 sample chamber. Cover with the vial cover. **See Fig 4.**
7. Press **meas** key for sample measurement. A two-minute reaction countdown will begin. The result in mg/L or ppm Silica will be displayed.

**NOTE:** If the display flashes “overrng”, it is due to high silica levels. Dilute a fresh sample and repeat the test. Multiply the result by the dilution factor.

### Test Method

The Silica HR Powder Chemistry employs the silicomolybdate method.<sup>1</sup> Under acidic conditions, silica and phosphate react with molybdate ion to form yellow silicomolybdic acid and phosphomolybdic acid complexes. The addition of citric acid destroys the phosphate complexes. The yellow color is directly proportional to the concentration of silica in the sample.

1. APHA Standard Methods, 15th edition, Method 425-C (1980)

### Ordering Information

Cat. No.	Description
AC4P60	Orion AQUAfast IV Silica, HR Powder Chemistry, 100 tests
AC2V24	24 mm Vials, 12 pack
AQ4CBL	Orion AQUAfast IV RS232 Cable
AQ4000	Orion AQUAfast IV Advanced Colorimeter

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