Replacing Bottle Seals on Reagent Bottles

Introduction

For successful DNA synthesis, a pressure-tight seal on reagent bottles is essential. To ensure a pressure-tight seal, reagent bottle seals on DNA synthesizer Models 391 PCR-MATE, 392, 394, 380A, 380B, and 381A must be replaced every time the bottles are removed from the instrument and new bottles are attached. (This does not apply to phosphoramidite bottles which have O-rings and should be changed annually.) Neglecting to replace an old bottle seal may result in failure to deliver reagents and poor syntheses.

Replacing a Bottle Seal

To replace the seal, follow the instructions below:

1. Select and start the appropriate bottle change procedure.

2. During the interrupt in the bottle change procedure, remove the bottle from the instrument.

3. Check to make sure that the semi-translucent plastic bottle seal has come off the instrument during the removal of the bottle. If not, look up into the bottle receptacle to make sure that the seal is not stuck inside. If this is the case, remove it with a pair of tweezers. Be careful not to damage the white Teflon insert in the instrument.

4. When the new bottle is ready to be installed on the instrument, place a new bottle seal on the mouth of the bottle, insert the delivery line into the bottle, mount the bottle on to the bottle receptacle, and gently rotate the bottle clockwise until it is hand-tight. If the synthesizer has ratchet-type receptacles (Models 391, 392, and 394), rotate until no more than the two clicks are heard. Excessive ratcheting will cause the mechanism to wear.

5. Resume the bottle change procedure.
How to Spot a Bottle Seal Failure

1. Become familiar with the reagent consumption of your instrument. If a reagent is not used at the usual rate, then the seal may have failed resulting in a decreased flow from that bottle.

2. All reagent fumes are vented to the fume hood or other ventilation plumbing. If there is a reagent smell near the instrument, the bottle seal may have failed.

3. If reagent from one bottle has entered another bottle, a pressure leak is the likely cause. If a reagent bottle seems too full or if reagent is discolored, a bottle seal may have failed.

Performing a Pressure Test

A pressure test is the best way to test a bottle seal without replacing it. Refer to the laminated plumbing diagram at the front of the User’s Manual.

1. Find the pressurizing valve for the bottle that requires testing, and open the valve using the Manual Control menu.

2. Shut off pressure to the instrument by closing the argon tank valve. Note the initial reading on the primary gauge (the gauge is typically scaled at 0-3000 psi). Compare the initial gauge reading with the reading shown after 5 minutes. If the reading drops, there is a leak.

3. End the test by opening the argon tank valve and closing the instrument valve in Manual Control. Replace the seal and re-test.

If replacing the seal does not stop the leak, contact ABI Technical Support or your field service representative.

Lifetime of Bottle Seals

The seals have a shelf life of several years if stored away from chemicals and ultraviolet light. Do not attempt to seal a bottle with a used bottle seal. If the bottle is loosened or removed, replace the bottle seal. If bottle seals fail prematurely, contact Technical Support for assistance. Once in place, reagent bottle seals will last for 6 weeks on the instrument.
How to Order Bottle Seals

Bottle seals are included in spare part kits with all new instruments and with all reagent kits. Replacement bottle seals can be ordered from your nearest ABI sales office: part numbers 400790 (8 oz./200 mL) and 400501 (16 oz./450 mL).