

# Agilent MP-AES Easy Fit Torch Maintenance

To help you achieve the maximum usable life from all models of the MP-AES Easy Fit torch, it is recommended that the cleaning procedures are followed as soon as any discoloration appears on the outer tube of the torch. To maximize torch lifetime and prevent contamination, you should inspect the condition and cleanliness of the torch daily.

This document is also available in other languages on the Agilent website at [www.agilent.com](http://www.agilent.com).

## CAUTION

**To prevent damage to the torch, always take care when handling or storing it. Do not use cleaning wire or abrasives like brushes or a scourer to clean the torch. To prevent potential damage to the instrument, do not use the torch if it is damaged.**

## WARNING



### Hot Surface and Chemical Hazard

**The torch and torch compartment become extremely hot during instrument operation and remain hot for some time after the instrument has been switched off. Allow the torch and torch compartment to cool for at least five minutes before attempting to remove the torch.**

**Nitric acid, hydrochloric acid and strong alkali solutions are very corrosive and can cause severe burns when they come into contact with the skin. Preparation of acid soak solutions and any soaking should be done under an extraction fume hood. It is essential that appropriate protective clothing be worn at all times when handling these acids. If acid contacts the skin, wash off with copious amounts of water and seek medical attention immediately.**

## IMPORTANT

Use a clean, wide diameter, open-top beaker (preferably 100mL tall form) or a similar container to hold the soak solutions. Use the recommended torch cleaning stand (see Figure 1) for Easy-fit MP-AES torches (part number G8003-68003) to hold the torch inverted while soaking during the cleaning process. Use clean/particle free detergents or acid to perform the soak.

The torch cleaning stand aids in cleaning the torch, preventing damage to the fragile end of the quartz outer tube and limiting exposure of the elastomer materials on the torch body to acid fumes, reducing premature degradation.

Ensure the acid does not contact the seal between the quartz outer tube and the plastic base. Keep the torch vertical, with the ball joint at the top, throughout all cleaning and rinsing steps unless otherwise directed.

## Cleaning the torch

Follow the steps below to remove any organic residue prior to the acid soak procedure. If the torch has not been used with organic solvents, skip these steps and go to section "Acid soak cleaning procedure" starting at the end of this page.

### Removing organic residue

To remove any organic residue prior to acid soak:

- 1 Prepare a 5% v/v **alkaline** detergent solution in a wide diameter open beaker.
- 2 Place the beaker containing the detergent solution under the torch cleaning stand.
- 3 Place the torch in the detergent solution through the hole provided in the torch cleaning stand as shown in Figure 1.

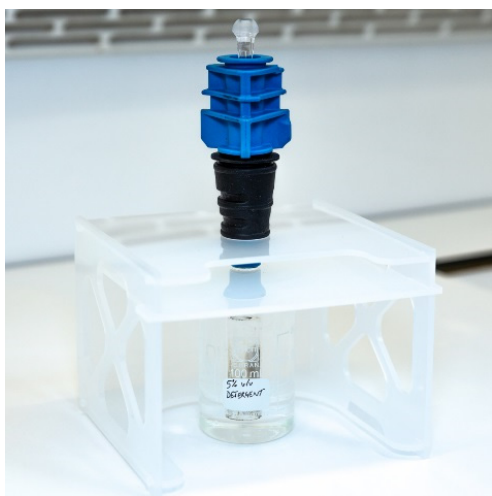


Figure 1. Place the quartz outer tube and injector in the detergent solution

- 4 Ensure the quartz outer tube and the injector are immersed in the detergent as shown in Figure 2, and then soak the torch in the detergent solution for 2 hours.



Figure 2. Ensure that the injector and outer tube are immersed and soaking in the detergent solution

- 5 Rinse the torch by following the steps outlined in "Rinsing the Torch" on Page 3. Ensure that all the detergent solution is washed away.
- 6 Perform the "Acid soak cleaning procedure".

## Rinsing the torch

### Acid soak cleaning procedure

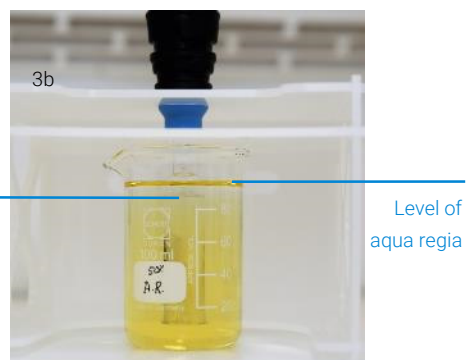
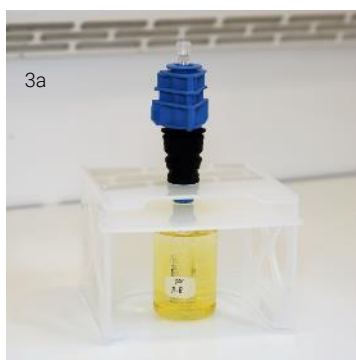
To clean the torch using an acid soak:

- 1 Prepare a 50% Aqua Regia solution (1 part deionized water to 1 part Aqua Regia) in a wide diameter open beaker. To make Aqua Regia combine 1:3 concentrated nitric acid: hydrochloric acid.

- 2 Soak the quartz parts of the torch in 50% Aqua Regia for at least 1 hour.

The length of time required for the cleaning procedure will depend upon the extent of the contamination. Do not leave the torch in the acid for longer than 4 hours. If deposits remain after using 50% Aqua Regia, repeat the cleaning process using a higher concentration of Aqua Regia.

- 3 Place the beaker containing the acid solution under the torch cleaning stand.
- 4 Place the torch in the aqua regia through the hole provided in the torch cleaning stand as shown in Figures 3a. Ensure the quartz outer tube along with the injector is immersed in the solution as shown in Figures 3b.



Figures 3a and 3b. Soak the torch in the aqua regia solution. Ensure the injector is immersed in the solution

- 5 Pipette some of the acid through the ball joint of the injector to remove build up from the lower part of the injector. See Figure 4.



Figure 4. Pipette some of the acid solution through the open-end of the ball joint to flush the injector

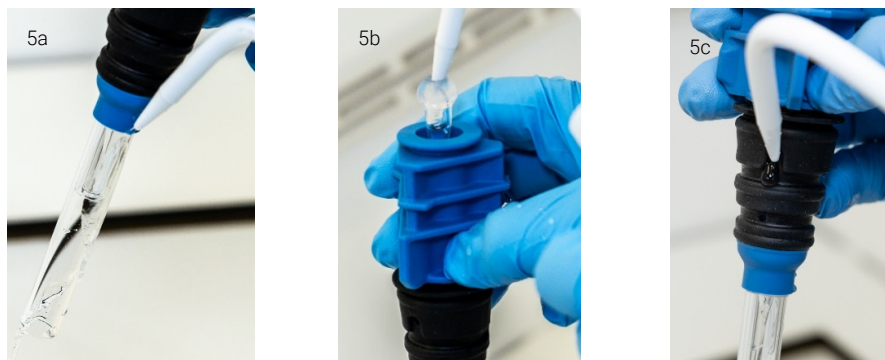
- 6 Rinse the torch thoroughly and dry completely prior to using the torch in the instrument.
- 7 Follow the steps outlined below for "Rinsing the torch" and "Drying the torch" on Page 4.

## Rinsing the torch

To rinse the torch:

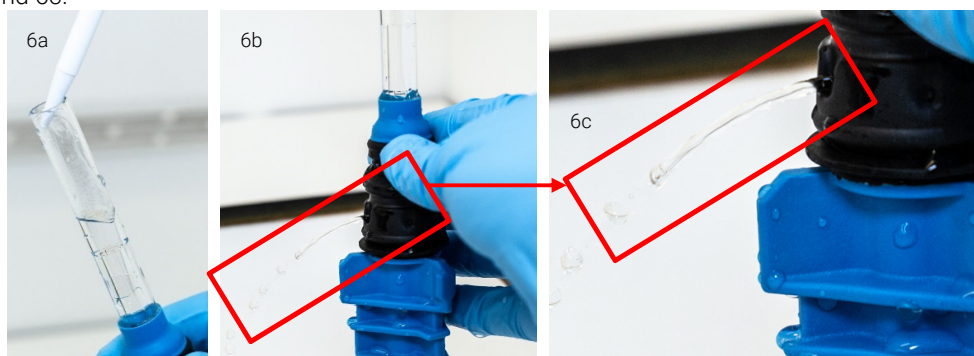
- 1 Hold the torch with the ball joint connector at the top.
- 2 Thoroughly flush the inside and outside of the torch with deionized water (18 MΩ.cm) using a wash bottle to direct the water stream. See Figures 5a, 5b and 5c.

## Drying the torch



Figures 5a, 5b and 5c. Rinse the torch with deionized water, flush the injector and gas ports

- 3 Invert the torch (see Figures 6a) so that the quartz tubes are at the top and the ball joint connector is at the bottom. Flush rinse water through the quartz tubes so that the water flows out of the gas entry ports and ball joint connector for at least 30 s. See Figures 6b and 6c.



Figures 6a, 6b and 6c. Flush the gas ports and ball joint connector with deionized water

### NOTE

For high total dissolved solids (TDS) samples such as soil digests, soak the torch in a 5% v/v detergent solution for 10 minutes after the initial acid cleaning step. Always rinse the torch thoroughly and dry completely prior to using the torch in the instrument. Follow the steps outlined above for “Rinsing the torch” and “Drying the torch” below. This extra step can help to reduce deposition on the outer tube of the torch.

## Drying the torch

### CAUTION

**Do not place the torch in a drying oven. It is not as effective at removing moisture as using compressed air or nitrogen, and may damage the torch.**

To dry the torch:

- 1 Hold the torch inverted (with the ball joint connector at the top).
- 2 Blow clean compressed air or nitrogen through the gas ports on the base and through the opening of the ball joint to remove moisture. See Figure 7a and 7b.

## Additional checks after cleaning

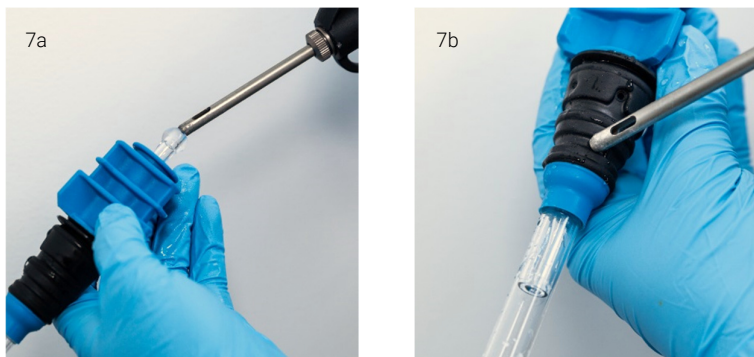


Figure 7a and 7b. Use compressed air or nitrogen to dry the torch

- 3 Ensure that all moisture is removed before refitting the torch into the instrument.

## Additional checks after cleaning

Perform the following checks after cleaning:

- 1 Inspect the torch for damage such as loose fitting of the quartz tubes in the plastic base, holes or significant cracks. If any damage is found, replace the torch immediately.
- 2 Check for carry-over after refitting the torch to determine if the cleaning procedure has been sufficient. If carry-over is found, repeat the cleaning process.
- 3 Replace the torch when the outer surface of the quartz outer tube is rough to the touch (which indicates signs of wear), or if there are any cracks visible.

### NOTE

Long term exposure to acid during cleaning may lead to discoloration of the plastic base. This change is cosmetic only and should not impact performance if the torch is clean and the results of the other torch checks are satisfactory.

Store the torch in the original box or a plastic bag when not in use.

## In This Document

This document describes maintenance and cleaning procedures required to maximize your Agilent MP-AES Easy Fit Torch lifetime.

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