ahn®



AHN myPette Pro:
Proven UV Resistance, Plus Guidance on Decontamination, Maintenance & Adjustment

Abstract

UV decontamination is routine in cell culture rooms, biosafety cabinets and PCR workstations, so pipettes kept there must tolerate it. The AHN myPette Pro was tested far beyond normal practice: 60 minutes of close-range exposure at 302 nm, and 2 days of continuous 254 nm UV-C exposure with no gap between the pipette and the UV source. The 302 nm exposure caused no change. After the 254 nm exposure, the only effect was discoloration. The pipette still aspirated and dispensed properly, and a 75 cm drop test showed no loss of strength.



Introduction

The UV resistance of the plastics used in a pipette is of central importance for many laboratory applications. UV light is widely used to disinfect cell culture workspaces, and a pipette that is left in such an area must not be harmed by it, either in material strength or in function.

A typical laboratory UV decontamination set-up uses a 30 W low-pressure mercury-vapor lamp with a characteristic wavelength of 254 nm, at a distance of approximately 60 cm between lamp and pipette. A UV-resistant pipette can remain in such an area without risk, because the UV light used to disinfect the workspace does not adversely affect the pipette material or its function.

This white paper reports how the AHN myPette Pro performed under UV well beyond that set-up, and then sets out good practice for decontamination, maintenance and adjustment that helps any pipette stay reliable.

Why a Harsher Test?

UV irradiance falls off sharply with distance from the source. Placing a pipette in direct contact with the lamp therefore delivers much more UV energy to its surface than a 60 cm decontamination distance does. Running this exposure continuously for two days adds a very large margin over any realistic routine decontamination cycle

Test Design

Two UV exposure tests were carried out on the AHN myPette Pro, each at a different wavelength. Both were run at the closest possible range to the UV source.

Test A: 302 nm, 60 minutes

The pipette was exposed to 302 nm UV (UV-B) at close range for 60 minutes.

Test B: 254 nm, 2 days

The pipette was exposed to 254 nm UV (UV-C) continuously for 2 days. It was placed directly against the UV source, with no space between the two. This is the most severe exposure geometry possible and is far harsher than normal use.

Checks after exposure

- **Visual inspection** of the housing, plunger and shaft.
- **Functional check** of aspiration and dispensing.
- **Drop test** from a height of 75 cm to assess any loss of strength.

Exposure compared with standard practice

Table 1 sets the AHN test conditions beside a typical laboratory UV decontamination set-up.

Table 1: UV exposure conditions (AHN myPette Pro Tests A & B)

	Typical Decontamination	Test A	Test B
Wavelength	254 nm	302 nm	254 nm
Distance	About 60 cm	Close range	Zero (no gap)
Duration	Routine cycle	60 min	2 days, continuous

Typical values for a 30 W low-pressure mercury-vapor lamp.

60 min
302 nm, close range
No change observed

2 Days
254 nm, zero distance
Discoloration only

75 cm
Drop test height
No strength degradation

Results

Test A

After 60 minutes of exposure at 302 nm at close range, the AHN myPette Pro did not show any changes.

Test B

After 2 days of consistent exposure to 254 nm UV-C radiation, with no space between the pipette and the UV source, the only effect on the pipette was discoloration of the housing. Figure 2 on the next page compares the exposed pipette with an unexposed.

Function and strength after exposure

Discoloration of a plastic surface does not by itself show that the pipette is still sound, so the exposed unit was checked for function and strength.

Aspiration, dispensing and drop test

After the 2-day exposure, the pipette continued to aspirate and dispense properly. It was then dropped from a height of 75 cm and showed no strength degradation, so the housing had not become brittle under the prolonged UV-C load.

What the discoloration means

Surface yellowing is a well-known cosmetic response of many plastics to prolonged UV-C exposure, and it was the only effect found. It did not change how the pipette worked or how strong it remained.

Table 2: Summary of results

Test	Observation
A: 302 nm, 60 min, close range	No change
B: 254 nm, 2 days, zero distance	Discoloration only
Aspiration and dispensing after B	Proper
Drop test, 75 cm, after B	No strength degradation

Practical notes for the laboratory

- Test B is a worst case. Routine UV decontamination of a work area runs for far shorter periods and at a greater distance, so the margin to the conditions tested here is large.
- A slight change of colour after long, repeated UV exposure is cosmetic and is not a sign that the pipette has failed. Routine performance checks should continue as part of normal laboratory quality practice.

Conclusion of the UV study

The AHN myPette Pro pipette tolerated 60 minutes of close-range 302 nm exposure with no change, and 2 days of continuous, zero-distance 254 nm UV-C exposure with discoloration as the only effect. Aspiration and dispensing remained proper, and the pipette showed no strength degradation in a 75 cm drop test. These results, obtained under conditions much harsher than the standard 254 nm decontamination set-up, support the use of the AHN myPette Pro in laboratories where UV decontamination of the pipette and its working area is part of the routine.



Decontamination and Maintenance

The practices below apply to piston-stroke air-cushion pipettes in general. Always check the user manual of your pipette model for what it permits.

Autoclaving

Air-cushion pipettes and pipette tips (with the exception of filter tips) are normally autoclaved at 121 °C and 1 bar (100 kPa) excess pressure for 20 minutes, where the pipette model is rated for it.

- Let the pipette dry completely and cool down after the cycle.
- If it was autoclaved in parts, let all parts cool fully before reassembly. Otherwise plastic parts may overexpand and be damaged.
- When several pipettes are processed together, keep the upper and lower parts of one pipette together so that parts are not mixed up.

UV decontamination

For UV decontamination, use a 30 W low-pressure mercury-vapor lamp with a characteristic wavelength of 254 nm. The optimal distance between lamp and pipette is approximately 60 cm.

Chemical decontamination

If a disinfectant or DNA/RNA decontaminant is used before UV or autoclaving, wipe or rinse it off the pipette surface with demineralized water first.

> **Do not combine** decontamination reagents (such as disinfectants or DNA/RNA decontaminants) with steam autoclaving or UV irradiation on a surface that still carries the reagent. Remove the reagent first.

Table 3: Decontamination at a glance

Method	Typical parameters	Observation
UV irradiation	254 nm, 30 W low-pressure mercury lamp, approx. 60 cm	Wipe off chemical decontaminants first
Steam autoclaving	121 °C, 1 bar excess pressure, 20 min (pipette and tips, not filter tips)	Dry and cool fully; do not mix up parts
Chemical decontamination	Disinfectants or DNA/RNA decontaminants	Rinse or wipe off with demineralized water before UV or autoclaving

Typical parameters. Confirm suitability for your pipette model in its user manual.

Maintenance and cleaning

Regular cleaning keeps a pipette working as intended. Clean the lower part on a regular basis, in line with how often the pipette is used. Release and remove it as described in the user manual of your model.

Single-channel pipettes: take the lower part out of the upper part, clean it, and push it back until it engages audibly.

Multichannel pipettes: the individual pistons and tip cones can be released from their holders for cleaning. Re-assemble in reverse order.



Adjustment and Accuracy

Liquids that differ from water

Piston-stroke pipettes are adjusted at the factory to distilled water under certified measuring conditions. Liquids whose density or other physical properties differ significantly from water, and work at altitude, can shift the delivered volume.

Where the pipette model allows user adjustment, follow the user manual. Verify every change gravimetrically following the test procedures of EN ISO 8655-2 and 8655-6, and label the pipette with the liquid and the volume the change applies to.

Worked Example

A 10 to 100 µl pipette is adjusted by 1 µl at a 100 µl setting. That is a 1% change.

At a 10 µl setting, the same 1 µl shift is 10%. Strictly speaking, an adjustment applies only to the volume at which it was tested.

Very long tips

Very long tips can cause volume errors because of the filling height in the tip and the resulting air cushion between the liquid and the piston. If demands on systematic error are very high, minimize them by adjusting the pipette or, for single dispensing, by raising the volume setting. Confirm any setting with your own gravimetric test.

Materials and chemical resistance

The plastics used for the piston, cylinder and seals decide which solvents and acids a pipette tolerates in daily use. In higher volume ranges, engineered plastics help keep handling forces and weight low.
Consult the chemical resistance information for your pipette model before working with aggressive reagents.

What a thorough reliability evaluation covers

A pipette is used thousands of times, so a sound evaluation exercises the mechanism far beyond a handful of cycles. A thorough evaluation covers checks such as these:

- Repeated tip attachment
- Repeated tip ejection
- Strokes including excess stroke
- Repeated volume adjustment
- Lower part removal and re-attachment
- Repeated autoclave cycles
- Drop tests
- Gravimetric tests (EN ISO 8655)

Conclusion

Reliability, simple cleaning and maintenance, safe decontamination and sound verification of adjustment all matter in daily laboratory routine. The AHN myPette Pro took severe UV exposure with only a change of colour. Combined with the good practice above, that supports confident use where UV decontamination is routine.

