

A red stylized icon consisting of two overlapping loops, resembling a DNA double helix or a molecular structure.

Automated Nucleic Acid Quantification

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Integrated Sample Analysis with an eviDense UV Photometer

UV-Vis spectrophotometry is an invaluable tool for nucleic acid quantification, providing a straightforward and rapid method to assess DNA and RNA concentrations. This technique uses the absorbance properties of nucleic acids, at approximately 260 nm, to estimate their purity and concentration. Despite the emergence of newer technologies, UV-Vis remains favored for its simplicity and non-destructive nature.

To bring this proven technology to a compact, automation-compatible solution, Beckman Coulter Life Sciences and HSE•AG integrated the eviDense UV Photometer with a Biomek i-Series Automated Workstation. This powerful combination can function as a standalone step or seamlessly integrate into existing workflows, ensuring a streamlined start-to-finish preparation process. By automating measurements, this integration minimizes user-induced errors, providing reliable data essential for making downstream applications even more efficient, bridging the gap between nucleic acid extraction and downstream analysis in your workflows.

The eviDense UV Photometer is a small form-factor laboratory instrument designed to measure the optical density (OD) or absorbance of biological or chemical analytes in aqueous samples at relevant wavelengths. It is specifically designed for robotic use with eviEtte Micro Cuvettes and an automated liquid handling system.

Benefits of eviDense UV devices include:

- Fixed optical pathlength via Micro-cuvette measurement technology
- Peak performance and walk-away time
- Enhanced lab efficiency and cost control
- Smart data handling
- Compact design, seamless integration



Figure 1. Image of eviDense UV Photometer.

Method Description

The eviDense UV Photometer rests on a single ALP position on the Biomek i-Series workstation deck (Figure 3) and is seamlessly integrated into Biomek i-Series software. It can be installed and incorporated into methods for Biomek i5 or i7 Hybrid Workstations with a Span-8 pipetting pod.

NOTE: A Beckman Coulter Life Sciences representative will install and configure the eviDense UV Photometer.

The companion Biomek i-Series workstation method supports P40F Tips and the span-8 pipettor in two basic modalities of read by sample count and read by pattern with flexibility to modify as needed. The eviDense UV Photometer uses eviEtte Micro Cuvettes that are contained within an eviEtte Micro Cuvette rack—which can hold up to 96 cuvettes. The eviDense UV Photometer can hold 2 eviEtte Micro Cuvette racks.

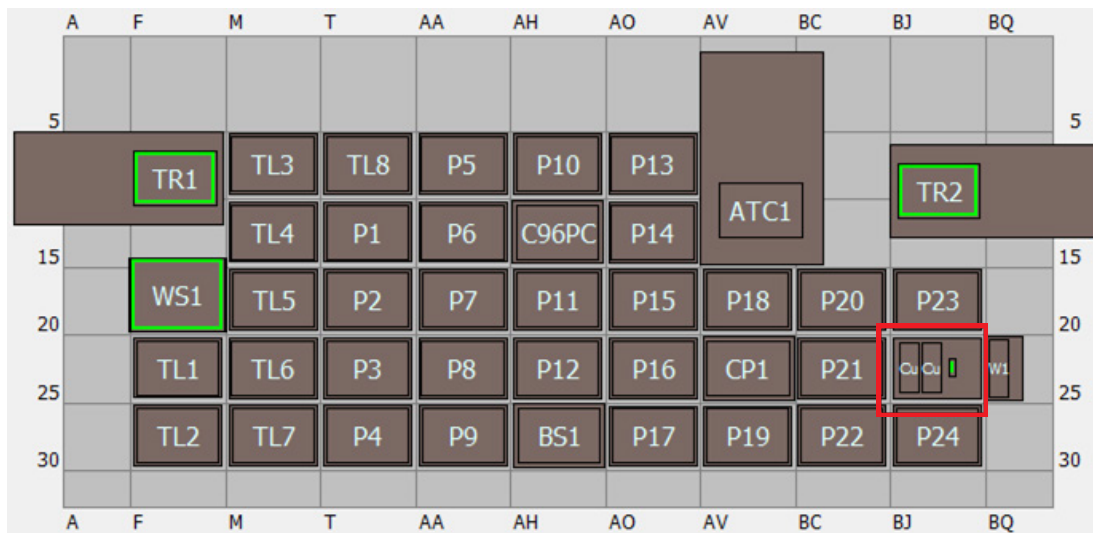


Figure 3. Biomek i7 Hybrid Workstation deck layout with integrated eviDense UV Photometer (outlined in red). The photometer uses a single ALP position, and holds 2 eviEtte Micro Cuvette racks and the UV photometer.



Figure 4. The eviDense UV Photometer in front of a Biomek software screen with device integration steps.

Biomek software has been designed for eviDense UV Photometer device integration to enable easy incorporation of an automated method.

Associated steps include:



Figure 5. Biomek integration software steps for eviDense UV Photometer.

- Load Cuvettes: loads cuvettes onto 40F tips
- EviDense Read:
 - Determines A230, A260, A280 and A340 absorbances
 - Will also combine baseline and blank measurements
- EviDense Quantify: Converts eviDense readings to concentration and quality ratios as referenced to a buffer blank

Data

To test eviDense UV Photometer processing with the Biomek i-Series workstation, commercially available Lambda DNA standards at 0 ng/μL, 5 ng/μL, 10 ng/μL, 20 ng/μL, 40 ng/μL, 60 ng/μL, 80 ng/μL and 100 ng/μL were purchased. A total of 5 replicates for each standard were processed on the Biomek i7 Hybrid Workstation with the eviDense UV Photometer.

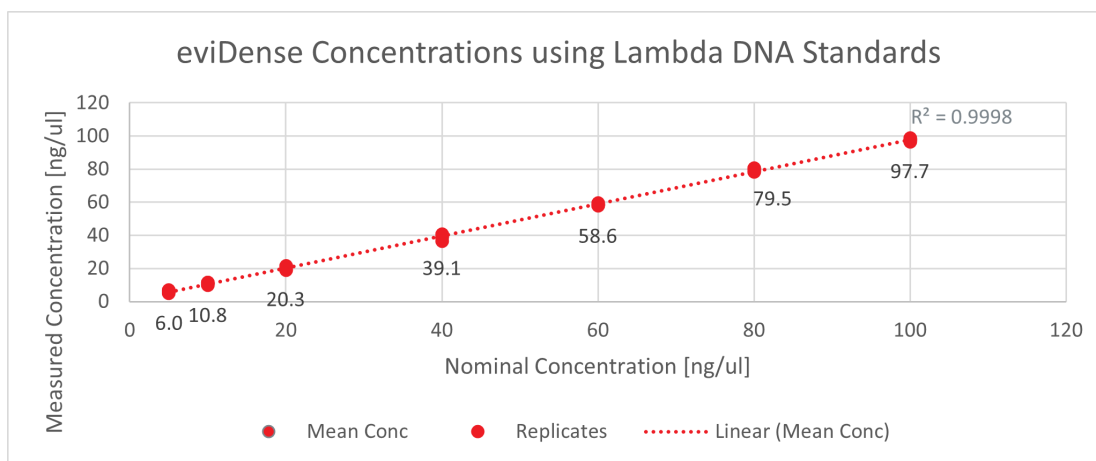


Figure 6. Concentrations measured with the eviDense UV Photometer closely approximate standard nominal concentrations.

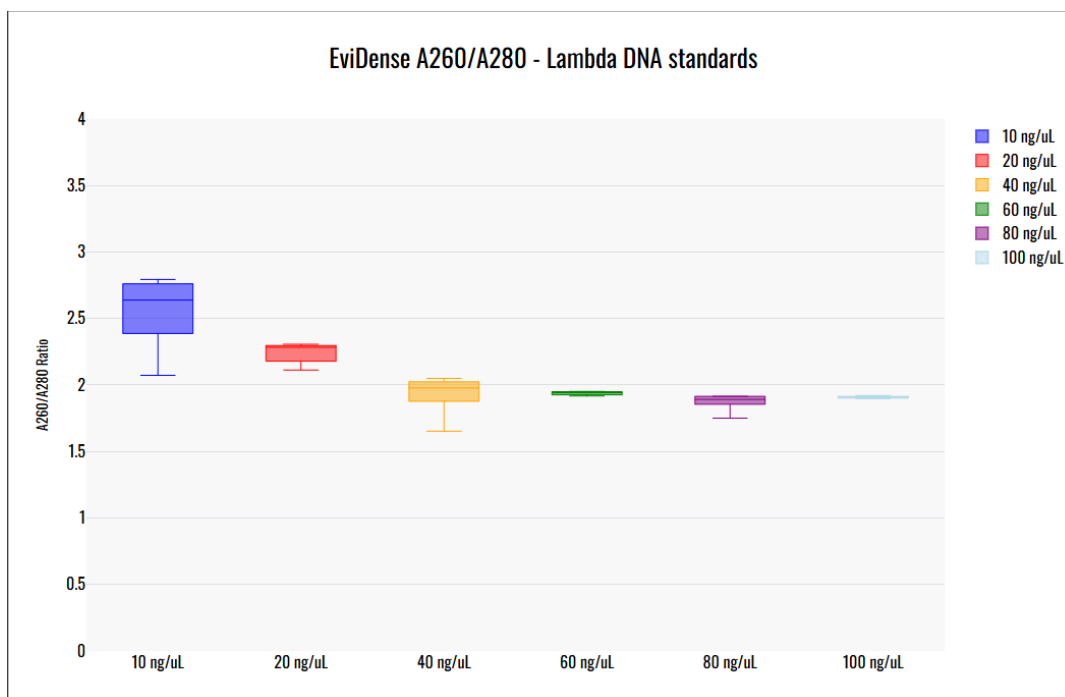


Figure 7. Reported A260/280 purity ratios converging to 1.8 as concentration increases.

Conclusion

When integrated with Biomek i-Series systems, the eviDense UV device provides users with the ability to quantify their nucleic acids without manual intervention and with consistent results through replicates.

Part number	Description
D27543	eviDense UV Photometer
969154	eviDense UV Integration Kit
C02852	eviDense UV Method Support (1-day)

References

1. HSE AG user manuals for the eviDense UV Photometer can be found at <https://www.hseag.com/on-deck-photometer>.
2. Beckman Coulter Life Sciences references can be found at <https://www.beckman.com/support>

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2025-GBL-EN-108176-v1

