UV-LED retrofitting of the EVG 620

The idonus light engine UV-EXP-LE is a high-power UV-LED source that can be integrated in virtually any photolithography mask aligner. Our team has completed the retrofitting of several mask aligners from the main manufacturers. In this document, we illustrate the retrofitting of the EVG 620 (EV Group).

Mercury lamp • A traditional photolithography mask aligner uses a mercury-arc lamp as its source of UV light. This lamp has a limited lifetime of typically 500 hours and needs to be replaced regularly. Furthermore, the use of mercury-arc lamps implies continuous recalibration of the equipment due to the ever-changing radiant flux.

UV-LED retrofitting • The retrofitting of mercury-based photomask aligners with high-power UV-LED offers many advantages, especially in terms of maintenance. Other benefits are detailed in our technical note "UV-LED light engine for photolithography exposure" (available online: https://dx.doi.org/10.13140/RG.2.2.31287.65446). Hereafter, our focus is on the simplicity of replacement, which can be completed in less than an hour on the EVG 620. As a complement to this document, you may check this unedited testimonial video prepared by Lithography Equipment Support Ltd. (LES, lithosupport.com): *https://youtu.be/mYtUK7bu2js*. This video lasts 10 minutes and shows in real time the entire retrofitting procedure completed by two technicians.

Specifications / requirements

- **EVG 620** and similar models are straightforwardly upgraded with the idonus *UV-EXP-LE(EVG620)*. The upgrade can be completed by your cleanroom staff. A technician from idonus can also perform the installation on site.
- **Wavelength(s)**: 365 nm and/or 385 nm / 395 nm / 405 nm. The light engine can also be configured with UV-LEDs with multiple wavelength peaks
- **Electronic control:** The system is delivered with our *UV-EXP-CU* Control Unit. This control unit (slave) is connected to the EVG 620 that drives the light engine
- **Dimensions (W × D × H):** 240 × 300 × 730 mm^3 (light engine alone).
- **Performance:**
  - Exposure area: up to 150 mm (6-inch) (optional larger size)
  - Max. irradiance > 50 mW/cm^2
  - Uniformity measured in terms of Michelson contrast ratio, C < 3%
  - Collimation angle <2° (half-angle, FWHM)



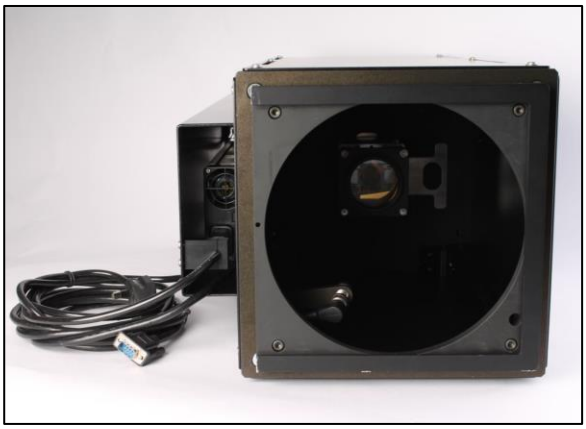
Detail of the idonus UV-EXP-LE(EVG620) • *The idonus Light Engine is controlled by the EVG 620 mask aligner via the idonus UV-EXP-CU Control Unit, the latter being used as a slave device. As shown in this illustration, the original 6'' lens is conserved.*

Hg
Mercury **free**

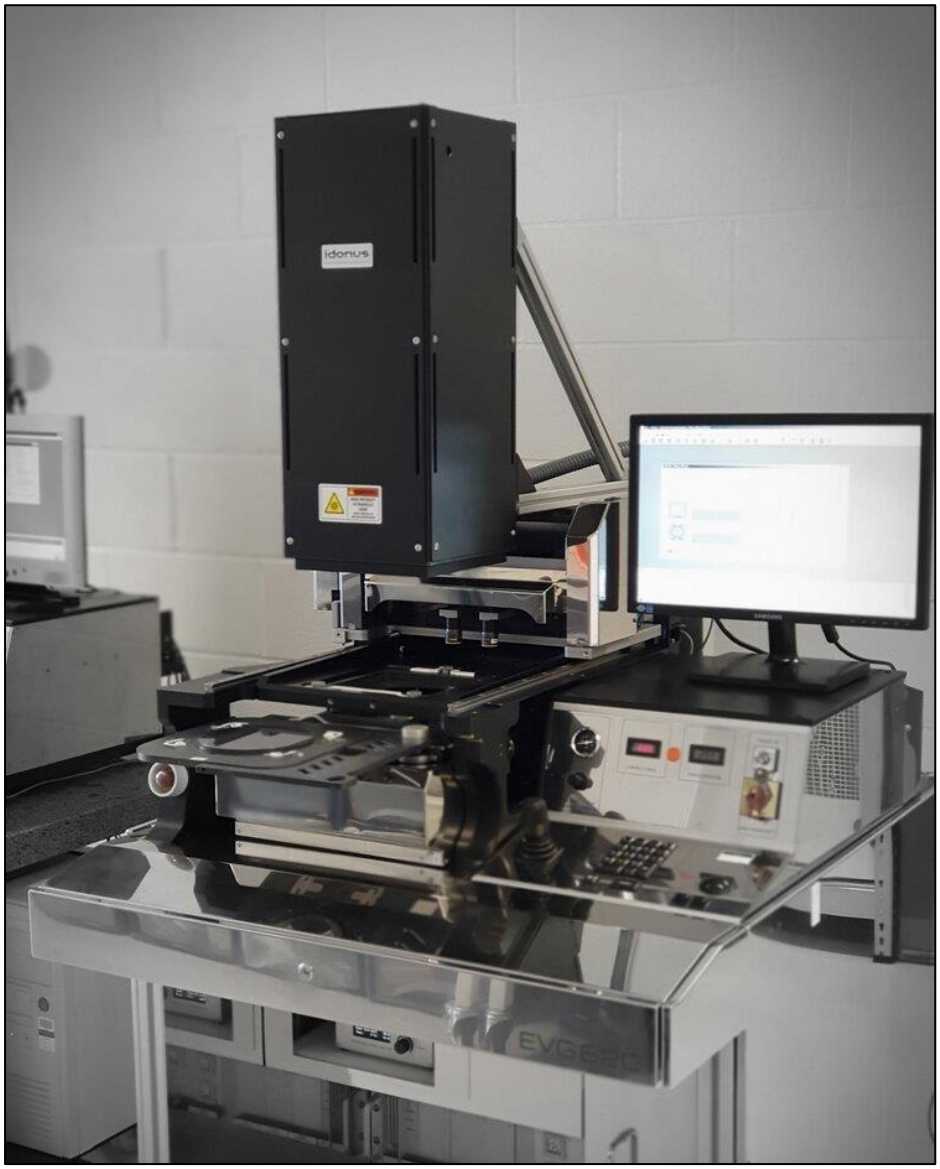
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Original parts from the EVG 620 • *This picture shows the original parts from the EVG 620 lamphouse that are re-used after retrofitting. From left to right: the 6'' front lens and its housing, the base plate that is used to fix the idonus Light Engine, the front lens aperture/guide.*



UV-EXP-LE(EVG620) ready for assembly on an EVG 620 mask aligner • *The original lens aperture from the EVG 620 lamphouse is fixed on the idonus Light Engine.*



EVG 620 retrofitted with the idonus UV-EXP-LE • *The EVG 620 is a mask aligner suitable for substrates/wafers up to 150 mm (6-inch). The idonus UV-EXP-LE (EVG620) is simply put in place of the original mercury lamphouse.*

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