

PLATFORMS



BAK

Evaporator family



THE BAK

A new generation

Taking the best from the past and expanding your horizons for the future!

Welcome to the latest generation BAK evaporator – a family of platform sizes and geometries taking all the best from the tried and tested BAK generations before, and extending your capabilities with new sources, new process control options and new handling solutions – from fully manual load in the BAK 501 to full robot calotte load in large systems.



BAK 501 – manual



Large BAKs – option for calotte load / unload via robot

More than 2000 BAK systems
delivered worldwide



THE BAK

Just the right size



The BAK batch coater delivers thin film deposition and etch capabilities for precision optics, optoelectronics and semiconductor applications to customers around the globe. From deposition of multilayer dielectrics and metals to TCOs or whole range of compounds, it can be configured just the way you need for directional coating, enhanced thickness uniformities and the tightest optical, mechanical and environmental specifications.

Our applications specialists are here to help you identify just the right platform in our range between 0.5 metres and 1.5 metres according to your throughput and processes. The new generation BAK family brings you the complete solution including processes and substrate handling know-how on a platform with proven production reliability for the best ever cost of ownership.



“For the best cost of ownership”

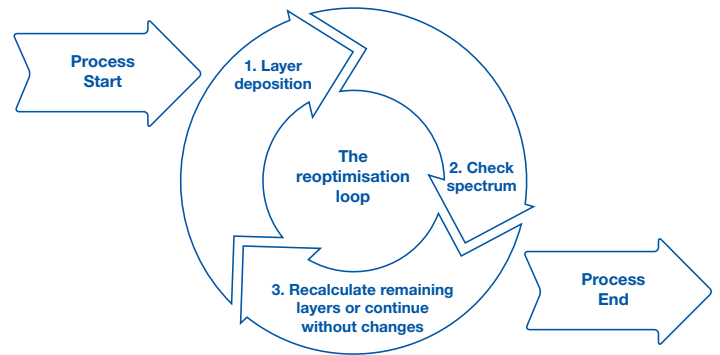
| BAK | 501 | 641 | 761 | 901 | 1101 | 1401 |
|-----|-----|-----|-----|-----|------|------|
| 2" | 47 | 95 | 152 | 186 | 216 | 330 |
| 3" | 20 | 36 | 64 | 88 | 104 | 167 |
| 4" | 9 | 24 | 40 | 51 | 64 | 104 |
| 6" | 5 | 9 | 18 | 23 | 24 | 47 |
| 8" | 3* | 6 | 9 | 10 | 16 | 28 |

Substrate capacity by machine type (full calotte)

LEADING THE WAY with Advanced Process Control (APC)

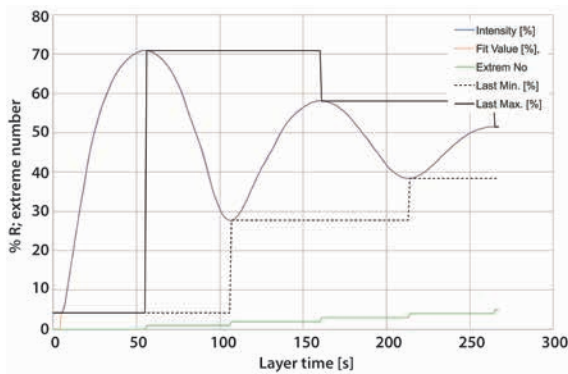
Full automation through pump down, process and vent and full data logging functionality on Evatec's "KHAN" system and process controller make production and quality control easier than ever. The information is displayed ergonomically and still represents the benchmark in the industry for evaporators. Host communication follows the protocols based on GEM and SECS-II standards.

Well established Advanced Process Control (APC) techniques like broadband optical monitoring with "real time in-situ process reoptimization" increase yields for the most demanding optical stacks.



In-situ process reoptimization enables tighter optical tolerances

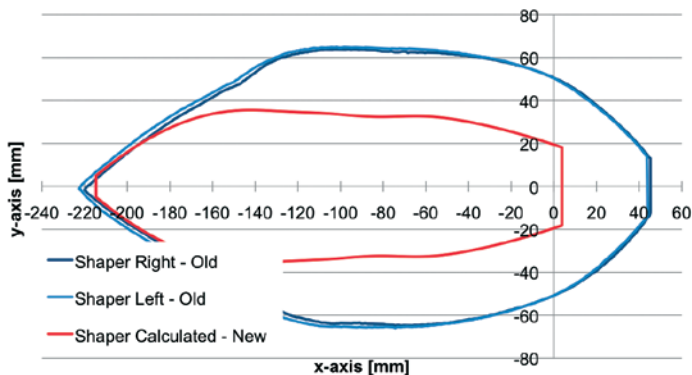
Hybrid monitoring raises the bar even further



Monochromatic monitor signal (reflectance at 906nm) of an absorbing layer material deposited in a BAK tool

In recent developments, hybrid monitoring solutions allow switch between monochromatic and broadband modes for different layers within a stack for the ultimate in process control. Due to absorption, the amplitude of the extrema is decreasing. However, by tracking the extreme values and the time between them, the layer termination can be triggered accurately at the intended thickness.

UNICALC shaper optimization solutions enable fast track development of efficient dielectric and metals deposition processes for optoelectronics and semiconductor applications, optimize thickness uniformity over the calotte, increase your throughputs and reduce your precious metals consumption costs.



Unicalc fast track shaper development for reduced materials consumption



THE BAK

Just the right geometry

The standard BAK chamber is just the starting point for a whole series of custom production solutions. Your BAK can also be delivered with “Lift Off” geometry where the source is lowered, and for the ultimate flexibility in deposition geometry we offer solutions for simple manual or motorized adaptation of geometry in the same chamber.

For handling of the most reactive coating materials or the very fastest cycle times, a “split chamber” variant enables the sources to be isolated in their own vacuum chamber and kept ready during main chamber vent, and for high uniformity “in-situ” deposition & etch capability the chamber back can be extended to enable installation of movable ion sources.

Irrespective of the geometry, all our platform variants are engineered for rapid source access, replenishment and easy use with comfortable operator access for maintenance and repair.

Platform geometry

Typical applications

Standard throw

- High rate metallization
- Optical interference coatings
- TCO deposition e.g. ITO



“Lift Off”

- Extended throw optimized for “Lift Off” processes
- SAW / BAW / Laser Bar device



Split chamber

- “Reactive” coating materials
- Special doping processes



Rear extension

- Combined deposition and etch



“The most flexible
BAK series ever built”

“Our engineering team has the solution”

BAK

A BLUEPRINT FOR SUCCESS

Process chamber

A tried and tested chamber design, extendable for different process geometries, flexible for different source configurations. Ready for whatever the future brings.



Sources

Choose from our biggest ever range of sources from deposition to custom etch, e-guns to effusion cells, barrel sources to boats. With closed loop process control to ensure the right thin film result every time.





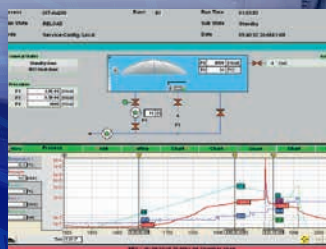
Pumping system

Pumping configurations according to your preference. Turbomolecular, diffusion or cryopumping. Tailor-made to bring you the best process results and highest production throughputs.



Custom tooling

Custom tooling for optics, optoelectronic and semiconductor processes. Manual handling or cassette-to-cassette with automated robot handling. With the BAK there is always a solution.



Process controller

An integrated system and process controller built around a robust industrial server, SEMATECH compliant, with intuitive handling for operators, process engineers and maintenance. Fully prepared for whatever sources you introduce.

THE BAK

SOURCES & LAYER THICKNESS CONTROL



Your BAK is prepared for installation of a whole range of deposition and etch sources including accessories like front and backside heating systems. The chamber base plate and side walls come with a series of standard feedthroughs enabling installation of the combinations of deposition and etch sources required for layer processing. All our sources are engineered for 24/7 production, robust and easy to maintain, optimized for the lowest materials utilization and the best repeatability. As process requirements change in the future, simply reconfigure your system by moving, exchanging or adding new ones, reconfigure your “KHAN” control system in just a few minutes and you are ready to go.

Control rates and terminate your layers with Evatec's QCM quartz monitoring technology at 5 or 6 MHz featuring high sampling rates, high speed switch between crystals and simultaneous control of up to 4 quartz heads from a single controller. For real time direct measurement of optical layer performance during deposition choose monochromatic, broadband or hybrid according to your process requirements.

“Tighter process tolerances than ever”



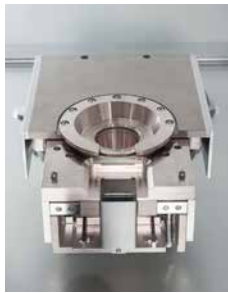
QCM Crystal monitoring system for multi head control

Maximise your process performance by choosing from our widest ever range of sources. From simple thermal boats and high capacity barrel sources to effusion cells, E-Guns and etch sources.



Thermal Evaporation

Standard and custom designs for complex substrate geometries and a large variety of coating materials



E-Guns

From 1 to 60 pocket, single or co-evaporation, for dielectrics, metals and TCOs



Wire Feeder

Two position wire feeder for source replenishment in thick layer deposition



Barrel Source

A range of source volumes for deposition of very thick layers



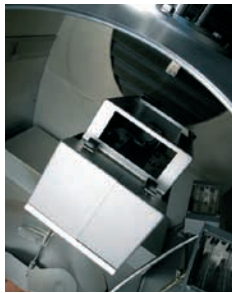
PIAD

Improved film qualities, lower process temperatures and shorter process times



Effusion Cells

Complex alloying processes and processing of very low vapor pressure materials at up to 2000°C



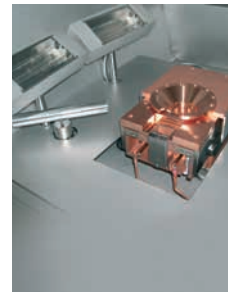
Etch

Round and moveable linear sources for high rate, accurate in-situ deposition and etch processes



Heating

Combined front and /or backside heating for process temperatures up to 350°C



Glow Discharge

700W or 2000W according to application

From multilayer optical stacks with edge tolerances <1nm to ultrathin precious metal layers and co-evaporation of alloys there is a BAK process control solution that fits.



KHAN

KHAN is the well-established and proven closed loop control system of the BAK. It supports a large range of processing and measuring equipment for a customer specific tool configuration. Its functionality includes co-evaporation of multiple sources, process statistics, run protocols, parameter tracking and a SECS/GEM interface for a host integration.



Quartz Monitoring

Single, 6, or 12 way quartz with increased sampling rates for termination accuracy in single and co-deposition processes

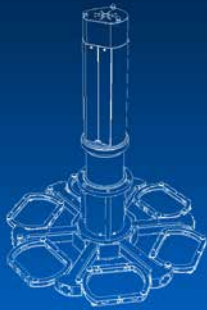


Optical Monitoring

UV to IR, monochromatic or broadband, test glasses or direct substrate measurement

TOOLING

that makes
the difference



*Complete freedom with "Flexcalotte"
2 axis rotation – individual axis control*



*"LOPS" - Planetary for "Lift off"
with 2 axis rotation*

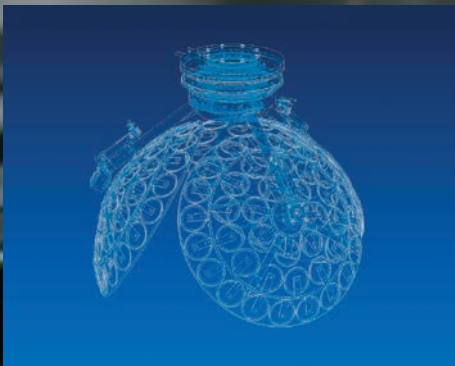


"Flip" calotte for double sided processes

Evatec's portfolio of tooling solutions is designed to maximize batch capacity for evaporation processes without compromise on film quality. Choose from single piece and segmented domes with standard or "lift off" geometries or flip systems for double sided processes. For high rate metallization our range of planetary system designs enable larger batch sizes and lowest material utilization and for complex substrate geometries our engineering department offers a bespoke design service.

Example of optimized capacity based on tooling choice for BAK 761

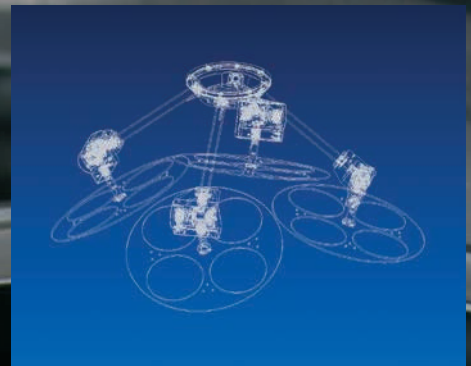
| Substrate size | Substrate handling | | |
|----------------|--------------------|------------|---------|
| | 4 segments | 3 segments | Knudsen |
| 3" | 64 | 72 | 123 |
| 4" | 40 | 39 | 78 |
| 6" | 16 | 18 | 33 |
| 8" | 8 | 9 | 15 |



Classic "Knudsen" planetary drive with 2 axis rotation



"Flip" planetary system for double sided coating



Complete custom engineering e.g. variable angle deposition

“For the best cost of ownership”

THE MULTI BAK

NEW THINKING IN EVAPORATION TECHNOLOGY

Evatec has long know-how in evaporation, vacuum load lock and automated handling technology for processing of 6 and 8 inch wafers, but now it's time to put them together in a new way in evaporators delivering improvements in throughput and process repeatability. Available either with manual calotte load for a single load lock / process chamber, or as cassette-to-cassette configuration with atmospheric robot handling when integrating up to 4 process modules.

MULTI BAK

For large volume manufacturing, integrating up to 4 tools in a cluster like configuration, the MULTI BAK offers even more:

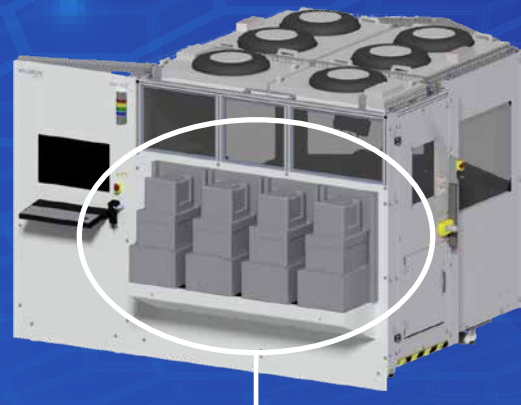
- Front end automation of wafer loading, (6 or 8 inch) direct from cassette to segment and then from segment to calotte in a controlled environment eliminating risk of operator errors and reducing risk of particles / wafer damage or breakage
- Automated management and tracking of substrate journey
- Wafer ID reading on the fly
- Tracking of each and every wafer to an individual location / segment / process batch
- Automated management of return of wafer to same cassette and location within the cassette after processing
- Optional: Automated handling of 2 inch monitor wafers for each and every batch. This includes placement of monitor wafers within a segment prior to coating plus retrieval and presentation of monitor wafers after coating to separate carriers alongside each cassette.



Watch the
MULTI BAK video



MULTI BAK



Front end now available with SMIF load ports

- Even lower particle levels
- Fully automated fabs

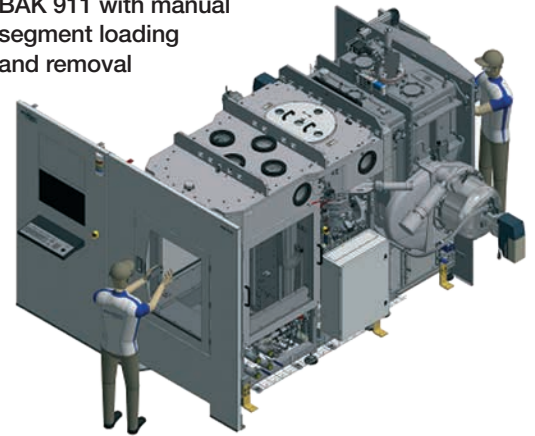
“Imagine increasing production output by 70% for a single tool”

BAK 911

The BAK 911 provides the next step in thin film production solutions for building on the advantages of split chamber systems:

- Not just source chamber, but also the complete process chamber remains under vacuum continuously, delivering the most stable process environment possible for even greater levels of process repeatability when required
- The only elements entering and leaving the process chamber during production are segments loaded with wafers. These enter and leave the process chamber via a load lock transfer module (LLTM)
- Rapid pump and transfer in this step offers a great opportunity to make additional overall gains in throughput
- Just as in the Split Chamber, sources replenished by wire feeder remain continuously under vacuum in a “ready state” for the highest stability. Opening of the process chamber itself is then limited to periodic maintenance such as shield change
- An operator loads and unloads the uncoated and coated segments at the front end

BAK 911 with manual segment loading and removal



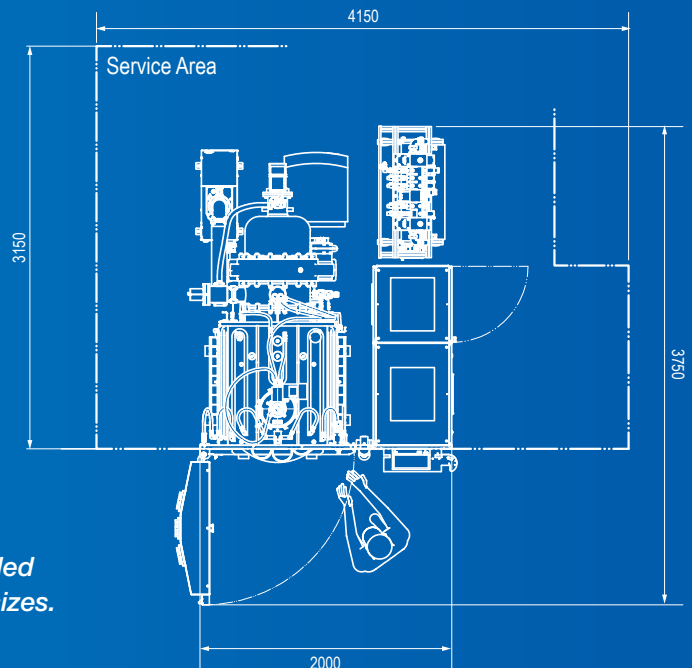
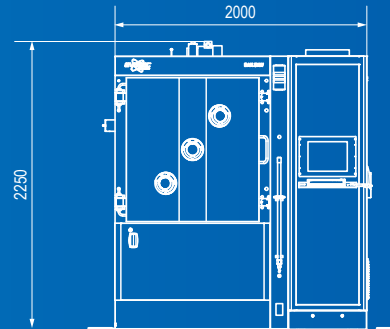
Watch the BAK 911 video



BAK FAMILY

With new levels of flexibility, and new levels of process control the BAK Evaporator is the industry leader in selected applications across Power Device, Wireless, LED, MEMS and Photonics applications. There is a BAK that is suitable for everyone - from the compact BAK 501 for universities and research institutions to the BAK 1401, a production giant.

BAK - The industry standard



Typical layout for the BAK 761 – an industry standard. Contact us for detailed specifications and layouts for all BAK sizes.*

**Approximate sizes for illustration only*

ABOUT EVATEC

Evatec offers complete solutions for thin film deposition and etch in the Advanced Packaging, Power Devices, MEMS, Wireless Communication, Optoelectronics and Photonics markets.

Our technology portfolio includes a range of advanced sputter technologies, plasma deposition & etch as well as standard and enhanced evaporation.

Our team is ready to offer process advice, sampling services and custom engineering to meet our customers individual needs in platforms from R&D to prototyping and true mass production.

We provide sales and service through our global network of local offices. For more information visit us at www.evatecnet.com or contact our head office.



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