

Multi BAK – Continuing to push boundaries in evaporation technology

It is only three years since Evatec launched the ground breaking Multi BAK concept. We took our know-how in automated handling and loadlock technology and combined it with up to 4 BAK process chambers in a clustered configuration. This brings even greater levels of process repeatability and enhanced throughput for high volume applications. Evatec Manager Customer Engineering *Marco Stupan* tells us about the latest Multi BAK platform capability developments giving customers across typical applications in wireless, power and optoelectronics even greater production choice.

New capabilities in substrate handling

The original platform based on Atmospheric Front End Module (AFEM) with cassette ports was launched in 2021. Since then we have added Standard Mechanical Interface (SMIF) ports as an alternative load port solution. This configuration has enabled handling of thinner wafers and

is ideal for those customers looking to integrate the tool within fully automated fabs. The single process module configuration BAK911 with manual wafer loading also remains available. Table 1 compares the substrate management capabilities of each configuration in the portfolio.

	BAK 941E – AFEM with Cassette Loadports	BAK 941E – AFEM with SMIF Loadports	BAK 911E – Manual Wafer Loading
Supported wafer sizes	150mm, 200mm	150mm, 200mm	Any type that fits on the calotte
Fully automatic wafer handling	✓	✓	✗
Mixed Operation of different wafer sizes (Bridge tool)	✓	✗	✓ (manual loading)
Substrate Introduction	Open cassette with vertically oriented substrates	SMIF pod or adapter pod for cassette loading	Manual loading of pre-loaded calotte segments or directly substrates
Aligner Type	In cassette batch aligner	Single wafer chuck type aligner	n/a
Warped / bowed wafers	✗	✓ (max ~3mm)	✓
Wafer Thickness	>250µm	>~120µm	Any
Wafer ID reader	✓	✓	✗

Table 1





Material Management

To maximize throughput of these systems we need to optimize material management, extending the time between process chamber venting for refill of sources. Multi BAK solutions can now be equipped with single or twin E-Guns configured with single or multiple crucibles and wire feeders to achieve typical targets of 10 or more process runs prior to chamber vent.



The Multi BAK – delivering other benefits too!

Keeping process chambers under vacuum between runs is a great way to achieve the most consistent process conditions and best process repeatabilities but has other benefits too. The overall Multi BAK design concept includes the Load Lock Transfer Module (LLTM) used to transport substrates in and out of the process chamber. This means less energy-hungry pump systems and significant overall energy savings in the fab.



“Multi BAK – reducing energy consumption compared with conventional stand alone platforms by up to 60%”

SPOTLIGHT ...Multi BAK

Why Multi BAK?

It is all about automation and throughput!

The driving force at the time of the platform launch in 2021 was to remove manual wafer loading by the operator and to increase the throughput. Evatec's LLTM technology essentially eliminates the pump down time out of the throughput equation.

The AFEM removes all human handling of wafers to load the calottes and provides a high class clean room environment to do so. Table 2 shows how throughput compares between a traditional system and a system equipped with LLTM based on the evaporation process times.

PROCESSING TIME (min)	CLASSIC BAK (Batch/h)	BAK WITH LLTM (Batch/h)	BENEFIT FACTOR
20	0.67	1.76	2.6
40	0.55	1.11	2.0
60	0.46	0.81	1.8
90	0.38	0.58	1.5
120	0.32	0.45	1.4
180	0.24	0.31	1.3
240	0.19	0.24	1.2

Table 2

One concept – Multiple configurations optimized for your process and throughput

Designed for up to 4 process chambers the Multi BAK delivers:

- Front end automation of wafer loading (6 or 8 inch), directly from cassettes to calotte segments in a controlled environment eliminating risk of operator errors and reducing risk of particles, wafer damage or breakage
- Automated substrate journey management to ensure a return of each substrate to the original cassette and slot.
- Wafer ID reading on the fly
- Tracking of each and every wafer to an individual location, segment or process batch

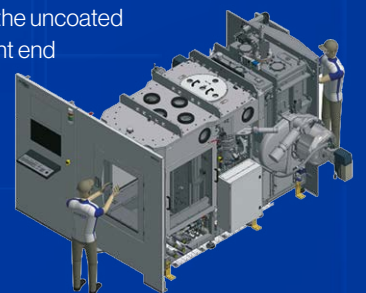


Watch the Multi BAK video

Starter configurations are available too

For single process chamber configuration the system can also be configured with manual segment loading and removal, but still with the same LLTM technology to retain the benefits of higher throughput and reduced energy consumption.

- 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. They enter and leave the process chamber via a LLTM
- Rapid pump and transfer in this step offers a great opportunity to make additional overall gains in throughput
- Sources replenished by the wire feeder remain under vacuum in a ready state for the highest stability. Opening of the process chamber itself is then limited to periodic maintenance such as pocket cleaning and shield change
- An operator loads and unloads the uncoated and coated segments at the front end



Watch the BAK 911 video



Want to know more about the Multi BAK?

Contact your local Evatec sales and service office to find out more.

