



# LLS

## RETROFIT

- Adding Process Capabilities
- Increasing Process Reliability
- Increasing System Throughput
- Extending System Lifetime
- Implementing Custom Solutions

# GETTING MORE FROM EVERY MEMBER OF THE LLS FAMILY

Your LLS may be a well proven production tool but that doesn't mean you can't introduce new features enabling new processes for a higher productivity in deposition of metals, TCOs and magnetic films. Evatec retrofits can enhance the performance of LLS EVO and LLS EVO II generation platforms.

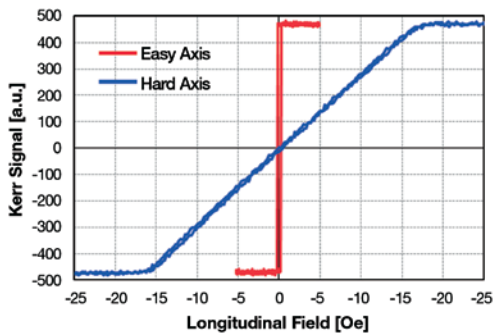


Figure 1: Typical magnetization curves for the 4  $\mu\text{m}$  thick CoZrTa/ $\text{Al}_2\text{O}_3$  soft magnetic multilayer sputtered with new LLS aligning field technology (measured by magneto-optic Kerr effect measurements).

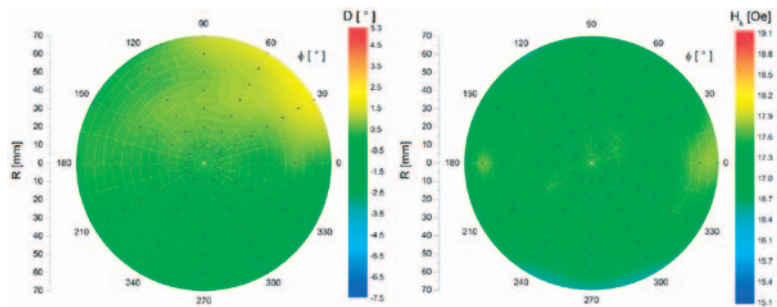


Figure 2: Distribution of the easy axis (left) and anisotropy field  $H_k$  (right) for a 4  $\mu\text{m}$  thick CoZrTa/ $\text{Al}_2\text{O}_3$  multilayer deposited on a 8"  $\text{SiO}_2$  wafer using the new aligning field. The 8" sputtered wafer was mapped by magneto-optic Kerr effect measurements on a mesh containing 80 points (edge exclusion 30 mm).

## WHY RETROFIT

- Increase deposition rates and throughputs
- Achieve new performance levels for deposition of soft magnetic thin films
- Reduce consumables costs using targets with extended life-times and lower manufacturing costs
- Integrate front end robot handling
- Replace obsolete parts
- Reduce particle contamination



# A RETROFIT THAT'S RIGHT FOR YOU

Our retrofit packages can be divided into five distinct areas.

- ✓ Adding Process Capabilities
- ✓ Increasing Process Reliability
- ✓ Increasing System Throughput
- ✓ Extending System Lifetime
- ✓ Implementing Custom solutions

They can all be done on site and are backed up with full training, documentation and inhouse engineering support at Evatec. Use our simple flag system to identify at a glance if the retrofit is suitable for your LLS and get an indication how long it would take. For a detailed specification and costing or simply to find out more, contact your local Evatec sales and service centre or contact us at [info@evatecnet.com](mailto:info@evatecnet.com)

# ADDING LLS PROCESS CAPABILITIES



## OVAL TARGET TECHNOLOGY

### THE BENEFITS

- ✓ Oval design means no unused outer re-deposition zones and improved target utilization with more than 20% saving in investment cost for precious metals
- ✓ Reduced particle generation

### SUITABILITY

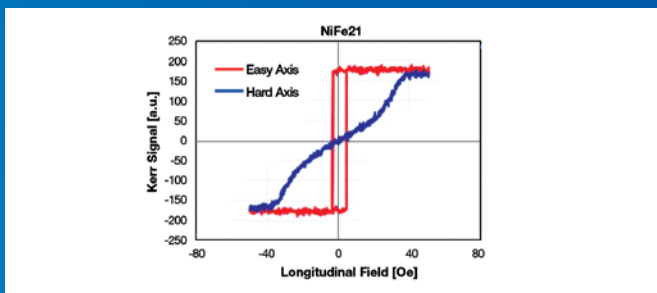
For LLS EVO and LLS EVO II

### COMPLEXITY / DURATION

TYPE 3

## 2 MAGNETIC ALIGNMENT

### OPTION 1: COLLIMATOR TECHNOLOGY



### THE BENEFITS

- ✓ Convert standard PVD cathodes to dedicated stations for magnetic alignment of magnetically soft material layers like NiFe alloys, using an extension kit for extended target – substrate distance and a collimator

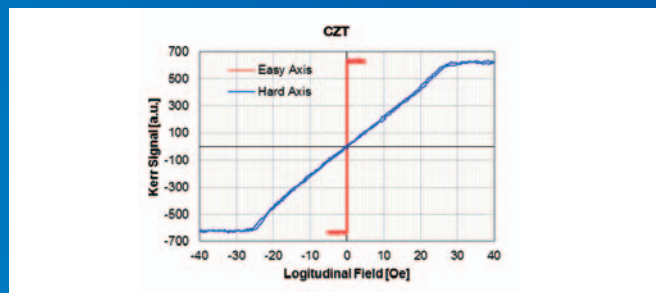
### SUITABILITY

LLS EVO and LLS EVO II

### COMPLEXITY / DURATION

TYPE 1

### OPTION 2: ALIGNING FIELD TECHNOLOGY



### THE BENEFITS

- ✓ Boost the sputter rate of the soft magnetic material by a factor of ~2.5 relative to collimator technology using a modified rotary cage housing enabling installation of aligning field magnet systems (AFA)

### SUITABILITY

LLS EVO II

### COMPLEXITY / DURATION

TYPE 3

3

Then take a look at all the other options to add to LLS process capabilities even more

Retrofit type	Benefit	LLS EVO	LLS EVO II
Sputter sources	Reconfigure / add sputter sources (DC, RF or mixed) or install co-sputter capability for alloy thin film laminating	✓ Yes	✓ Yes
Particle reduction packages	Install soft vent devices and arc sprayed shields to achieve even lower particle counts	✓ Yes	✓ Yes
Slow cage rotation	From 2 to 25000s per revolution for custom film growth applications	✓ Yes	✓ Yes
Heater	Install load or main chamber heating for enhanced outgassing control or preheating	✓ Yes	✓ Yes

## INCREASING PROCESS RELIABILITY BY AUTOMATION

Enhance your LLS for automated substrate and mask handling with our latest generation robot



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### 6 AXIS CASSETTE TO CASSETTE ROBOT HANDLING SYSTEM

#### THE BENEFITS

- ✓ Complete automation of substrate handling
- ✓ Available for full face deposition on 150mm and 200mm substrate diameters and masked deposition on 200mm substrates
- ✓ Increased system throughput

#### SUITABILITY

For LLS EVO and LLS EVO II (masked dep for LLS EVO II only)

#### COMPLEXITY / DURATION

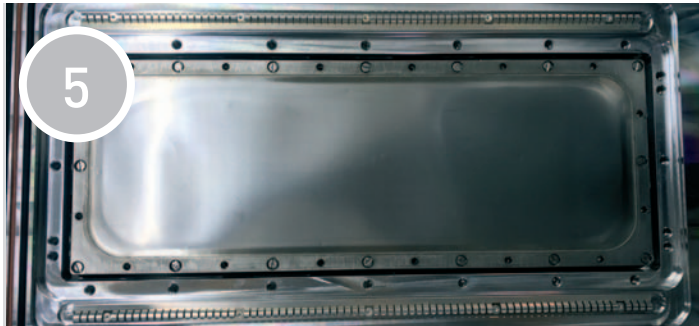
TYPE 3

#### NOTES

1. LLS EVO: GUI operating system Windows™ 7 required
2. Other substrate formats on request

# INCREASING LLS THROUGHPUT

See how you can achieve even more throughput from your LLS by upgrading your existing cathode technology...



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## HIGH ENERGY CATHODE TECHNOLOGY

### THE BENEFITS

- ✓ This simple retrofit installs foil cooling plates and improves the system throughput by high power sputtering at up to 12kW for increased deposition rates. Cathode with middle fixation (HECM) for soft aluminum, aluminium alloy and ferromagnetic targets.

### SUITABILITY

For LLS EVO and LLS EVO II

### COMPLEXITY / DURATION

TYPE 1



6

## MAGNET SYSTEMS

### THE BENEFITS

Upgrade to the optimum magnet system according to your application.

- ✓ Non magnetic materials - E-Magnet instead of the B-Magnet provides a target life improvement of up to 85%.
- ✓ Magnetic Materials - The F-Magnet instead of the C-Magnet boosts the target life by a factor of 15 or more. It allows use of much thicker targets and also provides much better target utilization.

### SUITABILITY

For LLS EVO and LLS EVO II

### COMPLEXITY / DURATION

TYPE 1

## 7 Or add new capabilities that deliver more substrates per hour

Retrofit type	Benefit	LLS EVO	LLS EVO II
Enhanced Pumping	Boost your pumping with Meissner traps or upgraded pumps and increase throughput by up to 50%	✓ Yes	✓ Yes
VaQflex™ refrigerant lines	Improve efficiency, eliminate condensation and particle generation in cleanroom area	✓ Yes	✓ Yes
Co-sputter	Enable parallel operation. Increase deposition rates by up to a factor of 3	✓ Yes	✓ Yes

# EXTENDING SYSTEM LIFETIME

Increase uptime and extend the working life of your LLS by replacing any obsolete parts or upgrading to the latest safety standards

## CONTROL SYSTEM MODERNISATION



### GUI SERVER UPGRADE

#### THE BENEFITS

- ✓ Improve system uptime using the latest LLS EVO II control system based on the GUI server (industrial standard PC) provided with operating system Windows™ 7, 19" chassis 1U (44.3mm), with DVD writer and "RAID 1" mirroring (2 hard disc drives 2.5") – reduced risk of data loss in case of failed disc drive.
- ✓ The new server is also able to replace the GUI PC on LLS EVO.

#### SUITABILITY

LLS EVO and LLS EVO II

#### COMPLEXITY / DURATION

TYPE 2

TYPE O



### PLC UPGRADE

#### THE BENEFITS

- ✓ PLC - PC has been replaced by Siemens Simatic Microbox PC. Siemens no longer provides Simatic software licences for PC installation. Microbox to be installed into the control rack.

#### SUITABILITY

LLS EVO II

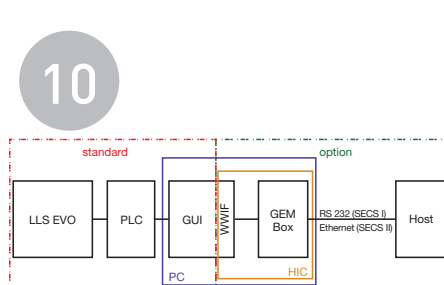
#### COMPLEXITY / DURATION

TYPE 2

TYPE O

#### NOTES

This upgrade requires the Windows™ 7 - GUI server upgrade



### SECS / GEM INTERFACE

#### THE BENEFITS

- ✓ SECS / GEM Host integration interface including update to latest SW edition including documentation.

#### SUITABILITY

For LLS EVO , LLS EVO II

#### COMPLEXITY / DURATION

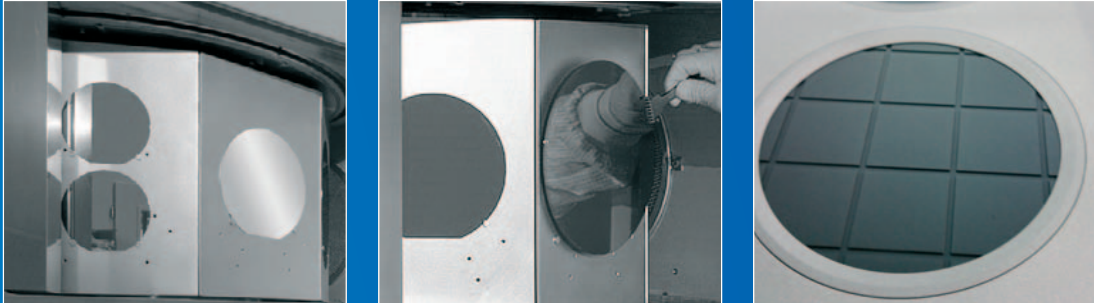
TYPE 1

## CONTACT YOUR LOCAL SALES & SERVICE OFFICE ABOUT EVEN MORE POSSIBILITIES INCLUDING:

- ✓ Replacement of existing obsolete components e.g - sputter and ion mill power supplies, RGAs and vacuum pumps
- ✓ Upgraded shutter box and gas inlet designs for improved uniformity
- ✓ Upgrades to latest RF supply including power supply, matching and switching units
- ✓ Transport protection systems for reduced risk from operator errors
- ✓ Replacement of obsolete rotary cage drive and controller

# CUSTOM SOLUTIONS SUPPORT

Let our engineering department help you with “custom engineering services” like substrate tooling design and manufacture.



We can offer design and manufacture services for all kind of substrate sizes, thicknesses and types up to 200mm diameter. The substrate tooling design can be customized to the specific needs, e.g. for small size substrates for MEMS applications.

Typical types of substrate toolings:

- ✓ Front-side loaded on pins 2” - 8”.
- ✓ Front-side loaded with moveable pins 4” – 8” (for vacuum tweezers handling).
- ✓ Backside loaded, masked, with or w/o passive cooling plates. 4” – 8”. For low temperature deposition or non backside contact, e.g. backside metallization. Also available with notches for partial full-face deposition.
- ✓ 8” Backside loaded, masked, with passive cooling plates now available for 9 substrates per batch.

Accessories to handle the backside loaded substrate toolings and dedicated stands for the backside loaded tooling sets can also be designed and manufactured.

## ABOUT EVATEC

Evatec offers complete solutions for thin film deposition and etch in the semiconductor, optoelectronics and photonics markets.

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

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](http://www.evatecnet.com) or contact our head office.



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