**TIGNIS**

# AI Process Control Platform Enabling Next Generation Technology

## Addressing a Growing Challenge

As feature dimensions in semiconductors continue to shrink and worldwide demand continues to expand, semiconductor equipment manufacturers need innovative ways to compete and deliver.

The Tignis PAICe Maker physics-driven AI computational modeling platform accelerates leading-edge semiconductor manufacturing—from equipment R&D to reliable high-yield chip fabrication capability. Tignis supports your success in delivering advanced processes, high and reliable throughput, improved overall equipment efficiency, and lower cost of ownership.

### DEMAND MORE FROM YOUR PROCESS CONTROLLER

Using the latest AI and machine learning techniques, Tignis process control makes the previously impossible possible.

- **Massively Multivariate:** it can control systems in response to millions of complex measured properties while accounting for non-linear interactions.

- **Adaptive:** machine learning continuously improves as data is collected, helping the process controller self-tune to compensate for simulation model error, environmental changes, product changes, or equipment drift.

- **Immediate:** physics-driven AI runs millions of times faster than legacy simulations, enabling real-time wafer-to-wafer recipe recommendations.

- **Predictive:** virtual metrology is built into the controller, enabling downstream process modification for better yield.

**The result?** Your semiconductor manufacturing equipment can have the power of AI and machine learning built-in, giving your fabrication customers the best control parameters to optimize each manufacturing run or batch.

**PAICe MAKER™**

## AT-A-GLANCE:

PAICe Maker is an embedded AI controller that learns the nuances of your equipment, configurations, and processes in order to develop the best control algorithm for the manufacturing line.

Tignis deploys machine learning-based control algorithms that drastically reduce the time and compute needed to calculate multidimensional critical inputs to semiconductor manufacturing equipment.

PAICe Maker enables a full range of capability enhancements, including: deposition optimization, etching optimization, bow and warp reduction, computational metrology, process drift/ recipe tuning, and more.
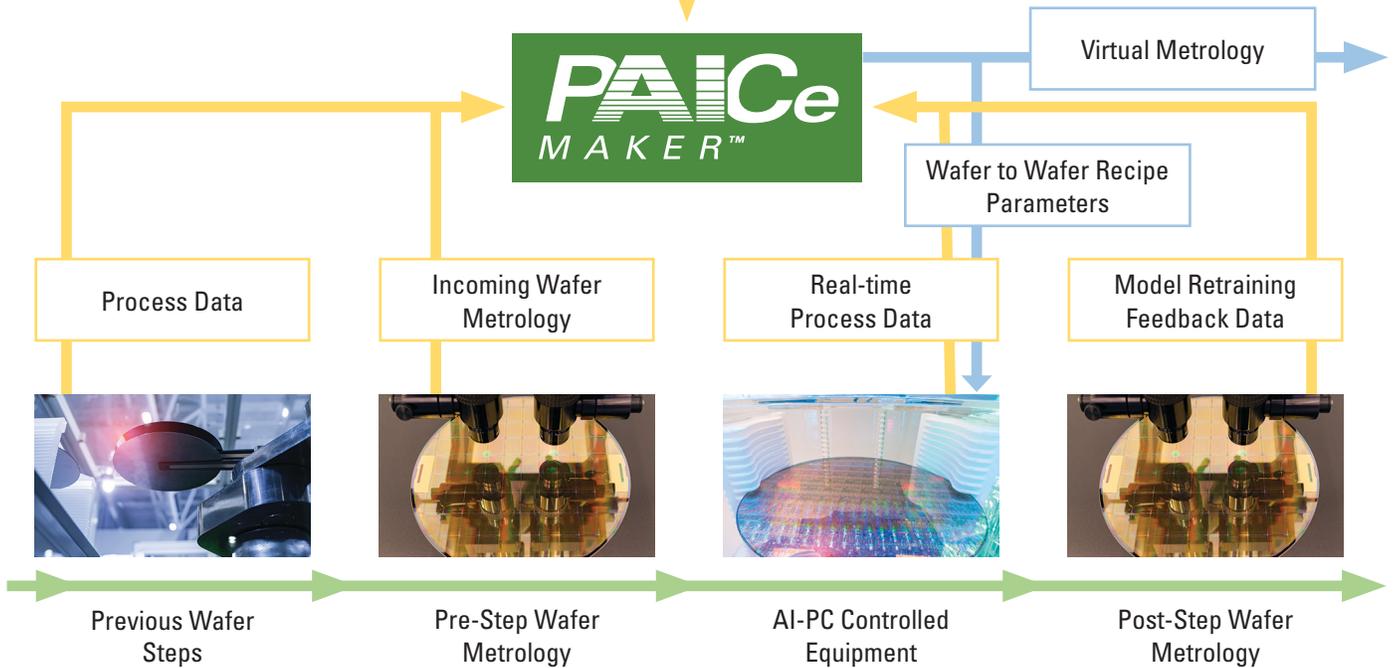
## PAICe Maker Flow Diagram

Tignis PAICe Maker constantly ingests vital process data and metrology, enabling it to continuously retrain and correct for process drift or any other process disturbances.


Physics Data on Process

Physics Knowledge of Process

### PAICe MAKER™

Virtual Metrology

Wafer to Wafer Recipe Parameters

| Process Data | Incoming Wafer Metrology | Real-time Process Data | Model Retraining Feedback Data |
|---|---|---|---|

Previous Wafer Steps

Pre-Step Wafer Metrology

AI-PC Controlled Equipment

Post-Step Wafer Metrology

**Legend**

Wafer Flow Path

PAICe Maker Data Ingestion

PAICe Maker Data Generation

## Tignis: Empowering Innovation

Actively working with the world's top semiconductor equipment manufacturers, Tignis also has a proven track record of empowering other large-scale mission-critical industries. Tignis solutions are deployed in hundreds of facilities worldwide. For more information, visit www.tignis.com.

info@tignis.com | (206) 745-9866