

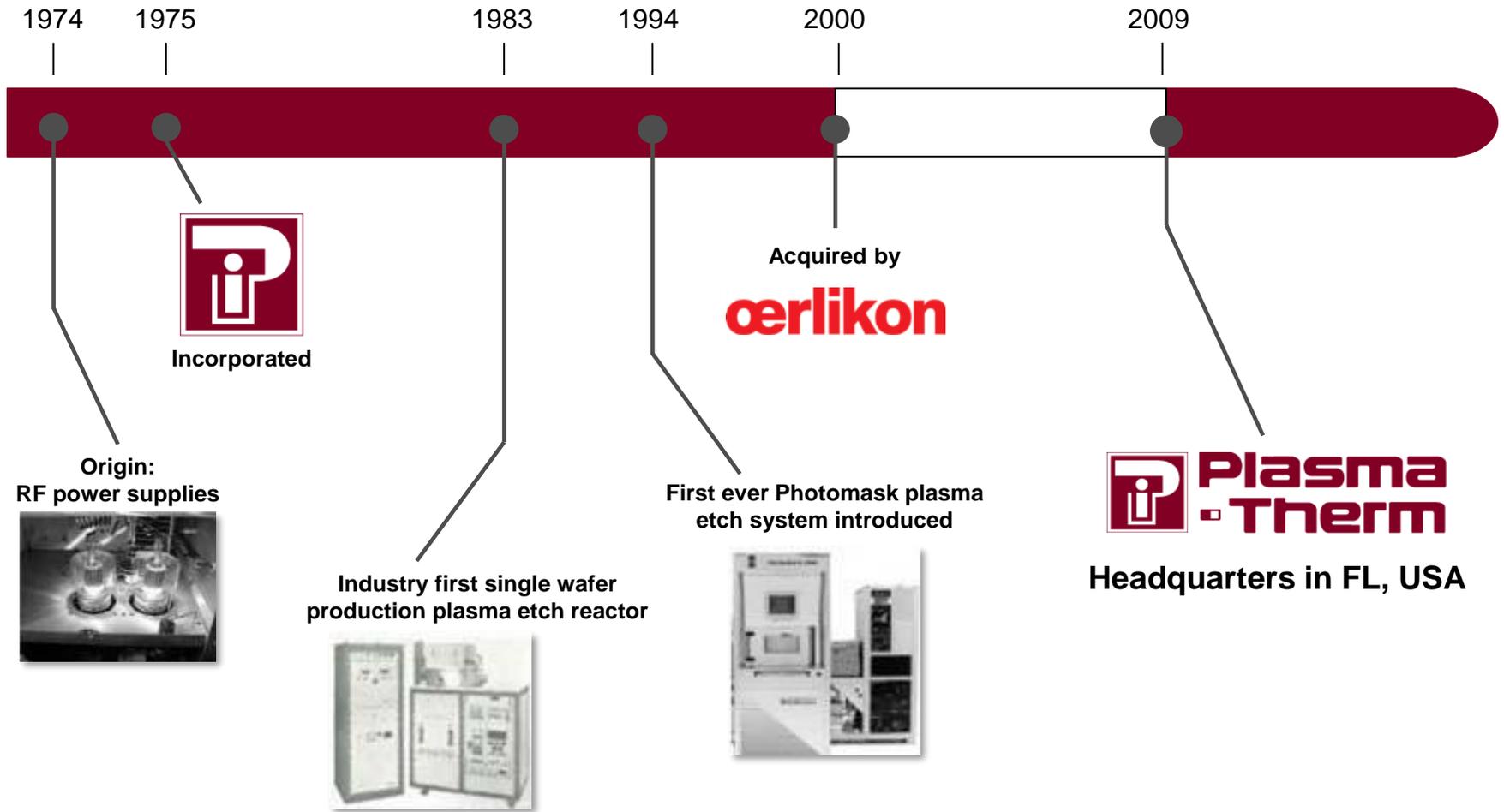


Technology Excellence for Specialty Markets

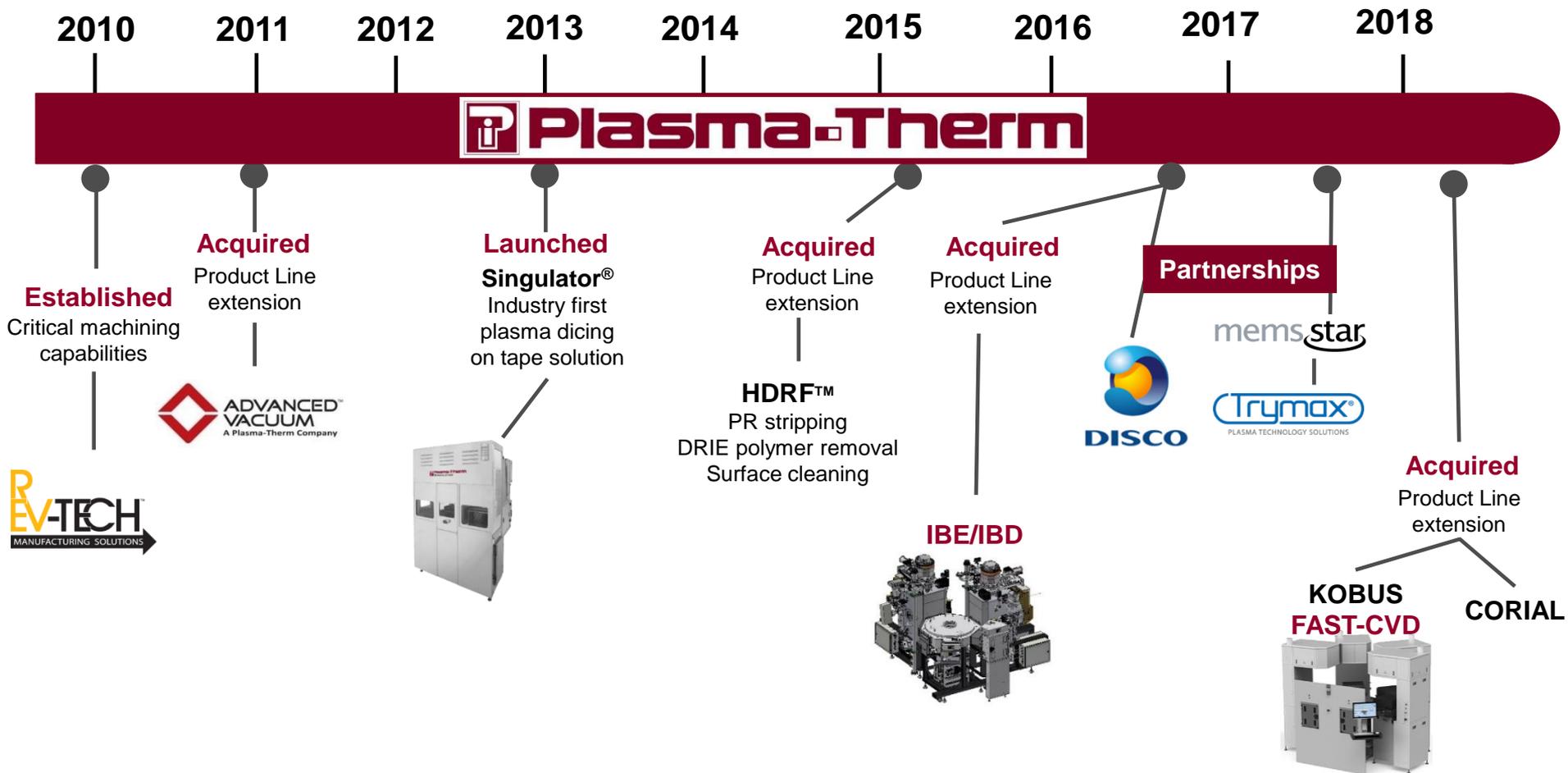
Corporate
Introduction



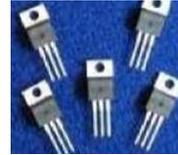
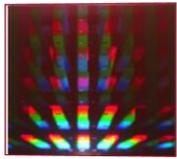
Long History of Success and Innovation



Continuing the Growth Path



Etch and Deposition Solutions Leveraged Across Markets



**Adv.
Photomask
&
Imprint**

Wireless

**Solid
State
Lighting**

Photonics

**MEMS
NEMS**

Power

**Data
Storage**

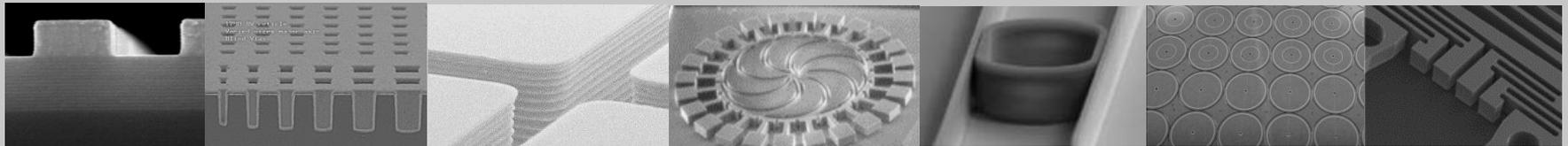
**Failure
Analysis**

R&D

Etch & Clean Solutions: ICP, RIE, PE, PHF-RIE, DRIE, HDRF, IBE, RIBE, HF release

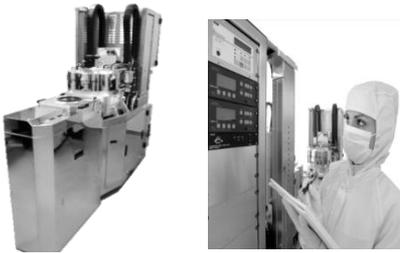
Deposition Solutions: PECVD, ICP-CVD, IBD, FAST-CVD

Plasma Dicing Solutions



Product, Process & Technology Innovation

VERSALINE®
Etch & Deposition



Navigator™ / Odyssey™
Stripping & Cleaning



Singulator®
Plasma dicing



LAPECVD™
Deposition

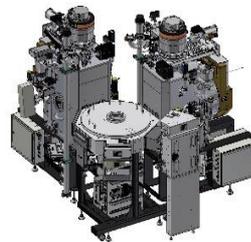


Etch, Clean & Deposition technologies

Kobus
Fast-CVD



Pinnacle™
Ion Beam Etch & Deposition



Corial & Vision
Etch & Deposition for R&D

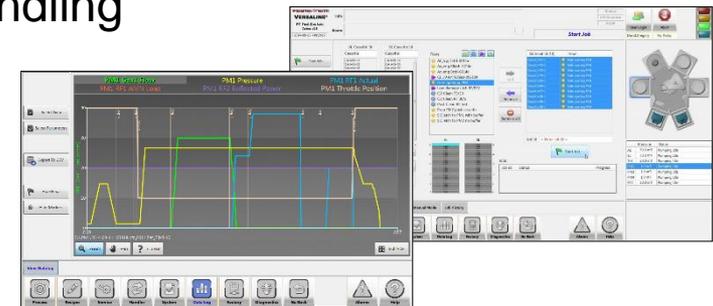


Mask Etcher®
Quartz, Cr, MoSi Etch

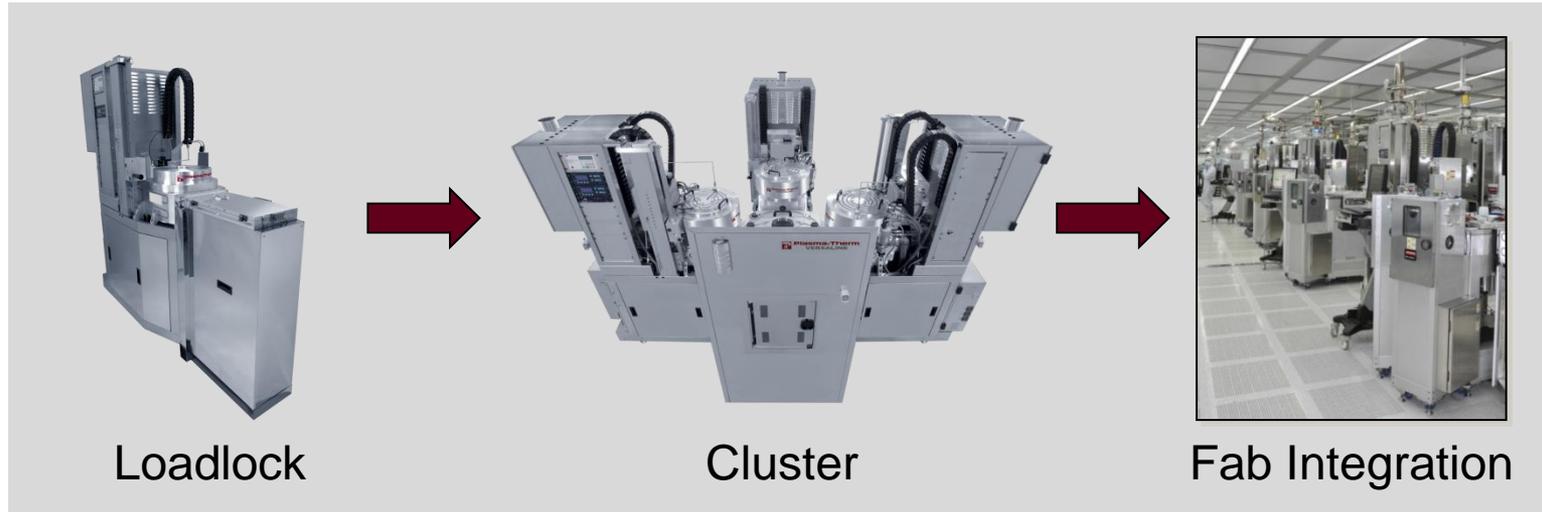


VERSALINE®

- Performance-leading, plasma etch and deposition system
 - Plasma technologies
 - Etch: ICP, RIE, DSE
 - Deposition: PECVD, HDPECVD, DLC-RIE
 - Broad application suite
 - >50 device materials supported
 - Versatile construction
 - Single-wafer or batch processing
 - Semi- to fully-automated substrate handling
 - Robust and field proven
 - Installed base of >350 chambers WW
 - R&D to production ratio: ~50/50
 - Feature rich
 - Best of breed components / benchmark software



Configuration Flexibility From Lab to Fab



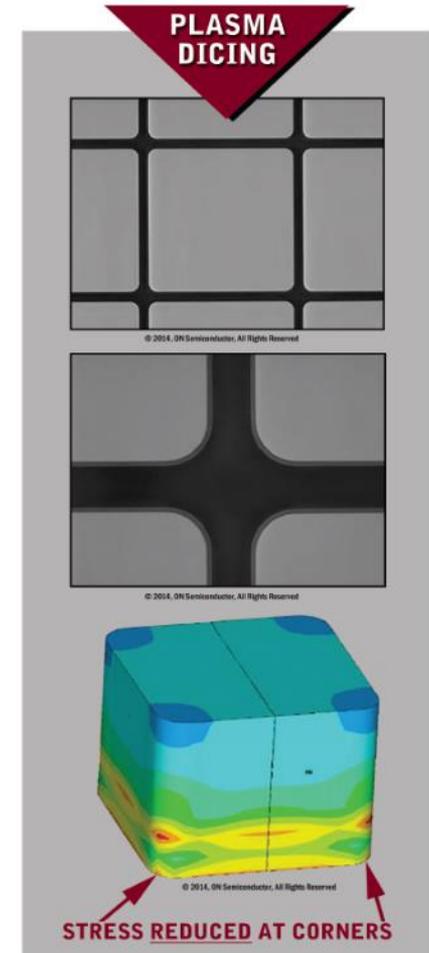
Single wafer



Cassette-to-cassette

Singulator[®]

- Plasma Dicing On Tape process (PDOT)
 - Industry standard tapes and frames
 - Superior die strength
 - No cracks, no chipping
 - No mechanical or thermal stress
 - No need for seal ring
 - No lateral damage
 - More die per wafer
 - Ultra-Narrow streets
 - Dice any shape
 - Round corners, hexagonal,
 - octagonal, round die, etc.
 - Accuracy
 - Same as lithography



KOBUS

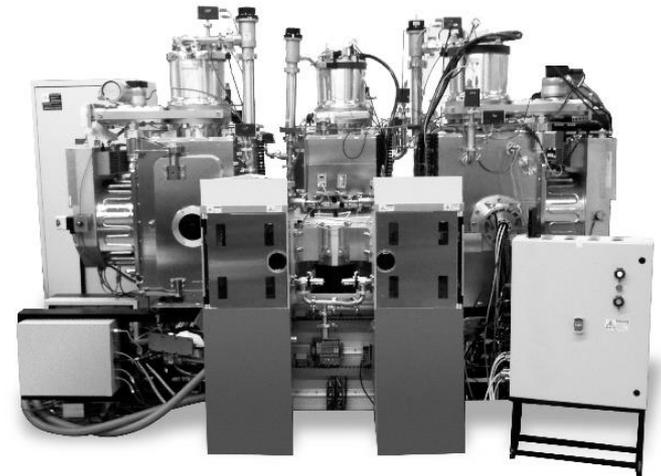
- **FAST-CVD** (Fast Atomic Sequential Technology)
 - ALD film performances at CVD speed
 - Advanced materials deposition : Oxides, Nitrides & Metals
 - Conformality engineering
- **PECVD**
 - Mature processes : Silane & TEOS based PECVD



	FAST	ALD	PECVD
Deposition rate	●	○	●
Process window	●	○	●
Conformality	●	●	○
Film quality	●	●	○
In-situ cleaning	●	○	●

Pinnacle™ & Quazar

- Planetary scanning Ion Beam Etch
 - Excellent uniformity < 0.6% (3σ) on 200mm wafer
- Standard Ion Beam Etching and Deposition technologies
 - Run to run repeatability < 0.75%
 - Source grids lifetime doubled versus competition
 - Higher throughput



Pinnacle™

HDRF Technology – Kayen & Odyssey™

- Patented HDRF plasma technology
- Low temperature resist stripping
- Deep Silicon Etch (Bosch) polymer cleaning



Kayen



Odyssey™
Single wafer or Cassette loading

Vision and Apex SLR



- Ideal for R&D and low volume production
- ICP, RIE, PERIE, PECVD, HDPCVD



Vision 300
Open load



Vision 400
Open load



Takachi ICP
Single wafer loading

CORIAL Etch and Deposition



- Ideal for R&D and low volume production
- ICP, RIE, PECVD, HDPCVD



CORIAL D250/D350L
Open load



CORIAL 210IL
Single wafer loading

Supporting Customers Worldwide Manufacturing & Innovation Sites



Supporting Customers Worldwide Sales, Service, and Spares warehouse



Partnership – at the heart of what we do



**#1 Etch Equipment Supplier for 8 years
with the highest score by any company – ever**

RANKED 1st

- Focused Suppliers of Chip Making Equipment
- Fab Equipment
- Suppliers of Fab Equipment to Specialty Chip Makers
- Etch & Clean Equipment

THE BEST

- Suppliers of Fab Equipment
- Suppliers of Fab Equipment to Specialty Chip Makers

10 BEST

- Focused Suppliers of Chip Making Equipment

(Plasma-Therm's 2019 VLSIresearch Customer Satisfaction Survey results)

Thank you

