领先的产品设计
优异的工艺性能
高效的生产能力

Innovative Design
Superior Performance
High Productivity



中微半导体设备（上海）股份有限公司
Advanced Micro-Fabrication Equipment Inc. China

AMEC Official Wechat

www.amec-inc.com

中微公司

证券简称： 中微公司　证券代码： 688012



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愿景 Vision

我们致力于开发微观加工的半导体设备，这些设备是数码时代的基础，而数码时代改变了人类的生产方式和生活方式。

We develop micro-fabrication equipment which is the foundation of the digital era that changes the way we work and live.

使命 Mission

中微致力于技术创新和产品的差异化；致力于持续开发一系列微观加工的设备，为客户和市场提供性能优越、高生产效率和高性价比的设备解决方案；并通过公司的持续发展回报股东和社会。

AMEC is committed to technology innovation and product differentiation, continually developing diverse micro-fabrication equipment that delivers high performance, high productivity and economic solutions for customers and market needs, while creating value for stakeholders and our society.



约 18万 m²
≈180,000m²
临港产业化基地
Lingang Industrialization Base



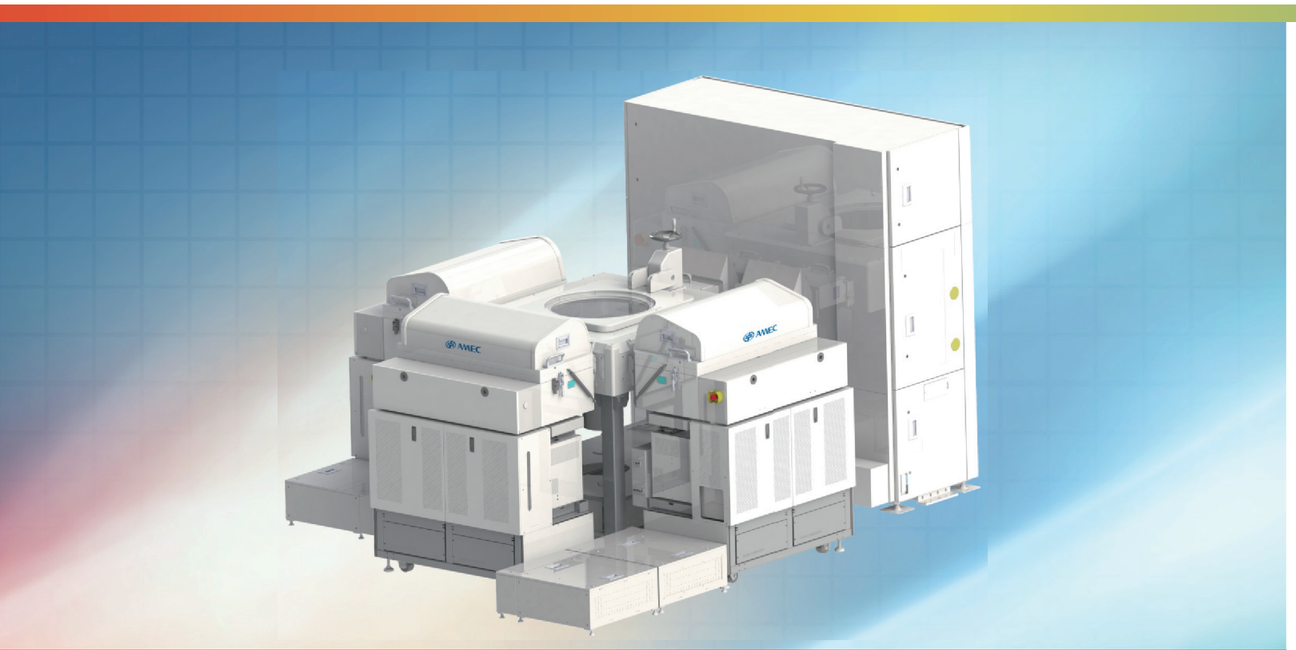
约 10万 m²
≈100,000m²
临港总部暨研发大楼
Lingang Headquarters and R&D Center



约 14万 m²
≈140,000m²
南昌产业化基地
Nanchang Industrialization Base

中微半导体设备(上海)股份有限公司(证券简称:中微公司，证券代码:688012)致力于为全球集成电路和LED芯片制造商提供领先的加工设备和工艺技术解决方案。中微公司开发的CCP高能等离子体和ICP低能等离子体刻蚀两大类、包括二十几种细分刻蚀设备已可以覆盖大多数刻蚀的应用。中微公司的等离子体刻蚀设备已被广泛应用于国内和国际一线客户，从65纳米到3纳米及更先进工艺的众多刻蚀应用，并已实现CMP湿法设备多种应用的覆盖。中微公司最近十年着重开发多种导体和半导体化学薄膜设备，如MOCVD、LPCVD、ALD、PVD、PECVD和EPI设备，并取得了可喜的进步。中微公司开发的用于LED和功率器件外延片生产的MOCVD设备早已在客户生产线上投入量产，并在全球氮化镓基LED MOCVD设备市场占据领先地位。此外，中微公司已全面布局光学和电子束量检测设备，并开发多种泛半导体微观加工设备，包括大平板显示设备等。这些设备都是制造各种微观器件的关键设备，可加工和检测微米级和纳米级的各种器件。这些微观器件是现代数码产业的基础，它们正在改变人类的生产方式和生活方式。在近五年的全球半导体设备客户满意度调查中，中微公司总评分四次获得第三，薄膜设备四次被评为第一。

AMEC (SSE STAR Market stock code: 688012) is China's leading provider of process technologies, tools and expertise which enable global manufacturers of semiconductors and LEDs to achieve their innovation, production, and profit goals. The CCP high-energy plasma and ICP low-energy plasma etching developed by AMEC, including more than ten types of segmented etching equipment, can cover most etching applications. The plasma etching equipment of AMEC has been widely used in domestic and international first-line customers, with numerous etching applications ranging from 65 nanometers to 3 nanometers and more advanced processes. The company has also achieved coverage of multiple applications for CMP wet-processing equipment. In the past decade, AMEC has focused on developing various conductor and semiconductor chemical thin film equipment, such as MOCVD, LPCVD, ALD, PVD, PECVD and EPI equipment, and has made remarkable progress. The MOCVD equipment developed by AMEC for the production of LED and power device epitaxial wafers has already been put into mass production on the customer's production line and occupies a leading position in the global gallium nitride based LED MOCVD equipment market. In addition, AMEC has also fully deployed its strategic layout optical and electron beam detection equipment, and developing various semiconductor microfabrication equipment including flat panel equipment etc. These devices are key equipment for manufacturing various microscopic devices, capable of processing and detecting various devices at the micrometer and nanometer levels. These microscopic devices are the foundation of the modern digital industry, and they are transforming the way humans produce and live. In the past few years, AMEC has ranked third in the overall score four times in the global semiconductor equipment Customer Satisfaction Survey, with its thin—film equipment being rated first four times.



为65到16纳米芯片制造提供创新的刻蚀解决方案
Innovative solutions for semiconductor device fabrication at 65nm to 16nm nodes

Primo D-RIE®

作为中微第一代电介质刻蚀产品，Primo D-RIE®是12英寸双反应台多反应腔主机系统，可灵活装置多达三个双反应台反应腔（六个反应台）。每个反应腔都可以同时加工两片晶圆。该设备运用了中微具有自主知识产权的创新技术，包括甚高频和低频混合射频去耦合反应等离子体源、等离子体隔离环、以及用于控制腔体内反应环境的先进工艺组件。Primo D-RIE刻蚀设备可用于加工包括氧化硅、氮化硅及低介电系数膜层等所有的电介质材料。Primo D-RIE于2007年发布之后，由于其较低的生产成本、较高的生产效率和卓越的芯片加工性能，已在国际主流芯片生产线上投入量产。

The Primo D-RIE® system, AMEC' s first-generation dielectric etch product, is a 300mm cluster tool that can be configured with up to three dual-station process modules (PM). Each PM allows two wafers to be processed simultaneously. The product utilizes AMEC' s proprietary decoupled VHF and LF RF system plasma source, FEIS ring plasma confinement, and advanced kits to control the processing chamber environment. The Primo D-RIE system was designed for etch applications for all dielectric film stacks, including Silicon Oxide, Silicon Nitride and Low-k materials. Since its launch in 2007, Primo D-RIE has been deployed in leading fabs worldwide for its cost effectiveness and high performance in mass production.

产品特点
Product Features

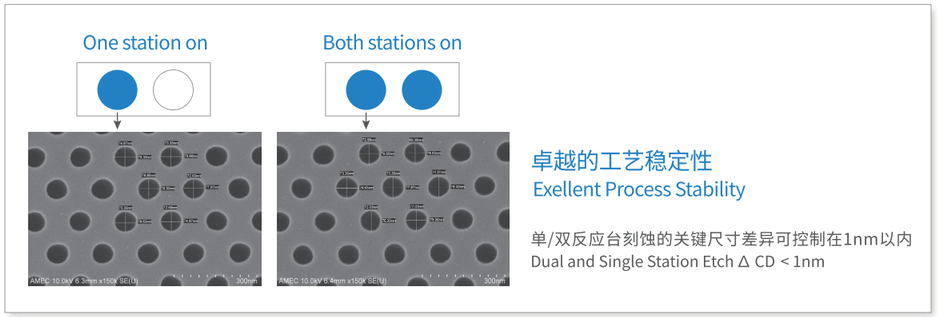
- 双反应台腔体设计具有更高的产出效率
- 双反应台独立射频系统和刻蚀终端控制系统
- 拥有自主知识产权的射频匹配系统
- 拥有自主知识产权的等离子体隔离技术

- Dual-station chamber design with more effective throughput
- Independent process station RF system (bottom HF and LF) and end-point control systems
- Proprietary RF match system
- Proprietary plasma-confinement technology

竞争优势
Competitive Advantages

- 高生产效率，低生产成本（CoO）
- 设备占地面积小
- 一体整合的除胶能力及表面电荷减除能力（Primo iDEA®系统）

- High throughput with low cost of ownership (CoO)
- Small footprint
- Integrated strip capability and surface charge reduction capability (Primo iDEA® System)



卓越的工艺稳定性
Exellent Process Stability

单/双反应台刻蚀的关键尺寸差异可控制在1nm以内
Dual and Single Station Etch Δ CD < 1nm



为芯片刻蚀和光刻胶移除提供创新的整合解决方案
Innovative interaged solutions for etch and photo-resist removal

Primo iDEA®

Primo iDEA® (即“双反应台刻蚀除胶一体机”)源于中微的一个新理念，即:将一个或两个双反应台D-RIE或AD-RIE工艺模块、和一个远程等离子体源除胶器(DsA)反应腔整合在同一个平台上。中微的远程等离子体源除胶器采用了双反应台腔体设计，顶置的远程等离子体源(RPS)产生的活性反应物质，被均匀地输送到晶圆表面以移除光刻胶。这种方法能够提高光刻胶移除效率，并降低等离子体直接接触晶圆的机会。这对于一些客户来说尤为重要，其芯片器件对表面电荷极其敏感，存在等离子体诱发损伤(PID)的潜在风险。为了解决这方面的顾虑,客户通常要付出巨大的人力和物力修改整合方案，或者为每个步骤(例如光刻胶移除)添置专用设备。拥有Primo iDEA整合系统后，客户可以在同一个平台上灵活地进行芯片刻蚀和光刻胶移除，显著减少设备占地面积，提高生产效率。Primo iDEA提供了极具成本优势的解决方案。

iDEA stands for “integrated Dual-station Etch and Asher”. It represents a new concept developed by AMEC that integrates one or two dual-station D-RIE or AD-RIE process modules with a DsA (“Downstream Asher”) chamber on the same platform. AMEC’s DsA design is a dual-station chamber that utilizes a top-mounted remote plasma source (“RPS”) to create reactive species that are then uniformly delivered to the wafer surface for photo-resist removal. This approach not only effectively removes the photo-resist material, but also offers less direct plasma exposure to the wafer. This is important for customers running devices that are highly sensitive to surface charge build-up and potential risk of plasma-induced damage (PID). Avoiding PID can involve exhaustive and expensive efforts to modify integration schemes or add dedicated machines for steps such as photo-resist removal. The fully integrated Primo iDEA® system offers a cost-effective solution to perform etch processing and dedicated photo-resist removal within the same platform.

产品特点
Product Features

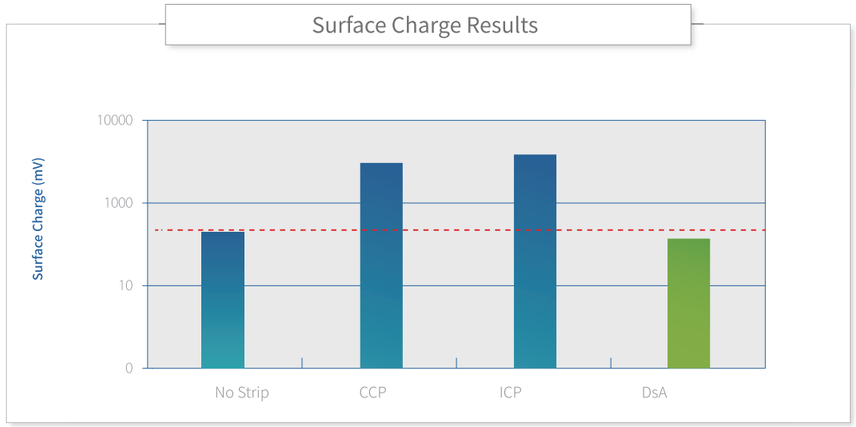
- 远程等离子体源
- 高效率除胶
- 高效离子隔滤，以避免对器件造成等离子体诱发损伤

- Remote plasma source Asher
- High photoresist removal rate
- Preventing plasma induced damage (PID)

竞争优势
Competitive Advantages

- 双反应台刻蚀与除胶整合一体机，显著减小占地面积
- 使用Primo iDEA®系统设计以代替单独的刻蚀和除胶系统，节省成本20%以上

- Small footprint with Asher and process chamber integrated system
- 20% CoO savings by using Primo iDEA® system design instead of separate individual tools





为40到5纳米芯片制造提供创新的刻蚀解决方案
Innovative solutions for semiconductor device fabrication at 40nm to 5nm nodes

Primo AD-RIE®

Primo AD-RIE®是中微第二代电介质刻蚀产品。基于已被认可的Primo D-RIE®刻蚀设备，Primo AD-RIE应用了具有自主知识产权的新设计，配备了可切换双低频射频源，优化了上电极气流分布以及下电极温控系统。为了使生产效率最大化，Primo AD-RIE系统同样可以灵活地装置多达三个双反应台反应腔（即六个反应台）。Primo AD-RIE具备能够满足最新一代芯片器件制造需求的先进性能，目前已被广泛应用于40到14纳米后段制程。

此外，中微基于Primo AD-RIE开发了子系列产品Primo AD-RIE-e和Primo AD-RIE-cr。Primo AD-RIE-e配备了自主研发的四区动态静电吸盘，每一制程步骤可独立进行控温，以达到更高的刻蚀均匀度和刻蚀选择比，目前已应用于5纳米前段和中段的掩膜层刻蚀的开发及量产。Primo AD-RIE-cr配备了拥有自主知识产权涂层技术的抗腐蚀反应腔，可应对电介质材料、金属及金属氧化物材料复杂结构的刻蚀要求。

The Primo AD-RIE® system is AMEC' s second-generation dielectric etch product. Built upon the proven D-RIE architecture, the system embodies new proprietary designs featuring advanced capabilities such as switchable dual-low-frequency RF generators, multi-zone gas distribution, and dual-chiller temperature control system. To maximize productivity, the AD-RIE system employs a cluster tool design that can be configured with up to three dual-station process modules (or six processing stations) per system. The AD-RIE product delivers the advanced capabilities for new generation IC device manufacturing requirements. Today' s customers are running the tool for 40-14nm BEOL applications.

Furthermore, AMEC developed Primo AD-RIE series: Primo AD-RIE-e and Primo AD-RIE-cr. Primo AD-RIE-e is configured with step-by-step temperature control 4-zone dynamic ESC, which helps improve etch uniformity and selectivity with wider process window. The tool has been used for R&D and mass production of mask etching for 5nm FOEL as well as MOL applications. The Primo AD-RIE-cr features corrosion resist chamber with AMEC' s proprietary surface coating technology, which offers solutions for dielectric, metal and metal oxide complicated structure etch.

产品特点
Product Features

- 双反应台腔体设计具有更高的产出效率
- 双低频功率切换系统，用于制程分步骤优化
- 脉冲射频系统选项
- 多区气体分配调节系统
- 静电吸盘双区冷却装置
- 低金属污染工艺组件选项
- 每一步骤可独立进行控温的四区动态静电吸盘（Primo AD-RIE-e）
- 拥有自主知识产权涂层技术的抗腐蚀反应腔（Primo AD-RIE-cr）
- 一体整合的除胶能力及表面电荷减除能力（Primo iDEA®系统）

- Dual-station chamber design with more effective throughput
- Switchable bias RF system for by-step recipe control
- Pulsing RF system as option
- Multi-zone gas distribution system
- Dual zone ESC for temperature control
- Process kits with low metal contamination asoption
- Dynamic ESC option for step-by-step temperature control (Primo AD-RIE-e)
- Corrosion resist chamber with proprietary surface coating technology (Primo AD-RIE-cr)
- Integrated strip capability and surface charge reduction capability (Primo iDEA® System)

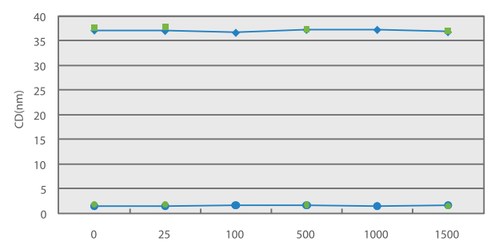
竞争优势
Competitive Advantages

- 双低频功率分步骤切换系统，以适用于更广的制程范围（特别是Trench/Via All-in-one制程）
- 卓越的工艺可调性和稳定性，以满足先进工艺标准
- 高生产效率，低生产成本（CoO）
- 扩展机型Primo AD-RIE-e, Primo AD-RIE-cr 和 Primo iDEA®，可应用于不同特殊制程

- In-situ high-and-low bias-frequency switch system, for wider process window (especially Trench/Via All-in-one applications)
- Excellent process control, tunability and stability for critical processing criteria
- High throughput and low cost of ownership (CoO)
- Primo AD-RIE series for various typical applications: Primo AD-RIE-e, Primo AD-RIE-cr and Primo iDEA®

Pattern Wafer Result (nm)	Burn-in Wafer Counts (per station)											
	0		25		100		500		1000		1500	
	PMA1	PMA2	PMA1	PMA2	PMA1	PMA2	PMA1	PMA2	PMA1	PMA2	PMA1	PMA2
CD (T25%)	37.1	37.6	37.0	37.8	36.7	n.a	37.3	37.3	37.2	n.a	36.8	37.1
3 sigma	1.5	1.8	1.5	1.8	1.7	n.a	1.7	1.8	1.5	n.a	1.6	1.5

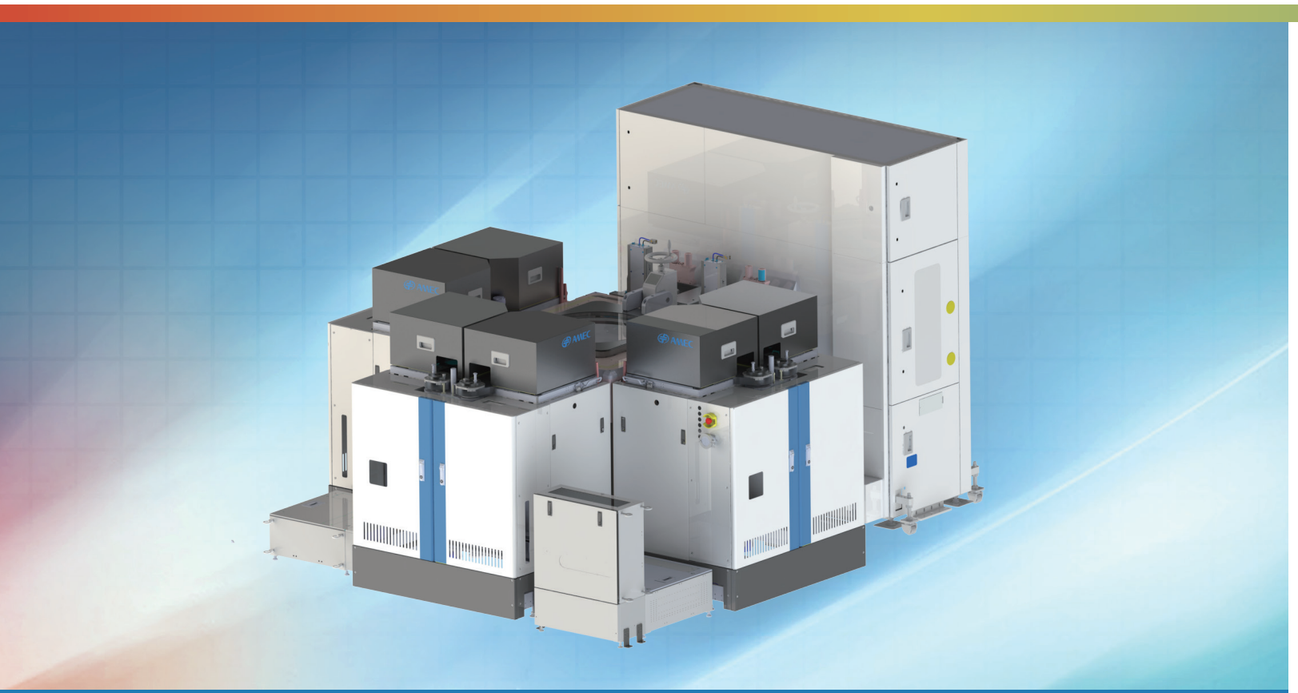
CD and CD Uniformity (3 sigma)



卓越的关键尺度刻蚀均匀度 3 sigma < 1.8纳米

Burn-in Wafer Counts（Per Station）

	CD-A1	CD-A2	CDU-A1	CDU-A2
0	37.13	37.59	1.48	1.82
25	37.04	37.75	1.54	1.78
100	36.67		1.66	
500	37.25	37.29	1.7	1.75
1000	37.24		1.53	
1500	36.8	37.1	1.62	1.52



低成本高产出的12英寸晶圆边缘干法刻蚀解决方案
Wafer bevel dry etching solution for logic and memory chips manufacturing, delivering high output density with low cost-of-ownership (CoO)

Primo Halona®

Primo Halona® 是中微自主研发的12英寸晶圆边缘干法刻蚀设备，采用独特的双反应台设计，可灵活配置最多三个双反应台刻蚀腔体，每个腔体可同时加工两片晶圆，显著提升了产出效率并降低了生产成本。腔体采用抗腐蚀材料，可耐受常见卤素气体侵蚀，满足中后段（MOL/BEOL）晶圆边缘刻蚀的量产需求。Primo Halona® 设备配备自对准上腔体设计，大幅提高上下极板的对中精度与平行度，减少校准维护停机时间。此外，Primo Halona® 可选装集成量测模块，支持在线检测，进一步优化工艺稳定性。

The Primo Halona® is a 12-inch wafer bevel dry etching system independently developed by AMEC. Featuring a unique dual-station design, the system can be configured with up to three dual-station process chambers, each capable of processing two wafers simultaneously, delivering higher throughput and lower production costs. The corrosion-resistant chamber materials withstand common halogen gases, meeting mass production requirements for MOL/BEOL wafer bevel etching applications. Equipped with a self-aligned upper chamber design, the system significantly improves alignment accuracy and parallelism between electrodes, minimizing downtime for calibration and maintenance. An optional integrated metrology module supports real-time in-line inspection, enhancing process stability and repeatability.

产品特点
Product Features

- 双反应台腔体设计，搭配Quadra-arm机械臂
- 抗腐蚀腔体材料，满足后段工艺需求
- 自对准上腔体设计，提升对中精度与平行度
- 可选集成量测模块，实现在线检测

- Dual-station process chamber with Quadra-arm robot
- Corrosion-resistant chamber materials for BEOL compatibility
- Self-aligned upper chamber design for enhanced alignment accuracy and parallelism
- Optional integrated metrology module for in-line monitoring

竞争优势
Competitive Advantages

- 更低的机台成本（CoO）
- 更高的产出密度与生产效率
- 易维护设计

- Lower cost-of-ownership (CoO)
- Higher output density and throughput
- Maintenance-friendly design



为NAND和DRAM芯片制造提供创新的刻蚀解决方案
Innovative solutions for NAND and DRAM semiconductor device fabrication

Primo HD-RIE®

Primo HD-RIE® 是中微于2015年推出的新一代电介质刻蚀产品，是在Primo SSC AD-RIE® 设计基础上实现的具有六个单反应台腔体的系统，定位于为中高深宽比刻蚀提供综合解决方案。该设备具有以下新特性:更高的同步脉冲射频功率、高功率高温静电托盘、气体脉冲、多区气体调节、可冷却聚焦环工艺组件和更稳定的上电极温度控制等。Primo HD-RIE在3D NAND及DRAM中高深宽比沟槽及深孔刻蚀上表现优异，在一些关键制程上已实现量产。

The Primo HD-RIE® system is AMEC' s latest-generation dielectric etch product, launched in 2015. Based on Primo SSC AD-RIE® platform with six etch processing stations capability to maximize productivity, the tool is designed to provide comprehensive solutions for middle and high aspect ratio (HAR) structure etch. New features include: High power synchronized RF pulsing, high power and high temperature ESC, gas pulsing, multiple-zone gas distribution, cooled focus ring process kits and enhanced lid temperature control. Primo HD-RIE has superb performance in middle and high aspect ratio (HAR) etch for 3D NAND and DRAM applications. The tool has already been used for critical applications in mass production.

产品特点
Product Features

- 具有独立气体输运系统的单反应台腔体设计
- 多区气体调节以及双区ESC温度控制
- 高功率以及高温静电吸盘
- 气体脉冲
- 双级同步脉冲射频系统，甚高功率的低频射频脉冲以提供高离子轰击能量
- 稳定的上电极温度控制系统
- 可冷却聚焦环以防止硅片边缘刻蚀停止
- 高上下电极面积比，以应用于中高深宽比刻蚀

- Dedicated gas delivery and pumping for each processing station
- Multi-zone gas feed and dual-zone ESC temperature control
- High power and high temperature ESC
- Gas pulsing system
- Synchronized dual-level RF pulsing (bias and source) with high bias power to enhance ion energy
- Stable lid temperature control
- Cooled focus ring process kit option for prevention of wafer extreme-edge etch unopen
- High upper/lower electrode area ratio for middle and high aspect ratio (HAR) structure etch

竞争优势
Competitive Advantages

- 高电介质材料刻蚀速率，多手段刻蚀均匀度调节
- 高粒子轰击能量，以扩大高深宽比刻蚀工艺窗口
- 气体脉冲系统，提供更灵活的工艺控制方案
- 应对特殊工艺的高温高功率静电吸盘选项

- High dielectric material etch rate, multiple functions for etch uniformity tuning
- High power synchronized dual-level RF pulsing, high ion energy to enlarge process window
- Gas pulsing system with flexible process control and enlarged process window
- High power and high temperature ESC



用于存储器件高深宽比刻蚀工艺的电容耦合等离子体刻蚀机
CCP etcher for high aspect ratio (HAR) dielectric etch applications in memory device fabrication

Primo UD-RIE®

Primo UD-RIE®是中微公司基于完全自主的知识产权开发的12英寸高端电容耦合等离子体（CCP）刻蚀机。针对存储器件制造中最关键的高深宽比介质刻蚀工艺，Primo UD-RIE® 配备了具备多级脉冲功能的超低频大功率射频系统，有效提高离子能量和准直性；强化了上电极冷却和加热设计，并采用耐高击穿电压的静电吸盘满足大射频功率下的工艺需求；可实现实时温度切换和分区冷却的下电极在扩大工艺窗口的同时提升晶圆边缘刻蚀表现；优化的腔体涂层适配新型腐蚀性刻蚀气体，有效扩大工艺窗口。Primo UD-RIE® 还配备了中微公司首创的主动边缘阻抗调节系统，突破了传统的晶圆边缘等离子体壳层的调节方式，极大地提升了设备的量产性能。Primo UD-RIE®可配置最多六个单反应台刻蚀反应腔和两个去胶反应腔，为高深宽比刻蚀提供灵活的解决方案。Primo UD-RIE® 在存储器件制造中的高深宽比深孔及沟槽刻蚀上表现优异，已经在先进生产线实现大规模量产。

Primo UD-RIE® is a high-end capacitive coupled plasma (CCP) etch system developed by AMEC based on its own IP. Specifically designed for the most critical high aspect ratio (HAR) dielectric etching process for memory device fabrication, Primo UD-RIE® features:
• Ultra low frequency, high-power RF system with multi-level pulsing function, effectively enhanced ion energy and directionality
• Improved upper electrode cooling and heating design, along with an electrostatic chuck (ESC) resistant to high voltage to meet high RF power process requirement
• Real time temperature switch enabled lower cathode with active by-zone temperature control (ATC) function , which improve etching performance at extreme edge of wafer and improve productivity
• Optimized chamber coating compatible with novel corrosive etching gases, significantly widening the process window
Primo UD-RIE® adopts AMEC's pioneering active edge impedance tuning (AEIT) system. This technology for wafer edge plasma sheath control substantially enhance the tool's production performance.
The system can be configured with maximum six single wafer etch reaction chambers and two photoresist strip chambers, providing flexible solutions for HAR etching.
Primo UD-RIE® delivers superior performance in HAR etch for memory device manufacturing and has achieved large scale mass production in most critical applications.

产品特点
Product Features

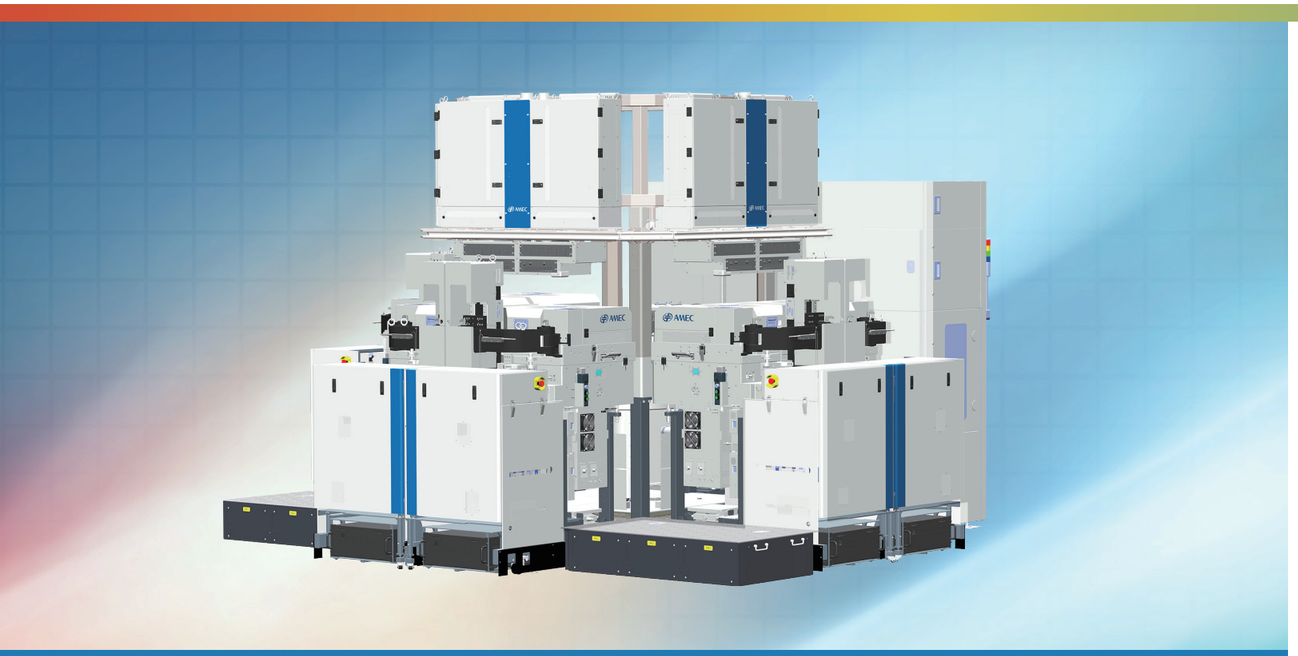
- 具备多级脉冲功能的超低频大功率射频系统
- 强化设计的上电极加热和冷却
- 耐高击穿电压的静电吸盘
- 可实时温度切换和带分区冷却功能的下电极
- 业内首创的主动边缘阻抗调节系统
- 可选的集成去胶反应腔

- Ultra low frequency high power with multi-level pulsing RF system
- Enhanced upper electrode heating and cooling
- High breakdown voltage electrostatic chuck (ESC)
- Real time temperature switch enabled lower cathode with by-zone cooling
- Active edge impedance tuning (AEIT) system
- Optional integrated photo resist strip chambers

竞争优势
Competitive Advantages

- 高离子能量及准直性，提高孔内刻蚀速率及刻蚀形貌控制
- 工艺调节手段多样，扩大高深宽比刻蚀工艺窗口
- 优异的高深宽比刻蚀重复性和稳定性
- 应对特殊工艺气体的防腐蚀工艺组件

- Ion with high energy and good directionality to provide high etch rate and superior profile control
- Multiple tuning knobs to enlarge HAR etch process window
- Excellent HAR etch repeatability and stability
- Anti-corrosive chamber for special process gases



用于极高深宽比刻蚀的电容耦合等离子体刻蚀机
High Aspect Ratio CCP Etcher

Primo XD-RIE™

Primo XD-RIE™ 是中微公司自主研发的全新一代的极高深宽比电容耦合等离子体 (CCP)刻蚀机。针对存储器制造中最关键的超高深宽比介质刻蚀工艺，Primo XD-RIE™采用全新 “低温室效应“气体架构，在保障刻蚀工艺性能的同时，有效降低温室气体排放。设备搭载超低温刻蚀系统、具备多级脉冲功能的大功率射频电源，搭配可调波形大功率直流偏压电源，全方位优化刻蚀精度与刻蚀效率，大幅拓宽工艺适配窗口。同时耐低温、高击穿电压的高性能静电吸盘，业内首创的4区镜像磁场等离子体分布调节组件与等离子体边缘鞘层主动调节技术，结合耐强腐蚀性气体的专用腔体结构，能够适配极端、高精度的严苛工况，保障设备长期稳定、高效运行，大幅提升量产可靠性。
Primo XD-RIE™ 最多搭载6个单反应台反应腔和两个去胶反应腔，为先进存储器件制造中的极高深宽比刻蚀提供解决方案。

Primo XD-RIE™ is a brand new capacitive coupled plasma (CCP) etch system developed based on AMEC IP, targeting the most critical high aspect ratio dielectric etching process in most advance memory device fabrication, Primo XD-RIE™ features:Novel chemistry (low global warming potential) for faster in hole etching rate and environment friendly. Cryogenic etching system, tailored rapid edge pulsing high voltage bias and high RF power system with multi-level pulsing function, which enhance process window significantly. 3D magnet field plasma tuning and active edge impedance tuning (AEIT) system, which improve productivity for mass production.
Primo XD-RIE™ can be configured with maximum six process chambers and two photoresist strip chambers, providing solutions for HARC etching for most advanced memory device manufacturing.

产品特点
Product Features

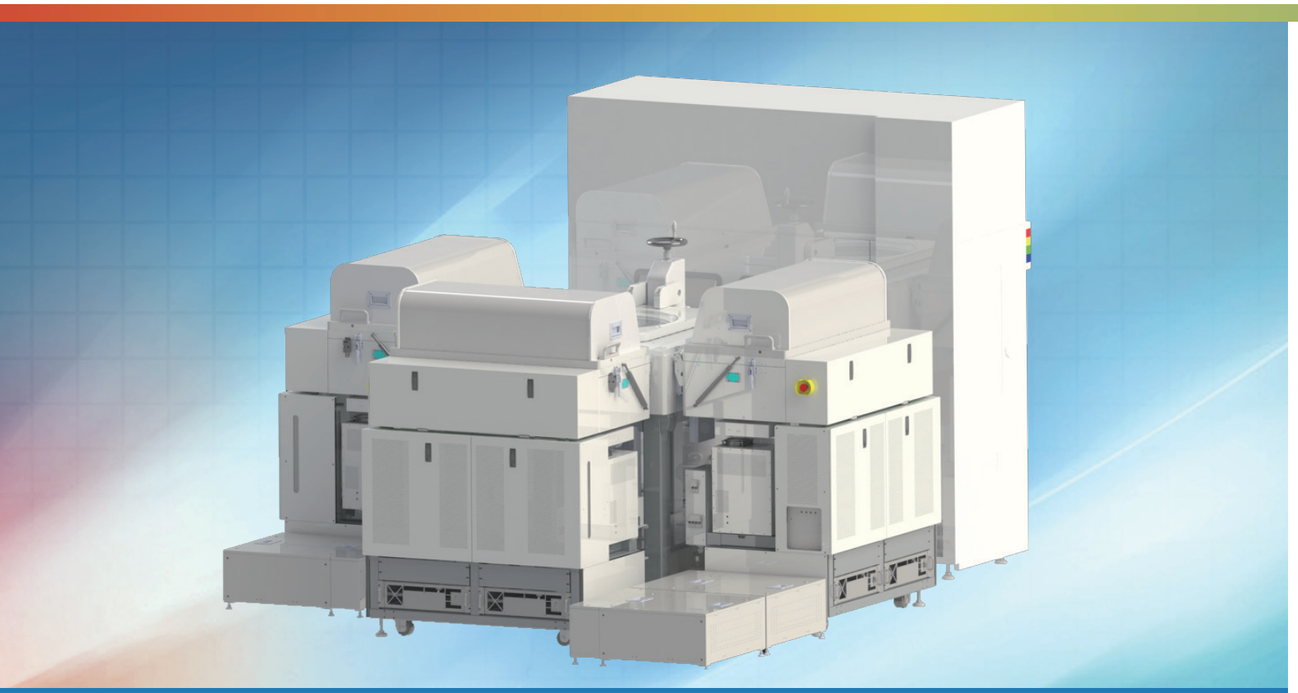
- 全新的刻蚀气体
- 可调波形大功率直流偏压电源
- 4区镜像磁场等离子体分布调节组件
- 耐低温、高击穿电压的高性能静电吸盘
- 等离子体边缘鞘层主动调节技术
- 耐强腐蚀性气体的大流导腔体结构

- Novel chemistry with low GWP
- Tailored Rapid Edge Pulsing high voltage bias system
- Multiple zone 3D Magnet field plasma tuning
- Cryogenic ESC with high breakdown voltage
- Enhanced edge engineering enable active wafer edge control
- Anti-corrosive and high flow conductance chamber architecture

竞争优势
Competitive Advantages

- 全新“低温室效应“气体架构，在保障刻蚀工艺性能的同时，有效降低温室气体排放
- 高离子能量及准直性，优化刻蚀精度与刻蚀效率
- 镜像磁场灵活调节等离子体分布，边缘主动阻抗调节系统精准控制晶圆边缘鞘层
- 耐强腐蚀性气体的大流导腔体结构，有效扩大工艺窗口

- Novel Chemistry for faster in-hole etching rate and environment friendly
- Ion with high energy and better directionality for better profile control
- 3D Magnet field plasma tuning, active wafer edge plasma sheath control
- Enhance anti-corrosive chamber design with high flow conductance



为功率器件、逻辑芯片和存储芯片等应用提供的高性价比的刻蚀解决方案
Most advanced dual-station CCP etcher on the market to achieve high process performance and low manufacturing cost for power device, logic and memory devices.

Primo AD-RIE® 200

Primo AD-RIE®200 是中微第二代电介质刻蚀产品。Primo AD-RIE®200 应用了具有自主知识产权的新设计，配备了高低频三频射频源，其中 2M/13M 可选，设备还采用了可实现双区温控的静电吸盘，使加工出的集成电路器件的关键尺寸达到高度均匀性。反应腔内部为实现低金属污染优化了腔室配件。为了优化生产效率，Primo AD-RIE®200 系统可以灵活地装配多达三个双反应腔（即六个反应台）。Primo AD-RIE®200 刻蚀设备可用于加工包括氧化硅、氮化硅及低介电系数膜层等的电介质材料。具备能够满足新一代芯片器件制造需求的先进性能，同时满足客户对于高性能和高性价比的需求。

Primo AD-RIE®200 is the second-generation dielectric etching product of AMEC. The Primo AD-RIE®200 adopts a new design with independent intellectual property rights, equipped with a high and low frequency with three band RF, with 2M/13M optional, The ESC has dual-zones with independent and temperature setting which enhances uniformity performance for CD control. The internal components of the reaction chamber have been optimized to achieve low metal pollution. In order to optimize production efficiency, it is a cluster tool which can be configured with up to three dual-station chambers (6 stations). The Primo AD-RIE® 200 etching equipment can be used to process dielectric materials including silicon oxide, silicon nitride, and low-K film layers. The Primo AD-RIE®200 product delivers the advanced capabilities for new generation IC device manufacturing requirements. Simultaneously meeting the needs of customers for high performance and cost-effectiveness.

产品特点
Product Features

- 双反应台腔体设计具有更高的产出效率
- 三频射频馈入
- 气体分配调节系统
- 静电吸盘双区冷却装置
- 低金属污染工艺组件选项
- 2管调节气体

- Dual-station chamber design with more effective throughput
- 2/13MHz Switchable and 60MHz
- Gas distribution system
- Dual zone ESC for temperature control
- Low metal pollution process component options
- 2 tuning gas

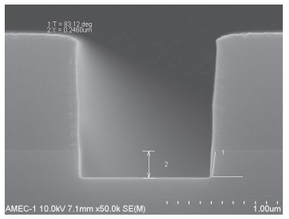
竞争优势
Competitive Advantages

- 离子浓度和离子能量独立可控
- 卓越的工艺可调性和稳定性，以满足先进工艺标准
- 优良的刻蚀均匀性
- 高生产效率，低生产成本（CoO）

- More independent ion energy and ion density controllability
- Excellent process control, tunability and stability for critical processing criteria
- Excellent etch uniformity
- High throughput and low cost-of-ownership (CoO)

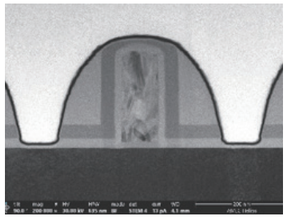
多种不同应用的Primo AD-RIE® 200刻蚀结果
Primo AD-RIE® 200 Etch Results for Various Applications

Power Device



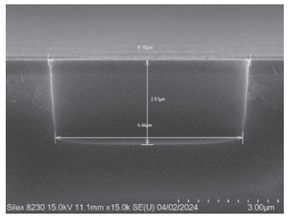
Hard Mask Open

Logic



Spacer Etch

MEMS



SiN/Poly



为功率器件、逻辑芯片和存储芯片等应用提供高性价比的刻蚀解决方案
Cost-effective etch solution for FEOL/BEOL conductive/dielectric film etch applications for IC devices

Primo Twin-Star®

Primo Twin-Star®是中微基于电感耦合(ICP)技术研发的12英寸刻蚀设备。它可以配置多达三个具有双反应台的刻蚀反应腔和两个可选的除胶反应腔。每个刻蚀反应腔可同时加工一片或两片晶圆并取得高度均匀和一致的结果。ICP发射天线采用了中微具有自主知识产权的低电容耦合3D线圈设计，可实现对离子浓度和离子能量的高度独立控制。设备还采用了可实现多区动态温控的静电吸盘，使加工出的集成电路器件的关键尺寸达到高度均匀性。反应腔内部涂有高致密性、耐等离子体侵蚀材料，以获得更高的工艺重复性和生产率。Primo Twin-Star® 适用于各种尺寸和深度的硅结构刻蚀以及逻辑和存储芯片的多种导体和介质薄膜刻蚀。此外，该产品和单反应台腔体相比还具有明显的低成本优势。

The Primo Twin-Star® system is AMEC's advanced 300mm etch product based on Inductively Coupled Plasma (ICP) technology. It is a cluster tool that can be configured with up to three dual-station chambers and two optional on-board integrated strip chambers. Each dual-station chamber can process one or two wafers at the same time with highly uniform and identical results. The ICP coils employ AMEC's proprietary low capacitive coupling 3D coil design which enables more independent ion density and ion energy control. The electrostatic chuck has multi-zones with independent and dynamic temperature settings which enhances CD control. The chamber interior is coated with high-density plasma-resistant material for more robust process repeatability and more steady productivity. The product is intended for etching Si with various CD and depths in CIS and power device, and thin conductive/dielectric films for various logic and DRAM IC devices. It has significant cost advantages compared to single-station chamber product.

产品特点
Product Features

- 双反应台腔体设计
- 低电容耦合3D线圈设计
- 高抽速大容量涡轮泵
- 双通道进气
- 精密的腔体温控和RF窗口温控系统
- 先进的高致密性、耐等离子体侵蚀涂层工艺
- 多区动态温控静电吸盘
- 13兆赫或400千赫脉冲偏压系统
- 可选的集成除胶反应腔

- Dual-station chamber design
- Low capacitive coupling dual 3D coil design
- High pumping speed with large capacity turbo pump (TMP)
- Dual-zone gas injection
- Precise chamber wall and RF window temperature control
- Advanced plasma-resistant interior coating
- Dynamic temperature-controlled ESC
- 13M or 400k pulsing RF biasing
- Integrated dual strippers

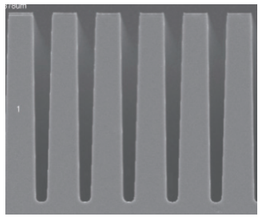
竞争优势
Competitive Advantages

- 离子浓度和离子能量独立可控
- 高排气量和更宽的工艺窗口
- 超凡的刻蚀均匀性
- 优异的高深宽比刻蚀性能
- 高生产效率，低生产成本（CoO）

- More independent ion energy and ion density controllability
- Higher pumping conductance for wider process window
- Excellent etch uniformity
- Superior profile control for high aspect ratio application
- High throughput and low cost-of-ownership (CoO)

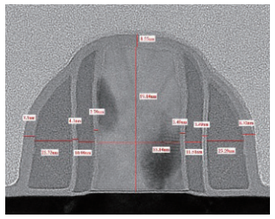
多种不同应用的Primo Twin-Star刻蚀结果
Primo Twin-Star Etch Results for Various Applications

Power MOS



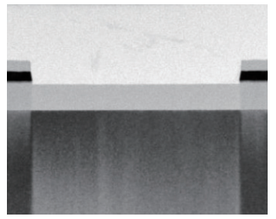
Deep Si trench etch

Logic

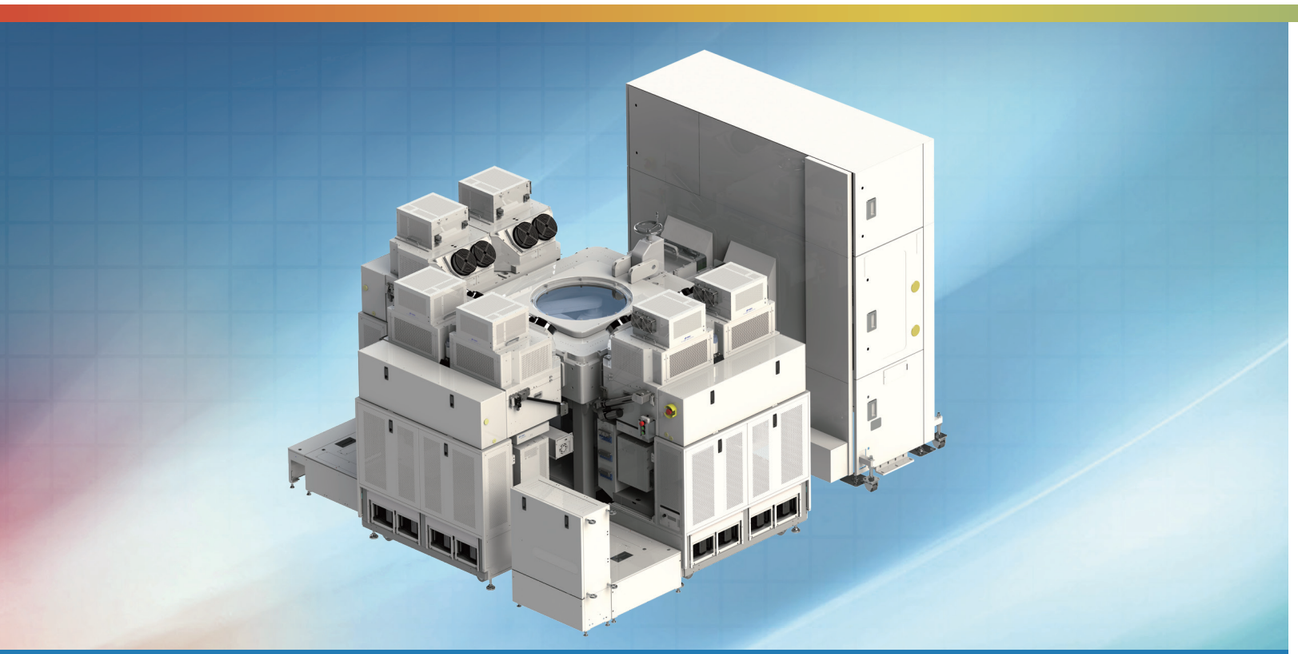


SiN Spacer etch

DRAM



SiN/W/TiN Etch



为功率器件、逻辑芯片、存储芯片和新型光学元件等应用提供的高性价比的刻蚀解决方案
Most advanced dual-station ICP etcher on the market to achieve high process performance and low manufacturing cost for FEOL/BEOL conductive/dielectric film etch applications for IC devices and optical applications

Primo Twin-Star® 200

Primo Twin-star® 200 是中微基于电感耦合(ICP)技术研发的8英寸刻蚀设备。它可以配置多达三个具有双反应台的刻蚀反应腔，亦可配置两个双反应腔加两个除胶单反应腔。每个刻蚀反应腔可同时加工一个或两个晶圆并取得高度均匀和一致的结果。ICP发射天线采用了中微具有自主知识产权的低电容耦合3D线圈设计，可实现对离子浓度和离子能量的高度独立控制。设备还采用了可实现双区温控的静电吸盘，使加工出的集成电路器件的关键尺寸达到高度均匀性。反应腔内部涂有高致密性、耐等离子体侵蚀材料，以获得更高的工艺重复性和生产率。Primo Twin-star® 200 适用于各种尺寸和深度的硅结构的刻蚀、逻辑和存储芯片的多种导体和介质薄膜的刻蚀以及为新型光学元件中的硅结构和介质薄膜刻蚀提供灵活的解决方案。该产品相对单反应台腔体还具有明显的低成本优势。

The Primo Twin-star® 200 system is AMEC's advanced 200mm etch product based on Inductively Coupled Plasma (ICP) technology. It is a cluster tool which can be configured with up to three dual-station chambers, and also it can be configured with two dual-station chambers plus two strip stations. Each dual-station chamber can process one or two wafers at same time with highly uniform and identical results. The dual ICP coils employ AMEC's proprietary low capacitive coupling 3D coil design which enables more independent ion density and ion energy control. The electrostatic chuck has multi-zones with independent and dynamic temperature setting which enhances CD control. The chamber interior is coated with high-density plasma-resistant material for more robust process repeatability and more steady productivity. The product is intended for etching Si with various CD and depths, and thin conductive/dielectric films for various logic and DRAM IC devices, and also provide etching solutions for Si and dielectric films on optical applications. It has significant cost advantages compared to single-station chamber products.

产品特点
Product Features

- 双反应台腔体设计
- 低电容耦合3D线圈设计
- 高抽速大容量涡轮泵
- 可配置12路工艺气体
- 精密的腔体及抽气路径温控
- 先进的高致密性、耐等离子体侵蚀涂层工艺
- 双区冷却9000V高压静电吸盘：可同时支持硅晶圆和玻璃晶圆加工
- 13兆赫或400千赫脉冲偏压系统
- 可选的集成除胶反应腔

- Dual-station chamber design
- Low capacitive coupling dual 3D coil design
- High pumping speed with large capacity turbo pump (TMP)
- 12 process gases can be configured
- Precise chamber wall and exhaust path temperature control
- Advanced plasma-resistant interior coating
- Dual cooling and 9000V high voltage ESC: can support Si wafer and glass wafer together
- 13M or 400k pulsing RF biasing
- Integrated dual strippers

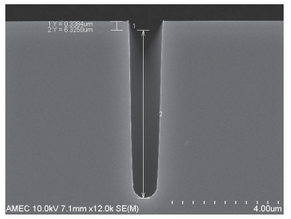
竞争优势
Competitive Advantages

- 离子浓度和离子能量独立可控
- 高排气量和更宽的工艺窗口
- 超凡的刻蚀均匀性
- 优异的高深宽比刻蚀性能
- 高生产效率，低生产成本(CoO)

- More independent ion energy and ion density controllability
- Higher pumping conductance for wider process window
- Excellent etch uniformity
- Superior profile control for high aspect ratio application
- High throughput and low cost-of-ownership (CoO)

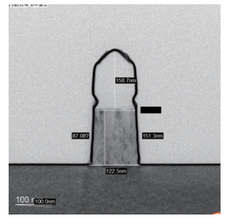
多种不同应用的Primo Twin-star ® 200刻蚀结果
Primo Twin-star ® 200 Etch Results for Various Applications

Power Device



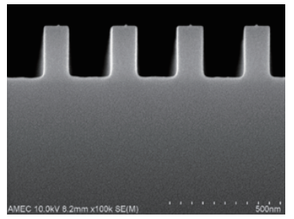
Si Deep Trench

Logic



Poly Gate

Optical



Poly Gate



为芯片提供高效稳定的金属刻蚀解决方案
High efficient and reliable metal etcher for semiconductor chips

Primo Menova®

Primo Menova®产品专注于金属刻蚀，尤其擅长金属Al的刻蚀，可扩展至TiN刻蚀，以及铟锡氧化物（ITO）、银（Ag）等金属刻蚀。为逻辑芯片、存储芯片、功率芯片、光学芯片等客户提供可靠的金属刻蚀解决方案。Primo Menova®基于中微ICP单腔刻蚀设备Nanova®开发，继承了Nanova®产品的先进特点，配以高效水氧去胶设备，在同一个平台上实现高良率高产出。Primo Menova®电感线圈采用了具有自主知识产权的低电容耦合3D线圈，射频源可实现中间/边缘馈入。采用双区动态温控静电吸盘，同时配有先进致密的耐等离子体腐蚀材料。此外，腔体独特的易维护特征和高流导特征设计，既有效保证了等离子体在腔室中的均一性，又极大增强了工艺窗口和量产稳定性。

Primo Menova® focus on metal etching, especially Al etching, it can also be used for TiN, ITO or Ag application. Primo Menova® provide a reliable metal etch total solution for the customer of logic, memory, power devices or optical chips. Primo Menova® developed based on AMEC Inductively Coupled Plasma (ICP) product Nanova®. Primo Menova® inherit the advanced key feature of Nanova®. It equipped with high-efficiency VoM photoresist asher. Primo Menova® can complete metal etching and photoresist removal in one system without vacuum break for high yield and high throughput production. The chamber equipped with AMEC's proprietary low-capacitance coupled 3D coil. RF power can deliver to center zone or edge zone at specific ratio. Chamber also equipped with dual zone dynamic ESC and advanced anti-corrosive coating material. On the other hand, unique easy-maintenance design and high conductance design ensure plasma uniformity of etching, also enhance the process window and productivity stability.

产品特点
Product Features

- 灵活的金属刻蚀腔和去胶腔的数量配置
- 低电容耦合3D线圈设计
- 高抽速大容量涡轮泵
- 先进的高致密性、耐等离子体侵蚀涂层工艺
- 双区温控静电吸盘
- 射频脉冲系统
- 精密的腔体温控和RF窗口温控系统
- 优异的可维护性和高生产率

- Flexible configuration for metal process chambers and photoresist stripper
- Low capacitive coupling dual 3D coil design
- High pumping speed with large capacity turbo pump (TMP)
- Advanced plasma-resistant interior coating
- Dual-zone temperature-controlled ESC
- RF pulsing system
- Precise chamber wall and RF window temperature control
- Easy PM maintenance and high productivity

竞争优势
Competitive Advantages

- 离子浓度和离子能量独立可控
- 高排气量和更宽的工艺窗口
- 良好的腔体温度控制
- 良好的工艺一致性和重复性
- 高生产效率，低生产成本

- Independent control of ion concentration and ion energy
- High exhaust capacity and wider process window
- Good chamber temperature control
- Good process consistency and repeatability
- High production efficiency and low production cost



为1X纳米及以下逻辑和存储器件刻蚀应用提供创新的解决方案
Innovative etch solution for logic and DRAM devices at 1x and beyond

Primo Nanova®

Primo Nanova® 是中微基于电感耦合(ICP)技术研发的12英寸刻蚀设备。它可以配置多达六个刻蚀反应腔和两个可选的除胶反应腔。其中刻蚀反应腔采用了轴对称设计，具有高反应气体通量。ICP发射天线采用了中微具有自主知识产权的低电容耦合3D线圈设计，可实现对离子浓度和离子能量的高度独立控制。反应腔内部涂有高致密性、耐等离子体侵蚀的材料，以获得更高的工艺重复性和生产率。下电极采用了能实现多区动态温控的静电吸盘或可选用能实现更多区域温度调节的Durga静电吸盘，使加工出的晶圆内的关键尺寸达到高度均匀性。晶圆边缘可选用能调节形貌倾斜角度的AEIT装置。Primo Nanova®适用于1X纳米及以下的逻辑芯片、1X纳米的DRAM存储芯片以及128P及以上的3D NAND存储芯片的刻蚀。

The Primo Nanova® tool is AMEC's advanced 300mm etch product based on Inductively Coupled Plasma (ICP) technology. It is a cluster tool which can be configured with up to six chambers and two optional on-board integrated strip chambers. The chamber is symmetrical in design with high flow conductance. The ICP coils employ AMEC's proprietary low capacitive coupling 3D coil design which enables more independent ion density and ion energy control. The chamber interior is coated with high-density plasma-resistant material for more robust process repeatability and more steady productivity. To achieve good in-wafer CD uniformity, the lower cathode is equipped with the dynamic multi-zone temperature-controlled ESC (electrostatic chuck) or the Durga ESC with more locally controlled zones. The impedance of the FR set is tunable for wafer edge profile tilting control (AEIT). The product is intended for 1x or beyond etch applications in logic, DRAM memory device, and 3D NAND over 128 Pairs.

产品特点
Product Features

- 轴对称腔体设计
- 低电容耦合3D线圈设计
- 高抽速大容量涡轮泵
- 精密的腔体温控系统
- 先进的高致密性、耐等离子体侵蚀涂层工艺
- 多区细分的高动态范围温控静电吸盘
- 阻抗可调聚焦环设计AEIT
- 切换式双频偏压系统
- 可选的集成除胶反应腔
- 可选的Durga ESC

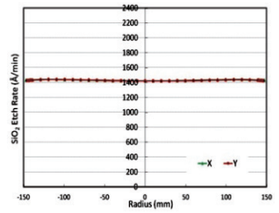
- Truly symmetric chamber design
- Low capacitive coupling 3D coil design
- High pumping speed with large capacity turbo pump (TMP)
- Precise chamber wall temperature control
- Advanced plasma-resistant interior coating
- Multi-zone temperature-controlled ESC
- Active impedance tuned focus ring design (AEIT)
- Switchable dual frequency RF biasing
- Integrated dual strippers
- Durga ESC ready for selecting

竞争优势
Competitive Advantages

- 离子浓度和离子能量独立可控
- 高排气量和更宽的工艺窗口
- 超凡的刻蚀均匀性
- 优异的高深宽比刻蚀性能
- 高生产效率，低生产成本（CoO）

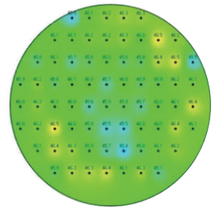
- More independent ion energy and ion density controllability
- Higher pumping conductance for wider process window
- Excellent etch uniformity
- Superior profile control for high aspect ratio applications
- High productivity platform with low cost of ownership (CoO)

SiO_2 Etch Rate Uniformity



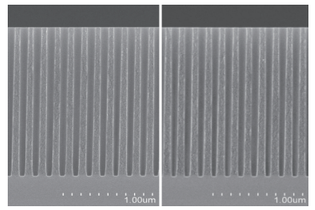
Uniformity: ±0.7%

QPT Trim/Core Etch for Logic



AEI CDU: 0.77nm(3σ)

3D NAND Carbon Mask Open



Uniform and Bow Free Profile



为新一代逻辑和存储芯片的关键制程提供解决方案的ICP等离子体刻蚀设备
AMEC’s most advanced ICP etch system for critical conductor etch and patterning applications for leading-edge memory and logic manufacturer

Primo Angnova™ ICP刻蚀机是在量产Primo Nanova® ICP的基础上，提升多方面性能而推出的第二代ICP单腔刻蚀机。主刻蚀腔体具有高流导和全对称抽气设计结构，结合优化的中微专利3D LCC电感线圈、直流辅助线圈和行业首创超低频200kHz四段脉冲射频技术，可快速排除反应副产物，实现高深宽比的控制形貌。快速灵活气体注入系统结合原子层沉积功能，使得在单一腔体能实现对多层不同材料的埃米级精度和高选择比刻蚀，减少图形化刻蚀的侧壁粗糙度。超过200区的静电吸盘ESC，结合E-CAT通讯和AI控制算法，在晶圆表面能实现<0.3C的温度均匀性和极致刻蚀均匀性。此外，非正弦波脉冲作为偏压可选方案，能直接控制晶圆表面电压和离子能量，满足存储客户对超高深宽比刻蚀的需求。

Primo Angnova™致力于为5nm以下逻辑、缩微2D和3D存储芯片制造的关键刻蚀工艺提供优异解决方案。

Primo Angnova™ is the 2nd generation single-chamber ICP etch system with various enhancement. The main chamber features a high gas conductivity architecture and fully symmetrical pumping system, together with AMEC proprietary 3D LCC coil, auxiliary DC and industry-leading 4-level pulsing RF system with unique 200kHz bias, enhancing strong profile controllability by pumping out byproduct efficiently and independent control of plasma density and ion energy. The fast gas delivery system with flexible 24-line GB and ALD, enables etching multi-layer of different materials in a single chamber with angstrom-level precision, high selectivity and reduced line edge roughness for logic and patterning applications. The ESC > 200 zones combined with E-CAT and AI algorithms, achieves <0.3C temperature range and small CD non-uniformity.

The non-sine wave power as bias option enables direct control of wafer surface voltage, ion energy distribution and incidence angle, providing tuning capability for high aspect ratio (HAR) etch in memory.

Primo Angnova™ consists maximum 6 chambers with 2 in-situ LL stripper, combining with production-proven and AI-assisted wafer sequence scheduling software system, providing good repeatability stability and high productivity.

Primo Angnova™ targets to provide excellent solutions for critical etch applications in logic beyond 5nm and shrinking 2D, and 3D memory.

产品特点
Product Features

- 单腔设计
- 对称腔体结构、高气体通量
- 第二代3D线圈
- 四段脉冲
- 双频偏压系统、超低频射频偏压源（200KHz）
- 非正弦波偏压系统（可选）
- VERSA气路系统（24 路气体,20路微调气体）、支持ALE/ALD
- 极低温>200 区Durga III ESC静电吸盘
- 高温刻蚀（300C）（可选）
- 先进的高致密性、耐等离子体侵蚀涂层工艺

- Single chamber design
- Symmetrical chamber design、high gas conductance
- 2nd generation 3D coil
- Four level pulsing
- Dual RF bias, ultra low frequency bias RFG (200KHz)
- Non-sine waveform bias power as option
- Versatile gas system (24 gas sticks with 20 tuning gas)、ALE and ALD
- Durga III ESC with >200 zones and cryogenic
- High temperature etching(300C) as option
- Advanced and high density anti-corrosive coating process

竞争优势
Competitive Advantages

- 高气体通量
- 超高深宽比刻蚀能力
- 灵活和强大的气体配置能力
- 离子浓度和超高离子能量独立可控
- 优异的刻蚀均匀性
- 优异重复性、稳定性和高生产效率

- High conductance
- Flexible and strong gas configuration with ALD
- Independent control of plasma density and ultra-high ion energy
- Superior etching uniformity
- Extreme high aspect ratio (HAR) etching capability
- Good repeatability, stability and high productivity



为3D结构中SiGe，SiO2等材料的高选择比刻蚀制程提供解决方案的气相刻蚀设备
A pure gas etcher for high selective etch applications such as SiGe and SiO2 etc. in 3D devices

Primo Domingo™

Primo Domingo™ 产品是中微公司推出的一款全新单腔气相高选择比刻蚀设备。
该产品满足逻辑芯片中的GAA，C-FET和3D-DRAM器件中的SiGe，SiO2等材料的高选择比、高精度刻蚀需求。该设备采用对称腔体设计、以及高均一性气体注入、流场控制、温度控制、搭配先进的腔体内表面涂层技术，可实现优异的气相刻蚀性能和稳定的晶圆刻蚀重复性。
Primo Domingo™ 采用中微成熟的Primo C6V3传送平台，最多搭载6个主刻蚀腔和辅助退火腔体，并配备集成LL冷却腔体，提高生产效率，降低生产成本。

Primo Domingo™ is a single station pure gas etcher for high selective etch applications such as SiGe and SiO2 etc., in GAA, C-FET logic and 3D-DRAM devices. The process chamber uses symmetrical chamber structure, and configured with uniform gas distribution system, uniform temperature control design, highly anti-corrosion chamber coating materials.
With these advanced key features, Primo Domingo™ can achieve high etch selectivity, high etching uniformity within wafer and wafer-to-wafer process repeatability.
Primo Domingo™ adopt AMEC mass-production proven C6V3 transfer system, with max 6 process or annealing chambers, along with 2 in-situ LL cooling stations, and thus achieves high productivity and low CoO for customers.

产品特点
Product Features

- 单腔体设计
- 全对称腔体结构
- 均匀的流场设计
- 宽压力范围
- 高抗腐蚀管路和腔体涂层材料，适应F2、ClF3，HF等气体
- 集成气柜设计，缩短气体注入距离，实现0.5s脉冲气体控制
- 双冷却和双加热晶圆基座
- AMEC量产的C6V3传输系统
- 主刻蚀腔和辅助退火腔灵活搭配，以及集成LL冷却腔，满足不同刻蚀应用的需求

- High selectivity, SiGe/Si >700:1
- Single chamber and symmetrical for super uniformity
- Highly anti-corrosion chamber interior coating materials, F2, ClF3, HF etc. compatible
- Uniform gas flow, gas pulsing function (0.5s) for high accuracy
- D/Z chiller and D/Z heater for C/E temp tuning
- Common C6V3 platform
- Maximum 6 main process chambers or post annealing chamber

竞争优势
Competitive Advantages

- 单腔设计，优异的晶圆精度和刻蚀一致性
- 集成气柜，缩短气体注入时间，获得气体脉冲
- 大压力控制范围，满足不同材料和应用的刻蚀需求
- 双冷却和双加热晶圆基座，提供更多的温度调节手段，获得优异的刻蚀均一性
- 高生产效率，低生产成本（CoO）

- Single chamber design with symmetrical gas flow path
- Integrated gas box with short gas delivery channel, enables gas pulsing tunability
- Wide pressure serving range
- Highly anti-corrosive chamber materials or coatings
- Dual-chiller and dual-heater pedestal
- High productivity and low cost of ownership(CoO)



为深硅刻蚀提供高性能、高产能的解决方案
High-productivity solution for deep silicon etching

Primo TSV200E® Primo TSV300E®

硅通孔技术已经成为先进封装应用的关键技术，应用于CMOS图像传感器、2.5D、三维芯片和芯片切割等领域。Primo TSV™是中微推出的首款用于高性能硅通孔刻蚀应用的高密度等离子体硅通孔刻蚀设备。每台系统可配置多达三个双反应台的反应腔。每个反应腔可同时加工两片晶圆。中微提供的8英寸和12英寸硅通孔刻蚀设备，均可刻蚀孔径从低至1微米以下到几百微米、深度可达几百微米的孔洞，并具有工艺协调性，可根据客户的需求产生不同的刻蚀形状（例如垂直、圆锥形和锥形等）。Primo TSV还具有多种独特的功能，诸如预热反应台、晶圆边缘保护环、低频射频脉冲、侧引入气体均匀化技术等，为TSV应用提供所需的高技术、灵活性和生产能力。

Through Silicon Via (TSV) has become a key technology for advanced packaging applications for various products such as CMOS image sensors, 2.5DICs, 3DICs and plasma dicing. The Primo TSV™ tool is AMEC' s first high-density plasma TSV etch product for high-performance TSV applications. The system employs a cluster configuration design which allows for up to three dual-station process modules to be attached to the main frame. Each module can process two wafers simultaneously. AMEC offers 200mm and 300mm TSV production tools capable of etching holes with CDs ranging from hundreds of microns down to <1um, and depth of up to several hundred microns. In addition, with its strong process-tuning capabilities, the tool can generate diverse profiles based on customer requirements (i.e., vertical, cone-shaped, tapered, and more). Finally, with unique features, such as a pre-heating station, wafer-edge protection ring, and low-frequency RF pulsing bias and side gas feed, the Primo TSV is an ideal tool to deliver the technology, flexibility, and productivity needed for the TSV market.

产品特点
Product Features

- 电感式耦合高密度等离子体源的双反应台刻蚀腔
- 高功率射频等离子体源，并具有连续或脉冲的射频偏压
- 具有快速气体转换的内置气箱
- 晶圆边缘保护环
- 制程终端光学控制系统
- 可调节的双发射天线

- Dual stations with inductively-coupled plasma source
- High-power source RF and continuous wave or pulsed bias RF
- On-board gas box with advanced fast gas switching
- Wafer edge protection ring
- Optical endpoint control system
- Tunable dual coil

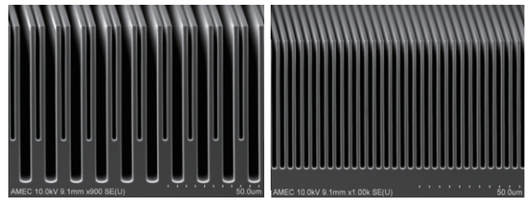
竞争优势
Competitive Advantages

- 具有适合不同应用的工艺调整性
- 高生产力的主机使每台系统的产能最大化
- 同一反应腔内融合了Bosch以及恒稳态制程的工艺性能
- 可从200mm升级到300mm

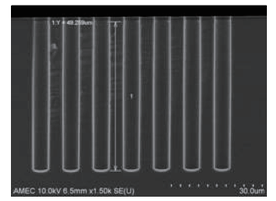
- Process tunability for diverse applications
- High-productivity mainframe for maximum throughput per system
- Bosch and steady-state processing capabilities within the same chamber
- Easily upgradable from 200mm to 300mm

多种不同应用的TSV刻蚀结果
TSV Etch Results for Various Applications

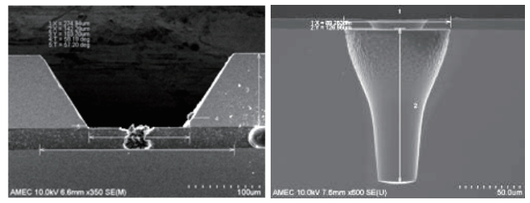
MEMS



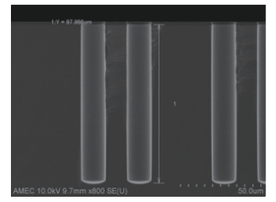
3D



CIS



2.5D





为逻辑，存储及功率等器件产品量产提供高性价比的外延解决方案
Provide cost-effective epitaxial solutions for mass production of logic, storage and power devices

PRIMIO Epita® RP

作为中微公司自主研发的创新双腔设计的外延减压设备，PRIMIO Epita® RP具有业内领先的紧凑型反应腔体积，并且可灵活配置多达到4+2个反应腔，在显著降低生产成本与化学品消耗的同时，实现了高生产效率。PRIMIO Epita® RP 配备多层独立控制气体分区以及多个径向调节能力的温场和温控设计，具有优秀的流场和温场均匀性和调节能力。PRIMIO Epita® RP具有卓越的工艺适应性和兼容性，为逻辑、存储及功率等器件产品量产提供高性价比的外延解决方案。

PRIMIO Epita® RP is an epitaxial reduced-pressure equipment with a innovative dual-chamber design developed independently by AMEC. It features one of the industry’ s most compact reaction chamber volumes and can be flexibly configured with up to 4+2 reaction chambers, enabling high production efficiency while ensuring low production costs and chemical consumption. Equipped with multi-layer independent gas control zones, and multiple radial control capabilities of the temperature field and temperature control design, the product delivers excellent uniformity and adjustability of both flow field and temperature field. It provides a cost-effective epitaxial solution for mass production of logic, storage and power devices.

产品特点
Product Features

- 模块化设计的具有灵活配置的平台
- 具有可调节性腔体形状的反应腔
- 多层独立气体分区控制
- 具备多个径向调节能力的温场和温控设计
- 可选的集成的处理氧化硅表面预处理腔
- 可选的集成更高选择性处理氧化硅表面预处理腔

- Modular design of the platform with flexible configuration
- Process chamber with adjustable cavity shape
- Multi-layer independent gas partition control
- Temperature field and temperature control design with multiple radial adjustment capabilities
- Integrated silicon oxide removal pre-clean chamber
- Integrated higher selectivity silicon oxide removal pre-clean chamber

竞争优势
Competitive Advantages

- 高生产率，低生产成本，低化学品消耗
- 优异的流场与热场的均匀性和可调性
- 卓越的工艺适应性和兼容性，可以满足从成熟到先进节点的逻辑，存储和功率器件等的外延工艺需求

- The industry's smallest volume reaction chamber,
- Higher productivity, lower production cost, lower chemical consumption.
- Excellent uniformity and tunability of flow and thermal process adaptability and compatibility to meet the epitaxial process needs of logic, storage and power devices from mature to advanced nodes



3D NAND制造过程中PECVD氧化硅/氮化硅叠层结构沉积解决方案
PECVD Solution for Silicon Oxide/Silicon Nitride Stack Layers in 3D NAND Fabrication

Performo QuaStar® ON

Performo QuaStar® ON产品是中微公司全新推出的一款PECVD设备，主要用于3D NAND制造过程中的氧化硅/氮化硅叠层结构沉积。该产品采用对称腔体设计，确保均匀对称的温场、流场和射频场，可实现优异的晶圆片内成膜均一性；同时采用第三代D-RID射频系统，具备更快的薄膜沉积速率和更高的成膜质量。
该平台采用先进的毫秒级控制系统，确保工艺步骤的高精度控制，可实现优异的氧化硅/氮化硅叠层厚度一致性及工艺稳定性。该系统可配4个反应腔，每个反应腔配备4个反应台，单系统可同时处理16片晶圆，在单位面积产出与综合运营成本方面均呈现出显著优势。

The Performo QuaStar® ON is AMEC' s newly released PECVD tool, dedicated to silicon oxide/silicon nitride stack deposition for 3D NAND fabrication. Adopting a symmetric chamber design, the tool ensures uniform and symmetric thermal, gas flow and RF fields to deliver excellent within-wafer film uniformity. Meanwhile, it integrates the 3rd-generation D-RID RF system, enabling higher film deposition rate and superior film quality.
The platform is equipped with an advanced millisecond-level control system to guarantee high-precision control over process steps, achieving outstanding thickness consistency and process stability for silicon oxide/silicon nitride stacks. The system can be configured with four process chambers, each housing four reaction stations. A single system can process up to 16 wafers concurrently, offering notable advantages in throughput per footprint and overall cost of ownership (CoO).

产品特点
Product Features

- 单腔四反应台设计
- 第三代D-RID射频系统
- 均匀的温场/流场/射频场设计
- 毫秒级控制系统
- 双温区静电吸盘设计
- 温控喷淋头

- Process chamber with 4 reaction stations
- 3rd generation D-RID RF system
- Uniform temperature field/flow field/RF field
- Millisecond-scale recipe control system
- Electrostatic chuck with dual zone heater
- Temperature controlled shower-head

竞争优势
Competitive Advantages

- 对称腔体设计，优异的晶圆片内成膜均一性
- 更快的成膜速率，更好的成膜质量
- 先进的毫秒级控制，优异的OX/SIN叠层厚度一致性
- 高生产效率，低生产成本（CoO）

- Excellent WiW, WtW film uniformity
- Higher deposition rate and superior film quality
- Millisecond-scale control with superior OX/SiN stack thickness uniformity
- High productivity and low CoO



芯片制造过程中广泛使用的PECVD硅基介质膜沉积解决方案
PECVD Solution for Deposition of Silicon-Based Dielectric Films Widely used in IC Fabrication

Performo QuaStar® GE

Performo QuaStar® GE产品是中微公司全新推出的一款PECVD沉积设备，可用于芯片制造过程中广泛使用的硅基介质膜沉积，涵盖氧化硅、氮化硅、氮氧化硅、碳氧化硅、碳化硅等膜种。
该产品采用对称腔体设计，确保均匀对称的温场、流场和射频场，可实现优异的晶圆片内成膜均一性。同时采用先进的毫秒级控制系统，确保工艺步骤的高精度控制，实现优异的片间一致性。
该系统可配3个反应腔，每个反应腔配备4个反应台，单系统可同时处理12片晶圆，在单位面积产出与综合运营成本方面均呈现出显著优势。该系统的晶圆传输设计大幅减少了反应腔内的机械动作，有效降低了颗粒污染风险。

The Performo QuaStar® GE is AMEC' s newly released PECVD deposition tool for depositing silicon-based dielectric films widely used in IC fabrication, such as silicon oxide, silicon nitride, silicon oxynitride, silicon oxycarbide and silicon carbide. Its symmetric chamber design ensures balanced thermal, gas flow and RF fields for outstanding within-wafer film uniformity. An advanced millisecond-scale control system enables precise regulation of process steps to deliver excellent wafer-to-wafer repeatability.
The system can be configured with three process chambers, each housing four reaction stations. A single system can process up to 12 wafers concurrently, offering notable advantages in throughput per footprint and overall cost of ownership (CoO). Its wafer transfer design drastically reduces mechanical movements inside the process chambers, effectively mitigating the risk of particle contamination.

产品特点
Product Features

- 全覆盖硅基介质膜沉积
- 单腔四反应台设计
- 均匀的温场/流场/射频场设计
- 毫秒级控制系统
- 温控喷淋头
- 先进晶圆传输系统设计

- Full coverage of silicon-based dielectric film deposition
- Process chamber with 4 reaction stations
- Uniform temperature field/flow field/RF field
- Millisecond-scale recipe control system
- Temperature controlled shower-head
- Advanced design of wafer transfer system

竞争优势
Competitive Advantages

- 优异的晶圆片内、片间成膜均一性
- 优异的颗粒表现
- 高生产效率，低综合成本（CoO）

- Excellent WiW, WtW film uniformity
- Good particle performance
- High productivity and low cost of ownership(CoO)



为逻辑和存储芯片中金属钨填充提供的高性价比的解决方案
Cost-effective tungsten fill solution for logic and memory devices

Preforma Uniflex® CW

作为中微公司自主研发的产出效率高且性能优秀的 12 英寸化学气相沉积（CVD）金属钨设备，Preforma Uniflex® CW 可灵活配置多达五个双反应台的反应腔，每个反应腔皆能同时加工两片晶圆，在保证较低的生产成本和化学品消耗的同时，实现较高的生产效率。Preforma Uniflex® CW 配备了完全拥有自主知识产权的优化混气模块，自主设计优化的分气抽气系统和真空卡盘，具有优秀的薄膜均一性、填充能力和工艺调节灵活性，对于弯曲度较大的晶圆，它也具备良好的工艺处理能力。其优异的阶梯覆盖率和填充能力，可以满足先进逻辑器件、DRAM 和 3D NAND 中接触孔以及金属钨线的填充应用需求。

Preforma Uniflex® CW system, a 12 inch CVD -tungsten deposition equipment developed by AMEC independently, is of good performance and high production-efficiency. It can configure with up to five dual-station chambers (total 10 stations), each capable of processing two wafers simultaneously, ensuring lower production costs and chemical consumption while achieving higher production-efficiency. With introduction of unique features, such as AMEC proprietary gas mixer, optimized gas distribution and pumping system, as well as AMEC designed heater with vacuum chuck, Preforma Uniflex® CW delivers good film uniformity, good gap fill performance, process flexibility, as well as high tolerance for warped wafer. Its excellent step coverage and gap fill capability are proven to be able to meet requirements of various W via/trench gapfill applications in advanced logic, DRAM and 3D NAND devices.

产品特点
Product Features

- 双反应台反应腔及多达五个反应腔的系统
- 独立紧凑的反应空间
- 高效灵活的工艺调节窗口
- 自主知识产权的优化混气方案
- 自主设计的真空卡盘加热台

- Dual-station chamber and system with up to five dual-station chambers configuration
- Isolated and compact reaction region
- Effective and flexible process tuning window
- AMEC proprietary gas mixer design
- AMEC-designed heater with vacuum chuck

竞争优势
Competitive Advantages

- 高生产效率，低生产成本，低化学品消耗
- 优秀的薄膜均一性和填充能力
- 优秀的工艺适应性和兼容性
- 对弯曲度较大的晶圆也具有良好的工艺处理能力

- High productivity, low cost and chemical consumption
- Excellent film uniformity and gap fill capability
- Excellent process adaptation and compatibility
- Good process handling capability for high-bow wafer



为高深宽比及复杂结构金属钨填充提供的高性能、高性价比解决方案。
A high-performance and low-cost solution for high aspect ratio and complex structures tungsten fill applications

Preforma Uniflex® HW

作为中微公司自主研发的具备超高深宽比及复杂结构钨填充能力的12英寸Preforma Uniflex® HW设备，该设备继承了前代Preforma Uniflex® CW设备的优点，可灵活配置多达五个双反应台的反应腔，每个反应腔皆能同时加工两片晶圆，在保证较低生产成本的同时，实现较高的生产效率。Preforma Uniflex® HW采用完全自主知识产权的生长梯度抑制工艺，可实现表面从钝化主导到刻蚀主导的精准工艺调控。硬件上，中微公司开发的可实现钝化时间从毫秒级到千秒级的控制系统，可满足多种复杂结构的填充。此外，搭配经过优化设计的流场热场系统，使该设备具备优异的薄膜均一性和工艺调节灵活性。

Preforma Uniflex® HW system is a 12 inch tungsten deposition equipment developed by AMEC independently, designed to achieve superior gapfill performance for high aspect ratio and complex structures in semiconductor devices. This system inherits the advantages of previous Preforma Uniflex® CW, which can flexibly configure up to 5 dual-station process chambers (total 10 stations), each chamber is capable of processing two wafers simultaneously, ensuring lower production cost and chemical consumption while achieving higher production-efficiency. Preforma Uniflex® HW adopted AMEC proprietary gradient tungsten growth inhibition process technology, in addition with AMEC developed control system, can precisely control the inhibition process from millisecond level to thousands of seconds, being able to meet gapfill requirements for various kinds of challenging structures. Together with optimized flow and thermal field design, this equipment delivers good film uniformity and process tuning flexibility.

产品特点
Product Features

- 双反应台反应腔及多达五个反应腔的系统
- 独立紧凑的反应空间
- 高效灵活的工艺调节窗口
- 自主知识产权精准抑制工艺设计
- 自主设计的真空卡盘加热台。

- Dual-station chamber and system with up to five dual-station chambers configuration
- Isolated and compact reaction region
- Effective and flexible process tuning window
- AMEC proprietary precisely controlled growth inhibition process technology
- AMEC-designed heater with vacuum chuck.

竞争优势
Competitive Advantages

- 高生产效率，低生产成本，低化学品消耗
- 优秀的薄膜均一性和工艺稳定性
- 优秀的高深孔填充能力和较强的不同复杂结构兼容适配性
- 对弯曲度较大的晶圆也具有良好的工艺处理能力

- High productivity, low cost and chemical consumption
- Excellent film uniformity and process stability
- Excellent high aspect ratio structure gapfill capability and good compatibility for different complex structures
- Good process handling capability for high-bow wafer



为复杂结构及三维结构金属钨填充提供高性能、高性价比的解决方案。
A high-performance and high-productivity solution for tungsten fill application in complex and three dimensional device structures.

Preforma Uniflex® AW

作为中微公司自主研发的具备三维填充能力的 12 英寸原子层金属钨沉积设备，Preforma Uniflex® AW 继承了钨系列产品的特点，可配置五个双反应台反应腔，有效提高设备生产效率。此外，系统中每个反应腔均可用于形核和主体膜层生长，可根据客户实际工艺需求优化配置，进一步提高生产中的设备利用率。Preforma Uniflex® AW 采用完全自主知识产权的高速气体切换控制系统，可精准控制工艺过程，实现精准的原子级别生长，因此所生长膜层具备优异的台阶覆盖率和低杂质浓度的优点。Preforma Uniflex® AW 还引入独特的气体输送系统，进一步提升性能，使该设备具备更先进技术节点的延展能力。该设备也继承了中微公司自主开发的流场热场优化设计，从而提升薄膜均一性和工艺调节灵活性。

Preforma Uniflex®AW system, a 12 inch atomic layer deposition equipment independently developed by AMEC, is designed to meet three-dimensional structure and complex structure tungsten-fill requirements in advanced devices. This system inherits advantages of previous Preforma Uniflex® CW products which can flexibly configure up to 5 dual-station process chambers (total 10 stations), each chamber is capable of processing two wafers simultaneously, ensuring lower production cost and chemical consumption while achieving higher production-efficiency. What' s more, each chamber is compatible for both nucleation and bulk growth process, which provides more flexibility for configuration optimization according to customized process conditions, therefore further improving productivity performance. With utilization of AMEC-proprietary developed ultra-fast gas switching system, Preforma Uniflex®AW can precisely control each process step, ensuring atomic level film growth, thus achieving tungsten film deposited of low impurity concentration and excellent step coverage. This equipment also introduces unique gas delivery system design, further enhancing the gapfill capability, making it extendable to more advanced nodes. This system also inherits AMEC optimized flow and thermal field design, ensuring good film uniformity and process tuning flexibility.

产品特点
Product Features

- 双反应台及多达五个反应腔的系统
- 独立紧凑的反应空间
- 中微专利的气体切换系统
- 高效灵活的工艺调节窗口
- 自主设计的真空卡盘加热台

- Dual-station chamber and system with up to five dual-station chambers configuration
- Isolated and compact reaction region
- AMEC proprietary fast gas switching system
- Effective and flexible process tuning window
- AMEC-designed heater with vacuum chuck

竞争优势
Competitive Advantages

- 高生产效率，低生产成本，低化学品消耗
- 优秀的薄膜均一性和工艺稳定性
- 优秀的三维结构及复杂结构填充性能
- 对弯曲度较大的晶圆也具有良好的工艺处理能力

- High productivity, low cost and chemical consumption
- Excellent film uniformity and process stability
- Excellent gapfill capability proven for three dimensional structures
- Good process handling capability for high-bow wafer



为逻辑芯片、存储芯片和其他特殊器件提供的高性能、高输出效率的原子层沉积氮化钛薄膜设备
High performance and high productivity ALD TiN deposition equipment for logic, memory and specific IC devices

Preforma Uniflash® TiN

Preforma Uniflash® TiN是中微自主研发的12英寸原子层沉积产品，可满足先进逻辑和先进存储器件金属栅应用需求，也可满足阻挡层等应用需求。该产品继承中微独特的双反应台设计，系统可灵活配置多达五个双反应台反应腔（十个反应台），可有效满足高真空工艺集成需求的同时，可以达到业界领先的生产率。该产品通过中微专利的多级匀气混气设计，基于模型算法的加热系统设计和可实现高效原子层沉积反应的反应腔流导设计等，可满足先进逻辑客户性能需求的同时，设备的薄膜均一性，污染物控制和生产效率均达到世界先进水平。

Preforma Uniflash® TiN system, a 300mm ALD product developed by AMEC independently, can adequately meet requirements of metal gate and liner applications in advanced logic and memory devices. With AMEC' s unique dual-station design, it can be flexibly configured with up to five dual-station chambers (totally 10 stations) to simultaneously realize both integrated process solutions under high-vacuum and high wafer throughput. By employing AMEC' s proprietary multi-level gas mixer design, simulation-based heater system design, and chamber gas conductance design specifically optimized for high-efficiency ALD reaction, it can satisfy strict performance requirements from advanced logic customers and guarantee internationally preeminent film uniformity, contamination control and productivity.

产品特点
Product Features

- 双反应台及多达五个反应腔的系统具备高输出效率
- 中微专利的多级匀气混气设计和反应腔流导设计
- 基于模型算法的加热系统设计
- 中微自主开发的可实现高效气体输送效率和吹扫效率整体设计

- Dual-station chamber and system configured with up to five dual-station chambers enable high wafer throughput
- AMEC' s proprietary multi-level gas mixer and chamber gas conductance design
- Heater system design based on simulation
- Integrated design originated from AMEC enables high-efficiency gas delivery and purge

竞争优势
Competitive Advantages

- 高生产效率，低生产成本（CoO）
- 优异的污染物控制
- 更好的薄膜均一性和薄膜间均一性
- 对于多种复杂结构实现优秀的台阶覆盖率
- 每个维护周期的晶圆数目大大增加

- High throughput and low cost-of-ownership (CoO)
- Superior contamination control
- Better WiW and WtW uniformity
- Excellent step coverage on multiple complex structures
- Significantly increased mean wafer between clean (MWBC)



为逻辑和存储芯片提供的高性能、高输出效率的原子层沉积氮化钽薄膜设备
High performance and high productivity ALD TaN deposition equipment for advanced logic and memory devices

Preforma Uniflash® TaN

Preforma Uniflash® TaN是中微自主研发的12英寸原子层沉积产品，可满足逻辑器件和存储器件多个应用需求。该产品继承中微独特的双反应台设计，系统可灵活配置多达五个双反应台反应腔（十个反应台），可以达到业界领先的生产率，也可以根据客户产能实现灵活配置的需求。该产品采用中微自主开发的温度控制系统设计，多区流道设计，多源供应系统设计和可实现高速气体置换效率的腔室设计，可满足先进逻辑和存储客户性能需求的同时，设备的污染物控制，薄膜均一性，生产效率均达到世界先进水平。

Preforma Uniflash® TaN system, a 300mm ALD product developed by AMEC independently, can adequately meet requirements of multiple applications in logic and memory devices. With AMEC' s unique dual-station design, it can be configured with up to five dual-station chambers (totally 10 stations) to simultaneously realize high wafer throughput and provide configuration flexibility based on customer capacity. By employing AMEC' s original temperature control system design, multi-zone flow channel design, multi-source supply system design and special chamber design enabling fast gas exchange, it can satisfy performance requirements from advanced logic and memory customers and guarantee internationally preeminent contamination control, film uniformity and productivity.

产品特点
Product Features

- 双反应台及多达五个反应腔的高真空系统设计
- 独特的温度控制系统设计
- 多区流道设计
- 多源供应系统设计

- Dual-station chamber and high-vacuum integrated system configured with up to five dual-station chambers
- Unique temperature control system design
- Multi-zone flow channel design
- Multi-source supply system design

竞争优势
Competitive Advantages

- 高生产效率，低生产成本（CoO）
- 优异的污染物控制
- 更好的薄膜均一性和薄膜间均一性
- 每个维护周期的晶圆数目大大增加

- High throughput and low cost-of-ownership (CoO)
- Superior contamination control
- Better WiW and WtW uniformity
- Significantly increased mean wafer between clean (MWBC)



为先进逻辑芯片提供的高性能、高输出效率的原子层沉积钛铝薄膜设备
High performance and high productivity ALD TiAl deposition equipment for advanced logic devices

Preforma Uniflash® TiAl

Preforma Uniflash® TiAl是中微自主研发的12英寸原子层沉积产品，可满足先进逻辑器件金属栅应用需求。该产品继承中微独特的双反应台设计，系统可灵活配置多达五个双反应台反应腔（十个反应台），可有效满足高真空工艺集成需求的同时，可以达到业界领先的生产率。该产品采用中微自主开发的温度控制系统设计，独特的表面处理技术，多区气体分布系统设计和基于模型算法的加热系统设计等，可满足先进逻辑客户性能需求的同时，设备的污染物控制，薄膜均一性，生产效率均达到世界先进水平。

Preforma Uniflash® TiAl system, a 300mm ALD product developed by AMEC independently, can adequately meet requirements of metal gate applications in advanced logic devices. With AMEC' s unique dual-station design, it can be flexibly configured with up to five dual-station chambers (totally 10 stations) to simultaneously realize both integrated process solutions under high-vacuum and high wafer throughput. By employing AMEC' s original temperature control system design, special surface treatment technique, multi-zone gas distribution system design, and simulation-based heater system design, it can satisfy strict performance requirements from advanced logic customers and guarantee internationally preeminent contamination control, film uniformity and productivity.

产品特点
Product Features

- 双反应台及多达五个反应腔的高真空系统设计
- 独特的温度控制系统设计
- 多区气体分布系统设计
- 基于模型控制的加热系统设计

- Dual-station chamber and high-vacuum integrated system configured with up to five dual-station chambers
- Unique temperature control system design
- Multi-zone gas distribution system design
- Heater system design based on simulation

竞争优势
Competitive Advantages

- 高生产效率，低生产成本（CoO）
- 优异的污染物控制
- 更好的薄膜均一性和薄膜间均一性
- 每个维护周期的晶圆数目大大增加

- High throughput and low cost-of-ownership (CoO)
- Superior contamination control
- Better WiW and WtW uniformity
- Significantly increased mean wafer between clean (MWBC)



用于先进逻辑、存储芯片的高性能双反应台金属硅化物集成系统
Integrated high-performance dual-station metal silicide system for advanced logic and memory devices

Preforma Uniflash® SPTi　Preforma Uniflash® TiN^{M}

Preforma Uniflash® SPTi/TiN^{M}金属硅化物集成系统，包含原位高选择性前清洁产品Preforma Uniflash® SA & SU，等离子体增强化学气相沉积金属钛产品Preforma Uniflash® SPTi，和原子层沉积氮化钛产品 Preforma Uniflash® TiN^{M}，是中微自主研发的12英寸薄膜沉积系统，可满足先进逻辑和先进存储器件金半接触、保护层、衬垫层、电容电极等多种应用需求。该系列产品继承中微独特的双反应台设计，系统可灵活配置多达五个双反应台反应腔（十个反应台），可有效满足高真空、多工艺集成需求的同时，达到业界领先的生产率。该系统通过中微自主设计，可实现原位高选择性前清洁工艺；可在小尺寸、高深宽比及多种复杂结构中实现优异的台阶覆盖率及选择性沉积；可在满足先进逻辑、存储客户性能需求的同时，设备的污染物控制、薄膜均一性、选择比、台阶覆盖率和生产效率均达到世界先进水平。

The Preforma Uniflash® SPTi/TiN^{M} integrated metal silicide system, consisting of the Preforma Uniflash® SA & SU in-situ high-selectivity preclean chambers, the Preforma Uniflash® SPTi plasma-enhanced chemical vapor deposition (PECVD) chamber, and the Preforma Uniflash® TiN^{M} atomic layer deposition (ALD) chamber, is a 12-inch thin film deposition system independently developed by AMEC. It is capable of addressing different applications in advanced logic and advanced memory devices, including metal-semiconductor contacts, capping layers, liners/barriers, capacitor electrodes, etc. This product series inherits AMEC's unique dual-station design and can be flexibly configured with up to five dual-station chambers (ten stations), effectively meeting high-vacuum multi-process integration requirements while achieving industry-leading productivity. The system, through AMEC's proprietary design, enables in-situ high-selectivity preclean processes; delivers excellent step coverage and selective deposition in small-feature high-aspect-ratio structures; and can meet the performance requirements of advanced logic and memory customers while guaranteeing world-class contamination control, film uniformity, selectivity, step coverage, and productivity.

产品特点
Product Features

- 双反应台及多达五个反应腔的系统可满足复杂工艺集成和高输出效率
- 系统集成高选择比前清洁腔室，提高器件性能，适配先进节点需求
- 采用中微独特的高频脉冲系统设计，实现优异的台阶覆盖率和选择性沉积
- 通过模拟优化的中微专利流场设计，实现最优化匀气分气效果和腔室流导设计
- 通过控制优化的从反应源到腔室多区温度控制，最小化副产物沉积，实现优异的颗粒污染物控制
- 优秀的薄膜均一性和晶圆间薄膜均一性

- System configured with up to five dual-station chambers enables complex process integration and high throughput
- Integrated high-selectivity preclean chambers can improve device performance and address advanced nodes requirements
- Unique high-frequency pulsed RF system from AMEC delivers excellent step coverage and selective deposition
- Optimized by simulation, AMEC’ s proprietary flow field design can achieve optimal gas distribution uniformity and chamber conductance
- From chemical source to chamber, optimized multi-zone temperature control minimizes byproduct deposition and ensures excellent particle control
- Excellent film uniformity and wafer-to-wafer film uniformity

竞争优势
Competitive Advantages

- 系统可配置多达五个双反应台反应腔，有效满足工艺集成需求的同时，提高输出效率
- 集成高选择比前清洁腔室，实现优异的工艺延展性
- 采用中微自主独特设计，污染物控制和薄膜均一性达到国际先进水平
- 可以在不同基底间实现高选择性生长，在小尺寸、高深宽比结构中实现均匀填充

- This product series can be configured with up to five dual-station chambers (ten stations), effectively meeting process integration requirements while achieving high throughput
- Integrated high-selectivity preclean chamber enables excellent process extendibility
- AMEC's proprietary designs guarantee world-class contamination control and film uniformity
- Highly selective growth on different substrates, and uniform gap fill in small-feature high-aspect-ratio structures



12 英寸化学机械平坦化设备
12 Inch Chemical Mechanical Planarization Equipment

TTAIS®300 CMP

全新紧凑的设备架构设计，6x研磨模组，2x清洗模组，多个抛光模组沿着晶圆传输通道依次布设的布局，可以根据需要选择任意数量的抛光模组，进行整个抛光流程实现并行加工与灵活调控，支持不同工艺需求，同时模块化设计便于快速维护，提升设备稳定性和生产效率，可用于ILD、STI、Poly、W等CMP工艺制程产线。

Novel design with compact platform structure, including 6 polishing module, 2 cleaner modules. With all polishing modules locating close to wafer transmission pathway, flexible process design capability is maximized, which would support various kinds of process requirement including ILD/ STI/POLY/W CMP process line. Each module is designed for maintain friendliness, which would highly improve system stability and production efficiency.

产品特点
Product Features

- 先进的终点检测技术，对工艺的精确控制
- 高效晶圆传输系统
- 先进的化学清洗/干燥模组设计，低金属污染和缺陷率
- 模块化设计，每组晶圆传输单元可以形成级联，完成晶圆在各个装卸台之间的传输

- Advanced endpoint detection leading to precise process control
- Rapid wafer transfer system
- Advanced post CMP cleaner & dryer system, low metal contamination& defectivity
- With modular-designed polisher transfer system, wafer can be directly transferred to next platen

竞争优势
Competitive Advantages

- 工艺灵活性高
- 制程兼容性好
- 独特的耗材成本降低技术解决方案
- 生产效率快
- 可维护性高

- Good flexibility on process flow design
- High process capability covering all common CMP process
- Advanced solutions in consumable cost reduction
- High throughput
- Easy maintenance



碳化硅衬底化学机械抛光系列设备
CMP Equipment Series For SiC Substrate Fabrication

TNTAS®ECMP

针对快速增长的新兴市场需求开发的第三代半导体材料碳化硅专用CMP装备。该装备配备了独特的碳化硅衬底电化学机械抛光解决方案，集成先进的单片自动传输设备，兼容6/8英寸衬底，具有高去除率、高产能、高效率等优点，满足第三代半导体材料工艺器件的技术需求。

To meet the expanding demand of 3rd generation semiconductor SiC material wafer production, TNTAS®ECMP is developed with novel electrochemical mechanical polishing solution. With advanced automatic wafer transfer system, the system is characterized as high remove rate, high production capacity, high efficiency, even compatible with 6/8 inch substrates.

产品特点
Product Features

- 电化学机械抛光工艺中电化学反应和机械抛光速率独立可控、可调
- 采用硬质导电盘负压吸附晶圆并实现电流传导
- 支持大电流设计

- Good control capability of polish rate
- Using the hard conductive wafer holder to hold wafer while transfer the current
- High load current design

竞争优势
Competitive Advantages

- 引入电化学反应，衬底材料去除率、抛光/平坦化速度显著提高，设备运营成本显著降低
- 6 英寸 /8 英寸兼容
- 不使用强氧化剂，有效减少环保负担以及降低晶圆表面污染
- 利用硬质导电盘，实现抛光头和晶圆衬底之间的电路导通进行电化学机械抛光，可保障电化学反应的长期稳定性

- Introducing electrochemical reaction into polishing process, significantly increasing the removing rate of substrates and optimizing the operating cost of the equipment
- Compatible with 6/8 inch substrate
- Removing strong oxidation, effectively reduce the cost of waste discharge treatment and the defect on substrate
- Using the hard conductive wafer holder to hold wafer while transfer the current, leading to high process stability



单/双CMP模组
Single/Dual CMP Module

SIZONE DMS®

SIZONE DMS® 产品主要服务于研发机构及实验室场景，通过定制化研磨模组设计、先进终点控制技术、自动化工艺控制和整机通用设计，实现CMP工艺结果。

SIZONE DMS® is mainly designed for R&D institutions and laboratory scenarios, achieving CMP process results through customized polish module design, advanced endpoint control technology, automated process control and universal equipment design.

产品特点
Product Features

- 定制化研磨模组设计
- 先进终点控制功能

- Customized CMP module combination
- Advanced endpoint control capabilities

竞争优势
Competitive Advantages

- 自动化工艺控制
- 整机通用设计
- 等同的工艺结果

- Automatic process control
- Common design with the standard TTAIS 300 system
- Equivalent process results with standard TTAIS 300 system



用于LED外延片大规模量产的MOCVD设备
MOCVD solution for high-volume LED production

PRISMO A7®

中微具有自主知识产权的PRISMO A7®MOCVD设备可配置多达4个反应腔，可同时加工136片4英寸晶片或56片6英寸晶片，其工艺能力还能延展到生长8英寸外延晶片。每个反应腔都可以独立控制，这一创新设计具备卓越的生产灵活性。

配备了716毫米托盘的中微 PRISMO A7 MOCVD设备专为LED高产能而设计，每个反应腔的产量是前一代MOCVD设备 PRISMO D-BLUE® 的2倍多，极大地提高了单位产能，能有效降低LED外延片的生产成本。

With its patented architecture, the PRISMOA7® MOCVD system can accommodate up to 4 reactors and process up to 136x4” wafers or 56x6” wafers simultaneously. It is extendible to 8” wafer processing. Each reactor is controlled independently – a novel design that enables exceptional manufacturing flexibility.

The PRISMO A7 MOCVD system is engineered for high throughput LED production with its 716mm diameter susceptor. It delivers high-productivity, high-throughput and low-energy-consumption solutions for LED production. Throughput performance is more than twice compared with AMEC’ s first-generation MOCVD tool (PRISMO D- BLUE®).

产品特点
Product Features

- 可独立控制的反应腔运行模式
- 自主的实时监控系统
- 精准的参数控制
- 全自动化处理
- 符合半导体标准的软件控制系统

- Independently controllable reactors
- Industry advanced in-situ, real-time monitoring system
- Precise process parameters control
- Automated and programmable maintenance routines
- SEMI S2 certified with enhanced tool safety performance

竞争优势
Competitive Advantages

- 优异的工艺重复性，简化工艺调整需求，提高产品良率
- 28英寸超大尺寸托盘，产量是前一代MOCVD设备 PRISMO D- BLUE®的2倍多，极大地降低了生产成本
- 集成顶盖升降机构，简化设备维护，提高设备利用率
- 符合SEMI S2安全标准，提升设备的安全性能

- Superb process repeatability, simplified tool maintenance and improved production yield
- High throughput and low cost with its 716mm diameter susceptor, doubled throughput compared with AMEC’ s first-generation MOCVD tool (PRISMO D-BLUE®)
- Integrated lid lifting mechanism, simplified tool maintenance and maximized tool utilization
- SEMI S2 certified with enhanced tool safety performance



用于深紫外LED外延片量产的MOCVD设备
MOCVD solution for deep UV LED mass production

PRISMO HiT3®

中微具有自主知识产权的PRISMO HiT3® MOCVD设备，是适用于高质量氮化铝和高铝组分材料生长的关键设备。反应腔最高工艺温度可达1400度，单炉可生长18片2英寸外延晶片，并可延伸到生长4英寸晶片。

中微PRISMO HiT3® MOCVD设备专为深紫外LED量产而设计，是目前业内极具竞争力的紫外LED高温MOCVD设备。

The PRISMO HiT3® MOCVD system is engineered to grow high-quality aluminum nitride and high-aluminum composition materials. With a maximum reactor temperature of 1400°C, the Prismo HiT3 MOCVD system can process up to 18x2" epitaxial wafers per run, with extendibility to 4" wafers.

PRISMO HiT3® is designed for deep UV LED mass production with major competitive advantages in the industry.

产品特点
Product Features

- 适用于高温氮化铝材料和深紫外LED生长的关键设备
- 优异均匀性和高效能相结合
- 适合高晶体质量和高AIN生长速率的新颖腔体设计
- 创新的实时监控系统
- 工艺温度最高可达1400度，具有优异的温场均匀性和控制稳定性
- 具有高稳定性、自动化的真空传送系统，抑制颗粒的产生
- 界面友好、全自动化的操作系统

- Enabling growth of high temperature AIN material and UVC LEDs
- Excellent epiyield, with industry-leading efficiency and uniformity
- Novel chamber features for high quality growth and high AlN growth rate
- Innovative in-situ, real-time monitoring system
- Process temperature up to 1400°C process with excellent temperature uniformity and stability
- Highly stable automatic vacuum transfer to minimize particle generation
- Fully automated operation system with user-friendly interface

竞争优势
Competitive Advantages

- 优异的工艺重复性，简化工艺调整需求，提高产品良率
- 单炉可生长18片2英寸外延晶片，具有较低的生产成本
- 集成顶盖升降机构，简化设备维护，提高设备利用率
- 业界领先的UVC LED产能及维护周期

- Superb process performance, simplified process adjustment and improved production yield
- Up to 18x2" epitaxial wafers per run with low production cost
- Integrated lid lifting mechanism, simplified tool maintenance and improved equipment utilization
- Superior UVC LED wafer capacity and long PM cycle



用于高性能Mini LED外延片量产的MOCVD设备
MOCVD solution for Mini LED mass production

PRISMO UniMax®

中微具有自主知识产权的PRISMO UniMax® MOCVD设备可配置多达4个反应腔,可同时加工108片4英寸或40片6英寸高性能氮化镓基蓝绿光Mini LED外延晶片，通过石墨盘的调整，可扩展至同时加工164片4英寸或72片6英寸外延晶片，其工艺能力还可延展到生长8英寸外延晶片。每个反应腔都可以独立控制，这一创新设计具备卓越的生产灵活性。中微PRISMO UniMax® MOCVD设备配置了新颖的局部温度补偿加热系统，专为高性能Mini LED量产而设计，具备优异的产出波长均匀性及产出稳定性。此外，PRISMO UniMax® MOCVD设备配置了785mm大直径石墨托盘，极大地提高了设备产能，并有效地降低了Mini LED外延片的生产成本。

With its patented architecture, the PRISMO UniMax® MOCVD system can accommodate up to 4 reactors and process up to 108x4” or 40x6” GaN based Blue/Green Mini LED wafers simultaneously. It is extendible to process 164x4” or 72x6” wafers through susceptor configuration change, and is also capable for 8” wafer processing. Each reactor is controlled independently – a novel design that enables exceptional manufacturing flexibility. The PRISMO UniMax® MOCVD system is engineered for high performance Mini LED production with its innovated local temperature adjustable heating system. It can deliver excellent wavelength uniformity and good reliability for Mini LED production. With its 785mm diameter susceptor, the PRISMO UniMax® MOCVD system can significantly improve the production throughput and reduce the cost of ownership.

产品特点
Product Features

- 自主的实时监控系统
- 精准的参数控制
- 自动化的控制与维护功能
- 符合半导体标准的软件控制系统

- Industry advanced in-situ, real-time monitoring system
- Precise process parameters control
- Automated and programmable maintenance routines
- SEMI S2 certified with enhanced tool safety performance

竞争优势
Competitive Advantages

- 可独立控制的反应腔运行模式
- 新颖的局部温度调控加热系统
- 优异的LED波长均匀性

- Independently controllable reactors
- Novel local temperature adjustable heating system
- Excellent LED wavelength uniformity



用于氮化镓功率器件量产的MOCVD设备
MOCVD Tool for GaN Power Device Production

PRISMO PD5®

PRISMO PD5®可配置多达四个反应腔，每个反应腔可同时加工6片6英寸或3片8英寸晶片。PRISMO PD5®采用中微具有自主知识产权的双区喷淋头以及基于模型的控温系统，每个反应腔可独立控制，并可实现6”/8”工艺的便捷切换，提供了卓越的生产灵活性。PRISMO PD5®为氮化镓功率器件量产提供高性价比的MOCVD解决方案。

PRISMO PD5® MOCVD tool can accommodate up to 4 reactors, each of these reactors can process 6*6” or 3*8” substrates simultaneously. PRISMO PD5® is configured with AMEC patent dual-zone showerhead and model-based temperature control system. Each reactor can be controlled independently and is flexible on 6”/8” process switching, which provides excellent production flexibility. PRISMO PD5 is designed for GaN power device production with cost efficiency in the industry.

产品特点
Product Features

- 可独立控制的反应腔运行模式
- 自主的实时监控系统
- 双区喷淋头设计
- 6”/8”生产灵活切换
- 基于模型的控温系统

- Independently controllable reactors
- Advanced in-situ, real-time monitoring system
- Dual-zone showerhead design
- Flexible on 6”/8” process switching
- Model-based temperature control system

竞争优势
Competitive Advantages

- 创新的实时监控系统，精确测量托盘温度
- 具有良好的设备扩展性，可便捷切换6”/8”工艺菜单
- 集成顶盖升降机构，设备维护简易，利用率高
- 界面友好、全自动化的操作系统
- 符合SEMI S2安全标准，设备安全性高

- Innovative in-situ monitoring system to measure susceptor temperature
- Good compatibility and flexibility on 6”/8” production
- Built-in lid lifting mechanism, easy tool maintenance and high utility ratio
- User friendly and fully automatic operating system
- SEMI S2 Compatible with enhanced safety performance



用于碳化硅功率器件量产的HTCVD设备
HTCVD System for SiC Power Device Epitaxy

PRISMO PDS8®

PRISMO PDS8® 设备最多可配置四个反应腔，同时加工4片8英寸外延片。其采用中微自主知识产权的垂直反应腔技术，显著延长免维护周期；配置符合Semi标准的片盒到片盒传送系统，有效控制颗粒度；配备实时温度与生长监测设备；应用基于模型的温度控制系统，精准调控外延生长温度；集成衬底预加热系统，减少衬底表面水汽残留和热变形。

PRISMO PDS8® HTCVD system can be configured with up to four reactors, enabling simultaneous processing of four 8-inch epitaxial wafers. It utilizes AMEC's proprietary vertical reactor technology for longer maintenance intervals. Featuring a Semi-standard cassette-to-cassette transfer system for superior particle control. The system includes real-time monitoring of temperature and reflectivity. A model-based temperature control system ensures precise temperature condition for epitaxial growth, while the integrated substrate pre-heating stations can minimize surface moisture and thermal deformation.

产品特点
Product Features

- 簇式系统布局，至多可配备四个反应腔
- 每个反应器支持单片6英寸或单片8英寸
- 垂直式反应腔技术，长维护周期
- 片盒到片盒的衬底传送系统
- 配备带SMIF的EFEM系统，兼容6英寸/8英寸
- 先进的生长监测系统
- 配备晶片预热模块
- 基于模型的温度控制系统

- Cluster tool configuration, up to 4 reactors
- 1*6”/1*8” each reactor
- Vertical reactor technology, long MTBM
- Cassette to cassette wafer transfer
- EFEM system with SMIF, 6”/8”compatiable
- Advanced real-time monitoring system
- Wafer pre-heating module
- Model-based temperature control

竞争优势
Competitive Advantages

- 垂直式反应器，免维护周期长
- Semi标准片盒到片盒传送系统，有效降低颗粒度
- 集成预加热腔，降低衬底残留水汽与热形变
- 基于模型的温度控制，提供高精确、高响应、高稳定性的温控

- Vertical reactor, realizes long PM cycle
- Semi standard cassette to cassette wafer transfer, achieves better particle performance
- Integrated pre-heating stations, minimizes substrate moisture residue and thermal deformation
- Model-based temperature control system, provides precise, responsive and stable temperature control



为Micro LED新型显示生产提供的MOCVD外延解决方案
MOCVD solution for GaN based Micro-LED production

Preciomo Udx®

中微具有自主知识产权的Preciomo Udx® MOCVD设备专为Micro LED量产设计，最多可配置两个反应腔，可同时加工18片6英寸或者12片8英寸高性能氮化镓基蓝绿光Micro LED外延片。每个反应腔可以独立控制，具有高度生产灵活性。中微Preciomo Udx® MOCVD设备采用了水平式双旋转反应器结构，具有优异的波长均匀性和产出稳定性；配备集成电路行业标准的EFEM和SMIF系统，可实现片盒到片盒的全自动化传输模式，有效降低Micro LED外延片的颗粒数。该设备凭借其优异的波长均匀性、低缺陷密度以及高产出稳定性，满足了Micro LED量产的严苛技术要求。

The Preciomo Udx® MOCVD system is engineered for high-volume Micro-LED manufacturing. Configurable with two independently controllable reactors, the system can accommodate up to 18x6”or 12x8”GaN-based Micro-LED epitaxial growth simultaneously. The dual-rotation wafer carrier with horizontal gas flow architecture ensures exceptional wavelength uniformity and production stability. Integrated IC industry standard EFEM and SMIF systems, achieving fully automated cassette-to-cassette wafer transfer and effectively reducing particle generation. Relying on its superior wavelength uniformity, low defect density and high production stability, the Preciomo Udx® MOCVD system fulfills the strict technical requirements and facilitates the Micro-LED mass production.

产品特点
Product Features

- 用于蓝宝石基与硅基氮化镓Micro LED外延生产的关键设备
- 6”/8”兼容，水平多片式反应器结构
- 兼具布局紧凑与维护便捷特性
- 基于模型的温度控制系统
- 符合集成电路行业标准的自动化传输系统

- Key equipment for GaN-based Micro-LED production
- Multi-wafer reactor with horizontal gas flow, 6”/8”compatible
- Compact footprint with friendly maintenance
- Model-based temperature control
- Automatic transfer system compliant with IC industry standard

竞争优势
Competitive Advantages

- 业界领先的单腔产能
- 优异的波长和厚度均匀性，低的缺陷密度
- 片盒到片盒全自动传片，传输效率高
- 软件界面友好、操作便捷
- 满足客制化需求，支持工厂自动化功能

- Industry-leading throughput
- Exceptional wavelength and thickness uniformity with low defect density
- Fully automated cassette-to-cassette transferring with high efficiency
- User friendly software interface for intuitive operation
- Customization and factory automation (FA) available



工业用大型VOC净化设备
VOC purifier for industrial use

VOC净化设备

中微利用分子筛的吸附原理的化学反应器，在国内率先开发制造了工业用大型VOC净化设备。设备采用机电一体化、半导体等级的人机防护，具有独特的在线浓度监测功能，能远程实时管理和智能控制，并可根据客户的要求灵活配置不同处理规模的系统，提供给客户可靠、稳定、安全和节能的VOC解决方案。目前，中微的VOC净化设备已被广泛应用于国内平板显示行业生产线，以改善洁净室的工作环境。

AMEC pioneered the first Volatile Organic Compounds (VOC) purifier developed in China and targeted for industrial use. The product features an integrated electronic cabinet and a design that meets stringent SEMI safety standards. A unique in-situ VOC monitoring function enables remote real-time monitoring and smart control. The tool, which can be customized and scaled to address diverse treatment capacity needs, offers a stable, reliable, safe and energy-efficient VOC removal solution. The product is widely used in LCD production lines in China to improve clean room environments.

产品特点
Product Features

- 与其他同类产品相比，占地面积小、功耗低
- 整合式电气控制柜设计，简化配线和设备布局
- 复合式处理风机设计，保证设备持续高效运行
- 安全设计符合IEC及相关的标准

- Compact footprint
- Integrated electronic cabinet and simplified system layout
- Composite design for process fans to ensure continuous, efficient operation and generate maximum energy savings
- Complies with IEC safety requirements and associated standards

竞争优势
Competitive Advantages

- 拥有多项专利的VOC浓度在线监测系统
- 多种针对不同VOC环境下的经济运行模式，实现高效运营目的
- 高效的处理能力和低成本的维护投入
- 可根据客户需求，提供定制化的产品
- 专业的信息化模拟团队，为客户提供多种参数模型设计

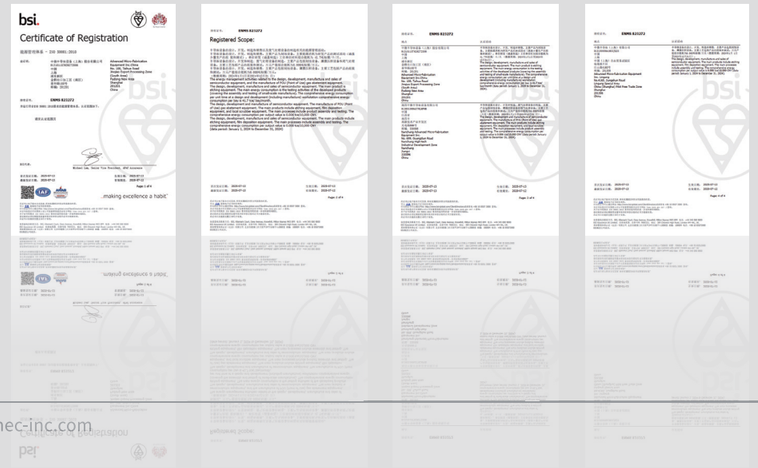
- Patented in-situ VOC monitoring functions
- Multiple smart-control modes for optimum energy savings
- High VOC removal efficiency with lower maintenance requirements
- Can be customized and scaled to address diverse treatment capacity needs
- Multiple parameter model design engineered by professional CFD team



零缺陷的质量管理和安全生产
Zero-defect quality management and safe production

高效营运缩短中间环节，保障及时供货
质量控制和保障落实到每个生产环节和个人
在保障环境和人员安全的前提下安全生产

Efficient manufacturing operations with optimized processing steps that ensure timely supply of parts
Implementation of quality control and assurance in each production step
Safe and secure production environment





第二十五届中国专利银奖
Award of the 25th China Patent Award

国家知识产权局 2025年5月



2009、2022年度上海科学技术进步奖一等奖
2011年度上海科学技术进步奖二等奖
1st & 2nd Prize-Shanghai Science and Technology Progress Award

上海市人民政府 2010年3月、2011年11月、2023年4月



2020 & 2022 & 2023 & 2024 福布斯中国最具创新力企业 50 强
2020、2022、2023、2024 Forbes China 50Most Innovative Companies

福布斯中国 2020 年 10 月、2022 年 10 月、2023 年 11 月、2024 年 12 月



第四届中国质量奖提名奖
China Quality Mangement Award

国家市场监督管理总局 2021年9月



第十五届 & 第二十二届中国专利金奖
Chinese Patent Gold Prize the 15th & 22nd China Patent Award Selection

国家知识产权局 2013年11月、2021年6月



国家企业技术中心
National Enterprise Technology Center

国家发改委、科技部、财政部等部门 2020年12月



上海市等离子体刻蚀技术重点实验室
Shanghai Key Laboratory of Plasma Etching Technology

上海市科学技术委员会 2019年12月



制造业单项冠军产品（中微28/22/14/7纳米刻蚀机系列）
Champion Product in Manufacturing Industry

工业和信息化部、中国工业经济联合会　2019年11月



2017年度突出贡献奖
Outstanding Achievement Award 2017

全国半导体设备和材料标准化技术委员会　2017年11月



SAP HANA创新奖
SAP HANA Innovation Award Winner 2017

SAP　2017年5月



上海市科技小巨人企业
Shanghai Little Giant Enterprise of Science and Technology

上海市科学技术委员会、上海市经济和信息化委员会　2016年6月



上海市认定企业技术中心
Certificated Enterprise Technology Center of Shanghai

上海市经济和信息化委员会、上海市财政局等　2016年2月



第十六届 & 第二十三届中国国际工业博览会金奖
Gold Prize awarded by the 16th&23rd Session China International Industry Fair

中国国际工业博览会组委会　2014 年 11 月、2023 年 10 月



第十五届中国国际工业博览会银奖
Silver Prize awarded by the 15　Session China International Industry Fair

中国国际工业博览会组委会　2013年11月

中微公司发展壮大的“五个十大”

