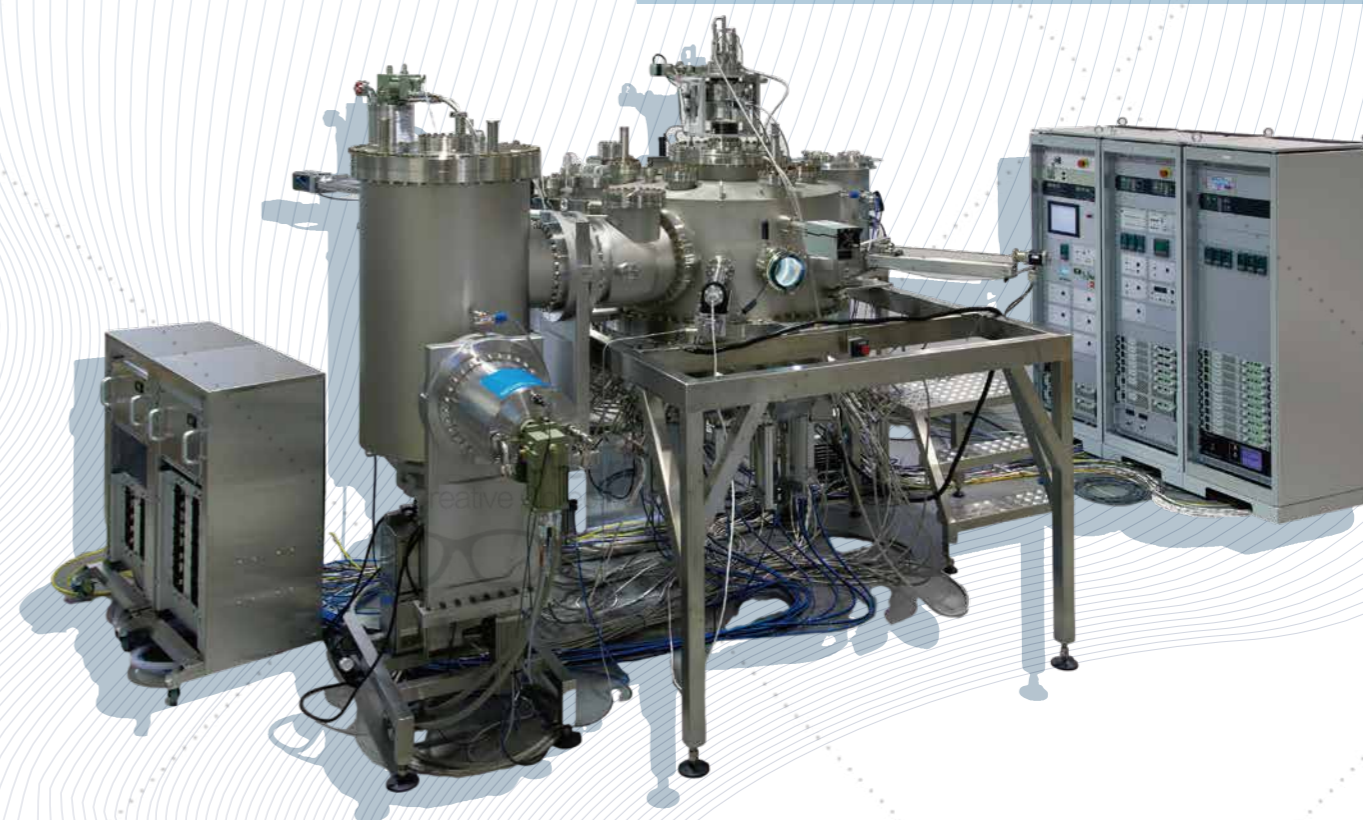


迪希埃（北京）半导体技术有限公司

DCA (Beijing) Semiconductor Technology Co., Ltd

技术服务指引

Technical Service Guide



致力于全方位服务中国客户
Devote to providing all-round service for Chinese customers

WeAre
Creative Collective



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COMPANY PROFILE



我们是谁 Who We Are

迪希埃（北京）半导体技术有限公司（以下简称“迪希埃”）成立于2020年3月，是由芬兰DCA Instruments Oy（以下简称“DCA”）参与设立的中方控股合资企业，也是DCA在中国唯一的技术服务中心。

DCA Beijing Semiconductor Technology Co., Ltd. (referred to as "DCA Beijing") was established in March 2020 as a Sino-foreign joint venture, with majority Chinese ownership. We are the exclusive technical service center for DCA Instruments Oy in China.

深耕中国，同行致远 Deeply Rooted in China, Advancing Together:

自2007年DCA向中国客户交付首台MBE设备以来，我们已在中国市场深耕十余年，参与支持了中国MBE领域的发展。我们为客户提供定制化的MBE解决方案，帮助客户获得创新成果。伴随着迪希埃的成立，我们也不断吸引优秀人才的加入，共同促进DCA在中国的长远发展。

Since DCA delivered its first MBE equipment to Chinese customers in 2007, we have been deeply involved in the Chinese market for over a decade, supporting the development of MBE technology in China. Our expertise and dedication have allowed us to deliver customized MBE solutions, enabling our customers to achieve innovative breakthroughs. With the establishment of DCA Beijing, we continue to attract top talent, contributing to the long-term growth of DCA in China.

致力于全方位服务中国客户 Comprehensive Customer Service Commitment:

迪希埃将以DCA世界领先的MBE设备为基础，以强大的安调及工艺团队为支撑，联合业内顶级合作伙伴，全面满足中国客户对MBE设备售前、售中、售后的需求，我们也将持续提升公司的综合服务能力，追求最佳的科学、经济和运营结果，致力于全方位服务中国客户。

At DCA Beijing, we prioritize delivering exceptional support to our Chinese customers at every stage of their MBE equipment journey. Powered by DCA's cutting-edge MBE technology and bolstered by our team of expert installation and process professionals, we forge partnerships with industry leaders to fulfill the diverse requirements of our customers, including pre-sales, during-sales and after-sales requirements. We remain committed to continuously enhancing our service capabilities, aiming for the utmost scientific, economic and operational outcomes, and providing comprehensive, top-quality services to our valued customers in China.

设备服务 Equipment services

01 DCA 设备安装衍生服务 Derivative technical services of equipment installation

定制化电线电缆布线走线 Customized wire and cable routing

对客户现场提供定制化电线电缆的布线走线、安装桥架、地面盖板等服务
Provide customers with customized wire and cable routing, installation of bridge, ground cover and other services

泵体、压缩机降噪 Noise reduction of pumps and compressors

为客户干泵、冷泵压缩机提供隔震垫铺设、消音器安装等降噪服务
Provide customers with isolation pad laying, silencer installation and other noise reduction services for oil-free scroll pumps and cryopump compressors

其他安装衍生服务 Other derivative services of equipment installation

对客户提出的各类需求积极响应，形成解决方案并落实执行
Actively respond to various requirements of customers, develop and implement solutions

02 DCA MBE设备售后服务 MBE equipment after-sales technical service

设备维修 Equipment maintenance

为超出质保期设备提供故障维修、替换部件等服务
Provide breakdown repair, parts replacement and other services for equipment out of warranty period

机械结构维护保养 Mechanical component maintenance

为设备所有运动部件（如CDC，Manipulator等）进行定期的维护保养工作
Perform regular maintenance work for all the moving parts of equipment (such as CDC, Manipulator, etc.)

干泵维护和维修 Oil-free scroll pump maintenance and repair

对客户干泵定期进行维护或维修更换服务
Perform regular maintenance service or repair & replacement service for oil-free scroll pumps of the customers

腔体清理服务 Growth chamber cleaning service

清理去除生长腔内沉积的多余材料；清理冷屏
Clean and remove residual deposition materials in growth chamber; Clean cryopanel

MBE设备移机服务 Relocation service of MBE equipment

将已安装运行的MBE设备拆分，转运至另一地点重新组装恢复运行
Disassemble the installed and operational MBE equipment, transfer to another location and reassemble and recover the equipment

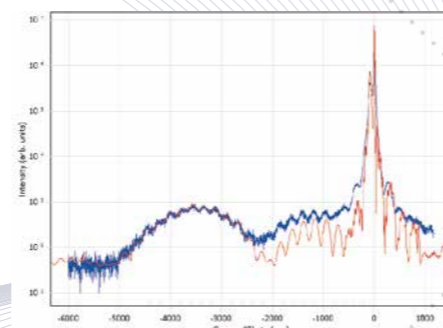
03 DCA 样品生长及检测服务 Sample growth and testing services

样品生长 Sample growth

按照客户要求的结构，提供生长材料样品服务
Provide sample growth service according to customer's required structures

样品检测 Sample test

按照客户的要求，提供样品材料多方面检测服务，并提供检测结果报告
Provide various sample material test services according to customer's requirements, and provide test results report



资源服务 Resourcing

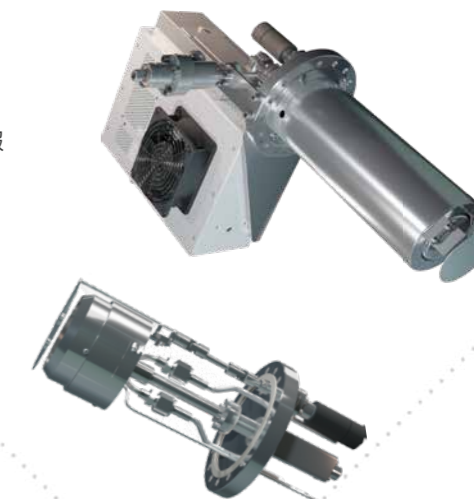
01 DCA 备品备件及其他物料供应服务 Supply service of spare parts and other materials

备品备件供应 Supply of spare parts

根据客户要求提供设备所需备品备件服务（如冷泵、离子泵、分子泵、钼托、坩埚、灯丝、螺栓及铜垫圈等）
Provide spare parts service of equipment according to customer's requirements (such as cryopump, ion pump, turbo pump, molybdenum holder, crucible, filament, bolt and copper gasket, etc.)

其他物料 Supply of other materials

根据客户要求提供设备其他相关物料服务（如衬底、源材料等）
Provide other materials service of equipment according to customer's requirements (such as substrate, source material)



02 DCA 工程、检测设备供应咨询服务 Consulting services of engineering and test equipment supply

洁净工程 Clean room engineering

提供洁净工程设计、施工方咨询服务
Supply consulting services of design party and construction party of clean room engineering

液氮循环系统工程 Liquid nitrogen circulation system engineering

提供液氮循环系统工程设计、施工方咨询服务
Supply consulting services of design party and construction party of liquid nitrogen circulation system engineering

外延检测设备 Epitaxy test equipment

提供外延检测设备采购及安装咨询服务
Supply consulting services of epitaxy test equipment purchase and installation

03 DCA 洁净间二次配设备供应服务 Secondary equipment supply service of clean room

冷水循环系统/水机 Cooling water circulation system/water cooling chiller

根据客户使用要求制定配套方案，并提供软硬件服务
Develop supporting schemes according to customer's requirements, and provide software and hardware services

不间断电源-UPS Uninterrupted Power Supply

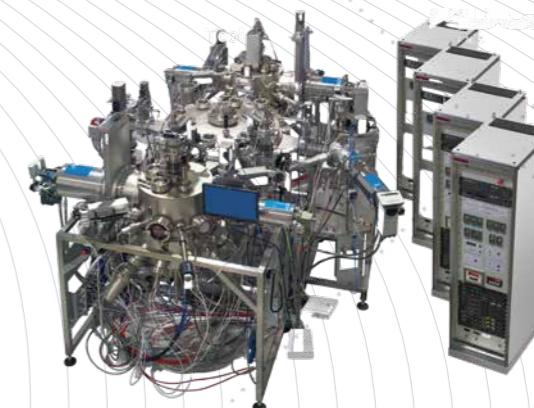
根据客户使用要求制定配套方案，并提供软硬件服务
Develop supporting schemes according to customer's requirements, and provide software and hardware services

液相分离器系统 Phase separator system

根据客户使用要求制定配套方案，并提供软硬件服务
Develop supporting schemes according to customer's requirements, and provide software and hardware services

进样室层流罩 FFU of load lock

根据客户使用要求制定配套方案，并提供软硬件服务，保证进样室洁净度接近百级
Develop supporting schemes according to customer's requirements, and provide software and hardware services, ensure an approximate 100 grade clean class of load lock



设备安装衍生服务

Derivative technical services of equipment installation



定制化电线电缆布线走线

Customized wire and cable routing

桥架: ¥5,500.00/米起
Bridge: ¥ 5,500.00/metre at least

地面盖板: ¥3,000.00/米起
Ground cover: ¥ 3,000.00/metre at least

根据用户现场实际情况规范电线电缆的布线走线, 安装桥架或者地面盖板。

Provide customers with standardized wire and cable routing, installation of bridge, ground cover according to the on-site situation.

- 以上价格包含材料费用和人工费用, 以桥架或地面盖板的总长度计算总价, 若需专程安装则另加收差旅费用。
- The above price includes material and labor costs. Total price is calculated based on the total length of the bridge or ground cover. Travel expenses shall be charged separately if dedicated installation is required.



泵体、压缩机降噪

Noise reduction of pumps and compressors

干泵降噪: ¥3,000.00/台起
Oil-free scroll pumps noise reduction: ¥3,000.00/each at least

冷泵压缩机降噪: ¥2,000.00/台起
Cryopump compressor noise reduction: ¥2,000.00/each at least

针对干泵和冷泵压缩机实施铺设隔震垫、加装消音器等降噪措施

Provide customers with isolation pad laying, silencer installation and other noise reduction services for oil-free scroll pumps and cryopump compressors

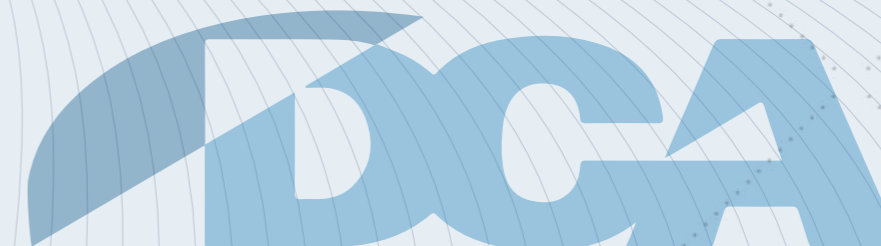
- 以上价格包含材料费用和人工费用, 若需专程安装则另加收差旅费用。
- The above price includes material and labor costs. Travel expenses shall be charged separately if dedicated installation is required.



其他安装衍生服务

Other derivative services of equipment installation

- 针对客户关于其他安装衍生服务的实际需求制定解决方案并提供相应服务。
- Develop solutions and provide services according to the actual needs of customers regarding other derivative installation services.



MBE设备售后服务

MBE equipment after-sales technical service



设备维修

Equipment maintenance

检查: ¥8,000.00/次起

Inspection: ¥8,000.00/each time at least

检查维修: ¥22,500.00/次起

Inspection and maintenance: ¥22,500.00/each time at least

根据客户提出的设备问题进行针对性的检查；
确定问题的根本原因，并完成对应的维修工作。

Targeted inspection according to the equipment problems raised by customers;
Determine the root cause of the problem and complete the corresponding maintenance work.

- 在解决问题的过程中，可能会需要打开腔体，因此工程师会和客户协调具体的工作计划；
- 解决问题的过程中需要用到的器械、材料等需要客户自备；
- 以上价格仅针对单生长腔设备，若涉及多个生长腔的维修价格则相应累加。
- In order to solve problems, it may be necessary to open the chamber, so the engineer will coordinate detailed work plan with the customer;
- The devices, materials, etc. required for problem solving shall be provided by the customer;
- The above prices are for single growth chamber equipment only and the prices will be accumulated if multiple growth chambers are involved.

干泵维护和维修

Oil-free scroll pump maintenance and repair

¥15,000.00/次起

¥15,000.00/each time at least

对nXDS系列干泵tip seal相关问题进行维护维修，
恢复其维持真空的能力。

Maintenance and repair of oil-free scroll pump tip seal of nXDS series related problems to restore its ability to maintain vacuum.

- 客户需将干泵寄送至北京工厂处进行此项服务。
- The customer needs to deliver the oil-free scroll pump to the Beijing factory for maintenance and repair.

设备年检服务

Equipment annual inspection service

¥20,000.00/次起

¥20,000.00/each time at least

检查设备的基本功能实现；
检查设备各部件的工作状态；
检查样品传输功能；
提供检验报告，评估设备存在问题的可能影响。

Check the basic functions of the equipment;
Check the operation status of components of the equipment;
Check the sample transfer function;
Provide an inspection report to assess the possible impact of equipment problems.

- 以上价格仅针对单生长腔设备，若为多生长腔设备价格则需酌情增加。
- The above price is only for single growth chamber equipment, and the price of multi growth chambers equipment will be increased as appropriate.

腔体清理服务

Growth chamber cleaning service

450系列生长腔: ¥150,000.00/腔起

450 series growth chamber: ¥150,000.00/chamber at least

600系列生长腔: ¥200,000.00/腔起

600 series growth chamber: ¥200,000.00/chamber at least

800/1000系列生长腔: ¥300,000.00/腔起

800/1000 series growth chamber: ¥300,000.00/chamber at lease

清理去除生长腔内因长时间外延生长而沉积的多余材料，包括冷屏的清理。

Clean and remove residual deposition materials in growth chamber due to prolonged epitaxial growth, including cryopanel cleaning.

- 以上价格包含清理所需材料费用和人工费用，不包含可能涉及的腔体包装和运输费用等。
- The above price includes the cost of materials and labor required for cleaning, and does not include the packaging and transportation costs of the chamber that may be incurred.

MBE设备移机服务

MBE equipment relocation service

手动传递系统: ¥200,000.00/台起

Manual transfer system: ¥200,000.00/each at least

自动传递系统: ¥300,000.00/台起

Automatic transfer system: ¥300,000.00/each at least

根据用户要求将已安装运行的MBE设备拆分，转运到另一地点重新组装恢复正常运行。

According to the user's requirements, to disassemble the installed and operational MBE equipment, transfer to another location to reassemble and recover the equipment

- 以上价格包含基本材料费用和人工费用，不包含可能涉及的设备包装、搬运、运输及腔体清洗费用等；
- 以上价格仅针对单生长腔设备，若为多生长腔设备价格则需酌情增加。
- The above price includes basic material costs and labor costs, and does not include the costs of equipment packaging, handling, transportation and chamber cleaning that may be incurred;
- The above price is only for single growth chamber equipment, and the price of multi growth chambers equipment will be increased as appropriate.

机械结构维护保养

Maintenance of mechanical structures

手动传递系统: ¥12,000.00/次起

Manual transfer system: ¥12,000.00/each time at least

自动传递系统: ¥20,000.00/次起

Automatic transfer system: ¥20,000.00/each time at least

为设备所有运动部件（如CDC，manipulator等）进行功能检查和维护保养，保证其正常工作。

Functional inspection and maintenance for all moving parts of the equipment (such as CDC, manipulator, etc.) to ensure their normal operation.

- 以上价格包含材料费用、人工费用和差旅费用。
- The above prices include materials, labor and travel expenses.

开腔作业辅助

Chamber unpacking assistance

¥20,000.00/次起

¥20,000.00/each time at least

根据客户提出的开腔要求进行开腔规划；
以标准化的充气、开腔、抽气流程执行开腔规划，
顺利完成预定的开腔任务。

The chamber unpacking plan is made according to the customer's requirements;
The chamber unpacking plan is implemented based on standardized gas charging, unpacking and gas extraction processes to ensure the success of the unpacking plan.

- 该服务不含移机、清洗等长时间开腔的项目；
- 开腔过程中需要用到的器械、材料等需要客户自备；
- 以上价格仅针对单生长腔设备，若为多生长腔设备价格则需酌情增加。
- This service does not include long-term unpacking items such as equipment relocation and cleaning;
- The instruments, materials, etc. needed in the chamber unpacking plan are provided by the customer;
- The above price is only for single-growth chamber equipment, and the price of multi-growth chamber equipment will be increased as appropriate.

设备使用培训

Equipment usage training

¥20,000.00/次起

¥20,000.00/each time at least

根据用户设备的具体配置，制定相应的定制化培训内容；对设备的各部分功能做详细的介绍；对设备的标准化使用流程做详细的介绍。

According to the specific configuration of user equipment, we will develop corresponding customized training plan, make a detailed introduction to the functions of each part of the equipment and give detailed instructions to standardized usage process of the equipment.

- 以上价格包含人工费用和差旅费用。
- The above prices include labor and travel expenses.

样品生长及检测服务

Sample growth and testing services



样品生长

Sample growth

根据客户的需求，派遣有生长经验的工程师到现场进行材料生长流程指导、材料生长品质优化指导；也可以针对客户咨询的材料生长问题，线上或远程协助客户进行问题分析、给与技术指导、提供解决方案等。覆盖范围包括GaAs系列材料、InP系列材料等。

According to the needs of customers, engineers with growth experience are sent to the site to guide the material growth process and material growth quality optimization; We can also assist customers online in analyzing problems, giving technical guidance, and providing solutions for the material growth problems consulted by customers. The service includes GaAs series materials, InP series materials, etc.

- 根据样品的具体要求综合定价
- Pricing shall take the specific requirements of the sample into consideration

检测服务

Testing services

PL检测

PL detection

单/多光谱测量

Single/Multi-spectral measurements

- 硬件配置：532nm/980nm激光器，CCD/InGaAs探测器；
- 波长与发光强度表征；
- 多元化合物组分表征；
- Hardware configuration: 532nm/980nm laser, CCD/InGaAs detector;
- Wavelength and luminous intensity characterization;
- Multi-compound component characterization;

Mapping测量

Mapping measurement

- 外延片波长、强度、积分强度、FWHM的整体分布与均匀性表征；
- Mapping分辨率0.1mm；
- Overall distribution and uniformity characterization of epitaxial wafer wavelength, intensity, integral intensity, FWHM;
- Mapping resolution 0.1mm;

其他项目

Other projects

- VCSEL反射光谱检测；
- 异质外延厚度检测表征；
- VCSEL reflection spectrum detection;
- Heterogeneous epitaxial thickness detection and characterization;



方阻检测

Sheet resistance detection

薄膜电阻检测

Thin film resistance detection

体电阻检测

Bulk resistance detection

- 晶圆电阻、电阻率Mapping分布，整片电阻均匀性表征；
- 阻值测量范围：0.035-10000Ω/sq
- Wafer's resistance, resistivity mapping distribution, full resistance uniformity characterization;
- Resistance measurement range: 0.035-10000Ω/sq

ECV检测

ECV detection

载流子浓度测试

Carrier concentration test

- 载流子浓度检测范围为 10^{13} - 10^{22} cm⁻³；
- 可变频率与光强；
- The carrier concentration detection range is 10^{13} - 10^{22} cm⁻³;
- Variable frequency and light intensity;

C-V/I-V曲线测试

C-V/I-V CURVE test

- 任意腐蚀深度的C-V/I-V曲线表征
- C-V/I-V curve characterization of arbitrary corrosion depth

X射线衍射检测

X-ray diffraction detection

摇摆曲线、高分辨率衍射测试

Rocking curve, high-resolution diffraction test

- GaAs、InP、GaN等系列结构的结构表征；
- 分辨率1/10000°；
- 拟合输出结构组分，厚度等信息；
- Structural characterization of GaAs, InP, GaN etc.;
- Resolution 1/10000°;
- Simulate the output structure components, thickness and other information;

X射线反射谱测试

X-ray reflectance spectrum test

- 1nm~1μm范围的厚度检测
- Thickness detection in the range of 1nm-1μm;

倒易空间Mapping

Mapping of the reciprocal space

- 失配度控制±0.1%；
- 弛豫度控制±0.1%
- Mismatch control ±0.1%;
- Relaxation control ±0.1%

Hall检测

Hall detection

霍尔检测

Hall detection

- 室温及低温（77K）Hall检测；
- 载流子浓度、迁移率、切片方阻等电学特性表征；
- Room temperature and low temperature (77K) Hall detection;
- Characterization of electrical characteristics such as carriers concentration, mobility, and sliced square resistance;

霍尔制样

Hall sampling

- 电极制作及退火制样
- Electrode production and annealing sample preparation

光学显微镜检测

Light microscopy detection

金相、断口等表面形貌检查

Surface topography inspection on metallography, fracture and etc.

- 50~1000倍放大倍数；
- 可实现明暗场、偏光检测；
- 50~1000x magnification;
- Light and dark field and polarization detection;



颗粒度检测

Particle detection

表面颗粒度检测

Surface particle density detection

- 外延片不同粒径范围颗粒数统计；
- 外延片不同区域颗粒分布统计；
- 测量颗粒精度0.1μm；
- Statistics of the number of particles in different particle size ranges of epitaxial wafers;
- Statistics of particle distribution in different areas of epitaxial wafers;
- Particle accuracy measurement 0.1μm;

表面Haze检测

Surface Haze Detection

- 外延片表面平整度表征；
- 检测精度：0.02ppm
- 分辨率：0.002ppm
- Characterization of surface flatness of epitaxial wafers;
- Detection accuracy: 0.02ppm
- Resolution: 0.002ppm

CF法兰密封垫圈 Gasket

型号 (Model)	规格 (Specification)
DN16CF	21.25OD 16.00ID 2mm
DN40CF	48.15OD 36.86ID 2mm
DN40CF oversized	48.15OD 38.70ID 2mm
DN50CF	61.60OD 50.90ID 2mm
DN63CF	82.40OD 63.45ID 2mm
DN63CF oversized	82.40OD 72.00ID 2mm
DN100CF	120.50OD 101.70ID 2mm
DN100CF oversized	120.50OD 106.00ID 2mm
DN125CF	141.40OD 127.20ID 2mm
DN160CF	171.10OD 152.50ID 2mm
DN200CF	222.00OD 203.25ID 2mm
DN250CF	270.10OD 254.00ID 2mm
DN350CF	376.70OD 356.50ID 2mm
DN400CF	423.90OD 405.00ID 2mm
Rectangular 50x366 VAT Seal Gasket	For 12-inch rectangular flange
DN1000WS	For 1000-series chamber
DN800WS	For 800-series chamber
DN600WS	For 600-series chamber
DN450WS	For 1000-series cassette
DN400WS	For 1000-series manipulator

快门组件 Shutter Assembly

型号 (Model)	规格 (Specification)
Linear Source Shutter Assembly	For 450-series system
	For 600-series system
	For 800-series system
Shutter Plate	For 1000-series system
	For 450-series system
	For 600-series system
	For 800-series system
	For 1000-series system

坩埚 Crucible

型号 (Model)	规格 (Specification)
Crucible for 450-series System	10 cc ~ 40 cc
Crucible for 600-series System	13 cc ~ 100 cc
Crucible for 800-series System	13 cc ~ 200 cc
Crucible for 1000-series System	20 cc ~ 1000 cc

样品托 Molybdenum Platen

型号 (Model)	规格 (Specification)
Mo Platen for 450-series System	1/4 x 2" ~ 4"
Mo Platen for 600-series System	1/4 x 2" ~ 4"
Mo Platen for 800-series System	2" ~ 4"
Mo Platen for 1000-series System	2" ~ 8"

说明 Note:

各品类供货周期及报价请向销售人员或技术人员详细咨询。
Please consult sales or technical personnel for the lead-time and quotation of each category.



源炉 Cell

型号 (Model)	规格 (Specification)
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	500 cc
Arsenic Valved Cracker Cell	1000 cc
	4000 cc
	10000 cc

Phosphorus Valved Cracker Cell	1000 cc
	2500 cc

Antimony Valved Cracker Cellt	300 cc
	500 cc

Cold Lip Cell (Single Filament Cell)	20 cc
	200 cc

	20 cc
	100 cc
Hot Lip Cell (Dual Filament Cell)	200 cc
	500 cc
	1000 cc
	2000 cc

Retractable Effusion Cell	200 cc
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冷屏 Cryopanel

型号 (Model)	规格 (Specification)
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Cryopanel	For 600-series system
	For 800-series system
	For 1000-series system

其他配件 Other

型号 (Model)	规格 (Specification)
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Power Feedthrough with LEMO Connector	1 PIN
	2PIN

Thermocouple Feedthrough (C Type)	C Type
	K Type

RHEED Filament	For Staib RHEED
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Gauge Ion Nude Filament	For Agilent Ion Gauge
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RGA Filament	For SRS RGA
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RHEED Screen	For Staib RHEED
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样品传输 Sample Transfer

型号 (Model)	规格 (Specification)
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Manipulator for Manual Transfer System	For 450-series or 600-series system
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Manipulator for Automated Transfer System	For 800-series or 1000-series system
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Robot for Automated Transfer System	For central distribution chamber
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说明 Note:

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