富临科技工程股份有限公司
F.S.E COPORATION
新竹市东光路55号7楼之3
TEL: (03)573-9601 FAX: (03)573-9603

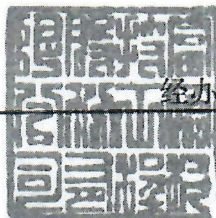
报 价 单

客户名称： 中科院物理所
ATTN ：潘老师
电 话：
传 真：

日期： 2021 年 11 月 19 日
編號: TW20211119001
币别：RMB

项目	品 名 及 规 格	数量	单位	单价	总价
1	High Vacuum E -Beam Evaporator System Model :FU- 12PEB-500 详细规格请参考规格书 付款条件: (1) 100% 不可撤銷信用狀 交机時 付款 90%不可撤銷信用狀 验收后付款 10%	1	set	985,000 (CIF天津港)	985,000
总额	RMB 玖拾捌万伍仟圓整			销售额RMB	985,000
	上述人民币价格为未税价（採外汇方式付款）				
				合 计RMB	985,000

［1］ 付款条件：
［2］ 交货日期：合同签订后4-5個月
［3］ 本报价单 30 天内有效，逾期另估



经办人：劉奉仁 分机：

SPECIFICATION FOR E-Beam Evaporator System (Metal Process)

製　作　規　格　書

機台名稱： 電子束蒸鍍系統
型　　式： FU- 12PEB-500
數　　量： 1台

1. 概要 ：

本設備為在 Ø4 inch 基板上形成薄膜之電子束蒸鍍設備。
本設備是由以下所組合而成：

1-1. 由电子束蒸发源（40cc*6）为蒸发源。
1-2. 电子束蒸发源在中央点。
1-3. 电子束蒸发源设有 10KW POWER SUPPLY 一组蒸发电源。
1-4. 基板为公转方式，一次為 4” 三片(前置式)。
1-5. 主排氣系統為 12 inch cryo pump 及機械 pump 組合而成。
1-6. 腔體可加熱至 320℃，控制用 SCR PID 控制。
1-7. 膜厚監控有石英振盪片（5MHZ）監控。
1-8. 製成氣體為 N2、O2 兩種，需搭配半開始主閥。
1-9. 控制系統，系統為自動排氣、自動鍍膜。
1-10. CRYO PUMP 為自動再生。

2. 性能 ：

2-1. 到達壓力　　$3X10^{-7}$Torr 以下(12hours)
2-2. 排氣時間　　$3X10^{-6}$Torr (主閥打開 20 分鐘)
上述 2-1.，2-2.為 target 及無基板時之常溫值，且真空槽內 vent 須導入 N2 氣體 3 分鐘才能獲得該值。
2-3. 基板加熱溫度　(1)基板加熱 MAX 320℃
溫度均勻性 300℃±10℃
2-4　處理量　　基板 ϕ4inch 基板 3 枚
2-5　操作　　全自動模式
自動排氣功能-自動加熱功能-自動再生暖機功能-自動鍍膜功能
2-6　膜厚均勻性： 4” Wafer 3000Å AL2O3
With in Wafer，Wafer to Wafer ，Run to Run 均需達到
3000Å AL2O3 ≦± 5% 以下(採用修正板修正)
2-7 膜厚均勻性量測方式及計算公式（如下）
量測試：採多點測量

量測公式：

Uniformity On the substrate

$$\frac{(\text{max.}) - (\text{min.})}{2 * (\text{av.of 9 points})} * 100\% \leqq \pm 5\%$$

3. 機器明細

3-1. 真空槽系統

(1)Chamber　500 * 500* 600 mm H
材質　SUS 304 製
內面　電解拋光
外面　水冷 pipe
附屬品　視窗(Ø100mm)
主排氣口 x1
大氣確認器導入口
防著板
熱電對導入口
高壓電極導入口
蒸發源遮板導入口
加熱電極導入口
抽氣口 water baffle

3-2. 基板尺寸：4 inch　1 式
(1) 採用公轉方式。
(2) 每 Run 可置 φ 4inch 基板三枚。
(3) 基板旋轉需要可以調整速度。

3-3. 內部加熱系統
(1)基板加热　卤素灯　1 式
AC110V 1 φ 500w PID 控制之 CA 热电偶
(2)需要石英罩板以防镀膜污染
(3)采用 SCR PID 控制

3-4. .蒸發源系統　(ULVAC)
(1)蒸发源：EGN-406M　1 式
Hearth：40cc*6
(2)电源供应器：HPS-1000N　1 式
功率：10KV.1A .10KW

3-5. 排氣系統
(1) 主 pump
cryo pump ：U-12　(ULVAC)　1 式
pumping speed：9500 l/sec（H_2O）
壓縮機：C30VRT
(2) Rough pump　(ULVAC)
Oil Rotary pump：VDN-602　1 式
Pumping speed：1000 l/min
(3) 主 valve：12” valve(全開、半開功能)
(4) 再生 valve
(5) 粗抽 valve
(6) 腔體 Leak valve
(7) cryo pump 再生管路
(8) 管路 Leak valve

(9) 真空配管
(10) 微量 Leak valve
(11) 機台必要管路

3-6. 量測系統

(1) 膜厚監控 1 式
膜厚監控器：CRTM-9200 (ULVAC)
設定程式：128 組
膜厚監控 Sensor：CRTS-4（5MHZ） 2 式
顯示：LCD 顯示
(2) 真空度監控
(2-1)高真空計：IKR-251 1 式
量測範圍：10^{-3}~10^{-9} mbar
(2-2)低真空計：TPR-280 2 式
量測範圍：1000~10^{-4} mbar

3-7. 氣體流量計(MFC) 2 式

Gas: O2 50sccm 1set
Gas: N2 50sccm 1set

4. 操作系统 1 式

1)操作盤
PC Controller
a) 作 业 环 境 WINDOWS-10 1 set
b) R2 interface for PLC 1 set
c) Ao card for CRTM-9200 1 set
d) soft 费 用 1 set
1) 提 供 下 列 服 务 项 目 :
图控软件备份,提供合法取得版权之 WINDOWS-10 (或更新版本)
一套提供操作手册及必要之训练 LCD MONITOR 1set
2) 在 WINDOWS-10 (或更新版本)下操作之图控软体提供
3) 可 储 存 DATA LOGGING 历史资料，并以趋势图形显示。
4) 趋势图可局部放大、移动，光标线可显示趋势图特定点数据之数值及记录时间。
5) 即时绘制趋势资料图形。
6) 记录项目 : 镀膜 POWER
CRTM-9200 的镀膜资料(rate ,thickness 等)
镀膜 rate 实时监控
制程温度值
真空度
Holder 旋转速

5. Utilities

5-1 機台面積

W*D*L：1600*2000*1800 mmH

重量：1100 Kg

5-2 機台所以水、氣、電（廠務所需由客戶提供二次側）

(1) 電量

220V ± 5% ，3 ϕ .4W. 60HZ. 100A

(2) 冷卻水

數量：三進三出 3/4” 接頭

水壓：2Kg/cm^2

水溫：20~25℃

(3) 空壓（CDA）：

壓力：5Kg/cm^2（Air）10mm 接頭*1

(4) Gas N_2（for Leak）：

壓力：1 Kg.cm^2 6*8 快速接頭*1

(5) Gas :

0.05MPa (N2、O2 製程用) 1/4 金屬接頭

(6) 廢氣排放口：50mm

(7) 接地 10Ω 以下

驗收規範

項目	採購規範	測試結果	合格與否
終端壓力	3 $\times 10^{-7}$Torr(12hr)	附排氣速度表	
到達壓力	至 3$\times 10^{-6}$Torr(主閥打開 20min)	附排氣速度表	
溫度要求	加熱燈 Max. 320℃ , 溫度均勻性 300℃±10℃	附加溫測試報告	
鍍膜測試	AL2O3 : 3KÅ (材料由客戶提供) 厚度為 3000Å≦±5% 量測 uniformity ≦±5% (with in 4” wafer, wafer to wafer, run to run.) (max-min / 2 * (av.of 9 points))x100 (採用修正板修正)	附膜厚均勻測試報告	
腔體尺寸	500*500*600mm		
4 “wafer Dome	4 “wafer 可置 3pcs(前置式)		
操作手冊	二份/台 包含各單體說明及設備電路圖		
真空計 各式 pump	需附進口證明或校驗報告書		
EMO 測試	動作時,系統 MAIN POWER 跳脫		

Kurt J. Lesker Company
Enabling Technology for a Better World
PROCESS EQUIPMENT DIVISION

1925 Route 51, Jefferson Hills, PA 15025 USA
www.lesker.com; sales@lesker.com
SALES: (800) 245-1656
Fax: (412) 384-2745

BUDGETARY ESTIMATE 预算报价
PRO Line™ PVD 75™ THIN FILM DEPOSITION SYSTEM
PRO Line™ PVD 75™ 薄膜沉积系统

COMPANY公司	IOP	REFERENCE # 报价单号#	
CONTACT联系人	Pan Ruhao		
PHONE电话	13020049070	PREPARED BY/方案拟定:	
EMAIL邮箱	panruhao@iphy.ac.cn	DATE日期:	19-Nov-2021

The Kurt J. Lesker Company® **PRO Line PVD 75™** is the next generation thin film deposition system based on the workhorse PVD 75 platform. With more than 400 units in service worldwide, the PVD 75™ is a proven, robust, and versatile design. The PRO Line PVD 75 builds on the successes of the original design with improved system base pressures and pumpdown times. A technically superior chamber design, an industry best software control system with advanced programming capability, automatic substrate loading, and numerous features for optimized thin film performance are a few of the key advantages offered in this innovative, best of class design. For more information please visit the website by clicking here.
科特莱思科公司的 **PRO Line PVD 75™** 是基于PVD75经典款开发的新一代薄膜沉积系统。全球保有量超过400台，**PVD75™**经典款是历经实践验证的技术成熟、性能稳定、多功能设计的薄膜沉积系统。**PRO Line PVD 75™** 在PVD75经典款基础上进一步提高系统的本底真空并缩短系统的抽空时间。对工艺腔室进行优化设计，工业化设计的控制系统具有先进的编程功能、基片自动加载功能，此次对经典款产品的系列技术创新旨

CLOSED FRAME 封闭框架 *OPEN FRAME WITH LOAD LOCK 开放式框架带样室*
Photo is for reference only, actual system may vary based on options

BASE SYSTEM DESCRIPTION 基本配置

PROCESS CHAMBER 工艺腔室

• Box Shaped 304L Stainless Steel chamber: internal dimensions 15.25" wide x 16.50" deep x 24" high (387.4mm wide x 419.1mm deep x 609.6mm high)
304不锈钢方腔，工艺腔内部名义尺寸约为：宽15.25" x 深16.50" x 高24" (宽387.4mm x深 419.1mm x高 609.6mm)
• Aluminum, O-ring sealed, hinged, front access door
O型圈密封，铰链连接，铝制前门
• Two (2) O-ring sealed side plates, allow for maximum modularity and upgradeability
两个侧面法兰采用O型圈密封，模块化设计和极具可升级性
• Viewport and replaceable viewport protector
门上配有观察窗，带有可更换屏蔽衬板
• Up to ten (10) 2-3/4" CF spare ports provided (selection dependent)
最多可预留10个2-3/4"CF法兰接口(具体数量基于设备具体配置)

VACUUM PUMPING 真空泵

• Pfeiffer HiPace 800 - 790 l/s speed control turbo pump is included in the base system
配置普发Hipace 800分子泵，抽速790L/s，分子泵转速可调
• 3-position gate valve is included with the base system
系统配置三位门阀
• 7.6 cfm oil sealed mechanical pump is included in the base system
配置抽速7.6cfm油封机械泵
• Foreline trap, mist eliminator, roughing valve, and roughing hardware provided as necessary
必要的前级管路过滤器，油雾过滤器，前级阀门和连接件
NOTE: Roughing pump is located remotely from system frame
注释：前级泵位于设备框架外部
NOTE: See "HIGH VACUUM PUMPING" and "ROUGH VACUUM PUMPING" in Options section below for additional details and other pumping choices
注释："高真空泵"和"前级真空泵"选项中提供了其它真空泵的可选型号及详细信息

VACUUM GAUGING 真空测量

• Wide range vacuum gauge reads from atmosphere to 10^{-9} Torr (Ion gauge and Pirani)
全量程真空计，测量范围由大气至10^{-9} Torr（离子规和皮拉尼规）
• Wide range gauge in load lock chamber (when applicable)
全量程真空计用于进样室（若适用）
• Pirani gauge in Cryo / foreline (when applicable)
应用于低温泵/前级泵的皮拉尼规（若适用）
• Readout is displayed on system control panel
读数显示于系统操作面板
• All mounting and connection hardware, adapters, etc.
包含所有安装和连接所需用到的硬件和转接件等

OPEN SYSTEM FRAMEWORK (standard) 开放式系统框架（标配）
• Fully enclosed system base cabinet
系统框架底部全封闭
• Open access to the chamber
开放式工艺腔室
• Leveling pads and caster wheels
带有脚轮和水平支脚
• Removable enclosure panels
可拆卸式系统框架面板
NOTE: See "FRAME" in Options section below for additional details
注释：更多信息请参见下面"框架"选项

WATER DISTRIBUTION MANIFOLD 冷却水分配系统
• Manual shut off valves
带有手动截止阀
• Interlocked flow switches to critical components
水流继电器控制系统关键部件的互锁
• Cryopump compressor requires separate water connection when applicable
冷凝泵氦压缩机需要独立冷却水路连接（若适用）
• NPT connections (inlet and outlet), adapters supplied when appropriate
NPT接口（进水口和出水口），如果需要，可以提供公制螺纹接头

GAS AND PNEUMATIC DISTRIBUTION 气路系统
• Inert Vent/Purge gas, Swagelok compression fitting inlet
惰性气体破空/吹扫，接口为Swagelok
• Compressed air (pneumatics), compression fitting inlet
压缩空气（气动），接口为快插形式
• Process gas, male VCR inlet(s), adapters supplied when appropriate
工艺气体，入口为VCR公接头，可根据需要提供公制转接头

POWER DISTRIBUTION 电源
Single service drop, 208VAC, 60Hz, three phase, 5-wire 单线接盒，208VAC，60Hz，三相五线制
Single service drop, 380-415VAC, 50Hz, three phase, 5-wire 单线接盒，208-415VAC，50Hz，三相，五线制
• Amperage rating based on selected components
设备额定电流取决于设备的具体配置
• Component wiring is routed to a centralized power distribution module
各部件的接电通过总控电源分配
• EMO protection
带有EMO紧急停机按钮
• Appropriate safety interlocks
带有相应的安全互锁
NOTE: A dedicated earth ground is required
注释：设备需要一个专用地线

KJLC eKLipse™ ADVANCED Control Package 软件控制系统高级配置

• Provides for automated process control (recipe)
镀膜工艺全自动程序控制
• Graphical Recipe Builder generates a recipe via mouse or touchscreen selectable user interface components
形象生动的工艺生成器：可以通过鼠标或触摸屏编写生成镀膜工艺程序
• Recipe Database Screen provides selection & editing of stock recipes, with copy functionality for modification of existing & saving of new recipes
通过程序数据库界面，可以选择调用和编辑现有程序，也可以通过程序复制功能，修改现有程序并另保存为新的程序
• Programming/control via a keyboard/touch pad or pop-up window on touch screen
可以通过鼠标、触摸板或触摸屏上的弹出式窗口来编程或控制设备运行
• User Interface via .NET application run on Windows PC platform
用户界面可通过.NET应用程序在Windows系统的计算机平台上运行
• Standalone Real Time Controller (RTC) executes equipment automation
独立的实时控制器（RTC)控制设备自动化运行
• RTC provides uninterrupted operation, independent of the Windows Computer and User Interface status
独立实时控制器（RTC）提供不间断运行，独立于Windows计算机和用户界面状态，计算机死机或者程序退出不影响设备运行
• All In One (AIO) PC, full HD touch-screen monitor, keyboard with touch pad
多合一式电脑，配有高清触摸屏与控制键盘
• PC provides supervisory interface to RTC, facilitates actuation of vacuum, transfer, maintenance, and deposition process components
电脑提供RTC监督界面，监控真空操作、运动传递、维护与沉积工艺部件
• UI Navigation and Title Panel: Visual display and control of System status messages, user login/logout, operation mode, and system abort
界面包含：直观的显示系统状态信息，用户登入/登出，操作模式和操作中止。
--Vacuum Screen: Visual display of valve position, pump status and vacuum status
真空界面：直观的显示阀门状态，泵的状态和真空度
--Deposition Screen: Indication of shutter position, deposition source status, source material
沉积界面：显示挡板状态，沉积源状态，沉积材料类型
--Gas Screen: Mass flow controller modes, gas valve status, pressure measurement and control display
气路界面：质量流量控制器的模式，气阀状态，压力测量和压力控制显示
--Motion Screen: Display/input of position and velocity as well as control of motors
运动界面：控制电机，显示和输入样品台的位置和转速
--Cooling Screen: Water flow switch status for all cooling channels
冷却界面：显示冷却水水流状态
--Heating Screen: Temperature setpoints & control parameters, PID and Auto Tuning features
加热界面：温度设定参数，控制参数和PID参数以及自动控温功能
• Standard Chart Recorder (plots up to 10 signals or "pens" simultaneously) and datalogging (.csv file)
图表记录功能（最多可以显示十个数据信号，或同时兼容画笔功能），带有数据记录功能（存为.csv文件)
• Supports multiple user accounts and password levels with custom security access for recipes and screens
支持多个用户账户和不同级别的密码权限管理，满足客户对程序和界面的安全保护要求
• System event log captures all user login/logout events, all recipes executed, and system status messages
系统事件日志功能可以记录所有的用户登录/注销信息、所有运行的程序信息以及系统的状态信息等
• Optional Maintenance Reminder screen available upon request
可根据需求提供设备保养提醒界面

WARRANTY AND LIABILITY 质保期和责任条款
• 12-month standard warranty as described in Kurt J. Lesker Company Standard Terms and Conditions of Sale
标准质保期限为12个月，在Kurt J. Lesker Company Standard Terms and Conditions of Sale 文件中有详细说明
• KJLC is not liable for any indirect or consequential damages; KJLC liability shall in no event exceed the amount paid by customer to KJLC for the products described in this document
KJLC不承担任何间接性损害赔偿；如果确实需要赔偿，KJLC赔偿的金额不超过本报价所述产品客户实付的金额

FACTORY TESTING 出厂测试和承诺
• The System is factory tested to comply with the standard PRO Line™ System Performance Specifications (SPS) per attached Appendix A
系统通过出厂测试，并符合附件A所列明的PRO Line™ 系统性能测试标准
• These will be the only specifications required to meet system compliance and acceptance.
这个标准将做为满足设备性能承诺和验收的唯一标准
• The customer will be supplied with applicable testing documentation
提供相应的测试报告
• No process guarantees of any kind are offered or implied with the system
设备不提供任何工艺上的保证

DIRECTIVE COMPLIANCE合规声明
• Systems within the European Economic Area (EEA) are CE marked and comply with the following EU directives:
在欧洲经济区销售的系统都有CE认证并符合欧盟法规
-Low Voltage Directive (LVD)欧盟(LVD) 2014/35/EU指令
-Electromagnetic Compatibility (EMC) Directive 2014/30/EU欧盟(EMC) Directive 2014/30/EU指令
• Systems outside of the EEA can be CE marked for an additional cost
在欧洲经济区以外出售的系统，如需CE认证，须额外支付相关费用

Base System Price 设备基本配置价格 $129,700.00

SYSTEM OPTIONS AND UPGRADES 设备可选项和升级选项：
NOTE: If an option is selected, the system price will reflect the selection. Options not selected will not be included in the system.
注释：如果勾选了选项，相应的价格将体现在总价中，没有勾选将不会体现。

FRAME OPTIONS 设备外框架选项

FR1	1	OPEN SYSTEM FRAMEWORK (standard) 开放式系统框架（标配） • Fully enclosed system base cabinet 设备底部采用全封闭式框架 • Open access to the chamber 开放式真空腔室 • Leveling pads and caster wheels 带有脚轮和水平支脚 • Removable enclosure panels 可拆卸式系统框架围板 NOTE: Some options selected below may require this option 下面其它选项可能需要此框架结构 NOTE: Not compatible with load lock assembly 此配置不兼容进样室 NOTE: Some sputtering options may require an open frame with extension (FR3) 注释：某些磁控溅射的选项可能需要选扩展型的框架	$0.00	INCLUDED IN BASE 包含在基础报价中

CHAMBER OPTIONS 腔体选项

CH1	1	Viewport shutter, manually operated 增加手动观察窗挡板 NOTE: When selecting 350°C heat or greater, viewport shutter is required 注释：如果基片加热温度≥350°C，建议增加观察窗挡板	$1,600.00	$1,600.00

HIGH VACUUM PUMPING OPTIONS 高真空泵选项

HP1	1	Pfeiffer HiPace 800 - 790 L/S Turbo with 3-position valve (standard) 普发HiPace 800分子泵，抽速790L/S，包含三位阀门（标配） • Pfeiffer HiPace 790 L/sec speed control turbo pump 普发HiPace 800分子泵，抽速790L/S，转速可调 • Foreline trap, mist eliminator, roughing valve, and roughing hardware (when applicable) 前级管路捕集器，油雾过滤器，预抽阀门和连接件（如果适用） • 3-position gate valve 三位门阀	$0.00	INCLUDED IN BASE 包含在基础报价中

ROUGH VACUUM PUMPING OPTIONS 前级泵选项

RP2	1	Dry Pump EDWARDS nXDS10i 爱德华干泵nXDS10i • 6.7 cfm dry scroll roughing pump 干式涡旋泵，抽速6.7cfm • This replaces the oil-sealed pump in the base system 此选项用于替代标准配置中的油封机械泵 NOTE: Roughing pump is located remotely from system frame 注释：前级泵位于系统框架外部	$5,000.00	$5,000.00

BASE FLANGE OPTIONS 底法兰选项

BF17	1	E-BEAM FLANGE, KL-8 适用于KL-8电子枪的底法兰 • Allows the use of a single KL-8 E-beam source 适用于安装单个KL-8电子枪 for more information on throw distances and offsets click here 点击此处以获取更多关于源基距等信息	$0.00	INCLUDED IN BASE 包含在基础报价中

ELECTRON BEAM EVAPORATION SOURCE电子束蒸发源选项

EB4	1	KL-8, 6-pocket E-Beam Source with 10kW power supply KL-8电子枪，6个坩埚，带10Kw电源 • KJLC 6-pocket (20cc) electron beam source KJLC 6坩埚（容量20cc)电子枪 • 10kW solid state power supply with programmable sweep and automatic crucible indexing 电子枪电源功率10kW，固态电容电源，自动坩埚导位功能 • High voltage discharge hook 配有高压放电杆 • Includes all electrical and water feedthroughs and shielding 包含所需的电/水穿通件和屏蔽装置 • One pneumatically actuated source shutter 一个气动蒸发源挡板 • Standard source to substrate distance is approximately 15" (381mm) 蒸发源到基片的距离约为15"（381mm) NOTE: No deposition materials are included with the base system unless specifically stated in this quotation. 注释：除非报价中特殊说明，不提供蒸发材料 NOTE: Six (6) Fabmate crucibles supplied with the source 注释：随设备提供6个Fabmate坩埚	$88,800.00	$88,800.00

Code	Qty	Description	Unit Price	Total
SUBSTRATE FIXTURE AND MANIPULATION 样品台				
SF4	1	Rotation and 350°C Heating 可旋转，带有350度加热的样品台 • Variable speed, motor driven rotating platen (up to 20 rpm) 连续旋转，转速可调电机驱动的样品转盘，最大转速20rpm • Accommodates a 150mm substrate 可兼容单片最大至直径150mm基片 • 350°C heating 可加热到350度 • PID control of temperature PID温度控制 NOTE: Not compatible with transfer, bias or cooling 注释：此样品台不兼容样品传递、基片偏压或冷却功能	$23,200.00	$23,200.00
SO1	1	Pneumatically actuated substrate shutter 气动基片挡板 • Recommended for RF bias substrate cleaning 样品台带有偏压清洗功能时需要配置基片挡板 • 150mm maximum substrate 适用于最大直径150mm的基片	$4,700.00	$4,700.00
PROCESS PRESSURE CONTROL (standard configuration allows for 4 channels)工艺压力控制（标准配置最多可装4路）				
PC1	0	Upstream Pressure Control (used with Magnetron Sputtering) 上游进气控制（适用于磁控溅射） • One (1) process gas channel; one (1) Fujikin FCST1000F flow controller (0-100 sccm), all cables, and PID upstream pressure control electronics 一个FUJIKIN FCST1000F流量计（0-100sccm），包含相应线缆和PID调节上游进气压力 • One (1) Inficon CDG025D Capacitance Manometer 100 mTorr (0.13 mbar) pressure transducer 一个Inficon CDG250D电容薄膜规， 满量程100mtorr(0.13mbar) • Orbitally welded gas lines provide maximum vacuum integrity 良好焊接的气路保证真空气密性 • All MFC's will be calibrated for N2. Correction factors are used in eKLipse ™ software to adjust to individual gases 所有MFC都用N2较准。其它气体的修正系数通过eKlipse™设备控制软件输入和修改。 NOTE: This option is required with magnetron sputtering 注释：磁控溅射工艺需要配置此选项	$11,700.00	NOT SELECTED 没有选择
PC2	1	One additional process gas channel 额外增加一个工艺气体气路 • Fujikin FCST1000F Mass flow controllers 增加一个Fujikin FCST1000F质量流量计 • MFC's will be calibrated for (0-20 sccm) 质量流量计流量范围为0-20sccm • All MFC's will be calibrated for N2. Correction factors are used in eKLipse ™ software to adjust to individual gases 所有MFC都用N2较准。其它气体的修正系数通过eKlipse™设备控制软件输入和修改。	$3,500.00	$3,500.00

ESTIMATED TOTAL SYSTEM PRICE预估设备总价 / TERMS AND CONDITIONS合同和条款

Clairton, PA 按照以上选项配置的设备总价	$256,500.00
Crate Fee木箱费:	$1,795.00
Freight charges to Shanghai (PVG) airport 运费:	$8,000.00
ESTIMATED SYSTEM TOTAL 预估设备总价:	$266,295.00
SYSTEM PLACEMENT, INSTALLATION AND TRAINING: 设备安装及培训费用:	$4,500.00
ESTIMATED TOTAL 预估总价:	**$270,795.00**

SYSTEM PLACEMENT, INSTALLATION AND TRAINING设备安放，安装及培训

• Customer is responsible for uncrating, placement and connection of the system at the customer's facility
客户负责设备的拆箱、搬运到实验室并定位，并且负责设备在客户现场的水气电等实验室设施的连接
• Customer is responsible to provide and connect all required utilities including but not limited to compressed air, water, process/vent gas, electric, and dedicated earth ground. Detailed specifications will be provided prior to system shipment
用户负责提供并连接所有设备所需的配套设施，包括（不仅限于）压缩空气、水路、工艺/充气气体、供电、地线等。KJLC将在发货前向用户提供安装配套设施的要求
• A KJLC technician will be on-site for a two day period to perform initial system start-up and training. Customer must verify that all utility connections have been made and are in service before the start-up visit is scheduled. At least two weeks' notice is required when scheduling system start-up.
在客户确认所有实验室配套设施连接已完成后，KJLC将安排技术人员前往客户现场提供为期两天的开机和培训服务，为客户演示开机程序和系统培训。相应的行程安排需要客户至少提前两周通知本公司
• The start-up and training visit must occur within 30 working days after system shipment. For visits that are delayed beyond this period by the customer, the contract will be completed, warranty started at this time and will be billed as such.
开机和培训服务需要在设备发货后的三个月内完成。由于客户原因，上门调试推迟超过三个月，将相应收取劳务费和差旅费，并且设备质保期从发货日开始计算
• No spare parts are included with the base system unless specifically stated in this quotation
除非报价中特殊说明，基本配置中不提供零备件

SYSTEM PLACEMENT, INSTALLATION AND TRAINING:
设备安装及培训费用: **$4,500.00**
A SEPARATE LINE ITEM OR PURCHASE ORDER IS REQUIRED
此安装培训费用签订合同时请单独列明

NOTE ON PRICE 价格注释: The price reflects a budgetary estimate and is subject to change depending on additional features and/or design requirements requested by you. A firm, fixed price will be agreed prior to KJLC's order acceptance.
现在的价格只是预估的预算报价，客户可能需要修改配置或者有特殊的设计要求，价格会做相应调整。最终的价格会在客户同意下订单购买前确定。

SHIPMENT 发货: 20-24 weeks after KJLC acceptance of order and receipt of first progress payment. Please note that shipment date is subject to review at time of order. Customer is responsible for all freight, crating and handling charges.
在KJLC公司接受订单和收到首付款后的20-24周发货。请注意，最终发货日期将会在接受订单时重新审核，客户承担所有运输、包装及装卸等费用。

Click here for LEF-203 KJLC Standard Terms and Conditions of Sale 点击此处以获取KJLC公司标准的销售条款LEF-203文件

TERMS 条款: Kurt J. Lesker Company Standard Terms and Conditions of Sale (LEF-203) shall apply to, and are incorporated by this reference into, the agreement(s) for the transaction(s) proposed or described in this document, unless the parties mutually agree in writing to other terms and conditions. LEF-203 is available at the link above and are also available directly through the Kurt J. Lesker Company website at www.lesker.com. They can also can be obtained by email request to sales@lesker.com or by calling 1-800-245-1656.
我们使用Kurt J. Lesker 公司标准的销售条款（LEF-203，此条款是此预算报价的组成部分，我们在此条款里面有介绍或者描述了相应的交易协议。这些条款可以在我们的目录本（第9版）和公司网站（www.lesker.com ）上面找到，您也可以发邮件到 sales@lesker.com 或者电话1-800-245-1656索取。

PAYMENT 付款方式: KJLC Standard Progress Payments will apply:
科特莱思科标准付款方式:
• 30% cash in advance by T/T with order
订单签订后T/T预付30%
• 60% cash in advance by T/T prior to shipment
发货前T/T支付60%
• 10% Net 30 days on installation and customer acceptance at a fully prepared customer site. Note: If a customer delays shipment or the startup and training visit beyond 30 days, then A) half of this progress payment will become due immediately, B) equipment warranty will begin immediately, and C) storage fees may apply. KJLC will issue a written notice.
设备安装和验收后30天内支付10%。若由于客户原因，推迟发货或者设备安装验收逾期超过30天，（a）客户要支付一半的费用（b）开始计算质保期（c）根据情况，我们可能收取存储费用，KJLC会发出说明说明。

Payment via check or wire transfer
付款采用支票或电汇的方式:
Add $250.00 fee for Sight Draft or Cash Against Documents Terms
增加$250美金，用于即期汇票或者凭单付现的费用
Add $800.00 fee for Letter of Credit Terms
增加$800美金，用于信用证手续费

If paying by Letter of Credit, advising bank must be PNC
如果采用L/C付款方式，我们会使用美国PNC银行

ADDITIONAL NOTE 备注： No duty or taxes are included unless specifically called out in the shipping terms above.
Prices valid for 30 days
本报价为不含关税等税款的美元报价，有效期30天

联系人：张照薪
电话：15010907160
传真：010-52818165
邮箱：alexzhang@timestorch.com.cn

方案编号：TVA20211118IPCAS

致：中国科学院物理研究所潘如豪老师

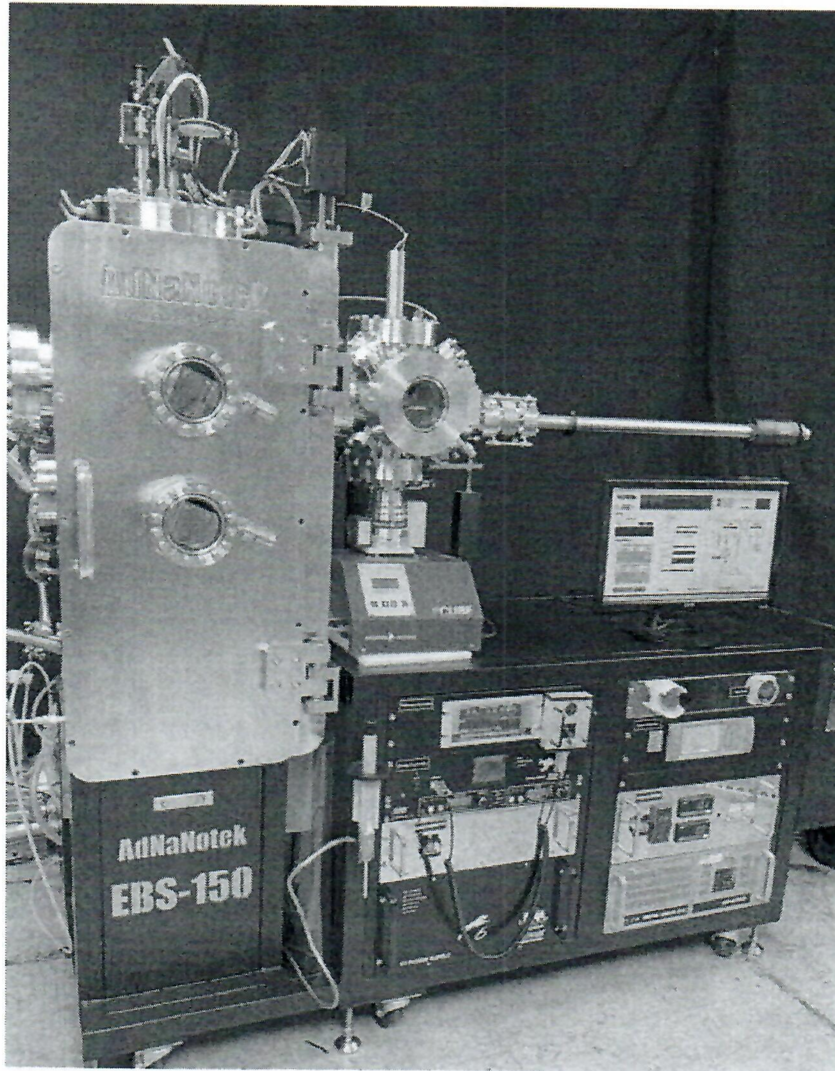
电子束蒸发镀膜系统技术方案及报价单

(有效期 60 天)

品牌信息： 台湾 Adnano
产品型号： 见方案报价列表

北京时代天启真空科技有限公司

2021.11.18



设备外观供参考

@中国科学院物理研究所			
院所/课题组	微加工实验室	负责人/联络人	潘如豪老师
电子邮箱			
@主要性能：			
1，本底真空优于 5E-7torr 2，基片尺寸最大 6 英寸 3，采用 TELEMARK 270° e 型超高真空电子枪，功率 10kW,底部安装方式 4，超高真空旋转蒸发源，采用 4×7cc 坩埚，自动旋转切换 5，全量程真空计，从大气到 10-9torr，量程自动切换 6，主腔室：采用分子泵系统，前级采用干泵系统			

7，进样室：采用分子泵机组独立抽气，进样室真空度优于 5E-6torr

8，全自动 LOAD-LOCK 样品传输系统

9，四轴超高真空样品台，可旋转，转速 0-20rpm，带气动基片挡板，样品带水冷

10，在线膜厚测量仪

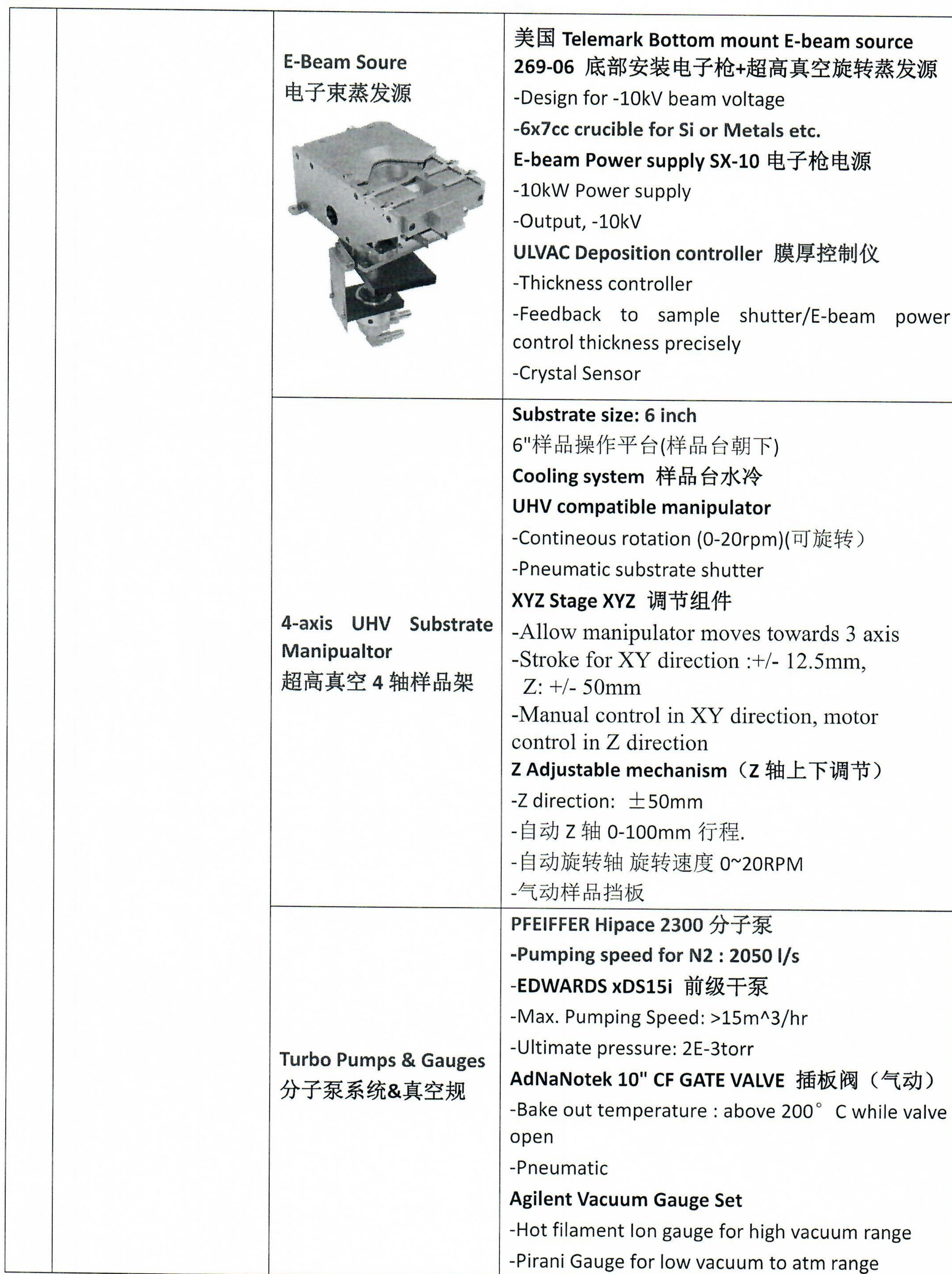
12，薄膜均匀性≤±5%

@推荐配置方案及价格：　USD29.85 万美元（CIP）

设备名称：EBS-150

1	**L. L Chamber** 进样室	**Chamber & Support** 进样腔	**LOAD LOCK CHAMBER** -Chamber made of sus304 -System base pressure **5E-6torr** **System Rack** -Wheels for moving the system -Height adjustable metal support legs
		Vacuum Pumps & Gauges 分子泵机组和真空计	**PFEIFFER Hicube80 分子泵机组** -Hipace80Turbo Pump Pumping speed(N2):70L/s **Agilent Vacuum Gauge Set** -Hot filament Ion gauge for high vacuum range -Pirani Gauge for low vacuum to atm range
		Susbstrate Transferring 全自动样品传输杆	**AdNaNotek Susbstrate Transferring Rod 传输杆** -Transferring rod mechanism -Electrical drived trasnfer rod -Substrate fork -Port aligner -Support mechanism fix on the electronic cabinet
		Doors & Viewports 门和视窗	**8" Double Oring Quick Access Door 双胶圈快速进样门** -Double oring seal with differential pumping -UHV compatible quick access door 4.5" Viewport 视窗

		Baking System	**Internal Baking System** 内置烘烤系统（石英加热灯） -UHV compatible IR lamp -IR heating: RT to 150 **Baking Tape** 外置烘烤带 -External baking tape can heat up the area which is can not be heated by internal baking system -220V baking tape
		Chamber Conncetion (to E-Beam) 腔体连接	**AdNaNotek DN 8" CF GATE VALVE** 气动插板阀 -Bake out temperature : above 150° C while valve open -Pneumatic
2	**E-beam Chamber** 电子束蒸发腔室	**Chamber & Rack** 真空腔体和支撑	**E-beam Chamber** 腔体 -Chamber made of sus316L 材质 sus316L -System base pressure after bakeout 5E-8torr 本底真空 5E-8torr **Double Oring Big Front Door** 双胶圈大开门 -Big font door design allow easy system maintanence -Double oring with differential pumping design **Anti-coating shield** 防污板 -Anti coating shield to optimized anti-coating for chamber cleaning -Roughness surface treamtment to prevent peering **System Rack** 系统支撑 -Wheels for moving the system -Height adjustable metal support legs

		E-Beam Soure 电子束蒸发源 	美国 **Telemark Bottom mount E-beam source 269-06** 底部安装电子枪+超高真空旋转蒸发源 -Design for -10kV beam voltage **-6x7cc crucible for Si or Metals etc.** **E-beam Power supply SX-10** 电子枪电源 -10kW Power supply -Output, -10kV **ULVAC Deposition controller** 膜厚控制仪 -Thickness controller -Feedback to sample shutter/E-beam power control thickness precisely -Crystal Sensor
		4-axis UHV Substrate Manipualtor 超高真空 4 轴样品架	**Substrate size: 6 inch** 6"样品操作平台(样品台朝下) **Cooling system** 样品台水冷 **UHV compatible manipulator** -Contineous rotation (0-20rpm)(可旋转) -Pneumatic substrate shutter **XYZ Stage XYZ** 调节组件 -Allow manipulator moves towards 3 axis -Stroke for XY direction :+/- 12.5mm, Z: +/- 50mm -Manual control in XY direction, motor control in Z direction **Z Adjustable mechanism（Z 轴上下调节）** -Z direction: ±50mm -自动 Z 轴 0-100mm 行程. -自动旋转轴 旋转速度 0~20RPM -气动样品挡板
		Turbo Pumps & Gauges 分子泵系统&真空规	**PFEIFFER Hipace 2300** 分子泵 **-Pumping speed for N2 : 2050 l/s** **-EDWARDS xDS15i** 前级干泵 -Max. Pumping Speed: >15m^3/hr -Ultimate pressure: 2E-3torr **AdNaNotek 10" CF GATE VALVE** 插板阀（气动） -Bake out temperature : above 200° C while valve open -Pneumatic **Agilent Vacuum Gauge Set** -Hot filament Ion gauge for high vacuum range -Pirani Gauge for low vacuum to atm range

<table>
<tr><td rowspan="2"></td><td rowspan="2"></td><td>Doors & Viewports</td><td>4.5" viewport
4.5" viewport shutter</td></tr>
<tr><td>Baking System</td><td>Internal Baking System 内置烘烤系统（石英加热灯）
-HV compatible IR lamp
-IR heating: RT to 150℃
Baking Tape 外置烘烤带
-External baking tape can heat up the area which is can not be heated by internal baking system
-220V baking tape</td></tr>
<tr><td rowspan="3">3</td><td rowspan="3">Electronics control & Gas/Water distribution</td><td>Electronics control</td><td>Control Cabinet & Power distribution System控制柜及配电系统
-electrical systems and controllers
-380V AC, 50Hz, 3 phases, 5 wire configuration
-Power supply line:20 square mm
-Air switch:80A
System Control Software系统控制软件
Acquisition Control Unit采集控制单元
-Industrial computer
-Multi RS232 ports
-Control software platform
Digital Control |Unit数字控制单元
-Integrated Motor control
-PLC control unis
-Digital interface
Automatic control System自动控制系统
-System automatic control package
-Digital control distribution</td></tr>
<tr><td>Gas Distribution System</td><td>Gas pressure
-Process gas:0.1-0.2MPa
-CDA:0.6-0.8MPa
-Ordinary N2:0.1-0.2MPa
Plumbing
-StainlessSteel tube
-Swagelok Connectors
-Isolation valves</td></tr>
<tr><td>Cooling Distribution System</td><td>Water pressure
-Inlet pressure⩾0.25MPa
-Backwater pressure⩽0.05MPa
Water temperature
-Inlet temperature： 18-20℃
-Backwater temperature⩽25℃</td></tr>
</table>

			Water flow -Total water flow≥30L/S -EB flow≥8L/S **Water flow sensor** -Safety interlock **Plumbing** -High qulity water pipe -Connectors -Isolation valves

@Packing and Deliverying

Packing and Deliverying (CIP)
-Packing goods in special & high quality wooden box
-System insurance fee
-Local Transportation fee
-International Shipment fee
-Delivery to the laboratory door, excluding unloading and handling to the laboratory

@ON-SITE INSTALLATION, TRAINING, AND WARRANTY

ON-SITE INSTALLATION, TRAINING, AND WARRANTY
-System installation in customer's laboratory：Free for 5 days，Over 5 days, USD200 a day
-Trainning：Customer appointed trainers, free training once, for 3days
-Travelling costs
-12-month warranty (not include consumables)

- **Payment Terms**

CIP price（免税）
All other charges not include
50% TT in advanced against contract signed by end user
40% TT before shipment
10% TT after installation

- **Delivery time: 6-8months**