



Veeco

E475 MOCVD

美國威科儀器

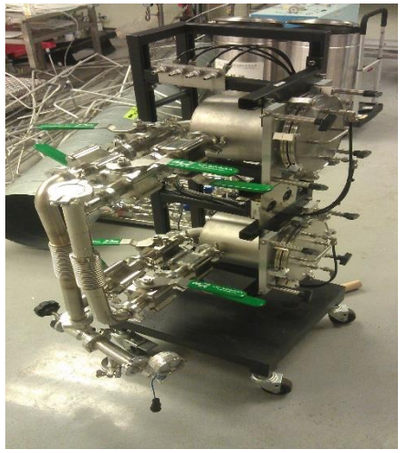
金屬有機化學氣相沉積系統

E475金屬有機化學氣相沉積系統說明

金屬有機化學氣相沉積系統

1主系統反應器

2電腦主機 3微控制器



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1. Veeco E475 MOCVD System Reactor x1

金屬有機化學氣相沉積系統 反應器

1. Reactor's Subsystem Contents
反應器 子系統說明

- As/P Growth Chamber
- Growth Chamber Exhaust System
- Loadlock & Platter Transfer
- Loadlock Exhaust System
- Glovebox System
- Water Cooling Assembly System
- Dual Phosphorous Trap Assembly System
- Hydrogen Detector System
- System Electronics and Control Modules - 380V
- EpiView Control and Monitoring Program
- Epiview Local Control Interface
- Liquid Refrigerator Bath
- 1/8" SS Bubbler Legs
- Custom Gas Panel

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2. Veeco E475 Monitoring System
系統電腦主機

In-Situ Monitoring System

- RealTemp 200 Monitoring System
- IDRT/RT Local Control Assembly
- Consumables Package
- Step Up Platform

3. Veeco E475 MOCVD Piezocon x2
氣體微控制閥共兩組

Custom Gas Panel Controller Bubbler :

- **DETex1, DMZnx1, TMInx2, TMGa x2, TMAl, CBr4x1, TBAx1, Disilanex1,**

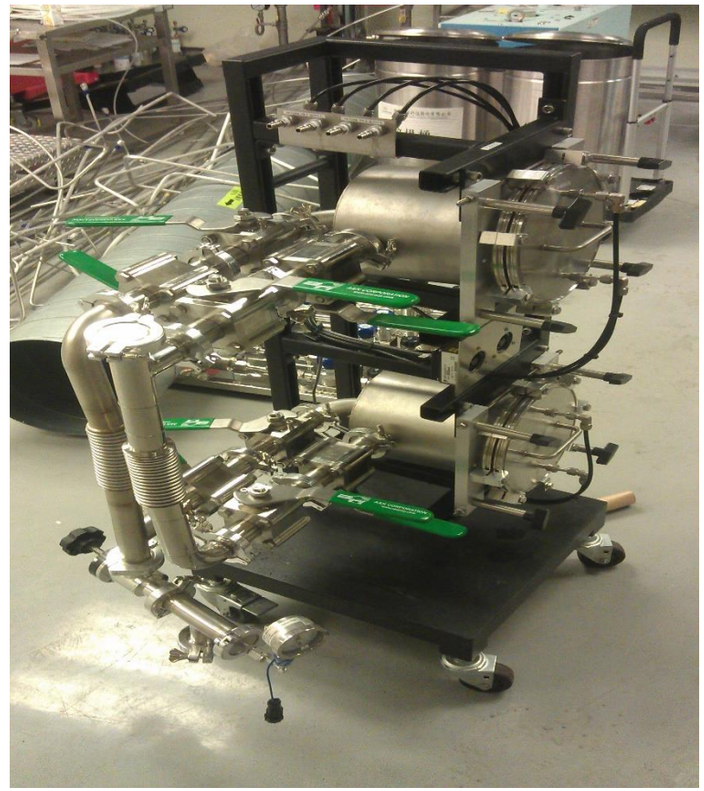
Dilution Network Source Manifold (Single Bubbler)

Hydride

- **Dopant#1: Disilane**

  Dual Input Hydride with One Standard and One Dilution Network Manifold

- **Dopant #2: Customer Specified Dopant Single Input Hydride**



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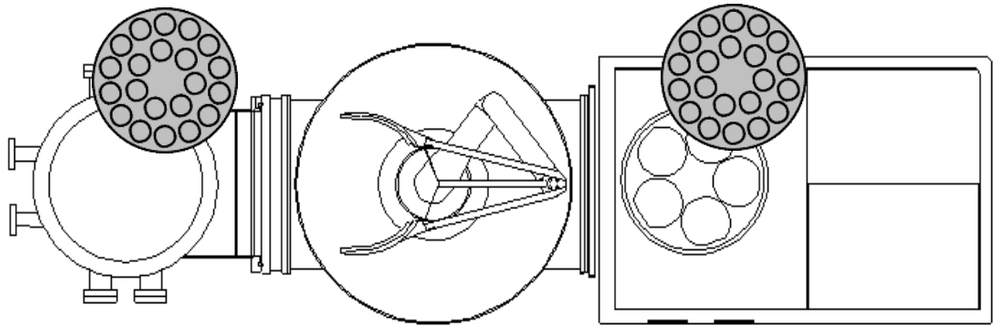
E475效能說明與比較分析

Vacuum Loadlock Minimizes Idle Time Between Runs

E475

Loadlock
8 Minutes Between Runs
Reactor Remains Under Vacuum
Between Runs



- Reactor remains under vacuum during platter transfer
- Platters can be loaded with wafers at any time during process cycle

Competitive Approach

No Loadlock
Open Chamber Between Runs
1 hr Between Runs

- Reactor is open for load/unload
- Must cool & vent reactor
- Large idle time for wafer load/unload

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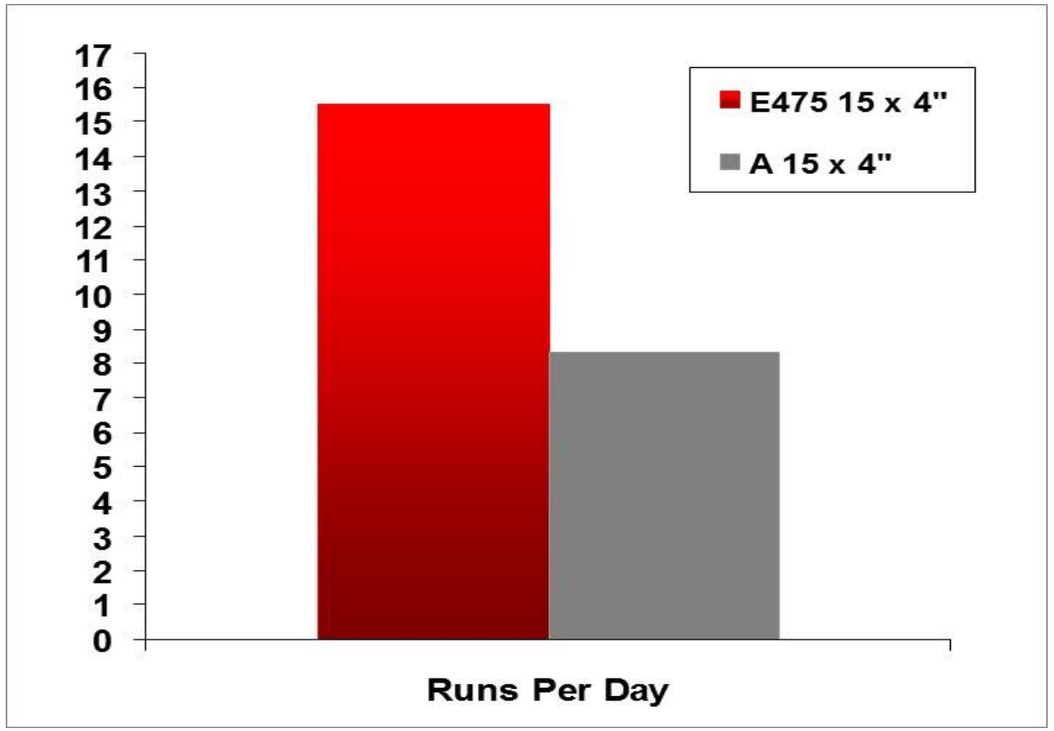
E475 Provides Highest Proven Throughput

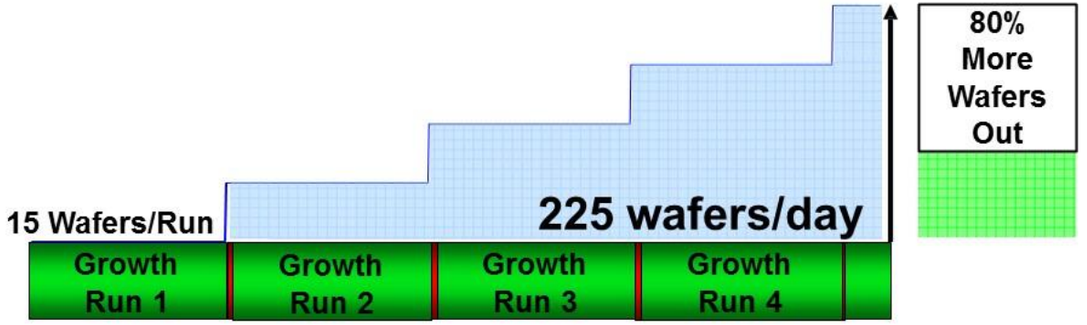
- Vacuum loadlock minimizes time between runs
- Platter transfer occurs at high temperature (300°C - 400°C)
- No reactor baking or vacuum cleaning needed between growths
- Fast growth rate (>14 μm/hr)



Standard 6-7 um Epi structure

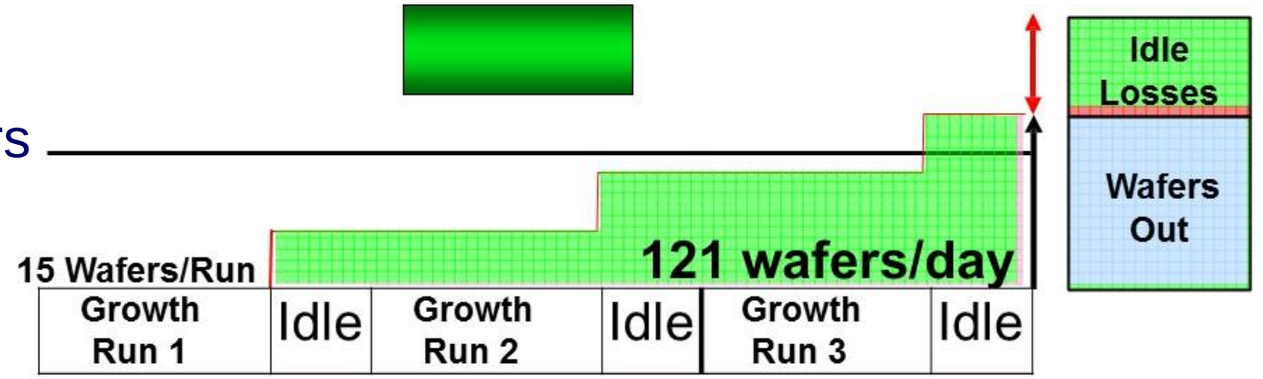
Loadlock Design - 80% Higher Throughput

E475 Loadlock System
allows continuous running



Reactor idle time 8 min. between ~1hr. runs

Non-Loadlock system must open
reactor between runs to load wafers



Reactor idle time ~ 0.5 hr between 2 hr. runs

E475 vs Competitor Throughput Comparison

Throughput	E475 15x4"	Competitor 15x4"
Steady state runs / day	15.5	8.1
Steady state runs / week	108	57
Steady state runs / year	5646	2970
Wafers / run	15	15
Tool uptime	88%	81%
Realized runs / year	4945	2392
Total realized wafers / year	74,181	35,881

100% more wafers with E475

Overall COO Advantage

Systems Compared	E475 15x4"	Competitor A 15x4"
RPD	15.5	8.1
Steady State Runs/Year / System	5646	2970
Wafers/Run	15	15
SteadyState Wafers/Year	84,691	44,555
% Uptime	88%	81%
Realized Runs/Year	4945	2392
Realized Wafers/Year	**74,181**	**35,881**
Total Realized Wafers/Month	6182	2990
# chips per wafer	50	50
Yield	100%	100%
Device Value (ASP)	$ 8	$ 8
Revenue ($) per wafer	$ 400	$ 400
Revenue ($) per system / year	**$ 29,672,485**	**$ 14,352,230**
Epi cost ($) per system per year	$ 1,375,087	$ 1,101,003
Substrate cost ($80 per wafer)	$ 5,934,497	$ 2,870,446
Margin	**$ 22,362,901**	**$ 10,380,781**

Margin improvement with E475 **+115%**

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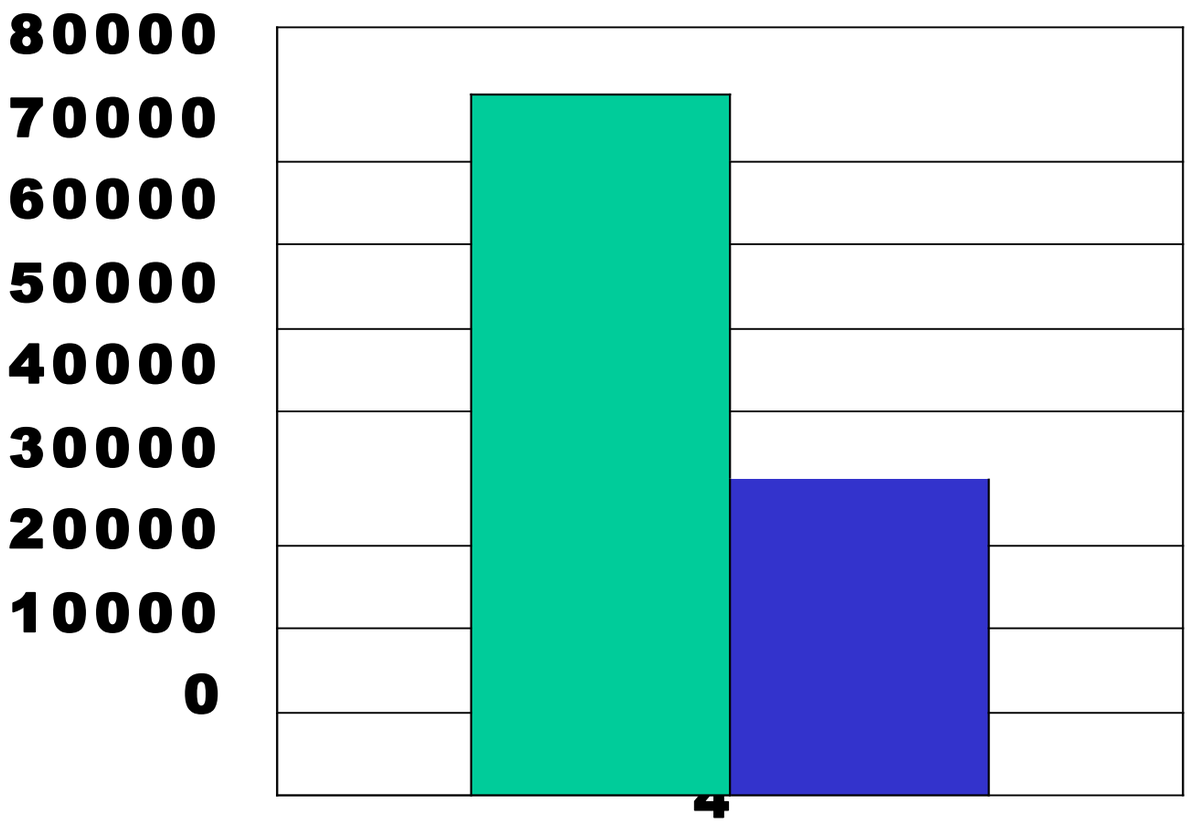
E475 – Highest Throughput



T/P	E475	Comp A
4" Wafer / Year	74,181	35,881

106% Higher Throughput than Competitor (4” wafers)