Maximize Laboratory Efficiency
Optimized Resource Utilization in Dynamic Business Environments

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Liquid Phase Separations
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A laboratory or department manager

- Optimizes the laboratory workflow
- Manages the facility for data generation
- Minimizes costs and targets highest returns on invested capital.
- Needs longterm planning, dealing with innovation and complexity of various CDS.

Striving for best laboratory efficiency!
Cost of Laboratory Analysis

Adapted from Wolfgang Kreiss, Forum Labmanager 2014

- Labor: 55%
- Equipment Write-offs: 10%
- Lab space: 11%
- Energy: 5%
- Consumables: 5%
- Maintenance: 3%
- IT: 5%
- Overhead: 5%
- Others: 2%
What is the Lab Situation?

Turnaround Time

Costs

Total Costs

Customer Costs

Lab Costs

Adapted from L.W. Collins, Man.Mod.Lab., 1999, 2,25-33

Excess Resources
Inefficient
Excellent Service

Insufficient Resources
Efficient
Poor Service

Agilent Technologies
What is a More Efficient Lab?

![Graph showing the relationship between Turnaround Time and Costs for Total, Customer, and Lab Costs.](image)
What's on the agenda today?

• Analytical methods and procedures
• Data analysis, storage & retrieval
• Lab organization & maintenance
• Innovation and return on investment

Driving towards a Next Gen UHPLC workflow!
Decrease Run Time – No Resolution Loss!

- Decreased run time due to reduced UHPLC column length
- No loss in resolution due to same number of theoretical plates
- Increased pressure due to smaller particles (despite shorter columns)
As an UHPLC system the **1290 Infinity II LC** is ideally suited to support narrow-bore columns, requiring significantly less solvents than conventional columns. However, still being able to support any legacy methods.
Reduce Set-up Time by 50% with Drag&Drop Entry

Simple and less error-prone than ever before -
The new visual sample entry in OpenLAB CDS Software delivers a spectacular user experience.

The time savings with the OpenLAB CDS and the 1290/1260 Infinity Autosamplers make 24/7 operation a reality and sets a new standard for ease of use.

I can reduce sequence set up time by 50% with visual sample entry and advanced sequencing.
Identify the Outliers in seconds with Peak Explorer
Customize Reports Rapidly

Sample Information

Sample chromatogram scaled to show only peaks of interest

Compounds reported by weight and weight % using custom calculations

Compound classes reported by weight and weight % using custom calculations

Normalized results according to ASTM formula using custom calculations

Agilent OpenLAB Intelligent Reporting
Chart the Trends for Cross Sequence Statistics

Leverage the OpenLAB CDS Report Templates

Reports with interactive elements when viewed online
Scheduled Easy Import of Data into Repository

OpenLAB ECM maintains all electronic data
- Regardless of source
- Direct import via Data System Integration

Scheduler
- Push or Pull
- Configurable options for data collection

Manually
- Office integration (Excel, Word, PowerPoint, Outlook, Explorer)
- Add Files (explorer right mouse click)
- Tool Bar (Microsoft)

Printed
- Acts as a printer driver
- Transparent
- Adobe pdf format

Now I can finally retire my legacy data system and retrieve all data in one place.
Save Bench Space with a Smaller Footprint

Within the footprint of an Agilent LC stack, the 1290 Infinity II Multisampler takes a maximum load of 16 microtiter plates for a total capacity of 6144 samples or up to eight vial trays for total sample capacities of 432 with 2 mL vials.

<table>
<thead>
<tr>
<th>System</th>
<th>Vendor A</th>
<th>Vendor A (+ ext.)</th>
<th>Vendor B (+ext.)</th>
<th>Vendor C (+ext.)</th>
<th>1290 Infinity II</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Width [cm]</td>
<td>52</td>
<td>86</td>
<td>54</td>
<td>96</td>
<td>60</td>
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<tr>
<td>Deep well plate capacity</td>
<td>4</td>
<td>12</td>
<td>6</td>
<td>12</td>
<td>7</td>
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<tr>
<td>Shallow well plate capacity</td>
<td>4</td>
<td>23</td>
<td>6</td>
<td>12</td>
<td>21</td>
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<tr>
<td>Vial Capacity</td>
<td>216</td>
<td>486</td>
<td>316</td>
<td>648</td>
<td>528</td>
</tr>
<tr>
<td>Vials/cm</td>
<td>4</td>
<td>6</td>
<td>6</td>
<td>7</td>
<td>9</td>
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</table>

Laboratory Efficiency Webinar
4/23/2015
Run Legacy & Latest Methods on a Single Instrument

Agilent Intelligent System Emulation Technology

Now I can finally retire my old instruments without retiring my validated legacy methods I still have to run.
ISET not only takes care for the various delay volumes in different LC systems but also for different mixing behavior – this is only available from Agilent and make instrument-to-instrument method transfer easier than ever before.
Train yourself faster and better at the right time

The new eFamiliarization for the 1290 Infinity II LC and the OpenLAB CDS not only makes the initial system familiarization more effective but also leaves a software tool at your side to retrain personal and keeps them trained even after not using certain functions for a while.
Rapidly Review All Instrument Utilization History

Lab Advisor Review Client

Access the content of the Data Share Folder.

Track records on
• Test Results
• Maintenance Logs
• FW Updates
• Error Messages

I regularly compare test results, downtime and utilization of all Agilent LC and CE instruments.
Keep Track of Instrument Wear to Secure Uptime

I finetune EMF values to reflect our use of the instrument and get an alert well before instrument efficiency degrades.

Agilent Lab Advisor

<table>
<thead>
<tr>
<th>Title</th>
<th>Value</th>
<th>Unit</th>
<th>Limit</th>
<th>Progress</th>
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<tbody>
<tr>
<td>G7120A 1290 High Speed</td>
<td>1.605</td>
<td>L</td>
<td>120</td>
<td>1%</td>
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<td>Pumped Volume Channel A</td>
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<td>L</td>
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<td>Pumped Volume Channel B</td>
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<td>Seal Wash Pump On-Time</td>
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<td>Count</td>
<td>15000</td>
<td>7%</td>
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<tr>
<td>Automatic Purge Valve Switches</td>
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<td>Count</td>
<td>20000</td>
<td>0%</td>
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<td>Solvent Selection Valve Switches (A)</td>
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<td>Count</td>
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<tr>
<td>Pumped without seal wash solvent (A)</td>
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<td>ml</td>
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<td>100%</td>
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<tr>
<td>Pumped without seal wash solvent (B)</td>
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<td>100%</td>
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<td>Right Needle Up-and-Down Counter</td>
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<td>Count</td>
<td>60000</td>
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<tr>
<td>Right Seat Wearout Counter</td>
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<td>Count</td>
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<td>Injection Valve Switches</td>
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<td>3000</td>
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<tr>
<td>Valve Switches</td>
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<td>Count</td>
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<td>0%</td>
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<td>Accumulated UV Lamp On-Time</td>
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<td>h</td>
<td>2000</td>
<td>22%</td>
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<tr>
<td>Number of UV Lamp Ignitions</td>
<td>39</td>
<td>Count</td>
<td>200</td>
<td>19%</td>
</tr>
</tbody>
</table>
Optimize Utilization with Inventory & Asset Reports

Agilent Remote Advisor maximizes your laboratory efficiency

Assist: *Simple Access to Pro’ Expertise*
- Bypass call center queues
- Direct access to Agilent experts
- Focus on solution not the problem

Alert: *Proactive Notification*
- Alerts when an instrument needs your attention
- Email, SMS or automated Push for Help
- Minimizes costly downtime

Report: *Detailed Insight*
- Inventory and capacity planning
- Availability and Utilization
- Maintenance and error tracking
- Helps optimize lab planning and operations

Now I can leverage various templates to see what I need:
- Lab at a Glance Report
- Asset Report
- Required Maintenance Report
- Module Movement Report
- Availability & Utilization Report
- PM/OQ Status Report
- Error History
Agilent RFID Based Inventory Management Service

RFID Tags on Assets

RFID Reader Used by Agilent service engineers for fast and accurate audits and re-inventory

Equipment Inventory Database (local)

Now I can conveniently standardize & optimize the inventory list

Agilent SAP

Asset Accounting

Excel file

USB
Can You Do More With Less?

Define the problem and objectives.

Define

Measure

Analyze the process. Define factors of influence.

Analyze

Improve

Assure that the improvements will sustain.

Improve

Control

need to improve? Can we measure

Identify and implement improvements.

Create Value

Strengthen Core Competencies

Standardize

Focus

Operate efficiently

Build Confidence

Convenient Workflows

Future-proof Partner

Agilent Technologies
Cost-effective Transition by Stepwise Upgrades

The modules that make the 1290 Infinity II LC system provide many exciting features. However, exchange all existing systems in a lab might be challenging. Due to Agilent’s backwards compatibility and upgradability commitment, you can stepwise upgrade your systems, keeping initial capex-cost low.
Reduce Cost per Sample with Latest Technologies

Cost per sample

1. 7x HPLC Reference
2. 1x 1290/6x 1220 Add UHPLC
3. 2x 1290/3x 1260 Balance flexibility
4. 7x 1290 Full capacity

Scenarios

100 86 89 68

W. Kreiss, Dr. Klinkner & Partner (2015)
Experience **improved instrument utilization** by high sample capacity, large application flexibility and automation capabilities for unattended solvent and column switching.

Increase Your Income Through Higher Utilization

8 h x 5 d per week = 24% of theor. max. utilization (168 h)

20 h x 5 d per week = 59% of theor. max. utilization

72% increase on income per sample

Instrument Utilization [%]

- Fix Cost per sample
- Total Cost per Sample
- income per sample

Adapted from W. Kreiss, Forum Labmanager 2014
Grow your Business and Drive Return on Investment

Growth Scenarios

1. 7x 1220 - HPLC Reference
2. 1x 1290/6x 1220
   a. Explore & learn
   b. Offer UHPLC
3. 2x 1290/3x 1220
   Match status quo
4. 2x 1290/3x 1260
   a. Add flexibility
   b. Exploit flexibility
5. 3x 1290
   100% conversion
6. 7x 1290
   Exploit capacity

W. Kreiss, Dr. Klinkner & Partner (2015), Dynamic Investment Calculation

Investment: ▲
NPV: ■

Scenarios

References:
- W. Kreiss, Dr. Klinkner & Partner (2015), Dynamic Investment Calculation
A New Level of Laboratory Efficiency

- Improved maintenance cost
- High reliability
- Less solvent usage (2.1mmID)
- Longer column & fitting lifetime
- Lower energy consumption by some modules
- Low benchspace per sample
- Higher utilization by increased capacity and flexibility

Non-disruptive transition to highest productivity and lowest cost of ownership - *The 1290 Infinity II LC allows seamless integration in current infrastructure and smooth method transfer from legacy equipment* -
New Benchmarks in Efficiency

The Agilent 1290 Infinity II LC, the next generation in Ultra High Performance Liquid Chromatography, raises the efficiency of your business in three dimensions:

Maximize Analytical Efficiency – Recorded Webinar

Unmatched separation and detection performance deliver analysis data of the highest quality—for ultimate confidence in your results.

Maximize Instrument Efficiency – Recorded Webinar

Highest sample capacity and fastest injection cycles combine with new levels of usability—for highest throughput for any application.

Maximize Laboratory Efficiency – Today’s Webinar

Seamless integration in current infrastructure and smooth method transfer from legacy equipment—for non-disruptive transition to highest productivity and lowest cost of ownership.
New Benchmarks in **EFFICIENCY**

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