



Lowering the Cost of Ownership (COO) of Spin Process Tools

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In the whitepaper "*The Outlook for the Semiconductor Industry*," we discussed the need to lower the COO of the tools of production for those who are both designing and building their chips. The issue that we attempt to address here is how does one make that happen and at the same time improve functionality permitting the customer to do things that perhaps his competitor is not even aware of as a problem.

The aspects (solid dots below) and the responses (open dots below) to COO issues are:

- The cost of the Bill of Materials (BOM) of the tool.
 - Employee identical hardware throughout the product line to improve economy of scale.
 - Minimize non-productive hardware, sensors and interconnect complexity.
 - Do not compromise on component quality, minimize the number of components.
- Minimize tool Footprint
 - Stack processes where it makes sense to do so
 - Integrate wafer handling and processes to eliminate wasted space
- Maximize Reliability (note the very same responses to minimizing BOM costs improve reliability a clear Win-Win).
 - Employee identical hardware throughout the product line to improve economy of scale. (Enables testing and long term improvement)
 - Minimize non-productive hardware, sensors and interconnect complexity. (components that are not there cannot fail)
 - Do not compromise on component quality, minimize the number of components. (The highest quality components fail less frequently)
- Minimize consumption of materials cost. (Things like photo resist, solvents, gases, etc.)
 - Improve tool functionality while lowering BOM cost
 - Creatively work with customers to take advantage of improved tool functionality.
 - Use software to improve functionality as well as hardware. Software has zero replication cost.
- Increase Tool Throughput
 - Provide wafer handling capability at low cost that balances process times with minimum handling overhead time. Provide smart robotics capability.

- Use "Small Grain" tools. By this we mean tools that can be provided in small increments of production while at the same time minimizing COO and Investment in absolute terms. All of the above items support this Aspect.

About Mr. Gary Hillman

Mr. Gary Hillman has enjoyed a long and distinguished career in the engineering and semiconductor industries. A graduate of the Georgia Institute of Technology with a B.S. in Ceramic Engineering, Mr. Hillman began his career with Corning Glass Works in Corning, New York.

Mr. Hillman has made multiple critical contributions while working at a variety of companies during his long and successful career, including receiving a patent for the semiconductor industry's first practical "robotic" wafer handling system while working at Machine Technology, Inc. in Parsippany, New Jersey. Since then, Mr. Hillman has 22 patents to his credit.

Mr. Hillman served as the Chairman of SEMI Standards in 1987 and Chairman of SEMI in 1989.

In 1994, Mr. Hillman and a group of others formed Service Support Specialties, Inc. and Creative Design Corporation. Service Support Specialties, also known as S-Cubed, evolved over time into a leading manufacturer of Photoresist processing tools and associated robotics.

Mr. Hillman has helped to develop significant advances in the engineering and semiconductor industries. He and his dedicated team at S-Cubed work to meet and exceed the needs of their customers.

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