FabTime Cycle Time Management Newsletter

Volume 7, No. 4 May 2006

Information

Mission: To discuss issues relating to proactive wafer fab cycle time management

Publisher: FabTime Inc. FabTime sells cycle time management software for wafer fab managers. New features in this version (7.5) include a "Lot in queue/hold at Operation" alert and support for flexible choice of nightly estimates in the capacity planning module.

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Welcome

Welcome to Volume 7, Number 4 of the FabTime Cycle Time Management Newsletter! Things seem to be looking up for the industry, at least if my travel schedule is any indication. I've visited seven different fabs in the past seven weeks. Although I'm a bit worn out from the travel, I'm happy to see that the industry is so vibrant. As another illustration of this liveliness in the industry, we have an announcement about new members of the Fab Owners Association, of which FabTime is an associate member. Our FabTime software user tip of the month is about generating a lot comments report (to display all of the MES comments for a particular lot). We have subscriber discussion related to last month's question about process cycle efficiency, and about cycle time variability.

The subscriber discussion questions about cycle time variability, in conjunction with a discussion that we've been having with one of our customers, inspired us to write this month's main article about cycle time variability (or the distribution of cycle times). We first briefly discuss benefits of and methods for tightening the distribution of shipped lot cycle times. We then review a couple of metrics for tracking variability within the fab, with emphasis on understanding the impact of this variability on overall cycle time distribution. We next describe several methods for tracking and reporting shipped lot cycle time distribution, including a new metric similar to the A20/A80 availability metric, which we have called CT20/CT80. We believe that this metric can help fabs to better understand, and hence to improve, the distribution of lot cycle times.

Thanks for reading!—Jennifer

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Community News/Announcements

Fab Owners Association Jumps to 30 Members & Associates

CUPERTINO, Calif. – April 24, 2006 – The Fab Owners Association (FOA), the association of semiconductor manufacturing executives and suppliers, has announced that Philips Semiconductors (Fishkill, NY) and MagnaChip Semiconductor (Seoul, Korea) have joined the organization as voting members. Applied Mechanical Corporation; CAE Online, Inc.; CIMAC, Inc.; Entrepix, Inc.; FabTime, Inc.; Toppan Photomasks, Inc.; and Vistec Semiconductor Systems have joined as associate members.

"The FOA's value proposition is that semiconductor fabs are a strategic selling and marketing advantage," stated L.T. Guttadauro, executive director of the FOA. "This organization provides the forum for device makers and suppliers to advance this business model and to find commonalities that can be leveraged through their combined strengths."

The benefits of joining are significant. The FOA, a nonprofit, mutual-benefit, international corporation, promotes cooperative efforts between member companies, exploring methods to improve manufacturing efficiencies. Major efforts include exploring manufacturing efficiencies by:

- Working closely with best in industry providers and products
- Pursuing collaborative purchasing efficiencies
- Providing a member to member marketplace for used manufacturing equipment
- Collaborating on developing solutions for common manufacturing problems
- Looking over the horizon at the future of our industry and the welfare of our member companies

Associate members are critical to our association's success. They are the suppliers to the semiconductor industry, representing the latest information, products, and practices that provide substantial efficiencies for our device-maker members. The FOA provides our associate members:

- Direct and personal access to senior manufacturing executives from device-maker member companies
- Exclusive presentation opportunities
- Participation in pooled purchasing and marketplace activities

The FOA's device maker members are the following companies: AMI Semiconductor, Cypress Semiconductor, Delphi Microelectronics Center, Fairchild Semiconductor, Intersil, Jazz Semiconductor, LSI Logic, MagnaChip Semiconductor, Micrel Semiconductor, ON Semiconductor, Philips Semiconductors, Spansion, and ZMD AG. FOA device maker member companies represent approximately 700,000 8-inch-equivalent monthly wafer starts and US$15.5 Billion in annual revenue.

About FOA:

Fab Owners Association (FOA) is an international, nonprofit, mutual benefit corporation, founded in 2004 and headquartered in Cupertino, California. The FOA provides a forum for semiconductor manufacturing executives and industry suppliers to discuss common manufacturing issues often leading to company wide cost savings. Full Membership companies must own and operate a semiconductor or MEMS fabrication facility. Other membership levels are available. Please visit www.waferfabs.org. "Fab Owners Association" and the "FOA" logo are trademarks of Fab Owners Association, a California corporation. References to other companies and their products use trademarks owned by the respective companies and are for reference purposes only.

FabTime User Tip of the Month

Create a Lot Comments Report

One of FabTime's customers asked us this week how she could generate as summary document displaying all of the MES comments for a particular lot. We suggested this procedure:

1. Create the Lot History chart for the lot.

2. In the "SQL" Filter (located near the bottom of the main set of filters, just above the "Rwk:" filter), type this text:

Comment <> ''

3. The important thing in the above is that it's not a double quotation mark, but rather, two single quotation marks. This is necessary to make this work. The filter tells FabTime to display only records for which the comment field is not empty.

4. Press the "Go" button below the SQL filter.

5. Edit the number of rows displayed in the data table (using the "Rows" control) so that all of the comments are displayed.

6. Export the data table to Excel (using the "Excel" button), and re-format as you like.

Note that the above procedure will only work if we are mapping lot-related comments from your MES into FabTime (and if such comments are tracked in your MES at all). The SQL filter can be used in a similar manner to extract other very specific data from FabTime charts. If you are trying to generate some sub-set of data that you can't achieve using the standard FabTime filters, you may be able to use the SQL filter. Contact FabTime for assistance.

If you have any questions about this feature (or any other software-related issues), just use the Feedback form in the software.

Subscriber Discussion Forum

Process Cycle Efficiency

Last month, a subscriber asked about Process Cycle Efficiency, or how to justly compare fabs on the basis of their cycle time when the cycle time is driven in large part by fab utilization. **Tiu Sau Ren** of **Infineon Technologies** submitted some thoughts on the matter, derived from comparing different partner back end facilities. Tiu Sau Ren said "I assumed that the capacity of a factory is equivalent to the bottleneck uptime, such that a fully loaded factory means running at 100% of uptime utilization. I learned the index comparison method that I used from an external cost benchmarking approach, and hope that it also helps here.

I first normalized the utilization of the different backend process steps (sawing, die attach, wire bond, and molding) to 90% of fully loaded utilization (using 90% instead of 100% because cycle time is hard to estimate if productive time is approximately close to total uptime). All of the process steps are equalized to 90% utilization, instead of only the bottleneck processes, in order to minimize the differences of line balance factors. I performed this normalization using the cycle time operating curve. For each process step, we did the following:

1. Plot the operating curve based on actual performance for each process step.

2. Considering the same variability, shift the operating point to the selected utilization (90%), and get the normalized cycle time or X-Factor.

3. Repeat the same procedure for the remaining process steps.

I then used the normalized x-factors to calculate an index for the respective partners, based on comparing each partner with the normalized averages across all partners. For each process step, the step-level index equals normalized x-factor divided by average normalized x-factor of all benchmark partners. An overall backend index across the process steps can be further created by using a weighted average based on the actual average cycle time of all benchmark partners for each step. X-factor was used instead of cycle time in order to eliminate the product mix factor. Normalized X-Factor is good enough for benchmarking at the process step level, but it doesn't tell much about the overall plant level. The overall index comparison is useful here to get a better overall picture of the performance of the different partners. The partner with the best index value is the one that is considered "best in class". I hope that this is helpful for others."

Cycle Time Distribution

Two different subscribers, from different companies, wrote to FabTime since the last issue, and asked about cycle time distribution / variability. The first, who wished to remain anonymous, asked: "Do you know of any sources that discuss policies or recommendations about how to reduce a fab's cycle time variability (not necessarily cycle time only)?"

The second subscriber, **Chris Howington** from **Freescale Semiconductor**, asked: "I am trying to research what would be an appropriate metric with which measure fabs on CT distribution – something we could set/target for our internal fabs and compare with others outside of our company. Clearly we would need to set the target in light of where we want to reside on the operating curve(s). Second, I want to be able to describe an on time delivery window – one that would be reasonable (achievable) and set a goal for benchmark or better. My main point is: how does one determine the appropriate window to expect given your "choice" where you will be on the operating curve?"

FabTime Response: What we told both of the above subscribers is that we haven't seen any benchmark numbers published for fab cycle time variability. Many fabs report a mean cycle time and a 95th (or 98th) percentile cycle time. And internally, fabs certainly look at the distribution of lot cycle times. However, we haven't seen much published on this. Therefore, in our main newsletter article below, we discuss cycle time variability and possible metrics for analyzing it. We welcome your feedback on this topic.

Cycle Time Variability

Introduction

We have discussed the impact that variability has on cycle time many times in this newsletter. As we say in our cycle time management class, anything that a fab can do to reduce variability in process times and in times between arrivals to tools will tend to improve average cycle time. Recently, however, people have been asking us more about cycle time variability. That is, various subscribers would like to know how to tighten up the distribution of shipped lot cycle times. There are many benefits to having a tighter distribution of lot cycle times. A tighter distribution makes it easier to predict when individual lots will complete manufacturing, and to meet on-time delivery targets.

It seems to us that anything that you can do in your fab to reduce process time and arrival time variability will tend to reduce cycle time variability, along with reducing the mean cycle time. We took a brief look at published papers on this topic (see the Further Reading section below). Several authors reported that smoothing lot releases into the fab was helpful in reducing cycle time distribution. Others suggested that lot dispatching choices could have an effect on cycle time variability. We most recently summarized our recommendations for reducing variability within the fab in newsletter Issue 6.10: Operational Recommendations for Wafer Fab Cycle Time Improvement.

Whatever you do to reduce variability in the fab, you need metrics that report your current cycle time, so that you can recognize improvements. In the remainder of this article, we will discuss graphical and statistical methods for measuring cycle time variability. We'll start by reviewing metrics for pinpointing variability within the fab, and then move on to metrics for analyzing shipped lot cycle time distribution.

Selected Metrics for Analyzing Variability within the Fab

The first step in improving cycle time distribution for a fab is to pinpoint underlying sources of variability inside the fab, and then look at the effect of this variability on the cycle time distribution. The idea here is to look for particularly high variability incidents, and see where they correlate with higher cycle time variability for shipped lots. While correlation is not the same as causation, it can certainly give us an idea of where to look for improvement efforts. Some examples of within-fab variability metrics are discussed below.

Tool Availability Variability: A20/A80

Back in Issue 4.02 we presented the tool availability metrics A20 and A80. A20 and A80 are estimated by recording the availability of each individual tool in a group, for each shift, over some time period, and then sorting them in ascending order. A20 is the availability achieved by the best 20% of all shifts. A80 is the availability not reached by the worst 20% of all shifts. In other words, A80 is the availability value reached 80% of the time, kind of a realistic worst case. Subtracting A80 from A20 gives something like the statistical measure Inter-Quartile Range (IQR), except that it uses quintiles (fifths) instead of quartiles (fourths). A20 - A80 measures the spread in tool availability from shift to shift. The smaller it is the better a fab can predict availability.

One way to use the A20 - A80 spread to analyze variability is to record it for various tool groups, look for the tool groups that have the widest range, and then look to see if particularly bad time intervals, in terms of availability, are correlated with increased shipped lot cycle times. This is particularly likely to be the case for one-of-a-kind tools, or other tools with single path operations.

Arrival Variability: Coefficient of Variation

In Issue 4.01 we discussed using the metric coefficient of variation to measure fab variability. For a series of values (e.g. times between arrivals to an operation), the coefficient of variation is the standard deviation of the series, divided by the average. A higher coefficient of variation of interarrival times (or a higher coefficient of variation of process times) will lead to increased cycle time through a tool or operation.

Arrival coefficient of variation by operation can be used to assess the impact of lot release policies on fab variability. If the arrival coefficient of variation is relatively high (greater than, say, 2) for early operations, this suggests that the lot release policy used in the fab may be contributing to higher cycle times.

Selected Metrics for Analyzing Overall Cycle Time Distribution

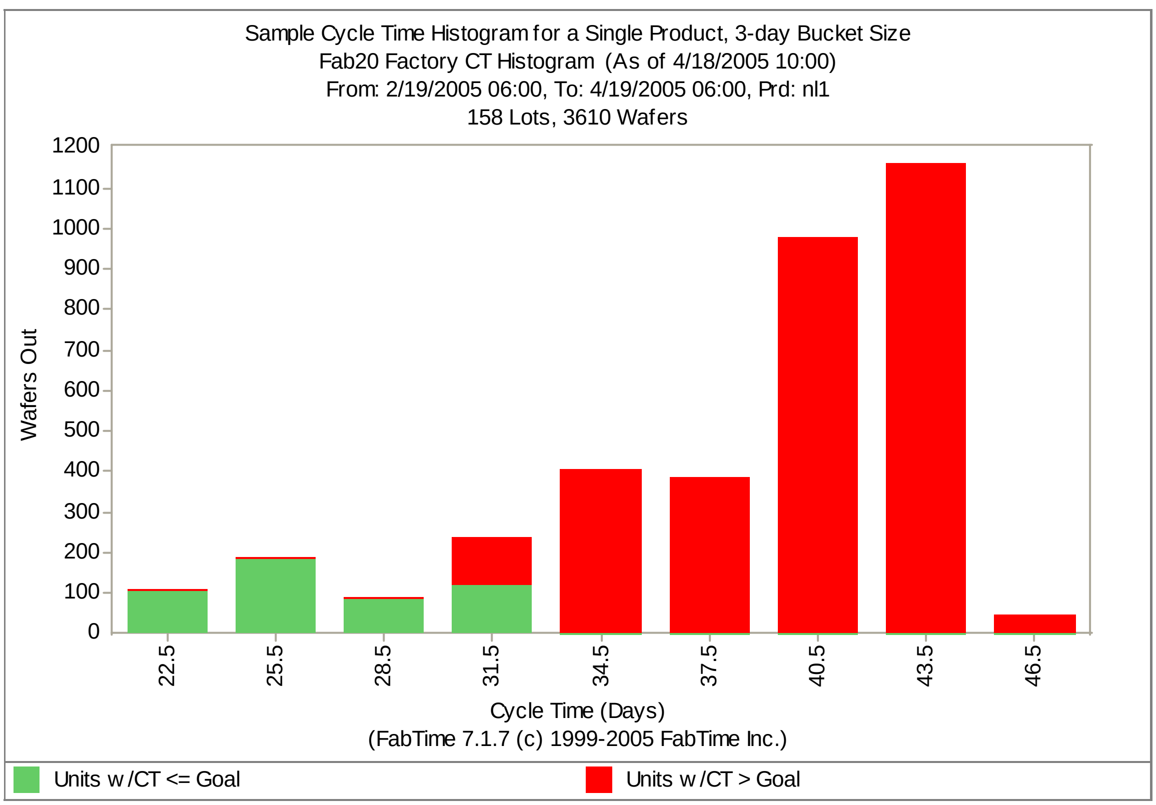
In this section, we discuss some existing and potential metrics for tracking cycle time distribution.

Mean and 95th or 98th Percentile Cycle Time

The most common method of tracking cycle time distribution in fabs seems to be to report the mean (average) cycle time along with a 95th or 98th percentile cycle time. The 95th percentile cycle time is the value for which 95% of the lots had a cycle time less than or equal to that value. This is used instead of reporting the 100th percentile cycle time to allow the discarding of outliers. Fabs that have a 95th percentile cycle time that is relatively close to the mean have a tight distribution of cycle times.

Histogram of Individual Lot Cycle Times:

For a bit more detail, some fabs also look at the individual lot cycle times in the form of a histogram. An example is shown below. A histogram is a way to get a quick visual impression of the distribution of the cycle times. The way to do this is to start with the complete range of cycle times over some time period, and then divide up that range into equal-sized intervals (usually one or more days). Then for each



interval, count up the number of wafers that had a cycle time within that interval. Graph the number of wafers on the y-axis for each interval, and this will be rough picture of the cycle time distribution. Note that histograms are fairly easy to generate in Excel and other statistical packages.

Standard Deviation or Coefficient of Variation

Similar to availability, fabs can track the standard deviation of fab cycle times. If cycle times are normally distributed (follow a symmetric, bell-shaped curve), then a rough guideline is that about 95% of all cycle times will fall within +/- two standard deviations of the average cycle time. Dividing the cycle time standard deviation by the average cycle time gives an estimate for coefficient or variation – the higher the coefficient of variation, the more variability in cycle times.

Box Plot of Cycle Times by Product:

Box plots (also sometimes called box-and-whisker plots) are another tool for conveying variability information in a concise format. They were invented by J. Tukey. In this case, the y-axis would display cycle time. Here are the steps for generating a box plot for a set of data. (These steps are adapted from the NIST/Sematech Engineering Statistics Handbook, for which we have included the full reference below.)

1. From the series of individual lot cycle times, calculate the median and the quartiles (the lower quartile is the 25th percentile and the upper quartile is the 75th percentile). The median is the value for which half of the lot cycle times are above the value, and half are below the value.

2. Draw a line at the median value and draw a box between the lower and upper quartiles. The box encompasses the middle 50% of the data.

3. Draw a line from the lower quartile to the minimum observed cycle time value and another line from the upper quartile to the maximum observed cycle time value. Usually a symbol is used to mark the end points of these lines (also sometimes called whiskers).

The box plot identifies the middle 50% of the data, the median, and the extreme points, all in a nice compact format. Box plots for different product families can be placed next to one another on the same chart. Alternatively, you can generate box plots for the same product family over different time ranges, to look for improvement. Sometimes outlier values are also individually displayed on the box plot, though this is optional. An example of a box plot is shown at the top of the next page.

CT20/CT80:

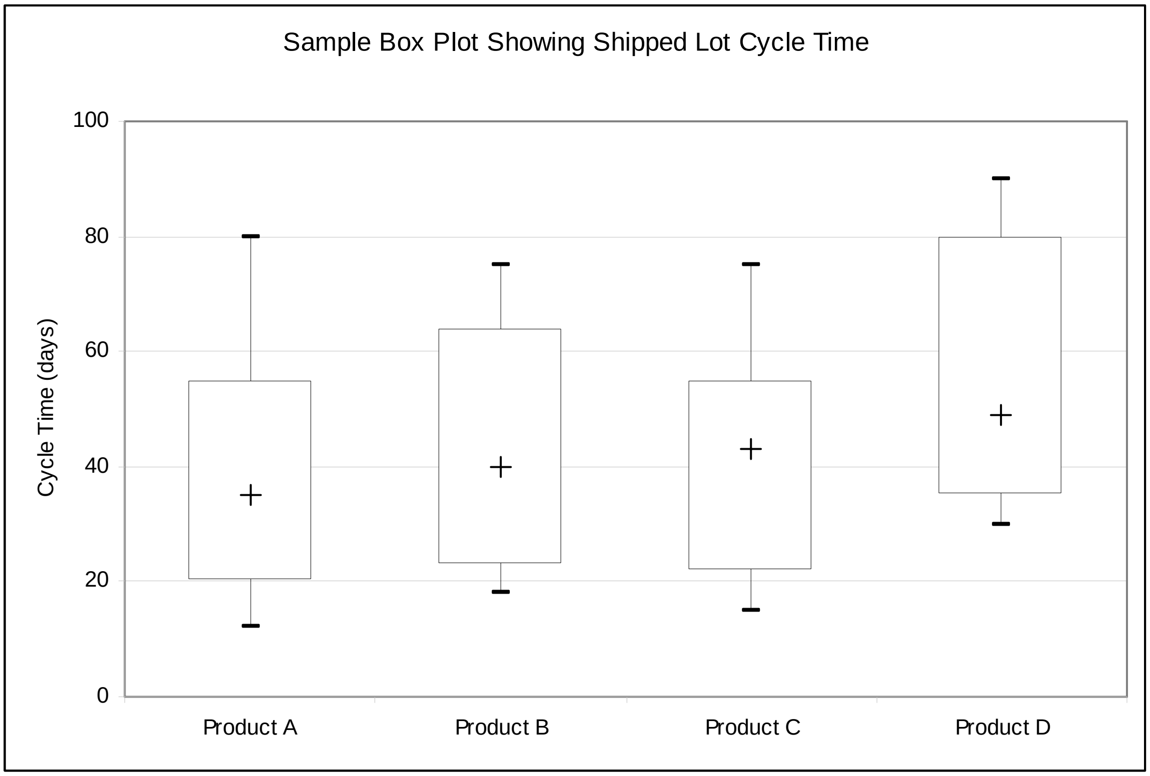
Note the similarity between the box plots described above and the A20/A80 charts used for illustrating availability variability. Both charts display the middle range of data, and also indicate the upper and lower bounds (in the A20/A80 case this is only true if you look at the individual availability observations, though there is an implied range of 0% to 100% anyway). A20 and A80 are based on the upper and lower quintiles (20%) instead of the quartiles typically used in box plots. But the idea is very similar.

If you are comfortable using A20/A80 to analyze tool variability, we propose that you apply the same concept to lot cycle times. It would work like this:

1. Generate the sequence of individual lot cycle times for some product family, and sort them in descending order.

2. Find the minimum cycle time target that is met by the best 20% of the lots. That is, 20% of the lots have a cycle time of this value or less. Call this CT20.

3. Find the minimum cycle time target that is met by the best 80% of the lots. That is, 80% of the lots have a cycle time this value or less. 20% of the lots have a cycle time greater than this value. Call this CT80.



4. Calculate CT80 - CT20. This is a measure of the spread of the cycle times for this product family, once best and worst-case lots are removed.

The goal with this metric is to reduce the range of CT80 - CT20, and hence to draw in the distribution of the shipped lot cycle times (while of course bringing CT20 and CT80 down also). What's nice about this is that it gives a set of three numbers (CT20, CT80, and the difference between them) that are easy to report and understand, and to track for improvement. 60% of the lots will have cycle times in the CT20 to CT80 range. Tightening up that range will make it easier to predict when lots will ship. We have not seen this metric used in any fabs, but we are proposing it here as a way to quantify and visualize shipped lot cycle time variability.

Sidebar: Exercise for FabTime Software Users

If you have FabTime's software, you can estimate CT20 and CT80 for yourself by doing the following:

1. Generate the Shipments Lot List chart for a product family, over a long enough date range to include at least 40 shipped lots.

2. Increase the number of rows displayed in the data table, so that all of the lots are displayed (you can see the number of lots in the title of the chart).

3. Sort the data table by Cycle Time, in descending order, and then export it to Excel.

4. Divide the number of lots in the spreadsheet by 5, and round to the nearest integer. Suppose that you do this and you get 14. Find the 14th lot from the bottom. That lot's cycle time is CT20, the cycle time achieved by the best 20% of the lots. Find the 15th lot from the top (N + 1). That lot's cycle time is CT80. 80% of the lots have a cycle time of this value or lower. 20% of the lots (including the 14th from the top, in this example) have a cycle time that is higher than CT80.

Tip: Use FabTime's A20/A80 charts for tool availability for ideas on how to present the CT20/CT80 results.

Conclusions

As customers request tighter and tighter delivery windows, fabs are going to need to move from understanding average lot cycle times to better understand the distribution of cycle times. In this article, we have briefly discussed benefits of and methods for tightening the distribution of shipped lot cycle times. We have briefly reviewed metrics for tracking variability within the fab, with emphasis on understanding the impact of this variability on overall cycle time variability. We have described several methods for tracking and reporting shipped lot cycle time distributions, including a new metric analogous to A20/A80, called CT20/CT80. We believe that this metric may help fabs to better understand, and hence to improve, the distribution of lot cycle times.

Closing Questions for FabTime Subscribers

How do you measure and report on cycle time variability in your fab? Are there techniques that you would recommend for reducing the variability of cycle times? Do you think that there should be industry benchmarks for cycle time variability?

Acknowledgement

Thanks to Chris Howington (Freescale Semiconductor), Mike Hillis (Spansion), and to a third anonymous subscriber for discussions that contributed to this article.

Further Reading

■ S. C. H. Lu, D. Ramaswamy, and P. R. Kumar, "Efficient Scheduling Policies to Reduce Mean and Variance of Cycle-Time in Semiconductor Manufacturing Plants," *IEEE Transactions on Semiconductor Manufacturing*, Vol. 7, No. 3, 1994, 374-380. This study reported that their "Fluctuation Smoothing policies achieved a reduction of 22.4% in the Mean Queueing Time, and a reduction of 52% in the Standard Deviation of Cycle Time, over the baseline FIFO policy."

■ M. Mittler, N. Gerlich and A. K. Schoemig, "On Cycle Times and Interdeparture Times in Semiconductor Manufacturing," Report No. 124, Institute of Computer Science Research Report Series, University of Wuerzburg, 1995. This paper showed that for the two semiconductor facilities studied the normal distribution was "a very good approximation of the cycle time distribution."

■ NIST/SEMATECH. "Box Plot." §1.3.3.7 in NIST/SEMATECH e-Handbook of Statistical Methods. http://www.itl.nist.gov/div898/handbook/eda/section3/boxplot.htm.

■ J. Robinson and F. Chance, "Operational Recommendations for Wafer Fab Cycle Time Improvement," *FabTime Cycle Time Management Newsletter*, Vol. 6, No. 10, 2005.

■ J. Robinson and F. Chance, "Quantifying Availability Variability," FabTime Cycle Time Management Newsletter, Vol. 4, No. 2, 2003.

■ J. Robinson and F. Chance, "Quantifying Wafer Fab Variability," *FabTime Cycle Time Management Newsletter*, Vol. 4, No. 1, 2003.

■ L. Sattler, S. O'Connor, M. Hallinan and T. Finucane, "Techniques for Analyzing Cycle Time Variability in Fab and Probe," *Proceedings of the 1999 Advanced Semiconductor Manufacturing Conference (ASMC)*, Boston, MA, 1999. This study found that probe cycle time variability could be significantly reduced by altering fab schedules to smooth the flow of lots into the probe area.

■ A. I. Sivakumar, "Simulation Based Cause and Effect Analysis of Cycle Time Distribution in Semiconductor Backend," *Proceedings of the 2000 Winter Simulation Conference*, 2000. (All 1997 to 2005 WSC papers are available for free download from www.informs-cs.org/wscpapers.html). This study showed the impact of lot release scheduling on cycle time distribution.

- A. I. Sivakumar, N. F. Choong and C. S. Chong, "Modeling Causes and Effects of Semiconductor Backend Cycle Time," *Solid State Technology*, Vol. 44, No. 12,51-53, 2001. This study (by the same author as above) said that "smooth lot release scheduling of demanded capacity gave shorter queue times and a narrower cycle-time distribution."
- Eric W. Weisstein. "Box-and-Whisker Plot." From MathWorld--A Wolfram Web Resource. mathworld.wolfram.com/Box-and-WhiskerPlot.html
- H. J. Yoon and D. Y. Lee, "A Control Method To Reduce The Standard Deviation Of Flow Time In Wafer Fabrication," *IEEE Transactions in Semiconductor Manufacturing*, Volume 13, No. 3, 389-392, 2000.

Subscriber List

Total number of subscribers: 2052, from 442 companies and universities. 22 consultants.

Top 10 subscribing companies:

- Intel Corporation (121)
- Analog Devices (76)
- Atmel Corporation (66)
- Infineon Technologies (64)
- Micron Technology (60)
- Freescale Semiconductor (58)
- STMicroelectronics (56)
- Texas Instruments (52)
- Philips (49)
- TECH Semiconductor (44)

Top 3 subscribing universities:

- Virginia Tech (11)
- Arizona State University (7)
- Ben Gurion Univ. of the Negev (7)

New companies and universities this month:

- CIMAC
- Qimonda

Note: Inclusion in the subscriber profile for this newsletter indicates an interest, on the part of individual subscribers, in cycle time management. It does not imply any endorsement of FabTime or its products by any individual or his or her company.

There is no charge to subscribe and receive the current issue of the newsletter each month. Past issues of the newsletter are currently only available to customers of FabTime's web-based digital dashboard software or cycle time management course.

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FabTime® Software Capacity Planning Module

Installation

For a fixed price, FabTime will:

- Identify the source of any additional data needed for the planning module.
- Automate the process of importing the additional data into FabTime.
- Validate against client data.

Interested?

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Do you need to answer questions like:

- Given a target product mix, do we need any new tools?
- Given the tools that we have, and the products that we are running, how many wafers can we expect to produce?
- Given our existing set of products and tools, what happens if the product mix changes? Where can we expect bottlenecks?

Are you tired of maintaining a standalone capacity planning spreadsheet?

FabTime's capacity planning module leverages the data already stored in the FabTime digital dashboard software, to make it easier to build capacity planning scenarios. The only required manual inputs are:

- Weekly ships per product.
- Product line yield percentages.

FabTime uses route information from the fab MES and calculates UPH data (tool speed) based on actual performance. FabTime also uses tool uptime performance to estimate availability (though this can be overridden). These inputs are used to generate predicted utilization percentages for each capacity type. Detailed intermediate calculations (UPH, tool productive time, tool rework percentage, etc.) are also available (an example for one tool is shown below). All outputs can be easily exported to Excel.

Capacity Planning Module Benefits

- Eliminate the need to maintain offline capacity planning models.
- Automatically update capacity planning data to reflect new conditions (process flows, tool uptime characteristics).
- Quickly run scenarios to anticipate (and avoid) bottlenecks caused by product mix changes.

C Type	Output	Value	Notes
1XStep	Rework Moves/Week	21	2004-09-06 10:00:00 to 2004-11-15 10:00:00
1XStep	Total Moves/Week	12310	2004-09-06 10:00:00 to 2004-11-15 10:00:00
1XStep	Rework Ratio	0	Rework Ratio = Rework Moves / Total Moves.
1XStep	Productive%	61	2004-09-06 10:00:00 to 2004-11-15 10:00:00
1XStep	Availability%	76.26	Availability = Productive% + Standby%.
1XStep	Historic Utilization%	79.99	Utilization (Mfg efficiency) = Productive% / Availability%.
1XStep	Productive(Rework)%	0.1	Productive(Rework)=Productive% * ReworkRatio.
1XStep	Net Availability%	76.15	Net availability% = Availability% - Productive(Rework)%.
1XStep	Arrivals (Units/Hour)	79.36	Based on total plan WGR=2025
1XStep	Tool Quantity	8	1XStep#1 ... 1XStep#8
1XStep	UPH	15.02	UPH = (TotalMoves/ToolQty) / (Productive% * 168)
1XStep	Required Hours/Day	126.84	Required hours = 24 * HourlyArrivalRate / UPH
1XStep	Predicted Utilization%	86.75	Util = 100 * ReqdHours / (24 * NetAvail * ToolQty / 100)
1XStep	Max WGR	2334.22	MaxWGR = PlanWGR / PredictedUtilization
1XStep	Historic WGR	2457.8	(Non Rework Moves) / (OperationCount / ProductCount).