Smart Manufacturing

M. Arnold
Managing Director
PEER Group GmbH, Dresden, Germany

Biography

Dr. Michael Arnold, Managing Director, has been responsible for PEER Group´s European operations since 2003. He established a strong services position in the global semiconductor manufacturing market. Michael is the account manager for several of PEER Group's top customers in Europe. He has served as a member of the SEMICON Europe technical program committee since 2009 and currently chairs the European chapter of the SEMI Smart Manufacturing Technology Community. In 2017, Silicon Saxony appointed Michael as a Board Member.

Prior to joining PEER Group, Michael was the operations manager of TRW's European Manufacturing Solution Business Unit in Dresden, Germany, where he was also responsible for service delivery. Before this he worked for a variety of companies, developing software solutions and implementing industrial vision systems and factory automation solutions for European productions sites.

Michael holds a Diploma degree in Physics and a Ph.D. from the Friedrich-Schiller University Jena.

Industry 4.0 driving business model transformation in Advanced Manufacturing Facilities

B. Kennedy
CEO
Irish Manufacturing Research, Dublin, Ireland

Abstract

Though the semi-conductor industry can rightly claim to have led the charge in the development and implementation of the technologies driving the Industry 4.0 revolution, it is now seeing wider affects happening with new business model transformation and emerging manufacturing technologies transforming the ways businesses are managed and run. This is driven by the products the Semiconductor industry make and the relentless drive to deliver these products with more capability and less cost allowing the wider manufacturing base to design these technologies into their manufacturing plants.
Are these emerging technologies now being used back in semiconductor facilities or is there opportunities to engage with them. This paper will put a mirror onto the industry.

Biography

Barry is currently CEO of Irish Manufacturing Research, Irelands leading cutting edge industrially focused research centre for advanced manufacturing.
Barry qualified with an MSc from University of Dublin, Trinity College Dublin in 1996.

He has worked as New Business and Strategic Program director for Ireland Fab Operations in Intel.
Prior to this he has held many senior management roles in Failure Analysis, Process Integration, Device,

Process Control and Statistics, Yield Analysis, Quality and Reliability, Yield Q&R.
He started his career in Intel working in many senior engineering roles as senior Process Integration and Failure Analysis engineer.

Barry has worked in a research environment in Trinity College Dublin for 10 years before commencing work with Intel.

Yield & Process Improvement by Data Analysis along the Supply Chain

R. Rapp
Director of Manufacturing Process Integration,
Deputy Technical Plant Manager/Reutlingen
Robert Bosch GmbH, Reutlingen, Germany

Abstract

Along the semiconductor supply chain an increasing amount of production data are generated and are waiting to be used for continuous process-, yield- and quality-improvements.

To classic SPC and data analysis, done by engineers, a variety of new applications were added over the years. Keywords are FDC, APC, ADC, data lakes, data mining - just to name a few.

Looking at the supply chain from wafer start up to electrical wafer test (EWS) traceability is a given. Other than ASICs many MEMS elements can't remember their origin, like wafer number or x/y position. So it is important to make use of data from different steps in production.

In this presentation examples for automatic analysis of inline defectivity and EWS are shown. Also the successful implementation of traceability, from final product test of MEMS sensors to inline production data.

Biography

Roberto Rapp has been employed at Robert Bosch GmbH since 2009 as Director of Manufacturing Process Integration, where he is responsible for the implementation and production of the ASIC, Sensor and Power technologies. In parallel he is deputy technical plant manager of the Bosch Semiconductor Plant in Reutlingen, Germany.

He studied physics at the University in Heidelberg, Germany and joined IBM in 1985, starting his professional career as Process Engineer in the Wafer-Fab in Böblingen, Germany. 1988 he worked in the first 200mm IBM Wafer-Fab in Burlington VT, USA. Working for IBM, SMST, Philips and NXP he has now over 30 years of experience in the semiconductor industry for consumer and automotive.

Since 1995 he held different management positions in Engineering, Quality and Production.

Predictive maintenance for plasma tools

M. Klick
CEO
Plasmetrex GmbH, Berlin, Germany

Abstract

Plasma processes are widely used in the semiconductor industry, they are completely distinct from mechanical manufacturing. Plasma processes are running in vacuum chambers and there are opened every month or quarter for maintenance. Each maintenance measure at a production chamber causes costs in the order of some 10 k€. Therefore, the prediction of the right time for maintenance can reduce manufacturing costs dramatically.

On the other hand, plasma processes are usually treated as black box due to their complexity. All important process parameter as uniformity, rate, selectivity, and stability depend of the plasma's parameters as flux of ions and reactive species. Thus, the main peculiarity of plasma processes can be compressed is one sentence: 'The plasma is the tool'.

Beyond this we have to take into account that plasmas can run in different modes, can oscillate, cause breakdowns at the chamber wall and depend on the state of the chamber wall. In particular the chamber wall changes its surface properties by the deposition of byproducts. So the only realistic approach for the predictive maintenance for plasma tools must be based on the plasma's properties.

It will be shown how plasma parameter can describe plasma and so also the effective chamber state, chamber differences and show undesired instabilities as arcing and wear of chamber parts. The early detection of changes and undesired effects are here the key for predictive maintenance.

Examples show the early detection of process faults, real-time process characterization, and preconditions and methods for chamber matching.

Biography

Objective:
CEO, Plasmetrex GmbH

Education:
Ph.D. in Plasma Physics, Ernst-Moritz-Arndt-University Greifswald, 1992
Dipl.-Ing., Technology of Electronic Devices, 1987

Grants and Fellowships:
Lecturer at Ruhr University Bochum since 2010: Plasma technology for semiconductor, MEMS, and PV applications

Research and manufacturing skills:
Plasma etch process development
Nonlinear Modeling of industrial RF Plasmas
Development of Plasma Sensor Systems for Etch and Deposition

20 years experience in joined projects with semiconductor fabs

Requirements for an Adaptable Material Tracking Solution of a 200mm Wafer Fab

G. Leditzky
Senior Project Manager
ams AG, Wafer Manufacturing, Premstaetten, Austria

Abstract

The production logistics within wafer manufacturing follows a complex iterative flow through hundreds of process steps until the integrated circuit on the wafer is finished. For fully automated 300mm wafer fabs state of the art solutions for material tracking systems are available, while for 200mm semi automated fabs the original logistics solutions are outdated and no more supported.

The functionality of the material tracking system and its integration into the MES environment of the shop floor impacts traceability and productivity and defines the user interface to the operator.

Based on ams AG's 200mm SMIF wafer fab this presentation will give an insight into the requirements for an adaptable wafer tracking and localization solution that supports current and future wafer manufacturing needs.

Biography

Guenter Leditzky was educated in mechanical engineering and physics and received his Ph.D. in solid state physics from Graz University of Technology. In 1995 he joined the process transfer group at ams AG. He could gain comprehensive experience in semiconductor manufacturing as he managed the process engineering group, the deposition module, and production line control at ams' wafer fabs. In 2006 he founded his company "Technology Consulting and Project Management". Since October 2007 Günter is employed as project manager at ams, where he has been responsible for Fab extensions and production ramp, the implementation of Fault Detection and Classification and Real Time Dispatching. Currently Guenter is working on the upgrade of the Material Tracking System in ams' 200mm wafer fab.

Cybersecurity for factories and tools: protecting yourself against potential threats

D. Suerich
Product Evangelist
PEER Group, Kitchener, Canada

Abstract

Highly-automated semiconductor manufacturing relies on machine-to-machine (M2M) and machine-to-host connectivity. But, this introduces a security risk for both equipment makers and factories. A virus on a single tool could cause costly factory-wide downtime. Forward-thinking OEMs are wondering whether they have protected their equipment adequately against potential cyber threats. Forward-thinking factories are considering all of the equipment on their manufacturing floors to ensure they stay risk free. This talk explores the need for OEMs to set up an ongoing equipment maintenance strategy that takes into consideration several important steps: upgrading all tools to modern-day operating systems that enable virus scanning, installing new connectivity software products to support new technologies and new factory requirements, and leveraging the secure remote connectivity to perform remote virus scans on all files moving into the factory, manage ongoing equipment maintenance activities to keep tools up to date, audit production tools to address software end of service (EOS) issues, and avoid causing factory-wide downtime by introducing a virus.

Biography

Doug Suerich is Product Evangelist at The PEER Group Inc., the semiconductor industry's leading supplier of factory automation software for smart manufacturing and Industry 4.0. Doug focuses on big data and remote connectivity solutions that help manufacturers collaborate securely on tools and data in production environments. A passionate advocate for smart manufacturing, Doug serves as an active member of the SEMI® Smart Manufacturing Advisory Council and SEMI SMART Manufacturing Technology Community, Americas Chapter.

Doug has over 20 years of experience leading software teams for a variety of industries including semiconductor, manufacturing, and transportation. Most recently, he was involved in architecting PEER Group's remote connectivity solution, Remicus™, and he was a champion in promoting the use of cloud computing and latest-generation web technologies.