

Taking the first step towards Industry 4.0

Marc Gimbert discusses the Tiamo IQ modular platform, which he describes as an important first step towards Industry 4.0 in the manufacture of glass containers.

The mention of 'Industry 4.0' often leads to quizzical glances or raised eyebrows. Many of those who have heard of it are still unsure about what it really entails, while those who have not heard of it probably assume that it is marketing jargon.

The fact is that Industry 4.0 has already started to gain momentum and the adaption to this new environment is not only an opportunity, it is a necessity.

Continuous improvement is a part of human nature - work, learn, apply and repeat. The same dynamic circle can be applied to manufacturing. Enter 'Industry 4.0', a digitised environment in which every system in the production process permanently communicates and exchanges data using Internet and virtual networks. The main tools required to develop a 'smart plant' already exist. These include sensors, PLC, Scada, computers, Big data, Internet of Things (IoF) and cloud computing. By being interconnected, machines are capable of producing intelligently, which is why Tiamo has released its 'IQ INTELLIGENCE systems' range, designed to support glassmakers with real-time data and access to information needed for the decision-making process. As a web-based, mobile software solution, Tiamo IQ gives users access to key

| Lab check specification | Furnace | Line | Article | CPK | Standard deviation | Minimum tolerance | Min | Avg | Max | Maximum tolerance | Population |
|-------------------------|---------|------|---------|-------|--------------------|-------------------|--------|--------|--------|-------------------|------------|
| Weight | AVR1 | L 1 | BN 1162 | 1.88 | 5.12 | 380 | 403.00 | 411.13 | 426.00 | 440 | 80 |
| Weight | AVR1 | L 3 | BN 1128 | 3.73 | 2.16 | 380 | 411.00 | 415.83 | 421.00 | 440 | 58 |
| Weight | AVR2 | L 6 | BN 726 | -0.32 | 2.74 | 196 | 199.00 | 202.64 | 217.00 | 200 | 42 |
| Weight | AVR1 | L 2 | BN 873 | -0.75 | 3.98 | 219 | 205.00 | 210.09 | 226.00 | 237 | 232 |
| Weight | AVR2 | L 5 | BN 129 | 2.10 | 1.40 | 219 | 225.00 | 228.22 | 230.00 | 237 | 18 |

Extract of a quality report on the subject of hot end weight evolution.

performance metrics in a focused and timely manner – anywhere, anytime – for vastly improved efficiency.

INNOVATIVE APPROACH TO LINE SUPERVISION

Following the Tiamo IQ Track (a system that enables glass plant management to have a quick overview of key performance metrics for their factories), Tiamo has introduced IQ Scan as the line monitoring system. While Tiamo IQ Track helps hollow glass plant managers to access relevant information and make the correct decisions promptly, Tiamo IQ Scan

provides an innovative approach to line supervision.

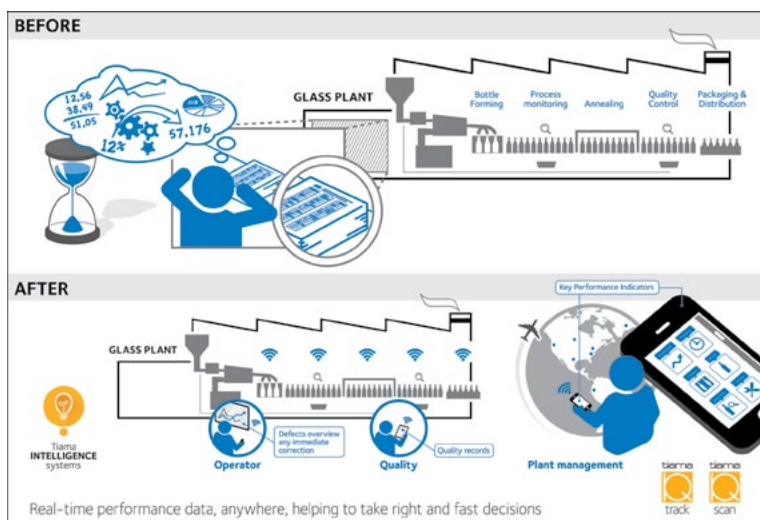
Instant visibility of information from the IS machine all the way through to the warehouse (including all major equipment used during the manufacturing process) provides a comprehensive view of the issues and opportunities at hand. Tiamo IQ Scan allows glass companies to employ current web technologies to improve their performance.

All players within the glass factory benefit from a clear production analysis thanks to real-time data on defects seen by inspection equipment. Tiamo IQ Scan pushes, notifies and delivers line data to clients as soon as it is available; it is not based on a fixed time interval (eg every five minutes). Its modular platform answers all quality control requirements in the forming, inspection, laboratory and mould departments.

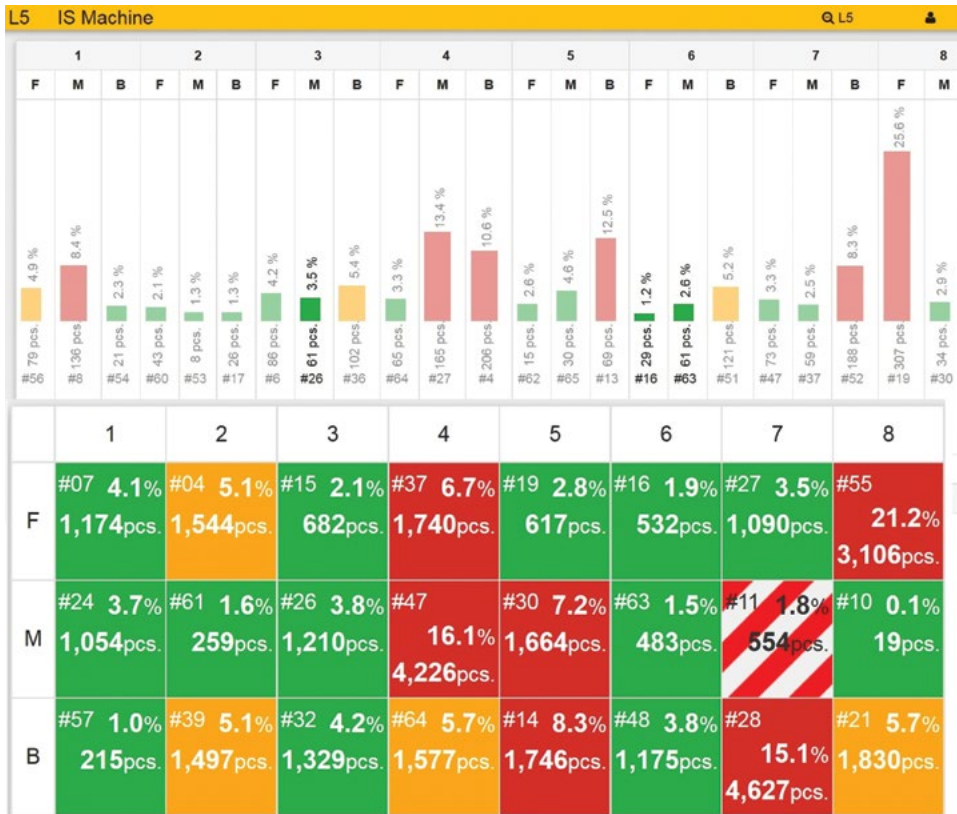
Implementation of Tiamo IQ Scan is simple and straightforward and allows users to benefit from its numerous advantages. The system allows for faster queries and faster access to data, regardless of whether it is local or remote. It uses the most advanced database appliances for faster access of large volumes of data and being fully web based, the entire application can be accessed through any modern web browser.

Tiamo IQ Scan is mobile and can be operated from all mobile devices. This has several advantages, including easy software upgrades. Once a new release has been deployed on the server, the user simply refreshes the browser to have it on the required device!

By collecting data from IS machine to palletisers, Tiamo IQ Scan quickly shows users where, why and when they are losing glassware. By receiving this crucial information, they can take action to solve issues or correct a deviation that has been detected, immediately. This capability automatically helps users to improve line performance, allowing them to reduce the false reject rate or adjust bad settings, thereby automatically increasing



Towards the digitised glass container plant environment.



Overview of IS rejection rates.

the percentage of packed ware. Most information can also be passed to the hot end operator, with the relevant mould number, allowing him to focus on the 'faulty' section and cavity to solve the problem.

MODULAR ARCHITECTURE

The modular concept of IQ Scan gives several solutions to answer the needs of glassmakers.

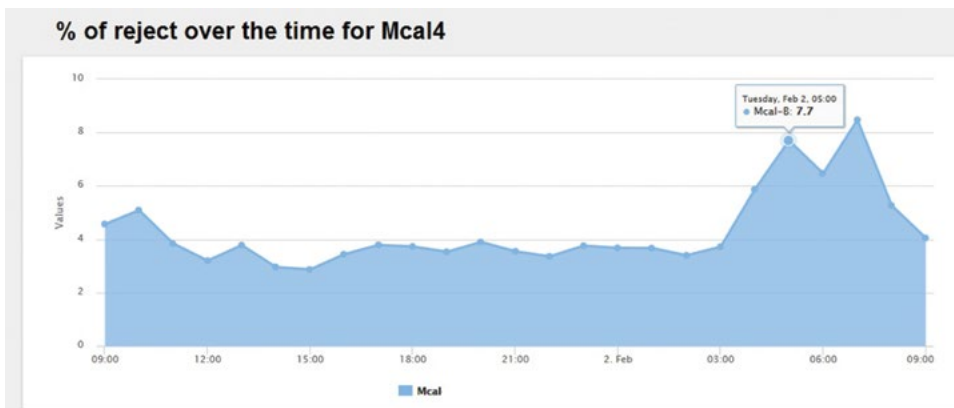
In addition to the monitoring system for production lines, other modules are also available: For quality (including quality procedures management and laboratory check recording), mould shop (repair follow up), equipment downtime (hot end, cold end, packing), sampling machine (on-line pressure, dimensional),

pallets management and communication with an ERP etc.

The IQ Scan can also record most of the operators' actions: Part changes (eg blank and blow mould changes), attributive controls at the Lehr exit, weight scale at the hot end, sample challenge etc. It also makes procedures much easier thanks to clear, comprehensible HMI to record data. Forget the paper trail along the line stations because now, users simply enter all their own procedures into the system. Managers can easily pick up what has been done and whether results are within specifications or not.

MULTI-LEVEL, TAILORED INFORMATION

The Tiamo IQ Scan system enhances glass plant operations by supplying valuable information across the entire company and to everyone within the organisation. Each employee can have his own login and password to the system. Depending on his role, the user can configure his own dashboard to see the widgets he has created for what matters most to him. And of course, users have access to the system anytime, anywhere.



Vision machine rejection rates for Mcal4.

While a plant manager may look at the key performance metrics of the whole plant during the day, the IS machine operator can focus on worst defects or worst cavities of an IS machine during the last 30 minutes, while the Quality Manager can monitor the quality records of his team from the start of the shift. Everyone can use his dashboard for what really matters to him.

OPEN-BASED ARCHITECTURE

Tiamo IQ Scan was developed in co-operation with market experts, EKF and IS engineering, combining compatible systems and moving towards increased quality. It opens the possibility easily to upgrade existing iAfis into a Tiamo IQ scan. It is more capable of staying abreast of the latest web technologies because it is designed according to an open-based architecture. Tiamo IQ operates in non-Latin languages, which reduces the need to invest more in hardware since most existing PCs can be used, as long as an updated browser is in place.

The system is extremely flexible:

Data, charts and messages can be tailored/customised to the client's norms using visual alerts or SMS messaging. IQ technology offers a user experience, similar to well-known web apps such as Google for messaging and charts, making it effortless to navigate. The system is clear and intuitive, using graphical reporting instead of numerical information, which is organised in tables. This makes the training required for users very easy, since most people already know how to use and navigate a website.

Tiamo keenly follows the challenges faced by everyone within a glass factory in their daily decision-making. IQs are already counted among all main technology adopters with glass groups such as Park Cam, Wiegand-Glas, AMBEV and Peskovskiy. By tracking the glass production process in a digitised environment, the Tiamo INTELLIGENCE range serves to increase overall efficiency and quality. ■

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