

Full Circle Traceability and Verification When Parts Have to Perform

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If you make things that must not fail, making them is only half of your job. If you want to continue being successful in business, *being able to prove that they were made correctly, beyond a reasonable doubt, is essential.* Accurate manufacturing records are a must. Unfortunately, this is the world in which we have to work. Instead of thinking of it as a threat, think of it as an opportunity to prove your company's stuff.

Three industry leading companies have partnered together bringing the molding industry the capability to combine data gathering, in-mold marking, and vision verification into a single "Full Circle Traceability" system. A data recording system records the part's "birth heartbeat" consisting of key variable graphics and data validating it was made correctly. The unique i-MET in-Mold Electronic Traceability System, molds an individual sequential part number, as well as date and time information, into each molded part. A digital imaging system photographs the imprint and verifies the unique part number is correct and readable.

All of this might sound a bit excessive but if you have ever had to defend yourself in a lawsuit where someone has been killed or disabled you know the stakes. Oftentimes, companies with what appears to be deep pockets have to prove they are not guilty or juries will find them at fault. *In many cases lawyers only have to plant a seed of doubt and your company can be at serious risk.*

With Full Circle Traceability & Verification, key process parameters from the machine and from inside the cavities of the mold are recorded at up to several hundred data points per second and archived along with the date, time, and the unique serial number mechanically imprinted on the part.

The data recording system is the driver and serves as the controller and archivist. A cycle begins as the microprocessor driven in-Mold Electronic Traceability System advances the part number to the next number in sequence. Key to the Full Circle Traceability System working is the i-MET System, which is the enabler of this approach. It changes the date or sequential number wheels electronically in the mold to a new number with each cycle.

The sequential number is recorded in the information gathering systems data file, which captures key data as the plastic is melted, during filling, packing, holding and curing of the part. The data is constantly being compared to a process template. The process template and key acceptance parameters are based on cycles captured when tests were made.

When the cycle is complete, the system sends a fail-safe signal to indicate that the process either passes the set parameters or not. The good or reject signal always defaults to reject or contain, except when a good signal is sent. This means that any system fault causes the parts to be rejected

Once the parts are accepted they are sent downstream to a Digital Vision System camera that reads the serial number. This system then reads the serial number and sends a digitally transcribed image to the Information Gathering System for comparison with the data record. Only when the serial number is verified, the record has been saved, and the part determined to be good, will a signal be sent that the part has passed and can continue being processed.

Once the parts are verified by the system, the sequential number is passed to the customer's data system where it can be used as a part of downstream processes and documentation.

When used with the molders properly constructed data archiving system, the saved graphical waveform data can easily be retrieved and replayed along with the template of reference parts. This data also includes material viscosity that can be used to help determine whether or not the material used in the part was normal during processing.

Information Processing Systems, such as those offered by RJG, Inc. makes gathering of key data easy with standard sensors. The one of a kind i-MET System, ELEDA-Cumsa/PCS, molds visible date and sequential numbers onto each molded part. The Digital Vision System, Cognex, verifies the permanent molded data allowing this information to be used in later processing operations

This approach is the most comprehensive way to insure yourself against being proven guilty by negligence. It's low cost insurance and safeguards your customers by insuring that only the best parts are used in your products. ***It's only expensive if you don't use it.***

Biographies:

Rod Groleau has worked in the plastics industry for over 40 years. He received a Bachelor's Degree of Engineering from Kettering University (General Motors Institute) and a Master's Degree from Michigan State University. After a stint as a Plastic Process Engineer with A. C. Spark Plug, he co-founded Control Process, Inc. (CPI) to apply electronic control technology to the injection molding process. While at CPI he developed the industry's first Process Control System to control the molding process by monitoring plastics variables, he also invented the first commercial Mold Pressure Sensor, and developed a complete product line of specialized controls and information systems for plastic injection molders. In 1980, Rod joined D-M-E Company a Director of Engineering and Technical Services. In 1985, Rod began his own training and consulting company, RJG Associates, Inc. In 1990 he founded RJG Technologies, Inc. to provide transducers, process monitoring equipment and control equipment to injection molders. In 1999 the two companies were merged as RJG, Inc., where Rod serves as director.

Gary W. Landless has spent the past 20 years working in the plastics industry for the PCS Company (Fraser, MI). He came to PCS from a long career in the welding supply business and has a BBA degree from Western Michigan University. His time at PCS has been spent working in Customer Service, as National Sales Manager and most recently as the North American representative of the i-MET Part Traceability System developed by ELEDA-Cumsa, Barcelona, Spain. Full Circle Traceability is a unique system put together through the combined efforts of PCS, ELEDA-Cumsa, RJG, Inc, and Cognex Modular Vision Systems.