techMatrix, LLC

APPLICATION BRIEF

Using WeldWorks™ to Collect Data from Miyachi Unitek Monitors

PROBLEM:

A simple and scalable means to collect and analyze weld data from Miyachi Unitek's MM-370A and MM-380A weld checkers (i.e. monitors) is needed.

INTRODUCTION:

The Miyachi Unitek handheld (MM-380A) and portable (MM-370A) weld monitors are powerful tools for quickly verifying the performance of large scale resistance weld systems (see Figure 1). Simply connect the appropriate voltage, current, force or displacement sensors to the monitor and one can quickly characterize a weld system. The addition of the techMatrix WeldWorks™ Software Suite now allows manufacturers to easily upload the weld data gathered from all their machines across the enterprise. The critical weld information is stored in a central database and information is accessible anywhere via the web. In this way, the information can be viewed and analyzed across departments (i.e. manufacturing, quality, product engineering, etc.) If desired, it can also be integrated into your Manufacturing Execution System (MES).

The combination of the Miyachi Unitek monitors and the WeldWorks Software Suite makes conducting design of experiments (DOE's), weld process characterization and validation, and statistical process control (SPC) a reality for organizations that want to achieve world class quality.

PERIODIC WELD MONITORING:

The WeldWorks software can be used with either the MM-370/380 to periodically check the resistance weld machine or they can be used to diagnose problems associated with a machine, part weld schedule, or production lot. The method described here is to collect weld data from the machines periodically - perhaps on a weekly basis - to ensure that each system is operating within its specifications. A technician would connect the monitor and sensors to the resistance weld machine, collect a data set, then disconnect the hardware and move to the next machine. The process would be repeated until the all the data was collected from the various resistance weld machines. Alternatively, the technician could collect data on only the machines exhibiting weld inconsistencies.

Figure 1 - Miyachi Unitek Weld Monitors (MM-370 left & MM-380 right)

After the resistance weld data has been collected, the technician would return to their office and use either a laptop or desktop PC to upload the information to the WeldWorks database (see Figure 2). Here, the technician would group and associate the data with machine, controller, and other relevant information. Finally, the technician would clear the monitor's data store.

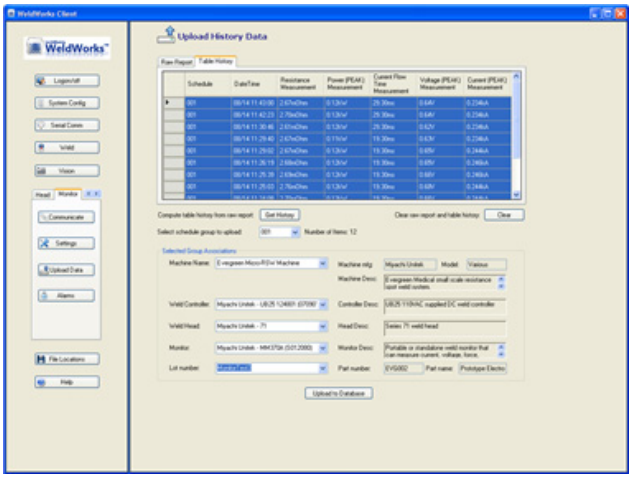

Figure 2 - Uploading Monitor Data into WeldWorks™

CONTINUOUS WELD MONITORING:

The WeldWorks software also allows the manufacture to automatically monitor and store the resistance weld data for every weld. In this case, the weld monitor (usually a MM-370A) and a low cost industrial PC are connected and left stationary at the machine. Prior to welding material, the operator bar codes or manually keys in the lot number into the WeldWorks client software. The software then gets the appropriate weld schedule for the part. The operator adjusts the resistance weld schedule and force accordingly on the machine.

Now, the operator begins welding the parts, while the monitor and software silently collect the spot weld data. The resistance weld results are automatically verified and the measurement results, including all waveforms, are uploaded to the database. The software can be configured to sound an alarm or illuminate a red light in the event of weld failure. Continuous monitoring is useful when high weld quality, minimal scrap or complete traceability is required. The process is immediately stopped if a measurement falls outside its predefined limits. This allows the operator to make basic machine adjustments or notify an engineer/technician of the problem.

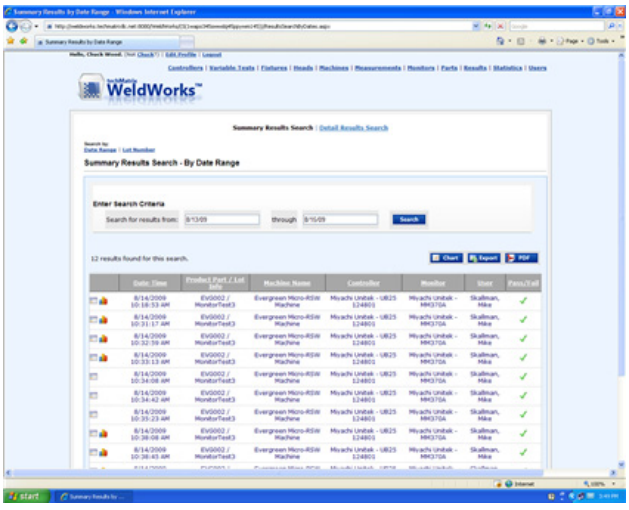

Figure 3 – Reviewing Results in WeldWorks™ Web Application

CONCLUSION:

The techMatrix WeldWorks Software Suite enables data collection and statistical analysis from weld data collected using Miyachi Unitek monitors. A monitor and software are an ideal solution to trouble-shoot, periodically verify, or continually monitor large scale resistance weld results from one machine to many machines across the enterprise (see Figure 3).

WeldWorks software allows manufacturers to easily manage weld data and control process quality. This application brief has described how one can increase large scale resistance weld yields, improve consistency, and achieve Six Sigma quality using a high performance monitor and leading edge weld management software.

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