

Honeywell Solution for Data Acquisition and Nadcap Reports for AMS2750D Applications



Honeywell's X-Series family of recorders provides the flexibility, security, accuracy and networking capabilities to meet your Nadcap recording needs. X-Series recorders support process monitoring and temperature uniformity surveys as detailed by the Aerospace Material Specification AMS2750D. The recorders can be set up to monitor and record thermocouple usages, due dates for the temperature uniformity survey, system accuracy test, instrument calibration dates and thermocouple usages to insure compliance to the specification.

X-Series Recorder AMS2750D Features

- Temperature Uniformity Summary screen provides easy monitoring of each set point of the survey
- Monitoring and recording of overshoot, min-max, temp difference and time duration for up to six survey set points
- Thermocouple usage monitoring
- Due date reporting for Temperature Uniformity Survey (TUS), System Accuracy Test (SAT) and instrument calibration dates are color coded for fast identification
- Automatic zoom function once temperature enters the uniformity range based on the defined furnace class
- Ability to enter correction factors for each T/C along with T/C calibration and traceability information
- Ability to set auto-detection or override the start of the soak period for each temperature survey set point
- Enter furnace and survey specific information to document the temperature uniformity survey results
- Ability to generate a secure report for documenting the TUS including furnace diagram, identification of equipment, identification of survey personnel and process data
- SAT template provided in report with ability to add furnace and user-specific data

X-Series Recorder Process Mode

The X-Series process screen provides online monitoring in the process recorder to insure and alert the user to potential AMS2750D noncompliance issues. It automatically monitors critical dates based on the defined furnace class. For the Multitrend SX recorder up to 12 pens can be displayed for each process display. Other information included on the process monitoring screen includes:

- Days until next Temperature Uniformity Survey
- Days until next System Accuracy Test
- Days until next control T/C change out
- Days until the recorder requires calibration
- Overview of T/C usage tracking for all T/Cs
- Color coded for early warning (five-day expiration)



Multitrend SX Process Screen

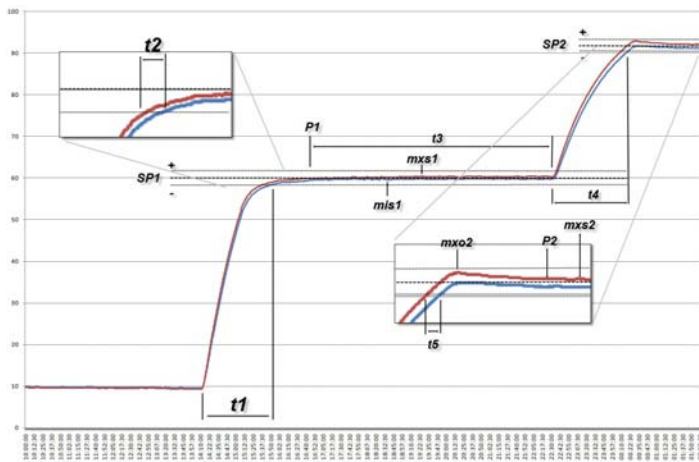
Automated Process Thermocouple Tracking

An integral part of any Nadcap audit of thermal processes involves monitor and tracking the usage of process thermocouples. X-Series recorders provide a means to track and alert the user of the current status of each process T/C. The recorder uses the information entered for each thermocouple such as T/C type, whether it is expendable or non-expendable along with the process conditions the T/Cs have been exposed to in determining the number of uses and days left before the thermocouple needs to be renewed.

Temperature Uniformity Survey

The temperature uniformity survey is a key parameter used by Nadcap auditors to insure compliance to the AMS2750D specification. There are many parameters and process measurements needed to document the compliance of the thermal processing equipment to AMS2750D and to determine which furnace class the equipment is qualified to work in. The Multitrend SX recorder TUS option is set up to track a number of parameters during a TUS, including:

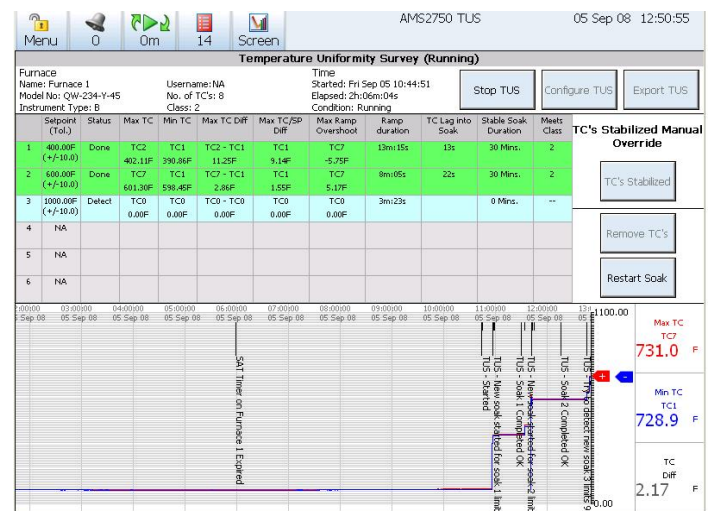
- The ramp time for the first ramp (t1)
- The time between the first T/C entering dwell zone and the last T/C entering dwell zone for SP1 (t2)
- The point where all T/Cs are stable and lie within the SP1 tolerance limits
- The dwell time (t3) (minimum of 30 minutes)
- Maximum temperature value during the dwell period (mxs1)
- Minimum temperature value during the dwell period (mis1)
- Ramp time for the second ramp (t4)
- The time between the first T/C entering dwell zone and the last T/C entering dwell zone for SP2 (t5)
- The maximum temperature overshoot (mxo2)



In addition to the process conditions, the information related to the equipment such as manufacturer's name, furnace serial number, furnace class, instrument type, furnace shape and size, thermocouple certifications, offsets and type of T/C are entered in the recorder set up to aid in determining, in real time, the current status of the process survey. This allows the survey engineer to know exactly how well the survey is going and whether corrective action is required before going to the next step. This information is presented in a single TUS Summary Screen (shown below).

Temperature Uniformity Survey Summary Screen

The TUS Summary Screen is a standard screen available when the TUS option is enabled and provides real-time information and tracking of each step of the process.



Multitrend SX Temperature Uniformity Survey Screen

When doing an actual temperature uniformity survey using the Multitrend SX recorder, data is recorded at two-minute intervals and a standard TUS Summary Screen provides real-time information and tracking of each step of the process. Key features include:


- Provides status information for up to six set points
- Header information provides furnace details
- In the active running mode the screen provides minimum and maximum T/C readings, maximum differences, maximum overshoot, durations and furnace class detail
- The trend graph auto-sizes when the first process values reach the set point limits for the defined furnace class
- Trend graph switches to display maximum and minimum temperature readings for the furnace

- Each step of survey process is color coded for fast visual indication of progress of the survey
- Summary report generated at completion of survey that can be e-mailed or exported

The recorder creates a separate secure data file that is used by the PC Analysis and Report Tool for generating the survey report.

PC Analysis and Report Tool

The TUS data stored on the removable media of the recorder can be imported into the PC Analysis Tool to generate the survey report to document the furnace's performance. The tool uses a report wizard to aid in entering the information not provided by the recorder. The Report Tool provides a complete report with survey details, furnace details, T/C identification, correction factors, a furnace diagram with T/C positioning and trend graphs of the recorded temperatures. Other documentation provided by the report includes max differences across survey T/Cs, differences between survey T/Cs and the control set point, maximum overshoot, ramp durations and T/C lag time. The tool also provides a SAT template.



Temperature Uniformity Survey Report

Certificate Number: Report 11-03-2008					
Customer: Big Heat Treat					
Equipment: Furnace 1					

Site Information					
Customer			Big Heat Treat		
Location Address			123 Big Heat Treat Lane Fairweather AZ		
Contact Name			Jim Heat		

Thermal Processing Equipment					
Equipment Name			Furnace 1		
Equipment Manufacturer			XYZ Furnace Co		
Furnace Class			2		
Model Number		QW-234-Y-45	Serial Number		1234567
Material Type		Parts	Instrument Type		A
Asset Tag	Model No.	Serial No.	Instrument Purpose	Cal. Certificate No.	Cal. Due Date
TC-101	XTC-1	123456	Work T/C	TC Cal No 101	12/1/2008
TC-102	XTC-2	123457	Load T/C	TC Cal No 102	12/1/2008
TC-103	XTC-3	123458	High T/C	TC Cal No 103	12/1/2008
TC-104	XTC-3	123459	Lo T/C	TC Cal No 104	12/1/2008
Comments: Vacuum Furnace DD1					

Survey Affirmation					
Certificate Number: Report 11-03-2008					
Issue Date: 11/3/2008					
Result: Meets requirements for furnace class 2					
TUS Test Complies with:					
Customer Signature:				Date:	
Engineer: J. Kilroy				Date: 11/3/2008	
Approved:		Signed:		Date:	
		Printed:			

Temperature Uniformity Class Achieved By Set Point					
SP1 200.0 °F	Met the requirements of Class 1 Furnace	Survey Passed <input type="checkbox"/>	Failed <input type="checkbox"/>		
SP2 300.0 °F	Met the requirements of Class 2 Furnace	Survey Passed <input type="checkbox"/>	Failed <input type="checkbox"/>		
SP3 500.0 °F	Met the requirements of Class 1 Furnace	Survey Passed <input type="checkbox"/>	Failed <input type="checkbox"/>		

Report Generated By Honeywell TUS Report Tool All measured values (except the control TC) are corrected Page 1 of 16

System Accuracy Test Log

Oven Name/ID	<u>Furnace 1</u>	Control Sensor	<u>T/C 10</u>
Manufacturer	<u>XYZ Furnace Co.</u>	Tolerance	<u>+/- 10F</u>
Location	<u>Fairweather AZ</u>	Additional Comments	_____
Oven Class	<u>2</u>		_____
SAT Calibration Company Name (If not done in - house)			

SAT Calibration Company Representative			

SAT Calibration Company Representative Signature			

Thermocouple Placement Information

Date / Time	Controller/Recorder Indication	Uncorrected Test Instrument Reading	Correction for Test TC	Correction for Test Instrument	Corrected Test Instrument Reading	Reading Error	Pass /Fail	Tech	PCN Test sensor / PCN Test indicator

SAT Procedure Number: SAT Proc 01-1001-A1 Engineer Name: _____

Approval Sign Off: _____

REF PROCEDURE: SAT Proc 01-1001-A1

More Information

For more information, visit www.honeywell.com/ps or contact your Honeywell account manager.

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