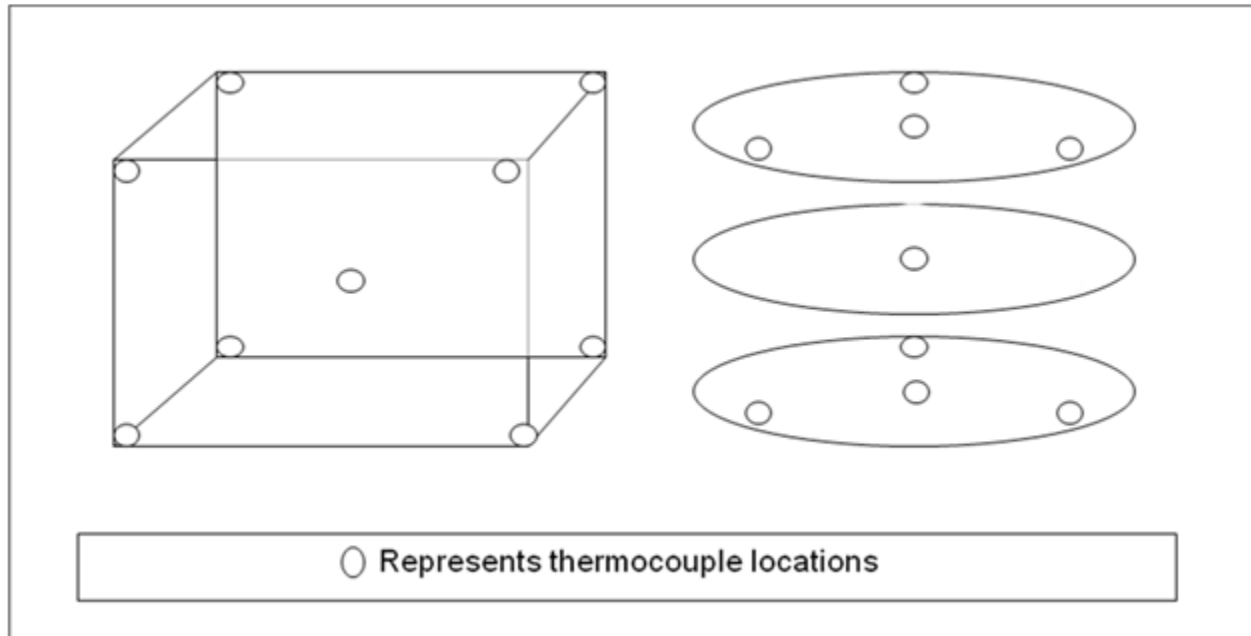


ERRATA SHEET FOR

CQI-9 Special Process: Heat Treat System Assessment, 3RD EDITION

- 1) Figure 3.4.1 -- The 12 thermocouple locations in the cylindrical furnace is changed to 9 thermocouple locations as shown below.



- 2) Cover Sheet Form – typographical error on CD
- The Header on the top right side should read, Version 3, Issued 10/2011.
 - Process Table G is listed twice and should read,
 - Process Table G – Sinter Hardening
 - Process Table H – Ion Nitriding
 - Directions for correction typographical error on CD:
 - When using the CD the first time, save the file to your computer
 - From the Cover Sheet, click on Page Layout tab, click the arrow in the bottom right corner of the Page Setup group to display the Page Setup dialog box
 - Click on Header/Footer tab and select the Custom Header button
 - Change to Version 3, Issued 10/2011, click OK.
 - Locate cell C- 40, change Process Table G to Process Table H
- 3) Process Table E – Annealing / Normalizing Stress Relieving – E4.1 changed as shown below.

4.0		IN-PROCESS/FINAL TEST FREQUENCIES	Batch Furnace	Continuous Furnace
E4.1	1.4 2.15	When specified - Microstructure shall be checked at a minimum magnification of 100x and, 400x or above 400x. Microstructural visual references shall be available.	Daily per furnace unless specified by customer to be checked with greater frequency, e.g., each batch.	Daily per furnace unless specified by customer to be checked with greater frequency, e.g., each batch.

- 4) Process Table G – Sinter Hardening; G3.1, The Process Monitor Frequencies for Atmosphere Generation was corrected as shown below (red circles).

3.0		PROCESS MONITOR FREQUENCIES	Batch Furnace	Continuous Furnace	Atmosphere Generation
G3.1	1.4 2.14	Monitor primary temperature control instrument(s).	Continuous recording with sign-off every 2 hours or each batch for processes under 2 hours. Alarm systems (if set per limits in G2.5) satisfy the sign-off requirement.	Continuous recording with sign-off every 2 hours or each lot for processes under 2 hours). Alarm systems (if set per limits in G2.5) satisfy the sign-off requirement	One of the three options is required. (1) Record temperature 2x per shift and after any change. (2) Continuously record temperature and sign-off 2x per shift and after any change. (3) Alarm system on temperature controller.

NOTE: G4.5 IS DELETED AND REPLACED BY G4.1 AS SHOWN ABOVE.

- 5) Process Tables A, B, and G – Microstructure inspection frequency changed to below.

PROCESS TABLE A – Carburizing / Carbonitriding / Carbon Restoration / Neutral Hardening / Austempering/Martempering/Tempering/Precipitation Hardening – Aging

4.0		IN-PROCESS/FINAL TEST FREQUENCIES	Batch Furnace	Continuous Furnace
A4.1	1.4 2.15	Microstructure shall be checked at a minimum magnification of 100x and, 400x or above 400x. Microstructural visual references shall be available.	Daily per furnace unless specified by customer to be checked with greater frequency, e.g., each batch.	Daily per furnace unless specified by customer to be checked with greater frequency, e.g., each batch.

PROCESS TABLE B – Nitriding (Gas) and Ferritic-Nitrocarburizing (Gas or Salt)

4.0		IN-PROCESS/FINAL TEST FREQUENCIES	Batch Furnace	Continuous Furnace
B4.1	1.4 2.15	Microstructure shall be checked at a minimum magnification of 100x and, 400x or above 400x. Microstructural visual references shall be available.	Daily per furnace unless specified by customer to be checked with greater frequency, e.g., each batch.	Daily per furnace unless specified by customer to be checked with greater frequency, e.g., each batch.

PROCESS TABLE G – Sinter Hardening

4.0		IN-PROCESS/FINAL TEST FREQUENCIES	Batch Furnace	Continuous Furnace
G4.1	1.4 2.15	Microstructure shall be checked at a minimum magnification of 100x and, 400x or above 400x. Microstructural visual references shall be available.	Daily per furnace unless specified by customer to be checked with greater frequency, e.g., each batch.	Daily per furnace unless specified by customer to be checked with greater frequency, e.g., each batch.

- 6) Process Table D - D4.2 typographical error changed as shown below.

4.0		IN-PROCESS/FINAL TEST FREQUENCIES PER COIL	
D4.2	1.4 2.15	Total or Effective Case depth	1 part at start-up, end of production run, and 1 part per 8 hours minimum, and 1 part pre and 1 part post tool change, equipment repair, station alarm (shutdown, malfunction, etc.).

ERRATA SHEET –

Items 7 through 10 were added April 2012 to Errata Sheet released January 2012

- 7) System Accuracy Test referenced in Table item #'s: A2.3, B2.3, C2.3, E2.3, F2.3, and G2.3.

Current reading: CQI-9 requires a System Accuracy Test (SAT) check of the control thermocouple in the Qualified Work Zone per Section 3.3

New reading: CQI-9 requires a System Accuracy Test (SAT) check of all control thermocouple per Section 3.3. Also, any recording or monitoring thermocouple(s) more than 5 centimeters from the controlling thermocouple in the zone, for example thermocouples in continuous belt furnaces near the drop point to quench used for recording or monitoring the hardening temperature (this does not include the “over-temperature” thermocouples that are used to protect the furnace from overheating).

- 8) Change Glossary definition of “Resident Thermocouple” to:

A test thermocouple that is not removed from its test location, and is used for the SAT Comparative Method. The resident thermocouple shall meet the requirements of Section 3.3.4.3 and Table 3.3.1.