Annex G (Informative)

Standard Procedure for Local Heating

This annex is not part of this standard but is included for informational purposes only.

Procedure No.: _____ Revision No.: _____ Date: _____

Governing Code: _____

Workpiece Identification Number: _____

Material Specification: _____

Component Dimensions: _____

Thermocouple, Heater, and Insulation Layout Drawing Number: _____

Thermal Cycle

Heating Rate: _____°_____/hour (specify max. or min.) above _____ ° _____

Hold Temperature Range: _____ ° to _____ ° _____

Minimum Hold Time: _____ hours Maximum Hold Time: _____ hours

Cooling Rate: _____°_____/hour (specify max. or min.) above _____ ° _____

Steps

G1. Match procedure/drawings to workpiece, including verification of workpiece identification number. Check the appropriateness of specified thermal cycle to the material and application.

Completed by: _____ Date: _____

G2. Install and test power/control equipment, including power supplies, temperature controllers, and temperature recorders.

Completed by: _____ Date: _____

G3. Check validity of calibration date on all temperature recorders. Enter serial number and date next calibration due for each recorder.

Serial number: _____ Date Next Calibration Due: _____

Serial number: _____ Date Next Calibration Due: _____

Serial number: _____ Date Next Calibration Due: _____

Serial number: _____ Date Next Calibration Due: _____

Completed by: _____ Date: _____

G4. Install thermocouples (including spares) per drawing/sketch using approved methods. Direct attachment by capacitor discharge welding (Annex D) is recommended.

Completed by: _____ Date: _____

G5. Verify specified (per drawing/sketch) placement of thermocouples.

Verified by: _____ (User's/Owner's Inspector) Date:_____

G6. Install heat sources and insulation per drawing/sketch using approved methods.

Completed by: _____ Date:_____

G7. Verify specified (per drawing/sketch) placement of heat sources and insulation before the start of heating.

Verified by: _____ (User's/Owner's Inspector) Date:_____

G8. Install and connect thermocouple extension wire. Check operation of all thermocouples. Check for reversal of thermocouple polarity. Note that it may only be possible to detect a double polarity reversal visually.

Completed by: _____ Date:_____

G9. Install and connect power cables. Check operation of all heat sources.

Completed by: _____ Date:_____

G10. Obtain approval to begin the heating operation.

Approved by: _____ (User's/Owner's Inspector) Date:_____

G11. Perform and document periodic checks during heating, including equipment operation (recorder and power supplies) and adherence to specified heating rate. If a deviation occurs during heating, follow approved corrective action. If it appears that achieving the hold temperature will be difficult and requires excessive time, the User/Owner's Inspector should be notified and a decision made regarding whether to continue heating.

Completed by: _____ Date:_____ Time: _____

Completed by: _____ Date:_____ Time: _____

Completed by: _____ Date:_____ Time: _____

G12. Verify the start of the hold period, e.g., all soak band thermocouples are within the required temperature range.

Verified by: _____ (User's/Owner's Inspector) Date:_____

G13. Perform and document periodic checks during the hold period, including equipment operation (recorder and power supplies) and adherence to required hold temperature range. If a deviation occurs during the hold period, follow approved corrective action. A maximum time in the hold temperature range may be specified for certain materials. If it appears that the maximum time limit will be exceeded, the User/Owner's Inspector should be notified and a decision made regarding whether to continue heating.

Completed by: _____ Date:_____ Time: _____

Completed by: _____ Date:_____ Time: _____

Completed by: _____ Date:_____ Time: _____

Completed by: _____ Date:_____ Time: _____

Completed by: _____ Date:_____ Time: _____

G14. Verify completion of the hold period, e.g., all soak band thermocouples remained within the required temperature range for the minimum required time. Must be verified before the start of cooling.

Verified by: _____ (User's/Owner's Inspector) Date:_____

G15. Perform and document periodic checks during cooling period, including equipment operation (recorder and power supplies) and adherence to specified cooling rate. If a deviation occurs during cooling, follow approved corrective action.

Completed by: _____ Date:_____ Time: _____

Completed by: _____ Date:_____ Time: _____

Completed by: _____ Date:_____ Time: _____

G16. Deactivate power/control equipment after the temperature is below that where cooling rate control is required.

Completed by: _____ Date:_____

G17. Remove all equipment after the temperature is safe for personnel. Cut thermocouple wires and mark locations of attached thermocouples for light filing/grinding.

Completed by: _____ Date:_____

G18. Note any deviations such as heating rate, hold time and temperature, or cooling rate that occurred during the thermal cycle. If no deviations occurred, enter "None."

_____

_____

_____

_____

_____

Completed by: _____ Date:_____

G19. Complete and submit to User's/Owner's Representative appropriate documentation in accordance with Standard Documentation Checklist (Annex H).

Received by:_____(User's/Owner's Representative) Date:_____