1. **Governing Specifications**

Examples:

* ASTM E 208 - Standard Test Method for Conducting Drop-Weight Test to Determine Nil-Ductility Transition Temperature of Ferritic Steels
1. **Technical Concerns**

Catastrophic failures of components can occur due to brittle fracture of ferritic steels. Brittle fractures due to the presence of a sharp defect can occur at stress levels at or below the yield strength of the material.

1. **Known Process Problems**
* The drop-weight test was developed to measure fracture initiation characteristics of 5/8 inch and thicker materials. To preclude problems, this test should not be performed on thinner materials.
* The use of nonstandard test specimens or nonstandard test conditions not specified in ASTM E 208 may yield misleading results.
* This test employs a small weld bead deposited on the specimen surface. Anomalous behavior may be expected for materials where the heat affected zone is made more fracture resistant than the unaffected plate.
1. **Checklist Items**

**Part A: Contract Compliance Items.** An explanation should be provided for any “no” response and follow-up questions should be asked as appropriate. Also, the “REMARKS” column should be used to explain the supplier’s method of compliance or other pertinent observations. **All applicable contract specific items should be filled in prior to the visit to customize the checklist for each visit.**

**Part B: Additional Supplier Capability and Data Gathering Items.**  Additional “how” or data-gathering type questions should be asked as appropriate to gain better understanding of the supplier’s operation, and the answers documented.

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| --- | --- | --- | --- | --- | --- |
| **Supplier:** |  | **Date:** |  | **QAR:** |  |

**PART A**

**CONTRACT COMPLIANCE ITEMS**

| **Line** | **Checklist Item** | **Yes** | **No** | **N/A** | **Remarks / Method of Compliance** |
| --- | --- | --- | --- | --- | --- |
| **A.1** | Is the test equipment sufficiently secure to prevent the base from jumping or shifting during the test? (6.3) |  |  |  |  |
| **A.2** | Is each test specimen marked to identify its particular source (heat number, lot number, test location, etc.), and in accordance with the material specification, welding standard or other contract documents? (7.1) |  |  |  |  |
| **A.3** | Are the specimen location and orientation as specified in the materials specification, welding standard or other contract document?  |  |  |  |  |
|  | * Is the material specified to be tested (i.e. base material, HAZ or weld metal) located below the notch in the crack starter weld deposit? (7.2 - 7.4)
 |  |  |  |  |
| **A.4** | Were the specimen surfaces machined or preserved in the as-fabricated condition, and not cut with a thermal process (e.g., flame cut)? (7.6) |  |  |  |  |
| **A.5** | Are standard size specimens being tested with dimensions in accordance with ASTM E 208 Paragraph 7.5, and Figure 6? |  |  |  |  |
| **A.6** | Is the crack-starter weld deposited with a stringer bead without interruption in a single pass? (7.7) |  |  |  |  |
| **A.7** | Is the contour, maximum size and depth of the weld notch in accordance with ASTM E 208 Paragraph 7.8 and Figure 9? |  |  |  |  |
| **A.8** | Is the correct size of anvil being used for the type of specimen being tested, and are the dimensions in accordance with Table 1 and Figure 4? |  |  |  |  |
| **A.9** | Is the specimen-anvil alignment correct? (9.2) |  |  |  |  |
|  | * Is the specimen horizontal with both ends resting on the anvil supports?
 |  |  |  |  |
|  | * Will the weight strike the specimen within 0.1 inch of a line directly opposite the weld notch and normal to the long edge of the specimen?
 |  |  |  |  |
|  | * Will all parts of the weld not touch the deflection stops?
 |  |  |  |  |
|  | * Are the specimen sides and ends free from interference?
 |  |  |  |  |
| **A.10** | Is the drop-weight energy correct (i.e. weight X height)? (10.0) |  |  |  |  |
|  | * Is the drop-weight energy in accordance with ASTM E 208 Table 1 for the specimen type and material yield strength?
 |  |  |  |  |
|  | * Does the tension surface of the specimen touch the anvil deflection stops as indicated by transfer of a wax-pencil mark from the specimen to the stops?
 |  |  |  |  |
| **A.11** | Is the temperature measuring device calibrated and accurate within +/- 2F (+/-1C)? (12.2) |  |  |  |  |
| **A.12** | Were the specimens soaked at the planned test temperature for 45 minutes minimum in a liquid medium or one hour minimum in a gas medium? (12.1) |  |  |  |  |
| **A.13** | Was the elapsed time between removing the specimen from the bath to release of the weight less than 20 seconds? |  |  |  |  |
| **A.14** | Were the tests to determine specimen break/no-break responses performed within 10 F (5 C)? (11.1) |  |  |  |  |
| **A.15** | Are there at least two specimens tested at 10 F (5 C) above the temperature judged to be the NDT that show no break performance? (11.1) |  |  |  |  |
| **A.16** | Are “break” specimens fractured from the weld to one or both edges of the tension surface? (13.2.1) |  |  |  |  |
| **A.17** | Do “no-break” specimens have a visible crack in the crack-starter weld that does not propagate to either edge of the tension surface? (13.2) |  |  |  |  |
| **A.18** | Do “no test” specimens have either no crack in the crack-starter weld or transfer of their wax-pencil mark to the masking tape on the anvil? (13.2.3) |  |  |  |  |
| **A.19** | When drop-weight tests are specified on a go, no-go basis for material qualification, are two or more specimens tested that show no-break performance? (15.1) |  |  |  |  |
| **A.20** | When drop weight tests are specified on a go, no-go basis for material qualification, do all specimens tested at the specified test temperature show no-break performance? (15.1) |  |  |  |  |
| **A.21** | Does the test report contain the following information? (14.0) |  |  |  |  |
|  | * Material composition and heat treatment condition or heat / lot traceability?
 |  |  |  |  |
|  | * Identification, orientation and location of test specimens?
 |  |  |  |  |
|  | * Specimen type, test conditions and test temperatures employed?
 |  |  |  |  |
|  | * Result of test (break, no-break or no-test) for each specimen?
 |  |  |  |  |
|  | * Deviations, if any, from ASTM E-208?
 |  |  |  |  |
| **A.22** | Is the acceptance criteria specified in the base material specification, welding standard or other applicable contract document met? |  |  |  |  |

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| **PART B****ADDITIONAL SUPPLIER CAPABILITY AND DATA GATHERING ITEMS** |
| **Line** | **Item** | **Remarks** |
| **B.1** | Describe the material (alloy) – specification, form, type, condition, etc. |  |
| **B.2** | What is the contract number? |  |
| **B.3** | What project and equipment is this material used in? |  |
| **B.4** | What is the part and drawing number? |  |
| **B.5** | List any specifications the supplier works with which have requirements or acceptance criteria more restrictive than the governing specification. |  |
| **B.6** | What specifications has the supplier worked to for compliance? |  |
| **B.7** | Describe the supplier’s other capabilities. |  |
| **B.8** | How many work shifts does the supplier operate? |  |
| **B.9** | How many employees does the supplier have? |  |