1. **Governing Specifications**

Examples:

* ASTM E4 - Verification of Testing Machines
* ASTM E8 - Tension Testing of Metallic Materials
* ASTM E21 - Elevated Temperature Tension Tests of Metallic Materials
* AWS B4.0 - Standard Methods for Mechanical Testing of Welds
1. **Technical Concerns**

Tensile testing data is used for determining strength and ductility of materials and weldments for design purposes for components and for quality control of materials. Proper measurement of strength properties is critical to the function of the material.

1. **Known Process Problems**
* Misalignment or improper gripping of specimens can lead to inaccurate test results.
* Specimen sizes, locations, and orientations must be carefully specified per the applicable specifications to ensure acceptable and accurate results.
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** | Does the supplier use an ASTM specification procedure or have a separate written tensile testing procedure? List the procedure. |  |  |  |  |
| **A.2** | Has the test apparatus been calibrated in the past 12 months? (E4) |  |  |  |  |
|  | * Do the certification and test report comply with ASTM E4 requirements (E4 21 and 22)?
 |  |  |  |  |
| **A.3** | Are test loads within the verified loading range? (E8 5.1) |  |  |  |  |
|  | * Is the equipment accurate within the +/- 1% limit on load?
 |  |  |  |  |
| **A.4** | Are periodic spot checks on load levels performed? (E4 20) |  |  |  |  |
| **A.5** | Are test specimens full size or prepared per the product specification, drawing requirements, or other contract requirements? (E8 6.1.1) |  |  |  |  |
| **A.6** | Are proper numbers, locations, and orientations of the specimens specified per the contract requirements?  |  |  |  |  |
| **A.7** | Is each specimen clearly marked with a unique identifier, which correlates it to a specific heat of material and orientation/location as applicable? |  |  |  |  |
| **A.8** | Does specimen surface finish meet product specifications? (E8 6.17) |  |  |  |  |
| **A.9** | Are original dimensions, locations and orientations for the specimens recorded properly on the test record sheet? (E8 7.1) |  |  |  |  |
| **A.10** | Is original cross sectional area calculated and documented? |  |  |  |  |
| **A.11** | Is the specimen properly engaged in the grip, are grips in good condition? |  |  |  |  |
| **A.12** | Is the strain rate documented along with the allowable limits? (E8 7.2.2) |  |  |  |  |
| **A.13** | Is speed of testing documented along with the method of determination? (E8 7.2) |  |  |  |  |
| **A.14** | Is yield strength (yield point) and method of determination documented? (E8 7.3 or 7.4) |  |  |  |  |
| **A.15** | Is an extensometer used to measure elongation?  |  |  |  |  |
|  | * Is it properly installed and zeroed? Specify if a single or double measurement was performed.
 |  |  |  |  |
| **A.16** | Is the elongation documented in terms of original and percent increase in gage length? (E8 7.6.1) |  |  |  |  |
| **A.17** | Is tensile strength calculation method and value documented on test record? (E8 7.5) |  |  |  |  |
| **A.18** | Are measuring devices such as extensometers and micrometers properly calibrated? |  |  |  |  |
| **A.19** | Is there a method or procedure for verification of proper alignment of the specimen? |  |  |  |  |
|  | * Is the alignment of the specimen axis in line with the axis of the test machine? (E8 5.2.1)
 |  |  |  |  |
| **A.20** | Is the gage length correct per the material specification requirements? (E8 6.15) |  |  |  |  |
| **A.21** | Is gage length properly marked on the specimen? (E8 6.15) |  |  |  |  |
| **A.22** | Is correct elongation measurement method used for samples with less than 3% elongation? (E8 7.6.3) |  |  |  |  |
| **A.23** | Is elongation properly measured and documented in percent elongation?(E8 7.6) |  |  |  |  |
| **A.24** | Is final area and percent reduction in area properly measured and calculated? |  |  |  |  |
|  | * Are elliptical or parabolic areas properly calculated?(E8 7.7.3)
 |  |  |  |  |
| **A.25** | If replacement test specimens are used, is the reason for replacement acceptable and properly documented? (E8 7.9) |  |  |  |  |
| **A.26** | Is test report acceptable per requirements of ASTM E8? |  |  |  |  |
| **A.27** | For elevated temperature testing are the specimen temperatures maintained within +/- 5 degrees for tests below 1800 degrees F and +/- 10 degrees otherwise? (E21 9.4.4) |  |  |  |  |
| **A.28** | Are temperature indicating devices properly calibrated using good pyrometric practice? (E21 9.4.5) |  |  |  |  |
| **A.29** | Prior to yielding is the strain rate controlled to be 0.005 +/- 0.002/min.? (E21 9.6.1.1) |  |  |  |  |
| **A.30** | After yielding is the strain rate controlled to be .05 +/- .01/min.? (E21 9.6.1.2) |  |  |  |  |
| **A.31** | Are test temperature, time to attain temperature, and time at temperature prior to test documented on the test report? (E21 11) |  |  |  |  |

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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** | Does the vendor perform other types of mechanical, chemical, physical, or nondestructive testing? |  |
| **B.6** | What other specifications does the vendor work to? |  |
| **B.7** | List any specifications the supplier works with which have requirements or acceptance criteria more restrictive than the governing specification. |  |
| **B.8** | Describe the supplier’s other capabilities. |  |