

# WP 13-QA1007

Revision 2

## Dimensional Inspection

Technical Procedure

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APPROVED FOR USE

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## INTRODUCTION <sup>1</sup>

This procedure provides instructions for performing dimensional inspection by authorized Quality Assurance personnel. Performance of this procedure is limited to using optical and mechanical dimensional inspection equipment to verify dimensions on parts and structures as required.

Dimensional inspections are performed in conjunction with source/receipt inspection plan, general inspection/test, and fabrication oversight requirements contained in WP 13-QA1003, WP 13-QA1006, WP 13-QA3020, and the Waste Isolation Pilot Plant (WIPP) work planning process. This method ensures the identification of the items and processes to be inspected, parameters or characteristics to be evaluated, techniques to be used, acceptance and performance criteria, hold points, and the organizations responsible for performing the inspections.

Performance of this procedure generates the following records:

- EA13QA1007-1-0, Dimensional Inspection Report
- Quality Assurance Measuring and Test Equipment (M&TE) Usage Log

The original inspection reports are attached to the parent document. Copies of the inspection reports (or the originals if there is no parent document) are placed in the Quality Assurance Inspection Report file.

All records generated by the implementation of this procedure will be handled, stored, and dispositioned in accordance with the department/section's Records Inventory and Disposition Schedule (RIDS).

## REFERENCES

### BASELINE DOCUMENTS

- WP 13-1, Washington TRU Solutions LLC Quality Assurance Program Description
- WP 13-QA.04, Quality Assurance Department Administrative Program

### REFERENCED DOCUMENTS

- WP 04-IM1000, Issues Management Processing of WIPP Forms
- WP 13-QA1003, Quality Assurance Receipt/Source Inspections
- EA04IM1000-1-0, WIPP Form
- WP 13-QA1006, Quality Assurance Plant Inspections

- EA13QA1006-1-0, Quality Assurance Inspection Report
- EA13QA1007-1-0, Dimensional Inspection Report
- WP 13-QA3004, Nonconformance Report
- WP 13-QA3017, Visual Examination of TRUPACT-II/HalfPACT O-Ring Seals
- WP 13-QA3020, Fabrication Oversight
- QAE-01, Quality Engineer Authorization Card
- QAI-01-1, Quality Assurance Receipt Inspector Qualification Card
- QAI-01-2, Quality Assurance Source Inspector Qualification Card
- QAI-01-3, Quality Assurance Plant Inspector Qualification Card
- QA-03, Dimensional Inspection Authorization Card

**EQUIPMENT**

Equipment for dimensional inspection may include, but is not limited to the following:

## Group 1

- Machinist's Rule
- Tape Measure
- Straight Edge
- Angle Gauge
- Radius Gauge
- Surface Block

## Group 2

- Protractor
- Pi Tape
- Micrometer
- Calipers
- Height Gauge
- Profilometer

## Group 3

- Optical Comparator
- Optical Measuring Machine
- Coordinate Measuring Machine (CMM)
- FARO Arm

## PRECAUTIONS AND LIMITATIONS

- Any cleaning solutions for austenitic stainless steel, nickel-based alloys, and titanium shall contain less than 1% halogens (chlorine and fluorine) and less than 1% sulphur. When using mechanical means, such as wire wheel or brush, use only like materials (e.g., stainless steel with stainless steel).
- The personal protective equipment (PPE) appropriate to the work area shall be worn at all times while using cleaning solvents and/or mechanical cleaning methods in preparation for dimensional inspections.
- All safety, environmental, and radiological requirements of the area where the examination is to be performed shall be complied with.
- Only personnel authorized per Attachment 1, Personnel Training Requirements, may perform dimensional inspections.
- The Material Safety Data Sheet(s) for any chemical to be used for cleaning is/are immediately available for employee examination.

## PREREQUISITE ACTIONS

### 1.0 Verify the following:

- The acceptance criteria provided by the parent document is appropriate to perform the dimensional inspection. If no parent document applies, verify appropriate acceptance criteria with the Cognizant Engineer (CE).
- The form or format required by the parent document to record/document the dimensional inspection results. If the parent document does not require a specific form or format a Dimensional Inspection Report (EA13QA1007-1-0) will be used.
- Instrument calibration is current, as applicable.
- The measuring equipment is clean, undamaged, and in good working condition.
- The measuring equipment is zeroed, as applicable.
- Verify tape measures against a calibrated standard (steel scale) prior to each use when being used for acceptance. Document verification on the applicable report form.
- Adequate lighting is present to perform the inspection. Adequate lighting is lighting bright enough for the inspector to accurately read and interpret precision measuring equipment.

- Item to be inspected is dry and free of contaminants that could interfere with measuring equipment or the inspection. If surface contamination is present, clean the area of interest or the entire part, as needed, with the most appropriate approved solution or method as allowed by the material and then process as described in Precautions and Limitations.
- 2.0 Allow both the part to be measured and the measuring equipment to be used to stabilize at ambient temperature as follows:
- 2.1 Group 1 Equipment: no temperature stabilization is required.
- 2.2 Group 2 Equipment:
- 2.2.1 No temperature stabilization is required for measurements taken within normal ambient temperature range of 35°-110° F.
- 2.2.2 A minimum stabilization time of 1 hour will be allowed for measurements taken outside the normal ambient temperature range of 35°-110° F or for measurements requiring an accuracy of four decimal places (x.xxxx inches).

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**NOTE**

Portable Group 3 equipment (i.e. FARO Arm) with manufacturer installed temperature compensation may be transported to and used at any job location without concern for temperature stabilization as required by Step 2.3.

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- 2.3 Group 3 Equipment: shall not be used in abnormal temperature environments.

**PERFORMANCE****1.0 PERFORMING MEASUREMENTS**

- 1.1 List identified dimensions, tolerances, M&TE, and calibration due date on Dimensional Inspection Report form (EA13QA1007-1-0), Quality Assurance Inspection Plan (QAIP), as directed by the governing procedure (e.g. WP 13-QA3017), or CE as applicable.
- 1.2 Measure and record all identified item features and dimensions as required by the parent document, QAIP, governing procedure, or CE as applicable.

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**NOTE**

When performing dimensional inspections for engineering information indication of acceptance or rejection is not required unless requested by the CE. Document the inspection results as directed by the CE.

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- 1.3 Evaluate measured dimensions in accordance with the appropriate acceptance criteria. Indicate acceptance or rejection of each measured dimension in the appropriate column of EA13QA1007-1-0 or as required by the parent document, QAIP, governing procedure, or CE as applicable.
- 1.4 If any questionable or out of tolerance dimensions are found, verify the instrument accuracy using calibrated gage blocks or equivalent (as applicable) and re-verify the dimension.
- 1.5 Document additional inspection information/requirements in accordance with the applicable governing document or as follows:
  - 1.5.1 Document additional supporting inspection/test criteria, sampling plan, or reference documents (including revision designation) in the comments section of EA13QA1007-1-0 or as required by the parent document, QAIP, governing procedure, or CE as applicable.
  - 1.5.2 Attach the original report(s) and additional supporting documentation to the parent document and place a copy (or the originals if there is no parent document) in the Quality Assurance Inspection Report file.

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**NOTE**

Corrective actions for programmatic issues, including CAQs, shall be addressed through the use of a WIPP Form (EA04IM1000-1-0) in accordance with WP 04-IM1000, Issues Management Processing of WIPP Forms.

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- 1.6 If deficiencies are identified during inspection/test, issue a nonconformance report (NCR) in accordance with WP 13-QA3004.
  - 1.6.1 Record the NCR number in the appropriate block of the applicable report form.
  - 1.6.2 Initiate and hang Hold Tags in accordance with WP 13 QA3004.

## 2.0 M&TE USAGE LOG

2.1 Designated Quality Engineer, perform the following:

2.1.1 Maintain an M&TE usage log on the QA database (Gallina/QRA/QAIS).

2.1.2 Compile data from the Quality Assurance Inspection Reports/Dimensional Inspection Reports on M&TE usage.

2.1.3 Enter compiled data on the M&TE usage log.

2.1.4 Generate and complete a Quality Assurance Inspection Report each month in accordance with WP 13-QA1006, documenting the M&TE usage.

2.1.5 Forward a copy of the monthly Quality Assurance M&TE Usage Log to the Metrology Office.

## Attachment 1 – Personnel Training Requirements

## PERSONNEL PREREQUISITES

- 1.0 Personnel considered for dimensional inspector shall have sufficient training and experience to perform dimensional inspections in accordance with applicable procedures and requirements.
- 2.0 Training shall be performed and documented using Form QA-03, Dimensional Inspection Authorization Card. Obtain a blank original QA-03 from Technical Training and when completed and signed by QA management forward to Technical Training for processing.
- 3.0 A dimensional inspector will be able to:
  - Read and understand engineering drawings or other given inspection requirements as applicable to dimensional inspections
  - Select and set up measuring and test equipment
  - Verify equipment calibration
  - Perform dimensional inspection using appropriate measuring and test equipment
  - Complete inspection reports
  - Interpret and evaluate results
  - Accept or reject an item in accordance with the applicable requirements
- 3.1 Personnel considered for dimensional inspector will complete a 10-point practical examination administered by the Subject Matter Expert (SME) or designee. The candidate will demonstrate familiarity reading engineering drawings, proper use of appropriate measuring and test equipment, and documenting test results. Minimum passing score shall be 80%.
- 3.2 Prior to authorization, Quality Engineers, Inspectors, and contract personnel will have completed the appropriate authorization/qualification cards required by WP 13-QA.04.
  - QAE-01, Quality Engineer Authorization Card
  - QAI-01-1, Quality Assurance Receipt Inspector Qualification Card
  - QAI-01-2, Quality Assurance Source Inspector Qualification Card
  - QAI-01-3, Quality Assurance Plant Inspector Qualification Card

## Attachment 1 – Personnel Training Requirements

3.3 All applicants will pass an annual eye examination to assure natural or corrected near-distance vision in at least one eye. The exam will be Jaeger Number 1 or equivalent at a distance of not less than twelve (12) inches.

3.3.1 Results of eye exams will be documented on EA13QA06-1-0, Visual Examination and maintained in the individual's WTS Technical Training Records.

## AUTHORIZATION

1.0 Upon completion of all required criteria, the SME or designee will prepare a formal letter to file attesting the candidate has fulfilled all requirements. The letter will specify any limitations, e.g., tool groups qualified to use. Management's endorsement of the letter constitutes authorization. The original will be placed in the candidate's training file and a copy presented to the individual.

2.0 A dimensional inspector will be subject to performance review at least once every two (2) years in accordance with one of the following criteria, as determined by the SME or designee:

- Evidence of continuing satisfactory performance
- Re-examination

The SME or designee will prepare a formal letter to file attesting to the dimensional inspector's successful performance review and continued authorization. The letter will specify any limitations, e.g., tool groups qualified to use. Management's endorsement of the letter constitutes continued authorization. The original will be placed in the inspector's training file and a copy presented to the individual.

3.0 Dimensional inspector performance authorization may be re-examined, extended, or revoked at any time at the discretion of the SME or designee, with documented cause.

4.0 Dimensional inspection personnel that have not performed a documented dimensional inspection within twelve (12) consecutive months shall be subject to re-examination as determined by the SME or designee.

5.0 All performance authorizations will be automatically revoked upon termination from WTS.