



INTERNATIONAL INSTITUTE OF
GEOMETRIC DIMENSIONING & TOLERANCING
12159 Quail Ave Lane N • Stillwater, MN 55082 • 651-275-8952
www.iigdt.com

Supplier Evaluation Questions

The following questions have been documented for consideration by customers and suppliers to aid in better understanding of true capabilities. These questions should be considered complimentary to the standard questions of interest that a company utilizes for their current evaluations. For ongoing optimization of this ever growing list, IIGDT would appreciate feedback and recommendations on additional questions or modifications to existing questions by all individuals who receive and utilize this list. In time, this list could aid others who receive the updated list. IIGDT is happy to maintain and update this list on an ongoing basis, and also re-distribute this list to those who request an update. Please send recommendations and requests to greg-hetland@iigdt.com.

Sincerely,

Dr. Greg Hetland, President
International Institute of GD&T

1. General GD&T Questions:

- a. Are all applicable employees trained to ASME Y14.5M-1994 or applicable revision?
 - i. ASME Certified GD&T Professional (Technologist or Senior)
 - ii. In-house training program (evaluate for correctness and if trainer is a Senior Level Certified GD&T Professional)
 - iii. External Seminars (evaluate certificates and dates)
 - iv. Evaluate other drawings for compliance to past revisions (1982, 1973, 1966, etc.)
 - v. Evaluate training history
- b. Are all applicable employees trained adequately to applicable supporting specifications and standards (the following is only a beginning list)?
 - i. Internal and external specifications
 - ii. ASME Y14.5.1M – Mathematical Definition of Y14.5
 - iii. ASME Y14.8 – Castings and Forgings
 - iv. ASME B46.1 - Surface texture (roughness, waviness and lay)
 - v. ASME B89.7.3.1 – Guidelines for Decision Rules (Considering Measurement Uncertainty in Determining Conformance to Specifications)
 - vi. ASME B89.7.2 – Dimensional Measurement Planning
 - vii. GUM – Guide to the Expression of Uncertainty in Measurement
 - viii. ASME B89.4.1 – Methods for Performance Evaluation of CMM's

2. Measurement Questions:

- a. What type of measurement systems analysis is used to ensure task specific measurements are (GR&R, GUM, other)?
- b. Are handling and control procedures in place which ensure ongoing control of measurements conducive to the appropriate level of task specific measurements?
 - i. Utilization of ASME B89.4.1 – Methods for Performance Evaluation of CMM's
 - ii. cleaning of fabricated components and measurement devices
 - iii. Visual inspection under magnification of probe tips
 - iv. Utilization of other Measurement Standards
 - v. Force displacement checks on probes for
 - vi. Traceable calibration artifacts
 - vii. Task specific artifacts
 - viii. Environmental controls
 - ix. Calibration procedures
 - x. Interim artifact testing
 - xi. Records
- c. Is the measurement equipment utilized for task specific measurements capable of measuring the particular characteristic of interest?
- d. Are the individual “task specific” measurement procedures capable of providing low uncertainty results representative of the characteristic of interest?
 - i. Do the procedures correct for natural biases on datum features?
 - ii. Do the CMM programs utilize the default “least-squares” algorithm for analysis of all features, and if so, does the programmer take into consideration the contributing effects to the task specific measurement?
 - iii. Is a Feature-of-Size measured for both parts of Rule #1
- e. Is the measurement software capable of analyzing multiple feature patterns correctly to lower portions of composite FCF's (position and profile)?
- f. Is the environment conducive to minimizing the uncertainty contribution to the characteristic of interest?
- g. Are task specific artifacts used and calibrations completed at a reasonable frequency to ensure minimal risk?
- h. Are secondary measurement devices utilized for higher-end analysis of size and form (roundness, roughness, waviness, form) and the information used in a manner to understand uncertainty implications?

3. Manufacturing Questions

- a. Are manufacturing processes taking advantage of MMC and LMC modifiers?
- b. Are in-process measurement equipment and procedures under the same control as all the above?
- c. Are in-process checks / procedures in place, conducive to ensuring positive process controls or is manufacturing relying on final inspection to ensure conformance to requirements?
- d. Are statistical analysis tools in place, which correctly deal with MMC and LMC modifiers on the considered feature as well as datums features?
- e. When drawings use Y14.5's default free-state condition, is feature deformation evaluated prior to and after manufacturing processing to determine free-state form implications?
- f. When restrained-condition is specified on the drawing, does manufacturing and inspection use the specified restraint criteria consistently?

4. Design Questions:

- a. Are designs compliant to ASME Y14.5M-1994?
 - i. Are ASME Y14.5 and the applicable revision stated on their drawings?
 - ii. Are customer specifications referenced on drawings with appropriate availability and understanding of criteria?
- b. Does the GD&T represent functional intent
 - i. Are datums specified correctly and utilized correctly in FCF's?
 - ii. Are material condition modifiers used correctly for considered features and datum features?
 - iii. Are datum features controlled adequately to themselves and in relationship to each other?
 - iv. Is Concentricity and Symmetry tolerances used on any features? BAD!!!!
 - v. Are floating and fixed fastener formulas used correctly with projected tolerances zones specified where appropriate?
 - vi. Are restrained conditions specified on the drawings for feature conformance or do they default to Y14.5's free-state condition?

5. Secondary Suppliers Questions

- a. Are supplier auditors qualified adequately to do supplier evaluations?
- b. Are suppliers held to the same expectations as specified above for the primary supplier?
- c. Does the primary supplier have plans in place with the secondary supplier to ensure positive capability of supplied product?
- d. Does the primary supplier have ongoing receiving inspection as the primary method of ensuring supplier conformance to requirements?
- e. Are corrective actions adequately followed up on to ensure no follow on discrepancies?
- f. Are inspection methods / procedures consistent between customer and supplier to minimize bias and variability?