Quality Clause Q16

Engineering Directed Standard Tool/Perishable Tool Inspection Requirements

The latest issue of this document is the version on the Lockheed Martin website:
https://www.lockheedmartin.com/en-us/suppliers/business-area-procurement/aeronautics/quality-requirements/clauses.html

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The terms "Item", "PO", and "Buyer" used herein have the same meaning as "work", "contract", and "Lockheed Martin", respectively, as may be defined in another provision of the Purchase Order (PO) of which this Quality Clause Q16 is a part.

1. APPLICATION

Except as otherwise directed by Buyer, the governing revision of this document shall be the revision in effect on the date of this Purchase Order (PO). Subject to limitation by Buyer, if any, if subsequent revisions of this Buyer document are issued, Seller is authorized to use the latest revision of this document. If Seller opts for use of the latest revision, Seller shall utilize the applicable portions of the latest revision in their entirety.

2. REQUIREMENTS

A. Seller shall perform an inspection after all normal manufacturing operations have been completed. Seller shall perform this inspection of any Item prior to delivery to Buyer.

B. If delegation has been awarded to the seller, the seller shall furnish the results of this inspection and any previous inspections to the Buyer or Buyer's Representative upon request. If delegation has not been awarded seller shall utilize 3rd Party Inspection Service as directed by purchase order.

C. Seller shall be permitted to perform sample inspection on the Items (reference Paragraph II. A.) if one (1) of the following statistically valid sampling plans is used, unless otherwise specified by Buyer in writing.

1. MIL-STD-1916

   Note: The sampling tables in MIL-STD-105 can still be used

2. ISO 2859-1

3. NSI/ASQ Z1.4-2003

3. ENGINEERING INSPECTION CRITERIA

A. Equipment to inspect and/or validate the required characteristics varies based upon the tool type. Seller shall ensure that each piece of inspection equipment is capable of measuring to the tolerance specified in Industry Standard and/or Buyer specifications. Seller shall provide a listing of measuring equipment, gages, holding devices, and method employed for validating each characteristic identified in Paragraph III. C (at the Seller's facility) to Buyer or Buyer's Representative upon request.

   1. Cutting Edges to be chip free at minimum 10X magnification, max 20X.

B. Prior to Buyer receipt, Seller shall ensure that all Items delivered shall have the following inspected for conformance to the applicable Buyer's Standard Tool Specification, "P" Sheet, "C" Number Drawing, Tool Manufacturing Standard (TMS), and/or National Aerospace Standard (NAS) :

   1. Tool number and Dash Number Identification

   2. Verification that the tool is obtained from an approved manufacturer *(if applicable)*

   3. Material certification required to validate sintered material (carbide only) used for manufacture was obtained from approved sources as required per TMS-CU-001, TMS-CU-CBD.

C. In addition to the baseline requirements specified in Paragraph III. B, Seller shall inspect each tool category identified below against the respective requirements for each of the Buyer's sites identified in Table 1.

Table 1 Buyer Inspection Requirements by Tool Category

	Lockheed Martin Aeronautics
Common Characteristics for Cutting Tools (Except Saws)	Damage Check Identification Material Type Surface Finish/Treatment Overall Length Flute Length Cutter Diameter Backtaper Pilot Diameter (Where Applicable) Pilot Length (Where Applicable) Helix Margin Width Relief & Clearance Angles Run-Out (Concentricity) Shank Diameter Hardness (Shank, Adapters)
	Threaded Shank (Integrated or Adapted) Hex Size, Length, Seat Angle and Thread
	Key Characteristics
Straight Shank Drills	Lip Height Variance Chisel Edge Centrality Core Diameter (W1) Web Thickness (W2) Point Type Alignment of Secondary Cutting Edges
Threaded Shank Drills	Lip Height Variance Chisel Edge Centrality Core Diameter (W1) Web Thickness (W2) Point Type Alignment of Secondary Cutting Edges
Chucking Reamers	Chamfer Lip Height Chamfer Angle Core Diameter Concentricity (between centers)
Threaded Reamers	Chamfer Lip Height Chamfer Angle Core Diameter Concentricity (between centers)
End Mills	Radial Rake Angle Corner Radius Radius Mismatch Preset Flats Length/Depth End Concavity
Counter-sinks	Countersink Angle Axial Rake Angle Seat Angle Thread 2A Fit Countersink/Pilot Radius
Counter-bores	Radial/Axial Rake Corner Radius Flat/Perpendicular Cutting Edges
Drill/Countersinks Drill/Countersink/Counterbore (Single Pass Tools)	Countersink Angle Countersink Axial Rake Angle Transition Between Countersink and Drill Radius or Counterbore Lip Height Variation Chisel Edge Centrality Web Thickness (W2) Alignment of Secondary Cutting Edges Key Characteristics Identified by Drawing
Taper-Lok Drills	See Paragraph IV for Verification by Buyer
Circular Saw Blades	Arbor Hole Kerf Width Number of Teeth Magnetic Particle Inspection (per ASTM-E-1444)
Hole Saws	End Configuration Arbor Threads
Drill & Reamer Bushings	End Configuration Inside Diameter Outside Diameter Length
Keller Lok Bushings	Inside Diameter Outside Diameter Length

For all PO's with "Buyer Source Inspection" as the point of acceptance, seller will utilize the designated approved 3rd party inspection facility as called out by the PO.

D. Seller shall inspect the following characteristics by Standard Tool Number for the Marietta, Meridian, and Clarksburg facilities for the specific features identified below:

1. 550H006
   Hole must be centered with no burrs per Buyer specification

2. 550H007
   Dash number must match bushing size per Buyer specification

3. 550H008 Slot dimension = 0.141" +.002"/-.000"

4. 550H203
   Surface coating adherence
   Dash number location per Buyer specification

4. TAPER-LOK DRILL AND REAMER VERIFICATION BY BUYER (Applies only to Items shipped by Seller to Marietta, Meridian or Clarksburg)

A. Seller shall submit a sample quantity of Taper-Lok drills and/or reamers to Buyer for verification. The verification process consists of the Buyer drilling and/or reaming holes to verify conformance to Engineering standards.

B. Seller shall ship the test samples to Buyer at Buyer's request.

C. Seller shall use the following guidelines to determine the proper quantity to be sent by Seller to Buyer for verification.

1. Two (2) drill or reamers from the first 50 received and one (1) drill or reamer for every additional 50 (or portion of 50).

2. The minimum quantity to be sent will be two (2) and the maximum quantity will be six (6).

D. Seller shall complete the Tapered Cutter Verification Request form or a Buyer-approved alternate for submitting the samples to Buyer. The form may be accessed at:
https://www.lockheedmartin.com/en-us/suppliers/business-area-procurement/aeronautics.html

Highlight "Quality Requirements" and select "Forms". Seller shall submit an individual form, in triplicate, for each unique tool.

E. Seller shall contact the buyer of record on the Purchase Order for specific shipping instructions for each sample to be submitted for verification.

F. If Seller receives a completed and approved Tapered Cutter Verification Request form from Buyer, Seller shall ship the remaining quantity to Buyer.

G. If Buyer has documented a rejection on the Tapered Cutter Verification Request form, Seller may submit additional sample quantities to Buyer for verification. If Buyer documents rejection of the additional sample(s), the entire lot is rejected and is not suitable for use by Buyer