
**Nelson Numeric, Inc.
Supplier Manual**

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Revision History

12/16/09 - # SUR 1002, Rev A- Original approval and distribution date of Nelson Numeric SPOC Manual

09/15/10- #SUR 1002 Rev B-Added section 2.5 and Section 9

10/13/11- #SUR 1002 Rev B-Added section 4.5 and updated 4.1

09/03/14- QF 1000 Rev C -Updated naming, and PPM and Delivery due to smaller batch sizes and order frequency.

05/28/15- QF 1000 Rev D removed; Updated Sampling Plan to match current QF 1011 Sampling Plan.

04/24/16- Updated new address; changed title to take out “spoc”; updated 1.1, 1.3, 1.6.2, 1.6.7, Section 2 definitions, 2.3.7, 2.4, 3.7, 4.1, 4.2, 4.3, 4.4, 7.5, 8.1; general grammar and sentence structure.

03/27/17- Updated Sampling Plan to current QF 1011 Rev E

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Section 1: General Requirements

- 1.1 Nelson Numeric Approved Suppliers (hereafter “Supplier(s)”) shall establish, maintain, and demonstrate compliance to a quality system that conforms to the requirements of the appropriate ISO/AS, or similar standards, relative to the scope of work performed. Suppliers shall demonstrate compliance to the appropriate AS9100 standard by certification, or through a Quality System Survey, approved by Nelson Numeric. Quality System Surveys may take the form of on-site surveys, performed by Nelson Numeric personnel, or by supplier self-surveys submitted to Nelson Numeric.
- 1.2 Where applicable, copies of all Supplier’s ISO/AS certificates of registration shall be made available to Nelson Numeric. Loss of certification or accreditation status shall be reported to Nelson Numeric within ten (10) business days.
- 1.3 Supplier personnel shall be adequately trained for the processes being performed. Where necessary, these operators shall be certified for the performance of the processes. Training and certification records shall be maintained.
- 1.4 In addition to the preceding Quality System requirements, other products, services, and/or customer specific requirements may apply. These requirements will be identified on the contract or purchasing document (hereafter “Order”) between Nelson Numeric and the Supplier. These requirements may take the form of a formal specification, and/or a statement on the Order.
- 1.5 The Supplier shall establish, define, implement, and maintain documented procedures and requirements for contract review. Supplier contract review shall take place prior to order processing.
- 1.6 The Supplier shall review each Nelson Numeric Order, including drawings, specifications, etc., to ensure that:
 - 1.6.1 The Supplier understands and agrees to all requirements of Order, drawings, specifications, etc., and is capable of fulfilling all requirements, including processing, certification, and due dates.
 - 1.6.2 All gauging requirements can be met, and are documented on Supplier’s work instructions.

- 1.6.3 The Supplier is able to provide required certification documents. If a Certification of Compliance is required by Nelson Numeric, the Supplier shall follow the requirements set out in Section 2.3 below. All certification documents must accompany shipment of completed Orders to Nelson Numeric. If unavailable at time of shipment, Supplier must communicate to Nelson Numeric that such documents will be sent at an agreed upon time and method.
- 1.6.4 Supplier shall notify Nelson Numeric of any changes to products, processes, and/or locations of Supplier manufacturing facilities. Supplier shall not subcontract without Nelson Numeric approval.
- 1.6.5 Right-of-access shall be granted to appropriate Nelson Numeric personnel, customers, and regulatory authorities, to all applicable Supplier's facilities, and records. Access shall include any and all levels of the Supplier's supply chain, as they relate to Nelson Numeric Orders.
- 1.6.6 All subject documents/records shall be available upon request.

Section 2: Approved Special Process Suppliers

Customer requirements can mandate that Nelson Numeric use a specific, customer certified, special process supplier (hereafter "Certified Supplier," or "Supplier"), to perform certain processes.

Definition of Approved Special Process Supplier:

- 1) Nelson Numeric **Customers APSL** and flow down requirements (Boeing, Honeywell, Triumph...)
 - 2) Accredited certification program (**NADCAP**, etc.)
 - 3) If no customer contractual flow down; then must be on the Nelson Numeric Approved Supplier List (minimum requirement)
- 2.1 A special process is herein defined as a process, whose results cannot be verified, except by destructive testing, or, when required testing techniques are beyond the capabilities of Nelson Numeric. A special process may also require proper performance, in order to ensure the proper function, and/or established reliability of the product.
 - 2.2 The Certified Supplier shall be held to the same standards outlined in Section 1: General Requirements.
 - 2.3 When required, a Certificate of Conformance shall legibly and accurately contain the following information:
 - 2.3.1 Supplier and/or special process business name and address
 - 2.3.2 Nelson Numeric Order number
 - 2.3.3 Nelson Numeric part number

- 2.3.4 Nelson Numeric part number revision level
 - 2.3.5 Quantity of parts being certified and sample size applicable to quantity.
 - 2.3.6 Positive statement of compliance to Order documents
 - 2.3.7 Special process specifications and revisions stated on drawing, to include the latest superseded specs & revs; including all pertinent methods, classes, types, etc.
 - 2.3.8 Quality Representative signature, title, and date
 - 2.3.9 Actual supplier hardness, plating thickness etc. readings.
- 2.4 The Certified Supplier shall notify the appropriate Nelson Numeric Supply Chain Management Representative, if any of the above requirements cannot be met, prior to completion of special processes, and shipment of product.
- 2.5 All processes or procedures designated or approved as **FROZEN PROCESS** cannot be altered or changed in any way, without Nelson Numeric and/or Nelson Numeric customer approval.

Failure to adhere to requirements 2.3.1 thru 2.3.9 is cause for rejection and return of product at Supplier's expense.

Section 3: Supplier Certification, Traceability and Record Retention

The following section applies to all Suppliers, who are required to provide certification documentation to Nelson Numeric. Set forth below are the requirements that the Supplier shall adhere to for content and retention of records.

- 3.1 Records shall be retained by the Supplier, or its sub-tier supplier, in some form of media, such as a hard, or electronic, copy. All required records shall be maintained for a minimum of ten (10) years unless otherwise specified.
- 3.2 Records shall be documented in such a manner that alterations will be evident. All records, including changes made therein, shall be legible, signed, and dated by Supplier.
- 3.3 Sufficient care shall be taken to prevent the loss, or damage, of records due to fire, water, uncontrolled access, etc.
- 3.4 Nelson Numeric reserves the right-of-entry for appropriate Nelson Numeric personnel, customers, and regulatory authorities, to gain access to all records relative to Nelson Numeric Orders.
- 3.5 If the Supplier ceases operations, any and all records relative to Nelson Numeric Order(s), shall be made available to Nelson Numeric. Notification of cessation of business operations shall be made in a timely manner to Nelson Numeric, to allow for the transfer of records.

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- 3.6 A Supplier, who ceases acceptance of an Order, shall continue to maintain records per the requirements of this document, or, by mutual agreement, transfer appropriate records to Nelson Numeric.
 - 3.7 No red line drawings, e-mails, verbal instructions, etc., which allow deviations from Orders, are acceptable, without written Nelson Numeric approval, and a revised Order must be submitted.
 - 3.8 Nelson Numeric will issue Supplier Corrective Action Request (SCAR) to Suppliers as required.

Section 4: Protection, Handling, Packaging, and Segregation

- 4.1 Nelson Numeric will provide specific packaging information, rust inhibiting applications and identification, if required, on the purchase order document. The Supplier shall return product to Nelson Numeric in same package and identified as purchase order required product. Packaging **MUST** identify PO number, part number and quantity to be received by Nelson Numeric. If no packaging requirements are stated, Supplier is to package to the best of their ability to protect the integrity of the product.
- 4.2 Where product originates from Supplier, the Supplier shall prevent damage or mixing of product during shipment to Nelson Numeric. Any Orders received by Nelson Numeric, containing damaged parts, are cause for rejection. A SCAR may be issued, along with possible charges for rework and/or re-manufacturing of product.
- 4.3 Products that have surface finish requirements should be packed in a manner that protects these finishes during shipping and handling. If these products are to be shipped in a container with appropriate dividers, it is recommended that egg-crate dividers be used. Other part features, such as threads or grooves, should be taken into consideration when choosing appropriate packaging to protect those features.
- 4.4 ***All Nelson Numeric suppliers shall keep each order segregated during processing to ensure integrity and material identification as received.***

Section 5: Non-Conforming Product

- 5.1 The Supplier shall immediately notify Nelson Numeric of lost, damaged, or non-conforming product.
 - 5.1.1 The Supplier shall immediately notify Nelson Numeric, upon discovery of damaged product, whether due to shipping, processing, or otherwise. Prompt notification will allow Nelson Numeric to quickly disposition product, and determine appropriate actions to take.
 - 5.1.2 Unless notified of shipping damage prior to processing, Supplier is responsible for maintaining the safety and integrity of received product, as well as its safe return to Nelson Numeric.
 - 5.1.3 Supplier shall segregate and tag process damaged product immediately.
 - 5.1.4 A SCAR will be issued to Supplier, which must be completed within 30 days of receipt. A returned SCAR must include objective evidence of root cause, and preventive action.
 - 5.1.5 All non-conforming products shall be identified and returned to Nelson Numeric, unless otherwise specified.
- 5.2 Supplier will be charged accordingly for any rework, or manufacture of replacement products, due to Supplier's non-compliance with Order, as determined by Nelson Numeric.
- 5.3 Non-return of any issued SCAR is cause for removal of Supplier from the Nelson Numeric APSL.

Section 6: Supplier Performance and Development

This section provides a guideline for the performance of all Suppliers. Suppliers will be rated on Quality, Delivery, Responsiveness, and Cost.

The Nelson Numeric expectation for Quality is zero (0) defects.

- 6.1 All Suppliers must establish and maintain documented procedures for a closed loop corrective and preventive action system. This system shall be used when a non-conformance to a Nelson Numeric Order, drawing, or specification occurs. Any corrective or preventive action taken, to eliminate the causes of non-conformance, shall be recorded prior to implementation. When a Supplier non-conformance is identified at Nelson Numeric, and is determined to be significant, a Supplier Corrective Action (SCAR) will be initiated, and sent to the Supplier. The Supplier shall respond to the request for corrective action with a detailed and complete

plan to correct the non-conformance. The response should include supporting data and objective evidence.

6.2 All Suppliers must maintain the following standards:

6.2.1 90% On-Time Delivery

6.2.2 PPM of less than 5,000 for a six month period.

6.3 Supplier's failure to maintain on-time delivery and PPM standards will be just cause and may result in removal from the Nelson Numeric Approved Supplier list. For re-instatement, a complete root cause analysis must be performed by Supplier, including a thorough plan for future preventive action. Also, an on-site audit of Supplier's business may be required. Nelson Numeric reserves the right to continue to use suppliers with delivery or PPM under the required amount, but will monitor these suppliers closely for quality and delivery.

Section 7: Material Requirements

- 7.1 All mill certifications must be sent with material shipments, if required by Order.
- 7.2 Material Suppliers are required to submit an independent material validation test once each year.
- 7.3 Nelson Numeric is to be notified of any changes in Supplier ownership, executive, and/or quality management, within ten (10) business days. Any significant changes in business climate, such as acquisitions, divestures, litigation, or any other activity that may change the financial viability of the supplier's organization, must be communicated to Nelson Numeric.
- 7.4 Raw material shipments shall not be under shipped. If a different length is to be substituted, Supplier must receive approval by Nelson Numeric prior to shipment.
- 7.5 Suppliers to perform sufficient due diligence towards conflict-free materials.

Section 8: Heat Treat Processes

- 8.1 Heat treat is to be performed in a manner to minimize scale and discoloration.
- 8.2 Any cleaning of parts by Supplier must be approved by Nelson Numeric prior to such cleaning.

Failure to meet any of the above requirements is grounds for possible removal from the Nelson Numeric Approved Supplier List.

Section 9: Inspection Sampling Plan

This sampling plan uses Zero Acceptance Number (c=0) and is based on the requirements of Honeywell, AeroControlex/Aerofluid Products, & Triumph (excluding SIDA).

Table 1 - Initial Reliability Requirement (IRR) and Classification of Characteristics

Classification of Characteristic	IRR	Establishing Inspection of a Characteristic (to satisfy IRR and qualify for sampling plan)	B/P Dimensional TOTAL Tolerance example: +/- .005 = .010 total tolerance = MAJOR classification	B/P Surface Finish	B/P Angular TOTAL Tolerance example: +/- 0 deg 30 min = 1 degree total = MAJOR classification	B/P Thread Class
CRITICAL	100%	100% Inspection of lot, without non-conformance	less than .001 inch	-	-	-
MAJOR	97%	76 Accepted in a row, without non-conformance	.001 inch to .010 inch	32 microinch (Ra) or less	1 degree or less	Class 3
MINOR	92%	28 Accepted in a row, without non-conformance	.0101 inch or greater	33 microinch (Ra) or greater	over 1 degree	Class 2

Unless otherwise specified on customer blueprint (B/P) or quality assurance provision (QAP), characteristics are classified per Table 1 above. Statistical Process Control (SPC) is used per customer purchase order (PO) requirements.

Table 2 – Acceptance Sampling Requirements

Lot Sizes	AQL = .65%	AQL = 1.0%	AQL = 2.5%
	MAJOR	MINOR (AeroControlex & AeroFluid only)	MINOR (All other customers)
up to 13	ALL	ALL	7 *
14 to 15	ALL	13	7 *
16 to 50	20	13	8 *
51 to 90	21 *	13	11
91 to 150	22 *	13	11
151 to 280	29	29	13
281 to 500	47	29	16
501 to 1200	47	34	19
1201 to 3200	53	42	23
3201 to 10000	68	50	29
10001 to 35000	77	60	35
35001 to 150000	96	74	40
150001 to 500000	119	90	40
500001 & above	143	102	40

* modified to exceed the minimum sample required by corresponding AQL percentage

CRITICAL characteristics are inspected 100%.

MAJOR and **MINOR** characteristics sampled per Table 2 above, once IRR has been met/re-established.

This sampling plan is to be used for all customers, unless superseded by contract or by specific customer inspection requirements.

QF 1011 Rev E Sampling Plan