

<i>Title:</i> Supplier Quality Management Handbook	<i>Author:</i> Byron Murray	<i>Date:</i> 06/17/2013
<i>NEON Doc. #:</i> NEON.DOC.000621		<i>Revision:</i> A

Supplier Quality Management Handbook

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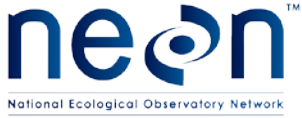
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See Configuration Management System for Approval History.

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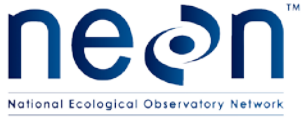
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Change Record

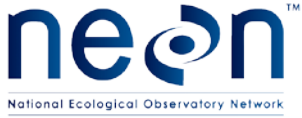
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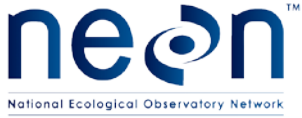
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1 DESCRIPTION

Quality starts with relationships, and we consider our suppliers to be partners as well as an extension of NEON’s manufacturing and assembly processes. This document describes the quality process for controlling the purchase of parts and assemblies used in NEON products and defines the suppliers’ responsibilities for manufacturing, testing and inspecting products shipped to NEON or NEON sub-contractors.

Suppliers are expected to maintain and adhere to an effective quality/manufacturing system that conforms to ISO 9000, to QS 9000 or to successor standards. Suppliers shall also conform to the requirements contained within this document and to all requirements indicated in the applicable NEON drawings and/or specifications. NEON expects its suppliers to be committed to achieving the goal of “zero defects” and NEON will not be obligated to accept any defective or otherwise nonconforming parts or products shipped by suppliers.

NEON depends upon its suppliers for raw materials, parts and assemblies. Because it is impractical to ensure quality by inspection upon receipt, each supplier must exercise sufficient control over its manufacturing processes to ensure that the product meets all science, engineering and quality specifications. In NEON’s business model, a product that is found to be nonconforming at receiving or during production causes serious disruptions of the production and shipping schedules, resulting in high production costs and schedule delays. Even the best receiving inspection program cannot detect all defective material. NEON requires suppliers to utilize internal process controls as well as rigorous inspection techniques to monitor and control the quality of material shipped to NEON, or its manufacturing partners, so that there should be no need to inspect the product when it is received.

1.1 Purpose

This handbook defines NEON’s global supplier part quality and quality system requirements for all parts going into NEON products. These requirements are essential to NEON’s ability to maintain overall product quality and reliability.

NEON expects suppliers to control the incoming and outgoing quality of materials, parts, and assemblies. NEON’s objective is to ensure that parts meet all specifications and present no quality issues.

1.2 Scope

This handbook applies to all contract manufacturers, suppliers, and sub-tier suppliers who provide parts, subassemblies, and assemblies utilized in NEON products. This handbook supplements requirements defined by science or engineering specifications.

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2 RELATED DOCUMENTS AND ACRONYMS

2.1 Applicable Documents

Applicable documents contain information that shall be applied in the current document. Examples are higher level requirements documents, standards, rules and regulations.

AD [01]	NEON.DOC.000006	NEON Quality Management Plan
AD [02]	NEON.DOC.000004	NEON Configuration Management Plan
AD [03]		
AD [04]		

2.2 Reference Documents

Reference documents contain information complementing, explaining, detailing, or otherwise supporting the information included in the current document.

RD [01]	NEON.DOC.000008	NEON Acronym List
RD [02]	NEON.DOC.000243	NEON Glossary of Terms
RD [03]	NEON.DOC.001158	Supplier Process Management Plan
RD [04]	NEON.DOC.001159	Supplier First Article Data Report
RD [05]	NEON.DOC.001169	PCBA Supplier First Article Data Report
RD [06]	NEON.DOC.001160	6-Sigma Process Capability Calculation Worksheet
RD [07]	NEON.DOC.000015	Failure Modes Effects Analysis Template
RD [08]	NEON.DOC.001172	Supplier Change Request
RD [09]	NEON.DOC.000982	Supplier Change Notification Procedure
RD [10]	NEON.DOC.004242	Supplier Quality System Assessment Template
RD [11]	NEON.DOC.001206	Corrective Action Template

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2.3 Acronyms

BOA – Basic Ordering Agreement

CIP – Continuous Improvement Process

COTS – Commercial Off the Shelf

Critical Part: Critical Parts are configuration-managed parts that have been identified as Single Point Failures and meet two or more of the following:

Sole sourced

Over \$5000

Less than 5 year Mean Time Between Failure (MTBF)

Lead time greater than 6 weeks.

Technical Risk

CTF – Critical to Function

Cpk – Process Capability

ESD – Electrostatic Discharge

PFMEA – Process Failure Modes Effects and Analysis

PPAP – Production Part Approval Package

SCAR – Supplier Corrective Action Reply's (SCAR's)

SPM – Supplier Process Management Plan

SSL – Supplier Status List

2.4 Verb Convention

“Shall” is used whenever a statement expresses a convention that is binding. The verbs “should” and “may” express non-mandatory provisions. “Will” is used to express a declaration of purpose on the part of the design activity.

2.5 International Standards

Where applicable the supplier will conform to the requirements of the following standards:

ANSI/ISO/ASQ Q9001:2008: Quality management systems – Requirements

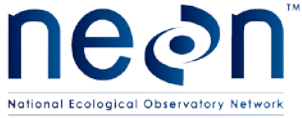
ANSI/ISO/ASQ E14001-2004: Environmental management systems – Requirements with guidance for use

ASQ/ANSI/ISO 26000-2010(E): Guidance on social responsibility

OHSAS 18001: Occupational Health & Safety Management System

SAE Aerospace AS5553: Counterfeit Electronic Parts; Avoidance, Detection, Mitigation and Disposition

ANSI/ESD S20.20-2007: ESD Association Standard for the Development of an Electrostatic Discharge Control Program for Protection of Electrical and Electronic Parts, Assemblies and Equipment (Excluding Electrically Initiated Explosive Devices)



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IPC-A-610 latest revision, Acceptability of Electronic Assemblies, Class 2

IPC/WHMA-A-620 latest revision, Requirements and Acceptance for Cable and Wire Harness Assemblies, Class 2

2.6 Order of Precedence

In case of conflict, the documentation order of precedence is:

- a) Basic Ordering Agreement (BOA)
- b) Part Number description on corresponding Purchase Order
- c) Engineering drawings/technical requirements/specifications
- d) Purchase order standard terms and conditions
- e) Supplier Quality Management Handbook
- f) Other referenced documents, specifications or standards

3 SUPPLIER APPROVAL PROCESS

NEON purchases parts and assemblies through an Approved Supplier List (ASL). The supplier’s qualification status is based upon the results of: (1) a documented self-assessment of the supplier’s quality; and/or (2) an on-site assessment and supplier performance studies as performed by commodity teams composed of members from Procurement and Contracts, Quality, Manufacturing, and Engineering departments , as appropriate based upon the criticality of the parts/assemblies. Supplier qualification approval level status is site-specific and suppliers with multiple production locations will be individually assessed.

3.1 Supplier Self-Audit Quality System Assessment

NEON requires suppliers to perform a quality self-audit assessment using NEON’s Supplier Quality System Assessment document RD [10]. NEON expects that suppliers shall openly and honestly answer every question on the self-audit assessment and that documented evidence of compliance will be provided for those questions as indicated. Process and system deficiencies shall be noted and action plans shall be provided indicating corrective actions and timelines to resolve. Scoring will be the same as noted on the assessment document and as discussed within the following NEON On-Site Quality System Assessment section of this document. A commodity team consisting of members from Procurement and Contracts, Quality Staff, Manufacturing, and Engineering will review the returned self-audit assessment data. The team will decide if a NEON on-site assessment will be performed based upon the supplier’s quality system and the complexity and/or critically of the parts/products.

3.2 NEON On-Site Quality System Assessment

Upon review of the supplier’s self-assessment, NEON may elect to perform an on-site quality system assessment. This assessment will utilize the NEON Supplier Quality System Assessment document RD

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[10]. Gaps between the supplier’s self-assessment and NEON’s on-site audit will be reviewed and action plans created as required. In order to obtain NEON Preferred supplier status (see section 3.3), the supplier must make their facility available for on-site process verification by Quality Engineering from NEON or its manufacturing partners at any time, with reasonable notice. Representatives from other NEON organizations (i.e., Procurement and Contracts, Engineering, Manufacturing, etc.) may support the Quality Staff in conducting the assessment audit.

3.3 Supplier Status Levels

The NEON Supplier Status List (SSL) will indicate approval status levels for each supplier based upon the following:

Part Type	Supplier Status	Criteria
Non-off-the-shelf (custom)	Qualified Level 0	Approval status level for a non-off-the-shelf part/product supplier indicating the following has occurred: (1) supplier has passed all supplier self-scoring sections of the NEON Supplier Quality System Assessment document RD [10] and/or NEON On-Site Supplier Quality System Assessment, and (2) the supplier provided parts have passed NEON First Article Inspections and Incoming Quality Inspections.
Non-off-the-shelf (custom)	Qualified Level 1	Highest approval status level for a non-off-the-shelf part/product supplier indicating the following has occurred: (1) supplier has passed all sections of an On-Site NEON Supplier Quality System Assessment every 5 years using document RD [10], etc., and (2) NEON historical data consisting of receiving inspection records, supplier performance, processes audits, Supplier Corrective Action Reply’s (SCAR's), etc., have indicated reliable and stable supplier processes. Qualified status level 1 suppliers shall meet or exceed all requirements as noted in Section 5 of this document. Qualified status level 1 suppliers shall be provided preference over Qualified status level 0 suppliers when quoting on new parts or expanded business relationships.
Non-off-the-shelf (custom)	Conditional	Approval status for a supplier with an unfavorable history and/or under a development plan. This status level is utilized for suppliers who were at a Preferred, Qualified or Approved status level leading to potential disqualification. This level may also be utilized for new suppliers that are under evaluation.

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Non-off-the-shelf (custom)	Disqualified	NEON will not procure materials from this supplier due to unacceptable history, relations, etc., with NEON.
Commercial Off The Shelf (COTS)	Qualified	Qualified status is utilized for COTS parts and assemblies for which NEON has selected the manufacturer via analysis to provide product. The parts and assemblies that the manufacturers provide will be implemented or disqualified through the Enterprise Change Order process AD [02].
Commercial Off The Shelf (COTS)	Disqualified	NEON will not procure materials from this manufacturer due to unacceptable history, relations, etc.
Commercial Off The Shelf (COTS)	Obsolete	NEON will not procure materials from this manufacturer due to a change in name, product offering, etc.

4 NON-OFF THE SHELF PARTS

Section 4 including sub-sections is applicable to suppliers providing custom fabricated Non-off-the-shelf parts and assemblies.

4.1 Quote Process

NEON expects that a supplier declines to quote if the proposed work does not fall into their area of expertise. For Example do not quote sheet metal work if you do not have the tools and processes to stamp, press, and punch.

Furthermore, NEON expects that if a supplier supplies a quote, which indicates that their manufacturing department has a clear understanding of the documentation and material requirements, including printing of part numbers on fabricated parts and cleansing of parts to remove manufacturing chemicals from surface where required, as noted on the drawings. (For example Aluminum 6061-T6, Stainless Steel 303, 304, or 316)

If you have questions submit an email to suppliertechsupport@neoninc.org

4.2 NEON Documentation

NEON expects that if the drawings provided to the supplier are not clear and unambiguous they will take the initiative to follow up with NEON. Supplier should submit an email to

suppliertechsupport@neoninc.org

NEON expects the supplier to verify that the part number and revision on the purchase order match the drawing? If no, contact suppliertechsupport@neoninc.org

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4.3 New Product Introduction

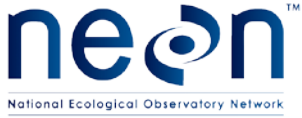
4.3.1 Production Part Approval Package (PPAP)

Contract manufacturers and/or suppliers must submit a detailed part qualification data package which is called a Production Part Approval Package (PPAP) to have their part qualified by NEON.

4.3.1.1 PPAP Required Deliverables

Each PPAP submission shall consist of the following five (5) standard deliverables (unless otherwise directed by NEON):

- **Drawing.** A legible copy of the NEON drawing (or supplier’s drawing if no NEON drawing exists). Each dimension must be numbered on the hard-copy drawing and have a one-to-one correspondence to numbered data in the First Article. In addition to dimensions the supplier shall acknowledge all notes including part markings and include this as a check mark in the First Article.
- **Supplier Process Management Plan (SPM).** The SPM must clearly state all controls, inspections, and tests to assure high quality, in-spec, defect-free parts for the duration of the project. Critical to Function (CTF) dimensions must be addressed in the SPM. Once the SPM is approved by NEON, any reduction in the level of controls must be approved by NEON. NEON prefers suppliers use form [RD 03], Supplier Process Management Plan, but will accept the supplier’s form if the same information is provided.
- **First Article.** The first article must include measurement data for a three (3) piece minimum sample for every dimension and measurable requirement on the engineering drawing. First article samples should be selected randomly from the production process. All first article inspection results should be recorded on the Supplier First Article Data Report [RD04, RD05 or equivalent supplier form].
- **Process Failure Modes Effects and Analysis (PFMEA).** The supplier must provide a PFMEA that represents that process used for NEON product. NEON prefers suppliers use form [RD07], Failure Modes Effects Analysis Template, but will accept the supplier’s form if the same information is provided.
- **Certificate of Conformance.** The supplier must submit a Certificate of Conformance attesting the supplier’s parts meet all specifications, including any related material certifications or chemical analysis reports, that includes the following:
 - In Process Data – For example, Automated Optical Inspection Results
 - Inspection Data
 - Test Data



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4.3.2 PPAP Optional Deliverables:

Process Capability (Cpk). The supplier may provide a Cpk for every CTF dimension on the part drawing using a minimum 30-piece sample. See NEON’s 6-Sigma Process Capability Reporting Worksheet [RD06] for details.

5 GENERAL QUALITY REQUIREMENTS

It is the expectation of NEON that all suppliers conform to the requirements in this section, regardless of Supplier Status.

5.1 Supplier Quality Documentation Requirements

Where applicable the supplier will conform to the requirements of the following documents:

NEON.DOC.000621	Supplier Quality Management Handbook
NEON.DOC.001158	Supplier Process Management Plan
NEON.DOC.001159	Supplier First Article Data Report
NEON.DOC.001169	PCBA Supplier First Article Data Report
NEON.DOC.001160	6-Sigma Process Capability Calculation Worksheet
NEON.DOC.000015	Failure Modes Effects Analysis Template
NEON.DOC.001172	Supplier Change Request
NEON.DOC.000982	Supplier Change Notification Procedure
NEON.DOC.004242	Supplier Quality System Assessment Template
NEON.DOC.001206	Corrective Action Template

5.2 Quality Management System

- a) Suppliers are expected to maintain and adhere to an effective quality/manufacturing system that conforms to ISO 9000, to QS 9000 or to successor standards. NEON expects its suppliers to be committed to achieving the goal of “zero defects” and NEON will not be obligated to accept any defective or otherwise nonconforming parts or products shipped by suppliers. NEON depends upon its suppliers for raw materials, parts and assemblies. Because it is impractical to ensure quality by inspection upon receipt, each supplier must exercise sufficient control over its manufacturing processes to ensure that the product meets all science, engineering and quality specifications. In NEON’s business model, product that is found to be nonconforming at receiving or during production causes serious disruptions of the production and shipping schedules, resulting in high production costs. Even the best receiving inspection program cannot detect all defective material. NEON requires suppliers to utilize internal process controls as well as rigorous inspection techniques to monitor and control the quality of material shipped to NEON, or its manufacturing partners, so that there is no need to inspect the product when it is received.

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5.3 Outgoing Quality Assurance

Suppliers shall maintain an outgoing quality assurance system that continuously monitors outgoing product quality and assures parts meet specifications including applicable quality/workmanship specifications. All outgoing inspections and tests must be documented in controlled Supplier Process Management Plans (SPM).

5.4 Control of Nonconforming Product

Supplier’s quality program will have an effective system for controlling nonconforming product. The system must provide for the identification, documentation, evaluation, segregation and timely disposition of nonconforming products. Supplier’s system must include controls for product returned from NEON. The process must create standards for definition of non-conforming product as either:

- a) Rework – product reworked to meet specified requirements
- b) Use as-is – no actions taken on product, product does not meet specified requirements, but is functional
- c) Repaired – product has been reworked to be functional but does not meet specified requirements for new lot product
- d) Scrap – product not useable and does not meet specified requirements
- e) Screen – additional product test/inspection to meet specification

5.5 Defect-Free Program/Corrective Actions

NEON’s goal is to receive Product(s) that are defect free. Supplier will document and implement a defect-free program as part of the Process in order to reduce the defect rate of its Product(s). NEON will not be obligated to accept any defective Product(s) shipped by Supplier.

- a) Supplier will establish a program to ensure the performance of effective corrective actions. This program will be based upon information derived from failure reporting and analysis and will ensure that material, parts or assemblies are corrected so as to properly perform their intended function.
- b) Supplier will maintain records of corrective actions indicating the frequency of defects during fabrication of Product(s), the proposed corrective change in process, evaluation of its effectiveness, and an effective date for implementation. Such records are subject to review by NEON.

5.6 Changes in Manufacturing Process.

If Supplier desires to change the fundamental manufacturing process in such a way as to affect the mechanical fit, electrical performance, serviceability or safety requirements of such Products, Supplier must request approval from NEON in writing using RD[08] Supplier Change Request and email to suppliertechsupport@neoninc.org within a reasonable period (no less than thirty (30) days) prior to the

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effective date of the proposed change. NEON must grant approval of these changes prior to their implementation, but such approval may not unreasonably be withheld. NEON agrees to respond within ten (10) business days of receipt of request from Supplier. Examples of changes that require approval include, but are not limited to, the following:

- a) Changes in material, parts or assemblies
- b) Changes in test or programming equipment
- c) Changes in manufacturing processes
- d) Changes in manufacturing facility locations
- e) Changes in sub-contracting

Supplier shall implement such changes in process only if collected quality/evaluation data verifies that existing quality and reliability levels would be sustained and/or improved as a result of such change. The quality data will be submitted to NEON for review before implementing the change. Supplier agrees to provide notification to the NEON Quality Manager of all significant process changes not affecting the mechanical fit, electrical performance, serviceability or safety requirements of such Products.

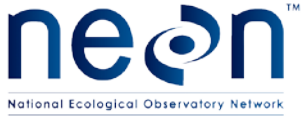
5.7 Changes to Product.

Supplier will request approval from NEON in writing using RD[08] Supplier Change Request and email to suppliertechsupport@neoninc.org prior to implementing any of the following types of changes to the Product(s):

- a) Any changes that affect form, fit, function, serviceability or safety to the Product(s).
- b) Any change of a programmed part of the Product(s).
- c) Any changes made to correct a problem in a NEON application or product, made at the request of NEON.
- d) Any change of specification, revision or change of process of which Supplier is aware or could have become aware through reasonable inspection processes even if not covered directly above:
- e) NEON has final approval on these changes prior to incorporation by Supplier. NEON must respond to Supplier's request within ten (10) business days of receipt of such request. Supplier agrees to provide notification to the NEON Quality Manager of all other process changes that do not affect form, fit, function, serviceability or safety to the Product, programmed part of the Product or changes made to correct a problem in an NEON application or product, made at the request of NEON.

5.8 Re-Qualification

Changes that require approval in manufacturing process or product construction/design will require re-qualification and/or re-certification to the Product Specification. NEON may require that Supplier perform reasonable reliability tests to confirm that the reliability of the Product after the requested change will be equivalent or improved. Supplier shall coordinate notification of planned major changes



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with NEON. The cost for re-qualification, re-certification, and/or reasonable reliability test associated with Product construction or design shall be paid for by NEON.

5.9 Change Requests Form.

All change requests will be implemented by use of a Supplier Change Request Form [RD08] submitted via email to suppliertechsupport@neoninc.org. NEON’s internal process for handling supplier changes is documented in RD[09] Supplier Change Notification Procedure.

5.10 Document Control

Supplier will ensure that all documents such as software/firmware, engineering drawings, specifications, policies, procedures and work instructions (including test procedures) are under revision control and available to all necessary Supplier personnel. A system will be established for the effective updating/removal of obsolete documents from all areas.

5.11 Continuous Improvement Process

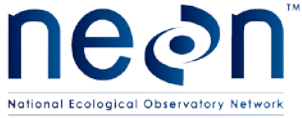
Supplier will develop and implement a Continuous Improvement Process (CIP) that will provide quality and process improvements for the Product. The program may include:

- a) A documented, systematic approach for identifying CIP focus areas
- b) Error Proofing (Poka Yoke)
- c) Supplier management cost reduction and quality improvement strategy
- d) Manufacturing process controls
- e) Defect reduction plans

5.12 Corrective Action Process

Supplier will develop and implement a Corrective Action Process that utilizes structured problem solving techniques to:

- a) Investigate the root causes of nonconforming product and identify the corrective actions needed to prevent a recurrence.
- b) Analyze the applicable processes, work operations, quality records, service reports, and NEON complaints to detect and eliminate potential causes of nonconforming product.
- c) Apply controls to ensure that corrective actions are taken and that they are effective.
- d) Implement and record change in procedures as a result of corrective actions taken. Additionally, Supplier’s Corrective Action Process must provide for documentation that identifies: specific defect, technical investigation/analysis, root cause, containment for defect, corrective action plan, preventive actions to preclude a recurrence, and verification of effectiveness of actions.
- e) Preliminary failure analysis for nonconforming Product must be communicated to NEON within 5 days. Implementation of corrective actions must be completed in less than 30 days from the



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issuance of a nonconformance document from NEON unless a longer period is agreed to by both parties.

NEON prefers suppliers use form [RD11], Corrective Action Template, but will accept the supplier’s form if the same information is provided.

5.13 Packaging, Suppliers Part Packaging

Suppliers are responsible for protecting delivered parts and assemblies. NEON recommends that parts and assembly packaging be tested using the following standards or equivalent:

- MIL-HDBK-781: Reliability Test Methods, Plans and Environments for Engineering Development, Qualification, and Production

Packaging shall provide maximum density and be capable of withstanding transcontinental or international next-day air shipment by major air carriers unless otherwise approved by NEON. Packaging of static-sensitive materials shall be in accordance with ANSI/ESD S20.20-2007 packaging standards or equivalent. NEON is an environmentally conscious company; when possible, recyclable packaging should be used. All packaging shall be marked with the appropriate environmental health, safety and recycling symbols.

5.14 Packaging Label, Supplier’s Part Packaging Label

Packaging shall be labeled with Customer, Purchase Order, NEON Part Number, Revision, Description, Box Quantity, Number of Boxes and Date. Boxes shall be labeled with human-readable text and bar code. Reference Appendix A for label example and format. Packages with sensitive parts shall be marked as such and to be opened only by qualified personal. For Example Optics and Printed Circuit Board Assemblies.

5.15 Disposal / Recycling

NEON is an environmentally conscious company. Supplier shall recycle and dispose of material, parts, and assemblies according to local agency guidelines.

5.16 Subcontracting

Supplier shall not subcontract any portion of the work to be performed hereunder without prior written approval by NEON, which is at NEON’s sole discretion.

5.17 Rework

Rework cost for out-of-warranty rework must be approved by NEON’s procurement personnel and confirmed by a purchase order prior to commencement of the rework. Supplier shall bear all rework cost for all warranty repairs of the Products.

Title: Supplier Quality Management Handbook	Author: Byron Murray	Date: 06/17/2013
NEON Doc. #: NEON.DOC.000621		Revision: A

6 APPENDIX A

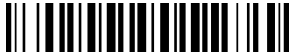



Supplier Name			
Customer:	NEON	P.O.:	4383
			
Part No.	CA02220072	Rev:	A
			
Description:	Assy, Cable 12-8 Standard 72"		
Box Qty:	10	Box:	1 of 2
			
Lot No.	12345	Date:	9/18/2012

Figure 1: NEON Carton Label Example

6.1 Label Requirements:

- a) Recommended label size is 4" x 6" or smaller depending upon content. Above labels are not to scale and are intended only as examples illustrating requirements.
- b) NEON Part Number, Revision Level and Description based upon NEON Drawing.
- c) Label content location and font types/sizes are recommended as illustrated but not required.
- d) Barcodes are required for PO, NEON Part Number, Revision Level and Box Quantity.
- e) Barcode symbology is Code 128: Part number barcode includes dashes; 10 - 15 mil minimum narrow bar width; 0.15" minimum barcode height; 0.10" or greater quiet zone.
- f) Barcodes must pass barcode verification test (performed at NEON with CR1 hardware) with grade C or higher.