



SUPPLIER QUALITY MANUAL

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A. Goal

The goal of this Manual is to promote the development of a quality system that provides for Supplier continual improvement, defect prevention, reduction of variation, and minimization of waste.

B. Purpose

This Manual describes Northern Stamping, Inc.'s (NSI's) quality system expectations for all Suppliers. NSI is committed to working with Suppliers in order to provide the highest quality and service at a competitive cost that benefits the final customer, the supply base, and themselves.

C. Approach

NSI is committed to operating within the guidelines of ISO/TS16949 and ISO14001, and therefore requires its product/service Suppliers to be third-party certified to the current ISO9001 Quality Management System Standard at a minimum. Suppliers who perform laboratory work must be third-party certified to ISO/IEC/EN17025.

D. Applicability and Supplier's Responsibility

NSI's Supplier Quality Manual applies to all Suppliers of production material, parts, and services that directly affect parts shipped to NSI's Customers. NSI reserves the right to amend this Manual from time to time. It is the Supplier's responsibility to ensure they stay current with the version on the NSI website: (www.northernstamping.com, Suppliers page).

E. Implementation

All Key Suppliers shall maintain a third-party certified Quality Management System based on the current ISO9001 or TS16949 Quality Management System Standard unless expressly waived by NSI Management in writing. Key Suppliers are those whose products or services directly affect the quality of NSI's products.

F. Zero Defects Policy

Northern Stamping, Inc. has a Zero Defects Policy, and does not accept any shipments containing nonconforming or defective material, parts, or services. Suppliers are required to monitor their shipments to ensure a quality level of zero parts defective.

SECTION 1: SUPPLIER APPROVAL PROCESS

1.1 Supplier Approval Process

- 1.1.1 Prior to an initial purchase, all proposed new Key Suppliers are considered to be “prospects”. The initial Purchase Order is identified as a “temporary” or “limited” purchase, and it is reviewed and approved by the Materials Manager before issuing.
- 1.1.2 The Materials Manager issues the following forms and collects them once completed:
- 1.1.2.1 Supplier Contact List
 - 1.1.2.2 Supplier Survey
 - 1.1.2.3 Supplier Quality Manual Acknowledgement
- 1.1.3 The Material Review Team reviews the completed forms, along with other information as detailed below, and determines whether to continue Supplier development with this prospect.
- **Quality System Certification:** Third-Party registration to the current ISO9001 Quality Management System Standard is a requirement of Key Suppliers, unless this requirement is expressly waived in writing by NSI Management.
 - **Sole-Source Suppliers:** If a sole-source Supplier is qualified in every way except Quality System Certification, Northern Stamping mitigates risks by conducting a Quality Systems Basic Audit (or similar Audit).
 - **Customer-Required Suppliers:** If the Supplier is a Customer-Required Supplier, they may be added to the Approved Supplier List without further investigation.
 - **Suppliers who Provide a Service On-Site:** If the Supplier is expected to actually be present on-site, satisfactory completion and submission of the Supplier ISO14001 Acknowledgement.
 - **PPAP Submission:** All Key Suppliers providing services or purchased part are required to maintain and/or submit PPAPs at the Submission Level requested by Northern Stamping.
- 1.1.4 Following the initial purchase, the Material Review Team determines if the prospect’s initial performance was satisfactory, and if so, they are added to the NSI Approved Supplier List. Suppliers scoring less than 70% are not added to the Approved Supplier List, but may be targeted for development so that they may be added at a later time.

1.2 Supplier Removal from the NSI Approved Supplier List

- 1.2.1 The Material Review Team may remove a Supplier from the Approved Supplier List for any of the following reasons:
- Unacceptable quality performance on materials/services.
 - Unacceptable delivery on materials/service.
 - NSI no longer requires the Supplier’s product.
 - Unprofessional business practices.
 - Failure to comply with NSI’s environmental or safety requirements.

SECTION 2: SUPPLIER QUALITY PLANNING

2.1 Planning For Product Quality (Advance Product Quality Planning)

The Automotive Industry Action Group (AIAG) has established a basis for an effective quality planning system in the Advance Product Quality Planning (APQP) Reference Manual.

This planning process should include input from Management, Manufacturing, Engineering, Sales and Quality, at a minimum. This advanced quality planning is initiated with the quotation process and is completed prior to the release of full production schedule.

NSI expects its Supplier to use Advanced Product Quality Planning, and to promote continual improvement. This planning should include education and training of employees in statistical problem solving techniques, error proof methodology, employee involvement, and analysis of cost of quality data.

2.2 Process Documentation

The Supplier of manufactured products or services must prepare and approve the following documents in advance. A copy of some or all may be formally requested by NSI.

1. Process Flow
2. Control Plan
3. Process Failure Mode & Effects Analysis (PFMEA)

All documentation must carry a revision date.

Once approved, the Process Flow becomes the authorized manufacturing method. Any proposed changes to the manufacturing process or parts must be communicated to NSI's Materials Manager, and formally approved by NSI prior to their implementation.

The Control Plan must list specific control characteristics, and the related control activities for each characteristic. The Control Plan must also address the *special characteristics* that NSI adds to this list.

2.2.1 Control Characteristics and Special Characteristics

Control Characteristics are those product or process characteristics that the Supplier controls in order to achieve product or process conformance to requirements.

Special Characteristics are a subset of Control Characteristics. They are product or process characteristics designated by the Customer, including governmental regulatory and safety, and/or selected by the Supplier through knowledge of the product and process. NSI expressly details Special Characteristics that Suppliers must control, and include in their written Control Plan.

SECTION 3: SUPPLIER MANUFACTURING PROCESS VALIDATION

3.1 Process Capability

Adequate process capability must be demonstrated for characteristics stated on the Control Plan. Records shall be maintained as evidence of the ability to achieve planned results.

3.1.1 As all product characteristics should meet engineering requirements, it is advised that the Supplier monitor and control each of them, including those not stated on the control characteristics list.

3.1.2 The Supplier of products containing special characteristics may be required to submit process capability data periodically upon request.

3.2 Production Part Approval Process (PPAP):

The Supplier shall submit samples and the appropriate signed Part Submission Warrant (Level 3 minimum, unless otherwise stated by NSI) for manufactured parts or services prior to full production release. In addition, any or all of the following may be required by NSI:

- Print and dimensional roadmap (separate or combined)
- Dimensional layout reports on at least six PPAP pieces per tool
- Capability study report on at least thirty PPAP pieces per tool
- Gauge R&R Study on each gauge or other measuring device.

3.2.1 Process Sign-Off (PSO)

If deemed necessary by NSI, a PSO run using production tooling may be conducted at the Supplier's production facility.

SECTION 4: SUPPLIER MANUFACTURING CONTROL

4.1 Supplier Quality Control

The Supplier must demonstrate conformance for all material, dimensional and processing requirements. This conformance must be established in accordance with process capability objectives described in Section 3.1 of this Manual. Material Suppliers must provide an appropriate product certification in the format given in Appendix 1 or equivalent.

4.1.1 Sub-Tier Supplier Quality Control

4.1.1.1 Sub-Tier Suppliers designated by the Supplier

The Supplier is fully responsible for the quality requirements of their Sub-Tier Suppliers, and must ensure that these requirements are adequately communicated to their Suppliers. When a Sub-Tier Supplier's products or process affects listed Control Characteristics, it is the responsibility of the Supplier to adequately define and monitor the control system for these characteristics in their Control Plan.

4.1.1.2 Sub-Tier Suppliers designated by NSI

When a Sub-Tier Supplier's products or process affects listed Control Characteristics, it is still the responsibility of the Supplier to adequately define and monitor the control system for these characteristics in their Control Plan, and notify NSI if NSI-supplied material or parts do not conform to product requirements.

4.1.2 Verification of Supplier Products

NSI reserves the right to inspect all products and services received, including finished product, to verify conformance to contractual requirements. NSI encourages Suppliers to provide statistical data as means of product acceptance.

When purchased product is to be verified at a Supplier's facility, the Materials Manager makes specific arrangements for inspection and a method of release as agreed to by the Supplier and NSI.

4.1.3 Rework/Repair Approval and Control

Suppliers who find it necessary to perform rework or repair to material, parts or assemblies must have appropriate process documentation and quality inspection in place. Reworked or repaired must conform to the original contracted requirements.

4.1.4 Deviation for Nonconforming Product/Material

Authorization to ship such material must be approved in writing by NSI prior to making the shipment. Suppliers are required to monitor their own shipments to assure an out-going quality level of zero parts defective.

4.1.5 Shipment of Suspect or Nonconforming Products/Material

In the event that suspect or nonconforming material has been shipped without NSI formal approval, the Supplier must notify NSI immediately. Sorting/rework is performed as necessary by the Supplier, their agent, or NSI. All sorting/rework expenses are the responsibility of the Supplier.

4.2 Tooling Management

Unless specifically exempted by NSI, the Supplier must establish and implement a system for production tooling management, including any tooling supplied by NSI.

The Supplier must establish an inspection and preventive maintenance procedure for all tooling which if worn or damaged, could result in the production of nonconforming product. Tooling inspection and preventive maintenance records must be documented and made available for review upon request.

All tooling remains the property of the party who provided the funding for the original tooling. All proposed revisions to NSI-supplied tooling must be formally approved by NSI prior to implementation. When requested by NSI, Tooling suppliers must mark the tooling with the required asset information.

4.3 Product Identification and Conformance Status

Each container, box, coil or pallet of parts or material shipped to NSI or directly to NSI's Customers must carry full identification, including Northern Stamping's part number, lot number, heat number, quantity, shipment date and deviation number, where applicable. If a barcode is required by NSI, the Supplier must use a barcode system that is compatible with NSI's barcode system.

In addition, products must be shipped on a lot basis. The Supplier's definition for "lot" must be acceptable to NSI, and identification must permit traceability back to all related manufacturing and inspection records.

Suspect or nonconforming product/material must be clearly identified as such to prevent inadvertent shipment to NSI or NSI's Customers.

4.4 Product/Material Packaging

As applicable, adequate packaging must be used to protect NSI's products/materials at all times. If packaging is provided by NSI, it must be protected from damage, inventoried daily, and inspected on a regular basis.

4.5 Inventory Control

The Supplier must establish an internal system to accurately control all NSI-contracted products and materials, and as applicable NSI-supplied products and materials. First-In, First-Out inventory control must be effectively implemented and maintained. Inventory figures must be made available to NSI upon request.

4.6 Material Handling and Storage

The Supplier must establish an internal system to prevent damage or deterioration to NSI's products/material throughout their operations.

4.7 Delivery

Delivery requirements must be clearly understood and communicated within the Supplier's organization to ensure that shipments of products/material will meet all NSI requirements.

Suppliers that fail to meet 100% on-time delivery performance may be issued an NSI Corrective Action Request to improve delivery performance. Failure to improve delivery performance or to submit a response to the Corrective Action Request could result in removal from the NSI Approval Supplier List.

On a periodic basis, NSI's Material Manager requests a total of Supplier-paid premium freight on shipments to NSI.

4.8 Red Tags/Corrective Actions

NSI issues a Red Tag when Supplier product/material is received that fails to conform to NSI's requirements. Disposition of these products/materials may include return to Supplier, or scrap by NSI. Suppliers are debited for the cost of the parts and any related shipping and administrative costs. Suppliers must also replace the nonconforming product/material according to the original schedule.

In addition to, or rather than a Red Tag, NSI may issue a written Corrective Action Request to the Supplier, and Supplier response is required as detailed below. The response must include:

1. Root cause of the nonconformance (within 15 days of issue)
2. Immediate steps taken to control the nonconformance (within 24 hours of issue)
3. Proposed permanent corrective actions to be implemented (within 15 days of issue)
4. Permanent corrective actions implemented (within 30 days of issue)
5. Verification of actions implemented (within 30 days of issue)
6. Follow-up to assess effectiveness (within 30 days of issue).

All costs associated with shipping, handling, processing, reworking and inspection nonconforming material, including a minimum \$250 administration fee for each rejection, is debited to the Supplier. Repeat issues may carry a higher penalty.

SECTION 5: GENERAL SUPPLIER QUALITY SYSTEM REQUIREMENTS

5.1 Supplier Performance Rating System

5.1.1 Performance Rating Frequency

Supplier performance ratings are communicated to High-Volume Key Suppliers on a quarterly basis, and annually to all other Key Suppliers.

5.1.2 Performance Rating Criteria

In support of NSI's Supplier Development process, NSI monitors Key Suppliers with respect to the following criteria:

Rating Criteria	Calculation	Value Range	Points Attained
Quality	$\frac{\text{No. of Defective Units}}{\text{Total Units Received}} \times 1,000,000$	≤ 100 ppm	25
		≤ 500 ppm	20
		Greater than 500 ppm	0
On-Time Delivery	$1 - \frac{(\text{No. of P.O. Receipts Late} + \text{No. of P.O. Receipts Early})}{\text{Total No. of P.O. Receipts}} \times 100$	≥ 98%	25
		≥ 95%	20
		Less than 95%	0
Cost	$1 - \frac{(\text{No. of Invoice Lines where Amount is less than or greater than the P.O. Line Amount})}{\text{Total No. of Invoice Lines}} \times 100$	≥ 95%	25
		≥ 90%	20
		Less than 90%	0
Responsiveness	$1 - \frac{(\text{No. of Days Late per Response to NSI Request})}{\text{Total No. of Days in Reporting Period}} \times 100$	≥ 90%	25
		≥ 80%	20
		Less than 80%	0

OVERALL RATING	Preferred Supplier: Thanks!	Greater than 80 points
	Adequate Supplier	Between 65 and 80 points
	Marginal Supplier: Corrective Action Needed	Less than 65 points

Rating Explanations:

1. Unit = part or pound, as applicable
2. Late = Delivered after the Requirement Date
3. Early = Delivered earlier than 5 days prior to Requirement Date
4. The invoices used for calculations are those that are entered during the reporting period, but the pricing is evaluated based on the invoice date
5. "Request" can be a Corrective Action Request, Request for Quote, etc.

Supplier Performance Reports are transmitted via email on a regular basis.

5.2 Continual Improvement

The Supplier's Management has the primary responsibility for continual improvement, and shall provide leadership in the improvement process. Suppliers are expected to continually strive for improvements in their Quality System and

reduction of process variations. Goals to reduce process variations, quality costs, scrap, rework, and customer returns should be established.

5.3 Material/Product Received at NSI or NSI Customers

The Supplier shall ensure that all materials/products being received by NSI or its Customers conform to the requirements specified in applicable specifications, documents or records. Incoming material may be withheld from use pending verification by one or a combination of the following methods:

5.3.1 Receiving Inspection: The incoming material is controlled through inspection/analysis of results. Records are maintained to provide evidence of conformance to specification.

5.3.2 Supplier Controls: Supplier records must exist that verify product/service conformity to requirements. All records that substantiate the Supplier's control methods must be available for review upon request.

5.3.3 Verification by Production Process: The control of incoming material quality can be monitored/measured through NSI's manufacturing process.

5.4 Supplier In-Process Material/Product Control

The Supplier must maintain inspection systems and/or tests that verify conformance with all requirements. In-process controls and associated records must be readily available for review by a Northern Stamping representative.

5.5 Drawing and Change Control

The Supplier must maintain the latest Northern Stamping-supplied drawings along with process and material specifications. The Supplier should have a documented system that provides for (1) the issue of all new or revised documents, (2) the recall and replacement of those that are obsolete, and (3) a system to evaluate compliance.

5.6 Inspection, Measuring and Test Equipment

The Supplier must provide and maintain the required inspection, measurement, and test equipment. Such equipment shall be calibrated at assigned frequencies to appropriate reference standards that are traceable to the National Institute of Standards and Technology (NIST) or equivalent international certification sources.

5.7 Audits (System/In-Process/Final)

The Supplier must conduct audits that are independent of in-process and final inspections. The audit frequency and sample size should ensure the integrity of the Supplier's inspection and test systems.

Dock audits of ready-to-ship product must be conducted on all shipments, and audit records are to be made available upon request.

5.8 Technical Support

The Supplier must have adequate support personnel and equipment, on-site and/or through service contracts and consultants, to effectively provide products/services, and to support analytical problem solving.

APPENDIX 1

Product/Material Certification

Suppliers who provide raw materials such as strips, coils, bars, castings, forgings, and non-metallic, and/or services such as heat-treatment, plating, coating and other contracted services must supply certification on a lot basis to the NSI Materials Manager.

Measurements and tests must be performed to determine the chemical, mechanical, and harden-ability properties specified in applicable material specifications. Results must be documented to certify specification conformance.

APPENDIX 2

NSI's Terms & Conditions