D&D Manufacturing Inc.

Supplier Quality Assurance Manual

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1.0 Introduction

Founded in 1987, D & D Manufacturing Inc. is proud to be one of the nation's premier suppliers of precision stampings for many OEM's in several key industries. Our leadership in the technology of both stampings and tooling has given us a loyal client list as well as recognition for our efforts in several specialty fields such as pre-finished stamping.

Since our establishment, D&D Manufacturing Inc. has outgrown three smaller facilities in Illinois, and now occupies two facilities (totaling approximately 125,000 square ft.) in Bolingbrook, Illinois, one in El Paso, Texas (76,000 square ft.) and one in Monterrey, N.L. Mexico (40,000 square ft.).

Our equipment and quality assurance is state of the art in every way. We strive to not just keep up with changing technology but to lead it.

2.0 D&D Manufacturing, Inc. - Quality Policy

“We supply to our Customers a quality, reliable, and cost effective product. D&D’s quality policy is to continually improve the quality of our products and workforce to meet/or exceed the requirements of customers and our Quality Management System.”

3.0 Purpose

This Supplier Quality Manual establishes the rules, standards, and requirements that must be maintained as a Supplier to D&D Manufacturing’s Inc.
Its purpose in to outline and communicate these required Quality System requirements for our suppliers.
This manual has been distributed in order to fully communicate these requirements for current and potential D&D Manufacturing, Inc. suppliers

4.0 General Requirements

All Products shall comply with D&D Manufacturing Inc. specifications and requirements. D&D Manufacturing Inc. has an expectation of ***zero defects*** on all Products delivered from the Supplier.
In line with our Zero Defects goal, the Supplier (including its sub-tier suppliers) are required to:

1. Demonstrate compliance with:

    a. Design, performance, reliability, and applicable legal requirements,

b. Process controls and capability requirements,
c. All provided specifications and requirements.

2. Explicitly review and understand all requirements provided to the Supplier related to the Products. Ensure resources are available to participate in product quality planning, as requested.

3. Establish a change control system that reacts to changes in a timely and accurate fashion. In all cases, acquires written approval from D&D Manufacturing Inc. prior to implementing any change that may impact form, fit, function, quality, reliability, safety, delivery, service or its compliance with regulatory and statutory requirements. This shall include, but not limited to, manufacturing processes, quality standards for acceptance, and testing requirements.

4. Have a documented and recognized quality management system in place, including continual quality system development with the goal of Supplier's conformity with ISO 90001, ISO/TS 16949 and IATF-16949, and continuous improvement in Product quality.

5. Measure their internal performance on all given KPI´s from D&D Manufacturing Inc.

6. Maintain process, product and service capabilities to fulfill D&D Manufacturing Inc. requirements.

7. Deploys D&D Manufacturing Inc. requirements, expectations and controls throughout the Supplier's entire supply chain for the respective Products.

8. Possess expertise and resources to perform effective root cause analysis, and to take corrective and preventive actions.

9. Notify D&D Manufacturing Inc. of any potential or actual Non-conformance in Products supplied to D&D Manufacturing Inc. that may affect its form, fit, function, quality, reliability, safety, delivery, service or its compliance with regulatory and statutory requirements.

10. Be responsible and accountable for the impact of poor Supplier Product quality on D&D Manufacturing Inc. and D&D Manufacturing Inc. customers.

11. Comply with all its obligations towards D&D Manufacturing Inc. including, but not limited to:
    • Recognized and certified Quality Management System (QMS)
    • Non-Disclosure obligations

- D&D Manufacturing Inc.'-Customer Specific Requirements (CSR)

4.1 Warranty related items

Any exception or deviation to the requirements, terms and conditions of this Supplier Quality Manual, including, but not limited to exceptions or deviations to D&D Manufacturing Inc. expectations, requires D&D Manufacturing Inc. prior written approval.
Any Supplier action that carries cost liability to D&D Manufacturing Inc. must be authorized by the D&D Manufacturing Inc. Purchasing Organization.

4.2 Quality Targets

Zero defects are the common expectation for all suppliers.

It is then expected that each Non-conformance claim raised by D&D Manufacturing Inc. will be diligently analyzed and solved with robust countermeasures by the Supplier.

This requirement of analyzing and solving each Non-conformance case is a fundamental basic of continuous improvement and customer satisfaction. This cannot be negotiated, in spite of any other agreed quality targets between D&D Manufacturing Inc. and the Supplier.
However, in order to monitor the Supplier's efforts to reach Zero defects, D&D Manufacturing Inc. may define intermediate Supplier PPM targets. Field rejects (Product failures from usage by final customer) are counted separately.

4.3 Quality Improvement Plan (QIP)

At D&D Manufacturing Inc.' request, the Supplier shall (within reasonable time) present a QIP to D&D Manufacturing Inc. that meets the targets and requirements stated in D&D Manufacturing Inc.' request.
Supplier's QIP should be based on a post-mortem analysis of previous year's failures in order to identify technical, managerial and systemic issues. QIP shall cover quality, reliability, logistic, service issues, as well as any specific D&D Manufacturing Inc. requests.
When the QIP has been accepted by D&D Manufacturing Inc., the Supplier is responsible for implementing the QIP. The effectiveness of the implemented activities shall on regular basis be evaluated by both the Supplier and D&D Manufacturing Inc. The Parties' evaluation may result in amendments of the QIP.

4.4 Communication

All formal communications must be in English and this general rule shall apply to all documents.
Supplier shall pro-actively, directly and effectively involve the D&D Manufacturing Inc. Purchasing Organization in every communication on all matters affecting D&D Manufacturing Inc. supply chain processes.

5.0 Quality Management System

This Supplier Quality Manual applies to all prototype and production intent product related materials (raw materials, processing, components, sub-assemblies, and assemblies) procured by D&D Manufacturing Inc.

The Supplier must maintain an effective documented quality management system that communicates, identifies, coordinates, and controls all key activities necessary to design (if applicable), develop (if applicable), produce, deliver, and service Products to D&D Manufacturing Inc.

The Supplier shall be certified/ registered to one of the following international quality management standards by a recognized, independent, and accredited third party certification/ registration body:

ISO 9001 Quality Management Systems – Requirements
ISO/TS-16949 or IATF-16949 Quality Management Systems – Automotive Requirements
Other internationally recognized standard(s), may be accepted, but require written approval from D&D Manufacturing Inc.

Note: The Supplier must notify D&D Manufacturing Inc. immediately, if Supplier's third party registration expires, or is revoked. D&D Manufacturing Inc. reserves the right to access all certification/ registration details of the Supplier.
In addition, D&D Manufacturing Inc. reserves the right to:

• Conduct D&D Manufacturing Inc. supplier quality assessments in addition to third party verification, as requested by D&D Manufacturing Inc.;

• Invite customers to participate in relevant audits;

• Disqualify, demote, and/ or adjust Supplier segmentation status, and/ or full requalification, prior to resuming business and/ or shipment with D&D Manufacturing Inc.

• Notify third party certification/ registration body used by the Supplier, in the case of breach/ misuse of its quality management system.

5.1 D&D Manufacturing Inc. Supplier Quality Assessment

a. **Quality Management System Assessment -** D&D Manufacturing Inc. is entitled at any time to audit the Supplier's quality management system.
D&D Manufacturing Inc. will inform Supplier of any relevant audit issues and parameters. During the audit, D&D Manufacturing Inc. shall have access to all facilities, staff and D&D Manufacturing Inc. requested documents, and this shall apply to the entire supply chain, if needed, as subject to the sole discretion of D&D Manufacturing Inc.

b. **D&D Manufacturing Inc. Code of Conduct Assessment**
Initial and follow up Code of Conduct assessments will be conducted, as part of Supplier qualification, by D&D Manufacturing Inc. or a third party at the Supplier's expense.

c. **Technology/ Process and Product Assessment**
Technology, Process and Product assessments will be conducted at the Supplier's site(s), as well as the entire supply chain, if needed, subject to the sole discretion of D&D Manufacturing Inc.

d. **Supplier Risk Assessment**
D&D Manufacturing, Inc. performs risk assessment per supplier in which different variables are considered in the supplier risk evaluation (Contingency plan, Quality Management System certification, number of facilities, scorecards, to name a few). D&D Manufacturing Inc. has implemented a second party audit process. The Supplier Quality Engineer will notify the supplier in advance to perform any of the following audits:
1. - Process audits
2.-Product audits
3.-Quality system audits (based on the automotive requirements).

6.0 Supplier Pre-Qualification Audit

On Site audits may be conducted as part of the initial introduction as a new supplier, or new supplier location, prior to sourcing. The audit assesses the supplier's entire Quality System and is based on the principles established in current revision ISO 9001 or ISO/TS 16949, IATF-16949. Notification of the audit will be given well in advance. The Supplier Quality Engineer and/or Corporate Quality Systems Administrator shall contact the supplier to schedule the onsite audit. At this time, the supplier will also be provided with the D&D Manufacturing Inc. Supplier Quality Systems Audit form and asked to perform

a self-assessment in preparation. The self-assessment shall be provided to the SQE or QSA prior to the onsite audit. This will allow the supplier to prepare evidence in advance of the visit, and serves to offer a comparison between the supplier and SQE/QSA assessment.

Suppliers must achieve a score of at least 80% to pass the audit. Once the audit is successfully completed, the supplier's location is considered approved. Each supplier production facility must be approved individually, suppliers shall be required to provide corrective actions to any non-conformances identified in the audit and complete implementation in timeframe provided.

Suppliers failing to pass the prequalification audit may be approved on condition basis. This classification may be granted at the discretion of the SQA/QSA/QM and the purchasing Department. Supplier will be on hold for business pending achievement of passing score.

7.0 PPAP Requirements/Checklist.

D&D Manufacturing Inc. requires that a PPAP submission are supplied by the supplier. The PPAP Checklist is used in order to define the specific PPAP requirements that are required.

Production Part Approval Process (reference the AIAG manual) ensures that the Product is capable of meeting D&D Manufacturing Inc.' technical and performance needs. PPAP ensures that the specific manufacturing processes are in place, and that the Supplier will produce Products of consistent and required quality expected by D&D Manufacturing Inc.
A PPAP parts submission shall be made and approved, before start of production, and shall be scheduled and executed in accordance to a date/ timeline, in agreement with D&D Manufacturing Inc. (the D&D Manufacturing Inc. factory using the Product).
Suppliers shall not ship any Product, until Full or Interim Approval is received from D&D Manufacturing Inc., through a signed Part Submission Warrant (PSW). In a case where full approval is not granted, D&D Manufacturing Inc. will advise the Supplier of the areas of concern. The Supplier shall make corrections accordingly and resubmit the PSW.
D&D Manufacturing Inc. reserves the right to determine if any or all of the PPAP items are to be reviewed on-site, and/ or at the supplier facility, as part of the PPAP process.
In the case of disagreements, concerns or queries on PPAP, it shall be addressed to D&D Manufacturing Inc. Purchasing Organization and subject to the final decision of D&D Manufacturing Inc.
All PPAP documentations and records related to the Product or production shall be kept for a minimum of 20 years and/ or for the duration specified by any relevant regulatory requirements.

The Supplier shall not make any changes to the Product or process, after PPAP approval from D&D Manufacturing Inc. In case of such a need for change, the Supplier shall refer to the required process for change request (c.f. Section 8 Change Management).
The Supplier shall submit the specified documentation according to D&D Manufacturing Inc. requirements (to the authorized D&D Manufacturing Inc. representative as communicated to the Suppliers). If D&D Manufacturing Inc. requires a PPAP, level 3 shall be used as the default level unless otherwise specified. PPAP content shall include the PPAP Requirements, and it shall be provided for each part/ family in the approval process.

PPAP Production Parts Approval Items

D&D Manufacturing Inc. requires to all suppliers to provide the PPAP submission checklist which includes the following items:

1. - Design Record
2. – Part Material Composition Report
3. - Authorized engineering change documents
4. - Customer Engineering Approval
5. - Design failure mode and effects analysis (Design FMEA)
6. - Process Flow Diagram(s)
7. - Process Failure Mode & Effects Analysis (Process FMEA)
8. - Control Plan
9. - Measurement System Analysis Studies (Gage R&R)
10. - Dimensional Results
11.1. - Record of Material
11.2. - Material Test Results
11.3. - Regrind certification letter (plastic parts only)
11.4. - Performance Test Results
12. - Process Capability Study(s)
13.1. - External lab accreditation
13.2. - Supplier Accreditation
14. - Appearance Approval Report (AAR)
15. - Sample Product
16. - Master Sample
17. - Checking Aids
18. - Shipping Label Samples
19. - Run @ Rate Documentation
20. - Part Submission Warrant (PSW)
21. - Bulk Material Checklist
22. - D&D Manufacturing Inc. Packaging approval sheet
23. - Required Documentation

7.1 Part Material Composition Report

a. The D&D Manufacturing Inc. “Green Guideline” restricts certain SOC substances. D&D Manufacturing Inc. reserves the right to request suppliers to provide certified quantitative lab results to substantiate SOC compliance.
b. Supplier shall have a current Safety Data Sheet (SDS) is required with any raw material or when a new submission or change in the material composition.
c. Restricted or declarable substances can be found by reviewing the global list at https://www.gadsl.org.
d. An IMDS submission considerations will be reviewed during:
    - Original PPAP submissions.
    - When using alternate materials.
    - When supplier of products and services is changed.
    - Change of part weight that can affect overall end item product weight.

The supplier shall insure the material certifications match the IMDS data. If the IMDS data is rejected for any reason, full PPAP approval will be withheld until the submission is corrected.

D&D Manufacturing Inc. suppliers are responsible for cascading this requirement and collecting data from their respective sub-suppliers.
- Marking (with shipping label and sample part label)
- Traceability

7.2 Process Flow Diagram(s)

The Supplier shall have a process flow diagram that clearly describes the production process steps and sequences beginning at material receipt through packaging and shipping, where process steps include operations performed by outside sources (such as sub-tier suppliers of the Supplier). These steps need to be identified within the diagram, and are subject to approval/ authorization from D&D Manufacturing Inc. (only authorized D&D Manufacturing Inc. representative, as communicated to Supplier).
A single process flow diagram may apply to a group or family of Products that are produced by the same processes in the same sequence.

7.3 Failure Mode and Effects Analysis (FMEA)

When specified on the PPAP Checklist, the Supplier is required to develop a Design (Product) FMEA and/ or a Process FMEA, and submit to D&D Manufacturing Inc. for approval. The Supplier may be invited to participate in the preparation of a higher level Design FMEA through participation in a Product development team. Suitable alternative

risk analysis means may be used, either in place of or in addition to the FMEA, as approved by D&D Manufacturing Inc.
As a general rule, Severity > 8, and / or the top 3 RPN levels, require actions from the Supplier on an annual basis. D&D Manufacturing Inc. reserves the right to request actions, even if the Severity is not >8, or if it is not one of the top 3 RPN levels.
The FMEA is a living document and shall be revised as changes are made to the Product, process and when quality issues are found.

PFMEA will include a tooling FMEA, if applicable.

7.4 Control Plan

The Supplier shall prepare a Control Plan, based on the DFMEA and PFMEA for the complete process. The corresponding method details the control and inspection activities that have been implemented to ensure conformity to D&D Manufacturing Inc. specifications. Special Characteristics will be marked with their respective reference number(s).
The Control Plan is identified by Product number, family, and revision level.

a. The initial Control Plan should include:

    1) Verification of material certifications and any test data.
    2) Until process stability and control is demonstrated, sample size, frequency, and any required functional testing) e.g. hardness, salt spray resistance, plating thickness, etc.) shall be increased
    3) Verification of packaging, markings and labeling
    4) Initial control plans should be used for the first 90 days of production or 30 days after an extended shutdown or as directed by D&D Manufacturing Quality Department.

b. Production control plans should include lessons learned from previous control plan levels.

    1) Control plans shall be reviewed and updated after a non-conformance
    2) Process settings and parameters required for the process to operate consistently should be documented on a process sheet referenced by the Control Plan or directly or the control plan (temperatures, pH, flow rates, air pressure, cycle times, etc.)

The Control Plan is a living document and shall be revised as changes are made to the Product, process and when quality issues are found.

7.5 Measurement System Analysis Studies (Gage R&R)

Product and process conformance must be determined by measurements made with appropriate test equipment and gages. The supplier must establish the error of measurement to specification ratio since the test equipment or gage is a significant part of the process. Any error in these measurements, whether known or unknown, has a direct bearing on the ability to judge process/product conformance and capability.

D&D Manufacturing Inc. requires that test equipment and gages used to evaluate any control plan characteristic have gage R&R studies conducted which meet the requirements of the AIAG MSA Manual current revision, or be removed from service and replaced with a conforming gage. Variable gauging shall be used wherever possible. GR&R studies shall be submitted for all CC/SC gauging for PPAP approval.

Acceptance Criteria for MSA Study		
Number of Distinct Categories (ndc)	**Gage R&R**	**Status**
ndc>= 5	GR&R =< 10 %	The measurement system can be approved.
2 =< ndc < 5	10 % < GR&R =< 30 %	The measurement system can be approved, if D&D Manufacturing Inc. accepts the measurement uncertainty. Corrective actions can be required, and the Supplier shall contact D&D Manufacturing Inc. (only authorized D&D Manufacturing Inc. representative, as communicated to Supplier).
ndc< 2	GR&R > 30 %	The measurement system cannot be approved

Attribute gages that are used to monitor Special Characteristics must also undergo applicable gage studies. The method used will be formally agreed upon between D&D Manufacturing Inc. and the Supplier.
If the gage system fails, the Supplier shall take corrective action to make the gage measurements repeatable and reproducible. A gage shall be proven repeatable and reproducible before it can be used in a capability study or to be used to accept or reject Products.

7.6 Dimensional Results

The Supplier shall submit all data electronically, unless otherwise agreed. Actual variable data must be provided in terms of measurements, except for attribute data (pass/ fail; go/no go; nominal or ordinal, etc.). All results must be traceable to the specific samples submitted by the Supplier.

7.7 Material, Performance and Reliability Test Results

The Supplier, or a qualified independent third party, shall provide specific material, performance and/ or durability test results. Actual results must be compared against agreed upon specifications. For certain parts, D&D Manufacturing Inc. may require third party testing, as necessary.

7.8 Process Capability Study (s)

a. D&D Manufacturing Inc. Supplier Quality may require charting of multiple process variables based on past problem history, or when raw material or process variation requires continual adjustment.
b. SPC sample sizes and frequencies will be approved by D&D Manufacturing Inc. Supplier Quality and documented in the control plan.
c. For all Special Characteristics, an acceptable level of process capability and performance shall be determined prior to production.
d. Based on capability study analysis, a minimum value of Cp–Cpk 1.67 and above is required unless otherwise specified by D&D Manufacturing Inc. Any exception must be approved by D&D Manufacturing Inc. (only the authorized D&D Manufacturing Inc. representative, as communicated to the Supplier) in writing, and subject to the final decision by D&D Manufacturing Inc.

If the required process capability/ performance is not met prior to the first production, a corrective action plan, and revised Control Plan (Reinforced Control Plan) shall be developed by the Supplier, and submitted to D&D Manufacturing Inc. for approval (only the authorized D&D Manufacturing Inc. representative, as communicated to Supplier). This Reinforced Control Plan will require 100% inspection, or other means, as agreed upon with D&D Manufacturing Inc... The corrective actions stipulated in the corrective action plan or the Reinforced Control Plan shall remain in place until capability can be demonstrated to D&D Manufacturing Inc., or Early Production Containment (EPC) exit criteria are fully met and sustained.

For attribute data, the Supplier shall propose for D&D Manufacturing Inc. approval, a method for evaluating process capability, with proper and detailed justification. D&D Manufacturing Inc. reserves the right to specify the type and nature of the attributes, and the corresponding measurement methodology and instrumentation.

Products used for evaluation of the preliminary process capability study shall be produced and randomly sampled in the production run for approval parts. The process

capability study shall contain a minimum of thirty (30) parts in total, when applicable. The samples shall be collected in production, when the process is stable (i.e., when no adjustments are being performed) during the production run. Products from each unique production process (i.e., each production cell, line, tool or cavity) shall be evaluated separately. No adjustments or maintenance to the process is allowed during the production run.

a. The number of Products used for a preliminary process capability study depends on the number of cavities or units per cycle. In case of Products used for high volume production, D&D Manufacturing Inc. (only authorized D&D Manufacturing Inc. representative, as communicated to Supplier) may requires three hundred (300) pieces to be used for the preliminary process capability.

7.9 Appearance Approval Report (AAR)

D&D Manufacturing Inc. may require an Appearance Approval Report (AAR) along with representative sample part(s) to be submitted, wherever applicable. An AAR is typically requested for an item, which is exposed to view on the exterior of a finished unit. If an AAR is specified on the PPAP Checklist, the Supplier shall contact D&D Manufacturing Inc. (only the authorized D&D Manufacturing Inc. representative, as communicated to Supplier) to ensure the requirements are clearly understood and formally agreed.

7.10 Sample Parts and Master Sample Parts

The Supplier shall:

1. Provide the required number of sample parts, as specified in the PPAP order.
2. Complete the dimensional and performance test reports as required, along with the required sample parts.
3. Retain master sample parts for the same period as the production part approval records.
4. Identify the master sample parts as such, and with a label or marking of the D&D Manufacturing Inc. approval date on the sample.

For detailed requirements, the Supplier shall take reference to latest revision of PPAP Reference Manual by AIAG, and shall consult with D&D Manufacturing Inc.

7.11 Run & Rate Documentation

a. Sub-Supplier Qualification (Only applies for Outside service)
   All suppliers should insure their sub-suppliers meet or exceed the requirements contained in this manual. Special emphasis should be placed on process stability, lot control and traceability.

b. Line readiness audit (Run @ rate) may be performed at the supplier and sub-suppliers using mass production equipment, tooling, fixtures, and gauging during a representative run. The trial results should be recorded on D&D Manufacturing Inc.'s form and submitted with the PPAP package. D&D Manufacturing Inc. Supplier Quality/Purchasing reserves the right to be present for these trials.

8.0 Special Characteristics

A Special Characteristic is any feature of a material, process, part, assembly, or test that has a significant influence on Product fit, form, function or any other expected deliverable, as specified by D&D Manufacturing Inc.

Note: Special Characteristics shall also include, but are not limited to, all relevant regulatory and statutory requirements. Special characteristics are defined at D&D Manufacturing Inc.'s customer drawing or by D&D Manufacturing Inc.'s Quality Manager and must be controlled at the sub-supplier location. Special characteristics are specified in the Purchase orders.

9.0 Master list of Approved Suppliers

D&D Manufacturing Inc. Maintains a Master list of Approved Suppliers which consists of all suppliers to D&D Manufacturing Inc. and their approval status (Approved, New business Hold, or de-source.)

10.0 Gauging Requirements

It is the responsibility of the supplier to deliver parts according to the drawing dimensions and tolerances. To assure this, the supplier may have to build gages and other measurement devices for his own in-house use. The design and function on those gages shall be reviewed and discussed with D&D Manufacturing Inc.

In addition, D&D Manufacturing Inc. may require a second set of gages for incoming inspection in the D&D Manufacturing Inc. plant.

11.0 Qualification of Heat Treat, Plating, Coating, Soldering & Welding

a. AIAG has published special process assessments for heat-treat, plating, welding, soldering and paint/coating processes. OWM customers require all tiers of suppliers insure these self-assessment audits are performed and results submitted to D&D Manufacturing Inc. annually per the applicable AIAG/CQI guidelines.
b. CQI findings and a corrective action plan should be completed with an implementation schedule and will be available to PPAP and SQA when requested. D&D Manufacturing Inc. reserves the right to confirm and/or validate the corrective actions from the CQI results performed by the supplier.

12.0 Product Identification

All parts must have a means to accurately identify part number, revision level, and lot number. Whenever possible these marking should be permanently affixed to the actual part.

a. When the part is too small or it is otherwise impractical to individually mark the parts, labels, tags or another identification method will be approved by Supplier Quality. *Material that goes for Outside Service (plating, e coat, heat treatment, etc.) shall not be mixed with different lots. It must be returned the same way it was delivered.*
b. Traceability must be maintained through all process steps, sub-supplier operations, packaging and shipping.
c. Parts from a multiple cavity or row tool shall be marked so there is traceability to the specific section of the tool producing the part.
d. When there is more than one tool in service producing the part, the marking scheme shall identify which tool and cavity produced the part. For example, cavity ID's will not duplicated when there are multiple tools for the same part number.

13.0 Traceability and Lot Size

A. Strict lot integrity and traceability are required. The supplier shall be able to produce accurate and complete information in a timely manner whenever requested by D&D Manufacturing Inc.
B. Parts shipped in a container shall have the same lot code.
C. The lot coding system shall identify parts made with different raw material lots, off different tooling, off different machines, processed through different heat-treaters or finishing processes, or by different sub-suppliers. Lot codes shall be changed whenever perishable tooling is changed or the tool itself is removed and re-set for any reason.

D. For rivets, nuts, threads, etc. that cannot be produced without bulk processing, the original lot should be broken into sub lots not exceeding 25,000 pieces per labeled container.

14.0 First In / First Out

Suppliers shall practice FIFO based inventory management. Procedures, warehousing arrangements, and visual tools shall be in place to insure the proper flow of material.

Packaging and Labeling

The supplier shall receive a notification from D&D Manufacturing Inc. regarding the packaging standards.

15.0 Sample and Document Retention

a. The supplier shall preserve documentation, and records to prevent loss or deterioration for 20 years after the end of serial production or as agreed by D&D Manufacturing Inc.
b. Minimum documentation includes:

- Raw material purchase orders and material certifications. Steel certifications shall include specification number, product designation (grade/type/class), heat number, and chemical and mechanical properties.
- Production records (dates, quantities, machine assignments, unscheduled downtime, PPMs)
- Copies of travelers, or lot cards verifying process steps were completed in sequence
- Set up sheets showing process parameters or logs verifying temperature, pH, air pressure, etc.
- Gage calibration records
- Tool maintenance history (replacements, and repairs keyed to production dates, lots),
- Copies of PPAP's and approved deviations
- Approved PPAP samples.

16.0 Supplier Change Request (SCR)

D&D Manufacturing Inc. shall be notified in advance of any change to the manufacturing process. SCR's are submitted to the PPAP Engineer.

a. SCR approval does not grant the Supplier approval to make the actual change it merely allows the supplier to obtain sufficient data and produce samples for the D&D Manufacturing Inc.'s verification/approval process.
b. Formal approval of the change is granted though the PPAP approval process. The supplier shall not ship production parts without a PPAP approval.
c. Supplier shall use an IPP system to notify the receiving plants when the change has been implemented.

Examples of Changes requiring an SCR:

Supplier:
- New supplier or sub-supplier
- Sub-supplier Change
- Transfer to new facility

Material:
- Change in material supplier
- Raw material changes including: basic ingredients, formulation, processing equipment, testing, specifications/tolerances, production location change, new sampling plan, packaging
- Change in material itself including rust inhibitors, lubrication, coatings

Manufacturing Method/Process:
- Changes in process sequence
- Changes in equipment
- Add/eliminate secondary operations
- Casting, forging, stamping, welding, or sintering method
- Plating or painting conditions

Equipment:
- Major repair or machine modification
- Move to a new location
- New or alternate machine

Fixture/Tool Change:
- New or modified fixturing
- Changes in tool features including gate locations, carrier location, runner systems, etc.

Inspection Method:
- Change in measuring tools or methods including sampling and gauges

Packaging/Transportation:

- Change in packaging method, containers, bins, pallets, etc.

17.0 Production Quality Requirements

Suppliers are responsible for optimizing their process targets. When a process yields unacceptable parts or demonstrates unacceptable capability, the supplier is responsible to add additional operations or use different technology to eliminate any defective pieces.

- All measured, observed, or calculated values, used to evaluate conformance shall be reported to the significant digits referred to on the drawing
- MAXIMUM (MAX). The maximum limit shall be absolute, and no additional tolerance or deviation shall be allowed.
- MINIMUM (MIN). The minimum limit shall be absolute, and no addition additional tolerance or deviation shall be allowed.

18.0 Sampling by the supplier

Sample sizes and frequency shall be based on lot size, anticipated variation, and statistical confidence.

a. The supplier may chose in-process-sampling, or collect a random sample at final inspection. Plans listed in industry standards (ANSI, ASTM, or DoD MILSPECs) should be used whenever possible.
b. The minimum default sample size per lot (for each cavity or progressive tool row) shall be 9 pieces for measurements and 18 pieces for attribute inspection.

19.0 Appearance and Boundary Samples

Appearance, boundary or limit samples used to clarify drawing or appearance requirements need to be approved by D&D Manufacturing Inc. Supplier Quality.

a. The control plan or inspection standard will specify “As per approved boundary sample”

20.0 Verification of Controls

Force, torque, pH, temperatures, pressures, function of electronic sensors, etc. shall be verified prior to start-up using approved master samples or with a calibrated instrument. A written record with times, dates, and employee doing the check must be maintained.

21.0 Supplier Performance and Reporting

a. Monthly Surveillance – D&D Manufacturing Inc.'s supplier quality assurance continually monitors supplier performance. Data from the Incoming Inspection Area is assembled and suppliers with negative trends are identified. The Scorecard are forwarded to the suppliers on a monthly basis.
b. Audits may be conducted whenever the situation warrants including but not limited to:
    - Initial evaluation of a potential supplier
    - Evaluation of new equipment, processes, or programs
    - New location or facility
    - Significant quality incident, repeated incidents, or poor response
    - Verify countermeasures, failure of containment
    - Late or premium freight shipments involving supplier delivery.
    - Compliance to this manual

22.0 Non-Conforming Material

In the event that non-conforming material is detected, the supplier shall work expeditiously with Supplier Quality until the issue is resolved.

22.1 Non-conformances identified after Shipment

If Non-conforming Products are identified after shipment from the Supplier, one or more of the following immediate containment actions shall be initiated, based on mutual agreement between D&D Manufacturing Inc. and the Supplier, and subject to D&D Manufacturing Inc.´ sole and final decision.
1. The Supplier shall inspect and sort Products with unidentified status at any defined place (D&D Manufacturing Inc., Supplier, D&D Manufacturing Inc.' customer, or others). All costs incurred will be at the Supplier's expense.
2. The suspected batch/ lot/ shipment will be retained for one or more of the following actions:
a. Supplier´s immediate replacement of the Product;
b. Return of batch/ lot/ shipment to the Supplier, with the condition of complete replacement, sorting or rework of the Products, and any other charges incurred, at the Supplier's expense;
c. Third-party sorting organized at any site specified by D&D Manufacturing Inc., at the Supplier´s expense;
d. Supplier sorting at D&D Manufacturing Inc. site, at the Supplier's expense;
e. Scrap, loss, and any other additional costs incurred by D&D Manufacturing Inc., as a result of Non-conforming Products, are at the Supplier's expense.

It is Supplier's responsibility to deliver quality Products to D&D Manufacturing Inc., which is in line with D&D Manufacturing Inc.' goal of Zero Defects.

22.2 Non-conformances identified before Shipment

If Non-conforming Products are identified at the Supplier's site, relevant actions, such as segregation, quarantine, and marking of the Products shall be initiated. Non-conforming Products shall not be shipped to D&D Manufacturing Inc., unless an authorized waiver is granted from D&D Manufacturing Inc. (only authorized D&D Manufacturing Inc. representative, as communicated to Supplier).
All waivers issued shall specify a specific time and/ or quantity limit, which is subject to the sole and final approval of D&D Manufacturing Inc.
In the following situations, the Supplier shall immediately notify D&D Manufacturing Inc. for waiver requisition:

• If the Non-conformance affects form, fit, function, quality, reliability, safety, delivery, service of the Product, or its compliance with regulatory or statutory requirements, and/ or is a cosmetic defect;

• If there is likelihood that Non-conforming Products have inadvertently leaked-out from the Supplier's factory;

• If the Non-conforming Products are likely to cause late delivery to D&D Manufacturing Inc.;

• In all cases, where there is a report of Non-conformance that possibly affects the form, fit, function, quality, reliability, safety, delivery, service of the Product, or its compliance with regulatory or statutory requirements.

If approved, all Products shipped to D&D Manufacturing Inc. covered by a waiver must be accompanied by a copy of the approved waiver requisition.

23.0 Corrective and Preventive Actions

In case of Non-conforming Products, the Supplier shall submit a formal written corrective and preventive action report, to address specific defects identified.

• The general format of the corrective and preventive action will be a Corrective Action Report form (8D), unless otherwise specified.
The Supplier shall submit in the approved 8D format from D&D Manufacturing Inc. for evaluation and acceptance or their response.

• The Supplier shall implement the containment action, and submit to D&D Manufacturing Inc. in writing (steps D1-D3 of the 8D form) within 24 hours (starting from Supplier´s receipt of the 8D form).

• If D&D Manufacturing Inc. disagrees with the containment action, Supplier must respond (with a revised containment action) within 24 hours (starting from D&D Manufacturing Inc.' receipt of Supplier´s notice).

Failure analysis leading to the root cause determination shall be done within 10 working days, or an alternative time frame agreed upon with D&D Manufacturing Inc.

• D&D Manufacturing Inc., encourages the use of appropriate tools such as, but not limited to, fishbone diagram, 5W+2H, FTA (Factor Tree Analysis) for occurrence and non-detection, LLC (Lessons Learned Cards) to effectively reach Zero recurrence, etc.

• The 8D form will not be considered complete until proposed corrective and preventive actions and an appropriate implementation plan has been approved by D&D Manufacturing Inc.

Involvement of D&D Manufacturing Inc. in the approval of remedial action does not change the fact that the Supplier remains liable for any Non-conformances in the Products, including Non-conformances resulting from the implementation of the remedial action. Until the claim has been verified and closed by D&D Manufacturing Inc., the Supplier shall adopt all measures to safeguard the interest of D&D Manufacturing Inc. (and D&D Manufacturing Inc.' customers).

24.0 Quality Incidents

a. All formal SCAR's (Supplier Corrective Actions Request) are issued, tracked, reviewed and approved by the Supplier Quality Engineer.

b. In all cases the receiving plant Supplier Quality Engineer will need information to contain suspect material and to minimize disruption of production lines. The supplier shall provide:

- Lot numbers, quantities, and destinations of all material that could be associated with the issue. This includes material in transit and finished goods awaiting shipment. It may also include work in process, and lots being processed at sub-contractors.
- What actions will be taken to protect D&D Manufacturing Inc. production from disruption, until long term countermeasures are implemented
- If certified material needs to be expedited to the plant, any premium freight and line downtime costs will be the responsibility of the supplier.

- Depending on the severity of the issue, D&D Manufacturing Inc. expects technical representatives to support the plant by visiting D&D Manufacturing Inc. production locations when requested.

- Without a timely response initial 24-Hour response from the supplier, D&D Manufacturing Inc. may be forced to take action to protect our customer. This may include emergency sorting and/or rework that will become the financial responsibility of the supplier.

- The Supplier initial response (Root Cause and Corrective Actions) should be submitted within a 7- day period.

    - D&D Manufacturing Inc. will sort the minimum amount of material required to maintain its production until certified replacement material is provided by the supplier, and the certified material is verified as acceptable.
    - If the supplier does not supply certified material, or countermeasures are found to be ineffective, D&D Manufacturing Inc. reserves the right to hire a third party company or perform the sorting activity at the supplier's expense.
    - The Supplier has 30-days for closure of corrective actions. (Unless prior arrangements are made in advance of the 30-Day period).

Associated costs may be incurred due to SCAR relayed issues in the following areas:

- Administrative fees
- Sorting cost
- Down time
- Reworking cost
- Customer's charges against D&D Manufacturing Inc. (Administrative fee, down time, rework, and sorting cost) due to D&D Manufacturing Inc. supplier issue are also to be debited on the SCAR break down cost.)

The Supplier will be updated as to the status of potential costs.

25.0 Disposition of Rejected Material

a. The plant Quality Supplier Quality will normally request disposition of rejected material to the Supplier.

    1.) D&D Manufacturing Inc. may return, or scrap the material at the supplier's expense. The supplier will provide a debit memo within 5 days, and be liable for all associated costs; including the cost of replacing the non-conforming material with acceptable material.

2.) The material may be returned to the supplier to be sorted or reworked and returned as “certified” material. However, approval shall be obtained in advance from the SQE. Detection of any defects in certified material will be cause to permanently reject or scrap the lot(s).

b. When the supplier fails to respond, or provide a debit memo, purchasing will be advised and the material will be warehoused at the supplier’s expense pending resolution of the commercial dispute.

c. When non-conforming material is found in VMI (Vendor Managed Inventory) and the supplier replaces it before the plant pulls the material into the production warehouse, no reject PPM will be charged to the supplier.

d. A certification inspection is not limited to visual inspection but includes whatever gauging, testing, or measurement is required to insure the parts are fit for use. Additional fixturing, gauging, lighting, and measurement equipment will be the responsibility of the supplier.

1.) D&D Manufacturing Inc. reserves the right to approve the inspection method, workstation layout, and work instructions.
2.) The supplier shall use the IPP procedure when shipping the initial lot.
3.) All containers will have the orange certified label applied near the shipping label.
4.) The SQE will determine whether controlled shipping continues for a minimum of 50,000 pieces, 5 lots, or 30 days after countermeasure is applied and/or the last defect is found. The supplier will maintain records of all lots and quantities certified, with the associated defect rate for D&D Manufacturing Inc.’s review.
5.) Any non-conformance in certified material, whether the target of the activity or not, will restart the controlled shipping period. Previously received certified material may be re-certified and the costs of any subsequent line down charges or expedited freight will be the responsibility of the supplier.
6.) When the supplier has met the exit requirements listed in the controlled shipping letter, the supplier shall petition D&D Manufacturing Inc. Supplier Quality for release from the requirement.

Controlled Shipping Level 2 (CS2) is a 100% (twice) third party certification instituted when a significant defect is found at D&D Manufacturing Inc.’s customer, or nonconforming parts are found due to a failure of normal controlled shipping activity. CS2 status shall be reported to the supplier’s ISO/TS registrar who may also verify the results of the permanent corrective action.

a.) D&D Manufacturing Inc. reserves the right to approve the third party and the certification methods. The supplier is responsible for providing limit samples,

and maintaining records of lots, quantities, and defect rates for D&D Manufacturing Inc.'s review.

b.) When the supplier has met the exit requirements, the exit process is the same as for normal controlled shipping status.

26.0 Continuous Improvement

The goal of Continuous Improvement is to make not only technical corrections, but also remove the environment that allowed the issue to manifest itself.

A simple program should include:

a. Use of statistical data to quantify and reduce process variation.
b. Analysis of scrap reports, PPM reported by D&D Manufacturing Inc. downtime, premium freight, and/or similar metrics.
c. Identification of a small number of initiatives that target the largest or repeat problem areas.
d. Lessons learned and permanent countermeasures should be applied to similar parts provided to D&D Manufacturing Inc.

27.0 Contingency Plans

Supplier must have a process in place to control the following items:

a) Identify and evaluate internal and external risks to all manufacturing processes and infrastructure equipment essential to maintain production output and to ensure that customer requirements are met;
b) define contingency plans according to risk and impact to the customer;
c) Prepare contingency plans for continuity of supply in the event of any of the following: -key equipment failures; interruption from externally provided products, processes, and services; recurring natural disasters; fire; utility interruptions; labor shortages; or infrastructure disruptions;
d) Include, as a supplement to the contingency plans, a notification process to the customer and other interested parties for the extent and duration of any situation impacting customer operations;
e) Periodically test the contingency plans for effectiveness (e.g., simulations, as appropriate);
f) Conduct contingency plan reviews (at a minimum annually) using a multidisciplinary team including top management, and update as required;
g) Document the contingency plans and retain documented information describing any revision(s), including the person(s) who authorized the change(s).

The contingency plans shall include provisions to validate that the manufactured product continues to meet customer specifications after the re-start of production

following an emergency in which production was stopped and if the regular shutdown processes were not followed.

28. Revision Records

Revision Level	Revision Date	Description of change	Name
1	1/19/2018	New Release	T. Lash, E. Titus, M. Roberts