SUPPLIER QUALITY REQUIREMENT - AUTOMOTIVE

ABOUT FLEX Flex is a leading sketch-to-scale™ solutions company that designs and builds intelligent products for a connected world. With more than 200,000 professionals across 30 countries and a promise to help make the world Live smarter™, the company provides innovative design, engineering, manufacturing, real-time supply chain insight and logistics services to companies of all sizes in various industries and end-markets. For more information, visit www.flex.com or follow us on Twitter @flexintl. The information in this document is proprietary and intellectual property of Flex and should not be disclosed to unauthorized recipients

1.0 BACKGROUND/INTRODUCTION

1.1 This document defines the basis for all quality agreements between all Flex legal entities ("Buyer") and Flex suppliers ("Seller" or Supplier").

2.0 PURPOSE AND SCOPE

2.1 Buyer's company serves a variety of industries and business segments and as such, Buyer has unique supplier quality requirements specific to these industries and business markets.

2.2 This document defines the special automotive industry requirements relating to the quality of all products or services, to be used in automotive applications, purchased by the Buyer from the Supplier during the term of any agreement referencing this document. Any deviations, exceptions or additional requirements shall be mutually agreed in writing between Buyer and Supplier. Specific quality criteria, targets and similar measures will be mutually agreed during APQP, if not already defined in a product specification. When referenced by the applicable agreements, all these requirements will comprise a complete quality agreement between Buyer and Supplier.

2.3 The terms of purchase transactions between Buyer and Supplier are governed by a General Business Agreement (GBA) or Terms and Conditions Checklist. If neither of those agreements exists the terms governing purchase transactions between Buyer and Supplier are the Buyers Standard Terms and Conditions, which are transmitted with every purchase order.

2.4 Requirements defined in this document are applicable to:

- Suppliers of parts, components, or production materials used in the manufacture and/or assembly of automotive products.
- Direct Materials as identified in the bill of materials and required for incorporation into the end-product.

2.5 By default, all Flex Automotive products are classified IPC Class 3. Different or additional project-specific requirements are applicable in the relevant complementary assets to this document.

3.0 DEFINITIONS AND ACRONYMS

AECQ:	Automotive Electronics Council for Quality
APQP:	Advances Product Quality Planning

CSL:	Controlled Shipment
CQI:	Continuous Quality Improvement
DPPM:	Defective Parts Per Million
EPC:	Early Production Containment
FMEA:	Failure Modes Effects Analysis
GBA:	General Business Agreement
IATF:	International Accreditation Task Force
IPC:	International Professional Committee
MSA:	Measurement Systems Analysis
NBH:	New Business on Hold
PPAP:	Production Part Approval Procedure
QMS:	Quality Management System
RMA:	Return Material Authorization
RFQ:	Request for Quotation
SCAR:	Supplier Corrective Action Report
SDP:	Supplier Development Program
SPC:	Statistical Process Control
USCAR:	Unites States Council for Automotive Research
VDA:	Verbarnd der AutomobileIndustrie
NPI:	New Product Introduction
OEM:	Original Equipment Manufacturer
R&R:	Repeatability and Reproducibility
Raw Material:	A material or substance used in the primary production or manufacturing of a good.

4.0 REFERENCE DOCUMENTS

4.1 Control of Documented Information FMS-QMS-1-001-00

4.2 Supplier Quality General Requirements FMS-QMS-3-005-00

4.3 Latest versions of CQI, PPAP, APQP, SPC, MSA and other related manuals available from Automotive Industry Action Group (AIAG) at http://www.aiag.org/.

4.4 IATF 16949, Automotive Quality Management System Standard, current version.

4.5 ISO 9001, Quality Management Systems – Requirements, latest version.

4.6 ISO/IEC 17025, General Requirements for the Competence of Testing and Calibration Laboratories, or national equivalent, latest version.

5.0 SUPPLIER REQUIREMENTS

5.1 **Supplier Quality System:**

5.1.1 An effective quality management system, according to the requirements of IATF 16949- current version, is a prerequisite for a supply relationship with Flex Automotive.

5.1.2 Suppliers certified to IATF 16949; current version shall be given preference for selection. Suppliers having processes shared by multiple facilities shall be individually registered either by single site or by corporate scheme. (See IATF Certification Reference or consult the certification body):

- In exceptional situations (special designed parts, low volume supplier, or small organization, or parts solely used for NPI), ISO 9001 certification maintained through third party audits is seen as a first step in becoming a Flex supplier.

NOTE: NPI supplier that have proven to be compliant early-on suppliers that are desired to become manufacturing site production part worthy suppliers, must then be fully compliant to 5.1.1 or subsequent bullets 5.1.2.

- Certification to ISO 9001 through third party audits with compliance to IATF 16949 with a documented, reliable time phased plan for achieving certification of IATF, it is also acceptable.
- Distributors of direct products or materials must be certified to the current version of ISO 9001 at a minimum through third party audits.
- Software development or service suppliers, at the minimum shall implement and maintain a process for quality assurance of their products. ISO 9001 certification through third party audits is considered a priority for selection.

5.1.3 Expiration of an ISO 9001, or IATF 16949 certificate without planned recertification must be reported to Flex Automotive at least three (3) months prior to the expiration date.

5.1.4 Updates to certificates must be sent to the receiving Flex Automotive buyer without further request from Flex Automotive.

5.1.5 The revocation of a certificate must be communicated to the Buyer immediately.

5.1.6 Supplier shall ensure that the latest valid versions from standards and regulatory frameworks are always implemented. (e.g.: ISO, IATF, VDA).

5.1.7 Supplier shall ensure compliance with applicable statutory and regulatory requirements and special product and process characteristics; Supplier shall cascade all applicable requirements down the supply chain to the point of manufacture.

5.1.8 Suppliers shall fulfill the requirement of AIAG/VDA manuals: Production Part Approval Procedure (PPAP), Advanced Product Quality Planning (APQP), Potential Failure Mode and Effects Analysis (FMEA), Measurement System Analysis (MSA), Statistical Process Control (SPC), etc., latest edition.

5.1.9 The same quality system requirements shall apply to sub-suppliers, and the Supplier is responsible for the compliance of all their sub-suppliers. Also refer to CQI-19 Sub-Tier Supplier Management Process Guidelines.

5.1.10 Supplier shall comply with OEM Customer-Specific Requirements as per the IATF.

5.2 **General Requirements:** For all deliveries of automotive products, the following key requirements apply:

5.2.1 It is the responsibility of distributors or non-manufacturing suppliers to Flex to ensure their suppliers provide proper parts and documentation as per I IATF 16949, latest version, AIAG and Flex or Flex's customer quality requirements. The Supplier shall demonstrate, through the use of SPC and/or otherwise, that all parameters of the part are under control.

5.2.2 Special Processes: Suppliers shall maintain and demonstrate the effectiveness of special processes (e.g., CQI-9 Special Process: Heat Treat System Assessment).

5.2.3 The Supplier shall obtain Flex approval before initiating process or design changes to the part.

5.2.4 The Supplier shall not supply product without Flex' authorization when statistical data indicates noncompliance with minimum capability requirements or with critical parameters as mentioned in the design records.

5.2.5 All custom-built tooling and equipment suppliers must utilize industry accepted best practices for the design, construction, validation and delivery of tooling and/or equipment. The activity must be supported by a documented plan (e.g., Gantt chart or equivalent).

5.2.6 All calibration, layout and test sources must be accredited to ISO/IEC 17025 or national equivalent.

5.2.7 The supplier shall understand, accept and fulfill the requirements of this document. When the requirements are not specified, the relevant international standards shall be applied.

5.2.8 Suppliers of automotive product-related software or automotive products with embedded software shall have an implemented and maintained process for software quality assurance for their products and retained documented information of a software development capability self-assessment.

5.2.9 For any failure, Supplier will provide a preliminary plan for diagnosing and addressing problem within five (5) business days. Supplier will be responsible for all costs incurred in rectifying any failure including, without limitation, for any solution, workaround, recovery plan or engineering change.

5.3 **Communication and Document Submission:**

5.3.1 While Flex has multiple manufacturing locations worldwide, the official communication and document submission language between Flex and its suppliers is only English. Each of those locations needs full attention and have the same priority:

- Each supplier has a dedicated Supplier Quality Engineer who is responsible for communicating quality related matters to the Supplier.

5.4 **Part Conformity and Part Reliability:**

5.4.1 Supplier shall be able to prove part's conformity under various operating conditions as per specifications (temperature, humidity, etc.) as well as under life time (life time simulation, etc.) as per AECQ, requirements or other relevant standard (VDA, etc.) or otherwise specified by Flex. Flex assumes the tests necessary for such proof have been considered at time of RFQ, therefore no additional costs will arise.

5.5 **Quality Objectives:**

5.5.1 Flex Automotive and the suppliers will jointly agree on quality objectives if needed otherwise than described in section 7.0.

5.6 **Quality Data Requirements:**

5.6.1 Initial Data Submission:

- Flex requires that all initial shipments of parts, components or production materials into our plants be supported by Supplier submissions of PPAPs, or otherwise agreed under exceptional situations.
- Dimensional data must be submitted 100% of all drawing requirements.
- Test and material content requirements as specified in purchasing documents or drawing NOTE's shall also be submitted.
- Qualification results as per industry standards, must be part of the initial PPAP submission (i.e. AECQ, USCAR, IPC 650, etc.).

5.6.2 Certificate of Conformity:

- Flex requires that Certificates of Conformity to be included in every shipment for all raw materials, and in PPAP documentation for all direct material, and available at any time. Missing documentation may trigger an official customer complaint.
- Test Results and Process Performance Data is to be submitted as specified on the drawing or purchase order. Flex expects the supplier to generate and maintain all inspection data for all production runs and make it available on request.

5.6.3 Production Part Approval Process (PPAP):

NOTE: The latest edition of the AIAG PPAP Manual is the resource for all PPAP documents. Additional requirements for qualification may be expressed by the Flex Supplier Quality representative.

- First time delivery of new items requires the completion and submission of the Production Part Approval Process (PPAP) as per AIAG requirements. Suppliers may not ship production parts until Flex has approved PPAP documentation. Due dates are agreed with the Supplier Quality Engineers.
    - If Flex receives data that is unacceptable, a corrective action, and/or cost recovery charge can be issued for the time taken to re-do any of the suppliers work or the supplier can be placed on the Supplier Development Program (SDP).
- Production parts are manufactured at the production site under final production conditions including, but not limited to, production tooling, gauging, process, materials, operators, environment, packaging and process settings, e.g. feeds, speeds, cycle times, pressures, temperatures, etc.
- Product approval by Supplier is required prior to first shipment of product in the following instances:
    - A new part or product not previously supplied to Buyer.
    - Correction of discrepancy on prior submitted parts.
    - Product modified by engineering change.
    - Use of other material or manufacture than previously approved.
    - Production from new or modified tooling.
    - Product supplied following change in tooling, process, manufacture, or equipment.
    - Product from tooling or equipment transferred to another facility.
    - Change of subcontractor sourcing.
    - Product re-released after twelve (12) months' inactivity.
    - After Buyer suspended shipment due to Supplier quality concern.
    - A material change that has not previously received PPAP approval.
    - Equipment moves or repositioning within the same plant requires re-qualification.
    - Each occurrence of reworking, re-sequencing, or reprocessing of a part involving customer critical/significant characteristics that are not already formally defined and documented in the approved flow chart and control plan.
    - Change in appearance not specified in "blueprints" by customer specification, e.g., paint dots, etc.
    - Change in packaging.
- Supplier shall inform Flex of any of the activities listed above prior to their implementation.
- Parts for production part approval must be taken from a significant production run. This run would typically be from one (1) hour to three (3) shift's production, with the specific production quantity to total three

hundred (300) parts minimum, unless some other quantity has been agreed upon in writing by Flex. Parts from all cavities of a multi cavity tool, mold, die or pattern are to be measured and representative parts tested (if applicable). Also, statistical evaluation data (Ppk) shall be submitted along with first samples.

- Dimensional reports shall be in the same measurement unit as called out on the drawing or specification. For the statistical analysis and process/part control, the supplier shall use a minimum of extra decimal to perform measurements.
- When results are obtained that fail to meet requirements or specifications, the supplier shall immediately notify Flex for instructions. Parts must be held by the Supplier pending written disposition instructions.
- If the supplier cannot pass the PPAP release, Flex reserves the right to purchase the product from another supplier.
- All Flex Distributors shall ensure their direct Manufacturers are meeting the expectations as stated in this document. Obligation to release PPAP documentation to Flex representative and verify compliance of its manufactures with AIAG requirements and Flex requirements will be under Distributor responsibility.

5.6.4 Special Characteristics:

- *Special Characteristics:* are defined as product characteristics or manufacturing process parameters which can affect safety and compliance with regulation, fit, form and function, performance or subsequent processing of a product.
- Dimensions or characteristics that are identified on the drawing, as *"Safety", "Critical", or "Key"* must be subjected to a process capability study containing a minimum of one hundred and twenty-five (125) samples. The results of the study must indicate a minimum process performance index (Ppk) of 1.67 or greater. Evidence must be submitted prior to obtaining initial rate production approval.
- *Safety characteristics*: Any dimension defined as "Safety" requires 100% verification.
- *Critical Characteristics:* Critical characteristics require a capability study from the supplier as indicated above. The supplier must maintain an on-going process capability index (Cpk) of 1.67 or greater for all critical characteristics. Critical characteristics affecting fit and function requires 100% verification.
- *Key Characteristic*: Any dimension defined as "Key" requires a capability study from the supplier as described above. The supplier must maintain an on-going process capability index (Cpk) of 1.67 or greater for all Key Characteristics.
- For all standard characteristics Cpk & Ppk is $\geq$ 1.33 during preliminary process, and $\geq$ 1 during serial production.

- When other than Flex drawings are involved, other types of symbols may be used and will be defined on the print.
- After sample approval, suppliers are responsible for assuring that future production continues to meet all specification requirements.
- Suppliers shall not ship their products for production use before receiving Flex approval.
- Process capabilities must be determined and documented for the agreed characteristics, passing criteria being defined as below, based on a capability study performed with a minimum of one hundred and twenty five (125) pieces from a minimum three hundred (300) piece run, from each production stream, unless otherwise specified. This data must be submitted with the initial submission (in the absence of a specific customer/design owner specification):

Type of Characteristic	Type of Investigation	Minimum Conditions (unless otherwise agreed)
Safety Critical Key	Preliminary process performance and capability/small batches	CPK & Ppk ≥ 1.67
	Serial process performance and capability	Cpk ≥ 1.67 Ppk ≥ 1.33
	Machine capability	Cmk ≥ 2
Standard	Preliminary process performance and capability/small batches	CPK & Ppk ≥ 1.33
	Serial process performance and capability	Cpk & Ppk ≥ 1
	Machine capability from minimum 125 consecutive parts	Cmk ≥ 1.67

EXCEPTIONS: For processes with wear-related elements such as stamping, forging, die casting, and molding, the initial tooling dimensions shall be skewed toward the appropriate specification limit to allow maximum tool life:

- In case of multiple press tools, testing is carried out per nest.
- Functional testing, as well as additional tests, agreed and documented in PPAP planner, are conducted and documented.
- A test of transport means/packaging including designation and labeling is conducted and documented in the PPAP documentation.
  There may be exceptions where an Interim Approval permits shipment of material for production requirements on a limited time or piece quantity basis. An exception will only be granted when the supplier has:

- Clearly defined the root cause of the non-conformities preventing production approval, and
- Prepared an interim approval action plan agreed upon by Flex Re-submission to obtain "production approval" is required unless the supplier is advised that Flex has revised the drawings or specifications to agree with the part as manufactured.

Material covered by an interim approval that fails to meet the agreed-upon action plan, either by the expiration date or the number of pieces or the authorized quantity, will be rejected. No additional shipments are authorized unless an extension of the action plan is granted.

5.6.5 Measurement System Analysis:

- Variable Gage Studies shall be completed with all operators who will be using the gage as part of normal production process. The study shall consist of a minimum of three (3) trials, using a minimum of ten (10) parts. All variable gage R&R studies should have a minimum of five (5) distinct categories:
  - For process control situations (where measurement determines stability, direction, and compliance with natural process variation) percentage R&R should be calculated based on study variation.
  - For product control situations (conformance or non-conformance) the percentage R&R should be calculated based on tolerance.
- Attribute Gage Studies shall be completed with three (3) operators, three (3) trials, using a minimum of thirty (30) parts:
  - **NOTE:** Fourteen (14) parts should be considered unacceptable to varying degrees, sixteen (16) parts to be considered acceptable. Out of the fourteen (14) parts unacceptable, seven (7) parts should be outside of each upper or lower limit, while the other seven (7) should be marginal, on both sides of the limit. The remaining sixteen (16) parts, acceptable, should represent the full range of the process variation.
  - All attribute gages for special characteristics used for process control must be built to 75% of the specified tolerance, centered around the target, unless otherwise agreed. Gages to the full tolerance may be used for product control (e.g. EPC, final inspection, or sorting operations).
  - Gages not meeting the acceptance criteria per the AIAG MSA manual shall have an alternate inspection method and a gage improvement plan. This shall be submitted in writing to the buyer for approval.
  - Gage studies should be re-verified at a frequency that is appropriate for gage use and wear.
  - Recommendation: Gage re-verification studies should be completed at the time of calibration.

5.6.6 Part Submission Levels:

- Flex will identify the submission level that will be used with each Supplier and part number combination, taking in consideration following factors:
  - Supplier compliance with IATF 16949 current version requirements.
  - Part criticality.
  - Experience with prior part submissions.
  - Supplier expertise with the specific commodity.
  - Supplier performance.
- Where no level is specified, level 3 becomes the default. Level 3 submittals are also required to support any change to approved processes or products or to correct previous submissions.

5.6.7 Special Process Assessments:

- Special processes for suppliers of heat treated, plated, coated, welded or soldered products, etc., suppliers shall comply with the requirements documented in (as per AIAG):
  - CQI-9 Special Process: Heat Treat System Assessment (HTSA).
  - CQI-11 Special Process: Plating System Assessment (PSA).
  - CQI-12 Special Process: Coating System Assessment (CSA).
  - CQI-15 Special Process: Welding System Assessment (WSA).
  - CQI-17 Special Process: Soldering System Assessment (SSA).
  - CQI-23 Special Process: Molding System Assessment (MSA).
  - CQI-27 Special Process: Casting System Assessment (CSA), etc.

6.0 NON-CONFORMING PRODUCTS

6.1 Non-conforming product is defined as a disruption created by Supplier impacting Flex or Flex' customer's processes (violation of specification, a DPPM/quality level over committed target, delayed response, lack of/non-robust containment/corrective action, delayed deliveries, etc.)

6.2 If non-conforming products are detected during APQP or after production starts, the Supplier shall take appropriate actions to reduce the effects of the nonconformity. After corrective action are implemented, product must be subjected to re-verification for a minimum period of three (3) consecutive deliveries, or minimum thirty (30) days of continuous production, or otherwise agreed with Flex Supplier Quality Engineer.

6.3 Any escape after implementation of the corrective actions, will be considered a gate breaker, triggering a new complaint, possibly accompanied by CSL status.

6.4 Supplier Corrective Action Request (SCAR):

- A Supplier Corrective Action Request (SCAR) may be issued to the supplier for non-conformances discovered during a Flex audit of the supplier's quality system or because of delivered product quality, customer satisfaction or continuing delivery performance problems. SCARs will also be issued for each rejection of material at Flex or our customer when it is determined that the Supplier is at fault.
- Supplier Corrective Action responses shall be in the 8-D format. As per specific customer requirements a 5 WHY may be requested. Containment Actions must be completed and communicated to Flex within one (1) working day (24 hours) of issue of the SCAR. Typical containment activities include sorting and rework activities (only under Flex approval), as agreed in advance with Flex Supplier Quality Engineer.
- Preliminary investigation plan, along with route cause analysis and proposed completion dates, must be submitted within five (5) working days of issuing the CAR. Any updates to the plan shall be promptly communicated to Flex. All destructive analyses must be promptly notified to Flex and agreed accordingly.
- Flex strongly encourages the use of the 8-D checklist that is attached to the SCAR and the 5-WHY.If the initial submission for root cause is not adequate, Flex can require that the supplier submit the 5-WHY, Fishbone diagram, along with the SCAR.
- Full implementation of final corrective actions is due thirty (30) calendar days from the date of notification. When necessary, suppliers may file for extension to Corrective Action deadlines with the Flex Supplier Quality Engineer.
- All products being shipped to Flex affected by the SCAR will require the packaging to include a visible label that reads "Sorted Material per SCAR#_____". This label shall be applied to incoming product until the SCAR and Corrective Action is closed.
- If the supplier fails to respond to containment within one (1) business day, Flex has the option to:
    - In case the parts need to be sorted and Flex personnel inspect and sort all incoming suspect materials, Cost Recovery should be initiated as mentioned in section 6.6.
    - Initiate third party sort for all incoming suspect materials. These costs will be billed to the supplier by the third-party sorting company.

6.5 Supplier RMA Requirements:

- When Flex requests a Return Material Authorization (RMA) the supplier must respond within one (1) working day (24 hours). If a response is not received within one (1) working day (24 hours), Flex may scrap the material if no investigations required, and debit the supplier or Ship the material back to the supplier "Freight Collect" and debit the supplier at Flex discretion. A customer satisfaction SCAR can be also triggered.

6.6 Cost Recovery Process:

- Supplier Cost Recovery will be initiated by Flex when it has been determined that the supplier is responsible for quality and or delivery events, through the Supplier Cost Recovery Note. Cost Recovery process will be initiated for such events as, but not limited to, affected stock on hand as received to Flex, product in transit, received goods, assembly line downtime due to delivery or quality related issues, sorting, etc., including customer damages.

  NOTE: Minimum of thirty (30) days Corrective Actions verification period with no re occurrences is mandatory.

6.7 Failure to Respond to Corrective Action Requests:

- Suppliers failing to respond to SCARs on time will be downgraded in quality and may be subject to Business on Hold, or de-sourcing, due to lowered rating. Flex Supplier Quality Engineer will review SCARs for completeness and acceptability of the corrective action plan. Supplier Corrective Action will be rejected if root cause or corrective actions are not robust enough.

6.8 Line Stop Events:

- Additional supplier support may be required at Flex site in case of epidemic or excessive failures. This may include problem analysis on the factory floor, screening, rework or other actions as necessary to ensure product quality and customer commitment deliveries are not compromised.
  - Factory Support, Normal: Within twenty-four (24) hours of contact.
  - Line Stops: Support within two (2) hours of contact.

7.0 PRODUCT QUALITY LEVEL

7.1 Zero Defect Policy:

- The supplier shall adopt the objective of ZERO DEFECTS and 100% on time delivery.
- Within the Zero-Defect policy, Supplier shall:
  - Implement all necessary measures to achieve zero defects.
  - Measure and evaluate achieved quality, by defining the following quality objectives:
    - Internal and external complaint rates preferably based on defective parts per million (DPPM).
    - Number of customer complaints.
  - Monitor and reduce the high cost of quality issues.
  - Continuously evaluate operations and systems where flaws may be introduced.

- Work proactively to address the flaws in its systems and processes which allow defects to occur.

7.2 Quality Target Conformance (DPPM):

- Supplier agrees to provide products with a failure rate of Zero (0) DPPM for any product delivered.
- Flex Automotive expects specific quality levels for the new products (e.g. in below table) on the way to achieve Zero (0) DPPM, based on a time phased plan, not exceeding twelve (12) months. These expectations are reflected in the supplier rating system.

Products Examples	Conformity Target Examples (DPPM)
Finish Goods	< 100 DPPM within the 1st year after SOP (start of production); 50 DPPM second year.
PCB	< 50 DPPM
Electronic Components	< 2 DPPM
Plastic Parts	< 50 DPPM
Power / Battery Manufacturing and Performance	< 20 DPPM
Sheet Metal / Casting Process	< 20 DPPM
Mechanical Assembly	< 50 DPPM
Wires, Cables	< 10 DPPM

- For any of the agreed DPPM target, a step-down chart will be applied as a Continuous Improvement Program in order to achieve ZERO DPPM target.
- These expectations are valid if they are not otherwise defined for specific customers when Flex will release a dedicated Quality Purchasing Agreement (QPA).

7.3 Any established DPPM target is not an acceptable quality level but represents an intermediate continuous improvement step towards shipments of products (components/materials) meeting zero defect objective.

8.0 CONTINUOUS IMPROVEMENT PROCESS

8.1 The supplier is required to have documented plans to:

- Baseline, and improve process capabilities for critical processes or parameters.
- Reduce variation within parts, part to part, and from manufacturing process to manufacturing processes.
- Centering of the processes.
- Reduction of inspection frequency.
- Avoidance of rework and scrap.
- Analysis of complaints.

8.2 When required, Flex Supplier Quality Engineer will work with supplier, and/or with Flex customers, to identify critical characteristics for products and processes/parameters that most impact these characteristics.

8.3 Improvement Roadmaps:

- Supplier's management responsibility is to assure continuous improvement. When Supplier underperforms, Flex will require its Suppliers to release an improvement roadmap within two (2) weeks after the receipt of the summary of the supplier rating. This roadmap should contain robust actions, meant to bring the rating at the highest rating level.
- Flex expects the following information in the Improvement Plan (as a minimum):
  - Area of improvement.
  - Short- and long-term actions for improvement.
  - Definition of responsibilities.
  - Clear objectives.
  - Clear target dates.
  - System for results verification and period.

8.4 In case of failure re-occurrences and continuous quality underperformance, the following Quality Escalation Process will be applied:

- Stage 1) Controlled shipment level 1 (CSL 1)
  - Level 1 containment is defined as additional 100% controls implemented at the Supplier's location, upon Flex' request, following the identification of a Supplier quality issue. The role of containment is to secure the entire system of any non-conforming material and to protect Flex from receiving any additional defective product. Supplier has the obligation to quarantine and sort all suspected products within their facility, at their subcontractors, in transit, and at Flex facilities, and at any customer service parts location which may have parts in inventory.
  - Upon identification of an issue, the Flex site quality contact will initiate containment activities by sending a Level 1 letter to the Supplier's Quality Manager. The letter details the specific nonconformance and required Supplier actions, including inspection and exit criteria.
  - Supplier is expected to define and implement a containment plan within twenty-four (24) hours of Level 1 notification, followed by Flex approval.

With the frequency agreed, supplier will report containment results to Flex contact.

- Data from the supplier's containment activities must be kept on file and available upon Flex request. Quality tools such as trend, Pareto, or Paynter charts are expected to be utilized as verification of containment effectiveness. This data will be held in Flex product file after completion and exit from Level 1 containment.
- Criteria for exiting Level 1 containment will be determined by the Flex site quality contact. Exit criteria will be based on reaching a pre-determined quality level, not a number of parts or days sorted. To exit required containment, the Supplier must achieve a pre-determined quality level after a minimum of thirty (30) days and, or three (3) production lots. After defined timelines and metrics, Flex site quality contact will evaluate the exit criteria and will communicate in writing that the Supplier has been removed from Level 1 containment.

- Stage 2) Controlled shipment level 2 (CSL 2)
  - Level 2 containment is defined as additional controls by an impartial third-party organization, selected by Flex at the expense of the Supplier. Level 2 containment is initiated when a Supplier's Level 1 containment activity fails to be met. After strict evaluation of the non-conformance issue, Flex site quality contact will initiate containment activities by making the selection of who will be doing the third-party containment and by sending a Level 2 letter to the Supplier's Site Manager and Quality Manager.
  - The Level 2 letter details the specific non-conformance and required Supplier actions, including inspection and exit criteria. In addition, the letter may communicate a kick-off meeting specific to the Supplier's failed Level 1 activities.
  - Supplier is responsible for confirming receipt of the Level 2 notification with an authorized signature by returning a copy of the letter to the Flex site quality contact.
  - The third party will be responsible for performing the sort function per the established inspection criteria and recording the results. The third party will provide documentation to both the Supplier and Flex site quality on the progress of containment activity.
  - **NOTE:** Initiation of Level 2 containment does not relieve the Supplier of any relevant Level 1 activities following the aforementioned containment guidelines and responsibilities.
  - Format and frequency of communication to the affected Flex location will be documented in a Level 2 communication plan. Any milestone, defects, or other limitations will be promptly communicated to Flex.
  - Level 2 containment will be removed only when all data indicates no issues are found in the Level 1 containment upstream in the process. If applicable, a review meeting will be scheduled at the Supplier's facility to review the data prior to discontinuing the audit.

- Following this review, the Flex site quality contact will evaluate the exit criteria and communicate in writing that the Supplier has been removed from Level 2 containment. Level 1containment must continue at the Supplier's location until the Flex site quality contact has given approval for Level 1 to be discontinued.
- The Supplier's third-party certification body must be informed about the CSL status, by supplier.

- Stage 3) Quality Improvement -- Meeting of upper management:
  - High management representatives of Flex and Suppliers define together immediate quality improvement actions and the Supplier dedicates for these actions all necessary resources.
  - The high-level management improvement meeting is the last attempt to solve the quality problems with Supplier before New Business Hold step.

- Stage 4) New Business Hold (NBH):
  - In cases of no improvement and not corrected underperformance Flex takes the right to place its Suppliers on the status of new business hold. Duration of NBH is minimum six (6) months and is defined by responsible SQA management, followed by exclusion from Flex Preferred Supplier list (PSL).
  - The Supplier's third-party certification body has to be informed about the NBH status.
  - NBH Criteria for application:
    - Negative trend with no improvement in three (3) months of deliveries.
    - Unauthorized process or tool change (resulting in major disruption).
    - Repeated major disruptions (downtime, stock out, warranties).
    - Lack of achievement in the DPPM step down chart.
    - Unsatisfactory high-level management improvement meeting.
    - Customer satisfaction in complaint management process.
    - Degraded communication.
  - When exit criteria have been met, the SQE sends the supporting documentation to Flex Supplier Quality Management for review and approval.

- Stage 5) Supplier Disqualification:
  - If the Supplier has not improved the quality, Flex reserves the right to re-source the product to another Supplier and interrupt any activity with underperforming Suppliers.

9.0 TRACEABILITY AND SHELF LIFE

9.1 Supplier must provide as per Automotive requirements full traceability by part and to ensure a minimum of six (6) months remaining prior to date code expiration.

10.0 RESPONSIBILITY

10.1 Changes to this procedure can only be made by approval from Corporate Supplier Quality Systems team or Global Automotive Segment team. Request for changes can be addressed to the team by anyone using this process.

10.2 Site and Segment/Business unit supplier quality and materials personnel are responsible for ensuring their Suppliers are familiar with this document.

10.3 Corporate Supplier Quality Systems team or the Automotive Segment team is responsible for ensuring this document is referenced in all supplier contract documents and current versions made available on the Flex external web page.

11.0 DOCUMENT REVIEW AND APPROVAL REQUIREMENTS

11.1 This document shall be reviewed and approved as defined in Control of Documented Information, FMS-QMS-1-001-00.