Supplier Quality Manual

INTRODUCTION

Welcome to SoundOff Signal

SoundOff Signal specializes in providing Vehicle Lighting and Signaling Solutions to our customers in law enforcement, amber and government markets.

Introduction to Manual

Our business success is only achievable through repeat customer orders and repeat orders can only be achieved if the desired saleable products meet quality, cost and delivery requirements. Suppliers who consistently deliver products that meet or exceed our expectation will earn more business and grow with us.

This manual is provided to clarify the requirements of the relationship between SoundOff Signal and our suppliers.

Scope

This information applies to all suppliers who have interest in doing business with SoundOff Signal and with our partners and/or subsidiaries.

SoundOff Signal Quality Policy

"*We are committed to providing our customers with superior products and services, produced in an environment of continuous improvement, that meet or exceed their requirements and expectations for quality and delivery."*

Notes:

The supplier's primary contact should always be the SoundOff Signal Buyer. Suppliers may work with Engineering and Quality team members as opportunities are presented.

This manual refers to other documents. Please check our website or request them from the SoundOff Buyer.

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1.0 Quality Management System Requirements

1.1 Quality Management System

Each SoundOff Signal supplier is required to maintain a quality management system, preferably one that conforms to an ISO or IATF standard. In addition, the supplier must meet all other requirements of this manual.

1.2 Quality Manual and Procedures

The supplier, *as requested*, will furnish SoundOff Signal with a copy of the supplier's Quality Manual and supporting procedures. This includes detailed documents and work instructions specific to production of material for SoundOff Signal.

1.3 Control of Sub-tier Suppliers

Suppliers are responsible for the quality of materials and components provided by their sub-tier suppliers and sub-contractors. SoundOff Signal suppliers must impose controls on their sub-tier suppliers that provide quality results and documentation comparable to the controls applied to suppliers by SoundOff Signal. The extent of the controls may vary, depending on the nature and complexity of the product and processes, but should normally include:

- Evaluation and qualification of sub-tier supplier facilities
- Control to ensure that raw materials used meet SoundOff Signal's requirements
- Part qualification, including first article inspection and process capability studies as applicable
- Control of drawings/revisions
- Control of non-conforming material
- Corrective action and preventive action programs
- Material and/or Process traceability
- A continuous quality improvement program
- Controls to ensure that the sub-tier suppliers of components used are those approved by SoundOff Signal, where applicable
- Ensure that sub-tier suppliers have an ESD control program that meets or exceeds the needs of SoundOff Signal, where applicable

Where appropriate, SoundOff Signal may specify the sub-tier suppliers that may be used, evaluate and qualify the sub-tier supplier's facilities, and assist the supplier in controlling the sub-tier supplier. Typically, this occurs when the sub-tier supplier is an essential component of the supply-chain process. *SoundOff Signal reserves the right to evaluate the quality system and records of such sub-tier suppliers as necessary*. *In the event of SoundOff Signal's involvement, it does not absolve suppliers of the ultimate responsibility for the quality performance of their sub-tier suppliers.*

2.0 Supplier Qualification Process

All suppliers of production materials to SoundOff Signal *must* be qualified suppliers. The extent of the qualification process is dependent upon the criticality of product purchased and other factors determined by SoundOff Signal. The qualification process in its most complete form consists of three parts:

- A questionnaire completed by the supplier.
- A quality management system self-assessment completed by the supplier, using the SoundOff Signal supplier assessment survey form. This is returned, along with the supplier's quality manual and documentation for review by SoundOff Signal.
- An on-site assessment by SoundOff Signal personnel or their authorized agents.

SoundOff Signal periodically reevaluates suppliers through the use of quality performance data and/or on-site assessments.

2.1 New Supplier Questionnaire

In the early stages of the supplier selection process, potential suppliers are sent a questionnaire. This questionnaire solicits general information about the company such as location(s), size, capabilities, contacts as well as detailed questions regarding the Company's quality management system and quality history.

2.2 New Supplier Self-Assessment

When a new supplier is being considered, they are sent a quality management system self-assessment survey form. The supplier completes the self-assessment and returns it along with a copy of their quality manual and supporting documents. SoundOff Signal will review the quality manual, procedures, and survey to determine if the quality system meets SoundOff Signal's requirements.

2.3 On-Site Assessment

For suppliers of critical components, an on-site assessment of the supplier's facility may be performed. The on-site assessment includes three components:

- A quality assessment to determine whether the supplier's quality management system is in place and functioning effectively.
- A business assessment to determine whether the supplier has financial resources, production capacity, and other business resources needed to fulfill SoundOff Signal's production needs.
- A technology assessment to determine whether the supplier has the needed technical resources, including production and inspection equipment, facilities, engineering resources, etc.

If the assessment team determines that the supplier meets SoundOff Signal's requirements, SoundOff Signal qualifies the supplier to bid on new business and supply production materials.

2.4 Periodic Re-evaluation

SoundOff Signal periodically re-evaluates current production suppliers through the use of performance data and/or on-site assessments. Performance Data includes but is not limited to *PPM and On time Delivery*. If requested, the supplier shall make their facility available for on-site process verification by SoundOff Signal personnel, with reasonable notice.

3.0 Part Qualification and PPAP

The supplier is responsible for submitting PPAP or relevant data, as requested. Part qualification and PPAP will be requested by the SoundOff Signal Quality team and should be submitted to the requesting personnel. A Level 3 PPAP per the AIAG standard with at least 3 samples is our standard. Where possible, all PPAP documents should be submitted in electronic format (preferably Adobe Acrobat or Microsoft Office).

3.1 First Article Requirements

The supplier is responsible for submitting all First Article data requested by SoundOff Signal. SoundOff Signal and the supplier will agree on the number of the samples to be checked and submitted with the first article data.

In some cases SoundOff Signal personnel may wish to be present during the initial production run. This will allow SoundOff Signal to verify and validate the process before any product is shipped.

3.2 Dimensional Inspection Report

SoundOff Signal notifies the supplier of the quantity of parts to be inspected, typically 3 from each tool or cavity. The supplier inspects or tests each sample for all dimensions, drawing notes, and specification requirements listed on the current revision of the SoundOff Signal drawing and/or specification. The supplier records the results on their First Article form/ISIR or equivalent. The supplier numbers a copy of SoundOff Signal's drawing and/or specification (balloons) to correspond with the supplier's results.

The dimensional inspection report must include the specification number, specified requirements, and the inspection/test results. A simple statement that the material meets the requirements is not acceptable. Each report must be traceable to the supplier's material, through lot/batch numbers or equivalent, and must be signed by the organization that performed the testing. For any requirements that the supplier does not have the equipment to inspect or test, the supplier may obtain reports from their sub-supplier or other test agency.

3.3 Material Certification/Test Report

When requested, the supplier must provide a material certification/test report. This report must include the specification number, specified material and/or physical requirements, and the inspection/test results. A simple statement that the material meets the requirements is not acceptable. Each report must be traceable to the supplier's material, and must be signed by the organization that performed the testing.

3.4 Gage Repeatability & Reproducibility (R&R) Studies

For those *characteristics specified* by SoundOff Signal, the supplier must perform gage R&R studies. SoundOff Signal must approve R&R values greater than 10 percent of the tolerance.

Standard process for variable gages, is three different operators measure ten samples three times each. SoundOff Signal must approve any alternative methods.

3.5 Gage Correlation Studies

For *characteristics specified* by SoundOff Signal, the supplier must perform a gage correlation study. This consists of the supplier identifying, measuring and recording a specified number of production parts. The supplier then sends the parts to SoundOff Signal for measurement. SoundOff Signal compares their measurements with the supplier's measurements to determine the correlation between the gages.

3.6 Process Capability Studies

Process Capability (C_{pk}) is a comparison of the inherent variability of a process output to specification limits *under statistically stable conditions*. There are a number of techniques for assessing the capability of processes. A Cpk of at least 1.67 is required for SoundOff Signal critical dimensions.

3.7 Failure Modes and Effects Analysis (FMEA)

When requested, the supplier must perform a Design Failure Mode and Effects Analysis (DFMEA) and/or a Process Failure Modes and Effects Analysis (PFMEA), and submit it for approval. For parts and assemblies that are designed by the supplier, the DFMEA considers all reasonably foreseeable design failure modes. The PFMEA considers all reasonably foreseeable potential failure modes of each process. Based on the potential seriousness and likelihood of the problem, the supplier develops design controls or process controls. The PFMEA should be a living document, and should be updated when process changes occur, or when defective material is produced.

3.8 Control Plan

When requested, the supplier must develop a control plan, and submit it for approval. The control plan is a detailed description of the supplier's proposed processing steps required to produce the part, and the controls that are put into place to control the quality at each step. The control plan must include all in-house processing, external processing, inspection, packaging, and shipping. Suppliers may use their own format. Measuring devices and fixtures designed and built to check SoundOff Signal parts must be identified with a gage number and drawing, and must be listed on the control plan.

The control plan must include all critical characteristics. Where detailed instructions are required, the supplier details those instructions in a work instruction, or equivalent, which must be listed in the control plan and submitted in the PPAP. Inspection methods, sample sizes, and sampling frequencies should be based on the process capabilities, seriousness and likelihood of potential non-conformances, and process stability. Critical characteristics that do not meet SoundOff Signal's process capability requirements must be inspected 100%, unless SoundOff Signal approves alternate control methods in writing.

3.9 Electrostatic Discharge (ESD) Susceptibility

When components or assemblies supplied to SoundOff Signal are susceptible to ESD, the supplier shall establish ESD susceptibility information for them. Procedures, methods, and equipment used for determining the ESD susceptibility shall be provided to SoundOff Signal. ESD failure modes shall be considered in PFMEAs, and ESD controls shall be included in control plans and packaging.

3.10 Material Safety Data Sheets (MSDS)

As applicable, Material Safety Data Sheets (MSDS) must be provided during First Article process.

3.11 Agency Approvals and Compatibility Reports

The supplier is responsible to provide the proper agency approval test reports per SoundOff Signal requirement. Examples are UL, CE, FCC, TUV, etc. The supplier is also responsible for agency test reports from their sub-supplier or other outside test agencies.

The suppler is responsible to submit test results that verify compatibility as required (USB, 1394 etc.). Testing may be done by the supplier or by a test facility certified by the supplier.

3.12 Traceability

The supplier must plan for traceability of components. The supplier will provide a written plan specifying how components will be marked with serial or lot numbers and date codes if required, or how containers will be identified with lot numbers or date codes if component marking is not required. The plan will also include sizes of lots or batches. Where possible, batch sizes should be minimized to aid in containment should quality problems be found.

4.0 Manufacturing Control

4.1 Process Control

SoundOff Signal suppliers are required to control all manufacturing processes in accordance with the control plan, which is approved during part qualification.

4.2 Statistical Process Control

Where *specified in the control plan*, the supplier is required to apply effective statistical process controls. Effective controls must include:

- The control chart displays control limits that are correctly calculated (specification limits may not be used as control limits).
- The control chart is at the process area, visible to the operator, or persons who are responsible for controlling the process.
- For each out-of-control condition, actions are taken to bring the process back into control. Actions taken to bring the process back into control are recorded.
- Product produced during any out-of-control condition is sorted, scrapped, reworked or dispositioned through the supplier's material review process as stated on the control plan

4.3 Process Improvement

Out-of-control or unstable processes (which have assignable causes) and processes that do not meet the minimum C_{pk}/ P_{pk} requirements must be identified and corrected. The Supplier must also improve processes with low yield rates per their established standards.

4.4 Lot Control

A lot consists of product of one part number and revision that are made at the same time, under the same processing conditions, from the same lot of raw materials. The primary purpose for identifying lots is to determine the scope of actions that must be taken when problems arise during further manufacturing or with customers. Each container of material shipped to SoundOff Signal must be identified with the Supplier's lot number. Inspection records must be traceable to lot numbers.

The following are typical conditions that result in a change of lot numbers:

Change of part number or revision
Change of part number or revision of components
Interruption of continuous production (typically for more than a few hours)
Repairs or modification to the tooling or equipment
Tooling changes (other than minor adjustment or replacement of consumable tooling)
Change to a different lot of raw materials
Process changes

4.5 Traceability

Traceability ties finished product back to the components used in the product. When traceability is specified, the traceability marking should be effective down to the individual component, i.e., lot code, batch or serial should be identifiable throughout SoundOff Signal's processes.

4.6 Workmanship

When workmanship standards are not referenced on SoundOff Signal drawings or specifications, the supplier is expected to follow industry-accepted standards (e.g. ANSI, IPC). When in doubt, consult with SoundOff Signal for clarification.

4.7 Safety

At no time should any customer, or person at a SoundOff Signal facility, be exposed to hazardous material or situations that are not inherent in a component's structure. Residues, films, out-gassing products and packaging materials should comply with OSHA (Occupational Safety & Health Association) standards. For items with inherent hazards, safety notices must be clearly observable. As applicable, MSDS sheets must be provided during the First Article process.

4.8 Electrostatic Discharge (ESD) Controls

If the supplier furnishes ESD-sensitive materials, the supplier must maintain an effective ESD handling program that meets all requirements for the material produced.

5.0 Drawings/Changes

5.1 Drawing and Change Control

The supplier must have a process for assuring that the latest SoundOff Signal drawings are in effect at their facility. The supplier's process must control the receipt, review, distribution, and implementation of all changes to drawings and specifications. In addition, the process must address control of obsolete drawings and specifications. There should also be a process that controls the method used to contain new or modified parts until approved by the customer.

5.2 Process Changes, Engineering Changes

Suppliers must have systems in place to control changes to drawings, specifications, processes, or produced parts. Systems should be capable of handling changes being requested by the customer, and also changes requested by the supplier.

NOTE: The First Article approval process is directed at a given part number for a specified revision level produced in a specific area of the manufacturer's facility. **Suppliers may not make any changes in their process, location, material, or to the part without written approval from SoundOff Signal.** The supplier must formally request a process change on all SoundOff Signal components using one of the forms described in 5.3 and 5.4

5.3 Supplier Deviation Request

A supplier is never permitted to knowingly ship product that deviates from the print, specification limits, or design intent without written authorization from SoundOff Signal. If such a condition exists, the supplier may request SoundOff Signal to allow shipment of the product. This is accomplished by initiating a Deviation Request. Reference SoundOff document QWI-PR-021 Supplier Deviation Authorization form.

If directed by SoundOff Signal, the supplier must send samples of non-conforming items to SoundOff Signal for evaluation. The cost of any testing required to determine the acceptability of the product will be charged to the supplier. SoundOff Signal will determine the item's acceptability and what corrective actions (if any) are required beyond the deviation. If approved, SoundOff Signal will send a written deviation approval to the supplier.

The deviation is only intended to be an interim action and **is not** to be construed as an engineering change. The supplier must begin work immediately to correct the condition in question. This must be accomplished within the time frame stated on the deviation. Failure to comply with the mutually agreed upon closure date for the deviation may result in the supplier's rating being affected.

In all cases, the supplier must fully contain all product suspected of being non-conforming at their facility. In addition, the supplier may be required to sort any suspect product at SoundOff Signal or in transit.

Any parts sent to SoundOff Signal that have been approved on a Deviation must be clearly identified on the box, container, or other packaging method with the appropriate markings decided jointly by SoundOff Signal and the supplier.

5.4 Supplier Request for Change Form

A Supplier Request for Change is used to request a change to a released part, process, drawing, or specification. SoundOff Signal encourages process improvements with the stipulation that before a change is submitted, the supplier thoroughly reviews their PFMEA and control plan to assure that all process-related issues have been addressed and resolved. Reference SoundOff document QSP-PR-002-B Supplier Request for Change Form.

The originator should include the following information:

- Drawing or part number and description
- Description of problem and recommended change
- Reason for change
- Proposed effective date

The supplier submits the Supplier Request for Change with the revised PFMEA and Control Plan (if applicable) to SoundOff Signal for evaluation of the following:

- SoundOff Signal Design Specifications
- Comparison to First Article data

After SoundOff Signal has completed the review, and concurs with the supplier, SoundOff Signal will notify the supplier as to the final disposition of the Request for Change Form and part submittal requirements and dates.

When monitoring is required, the appropriate markings must be identified on the lots etc. for a specified time frame as decided jointly with SoundOff Signal and the supplier.

6.0 Packaging & Labeling

6.1 Packaging

Each supplier must adequately plan for packaging. SoundOff Signal encourages supplier-initiated packaging improvements. Suppliers will provide packaging that provides protection from any damage that may occur. Packaging, labeling, and shipping materials must comply with the requirements of common carriers, in a manner to secure the lowest transportation costs.

Packaging for ESD sensitive items must meet appropriate ESD packaging requirements. Contamination is a serious concern to SoundOff Signal. Packaging must protect the components from contamination, including fibers from the packaging materials.

Expendable materials and packaging must be legal and safe for standard “light industry” disposal. The preferred maximum weight of manually handled packs is 35 lbs unless approved by SoundOff Signal in writing.

Only one part number and one supplier lot is to be packaged in a shipping container.

6.2 Labeling

Please reference SoundOff instruction Supplier Labeling Standard QWI-PR-020 for complete details on labeling requirements. Some of our drawings also include part specific labeling requirements. Please confirm with the Buyer if there are questions.

7.0 Corrective Action System

SoundOff Signal requires suppliers to utilize a closed-loop corrective action system when problems are encountered in their manufacturing facility, or after non-conforming product has been shipped to SoundOff Signal.

7.1 Corrective Action Process Approach

The corrective action system utilized should be similar to the process outlined below. The focus should be on identifying the root cause(s) of the problem and taking action to prevent its recurrence.

- Use a team approach
- Describe the problem
- Contain the problem
- Identify and verify root causes(s)
- Implement permanent corrective actions
- Verify corrective action effectiveness
- Close the corrective action

7.2 Supplier Corrective Action

SoundOff Signal requests a Corrective Action (CA) from a supplier when non-conforming parts are found at incoming inspection, in production, in test, or by a SoundOff Signal customer. They can also be requested as a result of a supplier audit. SoundOff's Quality team will issue an MRR (Material Reject Report) on parts found to be non-conforming to the Buyer. The Buyer will forward the MRR to the Supplier.
The supplier is required to respond by initiating a Corrective Action for their process and notifying SoundOff Signal. The following provides a brief outline of a recommended Corrective Action process:

- The supplier should take immediate containment action upon notification of the non-conformance. The supplier must submit a written response to SoundOff Signal, reporting the Supplier's initial observation and defining the interim containment plan within 24 hours of notification. The supplier's initial observation is an acknowledgement that the supplier has been informed of the problem, and has begun to gather information about the non-conformance.

- The containment plan must clearly define the containment actions at the supplier's facility to assure that no non-conforming product is shipped to SoundOff Signal. If suspect product has already been shipped, the supplier must address all suspect stock in transit and any stock at SoundOff Signal. The supplier will assist SoundOff Signal in identifying customer risk by identifying all suspect lot numbers and associated quantities involved.

- Within 10 days after the original notification, the supplier must report the results of the supplier's investigation into the cause of the problem.

- Within 3 weeks from the initial notification date, the supplier must submit the corrective action, including an updated PFMEA, to be taken to prevent recurrence of the problem, and the effectivity date (the date the corrective action will be implemented.). Actions such as "train the operator," "discipline the operator," or "increase inspection," are ***not*** acceptable corrective actions.

- The supplier is required to keep SoundOff Signal informed of progress towards implementing the corrective action. When corrective action implementation is complete, the supplier and SoundOff Signal verify that the corrective action is effective in preventing the problem's recurrence.

8.0 Supplier Monitoring

SoundOff Signal continually monitors its suppliers to ensure they continue to meet SoundOff Signal's requirements, and to ensure that the supplier continues to ship acceptable parts. This may consist of:

- A quality management system audit at the supplier's facility
- A random incoming inspection audit of a batch of product
- Review of supplier-furnished data packages
- A supplier progress review meeting conducted periodically at the supplier's site or SoundOff Signal to review supplier performance and progress
- PPM (failed Parts per Million)
- On Time Delivery

8.1 Supplier Audits

Periodically, SoundOff Signal may audit the Supplier's quality management system. The supplier must make their facility available for on-site process verification by SoundOff Signal personnel at any time, with reasonable notice. This may be a full or abbreviated documentation and on-site audit. The purpose is to evaluate any changes that may have occurred in the Supplier's quality management system, and to assess the supplier's continuing commitment to quality improvement.

Periodically, SoundOff Signal may also audit the supplier's continuing conformance to the control plan approved in the First Article process.

8.2 Inspection Audits

SoundOff Signal expects its suppliers to furnish material that conforms to all requirements, and that does not need to be inspected when SoundOff Signal receives it. SoundOff Signal may reject the entire lot when a single non-conforming part is found. At SoundOff Signal's discretion, in order to meet production requirements, 100% sorting may be done as necessary at the supplier's expense.

SoundOff Signal may inspect product at the supplier's facility to detect potential problems prior to shipment. SoundOff Signal may also inspect product at sub-tier suppliers.

8.3 Supplier-Furnished Lot Documentation

SoundOff Signal may require the supplier to furnish inspection, test, process performance, or other quality data with each shipment to ensure that the product meets SoundOff Signal's requirements. When data submission is required, the data must accompany each shipment, or be e-mailed or faxed to SoundOff Signal at the same time the lot is shipped. All documentation must be clearly identified with SoundOff Signal's part number, and the supplier's lot number.