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SOLUTIONS



Littelfuse Technologies: Power Thyristors • Protection Arrays • Fuses • PTCs • Varistors • TVS Diodes • GDTs • ESD Suppressors • SIDACTor Devices

Supplier Quality Manual



Expertise Applied | Answers Delivered

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General Quality Expectations

Our expectations of suppliers and ourselves extend beyond the basic entry criteria that correspond to quality, delivery and cost to encompass service, technical knowledge, continuous improvement and more!

We set high standards that apply to Littelfuse and to our suppliers. Our suppliers are responsible for ensuring the quality of their products — with a goal of zero defects — meeting delivery commitments, and keeping costs competitive.

All suppliers are also expected to deliver high quality service, maintain appropriate inventory, demonstrate technical knowledge and make continuous improvements. We look for suppliers who are flexible, committed to growing the relationship and focused on the end user. In return, we provide the support, information and resources needed to help our suppliers meet these expectations, and to jointly achieve our goal of total customer satisfaction.

What we expect from you:

Quality products that fully meet specification

Environmental compliance

On-time delivery

Competitive costs

Adequate inventory

Technical knowledge

High quality service

Continuous improvement

Shared goals, and

Commitment to the business relationship

All of the sections in this manual describe the specific requirements and expectations for doing business with Littelfuse.

Supplier Requirements Matrix

The following matrix describes the requirements for supplier qualification for doing business with Littelfuse.

Supplier Type	Risk Assessment	Environmental Testing	ISO/TS Required	Self-Survey Required	LF Validation Testing Required
Direct	Yes ¹	Yes	Yes ²	Yes	Yes
Indirect	Maybe ³	Yes	Maybe ⁴	Yes	Yes
MRO	No	Maybe	No	No	No
Critical	Yes	Yes	Yes	Yes	Yes
Distributor	Maybe	Yes	Maybe ⁴	Yes	Yes
Special Services	No	No	Yes	No	No

Direct Supplier – Any supplier of materials that are used in the creation of Littelfuse products. This will also include suppliers of pass-through or private label products sold by Littelfuse. Examples include plastic resin, resistance wire, purchased fuse holders, etc.

Indirect Supplier – Any supplier of material that is included with a product sold by Littelfuse but not part of the actual product. Examples include boxes, labels, foam packaging, blister packages, bulk chemicals, etc.

MRO Supplier – Stands for Maintenance, Repair and Operations. MRO Suppliers provide items and/or equipment that are necessary to produce Littelfuse products. Examples include cleaning supplies, paper towels, machine oil, small tools, repair parts, etc.

Critical Supplier – Any supplier that a Littelfuse Business Unit deems critical to the production of Littelfuse products. A Critical supplier can be made of any type of supplier in the Supplier Requirements Matrix.

Distribution Supplier – Any supplier that buys products from many manufacturers, stores the products, and then resells it to Littelfuse for production. Distributors can provide direct or indirect material for production but have little to no control over the quality of the materials they sell.

Special Services Supplier – Any supplier that provides services to Littelfuse that have no direct interaction with the manufacture of Littelfuse products. Examples include outside testing laboratories, gage calibration services, major vehicle/equipment maintenance services, etc.

Transportation and delivery suppliers are qualified and managed by the Global Logistics Department.

Note: In cases where a requirement is “Maybe” depends on how that product interacts with the customer. For example, Indirect materials suppliers and Distributors may require an risk assessment if they are considered Critical.

¹ Risk assessments are required of all direct suppliers as soon as practical. However, if a large, brand-name supplier (GE, DuPont, Lear, etc.) refuses to allow LF to audit them, the risk assessment can be skipped if there is consensus between the regional Purchasing Manager and the affected SBU Operations Manager to skip it.

² ASBU suppliers are required to have TS16949 or a plan to get certified to it within 2 year.

³ It is dependent on the relationship between the supplier and the final product of the customer. For example, if packaging is being used by the customer in their finished product, then a Risk Assessment will be required.

⁴ ISO certification is preferred.

Supplier Terms and Conditions

All suppliers are required to read and sign the Littelfuse Supplier Terms and Conditions and accompanying Cover Addendum. The Terms and Conditions boilerplate will be available on the Littelfuse.com website. Where the boilerplate is the document that covers all suppliers in general, the Cover Addendum will spell out all specific requirements for each part that a supplier will provide. Each buyer will go over this document with the top management of each supplier to make sure that the Terms and Conditions are understood and agreed to in writing. Once signed, the supplier will be expected to adhere to all of the requirements as specified. If there are any questions about the Terms and Conditions document, please speak with your assigned Strategic Buyer or regional Supplier Development Engineer.

Quality System Requirements

A current and recognized quality system is essential to start doing business with Littelfuse. In addition to being an overall good business practice, it also is a requirement of many of Littelfuse's customers. Documentation is a key element in providing all necessary proof that a supplier's quality system is being followed and that materials provided are within Littelfuse drawing specifications.

QUALITY PROGRAM

Suppliers providing direct and indirect materials to the Electrical (Powr-Gard) and Electronics Strategic Business Units (SBU's) are required to maintain a minimum a current of ISO 9000 certification. A copy of this certificate must be given to the regional Supplier Development Engineer upon initial receipt and upon each expiration date. The UL requirements are established on the drawing as needed.

Suppliers providing direct and indirect materials to the Automotive SBU are required to have a current ISO/TS16949 certification, or an ISO 9000 certification with the intent of achieving ISO/TS16949 certification within a 2-year period of starting business with Littelfuse. Those suppliers without either requirement will face the possibility of losing any automotive business to a supplier that does have these qualifications.

If the supplier has multiple facilities where Littelfuse products are made, one certificate with a scope covering all production facilities or each individual plant's certificate must be given to the regional Supplier Development Engineer.

MANAGEMENT RESPONSIBILITY

The Supplier's executive management will develop a company-wide quality policy. This policy will be deployed and understood by all employees. A management review system will be implemented. The Quality policy and system will be reviewed at prescribed intervals to assess the continuing suitability and effectiveness of the quality system. This review will include the quality policy, internal audit results, product complaints/returns, process/product quality reports, and others as they apply. Executive management will appoint a management representative with the responsibility/authority to monitor compliance to the system, and to ensure corrective/preventive measures are implemented.

ORGANIZATION

The Supplier will have an organization that supports, implements and maintains the quality system at all levels.

QUALITY POLICIES, PROCEDURES, AND WORK INSTRUCTIONS

The Supplier shall establish and maintain a documented quality program as a means of ensuring that product and/or services comply with the requirements set forth in this standard. All work affecting the quality of products and/or services shall be documented in clear and concise policies, procedures, and work instructions. The Supplier shall ensure that these documents are deployed, effectively implemented and understood within the company.

PRODUCT PROCESS CONTROL PACKAGE (Non- ASBU)

The Supplier shall submit a Product Process Control Package to Littelfuse that describes the overall quality program used for the design, manufacture, test, and inspection of product delivered to Littelfuse. The Plan shall, at a minimum, describe the following: *first article requirement, process control techniques (statistical techniques will be used such as SPC, CP/CPK, etc.), manufacturing processes, PFMEA analysis, control plan identifications and package example identifications.*

E571-142 Product Process Control Package

INTERNAL AUDIT PROGRAM

The Supplier shall implement an effective internal audit program that provides for the following: gap analysis, process audits and system audits. Only qualified auditors (trained) will conduct audits and will be independent from the area being audited.

TRAINING

The Supplier shall establish and maintain a program for the identification of training requirements for all personnel that affect the quality of a product during production and installation. Qualification to perform assigned tasks shall be based on individual education, training and/or experience as required. The Supplier shall also assure that a system exists for the qualification, re-qualification, and disqualification of personnel. As a minimum, training for applicable personnel shall consist of quality system training, auditing techniques, Supplier Quality Engineering processes, assembly techniques, workmanship standards, and inspection requirements. Supervisors in the production area shall also have a working knowledge of quality systems and statistics. Records of all training shall be maintained and made available for Regional Supplier Development Engineer to review upon request.

Environmental, Health, and Safety (EHS) Regulations

Compliance with the Littelfuse Supplier EHS Policy (P571-7.4.0-022) and all government and local regulations regarding environmental controls is mandatory for all Littelfuse suppliers. The EHS Policy is based off of all Littelfuse customer requirements regarding substances of concern. Although this document covers most requirements in general, the parts that you provide might have special requirements that are above and beyond those listed in the EHS Policy. Please refer to the Supplier Terms and Conditions and your Cover Addendum documents for any special requirements. In general, Littelfuse is focusing on the reduction and elimination of:

- Lead
- Cadmium
- Specific forms of Chromium (Hexavalent Cr)
- Mercury
- Specific Brominated Flame retardants
- Perfluorinated chemicals (PFOS and PFOA)
- Substances in the current candidate list of the REACH Substances of Very High Concern

IMDS submissions (International Material Data System) are required of all Automotive SBU suppliers for every part they provide to the ASBU. Creating an IMDS account is free of charge, and can be done at www.mdssystem.com. Instructions for creating modules in IMDS are on the site. This is not a Littelfuse-maintained system, so any questions about the IMDS program or its operation should not be directed to Littelfuse. All IMDS submissions should be directed to account #2426.

IPC Declarations are required from all direct and indirect raw materials and finished goods suppliers to Littelfuse. Maintenance, Repair, and Operations items are generally excluded from this requirement, although there are exceptions. Your Cover Addendum document will highlight any MRO purchased items that will be subject to the IPC Declarations requirement. Every part number provided to Littelfuse must

have a declaration, either individually or as a part family (if the family of parts contains the exact same material but only changes dimensional characteristics). This document must be resubmitted if there is any change to the raw material components or a change in supplier.

ICP Testing (Inductively Coupled Plasma Spectrometry) might also be a requirement highlighted on your Cover Addendum. Suppliers will be required to send their own materials out to an independent lab for testing and submit the results to Littelfuse, this test is required to be done every year to verify the consistence of RoHS compliance. Suppliers would bear the testing cost. Results of these tests are submitted to our customers upon request to prove compliance to customer substance of concern requirements. If a product is found to have any substances of concern over acceptable limits as defined in the EHS Policy, or found to have a significant change in characteristics to indicate a change in raw materials without prior notification, a corrective action will be requested. Note: XRF (X-Ray Fluorescence) testing is not an acceptable substitute for ICP Testing.

Material Safety Data Sheets (MSDS) must be submitted to Littelfuse for all raw materials used in the creation of all Littelfuse products. These are the documents that define all characteristics of a material from a safety perspective. Suppliers are responsible for collecting these documents from their own suppliers or for the creation of their own MSDS. All MSDS documents must be submitted to Littelfuse initially and anytime there is a change.

Littelfuse takes the safety of its workers and those of its suppliers very seriously. All suppliers must follow all applicable laws and regulations regarding worker safety.

P571-7.4.0-022 Supplier Environmental, Health and Safety Specification

EICC Compliance

Littelfuse expects our product material suppliers to act as responsible corporate citizens and take a positive, proactive stance regarding social and environmental issues. Suppliers are **REQUIRED** to provide a policy of continuous improvement and acknowledgement of EICC compliance to us. Littelfuse will provide self-assessment questionnaire or training material upon supplier's request. The Electronic Industry Code of Conduct may be voluntarily adopted by a business in the electronics sector and subsequently applied by that business to the suppliers. Fundamental to adopting the Code is the understanding that a business, in all of its activities, must operate in full compliance with the laws, rules and regulations of the countries in which it operates. The Code is made up of below 5 sections

- Labor
- Health and Safety
- Environmental
- Management System
- Ethic

For more information about adopting the EICC or becoming a member of the Electronic Industry Citizenship Coalition visit the web site: <http://www.eicc.info>

Littelfuse Risk Assessment Process

Littelfuse uses a documented Risk Assessment process to evaluate suppliers on a regular basis. The Risk Assessment is an onsite visit of your facility that assesses:

Management Philosophy

Manufacturing Process Audit

New Product/Process Development

Supplier Quality

Logistics

Continuous Improvement

Cost Analysis

Environmental Systems

Ethics

Company Security

Littelfuse risk assessment criteria are based off of the ISO/TS 16949:2002 standard, but the risk assessment also includes other sections not covered in that standard. It should be emphasized to suppliers that although it is based off of the TS standard, this is not a TS audit. This is a Littelfuse risk assessment, and the auditors assign findings based on the risk to Littelfuse, not strictly to TS guidelines.

A formal risk assessment report will be provided to suppliers within 2 weeks by Littelfuse Lead Auditor. Littelfuse will consider if a “corrective action verification” visit if necessary.

The outcome of the Risk Assessment is discussed with the regional Purchasing Manager, and the supplier’s status on the Littelfuse Approved Supplier List is decided. Supplier status is one of the following:

Approved – Supplier successfully meets the requirements of the risk assessment and is approved for all purchasing activities

Conditionally Approved – The Risk Assessment has identified issues that must be corrected. Suppliers on Conditional Approval will be reviewed in 6 months. If the corrective action has not taken place, a decision must be made by the Purchasing Manager to move them to Disqualified.

Disqualified – The supplier has been disqualified from doing business with Littelfuse. It is possible for a supplier to become approved again once they have been disqualified, but it will take another Risk Assessment and it will require proof that any problems have been addressed and are effective.

Upon successful completion of the risk assessment, approved suppliers are added to the Littelfuse Approved Supplier List.

Qualified existing suppliers that the Global Purchasing Team identifies as having potential to advance to a partner or alliance relationship may also undergo one or more Periodically Product and/or Process audits to ensure that their quality practices are aligned with our global supply base strategy.

E571-137 Supplier On-site Evaluation Template

Littelfuse Self-Survey Form

Prior to doing an On-Site Risk Assessment of a supplier, we send a Supplier Self-Survey. This survey gives us some basic information about the supplier and their capabilities, and allows Littelfuse auditors some familiarization with the supplier before visiting. The last section of the survey has to do with Company Security, which is part of a requirement by U.S. Customs to maintain Littelfuse’s C-TPAT (Customs-Trade Partnership Against Terrorism) certification. To maintain our certification and our ability to ship product across the border quickly and efficiently, we must ask every supplier about what security measures they have taken in their own facilities. The answers given in this survey are used in the Risk Assessment; 11 random “Yes” responses on the survey are chosen to be verified during the On-Site Risk Assessment. The Self-Survey must be returned within 5 days of the Risk Assessment to allow us time to review the responses and choose the questions Littelfuse auditors will verify.

E571-117 Supplier Self Survey Template

Advanced Product Quality Planning (APQP)

Suppliers are required to generate an Advanced Product Quality Plan in accordance with the AIAG APQP reference manual for every new Littelfuse automotive part. At a minimum the plan should include the five phases and listed contents below:

Plan and Define Program Phase

Kick-off Meeting

Technical Review

Risk and Feasibility Assessment

Program Review

Product Design and Development Phase

DFMEA

Design Review

Process Design and Development Phase

Gage Review

Process Flow

PFMEA

Control Plan

Prototype

Program Review

Product and Process Validation Phase

Proactive Containment

PPAP

Run-at-rate study

Program final review

Feedback, Assessment and Corrective Action Phase

Lessons Learned

Early Production Containment completed

Open Issues closed

Suppliers for Littelfuse automotive parts are required to develop a project management timeline. Littelfuse Strategic Buyers and regional Supplier Development Engineers will review the project schedule as necessary or at requested intervals.

Production Part Approval Process (PPAP)

Littelfuse uses the Production Part Approval Process to confirm that the supplier understands the design specifications and has a process capable of producing product to meet these requirements, during an actual production run, at the quoted production rate. An industry requirement for all automotive suppliers, PPAP is being expanded to include all of our suppliers.

PPAP requirements vary based on the submission level assigned to a supplier and/or part number. The Littelfuse Supplier Development Engineer is responsible for designating submission level. The submission level is generally determined during the RFQ process, based on such factors as:

Part criticality

Experience with prior part submissions

Supplier compliance with Quality System requirements

Supplier expertise with the specific commodity

The basic requirements associated with each submission level are identified on the Part Submission Warrant. More specific detail is provided in a table in the PPAP procedure. A copy of this table follows. The supplier shall use level 3 as the default for all submissions unless otherwise specified by Littelfuse. Production part approval records, regardless of the submission level, shall be maintained for the length of time the part is active plus one calendar year.

Submission Level

<u>Requirement</u>	<u>Level 1</u>	<u>Level 2</u>	<u>Level 3</u>	<u>Level 4</u>	<u>Level 5</u>
1. Design Record	R	S	S	*	R
- for proprietary components/details	R	R	R	*	R
- for all other components/details	R	S	S	*	R
2. Engineering Change Documents, if any	R	S	S	*	R
3. Customer Engineering approval, if required	R	R	S	*	R
4. Design FMEA	R	R	S	*	R
5. Process Flow Diagrams	R	R	S	*	R
6. Process FMEA	R	R	S	*	R
7. Control Plan	R	R	S	*	R
8. Measurement System Analysis Studies	R	R	S	*	R
9. Dimensional Results	R	S	S	*	R
10. Material, Performance Test Results	R	S	S	*	R
11. Initial Process Studies	R	R	S	*	R
12. Qualified Laboratory Documentation	R	S	S	*	R
13. Appearance Approval Report (AAR), if applicable	S	S	S	*	R
14. Sample Product	R	S	S	*	R
15. Master Sample	R	R	R	*	R
16. Checking Aids	R	R	R	*	R
17. Records of Compliance With Customer-Specific Requirements	R	R	S	*	R
18. Part Submission Warrant (PSW)	S	S	S	S	R
Bulk Material Checklist (see 4.1 above)	S	S	S	S	R

S = The organization shall submit to the customer and retain a copy of records or documentation items at appropriate locations.

R = The organization shall retain at appropriate locations and make available to the customer upon request.

* = The organization shall retain at appropriate locations and submit to the customer upon request.

Figure 1 - PPAP Submission Levels from PPAP 4th Ed. by AIAG

Use of the AIAG Bulk Materials Checklist is an acceptable substitute for a regular PPAP if it is applicable. Production part approval is always required prior to the first shipment of product.

After a supplier has been selected to make a Littelfuse part through the Request for Quote Process, the supplier will have to show data to prove that production parts can be made to the blueprint and consistently over time. Prior to receiving Production Purchase Orders from Littelfuse, the supplier will have to provide documentation to Littelfuse as specified in your Cover Addendum from the Supplier Terms and Conditions document.

In addition to the specified documentation, the supplier must also provide two sets of samples. The first set is a minimum of 10 pieces with a full dimensional layout to the drawing. Each piece will be uniquely identified, and a marked up drawing will be provided by the supplier labeling each measurement and the accompanying readings made. Once the samples are received, Littelfuse quality technicians will perform their own layout of the same sample parts, if needed, to verify the readings taken by the supplier.

The second sample is a full 8-hour production run using production machines and tooling. Capability studies (C_{pk}) for all critical characteristics on the drawing will be provided with the sample run. Littelfuse quality technicians will randomly select pieces from the lot and perform a dimensional layout. If the parts conform to drawing requirements, the documentation required is in hand, and the capability data is within specifications, the parts will be accepted. The Part Submission Warrant (PSW) will be signed, giving the supplier Littelfuse approval to run the parts as submitted. If there is no signed PSW, there is no approval from Littelfuse and parts cannot be shipped.

The PSW is reviewed by the Supplier Development Engineer or other Quality Department personnel and disposition is given, as follows:

- Production Approval: Indicates the part meets all specifications and requirements, and the supplier is authorized to ship production quantities.
- Interim Approval: Permits shipment of material for production requirements on a limited time or piece quantity basis, when supplier has clearly defined the root cause of the non-conformities preventing production approval and has prepared an interim approval action plan agreed upon by Littelfuse.
- Rejected: Prevents production quantities from being shipped because the submission, the production lot from which it was taken and the accompanying documentation do not meet customer requirements.

In addition, automotive OEM suppliers are required to provide an annual update to their PPAP, regardless of whether changes have occurred.

Special Characteristics

Special Characteristics are any product or process characteristics that affect safety or compliance with regulations, fit, function, performance or subsequent processing of product.

In accordance with the requirements of ISO/TS 16949, Special Characteristics shall be identified and specifically addressed in the Design-FMEA, Process-FMEA, Control Plans, Process Flows, Work Instructions and other associated documents. Suppliers are responsible to fully understand the usage of their product and also identify Special Characteristics, as appropriate.

Littelfuse expects suppliers to improve quality by systematically reducing variation of the special characteristics. Control plans document relevant information about the process followed to address sources of variation until a key characteristic is in statistical control and capable of meeting engineering specifications.

Key characteristics are typically identified by Littelfuse, and are noted on the design drawings. For each of the key characteristics, the supplier identifies: where in the process the characteristic is measured, control charts used, sample size and frequency of collection, maintenance of control charts and initial C_{pk}

A gage variation study is performed and results are documented, potential sources of variation are identified and controls are established to ensure that process parameters and settings do not change. This is documented in the key characteristic control plan. For these Characteristics, SPC data verifying a minimum 1.33 C_{pk} value or greater process capability,

Suppliers are also responsible for ensuring that relevant Special Characteristics are explained, understood and controlled by their sub-suppliers.

Statistical Process Control and Analysis

Suppliers are required to meet the process capability requirements as defined in the AIAG PPAP and SPC reference manuals. The supplier is responsible to ensure process capability and control requirements are documented in their control plan and that capability indices are achieved and improved throughout production.

Also, the supplier is required to continuously improve by reducing part-to-part variation and eliminating all waste. The organization shall monitor process performance utilizing the appropriate statistical techniques (i.e. First-pass yield, SPC, etc.) in accordance with the most current edition of the AIAG Statistical Process Control manual.

Additional areas in which statistical techniques may be applied are as follows: predictive maintenance programs, gage R&R studies, defect analysis and continual improvement processes. The results of the statistical techniques shall be documented and retained at the organization's location. This information shall be made available upon request by the Littelfuse team.

Approved Supplier List

There are 3 possible status outcomes for suppliers: Approved, Conditionally Approved and Disqualified. Only suppliers with Approved, Conditionally Approved can be on the Approved Supplier List. The regional SDE and Strategic Buyers will meet minimally on a semi-annually to review the performance of Conditionally Approved suppliers whose status is ready to change.

Any supplier who Littelfuse has been doing business with before January 1st, 2003 and have not had a risk assessment since that date are considered to be Approved, but should be scheduled for a risk assessment by Littelfuse when practical.

Notification of Changes

Any change to the product FORM, FIT, MATERIAL, FUNCTION OR CHANGE OF LOCATION must be approved in advance by Littelfuse. Any of these type changes to previously approved parts or materials cannot be made without prior approval. This approval will be given upon review of the change documents submitted to Littelfuse (explanation of the change, product validation and dimensional documentation). Littelfuse requires 90 days advanced notice of changes. In some cases, Littelfuse plants will decide if they need sample parts to test to confirm there is no impact to our process. If that is required, Littelfuse will coordinate with supplier teams to accomplish that in a mutually satisfactory manner. In the case of materials change updated ICP data and IPC declarations may be required. To request approval, the supplier must email or fax with notification form to regional Supplier Development Engineer or Strategic Buyer.

Performance Measurement – Supplier Scorecard

The Supplier performance is measured based on four (4) categories: On-time Delivery (delivery based on goods receipt), Reject Rate (Littelfuse incoming inspection), Defective Parts Per Million (Littelfuse production and customer rejects), and Responsiveness (corrective action response time). For an explanation of the scoring calculations, see the Figure below.

Suppliers who maintain an overall rating of A or B are considered acceptable.

Suppliers who have an overall rating of C are considered marginal. These suppliers will have to be monitored to make sure the C rating doesn't stay the same or get worse. Suppliers who have an overall rating of D may be considered unacceptable. If a plan for improvement is not formalized to improve the overall rating, Littelfuse may elect to shift business to other suppliers.

On-time Delivery is calculated through an import into a Supplier Scorecard database from SAP data. Reject Rate, DPPM, and Responsiveness, are imported into the Supplier Scorecard database from Supplier caWeb data.

All Littelfuse suppliers will be expected to follow the same performance criteria. All vendor scorecards for each month in the current calendar year will be emailed or communicated via internet to the supplier's management.

Littelfuse also internally monitors and measures the suppliers Environmental and Safety compliance response time. Supplier's are responsible for submitting any environmental compliance documentation (IMDS, IPC, Reach, RoHS, etc.) within 10 working days. Littelfuse monitors the response time and accuracy of data submitted.

Scorecard Rating Method

$$\text{Delivery (35\%)} \quad \text{OTD} = \frac{\# \text{ of on-time line items received}}{\text{Total line items received}}$$

If OTD is 70% below, the rating is 0%. From 70% to 100%, it is 0 to 35% in prorate.

+

$$\text{DPPM (35\%)} \quad \text{DPPM} = \frac{\# \text{ of Defective parts found in LF incoming and process and customer}}{\# \text{ of Total parts received}}$$

If DPPM is 250 above, the rating is 0%. From 250 to 0 DPPM, it is 0 to 35% in prorate.

+

$$\text{Incoming Reject Rate (20\%)} = \frac{\# \text{ of Complaints in LF incoming area}}{\# \text{ of Received line items}}$$

If reject rate is 0.3% above, the rating is 0%.
From 0.3% to 0%, it is 0 to 20% in prorate.

+

$$\text{Responsiveness (10\%)} = \frac{\# \text{ of on-time closed containment action}}{\# \text{ of containment action should be closed}} \times 5\%$$

$$+ \frac{\# \text{ of on-time closed corrective action}}{\# \text{ of corrective action should be closed}} \times 5\%$$

The **Weighted Overall** score is determined as follows:

Weighted Score	Rating
90% - 100%	A
80% - 90%	B
65% - 80%	C
< 65%	D

Figure 2 - Supplier Scorecard Criteria

Disaster Recovery Plan

Littelfuse requires our suppliers to prepare contingency plans (e.g. utility interruptions, fire, flood, storm damage, temporary or limited data loss, chemical spills, air/water contamination, earthquakes, tornados, hurricanes, storm surges, complete data loss) to reasonably protect Littelfuse's supply of product in the event that a supplier's facility cannot continue to operate. Please refer to the Terms and Conditions document for further guidance regarding Force Majeure or acts of God. Plans should be reviewed on a frequent basis to ensure that the contingencies listed are still valid. Disaster Recovery Plans should not be confused with internal Health and Safety plans.

Control of Nonconforming Product

The Supplier's quality program shall have an effective system for controlling nonconforming product. The system shall provide for the identification, documentation, evaluation, segregation, and timely disposition of nonconforming products. The Supplier's system shall include controls for product returned from Littelfuse.

Review and Disposition of Nonconforming Products

The nonconforming products will be including the following dispositions:

- Use as is: no actions taken on product, product does not meet specified requirements, but is functional
- Rework or sorting: product reworked or additional product test/inspection to meet specified requirements. Supplier shall assign capable rework or sorting person to Littelfuse to do rework and sorting or Littelfuse assigns at supplier's cost.
- Reject or replace: product returned or replaced with new lot by supplier to meet specified requirements. Supplier shall assign RMA(Return Material Authorization) for this particular rejection or replacement within 24 hours.

Supplier Corrective Actions – Supplier CaWeb

Supplier caWeb is the Littelfuse Global Supply Chain's on-line Corrective and Preventative Action System.

This system provides our global supply base with easy access to their concerns in real time and the ability to quickly respond and communicate containment actions with Littelfuse. It provides a structured and methodical approach to document permanent corrective actions by suppliers. It also provides a history in case the supplier's solution was not effective and needs to be reviewed. Every supplier has access to the system as long as supplier requests from regional Supplier Development Engineer.

The Supplier caWeb system is used any time a supplier quality issue arises. Issues requiring corrective actions include, but are not limited to: late deliveries, non-conforming material, incorrect labeling, environmental testing issues, quantity discrepancies, and production line shutdowns.

This centralized system is accessible to all of our plants around the world and uses the 8D format for problem management. Suppliers are responsible for managing their own responses and entering them into caWeb by the due date. A 3D containment response is required within 24 hours of notification and the completed 8D response is due within 10 working days of notification.

W571-7.4.0-014-4 - Supplier caWeb 4 Instructions

Supplier caWeb Address – <http://caweb4.hginet.com/LFSupplyBase>

Material Test Reporting

The Material Test Report must contain the actual results of physical testing, measurements and/or analysis specified by the contract confirming compliance with all identified requirements. Blanket statements of material conformance without data to support it will not be accepted.

Suppliers can use our form *E571-132 Material Test Results* to submit the Material Test Report if they do not have an equivalent form of their own. If the supplier uses their own form, it must have the same information contained within as the Littelfuse form. Suppliers must submit the material testing report in electronic format or paper format with the packing slip of each shipment sent to a Littelfuse location.

The supplier should have a system capable of retrieving and submitting the requested Material Test Report within 24 hours of Littelfuse request.

CoC(Certificate of Conformance) is required to attach for each shipment to Littelfuse or keep in supplier's quality document system for audit upon Littelfuse's request. Suppliers can use own form for CoC or contact respective Supplier Development Engineer for Littelfuse's form.

E571- 132 Material Test Results

Sub-supplier Control

Suppliers are required to monitor their sub-suppliers performance and to assure the quality of purchased parts and the management system of their sub-suppliers. Suppliers are responsible for providing disposition of defective parts due to their sub-suppliers poor control. This is including consigned supplier like plating supplier unless the supplier is billed by Littelfuse.

Suppliers are also recommended to perform their sub-suppliers quality management system development with the goal of the continuous improvement. Conformity with ISO9001:2000 and the RoHS Directive is the first step in achieving this goal. For Automotive suppliers, it is expected that suppliers will try to get their sub-suppliers in compliance with or certified to the ISO/TS16949 standard.

Continuous Improvement

Continuous improvement is fundamental to our business. At a minimum we require that our suppliers manage their quality systems to the same ISO/TS16949 or ISO 9000 standards that guide Littelfuse's quality efforts, and to demonstrate continuous improvement in areas that benefit the customer with regards to quality, price and service.

The supplier shall continually improve quality, delivery, cost and other services provided. To aid in fulfillment of this requirement the supplier's organization shall establish, monitor, prioritize, and act upon key performance objectives and targets. The objectives and targets should be established based upon (at a minimum) business plans, management systems, product quality, process capability, and customer satisfaction goals. Actions taken to regain previously sustained levels of performance are corrective actions, not continuous improvement.

Littelfuse may visit any supplier site to assess its continuous improvement programs and lean manufacturing practices, and make recommendations for improvement. In addition, Littelfuse may deploy personnel to focus on specific improvement issues.

Some common examples of Continuous Improvement programs are:

Cost reduction projects (examples include use of Six Sigma, Lean Enterprise, Value Analysis/Value Engineering)

Waste reduction projects (examples include use of Kaizen events, Setup Reduction, Value Stream Mapping, Standardized Work, Process Flow)

Variation reduction projects (examples include use of Six Sigma, Standardized Work, Statistical Process Control)

Factory Reorganization projects (examples include use of 5S Program, Single Unit or Cellular Manufacturing, Focused Factory, Kaizen events)

Inventory reduction projects (examples include use of Kanban system, Single Unit or Cellular Manufacturing, Supermarket Pull)

Yield improvement projects (examples include improvements to Equipment Uptime/Downtime, First Pass Yield, Rework reduction, Scrap improvement, On-Time Delivery)

Non-manufacturing Process Improvement projects (examples include Customer Service, Accounting, Purchasing, Warranty returns, Quality control)

Certificate of Origin

With our company's increasing global presence, we are required by governmental law to submit, as well as gather, documentation on our suppliers and products' country of origin.

Many of the countries we ship and receive components from have customs/tariff regulations restricting the importation of goods from certain countries. This includes regulations limiting by country the amount of a particular commodity that can be imported, or favorable duty treatment for goods originating in specific countries.

To meet these requirements, Littelfuse requires that all suppliers shipping into Littelfuse global facilities submit a Certificate of Origin. One document can be completed for a series of part numbers as long as each part is listed with the country of origin—where the goods are manufactured, NOT purchased— listed beside it. Also, if the product(s) qualify for NAFTA, this should be indicated on the certificate as well.

To determine if Littelfuse has the correct Certificate of Origin information, review the Statement of Work tab in Supplier Workplace. Each part number is listed and contains a field for Certificate of Origin. If the field is blank or contains incorrect information, the field must be updated and a new Certificate of Origin must be submitted immediately. The new document should be faxed directly into Littelfuse's Electronic Documentation system at: 011-52-878 -783-6759. (Mexico Phone Number) attention: Customs Compliance Department or email to : customscompliance@littelfuse.com

To qualify for preferential duty rates, suppliers must submit newly completed forms annually, by October 1. In addition, suppliers must update and submit Certificate of Origin documentation when a change in country of origin occurs.

E571-127 Certificate of Origin

Packaging and Labeling

Suppliers must comply with all import/export and customs regulations for their home countries. The Supplier shall ensure provide for secure storage areas or stock rooms to prevent damage or deterioration of product prior to consumption and/or delivery to Littelfuse. The Supplier shall implement a First In First Out (FIFO) system for disbursement of product from storage. The Supplier shall ensure all parts/products are packed, marked and preserved as defined in specifications. Parts/products shall be packaged to prevent damage and/or deterioration while facilitating usage requirements on the Littelfuse plants and during shipping. Littelfuse requires the Supplier to be responsible for product delivery quality until point of issue to Littelfuse plants or distribution center.

Littelfuse standardizes the label format and requirement for all purchased materials to eliminate data entry errors,ensure accurate use of logos, and maintain lot traceability. The labeling requirement for inner and outer pack is described as below.

- All cartons included in the shipment should be labeled
- A master label is required on pallets
- If multiple part numbers are combined on one pallet, a "Mixed" label shall be applied on the outside of the pallet, and all packages on that pallet must be individually labeled.
- If there are mixed lot numbers in one package, a separate label is required for each lot number
- All barcodes must use code 3 of 9 or code 128 (per ANSI standard)

- All letters printed in barcodes must be UPPERCASE
- Label #1 should be utilized at all times unless the package is too small to accommodate that size. Label #2 should be used on small package that will not accommodate the larger label. Label #3 should be used for all packages and/or pallets that have mixed parts on the pallet
- Information on label should coincide with the packing slip that is included with the shipment

Below is the minimum information that should be included on the Master Label from all suppliers.

- Littelfuse logo
- Littelfuse part number
- Littelfuse part description
- Littelfuse PO number
- Line item number on order
- Ship quantity
- UOM (Unit of Measure)
- Lot number
- Country of origin (complete country name)
- Packaging numbered with total quantity of packages included in shipment
- Date of shipment to Littelfuse
- Any logos required for part number being shipped

Sample labels are required for approval prior to use. Please forward an example of the bar-coded label to Elizabeth Rogers (erogers@littelfuse.com). The Littelfuse Global Labeling department will verify the label is readable and will properly scan.

NOTE: If specific labeling requirements were sent by Littelfuse with the contract to purchase, which may include UPC numbers, please forward that label for review and re-approval.

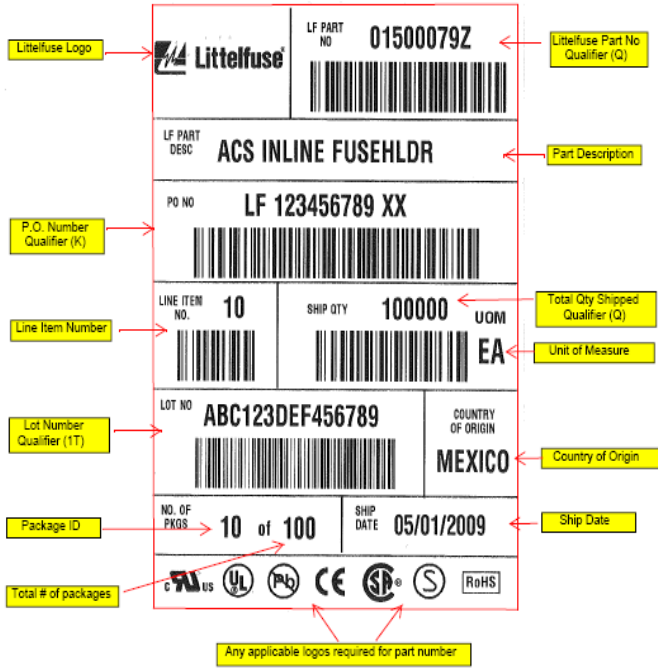
Although it is not our intention to penalize our suppliers for petty infractions or minor mistakes, in certain instances of clear neglect or continued failure to follow our requirements it will be necessary for Littelfuse to impose a penalty.

Step 1. Vendor is informed of the problem and is given a warning.

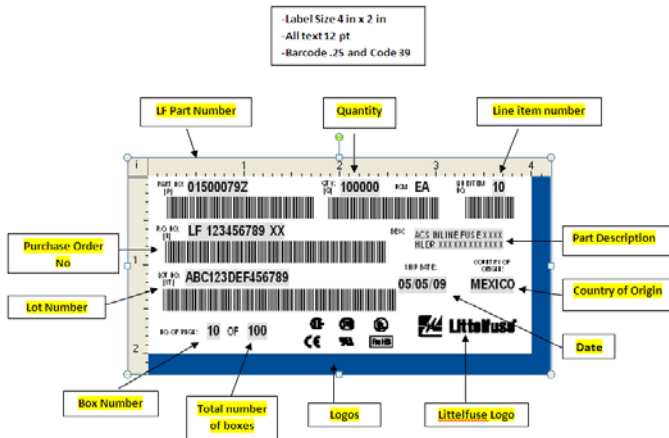
Step 2. Vendor is given a second warning and is required to provide Littelfuse with a corrective action plan detailing how the problem will be resolved.

Step 3. Vendor is fined. Fines will be assessed for any subsequent violations as well. Any product that needs to be relabeled due to non-compliance will start at \$3.00 USD charge per carton, with a minimum charge of \$50.00 USD per shipment.

- LABEL SIZE 4 INCHES X 6 INCHES
 - ALL TEXT 22 PT
 - BARCODE 50 IN AND CODE 128




Label #1



Label #2

**FOR RAW MATERIALS, THE LITTELFUSE LOGO IS NOT REQUIRED

		
MIXED PARTS		
		COUNTRY OF ORIGIN MEXICO
NO. OF PIGS	SHIP DATE	
10 of 100	05/01/2009	

LABEL #3 – TO BE USED FOR MIXED PALLETS/ BOXES
THE LABEL SIZE SHALL BE 4 IN X 6 IN