This manual is one of several methods we use to cascade our customer's requirements throughout our supply chain. This manual is designed with the intent to assist our suppliers in understanding the standards, requirements, procedures, and systems that should be in place to assure the shipment of defect free, on time parts to Carling Technologies.

Supplier Quality Manual

December 20, 2022

11th Edition

INTRODUCTION

Carling Technologies subscribes to the eight quality management principles, one of which is "Mutually Beneficial Supplier Relationships". As a supplier to Carling Technologies, you play an important role in our success and the success of our customers.

Carling Technologies is committed to working with suppliers to ensure customer satisfaction through total conformance to customer expectations. Carling Technologies continually strives to improve the quality of products we supply to our customers. To do this, our suppliers must also strive for continuous improvement.

Carling Technologies will assist our suppliers whenever possible to meet our requirements. The responsibility for quality and on-time delivery, however, remain with the supplier.

Sincerely,

Andy Yung
Director, Quality CVP

Alper Tuncer
Senior Manager, Direct Material Procurement - CVP

Table of Contents

Carling Technologies Mission Statement

Carling Technologies, now part of Littelfuse, commits to exceptional customer value through our relentless pursuit of operational excellence and zero defects, driving continuous improvement in everything we do. Engage with our customers to deliver best-in-class service and support; Leverage our applications expertise to understand our customers' needs and emerging opportunities; Deliver technology and products that provide innovation and reliable solutions to the market; Empower our people to create a data-driven and socially responsible culture that they are proud to be part of; Celebrate our individual and team successes.

Purpose

The SQM has been developed and provided to assist suppliers to understand the requirements of Carling Technologies regarding quality and management systems and in meeting the terms of Carling Technologies' purchasing agreement, engineering drawings, and specifications.

Scope

This manual applies to all direct material/service external suppliers, providing Carling Technologies with materials, components, software, products, processing, and related services. This manual applies to indirect material/service suppliers only when a Carling Technologies Purchase Order requires it. The requirements outlined herein are an integral part of Carling Technologies' total requirements.

Communications

Carling Technologies' official language is English. All formal communications with Carling Technologies must be in English. Documents may display the native language when integrated in parallel with the English translation. In this instance, the English translation is the one valid version. A specific Carling Technologies facility may allow exceptions for direct communications meant for that facility only.

Supplier Requirements

Suppliers are responsible for understanding and meeting the requirements of this manual. Failure to meet these requirements may result in the loss of existing and/or future Carling Technologies business, in addition to reimbursement of the cost to Carling Technologies resulting from those failures.

- Suppliers shall adopt the standards of Zero Defects and 100% On Time Delivery to Carling Technologies.
- Suppliers shall understand that any established PPM target is not an Accepted Quality Level but represents an intermediate continuous improvement step toward shipment of components/materials meeting the Zero Defects requirement.
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Corporate Social Responsibility and Ethics

Carling Technologies is committed to respecting the highest standards of labor, health and safety, environmental, ethics and management systems. Carling Technologies requires its supplier to operate in accordance with the principles and requirements, as applicable, in this Carling Technologies (part of Littelfuse) Supplier Code of Conduct, and in full compliance with applicable laws and regulations:
https://www.littelfuse.com/~/media/aboutus/supplier-quality/supplier-code-of-conduct-en.pdf?la=en
We require our critical Suppliers to, at a minimum, comply with the requirements of the RBA Code of

Conduct http://www.responsiblebusiness.org/standards/code-of-conduct/ . We require critical suppliers to have an active Code of Conduct or Ethics Policy that addresses all sections outlined in the RBA Code of Conduct. Carling will notify the critical suppliers directly if the supplier is on the Critical Supplier List.

Environmental, Health and Safety

Protecting the environment and the health and well-being of our employees, neighbors and business partners is a key principle of Carling Technologies. As such, we expect our critical suppliers to also adopt the same principals and we further expect them to work with their suppliers to the same end. We expect our critical suppliers to, at a minimum, comply with the Responsible Business Alliance (RBA) Code of Conduct and we encourage our suppliers to adhere to the current ISO14001 requirements.

Quality Manual

Upon request, the Supplier shall furnish Carling Technologies with a copy of their Quality Management System Manual.

Supplier Approval Process

Carling Technologies requires all Suppliers to be approved prior to the issuance of purchase orders. Carling Technologies must approve all Suppliers, regardless of approvals by customer or other entities. The Supplier selection process for production components begins when Carling Technologies has a requirement for a new material, or Carling Technologies is looking at alternate sources of supply for existing materials, services or products.

The Carling Technologies Supply Chain Group has the ultimate responsibility to identify suitable Suppliers. The procurement group provides a Supplier Quality Survey (QAF-160) to the Supplier. Should there be any deficiencies noted by the Carling Technologies Quality organization, the Quality Manager or designee will communicate these issues to Carling's Supply Chain team and the supplier for resolution. The Global Quality Manager or designee will identify the audit results as follows: "Approved", "Conditionally Approved", or "Disapproved". The Global Quality Manager and the Vice President, Procurement and Global Supply Chain or their designee will determine whether we can proceed with the Supplier with Conditionally Approved status.

***Documentation: QAF-160, Signed SQM, Account set-up form, Bank/ Credit references, ACH and CQI**

Special Processes

This document establishes Carling Technologies' quality requirements for suppliers who design, manufacture or control Heat Treatment, Plating, Coating, Welding, Soldering, Molding and/or Castings Systems. Each supplier of these special processes is required to complete the following AIAG CQI assessments as part of the QAF-160 or initial validation, and then annually:

- CQI-9 Special Process: Heat Treating System Assessment
- CQI-11 Special Process: Plating System Assessment
- CQI-12 Special Process: Coating System Assessment

- CQI-15 Special Process: Welding System Assessment
- CQI-17 Special Process: Soldering System Assessment
- CQI-23 Special Process: Molding System Assessment
- CQI-27 Special Process: Castings System Assessment

Substance Reporting and Management

The introduction of new/additional restricted and banned substances are ever changing and we expect our suppliers to remain current to the latest requirements. We will periodically audit the materials shipped and we request that the supplier also audit their sub-tiers suppliers for conformance. When applicable Suppliers must certify that the products/materials shipped to Carling are in compliance, and/or submit the applicable documentation as notified by the Carling representative.

We require compliance to the current standards:

- Restriction of Hazardous Substances (RoHS):
  - https://ec.europa.eu/environment/waste/rohs_eee/index_en.htm
- Registration, Evaluation, Authorization and Restriction of Chemicals (REACH):
  - https://www.echa.europa.eu/regulations/reach/understanding-reach
- Safe Drinking Water and Toxic Enforcement Act of 1986 (California Prop 65):
  - https://oehha.ca.gov/proposition-65

Other Substance Reporting:
We may also require compliance to the following banned substances requirements, Canadian Environmental Protection Act, Low Halogen or Halogen Free, Ozone Depleting substances, radioactive substances or asbestos. At times, our customers have their own restricted/banned substance lists. Any customer specific requirements will be communicated via the QAF-800 process and flowed down through this agreement and purchase order requirements.

Substance Management:

- Conflict Minerals (Yearly basis):
  http://www.responsiblemineralsinitiative.org/
- International Material Data System (Carling's IMDS account number 31900):
  - http://www.mdsystem.com/imdsnt/startpage/index.jsp)

Quality and Safety Planning

Sufficient quality planning must be done before mass production to minimize problems after industrialization. This planning may involve the use and/or creation of:

- Design documents
- DFMEA (if supplier is design responsible)
- Equipment, tooling and facility requirements
- Material sourcing and testing
- Process Flow Charts
- PFMEA
- Control Plans
- Initial Process Studies using quality indices such as Ppk or Cpk for important variable characteristics.
- MSA Gauge Studies
- PPAP Submission
- Process Work Instructions
- Process Control condition or set-up sheets
- Training and Qualification of Team Members
- Pilot production runs and analysis
- Others

Safety characteristics shall be controlled with SPC charts and made available to Carling Technologies upon request. Special product and process characteristics will be identified by Carling Technologies in addition to those selected by the Supplier through knowledge of the product and process.

All special characteristics shall be identified in the Control Plan, PFMEA and operator instructions with the Carling Technologies special Symbol. [CC] is denoted on the drawing for special characteristic, critical characteristics product safety characteristics. The product safety characteristics is applied to the entire products class and requirements will be stated on the supplier purchase, part print order and/or Technical Specification. Carling Technologies purchase order and/or part print will also provide supplier's instruction on management of these special characteristics which includes and not limited to Cpk analysis, Packaging/Handling/Storage requirements and flow down of requirements.
Some of the symbols used on part print by Carling Technologies are as follows –

△ Denotes significant characteristics on a feature which requires supplier's to never exclude it from inspection or sampling to be approved by Carling Quality or Engineering.

Denotes SPC controlled characteristics on a feature, please refer to Statistical Methods section

Denotes Cpk controlled dimension on a feature, please refer to the statistical methods section. This applies to tooling orders and usually eliminated after a certain confidence level is achieved.

An on-site audit is required for all components/materials/services identified as safety critical. Guidelines for quality planning activities should follow the AIAG Advanced Product Quality Planning reference manual.

Documentation and Record Retention

The following quality related data, records and procedures must be retained and kept for the life of the program (including service) plus 1 year:

- Statistical Quality Data
- Inspection and Test Results Data
- All Initial sample data
- Corrective action reports
- Receiving inspection information
- Control Plans / PFMEA / DFMEA / Flowcharts
- Quality procedures and system descriptions
- Written instructions, Test and Lab Instructions
- Test Procedures

These documents must be retained in such a manner that they can be made available to Carling Technologies within 48 hours of request.

Lot Control and Traceability

Carling recommends suppliers to have an effective system of traceability that ensures all delivered product can be traced from a finished product in the final application back to specific lots, sub-components, parts, blanks and raw materials. Lot traceability records must be kept on-hand and be available to Carling Technologies upon request for a period equal to 15 years from the end of production or as indicated by Carling Technologies.

Material Performance Test Data

The supplier is responsible for conducting and submitting all material and performance testing as specified on the print with the PPAP package. If the supplier is not capable of performing all tests, they can contract the service with a qualified source such as the sub-supplier or a third-party laboratory or test facility. Carling recommends that the contracted source shall be an accredited facility (A2LA, ISO 17025).

Statistical Methods

Suppliers are expected to utilize appropriate statistical methods, when required by drawings, for process control, process improvement, evaluation of process capability and other applications. Such statistical methods may include:

- Process Capability studies *(CP, CPK, PPK)*
- Trend Charts
- Pareto Analysis
- SPC charts

The supplier may be asked to provide statistical data to verify process control and capability. This request will come from a Carling Technologies Quality representative. A minimum CPK value of 1.67 must be achieved for all safety critical identified components. Additionally monitoring of PPK may also be required. For all other features requiring SPC, must maintain a minimum 1.33 Cpk. All statistical data is subject to be requested at any time (i.e., per shipment, Monthly, Quarterly, etc.). In an event the process is not capable of meeting these Cpk requirements, Carling Technologies may approve shipment provided 100% inspection of the feature is performed and the feature is within specification.

Use of statistical methods mentioned above is fully explained in the AIAG Statistical Process Control (SPC) manual.

Process Controls

The supplier is expected to establish, control and document production methods that will result in products that meet all Carling Technologies requirements.

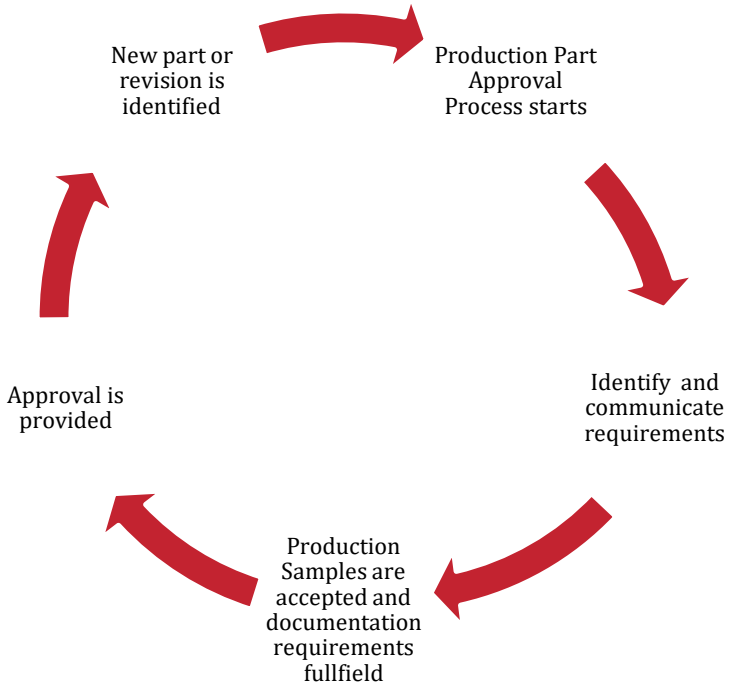
Software Quality Approval Process

When product includes custom created software, the activities for engineering consist of software development via the APQP process. The software shall be developed according to organization-wide processes tailored to the product being developed via the APQP process. The maturity of the software development process is expected to demonstrate the characteristics for repeatable, managed and defined processes. At times, Carling technologies will request evidence of consistently achieving software process maturity. Carling Technologies may require suppliers to be ASPICE Level 2 or 3 certified.

Production Part Approval Process

Suppliers to Carling Technologies may be required to comply with the PPAP submittal procedure and Carling Technologies PPAP approval documented on a PSW prior to shipping production parts. Carling Technologies will provide assistance, if needed. Contact your Carling Technologies Quality representative for the PPAP procedure and guidance or follow guidelines of the AIAG Production Part Approval Process reference manual.

QAF-800 Process



Product and Process Change Approval

The supplier will not make product or process changes or deviations, without prior written authorization from Carling Technologies

Any request for drawing changes, process changes or part deviation must be communicated in writing to the appropriate Carling Technologies buyer via Carling's QAF-670 form. The request should explain in detail; the requested change, the reason for the request, the cost/savings and benefits. This request may include, but is not limited to changes in:

- Manufacturing Location
- Material Processing
- Sequence of Processing, Manufacturing / Process methods
- Bill of Materials (BOM's) and their sources
- Design
- Quality Control Techniques (inspection and test)
- Sub-Suppliers (including Tier 2 and Tier 3)
- Fixtures
- Gages
- Dies
- Tooling
- Packaging Changes
- Rework or any activity not included in the initial PPAP/validation
- RoHS, REACH, SVHCs or other environmental requirements
- Software changes

Continuous Improvement

Carling Technologies strongly encourages its business partners to adopt a continuous improvement strategy. Please remember, any changes to design/product/process/materials that have been previously approved must be approved by the Carling Technologies Quality function prior to implementation. It is advisable to notify Carling Technologies as early in the CIP process as possible to avoid unnecessary delays.

Supplier Score Card

Carling Technologies will utilize a Supplier Score Card to rate its suppliers. The Supplier Score Card is a comprehensive, cross-functional, evaluation of a supplier's quality performance. This rating is used to develop the supply base and improve the quality of the product supplied. It is also used to determine future business opportunities with a supplier.

The supplier quality performance rating will be generated monthly by Carling Technologies and forwarded to the supplier. Any supplier that has a conditional performance for three consecutive months or is unacceptable is required to submit corrective action and/or will be subject to audit by Carling Technologies. Failure to receive acceptable performance may result in removal of supplier from the approved supplier list.

Suppliers are measured using the following criteria:

- Quality (PPM, Reject Occurrences, Line Disruptions)
- Delivery (OTD)
- Support (SCARs, Quality System)

Quality System

Suppliers of automotive products and services to Carling Technologies will be, at a minimum, registered to the current ISO 9001 standard. In addition, certain products/suppliers must be compliant to the requirements of IATF16949 standard and ideally, be registered.

Certification must be maintained, and any loss of certification or change to certification status, for whatever reason, must be reported to Carling Technologies. Carling Technologies reserves the right to perform Quality System Assessments at any time, with proper notice given to the supplier. Poor Supplier performance could also trigger a Quality System Process audit.

Delivery

Suppliers are expected to achieve 100% on-time delivery (defined as the agreed to delivery date to the specified Carling Technologies facility), in the correct quantity, according to the Purchase Order requirements. Suppliers delivering less than 100% on time may be required to submit a corrective action plan to improve and meet the requirement. Suppliers may be responsible for all costs incurred by Carling Technologies as a result of late shipments. If the supplier is unable to ship product as scheduled, a late shipment notification via E-mail and/or telephone communication must be sent to the suppliers' designated Carling buyer, indicating the reason for the delay and the target date for supplying the product and a corrective action plan. For expedited shipments, due to supplier issues, the supplier will assume responsibilities for the expedited portion of the shipping costs.

Material Rejection and Corrective Actions

If the supplier ships nonconforming products to Carling Technologies, the quality department will place the material on hold and notify the supplier. The initial contact will be by e-mail containing a Supplier Corrective Action Request (SCAR) to the designated supplier contact person. Suppliers are required to use disciplined problem-solving methods to investigate and eliminate the root causes of defective product and implement effective preventive/corrective action. Carling Technologies requires the use of the Carling Technologies SCAR or other similar 8D format. The supplier response must include the following:

- Implementation of Containment Actions
- Implementation of Temporary Corrective Actions
- Determination of Root Cause (five whys for occurrence and five whys for detection)
- Implementation of Permanent Corrective Actions
- Verification of the effectiveness of actions taken

Suppliers are required to initiate containment activities within 2 business days and final corrective action response within 10 business days after SCAR notification. Validation/Verification of the effectiveness of the correction action is required within 30 business days after the SCAR notification.

Carling Technologies may debit the supplier $250 per instance for administrative costs of Material Rejections and SCAR's. Charge-back fees may be imposed on suppliers who are unable to replace, sort or inspect materials that have been agreed to be out of specification should the component/material in question be needed and the supplier cannot replace or sort or inspect the materials.

Supplier Support Requirements to address the following items:

- On-Site Sort and/or Rework with supervision
- Third Party Sort and/or Rework
- Formal Corrective Action Response
- Return Goods Authorization
- Certified Replacement Stock

Counterfeit and Fraudulent Parts Control

Carling Technologies has modeled its Counterfeit and Fraudulent Parts Control process to comply with the SAE Standard AS5553 (Counterfeit Electronic Parts: Avoidance, Detection, Mitigation and Disposition). Carling requires all electronic parts will only be procured directly from the original manufacturer or through a franchised distributor.

Supplier C-TPAT Program Participation

The Customs-Trade Partnership Against Terrorism ("C-TPAT") is a joint United States Customs-business initiative to build cooperative relationships that strengthen overall supply chain and border security to protect against the introduction of terrorists and weapons of mass destruction into the United States.

Through this initiative, US Customs asks importers into the United States, such as Carling Technologies,

to ensure the integrity of their security practices and communicate security guidelines to their business partners within the supply chain.

As part of the C-TPAT program, Carling Technologies is obligated to develop and implement a program to enhance security throughout our supply chain in accordance with C-TPAT Minimum Security Criteria (MSC) guidelines. In order to meet our responsibility, Carling Technologies may ask you to review the C-TPAT security recommendations appropriate for your business, to respond to a questionnaire designed to assess your conformance to those recommendations, and to agree to address those areas where your company's security program should be improved in order to conform to the recommendations.

We also require our suppliers to ensure that carriers they use are compliant with all sanitization laws and any pallets used are compliant with International Standards For Phytosanitary Measures No. 15 (ISPM-15).

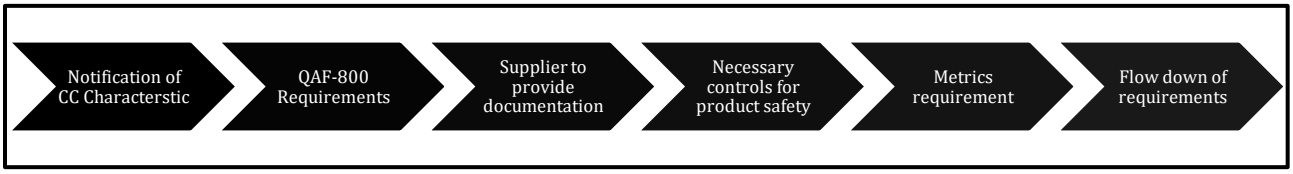
Business Continuity Planning / Disaster Recovery

Suppliers are expected to develop and have available upon request a documented Business Continuity Plan, which would allow for the uninterrupted flow of parts/services to Carling.

Product Safety Policy

Principle: Carling Technologies is committed to product safety. For those applications identified as safety critical, product safety will always be the primary consideration during the product design life cycle, manufacture, marketing, and sales of Carling Technologies' products. Carling Technologies employees must understand and follow all applicable standards, and procedures during product development, manufacturing and marketing for meeting all safety requirements and must report any safety related concerns in a timely manner. Carling Technologies management is responsible for addressing reported concerns and ensuring the products meet all safety related concerns. This principle applies globally to all employees, as well as suppliers and any agents acting on behalf of Carling Technologies.

Product Safety – Identification & Requirements



Safety requirements are determined based on the potential of a feature, product or system to create a personal hazard to any person in contact with the products or effects caused by the product. Suppliers of a safety critical part are categorized as a Safety Part Supplier.

Carling Technologies customers shall convey product safety requirements in technical specification, purchase orders and drawing requirements. [CC] is the symbol used for critical characteristic and/or product safety on Carling Technologies print. All requirements will also be clearly stated in the purchase order. In an event the supplier is unclear on any requirements; they are required to contact Carling Supply Chain or Quality on the pretext of clarification or more information. This shall be conducted at the supplier contract review stage or QAF-800 stage.

The methods used for marking lot/serial numbers on safety critical parts must support identification, traceability and failure investigation through all phases of the product 's life.

Product Safety – Responsibility

The production of safe, fully conforming products to the Carling Technologies is the supplier's responsibility and is part of the supplier's contractual commitment.

Suppliers are required to conduct a criticality analysis or risk analysis for features of the product design and production process that could result in a safety effect. For suppliers having design responsibility, special characteristics related to safety must be clearly identified within their design specifications, verification & validation plans, drawings, and technical documentation. Suppliers who are design responsible for products impacting safety are required to develop System, Sub-System, Design and Process Failure Modes Effects Analysis to assist in the analysis.

Carling Technologies must be notified of any product features or functions where the potential failure mode and associated customer safety effect are assigned a high severity score (9 or 10). (Severity for any features identified by Carling Technologies with a [CC] or [1] must have a severity score of a 9 or 10 on the supplier's FMEA.)

Suppliers are responsible to ensure that all sub-suppliers and contractors are aware of and comply with the requirements related to safety requirements.

Product Safety – Capability Requirements

Capability requirements for parts identified with [CC] are required to be under statistical control, normally distributed and minimum Cpk of 1.67

Product Safety – Modification of Product

All changes including modification (rework & repair) that may affect the integrity of the product characteristics, contents, traceability, visual attributes for product safety class product are not allowed without prior authorization from Carling Technologies Quality/Engineering department.

Modification of product types:

Repair – Action on a non-conforming product or service to make it acceptable for the intended use.

Rework – Action on a non-conforming product or service to make it conform to the requirements.

Product Safety – Identification of Shipment (Labels)

Minimum 4x4 inch orange label applied on all sides of the box denoting the product shipment as safety critical item is required. This is communicated to the supplier through purchase order, QAF-800 stage, and via Carling Technologies quality engineers assigned on the project.

Product Safety – Safety Audits

Carling Technologies periodically conducts audits on suppliers that provide safety class products. Suppliers must be able to demonstrate they have the organization, systems, processes, and competencies to manage Carling Technologies requirements related to safety critical features.