

# *Quality Manual*



*Our Mission  
Improve our customer's and their  
customer's competitiveness. Lower  
our customer's total costs and help  
them produce higher value,  
more profitable products*



## Table of contents

1	Introduction .....	4
1.1	Company primary activities and history .....	4
1.2	Scope and application .....	4
1.3	Distribution and control of quality manual.....	4
2	Normative references.....	4
3	Terms, definitions and acronyms .....	5
4	Quality Management system .....	5
4.1	Quality Management system, general requirements .....	5
4.2	Documentation requirements .....	7
4.2.1	General.....	7
4.2.2	Quality Manual.....	7
4.2.3	Control of documents and engineering specifications.....	7
4.2.4	Control of records .....	7
5	Management responsibility .....	8
5.1	Management commitment.....	8
5.2	Customer Focus .....	8
5.3	Quality policy .....	8
5.4	Planning .....	9
5.4.1	Quality Objectives.....	9
5.5	Responsibility, authority & communication .....	9
5.5.1	Responsibility and authority .....	9
5.5.2	Management and customer representative.....	9
5.5.3	Internal communication.....	10
5.6	Management review .....	10
5.6.1	General.....	10
5.6.2	Management review input/output.....	10
6	Resource management.....	11
6.1	Provision of resources .....	11
6.2	Human resources .....	11
6.3	Infrastructure .....	12
6.4	Work environment .....	12
7	Environmental Management.....	12
7.1	Regulatory Compliance .....	12
7.1.1	Hazardous Substances Management.....	12
7.1.1	Pollution Control Management.....	13
7.2	Product Design.....	13
7.3	Operations management.....	13
8	Product realisation .....	13
8.1	Planning of product realisation .....	13
8.1.1	Confidentiality .....	14
8.2	Customer-related processes .....	14
8.2.1	Determination of requirements related to the product and special characteristics.....	14
8.2.2	Review of requirements, contract review .....	14
8.2.3	Customer communication .....	14



8.3 Design and development.....	15
8.3.1 Design and Development Planning.....	15
8.3.2 Development of Product and Manufacturing Process INPUTS.....	15
8.3.3 Development of Product and Manufacturing Process OUTPUTS.....	15
8.3.4 Design and Development Review & Verification.....	15
8.3.5 Design and Development Validation, Prototype & PPAP.....	16
8.3.6 Control of Design and Development Changes.....	16
8.4 Purchasing .....	16
8.4.1 Purchasing process .....	16
8.4.2 Purchasing information .....	17
8.4.3 Verification of purchased product .....	17
8.5 Production and service provision.....	17
8.5.1 Control of production information.....	17
8.5.2 Equipment and tooling maintenance for Production .....	18
8.5.3 Production Scheduling.....	18
8.5.4 Validation of processes for production and service provision .....	18
8.5.5 Identification and traceability.....	18
8.5.6 Customer property .....	18
8.5.7 Preservation of product.....	18
8.6 Control of monitoring & measuring devices.....	19
8.6.1 Measurement system analysis and calibration records.....	19
8.6.2 Laboratory requirements.....	19
9 Measurement, analysis and improvement .....	20
9.1 General .....	20
9.2 Monitoring and measurement.....	20
9.2.1 Customer satisfaction .....	20
9.2.2 Internal audit .....	20
9.2.3 Monitoring and measurement of processes.....	20
9.2.4 Monitoring and measurement of product .....	21
9.3 Control of non conforming product .....	21
9.4 Analysis of data .....	21
9.5 Improvement .....	21
9.5.1 Continual improvement.....	21
9.5.2 Corrective/Preventive actions .....	22
10 Revision history .....	22



# 1 Introduction

## 1.1 Company primary activities and history

The Lavergne Group is a resin compounding enterprise, strongly axed on quality, customer service and environmental guidelines. The Lavergne Group has a remarkable list of successes

that started when the President, Jean Luc Lavergne, and a team of chemists, went into compounding with the philosophy of "build, develop, create". Ever since, the excellence of our products has gone all over the world satisfying at the most exigent industries.

**Getting The Job Done  
Better And Faster**

**High-Quality, Consistent  
Engineering Compound**

## 1.2 Scope and application

This manual is the highest level document that sets up the general policies that the Lavergne Group follows in its Quality System. This manual shows our ability to consistently provide product that meets all customers and regulatory requirements, according to the standard ISO/TS16949:2002, (including the ISO9001:2000 requirements plus the automotive particular requirements). We include the main policies followed by the Internal Laboratory, committed to provide reliable quality in all our products by the maintenance of the ISO17025 certification. This quality manual is applicable at the Montreal Lavergne Group compounding facility. Our scope is the Design and Manufacturing of thermoplastic blends and thermoplastic alloys with no exclusions.

## 1.3 Distribution and control of quality manual

This quality Manual is published with the intention to inform any interested party about our Quality Management System general guidelines, policies and procedures. All printed copies are uncontrolled and will not be updated except if a special agreement has been established with the Quality Management Department. The only controlled copy is in the informatic network of the Lavergne Group.

# 2 Normative references

TS 16949 - Particular requirements for the application of ISO9001 for the automotive production

ISO 9001:2000 - QMS - Requirements

ISO 17025 General Requirements for the Competence of Calibration and Testing Laboratories



ISO 19011 Guidelines for quality and/or environmental management systems auditing  
QC080000 IEC Hazardous Substance process management system requirement  
RoHS - Restrictions of Hazardous Substances  
GSE - General Specification for the Environment  
GM approved sources standards - Approved source of GMP.PA66.093R, GMP.PC.018R and GMP.PETP.015R  
UL Standards capability

### **3 Terms, definitions and acronyms**

ADP	Advanced development project
AIAG	Automotive Industry Action Group
APQP	Advanced Product Quality Planning
CAR	Corrective Action
COA	Certificate Of Analysis
CSST	Health and Security at Work Commission (Government)
DL / NCR	Non conformance report
LG / GL	Lavergne Group
LGL	Lavergne Group laboratory
Masterlist	Main document control tool, includes a list of all controlled documents, with their revision level and hyperlinks
OPS	Health and Security program at Lavergne Group
PPAP	Production Part Approval Process
QMS	Quality Management System
Qualipost	Internal communication board exclusive for the Quality Department, located on the cafeteria wall
WHMIS	Workplace hazardous material information system

### **4 Quality Management system**

#### ***4.1 Quality Management system, general requirements***

The Lavergne Group has identified the processes needed for this quality system as well as their interaction, as shown in figure 1. The QMS has been developed according to the TS16949 standards supporting the philosophy of continuous improvement and the quality policy aiming to enhance customer satisfaction. All listed standards in the Normative References are additional supports.

The effectiveness of the Quality Management System is assessed through:

1. Review of quality objectives at the management reviews
2. Internal audits
3. Corrective actions and improvement projects.



**Quality Management system, Processes and interactions**

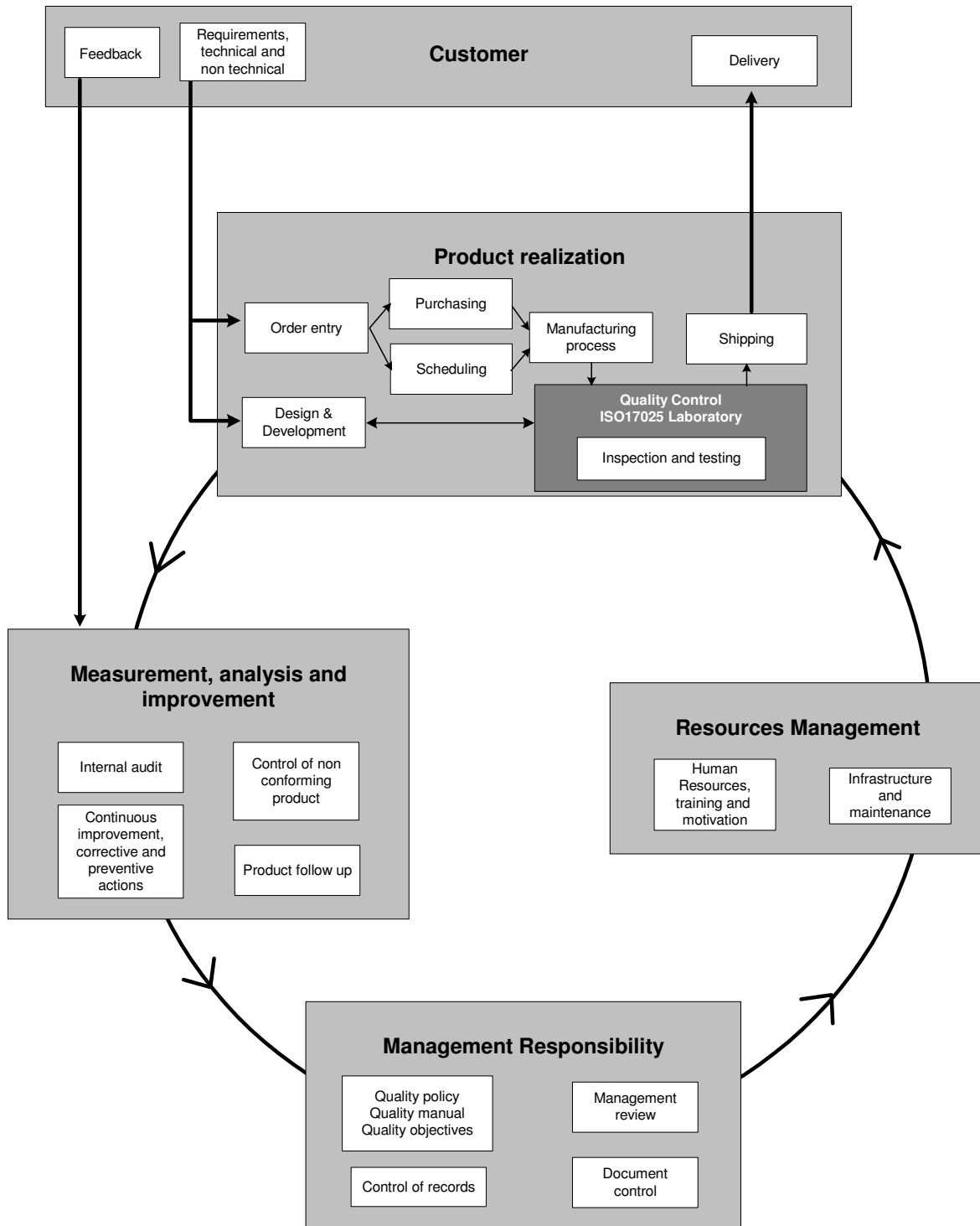


Figure 1



## **4.2 Documentation requirements**

### **4.2.1 General**

Our quality system documentation is divided in three levels:

**Level 1:** defines the guidelines and policies of the Lavergne Group, and includes this quality manual, the quality policy and the quality objectives

**Level 2:** composed of the Quality System Procedures that ensure the planning, operation and control of our operations. All of them are indexed in the Masterlist. (GL document series)

**Level 3:** the operational work instructions and forms that assure the adequate performance and traceability of our operations. (ITL document series)

### **4.2.2 Quality Manual**

This quality manual follows the prescriptions of the TS16949 standard as applied by the Lavergne Group.

### **4.2.3 Control of documents and engineering specifications**

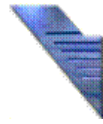
All Quality documents generated at the Lavergne Group, are approved prior to issue by at least two persons, they are reviewed and maintained at the latest revision level always available at the point of use. This is achieved by an informatic network giving access to electronic copies. The printed copies are available where computer is not present and those copies are controlled by the Masterlist. All external documents, including the customers and engineering specifications, are also controlled through the Masterlist.

The engineering specifications are updated at a maximum delay of two weeks after their release. There is one Masterlist for the factory and another for the laboratory and they are managed independently in order to keep the laboratory's decisions objective and independent.

The Control of documents is detailed in the Document Control Process GL.05. The control of the Engineering specifications is described in the Product Follow up process GL.24

### **4.2.4 Control of records**

Quality records providing evidence of the conformity to the standards are maintained. This is a key element for traceability, the hardcopies are legible and retrievable, and the electronic documents are backed up every day. Retention period is available in the Masterlist, most of hardcopies and electronic records are set up to five years and three years for the product samples.



The Quality records procedure GL.16 details this process.

## **5 Management responsibility**

### **5.1 Management commitment**

Top management is dedicated to maintain the Quality Management System, this is achieved through the communication of the importance of satisfying customers, complying regulatory requirements, the review of the Quality Policy, the Quality Objectives progress, and the execution of the Management reviews. All required resources are provided as a result of these reviews.

All the processes are reviewed by the concerned top managers at least in a yearly basis, to assure their effectiveness and efficiency.

### **5.2 Customer Focus**

The Lavergne Group is strongly customer focused. From the product design to the delivery process, we make sure that their requirements are kept and followed. Our tools, such as the Customer Analysis forms and the customer surveys, assure their constant satisfaction. Customer related processes are detailed in the sections 7.2 and 8.2

### **5.3 Quality policy**

**THE LAVERGNE GROUP Inc. manufactures quality thermoplastic blends and alloys that constantly meet or exceed our customers expectations in:**

- **Our products performance**
- **Our delivery**
- **Our customer service**

**Lavergne Group promotes continuous improvement of customer satisfaction by maintaining and reviewing the TS16949:2002 and ISO17025:2005 quality systems.**

**The performance of each of these processes is measurable, and their goals constitute our Quality Objectives which are controlled through management reviews.**



The achievement of the Quality Policy is accomplished through the Quality Objectives and the communication and implication of all employees, who are communicated and involved in understanding it. This policy is reviewed for suitability at the Management reviews.

## **5.4 Planning**

### **5.4.1 Quality Objectives**

The Quality Objectives are set up to download the Quality Policy within the overall processes of the company. They are marking the general lines for the effectiveness of the Quality Management System and their achievement level is measured and discussed at management reviews. The overall Quality Objectives are:

- Customer feedback
- Poor quality cost
- Control of non conforming material
- Continuous improvement processes (includes internal audits remarks)
- Product conformity
- Production process efficiency

The measurement of these objectives has a target and is graphed in order to detect tendencies. Any deviation generates a corrective action.

## **5.5 Responsibility, authority & communication**

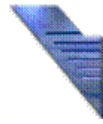
### **5.5.1 Responsibility and authority**

Top management ensures that responsibilities and authorities are defined and communicated within the Lavergne Group to promote effective management of the quality system. A Management Hierarchy Map illustrates the responsibility and relative authority of personnel who manage, perform, and verify the activities affecting the QMS. The personnel responsible for the product quality has the authority to stop production across all working shifts. This is documented in the Quality control process GL.10. All authorities and responsibilities are assigned in the Job Descriptions and a copy is kept at the Human Resources office.

The hierarchy map is detailed in the document GL.18F0

### **5.5.2 Management and customer representative**

Top management has appointed the Quality Director with the authority and responsibility to ensure that all processes needed for the quality management system are established, implemented and maintained, and to report to top management the performance of the Quality Management System and any need



for improvement. The quality Director can delegate part of his authority and responsibility to the Quality Control Analyst, in order to assure the effectiveness of the QMS. These two positions act as customer's representatives inside the enterprise to ensure that all their requirements are addressed and to promote awareness to meet and exceed their expectations throughout the LG.

### **5.5.3 Internal communication**

To warrantee that appropriate communication is established with all employees (regarding the effectiveness of the quality management system), the Qualipost is regularly updated and all feedback from the readers or employees comments is passed in review at the regular Quality Team meetings. Other communication tools include the employee reviews that are made by the management and direction.

## **5.6 Management review**

### **5.6.1 General**

Top management reviews the Quality System one to three times a year to ensure its continuing suitability, adequacy and effectiveness and includes all the requirements established in this international standard such as the performance trends and customer issues. Records of these reviews are maintained in chronological order.

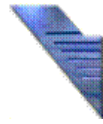
### **5.6.2 Management review input/output**

The input to management review includes the following:

- quality objectives follow up and information of the results of all audits,
- the status of preventive and corrective actions,
- follow-up actions from previous management reviews,
- changes that could affect the quality management system,
- all processes performances
- recommendations for improvement, and
- an analysis of actual and potential field-failures and their impact on quality, safety and environment (when applicable).

The outputs of these reviews include the following:

- actions and decisions related to the improvement of the effectiveness of the quality management system and its processes,
- the improvement of product related to customer requirements, and
- the determination of resource needs.



It outputs also Corrective Actions if the quality objectives are not accomplished and provides feedback to the laboratory regarding their performance, accuracy and readiness of the tests.

Details are shown in the Management Responsibilities process GL.01

## **6 Resource management**

### **6.1 Provision of resources**

Top management ensures that adequate staff and infrastructure (equipment and materials) are available to:

- Maintain and improve the effectiveness of the QMS
- Meet customer requirements and enhance customer satisfaction
- Meet the quality objectives
- Maintain an adequate work environment

### **6.2 Human resources**

Every person at all levels in the Lavergne Group whose work affects quality in any manner is competent, and fulfils the education, training, skills and experience as required in the job descriptions (including Product Design staff). This is assured by the determination of the training needs and the providence of all missing or obsolete competences, and the evaluation of the level of achievement for these objectives. All employees are aware of the relevance and importance of their work and how they contribute to the achievement of the quality objectives, this awareness is reinforced through the communication tools such as meetings with the production teams or the Qualipost.

Training needs are summarised at the Training Chart maintained by the H.R. responsible, as well as the appropriate records in the employees' files.

Every manager is responsible for the on the job training regarding their department, but records are maintained at the H.R office.

Motivation and empowerment is followed through the motivation process, where meetings are scheduled with the employees in order to listen to their innovation and improvement ideas.

Hiring, Training and Motivation processes are detailed in the Human Resource process GL.18



## 6.3 Infrastructure

The Lavergne Group determines, provides and maintains the infrastructure needed to achieve product conformity. The ADP team designs any product through the APQP system, which reviews any equipment, facility, service, and contingency plans. All product feasibility reviews ensure to meet and exceed our customer's expectations from the Product Design stage, the Production processes and the Quality and Administrative capabilities. When required this is discussed in the Management Reviews.

## 6.4 Work environment

The work environment is considered and addressed to achieve the conformity to product requirements, the safety of the personnel is assured through the Emergency Plan which includes risks of fire, chemical exposition, and other topics for all employees of the GL and the LGL. The information system WHMIS is properly stored, indexed and updated.



The 5S's program is maintained in the areas of the Lavergne Group accordingly to the product needs. The OPS program is part of the CSST rules to assure that employees are in a safe environment. There is an established policy for the safety of the labour workforce and a bonus is granted to every employee who has no accidents within the year.

Health and security details are shown in the Prevention plan (GL18F8), Emergency Plan (GL18F7), 5S's procedure ITQ01, and the OPS records. Local health centers assess the quality of the work environment based on their own standards. We respect the health and security at work regulation [S-2.1,r19.01] (CSST).

## 7 Environmental Management

Environmental Management Process is detailed in the GL25 Process

### 7.1 Regulatory Compliance

Compliance is divided into:

- Hazardous Substances Management
- Pollution Control Management

#### 7.1.1 Hazardous Substances Management



Hazardous Substances list is referenced in the GL25 Process. The Lavergne Group does not use any hazardous or unhealthy substances within our operations or processes.

### **7.1.1 Pollution Control Management**

The respect of Governmental Pollution Control is assured through governmental inspections to our operations as required by them. The Lavergne Group provides all resources to maintain compliance to the city regulations.

## **7.2 Product Design**

From the Product Development stage, the Lavergne Group is engaged to produce environmentally friendly resins. The R&D team designs recipes that do not contain any hazardous or unhealthy substances, therefore respecting the human being and the environment.

## **7.3 Operations management**

To maintain and support 7.1 and 7.2 statements, our operations control includes:

- R&D approves safe sources of materials to produce the recipes (GL06-3.2, supplier selection process)
- Supply chain is controlled by Purchasing, who supplies only the approved source of raw materials (GL06 purchasing process)
- Manufacturing Control verifies the compliance by inspections and ensuring material management as per quality control procedures (Product audits)

# **8 Product realisation**

## **8.1 Planning of product realisation**

Product Realisation is achieved in all requirements through the APQP design approach, which embodies the concepts of error prevention and continual improvement on a multidisciplinary methodology.

The Quality Planning of product realisation at Lavergne Group is initiated at the Product Design stage. Among other aspects, the APQP system includes in the title I.1 the voice of the customer, I.6 customer input, I.7 design goals and I.8 reliability and quality goals, all this in order to set up the objectives and requirements for the product. We are able to verify, validate, monitor inspect and test with the criteria for product acceptance through this system. Control Plans, Process Maps and FMEAs are generated as well. Records are kept for each ADP project.



For details, the Design and Development process GL.04 and the ADP-APQP master form are available (GL.04F1).

### 8.1.1 Confidentiality

The Lavergne Group ensures confidentiality in all levels of customer related products and projects and all related product information. Every employee signs a confidentiality agreement at their hiring in the GL and the LGL.

## 8.2 Customer-related processes

### 8.2.1 Determination of requirements related to the product and special characteristics

All requirements for every product and customer are systematically analysed to determine the requirements either technical and non technical, such as delivery and post-delivery activities, regulations to respect, special characteristics, etc.

Details shown in the MN43 form (customer analysis form)

### 8.2.2 Review of requirements, contract review

Once the product requirements and special characteristics are defined, the APQP system will establish our ability to supply the product meeting all the stated requirements. This includes the feasibility and product capability measurements. The Customer Analysis form (MN43) becomes the base of the supplied product contract. The Sample request process (SOR, GL02) ensures that the customer is able to test the product and validate all results in his moulding lines. The Order Entry process GL.03 exposes details of the review.

### 8.2.3 Customer communication

Effective methods for communicating with the customers are:

- Enquiries through the customer service representatives and direct contact with our engineering team is distributed as follows:

Product status	Customer status	Action required	Responsible body
Commercial Product	Customer already using product	CAR in SAP Business One	QC (anyone who gets this type of complaint forwards the email, phone etc.. QC takes it from there)
Commercial Product	Customer not using the product or new Customer	Prospect action in SAP Business One	Sales fill in the Prospect. The remaining actions will be taken by the necessary group (QC, R&D, Sales)
New Product	Present or New Customer	R&D (GL# project)	R&D



- Customer feedback (customer surveys and customer complaints treatment) details in the continuous improvement process GL.14.

## **8.3 Design and development**

### **8.3.1 Design and Development Planning**

The Lavergne Group plans and controls the design and development of product. This is very effectively managed through the APQP system that is standard for all our developments. This is a multidisciplinary approach that holds the concurrent engineering principle, including as a minimum the Sales, Product Development, Quality, Logistics and Production departments.

The Chapter I of the APQP system sets up the planning and definition of the project stages. During the design and development planning, the Lavergne Group determines: the design and development stages, the review, verification and validation that are appropriate to each design and development stage, and the responsibilities and authorities for the design, including the monitoring methods, FMEAs and Control Plans.

### **8.3.2 Development of Product and Manufacturing Process INPUTS**

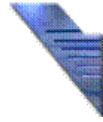
All required and applicable lines for the INPUT are defined in the APQP system chapters I and II for the case of Product Design and chapters III and IV for the Manufacturing Process. The Product design output is used as input for the Manufacturing Process. INPUTS incorporate customers specifications, regulatory standards, desired characteristics such as chemical properties and physical behaviours, performance and reliability targets, product quality objectives and costs constraints, between others. Manufacturing inputs include the required process capability, the FMEA and Control Plans.

### **8.3.3 Development of Product and Manufacturing Process OUTPUTS**

The required OUTPUTS are as well outlined in the APQP system. At the Product Design stage we have a formulation that meets or exceeds the customer requirements, including information for the purchasing and production departments, the product acceptance criteria, safety recommendations, MSDS and spec sheets, Design FMEA and Control Plans. The Manufacturing Process Output includes the floor plant layout, Work instructions, Packaging standards and methods for fast detection of non-conformities.

### **8.3.4 Design and Development Review & Verification**

Chapters II.3 and II.4 of the APQP system are the Review and verification phases of the Product Design, and involve:



- Verification: verify that the product design corresponds with the customer requirements and that the monitoring is adequate to achieve all goals
- Review: the engineering inspection and all affected areas, storage conditions, environmental conditions and dangers, datasheet made, simulations, tests, manufacturability, test failures, capable suppliers, any new quality work instructions and forms, new trainings, customer approvals, any new tooling or inspection equipment required

### **8.3.5 Design and Development Validation, Prototype & PPAP**

Chapter IV of the APQP system is the Product and Process Validation. To achieve it, it performs production trial runs, data for the preliminary process capability is obtained, prototypes are produced and analysed, and the PPAP is obtained whenever the customer requires it. We follow the AIAG PPAP manual.

There is a complementary standard form when the Customer Analysis reveals the need of the PPAP, see the MN43F0 PPAP form

If the customer does not require a PPAP, the product is still validated with the customer, through trial runs of the resins at their facilities and the respective tests. As a final stage of the APQP system we obtain feedback from the customers regarding the satisfaction with the product and service.

### **8.3.6 Control of Design and Development Changes**

Design changes are to be done following the Engineering Change forms, which guide the analysis of the impact of these changes, including for the review, validation and approval before implementation. If required, forms, procedures, FMEAS or Control plans are updated.

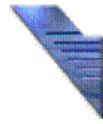
Reference MN32, Engineering Change Request

## **8.4 Purchasing**

### **8.4.1 Purchasing process**

Supplier selection is made based upon their ability to deliver in timely manner the resources meeting our requirements. Controls and evaluations depend on the effect that purchased product has on the final product. All suppliers shall conform to regulatory laws and constraints. We prefer suppliers who maintain quality systems such as the TS16949 or the ISO9000 and we collaborate as necessary to help them reach this certification. The approved sources are listed and evaluated on a yearly basis, based on their delivery, quality, price and general performance.

Details are described in the Purchasing Process GL.06



## 8.4.2 Purchasing information

Taking as base the output of the Design, Manufacturing and Other requirements specifications, purchasing has all specifications clearly defined prior to communication with suppliers and this information is enough to describe, where appropriate:

- requirements for approval of product, procedures, processes and equipment,
- requirements for qualification of personnel, and
- Quality management system requirements.

## 8.4.3 Verification of purchased product

All incoming product is verified at receiving, and this verification depends of its kind; concerning raw materials our policy is that if a COA is not enclosed, Laboratory tests should be performed before accepting it.

As mentioned in 8.4.1, Suppliers are monitored Based on the delivered product quality, non conformances and returns.

All details are in the Receiving Process GL.22 and the Receiving work instruction ITS03

## 8.5 Production and service provision

### 8.5.1 Control of production information

Information describing the characteristics of the product is available and used at all concerned points, as well as the work instructions that are accessible at workstations. Production documentation includes Control Plans and FMEAS from the APQP design process. All documents in the Control Plans are verified to be in stream usage to ensure that all controls are being monitored. Control Plans and FMEAS are a part of the Masterlist and are controlled following all documentation policies as stated in the Document Control Process.



Details are available in the Production Process GL.09



### **8.5.2 Equipment and tooling maintenance for Production**

Suitable equipment and tooling including the Preventive and Predictive maintenance are managed through the Synergy software. This is a system that leads the Lavergne Group to an Error Free maintenance schedule and equipment control. All equipments are identified and security stock of critical replacement pieces is maintained. Work orders are automated and are followed by the mechanics team. Predictive maintenance is followed.

See Maintenance Process GL.20

### **8.5.3 Production Scheduling**

The availability of customer requirements of product are met by appropriate production scheduling, providing, when required, a safety stock to prevent lack of material.

Scheduling process is included in the GL.09 Production Process

### **8.5.4 Validation of processes for production and service provision**

All new and special processes, such as the metal detectors, are validated and approved before being performed until they demonstrate their ability to achieve planned results. For this purpose, criteria are defined and tests carried on, the personnel is trained and the appropriate documentation such as work instructions and forms are generated. All records of training are guarded at the HR office.

### **8.5.5 Identification and traceability**

All products are tagged for identification by their product code, lot numbers, PO and material release, First-In-First-Out order, and box number as necessary to trace in an effective manner the kind of product and the inspection status. Any product is fully traceable in raw materials, performed tests, production processes, machinery parameters and responsible operators.

### **8.5.6 Customer property**

Information is the most important customer property that we could keep due to the nature of our product. Information is organised and protected in the network by password and access levels means. Back ups are safeguarded to warrantee their upholding. We do not have any customer tooling or equipment.

### **8.5.7 Preservation of product**

When our resins are in process, they are preserved by an automated transportation system, avoiding all contact with contamination and human error.



Products in boxes are identified by our labelling system. These boxes are properly built and assure the product preservation even after transatlantic carriage. In the case of containers we use interior wrapping so no external elements pollute it. Bulk product is kept in hermetic storage silos that are exclusive for each kind of resin and are purged after each lot. First-In-First-Out order is followed to assure the inventory turn over and avoid obsolescence.

Packaging is documented in the production work instructions.

## **8.6 Control of monitoring & measuring devices**

### **8.6.1 Measurement system analysis and calibration records**

We have divided the measurement devices in two categories: Production and Laboratory.

The Production systems are managed by the maintenance supervisor, who assures the proper calibration and verification before their use. Records are maintained in the Maintenance office and labels are placed for visual reference. Measurement devices are protected of non intentional miscalibration and damage by strategically placing them. All quality control measurements are depending on the Laboratory, detailed in the 7.6.3. When adjustments are made by the operators, these are made by trained personnel and as per established work instructions; records are maintained.

### **8.6.2 Laboratory requirements**

The Lavergne Group proudly maintains the ISO 17025 certification in its Internal Laboratory. Our modern, well equipped laboratory ensures unparalleled quality control standards for all our resins even in the most demanding specifications.

State of the art test and analysis machinery is available, such as the Perkin Elmer DSC7 and Paragon 1000 Thermal Analysis systems, Instron dual column for tensile, compression and flexural testing; from CEAST, our Laboratory includes the Resil Impactor for the charpy and Izod tests, the HDT (determination of temperature of deflection under load) and the smart RHEO for rheologic testing. For moulding samples, there is a dedicated injection machine, a vacuum oven and an environmental chamber to perform tests in all conditions from extremely low to extremely high temperatures.



The ISO17025 assures that rigorous standards are followed, including training, calibration, methods and record generation. ASTM, ISO and UL methods are in place. We are certified by UL for certain methods and we



participate in proficiency testings (inter-laboratory comparisons). Confidentiality is kept following the GL and the LGL general policies.

The Laboratory is impartial and this is achieved through independent authority and different subordination than the factory. There is a Quality Manual for the Laboratory in order to detail all the technical requirements that are additional to the ISO 9000 standards included in the ISO 17025.

## **9 Measurement, analysis and improvement**

### **9.1 General**

The Lavergne Group Quality Plans include tools for planning, monitoring and analysing the processes needed to demonstrate the conformity of the product, the conformity of the QMS and continually improve its effectiveness. We identify the necessary statistical tools as an output of the APQP design process, including the Control Plan and Process Capabilities. Our staff understands and uses these tools to control variation and manage continuous improvements.

### **9.2 Monitoring and measurement**

#### **9.2.1 Customer satisfaction**

The first performance measurement is the satisfaction of our customers. This is one of the columns in our quality objectives. All customer requirements are addressed and feedback is continuously encouraged. All customers complaints generate automatically a corrective action or continuous improvements.

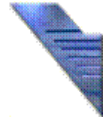
#### **9.2.2 Internal audit**

The ISO 19011 Guidelines for QMS auditing are followed since Internal Audits are one of the main tools to keep the QMS conforming to all applicable standards. The QMS is internally audited to comply with standards such as the TS16949, the European RoHS, ISO17025, and other customers' standards. The audit program is supervised and executed by the internal auditors team. These audits include the QMS, the product, the manufacturing process and all working shifts and are performed by trained auditors. Outstanding points are included in the Management Review.

Details are in the Internal Audit Process GL.17

#### **9.2.3 Monitoring and measurement of processes**

The process is monitored through the Process Capability, a Cpk of 1.33 or more is required. Control plans and process maps are respected and updated as



necessary. Reaction plans are included in the control plans and are reviewed with the customers whenever they require it.

### **9.2.4 Monitoring and measurement of product**

The APQP process plans the monitoring and inspection methods of the products. This includes incoming raw materials, in-process testing and final product analysis. The ISO17025 Internal Laboratory has the responsibility of monitoring the chemical and physical properties of our materials; the factory staff has physical inspection and manufacturing responsibilities.

There is a COA Certificate of Analysis issued for every lot. This assures that our products are conforming and respecting all standards before they are shipped to the customer.

## **9.3 Control of non conforming product**

Non conforming product is identified as soon as it is detected. This product has a DL number (NCR number) and is controlled by box identification means and by administrative procedures to prevent the unintentional shipping of non conforming material. There is a quarantine area in the warehouse for the products in the process of analysis or in transit and non-conforming. The issue of a COA indicates that all inspections have been passed.

The Quality control process GL.10 and the Non-conforming product process GL.13 describe in detail this materials handling and operations

## **9.4 Analysis of data**

Objective data is gathered to be analysed in order to verify the suitability and effectiveness of the QMS, customer satisfaction, product conformity and their trends. Techniques for analysis include Pareto graphs, capability studies, control charts, fishbone graphs, 5W analysis, and histograms. The results of the analysis are presented in the management review and provide base for preventive or corrective actions.

## **9.5 Improvement**

### **9.5.1 Continual improvement**

Primary part of the LG philosophy is based on the improvement concept. Kaizen and Six sigma principles are applied by the staff, as required by the particularities of the LG structure. Input for this process is the Quality Policy, Quality Objectives, Audit results (internal and external), customer observations, analysis of data, corrective and preventive actions and management review.



The process is defined in the Continuous improvement process GL.14 and the electronic SAP system.

### 9.5.2 Corrective/Preventive actions

Included in the same process as previous, Corrective and preventive actions have the objective of eliminating the root causes of non conformities or potential non conformities. Problem solving methods are used as required. We aim to use PokaYoke methods in our analysis. The progress of these actions is verified in the Management review.

## 10 Revision history

REVISION HISTORY				
Rev	Description of Change	Author	Approved by:	Effective Date
00	Initial Release	F. Senécal		Sept. 1, 2003
01	Update for 2004	F. Senecal		Dec 11. 2003
02	Hierarchy and Audit	F. Senécal		Dec, 2004
03	Quality policy, hierarchy chart, internal audit and quality plan update, inclusion of internal laboratory	P. Lopez	C. Filion	Oct 2006
04	Entire Quality Manual review	C Filion, P Lopez	J. L. Lavergne	April 2007
05	Mission statement inclusion	P Lopez	JL Lavergne	April 2008
06	Customer communication enhancement (7.2.3)	C Filion	F Tofan	Nov. 2008
07	Add section 7	P Lopez	C Filion	April 2009
08	5.6.1 change frequency	P Lopez	C Filion	Nov 2009