SUPPLIER QUALITY DEVELOPMENT MANUAL

Tim Chapman
Vice President

Gregory Post
Quality Manager

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 This Supplier Quality Assurance Manual is designed to assist Metelix suppliers in achieving improvements in quality, productivity and logistics that will benefit our suppliers and Metelix Products Inc.

1.2 This manual defines Metelix Products Inc's quality systems and procedures for suppliers.

1.3 Our supplier's quality systems are subject to review and evaluation by Metelix, with this manual serving as the basis for any such review. It will be the responsibility of the supplier to coordinate reviews of a sub-contractor's process or control systems.

1.4 It is our Supplier's responsibility to ensure that all documentation for Metelix's products is up to date (minimum annually) and available for reference. Metelix will supply required Metelix documents upon request if the Supplier review indicates the Supplier does not have them.

1.5 If Suppliers cannot comply with the requirements stated in this manual, the Supplier must submit a Supplier deviation request to Metelix. Deviation requests must include the Supplier's action plan detailing what the Supplier will do to correct the deviation, as well corrective action dates. Metelix must approve deviations in advance of production. An Incoming Corrective Action Report will be issues in the absence of Metelix approval for a deviation.

1.6 When packaging and transporting hazardous materials, our Suppliers must meet all applicable regulations. All containers must be adequately sealed to protect the contents during transportation.

1.7 All applicable Workplace Hazardous Materials Information System (WHMIS) & Material Safety Data Sheet (MSDS) documentation must be forwarded to Metelix on a timely basis.

1.8 When requested, Suppliers must submit material data through the International Material Data System (IMDS) using a Metelix ID number we will provide to you.

1.9 Any questions regarding this requirement should be directed to Metelix Purchasing.

2.0 COMPLIANCE OF BUSINESS AND PURCHASE ORDER

2.1 Metelix will generate a Request for Quote (RFQ) when we require products, as well as when we are considering a product or program change. Suppliers are expected to respond to Metelix by dates identified on the RFQ, with the appropriate documentation that is specified by the Metelix RFQ originator.

2.2 Metelix will issue Purchase Orders to Suppliers for awarded products or programs. Metelix's General Terms & Conditions are the ONLY terms and conditions that will govern the purchase of goods or services by Metelix.

2.3 Acceptance of Metelix's Purchase Order means acceptance of the requirements of this manual. Any deviation from the requirements of this manual or PO requires written agreement from Metelix Purchasing or an approved deviation sign-off.

3.0 QUALITY SYSTEM FOR ALL PRODUCTS

Incoming Materials and Components

3.1 Control of Subcontracted Products

3.1.1 The Supplier is responsible for ensuring products and services purchased from subcontractors for use in Metelix products conform to Metelix requirements. The Supplier is responsible for establishing procedures to meet this responsibility by implementing the following:

3.1.2 Ensuring there is documented evidence showing evidence of conformance to all applicable specifications.

3.1.3 Performing or purchasing the required inspection & testing at adequate frequencies to ensure conformance to specifications and performing appropriate statistical analysis.

3.1.4 Ensuring that materials that have been approved are identifiable & traceable. Non-conforming materials must be identified as such and must be segregated in a defined HOLD area.

3.1.5 The Supplier must verify their sub-contractor's certification at least once yearly.

3.2 Ongoing Verification & Testing

3.2.1 Suppliers must prepare written laboratory test & inspection instructions to enhance applicable engineering standards. These instructions could include inspection instruction sheets, test procedures or other documents normally used.

3.2.2 When Supplier's product or material has regulatory requirements within a product or material specification, the Supplier must maintain accredited test results that are less than one year old. These test results must be made available to Metelix or our Customers upon request.

3.3 Inspection Gages and Test Equipment

3.3.1 Suppliers should have gauges and test equipment to adequately control product quality and support analytical problem solving.

3.3.2 Supplier gages & measuring equipment (including fixtures) must be inspected periodically and calibrated at established intervals. Each gage must be identified and gage control records are to be maintained.

3.3.3 Calibration must be in accordance with recognized standards traceable to National Institute of Standards and Technology (NIST).

3.3.4 Gage and equipment calibration instructions must be available and current. Any calibration performed by an outside source must have proper certification.

3.3.5 Gage repeatability and reproducibility (Gage R & R) studies should be conducted on all variable gages in the inspection of control characteristics.

3.4 Product Status

3.4.1 Suppliers are responsible for identifying the inspection & test status (OK, Reject, Sort, Hold, Rework, etc.,) of the product through all stages of the process by means of stamps, tags or other effective control measures.

3.4.2 All containers, racks, box or pallet of material must by fully identified, including Metelix and supplier part numbers, quantity, shipment or manufacturing date and deviation numbers, if applicable.

3.4.3 Identifications must permit traceability back to Supplier manufacturing and inspection records that must be retained 15 years past the date of original creation. Products must be shipped on a lot and First in, First Out (FIFO) basis. A lot can be identified as a homogenous quantity of parts produced during a specified period of time that are traceable to a production date, raw material or other applicable grouping.

3.4.4 Supplier's must ensure that products are properly handled through every phase of the manufacturing and shipping process to prevent damage, deterioration, loss of identification and mixed parts.

3.4.5 **Shelf life control**: Every delivery of product or material that has a limited or specified shelf-life, the Supplier shall furnish data of the certification and the product or container label that shows a) the manufacturing date, b) expiration date Shelf-life, c) lot or batch number, and when applicable, any special handling or storage requirements. Unless specified by contract, all Shelf-life limited product or material delivered to Metelix must have a remaining Shelf-life of at least 80% of the total Shelf-life. Failure to comply with this requirement will result in a rejection or a return to Supplier for full credit upon the Shelf-life expiry.

3.5 **Periodic Layout Inspection:** Upon receiving Production Part Approval (PPAP) and unless specified by Metelix, layout inspection shall be performed according to OEM requirements.

3.6 **Reworked Products:** Suppliers must establish rework procedures to correct non-conforming product that occurs during production. Suppliers must perform inspection of the product following repair to ensure conformance to specification prior to shipment to Metelix. Rework that deviates from Metelix specifications requires an approved deviation.

3.7 Non-Conforming Products

3.7.1 Non-conforming products must be tagged immediately, segregated and sorted for either rework or scrap. Material awaiting disposition and / or rework / scrap must be identified and secured in a clearly marked HOLD area. Supplier's are required to notify Metelix of any suspect product shipped to Metelix and of the corrective action taken by Supplier's to ensure the non-conforming condition does not occur in future shipments.

3.7.2 If non-conforming product is shipped from the Supplier to Metelix, the Supplier may be held accountable for all costs incurred as a result of added inspection, down time, resulting scrap, administration and product recall costs. The Supplier is responsible for taking immediate corrective measures to ensure Metelix production requirements are met with conforming product.

3.7.3 Supplier's are fully responsible for the quality of their products and will not rely on Metelix's Receiving Inspection. Suppliers will be notified of rejections via ICAR.

3.7.4 **Customer Directed Pass-Through-Product Non-Conformance:** If non-conforming product is shipped from the Supplier and enters Metelix's customer production system, that Supplier will be responsible for all associated costs until full recovery is achieved. The Suppler shall follow the customer's prescribed format for documentation and resolution. Customer rejections, such as GM's PR&R, will be assigned to the Supplier's location using the Supplier's DUNS number.

3.8 Issuance of a ICAR

3.8.1 A debit may be applied with the issuance of a ICAR. Any debit will be automatically deducted from the applicable invoice for each ICAR issued to cover costs incurred. In addition, any customer penalties, downtime or expediting costs which may be incurred, may also be applied.

3.8.2 The issuance of an ICAR will result in adjustment to the Supplier rating.

3.9 Documentation

3.9.1 **Procedures:** Suppliers must develop, implement and maintain written procedures for ensuring product quality.

3.9.2 **Process Flow and Control Plans:** Advanced Quality Planning requires that Supplier's have Process Flow and Control Plans for all products. Control Plans are documents that summarize the Supplier's plan to ensure product quality for products. Reference AIAG's APQP manual.

3.9.3 **Failure Modes and Effects Analysis (FMEA):** Suppliers product design responsibility must develop a Design FMEA in accordance with, and compliant to ISO/TS/VDA requirements. A single Design FMEA may be applied to a family of similar parts or materials. Supplier's Must develop a Process FMEA in accordance with, and compliant to ISO/TS/VDA requirements. A single Process FMEA may be applied to a process manufacturing a family of similar parts or materials if reviewed for commonality by the Supplier. Reference AIAG FMEA manual.

3.9.4 **Drawing and Specification Change Control:** Supplier's must maintain the latest engineering drawings, specifications and deviations authorized through Metelix Purchasing. Suppliers are responsible for comprehending all drawing and specification requirements. Suppliers are responsible for immediately contacting Metelix if there are any questions or ambiguities.

3.9.5 If the Metelix purchase order, engineering drawings and/or specifications makes reference to non-Metelix supplied documents such as other engineering specifications, industry test standards, etc., the Supplier must obtain such documentation from the appropriate sources.

3.9.6 **Records:** Supplier's must prepare and maintain adequate quality records, including inspection & laboratory test instructions, gage and test equipment verifications and calibrations, and engineering test methods. The supplier must also prepare and maintain quality performance records indicating inspection and test results.

3.9.7 These records must be maintained for a minimum of ten years after the part is out of production. Safety data, such as flammability and critical part's test data must be maintained for 15 years after generation. Suppliers must be capable of retrieving and delivering test records to Metelix within 48 hours of Metelix's original request.

3.9.8 **Changes in Manufacturing Process**: Prior to shipping product manufactured by a changed process, Supplier's must complete all verifications and tests necessary to ensure that products continue to meet Metelix's requirements. PPAP updates will be required as described in section 5.0.

4.0 REQUIREMENTS FOR SUPPLIERS

4.1 Suppliers of metal materials, plastic resins, concentrates, components, fasteners, adhesives, coating services, heat treating services, adhesion promoters have the following requirements:

4.1.1 They are required to be registered to current editions of ISO 9001 or TS 16949 by an accredited third party registrar.

4.1.2 Supplier and sub-contractor labs must be registered to ISO Guide 17025 or meet the requirements of paragraph 7.6.3.1 of TS 16949.

4.1.3 Suppliers must analyze & report on first time quality, operating equipment efficiency and internal reject rates.

4.1.4 Suppliers are required to implement statistical process controls as identified by Metelix or the customer.

4.1.5 Suppliers are required to identify products with AIAG standard barcode labels which include supplier, part number, lot number, manufacturing date and bar code serial number as identified by Metelix or their customer.

4.2 Metelix recognizes any of the following certifications, accreditation or surveys in lieu of Metelix's Supplier Quality System Assessment requirements as stated above:

a) current ISO 9001, TS 16949 or equivalent certification

b) customer approved and/or accredited material source

4.3 Mould and tooling suppliers must be ISO 9001 registered.

4.4 Suppliers must submit a copy of above registration to Metelix purchasing for review and system update. Suppliers must notify Metelix purchasing in the event of a de-certification or changes to the Quality certification and scope. Suppliers not registered to ISO or TS must submit a plan to attain either of these standards to Metelix purchasing within 30 days of receiving this manual.

4.5 Metelix reserves the right to conduct on-site evaluations of Supplier's quality systems and their implementation and effectiveness of the Process Control Plan and related systems.

4.6 A self-survey or an on-site Supplier audit may be conducted as required.

4.7 Suppliers are encouraged to work towards TS 16949 certification.

4.8 Suppliers are also encouraged to be in compliance with ISO-14001 Environmental Management Systems.

4.9 Suppliers must comply to the latest OEM Specific Requirements.

5.0 PRODUCTION PART APPROVAL PROCESS (PPAP)

5.1 Metelix fully supports the AIAG Production Part Approval Process procedure and will adopt any and all AIAG manuals, standards, procedures and references as they supplement this procedure. Metelix will communicate any customer specific requirements in writing. It is a requirement that all suppliers have a copy of this standard and be familiar with it. All PPAP submissions will be in accordance with this manual.

5.2 Level 3 PPAP will always be required unless otherwise stated on Metelix's purchase order.

5.3 Metelix Quality Assurance will work with Metelix purchasing on new supplier introduction and PPAP activity at Metelix.

5.4 PPAP packages will be evaluated upon receipt at Metelix for conformance to specifications.

5.5 PPAP results will be reviewed by the quality and engineering functions and will be forwarded to the Supplier through the quality function. Re-submissions are permitted. However, a newly completed PPAP package is required for each submission.

5.6 Metelix's Quality function will notify Supplier's in writing of either PPAP approval or any discrepancies that require the Supplier's attention.

5.7 No Supplier's product or material will be released for production by Metelix purchasing until a formal approval has been received from the Metelix function.

5.8 Any changes to the current PPAP approved parts, process, material or equipment will require a new PPAP submission. The Metelix quality function must be notified prior to any changes.

5.9 **Run at Rate:** Upon PPAP approval, Suppliers must conduct a run at rate to identify that their process meets all quoted cycle times and part specifications. Suppliers must use all production tooling and run at full production speeds, using regular direct and indirect personnel and support systems. Capability of the process is to be verified using data from the run. Run at Rate is required to protect the price and quality of the part/product and the customer. Metelix and our customer may request documentation and/or elect to participate in Run at Rates prior to program launch.

6.0 ONGOING QUALITY REQUIREMENTS

6.1 Process Capability Study and Key Product Characteristics (KPC) Requirements

6.1.1 Process capability data must be taken from a significant production run of a minimum 300 consecutive piece run.

6.1.2 Any delay in the capability study will require an explanation in writing to Metelix and subsequent approval from Metelix.

6.1.3 Acceptance criteria is Cpk greater than 1.67. Refer to the AIAG SPC manual for more information on evaluating stability.

6.1.4 Significant Characteristic (SC) symbols are used by our customers on their drawings to indicate key product or process characteristics. Key product and process characteristics are defined as attributes of a component, material, manufacturing and/or assembly operation which have been designated by Metelix Engineering or their customer as being significant to part function relative to quality, reliability and durability performance.

6.1.5 Items identified or called out by key characteristics must be proven stable, capable and with a short term process capability index (Ppk) of 2.00 or better. Proven process capability requires statistical evidence of a long term process capability index (Cpk) of 1.67, unless otherwise specified. See drawing notes for additional gaging and control methods.

6.1.6 Short term process capability studies must be conducted prior to the start of production. These characteristics will be measured for Production Part Approval (PPAP) per AIAG guidelines. Special attention must be placed on these items in the PFMEA, Control Plans and process instructions to ensure compliance to specifications and controls. Quality records relating to these items with and SC symbols must be retained for period of life of the program and service requirements, plus one (1) year for all original equipment and original service orders.

6.1.7 Key product & process characteristics are to be monitored. The method for monitoring must be described and specified in the supplier's control plan. Variable data will be measured by the supplier with both Cpk and attribute data being tracked on an ongoing basis. This data is to be available for review by Metelix upon request.

6.1.8 The use of key product and process characteristics is in no way intended to minimize the importance of other requirements. The supplier is expected to develop a complete quality system for all parts and characteristics, regardless of significance.

6.2 **Raw Material/Product Certifications SPC & Test Results:** Raw material and/or product certifications are to be provided with each shipment and for each lot of material. Specific variable type data is to be included for all certifications. No motherhood statements.

6.3 Suppliers must ensure product certifications and applicable test results are sent with or before shipment. Materials without certification will be rejected and will not be used in Metelix's manufacturing process.

6.4 **Process Control:** Suppliers must identify and plan the moulding, forming, stamping, plating, painting, casting and assembly processes which directly affects the quality of the product and must ensure that these processes are carried out under controlled conditions. Metelix requires suppliers to audit each manufacturing process to determine its effectiveness. Applicability and effectiveness of plating, coating and heat treating processes shall be determined utilizing CQI's for special processes. Suppliers must provide CQI's upon request.

Examples: CQI-11 – Plating System Assessment, CQI-12 – Coating System Assessment, CQI-9 2nd Edition – Heat Treat System Assessment.

6.5 **Methods used to Evaluate Supplier's Performance:** The quality and delivery standard for suppliers is 0 PPM (parts per million defects) for all products and services supplied to Metelix Products Inc. and 100% on-time delivery. Any non-conformance found will result in a partial or total lot rejection and may be returned/sorted to/by the supplier at their expense. All product and material received by Metelix may undergo an inspection for any or all requirements as received or may be released for verification by production process. Rejections will be documented on an ICAR with corresponding charges included.

- Incoming Corrective Action Request
- Supplier Rating

6.5.1 Incoming Corrective Action Request: The purpose of this process is to provide notice of Supplier's product, packaging or delivery non-conformance requiring immediate action. (Containment action) that is due in 24 hours. This is followed up with a permanent corrective action that is due within 15 days of issuance.

6.5.2 When Suppliers are issued a ICAR, Suppliers are expected to meet the response time requirements for the ICAR. The number of ICAR's issued and the Supplier's ability to meet the response time requirements of the ICAR's will allow Metelix to evaluate a Supplier's performance.

6.5.3 Metelix encourages our supply chain to proactively notify Metelix of potential defective/suspect material or parts that have been shipped to Metelix. Metelix will work with Supplier to minimize the cost impact on Suppliers to recover from the reported issue. Please note that this policy is intended to support the Supplier for taking a proactive approach.

6.5.4 Suppler Scorecard: The Supplier Scorecard summarizes key performance indicators (KPI's) in Quality, Delivery and Service. Communicating these key indicators to our suppliers provides measurement and feedback on current performance and highlights opportunities for improvement.

6.5.5 Quality, service and delivery ratings are generated by Metelix's analysis of ICAR's and other issues for that time period.

6.5.6 Supplier scorecards will be issued on a annual basis. If there are no shipments received during that year, a supplier scorecard will not be issued.

6.5.7 QSB Supplier ratings are as follows: 90+ - GREEN, 75 to 89 – Yellow, less than 75 – RED.

6.6 **INTERNAL AUDITS:** The Supplier must carry out internal quality audits to verify the effectiveness of the quality system. Audits must be scheduled on the basis of the status and importance of that activity. The audits and follow-up actions must be carried out in accordance with documented procedures.

7.0 **TRAINING OF PERSONNEL:** Suppliers must establish and maintain documented procedures for identifying training needs and provide for the training of all personnel performing activities affecting quality or service. Personnel performing specific tasks shall be qualified on the basis of appropriate education, training and/or experience as required. Appropriate records of training shall be maintained. Training effectiveness shall be periodically reviewed.

8.0 **SERVICING:** A procedure for communication of information on service concerns to manufacturing, engineering and design activities shall be established and maintained. The Supplier's organization must be aware of non-conformities that occur external to the Supplier's own organization.

9.0 **STATISTICAL TECHNIQUES:** Where appropriate, Suppliers shall establish procedures for identifying adequate statistical techniques required for verifying the acceptability of process capability and product characteristics.

10.0 **CONTINUOUS IMPROVEMENT:**

10.1 **Reduction of Cost and Selling Price:** Suppliers shall develop standard costs, track actual costs and regularly compare the two and analyze the variances. Through comparison and scientific measurement of these costs, Suppliers shall focus on continuous improvement of its cost structure, while reducing cost. Suppliers are required to cooperate with Metelix in an effort to reduce costs both prior and during production. Suppliers shall be willing to share suggestions and cost reduction benefits with Metelix. Metelix expects its Suppliers to participate in our on-going effort to continuously improve our product quality, service and technology while decreasing costs to our customers.

10.2 **Metelix Supplier Development Program:** This Supplier Quality Assurance Manual are designed to improve the Supplier's operations in all aspects of their business, which includes new product development, engineering, quality communication, performance, delivery and cost, all through implementation of a certified quality system in conjunction with appropriate quality tools. If the Supplier requires any assistance in these areas please contact the Metelix quality function to arrange for help, guidance or workshops.

INCOMING CORRECTIVE ACTION REQUEST FORM

Date issued:	NCMR NO.:	CAR Log No.:
To:	Contact Name & Title:	Requested by: (Name & Title):

Non-conformance:

Part No.: Part Name: Lot / Serial No.: Quantity on hold: Number of rejects:	Reason for the nonconformance:

Initial response to be completed by the person assisted to the nonconformance.
(Return fax to the originator within 24 hours)

Summary Of Charges:

Administration Charges (Standard Cost):	=US $ 500.00
Sort / Rework Hours: Hrs.-------- X $ US 35.00	=US $
Line Shut Down:	=US $
Part Cost:	=US $
Other (Transportation)	=US $
	Total = US $500/00

1: Short term corrective action taken

2.Disposition of N/C material: R.A.N.:

3. Conforming material shipping date:

4. Contact person & title: Phone:

Long-term corrective action is required by means of the standard 8D or 5 Why response within 15 calendar days from date issued.

8D or 5 Why corrective action due date: