TI Automotive Global **Supplier Requirements** Manual

Fluid thinking.™

TI Automotive

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Global Supplier Requirements Manual

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Introduction

Fluid thinking.™

Fluid thinking™ shapes the mindset of TI Automotive. Global automotive manufacturers turn to TI Automotive for insight and focus to develop industry-changing **fluid storage, carrying, and delivery technology**. With more than 125 locations in 29 countries, our strength lies in our ability to creatively meet and exceed the increasing fuel economy and emissions regulations of tomorrow's automotive industry.

TI Automotive cannot be successful in meeting our customer expectations without the partnership and commitment from our many suppliers. By combining Quality & Purchasing, we are positioned to implement new global policies and standards that ensure success for our suppliers, ourselves, and our customers.

Global Supplier Requirements Manual

Controlled Document No.CP-30-ALL-10

This Global Supplier Requirements Manual replaces all previous versions of what was formerly known as Global Supplier Manual

This Manual is furnished to communicate some of the requirements of becoming and maintaining the status as an approved supplier to TI Automotive. Any additional plant or specific requirements will be communicated to the supplier by the respective customer facility.

The guidelines described in this manual apply to all Global TI Automotive suppliers of prototype, production and service components, as well as suppliers furnishing materials, equipment and services.


OUR CORE VALUES
CUSTOMER COMMITMENT
Whether internal or external, our customer is king. Don't just satisfy them, delight them! Make their life easier.
BEST IN BUSINESS
We are leaders, not followers. Outstanding quality and leading technology will keep us on top, today and tomorrow.
COMMUNICATION IS CRITICAL
Both top down and bottom up ... communication is essential. Keep information flowing so everyone is engaged and aligned.
PRIDE IN OUR PEOPLE
Respect your colleagues, value their input, encourage their ideas ... great teamwork will follow. Our people will be one of our competitive advantages.
FOCUS ON PERFORMANCE
Our future depends on positive financial results. Only profitable businesses are sustainable. Build on our successes and continuously improve everything we do.
Fluid thinking.™
TI Automotive

1.0 General

1.1 Scope

This manual applies to all suppliers, contractors and vendors to any Division of TI Automotive globally. The expectations defined in this manual apply to all types of suppliers including external, internal, inter-company and customer directed.

1.2 Expectations

TI Automotive expects our suppliers to deliver quality product on time, with no defects at a cost that enables both of us to be competitive and viable. We expect our suppliers to alert us of any potential problems, changes in process or product and situations that may arise causing risk to our joint ability to meet our contractual obligations to our customers.

1.3 Distribution of Manual

Suppliers will log onto the TI Automotive website where the latest revision of the Global Supplier Requirements Manual can be viewed and downloaded. http://www.suppliers.tiautomotive.com Any printed version of this document is an uncontrolled copy and may not accurately define the current requirements of TI Automotive. Logging on and accessing the manual will be considered acknowledgement the supplier has the most current version of this manual.

Any questions should be addressed to TI Automotive Purchasing.

1.4 Revision of Manual

TI Automotive will review the manual on a regular basis and revisions and improvements will be made as needed. When any changes are made to this manual; suppliers will be notified and they will be required to update all hard copies and electronic copies with the new revision.

Suppliers are responsible to check the revision on the TI Automotive web site to ensure they are following the most recent release.

1.5 Supplier Information

TI Automotive must have up to date and accurate information relating to our suppliers. Suppliers are responsible for supplying this information and for providing updates on any changes or corrections to the information. These updates will be provided by completing the TI Automotive Supplier General Information Survey (SGIS) At a minimum; suppliers shall provide an update via the SGIS at least once per year or when any change in this information occurs. Following are examples of required supplier information:

- Supplier Plant contact information
- Supplier Minority/Diversity Certification as applicable
- NAFTA (North American Free Trade Agreement) Certificate of Origin Form as applicable (TI Automotive North America)
- Copy of TS 16949 Registration Certificate
- Copy of ISO 14001 Registration Certificate
- Supplier Key Management Contact List
- Evidence of supplier financial stability
- PPAP/Annual Re-validation
- IMDS/REACH/evidence of compliance to environmental regulations and laws
- Change of control or ownership of supplier
- Conflict Minerals as required in the U.S. Dodd/Frank Wall Street Reform and Consumer Protection Act
- Supplier Safety Data Sheets (SDS)
- UK Modern Slavery Act

2.0 Supplier Management Guidelines

2.1 Business Conduct; Suppliers, Contractors and Vendors

TI Automotive is committed to operating with the highest level of integrity and fairness in all activities pertaining to our suppliers, contractors and vendors. We will not discriminate or base any purchasing decisions on anything but merit.

Our employees are committed to the highest ethical standards and we conduct our business with customers, suppliers and all others to avoid any perception or appearance of conflict or concerns regarding personal interests. All employees are governed by the TI Automotive Code of Business Conduct.
All associates of TI Automotive are prohibited from accepting any gift or entertainment should ever be offered, given, provided or accepted by any Company employee or family member of an employee unless it: *(1)* is not a cash gift; *(2)* is consistent with customary business practices and the policies and rules of the customer; *(3)* is of negligible value; *(4)* cannot be construed as a bribe or payoff; and *(5)* does not violate any laws or regulations.

Suppliers to TI Automotive shall conduct business fairly and operate under the same high level of ethical standards.

2.2 Child Labor Laws

TI Automotive supports the international effort to govern the rights of children. Suppliers to TI Automotive and their sub-contractors shall comply with all laws and regulations in any jurisdiction related to the rights of children.

2.3 Environmental Policy

TI Automotive and all companies in its supply chain must respect the environment and accept appropriate responsibility for protecting it. Each supplier shall create and maintain an environmental management system to support that commitment including but not limited to the elements of the European Union (EU) ecological audit directive (EMAS) and/or ISO 14001 should be reflected and taken into account. The review of environmentally relevant elements may be part of a quality systems survey/audit.

2.4 Confidentiality/Intellectual Property

TI Automotive has many innovative and highly technical products and processes. We are constantly working on new ideas; often with a supplier as a partner. We expect our suppliers to protect our intellectual property and we require confidentiality for all of our business relations. TI Automotive intellectual property includes without limitation its patents, copyrights, trademarks, business processes, systems, manufacturing processes, technical and marketing information and strategic planning. The applicable TI Automotive Terms and Conditions govern this topic.

2.5 Notification of Supplier Management Changes

All suppliers must notify TI Automotive in writing of any changes to key management staff. Key management staff would include but not be limited to; quality, materials, engineering, manufacturing, logistics and senior managers. In addition, suppliers must notify TI Automotive in advance of any expiration of union contracts and of any potential work stoppage. Suppliers must notify TI Automotive or mergers, acquisitions, plant closures and changes in plant location.

2.6 TI Automotive Conflict Minerals Policy

Background

"Conflict Minerals" refer to tin, tantalum, tungsten, and gold (3TG). On August 22, 2012, the U.S. Securities and Exchange Commission adopted final rules to implement reporting and disclosure requirements related to "conflict minerals," as directed by the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010. The rules seek to dissuade industries from purchasing minerals that were mined under conditions of violence and armed conflict in the Democratic Republic of the Congo and adjoining countries ("conflict region"). They require manufacturers who file certain reports with the SEC to disclose whether the products they manufacture or contract to manufacture contain "conflict minerals" that are "necessary to the functionality or production" of those products.

Policy

TI Automotive supports the SEC legislation to end violence and human rights abuses. We request our suppliers disclose the sources of conflict minerals used in their products, utilizing the Electronic Industry Citizenship Coalition (EICC) reporting template and following the automotive industry-wide approach as recommended by the Automotive Industry Action Group (AIAG). TI Automotive will not knowingly procure 3TG or components containing 3TG from the "conflict region" unless confirmed from "conflict free" sources. Our supply chain partners are expected to support this same initiative.

Note: TI Automotive is a private company and not subject to SEC reporting rules, however we will comply with conflict mineral reporting requests from our many global customers to enable their reporting.

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3.0 Supplier Selection/Approved Supplier List

3.1 Requests for Quotes/Purchase Orders

Only TI Automotive Purchasing is authorized to negotiate and enter into purchase agreements with suppliers; in the name of or and on behalf of TI Automotive. All quotations must be sent to the Purchasing Department. This includes official quotes, estimates and any other submission related to the quoting process. Distribution of copies to anyone outside of TI Automotive Purchasing must be approved by purchasing beforehand.

All purchase agreements and any amendments to these documents are only valid if signed by a Purchasing Department employee. Any agreement obtained from TI Automotive in violation of this policy may be cancelled by TI Automotive Purchasing without indemnity to TI Automotive.

3.2 Supplier Selection/Evaluation Process

3.2.1 Sourcing Committee

All sourcing decisions within TI Automotive will be made by Sourcing Committees specific to each of our product lines. In most cases, if a supplier is on the Approved Sourcing List (ASL) for one of our divisions they will not be required to go through a full assessment for consideration for another group. However, due to differences in the product line, ongoing quality metrics and other factors; our divisions may decide to evaluate a supplier for new business if they do not currently supply that division.

3.2.2 Financial Assessment/Z-Score

Suppliers must be willing and able to provide proof of financial stability. Potential new suppliers will be required to provide evidence of liquidity to be considered for addition to the TI Automotive ASL. TI Automotive utilizes the Altman Z Score process for verifying supplier financial stability. The required evidence will be defined by TI Automotive Purchasing and may vary depending on the region and in some cases the scope of the project. Suppliers must be financially viable in the reasonable opinion of TI Automotive to be considered for sourcing. Any false or inaccurate information will immediately disqualify a supplier. Suppliers may in certain circumstances, as deemed reasonable by TI Automotive, be required to provide bank guarantees for delivery. Suppliers are also required to submit proof they are able to cover costs that are due to supplier caused concerns. (Insurance, cash allotments, etc.)

3.2.3 Supplier General Information Survey

Potential suppliers will be required to complete a Supplier General Information Survey (SGIS) that will include basic information about the company, their business and other general information. The SGIS will also include questions relating to quality, manufacturing, engineering, supplier management and other management related areas Supplier must complete this form and submit regular updates as needed to be considered for business with TI Automotive.

3.2.4 TI Automotive Potential Supplier Assessment

The last step in becoming a new supplier to TI Automotive is to successfully pass the TI Automotive Potential Supplier assessment. Strong candidates for sourcing will be contacted by TI Automotive Purchasing to arrange for an onsite evaluation of the supplier's business including review of existing processes and process results, review of key metrics, and a very thorough review of how the supplier will produce, control and manage the product they would supply TI Automotive if awarded business. The format that will be used to complete this assessment is "Supplier Best in Class" assessment (SBIC)

Questions about the TI Automotive sourcing process should be directed to TI Automotive Purchasing. NOTE: In some cases TI Automotive may wish to revisit existing suppliers or may ask existing suppliers being considered for new business to update some of the information in these assessments.

3.3 Approved Supplier List

TI Automotive will maintain an Approved Supplier List (ASL) which will identify suppliers that are approved for sourcing as well as suppliers that require improvement to be considered for business.

New or Potential Suppliers must successfully meet or exceed the minimum requirements in the evaluation process before they will be considered approved and added to the Approved Supplier List.

Suppliers that are currently on the ASL must remain in good standing by providing quality products and service that continue to meet or exceed TI Automotive expectations. The Global Supplier Performance Rating will be a key contributor for consideration for the ASL.

Suppliers that do not meet these minimum expectations will be required to submit a corrective action plan with detailed steps and timing to return to the level of quality and service TI Automotive expects from suppliers. Suppliers may be placed on temporary "suspension" until the corrective measures have been implemented and confirmed.

Continued failure to meet these minimum expectations could result in removal from the ASL and termination of existing contractual relationships.

3.4 De-Sourcing Suppliers

TI Automotive reserves the right to de-source any supplier not able to meet the requirements as outlined in this manual. The Sourcing Committee will be convened when any supplier is considered for de-sourcing. Examples of some of the reasons a supplier may be considered for de-sourcing are:

- Consistent inability to maintain an acceptable status on the ASL list.
- Not notifying TI Automotive of any changes in product, process or materials as required by this manual and/or the PO and applicable TI Automotive Terms and Conditions.
- Critical quality concerns that jeopardize our business with our customer(s) such as field action, campaign, and yard hold, stop ship, excessive warranty costs, etc.
- Financial stress that places continuation of delivery in jeopardy.

NOTE- A supplier may be placed on "bid suspension" or "hold" pending open discussion and problem resolution between TI Automotive and the supplier.

4.0 Quality System Requirements

4.1 General

TI Automotive requires all suppliers of production materials and services to be 3rd Party registered to ISO/TS-16949. Suppliers must be able to provide evidence and adequate documentation they are certified and satisfy fully this global standard. This standard is the minimum requirement for conducting business with most of our customers and requires formal systems for ensuring continuous improvement, defect prevention and robust development and launch activities.

4.2 Management Responsibility

Successful adherence to global standards and driving improvement and attaining customer satisfaction requires full support, strong leadership and management of risk. TI Automotive expects all supplier organizations to have clearly defined plans, adequate personnel and leaders committed fully to requirements defined in TS 16949 as well as the TI Automotive and customer specific expectations defined in this manual. Suppliers must provide TI Automotive with an organizational chart that defines the personnel, the roles and who is responsible for ensuring compliance to these expectations.

4.3 Warranty Process

Suppliers must have a robust warranty and returned part analysis process. Suppliers may be required to share warranty data and the risk associated with warranty per CQI-14.

4.4 Record Retention

It is imperative that information and records relating to inspections such as, testing, PPAP, Lot Control and Traceability are maintained for immediate recovery should the need for the information. The default period for suppliers to TI Automotive to retain these types of documents/records is "The life of the program, + Service + one year". There may be customer or regional/local standards that require longer record retentions. In those cases suppliers will be notified during the quote and business award.

4.5 Regulatory/Environmental Management

TI Automotive works diligently to comply with all governmental, regional and local regulatory and environmental standards. Suppliers to TI Automotive shall have the same commitment. Examples of such standards are:

4.5.1 International Material Data System (IMDS)

All suppliers are required to provide material data in electronic format per the requirements defined in the International Material Data System (IMDS). For specifics and further information relating to this requirement; visit http://www.mdsystem.com. Suppliers of components are also responsible for the on-time provision of all IMDS relevant material data for their products and the products of their suppliers. PPAP packages will not be approved without this evidence.

4.5.2 REACH

Suppliers to TI Automotive must comply with European Union Regulation **R**egistration **E**valuation **A**uthorization and Restriction of **CH**emicals (REACH) and any/all amendments. This applies to suppliers that provide substances on their own, in preparations or in articles. For information about how to comply with this requirement and you can also obtain information from the following web site: www.echa.europa.eu. A written confirmation by the companies REACH responsible must be sent to the TI Automotive Purchasing department. PPAP packages will not be approved without this evidence.

4.5.3 CAMDS

China Automotive Material Data System (CAMDS) is a product data management platform for implementing the "Recycling and Reutilization Policy of Automotive Product", carrying out the certification of recoverability rate and prohibited/restricted substance and improving the recoverability rate of China automotive material. It will help the auto manufacturers to conduct information management of various products and links in their supply chain. Several of the OEMs in China are requiring adherence to this requirement. Therefore any product shipped to TI Automotive for use in the China market may be required to satisfy this requirement. More information can be found at the following website: http://www.camds.org/camds_en/

4.5.4 Containerization/Pallet Requirements

Some regions where TI Automotive ships product have regulations relating to containerization and packaging. Suppliers to TI Automotive must adhere to these regulations. Examples of this type of regulation are:

USDA Restrictions of Wood Pallets - The US requires TI Automotive and its suppliers to utilize pallets that have been certified as having been constructed from wood that has been treated/ fumigated. The pallets will need to bear a seal, showing certification.
For more information visit the following websites:

For the United States: http://www.aphis.usda.gov/
For Mexico: http://www.semarnat.gob.mx

EU legislation: Wood packaging material Introduction
The EU has laid down phytosanitary (plant health) requirements in order to prevent the introduction of organisms harmful to plants and plant products, and their spread within the EU. Wood packaging material (e.g. packing cases, boxes, crates, drums, pallets, box pallets) or dunnage (wood used to wedge and support non-wood cargo) are pathways for the introduction and spread of pests. The EU directive specifies the protective measures. It prohibits the presence of certain identified harmful organisms on plants or plant products, provides for phytosanitary checks and certificates for plant and plant products moving within EU Member States and imported from non-EU countries, including from developing countries.

4.5.5 Customs/Exports Regulations

Some OEM customers require compliance to C-TPAT which is a joint initiative of U.S. Customs and Border Protection and the trade community. TI Automotive is required to communicate with its supply chain business partners regarding the C-TPAT Security Criteria and to determine whether each partner is a member of C-TPAT or meets the C-TPAT Security Criteria. TI Automotive requires that all suppliers adhere to C-TPAT requirements in accordance with the criteria identified on www.cbp.gov , for importers.

4.4 Resource Management

Suppliers are expected to be in full compliance with TS-16949; including all provisions relating to management of human resources. Suppliers shall have a formal safety program which includes an emergency plan covering accidents, environmental events such as spills and leaks and evacuation measures for fire or other significant events. Formal process for training and evaluation new employees; or current employees performing new duties to eliminate the risk associated with human error.

4.5 Control of Subcontractors

1. Suppliers must obtain written authorization from TI Automotive Purchasing prior to changing any subcontractor or material via the TI Automotive supplier request for change process.
2. Suppliers shall ensure all sub-contractors are in compliance with TS16949 requirements and TI specific expectations as applicable.
3. Suppliers shall ensure TI Automotive has access to subcontractor facilities, working areas and records as applicable to enable onsite verification.
4. Suppliers are fully responsible for the quality and delivery of materials purchased to produce product for TI Automotive.

4.6 Supplier Request for Engineering Change

Prior to any supplier changes being implemented, a request for change form must be submitted to TI Automotive Purchasing for authorization. Forms must be submitted for changes to existing production parts including but not limited to changes in manufacturing location (additions, closures, change of ownership, etc.), change in manufacturing equipment/process, change in design intent of part, change in material or any other change that affects fit, form, or function. Suppliers are only authorized to make the requested changes after the appropriate approvals have been given by TI Automotive Purchasing and must comply fully with the requirements for approval before implementation and shipment. The form TI Automotive uses is the Supplier Request for Engineering Change form. (SRCA) Suppliers can get copies of the form and learn more about the process by contacting TI Automotive Purchasing.

4.7 Lot Control/Traceability

Suppliers shall have a formal process to identify product which enables tracking of the product throughout the process beginning with incoming raw materials and subcomponents all the way to the TI Automotive using plant. The process will ensure the ability of the supplier to quickly identify and quantify product by lot, manufacturing date, raw material or subcomponent batches/lots and key process variables.

The supplier must be able to quickly identify and segregate individual lots of product based off specific lot number or label information provided by TI Automotive and/or dates when the material was received by TI Automotive if that is all information that is available.

TI Automotive expects suppliers to be able to respond with full traceability information including ship dates, quantities, quality and test status, and where used within 4 hours of request by TI Automotive.

Lot sizes must be determined based on analytical analysis of risk using tools such as PFMEA and preventative maintenance metrics. Lot control and traceability should be ensured anywhere risk is identified in the process. Lot size must be based on the ability of the supplier to detect and prevent shipment of potential suspect product and also on the supplier's ability to manage any replacement needs and costs associated with the replacement. The RPN values in the supplier PFMEA and DFMEA must be utilized when developing lot control and traceability plans.

Suppliers shall ensure Tier N suppliers also maintain fast, accurate and effective lot control/traceability systems.

4.8 Preventative and Predictive Maintenance

Suppliers shall implement preventative and predictive maintenance practices to ensure regularly scheduled maintenance has been performed on any/all equipment and tooling used to build product for TI Automotive. The frequency and scope of the maintenance must ensure there are no quality or delivery concerns resulting from equipment or tooling problems. TI Automotive expects suppliers to use predictive maintenance methodologies rather than reactive.

The supplier shall maintain records and evidence of the preventative and predictive maintenance and must make them available at the request of TI Automotive.

4.9 Emergency/Contingency Planning

All suppliers to TI Automotive must have an "executable" emergency/contingency plan to protect TI Automotive and our customers from production stoppages or other disturbances that could impair the quality or threaten the delivery date or delivery quantity. The supplier must notify TI Automotive immediately of any potential situation that might impact our quality or delivery of product.

The supplier shall take all precautions and implement preventative measures to ensure the correct amount of defect-free products complying with the agreed upon specifications can always be delivered on time.

Examples of precautions the supplier might include are:

- Emergency/Safety Stocks
- Alternative production possibilities (Proven and verified for capacity)
- Alternative supply sources for raw material and subcomponents. (Must follow PPAP)
- Adequate back up IT measures.
- Regular risk assessments; internal and with Tier N suppliers.
- Regular monitoring of raw material and subcomponent suppliers for financial stability.
- Predictive and preventative maintenance methods.
- Back up energy and water/air plans.
- Formal plans for notification for preparation and planning for labor caused stoppages.

4.10 Continuous Improvement

The supplier shall implement a 4M process (Man, Method, Material and Machine) (Kaizen) for ensuring continuous improvement. The purpose is to eliminate waste and discrepancies that lower quality and increase costs. All changes to the process must be approved by TI Automotive via the SRCA process. (4.6 above)

4.11 TI Automotive Access to facility/Customer access

The supplier must allow TI Automotive and our customers full access to all TI Automotive product related processes, documentation, tooling, equipment, gages and facilities including those of sub-suppliers and sub-contractors with a minimum of 24 hours notice.

5.0 Commodity Specific Requirements

5.1 Plastics

5.1.1 Molding Tool/Technical Standard\

TI Automotive has provided injection molding suppliers with a technical standard as reference for our expectations relating to topics such as design and building injection molded tooling, set up of processes, control of processes and tool maintenance, etc.

CW-30-ALL-340- Global Tooling Standard for Injection Molding
Please contact TI Purchasing for a copy of this document.

5.1.2 Regrind and Processing Aides

Suppliers are required to adhere to regrind limits as defined on the drawing or in the appropriate material specification. The percentage of regrind shall be verified by appropriate validation testing and approved during PPAP. The supplier shall have a formal procedure defining the policy/process for controlling regrind used in product supplied to TI Automotive. Documentation shall include any blending, size of material granules if required and will be by lot.

Use of lubricants, oils, mold release agents or any other contaminants is prohibited unless approved in writing by TI Automotive or specifically identified on TI Automotive or customer drawings or specifications.

5.2 Raw Materials

5.2.1 Resins

Suppliers shall verify each batch of incoming raw material for correct material, quality and cleanliness of the material and verification of physical properties. On site testing is the preferred method of verification; however, formal material certifications provided by raw material suppliers may also be utilized. All records of compliance must be maintained in a file and available for review at the request of TI Automotive or our customers. Certificates must include actual test data and results and not blanket statements of compliance. Raw materials must be stored in containers and an environment to ensure the product is protected until use.

5.2.2 Steel and other metals

Suppliers shall verify each batch of incoming raw material for correct material, quality and cleanliness of the material and verification of physical properties. On site testing is the preferred method of verification; however, formal material certifications provided by raw material suppliers may also be utilized.

All records of compliance must be maintained in a file and available for review at the request of TI Automotive or our customers. Certificates must include actual test data and results and not blanket statements of compliance. Raw materials must be stored in containers and an environment to ensure the product is protected until use.

5.2.3 Chemicals/Coatings

Suppliers must provide written evidence that all chemicals/coatings and the processes used to apply them fully meet the requirements and specifications called out on the drawing or material specification. Suppliers are responsible to provide test data and results for any/all applicable standards or specifications as required. It is the supplier's responsibility to ensure any/all chemicals and coatings applied to finished components are properly reported in IMDS/REACH and fully comply with these regulations.

5.3 Special Process Requirements (CQI Standards)

Many OEMs have mandated Tier 1 suppliers implement the CQI requirements and assessments for some of the key Special Processes. In some cases, a 2nd party assessment is required, in others self-assessment is accepted. Process suppliers and their sub suppliers shall use the AIAG Guideline manuals, to perform and document process audits and evaluations. Suppliers shall be responsible for obtaining the standards and adhering to the requirements.

- CQI-8- Layered Process Audits
- CQI-9- Heat Treating System Assessment (2nd Edition)
- CQI-11- Plating System Assessment
- CQI-12- Coating System Assessment
- CQI-14- Warranty System Assessment (as applicable)
- CQI-15- Welding Process Assessment
- CQI-17- Soldering Process Assessment
- CQI-19- Sub-Tier Supplier Management
- CQI-23- Molding System Assessment

Completed assessments must be submitted with the PPAP for applicable processes and products.
These AIAG materials can be purchased directly from the www.aiag.com website. The process evaluations shall include the self assessment, actions taken and audit records. The audits shall be conducted as defined in the actual standards.

6.0 Engineering/ Product Development

6.1 APQP/Program Management

Advanced Product Quality Planning (APQP) is essential to ensure continuous improvement, process optimization and to prevent defects and warranty related concerns. The APQP process is required during all phases of product and process development and is a living system that must be assured throughout all phases of the product life cycle. APQP requires a cross-functional team comprising of representatives of all specialized areas such as Development, Production Planning, Manufacturing, Quality Assurance, Purchasing and Commercial Team members.

Participation by the supplier may be required by TI Automotive during design, prototype, and other pre-production phases of new product development and launch. TI expects the supplier to use a documented system which is able to monitor but not restricted to:

- Program Timing
- Engineering Changes
- Milestone plan as agreed with TI Automotive
- Design FMEA (If supplier is responsible)
- Process FMEA for pre-serial and production
- Control Plan (Including significant, critical and fit function requirements) for pre-serial and production.
- Planning and provision for design validation testing, process validation testing, measurement, gauging methods, including applicable qualification data such as R&R and MSA.
- Production of samples/ first off/ tool qualification in sample quantities as agreed upon by TI Automotive.
- Machine and process capability
- Production Start and system filling (Ramp plan)
- Contingency/Emergency planning for all critical materials and processes.

TI Automotive expects suppliers to assign adequate resources for Program Management and APQP throughout the product life cycle. Suppliers are required to provide name and contact information for the responsible manager for the program and must notify TI Automotive immediately if there is any change.

6.2 Design and Development Capabilities

In most cases the supplier is responsible for the design, development and engineering of the product they will supply to TI Automotive. In all cases the supplier is viewed as the technical expert for their product. Suppliers are expected to have the technical resources to support all phases of design, development, engineering and launch.

Suppliers must demonstrate the ability to participate in early design activities from concept throughout the product life cycle. Suppliers must have the ability to provide the required information and data.

6.3 Computer Aided Design (CAD)

Suppliers must have the ability to receive and transmit 3-D modeling data as required by TI Automotive. (Including visualizations) Suppliers must recognize that TI Automotive will provide CAD data in the native format required for each customer and platform. If suppliers outsource this requirement they shall provide project leadership, direction and will be responsible for the accuracy and timeliness of all information. The supplier must respect the IT protocol for sending/receiving the various types of data.

6.4 Dimensional Management

Accurate measurement of parts and correlation of measurement techniques between TI Automotive and supplier is critical for consistent quality performance and acceptance. Suppliers are expected to define the measurement methods early in the development process and communicate them to TI Automotive. These measurement techniques must be identified on PPAP documents as well as the control plans; pre-serial and production. TI Automotive must be notified of any planned changes or modifications to these techniques. Measurement methods for critical characteristics and for those using non-standard measurement techniques or devices should be correlated with the TI Automotive user plant for consistency. Suppliers must be capable of performing or participating in the following activities:

- Identification and establishment of customer fit form and function features and tolerances.
- Where required on the drawing; utilize Geometric Dimensioning and Tolerances (GD&T) to achieve proper fit, form and function objectives. (Including establishing Datum)
- Performing stack up analysis, RMS calculations etc as needed
- Review and verify check fixture designs and builds, GR and GR&R results to ensure accurate measurements.

6.5 Error Proofing

Suppliers are expected to utilize error proofing when developing new products and processes to reduce the risk for quality concerns and to improve the product. Error proofing is defined as the use of preventative techniques during the design and development phase to ensure the product will perform as intended throughout the life cycle. When designing a product suppliers must consider how the part will be manufactured and where improvements in the design can make the part more robust and easier to ensure high quality during manufacture. The manufacturing process should be assessed for risk and error proofing used where needed to minimize the risk. TI Automotive prefers suppliers utilize preventive types of error proofing; however detection style error proofing is acceptable if the level of confidence in the technique is sufficient to mitigate risk.

TI Automotive requires suppliers to consider error proofing when corrective action is required due to a quality concern. Warranty is considered part of the life cycle of the product; thus error proofing must consider the environment where the part will be used.

6.6 FMEA

6.6.1 Design Failure Mode and Effects Analysis (DFMEA)

When design responsible suppliers must prepare a design DFMEA to assess and identify any areas of potential risk related to the design of the product according to their affect on the customer. A DFMEA is a list of potential failure modes ranked according to their effect on the customer which will be used to determine priority for design improvements. (Such as fit, ability to assemble, environment where product is used, etc.) Suppliers must also consider how the part will be produced when determining the rank of the potential failures. Unless otherwise agreed upon by TI Automotive the rating criteria for the Risk Priority Number will be determined using the guidelines noted in the AIAG PPAP Manual.

DFMEA will be a living document and must be updated when any quality concern is due to the design. The DFMEA must also be reviewed and updated as needed anytime a design change is implemented.

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6.6.2 Process Failure Mode and Effects Analysis (PFMEA)

A PFMEA must be conducted during product quality planning and before production. A PFMEA is a disciplined review and analysis of any new or revised process to anticipate, resolve and monitor potential process problems. A PFMEA is a living document and must be reviewed and updated any time a new failure mode occurs or when a previous failure mode is discovered which indicates the controls may not have been effective. Like the DFMEA a PFMEA also ranks potential failure modes.

Unless otherwise agreed upon by TI Automotive the rating criteria for the Risk Priority Number will be determined using the guidelines noted in the AIAG PPAP Manual.

Items with critical or significant characteristics identified on the drawing or in the specification require special attention. Items found to have high RPN numbers in particular those with high severity numbers must also receive special attention. This includes making sure the site of production and all associates are aware of the importance of these items.

Suppliers should constantly review the DFMEA and PFMEA utilizing tools such as Pareto analysis to drive continuous improvement and reduce risk.

6.7 Prototype/Early Build Requirements

Suppliers that are producing prototype parts for TI Automotive will use whenever possible the same suppliers, tooling and manufacturing processes as will be used in production. Suppliers will also be responsible to submit documentation of quality, processing metrics and other data as agreed upon with TI Automotive. The required documentation could include:

- Part Submission Warrant
- Engineering change status/change requests
- Drawing or design record/ ballooned
- Inspection, Measurement and Test results
- SPC
- Materials Certification
- Lot control/ Build date information/Traceability
- Pre-Production Control Plan
- Special tags/ Product Identification

Suppliers supporting early builds but not necessarily prototypes may also be required to submit the information above.

6.8 Early Production Containment (EPC)

Suppliers are required to implement Early Production Containment procedures for all new program launches. Suppliers may also be required by TI Automotive to implement EPC for significant product or process changes. Another potential application for EPC could be after long periods of down time between production runs.

The early containment plan will include additional controls, inspection audits, testing and other measures required to ensure a high level of confidence in the quality of the product produced during the containment period and also to verify the effectiveness of the control plan and inspection methods to be used during production.

These measures must take into account all known quality concerns, all critical conditions of the part, areas identified in the PFMEA and DFMEA as potential risk items and how used criteria for assembly components. All containment measures must be documented, recorded, analyzed and provided to TI Automotive as requested.

Examples of additional controls:

- Increased sample size and/or frequency at receiving, in process and at final inspections and dock audits.
- Sub-supplier and Sub-contractor audits and early containment procedures.
- Additional verification of error proofing devices and poka yokes.
- Additional set-up verifications
- Increased predictive and preventative maintenance
- Increased tooling and gauging inspections.
- Increased verification of label accuracy and part identification
- Increased participation and involvement by top management.

Early production containment shall be in place commencing with the start of production, for 90 days or until exit criteria specified by TI Automotive has been satisfied.

Any/all non-conformances found during this activity will be recorded, promptly corrected and all documentation will be updated accordingly.

6.9 Launch Readiness/Plant Support

Suppliers may be requested to support new launches on site at the TI Automotive manufacturing plant. The onsite support is intended to improve communication between TI Automotive and the supplier for any build or delivery concerns, product improvements or pending changes and verification of the launch readiness plans.

Typical items that could be shared between TI Automotive and suppliers are:

- Engineering Status/ Product Status
- Ramp Plans
- Early Containment Procedures
- Contact information for quality, material control, scheduling etc.
- Packaging/labeling
- Sub-supplier and Sub-contractor readiness
- Manufacturability and ability to assemble components
- Lot control/Traceability

7.0 Production Part Approval Process (PPAP)

7.1 PPAP Requirements

7.1.1 Submission Guidelines

Suppliers shall fully comply with all requirements set forth in the TI Automotive PPAP approval process or TI Automotive specific requirements based on the AIAG “Production Part Approval Process” (latest edition PPAP) reference manual. This will also include any TI Automotive or OEM Customer specific requirements identified on the purchase order. This requirement is applicable to subcontracted material and services. The default PPAP level for all initial PPAP submissions shall be Level 3 unless otherwise directed by TI Automotive.

Unless otherwise specified by TI Automotive in writing suppliers are to provide the PPAP as directed in the purchase order. If the supplier has any questions or does not know for certain where/how to submit the required PPAP the buyer must be contacted immediately for direction. All sample parts must be clearly identified and labeled as “PPAP Parts” as defined by the receiving plant.

Failure to follow the PPAP requirements defined in this manual and the AIAG reference manual and failure to provide the PPAP on time as agreed in the P.O.; will render the supplier responsible for any/all associated costs incurred by TI Automotive and our customers. This could include any actual costs to TI Automotive and customers to review, evaluate, and re-test or other activities required to approve the PPAP packaged.

Documents and forms can be obtained by contacting TI Automotive Purchasing.

7.1.2 Checklists

TI Automotive has provided a series of checklists to support PPAP and to ensure many of the critical and required documents and APQP activities have been considered and included in the PPAP package. These checklists reflect the basic requirements defined in the AIAG reference document, TI Automotive Specific requirements, and OEM specific requirements where applicable and regional and governmental laws and regulation requirements. Suppliers are fully responsible for the content and accuracy of the PPAP packages and the checklists are intended as reference and are not all inclusive.

Unless otherwise directed by TI Automotive, the supplier shall complete each of the checklists fully noting each item as either included or not included and submit the checklists with applicable evidence in the PPAP submission package. In some cases the requirement may not be applicable for a specific submission and the checklist will be marked to reflect N/A. (NOTE: TI Automotive concurrence is required for any requirement to be N/A)

7.1.3 Disposition (Approved, Rejected, Interim)

TI Automotive will review the PPAP packages to ensure all required information and all requirements are included. Disposition will be provided to the supplier. TI Automotive does not accept any responsibility for the accuracy, quality or content of the package which is fully the responsibility of the supplier. The disposition is a basic review of the product to ensure the basic requirements have been met and to verify intent of PPAP has been satisfied. The disposition options are:
Approved- TI Automotive has reviewed the package and did not find any missing information or any obvious issues with any of the data or information reviewed.

Rejected- Either required information is missing or errors in the data or the submission were noted during review. The intent of PPAP was not satisfied fully. TI Automotive will clearly define any/all areas of concern causing rejection of the PPAP package.
Interim- Interim approval will be given in rare cases where the package cannot be fully approved but the open items do not affect the fit, form or function of the product and he supplier has written approval from TI Automotive. The written approval must be obtained by the supplier before submission and must be included with the PPAP submission. Interim approval shall not be considered FULL approval and is only valid for a maximum period of 90 days

Suppliers cannot supply production materials to TI Automotive without formal PPAP approval.

7.2 Product, Process and Material Changes

Any modification or changes to the process, the part or the facility must be communicated and approved by TI Automotive prior to commencement of the activity. Any changes will require resubmission and approval of PPAP.

7.3 Run @ Rate/ Production Sign Off (PSO)

The Run @ Rate verifies the capacity and quality output of serial processes and ensures the supplier can support the required volumes, quality levels as required in the purchase order including fluctuations in schedule typical for the global automotive industry. The supplier shall provide the Run @ Rate results with the initial PPAP submission in the format agreed upon with TI Automotive. TI Automotive reserves the right to conduct on-site verification of the Run at Rate at anytime during the life cycle of the product.

Any quality or capacity concerns identified during the Run @ Rate trials must be properly analyzed and corrective action implemented. The failure modes must be included in the PFMEA and the controls must be verified and recorded in the control plan.

7.4 Supplier Request for Change (SRCA)

Any PPAP requirements that cannot be satisfied at the time of submission must be approved by TI Automotive before the submission. This could include product deviations, process deviations, off-standard activities, sub-supplier changes, etc. The Supplier Request for Change Approval process must be initiated and is the only acceptable approval process. (See 4.6 Supplier Request for Engineering Change)

7.5 Yearly Re-Certification

Suppliers are expected to maintain the same process and quality levels approved during the original PPAP submission throughout the life cycle of the product. Suppliers must be able to provide evidence (if requested) demonstrating their product and process meets the standards established at PPAP.

Examples of the level of evidence TI Automotive might request:

Level 1- Warrant Only
Level 4- Warrant and other documents as defined by TI Automotive
Level 3- Full submission

8.0 Manufacturing

8.1 Process Control and Process Capability

Suppliers are responsible to ensure the products supplied to TI Automotive comply completely with specifications and meet TI Automotive quality and delivery expectations during the entire life cycle of the product. The supplier is responsible for all actions necessary including any agreed tests/inspections that must be carried out in accordance with the production control plan submitted and approved during PPAP. The scope of the process controls, tests and inspections must include continuous monitoring and must consistently ensure the stability and capability of the individual processes.

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To minimize test/inspection efforts and to increase process reliability all supplier activities should be focused on preventing defects. Proof of process capability is an important prerequisite for long-term production of defect-free product and is a requirement for any significant or critical characteristics or any requiring a greater level of certainty and confidence. For any/all significant or critical characteristics and for any characteristics where TI Automotive and the supplier have agreed to ensure process capability the following indices are to be used:

Pre-production: These runs do not typically involve all process variables such as human, material and other changes and therefore must be calculated and reported using the Potential Capability Indices; Ppk. Ppk should be calculated from data measured on 125 different parts and from a run of 300 pieces at minimum. **The acceptable level is 1.67 Ppk**

Production: For ongoing monitoring and reporting for process capability; Cpk will be the required format. Cpk is not valid unless the data is collected from enough production runs to ensure all process variables have occurred and the process has demonstrated statistical stability.
The acceptable level is 1.33 Cpk.

8.2 Measurement and Test Equipment

Suppliers are responsible for providing and using measurement and test equipment that verifies production of defect-free product for TI Automotive. (Reference AIAG MSA Manual) Wherever feasible suppliers; must provide variable data. The supplier shall establish, implement and maintain a procedure to verify the acceptability of all measurement and test equipment including gauges, fixtures, test apparatus and other devices. These controls must be included on the control plan and must be reviewed with TI Automotive prior to production and must be approved as part of PPAP.

The following characteristic values must be achieved with respect to Gauge Repeatability and Reproducibility. (GR&R)

- Less than 10% errors; the gauge or test equipment is suitable for use
- Between 10% and 30% errors; may be acceptable depending on the importance of the feature being measured. (Requires TI Automotive approval)
- Over 30% errors; is not acceptable for use on TI Automotive products.

8.3 Process Changes

Process changes can occur for a variety of reasons including to facilitate continuous improvement and to support corrective actions. A process change is defined as any modification of the process, method, materials, location, equipment, measurement and test equipment or sub-contractor changes from when the process utilized during PPAP approval. TI Automotive must be notified and must approve any/all process changes prior to implementation. Suppliers are not authorized to make the requested changes until the appropriate approvals have been provided by TI Automotive Purchasing. The form TI Automotive uses is the Supplier Request for Engineering Change form. (SRCA) Suppliers must understand the cost to TI Automotive for processing any changes since they may be charged back for those costs. Failure to comply with this requirement could result in serious actions from TI Automotive including loss of business.

8.4 Tool/ Equipment Move Process

Relocation or movement of any tool or manufacturing equipment is considered a significant process change and requires approval from TI Automotive before the tool/equipment can be moved. Failure to comply with this requirement could result in serious actions from TI Automotive including loss of business. A formal plan must be submitted along with the Supplier Request for Engineering Change that includes the following information at minimum:

- Project Manager for the tool/equipment move
- Reason for tool or equipment move
- Detailed description of move including timing, site details, locations, parts affected, etc.…
- Product Bank/ Production Assurance Plan
- Re-qualification plan which must be approved beforehand by TI Automotive and in many cases; our customers.
- Post move containment plan to ensure quality. (Similar to Early Containment Plan) Typically includes temporary enhancement of control plans and additional inspections and/or tests to eliminate any risk for quality concerns due to start up after the tool/equipment move.
- Any costs to TI Automotive resulting from this tool/equipment move may be charged back to the supplier including any costs TI Automotive has to manage the change, re-qualify our part or any delays and increased production costs.

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8.5 Statistical Process Control (SPC)

TI Automotive expects suppliers to use statistical process control (SPC) applications to control the critical and significant characteristics of the product or process. The statistical applications used must provide variable data allowing for capability information to be generated. Any exceptions must be approved by TI Automotive. The supplier must immediately implement containment and corrective actions for any out of control conditions and must immediately notify the TI user plant if the product has escaped. The AIAG SPC guidelines can be used as a reference.

8.6 Inspection/Audit

TS 16949, ISO 9001, VDA, Anfia and the other global industry standards have clearly defined the requirements for inspection and audit. However, TI Automotive supplies unique safety related products to our customer which is some cases may add additional risk or cost should quality concerns occur.

Therefore it is critical suppliers understand these risks and make certain all associates including inspectors and auditors are fully aware of the way these products are used and what potential risks may exist. All audits should be performed by personnel other than those who perform the actual work including personnel from other functions if applicable. Suppliers must have documented evidence of the reviews, the results of the inspection/audits and clear explanation of what measures were taken when concerns were found.

8.7 Material Certification, Verification and Testing

Suppliers are responsible for verification of any/all materials or sub-components used to produce product shipped to TI Automotive. Suppliers must have evidence that any/all materials or sub-components fully comply with the specifications, industry or government regulations and standards prior to use in production. This includes raw materials, coatings, treatments, sub-components, sub-assemblies etc. A document from a sub-supplier such as a Material Certification does not in itself guarantee the quality of the product.

8.8 Final Inspection and Testing

TI Automotive does not routinely require certificates of analysis and proof of compliance from all suppliers and for all supplied components. All suppliers shall verify the product that is being shipped meets or exceeds all TI Automotive expectations, product specification and performance requirements. Suppliers must have a process and documented evidence to support this expectation. Examples of some of the expectations to certify are:

- Quality of product
- Product Identification/ Lot Control/ Traceability
- Packaging/Labeling/Quantity
- Cleanliness of material
- PPAP approved/Annual Validation

8.9 VA/VE and Cost Reduction

Suppliers and TI Automotive must remain competitive and provide quality product at prices that help ensure future business and profitability on existing business. Suppliers of production materials and components are expected to have a system and processes for identifying and monitoring costs and for effectively managing those costs. It is imperative suppliers achieve internal cost reductions to support agreed upon pricing targets on an annual basis. This criterion will affect sourcing decisions and long-term supplier relations with TI Automotive.

VA/VE activities are an important and effective methodology for reducing costs by eliminating waste and reducing non-value added activities in the manufacturing and delivery processes. Suppliers are encouraged to pursue VA/VE opportunities and to bring them to TI for consideration and approval. The supplier should work with their buyer to discuss the opportunities and how they might be supported by TI Automotive.

Other examples of cost saving opportunities:

- Improved Payment Terms
- Consignment
- Volume Efficiency
- Reduction of complexity/simplifying the product or process
- Improved utilization of manpower
- Quality Improvement
- Sub-supplier Cost Reduction Programs

8.10 Production Releases/Scheduling

Suppliers shall ensure 100% on-time delivery of all products and services. Schedule changes from our customers and therefore to our suppliers are not uncommon and must be accommodated to ensure the flow of materials. TI will provide suppliers forecast/planning information, raw material planning information and schedules and projections. TI Automotive will also provide as much advanced notice as we can of any/all changes to the schedules or delivery requirements.

The required levels for these activities will be region specific and will be communicated to the supplier in the purchase order and agreed upon during the quoting process. Forecasts are nonbinding and are intended to assist suppliers with production planning.

It is the supplier's responsibility to contact the appropriate TI Automotive contact if an updated weekly production release has not been received. The supplier is responsible for any and all costs associated with failure to do so.

9.0 Materials Management/Logistics

9.1 Packing Slips and Shipping Documentation

Each shipment is to be accompanied by a packing list/shipping documentation that clearly identifies at minimum the following information and any other information specified by TI Automotive:

- Supplier name
- Supplier ID/Code (DUNS, if available)
- Date of shipment
- Packing slip number
- Purchase order number
- Shipping location
- TI Automotive part number
- Quantity shipped
- Part description
- Unit of measure
- TI Automotive Plant
- Carrier information

9.2 Direct Shipments

In some situations the supplier may ship the product directly to the TI Automotive OEM customer user location or staging location rather than to TI Automotive. It is the supplier's responsibility to comply with any/all unique packaging or labeling requirements for the receiving location. The supplier is also responsible to immediately communicate any/all potential or real concerns with direct ship product including any quality, delivery, packaging or labeling relating concerns.

9.3 Packaging and Labeling Requirements

9.3.1 Container Types and Sizes

Unless directed otherwise by TI Automotive or our customer suppliers of production parts and materials are responsible for packaging their products in safe, efficient containers that is pre-approved by TI Automotive and where applicable our customer. The design of the packaging should consider environment aspects. All packaging related information such as size, type of container, fill quantities, pallet information etc must be pre-approved and submitted formally during PPAP. Suppliers are responsible for adhering to any/all customer, governmental and environmental regulations relating to packaging. If the normal standard packaging is not available alternate packaging must be provided by the supplier and approved by TI Automotive prior to shipment.

9.3.2 Labeling

All boxes, containers and pallets must be labeled to ensure proper identification and verification of the product and quantity shipped. Bar code labels are required and must be visible from opposite sides of the shipment. The region/location of the TI Automotive user plant will define the type of bar coding used on the label. (Odette, VDA, ANSI, etc) The supplier is responsible for obtaining approval prior to shipments of labels from the TI user plant. Samples of the labels must be submitted to the TI Automotive user plant for review and approval; including ability to read with scanner as applicable. Approved label must be included in the PPAP submission.

The basic information required on each label is:

- TI Automotive part number including Revision level (if applicable)
- Part Description
- Quantity in container
- Manufacturing date
- Unique Serial number/ Lot Information
- Supplier name
- Supplier plant location
- TI Automotive receiving plant

9.3.3 Verification/Validations and Trials

Suppliers are responsible for verifying packaging used to ship product to TI Automotive will protect the part, prevent contamination and are ergonomically correct for both the supplier and TI plant usages. Suppliers are also responsible to ensure the bar code label(s) can be read by scanners at TI Automotive.

During product/process development and prior to PPAP submission suppliers must run verification/validation trials for all production intent packaging and labeling. This would include any alternate package considered as contingency in the event normal packaging is not available. Evidence of completion and approval shall be presented in the PPAP submission.

9.3.4 Returnable Containers

Returnable is defined as re-usable containers such as plastic or metal bins, racks, pallets, trays and separators etc. that are returned to the original shipping location for re-use. All returnable containers including any/all separators, dividers and internal dunnage must be approved by TI Automotive prior to use. Suppliers shall maintain a sufficient number of returnable containers to ensure continued supply of product through the supply chain including volume increases as agreed upon in the P.O, the applicable TI Automotive Terms and Conditions and any supply contracts that may apply.

a) Repair

For returnable containers and packaging to be effective they must be regularly inspected and maintained in good working condition. In most cases the responsibility for inspection and maintenance of returnable containers will belong to the supplier of the product being shipped. Any exceptions must be agreed upon during development (APQP) by TI Automotive. Suppliers must have a formal plan and resources to inspect and repair returnable containers as needed. If a supplier elects to outsource this activity they are still responsible for the effectiveness of the activity and any/all quality concerns resulting from poor practices.

b) Storage

Returnable containers must be stored in an environment that ensures the protection of the containers protects against contamination and damage and ensures the long-term usage of the containers.

c) Cleaning

Unless otherwise agreed upon by TI Automotive suppliers are also responsible for keeping returnable containers clean and for removing any old labels, tags or other add on identifiers between uses. Many of the products TI Automotive produces have strict contamination and cleanliness requirements and suppliers must take those in consideration when developing the schedule and method for cleaning containers.

9.4 Truck Loading/Transport

Suppliers are responsible for loading the trucks and for ensuring the containers/product are properly secured prior to delivery/transport. Where the supplier is responsible for the sourcing of the truck they are also responsible for ensuring the trucking company complies with all legal and regulatory requirements. Suppliers shall verify the trailer/truck does not have any damage that could allow product to get damaged or allow for contamination. Suppliers shall be responsible for any problems that occur and all costs associated with improper loading.

9.4.1 Load Security

Product must be properly secured prior to transport including any/all appropriate locking devices, shipping straps, blocks etc required to ensure the containers do not shift/move in a manner to allow for damage to the product. The supplier must notify TI Automotive prior to shipment of any off-standard loading methods that are used due to the capability of the trailer/truck or damage to the trailer/truck that prevents normal loading.

9.4.2 Receiving Hours

All TI Automotive plants have normal hours dedicated for shipping and receiving product. Suppliers should contact the local logistics/shipping personnel at the TI Automotive plant to confirm receiving hours. In those cases where the supplier and TI are working on specific schedules such as regular milk run deliveries those schedules must be adhered to at all times. Suppliers must obtain approval from the TI Automotive plant for any out of our deliveries and for any schedule changes.

9.4.3 Communication

Suppliers are responsible for communicating any/all changes or updates relating to timely delivery of materials. Suppliers shall immediately notify the TI Automotive plant of any unexpected changes, risks or modifications to shipping/delivery schedules.

Examples of some of the items suppliers must communicate to TI Automotive are:

- Changes in delivery schedule/time
- Changes in delivery method/loading
- Potential damage/ potential loss of product due to shipping
- Any concerns with the carrier or the carrier equipment
- Any changes in the route that could possible add risk to the shipment

9.4.4 Material Release Requirements

Suppliers are responsible to ship to the schedule and quantities as directed in the material release information provided by TI Automotive. (See section 8:10) All products must be shipped to those requirements including use of standard pack quantities and full containers unless authorized beforehand by the TI Automotive plant materials representative.

Over shipments may not be accepted and could be returned at the supplier's expense. An SNCR could be issued requiring written response and corrective action.

Under shipments may not be accepted and could be returned at the supplier's expense. An SNCR could be issued requiring written response and corrective action.

Some TI Automotive plants require ASN or other EDI information prior to shipment. It is the responsibility of the supplier to verify the requirement and to communicate to the TI Automotive plant any required information.

9.5 Cleanliness Standards

TI Automotive produces products that in most cases must be free of contamination including dust, processing aides, flash, fibers from packaging etc. In some cases the drawing or specification will define the level of cleanliness required based on the design and how the product is used. Suppliers shall ensure product produced and shipped to TI Automotive does not have contaminates either in the product or in the packaging.

9.6 Electronic Data Interchange (EDI)

In many of the global TI Automotive manufacturing locations EDI is utilized for scheduling and releasing production requirements sometimes including forecasts. Suppliers that are required to use EDI must verify the EDI connection between their plant and TI Automotive prior to PPAP and evidence provided in the PPAP submission.

For detailed information about this requirement contact the appropriate person at the TI Automotive user plant and/or the buyer.

9.7 Country or Region Specific Requirements

TI Automotive is a global company and is required to comply with country and region specific laws and regulations. TI Automotive suppliers shall also comply with these laws and regulations. Examples of country or region specific laws are:

9.7.1 NAFTA (For suppliers to North America only)

All suppliers must be in compliance with US, Canada and Mexico Customs regulations and requirements including completion of annual NAFTA Certificate of Origin for all parts supplied to North America. Issuing a Certificate of Origin carries legal consequences; so suppliers that are not certain about how this applies to product they supply should either contact the U.S. Customs NAFTA FACTS line ((972) 57401582 or the Mexico Customs (011-52-211-3545) CTPAT and AOE requirements may also apply to product being shipped across U.S. borders
Suppliers can also obtain information at the following website: www.customs.gov

9.7.2 Certificates of Origin

Canada, Mexico and the United States established a uniform Certificate of Origin to certify that goods imported into their territories qualify for the preferential tariff treatment accorded by the NAFTA. The Certificate of Origin must be completed and signed by the exporter of the goods. Where the exporter is not the producer, the exporter may complete the Certificate on the basis of:

- knowledge that the good originates;
- reasonable reliance on the producer's written representation that the good originates; or a completed and signed Certificate of Origin for the good voluntarily provided

9.7.3 Chinese Compulsory Certification (CCC)

The **China Compulsory Certificate mark**, commonly known as **CCC Mark**, is a compulsory safety mark for many products sold on the Chinese market. It became effective on May 1, 2002. It is the result of the integration of China's two old compulsory inspection systems, namely "CCIB" (Safety Mark, introduced in 1989 and required for products in 47 product categories) and "CCEE" (also known as "Great Wall" Mark, for electrical commodities in 7 product categories), into a single procedure.

TI Automotive suppliers that produce product for usage in China may be required to comply with this regulation. Suppliers can obtain information relating to this requirement at the following internet site: http://www.cqc.com.cn

9.8 Obsolescence

Suppliers are expected to build and deliver product adhering fully to material releases and scheduling requirements provided by TI Automotive. Any obsolescence resulting from a supplier not adhering to the releases and schedules could be the responsibility of the supplier including any associated costs. For obsolescence that occurs due to other measures beyond the control of the supplier; claims and supporting evidence and information must be presented to the TI Automotive plant materials department. All claim material may be audited and must be held in safe storage until the claim is settled.

9.9 Service Part Requirements

All suppliers are responsible for supply of service parts for a period of 15 years after scheduled production ends unless a source change is approved by TI Automotive. Product supplied for service must be produced from original tooling unless approve otherwise by TI Automotive. The quality requirements detailed in the TI Automotive Global Supplier Requirements Manual apply to all service parts and any exceptions must be approved by TI Automotive in writing.

Suppliers are expected to maintain preventative and predictive maintenance processes on all tooling and must report immediately any concerns with the tools, fixtures or other equipment that could cause delay of shipment or quality concerns.

10.0 Supplier Performance Monitoring and Reporting

10.1 Global Supplier Performance Rating

TI Automotive will maintain a global supplier performance monitoring and reporting system to help drive continuous improvement and to help TI Automotive make sourcing decisions. The process will be managed via the TI Automotive Internet Web Site and Portal and will include metrics such as quality, delivery, on time responses and PPAP. The ratings will be updated monthly with metrics for that specific month and Year-to-Date (YTD) using a rolling 12 month average. The Global Supplier Performance Rating will be used to identify strong suppliers and those needing improvement. This rating will be a key input for the Sourcing Committee.

11.0 Problems and Communication

11.1 Supplier Concern Management Process

11.1.1 Notification

In the event a supplier causes a quality or delivery concern they will be issued a **Supplier Non-Conformance Report (SNCR)** by the TI Automotive staff member initiating the concern. This format may also be used to notify suppliers of other types of failures such as warranty, delivery concerns, PPAP or other required documentation rejections. In many cases especially at times when response time and containment are critical TI Automotive will also contact the supplier via telephone or other more direct communication.

The SNCR will define the concern; detail the quantity of parts identified for concern and will also define the response action required by TI Automotive. There are several classifications for the concern that will be used to define the action required:

Formal Concern: Any concern sent to the supplier where TI Automotive is requesting immediate formal corrective action; typically in 8D format.

Critical Concern: *A formal concern is considered "critical" when it results in risk related to the product safety, liability/reliability, design, environment, customer designated high severity, customer sanction and/or field action. An SNCR can also be classified as critical if there is a high concern related to warranty and future risk.*

Safety **Concerns:** TI Automotive produces safety products which must comply with laws and regulations and must ensure safe operation for our customers. If a supplier is involved with a Safety/Regulatory issue (S/R) they must ensure early communications, awareness and escalation of customer critical issues involving product safety and potential field action or recall. For returned part analysis, confirm team expertise and prompt robust problem solving assignment with proactive communication and customer involvement.

Informal Concern: A potential concern that does not require formal corrective action from the supplier. These are typically concerns where the risk is either minimal or the situation is controlled by TI Automotive. Informal complaints may not require a formal corrective action but in all cases must be addressed in a way to drive preventative actions and continual improvements. In some cases; suppliers will be notified of an informal concern via telephone or email but an SNCR may not be issued. TI Automotive will still have a record of these concerns in our SNCR database and any repeat issues will likely result in more formal actions required.

11.1.2 Response/Timing Requirements

First 24 hours- Suppliers must complete the first three (3) steps of the corrective action report which includes containment and full traceability and lot control and initial root cause analysis including review of the process(s) where the issue could have occurred. Suppliers are also expected to have at least interim corrective action in place at this time. Suppliers must report status to the TI Automotive plant quality department via the initial 8D report and telephone.
Within 14 days- Suppliers must complete the formal corrective action report (8D), have permanent action identified, verified, validated and implemented where possible. If permanent action is not implemented interim corrective actions must be validated and approved by TI Automotive and in place until permanent corrective action is complete.

11.1.3 Corrective Action

Each supplier must implement effective corrective action immediately to resolve the open concern and to protect TI Automotive, our customers and the supplier from further risk and exposure. The default corrective action process will be the "8D" process. A basic description of the process is as follows:

Choose a Team- The 8D problem solving process is a "team oriented" activity that requires a cross-functional team comprised of staff with the right mix of skills, experience and authority to resolve the problem and implement permanent corrective action. A key concern with problem solving is not allowing the team members enough time to properly investigate a problem or to properly verify the solution is effective.

Define the problem- The more clearly a problem is described the more clearly it is understood by everyone involved. This is a significant step in this process and any mistakes made during this activity can greatly affect the outcome of the problem solving effort. The information must be concise, accurate and should not include anything but facts. The problem definition must include quantity, when, where, impact to the customer and photos and diagrams as needed.

Containment/Interim Corrective Action- One of the first things that must be completed is containment of any/all suspect material to prevent further manufacture and/or shipment of defective material. Containment must include any lot of material that could potentially have this concern anywhere in the supply chain including in transit. During the 8D process and until authorized by TI Automotive all product shipped to TI Automotive must be certified to ensure the issue does not exist in any new shipments.

Implement a temporary corrective action until such time as the root cause has been proven and the permanent corrective action has been implemented and verified as effective. Interim corrective action must be monitored at all times to ensure the measure is effective. Interim corrective action can include enhanced inspection such as 100% inspection providing the inspection is capable of detecting any/all defects.

Find the Root Cause and Eliminate it- A formal process must be followed for root cause analysis. There are many tools and techniques that can be used such as Pareto Analysis, Ishikawa (fish bone), Is- Is/Not, 5 Why process and many other tools that help distinguish differences between parts that failed and parts that did not fail. It is very common to identify several potential causes and in some cases multiple causes that may or may not be related. The most important part of this activity is to prove the root cause. The most effective way to do this is to replicate the problem. In all cases if the root cause is not proven then ALL potential causes must be addressed with formal, verified corrective action.

Choose and Verify Corrective Action(s) - Once the root cause(s) are identified and proven permanent corrective measures must be identified and tested for effectiveness. Permanent corrective action must prevent the problem from repeating anytime in the future and also on any other programs/products supplied to TI Automotive. Verification must be thorough and evidence of effectiveness must be provided in the 8D.

Implement Permanent Corrective Action(s) - Once permanent corrective action has been tested and verified to be effective for preventing repeat issues the action(s) must be formally implemented. All process and product related documents must be updated to reflect the improvement measures implemented including PFMEA, Control Plan, Work Instructions, Visual aides, etc.. Training must be completed as required and documented. These actions must also be implemented on any other product/processes where the same concern could exist. NOTE: Any changes to the product or process must be approved by TI Automotive before implementation following the SRCA process described in this TI Automotive *Global Supplier Requirements Manual.*

Prevention/ Lessons Learned- The problem must never occur again on any product from any manufacturing location or process. All documentation such as the APQP documents mentioned above as well as design standards, manufacturing standards, DFMEA's and specifications must be updated to prevent the same type of issue. Mistake proof options should be considered for all future products that could potentially have this same failure mode.

Celebrate Success/ Congratulate the Team- Corrective action/problem solving is hard work and when done correctly takes a lot of resources and commitment from team members. A properly completed 8D with effective permanent actions will prevent the same concern from reoccurring which in turn will save money and prevent further customer dissatisfaction. Preventing a problem from ever happening again is a very positive success and should be commended.

11.1.4 Elevation Process

TI Automotive produces safety critical items for the automotive industry. Any concern should be consider serious in nature and must be addressed accordingly. Should the problem require escalation or more focus; suppliers must have a formal process for elevation and communication to ensure immediate reaction and response.

11.1.5 Controlled Shipping Level 1 and Level 2 (CSL-1/CSL-2)

Occasionally, supplier response may not be adequate to prevent recurrence or to effectively contain suspect product and safeguard TI Automotive and our customer from potential field issues or production stoppage. Should this occur TI Automotive will have suppliers implement special measures such as a Controlled Level Shipping process to help reduce the risk. TI Automotive will inform the supplier in writing defining the controls we have chosen and where those controls should be implemented.

Controlled Level Shipping 1 (CLS-1)

CLS-1 typically includes a problem solving process as well as redundant inspection process. The CLS-1 is implemented at the manufacturing location and utilizes in-house staff for the process. The primary goal is to ensure that NO defects can leave the production facility and that all corrective actions and controls implemented are effective. CLS-1 is often referred to as the "Manager's Containment" because in most cases, it requires a sign-off and formal control by someone on the management staff.

Controlled Level Shipping 2 (CLS2)
CLS-2 includes the same processes as CLS-1 with additional inspection and auditing performed by a third party representing the customer's interests specific to the containment activity. Normally the third party is selected by the customer, approved by the customer, but paid for by the party under controlled shipping. CLS-2 can be implemented at several locations in the supply chain depending on where the action will be most effective. (Manufacturing plant, Customer Plant, off site, etc…)

Data must be collected for either level of containment to ensure the effectiveness of the containment, lot control and traceability of all suspect or "controlled" product and to demonstrate the permanent corrective actions are effective. In some cases the controlled shipping may verify "interim actions".

11.1.6 Closure

Formal closure of any SNCR requires approval from the TI Automotive plant quality team that initiated the concern. To receive that approval the supplier must have completed the corrective action report (8), verified/validated all corrective actions and demonstrated effective and permanent corrective actions were implemented. Suppliers must provide evidence they have completed a robust "lessons learned" and "read across" of the concern to ensure the problem will not occur anywhere else and must provide evidence all appropriate APQP documents such as DFMEA, PFMEA and Control Plan have been update as required.

11.2 COPQ/ Supplier Charge Back

All costs incurred by TI Automotive that are due to a supplier not adhering to TI Automotive quality and delivery requirements may be charged back to the responsible supplier. This includes customer issues, scrap or other in-process waste, warranty and other any process fall out.

Examples of events typically associated with supplier caused COPQ:

- Rework, sort and disposition of suspect and non-conforming product
- Premium freight
- Down time/ over time/ line speed reduction
- Increased inspection
- Late Delivery
- Shipping errors
- Additional manpower
- Product or equipment damage
- Replacement materials/costs
- Reimbursement of all charges from a customer
- Warranty Costs

A Supplier Non-Conforming Report (SNCR) will be issued to the supplier. This report will describe the problem in detail, the associated costs in detail and the COPQ to be reimbursed by the supplier. In most cases TI Automotive may also include an "administration" cost to address the costs for TI Automotive to administer and manage the concerns. The administration charge will vary depending on the location of the plant and the labor costs for the people involved. TI Automotive will only charge actual costs when recovering COPQ.

11.3 Supplier Improvement Process

In view of the major influence our suppliers have on the performance of TI Automotive products it is essential the entire supplier organization is involved in the process of continuous improvement.

Continuous improvement is required to minimize quality risks, reduce or eliminate waste and to ensure TI Automotive and our suppliers continue to have shared success and further opportunities. Suppliers shall regularly monitor and evaluate their level of quality; internal and external to identify areas for improvement. Suppliers shall also continuously look for ways to improve process and manufacturing methods to reduce waste and cost.

Examples of improvement opportunities are:

- The reduction of rejects/rework
- The reduction of downtime/improved equipment utilization
- Improved process capabilities and throughput
- Reduction of lead times, delivery times and overall delivery
- Identifying and implementing new technologies that foster improvement
- Improved measurement technologies
- VA/VE exercises and Six Sigma projects in all areas of the business

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Suppliers are expected to extend the continuous improvement process to all Tier N business partners and the improvements and results must be measured.

TI Automotive will also monitor supplier performance to identify where suppliers may need improvement. We will use metrics such as quality PPM, delivery performance, on time PPAP submissions etc to help identify where suppliers are having difficulty and where improvement is needed from the “customer” perspective.

12.0 Supplier Tooling and Capital Equipment

The following information describes the general expectations for suppliers relating to tooling and equipment utilized specifically to produce product either supplied to or manufactured by TI Automotive including the basic expectations for machines, devices, tooling, fixtures, gauges; service and installations. These general expectations should not be misconstrued to relieve the supplier of responsibility for the quality and functionality of the tooling or equipment they are providing.

TI reserves the right to visit the supplier and subcontractors to review progress and verify quality and status of the project.

12.1 Specifications/Customer Requirements

12.1.1 Specifications

TI Automotive will provide suppliers a technical specification in addition to general specifications for tooling and equipment. For tooling and equipment intended by the supplier to produce materials shipped to TI Automotive plants for use in our products; TI Automotive will provide the technical and design requirements for the product.

NOTE: Refer to section 6.3 of this manual for information regarding transfer of data/CAD.

If the supplier is design responsible for the machine, tooling etc; then the supplier must submit their plan and specifications to TI Automotive for approval prior to launch of the project.

12.1.2 Supplier Responsibility

- Responsible for the quality and correct function of the delivered machine, tooling, device or other equipment.
- Delivery of the machine, tooling, equipment etc on time and within agreed upon costs.
- Validation of the equipment, tryouts, layouts etc...
- Adherence to all relevant local laws and legal requirements such as German Law on Technical Work Equipment, regional and governmental safety laws and environmental laws and regulations.
- Fully functioning software as defined in the contract.

12.2 Confidentiality

TI Automotive and our supplier must commit to keeping in strict confidence all documents, drawings, procedures, technical standards, and intellectual property; including any knowledge found during the joint cooperation on the project. This commitment must include all employees including any that might leave either company during or after the cooperative effort.

The confidentiality obligation is also valid in case a business relationship is not accomplished or is not achieved in the intended extent. It is valid in unrestricted and unlimited form even after the conclusion of the business relation.

TI Automotive Terms and Conditions govern this topic.

12.3 Tool/Equipment Identification

All tooling, equipment, machinery and other devices must include a nameplate or other permanent tag that is clearly legible, contains all the agreed upon information and is durable. Unless agreed upon by TI Automotive, the nameplate must be metal. The information on the nameplate, the location of the nameplate and the type of nameplate must be included in the project plan; specifications and must be agreed upon by TI Automotive. Examples of some of the data that might be required are:

- Manufacturer, supplier, importer, contractor
- Type, model year, part number, unique identifier
- TI Automotive part or identification number
- OEM Customer part or identification number (if OEM owned)
- Basic information relating to safe operation and specific to the equipment, tool or device.
- Others as agreed upon during the development/planning discussions or as called out in the specifications or contract.

Evidence of proper identification must be presented to TI Automotive before approval is given for the tooling, equipment, device etc. and where appropriate included in PPAP.

A **Tooling Agreement** to cover tooling owned by TI Automotive may be required in certain cases. TI Automotive will confirm if a tooling agreement is required when the tooling purchase order is issued.

12.4 Warning Signs/Labels and Markings

Equipment, tooling, devices and machinery must have proper identification and markings to ensure safe operation and to prevent injury to the operator or damage to the equipment or product. These warning signs, labels and markings must be clearly visible to the operator and/or maintenance and technical personnel in any area needed. Unless agreed upon by TI Automotive the warning signs must be yellow with black lettering. This must be located on the operation device whenever possible and visible at all times to the person(s) using the machinery, equipment or devices. Areas of concern could include electrical instruments, outlets, plugs, wires connections etc. It could also include valves, locking mechanisms, doors, gates etc...

Areas where there are inherent concerns such as “heat”, slippery conditions, electrical or high pressure air/liquids must also be properly marked. Dangerous movements and areas where the operator must use caution when moving must be clearly identified.

All tooling, devices, and machinery used in the EU must be manufactured in compliance with CE regulations.

12.5 Mistake proofing/Error Proofing

Supplier designs and plans for tooling, equipment, machinery and other devices must include consideration and adaptation of mistake proofing. Mistake proofing and/or redundant protection should be clearly defined and included in drawings, specifications and must be proven and qualified for acceptance. Unless agreed upon by TI Automotive, all mistake proofing and error proofing devices must be orange in color.

12.6 Changes/Deviations

Any changes, deviations or alterations to the specifications or plans for tooling, equipment, machinery or other devices must have written approval from TI Automotive. Suppliers must identify any areas where deviations exist whether planned or unplanned. Corrections required when deviations/changes are not acceptable must be corrected at the supplier’s expense.

12.7 Safety/Machines and Equipment

12.7.1 Lock out/Tag out

Lock out/Tag out is a procedure to prevent undesired activation of machines or devices. This usually includes measures like placing locks on electric switches locking them in the “off” position, restricting hydraulic, pneumatic and other power from allowing a machine or device to function, etc. These devices and measures are required for any machine or device supplied to TI Automotive and must meet at minimum the requirements defined in governmental and industry standards such as: German Trade Associations VBG 5 which pertains to power-operated equipment and U.S. OSHA legislation 29 CFR 1910.146, Control of Hazardous Energy.

Safety circuits must have direct control of power and air if they do not go though PLCs.

12.7.2 Safe practices

All equipment and devices supplied to TI Automotive must be designed and built to provide 100% protection to operators, maintenance staff and others using the machines or devices. EC Guidelines such as the CE Regulation and OSHA requirements must be taken in to consideration as appropriate.

12.8 Tooling/Equipment Approval Process

12.8.1 Tooling/Equipment Design Approval

Suppliers must provide TI Automotive with basic “concept” designs at the time of quote. More detailed designs must be provided and approved by TI Automotive prior to start of tool or equipment build. In some cases such as for production tooling that information may be required in the form of math data or CAD. Designs must take into consideration the expected life of the program, the expected service requirements if applicable and must ensure the quality of product produced or qualified with these tools, fixtures, gauges, equipment or other devices throughout the life cycle.

12.8.2 Tool/Equipment Layout

Suppliers must provide evidence the tooling/equipment they are providing or using to provide product meets all specifications and technical requirements. This will typically require layout/measurement of the tooling/equipment as well as layout of the product produced. The criteria for this must be part of the supplier plan and must be approved by TI Automotive.

12.8.3 Trial Runs

Trial runs are common and often required to validate/verify tooling and equipment. TI Automotive will typically define those requirements as part of the RFQ and/or statement of work. In the event TI Automotive does not call out this requirement then the supplier must propose the trial run plan and obtain TI Automotive agreement before running the trial.

a) Supplier Site trials
These are trials that are run at the supplier location prior to shipment of the tooling/equipment or in the case of production level suppliers prior to acceptance of the tool and shipment of product to TI Automotive.

b) TI Automotive Plant Site Trial
These are trials that are run at the TI Automotive site where the tooling/equipment will be used and must be completed and prior to acceptance of the tooling/equipment. This would typically include a production trial utilizing the tooling/equipment or production run utilizing the supplied components prior to acceptance.

12.8.4 Maintenance Instructions

Suppliers of specialized equipment or devices must provide recommended maintenance instructions and recommendations for frequency for key functional elements of the equipment or device.

12.8.5 Spare Parts

Suppliers of specialized equipment or devices must provide a list of recommended spare parts and in the cases where these parts are not “shelf items” options for how to obtain those parts if needed. Suppliers must provide the part number, name of original manufacturer and drawings/specifications for all spare parts. Project or part specific requirements will also be detailed in the RFQ or specifications.

12.9 Warranty

Suppliers of equipment and tooling are responsible for any/all problems or concerns that result from design, manufacturing or quality related problems due to the supplier or sub-contractors to the supplier.

Service/Maintenance

During the warranty period the supplier is responsible for service/maintenance issues that occur that are not part of normal/expected maintenance. Suppliers may also be responsible if the normal/expected maintenance frequency is excessive or more frequent than the recommended or agreed upon levels.

13.0 Glossary/Acronyms

8D **(8 Discipline Problem Solving Report)** Corrective action process typical to the Automotive Industry that requires a specific process and 8 specific steps be followed.

AIAG **(Automotive Industry Action Group)** AIAG is an organization of component suppliers and automotive manufacturers which look at ways to standardize processes and procedures for the industry and between groups.

ANFIA **(Associazione Nazionale Fra Industrie Automobilistiche) (National Association of the Automobile Industry)** Italian auto industry standard

APQP **(Advanced Product Quality Planning)** A quality tool used for product planning and defining controls.

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ASL **(Approved Supplier List)** List of suppliers that are approved to supply product

ASN **(Advanced Shipping Notice)** An EDI transaction that contains various information regarding the shipment of parts and materials. (Typically referred to as an 856)

CAD **(Computer Aided Design)** The use of computer technology to aid in the design of products; real or virtual.

COPQ ***(Cost Of Poor Quality)*** *Metric used to quantify and track the cost of mistakes or poor quality. This metric* is not just used for product but for any areas where waste or problems can have cost.

CQI **(Continuous Quality Improvement)** Process and philosophy for driving continuous analysis, review and improvement.

CT-PAT **(Customs Trade Partnership Against Terrorism)** C-TPAT is a U.S. government-business initiative to build cooperative relationships that strengthen and improve overall international supply chain and U.S. border security.

Cpk **(Process Capability Index)** Statistical tool used to estimate/calculate the capability of a process to meet drawing requirements or specifications.

DFMEA **(Design Failure Mode and Effects Analysis)** Analytical method for evaluating the risks associated with the design of a product and for measuring the effectiveness of improvement actions.

EDI **(Electronic Data Interchange)** Method of communicating information between companies by using computers to transmit and interpret coded data.

EU **(European Union)** An economic and political union between 27 member countries primarily located in Europe. Committed to regional integration.

FAO **(Food and Agriculture Organization)** FAO is a United Nations specialized agency accountable to the FAO Conference of member governments. FAO participates in the United Nations Economic and Social Council (ECOSOC) which coordinates economic, social and related work of the 14 UN specialized agencies as well as regional commissions.

GD&T **(Geometric Dimensioning and Tolerancing)** The purpose of GD&T is defined as describing the geometric requirements for part and assembly geometry. Proper application of GD&T will ensure that the allowable part and assembly geometry defined on the drawing leads to parts that have the desired form and fit (within limits) and function as intended.

GR&R **(Gauge Repeatability and Reliability)** Statistical tool used to verify the effectiveness of a gauge to accurately and consistently measure a product. It also defines the variability of the gauge in relation to the tolerance of the feature.

IATF **(International Automotive Task Force)** The IATF is an "ad hoc" group of automotive manufacturers and their respective trade associations, formed to provide improved quality products to automotive customers worldwide. **IATF** members include the following vehicle manufacturers: BMW Group, Chrysler LLC, Daimler AG, Fiat Group Automobiles, Ford Motor Company, General Motors Corporation (including Opel Vauxhall), PSA Peugeot-Citroen, Renault, Volkswagen AG and the vehicle manufacturer's respective trade associations - AIAG (U.S.), ANFIA (Italy), FIEV (France), SMMT (U.K.) and VDA (Germany).

IMDS **(International Material Data System)** The International Material Data System (IMDS) is a collective, computer-based material data system used by automotive OEMS to manage environmentally relevant aspects of the different parts used in vehicles. Through this system the automotive industry is able to reconstruct the complete material flow.

MSA **(Measurement Systems Analysis)** MSA, is a specially designed experiment that seeks to identify the components of variation in the measurement**.**

NAFTA **(North American Free Trade Act)** The North American Free Trade Agreement (NAFTA) is a trade agreement among the United States, Canada, and Mexico that liberalizes restrictions on trade among the three countries. The agreement includes processes to manage tariff rates.

NIST **(National Institute of Standards and Technology)** NIST is the U.S. federal technology agency that works with industry to develop and apply technology, measurements, and standards.

OEM **(Original Equipment Manufacturers)** For the purpose of this manual the OEM's are the global manufacturers of original equipment; primarily automobiles; that TI Automotive supplies.

OSHA **(Occupational Safety and Health Administration)** OSHA is the main U.S. federal agency charged with the enforcement of safety and health legislation.

OHSAS **(Occupational Health and Safety Assessment Series)** OHSAS 18001 is an *Occupation Health and Safety Assessment Series* for health and safety management systems.

PFMEA **(Process Failure Mode and Effects Analysis)** Analytical method for evaluating the risks associated with the process used to produce a product and for measuring the effectiveness of improvement actions.

PO **(Purchase Order)** A purchase order (PO) is a commercial document issued by a buyer to a seller, indicating types, quantities, and agreed prices for products or services the seller will provide to the buyer. Sending a PO to a supplier constitutes a legal offer to buy products or services. Acceptance of a PO by a seller usually forms a one-off contract between the buyer and seller so no contract exists until the PO is accepted

PPAP **(Production Part Approval Process)** PPAP defines generic requirements for product part approval including production and bulk materials. The purpose of PPAP is to determine if all customer engineering design record and specifications are properly understood by the supplier and that the process has the potential to produce product consistently meeting these requirements during an actual production run at the quoted production rate.

Ppk **(Potential Process Capability Index)** Statistical tool used to estimate/calculate the "provisional" capability of a process to meet drawing requirements or specifications.

PSO **(Process Sign Off)** Process Sign-Off is a method to verify that a Supplier's quality planning processes have been successfully executed and that its production processes are capable of producing quality parts in sufficient quantity for production.

REACH **(Registration, Evaluation, Authorization, and restriction of Chemical substances)** European Community Regulation on chemicals and their safe use (EC 1907/2006). It deals with the **R**egistration, **E**valuation, **A**uthorization and Restriction of **Ch**emical substances.

RFQ **(Request For Quote)** A request for quotation is a standard business process whose purpose is to invite suppliers into a bidding process to bid on specific products or services.

RMS **(Reliability, Maintainability and Supportability Analysis)** Analytical tool used to evaluated and quantify risk.

RPN **(Risk Potential Number)** RPN is a measure used when assessing risk to help identify critical failure modes associated with your design or process.

SNCR **(Supplier Non-conforming Report)** Notification sent to suppliers defining a concern. The SNCR contains information defining the problem, the suspect quantities and other relevant information needed to conduct problem solving. The SNCR is also the format used by TI Automotive for tracking and recording supplier concerns.

SPC **(Statistical Process Control)** SPC is the application of statistical methods to the monitoring and control of a process to ensure that it operates at its full potential to produce conforming product.

SRCA **(Supplier Request for Change Authorization)** SRCA is the form and the process that TI Automotive uses to manage process and product changes proposed by suppliers. This is the only acceptable format TI will accept.

USDA **(United States Department of Agriculture)** United States federal executive department responsible for developing and executing U.S. federal government policy on farming, agriculture, and food

VA/VE **(Value Analysis/Value Engineering)** is a systematic method to improve the "value" of goods or products and services by using an examination of function. Value, as defined, is the ratio of function to cost.

VDA **(Verband der Automobilindustrie)** German Auto Industry Standard

14.0 References

IATF- ISO/TS 16949 Technical Standards

Obtain IATF Sanctioned Interpretations and FAQ, s at:
http://www.iatfglobaloversight.org/content.aspx?page=ISO/TS16949:2009

Customer Specific Requirements/ Addendums to ISO/TS 16949

The customer specific requirements to TS 16949 documents can be found under the following link on the IATF page:
http://www.iatfglobaloversight.org/

AIAG

APQP- Advanced Product Quality Planning and Control Plan
FMEA- Failure Mode and Effect Analysis
MSA- Measurement System Analysis
PPAP- Production Part Approval Process
Fundamental SPC- Statistical Process Control

Obtain AIAG documents and training materials at:
http://www.aiag.org/scriptcontent/index.cfm

Associazione Nazionale Fra Industrie Automoilistiche (ANFIA/Italy)

Obtain ANFIA documents and information at:
http://www.anfia.it

Comite des Constructeurs Francais d'Automobiles (CCFA/France)

Obtain CCFA documents and information at:
http://www.ccfa.fr/

DIN EN ISO 9000 Quality Management Systems- Fundamentals and Vocabulary
DIN EN ISO 9001 Quality Management Systems- Requirements

Obtain information for ISO 9000 and ISO 9001 at:
http://www.iso.org/iso/iso_catalogue/management_standards.htm

Society of Motor Manufacturers and Traders (SMMT/UK)

Obtain information for SMMT at:
http://www.smmt.co.uk/home.cfm

TI Automotive Specific References

TI Automotive Terms and Conditions (T&C)
GWQS-310- Global Supplier Tooling Standard/ Injection Molding

15.0 Changes/Document History

Date	Revision	Rev. Level	Approved By
14JAN2011	New Release	14JAN2011	*J. Phillion*
30MAY2011	Change: 7.5 Yearly Recertification- Modified statement to clarify Division role in requesting evidence from suppliers.	Rev B	*J. Phillion*
01MAR2015	1.3- Updated website to direct viewers to Supplier Portal 1.5- Made the following changes: - Added SGIS requirement as the format - Added Conflict Minerals requirement - Removed "other certifications and specified TS16949 3rd party and ISO 14001 - Added Supplier Safety Data Sheets (SDS) 2.6- Added section for Conflict Minerals 3.2.3- Removed requirement for Self-Assessment/ made SGIS a requirement. 3.2.4- Added SBIC as default assessment 4.1- Modified to make ISO/TS 16949 3rd party certification a requirement. 5.3- Changed name of this section/ added current CQI standards that are required. 14.0- Added link and reference to Customer Specific Requirements documents.	Rev C	Global Quality and Purchasing Directors
15FEB2016	Removed copies of policies which will be uploaded onto the supplier portal. 1.3- Changed website to Supplier Portal location 1.5- Added Copy of ISO 14001 Certificate Change of control or ownership Conflict Minerals Supplier Safety Data Sheets (SDS) UK Modern Slavery Act 2.6- Added TI Automotive Conflict Minerals Policy 3.2.2- Added Altmann Z Score Requirement Added requirement for proof of ability to pay 3.2.3- Removed Self Assessment/ Now just SGIS 3.2.4- Renamed TI Automotive Potential Supplier Assessment. 4.1- New requirements for 3rd Party Registration to TS 16949 4.3-Added Warranty Process 4.4- Added requirement for record retention 4.4.3- Added China Automotive Material Data System (CAMDS) 4.4.4 Removed list of countries 4.6- Removed SRCA form number Minor change to wording for simplification 4.10- Added section for Continuous Improvement (4M) 5.3- Renamed to Special Process Requirements Updated list of CQI Standards 11.1.1- Added section on Safety Concerns 12.3 Added note for Tooling Agreement	Rev D	

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