Supplier Quality Assurance Manual (SQAM) for Parts and Raw Materials

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I. Introduction and General Information
DENSO
Supplier Quality Assurance Manual (SQAM) for Parts and Raw Materials

a. Introduction to the DENSO Supplier Quality Assurance Manual (SQAM)

**Purpose:**

To provide basic information about DENSO to its suppliers and to outline the supplier quality assurance process as it is communicated through the SQAM.

**Scope:**

This SQAM applies to all suppliers of production parts and raw materials to DENSO.

**Explanation:**

DENSO Company Principles/ Background

1. DENSO Quality Policy:
   a) Thorough practice of “Quality First”.
   b) Assurance of quality beginning at the source.
   c) Promotion of quality control through participation of all associates.

**Supplier Expectations**

1. DENSO and its Customers demand and expect “zero defects” and DENSO recognizes the importance of its suppliers in providing DENSO with quality parts and raw materials on time so that those Customer’s expectations can be met.

2. DENSO requires certification to ISO 9001 latest edition at a minimum and encourages certification to the full ISO/TS 16949 standard, latest edition. DENSO also requires suppliers to comply with applicable customer specific requirements which may be outside the scope of the ISO/TS 16949 standard. DENSO may be able to assist you with basic questions regarding the systems through your Quality Representative.

3. ISO 14001 certification is encouraged.

4. Open Communication Philosophy:
   a) Suppliers are a very important part of DENSO and good communications are critical to building an effective relationship. By following the standardized supplier quality assurance procedures outlined in this SQAM, supplier issues affecting product
quality, service, and delivery can be controlled to eliminate any possible negative effect to DENSO Customers.

b) It is critical that suppliers become fully knowledgeable of the SQAM so that they understand how, when, and why submissions and documentation are provided to DENSO.

c) DENSO strives for effective and positive relationships with its suppliers. Suppliers are encouraged to contact their assigned supplier Quality Representative whenever clarification is needed about the SQAM or if the supplier foresees some problem in being able to meet the SQAM. Early effective communication can help resolve issues before they become a problem.
b. DENSO Site Safety and Security Guidelines for Visiting Suppliers

**Purpose:**
DENSO is committed to maintaining a safe and secure environment at all sites and expects all visiting suppliers to fully comply with company and governmental guidelines regarding safety and legal issues.

**Scope:**
These guidelines apply to all suppliers and suppliers’ support personnel who visit DENSO sites.

**Explanation:**
All suppliers and suppliers’ support personnel are required to abide by the guidelines as put forth in this policy. If there are any questions about specific safety and security requirements, the DENSO host department and/or Safety, Health, and Environment should be contacted for clarification before the visit.

**Supplier Expectations**

1. **General Guidelines:**
   a) All suppliers and suppliers’ support personnel are required to bring the appropriate safety equipment with them when they visit DENSO sites.
2. Safety glasses with side shields are required in the manufacturing areas (OSHA compliance Z87).
3. Steel-toed safety shoes are required in the manufacturing areas (ANSI Z41).
4. Special shoe covers may be required at certain facilities, please check with your Quality Representative. These covers may be available at the Plant Security Office.
5. Protective equipment such as gloves, body suits, respirators, helmets, anti-static overcoats and ear plugs may be required at these sites depending on the nature of the supplier’s visit.
6. Any visitors who will be going into manufacturing areas must wear appropriate clothing. Examples of articles that might be inappropriate are scarves, ties, jewelry, shorts and open shoes are prohibited.
7. No cameras or recording devices are allowed in DENSO facilities without the written approval by DENSO. Cell phones may not be permitted. Please check with your Quality Representative.
8. All DENSO manufacturing, office, and cafeteria areas are Smoke-Free. Some sites do have identified outside areas where Smoking is permitted.
9. All visitors must be accompanied by DENSO associates through the length of their tour and unless specific areas are indicated by the DENSO host visitors must stay within the marked aisle ways.
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10. DENSO sites are production facilities with a variety of machinery and forklifts/overhead cranes being used. Please be alert to your surroundings.

11. DENSO sites have emergency plans to deal with emergencies. Should the alarm system go off during your visit, listen carefully to the instructions of your host and other DENSO personnel and go with them to the appropriate staging area they indicate.

12. Accident/ Injury Reporting:
   a) In the event of an accident or injury, the DENSO host should be made immediately aware of the incident as well as the Safety, Health, and Environment Department. If there is no immediate response, contact the Security Department.
   b) Suppliers and supplier's support personnel must be covered under worker’s compensation insurance. Proof of coverage may be requested during visits to DENSO facilities.

13. First Aid/ Emergency Medical Services:
   a) DENSO facilities maintain First Aid Stations at each facility. Basic first-aid, such as bandages, can be obtained at these stations.
   b) In the event of an incident beyond basic first-aid, DENSO will assist in arranging medical transportation to outside medical facilities as needed. All costs related to such transportation and medical treatment is understood as being the responsibility of the supplier.

14. Loss Prevention/ supplier use of own tools, gages, and parts at DENSO facilities:
   a) Suppliers can bring in tools, gages, and parts. Any equipment that is not readily identifiable as being the property of the supplier must be put on an itemized list that states item type, manufacturer, and serial number that can be shown to the Security Department or DENSO host that establishes ownership of the equipment at the beginning of the visit. This list may be used when the supplier leaves the DENSO facility they have been visiting to audit the removal of equipment.
   b) Any equipment brought to DENSO facilities must be in safe working condition and operated by trained and, where applicable, certified operators.
   c) Use of DENSO equipment is not permitted without prior written authorization from the DENSO host facility.

15. Chemical Usage by suppliers at DENSO facilities:
   a) Suppliers may bring in chemicals necessary to their visit at DENSO, but all chemicals must be pre-approved by the Safety, Health, and Environment Department. The supplier is fully responsible for compliance with all laws regarding the transportation, packaging, storage, handling, and disposal of their hazardous materials. Chemical disposal shall be arranged with site host and/or SHE Department.

16. Legal Matters of Employment/ Sexual Harassment:
   a) It is fully understood that any individual sent by a supplier to a DENSO facility is the employee of that supplier and that the supplier accepts full responsibility for that employee’s actions while at a DENSO facility.
   b) DENSO expects full compliance to all governmental and DENSO policies regarding fair employment practices and sexual harassment. DENSO is fully committed to a positive working environment.

17. Environmental Management System
   All DENSO suppliers are strongly encouraged to establish an environmental management system based on the ISO 14001 standard.

18. Entry into DENSO
c. Supplier Use of Temporary Service Workers at DENSO

**Purpose:**

To define the requirements placed on suppliers when they have to use temporary service employees at DENSO facilities.

**Scope:**

This process applies to all suppliers that are asked to correct problems with "suspect" production parts or raw materials which they have sent to DENSO.

**Explanation:**

It is critical that only conforming materials be sent to DENSO. In the event of a problem occurring with a flow out of suspect product from the supplier to DENSO, it may be required that the supplier come on-site to the facility and arrange/carry out activities to correct the non-conformance. Each supplier’s Quality Representative will communicate the necessity of such activities to the supplier.

**Supplier Responsibilities**

1. In order to perform corrective actions at DENSO facilities, suppliers must obtain the approval of their Quality Representative and coordinate their activities through this representative.

2. Suppliers may use temporary service employees to support activities such as 100% inspection, sort, or re-work of nonconforming parts.

3. Supplier representatives must develop and implement a plan that will ensure no flow out of nonconforming products to DENSO Customers. This includes proper coordination and training of their temporary service employees to achieve this expectation. Suppliers are fully responsible for the safety of their temporary service workers and the quality of their work (Reference Section I.b - DENSO site safety and security guidelines for visiting suppliers).

4. Supplier’s temporary service employees must have full-time supervision provided by the supplier unless otherwise approved by the DENSO Quality Representative.
5. As an alternative to direct supplier supervision of temporary workers, the supplier may use a DENSO preauthorized “full service” sorting company. To use this option, the supplier must contact the appropriate DENSO Quality Representative.
d. Supplier Performance Monitoring System

**Purpose:**

To provide a comprehensive evaluation system used to monitor supplier performance based on a variety of metrics, such as quality, cost, delivery and service. These metrics are used for supplier management and to determine if any corrective action is necessary.

**Scope:**

This section applies to all suppliers of production parts and raw materials to DENSO.

**Explanation:**

Each group company conducts their own individual supplier ratings based on various quality, cost, delivery and service metrics. Suppliers are given a “score” according to their performance level in each metric. If a supplier scores inappropriately low in a particular category or metric, corrective action may be required.

Supplier ratings are generally conducted on a monthly basis. A report or some type of feedback is provided to suppliers. Suppliers are expected to actively conduct improvement (kaizen) activities for any low ratings, scores or performance deficiencies. Suppliers are encouraged to contact their DENSO representative if they have any questions, concerns or need help.

**Documents to be used:**

*Form I.d - Supplier Performance Monitoring (under development)*
Supplier Quality Assurance Manual (SQAM) for Parts and Raw Materials

e. Supplier Quality Assurance Contacts

*Purpose:*
DENSO views communications as being critical to ensuring a positive relationship with its suppliers. Good communications allows for easier understanding of new product start up and quicker resolution of potential problems that could affect our customer. It is recommended, when possible, that a Japanese speaking representative be available. This policy outlines the roles and responsibilities of supplier personnel pertaining to the SQAM and how these individuals are identified to DENSO.

*Scope:*
This section applies to suppliers of production parts and raw materials to DENSO.

*Explanation:*
Supplier Quality Assurance Contacts are the main liaisons between the supplier and DENSO and they are responsible for ensuring effective communications regarding issues of quality assurance within their department as well as other departments within their company. An up to date contact list will be provided by supplier. Changes to the contact list must be communicated to the DENSO Quality Representative as they occur.

*Documents to be used:*
Form I.e - Supplier Contacts
II. Quality Assurance in Pre-Mass Production
**DENSO**

Supplier Quality Assurance Manual (SQAM) for Parts and Raw Materials

a. **Notification of Quality Assurance Requirements (NQAR)**

**Purpose:**

Suppliers are notified of DENSO product submission requirements utilizing the NQAR. This includes detailed expectations of any and all trial part submissions prior to PPAP approval and identifies part or material critical product characteristics.

**Scope:**

Suppliers are notified of specific quality assurance requirements utilizing the NQAR form when a supplier is new or a current supplier with a new part number. These requirements are communicated after DENSO drawing release and prior to shipment of the initial samples. An NQAR may also be issued after an Engineering or Process Change. Unless parts/materials are similar and have the same requirements, one NQAR will be issued per part number.

**Explanation:**

The Notification of Quality Assurance Requirements (NQAR) informs the supplier of quality assurance requirements necessary for DENSO approval of parts/material prior to PPAP.

**Supplier Responsibilities**

1. DENSO will issue the NQAR to the supplier and indicate due dates for each requirement. The supplier should use the last column of the NQAR (SUBMISSION DATE) to help track actual submission dates for each requirement.

2. When the supplier receives the NQAR, each requirement should be reviewed thoroughly to determine if the requirements are feasible and/or understood. Any concerns or questions about the requirements should be discussed with your DENSO Quality Representative. Once agreed and understood, provide a signed copy of the NQAR to your DENSO Quality Representative.

3. Suppliers are required to use forms for PPAP as mentioned at the bottom of each applicable section. Refer to the sections that outline each requirement in this manual.

4. DENSO designates the items in the table on the NQAR form as critical part or material characteristics that should be controlled in the supplier’s process. The supplier should develop Inspection Standards and Process Control Instructions to give special attention to these items in addition to any items critical to the supplier’s process. A Process Capability Study is required for the critical characteristics as indicated on the NQAR (by a Y).

**Documents to be used:**

Form II.a - NQAR
**b. New Product Development Planning**

**Purpose:**

The purpose of this section is to explain the required information and submission procedure for the planning of new product or material.

**Scope:**

This section applies to suppliers of production parts and raw materials when specified by DENSO.

**Explanation:**

DENSO provides key milestone dates for new product or material planning purposes based on DENSO’s customer requirements. DENSO requires suppliers to use project planning to assure key milestone dates are met. Suppliers shall report project planning schedules and tooling status as requested by DENSO using the format specified by your DENSO representative. The New Product Development schedule shall be used by the supplier to provide DENSO with a schedule of all activities from issuing of the PO to initial mass production.

**Supplier responsibilities**

1. **New Product Development Schedule:**

   The supplier must create and submit a new product schedule on the DENSO requested format outlining activities required to support meeting customer milestones, including designated production trial builds to support SOP, advanced quality planning activities (reference AIAG APQP Manual), personnel training, and corresponding sub-component activities (if applicable). This schedule shall be submitted to DENSO by the due date. Schedules will be reviewed and adjustments negotiated as needed.

2. **Tooling Status Reporting:**

   Tooling scheduling and status reporting shall be included in the new product development schedule indicated above. DENSO may request a separate Tooling Progress Report which shall also include sub-supplier tooling (if applicable).

3. **Supplier Review and Approval Requirements**

   The new product development schedule including tooling, should be reviewed and approved by related departments. It is the responsibility of the supplier’s related management to monitor schedule attainment and ensure all milestones are achieved.

4. **Schedule Updates**
Any delay that could jeopardize reaching the customer milestones should be reported to your DENSO representative immediately. Timing for regular status reporting and format will be communicated to you by your DENSO representative.

**Document to be used:**
**Form II.b - QAS TPR - New Product Development Plan**
c. Critical Control Characteristics Requirements

**Purpose:**

Define the requirements for Critical Control Characteristics and their associated capability to DENSO suppliers.

**Scope:**

This section applies to suppliers of production parts and raw materials when specified on drawings or specifications by critical control symbols. The capability requirements cover both initial and ongoing process capability activities.

**Explanation:**

Critical control characteristics are those characteristics of a product or process either designated by the customer or selected by the supplier through knowledge of the product or process. They are important and need to be controlled with special attention as excessive variation may affect product safety, compliance with government regulations, fit, function, or quality of subsequent operations.

Suppliers of parts and materials with critical control characteristic symbols are required to maintain ongoing process capability monitoring on these products. DENSO requires a Cpk of 1.33 or higher unless otherwise approved by your DENSO Quality Representative.

Upon request (typically on an annual basis) suppliers will be required to confirm process capability by completing and submitting a process self-assessment sheet. DENSO Quality Representatives will also conduct on-site reviews (typically once per three years) to confirm supplier process capability.

In addition to DENSO identified critical control characteristics, suppliers are also required to confirm compliance to DENSO customer “Special Process” requirements. These processes included, but are not limited to heat treating, plating, coating, welding, soldering, and molding. Suppliers are responsible to provide evidence (on an annual basis) showing each process was assessed and conforms to the applicable CQI standard. In the case of process non-conformities, suppliers are expected to implement corrective action to bring the process to compliance.

DENSO suppliers must confirm lower tier supplier compliance to the full scope of special process requirements.
Supplier Responsibilities

1. DENSO will notify suppliers that critical control characteristics are applicable by releasing a drawing or specification with critical control symbols and by issuing a Notice of Quality Assurance Requirements (NQAR) or a Supplier Shipping Inspection Standard.

2. Suppliers must conduct initial process studies (Ppk) for each designated characteristic in order to obtain information on the inherent variation that exists within a process that is under statistical control (please reference Table 1 for Ppk requirements). Measurement system analysis must be conducted on measurement systems to assure reliability of data collected (Reference AIAG MSA Manual) The goal is to reduce the spread of variation to less than the tolerances stated within the product specification with some safety margin. These studies are only short term and will not predict the effects of time and variation in people, materials, equipment, measurement system and environment. Therefore capability studies (Cpk) are recommended which take into account variation between subgroups including variation in people, material, etc. over time (see Reference Table 2). The results of these long term studies should be made available at DENSO’s request.

Note: Mass production long term capability studies must include all sources of variation (e.g. shifts, die set, material source, etc.).

3. Process and part capability studies are not the same. Process study is related to process parameters such as temperature and pressure that could significantly affect part characteristics. The supplier should consider critical process parameters when decided which studies need to be completed.

4. Capability studies can be affected by engineering changes and process changes. Therefore they must be re-submitted for characteristics affected by these changes as required by the DENSO process/engineering change system.

Table 1: Short Term Process Performance Study Requirements

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Samples</td>
<td>As defined by DENSO Quality Representative</td>
</tr>
<tr>
<td>Expectations:</td>
<td></td>
</tr>
<tr>
<td>1) Process</td>
<td>In control 1</td>
</tr>
<tr>
<td>2) Ppk</td>
<td>1.67 or greater</td>
</tr>
<tr>
<td>If expectation is not achieved:</td>
<td>Provide Countermeasure and inspection plan to DENSO Quality Representative for approval</td>
</tr>
</tbody>
</table>

Note 1 Critical Control Items require the use of appropriate statistical control techniques. Refer to the AIAG manual Statistical Process Control- SPC for appropriate examples of statistical controls.

Table 2: Long Term Process Capability Requirements

| Actions on the process output (based on the historical process capability (Cpk)) |
The most recent point indicates that the process (see below):

<table>
<thead>
<tr>
<th>Is in control</th>
<th>Less than 1.33</th>
<th>1.33 - 1.67</th>
<th>Greater than 1.67</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact DENSO Quality Representative to discuss appropriate countermeasure.</td>
<td>Accept product. Continue to reduce process variation. Pursue Cpk of 1.67 or greater.</td>
<td>Accept product. Continue to reduce process variation.</td>
<td></td>
</tr>
<tr>
<td>Has gone out of control in an adverse direction. All individuals in the sample are within specification 1</td>
<td>Contact DENSO Quality Representative to discuss appropriate countermeasure.</td>
<td>a). Perform sampling on existing product, construct histogram from those samples, and take appropriate action. b) Increase sampling frequency until stability is re-established.</td>
<td>Accept product. Continue to reduce process variation.</td>
</tr>
<tr>
<td>Has gone out of control and one or more individuals in the sample are outside specification 1</td>
<td>Inspect 100% since the last in-control point. Use average and range charts (X, R).</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
</tbody>
</table>

**Note**^2 Control refers to the status of process stability. An “out of control” condition is defined by evidence of special causes of variation on the Statistical Process Control Charts (SPC) with control limits defined from the data. A process is considered “in control” when no evidence of special causes is found.

**Note**^3 See Table 3 for the acceptable sample size.

Table 3: Sampling Size Determination
(Note: This table is only an example; it can be different per product and shall be specified by your DENSO Quality Representative)

<table>
<thead>
<tr>
<th>Lot size or shipment size</th>
<th>Sample size per characteristic (Classification acceptance number = 0)^3</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 25</td>
<td>100% Inspection</td>
</tr>
<tr>
<td>26 - 50</td>
<td>25</td>
</tr>
<tr>
<td>51 - 75</td>
<td>35</td>
</tr>
<tr>
<td>76 – 125</td>
<td>40</td>
</tr>
<tr>
<td>126 - 425</td>
<td>45</td>
</tr>
<tr>
<td>426 and up</td>
<td>50</td>
</tr>
</tbody>
</table>

**Note**^3 If one or more individuals in the sample are out of specification, inspect 100% since last in-control point.

Table 4: critical control characteristics criteria
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<table>
<thead>
<tr>
<th>No.</th>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>S S</td>
<td>Safety Control Items: products, parts, components, and materials which could lead to injuries, death, car fire, and/or other accidents of grave consequence if they are defective, fail, or are improperly handled.</td>
</tr>
<tr>
<td>2.</td>
<td>E E</td>
<td>Emission Control Items: products, parts, components, and materials whose defect or failure could lead to an impediment of the exhaust gas purification system and of sensing or alarm indication features and other emission-related functions.</td>
</tr>
<tr>
<td>3.</td>
<td>F F</td>
<td>Running Function Control Items ('Fahren'): products, parts, components, and materials whose defect or failure could lead to an impediment of the running function of the automobile into which they are assembled.</td>
</tr>
<tr>
<td>4.</td>
<td>C</td>
<td>Critical Control Items: products, parts, components, and materials whose defect or failure could bring about any impediment of significance, other than those mentioned above, as a consequence of their defect or failure.</td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td>Products, parts, components and materials which if one dimensions is NG avoid the correct assembly into the car (This symbol is unique to DNMX-KINHOUIN Plant).</td>
</tr>
</tbody>
</table>

**Note 4**: Diamond designations are applied to products having a direct effect on Safety, Emission, and/or Running Function Items. Circle designations have an indirect effect on the product designation and are not as critical as the diamond designations.

**Note 5**: Drawings may also include customer related symbols that are not indicated above, please contact your QA/QC representative if you have any questions.
Supplier Quality Assurance Manual (SQAM) for Parts and Raw Materials

**d. Control Plan**

**Purpose:**

The purpose of this section is to explain the control plan submission and requirements to DENSO suppliers.

**Scope:**

This section applies to suppliers of production parts and raw materials specified on the Notification of Quality Assurance Requirements (NQAR).

**Explanation:**

The objective of the control plan is to ensure that all process outputs will be in a state of control by providing process monitoring and control methods to manage the associated product and process characteristics. Process control relies upon control of the elements that drive the process, whereas, product control verification of the product as it emerges from the process. In practice it is a combination of these that yields products of consistent quality.


**Supplier Responsibilities**

1. The control plan is to be written, controlled, and submitted by the supplier’s quality section (QA Manager or equivalent), and submitted to DENSO Quality Representative. The control plan content must meet all the requirements outlined in the AIAG manual “Advanced Product Quality Planning and Control Plan- APQP”. The format is optional, but the AIAG format is recommended. The Control Plan the supplier uses must include all critical items from Receiving Inspection through Packaging.

2. Submission timing is in accordance with NQAR (Reference Section II.a – NQAR).

3. Suppliers must test and analyze the process to obtain results that support the Control Plan contents.

4. For raw materials, the detail specifications and evaluation methods should be noted on the control plan.

5. The control plan must be approved by the supplier’s chain of command.
6. The supplier must re-issue the control plan to DENSO for all revisions.

7. Revisions must be reviewed by DENSO prior to shipment of parts reflecting the change. Depending on the change other submittals may be required.

8. No process change, temporary or permanent, is allowed after the start of mass production unless a process change request sheet has been submitted and approved by DENSO (Reference Section III.d - Process and Design Change Request (PCR)).

9. Check items requiring conformance to standard test methods (ISO, DIN, JIS, etc.) should be indicated.
e. QA Network

**Purpose:**

The system is used to foresee potential defects, to understand process QA weak spots, and take proactive QA Net strengthening countermeasures considering the full production process from sub-suppliers to shipping product.

**Scope:**

This section applies to suppliers of production parts and raw materials to DENSO when specified by your DENSO Quality Representative. QA Network analysis may be required for new parts and materials supplied to DENSO. The QA Network is a 'living document' and should be updated accordingly when the process is modified or new defect modes are discovered.

**Explanation:**

DENSO's QA Network is a matrix tool in which critical assurance items are identified and ranked according to occurrence and flow-out possibility. The purpose is to foresee potential defects for proactive control improvements.

**Supplier responsibilities**

1. The supplier is responsible to list and consider all part critical items provided by DENSO along with other important or critical items, which are understood, based on the process design, PFMEA, or 'know-how' of the supplier.

2. The supplier is responsible to coordinate the QA Network information from sub-supplier [i.e. material or sub-assembly process] and sub-contracted process [i.e. plating or heat treating] considering the full supply chain.

3. The supplier is responsible to take appropriate action to improve any weak areas identified through the QA Network ranking system.

4. After mass production, the supplier is responsible to maintain and revise the QA Network worksheet as required and resubmit the updated worksheet to DENSO

**Document to be used:**
*Form I.e - QA Network Evaluation*
f. Pre-Mass Part Approval Process

**Purpose:**

The purpose of this section is to describe the requirements for approval of parts or materials for shipment prior to Mass final approval (or PPAP approval). The parts and/or materials are to meet DENSO drawings and specifications.

**Scope:**

This section applies to suppliers of production parts and raw materials for product produced for trial shipments prior to final Mass Production approval.

**Explanation:**

1. Initial samples and data for new parts and materials shall be delivered to your DENSO Quality Representative by the specified due date.

2. The DENSO Quality Representative will communicate the sample requirements to the supplier contact. Samples should be off mass production tooling and process unless otherwise approved by DENSO.

3. The supplier shall tag or mark the sample product as instructed by your DENSO Quality Representative and package/label the shipment as instructed to the attention of your DENSO Quality Representative. Required documentation shall be included in the sample product. (i.e. ISIR or Shipping Inspection Standard)

**Supplier responsibilities**

1. Part Submission Requirements – (Unless otherwise instructed by your DENSO Quality Representative)
   a) Balloon the drawing and dimensions (using reference numbers).
   b) Number each dimension sequentially.
   c) Measure all drawing or material specification items including all notes, dimensions, special tests, and record on the specified format (e.g. ISIR or sample data sheet)
   d) All dimensions shall be measured, unless otherwise specified. It is the supplier’s responsibility to measure every dimension or material test item. If the supplier doesn't have measurement or testing capability the must contact their DENSO Quality representative for guidance.
   e) The supplier shall submit the requested documentation with the trial submission. If one or more dimensions do not meet specification complete the required deviation approval request forms as instructed by your DENSO Quality Representative.
f) All cavities and dies must be included in dimensional sheets unless otherwise directed by your Quality Representative.

2. Material Submission Requirements
   a) For all materials submitted to DENSO, the supplier is required to record the Material Test data on the ISIR Report or other format specified by your DENSO Quality Representative.
   b) Supply the required number of test specimens or material. A material certification and test report may be used in place of the ISIR or Trial Submission Warrant, as communicated by your DENSO Quality Representative.
   c) Resubmission of materials samples will be communicated to you by your Quality Representative. Examples of resubmission request may include process changes, re-start of production after extended non-supply, etc.

**Documents to be used:**
Form II.f - ISIR
g. Lot Identification and Traceability

**Purpose:**
The purpose of this section is to define supplier requirements for lot identification and traceability of parts and materials.

**Scope:**
This section applies to suppliers of production parts and raw materials. Lot identification and traceability requirements extend to sub-suppliers.

**Explanation:**
1. Definition of lot

   The lot refers to a group of materials, parts, and products that are manufactured under the same conditions (date, operator, equipment, manufacturing condition, raw material, etc.).

2. Traceability

   This refers to the ability to track a part back through all stages of manufacture to raw materials. Process parameters used in manufacture of critical components should also be traceable, with applicable inspection and test results.

3. Identification

   This refers to the method a supplier uses to identify a part in the event a problem occurs that allows the necessary information to be quickly collected. This typically includes:

   a) Part Number

   b) Special Identification Marks (material type, inspection item, etc.)

   c) Date of Manufacture, Packaging or Shipping (supplier must clearly indicate which of these applies)

   d) Cavity or mold number(s)

   e) Lot Numbers that should be noted on all supplied materials documents, such as:

      i) Material Specification Documents
      ii) Material Test Reports
      iii) Materials Packaging
      iv) Any other documents or packaging related to a specific lot of material
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With the above information, the supplier should be able to accurately determine the lot size, in process stock, final inventory at the supplier and the in transit quantity of parts/material with the applicable dates. Therefore, if the supplier is notified by the DENSO Quality Representative of a non-conformance, the supplier will be able to use this information to take containment actions at their facility.

**Supplier responsibilities**

1. Traceability

   a) The supplier must ensure that documented systems are in place at all sub-suppliers to control lot identification and traceability of all critical components to raw materials and date of manufacture.

   b) When requested by DENSO, the supplier must list the components, materials, and/or processes that are traced and traceable using the final lot number designation on the Lot Traceability Information Sheet, including a sample or sketch of the lot control tag.

   c) If the part/material supplied has a shelf life (expiration date), it must be recorded on the Lot Traceability Information Sheet and clearly identifiable on the associated product shipping labels.

2. Identification

   a) All products must be clearly identified per drawing or specification requirements. When requested by DENSO, the supplier must clearly record the details of the identification method on the Lot Traceability Information Sheet.

   b) DENSO will communicate requirements for packaging, labelling, preservation, and shipping.

**Documents to be used:**

*Form II.g - Lot Identification and Traceability*
h. Early Stage Control for Mass Production Ramp-Up

**Purpose:**

The purpose of this section is to outline the supplier quality assurance activities during volume ramp-up to mass production.

**Scope:**

This section applies to suppliers of production parts and raw materials to DENSO when specified by your DENSO Quality Representative.

**Explanation:**

During the initial Mass Production ramp-up, the supplier must undertake activities to ensure that quality and process standards are adhered to until the process becomes stable. The supplier needs to develop and implement an early stage control plan during the ramp-up period. This plan covers items found on the standard control plan, though required inspection rates may be higher during early stage. Also it can include other items that are critical for successful implementation of new processes. In some cases, DENSO may dictate items to be checked during early stage control with associated frequencies.

**Supplier Responsibilities**

1. Content of the early stage control plan:
   a) Include all control plan items as a minimum.
   b) Suitable goals and targets should focus on defect prevention and quick resolution of production and production control issues which would impact the supplier making shipments to DENSO.
   c) Management review of quality results for initial mass production shipments.
   d) Frequent quality review meetings involving key persons.
   e) The development and implementation of a system for documenting and resolving quality issues and complaints.

2. Timing of submissions for the early stage control plan:
   a) The initial submission timing of the early stage control plan by the supplier will be communicated by your DENSO Quality Representative.
   b) After the plan is implemented, no earlier than three months after the start of mass production, when process capability is sufficient and there are no specific
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concerns, the supplier may request approval to stop early stage control activities. The request form is fully signed-off by the relevant supplier management and quality representatives and submitted to your DENSO Quality Representative. This sign-off reflects that early controls were enforced and issues encountered were resolved. After DENSO written approval, early stage control can be terminated on the indicated date.

3. During the initial mass production:

The supplier’s goal should be to stabilize the process as quickly as possible. During this period (3 months as a standard) no design or major process changes are allowed, with the exception of those required by DENSO. If quality problems are causing the supplier to miss or not make full shipments, the supplier should contact their DENSO Quality Representative immediately.

**Documents to be used:**
*Form II.h - ESC FORMS*
i. Mass Production Readiness Audit

**Purpose:**

The purpose of this section is to describe the requirements for mass production readiness audits.

**Scope:**

This section applies to suppliers of production parts and raw materials when deemed necessary by the responsible DENSO division.

**Explanation:**

A process audit should be conducted by the supplier’s management preferably during the last production trial, but before mass production. DENSO may also require an on-site visit to confirm the supplier has completed all activities necessary to ensure a smooth start up of production with a minimal amount of defects / problems and can meet the production volumes.

**Supplier Responsibilities**

1. The Supplier should contact their DENSO Quality Representative for information on whether DENSO will perform an on-site production readiness audit and what documentation should be provided ahead of time.

2. Even if DENSO elects not to perform an on-site mass production readiness audit, the supplier’s management should confirm all activities necessary to ensure a smooth start-up has been completed and that production volumes can be achieved. DENSO may require evidence of this self-audit in associated PPAP or final approval documentation.

3. When an on-site audit is performed, DENSO will issue a report to the supplier summarizing the results of the visit. The report will show all items requiring countermeasures by the supplier. The supplier is responsible for responding promptly with countermeasures and due dates for all items. Requirements for follow-up activities will be communicated by the DENSO Quality Representative.

*Note: Failure to respond promptly may result in a delay in receiving Final Approval*

**Documents to be used:**

*Form II.i - Process Audit Check Sheet*
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**j. Mass Production Approval**

**Purpose:**

This section describes supplier requirements for obtaining final approval for mass production parts or raw materials.

**Scope:**

This section applies to suppliers of production parts and raw materials to DENSO.

**Explanation:**

The Final Approval or PPAP process is used by DENSO to confirm that the supplier has demonstrated that production parts or raw materials meet quality requirements. This final approval acknowledges that the supplier’s process can consistently provide acceptable quality parts at production volume. A due date for submission is given on the Notification of Quality Assurance Requirements (NQAR), or Supplier Inspection Shipping Standard. Suppliers are encouraged to submit it as soon as all of the required items listed have been completed or considered “N/A” by your DENSO Quality Representative.

**Supplier responsibilities**

1. When all requirements communicated to the supplier have been met, the supplier must submit a Request for Final Approval or Parts Submission Warrant as defined by your DENSO Quality Representative.

2. DENSO will review the supplier’s request for Final Approval or Parts Submission Warrant with required PPAP or NQAR documentation and if acceptable, DENSO will approve the request/warrant and return a copy to the supplier.

3. A copy of the Final Approval or Warrant will also be forwarded to DENSO Purchasing to resolve issues involving final (tooling) payment(s).

4. If the Final Approval or Parts Submission Warrant is given a ‘conditional approval’ or ‘rejected’, the form will be returned to the supplier along with the reason(s). The supplier must resubmit the Final Approval Request or Parts Submission Warrant with corrections (based on reason(s)) by the due date.

**Approval status**

1. Approved
   a) Parts including sub components meet all DENSO requirements and the supplier is authorized to ship production quantities.
2. Approved with Special Acceptance/Permanent (Die) Deviation:

   a) Minor discrepancies exist but are not deemed to be critical to the fit and function of the parts and judged by DENSO to be acceptable for lifetime of production.

3. Approved with Deviation Approval/Temporary Deviation:

   a) This means that the dispatch of products is only approved for a certain limited period or a certain number of pieces (deviation approval). The conditions are to be agreed individually between DENSO and supplier.

4. Rejected

   a) Part or submission does not meet DENSO requirements, based on the production lot from which it was taken and/or documentation. In such cases the submission and/or process shall be corrected, as appropriate to meet DENSO’s requirements. Where product is involved, then its shipment to DENSO is NOT permitted and re-submission is required following corrective action by the supplier.

NOTE: Tooling, equipment and process buy-off shall only occur when the PPAP submission has either full approval or conditional approval with Special Acceptance.

Documents to be used:
Form II.j - Supplier Final Approval Request

k. Supplier Capacity Verification

Purpose:

This section explains DENSO’s capacity verification requirements and practices.

Scope:

This section applies to suppliers of production parts and raw materials to DENSO when specified by your DENSO Quality Representative.

Explanation:

It is critical that each supplier is able to produce the target amount of inventory to meet DENSO’s volume needs and ensure timely delivery of quality parts to our customers. The Capacity Verification Form (CVF) is one tool to support this effort. Some key information:

1. The CVF may be completed by a DENSO Quality Representative at the Mass Production Readiness visit or at any other visit as required.
2. In some cases, the supplier may be requested to complete the form and supply the
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completed form to DENSO.
3. Your DENSO quality representative may use the form included in this SQAM or another form of their choice.

Supplier responsibilities

1. The supplier will provide necessary information such as the number of shifts, hours, or days/week, as well as downtimes, changeover times, and operation time dedicated to other customers.
2. The supplier should prepare to run the mass production process during the capacity verification step. The length of the run will be specified by the DENSO Quality Representative.
3. If the target capacity is not achieved, the supplier is responsible to develop an improvement plan to achieve target capacity. This plan should be shared with the DENSO Quality Representative for agreement.

Documents to be used:
Form II.k - Capacity Verification Form
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III. Quality Assurance in Pre-Mass & Mass Production
a. Product Shipment Notification - Stratification Control Process

**Purpose:**

Product shipment notification is used to notify DENSO that parts/materials differ from previously accepted parts or materials. It is used to identify shipment(s) of affected parts/materials. It is intended for the shipment notification information to remain with the parts/materials throughout the manufacturing process at DENSO (to Final Inspection) to ensure traceability of the modification at DENSO.

**Scope:**

Adherence to the procedure applies to suppliers of production parts and raw materials as specified in the below table. Stratification Control must be utilized with the parts/materials as specified in the tables below. (Please note that DNMX process – table 2)

**Explanation:**

Stratification Control identifies the use of parts/materials that differ from previously accepted parts due to design or process change, deviation, or any other change affecting the parts/materials or their packaging such as sorted or certified product.

**Supplier adherence responsibilities table 1:**

<table>
<thead>
<tr>
<th>Plant</th>
<th>Adherence to Procedure Required</th>
<th>Method of Notification</th>
<th>Stratification Requirement per Shipment</th>
<th>Stratification Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL DMTN Plants &amp; DMAT</td>
<td>Y</td>
<td>Form 017 (Stratification Control Sheet) on Yellow colored paper</td>
<td>Case by Case (please contact your Quality Representative)</td>
<td>Permanent Change – 1st shipment only; Temp Change/ Certified product – case by case (please contact Q-Rep)</td>
</tr>
<tr>
<td>DMMI</td>
<td>N</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Other DENSO Plants</td>
<td>Contact your Quality Representative for notification requirement</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Supplier adherence responsibilities table 2 (DNMX):**

<table>
<thead>
<tr>
<th>Plant</th>
<th>Adherence to Procedure Required</th>
<th>Method of Notification</th>
<th>Stratification Requirement per Shipment</th>
<th>Stratification Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>DNMX</td>
<td>Y</td>
<td>PCR Form 017 (Stratification Control Sheet) on Purple colored paper</td>
<td>1 sheet minimum per each box</td>
<td>1st 3 shipments only</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EC Form 017 (Stratification Control Sheet) on Orange colored paper</td>
<td>1 sheet minimum per each box</td>
<td>Permanent change – 1st 3 shipments; Temp Change – all shipments</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DEVIATION Form 017 (Stratification Control Sheet) on Yellow colored paper</td>
<td>1 sheet minimum per each box</td>
<td>Permanent change – 1st 3 shipments; Temp Change – all shipments</td>
</tr>
<tr>
<td></td>
<td></td>
<td>COUNTERMEASURE Form 017 (Stratification Control Sheet) on White paper</td>
<td>1 sheet minimum per each box</td>
<td>1st 3 shipments only</td>
</tr>
</tbody>
</table>

*Note: Should DNMX be required to repack material the SQA in charge will require an addition Stratification Control Sheet to be placed inside the packaging.*

Documents to be used:
Form III.a - Stratification Control sheet
Purpose:
The purpose of this section is to inform the supplier how to secure DENSO approval to ship parts or materials that do not meet drawing or specification requirements.

Scope:
This section applies to suppliers of production parts and raw materials to DENSO. This procedure must be followed when the supplier has parts or materials that do not meet all the requirements of DENSO’s drawings/specifications.

Explanation:
The deviation request is to be used to request DENSO approval for parts or materials that do not meet drawing or specification requirements or other DENSO approved requirements. The supplier is responsible for submitting a deviation request at Mass Production, or if required by your DENSO Quality Representative prior to Mass Production. If any non-conformance is found by the supplier which has the potential to cause shortages of acceptable parts or materials at DENSO, it must be communicated as soon as possible to the DENSO Quality Representative and DENSO Production Control.

Supplier responsibilities
1. A deviation represents conditions based on a start and end date, a known quantity/weight, or die life.

The following steps must be followed when submitting a deviation:

a) Timing
   • Mass Production: As soon as a non-conformance is found.
   • Pre-Mass: Contact your DENSO Quality Representative for direction.

b) Samples
   Contact your DENSO Quality Representative to see if samples are required or if sample data/pictures is/are sufficient.

c) Filling out the form
   Complete all applicable sections of the Deviation form thoroughly.
Note: Failure to fill out all areas of the deviation request properly will result in a rejection of the request.

d) The supplier must include any additional supporting documentation (as necessary) that will assist DENSO in evaluating the deviation request.

3. DENSO will evaluate the deviation request and inform the supplier of the decision. Follow instructions provided by your DENSO Quality Representative for shipping deviated parts or materials.

Note: If the use of deviated parts/ materials cannot be avoided and DENSO must modify its process, DENSO Purchasing will be involved to address costs incurred by modifying DENSO systems as a result of the deviation.

Documents to be used:
Form III.b - Deviation Request Reply
c. Boundary, Master or Material Samples

**Purpose:**

This section describes how DENSO and the supplier define acceptance criteria for parts and materials when further definition beyond the drawing or specification is required.

**Scope:**

This procedure most often applies to parts/material with appearance criteria, especially when visible to DENSO’s customer. If DENSO requests boundary or master sample(s), the supplier shall submit sample(s) for mass production level parts.

**Explanation:**

1. **Boundary samples**

   Boundary samples are used to define the boundary level of a given visual or sensory characteristic difficult to define by quantitative methods. Boundary samples may be temporary or permanent. The boundary sample defines the limit by which a judgment is made to reject or accept a questionable part. DENSO normally operates using boundary acceptable samples.

2. **Master samples**

   Visual parts bear critical importance to customer satisfaction. Master samples define the expectations of DENSO or the customer for part visual characteristics. Master samples are created to control consistency of final product approval.

3. **Material samples**

   The procedures and requirements related to material samples vary on a case by case basis. Please refer to the NQAR or contact your DENSO Quality Representative for specific sample requirements. Please refer to section IV.a of this SQAM for further details.

**Supplier responsibilities**

1. Boundary samples are created on an “as needed” basis when acceptance judgment questions arise.

2. Boundary samples and master samples must be submitted to DENSO Quality under approval of the supplier’s quality assurance engineer or manager.

3. At least two sets of samples must be submitted to the DENSO Quality Representative. One set will be retained by DENSO and the other returned to the supplier.
4. Each part must be clearly labelled using the form provided. The form may also be reduced and attached to the part(s). A master sample must be mounted such that it can be removed/manipulated for inspection purposes, e.g. by using a clear plastic envelope.

5. For sub-supplier appearance items, the supplier must develop agreeable samples with the sub-supplier for DENSO Quality approval. If necessary, the sample(s) can be developed with DENSO, and negotiated and approved by all three parties (DENSO, supplier, and sub-supplier). Three sets of sub-supplier samples are required, one of each to be retained by each of the parties involved.

6. The sample form must be completely filled out with as much descriptive information as possible, including the supplier approval section. The Log No. and approvals section will be completed by DENSO.

7. Temporary boundary samples may be approved. In such cases, a countermeasure plan must be submitted detailing the problem and corrective actions.

8. Master sample approval is based on visual and/or numerical evaluation. Emphasis is given to visual comparison of the master color and/or mating components. Numerical data forms a basis for bench marking and tracking process variation. The method used for numerical data collection must be the one which best replicates the operative technique or standard required by the customer such as u’ v’, L a b, etc.

9. Revisions, changes or renewals must be resubmitted according to the above guidelines.

10. Suppliers are responsible for maintaining color control with a system which documents the color history of parts provided to DENSO and which is in accordance with the master sample.

11. If applicable, the expiration date will be completed by DENSO. When the sample(s) reach the expiration date, the supplier must resubmit the sample(s).

**Documents to be used:**
Form III.c - Boundary, Master, or Materials Sample Form
d. Process and Design Change Requests

Value Analysis/Value Engineering (VA/VE)

Purpose:
DENSO’s VA/VE processes are designed to encourage quality improvement and cost reduction efforts by Suppliers. Specifically, VA is suggested improvements to an existing mass production component, and VE is suggested replacement of an existing design or material. VA/VE Supplier activities are coordinated by DENSO Purchasing Department. The VA/VE Proposal form needs to be completed and submitted in order for Process or Design Change Requests to be considered. This section also explains the procedure for suppliers to request approval for a Process and/or Design change, when Value Analysis/Value Engineering practices take place.

Scope:
This section applies to suppliers of production parts and raw materials to DENSO.

Explanation:
The process change request is used by suppliers to request a process change to parts/materials manufactured for DENSO prior to making the change. Process change definition can be reference in 1 below. In general, change of machinery location, manufacturing method, trading companies, cleaning agents, etc. are regarded as process changes, whereas changes in material (manufacturer, grade, specification) may be regarded by DENSO as design changes. Change requests for items specified on a drawing issued by DENSO are considered design change.

Supplier Responsibilities

1. Suppliers are encouraged to work with DENSO to improve quality and reduce costs. Participation in VA/VE will result in Suppliers being able to receive a portion of the cost savings associated with these activities, and increase their Supplier Performance Score.

2. The supplier must submit a process change request to DENSO Purchasing as soon as it is clear that the supplier would like to have a process change or design change considered. A minimum of 4 months is recommended in advance of the proposed process change. Please note, however, that approval or disapproval of a process change request may take considerably longer than this depending on testing requirements or customer specific approval requirements.

A process change is defined as, but not limited to the following:

a) Change of manufacturing equipment (New/Refurbished/Different).
b) Change of manufacturing process (Process sequence, Conditions, etc).

c) Change of material suppliers or material trading companies. Note: However, if the DENSO issued drawing indicates a specific grade number or manufacturer of raw material, then this change will be considered as a Design Change Request and will require further documentation.

d) Change of chemicals or sub materials used in the manufacturing process (etching, cleansing, heat treating, plating, etc...). Note: Heat treatment and surface treatment are considered as special processes within DENSO and may be considered as Design Change, pending the nature of said change.

e) Change of process/equipment/material at subcontractor. Note: If material at subcontractor is specified by DENSO, this is also considered as a Design Change.

f) Supplier’s in-house production is sub-contracted or vice versa.

g) Change of inspection method.

h) Any changes that DENSO judges a process change.

Note: Please reference the table at the end of this section for further definition of a Process / Design change. If the supplier is unsure whether a change requires the submittal of a process change request they should contact the DENSO Quality Representative for directions. Again, any change related to a notation on a DENSO drawing is considered as a design change, requiring additional documentation and evaluation by all parties.

3. The supplier must fill out the top portion of the process change request

Note: Supplier is not to fill out the Process Change Request Number, this is done by DENSO.

4. The supplier must attach any additional supporting documentation including planning for quality confirmation testing and a process change implementation schedule.

5. The process change request and supporting documentation must be approved by the supplier’s Quality Assurance Manager or equivalent. Consideration should be given when developing the proposed implementation schedule for the time that will be needed by DENSO to conduct initial internal testing. The supplier’s DENSO Quality Representative may be able to assist the supplier in determining how much time will be needed for these internal activities.

6. Once the process change request is received at DENSO, it will initially be reviewed for acceptability and additional requirements determined including consideration and confirmation if the request is only a process change or if it is a design change. DENSO will fill out the Initial Response or Plan Approval section and return a copy to the supplier. The supplier must submit all items required by the due dates specified on the process change request. No further consideration will be given to the process change until all items are completed to DENSO’s satisfaction.
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7. Once all items are received, DENSO will review, perform measurements/testing and make a final judgment on the process change request. A copy of the process change request with the final judgment may be sent to the supplier, along with a DENSO Engineering Change Instruction (ECI), including new drawings/specifications. In most cases a description of the ECI process will be provided by Purchasing. Suppliers are not authorized to implement any process change or design change until they receive the approved PCR/DCR form from DENSO. Contact your DENSO Quality Representative for specific requirements regarding your PCR/DCR.

8. Follow your DENSO Quality Representative’s direction as to what type of labelling or marking is required of initial shipments.

Documents to be used:
Form III.d-a – PCR
Form III.d-b - DCR
Form III.d-c - VA VE Proposal Quote Worksheet
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Items requiring process change notification (Notes section following this table includes items which are also considered as design change):

<table>
<thead>
<tr>
<th>Item</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Equipment</strong></td>
<td>Transfer to other plant and additional installation</td>
</tr>
<tr>
<td><strong>Machine</strong></td>
<td></td>
</tr>
<tr>
<td>Die, Jig &amp; Tool</td>
<td>1. Change from manual procedures to automated process 2. Change/alteration of equipment</td>
</tr>
<tr>
<td><strong>Materials</strong></td>
<td></td>
</tr>
</tbody>
</table>
| Content & Inspection | Change of raw materials/chemical compositions, including:  
 a. Impurities  
 b. Change of inspection methods/items |
| **Method** |  |
| **Inspection and Measurement** |  |
| 1. Change of Inspection Jig 2. Change of Inspection Jig (including in-process sizing jig) (applies to Plastic Molding & Casting Parts) 3. Change of Welding Monitor (applies to Welding Parts) | 1. Installation and change of Inspection Device 2. Change of inspection item (Applies to Assembling Parts (Electronic Parts)) |
| Environment | 1. Increase of power transformer load due to additional installation of Equipment (applies only to Welding Parts, Heat Treatment Parts & Soldering Parts) |
| Remarks | * Method - Conditions: Temperature, pressure, electric power, voltage, current, speed, density, time, and others. ** Manufacturing process: Notification must NOT be submitted for new parts to change from "Temporary process" to "Normal Process" |

Note: Items requiring Design Change shall include (but are not limited to) all items currently specified on a DENSO issued drawing, such as:

- Resin materials (specified by DENSO for either in-house use or for use at an outside molder)
- Materials and/or processes that are used in critical parts (as specified by DENSO)
e. Rework Procedure

**Purpose:**

To specify control methods for guarantee of quality when there is deviation from the normal process flow in order to rework product.

**Scope:**

This section applies to suppliers of production parts or raw materials to DENSO.

**Explanation:**

Rework is defined as any temporary steps taken outside of the documented process flow on product that will ship to DENSO. Because rework is abnormal, it must be carefully controlled in order to guarantee quality.

Permanent changes to the process should be requested through a Process Change Request (see section III.d)

**Supplier Responsibilities**

The supplier should develop, maintain, and follow a general rework procedure that is available to your DENSO Quality Representative upon request. This procedure should include, but is not limited to:

a. Requirements for specific rework instructions for each rework event.

b. Requirements for a rework record. These records should include the rework instructions, rework details, lot information, and quality check result of the reworked product. This record should be readily available if requested by your DENSO Quality Representative.

c. Requirements for identification method for reworked parts. DENSO preference is that each part be identified indicating rework occurred.

**Page 2 includes a table of rework guidelines. Contact your DENSO Quality Representative with any questions.**
<table>
<thead>
<tr>
<th>REWORK GUIDELINES</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Item</strong></td>
<td><strong>Guideline</strong></td>
</tr>
</tbody>
</table>
| Workplace | 1. There shall be a special defined workplace for rework, unless it occurs on mass production equipment.  
2. Products before rework, reworked products and rejected products shall be sorted by allocating the different space for the work piece, separating boxes by color, identification of the actual product, etc.  
3. Necessary equipment and tools for rework shall be provided. (This shall be specified on the rework instruction sheet.)  
4. Workplace environment, like lighting, shall be provided so that the work and its check can be ensured. |
| Rework instruction sheet | 1. There shall be a rework instruction sheet.  
2. The product to be reworked (‘rework item’) shall be specified.  
3. Work steps and work details shall be specified for each rework item. (potential negative influence by rework operation should be considered)  
4. Distinguish and define non-reusable from reusable parts.  
5. A check procedure for reusable parts shall be specified.  
6. An inspection procedure for reworked products shall be specified.  
7. Specify when, where and how to put reworked products into the normal line.  
8. All the items of a reworked product shall be inspected at the normal inspection process.  
9. When a product is disassembled and reloaded, checking method for preventing wrong parts shall be clarified (like identification, indication and controlling methods of the extra parts and space). |
| Operator | 1. The operator certified for rework shall be specifically trained. Training records should be kept, and made available to the DENSO Quality Representative upon request.  
2. The operator can and shall work according to the work instruction sheet.  
3. The operator shall understand that unusual failure modes different from the usual ones shall not be reworked and shall be reported and shared.  
4. The operator shall understand that a special action is necessary (like using an identification control tag) in case of a rework interruption. |
| Identification record | 1. The rework record shall include part no., date, reworking details, product quantity and operator name (this step can be omitted for the rework inside the line).  
2. Control the reworked products so that they can be sorted with clear identification etc. |
f. Trouble Shooting and Abnormalities

Purpose:
This section describes DENSO’s requirements for preventing outflow of nonconforming product in the case of abnormal conditions in the manufacturing process, and the need for specific procedures concerning this important topic.

Scope:
This procedure applies to suppliers of production parts and raw materials to DENSO.

Explanation:
“Abnormal condition” is defined as any situation where the manufacturing process is different than the PPAP approved manufacturing process that may cause a problem in the quality of the parts, customer rejections, line stop, delivery stop or potential safety risk.

Examples include the following:

1. A specific piece of equipment is not functioning properly, so some minimal (Work-In-Process) WIP is stored until the piece of equipment is repaired.

2. A specific assembly fixture is briefly out of service for repair, and an alternate method of assembly (hand assembly) is utilized so shipments are not missed.

3. Due to labor conditions, temporary or alternate personnel are trained to perform manufacturing or assembly processes.

Supplier Responsibilities
Since abnormal conditions frequently cause downstream quality issues, DENSO requires each supplier develop a specific procedure concerning controls required in the case of the occurrence of an abnormal condition.

These controls must include:

1. Identification and communication of abnormal conditions to proper managerial levels/ functions within the organization and to your DENSO Quality Representative.

2. Special activities to ensure quality levels are maintained until such time as the normal process resumes.

These controls shall also ensure all affected product is contained until such time as quality levels can be confirmed. Additionally, troubleshooting activities and responsibilities should also be included in the procedure to determine cause of abnormal conditions and prevention of future occurrences.
g. Non-Conforming Product Communication and Corrective Action Process

**Purpose:**

The purpose of this procedure is to describe the means of communicating required corrective actions for supplier responsible nonconforming parts or material, and to describe the DENSO Defect Containment Assurance Program (DCAP).

**Scope:**

This section applies to all supplied products (e.g. raw material, components, assemblies, etc.) that have been deemed to be nonconforming by DENSO, or by a DENSO customer. DCAP will be applied to all supplied products that have a defect history that warrants special containment measures (as determined by your DENSO Quality Representative’s Management).

**Explanation:**

Non-conformance is defined as product or material that has not fulfilled the requirements of the associated specification(s). Suppliers of non-conforming product or material must establish robust process and system improvements to prevent the suspect product from being used, transferred, or installed. The following items must be addressed:

- A) Evaluation
- B) Identification
- C) Containment
- D) Corrective actions to prevent recurrence.

**Supplier responsibilities**

A. When non-conforming product or material is found at DENSO or at a DENSO Customer:

1. DENSO will formally communicate non-conforming material issues using:

   Quality Failure Notices (QFN), Part Corrective Action Request (PCAR), or a Field Corrective Action Request (FCAR) formats. Your DENSO Quality Representative will inform you as to which form is used at their facility.

**Note:** These documents are system related at the various DENSO facilities, so they may vary in format. All are designed as communication tools to notify suppliers of non-conformance issues.

The format used will have a ranking. Generally defined as follows:

- A = Very Serious: Line stoppage or high quantity
- B = Serious: Functional rejection or repair required, appearance (for visible parts)
- C = Appearance (non-visible parts), low quantity
2. Supplier required initial response time:

   “A” rank issues – 24 hours

   On all other issues (you will be notified on response timing requirements by your DENSO Quality Representative

3. All responses must include the following information:

   a. Confirmation of defect mode

   b. Emergency Response Action(s) or containment activities

   c. Countermeasures:

      1. The supplier should take immediate corrective actions for the parts or raw material at the supplier’s facility and at DENSO. The supplier must immediately inform DENSO if any suspect parts are potentially in-transit to DENSO.

      2. Certified shipments may be required until permanent corrective actions have been implemented. Notification of shipment timing must be communicated to your DENSO Quality Representative.

      3. The supplier is required to assist in sorting inventory at DENSO when requested by DENSO Quality. If DENSO is required to rework/sort any non-conforming parts or product at DENSO or DENSO’s customer, DENSO may charge the supplier for this rework/sort activity.

      4. If any part is found to be non-conforming, the supplier is responsible for reworking or replacing the part. Rework of such part may be required at DENSO and at the supplier. Before any rework is begun, the rework and marking methods must be approved by DENSO Quality.

4. Corrective actions reporting:

   a. The form used for reporting corrective actions are one of the following: QFAS (Quality Failure Answer Sheet) Form, Global 8D, or PCAR format. Updating the appropriate documents, such as control plans & QA Networks, may also be required by your DENSO Quality Representative.

   b. The supplier’s quality assurance manager must approve the response. The supplier may decide any other appropriate signatures.

   c. The response should be sent to DENSO Quality by the due date listed, whether or not the permanent corrective actions have been determined.

      1. If the response is not a final response (lacking permanent corrective actions), the supplier should indicate it is an initial response.
2. Temporary corrective actions must be reported, along with a scheduled date for permanent corrective actions to be reported.

3. The supplier should follow up with DENSO Quality and report permanent corrective actions as scheduled.

B. When non-conforming product or material is found in the field (Warranty):

1. Investigation Report Requirements

   a. Investigation results must be in a technical report format, unless otherwise instructed by your Denso Representative. The supplier should include any other checks they determine necessary.

   b. For No Trouble Found (NTF) parts; a report stating NTF with no supporting data will NOT be accepted. At a minimum, functional/performance data, disassembly results and other testing related to the defect must be included.

   c. Investigation reports must be returned by the due date provided to the supplier by DENSO. This date is normally related to DENSO’s customer due date. Late responses can result in warranty charges by some of DENSO’s customers. Any costs resulting from late responses WILL be charged back to the supplier. If the due date cannot be met, contact your DENSO representative several days before the due date to request an extension.

   d. Most DENSO plants require that the Tag #, VIN #, part number and production date be included in all reports. (Note: If multiple parts are returned on the same report, this identification must be associated to each individual part). Please contact you DENSO Quality Representative for their specific requirements.

2. Warranty Cost Charge Back

   The general terms and conditions of Denso’s Purchase Orders require the supplier to pay expenses related to a failure of the parts to conform to all specifications, drawings, samples and other descriptions furnished and/specified by the Buyer. Please see your Purchase Order. Charge backs will be based on actual returned parts OR ratios established from returned parts. The supplier may also be charged for the shipping costs of returned parts.

   **NOTE 1:** If the supplier finds defective part(s) at their facility, the supplier must inform their DENSO Quality Representative of the potential for this problem to escape to DENSO.

   **NOTE 2:** The Supplier is liable for all direct, incidental and consequential damages, losses, costs, and expenses incurred by DENSO resulting from the failure of the Supplier to deliver conforming goods. These include costs associated with the off lining of goods, interruptions or delays in production, reduced line-speeds and plant shut-downs.

3. DCAP

   DCAP is an additional inspection program to assure containment and protection of DENSO and/or DENSO’s customer from receiving serious or repetitive defects. As supplier will be notified of this requirement via a DCAP Launch Notification Letter.
Supplier Quality Assurance Manual (SQAM) for Parts and Raw Materials

There are two levels of DCAP; Level 1 and Level 2

**DCAP Level 1:** Additional inspection performed at the supplier by supplier resources. This inspection is to occur outside the normal process above and beyond normal inspections.

**DCAP Level 2:** Additional inspection performed by a 3rd party with all costs assumed by the supplier.

DENSO may place a supplier on DCAP with little or no advance notice. Careful consideration is given by DENSO Management prior to placing a supplier on DCAP

**Supplier responsibilities (Relative to DCAP)**

A. **DECAP Notification Letter:** The supplier must acknowledge receipt of the DECAP Notification Letter in writing, by returning the Confirmation Notice along with their containment plan. This containment plan shall be reviewed and approved by DENSO.

B. **DECAP Execution:** The supplier will implement the DENSO approved containment plan. Inspection data must be collected by the supplier and submitted to the DENSO Quality Representative. Any defects found in the containment inspection must be reported to the DENSO Quality Representative, along with process control breakdown investigation and corrective actions taken. This process continues until the DCAP release criteria are met.

C. **DCAP Release:** The supplier must request a release from DCAP when the release criteria, as stated in the DCAP Launch Notification Letter are met. The DENSO Quality Representative will review release criteria, and when satisfied, sign the Request for Release document. In the case of DCAP2 release, the supplier must continue extra inspection for a time to be determined by the DENSO Quality Representative.

**Documents to be used:**
*Form III.g - Corrective Action Forms (QFAS/FCAR/PCAR)*
IV. Other Requirements
a. Special Section for Materials Only Suppliers

DENSO’s philosophy for the quality assurance of material extends to not only raw material used within DENSO facilities but also to those materials specified by DENSO made into parts supplied to DENSO. DENSO has taken efforts to develop and maintain a quality assurance system encompassing a range of activities, from the development, design, and prototype production of new products, to mass production, sale and after servicing, to provide a level of product quality that fully satisfies our customers.

Our suppliers must fully understand DENSO’s concept of quality assurance by providing reliable products, enhanced credibility, and improved standards within their respective companies. We hope you will secure a perfect quality assurance system through your efforts with DENSO.

Scope:

This section applies to suppliers of raw materials to DENSO as well as materials for parts that are specified by DENSO (as indicated in DENSO drawings released to said suppliers).

Explanation:

All materials suppliers and materials suppliers’ support personnel are required to abide by the guidelines put forth in this policy. If there are any questions about specific materials supply, contact your DENSO Quality Representative.

Supplier Expectations

1. Provide materials with a high level of quality that has been assured by the supplier and approved by DENSO

2. Take full responsibility for the production of materials that fulfill DENSO quality requirements, and deliver these materials to DENSO (and to our parts suppliers), in accordance with Material Specification documentation.

3. Establish and maintain a quality assurance system that can secure a constant level of materials quality, while appropriately controlling quality fluctuations, in order to ensure the quality of the material provided to DENSO.

4. Acknowledge Material Specification Documentation upon request from DENSO. Material Specification documentation to be used when:
   a) A material is being used for the first time.
   b) The type or quality of the material has changed.
c) The sub-supplier of the material has changed, or a new supplier has been added.

d) The standard size of the material or allowable deviation has changed.

e) The quality assurance requirements, chemical components or characteristic values of the material have changed.

f) The container shape for production or transport of the material has changed.

g) Test and inspection methods have changed.

h) The location of the factory (company) providing the material has changed.

Note: If material specifications have not arrived prior to start of production, the supplier must immediately contact their DENSO Quality Representative.

5. Issue a Materials Test Report

   a) As a general rule, test results should be reported in accordance with the agreed upon content of the Material Specification. If there are items to be changed, or items that cannot be disclosed, please inform your DENSO Quality Representative.

   b) Typical examples of Materials Test Report include: Certificate of Analysis, Mill Sheet, etc. Your DENSO Quality Representative can provide direction.

   c) The Materials Test Report should be submitted to DENSO prior to the delivery date of the material and be designated with the appropriate lot number corresponding to the material received.

   d) Please note that a Materials Test Report for items designated as early stage control items or critical point control items should always be disclosed.

6. Store and maintain the Material Specification documentation, drawings (if applicable), and inspection standards with updated versions to ensure appropriate inspection and data submission is performed.

7. Change requests to material specifications or any other material inquiries must be made following the Process and Design Change Request (PCR/DCR) procedures outlined in chapter 20 of this SQAM. Material specification changes must be approved by DENSO prior to supplier implementation. Depending on the nature of the specification change, many departments within DENSO may be involved (Product Design, Quality, Production, Materials Engineering, etc.); therefore, material specification change requests to DENSO must have strong viable reason. Final agreement upon material specification changes shall be communicated to the supplier through DENSO purchasing representative.

8. Comply with Inspection Sample Submission

   a) As part of DENSO’s incoming raw material inspection process, the supplier may be requested to provide appropriate samples for evaluation including

      i) Test bars (depending on material: molded, cured, or stamped)

      ii) Small sample quantity set aside (depending on material: pellets, sample vial, etc)
b) Your DENSO Quality Representative and/or a Purchasing Representative will communicate to you the requirements for Inspection Sample Submission including sample type, quantity, packaging, etc.

b. Conflict Mineral Requirements

**Purpose:**

The purpose of this section is to define the DENSO North America Conflict Minerals requirements and the corresponding reporting processes and procedures.

**Scope:**

This section applies to all suppliers of all component parts and raw materials.

**Explanation**

In July, 2010, the US government passed the “Dodd-Frank Act” (HR 4173) which requires companies to disclose their use of conflict minerals in their products each year. Conflict minerals are Tin, Tantalum, Tungsten, and Gold (and their compounds) that are sourced from the Democratic Republic of Congo (DRC) or the surrounding countries (Angola, Burundi, Congo, Central African Republic, Republic of Tanzania, Rwanda, Sudan, Uganda, Zambia)

DENSO Corporation and its Group companies promote the procurement of materials with commitment environmental sustainable products, with a strong disdain for social problems such as human rights infringements. DENSO requires their suppliers to procure their materials with the same commitment to the environment and social responsibility.

**Supplier Requirements**

1. All suppliers are required to conduct a reasonable “country of origin” inquiry to determine whether any of their minerals originated in any of the covered countries.
2. All suppliers are required to conduct “Due Diligence” in accordance with the OECD (Organization for Economic Cooperation and Development) Guidelines.
3. Educate your supply base with respect to the Conflict Minerals Legislation and in accordance with DENSO requirements.

DENSO supports AIAG in the development of Conflict Minerals standards and methods that have been adopted throughout the automotive industry. DENSO also supports CFSI (Conflict-Free Smelter Initiative) in their development of the CMRT (Conflict Minerals Reporting Template), and their smelter certification program.
Suppliers must submit their conflict minerals declarations to DENSO per one of the following formats:

A) iPCMP (iPoint Conflict Minerals Platform)
B) Excel file version of the CMRT.

Material declarations in any other formats are subject to rejection by DENSO.

c. **Substance of Concern (SoC) Requirements**

**Purpose:**

The purpose of this section is to define the Substance of Concern (SoC) requirements and explain the corresponding processes and procedures.

**Scope:**

This section applies to all suppliers of production component parts and raw materials.

**Explanation:**

The Substance of Concern (SoC) requirements outlines the material/substance reporting requirements, and the restrictions on the use of substances of environmental concern in production parts, components, and raw materials.

**Supplier Responsibilities**

1. **DENSO North America Statement of Environmental & Safety Requirements**

Supplier to comply with the DENSO Supplier Environmental and Safety requirements as stated in the DENSO General Terms & Conditions Agreement, and in the “DENSO North America Statement of Environmental & Safety Requirements”. (Refer to the Requirement Table 7.1)

2. **DENSO Design Standard DDS2004 Requirement**

Supplier shall comply with DENSO design specification: DDS2004 “Restrictions on Use of Substances of Environmental Concern as Materials or Product Components” for all production parts, components and raw materials sold to DENSO. (Refer to the Requirement Table 7.1)

3. **DDS2004 Deployment / Compliance Certification**
Supplier Quality Assurance Manual (SQAM) for Parts and Raw Materials

a) DENSO shall make the most current version of the DENSO SoC standard (DDS2004) available for supplier within the DENSO NA website. This is a secure document and requires a password for access. Passwords are available from form “007-Password Instructions”. It is the supplier’s responsibility to read and understand this standard.

4. IMDS Reporting

a) Supplier shall provide material content reports through the International Material Data System (IMDS), or other means defined by DENSO for all production parts, components and raw materials sold to DENSO. This reporting includes, but is not limited to 100% material composition and substances of concern (SoC). Substances of Concern (SoC) include those substances listed on the Global Automotive Declarable Substance List (GADSL), DENSO design specifications, and applicable OEM requirements.

b) Supplier shall submit IMDS data before DENSO facility receives shipment of mass production parts, components, and raw materials.

Table 7.1 Requirement Table
(* Requirement Document Located in Appendix)

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>* DENSO North America Statement of Environmental &amp; Safety Requirements</td>
<td>DENSO North America’s minimum environmental &amp; safety requirements.</td>
</tr>
<tr>
<td>DDS2004 (password protected)</td>
<td>DENSO Design Standard for restrictions on the use of substances of environmental concern as materials or product components.</td>
</tr>
<tr>
<td>DIS2320 (password protected)</td>
<td>DENSO Analysis method for substances of environmental concern. This form may be required – contact your DENSO Quality Representative for details.</td>
</tr>
</tbody>
</table>

5. Additional Requirements

a) Supplier shall also comply with any additional SoC requirements above and beyond IMDS reporting. This may include reporting SoC information in a customer specific format or submitting analytical test values and test methods to verify data reported in the IMDS process. When applicable, these requests will be issued directly from the plant. In all other cases, the global system outlined in Section IV.c will apply. Annual SoC conformance testing may be required as determined by your DENSO Quality Representative.

b) Please refer to form IV.c-Password Instructions to obtain passwords for protected documents.

Documents to be used:
Form IV.c - Password Instructions
d. Non-dimensional Product & Sub-Material Requirements

**Purpose:**

The purpose of this section is to identify the minimum environmental and safety requirements that must be followed.

**Scope:**

This section applies to all non-dimensional and sub-material suppliers who provide chemicals to DENSO.

**Explanation:**

All suppliers are required to abide by the expectations put forth in this policy. Additional requirements may exist and also apply for individual DENSO sites and program teams.

Hazardous Materials includes any material or substance that is regulated by any environmental or safety requirement including EPA, OSHA, DOT, etc.

**Supplier Expectations**

1. Comply with all applicable Federal, Provincial, State and local Environmental, Safety and Hazardous Material Transportation Regulations.

2. Safety Data sheets must be provided for all non-dimensional and sub-material products*.

3. All non-dimensional and sub-material products arriving on site must be properly shipped and labeled*.

4. 100% of formula must be disclosed on the SDS.

5. If the chemical composition information is a trade secret, the supplier can provide information under a non-disclosure agreement between DENSO and the supplier.

*Compliance with the updated SDS and labeling requirements of 29 CFR 1910.1200 (which includes global harmonization systems [GHS]) is mandatory for all shipments within the U.S.
### Supplier Quality Assurance Manual (SQAM) for Parts and Raw Materials

For shipments to Canada and Mexico, during the transition period to the GHS standard, compliance with the most current regulations in each country is required.

#### e. Functional Safety ISO26262

**Purpose:**
To be compliant with ISO26262 [Road Vehicles – Functional Safety] as one means of providing safe systems/products in the market; systems/products which have no serious risks caused by malfunction of electric/electronic systems.

**Scope:**
Apply to the supplier (including secondary or later supplier of DENSO) who designs, manufactures, and delivers the electrical, electronic, and programmable electronic (E/E/PE) system parts to DENSO. Also applies to development consigned suppliers of E/E/PE, which are defined in the Functional Safety standard of ISO26262.

*Examples being but not limited to: electronic circuits / electronic components (ASIC: application specific integrated circuit / microcomputer / active component / passive component), software / development tool and development process / system of E/E/PE, etc. The selection of applicable Functional Safety activities and work products will be agreed upon between DENSO and supplier.*

**Explanation:**
Functional Safety requirements of DENSO or DENSO’s customer will be specified on the DENSO drawing or DENSO specification, etc.
In addition, normal correspondence of Functional Safety must be exchanged between Design Engineering Department of DENSO and Design Engineering Department of the supplier when development starts or design (when the supplier is selected) of the product.

**Supplier Responsibilities:**
DENSO requests suppliers and development consigned suppliers to perform the following:

1. Suppliers of electrical, electronic, programmable electronic (E/E/PE) systems/parts shall comply with the ISO26262 standard as per the agreed upon application scope.

2. Suppliers must submit the required evidence of compliance with the ISO26262 standard by DENSO’s due date.

3. Suppliers are to follow the records retention periods defined by DENSO.

   Suppliers are to seek approval from DENSO in advance of the discarding of any quality history records related to DENSO parts.

4. DENSO reserves the right to perform Functional Safety Audits and Assessments to verify compliance with ISO26262 at the supplier’s premises. The supplier must make evidence of compliance available for DENSO to confirm during on-site Audits.
5. When the supplier is requested to provide details such as preparation or submission of design documents by “Development Interface Agreement (DIA)”, the supplier shall respond according to the agreement within the DIA.

6. The supplier shall submit relevant specification(s) such as electronic part temperature characteristics, electric characteristics, and quantity of transistors upon request from DENSO.

7. The supplier shall establish appropriate system (structure, process, etc.) to enable development in compliance with ISO26262, when it is required, by due date specified by DENSO.

*Development Interface Agreement (DIA): DIA is the term which details “duties and responsibilities of the customer and the supplier”, which is defined in ISO26262.*
V. Additional Information
## a. Glossary

<table>
<thead>
<tr>
<th>Item</th>
<th>Section</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIAG Compliance Connect Spreadsheet/IMDS</td>
<td>II-7</td>
<td>Forms used to report product structure, material, substance, and recyclability information for parts and materials supplied to DENSO. This is per EU directive and OEM requirements.</td>
</tr>
<tr>
<td>Blank Forms</td>
<td>Various</td>
<td>These are blank copies of DENSO forms that are to be used by Suppliers to meet the submission requirements of DENSO.</td>
</tr>
<tr>
<td>Boundary Sample</td>
<td>III-19</td>
<td>Boundary samples show the acceptable visual limit of a part/ material. Boundary samples are used in conjunction with the DENSO Supplier Inspection Standard and are developed with DENSO support.</td>
</tr>
<tr>
<td>Capability Index (Cpk)</td>
<td>II-9</td>
<td>A measure of process variation and centering relative to the specification range and target.</td>
</tr>
<tr>
<td>Control Plan (also check AIAG manual 'APQP')</td>
<td>II-10</td>
<td>The DENSO Supplier Control Plan is used by the supplier to indicate the critical product characteristics, process steps, Quality Assurance check items (with their frequencies), SPC reporting methods, process capability, and Gage R &amp; R studies that relate to the parts/ material which are supplied to DENSO. It is comprehensive and includes all important information from Receiving Inspection through Packaging.</td>
</tr>
<tr>
<td>Critical Control Characteristics</td>
<td>II-9</td>
<td>Characteristics of a product or process either designated by the customer or selected by the supplier through knowledge of the product or process. Excessive variation may affect product safety, compliance with government regulations, fit, function, appearance or quality of subsequent operations.</td>
</tr>
<tr>
<td>DENSO</td>
<td>Various</td>
<td>Within this manual the name “DENSO” shall refer to DENSO manufacturing companies in North America:</td>
</tr>
</tbody>
</table>

**DENSO**

supplier Quality Assurance Manual (SQAM) for Parts and Raw Materials
# Supplier Quality Assurance Manual (SQAM) for Parts and Raw Materials

<table>
<thead>
<tr>
<th>Form Name</th>
<th>Page</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deviation Request/ Reply</td>
<td>III-18</td>
<td>This form is submitted by the supplier to DENSO when the supplier wants DENSO to accept products, parts, components, or materials that do not meet drawings and/or specifications. This form is submitted for all non-conformances from Initial Samples through Mass Production.</td>
</tr>
<tr>
<td>Early stage control plan for production ramp-up.</td>
<td>III-14</td>
<td>This form contains the supplier's plans to help ensure that their production processes are stabilized as soon as possible after start of production. It focuses on early detection of potential problems and how countermeasures are to be implemented and reviewed by supplier management to help ensure a successful start-up of production.</td>
</tr>
<tr>
<td>Field Corrective Action Request (FCAR)</td>
<td>III-23</td>
<td>This form is sent to the supplier by DENSO when nonconforming parts/materials from the supplier have been detected at DENSO. It is also used to reply to the information sent by the supplier on the G8D Sheet. DENSO will either approve the actions taken by the supplier or request that further actions be taken before the Corrective Action is closed out.</td>
</tr>
<tr>
<td>Final Approval Request</td>
<td>III-16</td>
<td>This form is submitted by the supplier to DENSO once they have completed all the requirements stated on the DENSO Notification of Quality Assurance Requirements (NQAR). Your DENSO Quality Representative will review the form and the submissions that have been given by the supplier and if everything is satisfactory, will sign approval on the form and forward a copy to the supplier for their records.</td>
</tr>
<tr>
<td>Gage Repeatability and Reproducibility Study (GR&amp;R) (also check AIAG manual 'MSA')</td>
<td>II-10</td>
<td>This study is done by the supplier to evaluate the amount of measurement error associated with a particular gage. The GR&amp;R will demonstrate whether there is enough of a confidence level in the gage for it to be used to evaluate parts/materials that are to be supplied to DENSO.</td>
</tr>
<tr>
<td>Global 8D (G8D) Sheet</td>
<td>III-23</td>
<td>This form is completed by the supplier in response to a DENSO Supplier Quality Failure Notice that has been issued as the result of nonconforming parts/material from the supplier having been detected at DENSO. It documents the supplier’s effort to contain the nonconformance, detect the root cause, and implement countermeasures to prevent its recurrence.</td>
</tr>
<tr>
<td>Initial Sample Inspection Report (ISIR)</td>
<td>II-12</td>
<td>The supplier sends the ISIR to DENSO along with representative samples of the parts/materials that it will be submitting to DENSO. It is used to show initial stage confirmation of the parts/materials produced on mass production tooling to DENSO drawings and specifications.</td>
</tr>
<tr>
<td>Table Title</td>
<td>Page</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Lot Information and Traceability</td>
<td>II-13</td>
<td>Supplier utilizes this form to communicate important information about how their product is packaged and what is their system for traceability.</td>
</tr>
<tr>
<td>Master Sample</td>
<td>III-19</td>
<td>Master samples show acceptable visual final characteristics. Master samples are used in conjunction with the DENSO Supplier Inspection Standard and are developed with DENSO support.</td>
</tr>
<tr>
<td>Notification of Quality Assurance Requirements (NQAR)</td>
<td>II-6</td>
<td>This form is used by DENSO to convey to the Supplier DENSO SQAM requirements/submissions and due dates. Critical control items for DENSO's process/product are also included on the form.</td>
</tr>
<tr>
<td>Part Corrective Action Request (PCAR)</td>
<td>III-23</td>
<td>This form is sent to the supplier by DENSO when nonconforming parts/ materials from the supplier have been detected at DENSO. It is also used to reply to the information sent by the supplier on the GBD Sheet. DENSO will either approve the actions taken by the supplier or request that further actions be taken before the Corrective Action is closed out.</td>
</tr>
<tr>
<td>Process Change Request/ Reply</td>
<td>II-18</td>
<td>This form is used to document a supplier’s request to make a change to the process that they use to produce a product for DENSO. It also notes DENSO’s response to the request by the supplier.</td>
</tr>
<tr>
<td>Process Capability Studies</td>
<td>II-6</td>
<td>Process capability studies are carried out in order to obtain information on the inherent variation that exists within a process that is under statistical control, in order to reduce the spread of variation to less than the tolerances stated within the product specification.</td>
</tr>
<tr>
<td></td>
<td>II-9</td>
<td></td>
</tr>
<tr>
<td>Quality Assurance Schedule (QAS)</td>
<td>II-11</td>
<td>QAS should include the following items: Component Build and Ship Schedule; Production Process Development; Quality System Development; Material, ISIR, &amp; Appearance Evaluations.</td>
</tr>
<tr>
<td>Quality Failure Notice (QFN)</td>
<td>III-23</td>
<td>This form is sent to the supplier by DENSO when nonconforming parts/ materials from the supplier have been detected at DENSO. It is also used to reply to the information sent by the supplier on the GBD Sheet. DENSO will either approve the actions taken by the supplier or request that further actions be taken before the Quality Failure Notice is closed out.</td>
</tr>
<tr>
<td>Supplier QA Contacts List</td>
<td>I-5</td>
<td>This list is submitted to DENSO by the supplier to identify critical contacts for DENSO at the supplier.</td>
</tr>
<tr>
<td>Tooling Progress Report (TPR)</td>
<td>II-8</td>
<td>A TPR must be prepared for all new dies, moulds, equipment, jigs, custom gauges, and fixtures. This schedule must include all activities from design through mass production. This schedule must also include sub-supplier tooling schedules.</td>
</tr>
</tbody>
</table>
b. Revision Log

<table>
<thead>
<tr>
<th>Date</th>
<th>Section/Page</th>
<th>Deletion/Addition</th>
<th>Description of change</th>
</tr>
</thead>
<tbody>
<tr>
<td>6/23/2010</td>
<td>020</td>
<td>Change</td>
<td>020a Process Change Request Form updated</td>
</tr>
<tr>
<td>6/23/2010</td>
<td>006</td>
<td>Change</td>
<td>006 NQAR form updated</td>
</tr>
<tr>
<td>7/9/2010</td>
<td>007</td>
<td>Change</td>
<td>Section 007 protected document password info</td>
</tr>
<tr>
<td>7/9/2010</td>
<td>007</td>
<td>Addition</td>
<td>Form 007-password reference file</td>
</tr>
<tr>
<td>2/3/2011</td>
<td>006</td>
<td>Change</td>
<td>Unified the NQAR Form updated, and removed all language referencing the &quot;Supplier Shipping Inspection Standard&quot; form.</td>
</tr>
<tr>
<td>10/20/2011</td>
<td>012</td>
<td>Change</td>
<td>Form 012 ISIR had DMMI Sample Data Sheet added as separate tab</td>
</tr>
<tr>
<td>10/20/2011</td>
<td>017</td>
<td>Addition</td>
<td>New Language to the bottom of table 2, “Supplier adherence responsibilities table 2 (DNMX)”</td>
</tr>
<tr>
<td>10/20/2011</td>
<td>023</td>
<td>Addition</td>
<td>Language explaining DCAP (Defect Containment Assurance Program ) was added to section</td>
</tr>
<tr>
<td>04/01/2015</td>
<td>All</td>
<td>Change</td>
<td>New numbering system for Table of Contents.</td>
</tr>
<tr>
<td>04/01/2015</td>
<td>All</td>
<td>Change</td>
<td>Changed form numbers to match new Table of Contents formatting.</td>
</tr>
<tr>
<td>04/01/2015</td>
<td>II.k</td>
<td>New</td>
<td>Add guidelines for capacity verification and Run @ Rate due to customer requirements and past delivery problems caused by insufficient part availability. Reference new Capacity Verification Form</td>
</tr>
<tr>
<td>04/01/2015</td>
<td>IV. e</td>
<td>New</td>
<td>Add new section of requirements requiring compliance to ISO 26262 Functional Safety guidelines.</td>
</tr>
<tr>
<td>04/01/2015</td>
<td>IV. c</td>
<td>Change</td>
<td>Update requirements for SoC including requiring compliance to DDS 2004.</td>
</tr>
<tr>
<td>04/01/2015</td>
<td>IV. b</td>
<td>New</td>
<td>Add requirements of Conflict Mineral usage per Frank Dodd act from 2010.</td>
</tr>
<tr>
<td>04/01/2015</td>
<td>IV. d</td>
<td>New</td>
<td>EHS is attached both as a stand alone section entitled &quot;Chemical Compliance&quot; and also rolled into a renamed &quot;Substance of Concern (SoC) and Environmental &amp; Safety Requirements&quot; section which is attached as a red-line version.</td>
</tr>
<tr>
<td>04/01/2015</td>
<td>I. b</td>
<td>New</td>
<td>Add safety related requirements for raw material suppliers. Made TOC Standard.</td>
</tr>
<tr>
<td>04/01/2015</td>
<td>IV. a</td>
<td>Change</td>
<td>Slight re-wording of purpose for ease of supplier understanding.</td>
</tr>
</tbody>
</table>
Supplier Quality Assurance Manual (SQAM) for Parts and Raw Materials

<table>
<thead>
<tr>
<th>Date</th>
<th>Section</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>04/01/2015</td>
<td>III. d</td>
<td>Change</td>
<td>Clarification of expectation/content of &quot;Material Specification&quot; which is called out in the supplier expectations. Clarify reference of ECR/PCR to match Section III.d (Process &amp; Design Change Requests).</td>
</tr>
<tr>
<td>04/01/2015</td>
<td>I. a</td>
<td>Change</td>
<td>Updates to Introduction to SQAM Requires compliance to CSR's outside scope of ISO/TS</td>
</tr>
<tr>
<td>04/01/2015</td>
<td>II. c</td>
<td>New</td>
<td>Add requirements regarding process auditing and submission of process audit self-assessment sheets.</td>
</tr>
<tr>
<td>04/01/2015</td>
<td>II. c</td>
<td>New</td>
<td>Add special process requirements</td>
</tr>
</tbody>
</table>