



**Sensata**  
Technologies

# GLOBAL SUPPLIER QUALITY MANUAL GSQM

This document is edited and controlled by the  
SENSATA Technologies Global Supplier Quality Organization.

Printed versions are for reference only. It is the SUPPLIER's responsibility to assure that only the latest revision of this manual is used and all prior editions are identified as obsolete.

<b>Title:</b> Global Supplier Quality Manual	<b>Doc#:</b> QMS-1004255   G-SM-01	<b>Date:</b> April 23, 2024	<b>Rev:</b> W
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# GLOBAL SUPPLIER QUALITY MANUAL INDEX

For simplification, the ISO 9001 requirements are not repeated within this document; see 7.3 Table 1 to obtain a copy of the standard.

SENSATA Technologies is required to flow down industry/Customer requirements to SUPPLIERS whose component is incorporated into SENSATA Technologies finished parts or other applications. These are identified throughout this document with an **[A]** for **Aerospace-**, **[T]** for **Automotive-**, **[H]** for **Heavy Vehicle & Off/On Road (HVOR)-**, **[M]** for **Medical-**, or **[I]** for **Commercial/ SENSATA's End Customer - Business**. If there is no [A] or [T] or [H] or [M] or [I] noted, then the requirements are applicable to all SUPPLIERS regardless of end component use.

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# 1 INTRODUCTION

## 1.1 Purpose / Objective

This Global SUPPLIER Quality Manual (GSQM) is designed to assist all SENSATA Technologies global supply partners in promoting risk-based thinking, to establish a ZERO-DEFECT culture, to support preventive action and planning, fast elimination of non-conformities and continual improvement, to achieve Excellence in Quality, Delivery, Cost and Service.

It is also essential to have clear, documented requirements and descriptions of interaction processes, between SENSATA and its SUPPLIERS, defined.

It is our mission to provide our Customers with **ZERO-DEFECT products, on-time delivery** and to supply them globally **at the best cost.**

This goal can only be achieved with the support and commitment between you, our SUPPLIER, and us.

All sections of the GSQM are deemed significant to a positive, productive and rewarding SUPPLIER partnership.

SUPPLIER's non-compliance to the requirements contained within the scope of this GSQM, may drive the initiation of a SUPPLIER Management Review by SENSATA's Business Management Team.

***We are convinced that with your understanding and proactive cooperation, we will increase our common competitiveness by adopting a partnership approach.***

***We strive for Excellence and Customer Satisfaction. That is our priority!***

***We look forward to a mutually beneficial business relationship with our SUPPLIERS.***

## 1.2 Communication

The official business language for all communication and documents, referenced in this GSQM, shall be U.S. English. [The latest versions of the GSQM and other documents are located on the Sensata Supplier Portal https://www.sensata.com/resources/portals/suppliers.](https://www.sensata.com/resources/portals/suppliers) All Suppliers must register at SENSATA's Supplier Lifecycle Management (SLM) portal [https://supplierplanning.sensata.com/OA\\_HTML/AppsLocalLogin.jsp](https://supplierplanning.sensata.com/OA_HTML/AppsLocalLogin.jsp) Suppliers will be notified of any changes to these documents located on the portal via email to their registered contact. It is the Suppliers responsibility to ensure their contact information is up to date, failure to do so does not resolve them of the requirements noted in these communications.

The Supply Launch Manger (SLaM) is a communication tool between Sensata and the supplier for quoting and launch monitoring. Supplier will be invited to the system during the RFQ stage. To be eligible for business, suppliers must respond to quotes in the SLaM except for ITAR and restricted EAR products. The same system will then carry through to track and document the launch activities.

All bilateral communication notifications and questions are to be reviewed and handled through the SENSATA designated Purchasing Organization or Material Planning assigned person, or when appointed, by the assigned SENSATA Supplier Quality Manager & Supplier Quality Engineering (SQM/SQE) organization topics such as, but not limited to, the following:

- a) Status changes of the SUPPLIER Management Representative and business ownership
- b) Status changes of the existing Quality Management System (i.e., new certification, de-certification, re-assessments, etc.)
- c) Any deviation from the requirements, defined within this document, must be formally documented and approved prior to implementation.
- d) Any request for quality requirements content clarification noted within this document.
- e) All supplier data shared via SLM shall be current (i.e., not expired) and updated to reflect the current status by the supplier. (see also section 5.1)

### 1.3 Sustainability & Corporate Responsibility

It is SENSATA's objective to live our values and make our world safer, cleaner, more electrified and connected - from the products and solutions that we engineer and manufacture, to the care we take in sourcing raw materials, to the impact we have on our communities and our workforce. We Power Possibilities Together.

We have set aggressive yet attainable Diversity, Equity & Inclusion (DE&I), Energy & Emissions and Responsible Sourcing goals. SUPPLIERS must also have this consideration, promote similar target, and report these initiatives and expectations.

For more information, please visit <https://www.sensata.com/sustainability>.

## 2 SCOPE

SUPPLIERS are fully responsible for the **Quality, Delivery** and **Cost** of their products and services. It is the expectation that SUPPLIERS provide SENSATA with ZERO-DEFECT during programs, mass-production and service/aftermarket obligations.

This document describes/establishes SENSATA Supplier Management requirements for SUPPLIERS who design, and/or manufacture and/or control respective components in accordance with SENSATA design and product requirements. The SENSATA GSQM also provides guidance, at all program stages, for SUPPLIER's planning, implementation and sustaining a ZERO-DEFECT mindset and culture.

The GSQM requirements apply to SUPPLIERS that provide SENSATA manufactured components, outsourced processes and special processes. The GSQM requirements are in addition/complementary to those in purchase orders, contracts, specifications, or drawings.

The word '**shall**' indicates a mandatory requirement.

The word '**should**' indicates a guideline (mandatory requirement with some flexibility allowed in compliance methodology).

SUPPLIERS choosing other approaches to satisfy a '**should**', must be able to show that their approach meets the quality requirements of this document, which must be agreed upon prior to implementation.

The majority of the Global Supplier Quality Manual is consistent for all applications. Sensata is required to flow down industry and Customer requirements to Suppliers whose components are incorporated into Sensata's finished part. During the sourcing process, the applicable business segment is identified. The supplier is required to meet the General requirements contained in this document as well as the additional requirements identified for that specific business segment. The specific requirements for each business segment are identified throughout the GSQM as **[A] for Aerospace, [T] for Automotive, [M] for Medical, [H] for Heavy Vehicle & Off/On Road (HVOR) or [I] SENSATA's End Customer/ Commercial Business**. The specific requirements for the nonapplicable business segments do not apply to that specific award/component.

SENSATA expects that SUPPLIERS are experts with respect to industry specific standards and shall provide active support to SENSATA, to be able to deliver the perfect product and service to SENSATA Customers and end-consumers.

The content of the GSQM does not supersede or amend the terms of any policies of Sensata, which may be more detailed or restrictive.

## 3 SENSATA SUPPLIER CODE OF CONDUCT

SENSATA recognizes the shared values we have with customers, stockholders, employees, suppliers and the parties with whom we do business. We are committed to the highest standards of integrity and ethical behavior. We require third parties with whom we do business, to commit to similarly high standards.

SENSATA's [Supplier Code of Conduct](#) sets out the general requirements applicable to any SUPPLIER who provides goods or services to SENSATA. **We also expect SUPPLIERS to hold their supply chain, including subcontractors and third-party labor agencies, to the same standards contained in this Code.**

## 4 SENSATA SUPPLIER MANAGEMENT PROCESS

(ST: denotes Sensata Technologies)

### 4.1 ST Supplier Identification, Selection and Approval

All identified SUPPLIERS are evaluated to determine risks, adequacy of quality systems, development experience and technology/manufacturing capabilities, to continuously ensure the uninterrupted supply of high-quality products / services (ZERO-DEFECT) to SENSATA and its Customers.

The identified SUPPLIERS are assessed to the requirements defined in the SENSATA design, process and system documentation. This assessment may include a SUPPLIER self-survey, a SUPPLIER validation review, an on-site audit, and a Design for Manufacturing (DFM) review. Additional selection criteria is evaluated for parts that are classified as safety critical

The documented SUPPLIER Selection process, supported by cross functional teams at SENSATA, includes an assessment of software development and validation capabilities, in case of need.

### 4.2 ST Supplier New Component Sourcing

Component development for production is managed by the SENSATA Component Sourcing Process, which aligns and interfaces those requirements such as, but not limited to, Customer and End-User Industry requirements, the Product Development and Mass- Production Processes, etc.

Selected SUPPLIERS are expected to have the technical competence and proactive leadership, during program phases and mass-production, to ensure that all applicable requirements are met as required, prior to releasing product or information to SENSATA.

### 4.3 ST Supplier Performance Monitoring & Improvement

SUPPLIERS must demonstrate ongoing performance compliance to the agreed upon requirements. SUPPLIER's performance is monitored in key performance indicator areas including Quality, Delivery and Cost, to demonstrate continual improvement, ongoing capability/ compliance on the path to ZERO-DEFECT in programs and during volume production.

### 4.4 ST Supplier Corrective Actions & Escalation

SUPPLIERS shall establish and maintain a Quality Management System to protect SENSATA and our Customers from receiving non-conforming material, components, assemblies and services, see section 5.

In the event SUPPLIER's delivery performance has an adverse effect on SENSATA/Customer requirements or key performance indicators, the 8D-Corrective Action Process, CS (Controlled Shipment) or a SQIP (SUPPLIER Quality Improvement Plan/Process) shall be initiated.

If corrective and preventive actions are not effective, delayed or ongoing adverse effects continue demonstrating no improvement, or weaknesses cannot be eliminated in a robust way (re- occurrence of same issues), the Escalation Process will be initiated/reinforced (see also section 14.2/14.3/14.4/14.5).

#### 4.4.1 ST Supplier Business Hold / Supplier Disengagement

In the event SUPPLIER's performance does not demonstrate improvement during the escalation process described above, a disengagement process will be considered. This process will be initiated and communicated by the SENSATA Purchasing Team, including the launch of New Business Hold status as an initial, temporary stage or a permanent disengagement as the final stage. (see also section 14.5)



## 5 SUPPLIER QUALITY MANAGEMENT SYSTEM [QMS]

### 5.1 General Requirements

The SUPPLIERS QMS system shall ensure conformance of all products and processes, including service parts and those that are outsourced, to all applicable SENSATA, SENSATA customer, statutory and regulatory requirements.

The standards requirements are not repeated within this document (see section 7.3) to obtain a copy of the standard).

SUPPLIERS shall establish, implement, maintain and continually improve their QMS system, which is continually monitored against SENSATA requirements, Customer Specific Requirements (CSR) or expectations of other interested parties, requirements stated in this GSQM content, issued drawings /specifications, purchase orders, and/or separate purchase agreements, etc.

SENSATA requests that SUPPLIERS maintain a certification to the latest revision of ISO 9001, or according to the corresponding industry requirements AS9100 or IATF 16949 (see section 5.2) and upload applicable certificates to Sensata's Portal (Supplier Lifecycle Management – SLM), issued by an accredited third-party certification body. It is the responsibility of the SUPPLIER to ensure:

- **Certificate Scope:** The scope of the QMS is consistent with the component being submitted for the site(s), including any remote support locations, which may interface with the manufacturing sites (i.e., design centers, customer service, logistics, outsourcing, etc.).
- **Certificate Validity:** The certificate submitted to SENSATA is valid and not fraudulent. When it is identified that the certificate is fraudulent, SENSATA will be required to take immediate action by initiating a corrective action request from the SUPPLIER.
- The SUPPLIER is responsible for ensuring the necessary QMS systems are implemented at its sub-suppliers.

Information regarding 1<sup>st</sup>/2<sup>nd</sup>/3<sup>rd</sup> party SUPPLIER QMS audit results, should be made available to SENSATA upon request by the SENSATA Purchase Manager or Supplier Quality Team (SQM/ SQE), and may be taken into consideration for new business opportunities for SUPPLIER or SENSATA risk evaluation.

### 5.2 Industry Certification

SENSATA requires Component SUPPLIERS to maintain a valid third-party certification to the latest revision of the applicable QMS requirements as noted below.

All SUPPLIERS, shipping to SENSATA sites, shall provide evidence of third-party certification.

#### **Automotive & HVOR (On Road) Component SUPPLIERS**

**[T]** SUPPLIERS whose component is incorporated into SENSATAs automotive finished parts must (at a minimum) be certified to ISO 9001. It is the ultimate objective for each SUPPLIER to become IATF 16949 certified. Those suppliers who are not IATF16949 certified must submit a plan to become IATF16949 certified.

IATF 16949 8.4.2.3, describes the path to become certified to this QMS- standard, including Minimum Automotive Quality Management System Requirements (MAQMSR).

#### **Aerospace Component SUPPLIERS**

**[A]** SUPPLIERS whose component is incorporated into SENSATAs aerospace finished parts must (at a minimum) be certified to ISO 9001. It is the objective for each SUPPLIER to become certified to AS9100. Those suppliers who are not AS9100 certified must submit a plan to become AS9100 certified.

#### **Commercial/Industrial/ HVOR (Off Road) Component SUPPLIERS**

SUPPLIERS whose component is incorporated into a SENSATA finished parts must (at a minimum) be certified to ISO 9001.

#### **Medical Industrial SUPPLIERS**

SUPPLIERS whose component is incorporated into a SENSATA finished parts must (at a minimum) be certified to ISO 9001. It is the objective for each SUPPLIER to become certified to ISO13485.

### 5.3 Certification Exception

For those SUPPLIERS who are unable to obtain third-party QMS-certificates, a documented compliance plan must be submitted to the assigned SENSATA Purchase Manager or upon request to the assigned Supplier Quality Team (SQM/SQE) for review, acceptance (by SENSATA SQM, SQE) and monitoring.

The agreed plan must define the projected timeline, responsibilities, and actions to achieve a QMS certification by a third-party registrar. SUPPLIERS are responsible and accountable for the execution of the SENSATA accepted plan.

SENSATA may initiate an escalation process against SUPPLIERS who do not execute upon their agreed plan (see section 4.4& 14.2-14.5 for more details).

SUPPLIERS, who are not registered to an industry quality management standard as noted above, must have a QM-system in place to ensure they meet SENSATA's Quality, Delivery and Cost excellence expectation (ZERO-DEFECT).

SENSATA may schedule/request QMS compliance checks [SENSATA Process Assessment SPA] to measure the gap between fundamental QMS expectations and implementation at the SUPPLIERS site, to evaluate risks for SENSATA and SENSATA customers. The SUPPLIERS must correct identified weaknesses during a period defined by SENSATA.

## 6 PRODUCT SAFETY

***Sensata is committed to providing Products that are Safe by meeting our legal obligations by:***

***complying with safety and regulatory requirements and relevant standards***

***designing & manufacturing parts which mitigate unreasonable risk hazards***

***ensuring the health and safety of persons arising from use of our products***

***in the intended application for which they were made***

The SUPPLIER shall have documented processes for the management of product safety related products and manufacturing processes, which shall include, but not limited to the following:

- Identification by the SUPPLIER of statutory and regulatory product safety requirements
- SENSATA notification of requirements in item above
- Special approvals for design FMEA (Failure Mode and Effects Analysis) [in case of design by the SUPPLIER]
- Identification of product safety-related characteristics
- Identification and controls of safety-related characteristics of product and at the point of manufacture
- Special approval of control plans and process FMEAs with Safety Critical Characteristics on S9 & S10 failure effects
- Reaction plans in case of non-conformity or risk
- No rework is permitted on Safety Critical parts/features
- Defined responsibilities, definition of escalation process and flow of information, including top management, and SENSATA notification
- Training identified by the SUPPLIER or SENSATA for personnel involved in product-safety related products and associated manufacturing processes
- No temporary/ unqualified operators at product safety workstations
- Changes of product or process shall be approved prior to implementation, including evaluation of potential effects on product safety from process and product changes (see ISO 9001, Section 8.3)
- Transfer of requirements regarding product safety throughout the supply chain, including customer-designated sources
- Product traceability by manufactured lot (at a minimum) throughout the supply chain

- Lessons learned for new product introduction.
- Definition/ clarification if special approval needs to be defined between SENSATA and the SUPPLIER

In case the SUPPLIER is developing and manufacturing product safety components or assemblies for SENSATA, a “Product Safety Representative” shall be identified by the SUPPLIER management and a Safety Management Audit be performed and gaps addressed.

## 7 DOCUMENTATION AND RECORD MANAGEMENT

### 7.1 General Requirements

SUPPLIERS shall establish and maintain a procedure/structure to control all documents that relate to product and process requirements and the expectation of this SENSATA GSQM.

The process to control documents must include the origination, review, use, safe storage and change control of all documents. Document changes (latest revisions) are to be communicated to the impacted processes to ensure that the operations are being performed in a manner that meets product and process requirements. Document change history must be clearly noted.

Documents can be in any type of media, such as paper copies or an electronic format.

Documents may include:

- SENSATA Purchase Order and related documentation
- Drawings, customer and SENSATA Specifications, Component Specifications (form, fit & function)
- Failure Mode and Effects Analysis (FMEA), Control Plan, Work Instructions, Inspection/Testing Instructions/Plans, Control Charts, etc.

[T] SUPPLIERS shall clearly demonstrate the relationship between the requirements and the documented procedures in their own Quality Management System.

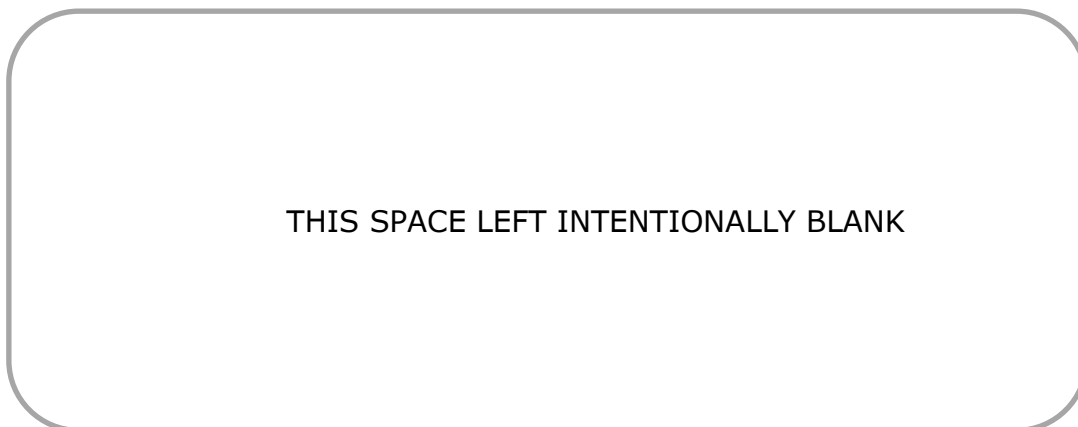
### 7.2 Product & Process Document Control

SENSATA requires SUPPLIERS to coordinate and obtain approval from SENSATA SQE, when previously approved production document changes are made that impact product function, testing and control methods according to Sensata’s RIS/Request for Initial Samples for PPAP/FAI documentation.

These documents may include, but are not limited to: FMEA, Control Plan, Inspection/Testing Method and Frequency, Equipment refurbishment frequency, etc.

### 7.3 Documents of External Origin

SUPPLIERS shall refer to the latest revision of the documents of external origin noted, but not limited to, documents listed in the table below, as applicable:



**Table 1 – Document of External Origin Listing**

*Suppliers are to reference the latest revisions of the documents of external origin, unless specifically specified by Sensata Sourcing and Supplier Quality Engineering Team*

REQUIREMENT	TITLE	LOCATION
ISO 9001	Quality management systems – Requirements	www.iso.org
ISO 10007	Quality management systems – Guidelines for configuration management	www.iso.org
ISO14001	Environmental management systems	www.iso.org
IATF 16949	Automotive Quality Management System	www.iatfglobaloversight.org
AS 9100	Aerospace Standard - Quality Management System Requirement	www.sae.org
AS 9102	Aerospace Standard – First Article Inspection Requirements	www.sae.org
AS 9103	Aerospace Standard – Variation Management	www.sae.org
AS 9003	Aerospace Standard – Inspection and Testing	www.sae.org
AS 9006	Aerospace Standard – Software Supplement for AS 9100	www.sae.org
ISO 26262	Road Vehicles -Functional Safety Automotive E/E Systems	www.iso.org
ECMP	Electronic Component Management Plan	www.sae.org
CP	<a href="#">AIAG - Control Plan</a>	<a href="#">www.AIAG.org</a>
APQP	AIAG - Advanced Product Quality and Control Plan	www.AIAG.org
FMEA	AIAG - Potential Failure Modes and Effects	www.AIAG.org
<a href="#">AIAG &amp; VDA FMEA</a>	<a href="#">AIAG &amp; VDA FMEA Handbook</a>	<a href="#">www.AIAG.org</a>
PPAP	AIAG - Production Part Approval Process	www.AIAG.org
SPC	AIAG - Statistical Process Control	www.AIAG.org
MSA	AIAG - Measurement Systems Analysis	www.AIAG.org
CQI-9	Special Process: Heat Treating System	www.AIAG.org
CQI-11	Special Process: Plating System Assessment	www.AIAG.org
CQI-12	Special Process: Coating System Assessment	www.AIAG.org
CQI-15	Special Process: Welding System Assessment	www.AIAG.org
CQI-17	Special Process: Soldering System Assessment	www.AIAG.org
CQI-23	Special Process: Molding System Assessment	www.AIAG.org
CQI-27	Special Process: Casting System Assessment	www.AIAG.org
CQI-29	Special Process: Brazing System Assessment	www.AIAG.org
CQI-30	Special Process: Rubber System Assessment	www.AIAG.org
Example: USCAR 21	Performance Specification for Cable-to-Terminal Electrical Crimps [see also other Customer specific standards of such application]	www.sae.org
ASME Y14.5M	ANSI - Dimensioning and Tolerancing	www.ansi.org
(ELVD)2000/53/EU	End of Life Vehicle - International Material Data System Directive (ELVD) 2000/53/EU	<a href="http://ec.europa.eu/environment/waste/elv_index.htm">http://ec.europa.eu/environment/waste/elv_index.htm</a>
EC 1907/2006 REACH, POPs - EU 2020/784, Conflict Free Minerals, WEEE / ELV / RoHS	Regulation EC 1907/2006 on Registration, Evaluation, Authorization (and Restriction) of Chemicals	<a href="http://reach.aiag.org/">http://reach.aiag.org/</a>
17 CFR Parts 229 and 249 Conflict Minerals	Title XV of the Dodd-Frank Wall Street Reform and Consumer Protection Act Conflict Minerals Reporting – Dodd Frank Section 1502, 1503, 1504	<a href="http://www.sec.gov/spotlight/dodd-frank/speccorpdisclosure.shtml">http://www.sec.gov/spotlight/dodd-frank/speccorpdisclosure.shtml</a>
Americas – E9898; Europe - QMS01106181	SENSATA Engineering Specification	Contact respective SENSATA Design Engineering and SENSATA SUPPLIER Quality Engineer
JEDEC	Global Standard for Microelectronics Industry	<a href="https://www.jedec.org/">https://www.jedec.org/</a>
AEC	Automotive Electronics Council – Component Technical Committee	<a href="http://www.aecouncil.com/index.html">http://www.aecouncil.com/index.html</a>

#### 7.4 Control and Retention of Records

SUPPLIERS shall establish and maintain a procedure defining the identification, collection, access, filing, storage and disposal of quality records.

Quality records shall be maintained to demonstrate conformance to specified requirements and the effective operation of the quality system.

All quality records shall be stored and retained in such a way, that they are readily retrievable and accessible, within an environment that provides safe storage conditions, suitable to prevent damage, deterioration and/or loss.

The specified retention periods shall be considered “minimums” and do not supersede any governmental or a specific customer requirement (see Table 2 for more details).

SUPPLIERS shall be responsible for notifying and flow down to their SUPPLIERS the requirements to retain and protect all documents and records referred to in this section.

If SENSATA record retention requirements for a specific product vary from those listed, special requirements shall be specified in the SENSATA requirements and purchase order for that product.

In the event of a termination of business, all SUPPLIERS shall be contacted in order to transfer any applicable records pertaining to products or services provided to SENSATA.

SUPPLIERS shall make records available for review when requested by the SENSATA Purchasing organization or the SENSATA Supplier Quality team.

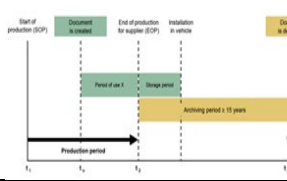
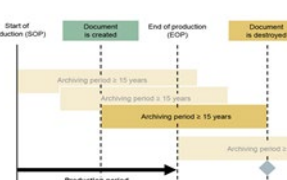
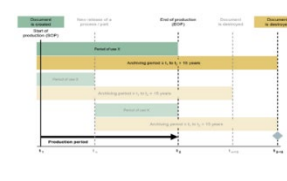
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**Table 2 - Record Retention**

Periods mentioned below are minimums but may be superseded by Governmental requirements, Customer Specific Requirements – CSR and industry specific standards.

[Example [T]: Customer CONTINENTAL: All documents “at least 15 years, after production has been terminated and scrapping of tooling has been granted”, valid for element: III, IV, V, VII, VIII, IX (see table 2)]

Product Active Life = Length of time that the part (or family of parts) is active for production and service requirements [EOP], plus one calendar year unless otherwise specified by SENSATA.

Record	Industry Retention Period [n.a.= not applicable]			
	Commercial [I] HVOR off road [H]	Automotive [T] HVOR on road [H] - See also VDA1 for more details -	Aerospace [A]	Medical [M]
<b>I. Quality requirement documents</b> <u>[covered by an updating system]</u> , example: QM- Manual, QM procedures, Production Control plan [Prototype, Launch, Production and Safe Launch], test/ inspection description, Standards, Guidelines, Work instructions, Process descriptions, test/ inspection instructions, limit samples/ scales ....	3 years	Product Active Life + 1 year (minimum 15 years after the process is rendered invalid) 	40 years	15 years
<b>II. Management Review</b>	3 years	3 years	3 years	3 years
<b>III. Quality records</b> <u>[must not be altered]</u> , example: Manufacturer specific titles, such as job card, batch tracking card, ... Results of <u>System, Process and Product audits</u> , QM System certificates. Process characteristics results, test and inspection capability certification, process releases, Results of FMEA analysis, Process capability certification, test/ inspection results. Corrective action records, Rework certification if relevant. Product audit results. Qualification certification. Product related records: Test/ inspection reports, control charts, product certificates, product releases ....	3 years	Product Active Life + 1 year (minimum 15 years after creation) 	40 years	15 years
<b>IV. Product Development Records</b> APQP incl. Design Verification, Tolerance studies, Control Plans, etc.	3 years	Product Active Life + 1 year (minimum 15 years after creation)	40 years	15 years
<b>V. Change Management and Engineering Changes</b>	3 years	Product Active Life + 1 year (minimum 15 years after creation)	40 years	15 years
<b>VI. First Article Inspection</b>	n.a.	n.a.	40 years	15 years
<b>VII. Production Part Approval</b>	Year of Expiration plus 10 years	Product Active Life + 1 year (minimum 15 years after end of production) 	40 years	15 years
<b>VIII. Annual Validation</b>	n.a.	Product Active Life + 1 year (minimum 15 years after creation)	n.a.	n.a.
<b>IX. Traceability</b>	3 years	Product Active Life + 1 year (minimum 15 years after creation)	40 years	15 years
<b>X. Product Specifications:</b> Purchase Orders and Amendments, drawing, BOM, ...	Year of Expiration plus 10 years	Product Active Life + 1 year (minimum 15 years after creation)	40 years	15 years
<b>XI. Purchase Orders for Customer Owned Tooling</b>	Year of Expiration plus 10 years	Product Active Life + 1 year (minimum 15 years after creation)	40 years	15 years
<b>XII. Preventive Maintenance</b>	1 year	3 years	3 years	

## 7.5 Configuration Management

[A] SUPPLIERS shall establish, document, and maintain a configuration management process appropriate for the component.

Configuration Management is a process for establishing and maintaining consistency of a product's performance, its functional and physical attributes with its requirements, design and operational information throughout its life.

Guidance on configuration management is provided in ISO 10007.

## 8 Management Responsibility of the SUPPLIER = Customer Satisfaction

### 8.1 Customer Satisfaction

SUPPLIERS shall ensure that SENSATA requirements are determined and met with the intent of enhancing customer satisfaction, monitoring trends within the processes, that production and quality systems are in place, to assure effectiveness and efficiency.

SUPPLIERS who have not yet achieved ZERO-DEFECT, in programs and mass production, related to parts and services provided to SENSATA, are immediately required to define a ZERO-DEFECT roadmap, which may be requested by SENSATA Purchase and/ or SENSATA SQM/SQE at any time.

### 8.2 Product and Process Special Characteristics SC or Key Characteristics, part 1 (KPC = Key Product Characteristic/KCC = Key Control Characteristic)

Throughout the product lifecycle (development, pre-launch, serial production and service parts) the SUPPLIER shall establish and document the method of identifying and controlling the flow down of all product Special Characteristics [Key Product Characteristics (KPC) and Key Control Characteristics (KCC)] that are Customer, SENSATA and SUPPLIER identified as outlined in section 10.1.

Control is considered by means of interface dimensions, functional testing, aging and simulation tests, re-qualification frequency and scope, etc. The identification and control requirements must flow down to the operator level, such as in work instructions, visual aids, inspection and testing plans.

The identification and control shall also be considered throughout all stages of the product quality/control plan development, such as prototype, pre-launch, safe launch and serial/mass-production.

The required inspection details, testing acceptance criteria (including sample size, frequency documentation and actions to launch in case of non-conformity or abnormality), machine parameter follow up, tooling and maintenance status, shall be detailed in the Control Plan/ documented in procedures and instructions.

### 8.3 Acceptance Criteria

SUPPLIERS shall proactively initiate the identification of acceptance criteria requirements throughout the product lifecycle for the component, commodity and equipment/tooling being sourced. This includes all relationships involved between SUPPLIERS, Sub-tier and SENSATA. SENSATA SUPPLIER Quality Engineering will support and require that acceptance criteria and standards are defined to avoid misunderstanding and vagueness.

Together with the assigned SENSATA SQE, the SUPPLIERS shall clarify acceptance criteria at least for Special Characteristics and the methods to control them, such as measurement and test procedures, checking frequencies, inspection sample size, failure catalogues, boundary samples, gage selection, including the required documentation.

Approved criteria sample representative(s) that are provided by SENSATA containing a permanent signature and date, are to be retained in a manner to preserve the integrity of initial part condition.



## 8.4 SUPPLIER Escalation Process in Programs, Serial Production and Aftermarket [Service/ Spare parts]

SUPPLIERS shall establish a robust escalation process, to ensure advance notification to SUPPLIER management and SENSATA to mitigate issues that may jeopardize the key deliverables, such as, but not limited to: Quality, Program Deliverables and Delivery (Line Shut or Stoppage, etc.).

A proactive notification to the assigned SENSATA Purchasing Manager and SQM by the SUPPLIERS, where the risk to SENSATA or its Customers' final products and programs are impacted, including any products previously shipped, referred to warranty or field, is expected.

This Escalation Process and the related advance notification also applies to issues resulting from the SUPPLIER's sub-SUPPLIERS (related to sub-components, sub-materials and contracted services).

## 8.5 Change Control, Notification and Approval

SUPPLIERS shall have a **process to control and react to changes** that are initiated internally and externally, including those initiated by SENSATA. Such changes that affect the product realization and related processes shall include product design, process design, manufacturing, etc.

For proprietary design, impact on form, fit and function (including performance and/or durability) shall be reviewed with the assigned SENSATA SQE, so that the effect can be properly evaluated and assessed for risk.

Change initiated by the SUPPLIERS and sub-SUPPLIERS, that affect SENSATA product and process requirements throughout all stages of the product lifecycle, initial production release, development, serial production and service, **require** that a written **SUPPLIER Request for Engineering Approval (SREA)** be submitted to SENSATA Procurement, including information of SENSATA Supplier Quality Engineering.

Prior to any change, the approval of SENSATA Procurement is mandatory.

- a) Typical MAJOR changes may include, but are not limited to:
- b) MOVEMENT | Facility, equipment, warehousing, etc.
- c) CHANGING | Component material, SUPPLIER source, testing method/frequencies, etc.
- d) IMPROVEMENT | "Lean"- efforts, Continual Improvement projects (HOSHIN, KAIZEN), Six Sigma actions, etc.
- e) ADDITIONS & REMOVALS | Add or removal of tooling and equipment, etc.

In case of questions, contact SENSATA Purchasing and the assigned SENSATA SQE, if there are questions as to whether an official, written notification of SENSATA is needed or not.

For all Electronics a recognized Process change notification methodology should be considered. Reference ZVEI PCN Delta- Qualification Matrix.

### **REMINDER:**

SUPPLIERS are required to notify and obtain approval prior to implementation of the identified **change** from the SENSATA Procurement Manager. This notification shall occur at the conception of potential change(s) at the SUPPLIERS or Sub-SUPPLIER, to provide ample time for review and approval by SENSATA and its customers prior to the implementation of the change.

SUPPLIERS shall use the **SREA- form (QMS-1006304)** available on the [Sensata Supplier Portal](#) to communicate with SENSATA Purchasing Manager for review, documentation and potential approval. SENSATA SQE and other cross functional teams will be involved. SENSATA expects SUPPLIERS to include, as part of the SREA, a risk assessment/mitigation concept and validation plan. The "risk-based thinking assessment" should consider the 6M-factor methodology (machine, man, method, materials, environment and measurement). For Automotive Electronics Components the Risk assessment should be accompanied with a test plan and outline the testing being considered and the rationale behind them. Test Results in form of generic data can be considered where notified and justified.

The product is validated taking into consideration of the materials, approved process, controls, and dimensional compliance. Failure to notify Sensata proactively of any changes to these items prior to implementation through the SREA approval process, will result in liability for any financial impacts generated by noncompliance.



SUPPLIER change notifications are required to meet SENSATA customer change notification and timing of submission before implementation of any change.

In order to ensure SENSATA compliance to end customer requirements, flow down of change notification lead-time ranges are: 6-18 months for HVOR, Industrial and Aerospace and 12-18 months for Automotive, depending on the significance of the change. SUPPLIERS must consider those circumstances when notifying SENSATA about planned changes.

Examples that do not require notification to SENSATA, but require before and after inspection records, as well as lot control records, include equipment and tool maintenance; repair of broken tooling or equipment; or replaced expendable tooling or fixtures; change of manpower and new lots of approved materials; or similar.

All changes noted above in this section 8.5, shall be managed, monitored, measured and recorded throughout pre- and post-change process, with consideration to all affected Special Characteristics (product and process) or relevant parameters, including validation plans and results. Change of validation plans and results must be made available to SENSATA SUPPLIER Quality Engineering and SENSATA CUSTOMER Quality Engineering, upon request.

Recording of Change description in the history for product and process documentation shall be controlled. (see Table 2 - Record Retention).

## 8.6 Control of Outsourced Processes Relationship

SUPPLIERS (TIER 1) shall notify SENSATA regarding any outsourcing processes, prior approval before execution by SENSATA Purchasing Manager is mandatory and required. SUPPLIERS shall ensure full control over outsourced processes (TIER 2).

The requirements outlined in the Global Supplier Quality Manual apply to TIER 2 SUPPLIERS and the TIER 1 SUPPLIER is responsible to ensure compliance.

SUPPLIERS shall notify SENSATA Purchasing Manager and SQM/SQE prior to implementation of any change in the outsourced process relationship between the SUPPLIERS and their respective TIERS.

SENSATA will initiate Containment/Corrective Action and escalation as appropriate to the violations for non-compliances to the GSQM requirements for TIER 2 SUPPLIERS.

The control over TIER 2 SUPPLIER processes, does not absolve the TIER 1 SUPPLIER of the responsibility for product conformity to all SENSATA requirements, including costs incurred by SENSATA due to quality nonconformance, incidents, and delivery disruptions (see section 13).

## 8.7 SUPPLIER Contingency Plans

SUPPLIERS shall maintain a contingency plan to satisfy SENSATA requirements in order to maintain continuity of quality product delivery in the event of an emergency.

These plans are to be made available upon request of SENSATA.

Emergencies may include, but are not limited to, natural or human disasters, utility interruptions, labor shortages, raw material or sub-component shortages, cyber-attacks, key tooling or equipment failures and field returns. Contingency plans shall consider communication methods and contacts necessary to facilitate timely exchange of information between SUPPLIERS and SENSATA.

# 9 PROCUREMENT MANAGEMENT OF THE SUPPLIER

## 9.1 Purchasing Process

SUPPLIERS shall use the Supplier and/or SENSATA and SENSATA Customer's approved sources when specified on prints or purchase orders.

All SUPPLIERS and Sub-SUPPLIERS must conform to Quality Management System requirements as described in section 5, including SENSATA designated sub-SUPPLIERS. This does not absolve the SUPPLIERS from the responsibilities to ensure qualification and requirement compliance.

## 9.2 Statutory and Regulatory Conformity

SUPPLIERS shall comply with the statutory and regulatory requirements related to the sourced product.

Each supplier must provide the contact details of their person responsible for compliance.

SUPPLIERS shall provide the component material information as requested by the assigned SENSATA Purchase Team and SENSATA SQE, such as, but not limited to:

ALL SUPPLIERS shall provide full material disclosure.

- Suppliers in the automotive sector shall enter all component Material and Substance Data using the most up to date version of the International Material Data System (IMDS).
- Suppliers in all other sectors have the option to use the most up to date version of IMDS or agree to provide material content data in the method agreed upon Sensata.
- Suppliers shall ensure that there is a trained and competent representative available for submitting entries into the IMDS or other system, as well as resolving any issues that may arise during the submission process.
- See section 10.16 for more information.

Examples of applicable regulations include, but are not limited to:

- The latest release standard of amended POPs, EC 1907/2006 on Registration, Evaluation, Authorization (and Restriction) of Chemicals (REACH).
- 17 CFR Parts 229 and 249 Conflict Minerals Reporting requires that materials or production process for those components purchased by SENSATA or SENSATA third party SUPPLIERS meet the conflict mineral reporting per the requirements set forth in section 1502 of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010.

Prior to any shipment into the U.S., the Supplier is to ensure the shipment does not contain unauthorized material per the U.S. CTPAT minimum security requirements. Suppliers not shipping to the U.S. should maintain any equivalent supply chain security programs administered by the affected regions. For information on becoming CTPAT certified, go to <http://www.cbp.gov/border-security/ports-entry/cargo-security/c-tpat-customs-trade-partnership-against-terrorism>.

## 9.3 Verification of Purchased Products

SUPPLIERS are responsible for purchased products. Therefore, SUPPLIERS shall have a process to assure the quality (ZERO-DEFECT) of purchased products that may include, but is not limited to:

- a) Obtaining objective evidence of quality of products from sub-SUPPLIERS (e.g., accompanying documentation, certificate of conformity, test reports, statistical records, process control)
- b) Inspection and audit at sub- SUPPLIERS premises
- c) Review of the required documentation
- d) Inspection of products upon receipt
- e) Delegation of verification to the SUPPLIER, or SUPPLIER certification
- f) Utilize Corrective Action Methodology when Sub-SUPPLIER provides Non-Conforming raw material and sub-components
- g) Monitor sub-SUPPLIER for ongoing performance and ensure Continual Improvement

Purchased product shall not be used or processed until it has been verified as conforming to specified requirements, unless it is released under positive recall methods or procedures.

## 10 PRODUCT & PROCESS DESIGN AND DEVELOPMENT PLANNING

# B

The following sections apply to new, derivative or changed, product and process development activities.

### 10.1 Risk based thinking - Risk Assessment

SUPPLIERS shall have a risk assessment and mitigation process to review and document the associated risks of a product or program related to: new technology, reduction in program timing, frequent or late changes, resource/staffing requirements and qualification, manufacturing feasibility, definition of special characteristics (including pass thru-characteristics), functional and dimensional challenges, product quality, delivery conditions, cost saving opportunities, etc.).

SUPPLIERS are to initiate, when requested by SENSATA Purchasing, the **Design For Manufacturability [DFM]**-process, to identify potential risks to ZERO-DEFECT related to the component being sourced by SENSATA. The purpose of the DFM is to proactively identify risks early within the development stages, prior to production release (not after), and to act accordingly.

SUPPLIERS are to interact with SENSATA Design Engineering and the SENSATA SQE, in the DFM evaluation process to review the risks and opportunities associated with the component being sourced.

In the case where risks have been identified a mitigation action plan must be documented and managed by the SUPPLIERS to drive closure to resolution.

### 10.2 SENSATA Design Control

The component is completely designed, developed and specified by SENSATA.

SUPPLIERS are expected to collaborate throughout the product lifecycle from development to serial production stages, as a technical expert of the component or process being sourced by SENSATA.

This partnership is to provide an opportunity to proactively contribute to the robust design of SENSATA designed products. Objectives should focus on risk mitigation, DFM, FMEA, lessons learned from previous projects or designs, process and special requirements, value added options, etc., to prevent a negative impact to ZERO-DEFECT throughout the whole supply chain to the final Customer or User.

### 10.3 SUPPLIER Design Control

A component/product/service completely or partly designed, developed and specified by the SUPPLIERS is required, to meet the SENSATA and SENSATA customer expectation related to Quality, Delivery and Cost.

SUPPLIERS shall have a process to manage and control the design development activities, ensuring a robust design of its products by the use of the following: risk analysis/mitigation, lessons learned from designs, process requirements, value-added options, Six Sigma, etc. The objective is to avoid risks throughout the product lifecycle, ensuring ongoing quality, reliability and durability expectations and specifications to meet SENSATA and Customer ZERO-DEFECT expectations.

SUPPLIERS design activities are to include the following: development and maintenance of dFMEA's and pFMEA's, design reviews, product validation related to quality, reliability and durability challenges of the product.

SENSATA encourages a collaborative exchange with the SUPPLIERS throughout the product lifecycle from development to serial production stages, to promote technical improvement and risk mitigation by all parties.

### 10.4 Advanced Product Quality Planning [APQP]

SUPPLIERS are to have an understanding and working application of APQP methodologies and tools during the Product Lifecycle from development through serial production, in the review of new products and processes and changes to products and processes, (see section 8.5 and 8.6).

APQP is an integral part of product design and development, tooling and equipment design and selection manufacturing methods and inspection procedures to ensure ZERO- DEFECT in mass-production.

The target is to “Build in Quality” with inputs into the design of a product, as well as into the process that will produce the product.

(T) Required to follow latest AIAG APQP requirements

(All others) List of required Quality Planning documents will be listed in the [Request for Initial Sample \(RIS\)](#).

SUPPLIERS shall utilize internal cross functional teams to prepare the production of new or changed products.

Conducting a complete manufacturing feasibility study (Risk Assessment) and mitigation plan, including tool life determination under mass-production conditions, including SUPPLIER sub-tiers.

Those teams typically include Design, Manufacturing, Engineering, Quality, Logistics, Production and Purchasing personnel.

SUPPLIERS shall make available the evidence required to support the APQP deliverables (see section 7.4 Table 2 Record Retention). Examples of such evidence include, but are not limited to, the following:

- Review of SENSATA customer applicable requirements and standards
- Review of SENSATA requirements, drawings and applicable specifications
- Review and application of “Lessons- Learned” of previous projects
- Use of a defined project plan, defining schedule, responsibilities including SENSATA timeline and milestones throughout the development and production release phases
- Identification and control of Critical and Significant Characteristics, including, where applicable, flow down to Sub-Tier SUPPLIERS
- Conducting a complete manufacturing feasibility study (Risk Assessment) and mitigation plan, including tool life determination under mass- production conditions
- Identifying the tool life and method of control, as identified and agreed by SENSATA Purchasing Team
- To implement and maintain a process for software quality assurance for their products, in case of automotive products with embedded software, evaluating risk and potential impact to any customer of the supply chain
- Development and management of FMEAs, including actions to reduce any risk.
- Development and management of Control Plans at all stages, prototype, prelaunch, production stages within the Project plan
- Identification, sourcing, control, and qualification of all applicable gauges, test equipment throughout the product lifecycle, including their development and production release phases
- Define, control and validate the methods of measurement systems and testing facilities used during project plan
- Identify, select, approve and release of Sub-SUPPLIERS including the control of requirements, as well as any changes (see also section 5 and 8.6).
- Validation of Product Design and Process Design
- Perform and record results of production trials throughout the development and pre-launch stages (RUN@RATE), with presence of valid representatives
- Review and define controls for packaging specification including validation to ensure product preservation, and when applicable packaging approval (i.e.: PPAP/FAI)
- Document and control PPAP/FAI requirements at all stages of component management including SENSATA and Sub-SUPPLIER
- Define, control and document Safe Launch Control to protect SENSATA during ramp up of production stages (Temporary Quality Walls/ Controlled Shipment, additional laboratory inspection, etc.)
- Identify a Cross Functional Team to manage, review, document and take action at all stages of the SENSATA project efficiently (including 8D, PDCA action plan, Single List of Issues (SLI), etc.)
- Define the Escalation process with identified responsibilities (see section 8.4).

Unless otherwise stated in writing by SENSATA Purchasing and Supplier Quality Engineering, all APQP elements shall be implemented that are dependent on the SUPPLIERS level of involvement in the component design control (see section 10.2 and 10.3).

The APQP process elements are to be controlled and managed by SUPPLIERS as a living process. The elements may require updates and changes to reflect the current product design and process and shall be documented within the SUPPLIER change management process and SENSATA as noted in section 8.6.

According to the nature of the component and depending on the specified requirements, the appropriate statistical tools and techniques for each process shall be identified during the advanced quality planning and product realization processes and documented in the Control Plan.

## 10.5 Special Characteristics Identification and Control, part 2

A Special Characteristic is a product characteristic (material, dimension, performance) or a process parameter whose variation can affect compliance.

### **Product Safety [Safety] - SCC & Critical Characteristic [Safety & Regulation] - CC:**

- Compliance with safety requirements for the user of a vehicle or a product
- Compliance with regulations (environment, safety)

### **Significant Characteristic - SC:**

- Do not relate to safety or regulatory considerations, but relate to Fit, Form or Function
- Compliance to SENSATA and SENSATA CUSTOMER product requirements related to quality, reliability or durability

SUPPLIERS shall have a method to identify and control the flow down of this designated Special Characteristic as identified by SENSATA, SENSATA CUSTOMER and SUPPLIER, including Sub-SUPPLIER.

The flow down is to include, but is not limited to, the following process steps and control documents, drawings, specifications, Key Characteristics list [including Pass Thru Characteristics], FMEAs, Control Plan and Work Instructions, equipment and process parameter control sheets, etc.

SENSATA requires SUPPLIERS to comply with the “Characteristics Symbol Identification and Control” table (see also Appendix A), unless agreed upon in writing by the assigned SENSATA Design Engineering and/or SQE.

## 10.6 Risk Assessment

### **(T, H) Failure Mode & Effects Analysis [FMEA]**

The FMEA is a preventive analysis methodology, aimed at reducing the risks throughout the product lifecycle. The process is initiated at the product and process design stage, taking into consideration those effects that affect functional specification compliance. FMEAs are considered as living documents and should continually reflect the product and process lifecycle ([T] see also AIAG/VDA FMEA manual).

SUPPLIERS must have a process to apply the FMEA methodologies related to design, reliability, safety, process, quality and durability challenges of the product. The FMEA process shall consider development, action prioritization, change control and monitoring action management for the failure modes identified. As part of the RIS/Request for Initial Samples process for PPAP documentation requirements, the FMEA process and methodologies are to be presented and agreed upon.

SUPPLIER FMEAs shall include those CC/SC and other relevant characteristics, identified by SENSATA and SENSATA Customer, as part of the risk identification and mitigation to ensure ZERO-DEFECT.

The FMEA analysis process must be performed by a cross functional team, considering the three factors related to the potential risk and the assigned ranking. The multiplication of all three rankings results in the [RPN] Risk Priority Number.

**RPN = [S] Severity x [O] Occurrence x [D] Detection**

The use of an RPN threshold is **NOT** a recommended practice for determining the need for actions. Applying thresholds assumes that the PRNs are a measure of relative risk (which they are not) and that continuous improvement is not required (which it is).<sup>1</sup>

SUPPLIERS shall act on the failure modes with the highest RPN, however, prioritization of actions should take into consideration those failure modes with the highest individual ranking of [10-9] of all three factors: S | O | D.

The actions to reduce the risks shall be directly related to the failure mode, such as, but not limited to, design changes, controls, process prevention, Poka-Yoke implementation, error proofing, mistake catching, etc.

SUPPLIERS shall consider a pareto-principle methodology for implementing improvement actions on those failure modes of S | O | D with [8 -6].

SUPPLIERS are expected to have continual improvement efforts to achieve SENSATA quality expectations, (ZERO-DEFECT or 0 ppm) with focus on reducing risks, that serve SUPPLIER, SENSATA and SENSATA Customers (Example: Top 10 Worst Detection Cases).

Application of reverse FMEAs to switch from corrective to preventive mode to support continual improvement, as the SUPPLIER shall challenge, at shop floor level, the existing FMEA and defines corrective actions in case of need.

(ALL Others) Risk assessment methodology to be performed however the format to be agreed upon with the SQE

### 10.6.1 Design FMEA [dFMEA]

Identifies potential failures of the product design during the complete lifecycle of the product (part manufacturing, sub-components assembly, part handling, car assembly, final Customer use, product end of life etc.). It applies to all products designed by and for SENSATA.

SUPPLIERS shall review the dFMEA with each product design change to validate the impact of the change on the failure mode [S | O | D] of the product.

### 10.6.2 Process FMEA [pFMEA]

Identifies potential failures of the product due to the manufacturing process from raw material through the production, as well as distribution to Customer use i.e., subcomponent manufacturing (electronics, injection molding, machining, etc.), subcomponents assembly, transportation, part handling, product assembly, etc., and applies to all products manufactured by the SUPPLIER and/or Sub-SUPPLIERS.

SUPPLIERS shall review the pFMEA or other risk assessment tools with each process change to validate the impact of the change on the failure mode [S | O | D] of the product and process. (Example: Process changes, new process, changes in layout of process flow, material changes, Sub- SUPPLIER addition or changes, etc.).

Reviews and potential updates of FMEAs (including reverse FMEA) are also part of an 8D process (after claims – Corrective Action Response Excellence (CARE) -, etc.).

## 10.7 Control Plan

SUPPLIERS shall establish and maintain a process that identifies product and process parameter controls for the Special Characteristics (CC/SC) and other relevant characteristics from receiving inspection through shipment.

SUPPLIERS shall ensure those characteristics are stipulated in the process flow and the Control Plan, describing the measurement control method of the part/ process, typically referred to as a Product Inspection Standard, and must be made available for review and approval by the assigned SENSATA SUPPLIER Quality Engineering team.

Control plans are considered living documents and should continually reflect the product- and process lifecycle.

Typical content of a Control Plan:

\_\_\_\_\_

<sup>1</sup> AIAG/VDA Potential Failure Mode and Effects Analysis – FMEA (1<sup>st</sup> Edition)



- What to check?
- How to check?
- The checking frequency and the sample size
- The acceptance criteria, attributive / appearance and variable criteria
- Documentation of results
- The reaction mode in case of non-conformity

SUPPLIERS must develop and submit for review the Control Plan and process flowchart/diagram for the product to the assigned SENSATA SQE.

During the pre-launch trials (Run@Rate), the SUPPLIERS must conduct testing, process analyses and validation to support the contents of the Control Plan. During the Process and Product validation process, the control plan to be reviewed/updated to reflect changes necessary to control the ZERO-DEFECT process.

Submissions of changes to the Control Plan during the pre- launch phase and after PPAP/FAI must be submitted by the SUPPLIERS and approved by the assigned SENSATA SQE.

## 10.8 Statistical Process Control [SPC]

Depending upon the nature of the component and depending on the specified requirements, the appropriate statistical tools/techniques for each process shall be identified, during the Advanced Quality Planning, Product Realization Processes and documented in the Control Plan/ Work Instruction.

SUPPLIERS shall initiate a reaction plan from the Control Plan for characteristics that are either not statistically capable or are unstable.

- The reaction plans shall include **containment** of the product and 100% inspection, as appropriate (in case short term/ long term capability indicators are below target, see section 18)

SUPPLIER's reaction plans must identify specific timing and assigned responsibilities to ensure that the process achieves the stable and capable requirements (ZERO-DEFECT). Corrective actions shall be implemented by the SUPPLIER to **permanently** sustain the capability requirements defined by SENSATA.

The plans shall be reviewed with and approved by the assigned SENSATA SQE.

SUPPLIERS shall submit upon request the SPC capability data (ppk, cpk) on CC/SC and SPC controls within 24hours from the request made by the SENSATA SQE.

This process shall result in the following records to be retained by the SUPPLIERS, according to section 6, reaction plan, corrective actions and effective date of process changes.

## 10.9 Work Instructions

SUPPLIERS shall document and control work instructions for all employees having responsibilities for the processes that affect conformity to product requirements.

Work instructions shall be derived from FMEAs and Control Plans and accessible for use at the workstations. Any media method may be used to document and control work instructions.

## 10.10 Design and Product Validation

SUPPLIERS shall perform product design and development validation in accordance with the program timing and in close collaboration with the assigned SENSATA Purchase/ Supplier Quality team and SENSATA Design Engineering.

The validation plan and results for component testing/verification shall provide evidence of the achievement of requirements of drawings and related SENSATA and SENSATA Customer specifications.

### 10.11 RUN@RATE (Process Potential Study)

SUPPLIERS shall have the ability to perform full speed tests to provide a preliminary study of the ability of the serial production equipment, process, people, etc. to produce the product to achieve the required capability targets, including special characteristics confirming production readiness and ZERO-DEFECT.

SUPPLIERS are to schedule accordingly to the program timing, the RUN@RATE study in coordination with the SENSATA SUPPLIER Quality Engineer.

SUPPLIERS shall document the full speed test studies using the SENSATA “RUN@RATE worksheet QMS-1006309” [located on the Sensata Supplier Portal](#). The documentation is to include objectives for the manufacturing process capability, reliability, maintainability and availability, as well as acceptance criteria of characteristics.

Results of the RUN@RATE are to be shared with the assigned SENSATA SUPPLIER Quality Engineering team and Purchasing Program Manager, in a timely manner.

The results of the RUN@RATE status will require the following:

■ **RED & ■ YELLOW:** Process capability targets not confirmed – corrective actions required - new RUN@RATE should be planned until the status changes to level GREEN.

■ **GREEN:** Process capability targets achieved and confirmed – continual process capability monitoring as agreed with the assigned SENSATA SQE.

**NOTE:** RUN@RATE studies are to consider Special Characteristic capability as defined in APPENDIX A – SENSATA Characteristics Symbol Identification and Control.

### 10.12 Control of Inspection, Testing and Equipment and Measurement Systems Analysis

All devices used to test and measure production parts according to product specifications and requirements (drawings, inspection standards, process control requirements or other quality standards) are to be controlled throughout product lifecycle from development, serial production to manufacturing of service parts/aftermarket products.

SUPPLIERS shall have a defined process to identify, control and maintain inspection related tools such as checking fixtures, gages, or other inspection/test equipment, which are used to measure product requirements against defined specifications and Control Plan.

All inspections, tests and equipment must have 10 times more resolution than the tolerance of the dimension and be calibrated annually, at a minimum [unless approved in writing](#). Shorter frequencies may be warranted, when supported by the SUPPLIERS Measurement Systems Analysis (MSA) process or equipment wear risk.

SUPPLIERS shall define the methods - instructions to handle – and perform the measurement and testing to avoid negative variability impact or differences, as agreed upon with SENSATA SQE and Design Engineering.

([T] SUPPLIERS are to refer to the AIAG Measurement Systems Analysis Reference Manual)

SUPPLIERS shall have a process defining the manner of recall when an inspection, testing or equipment is found to be out of calibration or error in testing method. This process shall consider all products produced within the defined timeframe, including notification of SENSATA SQE (see section 13).

### 10.13 Calibration/Verification Records

SUPPLIERS shall maintain a record/register of the calibration/verification activity for all gages, measuring and test equipment needed to provide evidence of conformity of product to determined requirements, including employee and Customer owned equipment.

The record/register shall include:

- a) Unique equipment identification
- b) GRR study results (equipment! and users!)
- c) The measurement standard against which the equipment is calibrated



- d) Revisions following engineering changes
- e) Any out-of-specification readings as received for calibration/verification
- f) An assessment of the impact of out-of-specification condition
- g) Statements of conformity to specification after calibration/verification
- h) Notification if suspect product or material has been shipped, because of poor measurement equipment.

## 10.14 Laboratory Management

### 10.14.1 Internal Laboratory Requirements

SUPPLIERS internal laboratory facilities shall have a documented scope of its capabilities to perform the required inspection, test or calibration services.

SUPPLIERS shall specify and implement within the laboratory, at a minimum, the technical requirements and management for:

- a) Adequacy of laboratory procedures
- b) Competency of laboratory personnel
- c) Testing of the product, capability to perform these services correctly, traceability to the relevant process standards (such as ASTM, EN, etc.)
- d) Review and control of related records

### 10.14.2 External Laboratory Requirements

External/commercial/independent laboratory facilities used for inspection, test or calibration services by the SUPPLIERS shall have a defined laboratory scope that includes the capability to perform the required inspection, test or calibration, and either an:

- a) External laboratories shall be certified to ISO/IEC 17025 or national equivalent or,
- b) Documented approval of the external laboratory by SENSATA SQE

## 10.15 Control of Initial Samples Related to a Program (New Product Development or Change Management)

### 10.15.1 Request for Initial Samples – RIS

SUPPLIERS shall have a process to manage requests for initial samples. Initial samples are considered as a small quantity of parts, produced on serial production equipment, tooling under serial process conditions, where parts are assured to meet the relevant dimensional/functional requirements.

Latest at this stage, the required PSW/ PPA- submission report level should be defined (see section 10.16.2).

Upon request for initial samples from SENSATA Purchasing or SENSATA SQE using the [Request for Initial Samples \(RIS\) QMS-1004961 located in SLaM and in the Sensata Supplier Portal](#). SUPPLIERS shall provide the following according to the information provided on the RIS Form:

- a) Distribution and process capability indicators, for the defined special characteristics or relevant characteristics indicated on the drawing
- b) Process flow diagram
- c) Control Plan
- d) Initial Sample inspection report

When a product criterion is detected to be out of tolerance during the initial sample inspection, SUPPLIERS shall notify SENSATA SQE for disposition resolution. Potential deviation approval must be granted prior to shipping product.

SUPPLIERS shall have a process to recall product already shipped to SENSATA, including prior notification of SENSATA SQE (see section 13 for more details):

- Non – conforming material or
- Deviation- Derogation request/ Concession / Waiver

### 10.15.2 Initial Sample product identification - Engineering Sample/ PPAP Sample identification

SUPPLIERS shall have a process to clearly identify initial samples/ engineering samples from serial production shipments. All sample products must be identified/labeled as follows:

- Individually numbered (on product, on individual bag or any other meaningful solution), securely linked to individual measurement results
- Name of the SUPPLIER, location and contact name
- Part description and reason for sampling
- Part number and release level
- Production date /lot number
- Quantity
- In case of embedded software: Software release level, including detailed validation documentation
- Inspection status
- [SREA/Deviation](#) number/-details

The type of label, content, size or color shall be determined in cooperation with the assigned SENSATA SQE.

## 10.16 Product/Process Approval Management

Due to the various industry markets served by SENSATA and our SUPPLIERS, it is imperative that both parties understand the requirements and ensure compliance to the product approval process expected within these industries.

In certain cases, First Article Inspection (FAI) approval process (see [section 10.16.5](#)) may be acceptable versus the Production Part Approval Process (PPAP), such as Heavy Off-Road, Agricultural, and Construction industries.

Note: END Customer Specific Requirements will dictate the production approval process required for the components being sourced for the finished part.

SUPPLIERS are requested to collaborate with SENSATA SQE directly for clarification as to Product Approval Process applicable to the component being sourced by SENSATA, related the industry market and END CUSTOMER requirements.

### 10.16.1 [T] / [H] Production Part Approval Process [PPAP]

To ensure that all SENSATA design and specifications are properly met and the SUPPLIERS can demonstrate serial production readiness (example: confirmed Run@Rates - serial tools), resulting in a Production Part Approval Process that applies to new and existing products, PPAP is the confirmed result of the completed APQP process or a workflow summary of smaller changes.

All PPAPed Special Characteristics are required to achieve the minimum capability index of  $\geq 1.67$  for (short-term capability), unless other approved by SENSATA SQE, or as specified by the project (see section 18).

The SENSATA SQE must approve serial products, prior to shipment by the SUPPLIERS to the SENSATA manufacturing location.

SUPPLIERS shall not proceed with shipments of production material without PPAP approval, unless a SENSATA signed concession, deviation, or interim approval has been issued.

Interim approval allows the SUPPLIERS to ship only for a defined timeframe or quantity, as approved by the SENSATA SQE. It is the responsibility of the SUPPLIER to manage the Interim approval timing and quantities granted.

NOTE: Unapproved products and changes are unacceptable for SENSATA, as they may cause serious disruptions and risks to SUPPLIERS, SENSATA, and SENSATA Customer relationships. SUPPLIER is required to adhere to the Change Control expectations defined in section 8.5.

SENSATA requires SUPPLIERS to follow the applicable industry revision of the AIAG- PPAP manual for American OEMs/Tiers and “Production Process and Product Approval PPA”, VDA volume 2 for German OEMs/Tiers.

### 10.16.2 [T] / [H] PPAP Submission Levels

The AIAG-Part Submission Warrant (PSW), or the optional VDA-Production Process and Product Approval (PPA), are the formats summarizing the Product Approval Package, documenting and confirming form – fit and function, including durability.

SUPPLIERS are required to submit either the PSW (or PPA) to SENSATA SQE, requesting the reason for submission (New product, design change, annual re-validation, etc.) and the PPAP submission level, as defined below:

Level 1 - PSW report only (cover page), submitted to SENSATA.

Level 2 - PSW with product samples and limited supporting data.

Level 3 - PSW with product samples and complete supporting data.

Level 4 - PSW and other requirements as defined by the SENSATA SQE.

Level 5 - PSW with product samples and complete supporting data available for review at the SUPPLIER's manufacturing location.

SENSATA SQE will determine and communicate the required PPAP submission level based on the reason requested by SUPPLIERS. The PSW/PPA is the formal communication record between SENSATA SQE and SUPPLIERS. When additional requirements beyond product quality are required related to the PSW/PPA, these are to be closely communicated and documented as necessary and may be done using SENSATA Purchase Order Clauses.

SENSATA requires at a minimum a Level 3 PSW (or a VDA 2, Level 2 PPA) from SUPPLIERS, unless communicated otherwise by SENSATA SQE.

In case of [I] – Sensata Commercial, a PSW Level 4 is required; defining specific PSW expectations of SENSATA linked to this business (see also QMS-1004961 - RIS (Request for Initial Samples) as first guideline).

SUPPLIERS are required to submit all Level required documents either electronically or hard copy in an organized manner.

All level required documentation must correspond with the samples provided (see section 10.15.2).

The SENSATA SQE and SUPPLIERS will agree upon the initial sample due date and the required product sample quantity, especially the quantity of numbered samples documented in dimensional PPAP documents.

SUPPLIERS shall ensure that all requirements related to the PPAP documentation submission is fully understood and compliant at submission.

SUPPLIERS shall ensure that all related documents related to the PSW/PPA request are retained in a manner to allow easy accessibility throughout the product lifecycle. The PPAP master representative sample(s) are to be stored in a manner to preserve the product integrity for the duration of the PPAP retention period (see section 7.4 Table 2).

### 10.16.3 [T] / [H] PPAP – Supplemental

SUPPLIERS acknowledge the following with regards to PAPP submissions, and when in doubt will request clarification from the SENSATA SQE.

- a) All data provided to SENSATA must be current.
- b) General statements indicating, “Parts conform to specification”, or similar, are not acceptable for SENSATA.
- c) When the SUPPLIER does not have access to laboratory or test equipment to supply detailed information, outside, qualified resources should be employed at the SUPPLIERS expense.

- d) Rejection and return of test data or dimensional reports indicating, that the representative production lot from which samples were taken and accompanying documentation does not meet SENSATA requirements.
- e) Corrected products and documentation must be resubmitted for approval, prior to production quantities being accepted by SENSATA.
- f) If complete data or correct samples cannot be provided the PPAP/PSW (or PPA) will be rejected.
- g) In case of PSW (or PPA) approval, SENSATA will sign and return the document to the SUPPLIER, which will indicate the successful PPAP submission.
- h) After initial approval, SUPPLIERS are responsible for assuring that future products continue to meet SENSATA requirements.
- i) Using continuous improvement techniques and proactive management at the SUPPLIERS, non-conformance is eliminated, or the process is optimized permanently.
- j) Any improvement change, including process and manufacturing facility location, should require resubmission for approval and new components, reflecting current quality, held as retain master (see also section 8.5 - 8.6).

#### 10.16.4 Material Content Reporting via International Material Data System [IMDS]

All SUPPLIERS, regardless of industry must submit an IMDS “international material datasheet” to Sensata specific Site ID prior to PPAP/FAI submission. However, if a SUPPLIER is non-Automotive or non-HVOR and not able to submit this type of documentation, the SUPPLIER will need to provide Full Material Declaration and / or Regulatory Compliance Declarations (RCD) to specific regulatory requirements such as, but not limited to: RoHS, REACH, POPs, California Prop 65, TSCA, CMRT, CRT. Supplier is required to notify Sensata if any of its compliance status changes as a result of a regulation/standard revision or update.

SUPPLIERS shall ensure that there is a trained representative available for submitting entries into the IMDS system.

SUPPLIERS IMDS submission will be reviewed and approved by the SENSATA Regional Material Content Reporting Group.

SENSATA SQE will work with SUPPLIERS to resolve any potential concerns related to the IMDS entry status.

#### 10.16.5 [A] First Article Inspection

SUPPLIERS shall conduct a First Article Inspection (FAI) to the requirements defined in the AS9102 standard. The FAI Report (FAIR) must be approved by SENSATA Precision Products Material Review Board (MRB) on production samples on new or changes to, current production parts or processes.

In addition to AS9102 standards, SENSATA Precision Products requires a new FAI for the following:

- a) If a change in design affecting form, fit, or function of the part
- b) A change in manufacturing sources, processes, inspection methods, locations of manufacture, tooling and materials that can potentially affect fit, form, or function
- c) A change in numerical control programs that can affect fit, form, or function
- d) A natural or manmade event, which may adversely affect the manufacturing process
- e) A lapse in production for 2 years or specified by SENSATA.

SUPPLIERS are requested to collaborate with SENSATA SQE directly for clarification as to the FAI requirements specific to the product being sourced.

## 11 Serial/Mass- production Management

SUPPLIERS are responsible for assuring that serial products continue to meet SENSATA requirements at all times. SUPPLIERS are to manage an effective serial product production, through the use of Product and Process Controls and active continual improvement culture.

SUPPLIERS shall anticipate and understand the industry market ZERO-DEFECT expectations and requirements for the components being sourced by SENSATA.

SENSATA is to flow down to SUPPLIERS, SENSATA Customer specific requirement, specification and expectations related to the component or part being sourced, through various methods, such as, but not limited to:

- Drawings
- Specifications
- Purchase order clauses
- Contract/agreements
- Requirements (see section 7.3 Table 1)

SUPPLIERS shall demonstrate the inclusion of the following sections in the serial product production processes.

### 11.1 Staffing Qualification

SUPPLIERS shall define a process to manage human resources as follows:

- a) Selection and qualification of employees according to the requirements of their job responsibilities
- b) Documented job descriptions
- c) Provide for retention and sustainment of employees required for the operational processes
- d) Assessment of competency and qualifications through employee development and personal growth at a minimum annual basis
- e) Address the assessment development actions required to help employees achieve their competency expectations
- f) Provide training plans for all employees from top management to operator levels with focus on:
  - Safety, Quality, Delivery, Cost efficiency
  - SENSATA requirements
  - ZERO-DEFECT [Methodology](#)
  - Product and process nonconformity recognition and reaction plans

Define a staffing contingency plan to ensure a high level of performance in case of urgency or missing regular employees.

### 11.2 Receiving Inspection

Purchased material and products shall be subject to inspection after receipt.

SUPPLIERS shall determine the risk associated with the definition of the sample frequency or size selected to support the incoming inspection plan, examples including:

- New products, no PPAP release yet
- After complaints received by Customers – like SENSATA

- Poor performing SUPPLIERS, critical products
- Re- occurrence issues
- Skip lot

SUPPLIERS shall document the instructions, correct measurement tools, methods, reaction plans and records used within the receiving inspection process. Operators shall be qualified to perform those tasks assigned within the roles of responsibilities in the receiving inspection process.

SUPPLIERS shall not rely solely on “Receiving Inspection” as a method to control nonconforming product. This does not absolve the SUPPLIER’s liability for shipping a non-conforming product to SENSATA. SUPPLIERS shall implement throughout the serial product production process the methods of controls to prevent nonconformance of product provided to SENSATA.

### 11.3 [T] / [H] Safe Launch Control

The Safe Launch process is the introduction of additional temporary controls and measures throughout a process.

“Safe Launch Control” will be performed, documented and managed by SUPPLIERS, in connection with the launch of a new product or the change of an existing product. It is the purpose to ensure/protect the ramp-up period for the SUPPLIERS, SENSATA and the SENSATA Customers.

SUPPLIERS must have a documented Safe Launch control process that can be implemented during the introduction of a new product or after a change. The Safe Launch control process must include what, when, where, how and by whom a criterion must be checked.

SUPPLIERS must obtain written approval of the Safe Launch Control Plan by SENSATA SQE prior to implementation.

The purpose of Safe Launch is:

- Document the SUPPLIER's efforts to verify control of its processes during ramp-up of serial production to ensure ZERO-DEFECT.
- Ensure that any quality issues identified during the safe launch period are contained and corrected at SUPPLIER's location and prevent escape to SENSATA.
- Involvement of SUPPLIERS top management to proactively monitor and provide feedback on progress of the safe launch.

SUPPLIERS shall document the safe launch plan, which should contain the following at a minimum:

- Criteria to be checked including both product and process special characteristics (Example: KPC 1, KPC 2, KCC 1, SC 1, etc.)
- Frequency and quantity to be checked per shipment (Example: 100% visual, five parts destructive, etc.)
- Timeframe and logical start date of the Safe Launch phase (Example: Three months before/during SOP period, five shipments, a defined OK quantity, etc.)
- Reaction plans when non-conformity is detected (Example: Five OK shipments after one NOK finding/shipment, etc.)
- Identification and traceability for products produced under Safe Launch Controls (example: Labeling product/packaging, etc.)
- Exit criteria approved by both parties - SUPPLIER and SENSATA SQE

SUPPLIERS shall use the following SENSATA prescribed safe launch control timeframe/quantity as a reference when establishing the Safe Launch Control Plan for SENSATA components:

- Timeframe = 3 months (90 calendar days) from a continuous production cycle
- Or
- Quantity = 250,000 total pieces from a continuous production cycle

SENSATA takes into consideration that lower volume production may require negotiation on safe launch control timing and quantities.

Exiting safe launch control phase requires SUPPLIERS to demonstrate that all activities within the plan have been implemented, documented, recorded and results reviewed and approved by SENSATA SQE prior to exiting the Safe Launch Control.

In cases where Safe Launch Controls have detected nonconformities, SENSATA will require an extension to the Safe Launch Control phase timing or quantity, until the nonconformities are eliminated/ permanent and efficient corrective actions are implemented.

This will require updating the Safe Launch Control plan currently in place.

#### 11.4 Continual Improvement Process

SUPPLIERS shall have a process for driving Continual Improvement (CI) activities at all facilities, which are to be documented, tracked, and provide evidence of “before and after”.

SENSATA promotes continual improvement and requests SUPPLIERS to ensure that any Continual Improvement activities are in compliance with section 8.5 Change Management of this GSQM.

SUPPLIERS are requested to contact SENSATA SQE in case of questions or doubts before the CI-actions are implemented.

It is SENSATA’s mission to provide its Customers with ZERO-DEFECT products, on- time delivery and global continuity of supply at the best cost.

SUPPLIER supports this mission by implementing and complying with basic serial production practices including:

- Adherence to product and process requirements and specifications
- Built-in quality both for process and product
- Monitoring of process capability
- Reacting in timely manner to nonconformities
- Driving continual improvement in product and process activities

SUPPLIERS shall ensure that SENSATA requirements are determined and met with the aim of enhancing customer satisfaction, risk reduction, monitoring trends within the processes, product and quality system to assure their effectiveness and efficiency.

Performance indicators shall be based on objective evidence data and includes, but is not limited to:

- SUPPLIERS notification to SENSATA related to quality (including rework and scrap), warranty/ field issues, including disruptions to continuity of supply that impact SENSATA production and line shutdowns,
- Corrective action (8D) progress response and monitoring, GATEBUSTERS/Re-occurrence and ppm.
- Delivery schedule performance (including incidents of NOTD not-on-time-delivery)

SUPPLIERS must monitor Sub-SUPPLIER quality and delivery performance and take action when objectives are not achieved, including those that affect SENSATA requirements.

##### 11.4.1 Product & Process Performance Monitoring

SUPPLIERS shall utilize a methodology such as but not limited to: Man, Machine, Material, Method, Measurement and Environment [6M], to establish and monitor product and process performance considering quality performance production processes (one-piece flow...), active stock level management, and highly qualified employees.

SUPPLIERS shall perform process studies on all new and existing manufacturing (including assembly or sequencing) processes to confirm process capability and provide additional input for process controls.

SUPPLIERS shall document the results of process studies in specifications, where applicable, for means of production, measurement, test, and maintenance instructions.



These documents shall include objectives for manufacturing process capability, reliability, maintainability, and availability, as well as acceptance criteria for GOOD and BAD products and processes.

SUPPLIERS shall maintain manufacturing process capability or performance as specified in the Production Part Approval Process -PPAP- requirements noted in section 10.16 and section 18 of this manual.

Proven processes and routines must be defined with continual adherence and evaluated applying suitable methods to ensure top quality, identify risks and discover and eliminate weaknesses. For example:

- Defined process parameters (e.g., pressures, temperatures, times, speeds)
- Data for machines, tools, tooling aids
- Machine and process capability records
- Strict application of Control Plan
- Acceptance criteria
- Verification of production start with Ok first piece (Work environment and Product)
- Avoidance Proof: Poka Yoke (preventing defects) and mistake prove: Testers (catching defects)
- Work instruction & Self inspection Tasks (incl. Stop@Defect)
- Qualification of the team, related to Product Safety, including restrictions for temporary workers at “Product-Safety” Workstations
- Statistical process control charts and reaction plans, including control limits and long-term capability calculation
- Final Inspection (Including Quality Walls – Safe Launch Control), including restrictions for temporary workers
- Handling of non- conforming material (including Rework under Control) and corrective actions in case of internal Scrap
- Internal supervision and auditing (product audit, layered audit, process audit, system audit)
- Problem Solving Methods

#### 11.4.2 Product & Process Reaction Planning

SUPPLIERS shall identify product and process associated risks from the development process and document the reactions plan to mitigate and prevent the nonconformance for characteristics in the Control Plan during serial production that are either not statistically capable or are unstable.

SUPPLIERS shall include in the reaction plan, timing, responsibilities, containment and corrective action process throughout the supply chain (internal and external) as appropriate to issue, including containment of the product, traceability, re-inspection, and verification to assure that the process becomes stable and capable.

The reaction plan may include the following application and methodologies: CONTAINMENT definition, PDCA, 8D, QRQC, 6-Sigma techniques, Quality Circles to drive permanent elimination of issues, and to promote KAIZEN.

#### 11.5 [T] Annual Product Qualification

SENSATA requires SUPPLIERS to provide annual product / process data to confirm and support product form-fit-function compliance to specifications and requirements, during the lifecycle of the product, until the end of the serial production.

SUPPLIERS shall submit a product annual qualification report for all active products being purchased by SENSATA.



Unless otherwise defined by SENSATA, a level 4 AIAG PSW (or a level 2 VDA2 PPA) or as otherwise agreed with Sensata SQE, shall be submitted to the SENSATA SQE by SUPPLIERS annually.

SUPPLIERS are requested to reference the latest version of the AIAG Manual "Advance Product Quality Planning and Control Plan" or VDA2.

For cpk/ ppk studies the values of the last three month/ or previous three lots can be used.

### **11.6 Identification and Traceability**

Identification and traceability provide a rapid response when it is required to locate products, components within the product lifecycle within the SUPPLIERS manufacturing operations, Sub-SUPPLIER outsourcing process, warehousing, in-transit, and when a containment of non-conforming product and/or lots is required.

SUPPLIERS shall have a defined and documented process for the identification and traceability of products throughout the product lifecycle throughout all stages from incoming raw components, sub-assemblies to the in-process transportation within manufacturing to inventory management, warehouse and shipping. Identification and traceability are to consider the following: lot numbers, production shifts, manufactured volumes, sequence numbering, product id/revision, and shipping locations.

Non-production trial sample (i.e., prototypes, etc.) shipments are to identify in a clear manner that the content is not for production use. There may be situations that require SENSATA SQE to prescribe the identification and traceability method as required by the program/product requirements (see section 10.15.2).

SUPPLIERS shall maintain the associated traceability records for the defined period as noted in section 7.4. in a manner to preserve their integrity. SUPPLIERS shall make such records available upon request by the SENSATA Purchasing Manager and/or SQE.

Any and all requests for deviations to the retention periods must be reviewed and approved by SENSATA SQE, as SENSATA Customer and Regulatory requirements must be adhered to.

### **11.7 Preventive Maintenance - Equipment, Tooling and Inspection Equipment including SENSATA Owned Property**

SUPPLIERS are responsible for the maintenance of all tooling, testing, and inspection equipment, to ensure a high level of product quality (ZERO-DEFECT) over lifetime, to avoid damage or accelerated wear.

SENSATA Owned Property (Equipment, Tooling, Inspection equipment): SUPPLIERS shall establish and maintain a process for permanently marking SENSATA owned property which may include tools, manufacturing, test, inspection tooling and equipment. Ownership of each item must be visible and able to be determined.

SUPPLIERS shall have a preventive maintenance program that includes the following: maintenance plans, spare parts, qualified staff and records of maintenance performed.

### **11.8 Production Tooling Management - including SENSATA Owned Tooling**

SUPPLIERS shall establish and implement a production tooling management system to ensure the part quality and tool life commitments are achieved and shall include the following:

- a) SENSATA Owned Tooling (tools, manufacturing, testing and inspection tooling and equipment) shall be permanently marked (visible to determine ownership)
- b) Maintenance, repair facilities and resources
- c) Storage and recovery
- d) Set-up, repair and changes
- e) Tool-change programs for perishable tools
- f) Tool design modification documentation, including engineering change level
- g) Tool modification and revision of documentation

- h) Defining tool identification status, such as production, repair and disposal.
- i) Monitoring of Tool Life: informing SENSATA Purchasing in a timely manner before tool end of life.

SUPPLIERS shall ensure the documentation of all tools affecting a SENSATA product throughout life of the tool. The documentation shall be in a measurable format and submitted to SENSATA Purchasing on request. SENSATA reserves the right to inspect the status of the tooling, testing, and inspection equipment at any time.

## 12 Inventory and Logistics Management

### 12.1 Production Scheduling

Production shall be scheduled in order to meet SENSATA requirements, such as just-in-time, supported by information systems that permits access to production information at key stages of the process and is order driven.

### 12.2 Storage and Inventory

Where applicable, the SUPPLIERS shall provide provisions for preservation of product in accordance with component specifications and/or applicable regulations, for:

- Cleaning
- Prevention, detection and removal of foreign objects
- Special handling for sensitive products
- Marking and labeling including safety warnings
- Shelf-life control and stock rotation
- Special handling for hazardous materials
- Ensuring that documentation required by the contract/order to accompany the product is present at delivery, is protected against loss and deterioration.

SUPPLIERS shall have a process to assess the condition of product in stock at appropriate planned intervals to detect deterioration.

SUPPLIERS shall utilize an inventory management system to optimize inventory turnover time and assure stock rotation, such as "First-In - First-Out" (FIFO), including the status of products considered to be obsolete. Control of obsolete product shall be controlled in a manner like the nonconforming product process, to prevent their shipment.

### 12.3 [A] Validation of Production Processes and Service Provision

SUPPLIERS shall document, maintain, and if required, submit (as specified on the drawing) a certificate of conformance containing the following items as a minimum:

- SENSATA part number
- Revision of part number
- Standards listed with revisions per the print, when applicable
- Lot or batch ID or certification number
- Age control, when applicable
- SUPPLIER part number or COTS item with revision, when applicable.

## 12.4 Packaging and Transport

The choice of packaging can have a significant effect on product quality. SUPPLIERS must ensure that parts are packaged in a manner which preserves the product in storage, handling and transit.

Unless otherwise stated by SENSATA, packaging requirements will be noted on a detailed packaging instruction. Back-up packaging plans need to be tested and defined.

This will be agreed with the SENSATA Purchasing Department / SENSATA SQE before mass-production shipments.

SUPPLIERS shall have a defined process for the handling of packaging materials within the Logistics Management process that considers the following:

- Appropriate, clean packaging
- Assessment of any deterioration due to poor / dirty packaging and reaction plan
- Special freight transportation selection (by taxi, by plane, etc.), as required and approved by SENSATA, violation of this item may cause a SENSATA claim / CARE (see also section 13.4).

SUPPLIERS shall ensure that the following information is contained on each package or supply container, at the minimum:

- SUPPLIER name and address
- SENSATA location and address
- SENSATA Part number, part description
- SUPPLIER part number, part description
- Quantity
- Lot number
- Engineering level
- All above information shall be contained in Barcodes or 2D Matrices for electronic data exchange (Example: AIAG Standard, ODETTE, VDA label standard, etc.)
- Components under UL certification must comply with UL requirements (see UL 00-UM-C0027 Issue No. 4.0 latest revision), examples:
  - Wire Harness need to include:
    - UL Listed processed wire
    - Respooled UL Listed processed wire
    - UL Classified processed wire
    - Respooled UL Classified processed wire
    - UL Recognized processed wire
    - Respooled UL Recognized processed wire
  - Molded, encapsulated, potted and other fabricated plastic parts (Category QMMY2) need to include:
    - UL-assigned designation
    - Name of molder/fabricator
    - Factory location, when more than one factory location is used
    - Part identification

- Date of molding or fabrication
- Material manufacturer’s name and grade designations.
- This may be a code mutually agreed upon between an end-product/designated-party manufacturer and a molder/fabricator.

Any detailed or additional requirement regarding the marking and identification of components or packaging, shall be agreed between the SUPPLIER and the SENSATA Supply Chain organization and/or SQE.

Prior to shipping products, linked to a SENSATA approved “Engineering Change” or an approved “Deviation-Request”; the SUPPLIERS shall ensure at the minimum, the first three shipments are:

- Clearly identified
- Contain delivery documents, as appropriate
- Part number
- Revision level
- Lot number
- Reason statement, such as “Engineering Change: XXXX – Shipment Y” or “Deviation: XXXX – Shipment Z”

In case of a complaint and the reporting of CLEAN POINTS/Certified Deliveries, the same principles apply.

Any requirement relating to the duration, the type of marking and identification of components or packaging, relating to a design change, a (temporary) deviation, or to identify OK shipments after a claim/ CARE, shall be agreed between the SUPPLIER and SENSATA SQE.

## 13 Control of Non-Conforming Material and Deviation– Approval

### 13.1 Control of Non-Conforming Material

SUPPLIERS shall establish and maintain documented procedures to protect SENSATA from receiving non-conforming material, components, and assemblies. The control system for non-conforming material procedures should include:

- a) Identification methods – clearly distinguishing the status of the material – OK, NOT OK, SUSPECT, etc.
- b) Segregation manner – separating materials in a way to prevent re-introduction into the process or shipment, including containers, cages, etc.
- c) Material review responsibility – clear authority level for the disposition of the non-conforming material, including release
- d) Disposition status control – identify and segregate the material after disposition when it is to be re-worked, regraded, scrapped, etc.
- e) Disposition documented instructions – provide clear direction to authorized and competent operators to reinstate the material to an acceptable status and available at point of use
- f) Inspection documented instructions – provide clear direction to authorized and competent operators or inspectors to re-inspect the repair, rework, regraded material and available at point of use
- g) Release and approval instructions – when required, final authorization for release of repair, rework, regraded material and available at point of use

SUPPLIERS shall ensure that all personnel involved in the handling and dispositioning of nonconforming product are competent and trained.

SENSATA guidance on control of nonconforming material:

- a) May forbid rework to be performed, unless prior authorization is approved by SENSATA SQE
- b) Reworked products shall be re-inspected to the original acceptance criteria and in accordance with the Control Plan or documented procedures.
- c) Records of all activities related to the repair/rework shall be retained and include the following information: part details, batch numbers, personnel who completed process, and re-inspection records.
- d) Installation of additional check points, Quality Walls to sort poor quality before shipping to SENSATA
- e) Tracking and monitoring of recording of all non-conformances to permit defect analysis and the generation of internal corrective action plans.
- f) All records are to be made available to SENSATA SQE upon request.

### 13.2 Request and Approval of Deviation- Derogation / Concession / Waiver

SENSATA expects that all products supplied, meet all specification and all contractual requirements.

Written approval from SENSATA is required prior to shipment of product, which does not conform to drawing or specification.

SUPPLIERS are required to submit in writing the deviation request with supporting information to the SENSATA Purchasing and/ or the assigned Supplier Quality Engineering team. All deviation requests shall be submitted using SUPPLIER Request for Deviation Form QMS-1006304 [SREA] [located on the Sensata Supplier Portal](#).

Until obtaining SENSATA deviation approval, the SUPPLIERS shall initiate all necessary controls to prevent the product from being shipped to SENSATA.

Upon receipt, SENSATA will review the request, supporting information, assess the risk associated and provide written approval or rejection to the SUPPLIERS, outlining the timing of deviation, quantities and as required the implementation of corrective actions.

A validation plan and a risk assessment, built by the SUPPLIERS, considering the 6M- factor analysis, is part of the SREA documentation.

A SUPPLIER deviation request must contain the following information:

- a) SUPPLIER Part number
- b) SENSATA Part number & Identify Product Safety / Functional Safety
- c) SUPPLIER concession number (if applicable)
- d) Description of deviation requested (Include photos of deviation if applicable)
- e) Impact to SENSATA if the deviation request is rejected
- f) Confirm that deviation does not affect functionality of the product. Evidence required!
- g) Total number of parts requested to be produced at this level and/or
- h) Time period requested to be produced at this level
- i) Confirm how all products under the concession are identified (Picture of identification required)
- j) SUPPLIER authorized quality representative signature

SUPPLIERS shall include a copy of the SENSATA SQE approved deviation request form with all deviation shipments to SENSATA as part of the packaging documentation.

The copy of the deviation request must show the following:

- a) Total products allowed, or a time period to be shipped under deviation.
- b) Quantity of product in the shipment.
- c) Total quantity of product shipped under concession to date.

d) See also section 10.15.2

If and when the quantity or timing is different than the original deviation request, an additional deviation request must be submitted for approval by the SENSATA SQE prior to shipment.

SUPPLIERS shall maintain a record of the approved deviation/ concession request. SUPPLIERS shall ensure compliance with the original or superseding specification and requirements when the authorization expires.

### 13.3 Cost of Non-Conformity

SUPPLIERS shall be responsible for any charges and cost incurred in the following cases associated with shipment of nonconforming product to SENSATA by the SUPPLIERS:

- Violate the agreed acceptance criteria, drawing requirements, SENSATA and SENSATA Customer specifications, PPAP approvals.
- Production slow down or line stops at SENSATA and SENSATA Customer
- SENSATA recalls
- SENSATA Customer recalls

SENSATA monitors SUPPLIER cost related claims caused by SENSATA'S SUPPLIER, may include but are not limited to (unless otherwise specified within a Sensata Technologies contract or agreement):

- Problem investigation
- SENSATA internal sorting costs, as far as SENSATA is not supported actively by the SUPPLIER
- Material/ Productivity lost because of Scrap or Rework of subcomponents/ finished goods
- Additional or unexpected transport activities.
- Tool and Equipment crash at ST because of poor SUPPLIER product, etc.
- Business trips/audits of SENSATA members to contain damage and to ensure Customer satisfaction
- Warranty cases

SENSATA Purchasing will be informed and involved when the SUPPLIERS are notified of cost incurrance, based on specific Supplier Cost Claim-/ debit note reports. Please reach out to your SENSATA Purchasing representative for more information.

SENSATA reserves the right to scrap non-conforming material at the SUPPLIER's expense. SUPPLIER representative will be notified of scrap decision which will take place within 15 days of the notification.

### 13.4 Corrective Action Management by 8D

SUPPLIERS shall have a documented process to drive root cause analysis of noncompliance to requirements both internally and externally. The process shall include response time, root cause analysis methodologies (8D, 5Why, etc.), systemic look across and preventive/ curative risk elimination.

When the SUPPLIERS protection system fails, non-conforming material, components or assemblies is/are detected at any point of the supply chain, at SENSATA or at the SENSATA Customer, a claim [e.g., CARE] will be issued by SENSATA to SUPPLIERS.

SENSATA **EXPECTS** from its SUPPLIERS:

- **FAST PROTECTION** - top priority when a claim is issued by SENSATA and SENSATA Customer
- **FAST RESPONSE** - rigor and speed in all aspects, communication, actions, etc., ensuring that SENSATA and SENSATA Customers maintain continuity of OK part shipments
- **CONTROL** – Effective actions to avoid reoccurrence of the claim issue

**Detection and Notification:** SUPPLIERS will be notified within 24hrs of the detected NOK (products) by the SENSATA SQE/ Incoming Inspection department.

**SUPPLIER Initial Response:** Upon notification, SUPPLIERS shall implement without delay an immediate action to contain any additional defects from being shipped to SENSATA.

**Containment:** SUPPLIER shall have a process to effectively contain the claim issue, which shall include all stages of the supply chain, including, but not limited to, inventory, in-process, and in-transit. Containment is to remain in place until appropriate actions are launched to eliminate root-causes and corrective actions are in place and effective.

**Corrective Action Methodology:** Unless otherwise specified, the SENSATA 8D- process described below is to be followed by the SUPPLIER, using the SUPPLIER Corrective Action – 8D form QMS01108101 [located on the Sensata Supplier Portal.](#)

#### **Within 24 hours after notification**

##### **D1 Problem Solving Team**

- Cross-functional team of the SUPPLIER
- Empowered to define containment actions and to drive the problem-solving process

##### **D2 Problem Description**

- Review of the problem description provided by SENSATA
- SUPPLIER's viewpoint: Re-define the problem description (as detailed as possible)
- (What happened/is the problem, Why, Where, Who, When, How detected, How many, ...)
- Risk for other products, plants, etc.

##### **D3 Containment Actions**

- Actions to ensure that SENSATA and Customers receive OK parts as quickly as possible
- Sorting of stocks (at the Customer, at SENSATA, at the SUPPLIER, safety stocks, warehouses, WIP, etc.)
- Actions defined for parts in transit
- Check of SUPPLIER purchase material
- Review of current production process and inspection methods (“Why not seen internally”)
- Re-enforcement of inspection process, adding Quality Walls
- Request of 3<sup>rd</sup> party support
- Definition of CLEAN-POINTS/BREAK-POINTS (also relevant for D6)
- Agreement of labeling for OK products (CLEAN-POINT/ BREAK-POINT sticker/ label, etc.)
- 8D- feedback of D3 actions launched towards SENSATA in writing
- Review of actions SUPPLIERS and SENSATA, driven by the SUPPLIERS
- **Ongoing verification of the effectiveness of any containments including results of additional testing of materials until permanent corrective action has been implemented.**

#### **Within 14 calendar days (10 workdays)**

##### **D4 Root Cause Analysis (Non-Detection – Why did the SUPPLIER not detect the issue?)**

- Basic question “Why not seen internally, but SENSATA observed it”?
- What did we learn from the containment activities D3?
- Inspection process not defined, inspection process unclear, no audits?
- Acceptance criteria unclear, no gauge R&R (variable data and attributive data)?
- Inspection time (cycle time) not matching with real workload?
- Operators not qualified, missing skills?
- Missing observation of the team, missing audit robustness?
- Testing / measurement equipment not reliable?



- OK 1<sup>st</sup> piece validation routines not effective?
- Rework not under control?
- Etc.

**D4 Root Cause Analysis (Occurrence – Why did the issue occur at the SUPPLIER?)**

- What did we learn from the containment activities D3?
- Process Parameters not defined/not respected/by-passed?
- Operators not qualified, missing skills, no clear definition in work instructions?
- Standardized Work not defined/ not respected?
- Rework not under control or mix up with NOK products?
- Un-coordinated changes (6M)? Poor tool changes/poor tool life management?
- Missing robust validation of design and process?
- Identification/ traceability not defined or not respected?
- Poor packaging?
- Etc.

When the SUPPLIERS identify the root cause, SENSATA requires the SUPPLIERS to reproduce the defect by applying the previous situation vs. the new definition, to re-create the problem (Example: “Turning ON / Turning OFF“ the problem), to demonstrate the confirmation of the root cause.

**D4 Root Cause Analysis (System – Why did the controls / management systems at the SUPPLIER not effectively avoid the escape/occurrence of the issue?)**

- Incorrect production planning?
- APQP of new programs not respected (Control Plan, no full speed tests [Run@Rate], etc.)?
- Uncoordinated changes?
- Real root-causes not found (re-occurrence issues)?
- “5 Why” principle not applied?
- Guessing, instead of application of the principle: Real parts! – Real place! – Real data!
- Insufficient application of Lessons Learned?
- Missing observation of the production process by the SUPPLIER management and/or team, no audit robustness?
- Etc.
- Poor Change Management Methodology Practices by the SUPPLIERS (Ref 8.5)

**D5 Definition of Corrective Actions and *implementation plan* (D5 = All actions proposed within 14 calendar days)**

- Definition of actions to eliminate / control negative influencing factors / root-causes
- Non- Detection actions
- Occurrence actions
- System actions
- Weaknesses detected during the 5Why - process
- Definition of owners and timing
- Follow up of defined actions, strict management in case of delays
- Checking of the effectiveness of implemented actions, CLEAN-POINTS
- In case of poor / no impact of corrective actions, the real root cause is not detected, a new loop of D4 is needed
- In case of working corrective actions, containment actions to review / to stop
- 8D sheet updated by the SUPPLIERS and shared with SENSATA, at least weekly if nothing else is defined. Daily communication is strongly recommended.
- Etc.

**Within 60 calendar days (~ 40 workdays) unless formally agreed upon by the SENSATA SQE,**

#### **D7 Prevention of Reoccurrence**

- Completion of D5 and D6, all corrective actions are implemented and verified, with effectiveness measure ongoing
- Update of all documentation (FMEA, Control Plan, Work Instructions, Parameter sheets, Samples, audit structures, etc.)
- Finalization of operator trainings
- Creation of Lessons Learned sheets for Non-Detection/ Occurrence and System weaknesses
- Look across/ fan down
- Introductions of LL sheets (Lessons Learned) to SENSATA and SUPPLIER internal to support non-re-occurrence and detection.

SUPPLIERS shall have a method to track and monitor the actions implemented throughout the processes impacted by the corrective actions. This process must be demonstrated as part of the corrective action record.

#### **D8 Final Meeting and Closure of the 8D**

- Completion of D7, including final confirmation by the SUPPLIER management, that all corrective and systemic actions have been implemented, verified and measured for effectiveness
- Lessons Learned sheets distributed, accepted and understood (SUPPLIER internal & SENSATA)
- Final approval of SENSATA SQE
- Final update of the 8D and sharing with SENSATA
- Congratulate the team

The compliance to the 8D timing milestones, noted above in D1-D8, and the quality of the 8D, will be reflected in SENSATA Supplier ratings.

SUPPLIERS shall have a process in place, which minimizes the 8D-cycle time, to support fast containment, problem solving, to demonstrate full cooperation in investigating and solving problems at SENSATA and Customers in case of impact by a purchased component, material, etc.

In the event of critical situations, the standard timing might be reduced.

**Effectiveness of Actions Taken:** It is understood by SENSATA that some action may exceed the closure timing target of 60 calendar days, therefore, SUPPLIERS shall notify SENSATA SQE of the timing required to measure the effectiveness of the actions taken, subject to SENSATA's approval.

## **14 Quality Performance - Escalation and Special Status**

### **14.1 SUPPLIER Performance Tracking & Quality Data Recording**

SENSATA will monitor and track the SUPPLIER performance utilizing the Supplier Scorecard and other performance indicators. The Scorecard performance will be utilized to determine:

- Schedule audits
- Launch escalation process
- SUPPLIER improvement actions
- Potential new business offerings or holds

The performance indicators may consider more than one of the following aspects below:

- Score of a system or process audit [Example: MMOG, VDA 6.3, SSA, etc.]
- Incidents: Number of claims [CARES] within a 6 to 12-month period
- Re- Occurrence issues [GATE-BUSTER] within a 6 to 12-month period

- Reactivity, delays in D3 [24h] – D5 [14 calendar days] – D8 [60 calendar days] within a 6 to 12-month period
- SUPPLIER ppm 12-month rolling
- OTD: On-Time Delivery [Ratio of early shipments to the total shipments of a SUPPLIER]
- Special freight events
- Payment Terms: Average payment term of Product Order [PO] in days
- Lead time: Days between the release of shipment and the expected receipt of SUPPLIER component(s)
- 8D Quality [SENSATA 8D- Assessment] of an individual 8D's, up to 12-month rolling average [12MR %]
- Score of any other kind of a SENSATA audit [ppm audit, 8D audit, Risk Assessment, Technology Audits etc.]
- Number of escalation cases [ALERT] in Programs and Serial Production [risk of line shut down, line stops, etc.]
- Soft skills: Transparency, Proactivity, Respect, Reliability, Fast Response, ...

## 14.2 SUPPLIER Quality Escalation Process (SQEP)

Excellence in performance [ZERO-DEFECT] is our expectation from our SUPPLIERS, to avoid negative impact to SENSATA sites and Customers. The SQEP is a proactive process to drive accelerated and sustainable continuous quality system improvements. The process is not intended to be punitive tool but instead to strengthen our relationship with our strategic suppliers.

SENSATA will monitor the 6 Months rolling Justified Quality CAREs and select the escalation Level for each supplier using the “Supplier Quality Escalation Overview” as a guideline:

- Level 0 = 1 or 2 Justified CAREs
- Level 1 = 3 Justified CAREs
- Level 2 = 4 Justified CAREs
- Level 3 = 5 or more Justified CAREs

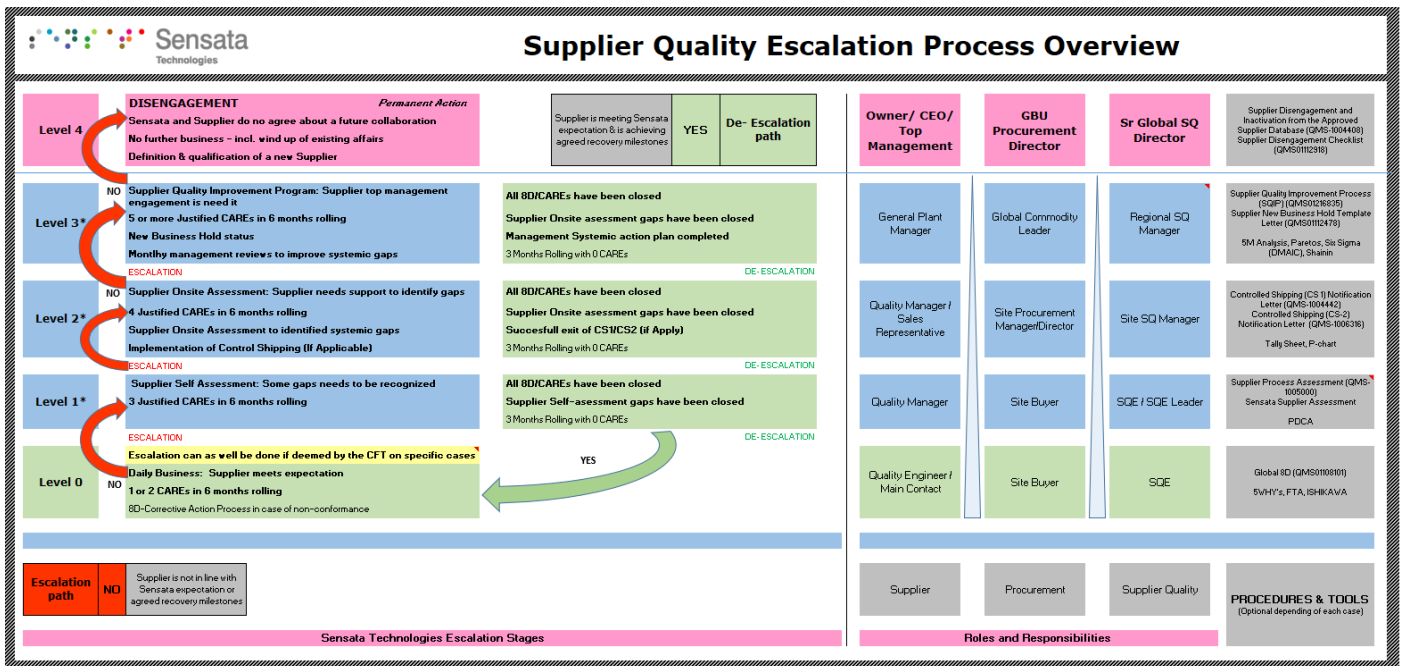
**Level 1.** In this level we need to recognize that there are some gaps in the manufacturing system that has allowed 3 Quality incidents to escape in a period of 6 Months. For this a Supplier Self-Assessment will be requested using the Sensata Supplier Assessment (SSA) and SUPPLIER will need to submit the results along with gap closure action plan in the next 14 calendar days after an official notification letter has been sent. As part of the exit criteria, SENSATA requires all 8D/CAREs and Supplier Self-Assessment gaps to be closed. On top of this a minimum period of 3 Months Rolling with ZERO Quality Claims found at SENSATA.

**Level 2.** If Quality performance continues to deteriorate (4 Quality incidents in a period of 6 Months), SENSATA SQE will support in identifying the gaps in the manufacturing system by performing an Onsite Assessment using the SSA. A Control Shipment Level may also be initiated (see section 14.3). As part of the exit criteria, SENSATA requires all 8D/CAREs and Supplier On-Site Assessment gaps to be closed. On top of this a minimum period of 3 Months Rolling with ZERO Quality Claims found at SENSATA.

**Level 3.** A Supplier Quality Improvement Program (SQIP) will be initiated if the SUPPLIER Quality performance reaches 5 Quality incidents in a period of 6 Months. The expectation is to provide a systemic process approach to identify immediate short-term and systemic long-term opportunities within the organization. To do this SUPPLIER Plant Manager will present the plan and status in Monthly management reviews. As part of the graduation criteria, SENSATA is looking for All 8D/CAREs to be closed, Supplier Onsite assessment gaps to be closed and the Management Systemic action plan to be completed. On top of this a period of 3 Months Rolling with ZERO Quality Claims found at SENSATA.

**Level 4.** New Business Hold (NBH) or Disengagement may initiated when SUPPLIER continually demonstrates negative performance trends against SENSATA's quality metrics (see section 14.5)

When Suppliers meet the graduation criteria of each Level per "Supplier Quality Escalation Overview" they will move into a monitoring program to make sure performance is sustained over time. If this performance is not sustained, they will be eligible to return to the appropriate level.



### 14.3 Controlled Shipment

SENSATA reserves the right to escalate and re-enforce protection actions if implemented containment and corrective actions do not adequately protect SENSATA, this is referred as Controlled Shipping (CS).

CS activities are to be incurred at the SUPPLIER's expense. The duration of the initial CS status or quantity to inspect will be defined by the SENSATA SQE.

[Example: CS 1 or CS2 effective date is MM/DD/YYYY and material received at SENSATA must be defect free for a period of minimum XX calendar days / or until MM/ DD/ YYYY, or a quantity of XXXXXX parts, to confirm the robustness of implemented actions.]

**Notification:** SUPPLIERS will be notified in writing by SENSATA Purchasing with the approval of the SENSATA SQE. The notification will provide details and the scope of the escalated actions required

#### Actions Required - Controlled Shipping level-1 (CS-1)

SUPPLIERS are required to add, at a minimum, an additional 100% inspection/ Quality Wall to ensure containment at their facility using their own personnel for the quality incident.

#### Actions Required - Controlled Shipping level-2 (CS-2)

SUPPLIERS are required to add, at a minimum, an additional 100% inspection using an independent 3rd party inspection operation at a defined location (at the SUPPLIER and /or at the SENSATA site /SENSATA Customer site). SUPPLIERS have full responsibility to coordinate and manage all 3rd-party arrangements.

SENSATA reserves the right to initiate the SQIP process when the SUPPLIERS cannot demonstrate effective CS status exit and / or requires additional development activities.

#### Continuity of Supply under CS Status:

SUPPLIERS shall have a process to manage all CS activities in a manner that will not affect the continuity of supply or affect the delivery status to SENSATA and SENSATA Customers.

### Reporting of CS Status:

SUPPLIERS shall report on a weekly basis the results of the sorting activities. Mitigation actions will be launched by the SUPPLIERS, if the sorting results demonstrate a negative performance.

### Exiting CS Status:

SUPPLIERS shall demonstrate that the problem-solving actions are effectively implemented and there have been no escapes or further issues identified by SUPPLIER and/or a 3<sup>rd</sup> party.

SENSATA SQE will review the SUPPLIERS performance, the SUPPLIERS robust action plan/ 8D management, and in case no NOK parts have been found during the agreed period, SENSATA SQE may allow exit of the CS1 status or a de-escalation from CS2 to CS1.

[Example: Confirmation of defect free receiving at SENSATA for a period of minimum XX calendar days / or until MM/ DD/ YYYY, or a quantity of XXXXXX parts]

To be finally removed from CS1, the SUPPLIERS must provide a request to the SENSATA purchase/ SQE contact person. If all criteria are met, SENSATA will accept the request indicating the date of the exit.

## 14.4 SUPPLIER Development Process

Potential new suppliers will be evaluated utilizing audits (see section 15.1), action plans addressing the gaps will be developed and executed. Additional onboarding to familiarize the SUPPLIER with SENSATA systems will also be reviewed at that time.

Once the SUPPLIER successfully completed those will be eligible for business awards.

## 14.5 New Business Hold [NBH]/ Disengagement

SENSATA reserves the right to place SUPPLIERS on New Business Hold (NBH), when the SUPPLIERS:

- Continually demonstrate negative performance trending against SENSATA's quality and delivery KPIs
- Do not successfully exit CS status according to plan and timing
- Do not successfully demonstrate improvement within the SQIP process
- Exhibit noncompliance or misrepresentation of compliance with Sensata

The SENSATA Purchasing Manager and/or Commodity Procurement Team will formally notify SUPPLIERS.

In the event SUPPLIER's performance does not demonstrate improvement during the Escalation Process, a disengagement process will be considered.

This process will be initiated and communicated by the SENSATA Purchasing Team.

# 15 AUDIT PROGRAMS

## 15.1 SENSATA Supplier audits

SENSATA may require an on-site Supplier Quality Audit to assess the SUPPLIER's Excellence status related to Quality, Product Safety, Delivery and Cost.

### Audit purpose:

Audits can be announced ad-hoc because of poor performance, to check potential risks, or as a planned preventive, repetitive action.

### Audit location:

Audits will be conducted at the SUPPLIER's facility or development center and may include any sub-SUPPLIER.

### Audit type:

Audit types are determined on risk analysis, associated with product/regulatory requirements, as well the need, type, frequency and scope of the audit, such as, but not limited to:

- QMS- Audit
- Process Audit
- Product Audit
- Product Safety Management Audit (If Safety Critical Characteristic apply for the components supplied to SENSATA)
- Technical Assessment (by Commodity, including product related software/embedded software)
- Quality Alert Audit
- Supplier claim/ppm Audit
- Production Readiness Check
- New Business opportunities (part of Supplier identification or selection)
- Confirmation of Continues Improvement, Re-Audit
- Sensata Supplier Code of Conduct Compliance Audit
- De-escalation Audit

#### **Audit frequency:**

SENSATA SQE will coordinate with the SUPPLIER to define the audit type, dates and duration.

The Supplier and audit frequency is determined by a risk base assessment which includes but not limited to the following evaluation factors:

#### **Main scope:**

- Strategic Suppliers and/or
- Key Technology Suppliers and/or
- Significant Business Impact Suppliers (Example: Single Source)

#### **Guideline:**

- Every 5 years – If there is an A score [GREEN]
- Every 3 years – In case of a B score [YELLOW]
- Every year— In case of a C score [RED], until B score [YELLOW] is achieved\*

SENSATA's Supplier audit frequency may be increased or reduced due to quality issues and poor performance, as warranted by SENSATA SQE Management based on a risk assessment done during the annual audit planning stage.

#### **Audit report/ follow up:**

SENSATA SQE shall provide the audit report, including scoring and findings, to the SUPPLIERS.

SUPPLIERS shall address the audit weaknesses detected during the audit using the FAST RESPONSE process to restrict the finding with a defined containment within 24 hours of its detection.

SUPPLIERS shall address the audit results within 14 calendar days from the receipt of the audit report. All responses must include corrective action plan and effectiveness verification.

*\* A "C"-score or a RED audit-score is identifying a significant weakness of the QMS system. With immediate effect, containment actions must be launched by the SUPPLIER [immediately - max 24 hours] and corrective actions shall eliminate the structural weakness within 90 days.*

*SENSATA Supplier Quality Engineering will decide, if an on-site re-audit will be scheduled to confirm the effectiveness of the measures taken, or a meaningful self-assessment by the SUPPLIER is sufficient. In any case, evidence documentation media shall be provided by the SUPPLIER to confirm the efficiency of actions taken to avoid reoccurrence.*

## **15.2 SUPPLIER First party - Internal audits**

SUPPLIERS shall have a documented audit program that includes planning, auditor competency, and reporting. The audit program shall ensure assessment of compliance to the SENSATA requirements as specified in this GQSM, product specifications, etc., as well as the applicable industry QMS requirements associated with the part being purchased by SENSATA.



The audit program shall be prioritized based upon risk, internal and external performance trends, and criticality of the process.

Where the SUPPLIER is responsible for software development, the organization shall include software development capability assessments in their internal audit program, including the qualification of the assigned internal team of auditors.

The frequency of audits shall be reviewed and, where appropriate, adjusted based on occurrence of process changes, internal and external nonconformities, and/or customer complaints. The effectiveness of the audit program shall be reviewed as part of a SUPPLIER- Management review.

The SUPPLIER shall have a documented process to verify that internal 1<sup>st</sup> and 2<sup>nd</sup> party auditors are competent, considering Customer Specific Requirements (CSR), the applicable scope of the audit or industry specific technical processes and product specific requirements, associated with the part being purchased by SENSATA.

For more details, please see the latest version of ISO 19011.

### 15.2.1 SUPPLIER internal - QMS Audits

The SUPPLIER shall audit all internal QMS- processes, over a defined period.

A three-year cycle is recommended as part of an annual QMS-Audit plan, to measure the effectiveness and efficiency of the internal standards.

The integration of Code of Conduct compliance audits shall be part of that program.

The audit program shall ensure assessment of compliance to the SENSATA requirements as specified in this GQSM, product specifications, etc. as well as the applicable industry QMS requirements associated with the part being purchased by SENSATA.

### 15.2.2 SUPPLIER internal - Process Audits

The SUPPLIER process audit program shall utilize tools and techniques of a risk-based audits process approach, example of which include:

- AIAG CQI
- GM BIQS – VW Formel Q etc.
- VDA 6.3
- Software capability assessments – like Automotive SPICE, VDA 2 - appendix 6 etc.
- Check sheets, flow charts or any similar methods to support audits of the manufacturing processes

SUPPLIERS shall audit each manufacturing process to determine its effectiveness against process requirements on all shifts. A three-year cycle is recommended as part of an annual plan.

Risk evaluations performed by the SUPPLIER, or intervention of SENSATA SQE/ SQM due to inadequate performance, may necessitate shorter audit frequencies.

Layered process-oriented audits may be scheduled to ensure the involvement of the whole organization at the SUPPLIER on the path to ZERO-DEFECT.

### 15.2.3 SUPPLIER internal - Product Audit

SUPPLIERS shall audit products at appropriate stages of production and delivery to verify conformity to all specified requirements, such as product dimensions, functionality, packaging or labeling, at a minimum of once per year, performed by production independent staff. Data collected might be used for annual re-qualification programs (see also [section 11.5](#))

A product audit standard within the SUPPLIER factory is defined and applied.



## 16 SENSATA Reference Forms and Links

SENSATA Reference Forms – contact the assigned SENSATA Supplier Quality team or the [Sensata Supplier Portal](#) for the latest revision:

DOCUMENT #	SEQUENCE #	DESCRIPTION
QMS01108101	----	Global 8D [Instructions & Template, Containment Instructions & Worksheets] <a href="#">See Sensata Supplier Portal</a>
QMS-1006304	G-SM-24	SREA and Deviation [Supplier Request for Engineering Approval & Deviation Approval Form] <a href="#">See Sensata Supplier Portal</a>
QMS-1006309	G-SM-29	Run @ Rate [Audit & Worksheet] <a href="#">See Sensata Supplier Portal</a>
QMS-1004961	G-SM-14	RIS/ISER Form [Request for Initial Sampling/ Initial Sample Evaluation Request] <a href="#">See Sensata Supplier Portal</a>
QMS-1004438	G-NP-19	DFM [Design for Manufacturing/ Project Risk Evaluation]
QMS01112977	G-SM-30	Supplier Material Content Reporting [Worksheet]
QMS 1004255	G-SM-01	Global Supplier Quality Manual [GSQM] <a href="#">See Sensata Supplier Portal</a>

## 17 SENSATA Technologies Supplier Portal

SENSATA has made available a Supplier Portal to obtain the latest communication on requirements.

*Sensata Supplier Portal*

<https://www.sensata.com/resources/portals/suppliers>

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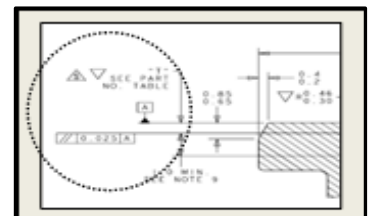
# 18 Additional Information

## APPENDIX A – SENSATA Characteristics Symbol Identification and Control

Characteristic Name	Characteristic Definition	Document Symbol	Drawing Symbol	Capability <sup>2</sup>	
				(Initial) Short Term cpk Process Capability Index	Long Term Ppk Process Performance Index
SAFETY	a characteristic of an item, element or production process for which reasonably foreseeable deviation could impact, contribute to or cause any potential reduction of safety (these safety causes are typically related to FMEA severities S10) Refer to latest revision of AIAG/VDA FMEA Handbook	SCC	+	≥ 1.67*	Monitoring of compliance required
			+ △ S	≥ 1.67*	≥ 1.67*
CRITICAL	Control Item products have Critical Characteristics that may affect compliance with government regulations.  Unique symbols identifying regulatory characteristics.	CC	▽	≥ 1.67*	Monitoring of compliance required
			▽ △ S	≥ 1.67*	≥ 1.67*
SIGNIFICANT	Significant Characteristics are those product parameters and requirements that are important for Customer satisfaction (form, fit and function) and for which Quality Planning actions must be addressed on a Control Plan. In cases where a characteristic is defined as significant, though ongoing SPC not required, SUPPLIER must define in-process controls on a Control Plan and agree prior through the DFM process as described in section 10.1.	FF or SC	◇	≥ 1.67*	Monitoring of compliance required
			◇ △ S	≥ 1.67*	≥ 1.33*
SPC	Used to specify ongoing SPC methodologies to be performed. Ongoing capability requirements are defined per 1 of the following guidelines: a) Section 10.8 of this procedure b) AIAG APQP reference manual latest revision c) noted on the print by the Design Engineering d) this symbol may be used in conjunction with any of the other characteristic designations noted within this table or standard characteristics. e) In cases where statistical capability is required by this symbol, but verification is unfeasible. 100% measurement via AOI or go/no-go gauging is an acceptable substitute.	S	△ S	≥ 1.67*	≥ 1.33*
STANDARD	Non-Key characteristic - Standard dimension vs. standard (incl. tolerance) a) first article inspection (dimensional data) for production release			First Article Inspection/ OK first part	First Article Inspection OK first part

\* **Capability values shown are minimums.** Required values might be elevated or reduced, depending upon SENSATA end Customer or SENSATA product requirements (Example: electronic components). Such increases shall be documented on the drawing of the component or assembly. All capability agreements must be clearly documented between SENSATA and SUPPLIER. Further guidance on characteristic controls refer to AIAG APQP reference manual.  
**In case “SPC capability” is not obliged or cannot be achieved,** indicate which other controls will be used to assure that the specification will be met over production lifetime. The checking method, frequency and quantity chosen must be appropriate in relation to process variation/ tool wear of the installed production process, see also section 10.8 “Reaction Plan”

Example of Characteristic and SPC noted on drawing:



<sup>2</sup> AIAG Advanced Product Quality Planning and Control Plan Reference Manual (latest revision)

## 19 Revision History

*This document is edited and controlled by the SENSATA Technologies Global Supplier Quality Organization. It is the SUPPLIERS responsibility to assure that only the latest revision of this manual is used and all prior editions are identified as obsolete*

Revision	Date	Description of Revision	Revised by:
W	4/23/2024	<p>Updated content page structure and linked with new numbering; Revisions noted in BLUE TEXT:</p> <p><b>Part A – Introduction</b> reworded section 1.2 and added the Sensata supplier portal location. Deleted original 1.3,1.4,1.5 and renumbering original 1.6 to 1.3... updated wording in section 2 scope...simplified section 3...added SREA-form doc number to section 8.5...wording updated...added cross reference to change record retention;...Added: Table 1 Documents of External Origin: statement on latest revision....CP Control Plan, AIAG &amp; VDA....</p> <p><b>Part B - PRODUCT &amp; PROCESS DESIGN AND DEVELOPMENT PLANNING</b> added "RUN@RATE worksheet QMS-1006309" located on the Sensata Supplier Portal in section 10.11; added condition of exception 'at a minimum. unless approved in writing' for inspection, test, equipment resolution in section 10.12; added RIS 'located in SLaM and in the Sensata Supplier Portal' in section 10.15; Updated Sensata terminology 'SREA/Deviation' in section 10.15.2;</p> <p><b>Part C – Serial/Mass- production Management</b> added "SUPPLIER Request for Deviation Form QMS-1006304 [SREA.]" located on the Sensata Supplier Portal in section 13.2...deleted specific cost amount for non-conformity specified categories in section 13.3; added "SUPPLIER Corrective Action – 8D form QMS01108101 (see section 16)" located on the Sensata Supplier Portal in section 13.4; updated wording and emphasize responses to audit result must include corrective action plan and effectiveness verification in section 15.1;</p> <p><b>Part D - SENSATA Reference Forms and Links</b> Updated Sensata reference forms and links in section 16; removed 'safety' from critical characteristics definition in Section 18 Appendix</p>	Kurt Heberling; Guilherme Pizzato Alberto Mendoza; Dimitar Markov; David Chen; Regina Altreuter; Michael Cashton
V	3/30/2023	<p><b>ECO-552296</b> Revisions noted in BLUE TEXT: Section 4.1: Updated wording .....Section 5.2 moved to Section 6 PRODUCT SAFETY .....renumbered all following sections/subsections starting at 5.2.....Section 7.3 Table 1: Added: CQI-27, CQI-29 and CQI-30 Section 10.12: updated wording....Section 13.2 updated wording...Revised Section 14.2 Title SUPPLIER Quality Escalation Process (SQEP)....Revised Section 14.4 Title SUPPLIER Development Process...Section 15.1: updated wording.</p>	Alberto Mendoza
U	5/20/2022	<p>Revisions noted in BLUE TEXT (Minor, non-system relevant adjustments of language, words or formatting will not be explained or highlighted in all cases) Sections added: 1.2, 1.6, 5.3, 6.3 (two items), 7.5 language regarding electronics, 7.6, 8.2, 9.16.4, 10.8i, 11.4, 12.3, and 15 added QMS 1004961 &amp; QMS0112977 Sections revised content for clarity: 5.1, 6.4 (updated timelines), 12.4, and 14.1 Section 5.3 deleted: "Second party (i.e., Customer or SENSATA) or third-party audit results, submitted to the assigned SENSATA Purchase Manager and/or on request to the assigned SQE, may demonstrate compliance and may support the SENSATA Supplier Selection Process for new business opportunities." Section 17: updated Special Characteristics Table ; SCC revised: definition: functional safety to safety (deleted reference to functional); added: new sentence to definition; CC: definition: deleted: reference to safe vehicle/product operation and/or;</p>	Kurt Heberling; Alberto Mendoza; Linda Sempey; Dimitar Markov; Ken Boschwitz; David Chen; Regina Altreuter
T	2/4/2022	<p>PG 8: Updated Supplier Code of Conduct link PG56: Updated Quality Policy</p>	Purchasing COE

R	9/28/2018	<p>[No Revision "Q"]</p> <p>Revisions noted in BLUE TEXT (Minor, non-system relevant adjustments of language, words or formatting will not be explained or highlighted in all cases)</p> <p><b>Part A – Introduction</b></p> <p>Main changes/ adjustments: Section 2: Added: "It is the expectation that the SUPPLIERS support SENSATA, during programs, mass-production and service obligations, with ZERO-DEFECT performance". Added: "The SENSATA GSQM provides also guidance, at all program stages, ... to ZERO-DEFECT"</p> <p>Section 6.4: "Control and retention of records". Added language to highlight customer specific requirements. Example for customer CONTINENTAL added. "Below mentioned periods are minimums! Governmental requirements, Customer Specific Requirements – CSR and industry specific standards to respect at any time.[Example [T]: Customer CONTINENTAL: All documents "at least 15 years after production has been terminated and scrapping of tooling has been granted", valid for element (see table 2, minimum): III, IV, V, VII, IX 7.1 Added: "SUPPLIERS who not yet achieve ZERO-DEFECT, in programs and mass production, related to parts and services provided to SENSATA, are immediately required to define a ZERO-DEFECT roadmap, which might be asked for by SENSATA Purchase and/ or SENSATA SQM/SQE at any time. Change of order of chapter 7.5 and 7.6 due to format issues 7.5 Rephrased/ added: "In order to ensure SENSATA compliance to end customer requirements, flow down of change notification lead-time ranges are: 6 – 18 months for HVOR, Industrial, Aerospace and 12-18 months for Automotive".</p> <p><b>Part B - PRODUCT &amp; PROCESS DESIGN AND DEVELOPMENT PLANNING</b></p> <p>General: VDA 2: Abbreviation "ISIR" Initial Sampling Inspection Report, replaced by "PPA" Production Process and Product Approval. 9.15.2: Initial Sample product identification - Engineering Sample/ PPAP Sample Identification Added: The type of label, content, size or color is determined in cooperation with SENSATA Supplier Quality Engineering.</p> <p><b>Part C – Serial/Mass- production Management</b></p> <p>Section 11.4: Rephrased, "Any detailed or additional requirement regarding the marking and identification of components or packaging, shall be agreed between the SUPPLIER and the SENSATA Supply Chain organization and/or SQE". "Any requirement relating to the duration, marking and identification of components or packaging relating to a design change or a (temporary) deviation, shall be agreed between the SUPPLIER and SENSATA SQE". 11.4: Added/rephrased: Labeling of shipments:" In case of a complaint and the reporting of CLEAN POINTS/Certified Deliveries, the same principles apply". Section 12.3: 1000 USD standard fee deleted, new "Reimbursement of administrative fees related to a confirmed complaint (CARE)" Section 12.4: rephrased D5+D6: Added: Definition and (D6 implementation of D5 actions within 60days) ... Added: D7 statement - within 60 calendar days (~ 40 workdays) Deleted: D8 – statement - within 60 calendar days (~ 40 workdays) ...Section 12.4...Deleted: reference to 24hs-60days ...Added: 8D timing milestones noted above in D1-D8... Section 13.1 Supplier Performance Tracking &amp; Quality Data Recording, highlighting and explaining the ST Supplier SCORECARD elements (Incidents, OTD, Leadtime, Payment terms Section 13.4 Rephrasing and reinforcement of the SREA escalation stage</p> <p><b>Part D - SENSATA Reference Forms and Links</b></p> <p>Section 15: Deleted reference to QMS-1004436 Supplier Agreement/Acknowledgement Letter as it is no longer required and replaced with use of PO clauses and T&amp;Cs Section 16: Update of the link to the ST Supplier Portal Section 18: Copy of GSQM Agreement form deleted, new order of table of content</p>	SMP Team & SQA Team, f.i: A.Kloeckner, R. Gross, R. Gilliland, L. Kelly, J.Kipker, O. Ghani, J.He, A Rivera, V. Subramaniam, L. Sempey, J. Abdullah, L. Scott
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P	3/15/2018	<p>Revisions noted in BLUE TEXT: Added: shall within content of sections; Aligned content with updates to ISO9001:2015, IATF16949:2016, AS9100:D requirements.</p> <p><b>Part A – Introduction</b> All provided links to the ST Internet reviewed and updated (New Portal). Section 1.1: Added: new sentence on promoting risk based thinking; section 1.5: added: new sentence on T&amp;C defining warranty periods; section 3: Full review of Chapter 3, 3.2/3.3 Detailed description of ST Supplier Code of Conduct; section 4.1: Added: new sentences on Supplier identification and selection requirements including development, technical, capabilities, software development process, etc.....section 4.3: Added: “compliance”; section 4.4.1: Added statements on disengagement temporary and permanent; section 5.1: added: new sentences on customer, statutory, regulatory requirement monitoring and compliance; section 5.2: Add: NEW PRODUCT SAFETY section; section 5.3: added: new sentence on IATF compliance and Minimum Automotive Quality Management System Requirements [MAQMSR]; section 5.5: added “containment &amp; execution” wording; section 6.4- Table 2: clarified Records to be retained and definition of Product Active Life; section 7.2: added “abnormality”; section 7.5: clarified change notification ranges for various industries. added “cyber-attacks”; section 7.6: added: new sentences on change control.....any change notification.....and written SREA requirements; section 8.2: add “statutory” and requirements related to country of receipt and shipment.....</p> <p><b>Part B - PRODUCT &amp; PROCESS DESIGN AND DEVELOPMENT PLANNING</b> Section 9.1: added “risk based thinking” expectations; section 9.4: added: automotive parts containing embedded software and controls; section:9.6 and 9.6.2: added new sentence on reverse FMEA use; section 9.7: added “attributive/appearance criteria”; section 9.15.2: added: new sentence on embedded software revision control;</p> <p><b>Part C – Serial/Mass- production Management</b> section 10.4.1: added new sentence related to qualification for product safety personnel including restrictions; section 10.5: added new sentence related to annual product/process data – product life; section 12.3 Cost of Non- Conformity; 1000 US\$ added as standard administration fee for each CARE; section 13.1: added “special freight”; section 13.2: added “NBH and disengagement”; section 14.1: Second Party Audits added: new types; frequencies and color rating; scope and follow up; scoring; section 14.2: First Party Audits: reviewed entire section; section 14.2.1-14.2.2-14.2.3 Supplier internal audits: added expectations to QMS, product and process audits;</p> <p><b>Part D - SENSATA Reference Forms and Links</b> Section 15: QMS DFM process added Section 18: Added new header to section GSQM agreement form</p>	SMP Team & SQA Team, f.i: A.Kloeckner, L. Scott, R. Gilliland R. Gross, J.Kipker. M. Hanley, D. O'Shea-Kerr
N	3/9/2017	All sections of the manual have been reviewed and revised.	A.Kloeckner R. Gilliland/J. Kipker D. O'Shea-Kerr A. Lister/ Lucy Scott Global SQE-team
M	1/20/2017	Added "In the event of a termination of business, all SUPPLIERS shall be contacted in order to transfer any applicable records pertaining to raw parts/or services provided to SENSATA." to Section 4.3.2 (6.4 in revision "N")	Krystyna Holz
L	10/1/2014	Revisions noted in BLUE TEXT: section Table 1: added: CQI-23; section 7.1.4: added New statement regarding program planning escalation process; section 7.2.2 Revised referenced procedure from Functionality & Feasibility Study of Characteristics (also known as Traffic Light Procedure) to Traffic Light Procedure (TLP) for Design Feasibility	J. Castañeda O. Ghani
K	8/25/2014	As a result of an external audit corrective action- the following revisions are noted in BLUE TEXT: section 4.1.1.1 a-b.	Y. Etienvre
J	9/1/2013	Revisions noted in BLUE TEXT: Added: 1.1.2 Terms & Conditions....Added: 4.2.5 Table 1: 17 CFR Parts 229 and 249 Conflict Minerals, E9898.....Added: New. Section 4.3.1... Revised Table 4.3.2 deleted records: Management Review, Internal audits, PO & Amendments...Consolidated Engineering Changes with Change Management...Added: Product Development & Advanced Product Quality Planning Records and revised retention periods... with new records..Product Design Development, Change Management, Annual Validation...7.3.2 and 7.5.2.e....added: safe launch controls....Revised: 7.3.3 Special Characteristics ...7.4.2: as follows....Added: 7.4.2.2 sentence was originally part of 7.4.2.1....New: Added: 7.4.2.3 “17 CFR Parts 229 and 249 Conflict Minerals Reporting....”Added: 8.4.5 “ demonstrate use of : 8.4.5.a such as but not limited to 8D, 5Why,....)	K. Dunn, S&C Design Directors, China SQE Manager (M. Xu, C. Yuan)

H	8/1/2012	Revisions noted in BLUE TEXT: Entire document: Removed all "Make" references. Reviewed and corrected all section-references inside GSQM Cover Page: Revised: "Sensors & Controls" by "SENSATA Technologies"... Revised: Section 3 (deleted: picture and clarified description)...Deleted: ISO9001 rev's....Revised: section 3.3, 3.4, 3.5 and 3.6...Deleted: section 4.2 : title "supplemental"....Add: ISO14001and ISO 26262 to table of standards....Revised: section 4.1.5: [A/T] general requirement..Revised: retention periods in Record Retention table [a] PO storage 8yrs ...[b] FAI also for automotive to Life+1 yr (same as PPAP)...[I] Tooling preventive maintenance records down to 1 yr ..[d] Added: ISO 14001, CQI-15, CQI-17....Deleted: retention period for Master Samples...Revised: section 6.1.1 to include contingency plan review when requested and examples of emergencies. Added: section 7.2.2 Functionality & Feasibility Study of Characteristics ...Revised: section 7.3.3...Revised: section 7.3.6 Added new sections referring to AS9012 and 3 years to 2 years...Revised: section 8.4.2...Deleted: Section 9.2.2 ISO/TS16949 revision level. Revised: Section 8.3.4 G-SM-26 to G-SM-24 as G-SM-26 is obsolete... Revised: Section: 8.4.4.3: NBH applicable in general. Removed reference to CS and 8Ds.	A. van Oosten
G	6/11/2012	Reaction to Customer-audits Feb-Apr 2012. Revised : section 1.2.2 deleting reference to "ppms". Added: section 1.2.2 text regarding " ZERO-DEFECTs and 100% OTD commitment (by Customer requirements on mindset)". Removed: section 1.2.3: Already covered in sections 3.4-3.6. Added: 7.1.3.3 on change lead time (and "change" also includes termination of supply, by definition). Added: section 7.4.1 text regarding " sub-SUPPLIERS " All sub-SUPPLIERS .... of this sub-SUPPLIER."	A. van Oosten
F	3/30/2010	Added: Section 7.3.5.2 requirements including process capability as noted in". Added: New section 7.5.3 work instructions and section 7.5.4 Verification of job set-ups. Renumbered following sections. Added: New section 7.5.7 production scheduling. Renumbered following sections. Added: Section 10 1006310 – G-SM-30 SUPPLIER Material Content Reporting Worksheet	SMP Team
E	6/26/2009	Blue Text notes changes made to document. Added: New section 1.1 Code of Conduct. Deleted: 1.2.2 "goals of ZERO-DEFECTs, and" Added: 1.2.2 "< 2 ppm for automotive component" . Added: New section 1.2.3. Deleted: 1.3 quality policy and renumbered following section. Added: 2.1 wording "reference in ..... specifications and drawings. Added: 2.2.1 "Business". Revised: 3.2 SMP Life Cycle Diagram. Added: 4.1.1 "latest revision of ISO 9001. Deleted: 4.1.1 reference to December 2006 and ISO/TS 16949: 2000....Added: 4.1.1 "demonstrate compliance". Added: 4.1.1.1, 4.1.1.2, 4.1.2 reference to "latest revision". . Added: 4.2.1 word "product" and sentence " this includes costs incurred by SENSATA related to as a result of quality nonconformance incidents and delivery disruptions. (see Section 9.1)". Added: new section 4.2.2. Added: 4.3.5 Table CQI requirements (9-11-12) and REACH. Deleted: 4.4 Record Table – Master Production Samples; Added: 4.4 Record Table Master Sample to PPAP Record. Added: 7.1.2 new sentence " Information is defined as specifications, ..... without prior written approval of SENSATA Technologies Business Unit Management Representative. Added: 7.2.2 "driving process capability and measurement controls" Added: 7.3.4 "Design Engineering" Deleted: 7.3.5.1 sentence referencing Global ESH and G-SM 30. Added: 7.4.2.1 REACH requirement. Revised: 7.4.3 "conformity to compliance" Added: 7.4.2 see section 4.1.1.2 – 4.1.1.3. Added: 7.4.4 " SUPPLIER responsible for purchased product. Added: 7.5.2 "product and process. characteristics". Added: 7.5.4 "SENSATA owned tooling" and see section 7.5.9 Added: 7.5.4.1 new sub-section a) Added: new section 7.5.6 Storage and inventory. Revised: 7.6.1.1-7.6.1.7 with a – g. Added: 8.2.1.c NOTD Added: 8.5.2 new sentence "When requested the assigned SQE, the SUPPLIER shall submit annual Cpk .....SPC dimensions. Revised: 8.2.7 section. Deleted: 8.4.1 Annex B. Revised: 8.4.3.3.f. Deleted: 10 reference G-SM-30 Material Data Sheet. Added: new section 11 SUPPLIER Portal.	SMP Team
D	11/21/2008	Updated Section 4.4 clarified the retention of Automotive [TS] records to ensure flow down of Customer requirements in this area. Product Life + 1 year (minimum 15 years)	SMP Team
C	3/12/2008	As a result of corrective action related to 3 <sup>rd</sup> party audit conducted by DnV. Added: Section 4.1.1.3 statement to clarify requirements for TS compliance for those SUPPLIERS who are not registered, i.e. plan	S. Zhou & SMP Team
B	2/1/2007	Revised entire document; incorporated Controls Business; aligned with Global SUPPLIER Management Process; flowed down industry (auto/aerospace) requirements.	S&C SMP Team
A	4/15/2005	Initial New Release – Sensor Products Business	MDM



# SENSATA TECHNOLOGIES QUALITY POLICY

## WE WILL DELIVER CUSTOMER EXCELLENCE BY:

Listening and serving our customers to provide a positive customer experience.

Providing quality products and services that comply with customer and regulatory requirements.

Encouraging and expecting the active involvement of every Sensata employee.

Actively involving our suppliers and business partners.

Continuously improving our products, processes and services to achieve business excellence.



**JEFF COTE**  
CHIEF EXECUTIVE OFFICER & PRESIDENT, SENSATA TECHNOLOGIES



### Remarks/Notes:

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