SMR Global Supplier Manual
Appendix T– Ford Customer Specific Requirements for Suppliers

As per Ford Motor Company Customer Specific Requirements for IATF 16949:2016
Effective Date 01-July-2023

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SMR Global Supplier Manual - Additional Customer Specific Requirements

Scope of this document

The scope of this document is to ensure compliance to customer requirement by sub-suppliers of SMR Automotive who are supplying for any Ford project. This document is listing requirements for these suppliers in addition to standard IATF16949 requirements and in addition to standard SMR requirements.

Responsibility:

Suppliers who are supplier for SMR of a component for a Ford product shall meet all requirements listed in this document during the whole project lifetime. This includes but not limited to:

- Regularly check for updates of this document on www.smr-automotive.com
- Ensure availability and awareness of related Ford standards and requirements mentioned in this document
- Ensure requirements are met in their supply chain

1.0 Corporate Responsibility (IATF 5.1.1.1)

The organization shall comply with Basic Working Conditions in the Global Terms and Conditions and the related Supplier Social Responsibility and Anti-Corruption Requirements Web-Guide https://web.fsp.ford.com/gtc/docs/hrandwc.pdf. The organization is also encouraged to adopt and enforce a similar code with Ford's Policy Letter #24 available through https://corporate.ford.com/social-impact/sustainability.html (search for "policy letter 24").

2.0 Planning (IATF 16949 6.0)

Contingency plans: (IATF 16949 section 6.1.2.3)

The Organization shall ensure that its Quality Operating System Supply Risk Management process includes:

- The application of the requirements for Risk analysis, preventive actions and contingency planning described in section 6.1.2.1 through 6.1.2.3 of IATF16949:2016 through the Organization's supply chain.
- Documentation of the Organization's supply chain (supplier name, location, parts) for all Ford-specified parts and associated raw materials

Supply Chain Risk Analysis

- The Organization shall have a documented Supply Risk Management Operating System in place – The Organization shall ensure that its Quality Operating System Supply Risk Management process includes: • The application of the requirements for Risk analysis, preventive actions and contingency planning described in section 6.1.2.1 through 6.1.2.3 of IATF 16949:2016 through the Organization's supply chain. • Documentation of the Organization's supply chain (supplier name, location, parts) for all Ford-specified parts and associated raw materials • A system to assess and monitor supply chain financial and operational risks.

3.0 Support (IATF 16949 7.0)

Plant Facility and Equiptment planning (IATF 16949 7.1.3.1)

Purchased Part Capacity (Average Purchased Part Capacity – APPC, or Maximum Purchased Part Capacity – MPPC) demonstration of compliance to the APW/MPW capacity requirements, the organization shall use the Capacity Analysis Report to determine the values of APPC and MPPC reported. Where equipment is not dedicated to the part being reported for PPC, the organization shall use either the Shared Loading Plan in the Capacity Analysis Report or the detailed shared loading tool.

Measurment Systems analysis Gauging requirements (IATF 16949 7.1.5.1.1)

All gauges used for checking Ford components/parts per the control plan shall have a gauge R&R performed in accordance with the appropriate methods described by the latest AIAG Measurement Systems Analysis Manual (MSA) to determine measurement system variability.The Gauge R&R is to be completed using Ford parts.
The control plan identifies which gauges are used for each measurement.
Any measurement equipment not meeting the MSA guidelines must be approved by SMR.
Acceptability criteria for Gauge R&R
To help assess the gauge, the organization shall report the value of +/- 2 Total Gauge R&R Standard Deviations to understand the 95% prediction interval (uncertainty) of any one measurement. This value can be used in conjunction with engineering judgment to help assess the distance between the edge(s) of the process distribution and the specification limit(s).The organization shall report gauge R&R as both a percent of study variation and a percent of tolerance.
Gauge R&R as a percent of tolerance < 10% is acceptable (the parts used for the Gauge R&R study must be representative of a production run with all known sources of variation). If Gauge R&R as a percent of tolerance is greater than or equal to 10%, but less than or equal to 30%, contact the STA site engineer to determine if the Gauge R&R is acceptable.
If Gauge R&R as a percent of tolerance > 30%, it is unacceptable and the organization shall implement containment actions and a corrective action plan to improve measurement capability until the Gauge R&R requirements are met.
Calculation for Gauge R&R with One-sided Tolerance for GD&T Dimensions (e.g.Position, Profile, Flatness, Parallelism, Roundness, Straightness, etc.) In these cases, calculate the tolerance by taking the upper specification limit and subtracting the lower boundary of zero.

$$Gauge\ R\&R\ \%\ Tolerance = 6\ Total\ Gauge\ R\&R\ Standard\ Deviation$$
$$USL - Lower\ Boundary\ Of\ Zero$$

Acceptability criteria for Gauge R&R with One-sided Tolerance
Upper specification limit with no lower boundary: In these cases, calculate percent tolerance by dividing 3 Gauge R&R standard deviation by the difference between the upper specification limit and the mean of the data.

$$Gauge\ R\&R\ \%\ Tolerance = 3\ Gauge\ R\&R\ Standard\ Deviation$$
$$|USL - \bar{\bar{X}}|$$

Lower specification limit with no upper boundary: In these cases, calculate the percent tolerance by dividing 3 Gauge R&R standard deviation by the difference between the mean of the data and the lower specification limit.

$$Gauge\ R\&R\ \%\ Tolerance = 3\ Gauge\ R\&R\ Standard\ Deviation$$
$$|\bar{\bar{X}} - LSL|$$

Determining Gauge Acceptability for One-sided Tolerances when Ppk <1
When Ppk is less than 1, the one-sided % tolerance will be artificially high. The team will need to use engineering judgment to assess gauge acceptability. Use +/- 2 Total Gauge R&R Standard Deviations to understand the 95% prediction interval (uncertainty) of any one measurement. This value can be used to help assess gauge acceptability by:
• Comparing the +/- 2 Total Gauge R&R Standard Deviations and the distance between tail of the distribution and the specification limit.
• Comparing the +/- 2 Total Gauge R&R Standard Deviations to the spread of the process (+/- 3 Standar Deviations).
• Use +/- 2 Total Gauge R&R Standard Deviations to compare different gauging methods or technology.
Family of gauges
Where multiple gauges of the same make, model, size, method of use and application (including range of use) are implemented for the same part, use of a single gauge R&R covering those multiple gauges (family of gauges) requires STA approval.
Parts and operators for Gauge R&R studies At a minimum:
Variable gauge studies should utilize a minimum of 10 parts, 3 operators and 3 trials.
Attribute gauge studies should utilize a minimum of 50 parts, 3 operators, 3 trials.
See the Ford PPAP customer specifics for details on attribute gauge measurement systems

analysis requirements https://web.qpr.ford.com/sta/Ford_Specifics_for_PPAP.pdf

External Labatory (IATF 16949 7.1.5.3.2)

The organization shall approve commercial/independent laboratory facilities prior to use. The acceptance criteria should be based on the latest ISO/IEC 17025 (available through ISO https://www.iso.org/), or national equivalent, and shall be documented. Accreditation to ISO/IEC 17025 or national equivalent is not required.

4.0 Compentence (IATF 16949 7.2.1)

Training shall include the appropriate Ford systems.

5.0 Documented Information (IATF 16949 7.5.2)

Where the organization uses Ford documents / instructions or other documents of external origin, the organization ensures that the appropriate revision level is used – this is either the most current version available from FSP (Ford Supplier Portal https://fsp.covisint.com) or as specified by Ford Motor Company. Note 2: Engineering Standards may be obtained from the following source: IHS Markit https://ihsmarkit.com/index.html

Engineering Specification (ES) Test Performance Requirements: (IATF .416949 section 7.5.2)

The goal of ES testing is to confirm that the parts meet design intent. ES test failure shall be cause for the organization to stop production shipments immediately and take containment actions. The organization shall immediately notify SMR of any test failure, suspension of shipments, and identification of any suspect lots shipped. After the root cause(s) of ES test failure are determined, corrected, and verified, the organization may resume shipments. The organization shall prevent shipment of suspect product without sorting or reworking, to eliminate the non-conformance.

These ES requirements apply equally to sub-tier suppliers.

Record Retention Inspeciton and Measurement Records (IATF 16949 7.5.3.2.1)

The organization shall retain records of process control data, product inspection data and records of appropriate reaction actions to readings outside the specification in a recoverable format for a minimum of 2 years, available upon request. The organization shall record the actual values of process parameters and product test results (variable or attribute). Simple pass/fail records of inspection are not acceptable for variable measurements.

Audits The organization shall retain records of internal quality system audits and management review for three years.

APQP The organization shall maintain the final External Supplier

APQP/PPAP Readiness Assessment (Schedule A) for the life of the part (production and service) plus one year as part of the PPAP record.

Training The organization shall retain records of training for 3 years from the date of the training.

Job set up The organization shall retain records of job set-up verifications for 1 year.

Retention periods longer than those specified above may be specified by an organization in its procedures.

Maintenance The organization shall retain records of maintenance for 1 year. The organization shall retain records of measurement equipment calibration for one calendar year or superseded, whichever is longer. Ford reserves the right to modify specific record retention requirements. These requirements do not supersede any regulatory requirements.

6.0 Operation (IATF16949 8.0)

Design and development planning – supplemental (IATF 16949 section 8.3.2.1

- The organization shall document special characteristics on the Special Characteristics including where special characteristics are controlled at sub-tier suppliers.
- This also applies to Ford-directed sub-tier suppliers without a Multi-Party Agreement. Documentation of Controls for Critical Characteristics. Both build-to-print and design responsible organizations identify in the APQP/PPAP Evidence Workbook the special controls to prevent shipment of any non-conformance to Ford specified Critical Characteristics, regardless of the location of the special controls in the supply chain (tier 1 through tier N).

Pre-Launch Control Plans

Pre-Launch / Safe-Launch control plan shall be completed and utilized during production of parts from / unit until , including demonstration of final process capability, before transitioning to the Production Control Plan. Note: For suppliers identified as a Priority Supplier, Safe-Launch Control Plan exit criteria must be agreed upfront for continuation of extraordinary controls beyond . Supplier should demonstrate a minimum of 4-weeks clean production

supply at required jobs per hour without any customer quality claims. Final inspection data/evidence should be available upon to confirm any identified defects are contained with implemented.Permanent Corrective Actions (PCA), before moving to the production control plan. Any concern observed during the safe launch period will require supplier to extend the safe launch control process for additional 2 weeks post PCA implementation.

Control Item - Fasteners The following control shall be included in the Control Plan for fasteners that are Control Items:
Material Analysis – Heat-Treated Parts
Prior to release of metal from an identified mill heat, a sample from at least one coil or bundle of wire, rod, strip, or sheet steel shall be analyzed and tested to determine its conformance to specifications for chemical composition and quenched hardness. The organization shall test a sample from each additional coil or bundle in the heat for either chemical composition or quenched hardness. The organization shall document the results and include the steel supplier's mill heat number. This requirement applies to both purchased material and material produced by the organization. Material Analysis –
Material Analysis – Non Heat-Treated Parts The organization shall visually check the identification of each coil or bundle of wire, rod, strip, or sheet steel to determine that the mill heat number agrees with the steel supplier's mill analysis document and applicable specifications. The organization shall test each coil or bundle for hardness and other applicable physical properties. Lot Traceability The organization shall maintain lot traceability.

For organizations responsible for component level Design Verification (DV) testing, the organization shall have a documented Design Verification Plan and Report (DVP&R) that includes organization /sub-tier supplier and Ford responsible test(s) as applicable. The organization provides evidence of successful completion on all component level DV testing on the DVP&R. The organization shall obtain SMR engineer approval for all tests and results. These requirements apply to all organizations; regardless of the organization's or part's PPAP submission level or design responsibility.

Prototype programme (IATF 16949 section 8.3.4.3)
The organization is responsible for the quality of the parts it produces and for any subcontracted services, including sub-tier suppliers specified by Ford Motor Company without a Multi-Party Agreement. This applies to all phases of product development, including prototypes. Individual Statements of Work may specify alternate responsibilities.

Product approval process (IATF 16949 section 8.3.4.4)
For production parts and approval of components from sub-tier suppliers, the organization shall comply with the AIAG Production Part Approval Process (PPAP) manual and Ford's Global Phased PPAP available through https://web.qpr.ford.com/sta/Phased_PPAP.html . Additional requirements are specified in Q1 https://web.qpr.ford.com/sta/Q1.html. For service parts, in addition to meeting the requirements of the AIAG Production Part Approval Process (PPAP) manual, the organization must comply with the AIAG Service Production Part Approval Process (Service PPAP) manual.
Submission of Sub-tier supplier PPAP:
Evidence of sub-tier component part approvals may be a summary (approved PSWs, a listing of PSW approvals or equivalent)

Control of Externally Provided process, products and services (IATF16949 8.4)
Supplier selection process (IATF 16949 section 8.4.1.2)
The Organization's supplier selection process should include evaluation of the supplier's supply chain management system. The Organization shall complete a financial assessment of the supply chain at a minimum annually, in conjunction with the annual audit program (see 9.2.2.2 of IATF 1 6949), not just at the initial supplier selection.

Customer directed sources/ Directed-Buy (IATF 16949 section 8.4.1.3)
When required by the contract with Ford, the organization shall obtain approval from Ford Motor Company prior to sourcing sub-tier suppliers.

Type and extent of control (IATF 16949 section 8.4.2)
- See ISO 9001:2015 requirements
- The organization shall have incoming product quality measures and shall use those measures as key indicators of sub-tier supplier product quality management.

Supplier quality management system development (IATF 16949 section 8.4.2.3)
The organization may meet this requirement by successful assessments of the Sub-tier suppliers per the authorization stated on https://web.qpr.ford.com/sta/. The frequency of these reviews shall be appropriate to the subtier supplier impact on customer satisfaction.

Sub-tier supplier quality management system requirements:
• Where a sub-tier supplier is not third party certified to IATF 16949, Ford reserves the right to require the organization to ensure sub-tier supplier compliance with the "Minimum Automotive Quality Management System Requirements for Sub-tier Suppliers" available through https://www.iatfglobaloversight.org/. Evidence of effectiveness shall be based on having a defined process and implementation of the process including measurement and monitoring.
• Where any organization has sub-tier suppliers not third party certified to IATF 16949, the organization is encouraged to require sub-tier supplier compliance with the "Minimum Automotive Quality Management System Requirements for Sub-tier Suppliers".
Ford or organization second party assessment or third party certification of sub-tier suppliers does not relieve the organization of full responsibility for the quality of supplied product from the sub-tier supplier (including Ford-directed sub-tier suppliers without a Multi-Party Agreement).
Although all sub-tier suppliers must be assessed per this section, sub-tier supplier improvement efforts shall focus on those sub-tier suppliers with the highest impact on Supplier Improvement Metrics (SIM).
Sub-tier supplier Management Process:
Organizations are encouraged to apply the principles outlined in "CQI-19 AIAG Sub-tier Supplier Management Process Guideline" to all their sub-tier suppliers. Additionally, Ford reserves the right to require the organization to apply the principles outlined in "CQI-19 AIAG Sub-tier Supplier Management Process Guideline" to address issues identified in the organization's supplier development and management process. Ford will communicate the requirement to apply CQI-19 to the specifically selected organization(s) based on sub-tier supplier management issues attributed to the organization. Evidence of effectiveness shall be based on having a defined process and implementation of the process including measurement and monitoring.
Critical Characteristic Controls at the sub-tier suppliers
For Critical Characteristics, the responsible organization ensures that sub-tier suppliers have controls in place to prevent shipment of non-conforming product at the location where the associated physical characteristics are manufactured by sub-tier suppliers. The sub-tier supplier controls for the Critical Characteristics are identified by the organization in the APQP/PPAP Evidence Workbook. This also applies to Ford-directed sub-tier suppliers without a Multi-Party Agreement.

Supplier monitoring (IATF 16949 section 8.4.2.4)
- In support of Ford's expectation of 100% on-time delivery, the organization shall also require 100% on-time delivery from sub-tier suppliers. The organization shall communicate any delay or risk to the affected Ford customer.
- The organization should monitor and minimize any premium freight expenses related to sub-tier suppliers for late deliveries.
- These also apply to Ford-directed sub-tier suppliers without a Multi-Party Agreement.

Production and Service Provision (IATF16949 8.5)
Identification and traceability (IATF section 8.5.2)
- Part identification and tracking
- Lot traceability throughout the value chain (lot traceability shall include subcontracted components of an assembly/module that are associated with compliance to any inverted delta requirement)
- Electronic communication with Ford and sub-tier suppliers
- Prevention of damage or deterioration of supplied products

7.0 Performance Evaluation (IATF16949 9.0)
Identification of statistical tools (IATF 16949 section 9.1.1.2)
- The organization ensures that Critical Characteristics (CC) have controls which prevent the shipment of nonconforming product, regardless of the location in the supply chain (tier 1 through tier N) of the manufacture of the physical characteristic(s) associated with the Critical Characteristic.

- The organization records the CC controls in the APQP/PPAP Evidence Workbook. Statistical process control on product characteristics without continuous manufacturing process controls is not appropriate or sufficient for Critical Characteristics.

Manufacturing process audit (IATF 16949 section 9.2.2.3)
The organization is responsible to ensure that all tiers of suppliers are assessed to the applicable Ford manufacturing process standards.
Note: Self-assessment by the sub-tier suppliers, including implementation of corrective action plans as required, meets this requirement.
Refer to https://web.qpr.ford.com/sta/Ford_GTS.html on Ford Supplier Portal for all these standards except AIAG CQI-xx, which are available through AIAG.

Heat Treat Assessment Requirements:
Organizations and sub-tier suppliers providing heat treated product and heat treating services shall demonstrate compliance to AIAG CQI-9 "Special Process: Heat Treat System Assessment" and Ford Specific CQI-9 requirements (available through https://web.qpr.ford.com/sta/CQI9_Ford_Specific_requirements.xls); CQI-9 is available through AIAG http://www.aiag.org/CQI-9 Special Process: Heat Treat System Assessment.
All heat-treating processes at each organization and sub-tier supplier manufacturing site shall be assessed annually (at all tier levels), using the AIAG CQI-9 "Special Process: Heat Treat System Assessment" (HTSA) and Ford Specific CQI-9 requirements. Assessments are also required following any heat treat process and/or changes of heat treat equipment or additions.
The organization shall maintain the 2 prior annual CQI-9 assessment reports and related information at the organization's site and make them available to STA upon request. Heat Treat assessments are conducted by the organization, heat treat suppliers, sub-tier suppliers or by Ford. Demonstration of compliance to CQI-9 and Ford Specific CQI-9 requirements does not relieve the organization of full responsibility for the quality of supplied product. To reduce the risk of embrittlement, heat-treated steel components shall conform to the requirements of Ford Engineering Material Specification WSS-M99A3-A, also available per section 0 of the document. **Verification of supplier conformance to AIAG CQI-15 latest edition Welding System Assessment Requirements (letter sent by FORD in November/2019).**
Required compliance to the AIAG CQI-15 latest edition Welding System Assessment by all suppliers using welding processes. This requirement is reportable by the tier 1 but applies to all tiers of suppliers using welding processes. Suppliers are required to comply with all applicable requirements for all welding processes.
Consistent with IATF 16949 all tiers of suppliers are required to assess to the AIAG CQI-15 latest edition Welding System Assessment. This requirement can be found at:
• AIAG CQI-15 latest edition: www.aiag.org

8.0 Improvement (IAFT 16949 10.0)

The organization shall have processes and systems in place to prevent shipment of nonconforming product to any Ford Motor Company facility.
The organization should analyze any non-conforming product or process output using the 8D methodology to ensure root cause correction and problem prevention.

History of Revision

No.	Cause of modification	Date	Modifier	Approved
1	First issue	26.10.2017	Altamiro Oliveira	Judith Robertson

2	Inclusion of the items 1.0 Planning (IATF section 6.1.2.3), 5.0 Prototype Programme (IATF 8.3.4.3), 12.0 identification and traceability (IATF section 8.5.2), and update items 10.0 Supplier quality management system requirements (IATF section 8.4.2.3), 11.0 Supplier Monitoring (IATF section 8.4.2.4), 14.0 Manufacturing process audit (IATF section 9.2.2.3)	17.11.2020	Leandro Coletta Marcio Villalva	Judith Robertson
3	Update to reflect update of FORD CSR dated June 2023	02/02/2024	J .Robertson	Judith Robertson
4				
5				