Ford Motor Company

Customer-Specific Requirements

For IATF-16949:2016

Effective 01-March-2024

Copyright © 2024 Ford Motor Company.

Summary of IATF-16949 Sections 1 through 10 with customer specific content

Contents

1 Scope 5

1.1 General 5

2 Normative references 6

3 Terms and definitions 6

4 Context of the organization 10

4.3 Determining the scope of the quality management system 10

5 Leadership 11

5.1.1.1 Corporate Responsibility 11

5.1.2 Customer focus 12

5.3 Organizational roles, responsibilities and authorities 12

5.3.1 Organizational roles, responsibilities and authorities - supplemental 12

6 Planning 12

6.1.2.3 Contingency plans 12

7 Support 13

7.1.3.1 Plant, facility, and equipment planning 14

7.1.5 Monitoring and measuring resources 14

7.1.5.1.1 Measurement system analysis 15

7.1.5.3.2 External laboratory 16

7.2 Competence 16

7.2.1 Competence — supplemental 17

7.5 Documented information 17

7.5.2 Creating and updating 18

7.5.3 Control of documented information 18

7.5.3.2.1 Record retention 18

8 Operation 19

8.1 Operational planning and control 19

8.2 Requirements for products and services 20

8.2.1 Customer communication 20

8.2.3 Review of the requirements for products and services 20

8.2.3.1.1 Review of the requirements for products and services — supplemental 21

Copyright © 2024 Ford Motor Company.

8.2.3.1.2 Customer-designated special characteristics ... 21
8.2.3.1.3 Organization manufacturing feasibility ... 21
8.3 Design and development of products and services ... 22
8.3.1.1 Design and development of products and services — supplemental ... 22
8.3.2.1 Design and development planning — supplemental ... 22
8.3.3 Design and development inputs ... 26
8.3.3.3 Special characteristics ... 26
8.3.4 Design and development controls ... 27
8.3.4.3 Prototype programme ... 27
8.3.4.4 Product approval process ... 28
8.3.5 Design and development outputs ... 28
8.3.5.1 Design and development outputs — supplemental ... 28
8.4 Control of externally provided processes, products and services ... 29
8.4.1.2 Supplier selection process ... 29
8.4.1.3 Customer-directed sources (also known as "Directed–Buy") ... 29
8.4.2.1 Type and extent of control — supplemental ... 29
8.4.2.2 Statutory and regulatory requirements ... 29
8.4.2.3 Supplier quality management system development ... 30
8.4.2.4 Supplier monitoring ... 31
8.5 Production and service provision ... 31
8.5.1.2 Standardized work — operator instructions and visual standards ... 31
8.5.2 Identification and traceability ... 32
8.6 Release of products and services ... 33
8.6.1 Release of products and services — supplemental ... 33
8.6.2 Layout inspection and functional testing ... 33
8.6.3 Appearance items ... 34
8.6.6 Acceptance criteria ... 34
8.7 Control of nonconforming outputs ... 34
8.7.1.1 Customer authorization for concession ... 34
8.7.1.6 Customer notification ... 35
9 Performance evaluation ... 35
9.1 Monitoring, measurement, analysis and evaluation ... 35
9.1.1.1 Monitoring and measurement of manufacturing processes ... 35

Copyright © 2024 Ford Motor Company.

9.1.1.2 Identification of statistical tools 35
9.1.2 Customer satisfaction 36
9.1.2.1 Customer satisfaction — supplemental 37
9.2 Internal audit 38
9.2.2.3 Manufacturing process audit 39
9.3 Management review 40
9.3.1.1 Management review — supplemental 40
9.3.2 Management review inputs 40
10 Improvement 40
10.2 Nonconformity and corrective action 40
10.2.1 and 10.2.2 40
10.2.5 Warranty management systems 42

Copyright © 2024 Ford Motor Company.

1 Scope

1.1 General

IATF16949:2016, First Edition, Oct 1, 2016, “Automotive Quality Management System Standard,” ISO9001:2015, Fifth Edition, 09/15/15, “Quality Management Systems – Requirements”, and this document defines Ford Motor Company and Lincoln Motor Company fundamental quality system requirements for organizations where automotive customer-specified parts, for production and/or service are manufactured.

Third party certification to IATF16949 shall meet the following conditions:
The certification scope must include both IATF16949 and the accompanying IATF16949 Ford-Customer Specific Requirements,
Certification Bodies currently contracted and recognized by an IATF Oversight office conduct the certification in compliance with the IATF recognized automotive certification scheme.

The organization shall address all IATF16949:2016 requirements including the requirements of this document in the organization’s quality management system.
References to “Ford” in this document apply to all of Ford Motor Company and Joint Ventures with Ford and Lincoln Motor Company unless otherwise specified.
The English language version of this document shall be the official version for purposes of third party registration.
Sanctioned translations of this document shall:

- Be for reference only.
- Reference the English version as the official language.
- Include Ford Motor Company in the copyright statement.

Any other translations are not authorized.
NOTES:
Copies of this document are available from Ford Motor Company at https://web.qpr.ford.com/sta/Ford_IATF_CSR.pdf or the IATF website at https://www.iatfglobaloversight.org/ .

Copyright © 2024 Ford Motor Company.

2 Normative references

Note: Unless otherwise noted, all references listed throughout these Ford Specific Requirements refer to the latest edition.

> Any question about the applicability of a specific reference should be directed to the organization's Supplier Technical Assistance engineer.

Note: Some hypertext links within this document may only be accessible on FSP (Ford Supplier Portal) by organizations contracted by Ford Motor Company (typically Tier 1). Lower tier organizations pursuing IATF 16949 registration may need to gain access to FSP (Ford Supplier Portal) or documents from FSP through a Tier 1.

3 Terms and definitions

Where inconsistent terminology exists between IATF 16949 and this document, this document shall take precedence. Otherwise, the definitions from IATF 16949 apply to this document.

3.1 ***Active Part***

An active part is one currently supplied to the customer for original equipment or service applications. The part remains active until tooling scrap authorization is given by the appropriate customer activity. For parts with no customer-owned tooling or situations where multiple parts are made from the same tool, written confirmation from Ford Engineering and the Buyer is required to deactivate a part.

NOTE: For bulk material, "active part" refers to the bulk material contracted, not the parts that are subsequently produced from that material.

3.2 ***Aftermarket Parts***

Replacement parts not procured or released by Ford Motor Company for service part applications that may not be produced to original equipment specifications.

3.3 ***APPC***

Average Purchased Part Capacity: The organization's capacity commitment (in part count per week) to meet the Average Production Weekly capacity requirement and recorded in Ford's capacity planning systems Global Capacity Planning (GCP) or Manufacturing Capacity Planning Volume (MCPV).

3.4 ***Average Production Weekly (APW)***

Average Production Weekly; capacity requirement for sustained production based on a 5 day work week. Organizations: see the Capacity Planning Web Guide available through https://www.fsp-wlp.ford.com/gtc/docs/capacityplan.pdf

3.5 ***Capacity verification***

A verification methodology included in Ford's Phased PPAP to demonstrate that an organization can meet Ford's capacity requirements. Organizations: see the Global Phased PPAP Handbook available through https://web.qpr.ford.com/sta/Phased_PPAP_Requirements_Handbook.pdf

Copyright © 2024 Ford Motor Company.

3.6 ***Consulting***

For the purpose of IATF 16949 and supporting documents, consulting is the provision of training, documentation development, or assistance with implementation of quality systems to a specific customer. If these activities are open to the public, advertised, and not customer specific, they are considered training rather than consulting. Other products, processes or services may be offered directly or indirectly, provided they do not compromise confidentiality or the objectivity or impartiality of its certification process or decisions [refer to IAF GD 8 “Informative Guidance on the Transition to ISO/IEC 17021 Accreditation from ISO/IEC Guide 62 and ISO/IEC Guide 66”], (available through ISO https://www.iso.org/).

3.7 ***Customer***

For the purposes of IATF 16949, references to “customer” in this document are to be interpreted as the entity, e.g., Ford Motor Company, which is both purchasing and receiving product from the organization complying with IATF 16949.

3.8 ***Families of FMEAs (Failure Mode and Effects Analysis)***

Families of FMEAs are FMEAs for multiple parts where the parts are substantially similar in application, design, manufacture, requirements and specification. Examples include right and left mirrors, blue or black interior consoles for the same vehicle and application.

3.9 ***Families of Control Plans***

Families of Control Plans are Control Plans for multiple parts where the parts are substantially similar in application, design, manufacture, requirements and specification. Examples include right and left mirrors, blue or black interior consoles for the same vehicle and application.

3.10 ***Final Capability Study***

Process capability study using mass production parts from the Capacity Verification full day’s run.

3.11 ***Ford Motor Company***

The names "Ford Motor Company" or "Ford" refer to the corporate entity comprising all brands under Ford Motor Company, including Lincoln.

3.12 ***Ford Engineering***

Ford Motor Company Product Development Engineering, including Program and non-Program Engineering organizations.

3.13 ***Foundation FMEAs***

Foundation FMEAs are also known as corporate, generic, baseline, core, master, or best practice FMEAs and contain knowledge of the organization from prior developments and problem-solving activities for each process type (e.g, stamping, riveting, injection molding, etc.). See the AIAG & VDA FMEA manual for more information.

3.14 ***Gauge families***

Gauge families are measurement devices of the same type, make, and model that are used in a similar environment (temperature, humidity, measurement range, method of measurement, etc.).

3.15 ***Global Product Development System***

GPDS is Ford's Product Creation Process and is applicable to all regions and brands. GPDS Awareness Training is available at the Ford Supplier Portal https://fsp.covisint.com/, log into Ford Supplier Portal, and under Applications select “Ford Supplier Learning Institute (FSLI)” then search for “GPDS Supplier Engagement Process Training”.

Copyright © 2024 Ford Motor Company.

3.16 ***IATF (International Automotive Task Force)***

The IATF is an ad hoc group of automotive manufacturers and their respective trade associations, formed to provide improved quality products to automotive customers worldwide. The IATF is responsible for the following:

- Developing a consensus regarding international fundamental quality system requirements, primarily for the participating companies' direct suppliers of production materials, product or service parts or finishing services
- Developing policies and procedures for the common IATF third party registration scheme to ensure consistency worldwide.
- Providing appropriate training to support IATF 16949 requirements and the IATF registration scheme.
- Establishing formal liaisons with appropriate bodies to support IATF objectives.

3.17 ***Initial Process Study***

Initial Process Studies are conducted to measure the performance of new or revised processes relative to internal or customer requirements based on a rational sampling plan from a significant production run. Initial process studies should be conducted at different points in the evolution of processes (e.g., on one manufacturing line or tool, then on the remaining manufacturing lines or tools and subsequently on any revised manufacturing lines or tools,). These studies provide the data to determine the process stability and control along with identifying the distribution (e.g., Normal or Uniform Distribution) for a statistically valid analysis.

3.18 ***Maximum Production Weekly (MPW)***

Maximum Production Weekly; capacity requirement based on a 6 day work week with no additional tooling, equipment or facilities. Organizations: see the Capacity Planning Web Guide available through https://www.fsp-wlp.ford.com/gtc/docs/capacityplan.pdf

3.19 ***MPPC***

Maximum Purchased Part Capacity: Capacity, is the organization's capacity commitment (in part count per week) to meet the Maximum Production Weekly capacity requirement and recorded in Ford's capacity planning systems GCP or MCPV.

3.20 ***Must***

A mandatory requirement

3.21 ***Organization***

Facility adding manufacturing value to production materials: providers of production or service parts, or of finishing services such as heat treating, plating, painting directly to Ford Motor Company or other customers subscribing to this document.

Note 1: For the purposes of registration under IATF 16949, the "organization" is the entity normally referred to by Ford as the "supplier". Ford Motor Company will continue to use that term when negotiating with the organization.

Note 2: To avoid additional confusion, although the term "supplier" is used by IATF 16949 to indicate "sub-tier supplier", Ford Motor Company will continue to use the term "sub-tier supplier" in its normal usage.

Note 3: "Design responsible organizations" also provide engineering services. Program specific Engineering Statement of Work defines program specific engineering responsibilities.

Note 4: Sequencing warehouses and other facilities not adding *manufacturing* value to the product are not eligible for stand-alone certification to IATF 16949.

Copyright © 2024 Ford Motor Company.

3.22 ***Oversight Office***

An organization established by the IATF to implement and manage its IATF 16949 certification scheme. (All IATF-recognized Certification Bodies are managed through Oversight Offices). At present, there are five Oversight Offices:
ANFIA (Associazione Nazionale Filiera Industria Automobilistica) / Italy
IAOB (International Automotive Oversight Bureau) / US
IATF France
SMMT (Society of Motor Manufacturers and Traders) / UK
VDA-QMC (Verband der Automobilindustrie – Qualitäts Management Center) / Germany

3.23 ***PPC***

Purchased Part Capacity: a term referring to both Average Purchased Part Capacity and Maximum Purchased Part Capacity.

3.24 ***PPM (Part Per Million quality metrics)***

A method of stating the performance of a process in terms of actual nonconforming material. PPM data can be used to prioritize corrective actions.

3.25 ***SIM***

Supplier Improvement Metrics – supplier performance measurements available through FSP (Ford Supplier Portal https://fsp.covisint.com).

3.26 ***SREA***

Supplier Request for Engineering Approval.

3.27 ***STA***

Supplier Technical Assistance – Ford Motor Company's team dedicated to assist in the development of supplier manufacturing processes.

3.28 ***Sub-tier Supplier***

Provider of production materials, or production or service parts, directly to an organization complying with IATF16949. Also included are providers of heat treating, painting, plating or other finishing services to organizations. Also known as "supplier" in IATF 16949 certification terminology.

3.29 ***System Design Specification (SDS):***

1) Describes the system in terms of interfacing subsystems and systems,
2) Consolidates system-level requirements from a variety of documented sources; provides selected and summarized text and metrics from these sources,
3) Documents requirements developed by the team not captured elsewhere,
4) Provides a means to sort the same set of requirements by type, by sub-system, by interfacing sub-system, and by source,
5) Supports systems engineering and thinking,
6) Accommodates continuous improvement of requirements, standards, and metrics as they are developed and refined.

3.30 ***Value-Added Production Processes***

Manufacturing activities or operations for which a customer would be willing to pay, given the option. See also **IATF16949:2016** definition of "manufacturing", "site", and "remote location".

3.31 ***8D Process***

A disciplined process that addresses problem solving in a methodical and analytical method, addressing root causes to eliminate the source(s) of the concern.

Copyright © 2024 Ford Motor Company.

4 Context of the organization

4.1 Understanding the organization and its context

No Ford Customer-Specific Requirement for this section.

4.2 Understanding the needs and expectations of interested parties

No Ford Customer-Specific Requirement for this section.

4.3 Determining the scope of the quality management system

The structure of this document aligns with the requirements with the applicable sections of IATF 16949. Several section headers are followed by the statement “No Ford Customer-Specific Requirement for this section” to verify that there is no auditable Ford-specific requirement for this section.

The presence of this statement does not mean that no other commercial or technical requirements exist for the subject addressed in the section, or that this statement supersedes existing commercial or technical requirements.

Tooling & Equipment suppliers to Ford Motor Company are not eligible for certification to IATF 16949. Registration to ISO 9001 is acceptable.

Third-Party Registration

To achieve Q1 (refer to https://web.qpr.ford.com/sta/Q1.html), Production and Service Part organizations supplying product to Ford shall be third-party registered to IATF 16949 through an IATF-recognized Certification Body. The official list of IATF-recognized Certification Bodies is available through https://www.iatfglobaloversight.org/

A sub-tier supplier hired by the organization to perform services not directly related to a Ford Motor Company contract (e.g. floor cleaning or grass cutting) is not impacted in any way by the sub-tier supplier development or other sub-tier supplier requirements stated in IATF 16949.

Evidence of IATF 16949 Certification Verification

Organizations shall record evidence of their certification to IATF 16949 in GSDB Online available through Ford Supplier Portal
https://web.gsdb2.ford.com/GSDBeans/servlet/gsdbeans.web.lib.GSDB

Notification of IATF 16949 Registration Status Change

Organizations shall notify Ford of any change in their IATF 16949 registration status via updating their certification information in GSDB Online.

Such changes include, but are not limited to:

- Initial certification.
- Recertification.
- Transfer of certification to a new Certification Body
- Certificate withdrawal.
- Certificate cancellation without replacement.

Copyright © 2024 Ford Motor Company.

IATF 16949 Certification Waiver

Ford may, at its option, fully waive certain organizations from IATF 16949 certification. This waiver generally applies to those organizations whose quality management system is acceptable without certification to IATF 16949, but Ford still requires the suppliers to maintain their quality, delivery, and warranty performance level at no less than an 80 point score in SIM while meeting Q1MSA requirements.

Identification of candidate organizations for waiver from IATF 16949 certification is the responsibility of Ford. Verification and maintenance of waiver status is the responsibility of Ford.

4.3.1 Determining the scope of the quality management system - supplemental
No Ford Customer-Specific Requirement for this section.

4.3.2 Customer-specific requirements
No Ford Customer-Specific Requirement for this section.

4.4 Quality Management system and its processes
No Ford Customer-Specific Requirement for this section.

4.4.1 Quality Management system and its processes

4.4.1.1 Conformance of products and processes
No Ford Customer-Specific Requirement for this section.

4.4.1.2 Product safety
No Ford Customer-Specific Requirement for this section.

4.4.2 Quality Management system and its processes
No Ford Customer-Specific Requirement for this section.

5 Leadership

5.1 Leadership and commitment

5.1.1 General
No Ford Customer-Specific Requirement for this section.

5.1.1.1 Corporate Responsibility
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://www.fsp-wlp.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").

Copyright © 2024 Ford Motor Company.

5.1.1.2 Process effectiveness and efficiency
No Ford Customer-Specific Requirement for this section.

5.1.1.3 Process owners
No Ford Customer-Specific Requirement for this section.

5.1.2 Customer focus
The organization shall demonstrate enhanced customer satisfaction by meeting the continuous improvement requirements of Q1, as demonstrated in the organization's QOS (Quality Operating System).

5.2 Policy

5.2.1 Establishing the quality policy
No Ford Customer-Specific Requirement for this section.

5.2.2 Communicating the quality policy
No Ford Customer-Specific Requirement for this section.

5.3 Organizational roles, responsibilities and authorities
No Ford Customer-Specific Requirement for this section.

5.3.1 Organizational roles, responsibilities and authorities - supplemental
The organization shall notify Ford Motor Company Supplier Technical Assistance in writing within 10 working days of any changes to senior management responsible for Product Quality or company ownership.

5.3.2 Responsibility and authority for product requirements and corrective actions
No Ford Customer-Specific Requirement for this section.

6 Planning
6.1 Actions to address risks and opportunities

6.1.1 and 6.1.2 See ISO 9001:2015 requirements.
No Ford Customer-Specific Requirement for this section.

6.1.2.1 Risk analysis
No Ford Customer-Specific Requirement for this section.

6.1.2.2 Preventive action
No Ford Customer-Specific Requirement for this section.

6.1.2.3 Contingency plans
The Organization shall notify the Ford receiving plant, the buyer and the STA engineer within 24 hours of organization production interruption. The organization shall communicate the nature of the problem to Ford and take immediate actions to assure supply of product to Ford.

Copyright © 2024 Ford Motor Company.

Note: Production interruption is defined as an inability to meet the Ford specified production capacity volume.

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.
    - A list of Ford endorsed supply chain monitoring services and tools is available through Appendix A https://web.qpr.ford.com/sta/Ford_IATF_16949_CSR_Appendix_A.pdf to assist in the establishment of the organization's Quality Operating System Supply Risk Management process. Ford reserves the right to review the documented information of the supply chain risk assessment reviews

6.2 Quality objectives and planning to achieve them

6.2.1 See ISO 9001:2015 requirements.
No Ford Customer-Specific Requirement for this section.

6.2.2 See ISO 9001:2015 requirements.
No Ford Customer-Specific Requirement for this section.

6.2.2.1 Quality objectives and planning to achieve them — supplemental
No Ford Customer-Specific Requirement for this section.

6.3 Planning of changes
See ISO 9001:2015 requirements.

7 Support
7.1 Resources

7.1.1 General
No Ford Customer-Specific Requirement for this section.

7.1.2 People
See ISO 9001:2015 requirements.

7.1.3 Infrastructure
See ISO 9001:2015 requirements.

Copyright © 2024 Ford Motor Company.

7.1.3.1 Plant, facility, and equipment planning
Capacity Reporting
Whenever the organization reports Purchased Part Capacity (Average Purchased Part Capacity – APPC, or Maximum Purchased Part Capacity – MPPC) to Ford in 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 Ford 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.

The Capacity Analysis Report is available through https://www.ecar.ford.com/

Reporting of Purchased Part Capacity to Ford may include the following:

- Quarterly Reporting of PPC to Ford's Capacity Planning systems
- Responding to a Request for Quote
- Responding to a capacity study
- Capacity Verification associated with PPAP
- Any other Ford request for reporting Purchased Part Capacity

Note: For the APPC and MPPC to be acceptable, the APPC and MPPC must meet or exceed the required capacity – APW in a 5 day operating pattern and MPW in 6-day operating pattern respectively.

Organization personnel completing the Capacity Analysis Report (CAR) are required to have completed the latest Capacity Analysis training available via
https://www.lrclean.ford.com/cqdc/Supplier_Training
Capacity Planners are to review the Capacity Analysis training annually. If the Capacity Analysis training is updated, Capacity Planners are required retake the Capacity Planning training and to re-register in the capacity Supplier Directory
https://web.supplierdirectory.ford.com/sd/homePage.

7.1.4 Environment for the operation of processes
No Ford Customer-Specific Requirement for this section.

7.1.4.1 Environment for the operation of processes — supplemental
No Ford Customer-Specific Requirement for this section.

7.1.5 Monitoring and measuring resources

7.1.5.1 General
See ISO 9001:2015 requirements.

Copyright © 2024 Ford Motor Company.

7.1.5.1.1 Measurement system analysis
Gauging requirements

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 STA.

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.

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

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.

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

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.

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

Copyright © 2024 Ford Motor Company.

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 Standard 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

7.1.5.2 Measurement traceability
See ISO 9001:2015 requirements.

7.1.5.2.1 Calibration/verification records
No Ford Customer-Specific Requirement for this section.

7.1.5.3 Laboratory requirements
No Ford Customer-Specific Requirement for this section.

7.1.5.3.1 Internal laboratory
No Ford Customer-Specific Requirement for this section.

7.1.5.3.2 External laboratory
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.

7.1.6 Organizational knowledge
See ISO 9001:2015 requirements.

7.2 Competence
See ISO 9001:2015 requirements.

Copyright © 2024 Ford Motor Company.

7.2.1 Competence — supplemental
Training shall include the appropriate Ford systems.
Ford training opportunities are available through Ford Supplier Learning Institute https://fsp.covisint.com log into Ford Supplier Portal and then go to the Ford Supplier Learning Institute (FSLI) application. Additional training is available through https://www.lrclean.ford.com/cqdc/Supplier_Training

7.2.2 Competence — on-the-job training
No Ford Customer-Specific Requirement for this section.

7.2.3 Internal auditor competency
No Ford Customer-Specific Requirement for this section.

7.2.4 Second-party auditor competency
No Ford Customer-Specific Requirement for this section.

7.3 Awareness
See ISO 9001:2015 requirements.

7.3.1 Awareness — supplemental
No Ford Customer-Specific Requirement for this section.

7.3.2 Employee motivation and empowerment
No Ford Customer-Specific Requirement for this section.

7.4 Communication
See ISO 9001:2015 requirements.

7.5 Documented information

7.5.1 General
See ISO 9001:2015 requirements.

7.5.1.1 Quality management system documentation
No Ford Customer-Specific Requirement for this section.

Copyright © 2024 Ford Motor Company.

7.5.2 Creating and updating

Note 1: 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

If any standards are not available through the above sources, organizations should contact Ford Engineering, or for organizations with Ford Intranet access, https://www.rlis.ford.com/standards/index.html may provide a more complete inventory.

Ford Engineering Specifications may be available in Ford's CAD database, Team Center, contact the Ford PD engineer for details.
Additionally, Ford Engineering CAD and Drafting Standards (FECDS) are available through https://azureford.sharepoint.com/sites/C3PNGMethods/FECDS/SitePages/Home.aspx

Engineering Specifications

Ford requires all manufacturing sites to report all materials per WSS-M99P9999-A1, as noted in PPAP, Ford Specific Instructions.
These requirements are detailed on Ford Supplier Portal https://fsp.covisint.com (Important Documents – RSMS Communication Package).

Engineering Specification (ES) Test Performance Requirements

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 Ford Engineering, STA and the using Ford Motor Company facility 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 nonconformance.

These ES requirements apply equally to sub-tier suppliers.

7.5.3 Control of documented information

7.5.3.1 and 7.5.3.2

See ISO 9001:2015 requirements.

7.5.3.2.1 Record retention
Inspection and Measurement Records

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 to Ford Motor Company 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.

Copyright © 2024 Ford Motor Company.

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.

8 Operation

8.1 Operational planning and control

Statement of Work
Appropriate to the organization's responsibilities, the organization shall meet the requirements of the Statement of Work(s). There may be an Engineering Statement of Work (available from the Ford Product Development Engineer), an Assembly Statement of Work, a Manufacturing Statement of Work or other types available from the appropriate Ford organization. See the Global Product Development System (GPDS) for specific timing.

APQP
The External Supplier APQP/PPAP Readiness Assessment (Schedule A) is available through https://web.qpr.ford.com/sta/APQP.html
The organization shall submit completed Schedule A's as specified in the Schedule A notification letter for each program (monthly and after any significant change in APQP status). This applies to priority and non-priority suppliers, see Supplier Engagement Process on https://web.qpr.ford.com/sta/GPDSSupplierEngagement.html
Even if the organization has not received a Schedule A notification letter for a program, but has New Tooled End Items (NTEIs) for a Ford program launch, the organization is still required to complete a Schedule A for each program milestone for all NTEIs and retain the final Schedule A in the PPAP file for the life of part (production and service) plus one year.

Copyright © 2024 Ford Motor Company.

Prototypes
When the organization is also sourced with the production of prototypes, effective use should be made of data from prototype fabrication to plan the production process. The organization records the dimensional data per the Prototype Build Control Plan, reviews the measured characteristics with Ford PD Engineer and obtains approval on the results from the Ford PD Engineer with confirmed acceptance of parts. If prototype parts are not fully compliant to specification, Ford PD Engineering can approve use of the part with a WERS Alert.
The organization should use the APQP/PPAP Evidence Workbook to record prototype part data for Ford PD review. The APQP/PPAP Evidence Workbook is available through https://web.qpr.ford.com/sta/APQP.html .

Prototype Tooling
To dispose of Prototype Tooling, the Supplier must contact Global Asset Management (GAM) within 30 days after PPAP2 completion and request a Prototype Tooling Disposal form. The Supplier submits the completed form to the Ford PD Engineering supervisor for approval and the approved form is to be returned to GAM for disposal authorization and scrap processing.

Supplier(s) must contact GAM via email: GAMNA1@ford.com
(Suppliers with Tooling in Europe, contact GAM at gamfoe@ford.com)

8.1.1 Operational planning and control — supplemental
No Ford Customer-Specific Requirement for this section.

8.1.2 Confidentiality
No Ford Customer-Specific Requirement for this section.

8.2 Requirements for products and services

8.2.1 Customer communication
After part approval, the organization shall use the SREA (Supplier Request for Engineering Approval) process to submit approval requests for organization-initiated process change proposals. Refer to https://web.qpr.ford.com/sta/SREA.html

8.2.1.1 Customer communication — supplemental
No Ford Customer-Specific Requirement for this section.

8.2.2 Determining the requirements for products and services
See ISO 9001:2015 requirements.

8.2.2.1 Determining the requirements for products and services — supplemental
No Ford Customer-Specific Requirement for this section.

8.2.3 Review of the requirements for products and services

8.2.3.1
See ISO 9001:2015 requirements.

Copyright © 2024 Ford Motor Company.

8.2.3.1.1 Review of the requirements for products and services — supplemental

The customer authorization for waiving formal review may be obtained from the appropriate Ford Organization (Ford Engineering, Purchasing, etc.).

8.2.3.1.2 Customer-designated special characteristics

Symbols

The organization is to contact Ford Engineering to obtain concurrence for the use of Ford Motor Company special characteristics symbols defined in the table below.

Characteristic	Symbol
CRITICAL CHARACTERISTIC – (CC) (With Safety or Legal Consideration)	∇
SIGNIFICANT CHARACTERISTIC – (SC) (Not Relating to Safety or Legal Considerations)	None
High Impact (HI) Characteristics	None
Operator Safety Characteristics (OS)	None

For internal use, the organization may develop its own special characteristics symbols.
The Special Characteristics definitions are available in the Ford FMEA Handbook.
Ford Designated Special Characteristics

Critical Characteristic (∇) Parts

Ford designated Control Item Parts are selected products identified by Ford Engineering, concurred by Ford/ organization manufacturing and identified on drawings and specifications with an inverted delta (∇) preceding the part. Control Item products have Critical Characteristics that may affect safe vehicle operation and/or compliance with government regulations. Unique symbols identifying safety and regulatory characteristics on components equivalent to the inverted delta (∇) symbol.

Fasteners with Critical Characteristics

For fasteners, base part numbers beginning with “W9” are to be treated as inverted delta. Critical Characteristics for fasteners may be designated by methods defined in Ford Engineering Fastener Specifications available through Ford Global Materials and Fastener Standards.

Other Special Characteristics

Significant and High Impact and Operator Safety Characteristics are described in the Ford FMEA Handbook.

8.2.3.1.3 Organization manufacturing feasibility

Manufacturing feasibility reviews for updated or new manufacturing processes or capacity increases requiring tooling or equipment shall be documented as specified on the Manufacturing Feasibility form (both initial feasibility and final feasibility) https://web.qpr.ford.com/sta/Feasibility_Form.xlsx, per the timing specified on https://web.qpr.ford.com/sta/APQP.html and shall include all appropriate organization and Ford organizations.

Copyright © 2024 Ford Motor Company.

8.2.3.2
See ISO 9001:2015 requirements.

8.2.4 Changes to requirements for products and services
See ISO 9001:2015 requirements.

8.3 Design and development of products and services

8.3.1 General
See ISO 9001:2015 requirements.

8.3.1.1 Design and development of products and services — supplemental
The organization should consider Incoming inspection when developing control strategies to prevent the use of non-conforming incoming material.

8.3.2 Design and development planning
See ISO 9001:2015 requirements.

8.3.2.1 Design and development planning — supplemental

FMEA and Control Plan Development
FMEAs and Controls Plans shall ensure that the manufacturing process complies with Critical to Quality process requirements as specified in the Supplier Manufacturing Health Charts located at https://web.qpr.ford.com/sta/Supplier_Manufacturing_Health_Charts.html .

Acceptance required for Inverted Delta parts
Process FMEA(s) and Control plan(s) for inverted delta component(s) require Ford Engineering & STA acceptance.

For all parts where the organization is Design Responsible
Design FMEA(s) prepared by design responsible organizations requires Ford Engineering acceptance.

Acceptance of revisions to these documents after initial acceptance per the above is also required. Ford reserves the right to require acceptance of FMEA and/or control plans for any part from any organization.

Acceptance can be demonstrated in the form of an email communication, verifiable electronic signature, or physical signature on the required documents.

Where required, Ford acceptance of the DFMEA, PFMEA, and Control Plans indicate that these documents have been reviewed for alignment with Ford's requirements. Even if reviewed and accepted by Ford, the organization remains responsible the accuracy and completeness of the PFMEA, Control Plans, and (where Design Responsible) the DFMEA.

Copyright © 2024 Ford Motor Company.

FMEA requirements
Organizations shall comply with the Ford FMEA Handbook requirements see FSP Document Library https://fsp.portal.covisint.com/web/portal/document_library . Organizations complying with the Ford FMEA Handbook will meet the FMEA and related requirements of the Q1 Manufacturing Site Assessment. Where Organizations are utilizing the AIAG & VDA FMEA Handbook, Ford will accept the use of the format. Where organizations are supplying Bulk Materials, Ford will continue to accept the PPAP Fourth Edition manual requirements for Bulk Materials.

Families of FMEAs
The organization may write FMEAs for families of parts, where typically the only difference in the parts is dimensional, not form, application or function. The organization should obtain STA review and concurrence prior to use of family process FMEAs. The organization should obtain Ford PD review and concurrence prior to use of family design FMEAs.

Foundation FMEAs
Organizations are required to have foundation FMEAs. Foundation FMEAs are typically created for each process type (e.g. stamping, riveting, injection molding, etc.). See the AIAG & VDA FMEA manual for more information. Foundation FMEAs are also known as corporate, generic, baseline, core, master, or best practice FMEAs and contain knowledge of the organization from prior developments and problem-solving activities. They play a critical role in the Prevent Recurrence process by capturing knowledge from problem solving and making sure the errors are not repeated in future launches. Knowledge gained from problem solving processes (8D, 6-Sigma, Shanin, etc.) shall be documented in both the part and the foundation FMEAs. The foundation FMEAs are not a replacement for the part FMEA but are a starting point for a part FMEA on a new launch.

FMEA Information Flow And Linkage
The Part and Foundation FMEAs shall be living documents that are always aligned. An update to the Foundation FMEA shall result in a review of the applicable information for the Part FMEA. This process also shall work backwards from the part FMEAs to the Foundation FMEA in that any updates to the part FMEAs result in updates of the applicable information in the Foundation FMEAs. In addition, FMEAs shall be aligned to the control plans and work instructions/visual aids.

FMEA Software
Suppliers shall use FMEA software which ensures the alignment of the Foundation FMEA, Part FMEA, control plan and other applicable documents.

Reverse FMEA Process (RFMEA)
Organizations are required to have a process in place that ensures all new launches complete an RFMEA event once the equipment is installed and running. This process should be first completed at the equipment manufacturer and then after final installation on the supplier plant floor. The reverse FMEA involves design and process engineers working with operators and attempting to make bad parts, beat the error proofing and find new failure modes, causes, and develop controls. The goal is to discover opportunities and implement improvements in the FMEA that were not previously discovered. Evidence of Reverse FMEA events must be available.

Copyright © 2024 Ford Motor Company.

Implementation For Foundation and FMEA Software
All Foundation PFMEAs for all manufacturing processes (current and forward model) and subsequent updates to all FMEAs must be available in the FMEA software.

FMEA documentation
Organizations are to provide copies of FMEA documents to Ford Motor Company upon request.

Special Characteristic traceability for build to print organizations
For build to print organizations, the organization shall obtain from Ford DFMEA information (including potential Critical Characteristics – YCs and potential Significant Characteristics – YSs) to develop the PFMEA and special characteristics (CC, SC, HI and OS, as appropriate). The organization shall document special characteristics on the Special Characteristics Communication and Agreement Form – SCCAF (FAF03-111-2) including where special characteristics are controlled at sub-tier suppliers, and obtain Ford approval. The SCCAF template is available through APQP/PPAP Evidence Workbook (through https://web.qpr.ford.com/sta/APQP.html)
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 nonconformance to Ford specified Critical Characteristics, regardless of the location of the special controls in the supply chain (tier 1 through tier N).

Control Plans
All Ford Motor Company parts shall have Control Plans (or Dynamic Control Plans – DCP if required by Powertrain).

Special Characteristic Traceability
Special Characteristics and control approach are traceable from the DFMEA through the PFMEA and the SCCAF to the Control Plan and recorded in the APQP/PPAP Evidence Workbook.

Ongoing Engineering Specification testing documentation
Any revisions to the Product Validation Engineering Specification or other inspection frequencies in the Control Plans and PFMEAs require Ford approval through the Supplier Request for Engineering Approval (SREA)

Copyright © 2024 Ford Motor Company.

Pre-Launch Control Plans
Pre-Launch / Safe-Launch control plan shall be completed and utilized during production of parts from <TT> / unit<TT> until <OKTB>, 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 <OKTB>. 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 request to the Site STA Engineer 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.

Submission of Pre-Launch Control Plan Data
Organizations providing parts to Ford plants shall have Pre-Launch Control plan data available for review for all launch build phases from <TT> to <OKTB> .

For Priority Selected Suppliers: Safe-Launch Control Plan data should continue to be collected and reviewed with the site STA Engineer to support demonstration of Exit Criteria approval.

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 – 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.

8.3.2.2 Product design skills
No Ford Customer-Specific Requirement for this section.

Copyright © 2024 Ford Motor Company.

8.3.2.3 Development of products with embedded software
No Ford Customer-Specific Requirement for this section.

8.3.3 Design and development inputs
See ISO 9001:2015 requirements.

8.3.3.1 Product design input
No Ford Customer-Specific Requirement for this section.

8.3.3.2 Manufacturing process design input
No Ford Customer-Specific Requirement for this section.

8.3.3.3 Special characteristics
See 8.2.3.1.2 for Ford Customer-Specific Requirement regarding customer-defined symbols.

Copyright © 2024 Ford Motor Company.

8.3.4 Design and development controls

The organization shall perform Design Verification (DV) to show conformance to the appropriate Ford Engineering requirements: Attribute Requirements List (ARL) and System Design Specification (SDS). ARLs and SDSs are available from Ford Product Engineering.
The organization shall record the Design Verification methods with the test results and submit to Ford Product Engineering for approval.

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 Ford PD 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.

The organization shall use GPDS (Global Product Development System) when reviewing product design and development stages. Information on GPDS is available through FSP (Ford Supplier Portal https://fsp.covisint.com) log into Ford Supplier Portal and then go to the Ford Supplier Learning Institute (FSLI) application.

Product Development
For Inverted Delta (∇) parts, design responsible organizations shall include Ford Engineering and Assembly / Manufacturing in GPDS milestone design reviews, as appropriate.
Where feasible, design responsible organizations shall include Ford Engineering and Ford Assembly and/or Manufacturing in design reviews for all Ford parts.

8.3.4.1 Monitoring
No Ford Customer-Specific Requirement for this section.

8.3.4.2 Design and development validation
No Ford Customer-Specific Requirement for this section.

8.3.4.3 Prototype programme
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. See GPDS for additional information on prototype programs on Ford Supplier Portal.

Copyright © 2024 Ford Motor Company.

8.3.4.4 Product approval process

Production Part Approval Process
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).

Organization initiated changes
Per PPAP, the organization shall submit via WERS all organization-initiated design change proposals, unless the organization or sub-tier supplier does not have access to WERS.
For process changes introduced by the organization, after SREA approval and change implementation, all changes require PPAP approval and functional trial approval or PPAP approval and functional trial waiver prior to shipping production quantities.
STA will not grant full PPAP approval by if the part or manufacturing process is under WERS Alert, per exception management process.
See https://web.qpr.ford.com/sta/Phased_PPAP.html

SREAs for service parts
The organization should process supplier-initiated change requests associated with Service-Unique parts no longer used in Ford production via the applicable FCSD Service Part Deviation SREA process found via https://web.srea.ford.com/ through the Ford Supplier Portal. Contact your local FCSD STA engineer for further clarification.

8.3.5 Design and development outputs
See ISO 9001:2015 requirements.

8.3.5.1 Design and development outputs — supplemental
Assistance in C3P or legacy data system compatibility with Ford CAD systems is available through https://azureford.sharepoint.com/sites/C3PNGMethods/SitePages/Home.aspx

8.3.5.2 Manufacturing process design output
No Ford Customer-Specific Requirement for this section.

8.3.6 Design and development changes
See ISO 9001:2015 requirements.

8.3.6.1 Design and development changes — supplemental
No Ford Customer-Specific Requirement for this section.

Copyright © 2024 Ford Motor Company.

8.4 Control of externally provided processes, products and services

8.4.1 General
See ISO 9001:2015 requirements.

8.4.1.1 General — supplemental
No Ford Customer-Specific Requirement for this section.

8.4.1.2 Supplier selection process
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 16949), not just at the initial supplier selection.

8.4.1.3 Customer-directed sources (also known as "Directed–Buy")
When required by the contract with Ford, the organization shall obtain approval from Ford Motor Company prior to sourcing sub-tier suppliers. Please contact the Ford Buyer.

8.4.2 Type and extent of control
See ISO 9001:2015 requirements.

8.4.2.1 Type and extent of control — supplemental
The organization shall have incoming product quality measures and shall use those measures as key indicators of sub-tier supplier product quality management.

8.4.2.2 Statutory and regulatory requirements
Applicable regulations shall include international requirements for export vehicles as specified by Ford Motor Company, e.g. plastic part marking (E-4 drafting standard –WSS-M99P9999-A1 and European End of Life of Vehicle (ELV) –available on FSP (Ford Supplier Portal https://fsp.covisint.com).
Material reporting requirements for ELV are specified by WSS-M99P9999-A1 under "Important Documents".

Copyright © 2024 Ford Motor Company.

8.4.2.3 Supplier quality management system development
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 sub-tier 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.

8.4.2.3.1 Automotive product-related software or automotive products with embedded software
No Ford Customer-Specific Requirement for this section.

Copyright © 2024 Ford Motor Company.

8.4.2.4 Supplier monitoring
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.

8.4.2.4.1 Second-party audits
No Ford Customer-Specific Requirement for this section.

8.4.2.5 Supplier development
No Ford Customer-Specific Requirement for this section.

8.4.3 Information for external providers
See ISO 9001:2015 requirements.

8.4.3.1 Information for external providers — supplemental
No Ford Customer-Specific Requirement for this section.

8.5 Production and service provision

8.5.1 Control of production and service provision
See ISO 9001:2015 requirements.

8.5.1.1 Control plan
No Ford Customer-Specific Requirement for this section.

8.5.1.2 Standardized work — operator instructions and visual standards
Operators shall use the most current work instructions.
The organization shall ensure that work instructions contain reaction plans for non-conformances showing the specific required steps.

8.5.1.3 Verification of job set-ups
No Ford Customer-Specific Requirement for this section.
8.5.1.4 Verification after shutdown
No Ford Customer-Specific Requirement for this section.

8.5.1.5 Total productive maintenance
No Ford Customer-Specific Requirement for this section.

8.5.1.6 Management of production tooling and manufacturing, test, inspection tooling and
No Ford Customer-Specific Requirement for this section.

8.5.1.7 Production scheduling
No Ford Customer-Specific Requirement for this section.

Copyright © 2024 Ford Motor Company.

8.5.2 Identification and traceability

The organization shall meet all logistics requirements as specified by Material Planning and Logistics (MP&L). MP&L requirements are available in the Global Terms & Condition (GTC) web guides at https://www.fsp-wlp.ford.com/gtc/production/index.jsp?category=guides and on MP&L-in-a-Box at https://azureford.sharepoint.com/sites/mplinabox/pages/mpldefault.aspx.
The organization is required to achieve level "A" on the Material Management Operation Guideline / Logistics Evaluation (MMOG/LE) to achieve and maintain Q1.
Key requirements for MMOG/LE (Material Management Operation Guideline/Logistics Evaluation) compliance include:

- Annual MMOG/LE assessment completed and reported 1 May to 31 July each year
- Adherence to Ford production and service delivery rating requirements for all regions as stated in Q1
- 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
- Management and maintenance of the Ford DDL CMMS3 system
- Prevention of damage or deterioration of supplied products
- Use of the appropriate packaging forms and maintenance of the Ford DDL CMMS3 DAIA Packaging screen, as applicable. Packaging requirements and forms can be found in the packaging GTC Web Guides at https://www.fsp-wlp.ford.com/gtc/production/index.jsp?category=guides
- Management and maintenance of returnable dunnage. Returnable container requirements are available through the GTC Web Guides at https://www.fsp-wlp.ford.com/gtc/production/index.jsp?category=guides
- Adequately trained personnel, as defined in MMOG/LE.

In all cases, if unsure of the MP&L requirements, contact the production and service delivery analyst for the organization site, for each region. The analyst contact information is available through SIM.

Inverted delta part identification

The inverted delta symbol (∇) shall precede the Ford Motor Company part number for parts with Critical Characteristics, in accordance with the Packaging Guidelines for Production Parts and Shipping Parts/Identification Label Standard, both available through Ford Supplier Portal MP&L page https://azureford.sharepoint.com/sites/mplinabox/pages/mpldefault.aspx
Note: Branding (E108) does not require the inverted delta symbol to be included with the part number physically marked on the part.

8.5.2.1 Identification and traceability — supplemental

No Ford Customer-Specific Requirement for this section.

Copyright © 2024 Ford Motor Company.

8.5.3 Property belonging to customers or external providers
See ISO 9001:2015 requirements.

8.5.4 Preservation
See ISO 9001:2015 requirements.

8.5.4.1 Preservation — supplemental
No Ford Customer-Specific Requirement for this section.

8.5.5 Post-delivery activities
See ISO 9001:2015 requirements.

8.5.5.1 Feedback of information from service
No Ford Customer-Specific Requirement for this section.

8.5.5.2 Service agreement with customer
No Ford Customer-Specific Requirement for this section.

8.5.6 Control of changes
See ISO 9001:2015 requirements.

8.5.6.1 Control of changes — supplemental
No Ford Customer-Specific Requirement for this section.

8.5.6.1.1 Temporary change of process controls
No Ford Customer-Specific Requirement for this section.

8.6 Release of products and services
See ISO 9001:2015 requirements.

8.6.1 Release of products and services — supplemental
Ford reserves the right to require the use of an independent third party inspector to ensure that the organization only ships compliant product to Ford facilities.

8.6.2 Layout inspection and functional testing
The organization shall perform annually a layout inspection (to all dimensional requirements) on at least 5 parts.
Where tooling has multiple cavities, tools or centers, the organization conducts the annual layout on at least one part from each cavity, tool or center, with a minimum overall sample of 5 parts.
Note: 5 parts are not required from each cavity; tool or center, only a minimum of 1 part is required from each cavity, tool or center.
The measurements are to be documented on the APQP/PPAP Evidence Workbook (Prototype or Production Measurement Results section), available through https://web.qpr.ford.com/sta/APQP.html .

Copyright © 2024 Ford Motor Company.

8.6.3 Appearance items
Appearance approval requirements are specified in PPAP, Ford customer specific requirements. https://web.qpr.ford.com/sta/Phased_PPAP.html

8.6.4 Verification and acceptance of conformity of externally provided products and services
No Ford Customer-Specific Requirement for this section.

8.6.5 Statutory and regulatory conformity
No Ford Customer-Specific Requirement for this section.

8.6.6 Acceptance criteria
For guidance on product monitoring and reaction plan techniques for product conformance to specification, see the references AIAG SPC and APQP.
For ongoing process capability requirements, see Table A of this document.

8.7 Control of nonconforming outputs

8.7.1
See ISO 9001:2015 requirements.

8.7.1.1 Customer authorization for concession
Ford Motor Company authorization of product differing from Ford specifications is managed by Worldwide Engineering Release System (WERS), limited to the quantity of parts or time-period approved in the WERS Alert. This is applicable to both prototype and production level parts. PPAP submission and Interim PSW acceptance are required for production use of parts with a WERS Alert.
Where written by the organization, Alerts must contain the following:

- The specific PPAP requirements that are not completed
- The modified specifications(s) that the part satisfies
- The justification why the modified specification(s) is acceptable
- The containment plan to assure the quality of parts (e.g. extraordinary controls / inspection process / robust measurement systems)

The period (typically in terms of days), the number of parts and the specific launch build event for which the Alert is effective.

The WERS help desk can provide information on WERS via email: hwers@ford.com
WERS training is available through Ford Supplier Learning Institute (FSLI) through https://fsp.portal.covisint.com/web/portal/home

8.7.1.2 Control of nonconforming product — customer-specified process
No Ford Customer-Specific Requirement for this section.

8.7.1.3 Control of suspect product
No Ford Customer-Specific Requirement for this section.

Copyright © 2024 Ford Motor Company.

8.7.1.4 Control of reworked product
No Ford Customer-Specific Requirement for this section.

8.7.1.5 Control of repaired product
No Ford Customer-Specific Requirement for this section.

8.7.1.6 Customer notification
The organization shall notify Ford within 24 hours or sooner in the event non-conforming product has been shipped.

8.7.1.7 Nonconforming product disposition
No Ford Customer-Specific Requirement for this section.

8.7.2
See ISO 9001:2015 requirements.

9 Performance evaluation

9.1 Monitoring, measurement, analysis and evaluation
Ford reserves the right to request the data collected by the organization as defined in either the pre-launch or production Control Plans.

9.1.1 General
See ISO 9001:2015 requirements.

9.1.1.1 Monitoring and measurement of manufacturing processes
Table A of this document details the on-going process capability requirements.
All process controls shall have a goal of reduction of variability, using 6-sigma or other appropriate methods.
All process metrics are to be traceable to Ford requirements.

9.1.1.2 Identification of statistical tools
The organization shall use the latest edition of the following references as appropriate:
See IATF 16949 for applicable references.

Process Capability
The capability index for reporting launch process capability and ongoing production process capability is Ppk (Performance Index)

See Ford's PPAP customer specifics for the launch process capability requirements.
https://web.qpr.ford.com/sta/Ford_Specifics_for_PPAP.pdf

See table A for ongoing process capability requirements.

The organization shall maintain ongoing process capability at Ppk $\geq$ 1.33.

The requirement for maintenance of ongoing process capability is to be included in the production Control Plan and the capability results recorded in the APQP/PPAP Evidence Workbook.

Copyright © 2024 Ford Motor Company.

The results of monitoring process capability are to be available to Ford upon request. When investigating a process capability issue it is advisable to use multiple indices, e.g. Pp, Ppk, Cp, and Cpk. When used together, the indices assist in the determination of sources of variation (see references on Statistical Process Control).

Table–A - Ongoing Process and Product Monitoring
Control Chart Interpretation and Reaction

The Control Chart indicates that the process:	ACTIONS ON THE PROCESS OUTPUT Based on Process Capability (Ppk)	
	Less than 1.33	Equal to or Greater than 1.33
Is in control	100% inspect*	Accept product Continue to reduce product variation
Has gone out of control	IDENTIFY SPECIAL CAUSE 100% inspect* all product since the last in-control sample	

*The organization ensures that the 100% inspection methodology prevents shipment of any non-conforming product to Ford. The 100% inspection methodology would typically include error proofing, such as a poka-yoke.

The organization ensures that Critical Characteristics (CC) have controls which prevent the shipment of non-conforming 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.

9.1.1.3 Application of statistical concepts
No Ford Customer-Specific Requirement for this section.

9.1.2 Customer satisfaction
No Ford Customer-Specific Requirement for this section.

Copyright © 2024 Ford Motor Company.

9.1.2.1 Customer satisfaction — supplemental

The organization shall monitor performance and customer satisfaction metrics (as defined by Q1) and updates to Ford requirements on Ford Supplier Portal (FSP) https://fsp.covisint.com.

It is recommended that the organization review their performance status on Supplier Improvement Metrics (SIM) at least weekly. (Some information is updated daily in SIM).

At least twice per year, the organization shall communicate customer satisfaction metrics to all employees who affect the quality of Ford Motor Company parts.

Notification for Q1 Revocation

Ford will notify the organization if the organization is placed in the Special Status of Q1 Revoked. Ford can submit an IATF Performance Complaint against the organization based on the issues leading to the Special Status of Q1 Revoked. The Performance Complaint process follows the IATF Certificate Decertification Process*

*See ***Automotive Certification Scheme for IATF 16949, Rules for Achieving and Maintaining IATF Recognition, section 8.0.***

Note 1: Reinstatement of Q1 requires at least 6 months of acceptable organization performance. The Certification Body may remove the suspension of the IATF 16949 certificate if the organization's corrective actions have addressed the issues which led to the Q1 revocation. The Certification Body may remove the suspension even though the site remains under Q1 revocation status, while accumulating the required 6 months of acceptable performance data.

Note 2: At its option, Ford may file an IATF OEM performance complaint when confronted with a specific organization quality or delivery performance issue associated with the organization's quality management system.

Note 3: A suspended IATF certificate, by itself, will not result in a revocation of Q1 status.

Copyright © 2024 Ford Motor Company.

When organizations are not meeting customer requirements

Between IATF 16949 audits, the organization shall use the standard approach to work with STA to resolve any issue(s) leading to a red or orange zero-tolerance metric (except industry standards in Q1 Capable Systems) score displayed in the Q1 Score dashboard in Supplier Improvement Metrics (SIM). The standard approach can include but not limited to: problem solving investigation, submission of Q1 Manufacturing Site Assessment to Ford, reviews with STA as requested, etc.

When the organization submits performance information to its certification body in preparation for an IATF 16949 audit, as specified by the organization's IATF certification body, the organization shall provide the full Q1 Scoring Detail and Performance Metrics Summary page prints to its certification body, including all interactions with Ford associated with any red or orange rated zero-tolerance metrics*

*Zero-tolerance metrics that impact RED supplier status are defined as (see Ford Quick Reference Guide):

- Commodity PPM for both Production and Service
- Stop Shipments
- Q1 Manufacturing Site Assessment
- Field Service Actions
- Delivery for both Production and Service

Note 1: Ford may also provide the Certification Body and/or relevant IATF Oversight Office with periodic reports of its supplier's performance.

Note 2: RED supplier status identified above is a performance status reported to the relevant IATF Oversight Office and is separate from red rated metrics in SIM

9.1.3 Analysis and evaluation
See ISO 9001:2015 requirements.

9.1.3.1 Prioritization
No Ford Customer-Specific Requirement for this section.

9.2 Internal audit
No Ford Customer-Specific Requirement for this section.

9.2.1 and 9.2.2
See ISO 9001:2015 requirements.

9.2.2.1 Internal audit programme
No Ford Customer-Specific Requirement for this section.

9.2.2.2 Quality management system audit
No Ford Customer-Specific Requirement for this section.

Copyright © 2024 Ford Motor Company.

9.2.2.3 Manufacturing process audit

Ford Manufacturing Process Assessment Requirements
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.

Ford Supplier Manufacturing Health Chart Requirements
The organization shall assess compliance to Critical to Quality process requirements in accordance with APQP as specified in the Supplier Manufacturing Health Charts located at https://web.qpr.ford.com/sta/Supplier_Manufacturing_Health_Charts.html

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/CQI-9_Ford_Specific_assessment.xls); CQI-9 is available through AIAG https://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 must review that the individual assessments are current (less than 12 months old), meet the requirements above and enter the CQI-9 assessment status into GSDB Online. GSDB Online is accessible through
https://web.gsdb2.ford.com/GSDBeans/servlet/gsdbeans.web.lib.GSDB

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 7.5.2 of this document.

Copyright © 2024 Ford Motor Company.

9.2.2.4 Product audit
No Ford Customer-Specific Requirement for this section.

9.3 Management review

9.3.1 General
See ISO 9001:2015 requirements.

9.3.1.1 Management review — supplemental
The organization management shall hold monthly QOS (Quality Operating System) performance meetings as specified in the Q1 Manufacturing Site Assessment available on https://web.qpr.ford.com/sta/Q1.html. The results of these QOS performance reviews shall be integral to the senior management reviews.
Note: the organization need not hold management review as one meeting, but it may be a series of meetings, covering each of the metrics monthly.

9.3.2 Management review inputs
Management review input must also include the Q1 Manufacturing Site Assessment results

9.3.2.1 Management review inputs — supplemental
No Ford Customer-Specific Requirement for this section.

9.3.3 Management review outputs
See ISO 9001:2015 requirements.

9.3.3.1 Management review outputs — supplemental
No Ford Customer-Specific Requirement for this section.

10 Improvement

10.1 General
See ISO 9001:2015 requirements.

10.2 Nonconformity and corrective action

10.2.1 and 10.2.2
The organization shall have processes and systems in place to prevent shipment of non-conforming 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.

Copyright © 2024 Ford Motor Company.

Customer Concerns

Organizations shall respond to Quality Concerns by:

Note: The clock starts once Ford has sent the notification to the organization

- Responding in 24 hours
- Implementing containment in the Ford plant. The organization and/or third party must follow local procedures and site rules while carrying out containment.
- Providing certified stock
- Delivering an 8D, beginning with Symptom and Emergency Response Actions (D0) through Interim Containment Actions (D3)
- Within 48 hours of notification by the Ford plant, the organization shall notify Ford Service if the product quality issue is suspected of affecting any FCSD shipments
- Within 15 calendar days delivering the 8D or (six sigma) 6 panel with preliminary or verified root cause, and a plan to implement corrective and preventive actions with supporting data

A summary of the Quality Concern Reporting Process is available through
https://web.qpr.ford.com/sta/QR2PTO_VO.htm
Global 8D system is available on FSP (https://web.global8d.ford.com/)

Returned Product Test/Analysis
The organization shall have a documented system for internal notification, analysis and communication of all Ford plant returns and warranty returned parts.

The organization shall communicate the results of analysis to the responsible Ford and organization work groups and include the results in the associated 8D report.

The organization shall communicate Ford plant PPM (Parts Per Million) to all organization plant team members.
The organization shall develop a system to monitor Ford plant and warranty concerns. The organization shall also implement corrective actions to prevent future Ford plant and warranty concerns.

Returned product test results are to be included in the monthly QOS performance report as part of the Management Review.

10.2.3 Problem solving
No Ford Customer-Specific Requirement for this section.

10.2.4 Error-proofing
No Ford Customer-Specific Requirement for this section.

Copyright © 2024 Ford Motor Company.

10.2.5 Warranty management systems
Organizations shall comply with the requirements in the Ford Production Purchasing Global Terms & Conditions (PPGT&Cs), Applicable Web Guides, Q1 Requirements and the Manufacturing Site Assessment https://web.qpr.ford.com/sta/Q1.html.

10.2.6 Customer complaints and field failure test analysis
See ISO 9001:2015 requirements.

10.3 Continual improvement
See ISO 9001:2015 requirements.

10.3.1 Continual improvement — supplemental
No Ford Customer-Specific Requirement for this section.

Copyright © 2024 Ford Motor Company.

Records of Revisions

Sections updated	Date updated
1. Administrative updates to correct numbering and links 2. Clarification and updates for Certification Body notification of Q1 revocation 3. Clarification and updates for Certification Body notification for not meeting customer requirements, including definition of zero-tolerance metrics and identification of RED supplier status	January 2024
1. Clarification added for Safe Launch Control Plans 2. Update reference to eCAR. 3. Updates for Gauge R&R Requirements. 4. Clarification on Bulk Material Requirements for FMEA software. 5. Administrative update to correct nomenclature of AIAG & VDA FMEA.	Jun 2023
1. Administrative updates to correct links 2. Prototype Tooling Disposal: - Updated contacts for Prototype Tool Disposal 3. FMEA updates: - Acceptance of Organization Design Responsible DMFEA - Foundation FMEAs - FMEA Information Flow and Linkage - FMEA Software - Reverse FMEA Process	November 2021
Administrative updates to correct links to: - Capacity Analysis Training - Ford Specific CQI-9 requirements	January 2021
1. Administrative updates to ISO/TS reference. 2. Clarifications and updates: 4.3 Determining the scope of the quality management system IATF 16949 Certification Waiver • Clarification for waiver 8.3.2.1 Design and development planning — supplemental • Update to include acceptance of the new AIAG & VDA FMEA Handbook 8.3.4.4 Product approval process Organization initiated changes • Clarification for organization process changes 8.7.1.6 Customer notification • Added clarification	September 2020

Copyright © 2024 Ford Motor Company.

• The organization shall notify Ford within 24 hours or sooner in the event non-conforming product has been shipped 9.1.1.1 Monitoring and measurement of manufacturing processes • Removed outdated reference for SPC manual 9.1.2.1 Customer satisfaction — supplemental Certification Body Notification • Updated wording	
Administrative correction in Ppk > / = 1.33	May 2017
New release for IATF 16949	February 2017

Copyright © 2024 Ford Motor Company.