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Mechanical Part and Sub-Assembly Qualification and Approval Process

Document Number and Revision:	923-3402 Rev 08

Overview

The purpose of this process specification is to document Oracle Make/Buy Mechanical Part/Sub-Assembly, Hard and Soft Tool approval process. This document describes First Article Inspection (FAI) Report and Inspection requirements and approval process for soft and hard tooled sheet metal, plastic, machined, die cast parts and assemblies, Process Capability (Cpk Report) requirements for soft and hard tooled parts, and Control Plan requirements. This process specification is intended to be utilized for both Oracle Mechanical designs (Oracle unique with Drawing) and commercial (off the shelf COTS) parts and sub-assemblies across all mechanical suppliers.

Audience

This document is intended for use by Oracle Design Engineers, Operations Engineers, Supplier Program Managers, Supplier Engineers (SE), and all suppliers who fabricate, assemble, design/build related tooling for Oracle mechanical parts and sub-assemblies.

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1. Roles and Responsibilities

The following organizations have defined responsibilities within the soft tooled part approval, hard tool design, and hard tooled part approval processes:

- Oracle Design Engineering

- Oracle Operations Engineering

- Oracle Supplier Program Management

- Oracle Operations Program Management

- Oracle Suppliers

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Table 1 – Roles and Responsibilities

Individuals	Roles and Responsibilities
Oracle Design Engineering Design Engineer (DE)	• Release part design/specifications in Agile. (CAD database,Drawing Package, BOMs) • Respond to Design for Manufacture (DFM) inputs, work collaborative solutions with suppliers and Oracle Operations Engineering, revise designs as appropriate to optimize design, manufacturing and quality. • Verify that no incorrect assumptions were made by suppliers regarding part design intent. This will be accomplished through scheduled DFM and Design reviews. • Review and sign off First Article Inspection (FAI) Reports. • Approve *Plastic Tool Specification Form,* 913-3565-xx*, Sheetmetal Tool Specification Form,* 913-3566-xx
Oracle Operations Engineering Supplier Engineer (SE) Product Engineer (PE) Either SE or PE can perform the Oracle Operations Engineering functions. Oracle will identify the specific Operations Engineering function and individual for each program on the Operations Product Team roster maintained by the Operations Program Manager.	• Provide input during DFM process, ensure DFM issues are addressed between supplier and Oracle Design. • Verify no incorrect assumptions were made regarding part design intent. This will be accomplished through scheduled DFM and Design Reviews. • Validate manufacturing process design and controls meets material specification and overall design intent. • Verify process capability is demonstrated for all Critical To Function (CTF) dimensions and features based on specified design tolerances. • Validate measurement and test processes, tools, and instruments are capable of providing accurate and repeatable results. • Work with suppliers to optimize processes, tools and measurement systems to obtain Cpk Performance Metrics. • Review and sign off FAI Reports and post in assigned beehive location. Final approved FAI reports will be posted in Agile. • Validate the method and frequency of inspection is appropriate at various levels of part and sub-assembly manufacturing. • Evaluate the process for SPC monitoring, production data collection and the method for review and analysis of collected data.

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Individuals	Roles and Responsibilities
	• Verify tool design meets quality standards (Reference 923-3404) • Verify tool design produces parts to meet design intent as specified in Oracle drawings. • Initiate and submit to Design Engineering for approval *Plastic Tool Specification Form,* 913-3565-xx, *Sheetmetal Tool Specification Form,* 913-3566-xx • Verify Control Plans for each part are accurate, complete, and implemented in the production line. • Verify Manufacturing Assembly Instructions (MAI's) meet the intended process requirements. • Create and maintain FAI Tracker (Reference 7329459) during each product build to facilitate part qualification process.
Oracle Supplier Program Management	• Track and Verify tool cost and tool lead time meets quotation.
Oracle Operations Program Management	• Create and maintain an Operations Product Team Roster for each program • Identify the specific Operations Engineering function and individuals responsible for each program
Oracle Suppliers	• Fabricate parts to meet Oracle Specifications. • Complete part measurements and provide original source measurement Data and FAI Reports to Oracle Operations engineering. Reports must include measurement tools and processes utilized to validate conformance to specifications. • Provide Material Certifications and/or Certificate of Compliance (CoC) to Oracle Operations Engineering. • Provide RoHS Material Declarations and/or RoHS CoC to Oracle Design Engineering. • Obtain FAI Reports from Sub-Tier Suppliers and complete FAI Validation/Reports for all Oracle custom parts and sub-assemblies with Oracle Drawings. • Verify all FAI Reports are completed, reviewed for compliance, and submitted to Oracle for approval by posting to assigned beehive location. • Provide certifications for all raw materials utilized in manufacture of Oracle custom parts and sub-assemblies as part of FAI Reports submitted for each build. In cases that material certifications cannot be obtained from the sub-tier supplier, supplier must perform all necessary

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Individuals	Roles and Responsibilities
	testing to validate conformance to material specifications. • Complete and submit tool design and tool spec sheets. • Verify tool design meets Oracle Specifications. • Verify control plans are completed and implemented in the production line. • Verify that SPC monitoring (control charting of CTF dimensions) is established for HT CTF's, and the results are reviewed and analyzed consistently during production.

2. General Requirements for FAI Reports

2.1 **Material Certifications:** are required to be provided to Oracle with all FAI Reports.

2.1.1 for Oracle unique designs (custom parts with Oracle Drawing) material certification must be from raw material supplier from where the material was purchased (for example Steel Mill, Plastic Resin Supplier).

2.1.2 Any part with post manufacturing treatment processes (such as painting, coating, plating, heat treatment, etc), applied by a supplier other than the provider of the original material certification, may require additional certification to ensure compliance with the specifications.

2.1.3 For Common off-the-shelf parts and catalog items (parts without an Oracle Drawing), supplier must validate material is compliant to data-sheet/specification via supplier Certification of Analysis (CoA) or vendor Certificate of Compliance (CoC).

2.2 **Original (source file) Measurement Data:** must be provided to Oracle with FAI Report for all automated measurement and/or inspection systems (for example Coordinate Measuring Machines (CMM), Automated Optical Inspection (AOI) machines). All FAI source data must be retained for a period of Five (5) years or until the Oracle product has completed End Of Life (EOL) Phase.

2.3 **FAI Reports:**

2.3.1 FAI reports are required for all parts designated by an Oracle drawing for each P-Build and RQT development phase change. P-Build phase change is indicated by a numeric naming convention change (i.e. P0.0, P0.1, P1.0, P2.0, etc.) and alphabetic name changes (i.e. P0.1A, P0.1B etc.). For specific requirements for Hard Tooling FAI reports see Section 4.

NOTE: Suppliers can request FAI waiver from Oracle Product Engineer (PE) if there was no change to the part/process from one P-Build Phase to the next and the parts utilized are from the same manufacturing lot as the parts for which FAI was completed and approved. Correspondingly Oracle Operations Engineering will provide a Process Alert or Engineering Deviation listing

> **parts/assemblies exempt from FAI if the parts to be utilized are from a previous lot with Approved FAI.**

2.3.2   Regardless of the program phase (NPI or Production Release), FAI Reports are also required for NEW parts and sub-assemblies, and all other parts undergoing changes to any of the following: Part Number, Revision, Note Block Specification, Dimensional Tolerance, Manufacturing Method or Process Change, Soft Tool to Hard Tool Transition, Manufacturing Site/Location Change and New Supplier (AML Add/Second Source).

2.3.3   FAI Reports are required for all Parts with an Oracle drawing regardless of supplier tier (Primary or Sub-Tier). The primary supplier is responsible for obtaining FAI reports from sub-tier suppliers for any sub-contracted parts or assemblies, reviewing the reports for completeness and accuracy, and submitting to Oracle for final review. If there is a need for Oracle to work directly with a sub-tier supplier in the review and approval process of any sub-contracted parts, this will be communicated to the primary supplier via an EBD (during the NPI phase) or a PA after release to production (sustaining phase). The primary supplier is also responsible for incoming quality, and for performing inspections and validations confirming parts purchased from sub-tier suppliers meet Oracle specifications.

2.3.4   If the FAI report yields out-of-spec CTF dimensions, the supplier is responsible for communication of the failure/issue to Oracle Engineering, and for making all efforts to improve the tool or process to meet Oracle specifications. If the supplier believes they are unable to meet the agreed upon specification, the supplier must work with Oracle to determine the root cause and corrective action until a resolution is met.

2.3.5   Deviation from standard process requires formal written approval (via EBD during NPI Phase, and Deviation during Sustaining Phase) by Oracle Engineering and Operations.

> **NOTE:** If at any time there is a need to invoke an FAI during any build, direction will be given via Engineering Build Documentation (EBD) in NPI Phase, and a Process Change Notice (Deviation) in P2 phase and beyond.

2.4   ***Oracle AML Parts Without Oracle Drawing (Commercial Parts):*** For standard off-the-shelf commercial purchased parts that do not have an Oracle specific drawing or specification, the supplier is required to validate these parts meet the manufactures specification/datasheet and provide record of this validation per Oracle request (if/when required). Supplier is required to complete incoming inspections per a statistically valid sampling plan and validate compliance to specifications. The compliance validation reports submitted by the supplier for commercial parts must include CoC's and Incoming Quality Control data (IQC) showing all measured dimensions.

2.5   ***Supplier Adds*** - Request to Add Parts to Oracle AML: Supplier must notify Oracle Product Engineer (during NPI Phase) or Supplier Engineer (during Production Phase) providing full material specifications (vendor specifications), FAI Report, Material Certification, and Sample parts for Oracle qualification and approval. Oracle PE/SE will review and present data to Oracle Design Engineering and request AML Update/Add.

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3. FAI Report Requirements Specific to Soft Tooled parts

In addition to the General FAI Requirements stated in sections 2 and 3, the following requirements apply to Soft Tooled Part qualification.

3.1   As stated in section 2.3.2, FAI reports are required for all parts designated by an Oracle drawing for each P-Build and RQT development phase change. P-Build phase change is indicated by a numeric naming convention change (i.e. P0.0, P0.1, P1.0, P2.0, etc) and alphabetic name changes (i.e. P0.1A, P0.1B, etc).

3.2   Sotf Tooled parts include: Fabricated Sheet Metal (NCT), Machined Metal (CNC), Machined Plastic Parts, and all other related assemblies.

4. FAI Report Requirements Specific to Hard Tooled parts

In addition to the General FAI Requirements stated in sections 2 and 3, the following requirements apply to Hard Tooling and Hard Tooled Part qualification.

4.1   For initial qualification of the tool, Five (5) sample parts must be subjected to FAI inspection and Two (2) of these parts will be sent to Oracle Operations Engineering as part of tool qualification).

4.2   FAI Reports are required for all parts designated by an Oracle drawing for each P-build phase change until the hard tooling has been fully qualified and has met process capability requirement (Cpk ≥ 1.33).

4.3   After initial tooling qualification, FAI Reports are required only when there has been a change to any of the following: Part Number, Revision, Note Block Specification, Dimensional Tolerance, Manufacture Process, Soft Tool to Hard Tool transition, manufacturing site change,and Sub-tier part supplier change.

4.4   In the case of multi-cavity tools, 5 sample parts from each cavity must be measured and submitted in FAI reports.

5. FAI Submission and Approval Process

5.1   A beehive location will be set up and designated by Oracle Operations Engineering to post the FAI Reports to be reviewed by Oracle.

5.2   All FAI report files shall be named according to the following standard:

> **FAI_Oracle PN_Rev #_PBuild #_Supplier Name**_ (Optional, Freeform Alphanumeric)
> Example: **FAI_7005000_01_P01B_SupplierX**
> For FAI reports submitted in production phase substitute "SUS" for "PBuild #"
> Example: **FAI_8005000_02_SUS_SupplierX**

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5.3   For all builds (i.e. P0, P1, RQT, P2, etc), Five (5) sample parts, built with manufacturing processes representative of those to be used in production for the build, must be measured.

5.4   All CTFs on Oracle drawing must be measured and variable data recorded on FAI form. The report must also include inspection results per drawing notes, measurement and/or inspection tools used, and the processes utilized to inspect and validate.

5.5   Any out-of-spec conditions must be highlighted on the FAIR Form by the supplier.

5.6   FAI sample parts must be marked 1 through 5, using a permanent marker. Markings cannot appear on Class A surfaces as referenced in *WWOPS Manufacturing: Global Cosmetics Quality and Workmanship Standards*, 923-2001. This allows for the material to be used without showing any marks on key visible surfaces.

5.7   FAI sample parts must include all secondary operations to bring part to final state prior to assembly.

5.8   Supplier must send Two (2) of the Five (5) inspected sample parts to Oracle Design Engineering. These two parts are in addition to the PO quantity required for the Build shipment and must be accounted for in the Build Plan. For example, if the required build quantity is for 100 parts, supplier must plan to build 102 parts. Exceptions to this requirement will be communicated to the supplier by specific instruction via EBD.

5.9   Each dimension location must be marked on Oracle 2D print and correspond with submitted FAI data.

5.10   If a particular dimension is called out multiple times (i.e. diameter call out for a series of holes), the supplier must measure each feature and record the data on each instance.   These dimensioned features on the drawing must be identified using a numeric system (i.e. dim 1.1, 1.2, 1.3, etc), so that the measurement values can be traced to the corresponding features.

5.11   Detailed description of each inspection instrument used for FAI Report measurements must be either included in the FAI report or provided by reference. The description must include: measurement instrument manufacturer, model and resolution (e.g. 0.01mm).

5.12   Upon request supplier must provide sufficient process detail in FAI data reporting to validate measurement data integrity. For example: detailed process description for electronic transfer from measurement device to FAI report (explain the process by which automated data is transferred to FAI reports). Supplier must submit original source data with the report (i.e. CMM data).

5.13   All FAI raw data (for each of the 5 FAI samples) must be retained and archived as a quality record. Supplier must be able to provide the original FAI data for every part upon Oracle request.

5.14   Original inspection source data must be retained by supplier for a period of 5 years and/or until completion of product End of Life (EOL). It is the supplier's responsibility to maintain a record of Oracle approvals for FAI reports as proof of compliance with the specifications.

5.15   Oracle Design Engineer and Operations Engineer will provide appropriate approval status (approved, rejected, limited) for every FAI report, and identify any actions to be taken by supplier to achieve full approval status.

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5.16   Full approval will be given for FAI reports when all design requirements as specified on the drawing are met, and:

>   a) If all measured values are at only one side of the target value, they do not exceed 90% of the tolerance range.
>
>   b) If measured values are at both sides of the target value, the range does not exceed 65% of the total allowable tolerance range.

5.17   Limited approval will be given for FAI reports when all design requirements as specified on the drawing are met, but:

>   a) If all measured values are at only one side of the target value, they exceed 90% of the tolerance range, but are still within tolerance.
>
>   b) If measured values are at both sides of the the target value, the range exceeds 65% of the total allowable tolerance range but are still within tolerance.
>
>   c) If the FAI report is missing information but Oracle reviewers have high confidence that the part will meet specifications.

5.18   FAI will be REJECTED if ANY design requirements as specified on the drawing are not met.

5.19   All parts, sub-assemblies, and assemblies must have full and documented FAI Approval (Approved or Limited Approval for Soft Tooled parts, and Approved for Hard Tooled parts) from assigned Oracle DE and Ops Engr before shipment is authorized. Hard Tooled parts with Limited Approval will require a Deviation from Oracle DE to authorize shipment.

5.20   No parts, sub-assemblies, or assemblies shall be shipped prior to receipt of documented FAI approval from the assigned Oracle DE and Ops Engr.

5.21   If Oracle Design or Operations Engineering chooses to accept a rejected part, a formal Deviation or an EBD will be required to authorize shipment.

5.22   Supplier must hold back Three (3) parts and maintain for baseline. The three parts will be retained until the first assembly using these parts is complete and FAI is approved. Once FAI approval is granted for the assembly, all 3 parts can be used for that specific build.

5.23   All FAI reports per build will be archived on Beehive. Operations Engineering will set up external Beehive locations. The FAI reports for each part will also be uploaded into Agile by Operations Engineering after full approval has been granted.

5.24   FAI tracker (7329459) is required for NPI phase but is optional for sustaining phase. The FAI tracker for NPI phase will be created and maintained by the Ops Engineering SE and will be posted on the beehive after each update.

6. General Requirements for Cpk Reports

Cpk studies are required and must be performed as part of process qualification on soft tooled and hard tooled parts. All CTF dimensions and noted specifications on the Oracle drawings must be measured to determine manufacturing process capability relative to meeting a goal of Cpk ≥ 1.33.

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6.1   A beehive location will be set up and designated by Oracle Operations Engineering to post the reports.

6.2   The Cpk study must be completed on 30 piece parts/assemblies no later than the completion of RQT Build. If the quantity for a single build does not meet the 30-part requirement for Cpk study, two or more builds can be combined to meet this requirement.

6.3   All CTF dimensions and noted specifications on Oracle 2D drawing must be measured to demonstrate manufacturing process capability of Cpk ≥ 1.33.

6.4   The Cpk Study will commence after FAI Approval has been granted on the 5 parts from the initial run. The measurement results for the first 5 parts can be used as part of the 30 total required for the Cpk study report.

6.5   Supplier will deliver Cpk study reports to Oracle Operations Engineering for review and validation of process capability.

6.6   All original raw data used for Cpk study reports must be retained and archived as a quality record, and available for review upon request from Oracle.

6.7   If the Cpk study does not yield Cpk ≥1.33, the supplier is responsible for communication of the failure/issue to Oracle Engineering, and for making all efforts to improve the tool or process capability to meet Oracle specifications. If the supplier believes they are unable to meet the agreed upon specification, the supplier must work with Oracle to determine the root cause and corrective action until a resolution is met.

6.8   If the process capability does not meet Cpk ≥1.33, and process improvement is not possible without substantial investment, supplier must provide recommendations on the necessary tolerance range increase which will lead to Cpk ≥1.33. Oracle Design Engineering will investigate the proposed tolerance range increase to determine if there is any design margin available to allow the proposed change.

7. Cpk Report Requirements Specific to Soft Tooled parts

In addition to the General Cpk Requirements stated in sections 6, the following Cpk requirements apply to Soft Tooled Part qualification.

7.1   If any CTF feature or characteristic fails to meet Cpk ≥ 1.33 in a single manufactured lot, action must be taken to identify the source of variation which is negatively impacting Cpk results, and to implement actions to improve Cpk results.

7.2   If it is determined that process capability can be improved by either centering the process or reducing the variation, the supplier must initiate and implement an improvement plan, and validate the results by conducting subsequent Cpk studies. This will insure better yield results during the subsequent builds. Some examples of process improvement are: development of better set-up procedures, use of set-up or alignment fixtures, use of hold-down fixtures, focus on achieving the CTF target values instead of the tolerance range, alignment of operator skill level to part complexity, etc.

7.3   Once Cpk ≥ 1.33 has been demonstrated for a single lot, the supplier is not required to maintain the process capability (Cpk ≥ 1.33) across all production lots. However, the supplier is required to

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implement a statistically valid sampling plan approved by Oracle to ensure that each lot conforms to agreed upon AQL requirements.

8. Cpk Report Requirements Specific to Hard Tooled parts

In addition to the General Cpk Requirements stated in sections 6, the following Cpk requirements apply to Hard Tooled Part qualification.

8.1 If any CTF criteria fails to meet Cpk ≥1.33, the supplier must take action to improve the process capability. This may require the modification of hard tooling or improvement of the manufacturing processes.

8.2 Until all necessary tool modifications or process changes have been implemented and Cpk ≥1.33 has been demonstrated, supplier must implement Acceptance Sampling Process for each lot, and if the lot is rejected, 100% inspection is required.

8.3 A part design and manufacturing process is not fully qualified from Oracle Operations Engineering until every CTF parameter has a process capability of Cpk ≥ 1.33.

9. Requirements for Control Plan

9.1 The supplier must create a control plan for each custom part (part with an Oracle drawing), documenting all steps of manufacturing and inspection/measurement processes.

9.2 The first draft of control plans must be submitted to Oracle Supplier Engineer (SE) for review prior to RQT build. All control plans must be finalized and submitted for approval prior to start of P2 build. If there is any change to tooling or process after P2, supplier must submit a PPCN with proposed updates to the affected control plans for review and approval by Oracle Ops Engineering.

9.3 The Control Plans must detail the steps that are taken to ensure the accuracy and conformance to quality requirements of the part, starting from incoming material inspection to final packaging before product shipment.

9.4 The Control Plans must include specific parameters that are to be monitored and tracked for process verification. The minimum requirements for Control Plans include:

1. Basic information on the part: Oracle part number, revision, supplier part number, etc.

2. Review and Approval information: Names, dates, status.

3. Part drawing: Showing all CTF's and any drawing notes to be monitored

4. Process steps and names of the operations: Incoming material inspection, NCT operations, bending, staking, painting, final inspection, packaging, etc.

5. Manufacturing devices: Machines, tooling, etc.

6. Product characteristics and specifications: Cosmetic requirements, CTF's, functional/performance requirements, etc.

7. Method of inspection: visual, calipers, CMM, test gauges, Go/no-Go gauges, etc.

8. In-process inspection process: frequency, sample size, and responsible party for

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inspection.

9.   Control method: Method for collecting and recording inspection data.

10.   Reaction Plan: Process for corrective action in case any quality issues are detected.

11.   Disposition process: Method for handling of defective parts (scrap, rework, etc).

12.   Lot acceptance criteria: Sampling plan, accept/reject criteria.

10. Hard Tool Design Approval and Qualification Process

The following steps must be followed when designing, building, and qualifying hard tooling for Oracle. Refer to *Figure 1 Part Approval and Tool Qualification Process Map* on page 14.
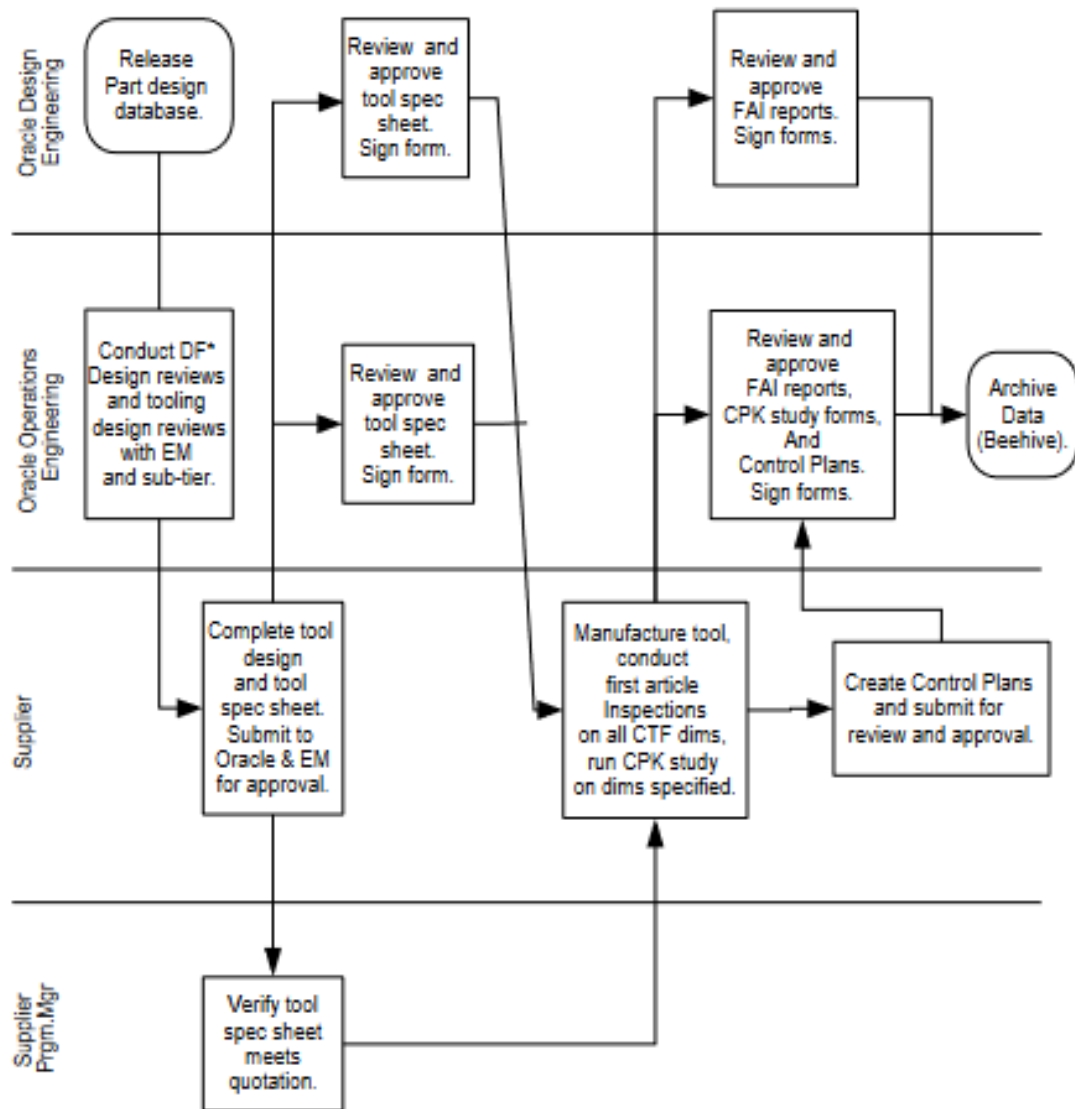
Complete the DF* tool design review (according to Sheetmetal and Plastic Tooling Requirements Specification and Guidelines, 923-3404-xx) Oracle DE/SE/PE, Supplier, Sub-Tier (if applicable). Complete the tool specification forms *Plastic Tool Specification Form*, 913-3565-xx and *Sheetmetal Tool Specification Form,* 913-3566-xx. This form must be completed by the supplier and submitted to Oracle for approval prior to tool construction.

> **NOTE: Production tooling must be qualified prior to RQT build phase.**

10.1 Conduct the tool First Article Inspection (FAI) on all Critical To Function (CTF) dimensions and features on Oracle drawing. See section 5 for FAI Submission and Approval Process.

10.2 Supplier will submit FAI reports for review and approval by posting the reports on a beehive location designated by Oracle Operations Engineering. Supplier must provide two (2) parts/assemblies with FAI Reports to Oracle for review. These two samples are part of the tool qualification process and do not require a separate purchase order.

10.3 Oracle Design Engineering and Operations Engineering will review FAI reports and determine approval status. After review, the signed FAI reports will be posted on the beehive in appropriate folders based on the approval status (Approved, Rejected, Limited). Unless full approval is given, further action by supplier to improve the process or tooling will be required before the tooling is fully qualified. Approved FAI reports for each part will also be uploaded into Agile by the Operations Engineer.

10.4 No parts shall be shipped before a full FAI approval has been granted by Oracle. For any Hard tooled parts with Limited Approval, a Deviation from Oracle DE will be required to authorize shipment.

10.5 Supplier must conduct a tool capability study (Cpk) on all CTF's specified on Oracle drawing. Tooling is not fully qualified until every CTF parameter has a process capability of Cpk ≥ 1.33. Supplier must post all Cpk study reports on the beehive location designated by Oracle Engineering for review and approval.

10.6 Supplier must submit Control Plans for each part to the assigned Oracle Supplier Engineer (SE) for review, to ensure they are accurate and complete and are implemented on the production line.

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Figure 1 Part Approval and Tool Qualification Process Map

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11. Payment Terms and Schedule for Hard Tooling

11.1   First 1/3 payment of the total cost will be released at the time when PO is placed. Tool design and raw material procurement can begin.

11.2   Second 1/3 payment of the total cost will be released after tool design review has been completed and approved by Operations Engineering and Design Engineering. Tool manufacturing can begin after the tool layout has been approved by Oracle.

11.3   Third 1/3 payment of the total cost will be released after FAI and tool Cpk have been completed, submitted for review and approved by Operations Engineering. Volume production using the tool can begin after FAI and Cpk reports have been fully approved.

Appendix A   Glossary

AML	Approved Manufacturer List
AOI	Automated Optical Inspection
AQL	Acceptable Quality Level
BOM	Bill of Materials
CAD	Computer Aided Design
CMM	Coordinate Measuring Machine
CNC	Computer Numerical Controlled Machine
CoA	Certification of Analysis
CoC	Certificate of Compliance
COTS	Commercial off the Shelf
Cpk	Process Capability Index
CTF	Critical to Function
DE	Design Engineer
DF*	Design for (manufacturing, assembly, test, etc)
DFM	Design for Manufacturing
EBD	Engineering Build Document
EM	External Manufacturer
Engr	Engineer
EOL	End of Life
FAI	First Article Inspection
FAIR	First Article Inspection Report

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HT	Hard Tooled
IQC	Incoming Quality Control
MAI	Manufacturing Assembly Instructions
NCT	Numerically Controlled Turret
NPI	New Product Introduction
Ops	Operations
PA	Process Alert
PE	Product Engineer
PN	Part Number
PO	Purchase Order
PPCN	Product and/or Process Change Notice
RoHS	Restriction of Hazardous Substances
RQT	Reliability Qualification Testing
SE	Supplier Engineer
SPC	Statistical Process Control
ST	Soft Tooled

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Reference Information

Reference Documents and Records

Document Title	Number	ESO Controlled [1]	
		Yes	No
Mechanical Tolerance Design Guideline	7078298		x
Plastic Tool Specification Form	913-3565	x	
Sheetmetal Tool Specification Form	913-3566	x	
Global Cosmetics Quality and Workmanship Standards	923-2001	x	
Oracle Sheetmetal and Plastic Tooling Requirements Specification and Guidelines	923-3404	x	
WWOPS Operations Engineering: NPI Build Mechanical FAI Tracker Template	7329459	x	

Document History and Approvals

Dash	Rev	Date	Description of Change	Originator
01	A	18 May 2004	Initial release.	N/A
Agile History				
	Rev	**Date**	**Description of Change**	**Originator**
	02	20 Nov 2013	Updated to Oracle Document	N/A
	03	25 Jul 2014	Added soft tool FAI process, and updated document to reflect current FAI process	N/A
	04	16 Sep 2014	Added: Sample Retention and Delivery to Oracle, Measurement Data Integrity, Supplier Engineering Responsibilities, Cpk Requirements, and Sample Retention.	N/A
	05	09 Jan 2015	Added Material Certification Requirements within FAI Report and Supplier Responsibility for FAI of Sub-Tier and Buy Parts and a Process for adding Buy-Part to Oracle AML and updated Product Engineer and Supplier Responsibilities and document title.	N/A
	06	25 Apr 2016	Updated and combined Roles and Responsibilities for Hard Tooling (HT) and Soft Tooling (ST). Updated General Requirements for FAI Reports to include both HT and ST. Consolidated FAI Report requirements for P0 and P1 for ST and included in the General Requirements. Created two separated sections (3 and 4) for specific FAI Report requirements for ST and HT. Updated FAI Report Submission and Approval process for both HT and ST and consolidated in section 5. Added requirements for FAI	N/A

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[1] All references to documents controlled by Engineering Services were current when this document was released.

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		Report naming convention and detailed description of three approval levels in section 5. Updated Cpk Report requirements for both HT and ST and consolidated in section 6. Created two separate sections (7 and 8) for specific requirements for HT and ST Cpk Reports. Updated Control Plan Requirements. Deleted previous sections 2.7 (Ongoing SPC Requirements), 2.8 (Out of Spec Actions), and 2.9 (Production Phase Sample Retention Requirement). Updated Hard Tool Design Approval and Qualification Process and Process Map (Flow Chart). Added section 11 for Payment Terms and Schedule for HT. Added reference to document 7329459. Added new section 2.1.2, Section 5.24, and Appendix A, Glossary.	
07		Reformat to Redwood Template. Update attachment category to Misc. No content changes.	
08	08 May 2023	Updated from WWOPS SPARC to Oracle and document titles throughout.	

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