

Supplier Quality Manual



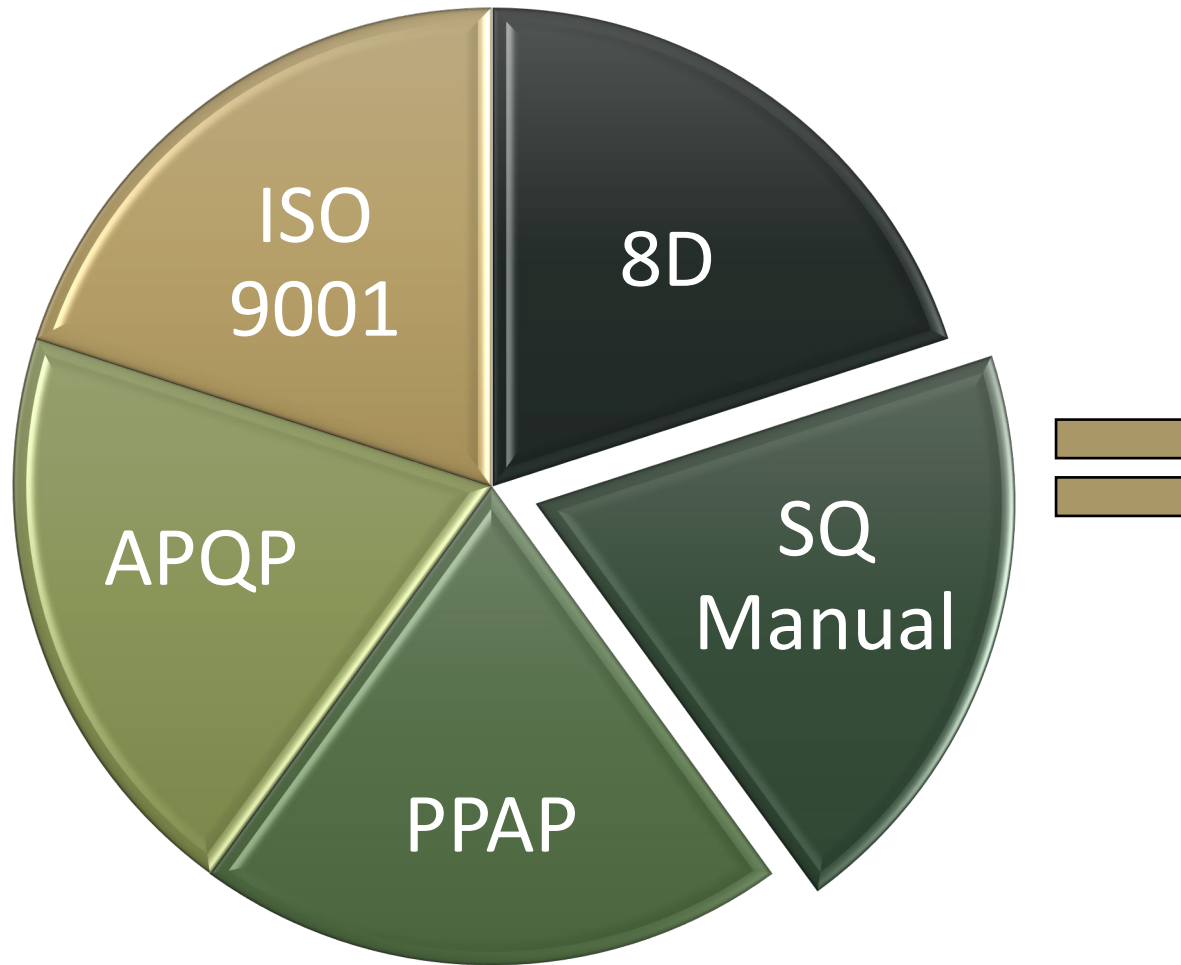
OSHKOSH™

Introduction



OSHKOSH™

Quality Scholars Education Series





What are your expectations or hopes for learning today?

Learning Objectives

- Communicate key elements of Oshkosh Corporation Quality Requirements and Expectations
- Discuss practices that supplier facilities are required to effectively implement
- Understanding of segment specific requirements



Supplier Intelligence

- Oshkosh Supplier Network (OSN)

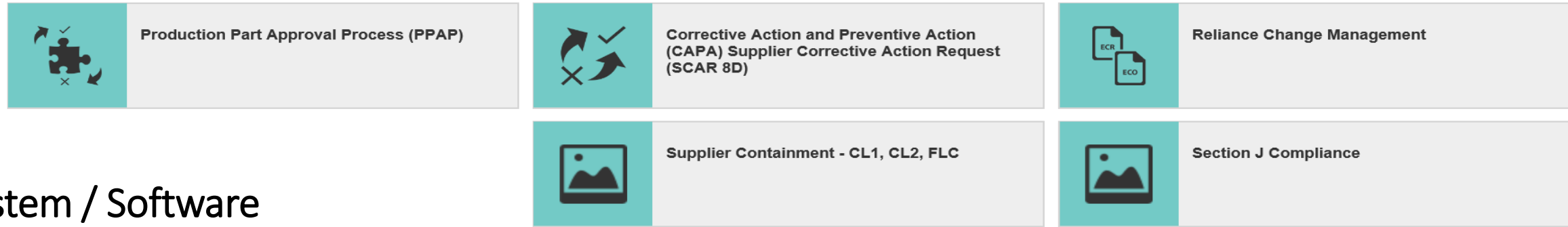
<https://osn.oshkoshcorp.com/>

- Supplier Quality Manual
- Supplier Terms and Conditions
- Oshkosh Reliance

The screenshot displays the Oshkosh Supplier Network (OSN) interface. The top header features the Oshkosh logo, the text "Oshkosh Supplier Network", and the vision statement "Vision: Making a difference through supply chain excellence". Below the header, a red banner contains a message about updates to the Supplier Standards Guide (SSG) regarding Cybersecurity. The main content area includes a "Login Here" section with links for MOVEit, Supplier, SDX, and TMC Center. A central image shows two men, with text indicating a leadership transition. To the right, there's a "Report Cyber Security Incidents" button. The bottom section shows a detailed view of the "Global Supplier Quality Manual" table of contents.

Section	Revision Date	Form Number	GSQM Page Number
Global Supplier Quality Manual	02/22/2017		
GSQM Defense Addendum	04/01/2019		
Training Materials			
8D Corrective Action	04/08/2013	OSK-T3000	16 - 17
Production Part Approval Process (PPAP)	02/15/2016	OSK-T2000	7 - 14
Supplier Change Request	09/19/2019	OSK-T1000	15
Containment Level 1 and 2	11/01/2012	OSK-T3100	17 - 18
Supplier Technical Review	09/26/2016	OSK-T2100	
CFAT JLTV E002 Plan Form	08/15/2016		
CFAT JLTV E002 Report	08/01/2018		
Measurement Systems Analysis (MSA) Instruction Guide	03/08/2017		
Procedures			
8D Corrective Action	04/08/2013	OSK-P3000	16 - 17
Production Part Approval Process (PPAP)	05/04/2018	OSK-P2000	7 - 14
Supplier Change Request	06/13/2018	OSK-P1000	15
Containment Level 1 and 2	11/01/2012	OSK-P3100	17 - 18
Supplier Technical Review	09/27/2013	OSK-P2100	
Forms			
8D Corrective Action Report	04/02/2018	OSK-F3000	16 - 17
PPAP Workbook	04/08/2019	OSK-F2000	7 - 14
Supplier Change Request	06/16/2018	OSK-F1000	15
Containment Level 1 and 2 Tracker	11/01/2012	OSK-F3100	17 - 18
Supplier Technical Review	09/26/2016	OSK-F2100	
Defense - Certificate of Conformance	08/27/2012	QC-899	22
SCRIP Submission Form	07/29/2014		
Logistics SCRIP Submission Form	09/04/2019		

Oshkosh Reliance



System / Software

- Web Based Integrated QMS

Current Modules


- PPAP – Production Part Approval Process
- SCAR (8D) – Supplier Corrective Action Request
- RCM – Reliance Change Management
Formerly Supplier Change Request
- CL1/CL2 – Supplier Containment
- Section J Compliance

What's next?

- Supplier Quality Audits
- Internal auditing for ISO, IATF, etc.
- Technical Reviews
- NMT, Non-conforming Material Ticket
- RMA, Return Material Authorization

Supplier Intelligence

Oshkosh Corporation Classification - Restricted

**OSHKOSH™**

Oshkosh
Supplier
Network

Vision:
Making a difference through
supply chain excellence

Login Here
[MOVEit Login](#)
[iSupplier Login](#)
[Oshkosh Reliance Login](#)
[SDX Login](#)
[Interested in becoming a Supplier?](#)

Global Supplier Quality Manual
[Global Supplier Quality Manual](#)
[GSQM Defense Addendum](#)
This section contains information and requirements for defense suppliers such as: Surface preparation, painting and finishing; Part marking, identification and traceability; Casting radiography; and Welding procedure.
Training Materials
[8D Corrective Action](#)
[Production Part Approval Process \(PPAP\)](#)
[Supplier Change Request](#)
[Containment Level 1 and 2](#)
[Supplier Technical Review](#)
[CFAT JLTV, E002 Plan Form](#)
[CFAT JLTV, E003 Report](#)
[Measurement Systems Analysis \(MSA\) Instruction Guide](#)

Procedures
[8D Corrective Action](#)
[Production Part Approval Process \(PPAP\)](#)
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[Containment Level 1 and 2](#)
[Supplier Technical Review](#)

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[PPAP Workbook](#)
[Supplier Change Request](#)
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Revision Date
02/22/2017
04/01/2019

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11/01/2012	OSK-T3100	17 - 18
09/26/2016	OSK-T2100	

Revision Date	Procedure Number	GSQM Page Number
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09/26/2016	OSK-F2100	
08/27/2012	QC-899	22
07/29/2014		
09/04/2019		

Core Values
[Supplier Standards Guide](#)
[Supplier Quality Manual/Forms](#)
[Supplier Communications](#)
[Oshkosh Supplier Diversity](#)
[Interested in doing business with Oshkosh](#)
[Oshkosh Logistics](#)
[Oshkosh Corporate Website](#)
[Training](#)
[FAQs](#)
[Report a Concern](#)

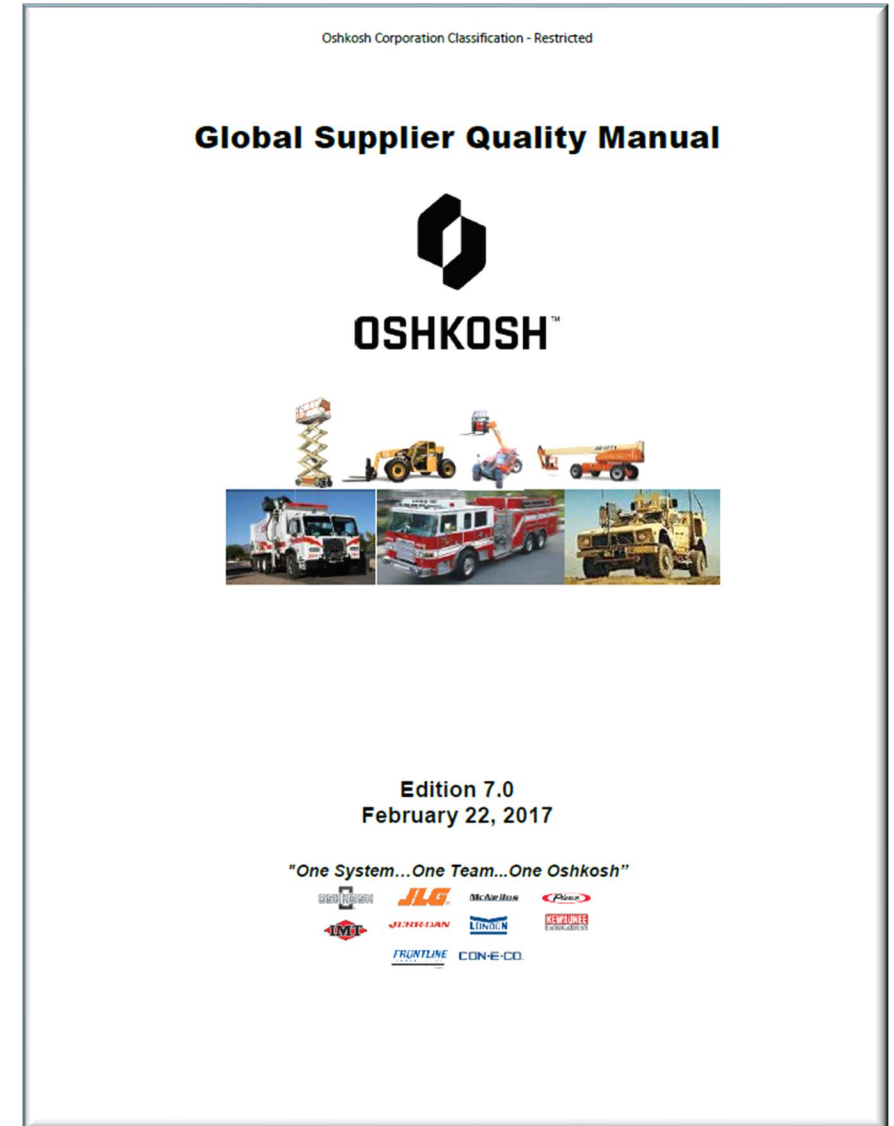
Supplier Quality Manual



OSHKOSH™

Global Supplier Quality Manual

- One Global Standard for Oshkosh Corporation that serves as a guide for aiding all suppliers in understanding Oshkosh Quality Requirements Expectations
- Requirements are not negotiable
- Provides direction from individual segments
- Available in eight languages

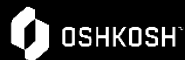


Global Supplier Quality Manual

29 Core Areas within the Manual

These requirements apply to ALL SUPPLIERS who provide/are:

- Production Materials
- Production or Service Parts
- Distribution Centers
- Manufacturers of Machinery



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Defense Segment Addendum



Global Supplier Quality Manual

DEFENSE SEGMENT ADDENDUM

*Revision 1.4
October 1, 2020*

New
Revision

These requirements apply to DEFENSE SUPPLIERS of:

- Production Materials
- Production or Service Parts
- Distribution Centers
- Manufacturers of Machinery

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Purpose

It is Oshkosh Corporation's mission to provide our customers with defect-free products and service and to supply them globally at the lowest total cost. The goal is simple - to be the benchmark supplier in every market. This goal can only be achieved with the support and commitment between you, our supplier and us. Clear Concise expectations and requirements will make the supplier-customer relationship more rewarding for all.



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Oshkosh Global Procurement & Supply Chain (GPSC) Vision

The GPSC Vision is to develop world class procurement and supply chain team members providing the best in logistics, quality, new product development (NPD) and competitiveness to the Oshkosh family of companies on a global basis.



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What is Oshkosh Corporations requirement for Quality System Management (QMS) Registration?

ISO 9001:2015

IATF 16949:2016

AS 9100

Either ISO 9001:2015
or IATF 16949:2016

None of the above

Quality Management System Requirements

- ISO9001:2015 or International Automotive Task Force, IATF 16949 registration by a third-party registrar
 - Noncompliance MAY have an impact on future business



Defense Segment Addendum



Global Supplier Quality Manual

DEFENSE SEGMENT ADDENDUM

*Revision 1.4
October 1, 2020*

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1.4	(blue text) Revised / New: section 1.1 (new), 1.2, 10.3, 10.4 (new)11.1, 11.2, 11.2.1.3, 12, 14, 14.2.1 (new), 14.11B (new),	Scott Ball	10/120

Requirements Introduction - Defense

1. Defense Segment Quality Assurance Requirements Introduction

Pursuant to OSK Defense being registered to IATF 16949, Defense Suppliers (servicing JLTV and FMTV A2) shall have a Quality Management System that is registered to ISO 9001-2015. The 3rd party ISO registrar is to be accredited, bearing the accreditation mark of a recognized IAF MLA (International Accreditation Forum Multilateral Recognition Arrangement) member (A2LA, ANSI, and ANAB for example).

For a listing of accredited ISO registrars, visit: <https://www.iaf.nu/>

1. One condition for OSK's IATF 16949 certification is for its suppliers (servicing JLTV and FMTV A2) to demonstrate a Quality Management System that is maturing beyond ISO 9001 certification, and towards IATF 16949 certification.

Steps toward QMS maturation can be achieved:

- a) compliance or certifications to other QMS requirements
 - b) compliance to IATF 16949 through second-party audits
 - c) certification to IATF 16949 by third-party certification through an IATF recognized certification body
- OSK will assess the suppliers' QMS status and make requests for progression as deemed necessary.



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Supplier On-Boarding Process (New Supplier Approval Process)

- Non-Disclosure Agreement (NDA)
- Suppliers shall also acknowledge that Defense-related technical information provided by Oshkosh Corporation is subject to export control laws and regulations of the US
 - Defense - International Traffic in Arms Regulations (ITAR)
 - Controlled Unclassified Information (CUI)
- Global Supplier Quality Audit and process audits
- Financial Information



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Supplier Qualification, Surveillance and Continual Improvement

Global Supplier Quality Audit

- 468 Questions
- ISO, IATF and Oshkosh specific Questions
- Approval: 80 – 100% on overall audits and no open critical requirements
- 8 Sections for review
 - Leadership
 - Production (Floor & Office)
 - Improvement
 - Purchasing
 - APQP
 - Design
 - Defense Specific Requirements
- Can be done as a remote audit



Oshkosh Global Supplier Quality Audit - Audit Results

Supplier Name : Input Supplier Name on Supplier Information Tab

Supplier Location : Input Supplier Location on Supplier Information Tab

Audit Date : Input Audit Date on Supplier Information Tab

Oshkosh Corp. Auditor(s) : Input Oshkosh Corp Auditor on Supplier Information Tab

SECTION	Section Applicable?	TOTAL POINTS	TOTAL POINTS	FAILED CRITICAL	SCORE % (Scored/Available)*100	
		AVAILABLE	SCORED	REQ'TS		
1 Leadership	Yes	20	0	4	0.0	
2 Production (Floor)	Yes	118	0	32	0.0	
3 Production (Office)	Yes	102	0	21	0.0	
4 Improvement	Yes	64	0	18	0.0	
5 Purchasing	Yes	49	0	8	0.0	
6 APQP	Yes	57	0	16	0.0	
7 Design	Yes	45	0	15	0.0	
8 Defense Specific Requirements	Yes	13	0	12	0.0	
Audit Type: Onsite Audit		TOTALS	468	0	126	0.0

Number of Open Nonconformances:

Supplier Quality Audit Scoring

Approved: 80% - 100% AND
Zero Open Nonconformances

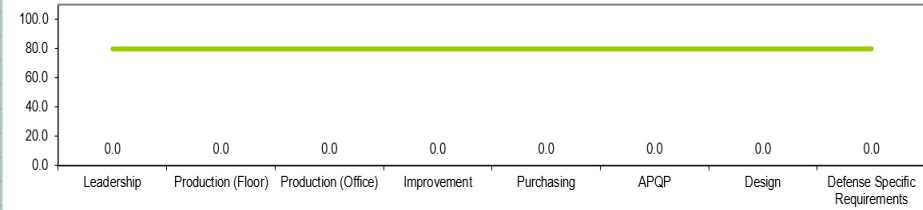
Corrective Action Required*: < 80% OR Open Nonconformances

Corrective Action Required

* All Nonconformances must be closed for audit approval. Nonconformances are required for all Critical Requirements that are not satisfied.

SYSTEM SCORING SECTIONS

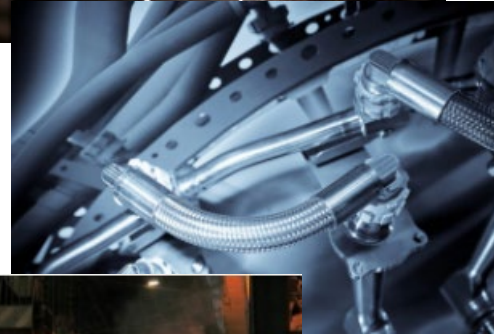
Total Points Scored 80%



Supplier Qualification, Surveillance and Continual Improvement

Global Supplier Process Audits

- Focus on specific process with questions that reflect best practices and Oshkosh Corp. quality standards



Global Supplier Process Audits

- Castings
- Hydraulic Cleanliness
- Hydraulic Cylinders
- Paint
- Weld
- Distributor
- Electrical Harness
- Machining

Defense Segment Addendum



Global Supplier Quality Manual

DEFENSE SEGMENT ADDENDUM

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Counterfeit/Used Parts

- The Defense Supplier shall establish, implement and maintain documented procedures, which shall preclude and/or detect the use of counterfeit/used parts. All Suppliers providing “electronic parts” (as defined within DFARS 252.246.7007,a) shall have developed and documented *Purchasing procedures* that reduce the risk of purchasing and utilizing counterfeit material. Suppliers shall have defined and documented *Product Verification procedures* that assure the detection of counterfeit parts prior to formal product acceptance. Suppliers shall have developed and documented a *Material Control Procedure* that includes quarantining, reporting, and dispositioning suspect and/or counterfeit components. Reference the Supplier Standard Guide, Section F, Attachment 2, Contractor Counterfeit Electronic Parts Detection and Avoidance for compliance requirements.

Defense Segment Addendum



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Source Inspection - Defense



- During performance on a subcontract, the Supplier's manufacturing and associated processes, products and inspection and/or test data are subject to review, verification, examination, test and/or analysis by authorized Government and/or Oshkosh representatives.



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What is APQP? - Word Cloud

Advanced Product Quality Planning (APQP)

Created by Automotive Industry Action Group (AIAG)

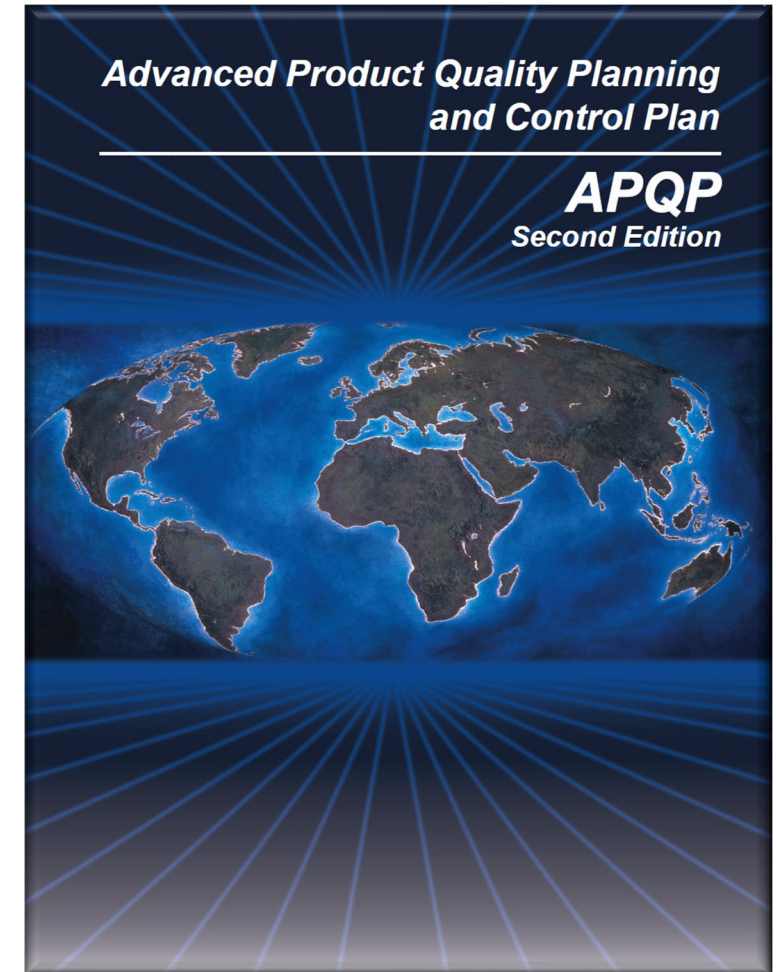
Structured method of defining and establishing the steps necessary to assure that a product meets customer specification and expectation

Identifies Critical to Quality sub-systems from the Voice of Customer

Details the implementation of appropriate quality tools at various phases in the product development cycle

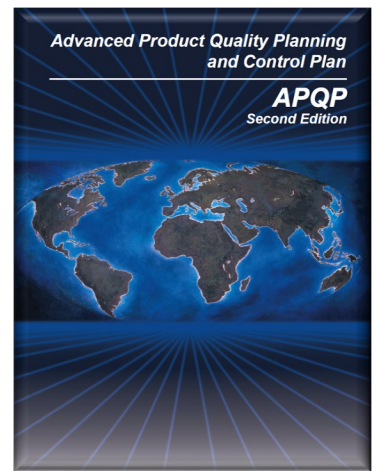
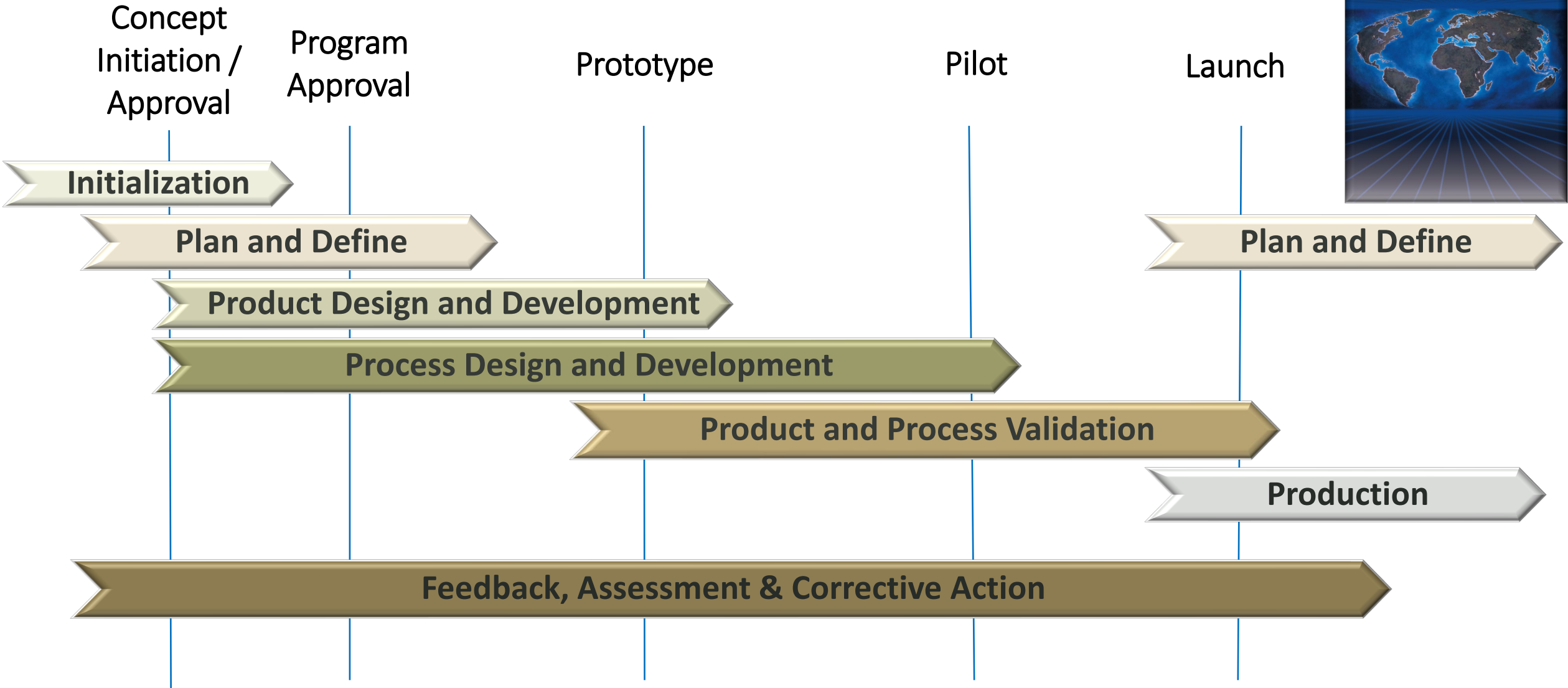
Five common phases of APQP:

1. Plan and Define Program
2. Product Design and Development
3. Process Design and Development
4. Product and Process Validation
5. Feedback Assessment and Corrective Action

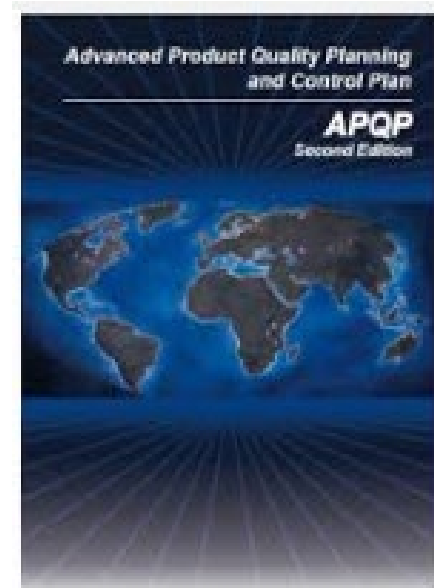




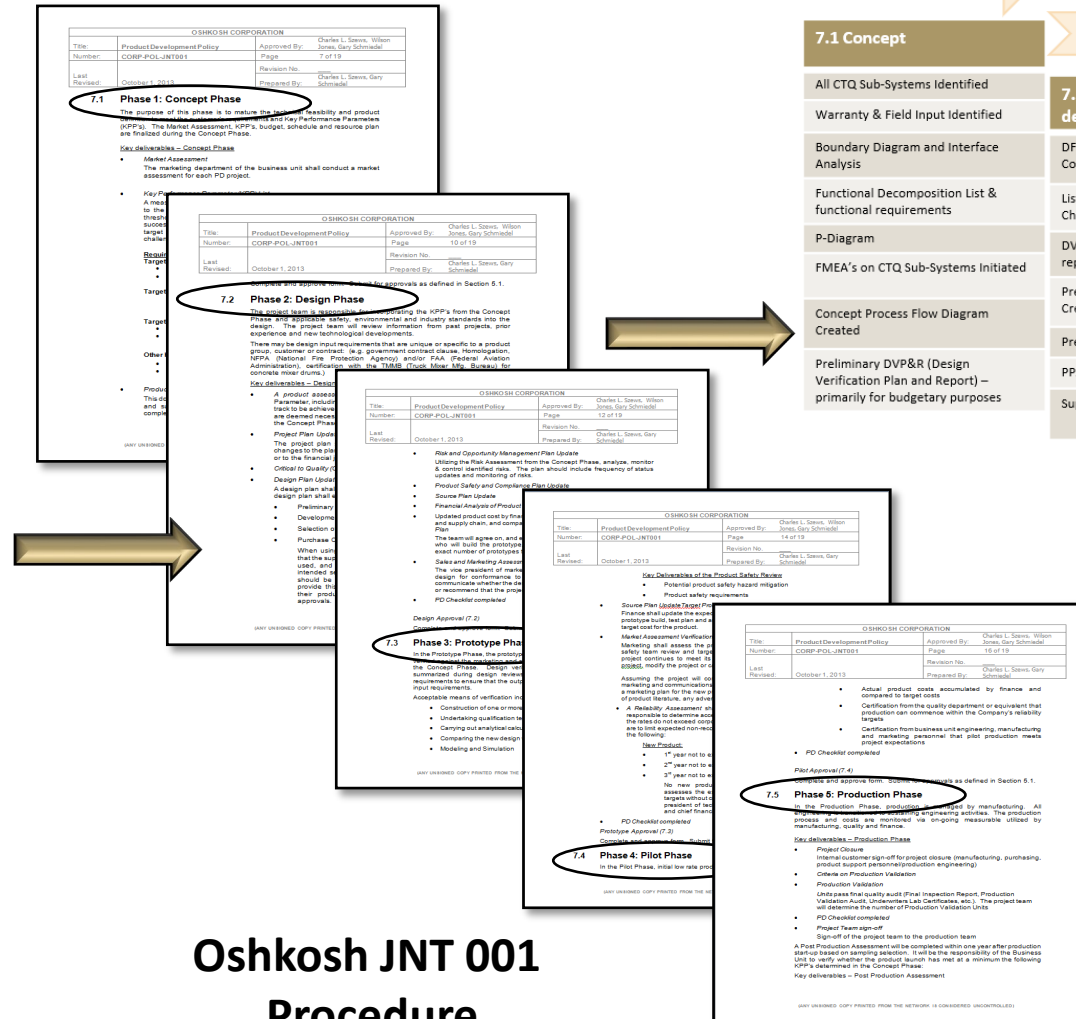
Product Quality Planning Element Timing Chart



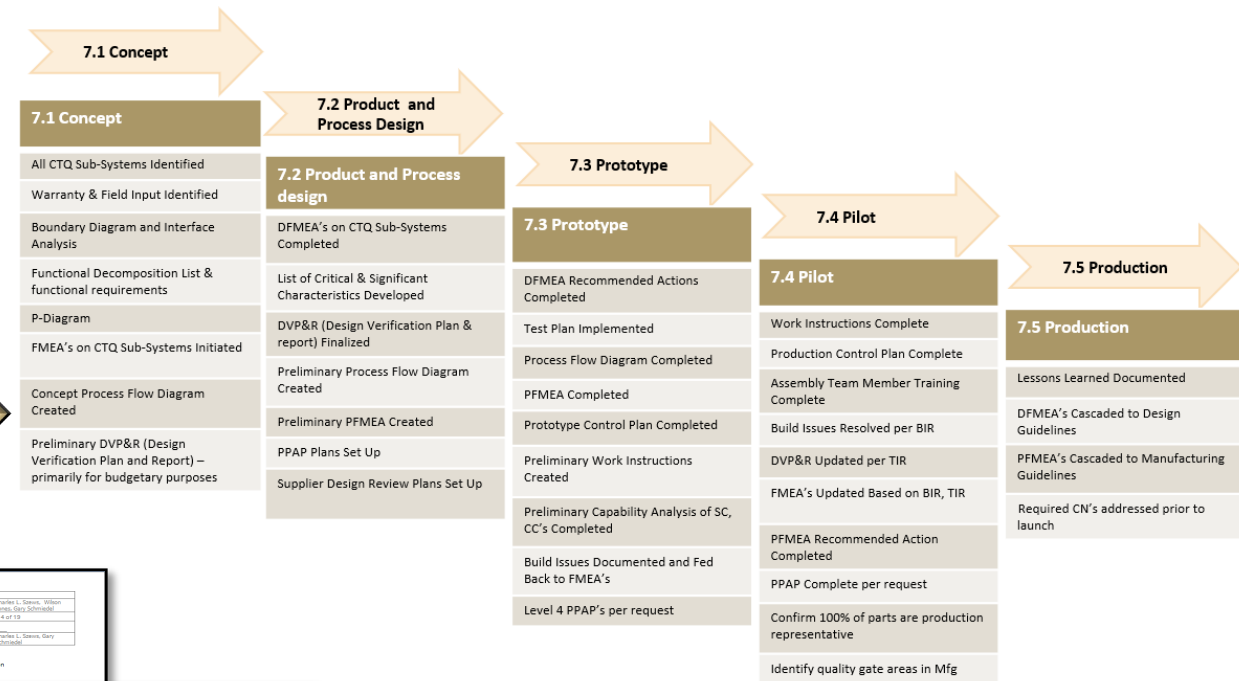
APQP and Oshkosh JNT001



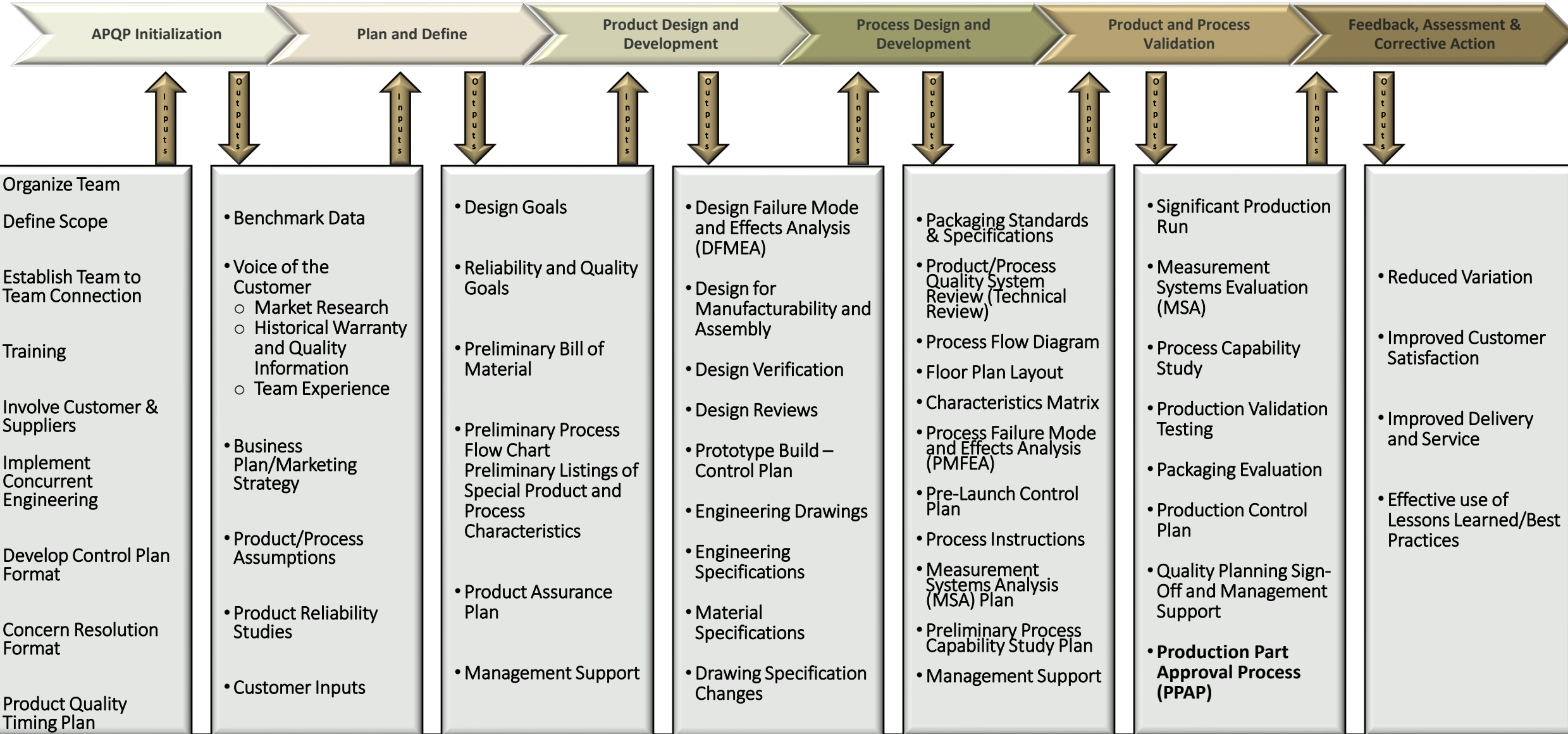
AIAG Guide - APQP



Oshkosh JNT 001 Inputs and Outputs



Product Quality Planning as Defined by APQP





APQP – Contract Provider

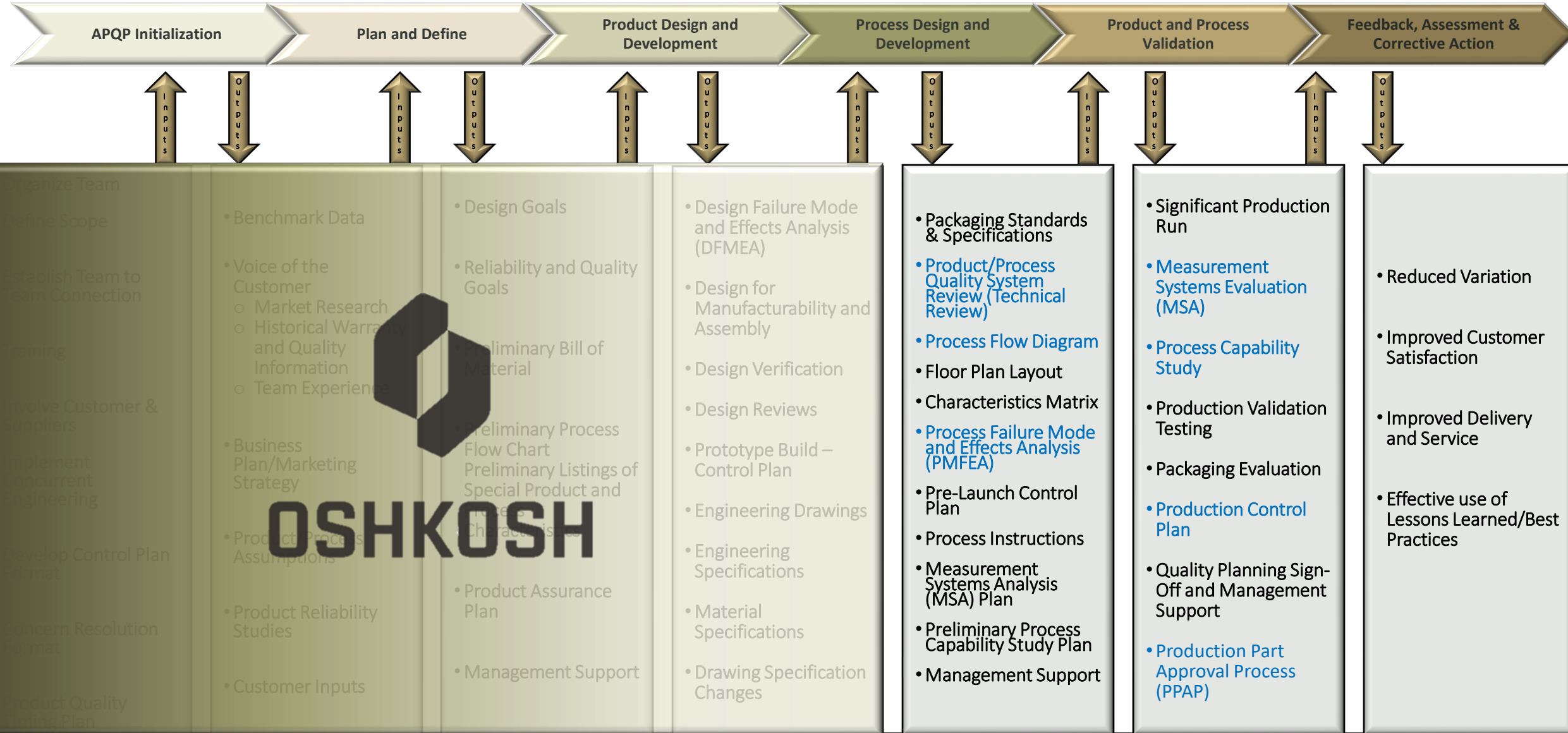
Oshkosh Corporation Classification - Restricted



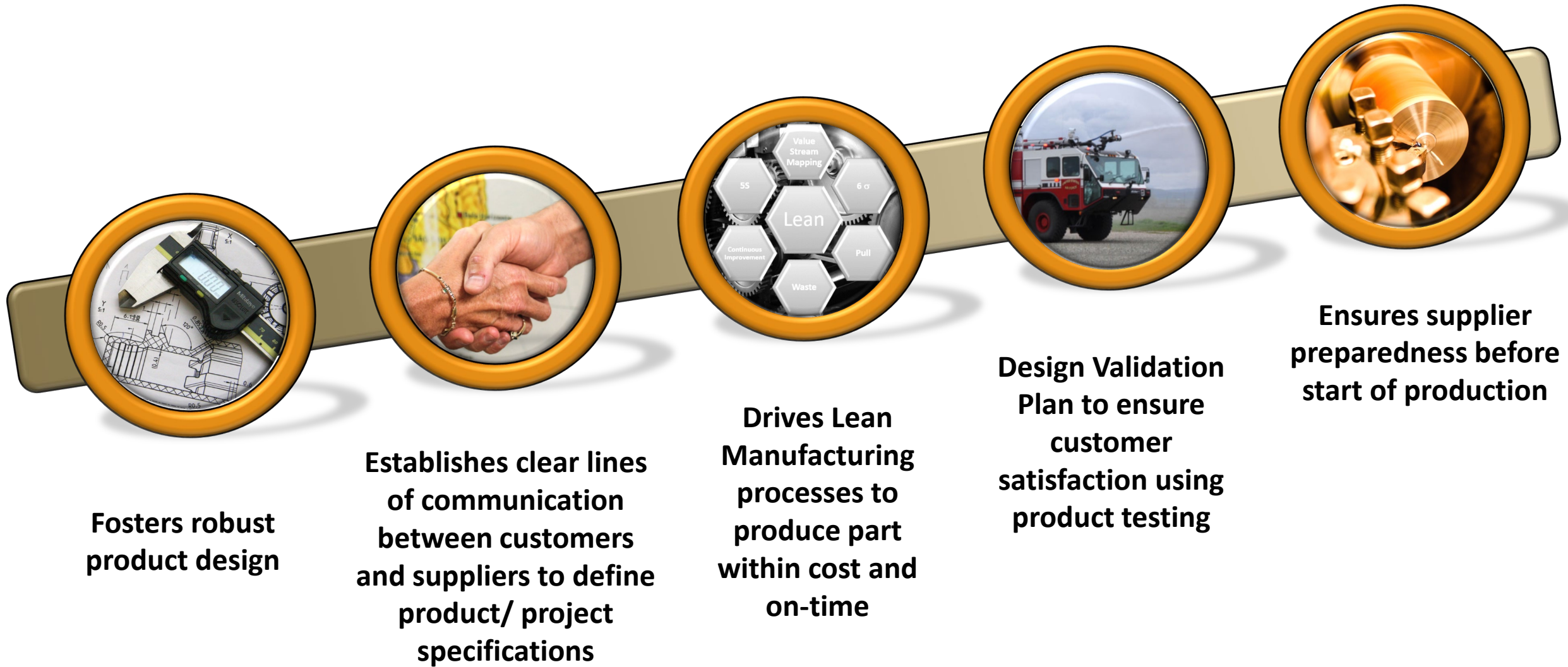
Deliverable



Action



Why do we do APQP?



-



Global Supplier Quality Manual

29 Core Areas within the Manual

These requirements apply to ALL SUPPLIERS who provide/are:

- Production Materials
- Production or Service Parts
- Distribution Centers
- Manufacturers of Machinery



Global Supplier Quality Manual

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PPAP is:

A machine that helps
you sleep better

Part of the APQP process

A stand alone process
from APQP

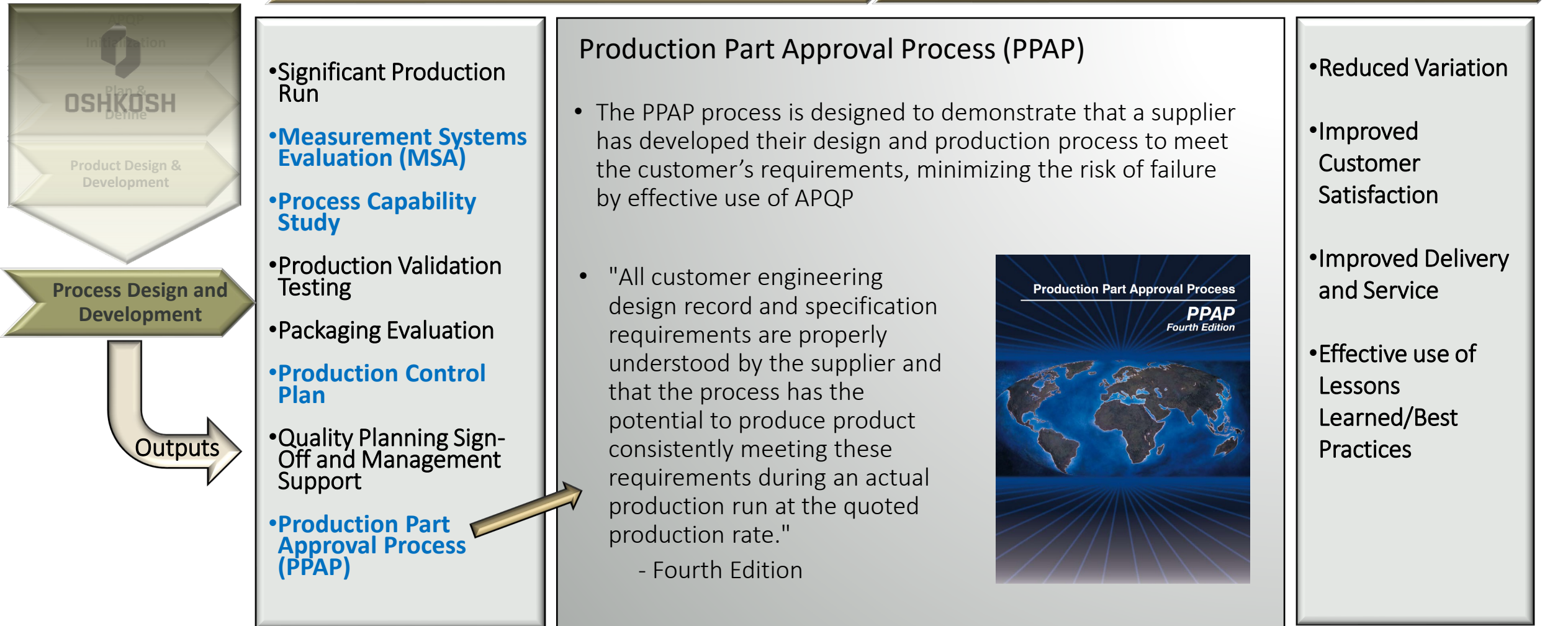
Pen Pineapple, Apple Pen

None of the above



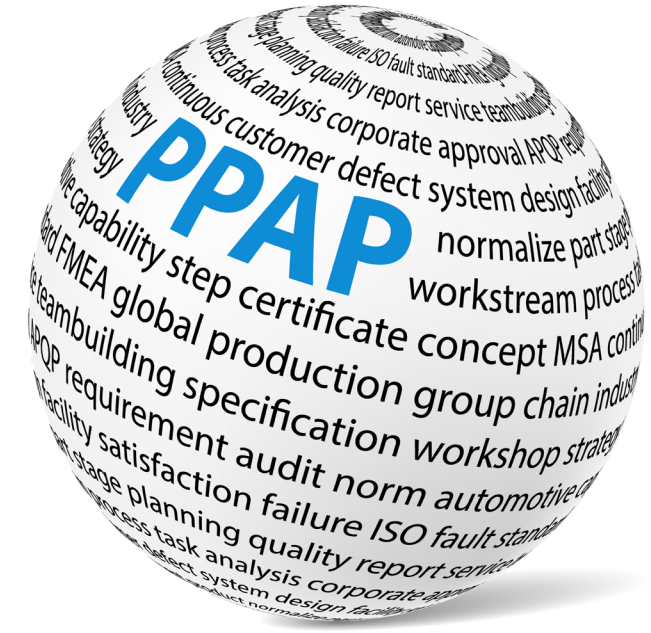
APQP Deliverables - PPAP

Oshkosh Corporation Classification - Restricted




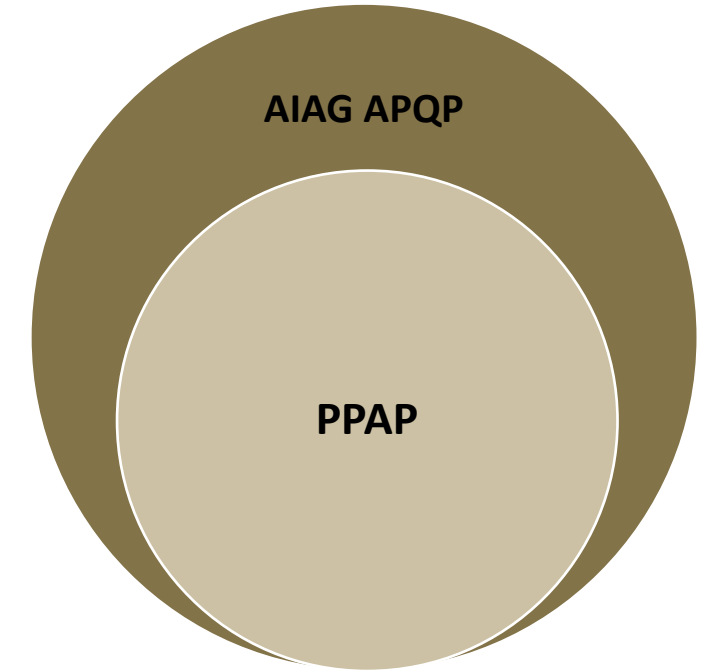
PPAP Submission

- Motivations for PPAP submission:
 - ☐ Initial Submission
 - ☐ Engineering Change(s)
 - ☐ Tooling: Transfer, Replacement, Refurbishment, or additional
 - ☐ Correction of Discrepancy
 - ☐ Production Break to Oshkosh Corporation > 3 year
 - ☐ Change to Optional Construction or Material
 - ☐ Sub-Supplier or Material Source Change
 - ☐ Change in Part Processing
 - ☐ Parts Produced at Additional Location
 - ☐ Ensuring proper drawing level is referenced and utilized
 - ☐ Other – Please specify



Production Part Approval Process (PPAP)

 OSHKOSH™		Oshkosh Corporation PPAP Part Submission Requirements					
Part Number:	PART NUMBER	Purchase Order No.	ALL PPAP CRITERIA MUST CONFORM TO Oshkosh Corporation Customer Specifics defined in the Global Supplier Quality Manual				
Revision Level:	ERL DATE	Part Description:				PART NAME	
Supplier Name:	SUPPLIER NAME	Reason for Request:					
Supplier Number:	101112	OSK Program:				MODEL / VEHICLE	
Date Issued:		Submission Due Date:					
UNLESS OTHERWISE SPECIFIED IN WRITING BY OSHKOSH CORPORATION:							
Default PPAP Submission Level 2 - Unless Otherwise Specified by Oshkosh Corporation (Segment Specific Requirements may vary) S = Supplier Must Send Items to Oshkosh Corporation for Approval * = Applicable material info required (material certification, Certificate of Compliance, or catalog page) with PSW N/R= Documents are not required for development or submission							
PPAP Submission Requirements and Detail Description		Submission Level					
		1	2	3	4		
1.) Part Submission Warrant (PSW)		S	S	S	S		
2.) Dimensional Results		N/R	S	S	S		
3.) Design Records (Bubble Print)		N/R	S	S	S		
4.) PPAP Samples - <i>first production order / upon request prior to production order</i>		N/R	S	S	S		
5.) Print Notes: (Attach copy of Raw Material Certification / Performance Test Report / Surface Finish, Paint Process, Welding Documentation such as WPS/PQRs/Welder Certs)		*	S	S	*		
6.) Supplier Change Request (OSK-F1000) - <i>if applicable</i>		S	S	S	S		
7.) Design Failure Modes effects Analysis (DFMEA) - <i>if supplier is design responsible</i>		N/R	N/R	S	N/R		
8.) Process Flow Diagram (PFD)		N/R	N/R	S	N/R		
9.) Process Failure Modes Effects Analysis (PFMEA)		N/R	N/R	S	N/R		
10.) Initial Process Capability - <i>for major / critical characteristics - if applicable</i>		N/R	N/R	S	N/R		
11.) Measurement System Analysis (MSA) - <i>for major / critical characteristics - if applicable</i>		N/R	N/R	S	N/R		
12.) Process Control Plan		N/R	N/R	S	N/R		
13.) Appearance Approval Report (AAR) - <i>if applicable</i>		N/R	N/R	S	N/R		
14.) Checking Aids (Fixture, gage, template, etc) - <i>if applicable</i>		N/R	N/R	S	N/R		
15.) Records of Compliance with Customer Specific Requirements - <i>if applicable</i>		N/R	N/R	S	N/R		
16.) Photo Documentation (Master Sample of PPAP parts & Section J-Labeling)		S	S	S	N/R		
17.) Tooling Photo Documentation - <i>if applicable</i>		N/R	S	S	N/R		
18.) QC-112 PPAP Check List		N/R	N/R	S	N/R		
Additional Submission Instructions below:							



Defense Segment Addendum



Global Supplier Quality Manual

DEFENSE SEGMENT ADDENDUM

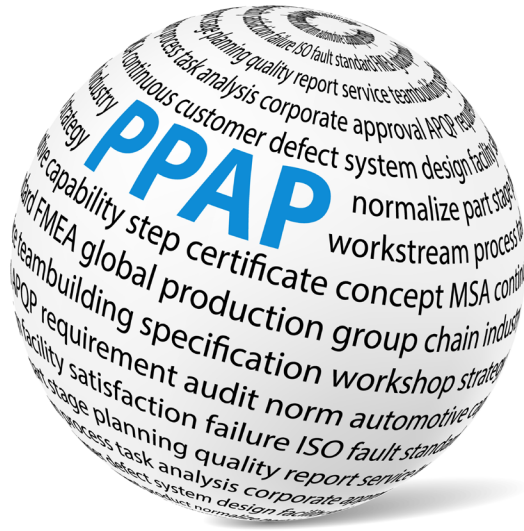
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Submission Requirements

- A **Level 2 PPAP** submission is the default PPAP level
- The default PPAP submission level can be changed by the Oshkosh Corporation Segment Quality Representative
- SQE can request additional PPAP samples and process documentation based on the part criticality
- When a **Level 1 PPAP** submission is required, it shall be sent to Oshkosh Corporation with the first production order
- Oshkosh Corporation provides written approval of the PPAP package via a Part Submission Warrant (PSW).

Submission Requirements - Continued



- When a **Level 3 PPAP** submission is required it shall be reviewed and approved by an Oshkosh Quality Representative prior to the first production delivery
- Oshkosh Corporation provides written approval of the PPAP package via a Part Submission Warrant (PSW)
- **When a Level 3 PPAP submission is required, Suppliers are not authorized to ship production material to Oshkosh Corporation without full or interim PPAP approval**
- Interim PPAP approval may be used to permit the supplier to ship material on a limited time or quantity basis in accordance to the Interim Approval Worksheet and Part Submission Warrant

Interim Approval

- Interim Approval may be temporarily granted and **must be considered the exception**
 - Interim Approval will not be granted if any of the following elements are missing or incomplete
- | | |
|---|---|
| <ul style="list-style-type: none"> <input type="checkbox"/> QC – 112 PPAP Checklist <input type="checkbox"/> Design Record & Dimensional Results <input type="checkbox"/> Engineering Change Documents – F1000 (if applicable) <input type="checkbox"/> Customer Engineering Approval (If applicable) <input type="checkbox"/> Print Note Verification | <ul style="list-style-type: none"> <input type="checkbox"/> Material/Performance test results <input type="checkbox"/> Qualified Lab Documents <input type="checkbox"/> Sample Production Parts <input type="checkbox"/> Master Sample Photos <input type="checkbox"/> Customer Specific Requirements – Certified First Article Testing (CFAT) <input type="checkbox"/> Part Submission Warrant (PSW) |
|---|---|

Part Submission Warrant	Dimensional Results/Print Notes	Design Record	Engineering Changes	DFMEA	Process Flow Diagram	PFMEA	Control Plan	Process Capability	MSA	Appearance Approval	Checking Aids	Material Performance Testing	Qualified Lab Docs	Sample Production Parts	Master Sample Picture	Customer Specific Requirements (CFAT)	
2.2.18	2.2.9	2.2.1	2.2.2	2.2.4	2.2.5	2.2.6	2.2.7	2.2.11	2.2.8	2.2.13	2.2.16	2.2.10	2.2.12	2.2.14	2.2.15	2.2.17	

Elements shaded green (above) indicate minimum submittal for interim approval

What Oshkosh Expects of the Supplier

- Suppliers shall manage the completion and submittal of PPAP's 7 calendar days (minimum) prior to the Purchase Order due date
- PPAP's are considered living documents and are expected to be maintained to represent the current production process
- When the supplier encounters Corrective and Preventive Actions, updates to the PFMEA and Control Plans should be made promptly
- PPAP re-submittals are required when:
 - Part Drawing is revised
 - Supplier process change is approved and made
 - Lapse in order fulfillment occurs for a period of > 3 years

Supplier Manual Highlights

14.3. Design Record (AIAG PPAP 2.2.1)

The Supplier shall comply with the OSK Design Record for the product/part referenced on the Purchase Order. This includes sub components (drawings) associated with Purchased product/part. Where the Design Record is in electronic format, the Supplier shall produce a hard copy. Examples include, but are not limited to pictorial of the parts, GD&T sheets, drawings and identifications of measurements taken. Engineering Drawings (Balloon Prints) shall accompany each PPAP submittal.

Best Practice: *Layout the balloon print so the numbering of all features is formatted sequentially in a left-to-right, clockwise pattern on the first page of the drawing, and continues sequentially and clockwise for pages, 2, 3, ... when design records have multiple pages. This pattern expedites the review and approval process.*

14.17. Master Sample (AIAG PPAP 2.2.15)

A master sample is not required to be retained by the supplier unless specifically requested by OSK, however, the Supplier is required to photo document a Master Sample for all PPAP submittals. Photo documentation should illustrate how the parts will look like in the final state in which they are provided to Oshkosh. Specific focus of photo documentation should be on part labeling (to include any date codes, vendor codes, etc. if applicable), no paint zones if applicable.

Defense Segment Addendum



Global Supplier Quality Manual

DEFENSE SEGMENT ADDENDUM

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October 1, 2020*

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Qualified Lab Documentation

Accredited ISO 17025 Laboratory

- ☐ The name of the laboratory performing the test
- ☐ The laboratory's accreditation standard (accreditation number and/or name of the 3rd Party organization that provided accreditation)
- ☐ List of standards used for testing
- ☐ The date on which the testing took place

Non – Accredited Laboratory

- ☐ The name of the laboratory performing the test
- ☐ Documentation (work instructions) for each type of tests conducted
- ☐ Training records / certifications of personnel who performed the testing
- ☐ List of all test equipment used to perform testing
- ☐ Calibration records of all test equipment used

Defense Segment Addendum



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What is FMEA?

- A) A Government Agency
- B) A process to be used during Design and determining processes
- C) Failure Mode Effects Analysis
- D) A process to analyze risk in a process and assign a priority number
- E) B, C and D

- For each item/function a Severity, Occurrence and Detection number is assigned
- These number are multiplied together to calculate a Risk Priority Number

[illegible]

FMEA Severity Ranking Assignment

- FMEA Severity rank values shall be in accordance with Severity Rating Scale Table
- If there is any disagreement between criteria for assignment of Severity Rank in the table while performing the FMEA analysis, the more severe (higher) rank shall always be utilized

SEVERITY RATING SCALE				
CUSTOMER EFFECT	SEVERITY OF EFFECT ON PRODUCT	RANK	SEVERITY OF EFFECT ON PROCESS	ASSY EFFECT
Failure to Meet Safety and/or Regulatory Requirements	Potential failure mode affects safe vehicle operation and/or involves noncompliance with government regulation without warning.	10	May endanger operator (machine or assembly) without warning.	Hazardous without warning
	Potential failure mode affects safe vehicle operation and/or involves noncompliance with government regulation with warning.	9	May endanger operator (machine or assembly) with warning.	Hazardous with warning
Loss or Degradation of Primary Function	Loss of primary function (vehicle / item inoperable, but does not affect safe operation).	8	100% of production run may have to be scrapped, line shutdown, or stop ship.	Major Disruption
	Degradation of primary function (vehicle / item operable but at a reduced level of performance)	7	A portion of the production run may have to be scrapped, deviation from primary process including decreased line speed or added manpower.	Significant Disruption
Loss or Degradation of Secondary Function	Loss of secondary function (vehicle / item operable, but does not affect safe operation, but secondary functions inoperable)	6	100% of production run may have to be reworked off line and accepted.	Moderate Disruption
	Degradation of secondary function (vehicle / item operable, but secondary functions operate at reduced level of performance)	5	A portion of the production run may have to be reworked off line and accepted.	
Loss or Degradation of Tertiary Function	Condition impacting a tertiary function but vehicle remains operable, appearance or audible noise, or item does not conform and noticed by >75% of customers	4	100% of production run may have to be reworked in station before it is processed.	Minor Disruption
	Condition impacting a tertiary function but vehicle remains operable, appearance or audible noise, or item does not conform and noticed by ~50% of customers	3	A portion of the production run may have to be reworked in station before it is processed.	
	Condition impacting a tertiary function but vehicle remains operable, appearance or audible noise, or item does not conform and noticed by <25% of customers	2	Slight inconvenience to process, operation, or operator.	Annoyance
No effect	No discernible effect	1	No discernible effect.	None

FMEA Occurrence Ranking Assignment

- FMEA Severity rank values shall be in accordance with Occurrence Rating Scale Table
- If there is any disagreement between criteria for assignment of Severity Rank in the table while performing the FMEA analysis, the more severe (higher) rank shall always be utilized

OCCURRENCE RATING SCALE				
LIKELIHOOD OF FAILURE	OCCURRENCE OF CAUSE FROM TESTING	OCCURRENCE OF CAUSE FOR DFMEA	OCCURRENCE OF CAUSE FOR PFMEA	RANK
Very High	Observed on over 50% of test assets.	New technology/new design with no history.	One occurrence per part/machine	10
High	Observed on >25-50% of test assets.	Failure is inevitable with new design, new application, or change in duty cycle/operating conditions.	One occurrence per shift *(>1 in 5)	9
		Failure is likely with new design, new application, or change in duty cycle/operating conditions.	One occurrence per day *(1 in 5)	8
		Failure is uncertain with new design, new application, or change in duty cycle/operating conditions.	One occurrence per week *(1 in 25)	7
Moderate	Observed on >12.5-25% of test assets.	Frequent failures associated with similar designs or in design simulation and testing.	One occurrence every 2 weeks *(1 in 50)	6
		Occasional failures associated with similar designs or in design simulation and testing.	One occurrence per month *(1 in 100)	5
		Isolated Failures associated with similar design or in design simulation and testing.	One occurrence per 3 months *(1 in 300)	4
Low	Observed on up to 12.5% of test assets.	Only isolated failures associated with almost identical design or in design simulation and testing.	One occurrence per 6 months *(1 in 600)	3
Very Low	No occurrences observed during testing.	No observed failures associated with almost identical design or in design simulation and testing.	One occurrence per year *(1 in 1200)	2
		Failure is eliminated through preventive control.	Less than one occurrence per year *(<1 in 1200)	1
*Occurrence frequency for PFMEA should be calculated based upon yearly production volumes (for example, if 1200 units are produced each year, one occurrence per month equals 1 in 100 units produced)				

FMEA Detection Ranking Assignment

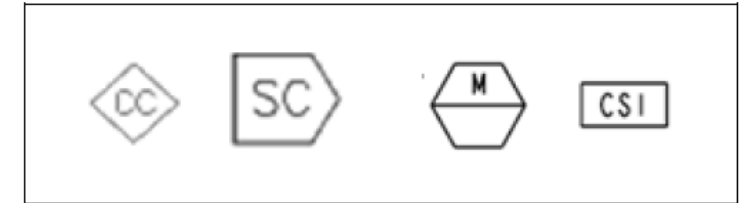
- FMEA Severity rank values shall be in accordance with Detection Rating Scale Table
- To determine the Risk Priority Number (RPN) values, the OSK standard table within the PPAP workbook shall be utilized

Detection Rating Scale		
Rank	DETECTION PROBABILITY	CRITERIA
10	No detection opportunity	No current process control; Cannot detect or is not analyzed.
9	Not likely to detect at any stage	Failure Mode and/or Error (Cause) is not easily detected (e.g. random audits)
8	Problem Detection Post Processing	Failure Mode detection post-processing by operator through visual/tactile/audible means.
7	Problem Detection at Source	Failure Mode detection in-station by operator through visual/tactile/audible means or post-processing through use of attribute gauging (go/no go, manual torque check/clicker wrench, etc.)
6	Problem Detection Post Processing	Failure Mode detection post-processing by operator through use of variable gauging or in-station by operator through use of attribute gauging (go/no go, manual torque check/clicker wrench, etc.)
5	Problem Detection at Source	Failure Mode or Error (Cause) detection in-station by operator through use of variable gauging or by automated controls in-station that will detect discrepant part and notify operator (light, buzzer, etc.). Gauging performed on setup and first-piece check (for set-up causes only).
4	Problem Detection Post Processing	Failure Mode detection post-processing by automated controls that will detect discrepant part and lock part to prevent further processing.
3	Problem Detection at Source	Failure Mode detection in-station by automated controls that will detect discrepant part and prevent automatically lock part in station to prevent further processing.
2	Error Detection and/or Problem Prevention	Error (Cause) detection in-station by automated controls that will detect error and prevent discrepant part from being made.
1	Detection not applicable; Failure Prevention	Error (Cause) prevention as a result of fixture design, machine design or part design. Discrepant parts cannot be made because item has been error-proofed by process/product design.

This scale was adapted from the AIAG FMEA Manual (4th Edition)

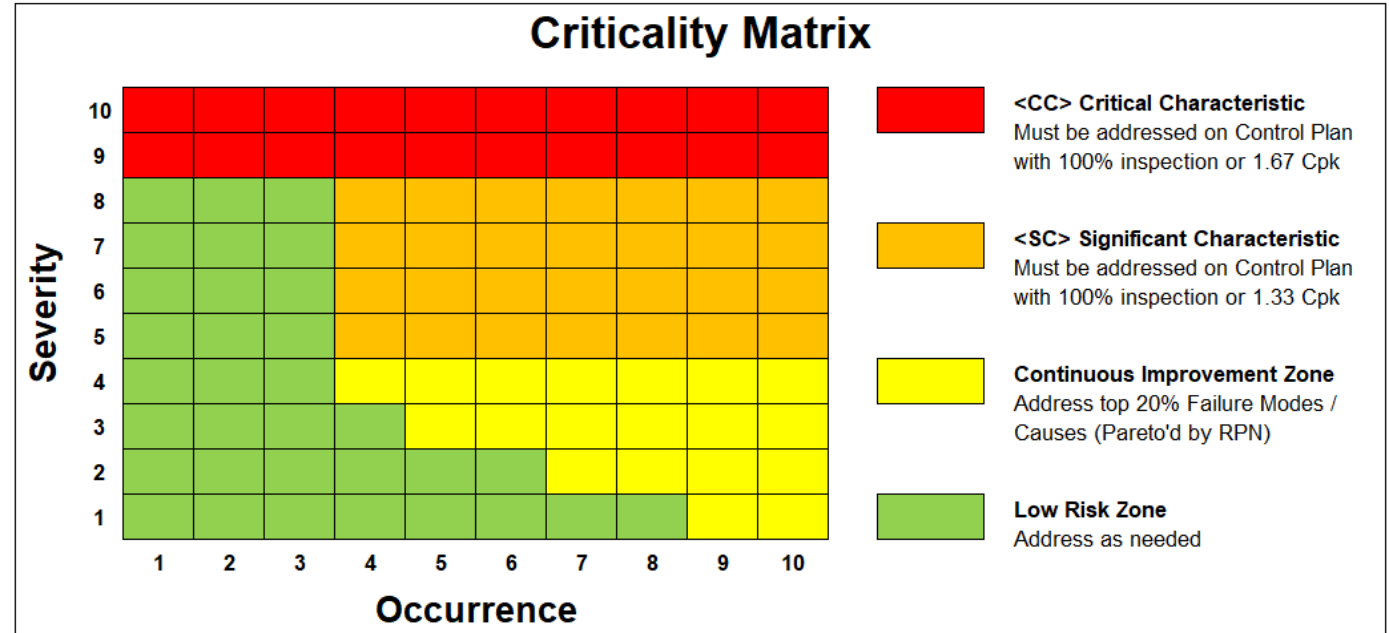
FMEA Special Characteristics

- Special Characteristics are defined as product characteristics or manufacturing process parameters which can affect safety or compliance with regulations, fit, function, performance or subsequent process of product.
- Two types of Special Characteristics
 - ❑ **Critical Characteristics (CC)** – A Critical Characteristic is defined as a product characteristic or manufacturing process parameter that can potentially affect compliance with government regulations, safe vehicle operation or safe equipment function.
 - ❑ **Significant Characteristic (SC)** – A Significant Characteristic is defined as a product characteristic or manufacturing process parameter which can affect fit, function, performance or impact subsequent process of a product.
- Critical and Significant Characteristics shall be assigned based on the Severity, Occurrence and Detection



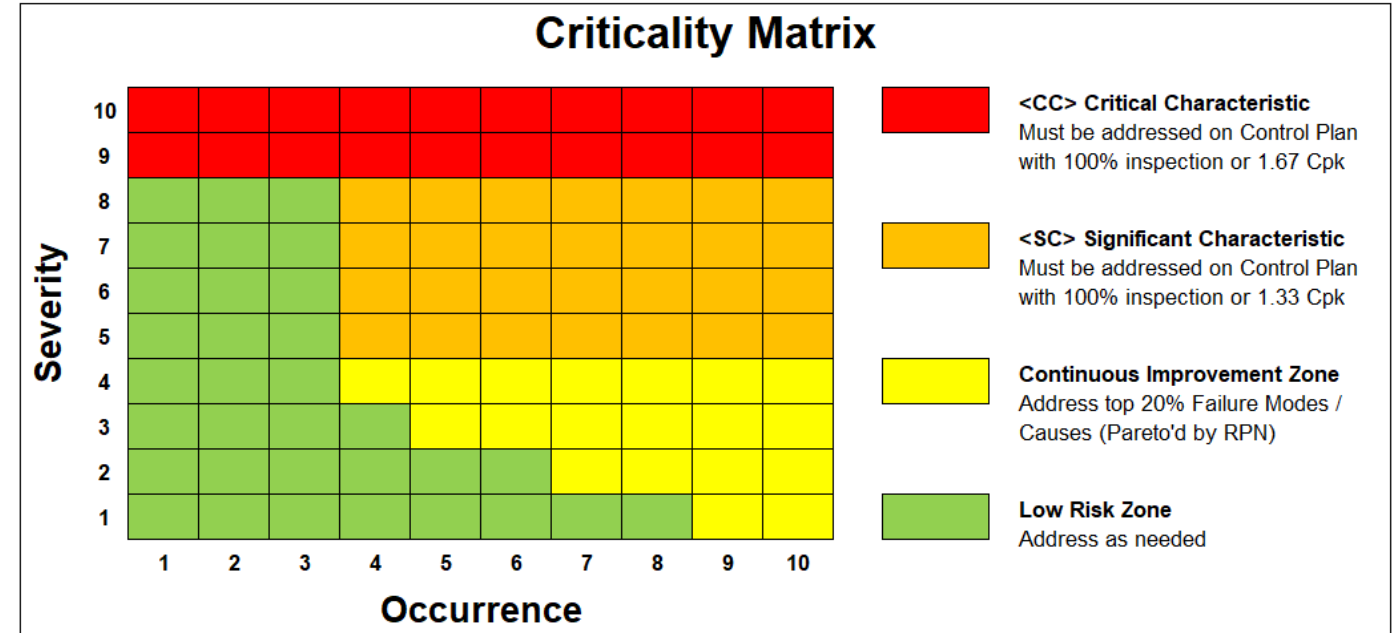
Critical Characteristics

- Critical Characteristics shall be identified, recorded, and implemented when a DFMEA PFMEA Severity rank of 9 or 10 regardless of the corresponding Occurrence Rank
- All items identified as a Critical Characteristics shall demonstrate a minimum Cpk of 1.67 or be subject to 100% inspection



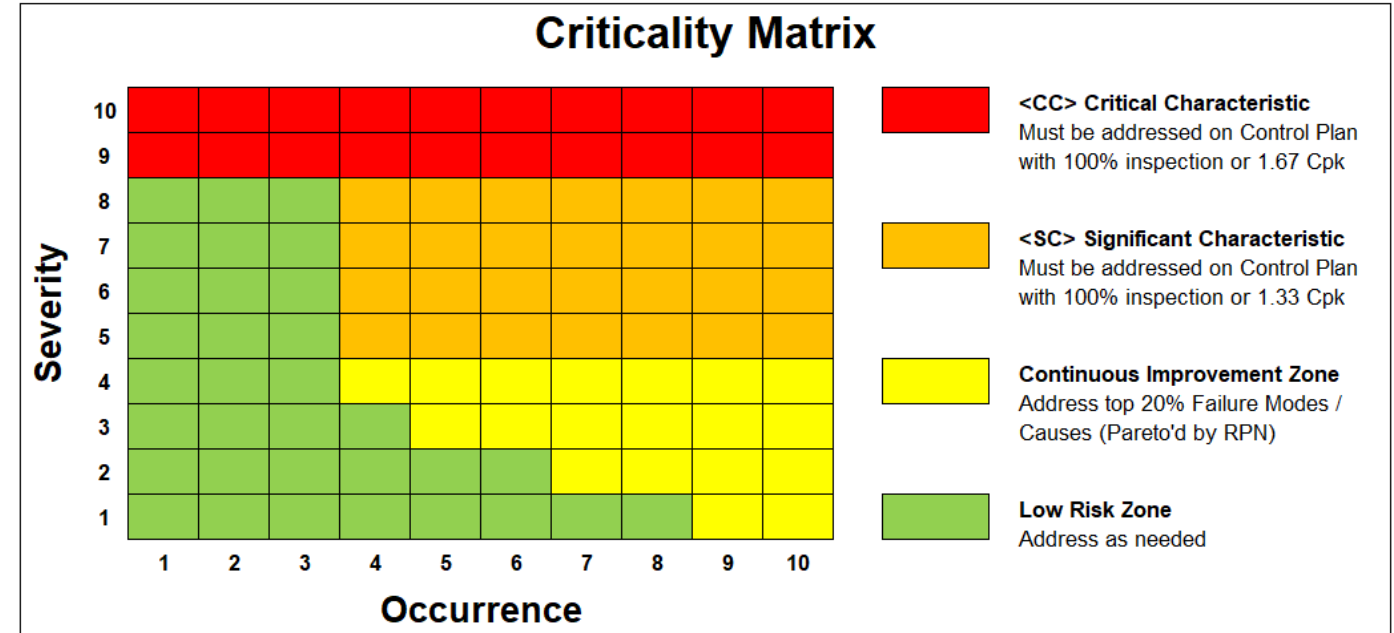
FMEA Characteristic Assignment Process

- Critical and Significant Characteristics shall be assigned based on the Severity and Occurrence data derived from the Design and/or Process Failure Mode and Effects Analyses (DFMEA and PFMEA)
- Criteria for assignment of special characteristics shall be in accordance with the Criticality Matrix
- All Special Characteristics shall be documented on the control plan



Significant Characteristics

- Significant Characteristics shall be identified, recorded, and implemented when a DFMEA PFMEA Severity rank of 5-8 is identified with corresponding Occurrence rank of 4-10
- All items identified as a Significant Characteristics shall demonstrate a minimum Cpk of 1.33 or be subject to 100% inspection



Defense Segment Addendum



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Measurement Systems Analysis (MSA)

- For all Level 3 PPAP submittals, Oshkosh requires separate GR&R's be submitted for each measurement gage or device family gage that is used to validate Critical, Significant, Major or CSI identified on the Design Record or listed on the Control Plan
- Oshkosh requires suppliers to perform MSA in accordance with the AIAG MSA manual 4th edition



Gage Repeatability and Reproducibility (GR&R)

- Gage R&R is used to ensure that measurements used in the manufacturing process are reasonably consistent regardless of how many times they are performed or by who they are performed

 OSHKOSH™ GAGE REPEATABILITY AND REPRODUCIBILITY DATA SHEET VARIABLE DATA RESULTS <small>(Format for example only; Supplier created templates may be used)</small>												 OSHKOSH™ GAGE REPEATABILITY AND REPRODUCIBILITY DATA SHEET VARIABLE DATA RESULTS <small>(Format for example only; Supplier created templates may be used)</small>															
Part Number PART NUMBER				Gage Name				Appraiser A				Part Number PART NUMBER				Gage Name				Appraiser A							
Part Name PART NAME				Gage Number				Appraiser B				Part Name PART NAME				Gage Number				Appraiser B							
Characteristic Lower Upper				Specification				Gage Type				Appraiser C				Characteristic				Gage Type				Appraiser C			
Characteristic Classification				Trials		Parts		Appraisers		Date Performed		Characteristic Classification				Trials		Parts		Appraisers		Date Performed					

APPRAISER/ TRIAL #	PART										AVERAGE	Measurement Unit Analysis				% Total Variation (TV)	
	1	2	3	4	5	6	7	8	9	10		Repeatability - Equipment Variation (EV)	Trials	K1	% EV		
1. A 1																	
2. 2																	
3. 3																	
4. AVE																	
5. R																	
6. B 1																	
7. 2																	
8. 3																	
9. AVE																	
10. R																	
11. C 1																	
12. 2																	
13. 3																	
14. AVE																	
15. R																	
16. PART AVERAGE																	
17. $(\bar{r}_a + \bar{r}_b + \bar{r}_c) / (\# \text{ OF APPRAISERS}) =$																	
18. $X_{DIFF} = (\text{Max } X - \text{Min } X) =$																	
19. $* UCL_R = R \times D_4 =$																	
<small>* $D_4 = 3.27$ for 2 trials and 2.58 for 3 trials. UCL_R represents the limit of individual R's. Circle those that are beyond this limit. Identify the cause and correct. Repeat these readings using the same appraiser and unit as originally used or discard values and re-average and recompute R and the limiting value from the remaining observations.</small>												Repeatability & Reproducibility (GRR) $GRR = \{(E V^2 + A V^2)\}^{1/2}$ = = = n = parts r = trials K ₂ 0.7087 0.5236				% GRR = 100 (GRR/TV) = =	
Part Variation (PV) $PV = R_p \times K_3$ = = =												Parts K ₃ 2 0.7087 3 0.5236 4 0.4464 5 0.4032 6 0.3745 7 0.3534 8 0.3378 9 0.3247 10 0.3145				% PV = 100 (PV/TV) = =	
Total Variation (TV) $TV = \{(GRR^2 + PV^2)\}^{1/2}$ = = =																ndc = 1.41 (PV/GRR) = =	
<small>For information on the theory and constants used in the form see MSA Reference Manual, Third edition.</small>																	
Notes: _____ _____ _____																	

MSA Results

MSA Math

- The Gage R&R use statistical methods to determine the variation due to the measurement system
- Results are given as a few key values:
 - GRR
 - %GRR (TV)
 - %GRR (Tol)
 - Number of Distinct Categories (NDC)

Part Number 314159	Gage Name Cal-01	Appraiser A W.E.
Part Name Widget, Front End	Gage Number Cal-01	Appraiser B Genechi
Characteristic Overall Length	Specification 8 8.12	Gage Type Calipers
Characteristic Classification Length	Trials 3	Parts 10
	Appraisers 3	Date Performed 1/1/2020

APPRAISER/		PART										AVERAGE
TRIAL #		1	2	3	4	5	6	7	8	9	10	
1. A	1	8.02	8.03	8.04	8.05	8.06	8.07	8.08	8.09	8.10	8.11	8.064
2.	2	8.01	8.02	8.03	8.05	8.06	8.07	8.08	8.09	8.10	8.12	8.064
3.	3	8.01	8.03	8.04	8.05	8.06	8.07	8.08	8.09	8.10	8.12	8.064
4. AVE		8.01	8.03	8.04	8.05	8.06	8.07	8.08	8.09	8.10	8.11	X ₀ = 8.064
5. R		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	R ₀ = 0.002
6. B	1	8.01	8.02	8.03	8.04	8.05	8.07	8.07	8.09	8.10	8.11	8.059
7.	2	8.01	8.02	8.03	8.04	8.05	8.07	8.08	8.09	8.10	8.11	8.060
8.	3	8.01	8.02	8.03	8.04	8.05	8.06	8.07	8.09	8.10	8.11	8.059
9. AVE		8.01	8.02	8.03	8.04	8.05	8.07	8.08	8.09	8.10	8.11	X ₀ = 8.059
10. R		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	R ₀ = 0.002
11. C	1	8.00	8.02	8.03	8.04	8.05	8.06	8.07	8.09	8.10	8.11	8.056
12.	2	8.00	8.02	8.03	8.04	8.05	8.06	8.07	8.08	8.10	8.10	8.055
13.	3	8.01	8.02	8.03	8.04	8.05	8.06	8.07	8.08	8.09	8.11	8.056
14. AVE		8.00	8.02	8.03	8.04	8.05	8.06	8.07	8.08	8.09	8.11	X ₀ = 8.056
15. R		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	R ₀ = 0.003
16. PART												X= 8.060
AVERAGE		8.01	8.02	8.03	8.04	8.05	8.07	8.08	8.09	8.10	8.11	R ₀ = 0.100
17.		(f _a + f _b + f _c) / (# OF APPRAISERS) =										R= 0.003
18.		X _{DIFF} = (Max X - Min X) =										X _{DIFF} = 0.009
19.		* UCL _R = R x D ₄ =										UCL _R = 0.007

* D₄ =3.27 for 2 trials and 2.58 for 3 trials. UCL_R represents the limit of individual R's. Circle those that are beyond this limit. Identify the cause and correct. Repeat these readings using the same appraiser and unit as originally used or discard values and re-average and recompute R and the limiting value from the remaining observations.

Notes:

GAGE REPEATABILITY AND REPRODUCIBILITY DATA SHEET							
VARIABLE DATA RESULTS							
(Format for example only; Supplier created templates may be used)							
Part Number 314159	Gage Name Cal-01		Appraiser A W.E.				
Part Name Widget, Front End	Gage Number Cal-01		Appraiser B Genechi				
Characteristic Overall Length	Gage Type Calipers		Appraiser C Walter				
Characteristic Classification Length	Trials 3	Parts 10	Appraisers 3		Date Performed 1/1/2020		
Measurement Unit Analysis			% Total Variation (TV)				
Repeatability - Equipment Variation (EV)			% EV = 100 (EV/TV) = 100(0.002/0.032) = 4.77				
EV =	$R \times K_1$	Trials					K1
=	0.003 x 0.5907	2					0.8865
=	0.002	3					0.5907
Reproducibility - Appraiser Variation (AV)			% AV = 100 (AV/TV) = 100(0.004/0.032) = 14.19				
AV =	$\{(X_{DIFF} \times K_2)^2 - (EV^2/nr)\}^{1/2}$		% AV = 100 (AV/TV) = 100(0.004/0.032) = 14.19				
=	$\{(0.01 \times 0.5236)^2 - (0.00^2/(10 \times 3))\}^{1/2}$						
=	0.004						
n = parts	r = trials	Appraisers					2
		K ₂	0.7087	0.5236			
Repeatability & Reproducibility (GRR)			% GRR = 100 (GRR/TV) = 100(0.005/0.032) = 14.97 <i>Gage system may be acceptable</i>				
GRR =	$\{(EV^2 + AV^2)\}^{1/2}$		Parts	K ₃			
=	$\{(0.002^2 + 0.004^2)\}^{1/2}$		2	0.7087			
=	0.005		3	0.5236			
Part Variation (PV)			% PV = 100 (PV/TV) = 100(0.031/0.032) = 98.87				
PV =	$R_P \times K_3$		4	0.4464			
=	0.100 x 0.3145		5	0.4032			
=	0.031		6	0.3745			
			7	0.3534			
Total Variation (TV)			8	0.3378			
TV =	$\{(GRR^2 + PV^2)\}^{1/2}$		9	0.3247	ndc = 1.41(PV/GRR)		
=	$\{(0.005^2 + 0.031^2)\}^{1/2}$		10	0.3145	= 1.41(0.031/0.005)		
=	0.032				= 9		
<i>Gage discrimination acceptable</i>							
For information on the theory and constants used in the form see MSA Reference Manual, Third edition.							

Gage Repeatability and Reproducibility (GR&R)

GRR	Decision
Less than 10 percent	Gage considered to be acceptable for application
10 percent to 30 percent	Gage may be acceptable for some applications. Use of gage must be approved by OSK
Over 30 percent	Gage considered to be unacceptable for application

Table VIII-A: GR&R Criteria

Defense Segment Addendum



Global Supplier Quality Manual

DEFENSE SEGMENT ADDENDUM

*Revision 1.4
October 1, 2020*

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Print Notes - Performance Test

- The Supplier shall perform tests for all part(s) or product material(s) when performance of functional requirements are specified by the Design Record or Control Plan.
- Performance testing is the process of verifying the functionality of the product when exposed to conditions that they will be used in.
- Qualified Lab Documentation must accompany each performance test result form.
- Welding Procedure Specifications (WPS) and Procedure Qualification Records (PQRs) shall be included within the PPAP submittal when applicable and shall be Stamped, dated as “approved” by a Qualified Welding Inspector.

[illegible]

- Performance Tests Results Shall indicate the following:
 - Design Record change level of parts tested
 - Authorized engineering changes
 - Number, date and change level of specifications to which part was tested
 - Date testing took place
 - Quantity tested
 - Specific parameters and actual results

Print Notes - Performance Test

- Performance Tests Results Shall indicate the following:
 - ☐ Design Record change level of parts tested
 - ☐ Authorized engineering changes
 - ☐ Number, date and change level of specifications to which part was tested
 - ☐ Date testing took place
 - ☐ Quantity tested
 - ☐ Specific parameters and actual results
- It is the supplier's responsibility to plan for ongoing material and performance testing which should be identified as separate line items on the control plan



Global Supplier Quality Manual

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Supplier Change Request (SCR)

- Suppliers may propose design changes or modifications to help reduce cost, improve quality, reliability and process capability
- All proposed changes should be submitted through Oshkosh ETQ Reliance Quality Management System
- If a Tier 1 wishes to change manufacturing locations, the change should be submitted through a SCR
 - The new manufacturing location shall be qualified by an audit
 - Materials & Parts be validated through PPAP submission
 - PPAP submission may be required even if the change is at the Tier 2 level

etq

Change Request # RCM-007127

Change Request # RCM-007127

Progress: Draft, Initial Approval, First Approval, **Second Approval**, Third Approval, Fourth Approval, SCRIP Review, Final Review, Void, Completed

New Document

Main

Internal Oshkosh Notes

Disposition Information

Access Control

Show All

Change Summary

Do NOT post ITAR or EAR controlled technical data relating to military vehicles, systems, or parts. The information on this site may be accessible by non-U.S. persons.

Change Number: RCM-007127

Segment: Pierce Manufacturing, Inc.

Deviation Type: --

Temporary or Permanent submissions must be approved by Oshkosh before any changes are made to the product or process.

(Emergency = Will impact delivery of parts if not implemented in less than 30 days)

Reason for Submission:

☐ Temporary Process Change

☒ Temporary Product Change

☐ Permanent Process Change

☐ Permanent Product Change

☐ SCRIP (Supplier Cost Reduction Idea Program)

☐ Obsolete Part

Submission by:

☐ Internal Submission

☒ Supplier Submission

Is this an Emergency Request?

☒ Yes

☐ No

Requested By: Ryan, Pam (pryan@us-wire-harness.com)

Drawing Change Required:

☒ Yes

☐ No

Temporary Deviation Duration: Mar 5, 2019

Temporary Change Quantity: 8

Requested Implementation Date: Mar 7, 2019

Due Date: May 8, 2019

Program: --

Supplier Reason:

- Manufacturing Request: Temporary Deviation
- Drawing Error: Inadequate or Incorrect Detail

Commodity(s): --

Priority: --

PO #: 2766111

PO Due Date: Mar 5, 2019

Buyer: Dave Fronsee

Description of the Proposed Change (Change To):

- Identify DEF PUMP connector with grey tie.
- Use Mylar Labels instead of shrink tubing.

Rationale for the Change:

- Drawing is not clear on instructions as cable ties are reflected as abbreviated words.
- Heatshrink labels may incur in manufacturing issues when adding loom as they require to be preinserted

These changes applies only for PO 2766111

What is the benefit to Oshkosh Corporation?

- To have a current print
- Using Mylar tags is more manufacturable

Attach a red-line drawing, marked up image, or any other supporting information to assist in communication of the change request.

Attachment(s):

Pierce 64-5271-H006 030619.pdf

Change Made:

☐ Supplier Location

☐ Oshkosh Location

☐ Tier 2 Supplier Location

There are five types of Supplier Change Requests:

- **Temporary Process Change** – Change to the PPAP approved process, tooling move, plant move, improved/new tooling, etc., however it may be functionally acceptable temporarily
- **Temporary Product Change** – Change to the product such the design intent, material change, etc. however it may be functionally acceptable temporarily
- **Permanent Process Change** – Change to the PPAP approved process, tooling move, plant move, improved/new tooling etc, on a permanent basis
- **Permanent Product Change** – Change to the product such that it meets the current design intent and requires a design change
- **Supplier Cost Reduction Ideas Program (SCRIP)** – Change to the product, process or design, generated and proposed by the Supplier to reduce product cost

Supplier Change Request Form

- Suppliers are responsible to ensure that all products supplied to Oshkosh Corporation meet the requirements of the current released drawing, to the current revision on the purchase order, and as documented in the Oshkosh PPAP (if required).
- This change request shall occur via the **Change Management** module within the Oshkosh Reliance Software.

Change Request # RCM-014368

Main Internal Oshkosh Notes Access Control All Tabs

Change Summary

Change Number: RCM-014368 Segment: Defense Production

Temporary or Permanent submissions must be approved by Oshkosh before any changes are made to the product or process.

Reason for Submission

☐ Temporary Process Change
 ☒ Temporary Product Change
☐ Permanent Process Change
 ☐ Permanent Product Change
☐ SCRIP (Supplier Cost Reduction Idea Program)
 ☐ Obsolete Part

Submission by
☐ Internal Submission
 ☒ Supplier Submission

Requested By
 Allen, Thomas (tallen@precisionrailandmfg.com)

Drawing Change Required
☐ Yes
 ☐ No

Temporary Deviation Duration (Date)
 Mar 20, 2020

Temporary Change Quantity
 1

Requested Implementation Date
 Mar 20, 2020

Program

Supplier Reason

PO #

PO Due Date

Buyer
 Kelly Lloyd

Description of the Proposed Change (Change To)
 This one casting has porosity below -G-

☒ Cost Information

ERP Supplier Number

Supplier Manufacturing Address
 6960 S. 10th Street Oak Creek WI. 53154

Supplier Contact(s)
 Allen, Thomas
 (tallen@precisionrailandmfg.com)

Email Address
 tallen@precisionrailandmfg.com

Telephone Number
 414-764-1131

Submitter Technical (Engineering) Contact Information

Submitter Technical Contact
 Tom Allen

Submitter Technical Contact Phone #
 414-764-1131

Submitter Technical Contact Email
 tallen@precisionrailandmfg.com

Supplier Contact

Oshkosh Purchase Level Part #
 4462851

Oshkosh Lower Level Part #

Supplier Part #

Prototype Part
☐ Yes
 ☐ No

Attachment

Engineering Revision Level
 C

Lower Level Part Revision

Production Part
☐ Yes
 ☐ No

Safety/Government Regulation
☐ Yes
 ☐ No
 ☐ N/A

Part Name

Lower Level Part Name

Aftermarket Part
☐ Yes
 ☐ No

Design Responsibility
☐ Oshkosh
 ☐ Supplier
 ☐ Other

Authorized Engineering Change Documents (AIAG PPAP 2.2.2)

- The Supplier shall maintain copies of any authorized engineering change documents for those changes not yet recorded in the Design Record but incorporated in the product, part or tooling
- Marked Drawings are acceptable for PPAP submission when a released drawing is not available due to timeline constraints
- Any Marked drawings from Oshkosh Defense must be signed approved by Oshkosh Design Engineering and a copy of the approved OSK Supplier Change Request (RCM) must accompany the PPAP Submittal



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Nonconforming Material or Product

What is Non-conforming Material?

- These are products or materials that do not conform to requirements
- They are identified and controlled to prevent their unintended use or delivery
- The controls and related responsibilities and authorities for dealing with nonconforming product shall be defined in a documented procedure



Nonconforming Material – Supplier Quality Handbook

- The supplier **shall** establish and maintain documented procedures to ensure that proven or suspected nonconforming products are prevented from unintended use or installation
- Control procedures must provide for identification, documentation, evaluation, segregation and disposition
- If nonconforming material happen, the Supplier is responsible to aid Oshkosh Corporation in evaluation, correcting the issue and Oshkosh may seek all costs reasonably incurred in taking corrective action per the terms and conditions





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In 8D what does the D stand for?

Damage

Days

Disciplines

Dudes

None of the above

Corrective Action

- Oshkosh Corporation will notify suppliers of problems regarding quality, delivery, packaging and services through Oshkosh ETQ Reliance and personal contact
- Initial response and containment is expected within 24 hours
- Oshkosh utilizes the **8 Discipline (8D)** methodology for Corrective Action
- Final result should include root cause problem solving tools such as Pareto, 5 whys, fishbone, Design of Experiments
- Failure Mode Effects Analysis (FMEA) and control plans must be updated to reflect the corrective action



Containment and Short-Term Corrective Action

- Initial response concerning Containment measures is expected within 24 hours
- The Supplier must contain all materials at Oshkosh Corporation's facilities, off-site warehouses, and any material in transit
- Containment Elevation - Containment Level 1 and Level 2
 - Containment Level 1 (CL1) - Requires 8D and 100% inspection of specified features by Supplier Personnel
 - Containment Level 2 (CL2) - Requires 8D and 100% inspection of specified features by an independent 3rd party



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Supplier Performance Monitoring & Metrics

- Parts and services furnished to Oshkosh Corporation are expected to meet and maintain zero defects and 100% on-time delivery
- Two main published metrics, Parts Per Million (PPM) & On Time Delivery (OTD)
 - Parts Per Million (PPM)
 - ❑ $PPM = (Total\ Nonconforming\ Quantity / Total\ Receipt\ Quantity) * 1,000,000$
 - ❑ Goal 175
 - On Time Delivery (OTD)
 - ❑ $OTD = (Total\ Late\ Quantity) / (Total\ Quantity) * 100$
 - ❑ Late = >3 days early or 0 days late
 - ❑ Goal 95%





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Warranty and Cost Recovery

- Oshkosh Corporation's expectation in the event of product failure is for the Supplier to collaborate with Oshkosh Corporation to determine the root cause and corrective action of the failure as well provide reimbursement for the repair expenses as explained in the Terms and Conditions





Global Supplier Quality Manual

29 Core Areas within the Manual

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Product Traceability

- The Supplier shall adhere to the ISO 9001:2015 and IATF 16949 for Product Identification and Traceability and always identify its products from applicable drawings, specifications, or other documents, during all stages of production, delivery, and installation, where appropriate (ISO 8.5.2 Identification and Traceability)
- If traceability is a specified requirement, the Supplier shall use unique identification for the product (Serial Number, Batch Number etc.)
- This information must be documented and retained appropriately
- Traceability requirements also apply to the supplier's sub-tier contractors

Defense Segment Addendum



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DEFENSE SEGMENT ADDENDUM

*Revision 1.4
October 1, 2020*

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Supplier Manual Highlights

10.1. Location Requirements

Some drawings specify only compliance to Military Standard 130 (MIL-STD-130) and may/may not include the marking method or location on the part. In those instances, it is important to ensure the identification is visible and legible during normal operational use (if it is affixed to the part), and it needs to be permanent through the life cycle of the part.

For components that are physically marked (by etching or stamping for example), the identification **MUST** be legible in its final state (after coating). It is the tier one supplier's responsibility to ensure conformance to this requirement.

Traceability – Armor ^(new)

- Armor traceability is considered a “CC” (Critical Characteristic) and shall be maintained & linked to the IUID (Item Unique Identification) label
- At a minimum the following Information shall be tracked and linked: serial number, part number, heat number, lot number, material certification number, materials standard, and MIL CAGE code
- For complex weldments or multi-piece assemblies, all material lots utilized for construction for that end item shall be recorded and linked to the IUID label
- The process of tracking the information prior to the final IUID label shall be IAW the prime contractor’s material traceability requirement (see drawing 3912088)
- The supplier’s Armor traceability Procedure shall be integrated from supplier’s Receiving raw materials, to sub-components (or assembled product), through the supplier’s Shipping, and ultimately traceable by the end-user
- The supplier shall have a defined traceability procedure that is referenced in the PFEMA and Control Plan.



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Distributor Requirements

- Distributors shall have in place a system to understand all parts origin, traceability to manufacturing location, and required specifications
- The distributor shall be responsible for proper handling and storage to prevent damage and product deterioration
- Stock control shall be implemented, as appropriate, for shelf-life items and the removal of obsolete/unacceptable product
- Packaging shall provide adequate protection to ensure safe delivery
- The distributor is responsible for corrective actions in regard to nonconforming product supplied to Oshkosh Corporation
- All requirements within this Manual apply to the Distributor.



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Control of Customer – Supplied Product

- If Oshkosh Corporation provides product for incorporation into the Supplier's product or related activities the Supplier shall establish and maintain documented procedures for the control, verification, storage and maintenance of Oshkosh Corporation product
- Any such product that is lost, damaged, or is otherwise unsuitable for use shall be recorded and reported to Oshkosh Corporation Purchasing.
- Oshkosh Corporation owned returnable packaging is included in this specific requirement.
- An affixed tag specifically containing the part number and/or customer name to identify ownership is the preferred approach. However, this requirement may be met by using a Supplier designated number cross-referenced with clear traceability back to the customer.



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Tooling Management

- The Supplier shall establish and implement a system for tooling management including the following:
 - Maintenance and repair facilities and personnel
 - Unique identification for tooling
 - Storage and recovery
 - Setup
 - Tool change programs for perishable tools
 - Tool modification, including tool design documentation
 - Tool condition (wear, dimensional integrity, etc.) verification
- Tools and Fixtures owned by Oshkosh Corporation must be marked “Property of Oshkosh Corporation” or with a tracking label if required by Oshkosh Corporation
- This must be visually documented in the PPAP workbook.





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Preventative Maintenance

- The Supplier shall identify key process equipment and shall develop an effective planned total preventative maintenance system in order to prevent delivery or quality failures
- The total preventative maintenance system should utilize predictive maintenance methods to continually improve the effectiveness and the efficiency of the identified key process equipment





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Sub-tier Supplier Quality Assurance

- The Supplier is responsible for all communication of all purchase order requirements to include those specified within this SQM
- The Supplier shall provide requirements and guidance to their Supply Chain consistent with the requirements of Oshkosh Corporation
- The Supplier shall have a process in place to ensure that all sub-tier Suppliers have and maintain a system to provide conforming product and services in accordance with Oshkosh Corporation requirements



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Packaging & Shipping

- The Supplier shall provide for adequate facilities and instructions for handling, packaging and shipping to protect the products and prevent damage during storage and transit
- The Supplier shall conform to the requirements of the Oshkosh Supplier Standards Guide Section J, which is available at
- <http://osn.oshkoshcorp.com>

 SECTION J LABELING VALIDATION			
ORGANIZATION:	SUPPLIER NAME	PART NUMBER:	PART NUMBER
SUPPLIER NUMBER:	101112	PART NAME:	PART NAME
TOOL / FIXTURE NUMBER:		DESIGN RECORD CHANGE LEVEL:	ERL 6
DATE:			
Supplier is required to provide sample of SSG Section J compliant label(s) and document with Photo in PPAP workbook			
PICTURE OF SECTION J COMPLIANT LABELING			
Part Number (P)  123456		Country Origin: USA Revision: A Container Code: C0001	
Quantity (Q)  12	Purchase Order (K)  246810		
Kanban ID (I)  AA10000	Location (L)  711		
Please Save This Space On The Labels For a Future Oshkosh Initiative			
Supplier Name City/State/Zip		OSK Location Name City/State/Zip	



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Identification, Preservation, Package and Packing

- The Supplier shall accomplish identification, cleaning, preservation, packaging, and packing in accordance with the applicable drawings, specifications, and instructions as referenced on the purchase order
- Unless otherwise specified, all uncoated or unprotected ferrous and nonferrous metal surfaces (internal and/or external) must be protected for a minimum of thirty (30) working days from date of shipment against rust and corrosion and be suitably packed to prevent damage from handling or shipping
- All openings (i.e. hydraulic tubes, electrical connections, etc.) must be adequately protected by closures to prevent contamination or damage

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Print Notes – Surface Preparation, Painting and Finishing

- Supplier must comply with the Oshkosh finish requirement specified on the drawing
- When the finish requirement is “silent”, supplier shall reference the OSK PS-100 Paint Standard and or FM100 Finish Methods
- Tier 1 suppliers are responsible to ensure that finish requirements are upheld by the sub tier finish suppliers. (JLTV and FMTV A2 mandate qualification and sustaining quality requirements) It is highly recommended that tier 1 suppliers mitigate risks by requiring sub tier suppliers to document process flows, FMEA and Process Control Plans in accordance with OSK’s PPAP format
- As referenced in Section D.32 of the Oshkosh Supplier Standards Guide, the use of any pretreatment, plating, painting or coating of any kind that contains Hexavalent Chrome is strictly prohibited

 APPEARANCE APPROVAL REPORT (COMMERCIAL PAINT RESULTS)									
PART NUMBER		PART NUMBER		DRAWING NUMBER		APPLICATION (VEHICLES)		MODEL / VEHICLE	
PART NAME		PART NAME		BUYER CODE		E/C LEVEL		DATE	
ORGANIZATION NAME		MANUFACTURING LOCATION		SUPPLIER / VENDOR CODE		SUPPLIER / VENDOR CODE ###			
REASON FOR SUBMISSION		<input type="checkbox"/> PART SUBMISSION WARRANT <input type="checkbox"/> PRE TEXTURE		<input type="checkbox"/> SPECIAL SAMPLE <input type="checkbox"/> FIRST PRODUCTION SHIPMENT		<input type="checkbox"/> RE-SUBMISSION <input type="checkbox"/> ENGINEERING CHANGE		OTHER	
APPEARANCE EVALUATION									
Coating Spec (If Applicable)	Attribute	Frequency	SPECIFICATIONS						
Color Match			Refer to Applicable QACs and or Specification on print/PO (Contact Buyer)						
TopCoat Gloss									
Crosshatch Adhesion									
Solvent Resistance									
Pencil Hardness									
Film Thickness (Powder)									
Film Thickness (Liquid)									
Production Adhesion Test									
Orange Peel									
Salt Spray Creepage									
Edge Coverage									
COLOR EVALUATION									
Color	Lot	Part #	SPECIFICATIONS						
			JLG Specifications Refer to: Color Code 4150613						
			JerrDan Specifications Refer to: Color Code Chart 4150613						
			Pierce Specifications Refer to: TBD						
			McNeilus Specifications Refer to: TBD						
COMMENTS									
Document Painting Method / Industry Standard used to prepare these components.									
Method # / Finishing Requirement on Drawing:									
Cleaning Standard Utilized:									
Painting Standard Utilized:									
Characteristic	SPECIFICATION / LIMITS		GAGE TYPE	SUPPLIER TEST RESULTS (DATA)			OK	NOT OK	Notes:
	MIN	MAX		Piece 1	Piece 2	Piece 3			
Prime Coat:									
Blast Profile*									
Oven Cure Time (if used)									
Time (if used)									
Salt Spray									

Supplier Manual Highlights - Defense

9. Surface Preparation, Painting and Finishing

The Supplier must comply with the Oshkosh finish requirement specified on the drawing. When finish requirements are “silent”, suppliers shall reference the OSK PS-100 Paint Standard and/or FM100 Finish Methods. These documents can be found on the <http://osn.oshkoshcorp.com/> website.

It remains the responsibility of the tier 1 supplier to ensure that finish requirements are upheld by the sub tier finish suppliers. Recent government contracts (JLTV and FMTV A2) mandate qualification and sustaining quality requirements, which are specified inside of the pertinent finish requirements drawings (ex: 12593834). Additionally, it is highly recommended that tier 1 suppliers mitigate risks by requiring sub tier suppliers to document process flows, Process FMEA, and Process Control Plans in accordance with OSK's PPAP format.

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Note: Product shipping in “raw” (unfinished state) shall be provided in accordance with FM100, section R20.

- Reference section 4.1 for cleaning/blasting requirements by substrate
- Reference section 4.3 for a list of allowable rust inhibitors by substrate



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Fastener Quality Requirements

- The Supplier must develop a program to assure fasteners conform to the specifications to which they are represented to be manufactured, to provide for accreditation of laboratories engaged in fastener testing, to require inspection, testing and certification in accordance with standardized methods of fasteners
- All externally threaded fasteners in which drawings specify Grade 5 and metric 8.8 or greater, must have available chemical and physical certifications, from an accredited laboratory
- Certifications must include lot traceability back through the manufacturing system to the heat lot of raw material used
- It is not necessary for shipments to include certification documents; however, the Supplier must be able to provide these certifications to Oshkosh Corporation within 24 hours of request

Fastener Quality Requirements

- Cartons must be marked with a unique lot number, which allows the Supplier to trace material back to the manufacturer.
- Oshkosh Corporation will not accept any cap screws or flange bolts which do not have a manufacturers head marking on them
- Cap screws must be produced per applicable International Fastener Institute (IFI), SAE J429, SAE 1199 or DIN Standards. Reference: Fastener Quality Act Public Law No. 106-34 (1999)



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Record Retention

- Records/documents providing objective evidence of conformance to drawings, standards, and other applicable specifications considered essential to the effective operation of the program shall be maintained
- They shall be legible, dated, clean, readily identifiable and maintained in an orderly manner
- They shall provide traceability to specific products and use actual data, as required by applicable specifications, to indicate acceptability of the product
- Records/documents may be either hard copy or computer media
- See segment addendums for any addition specific record retention requirements

Defense Segment Addendum



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Record and Documentation Retention Requirements

- While in storage, records and documents shall be protected from damage, loss and deterioration due to environmental conditions
- Records shall be maintained for (5) years
- At the end of (5) years, the Supplier shall provide Oshkosh Defense with the option of having the records forwarded to Oshkosh Defense for further retention, as required by the contract, or authorizing disposal of the records and documents at the Supplier's location
- Disposition shall be done in a timely and appropriate manner
- Oshkosh Defense shall be notified when disposition has taken place.



Global Supplier Quality Manual

29 Core Areas within the Manual

These requirements apply to ALL SUPPLIERS who provide/are:

- Production Materials
- Production or Service Parts
- Distribution Centers
- Manufacturers of Machinery

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Shelf Life

- The Supplier shall mark the parts and exterior shipping container in accordance to applicable specifications for any items subject to age control (i.e.: paint, adhesives, rubber, hose assemblies, etc.)
- If there is a shelf-life for the product, the expiration date must be noted on the outside of all containers





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Welding Requirements

- At a minimum the Supplier must comply with the appropriate industry accepted codes and standards, such as AWS, ASME or MIL-specs, or otherwise specified by the Business Segment Design Authority
- The Supplier MUST certify and maintain a record of any and all personnel that weld on Oshkosh Corporation components per the accepted codes and standards, along with maintaining that certification to satisfy Oshkosh Corporation's customer requirements

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WPS and PQR

- The supplier shall develop and deliver Welding Procedure Specifications (WPS), Qualification Records (PQRs) and Weld Repair Procedures
- Welder Qualification Records (WQRs) shall be available on request
- The use of pre-qualified weld joints as specified in American Welding Society (AWS) D1.1 does not preclude submittal of welding procedures

Welding Procedure Specification WPS 00875

Manufacturer: Welds R US Parent Material: P90SPL

Weld Type: Single - V Butt Type Material Thickness (mm): 15 mm

Welding Position: Flat

Weld Preparation Details (Sketch)

Joint Design

Welding Sequences

Parent Materials	
Material 1	Material 2
Steel	Steel
Designation	S960 QL
Thickness [mm]	10

Filler Material		Welding Position	
Type	Wire	Welding Position	PA
Designation	X96	Direction of welding	left
Diameter [mm]	1.2	Comments	--

Shielding Gas		Welding Technique	
Name	Mixture	Bead type	String
Mixture	82%Ar+18%CO ₂	Weave width	Do not use
Flow rate [l/min]	15	Number of passes	7
Preheat Temperature	80°C	Number of beads	7

Welding Parameters		Welding Parameters		Welding Parameters		Welding Parameters	
Run	Welding Process	Filler Material Type	Welding Current [A]	Arc Voltage [V]	Travel Speed [cm/min]	Welding Energy [kJ/cm]	Time t _w [s]
1	135	X96 1.2	120	17	12	10	10
2	135	X96 1.2	230	27	35	11	11
3	135	X96 1.2	230	27	35	11	11
4	135	X96 1.2	230	27	35	11	11
5	135	X96 1.2	230	27	35	11	11
6	135	X96 1.2	230	27	35	11	11
7	135	X96 1.2	230	27	35	11	11

Qualification Records (PQR)

(ASME Boiler and Pressure Vessel Code)

Conditions Used to Weld Test Coupon

Date: _____

Position of Test Coupon (Thickness shall be recorded for each filler metal or process used.)

Postweld Heat Treatment (QW-407)

Temperature _____

Time _____

Other _____

Gas (QW-408)

Percent Composition

Shielding	Gas(es)	(Mixture)	Flow Rate
Trailing			
Backing			

Electrical Characteristics (QW-409)

Current _____

Polarity _____

Amps _____

Volts _____

Tungsten Electrode Size _____

Other _____

Technique (QW-410)

Travel Speed _____

String or Weave Bead _____

Welding _____

Welds or Single Pass (per side) _____

Angle or Multiple Electrodes _____

Other _____

Armor Welding Procedure

- Prior to manufacturing, the Supplier shall develop welding procedures for all ballistic weldments in accordance with applicable welding code for Armor Steels and Aluminum
- For Defense, the welding code is dictated by the code in place during contract award
- Any deviation from the stated requirement is to be submitted and approved using Supplier Change Request



Qualified Welding Equipment

- The Supplier shall develop and maintain a welding equipment calibration program
- This program shall consist of, as a minimum, an annual comparison check of the machine output with instrumentation that has been certified and calibrated using standards traceable to the National Institute of Standards and Technology (NIST)

Qualified Welding Inspector

- Qualified inspectors trained to perform inspection functions shall be used for the verification of weld quality, and shall be in accordance with at least one of the following conditions:
 - Current certification in accordance with the American Welding Society (AWS)
 - Certified Welding Inspector (CWI)
 - Senior Certified Welding Inspector (SCWI), qualified and certified in accordance with provisions of AWS QC1.
- Current certified welding inspectors qualified by the Canadian Welding Bureau (CWB) to Level II or the Level III requirements of the Canadian Standards Association (CSA) Standard W 178.2 Certification of Welding Inspectors

Nondestructive Testing

- Armor steel(s) and quenched and tempered steels shall be visually inspected after the welds have completed to ambient temperature and no less than 48 hours
- The Supplier shall clearly identify in the product drawings, all critical joints required for Non-Destructive Testing (NDT) other than visual inspection
- When NDT is required, the inspectors shall be qualified IAW the current addition of American Society for Nondestructive Testing Recommended Practice No. SNT-TC-1A
 - Only individuals qualified for NDT LEVEL I and working under the NDT LEVEL II or individuals qualified for NDT LEVEL II may perform nondestructive testing except visual examination
 - The NDT personnel need not be an AWS CWI
 - The Supplier shall make available all NDT personnel qualification records upon request by Oshkosh



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Hydraulic and Pneumatic Component / System Cleanliness

- The Supplier shall ensure components and hydraulic assemblies are clean per Oshkosh Corporation Engineering Specification [01-MC](#)
- Procedures that meet or exceed the Oshkosh Engineering Specification 01-MC or QACO36 shall be maintained by the Supplier for review by the buyer or Oshkosh Quality Representative at request
-
- All hydraulic and pneumatic items shall have all fittings, ports, open ends, etc. protected from contamination by closures.
-
- Regular sampling and testing of the hydraulic fluid used in test stands shall be conducted with the results available to Oshkosh personnel if requested as part of the PPAP Workbook (tab within – PSC)
- The Supplier is responsible for notifying Oshkosh Corporation Purchasing and Quality in the event that conforming test results are not achieved.

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Software / Embedded Software

- Pursuant to OSK Defense being registered to IATF 16949, Defense Suppliers (servicing JLTV and FMTV A2) of product-related software, or products with embedded software, shall implement and maintain a process for software quality assurance
- The Quality Assurance methodology shall prioritize and mitigate risks based-upon the potential impact to the customer, and the organization shall retain documented information of the assessments conducted

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Certificate of Conformance

- The Supplier shall establish, implement, and maintain documented procedures, which ensure adherence to the Oshkosh Defense Certificate of Conformance requirement
- The supplier shall have an authorized representative certify that the parts ordered have been processed to procedures that ensure the material is conforming and free of counterfeit material
- The certificate of conformance will also acknowledge proper adherence to Purchase Orders, drawings, and contract requirements
- Suppliers shall utilize the Oshkosh Certificate of Conformance form (QC-0899) located on <http://osn.oshkoshcorp.com/> or another Certificate of Conformance form that at minimum contains all the information required per the Oshkosh Certificate of Conformance form
- The supplier shall complete and retain a Certificate of Conformance for each shipment of material
- This record shall be retained at the supplier's location for 5 years
- This document must be made available at the request of Oshkosh within 24 hours



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DEFENSE

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Certificate of Conformance (CoC)

Supplier Name: _____

Supplier Number: _____

Part Description: _____

Part Number: _____

Drawing Number: _____ Revision: _____

Purchase Order #: _____

Quantity: _____

Serial Number(s): _____ (if applicable)

Lot/Heat Number: _____ (if applicable)

All technical requirements of the contract are satisfied. Quality and performance are in accordance with the contract, the specifications, and all references and associated contractual drawings and documents.

I, as a supplier to Oshkosh Defense, acknowledge and certify the material covered under this document is produced in accordance with the following:

☐ All Contractual "Flow Down" Requirements

☐ Supplier Standards Guide

☐ Global Supplier Quality Manual

☐ Product Conformance

☐ Free of Counterfeit Material

(Acknowledge by marking the boxes)

Signature

Title

Completion Date

This certifies the parts/items/materials identified above conform to all applicable drawings and/or specifications as evidenced by reports or other documentation on file and all other purchase order and quality requirements have been met.

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Commercial Off the Shelf (COTS)

- COTS components are items that are commercially available, unaltered and may be procured through distributors
- For PPAP for COTS parts the supplier is expected to submit all 18 elements of PPAP
- With exception, suppliers may be unable to obtain all data for all 18 elements for a level 3 PPAP. In these cases, the supplier is expected to demonstrate/affirm conformance with supporting documents or Certificates of Conformance by supplying the following minimum PPAP elements:
 - ☐ Design Record & Dimensional Results
 - ☐ Engineering Change Documents – F1000 (if applicable)
 - ☐ Customer Engineering Approval (If applicable)
 - ☐ Print Note Verification
 - ☐ Sample Production Parts
 - ☐ Master Sample Photos
 - ☐ Customer Specific Requirements – Certified First Article Testing (CFAT)
 - ☐ Part Submission Warrant (PSW)
 - ☐ Catalog Page or equivalent from Original Equipment Manufacturer (OEM) to demonstrate commerciality (if available)

Commercial Off the Shelf (COTS) - Continued

- When the supplier cannot attain all PPAP elements, a Certificate of Conformance (C of C) will be submitted in addition to above elements
- The C of C shall:
 - ☐ Confirm the article is commercially available
 - ☐ Be on the supplier's company letterhead
 - ☐ Include the Oshkosh part number
 - ☐ Include the part revision level
 - ☐ Be signed by a representative within the contractor's organization that has decision making authority
 - ☐ Positively affirm that the part meets the requirements of the print

COMPANY LETTERHEAD REQUIRED

Certificate of Conformance (CoC)

Supplier Name: _____
Supplier Number: _____
Part Description: _____
Part Number: _____
Drawing Number: _____

Revision: _____

The following are the minimum PPAP elements that must be submitted with a COTS item.

- ☐ Design Record (balloon drawing)
- ☐ Engineering Change Documents (if applicable)
- ☐ Customer Engineering Approval (if applicable)
- ☐ Dimensional Results
- ☐ Sample Production Parts
- ☐ Master Sample (photo)
- ☐ Customer Specific Requirements (CFAT) (if applicable)
- ☐ Part Submission Warrant

I certify that the items / materials referenced above are commercially available.

I certify that the above mentioned items/materials meet the purchase order requirements and referenced drawing specifications and standards. I also certify I am an authorized supplier representative.

Signature

Title

Date



Summary

Expectations of the supplier

- Follow the Global Supplier Quality Manual / Defense Addendum requirements
- Parts must be produced to the engineering drawings and specifications
- Raw material must match the engineering specification
- All finish requirements must be followed
- If you have a verbal “OK” or email that is not an approved change
- If you can not make the parts to the engineering record submit a Reliance Change Management (RCM) form to Oshkosh