

GPSC Academy

Leaders Teach & Leaders Learn



Production Part Approval Process (PPAP)

The purpose of PPAP is to determine if all customer engineering design record and specification requirements are properly understood by the Suppliers and that the manufacturing process has the capability to produce product consistently meeting these requirements during an actual production run at the quoted production rates.

WHAT IS PPAP?

Oshkosh PPAP Level Definitions

Level 1 PPAP:

- **Part Submission Warrant (PSW)** - One page document that “warrants” the part meets the design requirements

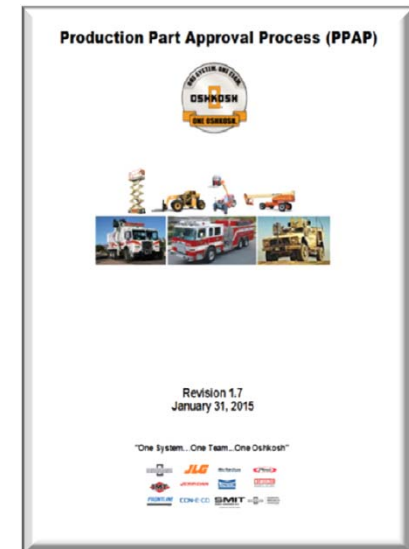
Level 2 PPAP: Includes Level 1 PPAP requirements PLUS...

- Part Submission Warrant
- Dimensional Results – 1 piece
- Design Records (Bubble Print)
- PPAP Samples – First production order / upon request prior to production order
- Print Notes (Attach copy of Raw Material Certification / Performance Test Report / Surface Finish / Labeling, Paint Process, Welding)
- Supplier Change Request (OSK-F1000) – if applicable

Level 3 PPAP: Includes Level 2 PPAP requirements PLUS...

- Dimensional Results – 3 pieces
- Process Flow Diagrams (PFD)
- Failure Mode and Effects Analysis' (PFMEA / DFMEA)
- Process Control Plans
- Initial Process Capability Studies – if applicable
- Measurement System Analysis – if applicable
- Appearance Approval Reports (AAR) – if applicable
- Checking Aids – if applicable
- Records of Compliance with Customer Specific Requirements
- Master Sample Photo Documentation of PPAP parts
- Tooling Photo Documentation – if applicable
- **Supplier Quality Engineer Approves**

Long Term
Benefit



**Oshkosh
Corporation
PPAP**

Level 4 PPAP

- Part Submission Warrant (PSW)
- Dimensional Results – 1 piece
- Design Records (Bubble Print)
- PPAP Samples

Example of PPAP Workbook



<http://osn.oshkoshcorp.com/gsq-en.htm>



Our Vision

To develop a world-class procurement and supply chain organization providing the best in logistics, quality, NPD and competitiveness to the Oshkosh family of companies on a global basis.

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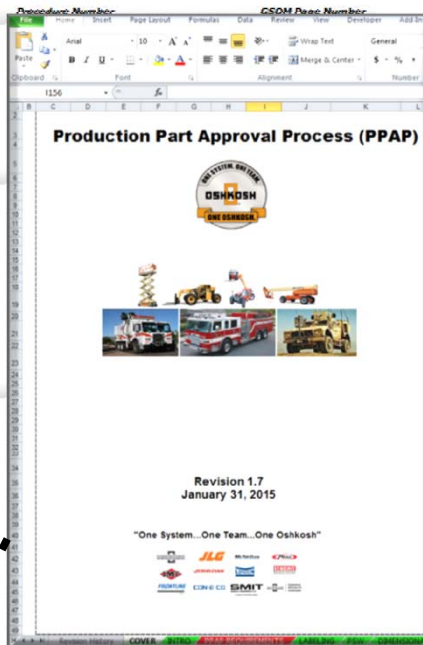
Links

Support Center

Supplier Quality Manual and Forms

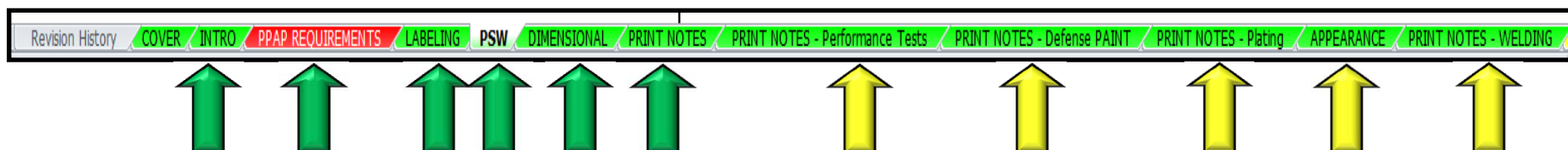
Global Supplier Quality Manual	Revision Date
Global Supplier Quality Manual - Fifth Edition	06/01/2012
Training Materials	Revision Date
8D Corrective Action	04/08/2013
Production Part Approval Process (PPAP)	11/01/2012
Supplier Change Request	11/01/2013
Containment Level 1 and 2	11/01/2012
Supplier Technical Review	09/27/2013
Procedures	Revision Date
8D Corrective Action	04/08/2013
Production Part Approval Process (PPAP)	09/01/2014
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Supplier Technical Review	09/27/2013
Forms	Revision Date
8D Corrective Action Report	04/17/2013
PPAP Workbook	01/31/2015
Supplier Change Request	11/22/2013
Containment Level 1 and 2 Tracker	11/01/2012
Supplier Technical Review	09/27/2013
License - Certificate of Conformance	08/27/2012
RIP Submission Form	07/29/2014
Single Point Lessons	Revision Date
Supplier Cost Reduction Idea Program	01/21/2015
SIPOC	01/21/2015
Pareto Chart	01/21/2015
Oshkosh Operating System	01/21/2015
OOS Roadmap	01/21/2015
Is-Is Not	01/21/2015
8D Problem Solving	01/21/2015

Click on: PPAP Workbook





PPAP Workbook – Level 2 Requirements



INTRO:

Type in Part / Supplier Information, this will be transferred throughout the workbook.

PPAP REQUIREMENTS:

This outlines the PPAP submission requirements. (Informational only)

LABELING:

This is the label to be used to Identify the PPAP sample part when shipped to OSK

PSW:

This documents the warrant that the Part Meets the design Intent

This will be used to communicate back to the supplier the acceptance or rejection of the PPAP

DIMENSIONAL:

This is used in conjunction with a “bubble print” to document the actual dimensions of the PPAP part.

PRINT NOTES:

This is used to document all the remaining notes on print (Attach copy of Raw Material Certification / Performance Test Report / Surface Finish / Labeling, Paint Process, Welding)

Required where applicable:

PRINT NOTES – Performance Tests:

This is optional depending if there are Print Notes specifying performance requirements.

PRINT NOTES – Defense PAINT:

This is optional depending if there are Print Notes specifying paint requirements for Defense Product.

PRINT NOTES – Plating:

This is optional depending if there are Print Notes specifying coating requirements.

PRINT NOTES – APPEARANCE:

This is optional depending if there are Print Notes specifying paint requirements for non-Defense Product.

PRINT NOTES – WELDING:

This is optional depending if there are Print Notes / Welding requirements specified.

Intro “TAB” – PPAP Workbook



PPAP INTRODUCTION

PPAP packages are expected to be received by Oshkosh Corporation by the date assigned by Purchasing. If for any reason you cannot meet this date, contact Purchasing for resolution.

It is the policy of Oshkosh Corporation to approve initial samples of supplier provided parts before receiving production orders of those parts. Oshkosh has developed the PPAP PROCESS to facilitate this requirement.

The Default PPAP is Level 2, unless otherwise required by the Oshkosh Segment Quality Representative

PPAP requirements apply to the following parts:

- 1) New parts.
- 2) Existing parts from a new supplier.
- 3) Existing parts from existing supplier where there has been a substantive change in the supplier's manufacturing process, tooling, materials, and/or location.
- 4) Any changes that affect the fit, function or appearance of the part.
- 5) Any request by OSK based on part rejection history.

There may be occasions where parts may be excluded from the PPAP PROCESS requirements. These may include parts that are manufactured to a higher standard or recognized external standard specification. Some examples of acceptable standards include ISO (International Standard Organization), SAE (Society of Automotive Engineers), and NIST (National Institute of Standards and Technology) among others. The supplier will have to provide documentation of higher standard or external standard specification. However, this will be at the discretion of the responsible Oshkosh Corporation Quality Representative.

Please reference the *Oshkosh Corporation Global Supplier Quality Manual* for more detail on PPAP requirements. The Manual can be retrieved on the <http://osn.oshkoshcorp.com/> website.

Important Note: These sheets have not been protected, so you can add additional information if needed. However, the information in blue is interlinked to the other spreadsheets.

FILL IN THE BLUE SECTIONS FOR AUTOMATIC INPUT INTO FORMS

Part Name Part Number Engineering Revision Level Engineering Revision Level Date Models / Vehicle	PART NAME PART NUMBER ERL ERL DATE MODEL / VEHICLE
Supplier Name Supplier Number Street Address City State Country Zip Phone Number Fax Number	SUPPLIER COMPANY NUMBER ADDRESS CITY STATE COUNTRY ZIP 555-555-5555 555-555-5554
Email Address	Emailme@somewhere.com



1. Part Information
2. Supplier Information

Note: This information will
Be transferred to all “like” fields
In this PPAP Workbook.

PPAP Submission Requirements



Oshkosh Corporation PPAP Part Submission Requirements

Part Number: PART NUMBER	Purchase Order No.	Part Description: PART NAME	ALL PPAP CRITERIA MUST CONFORM TO Oshkosh Corporation Customer Specifics defined in the Global Supplier Quality Manual
Revision Level: REV	Reason for Request:	OSK Program: MODEL / VEHICLE	
Supplier Name: SUPPLIER	Submission Due Date:		
Supplier Number: SUPPLIER			
Date Issued:			

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 - first production order / upon request prior to production order	N/R	S	S	S
5.) Print Notes: (Attach copy of Raw Material Certification / Performance Test Report / Surface Finish / Labeling, Paint Process, Welding Documentation such as WPS/PQRs/Welder Certs)	*	S	S	*
6.) Supplier Change Request (OSK-F1000) - if applicable	S	S	S	S
7.) Design Failure Modes effects Analysis (DFMEA) - if supplier is design responsible	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 - for major / critical characteristics - if applicable	N/R	N/R	S	N/R
11.) Measurement System Analysis (MSA) - for major / critical characteristics - if applicable	N/R	N/R	S	N/R
12.) Process Control Plan	N/R	N/R	S	N/R
13.) Appearance Approval Report (AAR) - if applicable	N/R	N/R	S	N/R
14.) Checking Aids (Fixture, gage, template, etc) - if applicable	N/R	N/R	S	N/R
15.) Records of Compliance with Customer Specific Requirements - if applicable	N/R	N/R	S	N/R
16.) Master Sample Photo Documentation of PPAP parts	N/R	N/R	S	N/R
17.) Tooling Photo Documentation - if applicable	N/R	S	S	N/R

Additional Submission Instructions below:



1. Level 2 Submission is the Default PPAP level.
2. List of what is Required based on submission level (Level 1, 2, 3, 4)

Note: Level 4 is commonly used for New Product Development (Prototype parts)

Any deviation from Oshkosh requirements (specification, material, print notes, etc) must be approved by use of the F1000 form prior to PPAP submission!



PPAP Parts Labeling Requirements



PPAP SAMPLE PARTS - LABEL

1

Send identified sample(s), such as, Piece#1, Piece#2, Piece#3, etc to Oshkosh Corporation with appropriate label.

Please complete and attach this page on the outside of each package in plain view of a fork lift/material handler/operator. Put the Packing slip pocket near the label.

In the event parts are "Loose" shipped, a label should be placed on each part. This would apply to parts laying on pallets also. Label on a Painted Part must be wire tied or attached in a way painted surface is protected from label adhesion.

PPAP SAMPLE PARTS

INSPECTION VERIFICATION REQUIRED

Purchased Order#:

Part Number:

Revision Level:

Supplier Name:

Supplier Number:

Supplier Inspected By:

2



1. All PPAP sample parts must be tagged with this label on the part and / or on the box.
2. Document all the appropriate Part / Supplier / PO information on the label.



PSW – Part Submission Warrant

Part Submission Warrant

Part Name 1 PART NAME Oshkosh Part Number 2 PART NUMBER

Show n on Drawing Number 3 Supplier Part Number 4

Engineering Revision Level 5 Issue DATE 6

Safety and/or Government Regulation ☐ Yes ☐ No Purchase Order No. 8

7 MANUFACTURING INFORMATION CUSTOMER SUBMITTAL INFORMATION

SUPPLIER NAME 9 BUYER NAME 10

Organization Name & Sup. 9 Customer 10

ADDRESS Buyer 11

Street Address 11

CITY STATE ZIP U.S.A. 12

City Region Postal Code Country

MATERIALS REPORTING 12

Compliant to requirements stated in the Suppliers Standards Guide (Section D.32) referencing Hazardous Materials.

☐ Yes ☐ No ☐ n/a

REASON FOR SUBMISSION (Check at least one)

☐ Initial submission ☐ Change to Optional Construction or Material

☐ Engineering Change(s) ☐ Sub-Supplier or Material Source Change

☐ Tooling: Transfer, Replacement, Refurbishment, or additional ☐ Change in Part Processing

☐ Correction of Discrepancy ☐ Parts produced at Additional Location

☐ Production Break to Oshkosh Corporation > 1 year ☐ Other - please specify

REQUESTED SUBMISSION LEVEL (Check one)

☐ Level 1 - Warrant only submitted to customer 14

☐ Level 2 - Warrant with product samples, ISIR, and Performance/Surface Finish/Paint Test Results

(Check items that have been submitted within this PPAP submission)

☐ 1. Part Submission Warrant (PSW) ☐ 5a. Print Notes: Material Tests ☐ 5d. Print Notes: Part Identification

☐ 2. Dimensional results (ISIR) ☐ 5b. Print Notes: Surface Finish Tests ☐ 5e. Print Notes: Paint, Plating, Coating Tests

☐ 3. Design Record / Drawing ☐ 5c. Print Notes: Functional Tests ☐ 5f. Welding

☐ 4. PPAP Samples ☐ 5. Print Notes (check all that apply)

☐ 6. Engineering Change Records / Deviations

☐ Level 3 - All Level 2 Requirements in addition DFMEA, PFD, PFMEA, Control Plan, Initial Process Capability, and MSA

(Check items that have been submitted within this PPAP Submission - See PPAP Requirements Tab for Definition)

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17

☐ Level 4

(Check items that have been submitted within this PPAP Submission)

☐ 1. Part Submission Warrant (PSW)

☐ 2. Dimensional results (ISIR)

☐ 3. Design Record / Drawing

☐ 4. PPAP Samples

5. Confirmation of conformance to all Print Notes: ☐ Yes ☐ No ☐ n/a

Is each Customer Tool properly tagged and numbered? ☐ Yes ☐ No ☐ n/a

Declaration:

I have noted on this part submission w 16 deviation from the associated design records and/or any areas of non-compliance to the Oshkosh Corporation requirements. 15

Organization Authorized Signature _____ Date _____

Print Name _____ Phone No. 555-555-5555 Fax No. _____

Title _____ Email _____ 17

FOR CUSTOMER USE ONLY

(Level 4 PPAPs do not require signed PSW)

PPAP Warrant Disposition: ☐ Approved ☐ Rejected ☐ Other _____

Customer Signature _____ Date _____

Print Name _____ Customer Tracking Number (optional) _____

DISTRIBUTION STATEMENT C: (Applies to all FMTV Technical Data)

Distribution is restricted to US government agencies and their contractors, Research, Administrative or Operational Use. Date of Determination (Part Submission Warrant Supplier Completion Date). Other requests for this document shall be referred to: The Project Manager, Medium Tactical Vehicles, Attn: Engineering Director, Mail Stop #500, 6501 East TM Road, Warren, MI 48397-5000 DSN 786-6622 or Commercial (866) 282-6622



Note: All fields must be completed. if an area is not applicable mark as "N/A". Below is a definition of what each "numbered" section is.

- 1.) Name of part on drawing
- 2.) Oshkosh part number on PO/drawing
- 3.) Oshkosh part number on drawing
- 4.) Supplier part number if applicable (n/a if not)
- 5.) Engineering change level (ex. Rev B, this will be on the drawing / PO)
- 6.) Engineering date (ex. 4/7/11, this will be on the drawing / PO)
- 7.) Is this is Safety / Government regulation (ex. Drawing will indicate if it is FMVSS, or other industry standard safety regulation.
- 8.) PO number from Oshkosh driving demand for this part / PPAP.
- 9.) This section requires all applicable Supplier location information.
- 10.) Oshkosh Corporation – Segment Division (ie Oshkosh Corporation – Defense, Oshkosh Corporation – Pierce, etc)
- 11.) Buyer Name
- 12.) Materials Reporting, acknowledgment the parts meet the hazardous material restrictions outline per the drawing, Supplier Standards Guides or other contract Flow down requirements.
- 13.) Check the reason for the PPAP submission
- 14.) Check the Level of PPAP that was requested by Oshkosh Corp. and check what documents in the PPAP have been submitted that are applicable for this component.
- 15.) If Supplier has Oshkosh Corp. owned tooling document here.
- 16.) Supplier Point of Contact Information
- 17.) Oshkosh will complete this section and send back to the Supplier Point of Contact.

DO NOT LEAVE ANY SECTIONS BLANK. N/A IS OK WHERE NECESSARY



COVER INTRO PPAP REQUIREMENTS LABELING PSW DIMENSIONAL PRINT NOTES PRINT NOTES - Performance

1. ITEM: Numbering needs to matches Design Record / “Bubble Print”
2. DIMENSION / SPECIFICATION:

User:
Mark Dim/Spec, +/- tolerances, Gage Type, Qty Tested and up to 3 pc measurements.
DO NOT CHANGE the MIN/MAX fields (they allow the conditional formatting to work)
3. GAGE TYPE: Mark the gage used to measure item
4. QTY TESTED: Mark how many parts measured
5. DATA: Mark actual results
6. OK / NOT OK: Check each measurement as good or bad by marking OK / NOT OK appropriately
7. SIGNATURE SECTION: Fill in Name, Signature, Title and Date for supplier sign off

All dimensions on the print must be verified as OK by the Supplier prior to submission!

Key Note

- (1) Piece required for Level 2
(3) Pieces required for Level 3





COVER INTRO PPAP REQUIREMENTS LABELING PSW DIMENSIONAL PRINT NOTES PRINT NOTES - Performance



Blanket statements of conformance are unacceptable for any test results.					

11 | PPAP Requirements Training - Revision 1.7

 **Required Always**



 Required where applicable



(ATTACH COPY OF RAW MATERIAL CERTIFICATION, SURFACE FINISH, PERFORMANCE TESTS & PART IDENTIFICATION)



Note: This sheet to be used to document all Print Note requirements via the "bubble print" and reference any applicable Test report numbers in the PPAP Package.



PRINT NOTES: SAMPLE

1. Design Record Requirement
2. ASTM Chemical Requirement
3. ASTM Mechanical Requirement
4. PPAP document to outline requirement and actual's per the print and Industry standard (ASTM)

NOTES:

1. APPLICABLE STANDARDS/SPECIFICATIONS:
A. ASME Y14.100-2000
B. ASME Y14.5M-1994
2. MATERIAL: STEEL, ASTM A36/A36M, (UNS K02600),
PLATE, HOT ROLLED, .250 INCH THK.
3. MATERIAL: STEEL, ASTM A36/A36M, (UNS K02600),
PLATE, HOT ROLLED, .500 INCH THK.
4. IEEE/ASTM SI 10 SHALL BE USED
IN CONVERTING AND ROUNDING OFF.
1 INCH = 25.4 mm APPLIES.

2

TABLE 2 Chemical Requirements

NOTE 1—When the values in this table, there is no requirement. The heat analysis for manganese shall be determined and reported as described in the heat analysis section of Specification A 6/A 6M.

Product	Shapes	Plates ^a				Bars			
Thickness, in. [mm]	All	To ¾ [20], incl	Over ¾ to 1½ [40 to 65], incl	Over 1½ to 2½ [65 to 100], incl	Over 2½ to 4 [100] incl	To ¾ [20], incl	Over ¾ to 1½ [40 to 65], incl	Over 1½ to 2½ [65 to 100], incl	Over 2½ to 4 [100] incl
Carbon, max, %	0.26	0.25	0.25	0.26	0.27	0.26	0.27	0.28	0.29
Manganese, %	...	...	0.80-1.20	0.80-1.20	0.85-1.20	0.60-0.90	0.60-0.90	0.60-0.90	0.60-0.90
Phosphorus, max, %	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Sulfur, max, %	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Silicon, %	0.40 max	0.40 max	0.40 max	0.15-0.40	0.15-0.40	0.40 max	0.40 max	0.40 max	0.40 max
Copper, min, % when copper steel is specified	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20

^a Manganese content of 0.85-1.35 % and silicon content of 0.15-0.40 % is required for shapes over 420 lb/ft (634 kg/m).

^b For each reduction of 0.01 percentage point below the specified carbon maximum, an increase of 0.06 percentage point manganese above the specified maximum will be permitted, up to the maximum of 1.35 %.

TABLE 3 Tensile Requirements^a

Plates, Shapes,^b and Bars:

Tensile strength, ksi [MPa] 58-80 [400-550]
Yield point, min, ksi [MPa] 36 [250]^c

Plates and Bars^{d,e}:

Elongation in 8 in. [200 mm], min, % 20
Elongation in 2 in. [50 mm], min, % 23

Elongation in 8 in. [200 mm], min, % 20
Elongation in 2 in. [50 mm], min, % 21^f

^a See the Orientation subsection in the Tension Tests section of Specification A 6/A 6M.

^b For wide flange shapes over 420 lb/ft (634 kg/m), the 80 ksi [550 MPa] maximum tensile strength does not apply and a minimum elongation in 2 in. [50 mm] of 19 % applies.

^c Yield point 32 ksi [220 MPa] for plates over 8 in. [200 mm] in thickness.

^d Elongation not required to be determined for floor plate.

^e For plates wider than 24 in. [600 mm], the elongation requirement is reduced two percentage points. See the Elongation Requirement Adjustments subsection under the Tension Tests section of Specification A 6/A 6M.

ITEM	SPECIFICATION	SPECIFICATION / LIMITS		GAGE TYPE	QTY. TESTED	ORGANIZATION MEASUREMENT RESULTS (DATA)			OK	NOT OK
		MIN	MAX			Piece 1	Piece 2	Piece 3		
1	A36/A36M PLATE 0.5"									
	C - MAX weighed %	N/A	0.25	LAB	1	0.1800	N/A	N/A	X	
	MIN - N/A	N/A	N/A	LAB	1	0.3400	N/A	N/A	X	
	P - MAX weighed %	N/A	0.04	LAB	1	0.0080	N/A	N/A	X	
	S - MAX weighed %	N/A	0.05	LAB	1	0.0120	N/A	N/A	X	
	SI - MAX weighed %	N/A	0.4	LAB	1	0.0200	N/A	N/A	X	
	CU - MAX weighed %	N/A	0.2	LAB	1	0.1400	N/A	N/A	X	
	Elongation (min %)	37	0	LAB	1	37%	N/A	N/A	X	
	Tensile (ksi)	58	80	LAB	1	69300	N/A	N/A	X	
	Yield (ksi)	38	N/A	LAB	1	46600	N/A	N/A	X	

PRINT NOTES: SAMPLE CERT PROVIDED

1. Use Chemical Weighted % from material cert. and transfer to print notes PPAP Page.
2. Mechanical Results to be transferred to print notes PPAP Page.
3. Signature on Cert. approving material

6500 S. Boundary Road
Portage, Indiana 46368

MATERIAL CERTIFICATION

MILL ORDER: 1039537   PART NUMBER: PAGE NUMBER: 1 of 1
P.O. NUMBER: 01075578 #3   P.O. DATE: 10/23/2009   PRINTED: 11/4/09 08:57

S McNeilus Steel, Inc.   S McNeilus Steel c/o IPPC
O T Dodge Center Facility   H T 6650 N. Nautical Drive
L O 702 Second Avenue South, P.O. Box 249   I O
D DODGE CENTER, MN 55927   P PORTAGE, IN 46368

Material Description: HOT ROLLED BAND PRIME COIL MILL EDGE A1018 HSLAS-F GR 50 HIGH STRENGTH LOW ALLOY STEEL

Size: 3340 X 60.000 X COIL MIN

Heat Number M2573	FNL	ARL	C	0.05	MN	0.33	P	0.008	S	0.003	SI	0.02
			CU	0.16	NI	0.08	CR	0.03	AL	0.029	MO	0.022
			V	0.001	CB	0.021	N	0.006	B	0	CA	0.0021
			SN	0.02	TI	0.001	SA	0.026				

Made and Melted in the USA

TENSILE:	ASTM AS ROLLED	TEN			
	Location	Dir	Tensile/PSI	Yield/PSI	% Elong
	T		67900.0	60200.0	32.00
	Location	Dir	Tensile/PSI	Yield/PSI	% Elong
	T		67300.0	58700.0	37.00

Material: 420317, 420318, 420319*

* Coil was not tested.

NOV - 5 2009

by Ryan McDonald
McNeilus Steel, Inc.

Robert M Chase
QA Representative

WE HEREBY CERTIFY THAT THIS MATERIAL WAS TESTED IN ACCORDANCE WITH THE APPR

% Elongation in two inch gauge length.

SA = Soluble Aluminum

FORM QI1002
Issue Date 10/03/00

ITEM	SPECIFICATION	SPECIFICATION / LIMITS		GAGE TYPE	QTY. TESTED	ORGANIZATION MEASUREMENT RESULTS (DATA)			OK	NOT OK
		MIN	MAX			Piece 1	Piece 2	Piece 3		
1	A36/A36M PLATE 0.5"									
	C - MAX weighed %	N/A	0.25	LAB	1	0.1800	N/A	N/A	X	
	MN - N/A	N/A	N/A	LAB	1	0.3400	N/A	N/A	X	
	P - MAX weighed %	N/A	0.04	LAB	1	0.0080	N/A	N/A	X	
	S - MAX weighed %	N/A	0.05	LAB	1	0.0120	N/A	N/A	X	
	SI - MAX weighed %	N/A	0.4	LAB	1	0.0200	N/A	N/A	X	
	CU - MAX weighed %	N/A	0.2	LAB	1	0.1400	N/A	N/A	X	
	Elongation (min %)	37	0	LAB	1	37%	N/A	N/A	X	
	Tensile (ksi)	58	80	LAB	1	69300	N/A	N/A	X	
	Yield (ksi)	38	N/A	LAB	1	46600	N/A	N/A	X	

(ATTACH COPY OF PERFORMANCE TESTS)

[illegible]

[VISIONAL](#)
[PRINT NOTES](#)
[PRINT NOTES - Performance Tests](#)
[PRINT NOTES - De](#)



- All dimensions on the print must be verified as OK by the Supplier prior to submission!**

Note: This sheet to be used to document all Print Note requirements via the “bubble print” and reference any applicable Test report numbers in the PPAP Package.



PRINT NOTES – Performance Tests: SAMPLE

- PERFORM TESTS OF PARA. 7A & 7B. RETURN THE ASSEMBLY TO $24^{\circ}\text{C} \pm 8^{\circ}\text{C}$ AND REPEAT TESTS OF PARA. 7A & 7B.
2. HIGH TEMPERATURE TESTS:
THE CABLE SHALL BE SUBJECTED TO HIGH TEMPERATURE TESTS IAW MIL-STD-883C, METHOD 2001.3, PROCEDURE 1. A TEMPERATURE OF 76°C SHALL BE MAINTAINED FOR A PERIOD OF 48 HOURS. AT THE END OF THIS TIME, WITH THE TEMPERATURE AT 60°C , TESTS OF PARA. 7A & 7B ARE PERFORMED. THE ASSEMBLY IS THEN RETURNED TO A TEMPERATURE OF $24^{\circ}\text{C} \pm 8^{\circ}\text{C}$, AND TESTS OF PARA. 7A & 7B ARE REPEATED.
3. SUBMERGENCE TEST:
PRIOR TO PERFORMING THE SUBMERGENCE TEST, PERFORM THE TESTS OF PARA. 7A & 7B. BEFORE SUBMERGING THE HARNESS, SEAL ALL CONNECTORS IN THE AREA FORWARD OF THE BACKSHELL/CONNECTOR INTERFACE. LEAKAGE FROM THIS SEALED AREA DURING THE TEST SHALL NOT CONSTITUTE A FAILURE. HOWEVER, A RETEST SHALL BE REQUIRED AFTER THE SEAL LEAKAGE IS CORRECTED. THE TEST SHALL BE CONDUCTED IN CLEAR, CLEAN WATER WITH THE UPPERMOST SURFACE OF THE HARNESS AT A MINIMUM OF ONE INCH BELOW THE WATER.

1. Design Record Requirement
2. ASTM Performance Requirement
3. PPAP document to outline requirement and actual's per the print and Industry standard (ASTM)



Test Report No. PR035848-2 Rev. -

Operating High Temperature Test

Specification / Reference:

Document: 12420908 Rev. H

Test Item: Sample 1

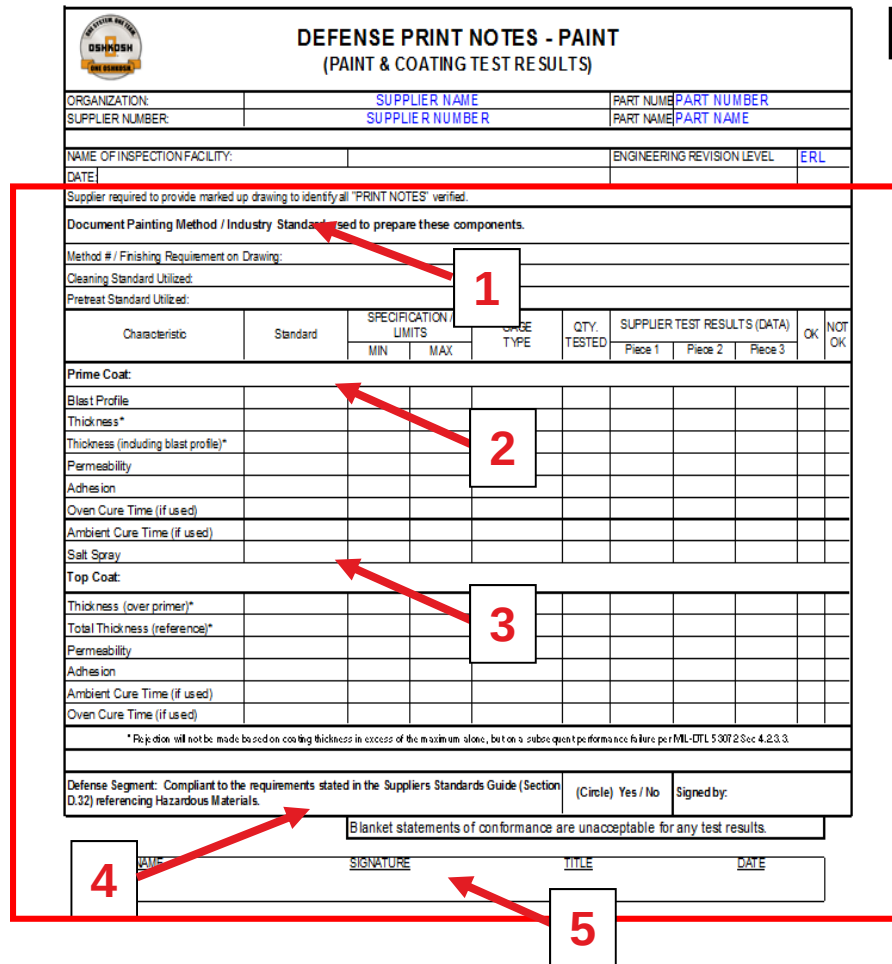
Date Started: 24 April 2015   Date Completed: 27 April 2015

Test Summary:

The Cable Harness Assembly was subjected to the Operating High Temperature test in accordance with 12420908 Rev. H Section 7.E.2.

The Cable Harness Assembly was placed into the chamber and the external interface cables connected. A pre-exposure continuity check was performed to ensure all connections were complete. The chamber

PRINT NOTES – Defense PAINT (Includes Paint & Coating Test Results)



DEFENSE PRINT NOTES - PAINT
(PAINT & COATING TEST RESULTS)

ORGANIZATION: _____ SUPPLIER NAME: _____ PART NUMBER: _____
 SUPPLIER NUMBER: _____ SUPPLIER NUMBER: _____ PART NAME: _____

NAME OF INSPECTION FACILITY: _____ ENGINEERING REVISION LEVEL: ERL
 DATE: _____

Supplier required to provide marked up drawing to identify all "PRINT NOTES" verified.

Document Painting Method / Industry Standard used to prepare these components.

Method # / Finishing Requirement on Drawing: _____ **1**
 Cleaning Standard Utilized: _____
 Pretreat Standard Utilized: _____

Characteristic	Standard	SPECIFICATION LIMITS		COAT TYPE	QTY. TESTED	SUPPLIER TEST RESULTS (DATA)			OK	NOT OK
		MIN	MAX			Piece 1	Piece 2	Piece 3		
Prime Coat:										
Blast Profile										
Thickness*										
Thickness (including blast profile)*										
Permeability										
Adhesion										
Oven Cure Time (if used)										
Ambient Cure Time (if used)										
Salt Spray										
Top Coat:										
Thickness (over primer)*										
Total Thickness (reference)*										
Permeability										
Adhesion										
Ambient Cure Time (if used)										
Oven Cure Time (if used)										

* Rejection will not be made based on coating thickness in excess of the maximum alone, but on a subsequent performance failure per MIL-OTL 53072 Sec 4.2.3.3.

Defense Segment: Compliant to the requirements stated in the Suppliers Standards Guide (Section D.32) referencing Hazardous Materials. (Circle) Yes / No Signed by: _____

Blanket statements of conformance are unacceptable for any test results.

4 DATE: _____ **5** SIGNATURE: _____ TITLE: _____ DATE: _____

Performance Tests PRINT NOTES - Defense PAINT PRINT NOTES - Platin



1. Document what print standard, Industry Standard, & Process Steps that were used to coat the part
2. Prime Coat Verification: Permeability, Adhesion, Thickness Salt Spray Results, Ambient Cure Time & Oven Cure Time
3. Top Coat Verification: Permeability, Adhesion, Thickness Salt Spray Results, Ambient Cure Time & Oven Cure Time
4. Acknowledge process isn't using Any hazardous material that is not Allowed per the Supplier's Standard Guide or Contract requirements. ****Make sure to circle Yes or No and sign****
5. Supplier Sign Off

Defense Paint Tab



PRINT NOTES – Defense PAINT: SAMPLE

6. ALL WELDS SHALL BE IAW MIL-STD-1261, CLASS 2, OR AWS D1.1/D1.1M.

7. UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS WITHOUT TOLERANCE SHALL BE ± 1 mm.

8. FINISH: FINAL PROTECTIVE FINISH IAW 12420325 METHOD 4 OR 1.

9. DIMENSIONAL LIMITS APPLY BEFORE PAINTING.

Supplier required to provide marked up drawing to identify all "PRINT NOTES" verified.

Document Painting Method / Industry Standard used to prepare these components.

Method # / Finishing Requirement on Drawing: **2**

Cleaning Standard Utilized: **TT-C-490 METHOD**

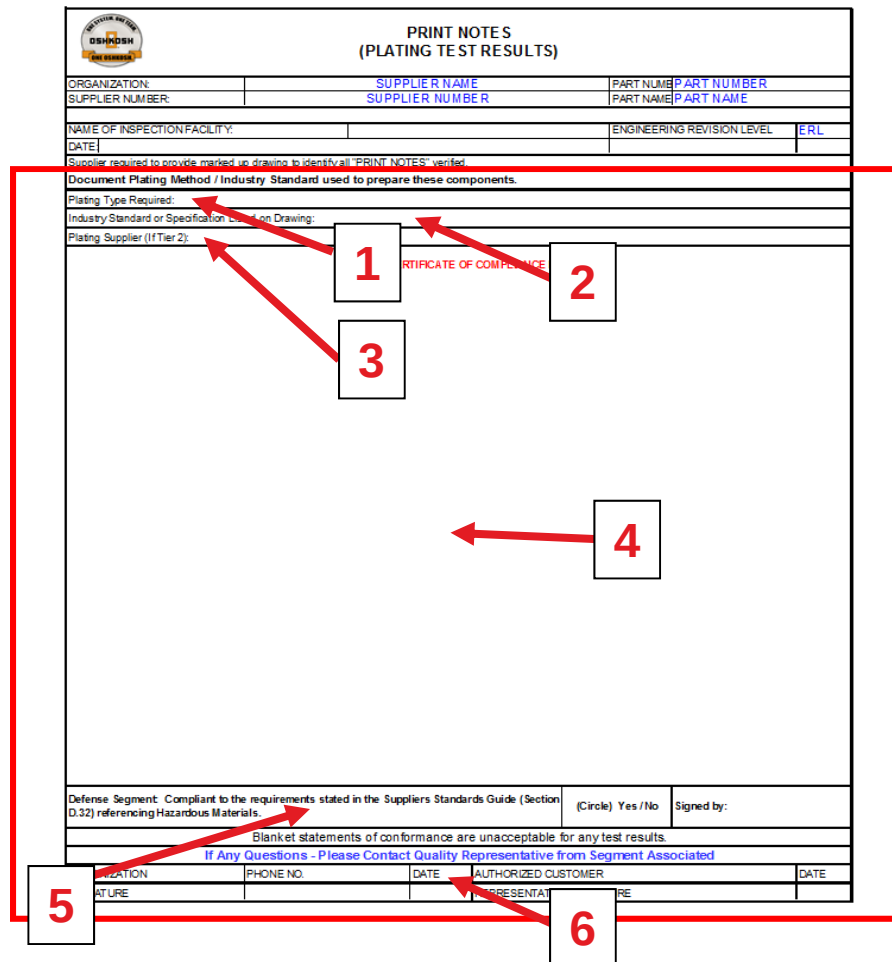
Precoat Standard Utilized: **TT-C-490 TYPE IZING PH**

Characteristic	Standard	SPECIFICATION / LIMITS		GAGE TYPE	QTY. TESTED	SUPPLIER TEST RESULTS (DATA)			OK	NOT OK
		MIN	MAX			Piece 1	Piece 2	Piece 3		
Prime Coat: White Epoxy Primer II MIL-DTL-53022 TYPE II, PM100 P-20 TYPE II										
Blast Profile		N/A								
Thickness*	MIL-DTL-53072	1.30	1.70	Milr	2	1.70	2.20	N/A	X	
Thickness (including blast profile)*		N/A								
Permeability	MIL-DTL-53072	N/A								
Adhesion	ASTM D3359	3B	5B	Scribe	2	5B	5B	N/A	X	
Oven Cure Time (if used)		21.5 min. @ 180°F								
Ambient Cure Time (if used)		N/A								
Salt Spray	ASTM B 117	336.00		Hours				7/28/2015	X	
Top Coat: N/A										
Thickness (over primer)*		N/A								
Total Thickness (reference)*	MIL-DTL-53072	3.10	20.00	Milr		N/A				
Permeability	MIL-DTL-53072	20 Straker								
Adhesion	ASTM D3359	3B/3A	5B/5A	Scribe		N/A				
Ambient Cure Time (if used)		N/A								
Oven Cure Time (if used)		N/A								
<i>*Replicates will not be made based on existing thicknesses in process. They will be a consequence of process control failure per MIL-DTL-53072 Sec 6.1.3.3.</i>										
Defense Segment: Compliant to the requirements stated in the Suppliers Standard Guide (Section D.32) referencing Hazardous Materials.					(Circle) Yes / No		Signed by: EGB			
Blanket statements of conformance are unacceptable for test results.										
PRINT NAME	SIGNATURE	TITLE	DATE							

1. Print Note Paint Note Requirement
2. Document what print standard or Industry Standard the part has been painted to.
3. Prime Coat Verification
  1. Reference standard for each process step
  2. document blast profile
  3. document actual thickness including profile
  4. Ensure that the thickness spec includes blast (1.0mil blast profile + 1.3 mil primer = 2.3 min thickness including blast profile)
4. Top Coat Verification
5. Compliant to hazardous material restrictions (Sign off)
6. Supplier Sign off



PRINT NOTES – Plating (Plating Test Results)



**PRINT NOTES
(PLATING TEST RESULTS)**

ORGANIZATION: _____ SUPPLIER NAME: _____ PART NUMBER: _____
 SUPPLIER NUMBER: _____ PART NAME: _____

NAME OF INSPECTION FACILITY: _____ ENGINEERING REVISION LEVEL: _____
 DATE: _____

Supplier required to provide marked up drawing to identify all "PRINT NOTES" verified.

Document Plating Method / Industry Standard used to prepare these components.

Plating Type Required: _____
 Industry Standard or Specification: _____
 Plating Supplier (If Tier 2): _____

CERTIFICATE OF COMPLIANCE

Defense Segment: Compliant to the requirements stated in the Suppliers Standards Guide (Section D.32) referencing Hazardous Materials. (Circle) Yes / No Signed by: _____

Blanket statements of conformance are unacceptable for any test results.
 If Any Questions - Please Contact Quality Representative from Segment Associated

DATE: _____ PHONE NO.: _____ DATE: _____ AUTHORIZED CUSTOMER: _____
 SIGNATURE: _____ REPRESENTATIVE: _____

Use PAINT / PRINT NOTES - Plating / APPEARANCE



1. Plating Type Required: From Design Record (Print)
2. Document what print standard, Industry Standard, & Process Steps that were used to coat the part
3. Plating Supplier (If Tier 2): If tier 2, plating supplier needs to be noted
4. Document plating / coating process Utilized to manufacture this part (Attach certificate of compliance here)
5. Acknowledge process isn't using Any hazardous material that is not Allowed per the Supplier's Standard Guide or Contract requirements. ****Make sure to circle Yes or No and sign****
6. Tier 1 Supplier Sign Off



PRINT NOTES – Plating: SAMPLE

1. APPLICABLE STANDARDS/SPECIFICATIONS:
 1. ASME Y14.100-2004
 2. ASME Y14.5-2009

2. MATERIAL: STEEL ASTM A36/A36M, PLATE, COLD ROLLED, 0.478 THK (18 GA).

3. FINISH: PROTECTIVE FINISH IAW 12424710,
 METHOD 1, CLASS 1.

4. IDENTIFICATION OF ITEM:
 NONE IS NOT TO BE PRESENT ON CONTINUED SUPPLY FOR THE ITEM

5. ORGANIZATION:
 SUPPLIER NUMBER:
 NAME OF INSPECTION FACILITY:
 DATE:

6. Document Plating Method / Industry Standard or Specification Listed
 Plating Type Required:
 Industry Standard or Specification Listed
 Plating Supplier (If Tier 2):

7. PLATING METHODS
 METHOD 1: SEALERS OR POST RINSES FOR ZINC COATINGS.
 WHERE USED: ONLY HEXAVALENT CHROME FREE POST RINSES OR SEALERS SHALL BE USED ON ZINC PLATINGS.
 CLASS: ZINC SHALL BE APPLIED IAW RECOGNIZED STANDARDS, I.E. ASTM, SAE, DIN ETC. IF ZINC THICKNESS IS NOT SPECIFIED, THE DEFAULT IS CLASS 2.

8. CLASS 1, 5 MICRONS ZINC
 CLASS 2, 8 MICRONS ZINC
 CLASS 3, 12 MICRONS ZINC
 CLASS 4, 25 MICRONS ZINC

9. ATTACH CERTIFICATE OF COMPLIANCE HERE

10. BEHRINGER®
 September 17, 2010
 Re: Directive 2002/95/EC (RoHS) Compliance
 This certificate is confirmation that Behringer Corporation's pipe clamps that are supplied with clear zinc plating and clear chromate are hexavalent chromium free and comply with Directive 2002/95/EC, RoHS. As per Directive 2002/95/EC, Behringer Corporation pipe clamps supplied with clear zinc plating and clear chromate are also free of lead, mercury, cadmium, polybrominated biphenyls (PBB), and polybrominated diphenyl ethers (PBDE).
 Behringer clear zinc plating is in accordance with ASTM B-633 Type III, Fe/Zn 5.
 Kindest Regards,
 Shawn Fantry
 Product Manager – Industrial Pipe Clamps
 Behringer Corporation
 17 Ridge Road
 Branchville, NJ 07826
 USA
 Tel: +1 (973) 948-0226 Ext. 125
 Fax: +1 (973) 948-2562
 Email: sfantry@behringersystems.com
 Web: www.behringersystems.com

11. Defense Segment: Compliant to the requirements stated in the Suppliers Standards Guide (Section D.3.2) referencing Hazardous Materials. (Circle) Yes / No Signed by:

12. Blanket statements of conformance are unacceptable for any test results.
 If Any Questions - Please Contact Quality Representative from Segment Associated

13. ORGANIZATION PHONE NO. DATE
 SIGNATURE DATE

14. CUSTOMER DATE
 ACTIVE SIGNATURE

1. Plating Type Required: From Design Record (Print)
2. Document what print standard, Industry Standard, & Process Steps that were used to coat the part
3. Plating Supplier (If Tier 2): If tier 2, plating supplier needs to be noted
4. Document plating / coating process Utilized to manufacture this part (Attach certificate of compliance here)
5. Acknowledge process isn't using Any hazardous material that is not Allowed per the Supplier's Standard Guide or Contract requirements. ****Make sure to circle Yes or No and sign****
6. Supplier Sign Off



APPEARANCE PRINT NOTES - WELDING DFMEA FLOW

- Note: WPS's, PQR's and welder certifications may be requested and must be provided upon request.

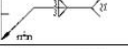
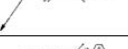
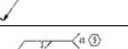
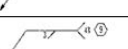
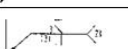
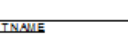
Example: Welding specification

PRINT NOTES (WELDING)

ORGANIZATION: **SUPPLIER COMPANY** PART NUMBER: **12345**
 SUPPLIER NUMBER: **NUMBER** PART NAME: **bracks**

NAME OF INSPECTOR: **xyz supplier** ENGINEERING REVISION LEVEL: **a**
 DATE: **4/13/2011**

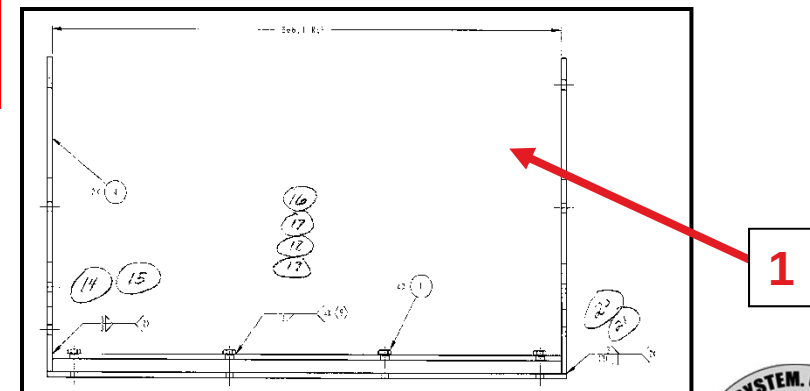
Supplier requires provide marked up print to identify ALL Weld items.

ITEM	WELD SYMBOL	WELD DESCRIPTION	WPS#	PQR# (IF NOT PRE-QUALIFIED)	CHECK FOR CONFORMANCE			OK	NOT OK
					WELD SIZE	WELD LENGTH	WELD QTY		
14		3mm fillet weld both sides	WPG-237	PQR 237-AR	3MM	CONTINUOUS	2		
15		3mm fillet weld both sides	WPG-237	PQR 237-AR	3MM	CONTINUOUS	2		
16		3mm fillet weld	WPG-238	PQR 238-AR	3MM	CONTINUOUS	4		
17		3mm fillet weld	WPG-238	PQR 238-AR	3MM	CONTINUOUS	4		
18		3mm fillet weld	WPG-238	PQR 238-AR	3MM	CONTINUOUS	4		
19		3mm fillet weld	WPG-238	PQR 238-AR	3MM	CONTINUOUS	4		
20		3mm fillet weld one side, butt weld opposite	WPG-240	PQR 240-AR	3MM	CONTINUOUS	2		
21		3mm fillet weld one side, butt weld opposite	WPG-240	PQR 240-AR	3MM	CONTINUOUS	2		

PRINT NAME: _____ SIGNATURE: _____ TITLE: _____ DATE: _____

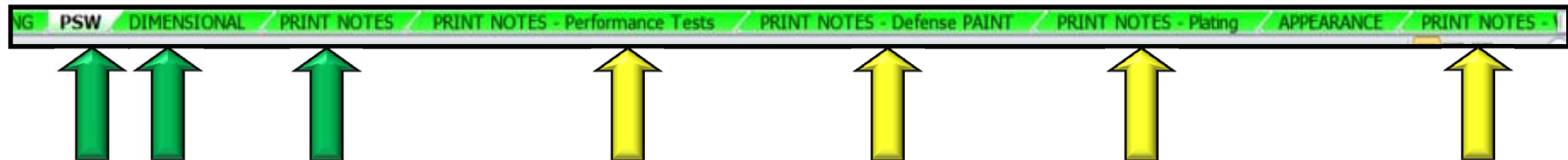
1. Document the Welding Symbol / Weld Description from From “bubble print”.
2. Document the Welding Specification /Weld Symbol from “bubble print”.
3. Document WPS / PQR (if not prequalified)
4. Document visual verification of weld size, Weld length, Weld Quantity.
5. Supplier Sign Off

Note: WPS's, PQR's and welder certifications must be provided upon request.

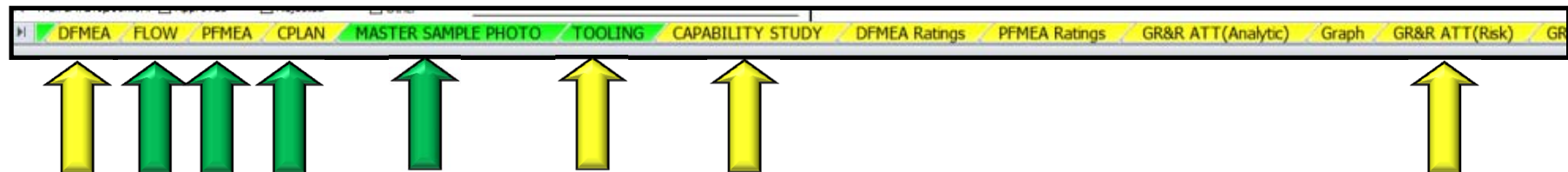


PPAP Workbook – Level 3 Requirements

LEVEL 2 - PPAP



LEVEL 3 - PPAP



- Same Requirements as Level 2 with the following additional requirements:
  - DFMEA
    - Design Failure Mode Effects Analysis is required if the Supplier is design responsibly
  - FLOW DIAGRAM
    - Process Flow diagram is required to outline and standardize the production process that is being approved. This should outline the entire process that is being used to manufacture the component & assembly.
  - PFMEA
    - Process failure Mode Effects Analysis is required to be conducted to understand all the potential failure modes and mitigate know failure modes.
  - CONTROL PLAN
    - The control plan is to be used to document and be used on the shop floor to monitor and control the standardized manufacturing process being approved.
  - MASTER SAMPLE:
    - This is used to document visually how the parts are being marked and pictures of the PPAP parts.
  - TOOLING
    - This sheet is used to visually document any Oshkosh owned tooling.
  - CAPABILITY STUDY
    - This sheet is to be used to show evidence the production process is capable to meet the design intent. This is required when Critical Characteristics are identified on the print or other wise specified by Oshkosh Corporation.
  - GAGE R&R
    - This sheet is to be used to show evidence that the measuring method used for the capability studies is repeatable and reproducible.

APPEARANCE PRINT NOTES - WELDING DFMEA FLOW PFMEA C



Process Flow Diagram



 PROCESS/INSPECTION FLOWCHART (Format for example only; Supplier created templates may be used)			
Product Program <u>MODEL / VEHICLE</u>		Issue Date _____	ECL <u>ERL</u>
Supplier Name <u>SUPPLIER NAME</u>		Part Name <u>PART NAME</u>	
Supplier Location <u>ADDRESS</u>		Part Number <u>PART NUMBER</u>	
Legend: ☐ Operation  Transportation ☐ Inspection  Delay  Storage			
Step	Operation or Event     	Description of Operation or Event	Evaluation and Analysis Methods
	☐ Operation  Transportation ☐ Inspection  Delay  Storage		


APPEARANCE
PRINT NOTES - WELDING
DFMEA
FLOW
PFMEA
C

Process Flow diagram is required to outline and standardize the production process that is being approved. This should outline the entire process that is being used to manufacture the component / assembly.



PFMEA



PFMEA - PROCESS FAILURE MODES & EFFECTS ANALYSIS (Format for example only; Supplier created templates may be used)																
Print #		PART NUMBER		Rev.		ERL		FMEA Number:								
Item:		n/a		Process Responsibility:				Prepared by:								
Model Year(s)/Vehicle(s):		MODEL / VEHICLE		Key Date:				Date (Orig.):								
Core Team:																
Process Step / Function	Requirements	Potential Failure Mode	Potential Effect(s) of Failure	S	C	Potential Cause(s) / Mechanism(s) of Failure	U	Current Process Controls - Prevention - Detection	D	H	Recommended Action(s)	Responsibility & Target Completion Date	Action Results			
				Severity	Occurrence				Effect	Priority			Actions Taken	Score	Update	RP

ES - WELDING / DFMEA / FLOW / PFMEA / C



Process failure Mode Effects Analysis is required to be conducted to understand all the potential failure modes and mitigate any know failure modes.

** To be used by Oshkosh SQE during 8D Problem Solving / PIP / etc **



When is the FMEA used?

- When new systems, products and processes are being designed
- When existing designs or processes are being changed or improved



When is the FMEA updated?

- When a change is being considered to a product or process Related to:
  - Design
  - Application
  - Environment
  - Material
  - Manufacturing or Assembly processes
- After actions are taken to:
  - Reduce the occurrence of the causes/failure modes
  - Increase the ability to prevent a failure mode from occurring

PFMEA



- Used to improve the process before failures occur and focus on prevention of product and process problems
- Used to prioritize action items for corrective action and ensure alignment with the needs of the customer
- A tool to document actions taken
- Useful when new systems, products and processes are being designed or existing designs or processes are being changed
- Updated when a change is being considered or when action items have been completed
- A tool that leads to future tool usage:
  - Data collection plans and experimentation
  - Control plans



Control Plan



CONTROL PLAN											
(Format for example only; Supplier created templates may be used)											
☐ Prototype ☐ Pre-Launch ☐ Production											
Control Plan Number			Key Contact/Phone			Date (Orig.)		Date (Rev.)			
Part Number/Last Change Level			Core Team			1/1/1996		1/1/1996			
Part Name/Description			Supplier/Plant Approval/Date			Customer Engineering Approval/Date (If Req'd.)					
Supplier/Plant			Supplier Code			Other Approval/Date (If Req'd.)		Customer Quality Approval/Date (If Req'd.)			
UPPLIER NUMBER											
PART/PROCESS NUMBER	PROCESS NAME/OPERATION DESCRIPTION	MACHINE, DEVICE, JIG, TOOLS FOR MFG.	CHARACTERISTICS			SPECIAL CHAR. CLASS	METHODS				REACTION PLAN
			NO.	PRODUCT	PROCESS		PRODUCT/PROCESS SPECIFICATION/TOLERANCE	EVALUATION/MEASUREMENT TECHNIQUE	SAMPLE SIZE	FREQ.	

The control plan is to be used to document and be used on the shop floor to monitor and control the standardized manufacturing process being approved.

** To be used by Oshkosh SQE during 8D Problem Solving / PIP / etc **

Control Plan

What is it?

- The control plan provides the method of monitoring, controlling, and inspection needs to create ongoing conforming product in the system
- It also provides the reaction plan to be followed for suspected non-conforming product

Why create it?

- Identifies process characteristics and control methods for sources of variation (input variables), which cause variation in the product characteristics (output variables)

When to create it?

- After the process flow diagram and PFMEA have been developed and recommended actions created. Before pilot/production builds are conducted

Control Plan

EFFECTIVENESS

- Plans are reviewed / updated every time there are changes / improvements to the process that effect the measurement system and control methods.
- Control plans DO NOT replace detailed operator/work instructions
  - Work Instructions should be developed using the control plan
- A single control plan may apply to a group or family of products that are produced by the same or similar parts

In theory, you only need 3 Master Control Documents within a facility: Process Flow, PFMEA and Control Plan

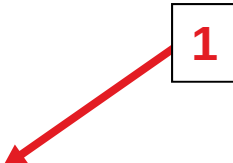
INTENT

- Minimize process variation consistently .
- Minimize process tampering.
- Verify / Validate that the process improvements have been implemented.
  - Need that link to the quality management systems (ISO, QMS, etc.)
- Provide for adequate training in all procedures.
- Include required maintenance/audit schedules.

CONTROL PLANS MUST BE REVIEWED REGULARLY FOR EFFECTIVENESS!!



Master Sample

PPAP MASTER SAMPLE "PICTURE" DOCUMENTATION			
ORGANIZATION:	SUPPLIER NAME	PART NUMBER:	PART NUMBER
SUPPLIER NUMBER:	SUPPLIER NUMBER	PART NAME:	PART NAME
		DESIGN RECORD CHANGE LEVEL:	ERL
Supplier is required to visually document the Master Sample (PPAP Parts):			
1.) Document how the parts are labeled. To include any date codes, vendor codes, etc.. (if applicable)			
2.) Document the parts as a whole what they look like in the final state in which they are provided to Oshkosh Corporation.			
PICTURES OF MASTER SAMPLE LABELING			
 1			
PICTURES OF MASTER SAMPLE PART			
 2			
PRINT NAME	SIGNATURE	TITLE	DATE



1. This section for visually documenting how the parts are being labeled
2. This section for visually documenting how the PPAP parts look

Tooling – Oshkosh Owned

 TOOLING & FIXTURES - PROPERTY OF OSHKOSH CORP.			
ORGANIZATION:	SUPPLIER COMPANY	PART NUMBER:	P-NUMBER
SUPPLIER NUMBER:	NUMBER	PART NAME:	NAME
TOOL / FIXTURE NUMBER:		DESIGN RECORD CHANGE LEVEL:	ECN
DATE:		ENGINEERING CHANGE DOCUMENTS:	
Supplier is required to identify all Oshkosh Owned Tools & Fixtures and document with Photo in PPAP workbook			
PHOTO OF OSHKOSH OWNED TOOLING AND FIXTURES			
PRINT NAME	SIGNATURE	TITLE	DATE



This sheet is used to visually document any Oshkosh owned tooling. It is required to attach a picture of tooling as well as the tooling identification method.

Capability Studies

Oshkosh Corporation

Supplier: SUPPLIER COMPANY
 Supplier #: NUMBER
 Part #: PART NUMBER
 Nominal: 22
 Tolerance (+): 1
 Tolerance (-): 1

Characteristic:
 Reason For Study:
 Study Date:
 Prepared By:
 Date Completed:

Sub-Group#	Value 1	Value 2	Value 3	Value 4	Value 5
1	22.0000	22.0500	22.1000	22.0000	22.0000
2					
3					
4					
5					
6					

Fill in data horizontally for each subgroup
 Note: Complete all "white" cells in Blue Area.

Supplier: SUPPLIER COMPANY
 Part Number: PART NUMBER
 PPC Number: 22
 Nominal: 22
 Tolerance(+): 1
 Tolerance(-): 1

Characteristic:
 Incident: 0
 Incident Date: 1/0/1900
 Prepared By:
 Date Completed: 1/0/1900

CPK: -0.66
 PPK: -0.69

Sub-Group	1	2	3	4	5	Average	Range
1	22.0000	22.0500	22.1000	22.0000	22.0000	3.6667	22.0000
2	0.0000	0.0000	0.0000	0.0000	0.0000	3.6750	22.0500
3	0.0000	0.0000	0.0000	0.0000	0.0000	3.6833	22.1000
4	0.0000	0.0000	0.0000	0.0000	0.0000	3.6667	22.0000
5	0.0000	0.0000	0.0000	0.0000	0.0000	3.6667	22.0000
6	0.0000	0.0000	0.0000	0.0000	0.0000		

X-bar
 UCL: 19.7536
 LCL: -12.4102

R-bar
 UCL: 50.2284
 LCL: 0.0000

WARNINGS:
 CPK Value is Unacceptable:
 lue is Unacceptable:

WARNINGS:

X-Bar: 3.6717
 Sigma: 8.6938
 R-Bar: 22.0300

USL: 23.0000
LSL: 21.0000

X-bar Chart

R-bar Chart

X-bar
 UCL: 17.0733
 LCL: -9.7299

R-bar
 UCL: 41.8570
 LCL: 0.0000

X-Bar: 3.6717
 Sigma: 8.3505
 R-Bar: 18.3583

USL: 23.0000
LSL: 21.0000

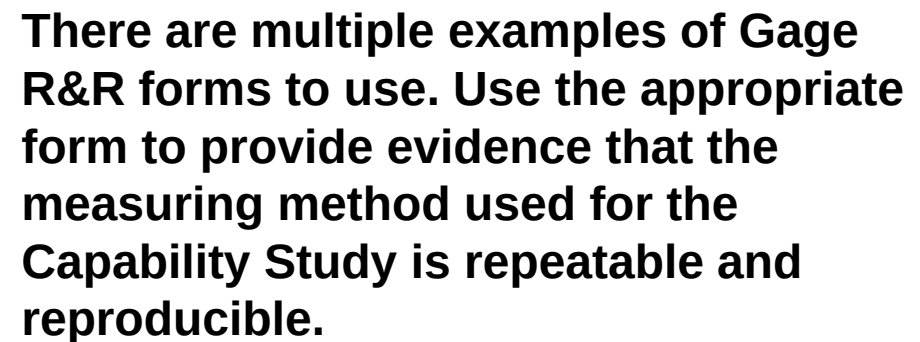
TOOLING CAPABILITY STUDY DFMEA Ratings



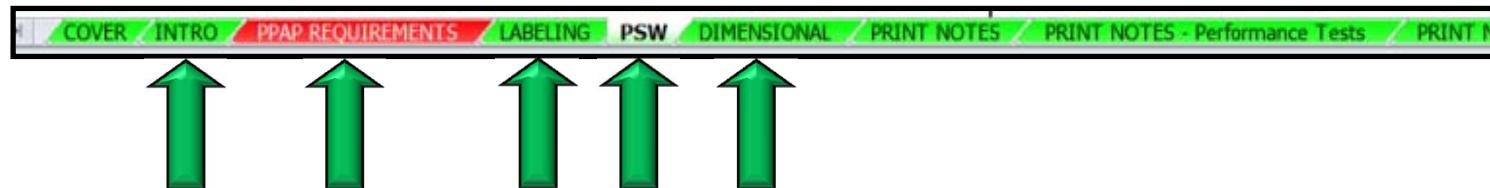
This sheet is to be used to show evidence that the production process is capable to meet the design intent. This is required when Critical Characteristics are identified on the print or other wise specified by Oshkosh Corporation.



atings	GR&R ATT(Analytic)	Graph	GR&R ATT(Risk)	GR&R VAR(TV)	GR&R VAR(Tol)	GR&R ANOVA	Graphical	GR&R X&R	Gage R



PPAP Workbook – Level 4 Requirements



- **Intro:**
  - Type in Part / Supplier Information, this will be transferred throughout the workbook.
- **PPAP Requirements:**
  - This outlines the PPAP submission requirements. (Informational only)
- **Labeling:**
  - This is the label to be used to Identify the PPAP sample part when shipped to OSK
- **PSW:**
  - This documents the warrant that the Part Meets the design Intent
  - This will be used to communicate back to the supplier the acceptance or rejection of the PPAP
- **Dimensional:**
  - This is used in conjunction with a “bubble print” to document the actual dimensions of the PPAP part.

PPAP – DEFENSE: Submission / Notification Process

- Oshkosh Purchasing FTP Site Homepage
  - Upload **ALL** PPAP's to the FTP Site
  - <https://ftp.oshkoshcorp.com/thinclient/>
- Email Notification of Documents on FTP site
  - Email for Level 1 & 2 PPAPs: PPAP@defense.oshkoshcorp.com
  - Email for Level 3 PPAPs: assigned SQE's email
  - (Defense IPS) Email for all Level PPAPs:
PPAP@defense.oshkoshcorp.com

NOTE Do not email DEFENSE PPAPs.
Load Defense PPAPs to FTP Site due to ITAR regulations.



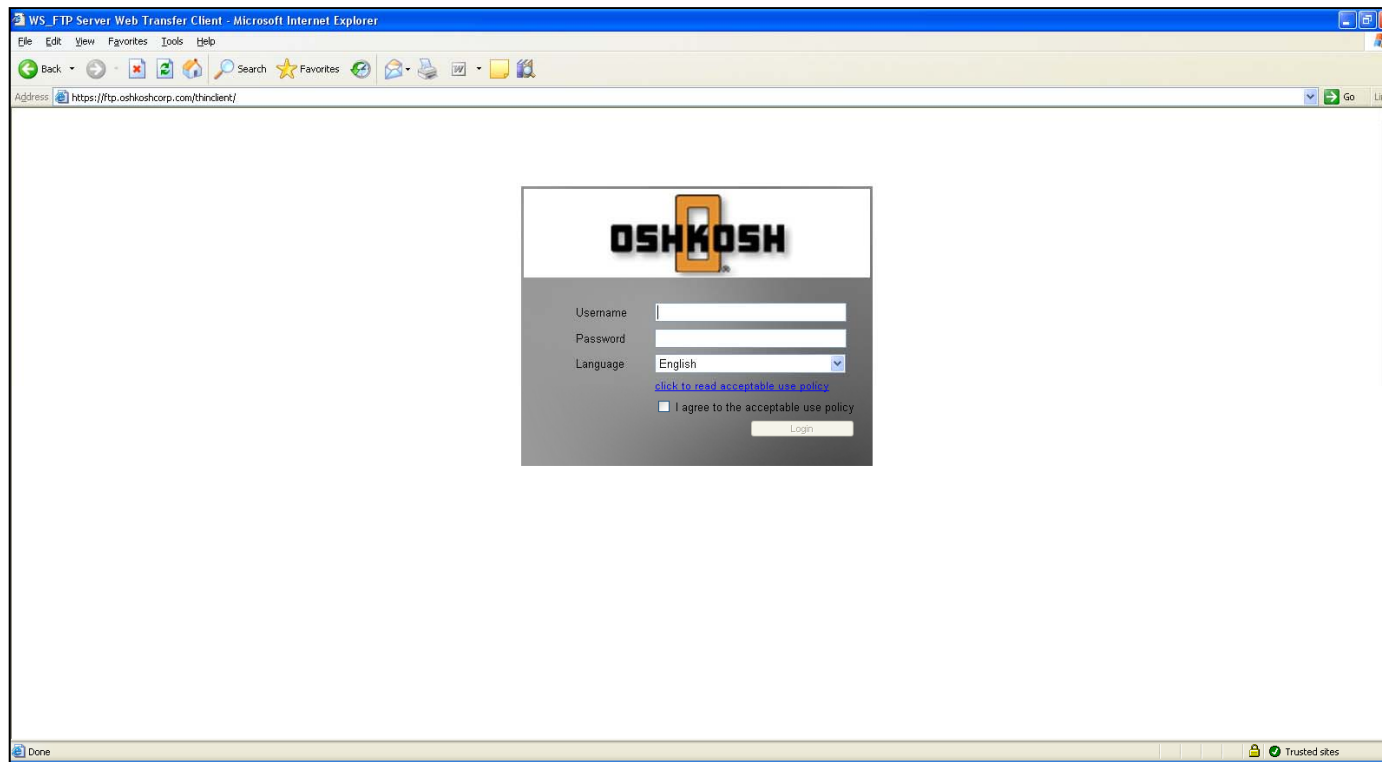
Send PPAP documentation with the first order.

- Not required to send to FTP Site
- Not required to notify via email

NOTE Do not email DEFENSE PPAPs. Load Defense PPAPs to FTP Site due to ITAR regulations if not sent with first order.



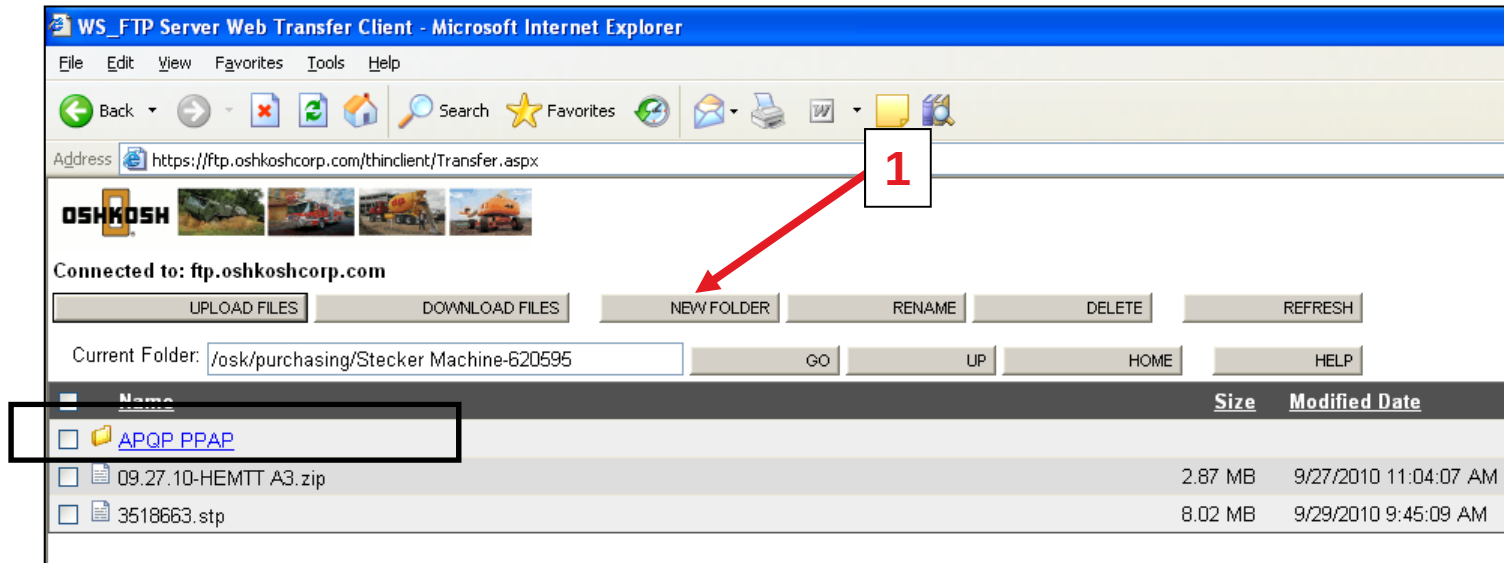
DEFENSE: FTP Site



Oshkosh Purchasing FTP Site Homepage: <https://ftp.oshkoshcorp.com/thinclient/>



DEFENSE: FTP Site – APQP PPAP Folder



Supplier should load PPAP's into APQP folder.

If no APQP PPAP folder exists, create one using 1. NEW FOLDER button



DEFENSE: FTP Site – File Naming Convention

Suppliers are required to load PPAP packages to the Purchasing FTP site using the following naming convention:

PN_SUPPLIER NAME_MMDDYY_REV



PPAP - F&E: Submission / Notification Process

Email PPAP Documents to:

PPAP@piercemfg.com



PPAP - COMMERCIAL: Submission / Notification Process



Email PPAP Documents to:

PPAP@McNeilusco.com



McNeilus



CON-E-CO.



PPAP - ACCESS: Submission / Notification

- Oshkosh Purchasing FTP Site Homepage
  - Upload **ALL JLG Military** PPAP's to the FTP Site:
<https://ftp.oshkoshcorp.com/thinclient/>
  - Send notification email for JLG Military Level 1, 2 & 3 PPAPs:
PPAP@jlg.com
- For non-JLG Military PPAPs, email PPAP Documents to the applicable region parts are shipped to (or where Purchasing POC indicates):
  - ppap@jlg.com, ppapchina@jlg.com, ppapeame@jlg.com,
ppapbrazil@jlg.com

NOTE Do not email JLG Military PPAPs.
Load PPAPs to FTP Site due to ITAR regulations.



PPAP – Corporate (Mexico): Submission / Notification

Email PPAP Documents to segment supplier quality point of contact (POC)



GPSC Academy

Leaders Teach & Leaders Learn



THE END

