

# Process Failure Mode & Effects Analysis

PART NUMBER:A3C0715510000

PART NAME:FLANGE NUT SOFT

Model Year(s)/Vehicle(s):

Process Responsibility: Huang

Core Team:Yuki, Rex, Tina,Anni, Huang,Nicole

Drawing number : 41571912

Drawing Level : AB

Drawing Revise Date : 05/28/2020

Key Date:05/26/2020~06/30/2020

FMEA Number: A3C0715510000

Prepared By:Tony

FMEA Date(Orig.):05/26/2020

FMEA Date(Rev.): R2-09/25/2020

S t e p	Process Function Requirements	Potential Failure Mode	Potential Effect(s) of Failure	S e v	C l a s s	Potential Cause(s)/ Mechanism(s) of Failure	O C C	Current Process Controls Prevention	Current Process Controls Detection	D e t	R P N	Recommended Action(s)	Resp. &Target Completion Date	Actions Taken	S e v	O c c	D e t	R P N
P1	Material Receiving	1.Appearance out of spec (rusty, pitting, bent)	1.effect mechanical properties.	7		1.Storage too long. 2.Cracks, Shears, Nicks...etc. of Mater	2	1.Incoming Inspection	1. Inspecting visually	4	56	None						
		2.Wrong Diameter	1.Hard to Produce	7		1.Material Rolled Failure 2. Using wrong dia 3. Improper assessment of material dia	2	1. Incoming Inspection 2.Establishing material dia data.	Re-checking material dia before production.	4	56	None						
		3.Wrong Grade	1.Tensile Strength & Hardness of Failure	7		1.Material Rolled Failure 2. Wrong Grade Used	2	Incoming Inspection	Checking traveling card of material.	4	56	None						
P2	Forming	Drawing incorrect material.	1.Hard to Produce 2.Cannot reach mechanical properties requirement. 3.Non-conforming part.	7		1. Material is stored at incorrect place. 2. Incorrect label of material. 3. Staff's negligence.	2	1.Applying wire controlling system and use wire control card. 2.Storing wire per SOP. 3.Enhancing operator's training.	Operator must re-check traveling card and identified color.	4	56	Re-check traveling card of material when 1st article inspection.	QC	Re-check traveling card of material when 1st article inspection.	7	2	3	42
		Tooling management (mold & punch)	Producing incorrect parts.	7		1. Using incorrect tooling/punch to produce. 2.Tooling management is not implemented.	2	1-1.Application per SOP. 1-2.Creating tooling drawing. 1-3.Creating prototype drawing. 1-4.Establish sample library (including customer's sample and samples of previous order.) 2.Using controlling sheet to control tooling life.	1. First article inspection 2.Tooling managers must check controlling sheet when tooling is returned to tooling room.	4	56	None						

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		Material seams	Products can't be used	6		1. Material too hard 2. Die design non-confirm 3. Die incorrect modified	3	1.Verification & Issue of Die drawing 2.Rod receiving inspection	1.Operator 1st Piece Inspection 2.Self & Patrol Inspection 3.Final inspection.	2	36	None						
		Head eccentricity.	Products can't be used	6		Improper adjustment on the machine.	3	Enhancing operator's training	1.Operator 1st Piece Inspection 2.Self & Patrol Inspection 3.Final inspection.	4	72	None						
		The head too large	Products can't be used	6	CP	Improper adjustment on the machine.	3	Enhancing operator's training	1.Operator 1st Piece Inspection 2.Self & Patrol Inspection 3.Final inspection.	4	72	None						
		The head too small	Products can't be used	6	CP	Improper adjustment on the machine.	3	Enhancing operator's training	1.Operator 1st Piece Inspection 2.Self & Patrol Inspection 3.Final inspection.	4	72	None						
		Insufficient head height	Customer rejects	6		1.Material fed not enough. 2.Improper adjustment on the machine.	3	Enhancing operator's training	1.Operator 1st Piece Inspection 2.Self & Patrol Inspection 3.Final inspection.	4	72	None						
		Over head height	Customer rejects	6	SP C CP	1.Material fed too much. 2.Improper adjustment on the machine.	3	Enhancing operator's training	1.Operator 1st Piece Inspection 2.Self & Patrol Inspection 3.Final inspection.	4	72	None						

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		The length too long	Products can't be used	7		Improper adjustment on the machine.	2	Enhancing operator's training	1.Operator 1st Piece Inspection 2.Self & Patrol Inspection 3.Final inspection.	4	56	None						
		The length too short	Length too short after rolling.	7		Improper adjustment on the machine.	2	Enhancing operator's training	1.Operator 1st Piece Inspection 2.Self & Patrol Inspection 3.Final inspection.	4	56	None						
		The rolling dia too large	1. Production stops 2. Shorten Service life of tooling.	7		1. Wrong material dia 2.Tooling damages.	2	1.Rod receiving inspection 2.Tooling maintenance	1.Operator 1st Piece Inspection 2.Self & Patrol Inspection 3.Final inspection.	4	56	None						
		The rolling dia too small	1. Products can't be used. 2. Tensile Strength not enough	7		1. Wrong material dia 2.Tooling damaged.	2	1.Verification & Issue of Die drawing 2.Rod receiving inspection	1.Operator 1st Piece Inspection 2.Self & Patrol Inspection 3.Final inspection.	4	56	None						
		Chamfering failure	Customer rejects	5		1.Wrong tooling 2.Tooling damaged	2	1.Verification & Issue of Die drawing 2.Rod receiving inspection	1.Operator 1st Piece Inspection 2.Self & Patrol Inspection 3.Final inspection.	2	20	None						
		Punch broken	1.Recess depth not enough. 2. Products can't be used	7		1.Improper adjustment on the machine. 2. Improper life control of punch. 3. Improper design of punch.	2	1.Enhancing operator's training. 2. Applying tooling life control per working sheet.	1.Operator 1st Piece Inspection 2.Self & Patrol Inspection 3.Final inspection.	4	56	NONE						

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		Abnormal shape of head.	1. Bad appearance. 2.Products can't be used	7		1. Improper design of tooling. 2. Punch stuck.	2	1.Enhancing operator's training. 2. Applying tooling life contorl per working sheet.	1.Operator 1st Piece Inspection 2.Self & Patrol Inspection 3.Final inspection.	4	56	NONE						
P3	Tapping Thread	Minor dia out of spec.	1.Out of spec. Customer may reject. 2.May affect assembling 3.May affect next process	6		1.The tap design is improper. 2.The tap is abrasive. 3.Improper adjustment on the machine.	2	1.enhancing the tap management and control. <b>2. periodic the maintenance of tap.</b> <b>3. enhancing the training operator.</b>	The operator Indepnedent Inspection and First article inspection	4	48	None						
		Thread NOGO&GO (Gage)	1.Out of spec. Customer may reject. 2.May affect assembling 3.May affect next process	6		1.The tap design is improper. 2.The tap is abrasive. 3.Improper adjustment on the machine.	2	1.enhancing the tooling management and control. 2. periodic the maintenance of tooling. 3. enhancing the training operator.	The operator Indepnedent Inspection and First article inspection	4	48	None						
		Bad tapping	1.Out of spec. Customer may reject. 2.May affect assembling	6		1.The tap is abrasive. 2.Improper adjustment on the machine.	2	1.enhancing the tooling management and control. 2. periodic the maintenance of tooling. 3. enhancing the training operator.	The operator Indepnedent Inspection and First article inspection	4	48	Change tapping method. use "go- through" style to improve blocking issue.	Mfg Engineer	Change tapping method. use "go- through" style to improve blocking issue.	6	2	3	36
P4	Plating	Bad appearance	Function is qualified, but customer might not be satisfied.	4		1.Temperature of plating solution is not appropriate. 2. Bad controlling of plating solution.	2	Comparing with the limit samples.	Receiving Inspection	2	16	None						

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		Plating Thickness not enough.	Anti-corrosion ability might be affected.	5		1.PH of Plating Solution is too low or overhigh 2.Inappropriate solution concentration. 3. Plating time is not enough.	2	Enhancing the operator's training to follow working instruction.	Receiving Inspection	4	40	None						
		Plating Thickness too high.	Assembling might be affected, customer claim might happen.	5		1. Plating time is too long. 2. Amperage is too high.	2	Enhancing the operator's training to follow working instruction.	Receiving Inspection	4	40	None						
		Salt spary test fail.	Poor Function,customer unsatisfied, parts may be re-worked or scraped.	4		Plating Thickness not enough.	2	enhancing the training operator to follow working instruction.	Receiving Inspection	4	40	None						
P5	Optical Sorting	Dimensions out of spec	Approval or rejection	5		Operation w/o per Sorting work order operation	2	Operation per Sorting work order operation	Maintain Inspection Procedures.	4	40	Change optical sorting machine to have more precision camaras.	Mfg Engineer	Change optical sorting machine to have more precision camaras.	5	2	3	30
		Mixed parts out of spec	Approval or rejection	5		Operation w/o per Sorting work order operation	2	Operation per Sorting work order operation	Maintain Inspection Procedures.	4	40	NONE						
		Impurities out of spec	Approval or rejection	5		Operation w/o per Sorting work order operation	2	Operation per Sorting work order operation	Maintain Inspection Procedures.	4	40	NONE						
P6	Manual Sorting	Dimensions out of spec	Approval or reject	5		Operation w/o per Sorting work order operation	2	Operation per Sorting work order operation	1. Incoming Inspection 2. Audit inspection	4	40	Change manual sorting method to put Hex side of nuts on table to check.	Mfg Engineer	Change manual sorting method to put Hex side of nuts on table to check.	5	2	3	30
		Mixed parts out of spec	Approval or reject	5		Operation w/o per Sorting work order operation	2	Operation per Sorting work order operation	Maintain Inspection Procedures.	4	40	NONE						

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		Impurities out of spec	Approval or reject	5		Operation w/o per Sorting work order operation	2	Operation per Sorting work order operation	Maintain Inspection Procedures.	4	40	NONE						
P7	Final inspection	Failure of dimension & performance	Approval or rejection	6		Incorrect testing methods.	1	Final audit inspection	Receiving inspection Customer's feedback	3	18	NONE						
P8	Packing	Q'ty Shortage	Dissatisfaction of customer	6		Inaccurate scales was used	2	Calibrating scales before using.	Packaging Inspection	2	24	NONE						
		Wrong Label	Dissatisfaction of customer	6		Operators used wrong lable.	2	Enhancing operator's training	Packaging Inspection	2	24	NONE						
		Incorrect parts	Dissatisfaction of customer	6		Operators packed wrong items.	2	Enhancing operator's training	Packaging Inspection	2	24	NONE						
P9	Shipping	Wrong dock delivered	Customer will not receive the parts	5		Staff's negligence	2	Enhancing operator's training	Shipping checking.	2	20	NONE						