

MAHAVIR INDUSTRIES		PROCESS FLOW DIAGRAM						Rev.00	F/NPD/04	Dt:..	
K-11,MIDC,Waluj,A'bad		(Piston Rod Boxer Plated)						02/02/2020			
Customer:- Endurance Technologies Ltd. E-92/93				Cross Functional Team:Mr. RDJ, SKK, ISS,PJB,MNY,DJG				PFD No. :-351			
Part Name:- PISTON ROD Boxer				Process Responsibility :Mr.S.K.kapgate				Process Identification			
DRG No :- S2JL014040		Part Name:S2JL01404B		Prepared By:Mr. Mahendra Yadav				MOVEMENT			
Drg.Rev. :XC-26.05.2021				Approved By:Mr.Ramchandra Jawale				STORAGE			
PFD Originating Date & Rev.No: 02/01/2024				PFD Rev. Details:- 01 Hard Chrome Plating Added.				PROCESS			
								INSPECTION			
PROCESS NO.	SYMBOL	Process Name / Description	Incoming source of variation	Product Characteristics	Process Characteristics	Location/ Machine	Record Title	Record No.	Retention Period		
10		Raw material Inspection	Wrong Material , Grade , OD, Other RM Mix UP	EN8A	MI- k-11 Inward Inspection	R/M inward Register k-11	F/QA/09	One Year		
20		Material Storage	Bending of bars/ MIX	Material stored in a planned manner.	No material mixing chances at storage area	MI- k-11 store	Store	F/STR/11	One Year		
30		Parting	Length Variation	173.5±0.2	Band saw cutting blade setting	MI-K-11	FFPA	F/QA/02	One Year		
40		PIP REMOVAL	HEAVY BURR AT FACE	NO BURR ON FACE		MI-K-12	FFPA				
50		Straightening	Wrong Material selected for Straightening of bar	0.05/200mm(0.04)	Setting of rollers	At k-11,Raw Mate, Sec.	HIR	F/QA/03	One Year		
60		Rough Grinding- I	Bend Job , dia.U/S & O/S. variation	Φ11.10±0.02	Blade setting,dressing of grindwheel,speed, feed,height of Blade	At k-11,Grinding Sec.	FFPA/HIR	F/QA/04	One Year		
70		Rough Grinding-II	OD Dia.U/S & O/S. varies	Φ11.00 ~11.025 mm							
80		CNC Mouting side Machining	Length Variation , OD Variation,Chamfer Variation,Runout Variation	Total Length 172.5±0.2, Before Threading OD Ø9.12-0.03, Mounting Length19±0.2, Runout 0.08, OD Chamfer 1.0x45°, OD Chamfer 0.5x45°	Tool setting, Progaming, Tool Offset, Clamping Pressure,Cutting Speed , Cutting Feed	CNC Shop At K11	FFPA/HIR	F/QA/01	One Year		
90		CNC Piston side Machining	Length Variation, OD variation,Chamfer Variation,Runout Variation	Total Length 171.5±0.2 Piston side length 23, Dia Ø6.32-0.03, Dia Ø7-0.005/-0.035, Length 10 Max, Runout 0.04 , Chamfer 0.5x45° Radius 0.04 Max	Tool setting, Progaming, Tool Offset, Clamping Pressure,Cutting Speed , Cutting Feed	CNC Shop At K11	FFPA/HIR	F/QAD/01			
100		Thread rolling piston side	Variation in Thread Length Size ,Thread Damage,Thread Overlapped,Heavy Burr On Thread	Tread Size M7X1-6g, Thread Length 9mm Min	Dwell Time, Rolling pressure, Thread Roll Life Etc	Thread Roll Machine	FFPA/HIR	F/QA/05	One Year		
110		Thread Rolling Mounting side	Variation in Thread Length Size ,Thread Damage,Thread Overlapped,Heavy Burr On Thread	Tread Size M10X1.25-6g, Thread Length 18 mm Min	Dwell Time, Rolling pressure, Thread Roll Life Etc	Thread Roll Machine	FFPA/HIR	F/QA/05	One Year		
120		Final Grinding- I	Burning mark , Dent Marks,dia.U/S & O/S.	Φ10.970~10.990mm	Blade setting,dressing of grindwheel,speed, feed,height of Blade	Grinding Sec.	FFPA/HIR	F/QA/04	One Year		
130		Final Grinding-II	Burning mark , Dent Marks,dia.U/S & O/S. varies	Dia Φ10.930~10.940 mm, Surface Finish Ra0.35Max							
140		Inspection	Diameensional parameters not ok part OD under size ,Rejected Material at Customer end	Accepted Material.	skill of inspector	Final Inspec.Line	PDIR	F/QA/07	One Year		
150		Hard Chrome Plating	Plating Defects, Surface Hardness, Dent Marks,dia.U/S & O/S., Surface Finish varies	Dia Φ11(-0.023/-0.04) mm, Plating Thickness 12 Microns Min.,Surface Hardness 800 Min., Microcrack Shall Be 600 Cracks/Liner cm Max.	Hard Chrome plating Parameters As per control plan (Plating Time,chemical,etc.)	Out Source (M/S Saptagiri Galvo Solutions)	Saptagiri's Inprocess & PDIR		One Year		
160		Post Chrome Buffing	Surface Finish above than 0.1Ra, Ring Marks, Etc.	Surface Finish Ra0.1Max,	Post Chrome Buffing Parameters As per control plan (Plating Time,chemical,etc.)						
170		Final Inspection	Ring Marks,Dent Marks,Plating Defects,Surface Finish,Low Plating Thickness,,Low Surface Hardness,Visual Defects,Etc.	No Dent,Ring Marks,No Pell Off & Other Plating Defects, Thickness 12 Microns Min.,Surface Finish 0.1 Ra Max.,	skill of inspector						
180		Inward Inspection & Final Inspection	Diameensional parameters not ok part OD under size ,Rejected Material at Customer end	Accepted Material.	skill of inspector	Final Inspec.Line	PDIR	F/QA/07	One Year		
190		Apply Anti Rust Coat	Rusty Rods	Accepted Material.	Apply anti rust coat	Packing section	PDIR				
200		Packing & Dispatch	Excess or Short Qty./Pack.	Std.Packing	Qty, Packing	Dispatch	Sales Invoice	F/STR/04		
Remarks :											
Prepared By					Approved By			Page 1/1			