

PRODUCTION PART APPROVAL PROCESS

[PPAP REPORTS]

CUSTOMER NAME : SAI INDUSTRY

PART NAME PUSH ROD

PART NUMBER : ENHT 402

PROCESS : CARBURISING HARDENING & TEMPERING

SUBMISSION LEVEL 3

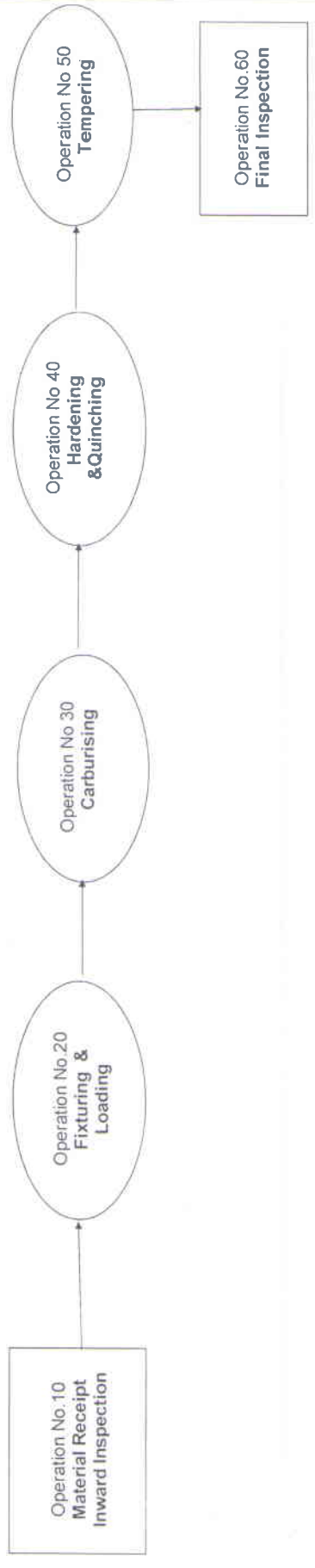
**SUPPLIER DECK INDIA ENGINEERING PVT.LTD
S.NO.671,KUDALWADI (CHIKHALI),
PUNE-411062.**

Deck India Engg. Pvt. Ltd.

PROCESS FLOW DIAGRAM

System
Sub-system
Component
X Customer SAI INDUSTRY
Part Number(s) : ENHT 402
Part Name(s) : PUSH ROD
Material: 16 MnCr5
Process : Carburising ,Hardening &Tempering
Core Team : SLD, MKK ,DBB,SLD,TPM,LVH

PFD Number : PFC/S/PR/00
PFD (Orig.) Date : 10/04/2024
PFD (Rev.) Date :



- Operation ⇔ - Transportation D - Delay - Inspection ▽ - Storage

Prepared by:

Approved by:

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DECK INDIA ENGINEERING PVT. LTD.

PROCESS FLOW CHART

Part No: ENHT 402		Customer Name: SAI INDUSTRY		Process flow chart No. PFC/RD/CHT/2H/03.00	
Part Name: PUSH ROD		Process responsibility : MKK,SLD		Key Date	Date (Orig)
Material: 16MnCr5				10/04/2024	Date (Rev)
Process: Carburising, Hardening & Tempering		Core Team SLD, MKK, DBB, SLD, TPM, LVH		Prepared By : LVH	
Supplier : DECK INDIA ENGINEERING PVT.LTD.		PROCESS FLOW			
PART/PROCESS NO.	PROCESS NAME/OPERATION DESCRIPTION	Incoming Source of Variation	PROCESS FLOW	PRODUCT CHARACTERISTICS	PROCESS CHARACTERISTICS
10	Receiving Inspection	Dentmarks;Rusty surface,Qty	○ □ ▽ ▢	Identification Tag	Visual Inspection
20	Fixturing & Loading	Manual OR Equipment (Time & Temp. variation)	○ □ ▽ ▢	As per capacity of furnace. (F14 /F22- 600 KG)	As per Loading parttern
30	Carburising	Manual OR Equipment (Time & Temp. variation)	○ □ ▽ ▢	As per process sheet/ control plan	As per process sheet/ control plan
40	Hardening & Quenching	Time & Temp	○ □ ▽ ▢	As per process sheet/ control plan	As per process sheet/ control plan
50	Tempering	Time & Temp.	○ □ ▽ ▢	As per capacity of Furnace. (F7-150 Kg.; F21-600 Kg.	As per process sheet/ control plan
60	Final Inspection	Manual error OR Equipment error	○ □ ▽ ▢	Identification Tag	As per quality plan

Legends: Operation; Transportation; Storage; Inspection; Operation & inspection

Prepared by: LHV

Approved by: SLP

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Process Function No	Process Function Requirements	Potential Failure Mode	Potential Effects of Failure	SEVERITY	SCLAS	Potential Causes / Mechanisms of Failure	OCCURENCE	Current Process Controls Prevention	Current Process Controls Detection	DETECTION	RPN	Recommended Actions	Responsibility & Target Completion Date	Action Results		
														Action Taken	SEVER	ODEUR
50	Tempering	Incomplete stress relieving	Reduces service life	4	M	Lower tempering temperature than specified	2	Confirmation of temp. setting, Calibration of thermocouple.	PCRS /Data Logger	5	40					
		Low Hardness	Reduces service life	4	M	High tempering temperature than specified	2	1. Excess Temp. Alram. 2. Confirmation of Temp. Setting Calibration of Thermocouple	PCRS /Data Logger	5	40					
60	Final Inspection	Inspection	Unnecessary holding of lot/Delay delivery	3	M	Machine out of Service, Improper seating of component to be checked /Inadequate Training	3	Calibration of machine for every year. Weekly hardness verification with the help of standard blocks /Proper Training	Hardness verification record / Calibration record.	4	36					

PREPARED BY: LVH

CF/QA/08/01

APPROVED BY: 

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CONTROL PLAN

Control Plan Number: CP/IRDICHT/2H/01/02

Key Contact / Phone: -MKK 9561065642 /SLD -7709940638

Customer :- SAI INDUSTRY

Part Name/Description :- PUSH ROD

Part Number :- ENHT 402

Material :- 16MnCr5

Core Team :- SLD, MKK ,DBB,SLD,TPM,LVH

Process/ Operation No	Process Name/ Operation Description	Machine, Device, Jig, Tools For Mfg.	Characteristics				Characteristics				Methods		Sample		Control Method	Reaction Plan
			No.	Product	Product Specification/ Tolerance	No.	Process	Process Specification/ Tolerance	Special Char. Class	Evaluation/ Measurement Technique	Size	Freq.				
			1	Material specification	16MnCr5	1	Visual Inspection	Free from surface cracks, dent marks	*M	Cross check on challan & contract review	Per Lot	Every Batch				
20	Fixturing & Loading	Fixture		Do not stuct with each other	1	Loading	Loading without stacking	*M	Visual inspection	1200 Nos /Batch	Every Batch	PCRS(QF/FPD/01/02)	Inward inspection (QF/MK/11)	Re loading		
30	Carburising	Gas carburising F/C (F-4/6)	1	Case Depth	0.7-0.9 mm	1 2 3 4 5 6 7 8	Carb Temp Carb Time Carb mV Methanol Flow Acetone Flow Diffusion Temp. Diffusion Time Diffusion mV	M	DTC Timer mV controller Flow-meter Flow-meter Timer mV controller	-	Every 1/2 hr	PCRS/Data Logger (QF/FPD/01/02)	Re-adjust as per Process Qualification Record / Process Sheet			
40	Hardening & Quenching	Gas carburising F/C	1	Sf Hardness & Core Hardness	62/63 HRC CORE-35/45 HRC	1 2 3 4	Hardening Temperature Methanol Flow Seaking Time	M	DTC Flow-meter mV Controller Timer	-	Every 1/2 hr	PCRS/Data Logger (QF/FPD/01/02)	Re-adjust as per Process Qualification Record / Process Sheet			
50	Tempering	Oil tank	1	Surface Hardness		1	1. Quenching oil temperature 2. Oil Grade-Hiquench M	M	M	As per C.P	Every Batch	PCRS (QF/FPD/01/01)	Rework as per Process Qualification Record / Process sheet			
60	Final Inspection	Temp. F/C F21	1	Hardness	59-63 HRC	1 2	Tempn. Time	M	DTC Timer	-----	Every 1/2 Hrs.	PCRS/ Data Logger (QF/FPD/01/01)	Re-adjust as per Process Qualification Record/ Process Sheet			
		Rockwell Hardness Tester	1	Hardness	59-63 HRC			M	Timer	-----	Every 1/2 Hrs.	PCRS/ Data Logger (QF/FPD/01/02)	Re-work as per Process Qualification Record/ Process Sheet			
		Microhardness Tester	3	Case Depth	07-0.9MM			M	150 Kg Load & diamond indenter	As per QA Plan	Every Batch	Register (QF/QA/03)	Reinspection/ Inform to PD Supervisor/ Rework			
		Micro Hardness Tester	4	Microscope	Fine Tempered Martensite			M	Micro Hardness Tester	1 Nos	Every Batch	Register (QF/QA/03)	Reinspection/ Inform to PD Supervisor/ Rework			

APPROVED BY: AHJ

PREPARED BY: S
M-Minor

Special Characteristics Class :- C-Critical

QF/QA/03

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