

Tube Investments of India Limited

*Gearing for
Growth*



**M/s Endurance Technologies
Comparison Avadi vs Shirwal
43.30x39.20**

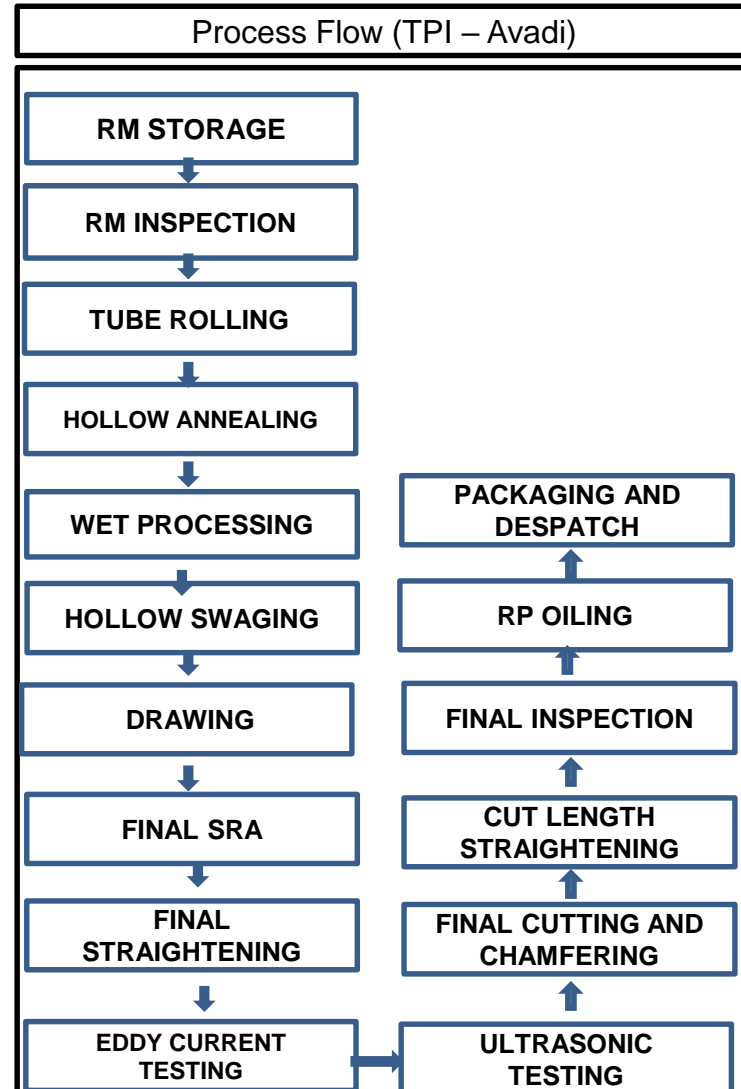
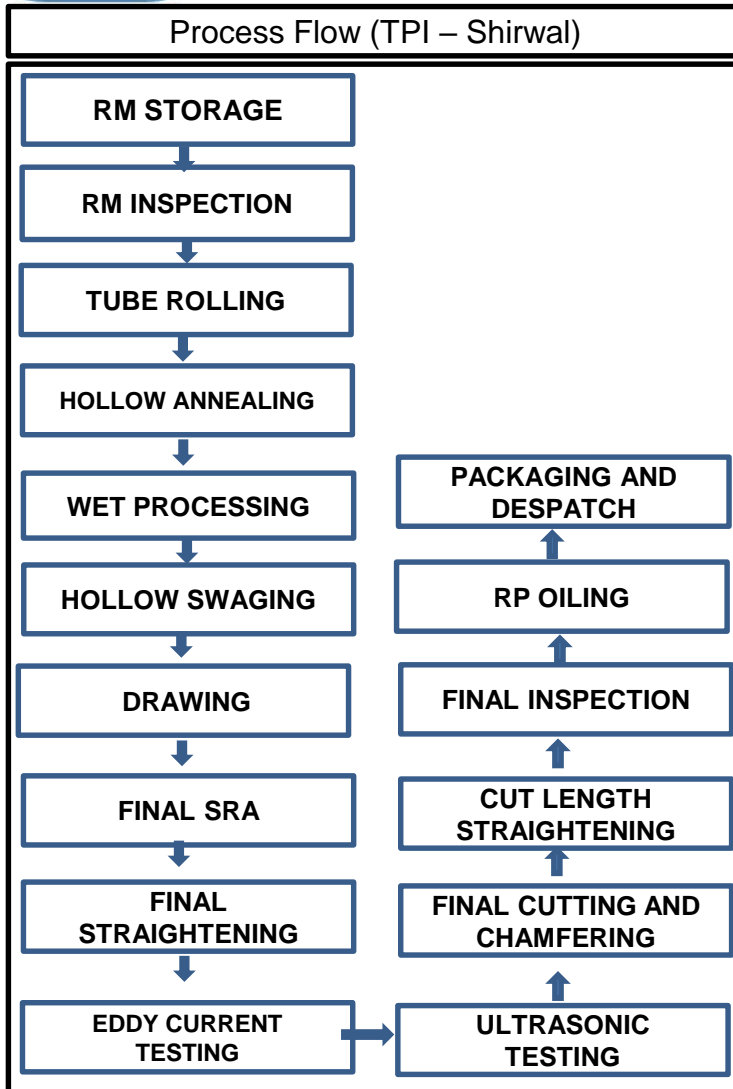


- **Mills capabilities**
- **Process flow diagram and control plan comparison**
- **Technical data sheet**
- **Testing results(Mechanical and chemical)**

Mills capabilities(Avadi vs Shirwal)

- **Both the (Shirwal mill) and (Avadi Mill) capable of producing the hollows for the size 43.30x39.20 mm.**
- **Both the mills have good Poke-yoke controls.**

Process Flow comparison (Shirwal vs Avadi)



No changes in process.

Technical data sheet

TUBE INVESTMENTS OF INDIA LTD.				
UNIT-TUBE PRODUCTS OF INDIA POST BOX NO 5,AVADI CHENNAI - 60054				
TDC CAPABILITY				
ENQUIRY REF NO.	PAH166C032	DATE	15-JUN-16	TUBE SIZE (OD X ID X THK X LENG)
CUSTOMER	ENDURANCE TECHNOLOGIES LIMITED		INDUSTRY	AUTO
CUST DRG/PART NO	F2FA081000		END USE	TFF
SEGMENT	2 WHEELER	SUB SEGMENT	2W-MOTOR CYCLE	OEM
				BAJAJ AUTO
SL NO.	ELEMENTS	CUST.REQMNT	TPI CAPABILITIES	CUSTOMER COMMENT
1.0	TYPE OF TUBE (CDW / ERW)	CDW	CDW	
2.0	SPECIFICATION REFERENCE	SAE 1541M	SAE 1541M	OK
2.1	SUPPLY CONDITION	SRA	STRESS RELIEVED	OK
3.0 DIMENSIONS				
3.1	OUTER DIAMETER-MM	43.2	43.30	OK
3.2	OUTER DIA TOL-1 MM	-0.0	-0.0	OK
3.3	OUTER DIA TOL-2 MM	+0.25	+0.10	OK
3.4	INNER DIAMETER-MM	39.4	39.20	OK
3.5	INNER DIA TOL-1 MM	-0.20	-0.25	OK
3.6	INNER DIA TOL-2 MM	+0.0	+0.05	OK
3.7	THICKNESS-MM	0	0	OK
3.8	LENGTH 1-MM	593	593.00	OK
3.9	LENGTH TOLERANCE-1-MM	-0.0	-0.0	OK
3.10	LENGTH TOLERANCE-2-MM	+1.0	+1.05	OK
3.11	LENGTH TYPE	CUT LENGTH	CUT LENGTH	OK
3.12	STRAIGHTNESS	0.08/500MM	0.10/500 MM MAX	OK
3.13	SURFACE FINISH-ID	0.8 Ra MAX	0.5 Ra MAX	OK
3.14	CIRCULARITY		0.07 MAX IN OD	OK
3.15	PERPENDICULARITY	0.1 MM	0.15 MM MAX	OK
3.16	CONCENTRICITY	0.2 MAX	0.2 MAX	OK
4.0 CHEMICAL COMPOSITION				
4.1	CARBON MIN %		0.30	} OK
4.2	CARBON MAX %		0.47	
4.3	MANGANESE MIN %		1.35	
4.4	MANGANESE MAX %		1.65	
4.5	SULPHUR MAX %		0.03	
4.6	PHOSPHORUS MAX%		0.03	
4.7	SILICON MAX %		0.35	
5.0 MECHANICAL PROPERTIES				
5.1	UTS MIN N/SQ.MM	950	950	} OK
5.2	YST MIN N/SQ.MM	850	850	
5.3	ELONG MIN %	10	10%	
5.4	ELONG GAUGE LENGTH		90 MM	

Rajasekar M

ETD

6.0 WELD TESTS REQUIRED				
6.1	EDDY CURRENT TEST %	100%	100%	OK
6.2	ULTRASONIC TEST	100%	100%	OK
7.0 OTHER REQUIREMENTS				
7.1	PACKING TYPE	BUNDLED AND WRAPPED	CARTON BOX PACKING	
7.2	WTC	Yes	Yes	
7.3	TONS/MONTH(MOO)		3.89 Ton	
NOTE				
F/MKTG/03 Part 1	Rajasekar M		CUSTOMER SIGNATURE WITH SEAL	
REV 2	TPI REPRESENTATIVE			

Rajasekar M

Note -

- 1) Hardness
- 2) Inclusion level
- 3) Depth of crack & width specification to be added for eddy current test.
- 4) IS condition to be specified - free from burn oil
- 5) IS should be free from burn oil



Testing results comparison

Sample Inspection report - Shirwal

Tube Investments of India Ltd									
Unit : Tube Products of India Ltd. Shirwal									
Sample Inspection report									
Size		43.30x39.20x593		Item code		3D1734128255211T			
Part Name		FORK PIPE RAW		Drg no./Part No.		F2FA081000-XA			
SR. No.	Parameter	Specification	MEASUREMENT TECHNIQUE / INSTRUMENT	Observations					Remark
				1	2	3	4	5	
1	OD	43.30±0.1	Micrometer	43.33	43.34	43.32	43.34	43.33	Ok
2	ID	39.20±0.05	Bore gauge	39.17	39.21	39.18	39.18	39.2	Ok
3	Total Length	593±1	Height Gauge	593.64	593.8	593.61	593.76	593.89	Ok
4	Straightness	0.12 Max	Dial 0.01	0.06	0.05	0.07	0.07	0.07	Ok
5	ID Roughness	0.8	Roughness Tester	0.56	0.58	0.75	0.62	0.72	Ok
6	Circularity	0.07 Max	Bore gauge	0.03	0.03	0.03	0.02	0.03	Ok
7	Perpendicularity	0.15	Height Gauge	0.06	0.09	0.05	0.11	0.08	Ok
8	Concentricity	0.2 Max	Bore gauge	0.06	0.08	0.11	0.11	0.13	Ok
9	Max Thickness variation	0.2 Max	Micrometer	0.04	0.04	0.03	0.03	0.04	Ok
10	Surface quality	ID Free from Burn Oil & fin marks	Visual	Ok	Ok	Ok	Ok	Ok	Ok
11	%Carbon	0.39-0.47	As per RMTC	0.43					Ok
	%Magnese	1.35-1.65		1.46					Ok
	%Silicon	0.35 Max		0.178					Ok
	%Phosporus	0.03 Max		0.011					Ok
	%Sulphur	0.03Max		0.004					Ok
	%Chromium	0.10Max		0.046					Ok
12	Tensile strength	950 N/Sq mm	UTM	1020.098					Ok
	Yield strength	850 N/Sq mm	UTM	947.81					Ok
	Elongation	10% Min (90 mm gauge length)	UTM	16.756					Ok
13	Eddy current	100%	ECT Machine	Ok	Ok	Ok	Ok	Ok	Ok
14	UT	100%	UT Machine	Ok	Ok	Ok	Ok	Ok	Ok
15	Packing	Corton box Packing	Visual	Ok	Ok	Ok	Ok	Ok	Ok
16	Oiling	100% Oiling	Visual	Ok	Ok	Ok	Ok	Ok	Ok
17	Hardness	HRC	Rockwell hardness tester	32	33	32	33	32	Ok
18	Inclusion	-	Metallurgical microscope	Ok					Ok

WTC-Avadi

TPI Work Test Certificate									
TUBE INVESTMENTS OF INDIA LIMITED									
TUBE PRODUCTS OF INDIA - AVADI									
POST BOX NO.4 & 18, M.T.H. ROAD, AVADI, CHENNAI - 600054									
21-JUN-2023 05:06:09 PM									
Customer		TPI PUNR W/H UNIT OF TUBE INVESTMENTS OF INDIA LTD. GAT NO. 701/L, CHAKAN-SHIKRAPUR ROAD AT POST BHOSR, TALUKA - KHED - CITY-PUNE State-MAHARASHTRA PinCode-410501						WTC NO:CDW2561244 Date:21-JUN-23	
Item code		3D1734128255211T							
Ex. Inv. NO & Dt		PAH-STN-11005 & 21-JUN-23							
Ar. Inv. NO & Dt		& 21-JUN-23							
Description		FRONT FORK - FRONT FORK						Quantity	
Job Order No		AFP236804330002						No :1650	
Specification		SAE 1541 M						Mtr :978	
Heat No		CE13825						Ton :2.1	
Tube Size (mm)		OD		ID		Thick		Length	
		43.30		39.20		.00		593.00	
Tolerance (mm)		Min	Max	Min	Max	Min	Max	Min	Max
		-0	+0.10	-0.05	+0.05			-0.0	+1.0
Dimensions	UOM	Spec		Actual		Chemical %	Spec		Actual
		Min	Max	Min	Max		Min	Max	
OD	MM	43.30	43.40	43.36	43.39	Carbon	0.390	0.470	0.440
ID	MM	39.15	39.25	39.21	39.23	Manganese	1.350	1.650	1.450
Thick	MM					Sulphur	0.030	0.030	0.030
Length	MM	593.00	594.00	593.56	593.65	Phosphorous	0.030	0.015	0.015
						Silicon	0.350	0.180	0.180
						Aluminium		0.024	0.024
Straightness	0.12 MAX			0.05		Copper		0.007	0.007
Pin Height						Chromium	0.100	0.059	0.059
Ovality OD						Nickel		0.009	0.009
Ovality ID						Vanadium			
Concentricity	0.20 MAX			0.1		Titanium			
						Boron			
						Niobium			
Destructive Test	Spec	Actual		Mechanical		UOM	Spec		Actual
Flattening					UTS	N/SQ.MM	950		988.8
Rev., Flattening					YFT	N/SQ.MM	850		891.36
Flange					Elongation	GL 90 MM	10		19
Crushing					Hardness				
Flare					Sur Pin OD				
Impact Test					Sur Pin ID				
NonDestruct Test	Spec	Actual		RA MAX			0.8		0.4
Eddy Current	100	NO FLAW		Grain Size					
Pressure									
Ultrasonic	100	NO FLAW							
Marking :									
Prepared By : For Tube Products of India									
Signature									
Digital Test Report generated from ERP, therefore no signature is required									
P/QA/66									



Thank you