

CONTROL PLAN

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Control Plan Number :		Control Plan Number : CP/ ETPL / FOCS70053		Key Contact / Phone :		Udham Singh / 9729202173 udham.singh@ssssprings.com		02.11.2017		00		Originated			
Part Number / Latest Change Level :		53BHT00807-XA		Core Team :		Mr.Manikant,Mr.Chandrasekhar,Mr.Dixit,Mr.Yash ,Mr.Shashank, Mr. Maulesh		30.06.2019		1		Tolerance revised at grinding from 235.00 ± 2.0 mm to 235.00 ± 1.50 mm and at 100% length inspection from 233.3 ± 2 mm to 233.3 ± 1.50 mm and process parameter added in winding and grinding			
Part Name / Description :		Outer Spring						08.08.2019		2		RM grade change from IS 4454 - Gr3 to DH grade.			
Supplier / Plant : SS&S - HALOL		Customer : ETPL		Supplier / Plant Approval / Date Other Approval / Date (if Req'd)		02.11.17									
												Customer Quality Approval / Date (if Req'd)			
Reaction Plan & Corrective action : 1. Reject and return to supplier , raise CAR for corrective & preventive action , 2. Stop production Quarantine the suspect parts and Check some more parts (Sort if required) / do 100 % inspection / Rework (MF-WI-0011) / Reject / reset the parameters in consultation with Engineers and revalidate process (if necessary)															
Part / Process No.	Process Name / Operation Description	Machine, Device, Jig Tools for Mfg.	Characteristics				Special Char. Class	Methods		Evaluation / Measurement Technique	Sample		Control Method & Error Proofing	Responsibility & Record	Reaction Plan & Corrective action
			No.	Product	Process	Product/Process Specification/Tolerance as per drg		Stage specification of Product / Process parameters	Size		Freq.				
5	Receipt & Inspection of raw material	-----	1	Diameter of the wire	-----	-----	8.5±0.045mm	8.5±0.045mm	Verification of Sup.TC /Insp. report , DC and Identn tag	Once	Every Lot	Verification during Receipt	Stores Incharge, Goods Receipt Note / SAP	1	
			2	Grade	-----	-----	IS 4454 - DH	IS 4454 - DH							
			3	Mechanical properties	-----	-----	IS 4454 - DH	Tensile strength / Chemistry	Verification of Sup TC Micrometer (0-25 mm,						
	4	Diameter of the wire	-----	-----	8.5±0.045mm	8.5±0.045mm	Visual	As per Sampling Plan QS - WI - 100		Incoming Inspection & Cross verification	Quality Inspector, Inward inspection record Supplier TC	1			
Visual	-----	5	Appearance	-----	-----	Should be free from Oiled,Rust and Damage	Should be free from Oiled,Rust and Damage		Visual						
	Storage of materials	-----	1	Appearance	-----	-----	-----	1.Should be free from Rust and Damage and to be Stacked in the allocated & identified racks with proper packing & Identification tag	Visual Verification	Once	Every week	Cross verification	Stores Incharge	2	
10	Winding RH	Winding machine 5120 TK-	1	Wire diameter	-----	-----	8.5±0.045mm	8.5±0.045mm	Micrometer	Once	Every setup	First Sample approval & Inprocess inspection	Operator First sample report (MF-PR-051 Rev-01) & PMC (MF-FR-005 - REV-02)	2	
			2	Outer coil Diameter Bigger side	-----	-----	54.00 mm Max	54.40 ± 0.1 mm	Vernier caliper	2 nos	Every setup & 30 Minutes				
			4	Free Length	-----	-----	233.3 ± 2.0 mm	243.00 ± 2.00 mm	Vernier caliper						
			5	Total coils	-----	-----	16.9 ± 0.25	16.50 ± .05	Manual Count						
			6	Tool mark,Burr,breakage	-----	-----	Free from Tool mark,Burr,breakage	Free from Tool mark,Burr,breakage	Visual						
			7	Coil Direction	-----	-----	RH	RH	Visual						
			8	Deflection @ 5.3 mm	-----	-----	21.2 ± 5% kgf	21.2 ± 5% kgf	Elasticometer	2Nos	Every setup	First Sample approval & Inprocess inspection	Operator First sample report (MF-PR-051 Rev-01)		
			9	Deflection @ 35 mm	-----	-----	140.0 ± 5% kgf	140.0 ± 5% kgf	Elasticometer						
			10	Deflection @ 40 mm	-----	-----	160.0 ± 5% kgf	160.0 ± 5% kgf	Elasticometer						
			11	Deflection @ 65 mm	-----	-----	290.0 ± 7% kgf	290.0 ± 7% kgf	Elasticometer						
			12	Deflection @ 75.3 mm	-----	-----	351.80 ± 7% kgf	351.80 ± 7% kgf	Elasticometer						
			13	Spring rate K1	-----	-----	4.00 kgf/mm	4.00 kgf/mm	Elasticometer						
			14	Spring rate K2	-----	-----	6.00 kgf/mm	6.00 kgf/mm	Elasticometer						
			15	Solid Height	-----	-----	145.8mm Max	145.8mm Max	Elasticometer						
			16	-----	-----	Program No.	-----	-----	10					10	Visual
			17	-----	-----	Feed roller pressure	-----	-----	4 to 5 Bar	4 to 5 Bar	Visual	once	Every Shift	Daily monitor	Operator DPM Check sheet MF-FR-018

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			No.	Product	Process		Product/Process Specification/Tolerance as per drg	Stage specification of Product / Process parameters		Size	Freq.						
20	Stress Relieving	Stress relieving Furnace	1	-----	Temperature	-----	-----	300° ± 20°c	Temperature Indicator	Once	Once in shift	Verification @ setup Inprocess inspection	MF-FR-10D Operator First sample report (MF-PR-051 Rev-01)	2			
			2	-----	Duration	-----	-----	12 'Min	Timer								
			3	Outer Copil diameter Bigger side	-----	-----	54.00 mm Max	54.00 mm Max	Caliper	2 Nos							
30	Grinding	Grinding M/C SGM 12	1	Free Length	-----	-----	233.3 ± 2.0 mm	235.00 ± 1.50 mm	Vernier caliper	2 nos	Every setup & 30 Minutes	First Sample approval & Inprocess inspection	Operator First sample report (MF-FR-052A) & PMC (MF-FR-005A - Rev - 02)	2			
			2	Axial Squareness	-----	-----	6.63 mm Max	6.63 mm Max	Angle block & Feeler Gauge or Wire								
			3	Ends types	-----	-----	Squared & Ground 270° Min	Squared & Ground 270° Min	Visual								
			4	Burr,dent,breakage,damage & End coil damage	-----	-----	Free from Burr,dent,breakage,damage & End coil damage	Free from Burr,dent,breakage,damage & End coil damage	Visual								
			5	Tip thickness	-----	-----	2.13-2.83	2.13 Min.	Caliper/Height gauge	once					Every Setup	FSA & Inprocess inspection	(MF-FR-052A)
			6	-----	Dressing of wheels	-----	-----	Wheel Dresser	----	Every 4 hour.					-----	(MF-FR-005 A-Rc-02)	
			7	-----	Dresser Unit	-----	-----	Check for free movement	By hand Visual	Once					Daily	Daily monitor	Operator DPM Check sheet (MF-FR-018)
			8	-----	Dust Collector	-----	-----	Check dust Extraction systems.	Visual								
			9	-----	Gap b/w grinding wheel & Guide plate < 5.0 mm	-----	-----	< 5.0 mm	Feeler Gauge	Once					Every Setup	First Sample approval	Operator Shotpeening record MF-FR-10F
			10	-----	Work table speed	-----	-----	25-30 RPM	Visual								
40	Shot peening	Shot Peening Machine (SP-05)	1	-----	Shot Size	-----	-----	0.87mm	Profile Projector	Once	Every Batch	T.C verified.	Quality inspector	2			
			2	-----	Arc Height	-----	-----	0.40 mm Min.	Almen Dial Gauge								
			3	-----	Duration	-----	-----	25 Minutes min.	Timer	Every week	Checked with Almen strip						
			4	Coverage	-----	-----	-----	95 % (minimum)	Comparison with Std Photograph			Every Batch	First sample @ stage between process				
			5	-----	Amperage	-----	-----	12-15 amp	12-15 amp	Visual	Once In Quarter				R & D andXRD logbook.		
			6	Residual Stress Check	-----	-----	-----	-100 'to -1000 Mpa	-----	XRD		Once in 48 hours	Operator (PMC board)				
			7	Sieveing	-----	-----	-----	-----	-----	Sieve Analyser							
50	Scragging	Hydraulic press	1	-----	Setting Height	-----	158 mm	158 mm	-----	Once	Every Batch	First Sample	Operator	2			
			2	-----	Bend	-----	-----	No Bend	No Bend	Visual	100%	Every Batch	First Sample	Operator	2		

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60	100% Lo,e1, e2 & ID Sorting	Manual	1	Free Length			233.3 ± 2.0 mm	233.3 ± 1.50 mm	Vernier caliper / Length Gauge	100%	Every Batch	First Sample	Operator	2		
			2	e1			6.63 mm Max	6.63 mm Max	Angle block & Feeler Gauge or Wire	100%	Every Batch	First Sample	Operator	2		
			3	e2			1.00 mm Max	1.00 mm Max	Dial Gauge/Surface plate	100%	Every Batch	First Sample	Operator	2		
			4	Inside diametr D1			36.5+ 0.50 mm	Go-36.70, Nogo-37.0	Plug gauge	100%	Every Batch	First Sample	Operator	2		
			5	Inside diametr D2			35.10 + 0.50 mm	Go-35.30, Nogo-35.60	Plug gauge	100%	Every Batch	First Sample	Operator	2		
70	In House (HAL-CP-PC001)															
80	Final Inspection	Measuring & Tessting Equipment	1	Product parameter	-----	-----	As per drg	As per QS-IP-FCOS 70053	QS-WI-001	QS-WI-003	Every batch	QS-FR-006	QA Inspector (QS-FR-006)	2		
90	Packing	Packing materials	1	Parts damage	-----	-----	Free from damage	Free from damage	Visual	100%	Every batch	Final stage	Dispatch peoples	2		
			2	Less Qty	-----	-----	As per the invoice	As per the invoice	Visual	100%	Every batch	Final stage	Operator	2		
			3	Parts mix up	-----	-----	Free from other parts	Free from other parts	Visual	100%	Every batch	Final stage	Operator	2		
			4	Quantity	-----	-----	-----	28no's / plastic bin	Visual	100%	Every batch	Final stage	Operator	2		
<i>m/c - Machine</i>		<i>FCOS 70053 - Inspection plan</i>		<i>QS-FR-006 - Inspection flow sheet</i>				<i>QS-WI-001-Work instnction for Checking method</i>				<i>QS-WI-003- Work instnction for Sampling plan</i>				