



# CONTROL PLAN

<input type="checkbox"/> Prototype	<input type="checkbox"/> Pre-launch	<input checked="" type="checkbox"/> Production	Key Contact / Phone :	Udham Singh / 9729202173 udham.singh@sssprings.com	Control plan Date	Rev.no	Change Details
Control Plan Number :	Control Plan Number : CP/ETL/012				15.08.2021	00	Originated
Part Number / Latest Change Level :	S2HT52107O/XC		Core Team :	Mr.Shashank,Mr.Chandrasekhar, Mr.Manikant,Mr.Yash,Mr.Paresh, Mr. Maheshwar, Mr.Parmanand	22.08.2021	01	Drawing revised for Tip thickness (from 2-2.67 to 2.4 min.) and Shot size(From 0.7 to 0.3 min.)
Part Name / Description :	Outer Spring (K0PG)				27.09.2021	02	Burr part found at customer end. Action taken to resharpener cutting tool & mandrel with every change of coil.
Supplier / Plant : SS&S - HALOL	Customer :	Endurance Technologies Ltd.	Supplier / Plant Approval / Date		06.04.2022	03	ID inspection & Control added at Grinding stage.
			Other Approval / Date (if Req'd)	(if -----)	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	-----	-----	8.0±0.045mm	8.0±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	-----	-----	SAE 9254	SAE 9254							
			3	Mechanical properties	-----	-----	SAE 9254	Tensile strength / Chemistry	Verification of Sup TC Micrometer	As per Sampling Plan QS - WI - 100	Incoming Inspection & Cross verification	Quality Inspector, Inward inspection record Supplier TC	1		
			4	Diameter of the wire	-----	-----	8.0±0.045mm	8.0±0.045mm							
	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	-----	-----	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		-----	8.0±0.045mm	8.0±0.045mm	Micrometer	Once	Every setup	First Sample approval	operator MF-FR-001A/02	2	
			2	Inside diametr D1				37.50 + 0.5 mm	Go-38.20, Nogo-38.6	Plug gauge	2 nos	Every setup & 30 Minutes	First Sample approval & PMC		Operator First sample report (MF-FR-001A/02 & PMC (MF-FR-005 - REV-02)
			3	Inside diametr D2				30.70 + 0.50 mm	Go-31.2, Nogo-31.6	Plug gauge					
			4	Outer diameter				56.50 mm Max	57.10 mm Max.	Vernier/Height gauge					
			5	Free Length		-----	-----	217 ± 2.0 mm	226- 230 mm	Vernier caliper					
			6	Total coils		-----	-----	12.00 ± 0.25	11.80 - 12.00	Manual Count					
			7	Appearance	-----	-----	-----	Free from Tool mark,Burr,breakage	Free from Tool mark,Burr,breakage	Visual					
			8	Coil Direction		-----	-----	RH	RH	Visual					
			9	Deflection @ 9.0 mm		●	33.0 ± 5% Kgf	33.0 ± 5% Kgf	Elasticometer	2Nos	Every setup	First Sample approval	Operator First sample report (MF-FR-001A/02)		
				Deflection @ 19.0 mm		●	69.7 ± 5% Kgf	69.7 ± 5% Kgf	Elasticometer						
				Deflection @ 25.0 mm		●	91.7 ± 5% Kgf	91.7 ± 5% Kgf	Elasticometer						
				Deflection @ 40.0 mm		●	146.8 ± 7% Kgf	146.8 ± 7% Kgf	Elasticometer						
				Deflection @ 45.0 mm		●	174.80 ± 7% Kgf	174.80 ± 7% Kgf	Elasticometer						
Deflection @ 55.0 mm		●		230.90 ± 7% Kgf	230.90 ± 7% Kgf	Elasticometer									
Deflection @ 65.0 mm		●	287.0 ± 7% Kgf	287.0 ± 7% Kgf	Elasticometer										
Deflection @ 82.0 mm		●	382.30 ± 7% Kgf	382.30 ± 7% Kgf	Elasticometer										
10	Spring rate K1		.....	3.67±5% Kgf/mm	3.67±5% Kgf/mm	Elasticometer									
11	Spring rate K2		.....	5.61±7% Kgf/mm	5.61±7% Kgf/mm	Elasticometer									
12	.....	Resharpener of cutting tool	.....	No burr	Every coil change	Visual	Every Time								
13	.....	Program No.		55	55	Visual	once								



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Control Plan Number :		Control Plan Number : CP/ETL/012								15.08.2021		00		Originated	
Part Number / Latest Change Level :		S2HT52107O/XC				Core Team :		Mr.Shashank,Mr.Chandrasekhar, Mr.Manikant,Mr.Yash,Mr.Paresh, Mr. Maheshwar, Mr.Parmanand		22.08.2021		01		Drawing revised for Tip thickness (from 2-2.67 to 2.4 min.) and Shot size(From 0.7 to 0.3 min.)	
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			No.	Product	Process		Product/Process Specification/Tolerance as per drg	Stage specification of Product / Process parameters		Size	Freq.				
			14	.....	Feed roller pressure		4 to 6 Mpa	4 to 6 Mpa	Visual	once	Every Shift	DPM Check sheet	Operator 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	-----	-----	420°-440°C	Temperature Indicator	once	Every Shift	Verification at setup.	Operator MF-FR-001A/02 MF-FR-10D	2	
			2	-----	Duration	-----	-----	12' Min	Timer						
			3	Outer diameter	-----	56.50 mm Max	56.50 mm Max	Vernier/Height gauge	2 Nos						
30	Grinding	Grinding M/C SGM 12-1,2,3,4	1	Free Length	-----	-----	217 ± 2.0 mm	219 ± 2.0 mm	Vernier/Height gauge	2 nos	Every setup & 30 Minutes	First Sample approval & PMC	Operator First sample report (MF-FR-052A) & PMC ( MF-FR-005A - Rev - 02 )	2	
			2	Squareness (e1)	-----	-----	4.34 mm Max	4.34 mm Max	Angle block & Feeler Gauge or Wire						
			3	Ends types	-----	-----	Squared & Ground 270° Min	Squared & Ground 270° Min	Visual						
			4	Appearance	-----	-----	Free from Burr,dent,breakage,damage & End coil damage	Free from Burr,dent,breakage,damage & End coil damage	Visual						
			5	Tipthickness	-----	-----	2.4 Min	2.4 Min	Digital caliper	5 Nos	Every Shift	First Sample approval	Operator First sample report (MF-FR-052A)		
			6	Parallelism (e2)	-----	-----	1.0 mm Max	1.0 mm Max	Dial Gauge/Surface plate						
			7	Solid height	-----	-----	101.6 mm Max	101.6 mm Max	Elasticometer						
			8	Inside diametr D1	-----	-----	37.50 + 0.5 mm	Go-38.20, Nogo-38.6	Plug gauge	2 nos	Every setup & 30 Minutes	First Sample approval & PMC	Operator First sample report (MF-FR-001A/02 & PMC (MF-FR-005 - REV-02)		
			9	Inside diametr D2	-----	-----	30.70 + 0.50 mm	Go-31.2, Nogo-31.6	Plug gauge						
			10	-----	Dressing of wheels	-----	-----	-----	Wheel Dresser	---	Every 4 hour.	-----	Operator, PMC (MF-FR-005 A-Re-02)		
			11	-----	Dresser Unit	-----	-----	-----	Check for free movement	By hand Visual	Once	Every Shift	DPM Check sheet		Operator (MF-FR-018)
			12	-----	Dust Collector	-----	-----	-----	Check dust Extraction systems.	Visual					
			13	-----	Gap b/w grinding wheel & Guide plate < 5.0 mm	-----	-----	-----	< 5.0 mm	Feeler Gauge					
			14	-----	Before grinding Position	-----	-----	-----	235-250mm	Visual					
			15	-----	Before grinding Spring Length	-----	-----	-----	227-231mm	Visual					
			16	-----	Grinding Feed Speed	-----	-----	-----	1.2-1.6m/min	Visual			First Sample approval		Operator First sample report (MF-FR-052A)
			17	-----	Finish Grinding time	-----	-----	-----	80-140 Sec.	Visual					



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			No.	Product	Process		Product/Process Specification/Tolerance as per drg	Stage specification of Product / Process parameters		Size	Freq.			
			18	-----	Total time of cycle	-----	-----	330-480 Sec	Visual					
			19	-----	Magazine Plate Speed	-----	-----	25-30 RPM	Visual					



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			No.	Product	Process			Product/Process Specification/Tolerance as per drg	Stage specification of Product / Process parameters	Size		Freq.				
40	Shot peening	Shot Peening Machine (SP-05)	1	-----	Shot Size	-----	-----	0.87 mm	Profile projector/Micrometer	Once	Every Batch	-----	Quality inspector	2		
			2	-----	Arc height	-----	-----	0.40 mm Min.	Almen Dial Gauge			Checked with Almen strip				
			3	-----	Duration	-----	-----	35 Minutes min.	Timer			Every Shift			Shotpeening record	Operator MF-FR-10F
			4	-----	Coverage	-----	90% Min	90 % ( minimum )	Comparison with Std Photograph							
			5	-----	Amperage	-----	12-15 amp	12-15 amp	Visual							
			6	-----	Residual Stress Check	-----	-100 'to -1000 Mpa	-----	XRD		Once In Quarter					
			7	-----	Sieveing	-----	-----	-----	Sieve Analyser		Once in 48 hours	Operator (PMC board)				
50	Scragging	Hydraulic press	1	-----	Setting Height	-----	135 mm	135 mm	-----	Once	Every Batch	First Sample Approval	Operator	2		
			2	-----	Bend	-----	No Bend	No Bend	Visual	100%	Every Batch			2		
60	100% Lo,e1, e2 & ID sorting and correction	Manual	1	-----	Free Length	-----	217 ± 2.0 mm	217 ± 2.0 mm	Vernier caliper / Length Gauge	100%	Every Batch	First Sample Approval	Operator	2		
			2	-----	Inside diametr D1	-----	37.50 + 0.5 mm	Go-37.50, Nogo-38.0	Plug gauge					2		
			3	-----	Inside diametr D2	-----	30.70 + 0.50 mm	Go-30.75, Nogo-31.0	Plug gauge					2		
			4	-----	e1	-----	4.34 mm Max	4.34 mm Max	Angle block & Feeler Gauge or Wire					2		
			5	-----	e2	-----	1.0 mm Max	1.0 mm Max	Dial Gauge/Surface plate					2		
70	Stress Relieving	Stress relieving Furnace	1	-----	Temperature	-----	-----	200°- 220° C	Temperature Indicator	Once	Every Shift	Verification @ setup	Operator MF-FR-10D	2		
			2	-----	Duration	-----	-----	8' Minimum	Timer							
80	Powder Coating	In House (HAL-CP-PC001)														
90	Final Inspection	Measuring & Tessting Equipment	1	-----	Product parameter	-----	-----	As per drg	As per Inspection std.- QS-IP-FOCS70128	QS-WI-001	QS-WI-003	Every batch	Inspection flow sheet	QA Inspector ( QS-FR-006 )	2	
100	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		2	
			3	-----	Parts mix up	-----	-----	Free from other parts	Free from other parts	Visual	100%	Every batch	Final stage		2	
			4	-----	Quantity	-----	-----	-----	28no's / plastisc bin	Counting	100%	Every batch	Final stage		2	
<i>m/c - Machine</i>		<i>Inspection plan-QS-IP-FOCS70128</i>			<i>QS-FR-006 - Inspection flow sheet</i>			<i>QS-WI-001-Work instuction for Checking method</i>			<i>QS-WI-003- Work instuction for Sampling plan</i>					