

# MAHALUXMI STEELS P. LIMITED

## INSPECTION & TEST PLAN / QUALITY PLAN

DOC. No. : WI -- 08

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ISSUE: 1.0 , DATE: 01.06.2015

APPROVED BY: DIRECTOR

SR. NO.	MATERIAL / PROCESS	SAMPLING PLAN		CHARACTERISTICS	SPECIFICATIONS	METHOD OF TEST /	RECORD REFERENCE
		SAMPLE SIZE	FREQUENCY				

### INCOMING INSPECTION

1.	Ferro Silico Manganese	1 Sample	Each Lot	Silicon	14% (Minimum)	Chemical Analysis (In-House_ / Supplier T.C)	Incoming Inspection Register
				Manganese	60% (Minimum)	--do--	--do--
2.	Ferro Silicon	1 Sample	Each Lot	Silicon	70% (Minimum)	--do--	--do--
3.	Ferro Manganese (LC)	1 Sample	Each Lot	Manganese	70% (Minimum)	--do--	--do--
4.	Ferro Manganese (HC)		Each Lot			--do--	
5.	Nickel (Square / Plate)	1 Sample	Each Lot	Nickel	99% (Minimum)	--do--	--do--
6.	Calcium Silicide	1 Sample	Each Lot	Calcium	30-35%	--do--	--do--
				Silicon	50% (Minimum)	--do--	--do--
7.	Ferro Titanium	1 Sample	Each Lot	Titanium	60% (Minimum)	--do--	--do--
8.	CPC	1 Sample	Each Lot	Carbon	100%	--do--	--do--
9.	Ferro Moly	1 Sample	Each Lot	Moli	60% (Minimum)	--do--	--do--
10.	Ferro Chrome (LC)	1 Sample	Each Lot	Chrome	60% (Minimum)	--do--	--do--
11.	Ferro Chrome (HC)	1 Sample	Each Lot	Chrome	60% (Minimum)	--do--	--do--
12.	Vanadium	1 Sample	Each Lot	Vanadium	45-50% / 70-80% (as per requirements)	--do--	--do--
13.	Aluminum Bar	1 Sample	Each Lot	Aluminum	95% Minimum	--do--	--do--
14.	Sponge Iron	1 Sample	Each Lot	Total Iron	98% Minimum	--do--	--do--
				Metallic Iron	92 % Minimum	--do--	--do--
15.	B. P. Set (IS-8)	1 Sample	Each Lot	Alumina (Al <sub>2</sub> O <sub>3</sub> )	40 % Minimum	--do--	--do--
		3 Sample		Porosity	22% Maximum	--do--	--do--
16.	Teeming Compound	1 Sample	Each Lot	Moisture	0.50% Maximum	--do--	--do--
17.	Slag-30	1 Sample	Each Lot	Moisture	0.50% Maximum	--do--	--do--
18.	Incoming Scrap						
	* Turning – Boring	<ul style="list-style-type: none"> <li>• Every Lot of the in-Coming Scrap shall be inspected – Visually</li> <li>• Chemical Composition of Graded Scrap shall be checked on Spectrometer before use</li> </ul>		Moisture	NO Moisture	* Before Use of the Scrap for Melting in Induction Furnace , Concerned Melter shall check the available Scrap Lot & record in the ‘Steel Melting Note-Book .	
	* Melting			Rust & Dust	NO Rust & Dust		
	* Heavy Melting			Oil Contamination	NO Oil Contamination		
	* Jali-Dana			Grade	Grade of the Scrap should be complied as per the agreement		
	* Tin-Tapper						
* Bundle							

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	* Graded Scrap		of the Scrap. •				
<b>IN-PROCESS &amp; FINAL INSPECTION</b>							
1.	Steel Melting	Before Transfer of Liquid Metal to Ladle & in Ladle	Each Heat	Temperature	As per Standard Chart (S-QAD-01)	Temperature Indicator	Steel Melting Note Book
		02/03 Samples in Every Heat	Each Heat	Chemical Composition	As per Standard Chart (S-QAD-01)	Spectro Analysis	--do--
2.	Teeming / Ingot Casting	Full Heat	Each Heat	Chocking of Nozzle	No Chocking	Visual	--do--
				Teeming Speed	Smooth Casting		
3.	Ingots / Billet	One	Each Heat	Chemical Composition	As per Standard Chart (S-QAD-01)	Spectro Analysis	--do--
		100%	Each Heat	Dimensions /	Size +/- 2 mm	Vernier Calliper / Compass / Scale	--do--
		100%	Each Heat	Piping & Surface (Visual Inspection)	NO Piping NO un-even Surface	Visual	--do--
4.	In House 'Hot Rolling Process'	Continuous	Each Heat / Lot – Min. 01 Sample per Hour during Continuous Rolling	Dimension	Size +/- 10% mm	Vernier Caliper	Rolling Process Sheet
				Surface Conditions	Free from cracks, marks, etc.	Visual Inspection (100%) & Acid Etching	
				Rolling Temperature	As per Chemical Composition / Grade	Verification of 'Temperature Indicator'	
5.	Rolling Process (If Rolling is Outsourced)	Min. 20 Pcs. Per Lot  (Randomly selected from the Heat wise Lot of Rolled Product received)	Each Lot	Dimensions (Recording of min. 05 Pcs.)	Size +/- 10% mm	Vernier Calliper	Final Inspection Register
				Chemical Composition (Min. 02 Samples shall be checked for Chemical Composition on Spectrometer & if the same Chemical Composition received as that of Ingot, No recording shall be there, in case of any difference, same shall be investigated & recorded)	As per Standard Chart (S-QAD-01)	Spectro Analysis	

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				Surface Conditions	Free from cracks, marks, etc.	Visual Inspection (100%) & Acid Etching (05 Samples)	
				Step Down Test (of Min. 02 Pcs.)	Min. 04 Steps to be Checked	Visual Inspection for No Crack & Seams on any Step.	
				Spark Test	Conforming to Grade	Visual	
				Ends Inspection	No Crack	--do--	
				Surface Hardness (if required by Customer)	As per Grade	Hardness Testing Machine	
				Mechanical & Metallurgical Properties (if required by Customer)	UTS, YS, EL%, RA%, Impact Test, Inclusion Rating & Grain Size	Outsourced Lab	
6.	Annealing (If required)	100%	Each Heat	Temperature	As per Standard Chart (S-QAD-02)	Temperature Indicator	Heat Treatment Sheet
				Time	--do--	Watch	--do--
				Hardness	As per Standard Chart (S-QAD-02) / As per Customer Requirements	Hardness Tester	--do--
7.	<b>FINAL INSPECTION</b>	100%	Each Heat / Lot	Dimensions (Recording of min. 05 Pcs.)	Size +/- 10% mm	Vernier Caliper	Final Inspection Register
				Surface Conditions / Visual Inspection / End's Inspection	Free from cracks, marks, etc.	Visual Inspection (100%) & Acid Etching (05 Samples)	
				Spark Test	Conforming to Grade	Visual	
				Chemical Composition (Min. 02 Samples shall be checked to confirm the Chemical Composition)	As per Standard Chart (S-QAD-01)	Spectro Analysis	
				<b>Other Test (In case of Customer's Req.)</b>			
				1. Surface Hardness	As per Grade	Hardness Testing Machine	
			2. Step Down Test (Min. 02 Pcs.)	Min. 04 Steps to be Checked	Visual Inspection for No Crack & Seams on any Step.		

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				3. Mechanical & Metallurgical Properties	UTS, YS, EL%, RA%, Impact Test, Inclusion Rating & Grain Size	Outsourced Lab	