

Heavy Metal & Tubes Limited Unit-III

Quality Plan For Hot Finish Seamless Alloy Steel Pipe/Tube

S.R.No	Operation	Characteristics	Equipment	Frequency	Method of Checking	Quantum of Checking	Acceptance Norms Criteria	Responsibility	Document	Remark
1	Raw Material Inspection(Round Bar)	Micro Examination	Microscope	1 Nos / Heat	Visual	One / Heat		QA	Format	Review Of Report
		Chemistry	Spectrometer	1 Nos / Heat	Spectrometer	One / Heat	AS per Specification/P.O	QA	Format	Review Of Report
		Inclusion rating	Microscope	1 Nos / Heat	As per ASTM E 45	One / Heat	AS per Specification/P.O	QA	Format	Review Of Report
		Grain Size	Microscope	1 Nos / Heat	As per ASTM E 112	One / Heat	AS per Specification/P.O	QA	Format	For Alloy Steel
		Dimensional	Micro Meter	Random/Heat	OD	2 Nos / 250 Nos	As per TDC	QA	Format	--
	Surface Inspection	--	Random/Heat	Visual	2 Nos / 250 Nos	Visual	QA	Format	--	
2	Round Bar Cutting	Length	Gas Cutting	10% Heat	Measuring Tape	2 Nos / 250 Nos	AS per Specification/P.O	Production/QA	Format	--
		End taper			Rught Angle	2 Nos / 250 Nos		Production/QA	Format	--
3	Heating	Set.Temp.	Rotary Hearth Furnace	For each size.Grade	Digital temp.	Check Temp	+/-20 deg.C	Production/QA	Format	--
		Actual Temp.		every hour	Indicator	Check Temp	--	Production/QA	Format	--
		Soaking Time		each billet	Chargingg/ Dischargin	Check Temp	As per Chart	Production/QA	Format	--
4	Descaling	Surface Scale		each billet	Visual	--	Free from Scale	Production		--
5	Piercing	OD/Wt	Piercing M/c		Out Side Caliper		As per Process Card	QA	Format	--
		Surface inspection			Visual	First 2 Tubes & then every 50 Tubes	Free From Line Marks, Crack,Laps & Dent Mark	QA		--
		Temp.after Piercing		each billet	Pyrometer	First 2 Tubes & then every 50 Tubes	--	Production/QA	Format	--
6	Hot Rolling	Dimensional	Accu-rolling M/c	Random/Heat	Bore Gauge	First 2 Tubes then every	As per Process Card	QA	Format	--
		Temp.after rolling		each tube/pipe	Pyrometer	20 tubes	--	Production/QA		--
7	RE-Heating	Zone Temperature	WBF	For each size.Grade every hour	Digital Temp. Controller	Check Temp		Production/QA	Format	--
		Soaking Time			Chargingg/ Dischargin	Check Temp	AS per chart	Production/QA	Format	--
8	Hot Rolling	OD/Wt	SRM	Random/Heat	Out Side Caliper & Bore Gauge	First 2 Tubes then every 50 tubes	As per process card	Production/QA	Format	--
		Surface defects		Random/Heat	Visual		free from Scale	Production/QA		--
		Temp.after rolling		each tube/pipe	Pyrometer		--	Production/QA		--



9	Normalizing & Tempring	Set temp. and actual temp.	Roller Hearth Furnace	Continuous	Digital temp Indicator	Check Graph	AS per specification/Heat Treatment chart	Production/QA	Format	--	
		Roller Speed		1 to 2 nos/shift		1 to 2 nos/shift		Production/QA		--	
		Hardness test		Two sample / heat	Rockwell Hardness tester	Two sample / heat		Production/QA		--	
10	Sample Cutting for Lab testing	Tensile test	Cutting M/c	As per Product Specification	Sample select as per product specificatin	As per Product Specification	As per Product Specification	QA	Format	--	
		Impact test [If Req.]						QA		--	
		Bend test						QA		--	
		Flattening test						QA		--	
		Flaring Test						QA		--	
		Hardness test						QA		--	
11	Mechanical/ Physical tets	Tensile test	UTM 100T	As per Product Specification	As per procedure	As per Product Specification	As per Product Specification	QA Lab	Format	--	
		hardness test	Charpy/Izod					As per procedure	QA Lab		--
		Bend test	--					As per procedure	QA Lab		--
		Flattening test	UTM 100T					As per procedure	QA Lab		--
		Flaring Test	UTM 100T					As per procedure	QA Lab		--
		Hardness test	Rockwal/Hardness					As per procedure	QA Lab		--
12	Product Chemical	Chem. Analysis	Spectrometer	Heatwise	By Spectrometer	One / Heat	As per Product Specification	QA Lab	Format	--	
13	Straightning	Straightness	Straightner	each tube/pipe	Visual	First 2 Tubes then every 20 tubes	Reasonably Straight/easy to roll	Production/QA	Format	--	
		Surface		Random/Heat	Visual		Free from roller marks , Mechanical marks.	Production/QA	Format	--	
14	Cutting	End Cutting	Cutting M/c	As per PO / Spec	Measuring Tape	100%	As per PO / Spec	Production	Format	--	
15	Eddy Current Testing [If Reuired]	Surface & Sub Surface	Eddy Current testing M/C[Modle No.] M/s Technofour	100%	As per procedure	100%	as per product Specification	QC	Format	--	
16	Ultrasonic Testing [If Reuired]	Internal diffect	UT Rota	100%	As per procedure	100%	As per Product Specification	QC	Format	--	
17	Hydro test [If Required]	Test pressure / Tube leakage	Hydrotester	100%	Visual	100%	As per Product Specification	QC	Format	--	
		Holding time		As per Product Specification	Disply gauge		As per Product Specification	QC		--	



18	Cutting	Final Length	Cutting M/c	As per P.O/ Specn.	Tape		As per P.O/ Specn.	Production/QA	Format	--
19	Bevelling (If Required)	Bevel angle	Bevelling M/C	First 2 to 5 tubes and after every 100 Nos	Bevel Protractor	100%	As per Product Specification	QC		--
		Root Face		-- do --	Root Face gauge	100%	As per Product Specification	QC		--
		Free of burrs		100%	Visul	100%	Free from burr on OD & ID	QC		--
20	Final Dimension	OD	UT Rota	100%	UT Rota	100% Checking & keep record for 2Nos / 250 Nos	As per P.O/ Specn.	QC	Format	--
		WT	UT Rota	100%	UT Rota		As per P.O/ Specn.	QC		--
		Length	Tap	100%	Tap		As per P.O/ Specn.	QC		--
	Visual Insp.	Surface defact	UT Rota	100%	UT Rota		As per P.O/ Specn.	QC	Format	--
21	PMI [Alloy Steel]	Grade Verification	PMI Tester	each tube/pipe	Visual	100%	As per P.O./ Specn.	QC	Format	--
22	Rust Preventive Coating	uniform Coating	Varnishng M/C by Spray	each tube/pipe	Visual	First 2 Tubes then every 20 tubes	As per P.O./ Specn.	QC		--
23	Marking	Verification od Stencilling details & Colour Code	----	each tube/pipe	Visual		As per P.O./ Specn.	QC		--
24	Clearance For predespatch activities	Varification of all Insp. & test reports,rework activities & Heat No.	--	Heatwise	Record/document verification.		As per procedure	QC		--
25	Bundle strapping & bundle tag.	Proper strapping of bundle	Strapping M/c	each bundle	Visual	Check each bundle. Take 2-3 Photographs of Packing for Export order	As per procedure	Despatch		--
26	Loading & Despatch	Loading of correct tubes	EOT Crane	each bundle	visual		As per procedure	Despatch		--

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