

## Heavy Metal & Tubes Limited Unit-III

### Quality Plan For Hot Finish Seamless Carbon Steel Pipe/Tube

S.R.No	Operation	Characteristics	Equipment	Frequency	Method of Checking	Quantum of Check	Acceptance Norms Criterla	Responsibility	Document
1		Chemistry	Spectrometer	1 Nos / Heat	Spectrometer	One sample/Heat	AS per Specification/P.O	QA	Formet
		Dimensional	Micro Meter	Random/Heat	OD	2 Nos / 250 Nos	As per TDC	QA	Formet
		Surface Inspection	--	Random/Heat	Visual	2 Nos / 250 Nos	Visual	QA	Formet
2	Round Bar Cutting	Length	Gas Cutting	10% Heat	Measuring Tape	2 Nos / 250 Nos	AS per Specification/P.O	Production/QA	Formet
		End taper			Rught Angle	2 Nos / 250 Nos		Production/QA	Formet
3	Heating	Set.Temp.	Rotary Hearth Furnace	For each size.Grade	Digital temp.	Check Temp	+/-20 deg.C	Production/QA	Formet
		Actual Temp.		every hour	Indicator	Check Temp	--	Production/QA	Formet
		Soaking Time		each billet	Chargingg/ Dischargin	Check Temp	As per Chart	Production/QA	Formet
4	Descaling	Surface Scale		each billet	Visual	--	Free from Scale	Production	
5	Piercing	OD/WT	Piercing M/c		Out Side Caliper	First 2 Tubes then every 50 tubes	As per Process Card	QA	Format
		Surface inspection			Visual		Free From Line Marks, Crack,Laps & Dent Mark	QA	
		Temp.after Piercing		each billet	Pyrometer		--	Production/QA	Format
6	Hot Rolling	Dimensional	Accu-rolling M/c	Random/Heat	Bore Gauge	First 2 Tubes then every 20 tubes	As per Process Card	QA	Format
		Temp.after rolling		each tube/pipe	Pyrometer		--	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	Sample Cutting for Lab testing	Tensile test	Cutting M/c	As per Product Specification	Sample select as per product specification	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	
10	Mechanical/ Physical tests	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	Format
		Bend test	--		As per procedure			QA Lab	Format
		Flattening test	UTM 100T		As per procedure			QA Lab	Format
		Flaring Test	UTM 100T		As per procedure			QA Lab	Format
		Hardness test	Rockwal/Hardness		As per procedure			QA Lab	Format
11	Product Chemical	Chem. Analysis	Spectometer	Heatwise	By Spectometer	One sample/Heat	As per Product Specification	QA Lab	Format
12	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	
13	Cutting	End Cutting					No taper cutting	Production/QA	Format
14	Eddy Current Testing [ If Reuired]	Surface & Sub Surface	Eddy Current testing M/C.	100%	As per procedure	100%, if required by Code or PO	as per product Specification	QC	Format
15	Ultrasonic Testing	internal diffect	UT Rota	100%	As per procedure	100%	As per Product Specification	QC	Format
16	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	



17	Cutting	Final Length	Cutting M/c	As per P.O/ Specn.	Tape	100%	As per P.O/ Specn.	Production/QA	Format
		Bevel angle	Bevelling M/C	Initial 2 to 4 tubes and after that 2Nos/100Nos	Bevel Protector	Initial 2 to 4 tubes and after that 2Nos/100Nos	As per Product Specification	QC	Format
19	Final Dimension	Root Face		-- do --	Root Face gauge	100% Checking & keep record for 2Nos / 250 Nos	As per Product Specification	QC	
		Free of burrs		100%	Visul		Free from burr on OD & ID	QC	
		Length		Tap	Tap		As per P.O/ Specn.	QC	Format
	Visual Insp.	Surface defact	Manual	100%	Manual		As per P.O/ Specn.	QC	Format
20	Rust Preventive Coating	uniform Coating	Varnishing M/C by Spray	each tube/pipe	Visual	First 2 Tubes then every 20 tubes	As per P.O./ Specn.	QC	
21	Marking	Verification od Stencilling details & Colour Code	Marking M/C	each tube/pipe	Visual		As per P.O./ Specn.	QC	
22	Clearance For predespatch activities	Verification of all Insp. & test reports, rework activities & Heat No.	--	Heatwise	Record/document verification.		As per procedure	QC	
23	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	
24	Loading & Despatch	Loading of correct tubes	EOT Crane	each bundle	visual		As per procedure	Despatch	

**QAP No :- HMTL/HF/QC/001 Rev.01 Dt:- 15.11.2011 Page No. 3 of 3**



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