

## QUALITY CONTROL

**Sub:**Hydro & Pneumatic Test of Castings at RT - C25 - QC Plan - Reg.

### Quality Control Plan

S. No.	Stage	Control Activity	Responsibility <sup>1</sup>		
			WC	QC	
1	Input material (Casting)	Ensure stage clearance before PT by PTRC committee. Check the ID No on the job.	R	W	
2	Pre Machining of casting	Machining of casting as per approved casting drawing / Dimension Inspection plan / pre-machining plan. Dimension inspection as per Annexure 2.	P	R / W	
3	Visual Inspection (Post Machining + Cleaning)	Surface shall be free from contamination	P	R	
4	Pressure test set up (Pneumatic and Hydro)				
	a) O-ring	Check for damage before use / reuse	-	P	R
		Check test certificate for validity		P	R
		Thickness of O-ring as per Annexure 1		P	R
	b) Pressure gauge	Check calibration	-	P	R
	c) Assembly of closer / fixture	Torque Measurement	-	P	W
		Ensure proper assembly of castings		P	W
	d) Tank with water (Pneumatic)	Capacity sufficient to immerse the casting	-	P	W
	e) Drying Method (Pneumatic)	Circulating Air for drying	-	P	W
5	Test Media				
5a	DM Water (Hydro Test)				
	a) PH value	6.5-7.5	-	P	R
	b) Electrical Conductivity	0-10 $\mu$ S/cm	-	P	R
	c) Total dissolved solids	1 - 10 PPM	-	P	R
	d) Temperature	Ambient	-	P	R/W

<sup>1</sup> **P:** Perform & Record      **W:** Witness      **R:** Review      **W:** Work Centre

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S. No.	Stage	Control Activity			Responsibility	
					WC	QC
5b	Compressed Gas (Pneumatic test)					
	a) Source	Gaseous N <sub>2</sub> / Compressed air	-	P	R	
6	Post Pressure Test					
	Visual Inspection	Entire casting surface shall be assessable for visual inspection.			P	W
	Cleaning of the casting	Cleaning of casting shall be done by IPA followed by pressurised air drying.			P	R/W
	Surfaces of casting	Surfaces of casting shall be free from chips, impurities and contamination.				
7	Methodology & Specification					
	<b>Refer annexure 1 for each casting</b>					
8	Important Notes:					
	a) Fasteners class and type shall be as per approved assembly drawings.					
	b) Pneumatic testing shall be done by immersing the casting in the tank.					
	c) All outer surfaces of casting shall be assessable for visual inspection during testing.					

## Annexure – 1

### Methodology & Specification

#### Pressure Testing (Hydro) Castings

S. No.	Specification	Remark / Value		
A	<b>Castings</b>			
1	LOX Exhaust Casing Casting	Hydraulic Pressure (Bar)	Time (Minutes)	Acceptance
		6 (+0.6)	5	No pressure drop during the test time. No leakage from the casting allowed.
	O-ring	Ø5 mm		
	<b>Torque Values for LOX Exhaust Casing casting pressure test assembly</b>			
	Type of Nut	Torque Value (Nm)		
	M12 nut	10 <sup>+1</sup> Nm		
	<b>Methodology</b>			
	(a) Step 1: raise the Pressure and hold	3.5	2	Holding time shall be applicable after stabilization.
	(b) Step 2: raise the Pressure and hold	6	5	

#### Pressure Testing (Pneumatic) Castings

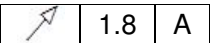
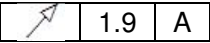
S. No.	Specification	Remark / Value		
B	<b>Castings</b>			
1	LOX Turbine Exhaust Casing Casting	Pneumatic Pressure (Bar)	Time (Minutes)	Acceptance
		4.5 (+0.5)	5	No Pressure drop during the test. No bubbles of any size sticking or rising from casting surface.
	O-ring	Ø5 mm		
	<b>Torque Values for LH2 Exhaust Casing Casting pressure test assembly</b>			
	Type of Nut	Torque Value (Nm)		
	M12 nut	10 <sup>+1</sup> Nm		
	<b>Methodology</b>			
	Step 1: raise the Pressure and hold	4.5	5	Holding time shall be applicable after stabilization.

## Annexure – 2

### Dimensions to be discussed in PTRC (Casting) prior to pressure test:

Dimensions mentioned below shall be ensured during inspection in HIP + HT condition.

#### 1. LOX Turbine Exhaust Casing Casting:

S. No.	Sl. No. as per dimension inspection plan	SPECIFIED	
		DIMENSION	TOLERANCE
1	8	99.1	±0.55
2	9	14	±0.22
3	11	 1.8 A	-
4	13	Ø 191	±1.2
5	17	Ø 133	±0.8
6	31	6.5	±0.18
7	32	16	±0.22
8	35	Ø 318	±1.8
9	36	Ø 264	±1.3
10	59	 1.9 A	-