

HAL Test Facilities for Private Sectors

**Division/ R&D Centre: CENTRAL MATERIALS AND PROCESSES LABORATORY, Foundry and Forge
Division, HAL Bangalore Complex**

A	PHYSICAL AND MECHANICAL TESTS		
Sl. No.	Test Facilities	Specification	Rate (in Rs.)
1	Tensile testing at room temperature (Proof/yield stress, % Elongation and Reduction in area)	ASTM E8/ E8M	Rs. 975 Per sample
2	Tensile testing at elevated (up to 1000 deg C) temperature (Proof/yield stress, % Elongation and Reduction in area)	ASTM E 21	Rs. 5695 Per sample
3	Izod impact at Room temperature	ASTM E 23	Rs. 790 per sample
4	Charpy impact at Room temperature	ASTM E 23	Rs. 790 per sample
5	Charpy impact test at sub zero temperature	ASTM E 23	Rs. 2070 per sample
6	Creep and stress rupture test up to 900 deg. Centigrade	ASTM E 139	Rs. 10725 for 24 hours duration test and additionally Rs 490 per hour.
7	Stress corrosion cracking (SCC)	ASTM G 44 and G47	Rs. 2925 per sample for 30 days. Rs. 210 per day for additional exposure
8	Endurance limit of 10^7 cycles (HCF) at room temperature.	BS 3518 part II	Rs. 2280 per sample
9	Endurance limit of 10^7 cycles (HCF) at elevated temperature.	BS 3518 part II	Rs. 11595 per sample
10	LCF at room temperature (pre determined stress level 10^4 cycles)	ASTM E 466	Rs. 9730 for 6 hours. Additional Rs. 310 per extra hour
11	LCF at high temperature (pre determined stress level 10^4 cycles)	ASTM E 466	Rs. 11385 for 6 hours. Additional Rs.1760 per extra hour.
12	Hellical springs (Tension/ Compression)	As per drawing	Rs. 620 per spring
13	Cables and Wires upto 12 mm dia (Breaking load only)	ASTM E 8/E8M	RS. 725 per sample
Note:- The testing chagres indicated above does not include sample preparation. Test specimen preparation will be at extra cost.			

B METALLOGRAPHY AND ALLIED TEST			
Sl. No.	Test Facilities	Specification	Rate (in Rs.)
1	Micro examination of metals and alloys (including specimen mounting, polishing , etching etc..)	ASTM E 3, ASTM E 407	Rs. 2200 per sample.
2	Macro examination of Forgings for grain flow / Fractographic examination using stereomicroscope	ASTM E 340, ASTM E 381	Rs. 1900 per sample
3	Austenitic grain size assessment (Including Heat treatment and sample preparation)	ASTM E 112, ASTM E 1382	Rs. 2200 per sample
4	Inclusion rating in steels	ASTM E 45	Rs. 2200 per sample
5	Decarburisation test by a)Micro examination	ASTM E 1077	Rs. 2200 per sample.
	Decarburisation test by b)Hardness survey method	ASTM E 1077, ASTM E 384	Rs. 2200 per sample.
6	Case depth determination by Micro hardness survey per location	IS 6416, ASTM E 384	Rs. 2200 per sample.
7	SEM/ EDX examination	NOT APPLICABLE	
	i) Fractography with 2 copies of micro/ Fractographs		Rs.5400 per sample
	ii) Scanning charges for every additional location/ magnification		Rs.1000 per sample
	iii) EDX micro analysis		Rs. 5400 per sample
	iv) Every additional location/magnification in EDX		Rs. 800 per sample
8	Embrittlement test for stainless steel / Weld decay test on non-corrodible steel welds	ASTM A 262, AvP84 D505 Issue 1 or applicable welders approval documents	Rs. 2600 per sample
9	Quantitative estimate of identifiable micro structural constituents by image analysis system	ASTM E 112, ASTM E 1382, ASTM E 45	Rs. 2800 per sample and Rs.1200 for every identifiable additional test
10	Hardness measurement		
	i) Macro Hardness test	ASTM E 10, ASTM E 18, ASTM E 384	Rs. 800 per sample
	ii) Micro Hardness test (including specimen mounting and polishing)	ASTM E 384	Rs. 2200 per sample for sample preparaton and Rs.135 per indentation.
11	Bend test on welded sheets for welders approval	AvP84 D505 Issue 1 or applicable welders approval documents	Rs. 500 per sample
12	Metallurgical consultancy/ Assessment per hour	NOT APPLICABLE	Rs.1200 per hour

C NON DESTRUCTIVE TESTING			
Sl. No.	Test Facilities	Specification	Rate (in Rs.)
1	Radiographic Inspection	ASTM E 1742	Rs. 8 per square inch of the exposed film. Minimum test charges Rs. 1000
2	Ultrasonic Inspection	AMS 2154, AMS 2630	Rs. 1500 per hour of work. Minimum test charges Rs. 750
3	Electrical conductivity check by Eddy current	MIL STD 1537	Rs. 1500 per hour of work. Minimum test charges Rs. 750
D CALIBRATION			
1	Calibration Of Torque Wrenches (0-1100 Nm)	ISO 6789	Rs 3000 Per Torque Wrench
2	Calibration Of Hardness Testers	ASTM E 18	Rs 6825
3	Calibration Of Universal Testing Machines	ISO 7500/ IS 1828	Rs 11375
4	Calibration Of RTD's/THERMOCOUPLES (0-1200 °C)	ASTM E 220	Rs 6425
5	Calibration Of Temperature Indicators	AMS 2750	Rs 2800
6	Calibration Of Furnace/Ovens	AMS 2750	Rs 10250
E CHEMICAL INORGANIC			
	Metallic Materials		
1	Carbon and Sulphur	ASTM E 1019 / IS 228	Rs.850/- per sample
2	Other elements by conventional wet analysis	IS 228	Rs.1250/- per element
3	Plated Parts		
	Thickness of plating/ Finish / Porosity etc. per sample	ASTM D7091 / ASTM B499	Rs.725/- per sample
4	Plating solutions/ Effluent/ Water analysis/ Visual examination	IS 228/ APHA	
5	Spectrovac Analysis		
	For 5 elements or less		
	a) Ferrous material	IS 8811 / IS 9879	Rs.1700/- min for 5 elements. Each additional element is Rs.100.
			For fixing the specification Rs.1050/-
	b) Non-Ferrous material	ASTM E 1251	Rs.1775/- min for 5 elements. Each additional elements Rs.100.
			For fixing the specification Rs.1050/-
6	Hydrogen Content in steel / Titanium	IS 228 / ASTM E 1447	Rs.3150/- per sample
7	Atomic Absorption Spectrophotometer	ASTM E507	Rs.1700/- per element
8	pH / Conductivity	IS 3025	Rs.525/- per sample
9	Break down Voltage	IS 1868	Rs.525/- per sample
10	Sieve Analysis	BSS / AFS	Rs.525/- per sample
11	Salt Spray Test(Set of three or less)	ASTM B 117	Rs.2200/- per day(24 hrs)
12	Moisture/Water Content	ASTM D 1744	Rs.1150/- per sample

F	CHEMICAL ORGANIC MATERIAL TESTING		
Sl. No.	Test Facilities	Specification	Rate (in Rs.)
1	Rubber - Density	ASTM -D-297	Rs.600 per sample
2	Density - Solvent	ASTM-D-3505	Rs.800 per sample
3	Rubber -Hardness Shore A/D	ASTM-D-2240	Rs.380 per sample
4	Scratch hardness	ASTM-D-548	Rs.350 per sample
5	Brittleness/ Flexibility at low temprature	BS-2X-34	Rs.3100 per sample
6	Permanent set	ASTM-D412	Rs.300 per sample
7	Compression set test in fluid	ASTM-D-395	Rs.1050 per sample
8	Tensile strength and elongation	ASTM-D-412	Rs.1250 per sample
9	Tensile strength and elongation in fluid	ASTM-D-412	Rs.1750 per sample
10	Tear strength for Rubber	ASTM-D-624	Rs.930 per sample
11	Volume/weight change after immersion in fluid	ASTM-D-471	Rs.670 per sample
12	Adhesive testing	AS 5127	Rs.8130 per sample

The above rates are exclusive of taxes and prevailing taxes will be applicable.