

**LIST OF EQUIPMENT AT NCCRD, IIT MADRAS WITH HOURLY CHARGES
(GST EXTRA , AS APPLICABLE)**

S no	Equipment	Description	Hourly cost (INR) per machine for external testing	Hourly cost (INR) per machine for internal testing
1	Spray patternator	To measure spray patterns of industrial spray nozzles (atomiser) , droplet distribution & uniformity.	5500	5000
2	Spray Rig 3a	To study spray at high pressure upto 10 bar.	1000	1000
3	2D Mini LDV	To measure the velocity of particle in the flow .	9000	8000
4	FTIR Spectrometer	To determine the organic functional groups in solid and liquid samples	1000	1000
5	Ash fusion tester	To determine the ash fusion temperature and other salient thermal transitions during melting of ash	2000	2000
6	Micro balance	To determine the mass of samples with an accuracy of 1 microgram	1000	1000
7	HPTGA Thermogravimetric Analyser	To determine the mass loss data of solid fuels when subjected to high temperatures (Upto 1000 C) and pressures (upto 100 bar) in different gas ambience	7000	7000
8	Pyroprobe 5200 High Pressure Pyrolyzer with Reactant Gas Operation	To obtain organic composition from pyrolysis and catalytic pyrolysis of solid fuels. This is interfaced with GC/MS	2500	2000
9	Gas chromatography with flame ionisation detector, Thermal conductivity detector and Mass spectrometer	To identify the organic constituents in liquid samples/fuels, and quantify them	2500	2000
10	Automatic microprocessor controlled calorimeter (bomb calorimeter)	To determine the higher heating value of solid and liquid fuels	1000	1000
11	Tensiometer " Attension SIGMA 700 "	To measure surface tension and inter facial surface tension of liquid fuels	1500	1500
12	Gel permeation chromatography	To obtain molecular weight distribution of polymer samples	1500	1000
13	Microwave reactor ROSO200A	For digestion of liquid samples and also conduct microwave assisted solvolysis and catalytic reactions.	1500	1000
14	Stabinger viscometer " ANTON PAAR SVM3000"	To measure density & viscosity of liquid fuels	1500	1500
15	Bomb calorimeter "IKA C2000 BASIC "	To measure higher calorific value of liquid & solid fuels	1000	1000
16	High speed camera motion xtra nxa 453	To acquire images at high framing rate.	3000	3000
17	Cone calorimeter	Test for heat and visible smoke release rates for materials up to a size of 100mm X 100mm with a peak heat release rate of 0.15 kW	3600	3500
18	Light system 600W led complete set	To freeze image at LED light pulse rate with high intensity	1000	1000
19	Open calorimeter	Test larger and multi-component samples up to a peak heat release rate of 200kW	8000	7000
20	High speed tomographic PIV	To measure time resolved three component velocity field in a volume	12000	11000
21	PDPA System with accessories	To measure droplet diameter & droplet velocity with high accuracy	6000	5000
22	Proximate Analyser	To perform proximate analysis of solid samples as per ASTM standard procedure.	1500	1500
23	ACE Forklift upto 3 ton capacity	For Material Handling	1000	1000
24	Nd:YAG laser 532 nm litron -Low speed PIV	For stereoscopic PIV & tomographic PIV	1000	1000
25	Wavelength meter WS6_200(standard)-3no with calibration light	To measure wavelength of laser beam	3500	3000
26	Nd:YAG laser 1064 nm - Low Speed LII / PLIF	To perform low speed LII & PLIF	1500	1500
27	Flow facility for supersonic combustion	To study physics of supersonic combustion at Mach 2.5	3000	2500
28	Nd:YAG plus tunable dye laser Quantel make - 10 Hz OH PLIF Laser	For CH,OH,NO and similar radical based PLIF experiments for low speed (upto 10 Hz) imaging application	5000	4500
29	Dantec High speed OH PLIF	For CH,OH,NO and similar radical based PLIF experiments for high speed (upto 10 KHz) imaging application	11500	10500
30	Scanivalve Pressure scanner	To measure static pressure in test section .	1500	1000