

CSIR-CENTRAL GLASS & CERAMIC RESEARCH INSTITUTE

196 RAJA S C MULLICK ROAD, Kolkata 700032, West Bengal, INDIA



TESTING FACILITY AND TESTING CHARGES

(with Effect from 01.04.2025)

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ADVANCED CERAMICS & COMPOSITES DIVISION (ACCD)

Sl. No.	Name of the Test(s)	Sample Specification	Rate(s) per Samples (Rs.)
1	Control atmosphere sintering, Atmosphere: Argon/Nitrogen/Vacuum:(10- 3 torr)	Maximum Sample size: 50mm dia. x 100 mm height	
	i) Basic charge up to 1500°C, 1 hr.		21340.00
	Extra. Charge per hour		1730.00
	ii) Basic charge between 1500°C-1800°C, 1 hr.		26740.00
	Extra. Charge per hour		2300.00
	iii) Basic charge between 1800°C-2000°C, 1 hr.		32030.00
	Extra. Charge per hour		2650.00
	iv) Basic charge between 2000°C-2200°C, (Max. 30 min hold)		4140.00
2	Hot pressing Temperature: 1700°C, Presser: 5 Mpa, Atmosphere: Argon/Nitrogen/ Vacuum: (10-3 torr)	Maximum Sample size: 70mm dia. x 50mm height	34680.00
	Extra. Charge per hour. Cost of Graphite die extra as per design		2820.00
3	Hot pressing Presser: 35MPa, Atmosphere: Argon/Nitrogen	Maximum Sample size: 170 mm dia. X 100 mm height	
	i) Basic charge up to 1500°C , 1 hr.		87860.00
	Extra. Charge per hour		6790.00
	ii) Basic charge between 1500°C-1800°C, 1 hr.		10470.00
	Extra. Charge per hour		8110.00
	iii) Basic charge between 1800°C-2000°C, 1 hr.		146460.00
	Extra. Charge per hour		13400.00
	iv) Basic charge between 2000°C-2200°C, 1 hr.		175670.00
	Extra. Charge per hour		26740.00
4	Spark Plasma Sintering Furnace Pressure : 35MPa, Atmosphere: Argon/Nitrogen/Vacuum		
	Sample Dia. 20-30 mm		
	i) Basic charge up to 1500°C, 5 min.	Maximum Sample size: dia. 80 mm and height 10 mm	15670.00
	ii) Basic charge between 1500°C-2000°C, 5 min.		18290.00
	iii) Basic charge between >2000°C, 5 min.		19840.00
	Extra. Charge per 5 min holding		1610.00
	Sample Dia. 60-80 mm		
	i) Basic charge up to 1500°C, 5 min.		15670.00
	ii) Basic charge between 1500°C-2000°C, 5 min.		18290.00
	iii) Basic charge between >2000°C, 5 min.		19840.00
	Extra. Charge per 5 min holding)		1610.00
5	Thermal Conductivity (per run)	Dia 12.4-12.6 mm Thickness 2-2.5 mm	5750.00

4M (Multiscale Microstructure and Mechanics of Materials)

(Mechanical Characterisation)

Sl. No.	Name of the Test(s)	Sample type/nature	Sample Specification	Rate(s) per Samples (Rs.)
1	Glass to Resin Ratio (Glass/Ash content) as per IS:10182	FRP/Composite materials	6" x 6" – 1 No. (Laminated Sheet); 2" x 1.6" - 1No. (Corrugated Sheet)	1730.00
2	Density/Specific Gravity (Composites) FRP/Plastics- ASTM:0792, IS: 10182, D4762-11a	FRP/Composite materials	IS: Standard – 1" x 15" – 1 No; 4" x 4" – 1 No. (Laminated Sheet)/ 2" x 1.6" - 1No. (Corrugated Sheet)	1730.00
3	Viscosity as per D2857-95(2007)	Liquid Resin/Favicall	Minimum: 500 ml.	2820.00
4	Monomer Content/Solid Content as per D3749-08	Liquid Resin	Minimum: 100 ml.	1500.00
5	Gel Time, as per ASTM:2471	Liquid Resin	Minimum: 500 ml.	1730.00
6	Gel Time with Peak Exothermic Temperature as per ASTM:D2471	Liquid Resin	Minimum: 500 ml.	2820.00
7	TEX MEASUREMENT ISO	Glass Roving	10 Meter	1210.00
8	Barcol Hardness ASTM:D2583, IS:12866 & BS:4994	Plastic/FRP Composite material	2" x 2" – 1 NO. (Laminated Sheet) / 2" x 1.6" - 1No. (Corrugated Sheet)	1210.00
9	Water Absorption as per ASTM:D570, IS: 10182 & BS:2782	FRP Composite/Plastics materials	10" x 10" - 1 No. (Laminated Sheet) / 2" x 1.6" - 1No. (Corrugated Sheet)	1730.00
10	Tensile Test as per ASTM:E8	Metal	Sample provided by party as per requirement (Dimensions)	
	a) Crosshead (Loading) speed <0.5 mm/min (1Pc.)			1730.00
	b) Crosshead (Loading) speed <0.5 mm/min (5Pcs.)			7020.00
	c) Crosshead (Loading) speed >0.5 mm/min (1Pc.)			980.00
	d) Crosshead (Loading) speed >0.5 mm/min(5Pcs.)			4260.00
11	a) Flexural Test (Cross-breaking)/Bending Strength/Modulus of Rupture ; Advance Ceramics as per C1341-06; Glass ASTM : C158 Ceramic- ASTM: C674 & C689 ; FRP/Plastics- ASTM: D790, BS: 2782 & IS: 10182.	Glass, Ceramic & Composites	Sample provided by by party as per requirement. Bar Sample: Glass: T 10 x L 250x W 50mm (10 pcs); Ceramic: T 5-10 mm x L 130-150mm x W 25mm (10 Pcs); Cement/Plaster: T 25x L 250x W 12.7mm (10 pcs); Rod Sample: Glass: D 6-8mm x L 120mm (10 pcs); Ceramics: D 4mm x L 120mm (10 Pcs. Set); Composite : Dimension	2820.00

			confirmed by Testing Division as per requirement.	
	b) Young's Modulus of Glass, Ceramic Glass-ASTM: C158 Ceramic- ASTM: C674 & C689 FRP/Plastics- ASTM: D790, BS:2782 & IS: 10182.	Glass/Ceramic/FRP Composites/Plastic	For Ceramic (5Pcs. Set): sample size : 60x6x5mm or 50x5x4 mm ; Composite : Dimension confirmed by the concerned testing division according to type of material	2820.00
12	a) Tensile Test	Composites, Rubber & Polymers	Laminated Sheet (Range >3mm to <10mm) for IS and ASTM Standard : Finished sample will be provided by party as per requirement (dimension) (5Pcs. Set)	2820.00
	b) Young's/E-modulus	Composites, Rubber & Plastics	Laminated Sheet (Range >3mm to <10mm) for IS and ASTM Standard : Finished sample will be provided by party as per requirement (dimension) (5Pcs. Set)	2820.00
	c) Percent Elongation of as per D638-10, FRP/Plastics- ASTM: D638, BS: 2782 & IS: 10182.	Composites, Plastics etc.	Laminated Sheet (Range >3mm to <10mm) for IS and ASTM Standard : Finished sample will be provided by party as per requirement (dimension) (5Pcs. Set)	2820.00
13	Tensile Test as per ASTM: D3379	Single Fibre (Glass/Carbon/Jute/Coir)	Specimen will be provided by party otherwise as per requirement(10pcs.)	4260.00
14	Impact Test (Charpy & Izod) as per ASTM: D256, BS: 2782 & IS: 10182.	Glass, Ceramic, Composites & Plastics /FRP/Plastics	Specimen will be provided by party as per requirement(10pcs.)	2820.00
15	Load Deflection Test as per IS:12866, BS: 4154	FRP Corrugated Sheet	5" x 3.6" Min. or 5'6" x 4' – 3pcs.	2820.00
16	a) Bolt-Shear Test IS:12866, BS: 4154	FRP Corrugated Sheet	Specimen will be provided by party as per requirement (6pcs.)	2820.00
	b) Shear Bond Strength	Resin-Zirconia/Dental Cement base sample	a batch of five nos test samples	2820.00
17	Young's Modulus by Resonance as per D 4435-08 (Elastosonic) (As per ASTM Standard)	Ceramic and Metal	Finished sample should be provided by party as per requirement. 5 Nos. (Parallel Surface)	4660.00
18	Compressive Strength/ Crushing Load as per C1424-10	Ceramic/Compositite/Refractory	Finished sample should be provided by party as per requirement. 5 Nos. (Parallel Surface)	2820.00

19	Vicker's Micro Hardness as per C1327- 08/Knoop Hardness	Ceramic/Glass/Metal	Minimum 5mm x 5mm x 5mm Cube – 6No ; 5-10 mm dia disc x 4 mm Thickness, Paralell surface and One surface should be polished (min 2 pcs)	3630.00
20	Vicker's Macro hardness Data using Macro indenter (100-300 N load) (data only)	Ceramic/Glass/Metal	Sample size : 20x20x5 mm parallelopiped samples or 25 mm dia disks ; 8-12 mm Thickness	5870.00
21	Vicker's Macro hardness Data of using Macro indenter (100-300 N load) with data and indent's optical picture with scale bar,	Ceramic/Glass/Metal	Sample size : 20x20x5 mm parallelopiped samples or 25 mm dia disks ; 8-12 mm Thickness	7020.00
22	Vicker's Micro hardness Data using Micro indenter (10-30 N load)(data only)	Ceramic/Glass/Metal	Sample size : 20x20x5 mm parallelopiped samples or 25 mm dia disks ; 8-12 mm Thickness	4660.00
23	Vicker's Micro hardness Data using Macro indenter (10-30 N load) with data and indent's optical picture with scale bar,	Ceramic/Glass/Metal	Sample size : 20x20x5 mm parallelopiped samples or 25 mm dia disks ; 8-12 mm Thickness	5870.00
24	Fracture Toughness by the Single Edge Notched Beam (SENB) Technique (data only),	Glass and Ceramics	Sample size : 50x5x4 mm parallelopiped samples	9320.00
25	Fracture Toughness by the Single Edge Notched Beam (SENB) Technique (data only) along with load displacement plots	Glass and Ceramics	Sample size : 50x5x4 mm parallelepiped samples	11680.00
26	Fracture Toughness by the Indentation Method using Macro indenter (100-300 N load) (data only),	Bulk Glass and Ceramics	Sample size : 25x25x10 mm parallelepiped samples or 25 mm dia disks, thickness – 10 mm	7020.00
27	Fracture Toughness by the Indentation Method using Macro indenter (100-300 N load) with indent's optical pictures with scale bar,	Bulk Glass and Ceramics	Sample size : 25x25x10 mm parallelepiped samples or 25 mm dia disks, thickness – 10 mm	9260.00
28	Fracture Toughness by the Indentation Method using Macro indenter (100-300 N load) with optical pictures with scale bar and crack length and hardness data,	Glass and Ceramics	Sample size : 25x25x10 mm parallelepiped samples or 25 mm dia disks, thickness – 10 mm	11680.00
29	Fracture Toughness by the Indentation Method using Micro indenter (10-30 N load) (data only),	Glass and Ceramics	Sample size : 25x25x10 mm parallelepiped samples or 25 mm dia disks, thickness – 10 mm	5870.00
30	Fracture Toughness by the Indentation Method using Micro indenter (10-30 N load) with optical pictures with scale bar,	Glass and Ceramics	Sample size : 25x25x10 mm parallelepiped samples or 25 mm dia disks, thickness – 10 mm	7020.00

31	Fracture Toughness by the Indentation Method using Micro indenter (10-30 N load) with optical pictures with scale bar and crack length and hardness data,	Glass and Ceramics	Sample size : 25x25x10 mm parallelepiped samples or 25 mm dia disks, thickness – 10 mm	9260.00
32	Nanohardness of Glass using Hysitron triboindenter (0.01 μ N- 12,000 μ N) (data only),		Sample size : 25x25x10 mm	17480.00
33	Nanohardness of Glass using Hysitron triboindenter at load range of (0.01 μ N- 12,000 μ N) with indent's Scanning Probe Microscope (AFM) pictures,		Sample size : 25x25x10 mm	20930.00
33	Nanohardness of Glass using Hysitron triboindenter at loads in the range of (0.01 μ N-12,000 μ N) along with indent's Scanning Probe Microscope (AFM) pictures and load depth plots,		Sample size : 25x25x10 mm	23180.00
34	Nanohardness of Bulk ceramics using Hysitron triboindenter at load range (0.01 μ N-12,000 μ N) (data only),		Sample size : 25x25x10 mm	17480.00
35	Nanohardness of Bulk Ceramics using Hysitron triboindenter at load range of (0.01 μ N-12,000 μ N) with indent's Scanning Probe Microscope (AFM) pictures, Sample size : 25x25x10 mm		Sample size : 25x25x10 mm	20930.00
36	Nanohardness of Bulk Ceramics using Hysitron triboindenter at load range of (0.01 μ N-12,000 μ N) along with indent's Scanning Probe Microscope (AFM) pictures and load depth plots,		Sample size : 25x25x10 mm	23180.00
37	Nanohardness of thin films using Hysitron triboindenter at load range (0.01 μ N- 12,000 μ N) (data only),		Sample size : 25x25 mm by t (micron) [t-film thickness]	17480.00
38	Nanohardness of thin films using Hysitron triboindenter at load range of (0.01 μ N- 12,000 μ N) with indent's Scanning Probe Microscope (AFM) pictures,		Sample size : 25x25 mm by t (micron) [t-film thickness]	20930.00
39	Nanohardness of thin films using Hysitron triboindenter at load range of (0.01 μ N- 12,000 μ N) along with indent's Scanning Probe Microscope (AFM) pictures and load depth plots,		Sample size : 25x25 mm by t (micron) [t-film thickness]	23180.00

Central Material Characterisation Facility (CMCF)

Sl. No.	Name of the Test(s)	Sample type/Nature	Sample Specification	Rate(s) per Sample (Rs.)
1	Co-efficient of linear thermal expansion and supply of data with Curve, Glass transition, Softening point , etc. [DIN:51045, ASTM E 831-86] RTE, TDA - Thermal Dilatometer Analysis, INST.: NETZSCH make Dilatometer 402C.	Solid cylindrical	25 mm (length x 6-8 mm dia) (Three identical specimens for each sample)	
	(i) Up to 1200°C (only heating curve)			3970.00
	(ii) Up to 1500°C (only heating curve)			5870.00
	(iii) Extra charge for cooling curve, if required			1500.00
	(iv) - 40°C to 400°C			5500.00
2	Differential thermal analysis (DTA): [DIN: 51007, ASTM E 473-85]	Powder	200 mg /10 micron (approxly)	
	(i) Up to 1200°C (only heating curve)			5470.00
	(ii) Up to 1500°C (only heating curve)			6790.00
	(iii) Extra charge for cooling curve, if required			1500.00
3	Thermo-gravimetric analysis (TGA): [DIN: 51006, ASTM E 914-83]	Powder	200 mg /10 micron (approxly)	
	(i) Up to 1200°C (only heating curve)			5470.00
	(ii) Up to 1500°C (only heating curve)			6790.00
	(iii) Extra charge for cooling curve, if required			1500.00
4	Determination of Specific heat: [ASTM E 1269] ; DSC - Differential Scanning Calorimetry	Powder/ Bulk	Powder: 200 mg /Bulk: 5.2 mm dia/0.25 - 0.5mm thick	
	(i) Up to 1000°C (only heating curve)			6790.00
	(ii) Up to 1400°C (only heating curve)			8110.00
	(iii) Extra charge for cooling curve, if required			1500.00
5	Particle Size Analysis (micron range) using LASER Diffraction System [ISO:13320-1]	Powder	1 gm	6100.00
6	(i) Nano particle size analysis by DLS (Dynamic Light scattering)	Dispersion	20 ml dispersed sol.	5290.00
	(ii) Zeta potential			5290.00
	(iii) Isoelectric point determination			7020.00
7	i) Determination of Thermal Conductivity (within 80°C) at single temperature point; for Solid Sample only RT; Liquid/Paste sample any temperature within 80°C	Solid/ Liquid/ Paste	Bulk sample(two nos of identical samples)/Dia: 50mm., Height:20.5mm /Liquid/paste sample: 80c.c/Powder samples: 25 c.c.	10990.00
	ii) Determination of Thermal Conductivity up to 400°C			14550.00
	iii) Determination of Thermal Conductivity up to 1000°C			31740.0
8	Determination of carbon content in sample (Carbon Analyser C 600 LECO, USA)		4 ml for liquid sample (5-10) CC Powder	2420.00

			sample	
9	(i) Surface area measurement by BET method [ASTM B 922-10]	Powder	30 cc powder sample	5470.00
	(ii) Pore volume and Pore size by N ₂ gas adsorption (if surface area > 20 m ² /gm)	Powder		8110.00
10	Measurement of Density of sample (any shape) by Gas Pycnometry		100 cm ³ volume / 3-5 mm	1730.00
11	Pore size distribution by mercury Porosimeter: [ASTM D 4284-07]	Solid	15 cc powder sample / 6 mm x 3 mm x 4 mm of solid sample 10 to 15 pieces.	5075.00
	Porosity measurement (Bulk Density provided by user)	Solid		
12	Determination of Nitrogen content in sample		4 ml for liquid sample / 4mm x 4 mm x 10 mm for solid sample	2420.00
	LECO TC 600 O ₂ /N ₂ determinator			
13	Determination of Oxygen content in sample		4 ml for liquid sample / 4mm x 4 mm x 10 mm for solid sample	2420.00
14	Evaluation of Rheological Properties of gels, pastes and other viscous substances.	Slurry		
	(i) Flow characterization		50 ml	3630.00
	(ii) Creep and relaxation analysis		50 ml	3630.00
	(iii) Thixotropic analysis		50 ml	3630.00
	(iv) Oscillation		50 ml	3630.00
15	Magneto-Rheology (at 3 magnetic field values)	Slurry	50 ml	4950.00
16	Fourier-Transform Infrared Spectroscopy, absorption/emission spectra	Powder/Film	500 mg	1000.00
17	Sample preparation charge as applicable			1210.00

(CHEMICAL CHARACTERISATION)

Sl. No.	Name of the Test(s)	Sample Specification	Rate(s) per Samples (Rs.)
1	Quantitative chemical analysis of ceramic raw materials, finished products and industrial waste for determination of 09 constituents : SiO ₂ , Al ₂ O ₃ , Fe ₂ O ₃ , TiO ₂ , CaO, MgO, Na ₂ O, K ₂ O and loss on ignition	Minimum 100g powdered sample	16050.00
2	Quantitative chemical analysis by wet chemical method for determination of each of the following constituents SiO ₂ , Fe ₂ O ₃ , TiO ₂ , CaO, MgO, PbO, BaO, SrO, ZnO, CdO, CuO, MnO ₂ , Li ₂ O, CoO, NiO, B ₂ O ₃ , SO ₃ , Na ₂ O & K ₂ O)	Minimum 50g powdered sample	3340.00
3	Quantitative chemical analysis by wet chemical method for determination of each of the following constituents (Al ₂ O ₃ , ZrO ₂ , Cr ₂ O ₃ , P ₂ O ₅)	Minimum 50g powdered sample	5700.00
4	Quantitative chemical analysis by ICP AES for determination of each element (Si, Al, Fe, Ti, Ca, Mg, Na, K, Li, Sr, Ba, Mn, Zn, Zr, Cu, Cr, Ni, Co, Mo, Pb, Cd, Pt, Pd, As, Sb, S, P, Ag)	Minimum 50g powdered sample	4660.00
5	Quantitative chemical analysis by AAS (Atomic Absorption Spectroscopy) for determination of each element (Pb, Cd, As)	Minimum 50g powdered sample	3340.00
6	Quantitative chemical analysis by UV-VIS Spectrophotometer for determination of each element (Fe, Ti)	Minimum 50g powdered sample	3340.00
7	Quantitative chemical analysis by Flame photometer for determination of each element (Na₂O, K₂O, Li₂O)	Minimum 50g powdered sample	3340.00
8	Quantitative chemical analysis of Fluoride / Chloride by Ion selective electrode	Minimum 50g powdered sample	3340.00
9	Determination of loss on ignition / ash content of carbonaceous material / graphite	Minimum 50g powdered sample	3340.00
10	Grading of glass for Alkalinity as per IS : 2303-1994	Minimum 500g solid sample (not powdered)	4660.00
11	Determination of Lead and Cadmium extracted from Glazed Ceramic surfaces as per ASTM C 738-94 (Each element)	Minimum 6 pieces of sample	4660.00
12	Acid Resistance of bricks as per IS:4860-1968	Minimum 500g solid sample (not powdered)	4660.00
13	Chemical Analysis of Water	Minimum 1 litre	
	i. pH measurement		1730.00
	ii. Hardness test		7420.00
	iii. TDS test		3740.00
	iv. Arsenic by FI-HG-AAS		4660.00
	v. Fluoride / Chloride		1730.00
	vi. ICP AES analysis of each element (Si, Al, Fe, Ca, Mg, Na, K, Sr, Ba, Mn, Zn, Cu, Cr, Ni, Co, Mo, Pb, Cd, S, P)		2300.00

14	Chemical analysis of castable (Al ₂ O ₃ , Fe ₂ O ₃ , TiO ₂ , CaO)	Minimum 100g powdered sample	9430.00
15	Quantitative chemical analysis of Glass and Frit :	Minimum 100g	
	SiO ₂ (wet chemical method) :		3340.00
	B ₂ O ₃ (wet chemical method) :		3340.00
	Al ₂ O ₃ , Fe ₂ O ₃ , TiO ₂ , CaO, MgO, Na ₂ O, K ₂ O (ICP AES Method, 7 x Rs. 2300.00)		16100.00
	Total cost		22780.00
16	Quantitative chemical analysis of Silica Ramming mass and Rice Husk Ash :	Minimum 100g	
	SiO ₂ (wet chemical method) :		3340.00
	LOI (wet chemical method) :		3340.00
	Al ₂ O ₃ , Fe ₂ O ₃ , TiO ₂ , CaO, MgO, Na ₂ O, K ₂ O (ICP AES Method, 7 x Rs. 2300.00)		16100.00
	Total cost		22780.00
17	Quantitative chemical analysis of Fly Ash :	Minimum 100g	
	SiO ₂ (wet chemical method) :		3340.00
	LOI (wet chemical method) :		3340.00
	Al ₂ O ₃ (wet chemical method) :		5700.00
	Fe ₂ O ₃ , TiO ₂ , CaO, MgO, Na ₂ O, K ₂ O (ICP AES Method, 6 x Rs. 2300.00)		13800.00
	Total Cost		26180.00
18	Quantitative chemical analysis of Magnesite :	Minimum 100g	
	SiO ₂ (wet chemical method) :		
	LOI (wet chemical method) :		3340.00
	MgO (wet chemical method) :		3340.00
	Al ₂ O ₃ , Fe ₂ O ₃ , TiO ₂ , CaO, Na ₂ O, K ₂ O		3340.00
	(ICP AES Method, 6 x Rs. 2300.00)		13800.00
	Total cost		23820.00
19	Determination of % Sodium dichromate (Na ₂ Cr ₂ O ₇) as per IS:249- 1979	Minimum 50g powdered sample	7310.00
20	Sample preparation for chemical analysis		1500.00

XRD/ XRF/FESEM/XPS

Sl. No.	Name of the Test(s)	Sample Specification	Rate(s) per Samples (Rs.)
1	XRD Diffractogram without any analysis	Min. 5gms. Powder or Solid sample/ Thin Film Length x Breadth x Width(cm) 2.5cm x 1.5cm x 0.5cm(Min.)/6 cm x 3 cm x 1cm(Max.)	2130.00
	Soft Copy		180.00
2	XRD Diffractogram with qualitative phase analysis	-do -	3630.00
3	XRD Diffractogram with quantitative phase analysis	-do -	7020.00
	a) Sample containing less or equal to three phases multiphase)		

	(b) Sample containing more than three phases (multi-phase)	-do -	11680.00
4	XRD Diffractogram with only amorphous phase quantification	Minimum 10 gms powder	7020.00
5	Semi-Quantitative elemental analysis by X-Ray Florescence (XRF)	Minimum 8 gms powder	8580.00
6	To Study the materials interaction at atomic level by using XPS	50mg powder of Pellet of 5mm diameter sample	10570.00

FIELD EMISSION SCANNING ELECTRON MICROSCOPY (FESEM)

Sl. No.	Name of the Test(s)	Sample Specification	Rate(s) per Sample (Rs)
1	High Resolution Micro structural analysis by Field Emission Scanning Electron Microscopy (Including conducting coating & 6 nos. of micrographs). (FS)	Bulk: 2 x 2 x 0.5mm(min); 10 x 10 x 5mm (max) : Powder: 100 mg.(min) 1gm.(max)	7080.00
	SOFT COPY		180.00
2	Additional Micrographs (a package of 4) (FS-A)		980.00

EDAX Analysis

Sl. No.	Name of the Test(s)	Sample Specification	Rate(s) per Samples (Rs.)
1	Elemental Analysis by Energy Dispersive X-Ray Analysis (EDX) in FESEM (Including conductive coating).	Bulk: 2 x 2 x 0.5mm(min); 10 x 10 x 5mm (max) : Powder: 100 mg.(min) 1gm.(max)	8230.00
	SOFT COPY		180.00
2	Elemental Distribution Analysis EDX Line Scanning/ Dot Mapping in FESEM (Including conductive coating) (EDX-LS)	Bulk: 2 x 2 x 0.5mm(min); 10 x 10 x 5mm (max) : Powder: 100 mg.(min) 1gm.(max)	10760.00

TRANSMISSION ELECTRON MICROSCOPY (TEM)

Sl. No.	Name of the Test(s)	Sample Specification	Rate per Sample (Rs.)
1	Transmission Electron Microscope (TEM) studies (Includes powder sample preparation only and 6 micrographs)	Powder:100mg(min) 1gm(max)	9040.00
2	Additional Micrographs (a package of 4)	-----	1500.00

Sample Preparation for TEM Study

1	For bulk sample	3 D x 10 L (mm, min) ; 10 x 10 x 20 (mm, max)	5470.00
2	For Cross-sectional view of thin films/layers on substrates	2.5W x 10L x 0.2T(min) ; 2.5W x 10L x 1T(min)	8230.00

EDAX Analysis

Sl. No.	Name of the Test(s)	Sample Specification	Rate per Sample (Rs.)
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1	Elemental Analysis by Energy Dispersive X-Ray Analysis (EDX) in SEM/FESEM/TEM (Including conductive coating).	Same as TEM sample	8230.00
2	Elemental Distribution Analysis EDX Line Scanning in SEM / FESEM/TEM (Including conductive coating) (EDX-LS)	Same as TEM sample	10760.00
3	Elemental Distribution Analysis EDX Dot Mapping in SEM / FESEM/TEM (Including conductive coating) (EDX-DM)	Same as TEM sample	10760.00

ENERGY MATERIALS AND DEVICES DIVISION (EMDD)

Sl. No.	Name of the Test(s)	Sample Specification	Rate(s) per Sample (Rs)
1	Li-ion coin cell fabrication (2032 type) without powder processing or casting		2130.00
2	Li-ion coin cell fabrication (2032 type) including powder processing and casting	Minimum 1 gm sample	4140.00
3	Galvanostatic charge discharge (Range 6 V, 500 mA)		
	Up to 3 cycles		2130.00
	Up to 10 cycles		6100.00
	Up to 50 cycles		10070.00
	Up to 300 cycles		20240.00
4	Cyclic voltammetry (Limit 6 V, 1 A)		
	Normal Scan (≥ 1 m V/s)		4140.00
	Slow Scan (< 1 m V/s)		6100.00
5	Electrochemical impedance spectroscopy (Range 1 mHz to 100 kHz)		2130.00
6	Other electrochemical tests		Rate as per request

FUNCTIONAL MATERIALS AND DEVICES DIVISION (FMDD)

Sl. No.	Name of the Test(s)	Sample Specification	Rate(s) per Samples (Rs.)
1	Current- Voltage property of some films using I-V Source measuring unit	Films	1210.00
2	To determine the surface profile of coating & Thin films by Profilometer	Thin Films	390.00

SPECIALTY GLASS DIVISION (SGD)

Sl. No.	Name of the Test(s)	Sample Specification	Rate per Sample (Rs.)
1	Generation of Glass Annealing Curve including Co-efficient of linear thermal expansion, Dilatometric Softening Point, Strain Point and Annealing Point.	6-8 mm (dia) x 25 mm length	80040.00
2	Co-efficient of linear thermal expansion of Glass and supply of data with Curve including Dilatometric Softening Point.	6-8 mm (dia) x 25 mm length	6270.00
3	Spectroscopic measurement of overall transmission in UV/Visible/NIR	25mm x 25mm x at actual thickness	1570.00
4	(a) Whether Sheet Glass or Float Glass	100mm x 100mm x at actual thickness	7190.00
	(b) Thickness of the Glass	At actual size and thickness. Sample should be flat	1900.00
5	Determination of Density of Glass	10mm cube – 20mm cube /rectangular block	2650.00
6	(a) at one wavelength of light	20mm x 20mm x 2mm	3630.00
	(b) at each additional Wavelength	20mm x 20mm x 2mm	1500.00
	c) Refractive index (nd) and Abbe number (Vd)	20mm x 20mm x 2mm	3090.00
	(d) Abbe number (Vd) only	20mm x 20mm x 2mm	3090.00
7	Polarization test for toughened window glasses	100mm-200mm x 100mm-200 mm x at actual thickness	6270.00
8	Softening Point Test	5mm x 5mm x 3mm	7710.00
9	Optical microscope observation	20 -25mm x 20 -25mm x 2-5mm thick parallel optical polished surfaces	9260.00
10	Residual Stress test Expert opinion on the overall result (for 5 samples Max.)	50 – 150 mm x 50 – 150 mm x 50 – 150 mm	9660.00 13400.00
11	Samples for Tempered or Toughening of opal glass articles/transparent glass articles	As such product	25820.00
12	Fabrication/ Sample preparation charge wherever applicable		2000.00
13	Thermal Shock Resistance/ Thermal durability	As such product (1 ft x 1 ft)	25820.00
14	Young's modulus, Poisson's Ratio and Bulk Density		5470.00
15	Viscosity Measurement using FRS 1800 High temperature Viscometer (Make Anton Paar, Austria)	100g powder sample	29510.00
16	Glass Melting (Platinum crucible)		19225.00
	Glass Melting (Refractory crucible)		11730.00
17	Raman Spectroscopy	Powder, bulk samples, thin films Range: 50 – 3000 cm ⁻¹ : Laser Sources: (i) 488nm Argon ion laser (20mW) (ii) 785nm diode laser (100mW). Detector: TE cooled CCD detector; Additional:	1620.00

		Equipped with LINKAM temperature controller (-150°C to 600°C)	
18	Vicker's/Knoop Micro Hardness only data	10mm x 10mm x actual thickness	4660.00
19	Vicker's/Knoop Micro Hardness data with optical picture	1" x 1" X actual thickness	5870.00
20	Detection of defects like cracks, bubbles, scratches, unmelted particles in Glass lenses of glass blocks samples by shadow technique		25300.00
21	Expert Opinion		5470.00
22	Contact Angle (Srikrishna Manna)	Coated or uniform shaped flat sample dimension (Sample size Minimum 1" x 1" to Maximum 4" x 4")	1380.00
23	Fragmentation Test	Min 600mm x 600mm	31000.00

REFRACTORY & TRADITIONAL CERAMICS DIVISION (RTCD)

Sl. No.	Name of the Test(s)	Sample Type	Sample Specification	Rate(s) per Sample (Rs)
1	Sieve Analysis as per IS : 1528 (Part – XIV)	Refractory Sample	1 kg material (minimum)	
	a) Dry			2300.00
	b) Wet (single sieve)			3220.00
2	Size tolerance as per IS : 1528 (Part – X)	Brick	Minimum 30 nos. of sample or as desired by the party	810.00
3	PCE/Refractoriness (Pyrometric Cone Equivalent) as per IS:1528 (Part-I)		1 kg material (-72 BS)	6250.00
4	RUL (Refractoriness Under Load) as per IS:1528 (Part-II)		50mm dia x 50mm height (2 nos.)	6250.00
5	PLCR (Permanent Linear Change after Reheating) as per IS:1528 (Part-VI)		50 x 50 x 60 mm / 50 mm dia 60 mm height (5 nos. of samples)	
	(a) Up to 1400°C for 5 hours			10760.00
	(b) Above 1400°C and up to 1600°C for 5 hrs			13920.00
6	Spalling resistance test as per IS:1528 (Part-III) Prism method by air quenching up to 1000°C (Thermal Shock Resistance)		3" x 2" x 2" or 50mm (dia) x 50mm (H) (3 nos. of samples)	15360.00
7	CCS (cold Crushing Strength) as per IS:1528(Part- IV) (Sample preparation charge extra)		3" cube or std. size bricks (5nos. of samples)	2300.00
8	a) Hot MOR (up to 1400°C) IS : 1528 (Part XX)	Brick/Prefired Castable	150mm x 25mm x 25" (5 nos of samples)	10320.00
	b) CMOR (Cold Modulus of rupture) as per IS: 1528 (Part-V) (Sample preparation charge extra)	Standard Brick/Castable	160 x 40 x 40 mm or std. size bricks (5nos. of samples)	2300.00
9	Water Absorption/Apparent Porosity/ Bulk density/ Apparent Specific gravity as per IS : 1528 (Part- VIII) (Sample preparation charge extra)	Brick	65 x 65 x 40mm or std. size bricks (5nos. of samples)	2300.00
10	True density/Specific gravity as per IS:1528 (Part- IX) (Sample preparation charge extra)	Brick/Castable	500 gm powder (150 micron)	2650.00

11	True porosity / Closed Porosity as per IS:1528 (Part XV) (Sample preparation charge extra)		Standard Bricks (5 nos. of samples)	4370.00
12	Compressive strength/ modulus of rupture as per IS:10570:	Monolithic /Castable	6 kg sample for a particular temperature	
	a. after 24 hrs. curing			3220.00
	b. after 72 hrs. curing			3740.00
	c. after firing at temp up to 1000°C (3 hrs) ...			8630.00
	d. after firing at temp up to 1400°C (3 hrs) ...			12310.00
	e. after firing at temp up to 1550°C (3 hrs) ...			13920.00
13	Firing in electric furnace : a) up to 1000°C (5 hrs)		As desired by the party	7190.00
	b) up to 1500°C (5 hrs)		As desired by the party	10760.00
	c) up to 1700°C		As desired by the party	15000.00
14	Abrasion Resistance/Abradability index as per B.S. 1902 Part-1A By Morgan Marshal Index Method	Refractory sample	3" x 2" x 1" ; 4nos. of samples	4370.00
15	Static Cup Slag Resistance		Sample details	15360.00
16	MOHS' Scale Hardness		Regular shape sample with smooth surface (Defect Free)	1730.00
17	Dry & Fired Shrinkage (each) (firing Charge extra)			2300.00
18	Creep Test upto 1500°C	Pre fired Refractory Sample	50 mm dia x 50 mm height; 10-12 mm dia (two identical sample)	
	a) 5 to 25 h			17410 .00
	b) 5 to 50 h			34500.00
20	Thermal Diffusivity up to 1000°C for Ceramic Sample			4220.00
19	Sample preparation charge as applicable			1610.00
20	Sample preparation charge for Fabrication of Castable Samples (per sample)			2650.00
21	Expert Opinion			5470.00

TRADITIONAL CERAMICS

Sl. No.	Name of the Test(s)	Sample Type/Nature	Sample Specification	Rate(s) per Sample (Rs.)
1	Water Absorption as per IS 13630 (Pt 2) /Apparent Porosity/ Bulk density	Fired samples	Minimum. 5 nos	2300.00
2	Firing Between 1000°C to 1350°C in electric furnace (one firing) and examination of fired characteristics like: Colour, Shrinkage, Water Absorption, Apparent Porosity and Bulk density		Size of the tiles: 6'x 6' and 8' x 8' (No of tiles max. four) on each cycle	13920.00
3	a) Determination of Moisture Expansion using boiling water- unglazed tiles as per IS:13630 (Pt 3) - 1992	Unglazed tiles	Minimum. 5 nos	2820.00

	b) Determination of Thermal shock resistance of tiles as per IS : 3630 (pt %)- 1992 +	Tiles	Minimum. 5 nos	2420.00
	Water Absorption (must)			2300.00
4	Determination of modulus of rupture as per IS:13630 (part 6)-2006	Tiles	Minimum. 7 nos/ As per IS 13630 (part 6) : 2006	800.00
5	Burnt Clay Building Bricks as per IS - 3495:1992			
	i) Water Absorption (Pt - 2)		Minimum. 5 nos /As per IS 5454 (1978)	2420.00
	ii) Efflorescence (Pt - 3)		Minimum. 5 nos	4140.00
	iii) Warpage (Pt - 4)		Minimum. 5 nos	4140.00
Test detail of various types of Ceramic bodies				
6	Grit Content	Clay sample		980.00
7	Water of Plasticity	Clay sample		1610.00
8	Plasticity By Hand Feel	Clay sample		340.00
9	Atterbeg Number	Clay sample		1100.00
10	Slaking test	Clay sample		340.00
11	Dry Liner Shrinkage			530.00
12	Dry/Green/Fired MOR (without firing)	Clay sample		800.00
13	FIRED Color	Clay sample		340.00
14	Water Absorption, Aparent Valoume Porosity, bulkdensity	Clay sample		2300.00
15	Total Linear Shrinkage	Clay sample		530.00
16	Water Absorption, Apparent Porosity, Bulk density with fabrication of bar and one firing upto 1300°C (Max) (Single mix up to 24 hrs. grinding/ max. ten samples or 1 kg. batch)	Clay sample	Single mix upto 24 hrs. grinding/ max. ten samples or 1 kg. batch	11390.00
17	Dry & Firing Shrinkage with fabrication of bar and one firing upto 1300°C (Max)		Single mix upto 24 hrs. grinding/ max. ten samples or 1 kg. batch	10870.00
18	Sample preparation	Clay sample		1060.00
19	Expert Opinion on types of Tiles/Bricks			5470.00

Membrane and Separation Technology Division (MSTD)

Sl. No.	Name of Test(s)	Sample Type/Nature	Sample Specification	Rate(s) per Sample (Rs.)
1.	Liquid permeability of water through porous samples	Sintered porous ceramic / metallic material	i. Sample shape & size : (a) Flat sample : ϕ 5 mm – 50 mm, sample thickness: 2mm-10 mm (max) (b) Hollow tube of single channel / multichannel configuration: Outer dia.- 6mm, 10mm, 25mm & 34mm; Sample length- 200 mm to 1000 mm ii. Operating water pressure: up to 10 bar. iii. Sample information needed : material of composition, sintering temperature, total porosity (approx.), toxicity (if any), any special instruction.	2000.00

Sampling and Analysis charges for Water and Wastewater

Sl. No	Name of the Tests	Sample Volume /Quantity	Rate per Sample (Rs.) excluding GST
1.	Sample Processing / Pre-treatment Charge		1150.00
2.	pH	500 ml	190.00
3.	Temperature	500 ml	120.00
4.	Conductivity	500 ml	190.00
5.	DO(Dissolved Oxygen)	500 ml	460.00
6.	BOD	1 ltr	1840.00
7.	Oil & Grease	500 ml	690.00
8.	Turbidity	500 ml	190.00
9.	COD(Chemical Oxygen Demand)	1 ltr	920.00
10	Total Kjeldal Nitrogen	500 ml	1150.00
11	Total Dissolved Solid	500 ml	350.00
12.	Fluoride, Chloride, Bromide, Nitrate, Sulphate, Phosphate, : Ion Chromatography analysis	500 ml	4030.00
13.	Lithium, Sodium, Potassium, , Calcium, Magnesium, Copper, Nickel, Zinc, Cobalt, Cadmium, Iron: Ion Chromatography analysis	500 ml	4030.00
14.	Total Suspended Solids	500 ml	690.00
15.	Total Organic Carbon	500 ml	1150.00

Through Pore Size Measurement : Bubble Point Method

Sl. No	Name of the Tests	Sample Volume /Quantity	Rate per Sample (Rs.) excluding GST
1.	Through pore size measurement : bubble point method <u>Measureable data:</u> (i) Min. pore size (ii) Max. pore size (iii) Mean Flow Pores size (iv) Bubble point flow & Pressuer	i. Sintered porous ceramic / metallic material ii. Sample shape & size : (a) Flat sample : ϕ 2.5 cm \pm 0.1 mm, sample thickness: 0.5 mm – 1.0 mm (b) Hollow tube of single channel / multichannel configuration : Outer dia.- 10 mm, 25 mm & 34 mm; Sample length- 110 mm (min) to 1000 mm (max) iii. Pore size range : 0.15 μ m (min.) to 100 μ m iv. Wetting liquid : water. v. Sample information : material of composition, sintering temperature, total porosity (approx.), toxicity (if any), Mercury Intrusion Pore size measurement data (optional), any special instruction.	2600.00