

**PROVISION OF DATA REGARDING EXISTING FACILITIES / LABORATORY TESTS AVAILABLE AT PCSIR LABORATORIES COMPLEX, LAHORE**

S. No.	Description of Services	Test Method
<b>Applied Chemistry Research Center (ACRC)</b>		
<b>Pharmaceutical Section</b>		
1	Steroids Analysis (Qualitative)	British Pharmacopoeia
2	Steroids Analysis (HPLC)	British Pharmacopoeia
3	Narcotics	HPLC/USP
4	Analysis of Pharmaceutical Samples with Spectroscopy	BP/USP
5	Analysis of Pharmaceutical Samples with HPLC	BP/USP
6	Estimation of Nicotine in Tobacco	HPLC/BP
7	Purity of Organic Compounds	GC, HPLC, LCMS and UV/AOAC/BP/USP
8	Drug testing for purity (BP grading)	BP/USP
9	Acute toxicity test (Oral / Parenteral)	Screening method in Pharmacology
10	Disintegration	----
11	Dissolution	----
12	Dermal Irritant Test	Screening method / BP
13	Pyrogen Test	USP/BP
14	Bioburden Test	BP-/ USP
15	Microbiology/TPC/Sterility testing	USP / BP
16	Mineral / Metal Contents	BS, USP
17	Drug Residues Testing	BP, USP
18	Estimation of Herbal Active Ingredients	---
19	Preparation of Herbal Extract	---
20	TPC	BP,, USP
<b>Paper Section (Printing Paper / Box Board / Duplex Board / Bleach Board)</b>		
21	Grammage	ASTM / D646-96
22	Burst factor / Burst Strength	ASTM/D774M-97
23	Tear factor / Tear strength	ASTM D689-03
24	Brightness	TAPPI T-524
25	Opacity	TAPPI T-619
26	Gloss / Glazed	---
27	Quality / Paper Texture	---
28	Thickness	ASTM D645-97
29	Density	
30	Bulk	
<b>Paper Section (Carbon Paper / Z-fold Braille Paper)</b>		
31	Grammage	ASTM D646-96
32	Burst strength	ASTM D774 M-97
33	Ash content	ASTM D586-97
34	Wax content / Bitumen content	
<b>Paper Section (CBS / Security Check Paper)</b>		
35	Complete testing	---
36	Fine spray / Water proofing	---

S. No.	Description of Services	Test Method
<b>Paper Section (Insulating Material)</b>		
37	Moisture	ICE-6O641-2-13
38	Ash content	ICE-6O641-2-14
39	Conductivity of Aqueous extract	ICE-6O641-2-15
40	pH value of aqueous extract	ICE-6O641-2-16
41	Oil absorption	ICE-6O641-2-17
42	Density	ICE-6O641-2-6
<b>Leather Section</b>		
<b>Physical Testing:</b>		
43	Tensile strength	IUP 6 (SLP 6)
44	Elongation	IUP 6 (SLP 6)
45	Tearing Load (Double edge)	IUP 8 (SLP 7)
46	Water vapour permeability	BS EN 420:2003
47	Water vapour absorption	BS EN ISO 17229:2002
48	Shrinkage temperature	SLP 18 (IUP 16)
49	Abrasion resistance	BS EN 388:2003
50	Sole of adhesion	---
51	Dexterity (Protective gloves)	BS EN 420:2003
52	Tear resistance (Single edge)	BS EN 388:2003
53	Colour fastness to rubbing (wet & dry)	SLF 5(BS 1006 UK-LC)
54	Colour fastness to perspiration	SLF 426 (IUF 426)
55	Colour fastness to washing	SLF 423 (IUF 423)
56	Colour fastness to water	SLF421 (IUF 421)
57	Colour fastness to dry cleaning	SLF 12 (BS 1006:D01)
<b>Chemical Testing:</b>		
58	AZO dyes	TLC Method
59	Pentachloropheol (PCP)	Combination of CLRI & Freiburg Methods
60	Formaldehyde	IUC 19 (SLC 23)
61	Chromium-VI	SLC 22 (IUC 18)
62	Chromic oxide	SLC 8 (IUC 8) / SLC 135 (SLT 6/1)
63	Basicity	SLC 136 (SLT 6/2)
64	pH	SLC 13 (IUC 11; BS 1309:9) /BS EN 420:2003
64	Ash content	SLC 6(IUC 7)
65	Fat content	SLC 4 (IUC 4; BS 1309:4)
66	Water soluble	SLC 5 (IUC 6)
67	Hide substance	SLC 7 (IUC 10)
68	Volatile matter	SLC 3 (IUC 5)
69	Heavy Metals: Pb, Cd, Ni, Co, Cu, Mg, etc	AAS Method
69	Phthalate analysis	In-house methods
<b>Polymer Section</b>		
<b>Polymers, Plastic &amp; Rubbers</b>		
70	Material Evaluation for identification of base polymer (high and low density polyethylene polypropylene, polystyrene, nylon etc.)	---
<b>Polymers i.e. Polyethylene &amp; Polypropylene</b>		
71	Quality (virgin/recycled ) for Polyethylene & Polypropylene	

S. No.	Description of Services	Test Method
72	Heat Reversion of Pipes	
73	Quality estimation of Additives by GC-MS in Polymer	
<b>Plastic Materials</b>		
74	<b>Polymer Additives as</b>	
75	Filler content (%age by weight)	
76	Plasticizer content (%age by weight)	
77	Quantification of BHT by GLC in polyolefin	
<b>Polymeric Materials and Paint Formulations</b>		
78	Quantification of Trace Metals (Pb, Cd, Cr etc.)	
79	Qualitative Evaluation of Phthalates by GC-MS	
<b>Paint</b>		
80	Evaluation of road marking <b>Chlorinated Rubber Paints</b> <ol style="list-style-type: none"> <li>1. Pigment percentage</li> <li>2. Vehicle solvent and additives percentage</li> <li>3. Drying time</li> <li>4. %age of Volatile contents</li> <li>5. %age of Non Volatile contents</li> <li>6. Mass/ltr.</li> </ol>	
81	Evaluation of road marking <b>Thermoplastic Paints</b> <ol style="list-style-type: none"> <li>1. %age of binder (Resin &amp; oil)</li> <li>2. %age of Aggregate pigment ,extender and ballotini</li> <li>3. Softening point (Resin flakes)</li> <li>4. Density</li> <li>5. Flash point</li> </ol>	
82	<b>Enamel Paint</b> <ol style="list-style-type: none"> <li>1. Total solid contents</li> <li>2. Drying time (Surface dry Hard dry)</li> <li>3. %age of Volatile contents</li> <li>4. %age of Non Volatile contents</li> <li>5. Specific gravity</li> <li>6. Mass per liter</li> <li>7. Hiding power</li> </ol>	
<b>Polymers</b>		
83	Melting range	
84	Density/Specific gravity	
85	%age of Volatile content	
<b>Plastic Materials</b>		
86	Tensile Strength %age Elongation	
<b>Plastic Sheets</b>		
87	Thickness of Plastic Sheets	
<b>Glass Reinforced Plastics</b>		
88	%age of Resin %age of Glass fiber %age of Inorganic Filler	

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<b>Petrochemical Section</b>		
89	Quality Analysis Bitumen (60/70)	AASHTO M-20
90	Quality Analysis (Emulsified asphalt (RS)	AASHTO M-140
91	Quality Analysis (Asphalt Rapid curing)	AASHTO M-81
92	Quality Analysis (Asphalt Medium curing)	AASHTO M-82
93	Quality Analysis (Lubricating oil Without wear metals)	ASTM
94	Quality Analysis (Lubricating oil/each wear metal)	ASTM, Colorimetric/Atomic Absorption Technique
95	Quality Analysis (Transformer Oil Aromatics PCB's, & Furfurals)	BS 2000 part 346, IEC 61619, 61198, by GC-MS, HPLC
96	Quality analysis (Hydraulic oil)	ASTM
97	Quality analysis (Diesel Oil )	ASTM
98	General Quality Analysis (Diesel Oil)	ASTM
99	Flammability / inflammability / non-inflammability	ASTM D92/ D93
100	Quality Analysis (Creosote oil)	ASTM, BS144 & GLC
101	Specific gravity	ASTM D1298
102	Kinematic viscosity	ASTM D445
103	Viscosity index	ASTM D2270
104	Copper strip corrosion	ASTM D130
105	Ash petroleum product	ASTM D482
106	Flash point (General solvent)	ASTM D92
107	Flash point (sticky solvent /polymer)	ASTM D92
108	Flash point (closed up)	ASTM D93
109	Cloud point	ASTM D97
110	Softening point bitumen (Ring & Ball Method)	AASHTO T53-04/ASTM D36
111	Carbon conrandson residue	ASTM D189
113	Sulphated residue	ASTM D874
114	Cone/Needle penetration of petroleum waxes	ASTM D1321, 5329
115	Penetration of bituminous materials	ASTM D5 / AASHTO T49-93
116	Total acid number	ASTM D974
117	Distillation of petroleum products	ASTM D86
118	Water in petroleum products and bituminous materials	ASTM D95
119	Benzene in insoluble (wear metals) in petroleum products	ASTM D893
120	Melting point	ASTM D127
121	Oil contents/soap (Greases)	Sweeting process
122	Evaporation loss (oil/Greases)	ASTM D972
123	Resistance to heat (Bituminous Products)	ASTM D2042
<b>Industrial Chemical Section</b>		
<b>Lithium Bromide Solution (For Absorption Chillers)</b>		
124	Complete analysis	APHA, 1998
125	Density	AOAC
126	Alkalinity	AOAC
127	Lithium Bromide	AOAC
128	Copper	AOAC
129	Iron	AOAC
130	Octyl alcohol	AOAC
131	pH	AOAC
132	Inhibitor	AOAC

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<b>Pesticides &amp; Micronutrients</b>		
133	Pesticides in liquid formulations (DDVP, Chlorpyriphos, Deltamethrine etc.) (Quantitative analysis)	AOAC
134	Pesticides in solid formulations (Quantitative analysis)	AOAC
135	Pesticide residues in wheat, rice etc. (Quantitative analysis)	AOAC
136	Aluminum Phosphide Fumigation Tablets (Quantitative analysis)	Documentation Phosphin
137	N P K (Complete Analysis)	AOAC
138	Nitronen (N) (Quantitative analysis)	AOAC
139	Phosphorous (P) (Quantitative analysis)	AOAC
140	Potassium (K) (Quantitative analysis)	AOAC
<b>Potassium Humate: (Complete Analysis)</b>		
141	Humic acid	AOAC
142	Potassium	AOAC
143	Moisture	AOAC
144	pH	AOAC
145	Water Insoluble matter	AOAC
<b>Cement Admixture (Complete)</b>		
146	pH	BS
147	Solid Contents	BS
148	Chloride contents	BS
149	Specific Gravity	BS
150	<b>Phthalates</b> (Qualitative detection by GC-MS)	GC-MS
<b>Rock Salt (Sodium chloride)</b>		
151	Complete analysis	AOAC
152	With additional parameters	AOAC
153	Metal	APHA 1998
<b>Industrial/ Analytical Chemicals</b>		
154	Acids (% of purity)	AOAC
<b>Ammonium Nitrate:</b>		
155	Assay	AOAC
156	pH	AOAC
157	Density	AOAC
158	Insoluble matter	AOAC
159	Moisture	AOAC
160	Oil & Grease	AOAC
161	Formalin/ Formaldehyde (Quantitative analysis)	Snell
162	Sodium hypochlorite (Quantitative analysis)	Snell
163	Sodium dithionite (Quantitative analysis)	Snell
164	Potassium Chloride (Quantitative analysis)	AOAC
165	Anti-Lice Lotion (Permethrine) (Quantitative analysis)	AOAC
166	Aluminium hydroxide (Quantitative analysis)	AOAC
167	Inorganic compound (per test) (Quantitative analysis)	AOAC
168	Inorganic element (per test) (Quantitative analysis)	AOAC
169	Inorganic salt (Quantitative analysis)	AOAC
170	Soap / Detergents (Quantitative analysis)	AOAC
171	Sulphur (volatile matter, purity, ash acidity, chloride) (Quantitative analysis)	AOAC

S. No.	Description of Services	Test Method
172	Soda ash (Quantitative analysis)	AOAC
173	Potassium Iodide (Quantitative analysis)	AOAC
174	Potassium Iodate (Quantitative analysis)	AOAC
175	Potassium dichromate (Quantitative analysis)	AOAC
176	Potassium permanganate (Quantitative analysis)	AOAC
177	Sodium thiosulphate (Quantitative analysis)	AOAC
178	Hydrogen peroxide (Quantitative analysis)	AOAC
179	Inorganic chemicals (Purity)	AOAC
180	Organic chemicals (Purity)	AOAC
181	Bleaching earth per element (Purity)	AOAC
182	Naphthalene Balls (Purity)	AOAC
183	Sodium/ Potassium stearate (Purity)	AOAC
184	Urea (Purity)	AOAC
185	Zinc Sulphate (Purity)	AOAC
<b>Phosphate Rock</b>		
186	P <sub>2</sub> O <sub>5</sub> contents	AOAC
187	Silica	AOAC
188	Fe	AOAC
189	Al	AOAC
190	CaSO <sub>4</sub>	AOAC
191	P <sub>2</sub> O <sub>5</sub>	AOAC
192	pH	AOAC
193	Sodium / Potassium	AOAC
<b>Boiler Scale</b>		
194	Chemical analysis	AOAC
195	Each Element	AOAC
<b>Water</b>		
196	Chemical analysis (Complete)	WHO standards of Drinking Water
197	Poultry water	
<b>Industrial water[Boiler / Construction]</b>		
198	Sulphate, chloride, harness, organic matter, calcium, magnesium and iron	BS 2690/ BS3148
<b>Agriculture Water</b>		
199	Sulphate, chloride, harness, organic matter, calcium, magnesium and iron	
200	Swimming pool	WHO
201	Temperature	AOAC
202	Total dissolved solids (TDS)	AOAC
203	TSS	AOAC
204	Grase & Oil	AOAC
205	Phenolic compounds	AOAC
206	Chloride	AOAC
207	Fluoride	AOAC
208	Cyanide	AOAC
209	Anionic detergents	Qualitative / Quantitative
210	Sulphate	AOAC
211	Sulphide	AOAC
212	Ammonia	AOAC
213	Metals	AOAC

S. No.	Description of Services	Test Method
<b>Water (Quantitative)</b>		
214	Cadmium	APHA, 1998
215	Chromium	AOAC
216	Copper	AOAC
217	Lead	AOAC
218	Nickel	AOAC
219	Zinc	AOAC
220	Barium	AOAC
221	Iron	AOAC
222	Manganese	AOAC
223	Colour / Description	AOAC
224	pH value	AOAC
225	Specific gravity	AOAC
226	Total hardness as CaCO <sub>3</sub>	AOAC
227	Calcium hardness as CaCO <sub>3</sub>	AOAC
228	Magnesium hardness as CaCO <sub>3</sub>	AOAC
229	Total alkalinity as CaCO <sub>3</sub>	AOAC
230	Sodium as Na <sup>+</sup>	AOAC
231	Potassium as K <sup>+</sup>	AOAC
232	Calcium as Ca <sup>++</sup>	AOAC
233	Magnesium as Mg <sup>++</sup>	AOAC
234	Phosphate	AOAC
235	Turbidity	AOAC
236	Nitrate	AOAC
237	Aluminium	AOAC
238	Silica	AOAC
<b>Dyes Section</b>		
239	Azo dyes test	Qualitative
240	Carcinogenic dyes	Qualitative
241	Allergenic dyestuff	Qualitative
242	%age purity of dye intermediate	Quantitative
243	Class of dye test	--
244	Strength of dye test	Quantitative
<b>Oils, Fats &amp; Cosmetics Group</b>		
<b>Oils/Ghee/ Seeds/Meal/Edible products/Waste oils</b>		
245	Color	PS/AOCS/AOAC/ASTM
246	Free fatty acid (FFA)	PS/AOCS/AOAC/ASTM
277	Iodine value (IV)	PS/AOCS/AOAC/ASTM
278	Moisture/volatiles (M)	PS/AOCS/AOAC/ASTM
279	Peroxide value (PV)	PS/AOCS/AOAC/ASTM
280	Rancidity	PS/AOCS/AOAC/ASTM
281	Refractive index (RI)	PS/AOCS/AOAC/ASTM
282	Saponification value (SV)	PS/AOCS/AOAC/ASTM
283	Unsaponifiables	PS/AOCS/AOAC/ASTM
284	<b>General tests report</b>	PS/AOCS/AOAC/ASTM
285	Acid value (AV)	PS/AOCS/AOAC/ASTM
286	Cholesterol	PS/AOCS/AOAC/ASTM
287	Cloud point	PS/AOCS/AOAC/ASTM
288	Fatty acids (GC)	PS/AOCS/AOAC/ASTM
289	Nickel contents	PS/AOCS/AOAC/ASTM
290	Oil/fat yield	PS/AOCS/AOAC/ASTM

S. No.	Description of Services	Test Method
291	Saturated/unsat.fat/oil	PS/AOCS/AOAC/ASTM
292	Slip point	PS/AOCS/AOAC/ASTM
293	Trans fat/oil	PS/AOCS/AOAC/ASTM
294	Vitamin	PS/AOCS/AOAC/ASTM
<b>Butter/Desi Ghee and Confectionary/ Milk Fats</b>		
295	Acid value <sub>(AV)</sub>	PS/AOCS/AOAC/ASTM
296	BR value	PS/AOCS/AOAC/ASTM
297	Free fatty acid <sub>(FFA)</sub>	PS/AOCS/AOAC/ASTM
298	Moisture/volatiles <sub>(M)</sub>	PS/AOCS/AOAC/ASTM
299	Peroxide value <sub>(PV)</sub>	PS/AOCS/AOAC/ASTM
300	Slip point	PS/AOCS/AOAC/ASTM
301	Unsaponifiables	PS/AOCS/AOAC/ASTM
302	<b>General tests report</b>	PS/AOCS/AOAC/ASTM
303	Acid value <sub>(AV)</sub>	PS/AOCS/AOAC/ASTM
304	Animal fat	PS/AOCS/AOAC/ASTM
305	Cholesterol	PS/AOCS/AOAC/ASTM
306	Cloud point	PS/AOCS/AOAC/ASTM
307	Color	PS/AOCS/AOAC/ASTM
308	Fatty acids <sub>(GC)</sub>	PS/AOCS/AOAC/ASTM
309	Nickel contents	PS/AOCS/AOAC/ASTM
310	Oil/fat contents	PS/AOCS/AOAC/ASTM
311	Saturated/unsat.fat/oil	PS/AOCS/AOAC/ASTM
312	Trans fat/oil	PS/AOCS/AOAC/ASTM
313	Vitamin	PS/AOCS/AOAC/ASTM
<b>Oil Bleaching Clay/Bleaching Earth</b>		
314	Bleachability	AOCS/ASTM
315	Bulk density	AOCS/ASTM
316	Compact density	AOCS/ASTM
317	Filtration rate	AOCS/ASTM
318	Moisture contents	AOCS/ASTM
319	Oil retention	AOCS/ASTM
320	pH/free acids	AOCS/ASTM
321	<b>General tests report</b>	AOCS/ASTM
322	Sieve analysis	AOCS/ASTM
323	Composition analysis	AOCS/ASTM
<b>Industrial oils/Fatty oils/Lubricants/ Biofuels</b>		
324	Color	AOCS/ASTM
325	Free fatty acids <sub>(FFA)</sub>	AOCS/ASTM
326	Glyceride contents	AOCS/ASTM
327	Iodine value <sub>(IV)</sub>	AOCS/ASTM
328	Moisture/volatiles <sub>(M)</sub>	AOCS/ASTM
329	Peroxide value <sub>(PV)</sub>	AOCS/ASTM
330	Refractive index <sub>(RI)</sub>	AOCS/ASTM
331	Saponification value <sub>(SV)</sub>	AOCS/ASTM
332	Specific gravity	AOCS/ASTM
333	Titre	AOCS/ASTM
334	Total fatty matter <sub>(TFM)</sub>	AOCS/ASTM
335	Unsaponifiables	AOCS/ASTM



S. No.	Description of Services	Test Method
<b>Detergents/Soaps/ Cleansers/House hold products</b>		
336	Cleasers(multipurpose)	AOCS/ASTM/STD. REF.
337	Cleasers (toilet)	AOCS/ASTM/STD. REF.
338	Detergent (kitchen)	AOCS/ASTM/STD. REF.
339	Detergent (laundry)	AOCS/ASTM/STD. REF.
340	Soap bar (kitchen)	AOCS/ASTM/STD. REF.
341	Soap (laundry)	AOCS/ASTM/STD. REF.
342	Soap (noodles)	AOCS/ASTM/STD. REF.
343	Soaps (toilet)	AOCS/ASTM/STD. REF.
344	Phenyl (liquid)	AOCS/ASTM/STD. REF.
<b>Cosmetics/ Essential oils/ Personalcare products</b>		
345	Cosmetics	General
346	Essential oils/fragrances	SASO/Export
347	Essential oils (GC)	AOCS/STD.REF.
348	Essential oils (GCMS)	AOCS/STD.REF
349	Ethanol contents	AOCS/STD.REF
<b>Waxes/Polishes/ Allied products</b>		
350	Coating waxes	ASTM/AOCS
351	Polishes	ASTM/AOCS
352	Wax (qualitative)	ASTM/AOCS
353	Mould release agents	ASTM/AOCS
354	Cosmetics (whitening products)	ASTM/AOCS
355		
<b>Textiles Section</b>		
<b>Composition &amp; Analytical Tests:</b>		
356	Fiber Analysis Quantitative upto 2 Fibers	AATCC 20A / ASTM D 629 / BS 4407 ISO 1833 / ISO 5088 / IWS TM 155
357	Each additional	
358	Fiber Analysis Qualitative upto 2 Fibers	AATCC 20
359	Each additional	
360	Moisture Content	ASTM D 2654
361	Moisture Regain	
362	Mercerization in Cotton	AATCC 89
363	% of Finishing Materiel	
364	% of Sizing / Starching	
<b>Construction Analysis Tests:</b>		
365	Fabric weight:	
366	per unit area	ASTM D 3776 / BS EN 12127 / ISO 3801
367	Per unit length	ASTM D 3766 / BS 2471
368	Ends & picks (Woven Fabric)	ASTM D 3775 / ISO 7211
369	Wales & courses (Stitch Density) Knitted Fabric	ASTM D 3887 / BS 5441
370	Fabric Width	ASTM D 3774 / BS 1930 / ISO 5084
371	Fabric Thickness	ASTM D 1777 / BS 2544 / ISO 5084
372	Yarn count (per yarn):	
373	Woven	ASTM D 1059 / BS 2865 / ISO 7211/5 / JISL 1018
374	Knitted	ASTM D 1059

375	Yarn Twist	ASTM D 1422, ASTM D 1423
S. No.	Description of Services	Test Method
376	Length of Woven Fabric	ASTM D 3774
377	Width of Woven Fabric	ASTM D 3776
<b>Fabric &amp; Garment Shrinkage (Dimensional Stability) &amp; Related tests:</b>		
378	Fabric shrinkage/Dimensional change (After 1 wash)	AATCC 135 / AATCC 150 / ISO 6330-5077 / DIN 53892 / DIN BS EN 25077
379	Each additional wash (Fabric)	
380	Garment shrinkage/Dimensional change (After 1 wash)	AATCC 150 / ISO 6330-5077 / DIN 53892
381	Each Additional Wash (Garment)	
382	Appearance	Fabric (AATCC 124) per wash cycle Print durability (ISO 6330 / AATCC 135 / AATCC 150 ( per wash cycle) Seam / Crease (AATCC 88B / AATCC 88C / ISO 7769 (per wash cycle) Garment (AATCC 143 / ISO 15487) per wash cycle
383	Skewness/Twisting after Laundering	AATCC 179 (per wash cycle)
384	Dimensional restoration of knitted & woven fabrics after laundering	AATCC 160 (per wash cycle)
<b>Colour Fastness Tests:</b>		
	Washing & Laundering	
385	Low to Medium Temp. (30-50°C)	AATCC-61-1A & 2A, BS 1006 C01- C03; C06 A-C / BS EN 20105-C01- C03, C06 A-C
386	High temp. (60-95°C)	AATCC 3A, 4A / BS 1006 C04, C05, C06, D-E / ISO-105 C04-C05, C06 D-E / DIN 54011
387	Washing with soap or soap & soda	ISO 105 C10
388	Perspiration (Acidic & Alkaline)	AATCC15 / BS 1006 E04 / ISO 105 E04
389	Dry & wet crocking/rubbing	AATCC 8 / BS 1006 X12 / ISO 1006 X12 / BS EN ISO 105 X12
390	Dry & wet crocking after 1 wash	AATCC 8
391	Light by Exposure to Xenon (Water cooled)	BS EN ISO 105 B02
392	Grade 4 or below	
393	Grade 5	
394	Grade 6	
395	Grade 7/8 (Upon Special Request)	
396	Light by Exposure to Xenon (Water Cooled)	AATCC 16 E-2004
397	20 Fading units or below	
398	40 Fading units	
399	80 Fading units	
400	150 Fading units (Upon Special Request)	
401	Water	

		105 E01
S. No.	Description of Services	Test Method
403	Chlorinated Water	BS EN ISO 105 E 03
404	Sea Water	AATCC 106/ BS 1006 E 02 / ISO 105 E 02
405	Dry Cleaning	AATCC 132 / BS 1006 D01 / ISO 105 D01
406	Bleaching	Actual laundering using chlorine bleach
		Hypochlorite BS 1006 N01 / BS EN ISO 105 N01 / ISO 105 N01
		Peroxide BS 1006 N02 / ISO 105 N02 / AATCC 101
407	Non-Chlorine Bleaching	AATCC 172
408	Hypochlorite bleach in home Laundering	AATCC 188
409	Organic Solvents	BS 1006 X05 / ISO 105 X05
410	Water Spotting	AATCC 104 / ISO 105 E07 / BS 1006 E07/ BS EN ISO 105 E07
411	Acid Spotting	BS 1006 E05 / ISO 105 E05 / BS EN ISO 105 E05
412	Alkaline Spotting	BS 1006 E06 / ISO 105 E06 / BS EN ISO 105 E05
413	Color fastness to domestic & commercial laundering oxidative bleach	ISO 105 C09
414	Dye Transfer in Storage Fabric to Fabric	AATCC 163
415	Hot Pressing	AATCC 133 ISO 105 X11
<b>Strength Tests:</b>		
<b>Tensile Strength</b>		
416	Grab Method	ASTM D 5034 / ISO 13934-2 / BS EN ISO 13934-2
417	Strip Method	ASTM D 5035 / BS 2576 / ISO 13934-1 / BS EN 13934-1
418	In addition to tensile strength Elongation at break	
<b>Seam Performance</b>		
419	Slippage	ASTM 434 / BS 3320 / ISO 13936-1&2
420	Seam Strength	ISO 13935-1 / ISO 13935-2 / ASTM D 1683
421	Garment Seam (Per seam)	
<b>Tearing Strength</b>		
422	Elmendorf/ Elmatear	ASTM D 1424 / ISO 13937-1 / ISO 9290
423	Tongue Tear	ASTM D 2261 / BS EN ISO 13937-2 / 4
424	Wing Rip	BS EN ISO 13937-3 / BS 4303
425	Trapezoid	ASTM 5587
426	Loop Strength	ASTM D 2256
<b>Fabric/garment Performance &amp; Flammability Tests:</b>		
<b>Water Repellency</b>		
427	Spray Rating Test	AATCC 22 / BS 3702 / ISO 4920

S. No.	Description of Services	Test Method
428	Hydrostatic Head Pressure Test	BS 2823 / ISO 811 / BS EN ISO 2062
429	Soil Release	AATCC 130
430	Oil Repellency	AATCC 118
431	Absorbency of Bleached Textile	AATCC 79 / BS 4554
432	Abrasion Resistance	Martindale ISO 12947-1,2,3,4 / ASTM D 4966 / BS 5690
		Upto 10,000 rubs
		Subsequent 10,000 rubs
		Shade Change (Additional)
433	Pilling Resistance	Martindale ISO 12945-2 / ASTM D 4970
		Upto 5,000 cycles
		Upto 7,000 cycles
434	Pilling Resistance	ICI Pilling Box ISO 12945-1 / BS 5811
		Upto 10,000 cycles
		Upto 20,000 cycles
		Subsequent 5,000 cycles
435	Wrinkle/ Crease Recovery (Appearance Method)	AATCC 128
436	Stiffness	ASTM D 1388 / BS 3356
437	Flammability 45 <sup>0</sup> Test	
438	Textile and clothing	ASTM D 1230 / US CPSC CFR 16 Part 1610
<b>Accessories:</b>		
<b>Zipper</b>		
439	Zipper strength	BS 3084 / ASTM D 2061
440		Each Additional Test
441	Colour Fastness of Zipper Tapes to :	
442	Dry Cleaning	BS 1006 D01 / ISO 105 D01
443	Washing/Laundering	BS 1006 C03 / ISO 105 C03
444	Water	BS 1006 E01 / ISO 105 E01
<b>Dyes &amp; Chemicals Testing</b>		
445	Sulphuric Acid	Strength / Purity
446	Hydrochloric Acid (HCl)	Strength / Purity
447	Oxalic Acid	Strength / Purity
448	Formic Acid	Strength / Purity
449	Benzoic Acid	Strength / Purity
450	Acetic Acid	Strength / Purity
451	Hydrogen peroxide	Strength / Purity
452	Sodium Hydroxide	Strength / Purity
453	Sodium Carbonate	Strength / Purity
454	Sodium Bicarbonate	Strength / Purity
455	Sodium Perborate	Strength / Purity
456	Calcium Hypochlorite	% of Cl
457	Sodium Hypochlorite	% of Cl

S. No.	Description of Services	Test Method
<b>Detergent</b>		
458	Wetting Power	
459	Absorbency	
460	Foaming	Distance
461	Staining	Change in Shade
462	Stability	Change in Shade
<b>Other Tests</b>		
463	Ageing of Sulphur Dyed Textiles: Accelerate	AATCC 26
		Aging only
		Strength test before and after aging
464	Colour difference	Visual Assessment per pair
		Data color
465	Ash content	
466	Insoluble Matter	
467	pH	
468	Absorbency	
469	Sinking time (at pH -7 & 9)	
470	Foaming behavior (at 25 °C, 65 °C, 90 °C)	
471	Cloud Point (at pH-9)	
472	Count Lea strength product (CLSP)	
473	Cone Test	PS4459
474	Stain removed in laundering	
<b>Food &amp; Biotechnology Research Center</b>		
<b>Microbiology Laboratory</b>		
<b>Water Samples</b>		
<b>Sample type</b>		
Bottled water, RO water, Filtered water, Tap water for drinking purpose.		
475	Total plate count	APHA, 2017
476	Total coliforms	APHA, 2017
477	Fecal coliform	APHA, 2017
478	<i>E. coli</i>	APHA, 2017
479	<i>Pseudomonas</i> sp.	APHA, 2017
<b>Food sample</b>		
<b>Sample type:</b>		
Sugar, White Rice, Brown Rice, Pasteurized milk, UHT milk, Milk powder, Yogurt, cheese, ice cream, butter, Beef, mutton, chicken and chicken product, Eggs, Tomato ketchup, Vinegar, spices, cakes and Bakery products, Jams, Vegetables, Chocolate and candy products, Fruit juices, Beverages etc.		
480	Total plate count	FAO, 1992
481	Total coliforms	FAO, 1992

S. No.	Description of Services	Test Method
482	Fecal coliform	FAO, 1992
483	E. coli	FAO, 1992
484	Staph. aureus	FAO, 1992
485	Salmonella sp	FAO, 1992
486	Yeast count	FAO, 1992
487	Mould count	FAO, 1992
<b>Antimicrobial activity:</b>		
<b>Sample Type:</b>		
Detergents, paint, disinfectants, plastic material,		
488	Antibacterial activity (Gram+ve & Gram-ve bacteria)	ISO-22196, 2007 ; EN-13727, 2010
489	Antifungal activity	EN-13624, 2010
<b>Antimicrobial activity of Hand Sanitizer.</b>		
490	Antibacterial activity (Gram+ve & Gram-ve bacteria)	EN-13727, 2010; prEN-12054, 1995
<b>Meat Laboratory</b>		
491	Moisture (Oven Drying)	AOAC, 2016
492	Ash (Muffle Furnace)	
493	Protein (Kjeldahl)	
494	Fat (Soxleht Extraction)	
495	Fiber (Acid /Alkali Digestion)	
496	Carbohydrates (Calculation)	
497	Energy (Calculation)	
498	<b>Shelf life Study of Food Products</b>	In-house / Eccelerated Shelf Life test
	Eggs; Processed meat products like kofta etc; Bakery products like biscuits, cake rusk, fruit cake; Sweets like sohan halwa, petha; Candies/Toffees; Rice; Jam; Tomato Ketchup; Juices and Drinks; Snack products like Nimko, slanty, potato chips; Pickle; Moringa leaf powder and Turmeric powder, Dried Mangoes; Energy Bar etc.	
<b>Dairy Testing Laboratory</b>		
<b>Proximate/Nutritional Testing:</b>		
499	Total Solids/Moisture(Oven Drying)	(AOAC,2016)
500	Total Ash (Muffle Furnace)	
501	Total Protein (Kjeldahl)	
502	Total Fat (Gerber)	
503	Total Carbohydrates (Calculation)	
504	Energy (Calculation)	
<b>Adulteration Testing: (FSSAI,2012)</b>		
505	Formalin (Colorimetric Detection)	(AOAC,2016)
506	Urea (Colorimetric Detection)	
507	Detergent (Colorimetric Detection)	
508	Neutralizers (Colorimetric Detection)	
509	Starch (Colorimetric Detection)	
510	Hydrogen Peroxide (Colorimetric Detection)	
<b>Water and Food Testing Laboratory</b>		
<b>Chemical Examination</b>		
Water Testing		
511	Color	A.P.H.A., 2017
512	Odour	
513	Turbidity (NTU)	
514	Total suspended solids (mg/L)	
516	Total dissolved solids (mg/L)	
517	Total solids (mg/L)	
518	Electrical Conductivity at 25°C (µS/cm)	

S. No.	Description of Services	Test Method	
519	pH at 25°C	A.P.H.A., 2017	
520	Sodium as Na <sup>+</sup> (mg/L)		
521	Potassium as K <sup>+</sup> (mg/L)		
522	Calcium as Ca <sup>2+</sup> (mg/L)		
523	Magnesium as Mg <sup>2+</sup> (mg/L)		
524	Manganese (mg/L)		
525	Total Alkalinity as CaCO <sub>3</sub> (meq/L)		
526	Carbonates (mg/L)		
527	Bicarbonates (mg/L)		
528	Total hardness (mg/L)		
529	Calcium hardness as CaCO <sub>3</sub> (mg/L)		
530	Magnesium hardness as CaCO <sub>3</sub> (mg/L)		
531	Sulphate as SO <sub>4</sub> <sup>2-</sup> (mg/L)		
532	Phosphate (mg/L)		
533	Ammonia (mg/L)		
534	Chloride as Cl (mg/L)		
535	Antimony (mg/L)		
536	Iron (mg/L)		
537	Copper (mg/L)		
538	Cadmium (mg/L)		
539	Chromium (mg/L)		
540	Silver (mg/L)		
541	Lead (mg/L)		
542	Nickel (mg/L)		
543	Molybdenum (mg/L)		
544	Zinc (mg/L)		
545	Fluoride F <sup>-</sup> (mg/L)		
546	Phenol (mg/L)		
547	Sulphide (mg/L)		
548	Arsenic (µg/L)		
549	Cyanide (mg/L)		
550	Nitrate as NO <sub>3</sub> <sup>-</sup> (mg/L)		
551	Nitrite NO <sub>2</sub> <sup>-</sup> (mg/L)		
552	Oil & Grease (mg/L)		
553	Phosphorus (mg/L)		
554	BOD (05 days)		
555	COD		
556	Dissolved oxygen (mg/L)		
557	Chlorine (mg/L)		
<b>Vitamins</b>			
558	Vitamin A (mg)		A.O.A.C., 2016
559	Vitamin D (mg)		
560	Vitamin E (mg)		
561	Vitamin K (mg)		
562	Vitamin C (mg)		
563	Thiamine (Vitamin B1) (mg)		
564	Riboflavin (Vitamin B2) (mg)		
565	Vitamin B3 (mg)		
566	Biotin (Vitamin H) (mg)		
567	Panthenic Acid (mg)		
568	Nicotinamide (mg)		
569	Panthenic Acid (mg)		
570	Vitamin B6 (mg)		

571	Pyridoxine (mg)	A.O.A.C., 2016
572	Folic Acid (mg)	
573	Nictinatmide (mg)	
574	Arsenic (mg)	
575	Lead (mg)	
576	Cadmium	
577	Mercury	
578	Copper	
579	Zinc	
580	Iron	
581	Nickle	
582	Chromium	
583	Manganese	
584	Minerals (Sodium, Potassium, Calcium,etc.)	
<b>Shelf life Study of Drinking Water</b>		
585	Hydrogen per oxide (%)	A.O.A.C., 2016
Pesticide residue as		
586	i. Chlorpyrifos (ppm) ii Bifenthrin (ppm)	Pesticide Science, 55: 1222-1228, 1999.
<b>Food Additives &amp; Contaminants Laboratory</b>		
587	Aflatoxins (B1,B2, G1, G2)	A.O.A.C., 2016
588	Ochratoxins	Ochratoxin Elisa Kit, Veratox 8610, Neogen, 620 Lasher Place, Lansing, M1 48912 USA
589	Deoxynivalenol	Deoxynivalenol (DON) Elisa Kit, Veratox 8335, Neogen, 620 Lasher Place, Lansing, M1 48912 USA
590	Fumonisin	Fumonisin Elisa Kit, Veratox 8830/8831, Neogen, 620 Lasher Place, Lansing, MI 48912 USA
591	1- Aflatoxin M1 2- Melamine	1- Aflatoxin M1 Elisa Kit, Veratox 8019, Neogen, 620 Lasher Place, Lansing, M1 48912 USA 2- MaxSignal Melamine Elise Kit, Cat. # 1074, Bio Scientific Corporation, Austin, USA
592	Sudan Dyes	Food Additives & Contaminants by S. N. Mahindru 2000
593	Analysis of Synthetic Dyes	
<b>Antioxidant activity, Phenolic Content and Flavonoid Content</b>		
594	All food items	(Brands & William et al,1995)(Chang et al, 2000)
595	Vegetables and fruits	(Brands & William et al,1995)(Chang et al, 2000)
596	Acrylamide	A.O.A.C., 2016
597	Nitrosamines	
598	Bis-phenol A	
<b>Nutrition Lab</b>		
599	Moisture	A.O.A.C., 2016
600	Ash Protein	
601	Fat	
602	Fiber	
603	Carbohydrates	
604	Energy	



605	Gluten	A.A.C.C., 1999
606	Physical Testing of Wheat, Rice, Pulses also performed in the nutrition lab	A.A.C.C., 1999
S. No.	Description of Services	Test Method
<b>Fruit and Vegetable Processing Lab</b>		
607	Brix / Total Soluble Solid	A.O.A.C., 2016
608	pH	
609	Acidity	
610	Gas Volume	
611	Viscosity	
612	Moisture	
613	Protein	
614	Ash	
615	Carbohydrates	
616	Fiber	
617	Sensory Evaluation	
618	Falling Number	
619	Wet and dry gluten	
<b>Molecular Biology Lab</b>		
620	Determination of heterocyclic amines (carcinogens) in food	A.O.A.C., 2008/ A.O.A.C., 2016
621	Determination of glucosinolates (anti cancer agents) in food stuff.	
622	Analysis of acrylamide in food.	
623	Alcohol analysis	
624	Sugar analysis	
625	Antimicrobial testing	
626	Antibiotic testing of milk	A.P.H.A., 1972
627	DNA Extraction	
628	Gel Electrophoresis	
<b>Quality control testing of Honey</b>		
629	Moisture	AOAC 2016
630	total Ash	
631	Crude fiber	
632	Crude Protein	
633	Crude Fat,	
634	Carbohydrates	
635	Energy	
636	Reducing sugars	PS-2007
637	Sucrose	PS-2007
638	Water insoluble matter	PS-2007
639	Hydroxyl methyl furfuryl (HMF)	AOAC 2016
640	Fiehels test	Pearson composition and analysis of fruits
641	Diastase activity	AOAC 2016
642	Antibiotics residue detection	Pearson composition and analysis of fruits
<b>Tea analysis (Black tea, Green tea, Coffee)</b>		
643	Moisture	A.O.A.C., 2016
644	total Ash	
645	Crude fiber	
646	Crude Protein	
647	Crude Fat	

648	Carbohydrates	
649	Energy	
650	Alkalinity of ash as K <sub>2</sub> O	PS-2007
S. No.	Description of Services	Test Method
651	Acid insoluble ash	PS-2007
652	Water extract	PS-2007
653	Caffeine	Pearson composition and analysis of fruits
654	Tannins	Pearson composition and analysis of fruits
655	Ratio of water soluble ash to total ash	PS-2007
656	Extraneous matter	PS-2007
<b>Antioxidant activity, Phenolic Content and Flavonoid Content</b>		
657	All food items	(Brand William et al,1995)(Chang et al, 2000)
658	Vegetables and fruits	(Brand William et al,1995)(Chang et al, 2000)
<b>Beverages, Juices, Ketchup, Vinegars and Squashes</b>		
659	Artificial sweeteners (Saccharine, Aspartame)	Pearson composition and analysis of fruits
660	Sugars	Pearson composition and analysis of fruits
661	Preservatives (Sodium Benzoate, Potassium metabisulphite, Potassium sorbitol)	Pearson composition and analysis of fruits
662	Acidity (as citric acid, acetic acid, formic acid, maleic acid)	Pearson composition and analysis of fruits
663	Caffeine	Pearson composition and analysis of fruits
664	Fruit content	Pearson composition and analysis of fruits
665	Added color	Pearson composition and analysis of fruits
666	Moisture	A.O.A.C., 2016
667	Total Ash	
668	Crude fiber	
669	Crude Protein	
670	Crude Fat	
671	Carbohydrates	
672	Energy	
<b>Bubble Gum and Candies</b>		
673	Sugars	Pearson composition and analysis of fruits
674	Base content	Pearson composition and analysis of fruits
675	Sulphated ash	Pearson composition and analysis of fruits
676	Acid insoluble ash	Pearson composition and analysis of fruits
677	Added colour	Pearson composition and analysis of fruits
<b>Sugars (Refined, White, Brown)</b>		
678	Moisture	PS-2007
679	Total Ash	PS-2007
680	ICUMSA	PS-2007
681	Turbidity	PS-2007

S. No.	Description of Services	Test Method
682	Polarization	PS-2007
683	Glucose/Fructose ratio	PS-2007
684	Water insoluble matter	PS-2007
685	Conductivity ash	PS-2007
<b>Quality control of food colors</b>		
686	Colour content	Specification for identity and purity of food colors by JECFA, 1984
687	Auxiliary colour	Specification for identity and purity of food colors by JECFA, 1984
<b>Spices and Condiments</b>		
688	Curcumin content	Hand book of fruits and vegetables by S.Rangana
689	Lycopene content	Hand book of fruits and vegetables by S.Rangana
690	Pungency test	Specification for identity and purity of food colors by JECFA, 1984
691	Fineness	Pearson composition and analysis of fruits
692	Extraneous matter	Pearson composition and analysis of fruits
693	Volatile oil	Pearson composition and analysis of fruits
694	Non-volatile ether extract	Pearson composition and analysis of fruits
695	Starch content	Pearson composition and analysis of fruits
<b>Confectionary products, Flour and all-purpose flour</b>		
696	Cholestrol	Biochemistry by Campbell et al.2005
697	Sugars	Pearson composition and analysis of fruits
698	Starch solubility (in water. alcohol)	Pearson composition and analysis of fruits
699	Acidity as H <sub>2</sub> SO <sub>4</sub>	Pearson composition and analysis of fruits
700	Viscosity	Pearson composition and analysis of fruits
<b>Quality control test of Sanitizer</b>		
701	Alcohol content	IUPAC, Perrys chemical engineers Handbook 6 <sup>th</sup> edition
702	pH	Pearson composition and analysis of fruits
<b>Quality control test of Rose/Jasmine Concrete</b>		
703	Solubility	Pearson composition and analysis of fruits
704	Specific gravity	Pearson composition and analysis of fruits
705	Refractive index	Pearson composition and analysis of fruits
<b>Pakistan Institute Of Technology For Minerals &amp; Advanced Engineering Materials PITMAEM</b>		
<b>Chemical Analysis</b>		
706	Optical Emission Spectrometer	E-1476-04, 415, 1080, 2209, 1251, 1999
707	Carbon Sulphur Determinator (LECO)	E-1019-18

S. No.	Description of Services	Test Method
708	Micro XRF	E-1476-04
<b>Microscopy / Metallography</b>		
709	Micro Examination	ASTM E-03, 407
710	Macro Examination	ASTM E-03, 407
711	Coating Thickness Measurement (in microns)	ASTM E-03, 487
712	Coating Weight Measurement	ASTM A-90
713	Seamless Test (macro examination)	ASTM E-340
<b>Non Destructive Testing</b>		
714	<ul style="list-style-type: none"> <li>➤ Ultrasonic Testing</li> <li>➤ X-Rays (Radiography) Testing</li> <li>➤ Magnetic Particle Testing</li> <li>➤ Dye Penetrant Testing</li> </ul>	ASTM E-164, 587, 114  ASTM E-1030, 1032  ASTM E- 709, 1444  ASTM E-165
<b>Hardness Testing</b>		
715	Brinell Hardness	ASTM E-10-08
716	Rockwell Hardness	ASTM E-18, D-785
717	Vicker Hardness	ASTM E-92
	Micro Vicker Hardness	ASTM E-384-09
718	Portable Hardness	ASTM E-110-82
719	Shore Hardness Tester (for Rubber, Plastic & Polymers)	ASTM D-2240, D-1415
720	Case Depth (Hardness Profile & Micro Examination)	Hardness Tester+ Microscopy
721	Density Measurement	ASTM D-792
<b>Mechanical Testing</b>		
722	Tensile Testing of Steel Samples	ASTM A-370, 931, E-8
723	Tensile Testing of Other Soft Materials (Paper, Textile, Rubber etc)	ASTM D-412, 638
724	Compression Test	ASTM C-140, 39
725	Bend Testing	ASTM A-370, 615
726	Impact Testing	ASTM A-370
727	Differential Scanning Calorimetry (DSC/TGA) Analysis	ASTM E793,794, 1356
728	Coefficient of Linear Thermal Expansion (Dilatometer)	ASTM E 372, E80
729	Scanning Electron Microscopy (SEM/EDX) Analysis	SEM/EDX technique
730	Wear & Friction Properties (Tribology Study)	ASTM G-99
731	Surface Roughness (by Profilometer)	JIS-94, 2001, 82, ASME 95, ISO 97, 2001
732	Nano-indentation Test	Oliver and Pharr rule
733	Thermal Spraying (Reclamation/ Re-metallization)	Plasma Spraying technique
734	Failure Investigation / Consultancy	-----

S. No.	Description of Services	Test Method
<b>Testing Of LPG Composite Cylinders</b>		
735	Torque Test	EN 14427:2020, ISO 11119-3: 20, EN 14427: 20,
736	Leak Test	
737	Burst Pressure	
738	Cyclic Test	
739	Hydraulic Proof Test	
740	High Velocity Impact Test	
741	Flaw Test	
742	Drop Test	
743	Exposure to Elevated Temperature	
744	Fire Test	
745	Permeability	
<b>Electrical Measurement Center (EMTL)</b>		
<b>Electric Cables (Electrical &amp; Mechanical Properties)</b>		
746	Electrical Resistance of conductors	IEC 60227-1: 2007 IEC 60227-2:1997 + A1:2003 IEC 60227-3:1993 + A1:1997 IEC 60227-4:1992 + A1:1997 IEC 60227-5:2011 IEC 60502-1:2004 + A1:2009 IEC 60502-2:2014 BS EN 60228:2005 DDS-8:2007 DDS-82:2007 P-29:2010 KESpec:253,341,81B,45B,67B&S307 BS6004 :2012 BS 6346 :1997
747	Voltage test on cores	IEC 60227-1: 2007 IEC 60227-2:1997 + A1:2003 IEC 60227-3:1993 + A1:1997 IEC 60227-4:1992+ A1:1997 IEC 60227-5:2011 IEC 60502-1:2004 + A1:2009 IEC 60502-2:2014 DDS-8:2007 DDS-82:2007 KE- Spec:253,341,81B,45B,67B&S307 BS 6004:2012 BS6346:1997

S. No.	Description of Services	Test Method
748	Voltage test on completed cable	IEC 60227-1: 2007 IEC 60227-2:1997 + A1:2003 IEC 60227-3:1993 + A1:1997 IEC 60227-4:1992 + A1:1997 IEC 60227-5:2011 IEC 60502-1:2004 + A1:2009 IEC 60502-2:2014 DDS-8:2007 DDS-82:2007 P-29:2010 KE- Spec:253,341,81B,45B,67B&S307 BS 6004:2012 BS6346:1997
749	Long term resistance to DC	BS 6004:2012
750	Insulation Resistance Test	IEC 60227-1: 2007 IEC 60227-2:1997 + A1:2003 IEC 60227-3:1993 + A1:1997 IEC 60227-4:1992 + A1:1997 IEC 60227-5:2011 IEC 60502-1:2004 + A1:2009 IEC 60502-2:2014 DDS-8:2007 DDS-82:2007 KE- Spec:253,341,81B,45B,67B&S307 BS 6004:2012 BS6346:1997
751	Resistivity of extruded semi conducting screen applied over conductor and insulation	IEC 60502:2020 P-29:2010
<b>Electric Cables (Electrical &amp; Mechanical Properties)</b>		
752	Checking of compliance with constructional provisions	IEC 60227-1: 2007 IEC 60227-2:1997 + A1:2003 IEC 60227-3:1993 + A1:1997 IEC 60227-4:1992 + A1:1997 IEC 60227-5:2011 IEC 60502-1:2004 + A1:2009 IEC 60502-2:2014 DDS-8:2007 DDS-82:2007 P-29:2010 KESpec:253,341,81B,45B,67B&S307 BS 6004:2012 BS6346:1997

S. No.	Description of Services	Test Method
753	Measurement of Insulation Thickness	IEC 60227-1: 2007 IEC 60227-2:1997 + A1:2003 IEC 60227-3:1993 + A1:1997 IEC 60227-4:1992 + A1:1997 IEC 60227-5:2011 IEC 60811-201:2012 IEC 60502-1:2004 + A1:2009 IEC 60502-2:2014 DDS-8:2007 DDS-82:2007 P-29:2010 KE- Spec:253,341,81B,45B,67B&S307 BS 6004:2012 BS6346:1997
754	Measurement of Sheath Thickness	IEC 60227-1: 2007 IEC 60227-2:1997 + A1:2003 IEC 60227-4:1992 + A1:1997 IEC 60227-5:2011 IEC 60811-202,,:2012 IEC 60502-1:2004 + A1:2009 IEC 60502-2:2014 DDS-8:2007 DDS-82:2007 P-29:2010 BS 6004:2012 BS6346:1997
755	Measurement of separation sheath/ bedding thickness	IEC 60502-1:2004 + A1:2009 IEC 60502-2:2014 DDS-8:2007 P-29:2010 BS6346:1997
756	Measurement of overall diameter	IEC 60227-1: 2007 IEC 60227-2:1997 + A1:2003 IEC 60227-3:1993 + A1:1997 IEC 60227-4:1992 + A1:1997 IEC 60227-5:2011 IEC 60502-1:2004 + A1:2009 IEC 60502-2:2014 IEC 60811-203:2012 DDS-8:2007 P-29:2010 KE- Spec:253,341,81B,45B,67B&S307 BS 6004:2012 & BS6346:1997
757	Thickness of extruded inner covering	IEC 60502-1:2004 + A1:2009 IEC 60502-2:2014 BS6346:1997
758	Diameter of armoured wires and tapes	IEC 60502-1:2004 + A1:2009 IEC 60502-2:2014 BS6346:1997 DDS-8:2007 and P-29:2010

S. No.	Description of Services	Test Method
759	Ovality	IEC 60227-1: 2007 IEC 60227-2:1997 + A1:2003 IEC 60227-4:1992 + A1:1997 IEC 60227-5:2011 BS6004:12
<b>Electric Cables (Electrical &amp; Mechanical Properties)</b>		
760	Tensile strength and %age elongation of insulation before and after ageing	IEC 60227-1: 2007 IEC 60227-2:1997 + A1:2003 IEC 60227-3:1993 + A1:1997 IEC 60227-4:1992 + A1:1997 IEC 60227-5:2011 IEC 60502-1:2004 + A1:2009 IEC 60502-2:2014 IEC 60811-501 :2012 IEC 60811-401 :2012 DDS-8:2007 DDS-82:2007; P-29:2010 KE- Spec:253,341,81B,45B,67B&S307 BS 6004:2012 BS6346:1997
761	Tensile strength and %age elongation of Sheath before and after ageing	IEC 60227-1: 2007 IEC 60227-2:1997 + A1:2003 IEC 60227-3:1993 + A1:1997 IEC 60227-4:1992 + A1:1997 IEC 60227-5:2011 IEC 60502-1:2004 + A1:2009 IEC 60502-2:2014 IEC 60811-501 :2012 IEC 60811-401:2012 DDS-8:2007 DDS-82:200; P-29:2010 KE- Spec:253,341,81B,45B,67B&S307 BS 6004:2012 BS6346:1997
762	Loss of mass test on insulation and Sheath	IEC 60227-1: 2007 IEC 60227-2:1997 + A1:2003 IEC 60227-3:1993 + A1:1997 IEC 60227-4:1992 + A1:1997 IEC 60227-5:2011 IEC 60502-1:2004 + A1:2009 IEC 60502-2:2014 IEC 60811-409:2012 DDS-8:2007 DDS-82:2007 and P-29:2010 BS 6004:2012 BS6346:1997



S. No.	Description of Services	Test Method
763	Pressure test at high temperature on Insulation and Sheath	IEC 60227-1: 2007 IEC 60227-3:1993 + A1:1997 IEC 60227-4:1992 + A1:1997 IEC 60227-5:2011 IEC 60811-508:2012 IEC 60502-1:2004 + A1:2009 IEC 60502-2:2014 DDS-8:2007 DDS-82:2007 P-29:2010 BS 6004:2012 BS6346:1997
764	Cold Bend test of insulation and Sheath at low temperature	IEC 60227-1: 2007 IEC 60227-3:1993 + A1:1997 IEC 60227-4:1992 + A1:1997 IEC 60227-5:2011 IEC 60811-504:2012 DDS-8:2007 and DDS-82:2007 BS 6004:2012 BS6346:1997
765	Cold Elongation test of insulation and Sheath at low temperature	IEC 60227-1: 2007 IEC 60227-3:1993 + A1:1997 IEC 60227-4:1992 + A1:1997 IEC 60227-5:2011 IEC 60811-505:2012 IEC 60502-1:2004 + A1:2009 IEC 60502-2:2014 DDS-8:2007 DDS-82:2007 P-29:2010 BS 6004:2012 BS6346:1997
<b>Electric Cables (Electrical &amp; Mechanical Properties)</b>		
766	Impact test of PVC insulation and Sheath at low Temperature	IEC 60227-1: 2007 IEC 60227-3:1993 + A1:1997 IEC 60227-4:1992 + A1:1997 IEC 60227-5:2011 IEC 60811-506:2012 <u>and</u> P-29:2010 BS 6004:2012 BS6346:1997
767	Test for resistance of PVC Insulation and Sheath to Cracking (Heat Shock Test)	IEC 60227-1: 2007 IEC 60227-3:1993 + A1:1997 IEC 60227-4:1992 + A1:1997 IEC 60227-5:2011 IEC 60502-1:2004 + A1:2009 IEC 60502-2:2014 IEC 60811-509:2012 DDS-8:2007 DDS-82:2007 and P-29:2010 BS 6004:2012 BS6346:1997
768	Flexing test of completed cable	IEC 60227-1: 2007 IEC 60227-2:1997 + A1:2003 IEC 60227-5:2011 BS 6004:2012

S. No.	Description of Services	Test Method
769	Test of flame retardance of completed cable	IEC 60227-1: 2007 IEC 60227-3:1993 + A1:1997 IEC 60227-4:1992 + A1:1997 IEC 60227-5:2011 IEC 60502-1:2004 + A1:2009 IEC 60502-2:2014 IEC 60332-1-1:2004 IEC 60332-1-2:2004 BS 6004:2012 BS6346:1997
770	Water absorption test	IEC 60502-1:2004 + A1:2009 IEC 60502-2:2014 IEC 60811-402:2012 DDS-8:2007 DDS-82:2007 P-29:2010 KE- Spec:253,341,81B,45B,67B&S307 BS 6004:2012 BS6346:1997
771	Colour fastness test for insulation & sheath	DDS-8:2007
772	Hot Set Test for cross linked materials	IEC 60502-1:2004 + A1:2009 IEC 60502-2:2014 IEC 60811-507:2012 DDS-82:2007 P-29:2010 KE-Spec:253,341&S307 BS 6004:2012 BS6346:1997
773	Shrinkage test for insulation and sheath	IEC 60502-1:2004 + A1:2009 IEC 60502-2:2014 IEC 60811-502:2012 IEC 60811-503:2012 DDS-82:2007 P-29:2010 KE-Spec:253,341&S307 BS 6004:2012 BS6346:1997
774	Bending test of completed cable	IEC 60502-1:2004 + A1:2009 IEC 60502-2:2014 KE-Spec:253,341 &S307
775	Measurement of the thickness & resistivity of semi conducting screens over insulation and conductor	IEC 60502-2:2014 P-29:2010
776	Thermal stability test for PVC insulation and sheath	IEC 60227-1: 2007 IEC 60227-3:1993 + A1:1997 IEC 60227-4:1992 + A1:1997 IEC 60227-5:2011 IEC 60811-405:2012
<b>Electric Cables (Electrical &amp; Mechanical Properties)</b>		
777	Additional ageing test on pieces of completed cables /compatibility test	IEC 60502-1:2004 + A1:2009 IEC 60502-2:2014 P-29:2010,BS6004:2012,BS6346:97
778	Electrical Resistivity/ Conductivity Test	ASTM B193 P-44-96

S. No.	Description of Services	Test Method
<b>Electric Fans (Safety Testing)</b>		
779	Classification	IEC 60335-1:2016 IEC 60335-2-80:2015 Excluding Clause:19.11.4
780	Marking and instructions	
781	Protection against access to live parts	
782	Power input and current	
783	Heating	
784	Leakage current and electric strength at operating temperature	
785	Transient over voltages	
786	Moisture resistance	
787	Leakage current and electric strength	
788	Abnormal operation	
789	Stability and mechanical hazards	
790	Mechanical strength	
791	Construction	
792	Internal wiring	
793	Components	
794	Supply connection and external flexible cords	
795	Terminals for external conductor	
796	Provision of earthing	
797	Screws and connections	
798	Clearances, creepage distance and solid insulation	
799	Resistance to heat and fire	
800	Resistance to rusting	
801	Radiation, toxicity and similar hazards	

S. No.	Description of Services	Test Method
<b>Electric Fans (Performance Testing)</b>		
802	Marking	IEC 60879:1986 PS-1:2010
803	Test of Air Performance (Air Delivery Test)	
804	Measurement of Speed of the Fan	
805	Measurement of Power Factor	
806	Measurement of Power Input	
807	Service Value	
<b>Self Ballasted Fluorescent Lamps (Safety Testing)</b>		
808	Marking	IEC 60968:2015
809	Interchangeability, mass bending moment	
810	Protection against Electric Shock	
811	Insulation Resistance and Electric Strength	
812	Mechanical Strength	
813	Cap Temperature Rise	
814	Resistance to Heat	
815	Resistance to Flame and Ignition	
816	Creepage distances and clearance	
817	Photo-biological safety	
<b>Self Ballasted Compact Fluorescent Lamps (Performance Testing)</b>		
818	Marking	IEC 60969 :2016
819	Initial power	
820	Initial luminous flux	
821	Chromaticity coordinates	
822	Colour rendering index (CRI)	
823	Starting time	
824	Low temperature and low supply voltage starting	
825	run-up time	
826	Lumen Maintenance	
827	Premature lamp failure rate	
828	Life time	
829	Switching withstand	
830	Dimensions	
<b>Double Capped Fluorescent Lamps (Performance Testing)</b>		
831	Caps	IEC 60081 :1997 + A1:2000 + A2:2003 + A3:2005 + A4:2010 + A5:2013+ A6:2017
832	Dimensions	
833	Starting Characteristics	
834	Electrical & Cathode Characteristics	
835	Photometric Characteristics	
836	Lumen Maintenance	
837	Marking	
<b>Mineral Processing Research Centre (MPRC)</b>		
838	Alkali Silica Reactivity (Chemical method)	ASTM C-289
839	Alkali Carbonate Reactivity (Rock Cylinder Method)	ASTM C-586
840	Specific Gravity	ASTM C-127
840	Water Absorption Capacity	ASTM C-127

S. No.	Description of Services	Test Method
841	Unit weight	ASTM C-138
842	Sieve Analysis (Coarse Aggregate)	ASTM C-136
843	Sieve Analysis (Fine Powder)	ASTM C-136
844	Los Angeles Abrasion test	ASTM C-131
845	Sodium Sulphate Soundness test	ASTM C-88
846	Aggregate drying Shrinkage	BS-812
847	Aggregate Durability test	ASTM C-3744
848	Chloride content	
849	Sulphate content	
850	Aggregate Particle Shape (Flakiness and Elongation)	BS 812: 105.1-105.2
851	Light weight particles in Aggregate	ASTM- 123
852	Clay lumps and friable particles in Aggregate	ASTM C- 142
853	Material finer than 200 sieve in Aggregate by washing	ASTM C- 117
854	Specific Gravity of powdered material	
855	Moisture in Coal/Coke	ASTM
856	Ash Content in Coal/Coke	ASTM
857	Volatile matter in Coal/Coke	ASTM
858	Fixed Carbon in Coal/Coke	ASTM
859	Total Sulphur in Coal/Coke	ASTM
860	Estimation of Silica in Mineral Ore	
861	Estimation of Chromium in Chromite	
862	Estimation of Stibium in Antimony Ore	
863	Estimation of Copper in Copper Ores	
864	Estimation of Iron in Iron Ore	
865	Estimation of Aluminum in Mierals	
866	Complete Chemical Analysis of Minerals/Ores/Roacks/Alloys/other Inorganic Chemicals	
867	Silica (SiO <sub>2</sub> )/Silicon (Si) in ores and Alloys	Quantitative Inorganic Analysis by Arthur I. Vogel 3 <sup>rd</sup> Edition
868	Metal Oxides (R <sub>2</sub> O <sub>3</sub> ) in Ores and other Inorganic Materials	Quantitative Inorganic Analysis by Arthur I. Vogel 3 <sup>rd</sup> Edition
869	Calcium Oxide (CaO)	Quantitative Inorganic Analysis by Arthur I. Vogel 3 <sup>rd</sup> Edition
870	Masgnessium Oxide (MgO)	Quantitative Inorganic Analysis by Arthur I. Vogel 3 <sup>rd</sup> Edition
871	Sodium Oxide (Na <sub>2</sub> O)/Potassium Oxide (K <sub>2</sub> O)	Quantitative Inorganic Analysis by Arthur I. Vogel 3 <sup>rd</sup> Edition
872	Phosphorous (P)/ Phosphorous Oxide (P <sub>2</sub> O <sub>5</sub> )	Quantitative Inorganic Analysis by Arthur I. Vogel 3 <sup>rd</sup> Edition
873	Titanium Oxide (TiO <sub>2</sub> )	Quantitative Inorganic Analysis by Arthur I. Vogel 3 <sup>rd</sup> Edition

S. No.	Description of Services	Test Method
874	Moisture	Quantitative Inorganic Analysis by Arthur I. Vogel 3 <sup>rd</sup> Edition
875	Loss on Ignition (LOI)	Quantitative Inorganic Analysis by Arthur I. Vogel 3 <sup>rd</sup> Edition
876	Chloride (Cl <sup>-</sup> )	Quantitative Inorganic Analysis by Arthur I. Vogel 3 <sup>rd</sup> Edition
877	Sulphates (SO <sub>4</sub> <sup>-2</sup> )	Quantitative Inorganic Analysis by Arthur I. Vogel 3 <sup>rd</sup> Edition
878	Trace Elements by AAS in Different Alloys Fe, Cr, Ca, Mg, Zn, Ni, Co, Cd, Lead(Pb), Cu, Ag and Au, Pt	Quantitative Inorganic Analysis by Arthur I. Vogel 3 <sup>rd</sup> Edition

### **Glass & Ceramics Research Center**

#### **Glass and Ceramics Testing Laboratory:**

879	Chemical Analysis Ceramic Raw Material, Limestone, Feldspar, Quartz, Dolomite, Clays, Marble, Sand	ASTM C-323 ASTM C-25 -do- ASTM C-146
880	Partial Chemical analysis Ceramic Raw Material, Limestone, Feldspar, Quartz, Dolomite, Mangnesite, Clays, Marble, Sand	ASTM C-323 ASTM C-25 -do- ASTN C-146 -do-
881	Chemical Analysis (Purity) of Cement	ASTM C-114
882	Setting Time of Cement	ASTM C-191
883	Alkalies of Cement	ASTM C-144, C-150
884	Declaration of Tiles through Customs	ASTM C-67, ASTM C-895, C-126
885	Sieve Analysis (3 sieves)	
886	SASO Certification/BS of Sanitary Wares	SASO Standard
887	Chemical Analysis of Glass	ASTM C-169
888	Chemical effect of Tiles	ASTM C-1378
889	Colour measurement	Colormeter
890	Light Transmission	ASTM C-1649

#### **Building and Binding Material Laboratory**

891	Chemical Analysis of Bricks, Refractory	ASTM C-323
892	Moisture Contents of Brick	ASTM C-323
893	Water Absorption of brick	ASTM C-20
894	Porosity of Brick	ASTM C-20
895	Bulk density of Brick	ASTM C-20
896	Specific Gravity	ASTM C-20
897	Whiteness	JSZ-8722
898	Brightness	JSZ-8722
899	Refractoriness (service Temperature) of Bricks	ASTM C-24
900	Cement Sand Ratio of Mortar	ASTM C-1084
901	Cement Sand / Aggregate Ratio of Concrete, Mortar	ASTM C-1084
902	Thermal shock Resistance	ASTM C-149/C-484

S. No.	Description of Services	Test Method
903	Firing Shrinkage	ASTM C-326
904	Clay or dust percentage	BS 1881
905	Chloride	ASTM C-323
906	Sulphate	ASTM C-323
<b>Geo-Technical Laboratory</b>		
907	Sieve analysis / Gradation curve	ASTM D-6913
908	Liquid limit	ASTM D-423
909	Plastic limit	ASTM D-423
910	Gelling time	
911	Gelling Index	
912	Scratch Hardness Test (Moh's Scale)	
913	Proctor Compaction Test	ASTM D-698, D-1557
914	Soil Classification	ASTM D-2487
915	Plasticity Index	ASTM D-4318
916	Passing # 200	ASTM C-117
917	Swelling capacity	ASTM D-5890
<b>Center For Environmental Protection Studies (CEPS)</b>		
<b>Water Analysis for Parameters:</b>		
918	pH	Std. Methods for analysis of Water & Wastewater -pH meter
919	Conductivity	Std. Methods for analysis of Water & Wastewater -Conductivity meter
920	Turbidity	Std. Methods for analysis of Water & Wastewater -Turbidity meter
921	Total Hardness, Calcium Hardness, Magnesium Hardness, Total Alkalinity, P-Alkalinity	Std. Methods for analysis of Water & Wastewater -Titration
922	Chloride, Fluoride	Std. Methods for analysis of Water & Wastewater - Ion Chromatogram
923	Sulphate	Std. Methods for analysis of Water & Wastewater -Turbidity meter
924	Sodium, Potassium	Std. Methods for analysis of Water & Wastewater -Flame photometer
925	Iron, Arsenic	Std. Methods for analysis of Water & Wastewater -Inductive Couple Plasma (ICP)
<b>Wastewater/Industrial Effluent Analysis for Parameters</b>		
926	Temperature	Std. Methods for analysis of Water & Wastewater - Thermometer
927	pH	Std. Methods for analysis of Water & Wastewater - pH meter

S. No.	Description of Services	Test Method
928	Total Dissolved Solids (TDS), Total Suspended Solids (TSS)	Std. Methods for analysis of Water & Wastewater - Oven Dry Method
929	Total Hardness, Calcium Hardness, Magnesium Hardness, Alkalinity, P-Alkalinity, M-Alkalinity, Sulphide	Std. Methods for analysis of Water & Wastewater - Titration method
930	Anionic Detergents	Std. Methods for analysis of Water & Wastewater - titration
931	Cyanide	Std. Methods for analysis of Water & Wastewater - Merk-Kit
932	Phenolic Compounds Sulphate	Std. Methods for analysis of Water & Wastewater -UV-Spectrophotometric Method
933	Ammonia, Kjeldahl Nitrogen Chemical Oxygen Demand (COD)	Std. Methods for analysis of Water & Wastewater - Digestion followed by titration method
934	Oil and Grease	Std. Methods for analysis of Water & Wastewater - Solvent Extraction Method
935	Biochemical Oxygen Demand (BOD),	Std. Methods for analysis of Water & Wastewater - Incubation followed by titration
936	Turbidity, Sulphate	Std. Methods for analysis of Water & Wastewater - Turbidity meter method
937	Chloride, Fluoride	Std. Methods for analysis of Water & Wastewater - Ion Chromatogram
938	Sodium, Potassium	Std. Methods for analysis of Water & Wastewater - Flame photometer
939	Arsenic, Cadmium, Chromium, Copper, Iron, Lead, Mercury, Nickel, Manganese, Zinc	Std. Methods for analysis of Water & Wastewater - Inductive Couple Plasma (ICP)
940	Chlorine	Std. Methods for analysis of Water & Wastewater - Titration
<b>Solid waste and Fuel Analysis</b>		
941	Calorific Value Sulphur content	Bomb Calorimeter
942	Proximate Analysis	ASTM - Oven and Furnace method
<b>Stack Gaseous Emission</b>		
943	CO <sub>2</sub> , CO, NO <sub>2</sub> , NO, SO <sub>2</sub> , O <sub>2</sub>	Stack Emission system
944	PM10	PM testing system



S. No.	Description of Services	Test Method
945	Noise	Noise level monitoring system
<b>Ambient Air quality</b>		
946	CO, Oxides of Nitrogen, Oxides of Sulphur (as SO <sub>2</sub> )	Stack Emission system
947	PM10	PM testing system
948	Noise	Noise level monitoring system
<p><b>Note:</b></p> <ul style="list-style-type: none"> <li>➤ Centre is accredited for <b>ISO- IEC-17025</b> Quality Control and Quality Assurance by <b>PNAC</b>.</li> <li>➤ <u>The lab is approved by the <b>Environmental Protection Department</b></u></li> </ul>		

### **Up-gradation & Modernization of Workshop (UMW)**

S. No.	Name of Machine	Specifications	Capabilities
949	CNC Turning Centre with milling attachment LTC 25 ALM Taiwan	Swing over bed = 500 mm Longitudinal travel = 850 mm Spindle Speed range = 30-4000 rpm Spindle Bore = $\Phi$ 75 mm 08 Tool Charger Turret Programmable	Multiple type of Lathe & Milling operations.
950	CNC Turning Centre T-6 Taiwan 2 Nos.	Swing over bed = 200 mm Longitudinal travel = 400 mm Spindle Speed range = 25-6000 rpm Spindle Bore = $\Phi$ 50 mm 08 Tool Charger Turret Programmable	Multiple type of Lathe operations.
951	CNC Machining Centre TW - 1065 Taiwan	(X, Y, Z) = 1000 mm, 500 mm, 500 mm Spindle Speed range = 30-3500 rpm With universal Milling, Indexing Head & Rotary Table Programmable	Multiple type of Milling operations
952	Tool & Cutter Grinder M40 Taiwan	Work table: 400mm Wheel head Cross movement: 250mm Wheel head vertical movement: 250mm Wheel head: 360°	Multiple cutting & grinding operations
953	Surface Grinder PFG-D 4080 AH Taiwan	XYZ = 800 x 400 x 350 mm	Metal surface grinding
954	Dual Purpose TIG/SMAW Welding Machine AEP - 300 Japan	Main Supply Input : 380-440 V/ 50 Hz, 3- Phase Rated DC Output: 300Amp Rated DC Output Max. Load Voltage - GTAW: 22V Max. Load Voltage -	Multiple type of welding

		SMAW : Yes Max. Open Circuit Voltage : 32V Welding Torch : Water Cooled duty cycle : 300 AMP Processes : GTAW AC & DC - SMAW	
955	Universal Milling Machine	Vertical Turret & Horizontal Milling FVHM-300-A	Multiple type of Manual Milling operations
956	CNC Milling	DECKEL upgraded to GSK Control Panel	Multiple type of Milling operations
957	Heavy Duty Lathe	1660 G Copy Attachment	Lathe operations
957	Heavy Duty Lathe	CS 6266C / 3000 GAP – BED	Lathe operations
959	Lathe	CDL 6241 DMTG	Lathe operations
960	Heavy Duty Drill	Vertical Precision	Drilling operations
961	Steel Worker	Hydraulic Multi-Functional Sheet Metal Working Machine	Multi-Functional Sheet Metal Working Machine

### Testing Facilities

S. No.	Name of Machine	Specifications	Capabilities
962	Coordinate Measuring Machine (CMM)	Renishaw operating system.	CHIEN WEI PPRECISION CO LTD Made in Taiwan

### Calibration Center

S. No.	Test / Calibration Capabilities
963	Instrument / Parameter
964	Voltmeter Single Phase
965	Voltmeter Three Phase
966	Ampere Meter Single Phase
967	Ampere Meter Three Phase
968	Multimeter (AC/DC Voltage & Current, Resistance)
969	Resistance Meter
970	Clampmeter (AC/DC Voltage & Current, Resistance)
971	Megger (upto 1 G $\Omega$ ohm)
972	Milliohm Meter
973	Decade Resistance Box
974	RCL Meter
975	Decade Capacitance Box
976	Decade Inductance Box

977	High Voltage Meter upto 10 kV
978	High Voltage Meter 50 kV and Above
979	DC or AC Oil Dielectric Test Set
980	Transformer Turn Ratio Meter (Single Phase)
981	Transformer Turn Ratio Meter (Three Phase)
982	Earth Resistance Meter
983	Power Meter Single Phase (Power Only)
984	Power Meter Three Phase (Power Only)
985	Tachometer Contact Type
986	Tachometer Non Contact Type
987	RPM Measurement
988	Multifunction Calibrator (Gen & Measurement) Per Parameter
989	Multifunction Calibrator (Gen or Measurement) Per Parameter
990	Frequency Generator (Frequency per Channel per wave shape)
991	Stopwatch
992	Sound Level Meter
993	Sound Level Meter Calibrator
994	Oscilloscope
995	Set of Mass
996	Mass upto 20 kg
997	Mass upto 50 kg
998	Weighing Scale (20 kg)
999	Weighing Scale (50 kg)
1000	Weighing Scale (100 kg)
1001	Weighing Scale (1000 kg)
1002	Force Gauge
1003	Measuring Tape (5m)
1004	Line Length Standard
1005	Vernier Caliper (300 mm)
1006	Micrometer (25 mm)
1007	Gauge Block
1008	Dial Indicator
1009	Spectrophotometer
1010	pH Meter
1011	Conductivity Meter
1012	TDS Meter
1013	Measuring Flask
1014	Measuring Cylinder
1015	Measuring Beaker
1016	Measuring Pipette
1017	Measuring Burette
1018	Hydrometer
1019	Alco-meter
1020	Liquid in Glass Thermometer
1021	Digital Thermometer
1022	Temperature Controller
1023	Hygrometer
1024	Oven
1025	Incubator
1026	Furnace

1027	Tumble Dryer
1028	Water Bath
1029	Pressure Gauge(3000 psi)
1030	Pressure Gauge(5000 psi)
1031	Pressure Gauge(10000 psi)
1032	Dead Weight Pressure Tester
1033	Vacuum Gauge
1034	Pressure Calibrator
1035	Temperature Calibrator
1036	Wascator
1037	Crock Meter
1038	Wrapping Reel
1039	Sample Cutter
1040	Light Box
1041	Twist Tester
1042	Strength Testing Machine
1043	Universal Tensile Testing Machine (180 ton)
1044	Universal Tensile Testing Machine (100 ton)
1045	Auto Flame Chamber
1046	Autoclave
1047	Deep Freezer
1048	Digital Elmendorf Tear Tester
1049	Mano Meter
1050	Micro Pipettor
1051	Pneumatic Stiffness Tester
1052	Dispenser
1053	Feeler Gauge
1054	Glow Wire Tester

## **Centre For The Development Of Laboratories Equipment (CDLE)**

### **The services and activity:**

The Centre for development of laboratory equipment (CDLE), established in 2004 at Pakistan Council of Scientific & Industrial Research (PCSIR) Laboratories Complex, Ferozpur Road, Lahore, is constantly engaged in R & D activities in areas related to fabrication and Design & Development, Repair & Maintenance, Back up Service of laboratory equipment. This Centre has Mechanical work shop, Electrical laboratory, Electronics Laboratory and R & D Laboratory, which is a centralized facility capable of beneficiation of R & D studies on different types of electronics and electrical mechanical equipment. It also undertakes design & development and fabrication of laboratories equipment, electronic circuits, micro controller programming and software studies of different equipment based on PLC. This Centre is also actively involved in automation and control of lab equipment.

Production of Scientific Laboratory Equipment is a great venture and breakthrough in Scientific Laboratory instrumentation. This activity is being carried out at Centre for the Development of Laboratory Equipment (CDLE), PCSIR Labs Complex Lahore. It is the outcome of long experience & efforts of the in-house R & D work of PCSIR.

Scientific Laboratory Equipment for use in education, industries & R&D sectors etc. are being imported from different countries. When the prices of these equipments rising up because of the basic changes in the technologies and sudden rise in the exchange rate of foreign currencies, PCSIR started in-house R & D activity pertaining to the design, development and fabrication of commonly used low cost laboratory

equipment to supplement the education, R&D sectors where the budget allocation constrained them to buy the costly imported scientific laboratory equipment.

### **Our competitive advantages include:**

- Utilization of indigenous resources.
- Availability of development of equipment according to customer requirement or user's own specification.
- Availability of the equipment locally at almost one-third to one tenth of the price of equipment of foreign origin.
- The quality and reliability / performance is as good as similar foreign origin equipment.
- Availability of fast, easy and cheaper back up services locally for the equipment developed at CDLE PCSIR LLC.
- A range of 65 different types of Laboratory Equipment is available at CDLE, PCSIR and this list is increasing every year.

### **Main Services**

Centre for the Development of laboratory Equipment PCSIR, Lahore has developed various Laboratory Equipment, which are being used in the R&D Organizations, Educational Institutions and Pharmaceutical Industry and in the Quality Control Laboratories of several Industries. Besides this, the centre is also disseminating its expertise towards following:

### **Main Section of This Centre**

- MECHANICAL WORKSHOP
- R&D LAB
- ELECTRONICS LAB
- ELECTRICAL LAB
- EQUIPMENT ASSEMBLING & TESTING LAB
- REPAIR & MAINTENANCE LAB
- DISPLAY ROOM
- DOCUMENTATION

### **Capabilities / Facilities for Production at Pilot Plant Level**

- For the Production & development of Industrial Chemicals
- For the Production of standardized Ink Stamp Pad (SISP)
- For the beneficiation of Minerals & Ores