

**Provision of Data Regarding existing Facilities / Laboratory Tests Available at
PCSIR Laboratories Complex, Peshawar**

Material Science Centre (MSC)

S. No.	Description of Services	Test Method
Materials Science Center		
Chemical Analysis of ores (Complete)		
1.	XRF Analysis	XRF
Tensile Testing		
2.	Steel Samples (less than 1" Dia) (more than 1" Dia)	ASTM (2008): A-615
3.	Bend Testing	ASTM (2008): A-615
Cold Rolling composition		
4.	Alloys (emission spectrography without sample cutting)	Emission Spectrograph
5.	Alloys (emission spectrography with sample cutting)	Emission Spectrograph
Printing Paper/Box Board/Duplex Board/Bleach Board/Carbon Paper		
6.	Grammage	ASTM D 646-96
7.	Burst Factor/Burst Strength	ASTM D774/D774-97
8.	Brightness	ASTM D985-97
9.	Opacity	ASTM D589-97
10.	Thickness	ASTM D645/D645 M-97
11.	Tear strength	ASTM D689-96a
Glue		
12.	Test of Glue (solid contents, viscosity, density, pH)	ASTM D 1583-01, Rotational Viscometry, Densitometry, Flame Photometry, N.H. Furman, Standard Methods of Chemical Analysis, 6 th ed., Vol. I, 1963 D. Van Nostraid Company, Inc. New York
Polymers, Plastic & Rubber		
Polymers		
13.	Material Evaluation for identification of base polymer (high and low density polyethylene, polypropylene, polystyrene, nylon etc.)	Easy identification of Plastics and Rubber
14.	Melting range for thermoplastic only	Melting point apparatus
15.	Composition of Polymers	Easy identification of Plastics and Rubber
16.	Coating on wood and steel	M.T
17.	Test of Wood (Ash & Water absorption)	ASASTMD-4442-15 D 1102(84) 2013.
18.	Pipe thickness, diameter	Digital Vernier Calliper
19.	Heat reversion, longitudinal reversion	ISO 12091:1995 ISO 2505:2005
20.	Food grade Polymers	Atomic Absorption Spectrophotometry
21.	Density/Specific gravity: Plastic granules, pipes	ISO 1183:2012
Plastic		
22.	Plastic pipes: Tensile Strength % age	ASTM D 638
Evaluation of road marking Chlorinated Rubber / Thermoplastic Paints		
23.	Total solid contents: Drying time (Surface	ASTM D 1475-98: D 5125-10 (2003), D 3335-85

S. No.	Description of Services	Test Method
	dry and Hard dry), %age of Volatile contents, Specific gravity, Mass per liter, Hiding power of Enamel Paint	(a) (2014)
Rubber		
24.	Identification of Rubber	Easy identification of Plastics and Rubber
25.	Composition of Rubber	-do-
26.	Compounding of Rubber	-do-
27.	Density & Specific Gravity of Rubber	-do-
Petrochemical Section		
28.	Bitumen (Ductility, Sp. Gravity, Penetration, Softening Point, solubility)	ASTM (2008):D-5, D -70; D – 113; D-2042
29.	Diesel: Complete Analysis Quality without Sulphure & Calorific value	M.T
30.	Petroleum Products test perform on CHNS	CHNS analyzer
31.	Test of Oil (Lubricant, rifle etc.) (for pH, viscosity, viscosity Index, density, pour point)	ASTM D 445, ASTM D 1298, ASTM D 97; pH meter
32.	Test of Organic compound/Hydrocarbon/Graphite (C, H, N, S-O by CHNS analyzer)	CHNS analyzer
Chemical Parameters		
33.	Inorganic Chemicals Purity	M.T
34.	P ₂ O ₅ contents Phosphate Rock	N.H. Furman, Standard Methods of Chemical Analysis, 6 th ed.
35.	P ₂ O ₅ contents Phosphate Rock + Complete	-do-
36.	Soap/Detergents	L.P.T
37.	Fertilizers NPK	N.H. Furman, Standard Methods of Chemical Analysis, 6 th ed.
38.	Fertilizer DAP	-do-
39.	Fertilizer Urea	-do-
40.	Liquid Fertilizer (Boron, Humic Acid, K, S, N, P,)	-do-
41.	Test of Kidney stone (Qualitative Analysis)	Text Book of “Qualitative Inorganic Analysis”, by Vogel 2006.
42.	Test of Gall Stone (Qualitative Analysis)	Text Book of “Qualitative Inorganic Analysis”, by Vogel 2006.
43.	Test of Fumigation Tablets (Aluminum Phosphate)	N.H. Furman, Standard Methods of Chemical Analysis, 6 th ed.
Textile and Fabrics		
44.	Fiber identification	AATCC 20
45.	Fabric composition	AATCC 20 A
46.	GSM	ASTM-D3776-07
47.	Yarn count	ASTM D1907-07
48.	Fabric count	ASTM D3775-98
49.	Fiber diameter	ASTM D1448-05
50.	Shrinkage	ISO 7771
51.	Color fastness	BS1006
52.	Water resistance	AATCC 127
53.	Dimensions of tent	-
Chemicals Testing		
54.	Sulphuric Acid (Purity)	Quantitative inorganic analysis by Vogel 2 nd edition
55.	Nitric Acid (purity only)	Quantitative inorganic analysis by Vogel 2 nd edition
56.	Sodium Silicate (purity only)	Quantitative inorganic analysis by Vogel 2 nd edition
Mineral Processing		

S. No.	Description of Services	Test Method
Minerals / Ores / Rocks etc.		
57.	Chemical Analysis (Complete)	N.H. Furman, Standard methods of Chemical analysis, 6 th edition.
58.	Loss on Ignition	-do-
59.	Ore/Mineral (Cu, Al, Ba, Si, F, Cl, Fe, Mn, Sb, Cd, Pb, Ni, Ag, Pt, Cr, Zn, Co, Sn, Li, Na, K, Au, Tin, Antimony, Molybdenum, Phosphorous, Sulphate)	Atomic Absorption Spectrophotometry
60.	Particle size	Particle size analyzer
Coal		
61.	Proximate Analysis (complete)	ASTM D 3173-74, D 3175-01, D 5865, D1757-96 (ASTM 2002)
62.	Gross Calorific, Value	Bomb Calorimeter
63.	Ammonium Bisulphite (percentage)	Quantitative inorganic analysis by Vogel 2 nd edition
64.	Sodium Sulphate (purity)	Quantitative inorganic analysis by Vogel 2 nd edition
65.	Test of Calcium Fluoride (complete chemical)	N.H. Furman, Standard methods of Chemical analysis, 6 th edition.
66.	Test of Match (Cr, Pb, Mn, Sb, Cd)	Atomic Absorption Spectrophotometry
67.	Test of Gunny/PP Bags (Dimension, Weight, ends, picks, breaking load Seam strength))	PS: 1436-1986, PS: 143-1984, PS: 161-1984, PS: 1553-1982, PS: 1436-1986
68.	Test of Chromite (Chromium only)	Atomic Absorption Spectrophotometry
69.	Chromite Ore (Chromite complete analysis)	N.H. Furman, Standard methods of Chemical analysis, 6 th edition.
70.	Test of Bentonite (complete analysis)	N.H. Furman, Standard methods of Chemical analysis, 6 th edition.
71.	Test of Manganese Ore (complete analysis)	Atomic Absorption Spectrophotometry
Test of Soil / Coal		
72.	Humic Acid	L.P.T
73.	Plant Nutrients, humic dew	L.P.T
Pilot Plant Services Charges		
74.	Crushing rock and minerals (Jaw crusher)	L.P.T
75.	Grinding rock and minerals (Ball Mill)	L.P.T
76.	Rotary Kiln (Temp. Upto 800 °C)	L.P.T
77.	Rotary Kiln (Temp. above 800 °C)	L.P.T
78.	Lightweight Aggregate (with raw material)	L.P.T
79.	Lightweight Aggregate (without raw material)	L.P.T
80.	Rice husk ash (with raw material)	L.T
81.	Rice husk ash (without raw material)	L.T
Ceramic Raw Material, Limestone, Feldspar, Quartz, Dolomite, Clays, Marble, Sand		
82.	Complete Chemical Analysis	N.H. Furman, Standard methods of Chemical analysis, 6 th edition
83.	Fineness of Marble	ASTM C-786
84.	Hardness of Marble	ASTM (2008):C-170
85.	Specific Gravity of Marble	ASTM (2008): C-97
86.	Loss on Ignition for Stone	N.H. Furman, Standard methods of Chemical analysis, 6 th edition
Tile, Bricks, Refractory, Bauxite, Gypsum		
87.	Water Absorption	ASTM (2008): C-67
88.	Porosity	L.P.T
89.	Bulk Density	L.P.T
90.	Specific Gravity	ASTM (2008): C-67

S. No.	Description of Services	Test Method
91.	Compressive Strength	ASTM (2008): C-67
Cement		
92.	Chemical Analysis (Purity)	ASTM C-114
93.	Setting Time	ASTM C-191
94.	Alkalies	ASTM C-150
95.	Fineness	ASTM C-430
96.	Compressive Strength (3 to 7 days)	ASTM C-109
97.	Soundness	ASTM C-1012
98.	Sieve Analysis of Material (3 sieves)	ASTM C-430
99.	Consistency	ASTM C-187
Aggregate / Sand		
100.	Soundness	ASTM C-88
101.	Coarse & fine aggregates analysis Abrasion, ASR, ACR, unit weight, sieve fineness	ASTM C131, C 586, C 136, C 535, C 289
102.	Organic Impurities of Sand	C 40
103.	Bulk density of sand	C 29
104.	Chloride	C 1218
105.	Sulphate	H.T
106.	Test of Admixture in liquid (Chloride, specific gravity, pH value)	ASTM C-494
Tile Bond		
107.	Open time, adjustability, Shear strength, tensile strength	PS 3460-1993
GI wire		
108.	Galvanization, Tensile strength, Size	ASTM:A-90;A-370
Copper Wire		
109.	Copper purity	N.H. Furman, Standard methods of Chemical analysis, 6 th edition.
Barrier		
110.	Mesh size, diameter, yield strength, tensile strength, elongation	Digital Vernier Caliper ASTM:A-90;A-370
Steel Rope/ Wire Strand		
111.	Unit weight, Diameter, Breaking load, Young Modulus, Elongation	ASTM (2008): A-416

Food Technology Centre (FTC)

S.No.	Description of Services	Test Method
112.	Apple Juice PS-1739-2009	Degree Brix Clear sample Min AOAC 2000
		Acidity as anhydrous citric acid %by weight Min AOAC 2000
113.	Balance Feed Mixture for Livestock PS-234-2016	Crude Protein (%) AOAC 2000
		Crude Fibre (%) AOAC 2000
		Crude Fat (%) AOAC 2000
		Total Ash (%) AOAC 2000

S.No.	Description of Services	Test Method
		Moisture (%) AOAC 2000
		Acid Insoluble Ash (%) AOAC 2000
		Metabolic Energy/ Kcal/100 gm
		Dairy Feed Type-1 Aflatoxin (B1, B2, G1, G2)
		Dairy Feed Type-2 Aflatoxin (B1, B2, G1, G2)
		Cattle Feed Aflatoxin (B1, B2, G1, G2)
		Dairy Feed Type-1, Type-2, Cattle Feed (Total coliform) FAO 1992/ Compendium 2001
		Dairy Feed Type-1, Type-2, Cattle Feed (<i>E. coli</i>)
		Dairy Feed Type-1, Type-2, Cattle Feed (Salmonella)
		Dairy Feed Type-1, Type-2, Cattle Feed (Total Plate Count at 37 °C)
114.	Banaspati GheePS-221-2010	Moisture and insoluble impurities Percent by weight max PS: 56-196
		Butyro Refracometer reading at 40°C
		Free fatty acid
		Nickel mg/kg, max
		Unsaponifiable matter, percent by weight, Max
		Peroxide Value, express as milliequivalent oxygen per Kg, Max
		Anisidine value max/ rancidity test PS: 221-2003
		Vitamin-A PS: 56-196
		Soap Content, ppm, Max PS:221-2003
		Moisture, % by weight AOAC 2000
		Acid Insoluble Ash (on dry basis) AOAC 2000
		Acidity of extracted fat (as oleic acid) AOAC 2000
		Water Extract % mass fraction AOAC 2000
		Total Ash % mass fraction AOAC 2000
		Alkalinity of Water soluble ash (as KOH), % mass fraction of total ash AOAC 2000
		Acid Insoluble ash, % mass fraction AOAC 2000
		Crude Fibre % mass fraction AOAC 2000
		Milk Fat % m/m AOAC 2000

S.No.	Description of Services	Test Method
		Milk Solids Not Fat Content, % m/m AOAC 2000
		Water Content m/m % AOAC 2000
		Carbon Dioxide AOAC 2000
		TSS AOAC 2000
		Moisture, % by weight AOAC 2000
		Total Ash % on dry basis AOAC 2000
		Ash Insoluble in HCl acid % on dry basis AOAC 2000
		Non-volatile ether extract % on dry basis AOAC 2000
		Crude Fibre % on dry basis AOAC 2000
		Fatty Acid Profile
115.	Biscuits (excluding Wafer Biscuits) PS-383-2014	Total Microbial Count FAO 1992/ Compendium 2001
		Coliform
		E. coli
		Yeast & Molds
		Staphylococcus aureus
		Salmonella
116.	Black Tea PS- 493 -2012	Water Extract % mass fraction AOAC 2000
		Total Ash % mass fraction AOAC 2000
		Alkalinity of Water soluble ash (as KOH), % mass fraction of total ash AOAC 2000
		Acid Insoluble ash, % mass fraction AOAC 2000
		Crude Fibre % mass fraction AOAC 2000
		Total Polyphenols, % Mass Fraction
117.	Bottled Drinking Water 4th Rev. PS 4639-2018	Colour
		Odour
		Taste
		Turbidity
		pH range
		TDS
		Nitrite as (N)
		Chloride

S.No.	Description of Services	Test Method
		Sulphate
		Potassium
		Sodium
		Magnesium
		Calcium
		Chlorine
		As
		F
		Total Coliform *
		APHA
		Thermotolerant / fecal coliform *
		APHA
		E. coli
		APHA
		Fecal enterococci/ streptococci
		Pseudomonas aeruginosa
		APHA
		* Total Viable Count at 20 – 22 °C
		APHA
		* Total Viable Count at 37°C
		APHA
	118. Bottled Natural Mineral Water Final PS 2102-2010	pH
		TDS
		T.Hardness as CaCO ₃
		Nitrite
		Cl
		Sulphate
		Na
		K
		Mg
		Ca
		Sb
		As
		Ba
		Cd
		Cr
		Cu
		F

S.No.	Description of Services	Test Method
		Pb
		Mn
		Ni
		NO ₃
		NO ₂
		Se
		B
		As
		F
		* Total Coliform APHA
		* Thermotolerant / fecal coliform APHA
		E. coli APHA
		Fecal enterococci/ streptococci No facility
		Pseudomonas aeruginosa APHA
		* Total Viable Count at 20 – 22 °C APHA
		* Total Viable Count at 37°C APHA
119.	Butter PS- 1831-2012	Milk Fat % m/m AOAC 2000
		Milk Solids Not Fat Content, % m/m AOAC 2000
		Water Content m/m % AOAC 2000
		Sodium Chloride m/m %
		Rancidity
120.	Carbonated Beverages PS 1654-2012	Ba
		F
		Cd
		As
		Cu
		Se
		Cr

S.No.	Description of Services	Test Method
		Mn
		Total Plate Count APHA
		Coiliform APHA
		Yeast & Molds APHA
121.	Chilli (Red Pepper) Powder PS-1742-2010	Salmonella FAO 1992
		Total Coliforms -do-
		Yeast / Molds Count -do-
		Total Plate Count FAO 1992/ Compendium 2001
		Aflatoxin AOAC 2000
		Moisture, % by weight AOAC 2000
		Total Ash % on dry basis AOAC 2000
		Ash Insoluble in HCl acid % on dry basis AOAC 2000
		Non-volatile ether extract % on dry basis AOAC 2000
		Crude Fibre % on dry basis AOAC 2000
		BR Value at 40°C
122.	Concentrated Fruit Juice PS-527-2016	Degree Brix Clear sample Min AOAC 2000
		Acidity as anhydrous citric acid %by weight Min AOAC 2000
		Milk Fat, % by weight AOAC 2000
		Total Milk Solid, % by weight AOAC 2000
		Milk Protein in Milk SNF (%) AOAC 2000
		Color AOAC 2000
		Titratable Acidity (%) AOAC 2000
		Pasturized Juice (Yeast & Molds)
		Pasturized Juice (Coliforms)
		Sterilized Juice (Sterility Test)
123.	Condensed Milk PS-364-2013	Total Plate Count FAO 1992/ Compendium 2001
		Coliform
		Yeast

S.No.	Description of Services	Test Method
		Mold Milk Fat, % by weight AOAC 2000 Total Milk Solid, % by weight AOAC 2000 Milk Protein in Milk SNF (%) AOAC 2000 Color AOAC 2000 Sugar % Titrateable Acidity (%) AOAC 2000
124.	Cooking Oil Blended PS-2858-2012®	Moisture and insoluble impurities Percent by weight max PS: 56-196 Color in a 5 ½ inch cell on lovibond scale Refractive Index at 40°C Free fatty acid Saponification value Iodine Value (wijs) Unsaponifiable matter, percent by weight, Max Do Peroxide Value, express as milliequivalent oxygen per Kg, Max Anisidine valuemax/ rancidity test PS: 221-2003 Vitamin-A PS: 56-196 Soap Content, ppm, Max PS:221-2003 Fatty Acid Profile
125.	Curry Powder PS- 1741-2010	Moisture, % by weight AOAC 2000 Acid Insoluble Ash (on dry basis) AOAC 2000 Crude Fibre on dry basis AOAC 2000 Salmonella FAO 1992 Total Coliforms Yeast / Molds Count Total Bacterial Count FAO 1992/ Aflatoxin AOAC 2000
126.	Enamel paint exterior/ interior	Pb

S.No.	Description of Services	Test Method
	(undercoating, finishing colour)PS 616 & 617 – 2017	Cr
		Cd
127.	Flavoured Milk PS-3189-2012	Milk Fat % AOAC 2000
		Milk Solids Not Fat(SNF) % AOAC 2000
		Creaming Index
		Phosphatase Test
		Sterilized (Coliform Count) FAO 1992/
		Sterilized (Total Colony Count) FAO 1992/
		Sterilized (Bacterial Spores) No facility
		Pasteurized (Coliform Count) FAO 1992/
		Pasteurized (Total Colony Count) FAO 1992/
		Pasteurized (Bacterial Spores) No facility
128.	Food For Infants & Children PS-1688-2008	Protein AOAC 2000
		Total Fat AOAC 2000
		Total Carbohydrates AOAC 2000
		Vitamins etc.
		Fe
		Ca
		P
		Mg
		Na
		Cl
		K
		Mn
		Se
		Cu
		Zn
129.	Fruit Squashes PS 506- 2010	Degree Brix (clear Sample) AOAC 2000
		Acidity (as anhydrous citric acid) % by weight AOAC 2000
		Degree Brix Clear sample Min AOAC-2000
		Acidity as anhydrous citric acid %by weight Min AOAC-2000

S.No.	Description of Services	Test Method
		As
		Pb
		Cu
		Sn
		Yeast & Molds
		Coliforms
130.	Honey PS-1934-2012	<p>Apparent Reducing Sugar Content a. Honey not listed below b. Honeydew Honey c. Blackboy (Xanthorrhoea premissii)</p> <p>Moisture Content a. Honey not listed below b. Heather Honey (Calluna) c. Clover Honey (Trifolium)</p> <p>Apparent Sucrose Content *Depending on honey type</p> <p>Water Insoluble Solids Contents a. For honeys other than pressed honey b. Pressed honey</p> <p>Mineral Content (ash) a. Honey not listed below b. Honeydew Honey or a mixture of Honeydew honey and blossom honey</p> <p>Acidity AOAC 2000</p> <p>Diastase Activity Determined after processing and Blending AOAC 2000</p> <p>Hydroxymethyl furfural Content AOAC 2000</p>
131.	Jam and Jellies PS-2096-2010	<p>Tartrates AOAC 2000</p> <p>Sorbates AOAC 2000</p> <p>benzoate sulfites AOAC 2000</p> <p>Fruit content AOAC 2000</p> <p>Soluble Solid AOAC 2000</p> <p>Total Coliforms FAO 1992</p> <p>Yeast / Molds Count FAO 1992</p>
132.	Liquid Tea/Coffee Whitener PS-5383-2017	Milk Fat or Vegetable Fat or Blend AOAC 2000

S.No.	Description of Services	Test Method
		Milk Solids Not Fat AOAC 2000
		Pb
		As
		Cd
133.	Margarine 3rd Revision PS 1653-2012	Fe
		Cu
		Ni
		Total viable Plate Count FAO 1992/ Compendium 2001
		Coliform
		Yeast
		Mold
		Salmonella
134.	Marmalades PS-514-2010	Yeast & Molds
		Coliforms
135.	Mayonnaise PS-3947-2010	Fat % AOAC 2000
		As
		Pb
		Cu
136.	Milk Powder- PS-363-2011	Flavor & Color AOAC 2000
		Moisture (%) AOAC 2000
		Total Solids % by weight AOAC 2000
		Total Ash (%) AOAC 2000
		Milk Fat (%) AOAC 2000
		Titratable Acidity (%) AOAC 2000
		Milk Protein (%) AOAC 2000
		Whole milk/ Full cream Milk Powder (Aflatoxin M1)
		Partially Skimmed Milk Powder (Aflatoxin M1)
		Semi-Skimmed Milk Powder (Aflatoxin M1)
		Skimmed / Low Fat Milk (Aflatoxin M1)
		Milk Powders (Total Bacterial Count) FAO 1992/ Compendium 2001
		Milk Powders (Salmonella) FAO, 1992

S.No.	Description of Services	Test Method
137.	Orange Juice (1st Rev.) PS-1738-2009	Degree Brix Clear sample Min AOAC 2000 Acidity as anhydrous citric acid %by weight Min AOAC 2000
138.	Palm Oil Edible Grade PS-1561-2010	Moisture and insoluble impurities Percent by weight max PS: 56-196 Refractive Index at 40°C PS: 56-196 Relative Density (20°C/water at 20oC) PS: 56-196 Saponification value PS: 56-196 Iodine Value (wijs) PS: 56-196 Unsaponifiable matter, percent by weight, Max PS: 56-196 Peroxide Value, express as milliequivalent oxygen per Kg, Max PS: 56-196 Anisidine valuemax/ rancidity test PS: 221-2003 Vitamin-A PS: 56-196 Melting point PS: ISO: 3015-1992 Free Fatty Acid PS: 56-196
139.	Pickles 3rd Revision PS 520-2013	As Pb pH Sn
140.	Poultry Feed- PS 233-2012 Aflatoxin (B1, B2, G1, G2)	Crude Protein (%) AOAC 2000 Crude Fibre (%) AOAC 2000 Crude Fat (%) AOAC 2000 Total Ash (%) AOAC 2000 Moisture (%) AOAC 2000 Chick starter AOAC 2000

S.No.	Description of Services	Test Method
		Grower / Prelayer AOAC 2000
		Layer Feed AOAC 2000
		Broiler Starter AOAC 2000
		Broiler Finisher AOAC 2000
		Broiler Breeder Starter AOAC 2000
		Broiler Breeder Grower AOAC 2000
		Broiler Breeder Prelayer AOAC 2000
		Layer Breeder Starter AOAC 2000
		Layer Breeder Grower AOAC 2000
		Layer Breeder Layer AOAC 2000
		GB Breeder Starter AOAC 2000
		GB Breeder Grower AOAC 2000
		GB Breeder Layer AOAC 2000
		Broiler Breeder Male AOAC 2000
		Layer Breeder Male AOAC 2000
		GB Breeder Male AOAC 2000
		Quails AOAC 2000
141.	Powder Tea/Coffee Whitener PS-5384-2017	Moisture % by mass AOAC 2000
		Milk Solids Not Fat(MSNF)% AOAC 2000

S.No.	Description of Services	Test Method
		Total Ash (on dry basis) % AOAC 2000
		Fat (Milk/Vegetable/Blend) % AOAC 2000
		Pb
		As
		Cd
		Standard Plate Count / TPC FAO 1992
		Salmonella FAO 1992
		Staphylococcus FAO 1992/
		Yeast & Molds FAO 1992
142.	Refined Coconut Oil PS-99-2010	Moisture and insoluble impurities Percent by weight max PS: 56-196
		Refractive Index at 40°C
		Relative Density (20°C/water at 20oC)
		Saponification value
		Iodine Value (wijs)
		Unsaponifiable matter, percent by weight, Max
		Peroxide Value, express as milliequivalent oxygen per Kg, Max
		Anisidine valuemax/ rancidity test PS: 221-2003
		Vitamin-A PS: 56-196
		Melting point PS: ISO: 3015-1992
		Free Fatty Acid PS: 56-196
143.	Refined Cotton Seed Oil PS-21-2003®	Moisture and insoluble impurities Percent by weight max PS: 56-196
		Refractive Index at 40°C
		Relative Density (20°C/water at 20oC)
		Saponification value
		Iodine Value (wijs)
		Unsaponifiable matter, percent by weight, Max
		Peroxide Value, express as milliequivalent oxygen per Kg, Max
		Anisidine valuemax/ rancidity test PS: 221-2003

S.No.	Description of Services	Test Method
		Vitamin-A PS: 56-196
		Cloud point, Max PS: ISO: 3015-1992
		Free Fatty Acid PS: 56-196
		Soap Content, ppm, Max PS:221-2003
144.	Refined Maize oil PS-1562-2003®	Moisture and insoluble impurities Percent by weight max PS: 56-196
		Refractive Index at 40°C
		Free fatty acid
		Saponification value
		Iodine Value (wijs)
		Unsaponifiable matter, percent by weight, Max
		Peroxide Value, express as milliequivalent oxygen per Kg, Max Do
		Anisidine valuemax/ rancidity test PS: 221-2003
		Vitamin-A PS: 56-196
		Soap Content, ppm, Max PS:221-2003
145.	Refined Mustard Oil PS-25-2003®	Moisture and insoluble impurities Percent by weight max PS: 56-196
		Refractive Index at 40°C
		Relative Density (20°C/water at 20oC)
		Saponification value
		Iodine Value (wijs)
		Acid Value, Max
		Unsaponifiable matter, percent by weight, Max
		Peroxide Value, express as milliequivalent oxygen per Kg, Max
		Anisidine value max/ rancidity test PS: 221-2003
		Vitamin-A PS: 56-196
		Soap Content, ppm, Max PS:221-2003

S.No.	Description of Services	Test Method
146.	Refined Soya Bean oil PS-1563-2003®	Moisture and insoluble impurities Percent by weight max PS: 56-196
		Refractive Index at 40°C
		Free fatty acid
		Saponification value
		Iodine Value (wijs)
		Unsaponifiable matter, percent by weight, Max
		Peroxide Value, express as milliequivalent oxygen per Kg, Max
		Anisidine valuemax/ rancidity test
		Vitamin-A PS: 221-2003
		Soap Content, ppm, Max PS: 56-196
147.	Refined Sunflower oil PS-1564-2003®	Moisture and insoluble impurities Percent by weight max PS: 56-196
		Refractive Index at 40°C
		Free fatty acid
		Saponification value
		Iodine Value (wijs)
		Unsaponifiable matter, percent by weight, Max
		Peroxide Value, express as milliequivalent oxygen per Kg, Max
		Anisidine valuemax/ rancidity test PS: 221-2003
		Vitamin-A PS: 56-196
		Soap Content, ppm, Max PS:221-2003
148.	Refined & White Sugar PS-1822-2007	Moisture % AOAC 2000
		Cu
		As
		Pb
149.	Skin Creams PS 3228-2017	Pb
		As
150.	Synthetic Vinegar PS 3602-2018	Cu

S.No.	Description of Services	Test Method
		Zn
		As
		Pb
		Fe
		Taste and Color AOAC 2000
151.	Tooth Paste PS 1721-2009	F
		Pb
		As
152.	Triple Super phosphate PS 216-2009	P
153.	Turmeric Whole and Ground PS 1820-2010	Pb
		Extraneous matter % m/m, AOAC 2000
		Moisture, % by weight AOAC 2000
		Total Ash % on dry basis AOAC 2000
		Acid Insoluble Ash % on dry basis AOAC 2000
154.	Wafer Biscuits PS-614-2011	Moisture, % by weight AOAC 2000
		Acid Insoluble Ash (on dry basis) AOAC 2000
		Acidity of extracted fat (as oleic acid) % by weight AOAC 2000
		Total Microbial Count FAO 1992/ Compendium 2001
		Coliform
		<i>E. coli</i>
		Yeast & Molds FAO 1992
		<i>Staphylococcus aureus</i>
		Salmonella
155.	Cereals / Coarse Grains Aflatoxin (B1, B2, G1, G2)	Maize
		Rice Broken
		Sorghum
		Wheat
		Barley
156.	Vegetable Protein Sources	Cotton Seed Meal
		Rape Seed Meal

S.No.	Description of Services	Test Method
	Aflatoxin (B1, B2, G1, G2)	Canola Meal
		Sunflower Meal
		Soybean Meal
		Sesame Meal
		Linseed Oil Cake
		Maize Oil Cake
		Maize Gluten Feed
		Maize Gluten Meal
		Rice Polishing
		Rice Protein Meal
		Wheat Bran
		Rice Bran Meal
		Matri
		Guar Meal
157.		Pulses Meal

Medicinal Botanic Centre (MBC)

S.No.	Description of Services	Test Method
158.	Amino Acid Analysis (17 components) Plant materials, fruits, seeds, vegetables, meat, fish	Quantitative and Qualitative test on Amino Acid Analyzer.
159.	Fatty Acid and Oil (33 components)	Quantitative and Qualitative test on GC-MS
160.	Organochlorine pesticides (20 Components)	Quantitative and Qualitative test on GC-MS
161.	General Pesticides (20 components)	Quantitative and Qualitative test on GC-MS
162.	Cholesterol (Meat, Poultry, eggs, milk)	Quantitative and Qualitative test on GC-MS
163.	Cholesterol	Qualitative/Chemical
164.	Steroid	Quantitative/qualitative analysis on HPLC
165.	Steroid	Quantitative/chemical
166.	BTX (Benzene Toluene Xylene)	Quantitative and Qualitative test on GC-MS
167.	Hydrocarbons (110 Components in petrol, plastics, Mobil oil, diesel, biodiesel, bio transform products)	Quantitative and Qualitative test on GC-MS
168.	Degraded polymers (In plastics material, biodiesel, styrene polymers)	Quantitative and Qualitative test on GC-MS

S.No.	Description of Services	Test Method
169.	Heroin (Diacetylmorphine)	Quantitative and Qualitative test on GC-MS
170.	Narcotics	Quantitative and Qualitative test on GC-MS
171.	All organic solvents	Quantitative and Qualitative test on GC-MS
172.	PAH (Poly Aromatic Hydrocarbon) (10 components)	Quantitative and Qualitative test on GC-MS
173.	Phenolic acid	Quantitative and Qualitative test on GC-MS
174.	Cannabinoids	Quantitative and Qualitative test on GC-MS
175.		
176.	Active ingredient (Single component)	HPLC
177.	Active ingredient two component	HPLC
178.	Active ingredient Single component	Qualitative and Quantitative on UV
179.	Inactive ingredient (Excipient)	Qualitative Identification
180.	Inactive ingredient (Excipient)	Qualitative and Quantification on HPLC
181.		
182.	Active ingredient	Qualitative
183.	Active ingredient	Qualitative and Quantitative on HPLC
184.	Active ingredient	Qualitative and Quantitative on UV.
185.	Phytochemical Screening	Qualitative/ Chemical
186.	Brine shrimp cytotoxicity test	Biological
187.	Phytotoxicity	Biological
188.	Plant identification	Flora of Pakistan
189.	Herbarium sample / voucher #	
190.	Antimicrobial activities of plant extracts, fractions, synthetic compounds, Schiff bases etc. against i. <i>Escherichia col</i> ii. <i>Pseudomonas aeruginosa</i> iii. <i>Salmonella typhi</i> iv. <i>Citrobacterspp</i> v. <i>Klebsiella pneumonia</i> vi. <i>Proteus mirabilis</i> vii. <i>Bacillus atrophoeus</i> viii. <i>Bacillus subtilis</i> ix. <i>Staphylococcus aureus</i> x. <i>Candida albicans</i>	Disk Diffusion Method
191.	Assay of Pharmaceutical products	UV
192.	Assay of Pharmaceutical products	HPLC
193.	Dissolution test of tablets and capsules	British Pharmacopeia 2016
194.	Friability test of tablets and capsules	British Pharmacopeia 2016
195.	Hardness test of tablets and capsules	British Pharmacopeia 2016
196.	Disintegration test of tablets and capsules	British Pharmacopeia 2016
197.	Chemical assay of active constituents in herbal medicines	Qualitative and Quantitative analysis on HPLC
198.	Estimation of saponins	Quantitative analysis (gravimetric)
199.	Estimation of alkaloids	Quantitative analysis
200.	Estimation of fats	Quantitative analysis
201.	Estimation of essential oil in plants	Quantitative analysis
202.	Determination of melting point	Physical Test
203.	Determination of boiling point	Physical Test
204.	Determination of solubility	Physical/Qualitative

S.No.	Description of Services	Test Method
205.	Determination of ash value	Physical/Qualitative
206.	Determination of acid value	Physical/Qualitative
207.	Determination of soluble ash	Physical/Qualitative
208.	Determination of Acid insoluble Ash	Physical/Qualitative
209.	Determination of density	Physical/Qualitative
210.	Determination of specific gravity	Physical/Qualitative
211.	Determination of extractive value	Physical/Qualitative
212.	Determination of moisture	Physical/Qualitative
213.	Steroids analysis	Qualitative/Chemical
214.	Alkaloids analysis	Qualitative/Chemical
215.	Flavonoids analysis	Qualitative/Chemical
216.	Terpinoids analysis	Qualitative/Chemical
217.	Coumarins analysis	Qualitative/Chemical
218.	Phenols analysis	Qualitative/Chemical
219.	Tannins analysis	Qualitative/Chemical
220.	Glycosides analysis	Qualitative/Chemical
221.	Carbohydrates. analysis	Qualitative/Chemical
222.	Determination of Nicotine Content	Qualitative/Chemical
223.		
224.	Determination of Peroxide value in oil and fats	Qualitative/Chemical
225.	Determination of Iodine value	Qualitative/Chemical
226.	Determination of Saponification value	Qualitative/Chemical
227.	Macroscopical and microscopical examination including taxonomic markers	Qualitative/Chemical
228.		
229.	Skin irritancy test	Pharmacology
230.	Toxicity Test	Pharmacology
231.	Pyrogen/Sterility Test	Pharmacology
232.	Analgesic activity	Pharmacology
233.	Anti-inflammatory	Pharmacology
234.	Anti pyretic	Pharmacology
235.		
236.	FTIR Finger Printing	Physical Test
237.	UV –VIS-Spectra	Physical Test

Engineering Services Centre (ESC)

S. No.	Name of Machine	Specification	Capabilities
238.	CNC Vertical Machining Center	<ul style="list-style-type: none"> • 3 Axis Vertical Machining centre • Controller FANUC Series Oi-MC • Size (1000X650X600) mm • ATC 24 Tools • Make TOPWELL Model TW1065 2008 Taiwan 	Multiple type of Milling operation i.e., Machining of Dies, Molds, Machine Parts, Slots etc.,
239.	CNC Turning Center	<ul style="list-style-type: none"> • 2 Axis Turning Centre • Controller FANUC Series Oi-TD • Size (350X240)mm • ATC 12 Tools • Make Shenyang Billow HT 360 L China 2014 	Multiple type of Lathe Operation, i.e., Machining of Different machine parts, Boring, threading, Taping Etc.,

240.	CNC Plasma Cutting Machine	<ul style="list-style-type: none"> • 3 Axis • Controller FLSK – F21 00B • Size (2000X3000)mm • Cutting Thickness 1 Inch • Make Hypertherm Power Max 45 Model T-45 V USA 	Sheet Metal Cutting
241.	CNC Laser Engraving Machine	<ul style="list-style-type: none"> • Bed Size (100X160)mm • Bodor China Model 1610 X 	Engraving work on Non Metal items i.e., Decoration items, textile and embroidery Die, Name Plates, Logos etc.
242.	CNC Cutting and Tool Grinder	<ul style="list-style-type: none"> • LC 25E CNC UT-MA 	Sharpening of Milling Cutters
243.	3D Scanner	<ul style="list-style-type: none"> • ATOS GOM Germany 	Scanning of different Parts
244.	Surface Grinding Machine	<ul style="list-style-type: none"> • Size (800X400)mm • Perfect Machine Ltd • D 4080 AH • 2008 Tiawan 	Finishing of flat surfaces
245.	Iron Worker	<ul style="list-style-type: none"> • Type Q35 -1-20 • Punching Pressure 750 KN • 2014 Model • Hoston Machinery Manufacturing Co. China 	Punching and forming Die Operation
246.	Electroplating Plant	<ul style="list-style-type: none"> • Makwell Machinery China 	Surface Treatment of Machine Parts
247.	Heat Treatment and Muffle Furnace	<ul style="list-style-type: none"> • Annealing Furnace KJ 260 X • Keji Furnace 	Annealing Operation
248.	MIG Welding Plant	<ul style="list-style-type: none"> • Nantong Sanjio weldinf machine • NBC -2001-1 China 	Precise Welding Operation

Existing Expertise available in CNC workshop:

- i) Designing and programming using DELCAM and other CAD/CAM Software's
- ii) Operation on 3- Axis CNC Vertical Machining Centre
- iii) Operation on 2- Axis CNC Turning Centre
- iv) Designing and machining operation on Non-metal Materials using Laser Engraving Machine
- v) Operation of Surface Grinding Machine

Calibration Centre

S. No.	Test / Calibration Capabilities
Mass Metrology	
249.	Balances
250.	Standard Masses(05) paces
251.	Top Loading Balance
252.	Analytical Balance
253.	Weight/piece (1 mg ~ 500 g)
254.	Weight/piece (1 kg ~ 20 kg)
255.	Weight/piece (30 kg ~ 200 kg)
256.	Top Loading Balance
Length Metrology	
257.	Vernier Calliper
258.	Micrometer

S. No.	Test / Calibration Capabilities
259.	Measuring Tape
260.	Gauge Block
261.	Measuring Scale
262.	Angle Measurement
263.	Temperature Metrology
264.	Digital Thermometer
265.	Liquid in Glass Thermometer
266.	Oven
267.	Furnace
268.	Incubator
269.	Dissolution Apparatus
270.	M. Point Apparatus
271.	Disintegration Apparatus
272.	Water Bath
273.	Temp Probe/ Temperature Controller/Gauge
274.	Thermo hygrometer
275.	Thermocouple
276.	Oil Bath
277.	Bio Chemical Freezer
278.	Auto Clave
Volumetric Metrology	
279.	Micropipette
280.	Burette
281.	Glass Wares
282.	Beaker
283.	Pipette
284.	Graduated Cylinder
285.	Volumetric Flask
286.	Titration Flask
Electrical Meteorology	
287.	Voltmeter
288.	Ammeter
289.	Ohm-meter
290.	Frequency Meter
291.	AC/DC Power Sources
292.	Insulation Tester/ Magger
293.	Energy Meter
294.	Multimeter AC/DC
295.	CRO
296.	Capacitors
297.	Resistors
298.	Frequency Counter/Universal Counter
299.	Frequency Generator
300.	Current Calibrator
301.	Earth Tester
302.	Ductor Set
303.	Stop Watch
Pressure Metrology	
304.	Pressure Gauge
305.	Safety Valve
306.	Flexible Hose
307.	Dead Weight Tester
308.	Pressure Calibrator

S. No.	Test / Calibration Capabilities
309.	Torque Meters
Chemical Metrology	
310.	pH Meter
311.	Conductivity Meter
312.	Spectrophotometer
313.	Refractometer / Brix meter
314.	Viscometer
RPM	
315.	Centrifuge Machine
316.	Tachometer
Cable Testing	
317.	DC Resistance at 20 °C including dimensional tests
318.	routine sample test DC Resistance at 20 °C including dimensional test Insulation resistance at 20 °C Insulation Test on Cable at 2 kV for 5 minutes
Without Insulated Conductor	
319.	Dc resistance
320.	Cross Sectional Area
321.	No of strands
322.	Cross Sectional Area of single Strand
323.	Breaking load
324.	Copper/Aluminum Purity
Insulator	
325.	Insulation Resistance of shackle
326.	Insulation Resistance of pin Insulator
327.	Insulation Resistance of disc Insulator
Insulated Conductor	
328.	Over All Cross Sectional Area
329.	Insulation Thickness
330.	Insulation Resistance
331.	Insulation Test on Cable at 1.5 kV / 2 kV for 5 minutes
332.	DC Resistance
333.	Cross Sectional Area of conductor
334.	Copper Purity

Capabilities / Facilities for Production at Pilot Plant Level

335. Food Pilot Plant:

The following products production capacity is available:

- i) Herbal Drink
- ii) Polymucil
- iii) Citra Blend Nectar
- iv) Apple Jam
- v) Mango Nectar
- vi) Guava Nectar
- vii) Mango Squash

336. Chemical & Mineral Pilot Plant:

Following products can be produced in the chemical & mineral pilot plant.

i. Lightweight Aggregate

A specialized construction material weighing less than usual aggregates that can be used in flyovers, bridges, runways, high rise buildings etc.

Production Capacity: 6 ton/day

- ii. **Degreasing Agent**
Superior metal degreasing agent that can be used in metals, arms, ammunition and automobile industry
Production Capacity: 1 ton/day
- iii. **Cultured Marble from Marble Waste Slurry**
A composite of polymeric resin and marble waste powder that can be used in making of table tops, counter tops, stair steps, bath tubs, shower basins etc.
Production Capacity: 300 Kg/day
- iv. **Ceramic Grout**
Low cost, environment friendly and high bonding strength powder that can be used in grout filling of ceramic tiles.
Production Capacity: 300 Kg/day
- v. **Adhesive Bond**
Low cost, environment friendly and high bonding strength powder that can be used in binding of ceramic tiles.
Production Capacity: 300 Kg/day
- vi. **Zeolite 4-A Powder**
Domestic and commercial water softener and cleaner.
Production Capacity: 10 Kg/day
- vii. **Aluminum Hydroxide**
Commonly known as Hydrated Alumina made from bauxite ore of Khoshab that can be used in manufacturing of glass, glazes, frit, fire retardants etc.
Production Capacity: 10 Kg/day
- viii. **Food Grade Calcium Carbonate**
Food grade calcium carbonate is produced from marble waste slurry which is abundantly available as a waste material from the marble processing industry.
Production Capacity: 10 Kg/day
- ix. **Coated Calcium Carbonate**
Coated calcium carbonate is produced from marble waste slurry which is abundantly available as a waste material from the marble processing industry.
Production Capacity: 10 Kg/day
- x. **Magnesium Sulphate**
Hydrated Magnesium Sulphate commonly known, as Epsom Salt made from Hazara Magnesite ($MgCO_3$) ore that can be used for medical purposes, leather tanning, paper, textile, ceramics and soap manufacturing etc.
Production Capacity: 10 Kg/day

Other Technical Services Offered:

Following additional services are offered.

- i) Size reduction & classification
- ii) Chemical Reactions in various type of reactors
- iii) Mixing & blending
- iv) Filtration
- v) Drying
- vi) High temperature processing (300-1300°C)
- vii) Froth flotation
- viii) Gravity separation
- ix) Magnetic separation
- x) Blocks production

337. Pharmaceutical Pilot Plant Machinery / Equipment:

The following products production capacity is available:

- i) Capsule Filling Machine
- ii) Capsule Polishing Machine
- iii) Tablet Rotary Machine

- iv) Cream/ Ointment Manufacturing Vessel
- v) Automatic Tube filling and Sealing Machine
- vi) Automatic Liquid Filling Line (Filling, Washing, Capping & Labeling machine)
- vii) Grinding Mills
- viii) Strip/Blister Packing Machine
- ix) Sigma mixer
- x) Water Deionizer
- xi) Dehumidifier (Portable Type)
- xii) Oil Expeller
- xiii) Freeze Dryer Karl Kolb
- xiv) Dedicated Powder Cone Mixer
- xv) Batch Solvent Extraction Unit

338. Dimension Stones Centre (DSC)

Skill Training on Marble Cutting, Polishing and Mosaic Preparation