



ACCREDITATION DOCUMENT

F-06/02
Issue Date: 18/08/2020
Rev. No: 09
LAB 151

Accreditation No: LAB 151

Awarded to

Soil & Water Testing Laboratory, For Research, Near Dar ul Aman, Dera Ghazi Khan, Pakistan.

The scope of accreditation is in accordance with the standard specifications outlined in the following page(s) of this document. The accredited scope shall be visible and legible in areas such as customer service, sample-receiving section etc and shall not mislead its users.

The accreditation was first time granted on **09-07-2018** by Pakistan National Accreditation Council.

The laboratory complies with the requirements of **ISO/IEC 17025:2017**.

The accreditation requires regular surveillance, and is valid until **07-07-2027**.

The decision of accreditation made by Pakistan National Accreditation Council implies that the organization has been found to fulfill the requirements for accreditation within the scope.

The organization however, itself is responsible for the results of performed measurements/tests.

PAKISTAN NATIONAL ACCREDITATION COUNCIL

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Director General

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Testing Laboratory.


**Accreditation Scope of Soil & Water Testing Laboratory, For
Research, Near Darul Aman, Dera Ghazi Khan, Pakistan.**

Permanent laboratory premises

Materials/ Products tested	Testing field (e.g. environmental testing or mechanical testing)	Types of test/ Properties measured	Reference to standardized method (e.g. ISO 14577- 1:2003)/ Internal method reference
Nitrogen Fertilizer	Chemical testing	Ammonical Nitrogen (Single/Mixture/Solid/ Liquid)	i. Tandon HLS (Ed.) 2009. Methods of Analysis of Soils, Plants, Waters, Fertilizer and Organic Manures Fertilizer Development Organization, New Delhi Pp 161-162 ii. Official methods of Analysis of AOAC International, 20 th Edition, 2016, Method No.2.4.10 (AOAC Official Method 892.01), Fertilizer Chapter 2 Page 15/ SOPs Macronutrients (SWT-DGK/SOP-MACRO/01) 6.1 to 6.6
Nitrogen Fertilizer	Chemical testing	Nitrate Nitrogen (Single/ Mixture/ Solid/ Liquid)	i. Tandon HLS (Ed.) 2009. Methods of Analysis of Soils, Plants, Waters, Fertilizer and Organic Manures Fertilizer Development Organization, New Delhi Pp 161-162 ii. Official methods of Analysis of AOAC International, 20 th Edition, 2016, Method No.2.4.10 (AOAC Official Method 892.01), Fertilizer Chapter 2 Page 15/ SOPs Macronutrients (SWT-DGK/SOP-MACRO/01) 6.1 to

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			6.6
Nitrogen Fertilizer	Chemical testing	Total Nitrogen (Single/Mixture/Solid/ Liquid)	i. Tandon HLS (Ed.) 2009. Methods of Analysis of Soils, Plants, Waters, Fertilizer and Organic Manures Fertilizer Development Organization, New Delhi Pp 161-162 ii. Official methods of Analysis of AOAC International, 20 th Edition, 2016, Method No.2.4.05 (AOAC Official Method 978.02), Fertilizer Chapter 2 Page 15/ SOPs Macronutrients (SWT- DGK/SOP-MACRO/01) 6.1 to 6.6

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Nitrogen Fertilizer	Chemical testing	i. Uric Nitrogen ii. Biurate (in case of N) (Single/Mixture/Solid/ Liquid)	i. Tandon HLS (Ed.) 2009. Methods of Analysis of Soils, Plants, Waters, Fertilizer and Organic Manures Fertilizer Development Organization, New Delhi Pp 161-162 ii. Official methods of Analysis of AOAC International, 20 th Edition, 2016, Method No.2.4.05 (AOAC Official Method 978.02), Fertilizer Chapter 2 Page 15/ iii. Pakistan Standard Specification for Liquid Nutrient Supplement PS No. 5469-2020. Chemical Division SDC/PSQCA Page No. 1-38. SOPs Macronutrients (SWT-DGK/SOP-MACRO/01) 6.1 to 6.6	
Phosphate Fertilizer	Chemical testing	Citrate Soluble Phosphorus Estimation (Single/Mixture/Solid/ Liquid)	Pakistan standard for Single Superphosphate (2 nd edition) PS: 67-1996. PSQCA. Karachi/ SOPs Macronutrients (SWT-DGK/SOP-MACRO/01) 7.1 to 7.8	
Phosphate Fertilizer	Chemical testing	Total Phosphorus (Single/Mixture/Solid/ Liquid)	Pakistan standard for Bio Organophosphate fertilizer (2 nd edition) PS: 5295 /2017. PSQCA. Karachi/ SOPs Macronutrients (SWT-DGK/SOP-MACRO/01) 7.1 to 7.8	
Potassium fertilizer	Chemical testing	Water Soluble Potassium (Single/ Mixture/ Solid / Liquid)	i. Pakistan Standard Specification for potassium Sulphate PS:1501: 2022 (3rd Revision) ICS: 65.080 PSQCA Karachi ii. Testing Methods for Fertilizers (2016). Incorporated Administrative Agency. Food and Agricultural Materials Inspection Center. Japan. Section: 4.3.3.a	

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			iii. Official Methods of Analysis of AOAC International, 20th Edition, 2016, Method No 2.5.04 (AOAC Official method 983.02), Fertilizer Chapter 2, Page 23 SOPs Macronutrients (SWT-DGK/SOP-MACRO/01) 8.1 to 8.6
Boron Fertilizer	Chemical testing	Water Soluble Boron (Single/Mixture/Solid/Liquid)	Official Methods of Analysis of AOAC International, 20th Edition, 2016, Method No 2.6.04 (AOAC Official method 982.01), Fertilizer Chapter 2, Subchapter 6, Page 31/ SOPs Micronutrients (SWT-DGK/SOP-MACRO/02)16.1 To 16.6
Humic Acid	Chemical testing	Humic Acid (Solid/Liquid)	i. ISO 19822:2018 https://www.iso.org/standard/66271.html/ ii. Pakistan Standard Specification for potassium Humate PS:5610: 2023 ICS: 65.080 PSQCA Karachi SOPs Macronutrients (SWT-DGK/SOP-MACRO/01) 9.1 to 9.6
Organic Matter	Chemical testing	Cation Exchange Capacity (Single/Mixture/Solid)	Official Methods of Analysis of AOAC International, 20 th Edition, 2016, Method No. 2.7.13 (AOAC Official Method 973.09), Fertilizers Chapter 2, Subchapter 7 Page 56/ SOPs Macronutrients (SWT-DGK/SOP-MACRO/01) 17.1 To 17.6

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Organic Matter Solid	Chemical testing	C:N ratio (Single/Mixture/Solid)	i. Tandon HLS (Ed.) 2009. Methods of Analysis of Soils, Plants, Waters, Fertilizer and Organic Manures Fertilizer Development Organization, New Delhi Pp 161-162 ii. Official methods of Analysis of AOAC International, 20 th Edition, 2016, Method No.2.4.10 (AOAC Official Method 892.01), Fertilizer Chapter 2 Page 15/ SOPs Macronutrients (SWT-DGK/SOP-MACRO/01)18.1 to18.6
Organic Matter	Chemical testing	Organic Matter/ Organic Carbon (Single/Mixture/Solid)	i. AOAC International, 20 th Edition,2016, Method No 2.7.08 (AOAC Official method 967.05), Fertilizer Chapter2, Subchapter 7, Page54 ii. Tandon HLS (Ed.) 2009. Methods of Analysis of Soils, Plants, Waters, Fertilizer and Organic Manures Fertilizer Development Organization, New Delhi Pp 161-162/ SOPs Macronutrients (SWT-DGK/SOP-MACRO/01)11.1 to11.6
Micronutrient (Single or Mixed element, Solid/Liquid, Inorganic/Organic, Chelated)	Chemical testing	Quantitative analysis of Water-Soluble Zinc sulphate Fertilizer (Single/Mixture/Solid/ Liquid)	Official Method of Analysis of AOAC International, 20 th Edition,2016 MethodNo.2.6.01 (AOAC Official Method 965.09), Fertilizer Chapter 2, Subchapter 6, Page 29-30/ SOPs Micronutrients (SWT-DGK/SOP-MACRO/02)6.1to 6.6

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		Acid Soluble Zinc (Single/Mixture/Solid/ Liquid)	Official Method of Analysis of AOAC International, 20 th Edition,2016MethodNo.2.6.01 (AOAC Official Method 965.09), Fertilizer Chapter 2, Subchapter 6, Page 29-30/SOPs Micronutrients (SWT- DGK/SOP-MACRO/02)7.1to 7.6
		Quantitative Analysis of Acid Soluble fraction estimation of Zn, Fe, Cu and Mn from Multi-micro containing Fertilizer (Single/Mixture/Solid/ Liquid)	Official Method of Analysis of AOAC International, 20 th Edition, 2016 Method No. 2.6.01-C (a) (AOAC Official Method 965.09), Fertilizer Chapter 2, Subchapter 6, Page 29-30/SOPs Micronutrients (SWT- DGK/SOP- MACRO/02)8.1to 8.6
		Quantitative Analysis of Charred/ ashed fraction/ Bio-active estimation of Zn, Fe, Cu and Mn from Organic Multi-micro Fertilizers (Single/ Mixture/ Solid / Liquid)	Official Method of Analysis of AOAC International, 20 th Edition, 2016 Method No. 2.6.01-C (b) (AOAC Official Method 965.09), Fertilizer Chapter 2, Subchapter 6, Page 29-30/ Pakistan Standard Specification for Bioactive nutrient fortified fertilizers (BNFF) PS No. 5336- 2021 (2 nd Rev) ICS: 65.080. Chemical Division SDC/PSQCA Page No. 1-13.
		Quantitative analysis of Water Soluble Zn, Cu, Mn and Fe estimation from Inorganic Multi-micro fertilizers (Single/Mixture/Solid/ Liquid)	Official Method of Analysis of AOAC International, 20 th Edition, 2016 Method No. 2.6.01 (AOAC Official Method 965.09), Fertilizer Chapter 2, Subchapter 6, Page 29-30and Method 2.6.25 page 38 /SOPs Micronutrients (SWT- DGK/SOP-MACRO/02) 10.1 To 10.6

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		Quantitative analysis of Water Soluble Mn, estimation from Inorganic Multi-micro fertilizers (Single/Mixture/Solid/ Liquid)	Official Method of Analysis of AOAC International, 20 th Edition, 2016 Method No. 2.6.01 (AOAC Official Method 972.03), Fertilizer Chapter 2, Subchapter 6, Page 29-30and Method 2.6.25 page 38
		Quantitative analysis of Chelated Fraction estimation of Zn, Fe, Cu and Mn from multi-micro chelated fertilizers (Single/Mixture/Solid/ Liquid)	Official Method of Analysis of AOAC International, 20 th Edition,2016MethodNo.2.6.01 (AOAC Official Method 965.09), Fertilizer Chapter 2, Subchapter 6, Page 29-30/SOPs Micronutrients (SWT-DGK/SOP-MACRO/02) 11.1 To 11.6 i. Vogel's Textbook of Quantitative Chemical Analysis, 6th Edition, J Mendham, R c Denney, J D Barnes, M J K Thomas Official Methods of Analysis of AOAC International, 20 th Edition,2016,MethodNo2.6.01 (AOAC Official method965.09), Fertilizer Chapter 2, Subchapter 6, Page 29-30/ SOPs Micronutrients (SWT-DGK/SOP-MACRO/02)17.1 to17.6
Amino Acid	Chemical testing	Total Amino Acid (Protein Base) (Solid / Liquid)	i. Official Methods of Analysis of AOAC International, 20 th Edition,2016,MethodNo2.4.10 (AOAC Official method892.01), Fertilizer Chapter 2, Page15 ii FAO nutritional studies no 24 (1970) iii Pellet, LP and Young (1980). iv Theymoli Balasubramanian sadasivam (1987) v www.eplantsceinece.com / SOPs Macronutrients (SWT-DGK/SOP-MACRO/01)16.1 to16.6

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Magnesium Fertilizer	Chemical testing	Water Soluble Magnesium (Single/ Mixture/ Solid / Liquid)	Official Method of Analysis of AOAC International, 20 th Edition, 2016 Method No. 2.6.21 (AOAC Official Method 937.02), Fertilizer Chapter 2, Subchapter 6, Page -37 MethodNo.2.6.01-B (e) (AOAC Official Method 965.09), Fertilizer Chapter 2, Subchapter 6, Page 29-30/ SOPs Micronutrients SOPs Micronutrients (SWT- DGK/SOP-MACRO/02)21.1 to21.6
Magnesium Fertilizer	Chemical testing	Acid Soluble Magnesium (Single/ Mixture/ Solid / Liquid)	Official Method of Analysis of AOAC International, 20 th Edition, 2016 Method No.2.6.01-B (e) (AOAC Official Method 965.09), Fertilizer Chapter 2, Subchapter 6, Page 29-30/ SOPs Micronutrients SOPs Micronutrients (SWT- DGK/SOP-MACRO/02) 22.1 to22.6

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Total Sulphur	Physical and Chemical Testing	Total Sulphur (Single/Mixture/Solid/ Liquid)	i. Diagnosis and Improvement of Saline and Alkali Soils, USDA, Handbook Book No. 60 pp 146 ii. Official Method of Analysis of AOAC International, 20 th Edition, 2016 AOAC Official Method 2.6.28 Method No. 980.02 Page 39
Chloride	Chemical testing	Chlorides (Single/Mixture/Solid/ Liquid)	i. Diagnosis and Improvement of Saline and Alkali Soils, USDA, Handbook Book No. 60 pp 146 ii. Official Method of Analysis of AOAC International, 20 th Edition, 2016 AOAC Official Method 2.6.09 Method No. 928.02 page 33 iii. Pakistan Standard Specification for SOP Fertilizer Grade PS:1501-2022 @ ICS:65.080 Pakistan Standards and Quality Control Authority, Karachi / iv. Pakistan Standard Specification for Liquid Nutrient Supplement PS No. 5469-2020. Chemical Division SDC/PSQCA Page No. 1-38. SOPs Macronutrients (SWT-DGK/SOP-MACRO/01)15.1 to 15.5
pH	Chemical Testing	pH in Fertilizer	i. George Estefan, Rolf Sommer, and John Ryan 2013. Methods of Soil, Plant and Water Analysis: A Manual For the West Asia and North Africa region. (ICARDA) ii. Official Method of Analysis of AOAC International, 20 th Edition, 2016 AOAC Official Method 2.7.05 Method No. 973.04 chapter 2, page 53 iii. Pakistan Standard Specification for Multi-Nutrient Fertilizer PS No. 933-1973. Chemical Division SDC/PSQCA Page No. 1-38.

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Size Fertilizer	Physical Testing	Particle size of i. BOP, ii. SSP, iii. K ₂ SO ₄ , iv. MAP v. TSP vi. DAP vii. Urea (Single/ Mixed/ Solid/ Liquid)	i) Pakistan Standard Specification for BOP Fertilizer (2 nd Revision). PS No. 5295/2017(2 nd Revision) Chemical Division SDC/PSQCA Page No. 1-12. ii) Pakistan Standard Specification for SSP (2 nd Revision) PS No. 67-1996 (2 nd Revision) ICS: 65.080. Chemical Division SDC/PSQCA Page No. 1-16. iii) Pakistan Standard Specification for Potassium Sulphate, Fertilizer Grade (2 nd Revision) PS No. 1501-2022 (3rd Revision) ICS: 65.080. Chemical Division SDC/PSQCA Page No. 1-11. iv) Pakistan Standard Specification for Monoammonium Phosphate (1 st Revision) PS No. 4991-2017 (1 st Revision). Chemical Division SDC/PSQCA Page No. 1-16. v) Pakistan Standard Specification for Triple Super Phosphate (2 nd Revision) PS No. 216-2009 (2 nd Revision) ICS: 65.080. Chemical Division SDC/PSQCA Page No. 1-16. vi) Official Method of Analysis of AOAC International, 20 th Edition, 2016 AOAC Official Method 2.7.04 Method No. 973.04, Chapter 2, page 53 vii) Pakistan Standard Specification for Liquid Nutrient Supplement PS No. 5469-2020. Chemical Division SDC/PSQCA Page No. 1-38. viii) Pakistan Standard Specification for DAP, PS No. 3517-2023. 2 nd Revision) ICS: 65.080. Chemical Division SDC/PSQCA Page No. 1-20.
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			ix) Pakistan Standard Specification for Urea, PS No. 217-2023. 5th Revision) ICS: 65.080. Chemical Division SDC/PSQCA Page No. 1-19.
Moisten Fertilizer	Chemical Testing	Moisture in i. BOP ii. SSP iii. Ammonium Sulphate iv. K ₂ SO ₄ v. MAP vi. TSP vii. KNO ₃ viii. KCl (MOP) ix. DAP x. Urea xi. Nitrophos xii. CAN xiii. Urea Phosphate (Single/Mixed/Solid/Liquid)	i) Pakistan Standard Specification for BOP Fertilizer (2 nd Revision). PS No. 5295/2017(2 nd Revision) Chemical Division SDC/PSQCA Page No. 1-12. ii) Pakistan Standard Specification for SSP (2 nd Revision) PS No. 67-1996 (2 nd Revision) ICS: 65.080. Chemical Division SDC/PSQCA Page No. 1-16. iii) Pakistan Standard Specification for Ammonium Sulphate, Fertilizer Grade (2 nd Revision) PS No. 36-2022 (3 rd Revision) ICS: 65.080. Chemical Division SDC/PSQCA Page No. 1-11. iv) Pakistan Standard Specification for Potassium Sulphate, Fertilizer Grade (2 nd Revision) PS No. 1501-2011 (R) (2 nd Revision) ICS: 65.080. Chemical Division SDC/PSQCA Page No. 1-11. v) Pakistan Standard Specification for Monoammonium Phosphate (1 st Revision) PS No. 4991-2017 (1 st Revision). Chemical Division SDC/PSQCA Page No. 1-16. vi) Pakistan Standard Specification for Triple Super Phosphate (2 nd Revision) PS No. 216-2009 (2 nd Revision) ICS: 65.080. Chemical

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			<p>Division SDC/PSQCA Page No. 1-16.</p> <p>vii) Pakistan Standard Specification for Potassium Nitrate PS No. 5341-2016, ICS: 65.080. Chemical Division SDC/PSQCA Page No. 1-7.</p> <p>viii) Pakistan Standard Specification for Potassium Chloride (Murate of Potash) PS No. 1517-1981. Chemical Division SDC/PSQCA Page No. 1-11.</p> <p>ix) Official Method of Analysis of AOAC International, 20th Edition, 2016 AOAC Official Method 2.7.03 Method No. 967.03, Chapter 2, page 53</p> <p>x) Pakistan Standard Specification for DAP, PS No. 3517-2023. 2nd Revision) ICS: 65.080. Chemical Division SDC/PSQCA Page No. 1-20.</p> <p>xi) Pakistan Standard Specification for Urea, PS No. 217-2023. 5th Revision) ICS: 65.080. Chemical Division SDC/PSQCA Page No. 1-19.</p> <p>xii) Pakistan Standard Specification for Nitrophos, PS No. 1873-1987. ICS: 65.080. Chemical Division SDC/PSQCA Page No. 1-19.</p> <p>xiii) Pakistan Standard Specification for CAN, PS No. 229-1980. ICS: 65.080. Chemical Division SDC/PSQCA Page No. 1-20.</p> <p>xiv) Pakistan Standard Specification for Urea Phosphate, PS No. 5611-2023. ICS: 65.080. Chemical Division SDC/PSQCA Page No. 1-7.</p>

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Shape Fertilizer	Physical Testing	Physical Condition of i. BOP ii. K ₂ SO ₄ iii. MAP iv. TSP v. KNO ₃ vi. KCl vii. ZnSO ₄ .2H ₂ O viii. DAP ix. Urea x. CAN (Single/ Mixed/ Solid/ Liquid)	i) Pakistan Standard Specification for BOP Fertilizer (2 nd Revision). PS No. 5295/2017(2 nd Revision) Chemical Division SDC/PSQCA Page No. 1-12. ii) Pakistan Standard Specification for Potassium Sulphate, Fertilizer Grade (2 nd Revision) PS No. 1501-2022 (3rd Revision) ICS: 65.080. Chemical Division SDC/PSQCA Page No. 1-11. iii) Pakistan Standard Specification for Monoammonium Phosphate (1 st Revision) PS No. 4991-2017 (1 st Revision). Chemical Division SDC/PSQCA Page No. 1-16. iv) Pakistan Standard Specification for Triple Super Phosphate (2 nd Revision) PS No. 216-2009 (2 nd Revision) ICS: 65.080. Chemical Division SDC/PSQCA Page No. 1-16. v) Pakistan Standard Specification for Potassium Nitrate PS No. 5341-2016, ICS: 65.080. Chemical Division SDC/PSQCA Page No. 1-7. vi) Pakistan Standard Specification for Potassium Chloride (Murate of Potash) PS No. 1517-1981. Chemical Division SDC/PSQCA Page No. 1-11. vii) Pakistan Standard Specification for Zinc Sulphate Monohydrate (ZnSO ₄ .2H ₂ O) Fertilizer Grade PS No. 4750-2001. Chemical Division SDC/PSQCA Page No. 1-5. viii) Pakistan Standard Specification for DAP, PS No. 3517-2023. 2 nd Revision) ICS:

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			65.080. Chemical Division SDC/PSQCA Page No. 1-20. ix) Pakistan Standard Specification for Urea, PS No. 217-2023. 5th Revision) ICS: 65.080. Chemical Division SDC/PSQCA Page No. 1-19. x) Pakistan Standard Specification for CAN, PS No. 229-1980. ICS: 65.080. Chemical Division SDC/PSQCA Page No. 1-20.
Sodium Determination from fertilizers	Chemical Testing	Quantitative analysis of Total Soluble and Acid soluble Sodium from Chloride containing fertilizers (Liquid/Solid)	i. Official Methods of Analysis of AOAC International, 20th Edition, 2016, Method No. 2.6.01-C(a). (AOAC Official Method 965.09), Fertilizers Chapter 2, Sub Chapter-6. Page 29-30. ii. Pakistan Standard Specification for Liquid Nutrient Supplement PS No. 5469-2020. Chemical Division SDC/PSQCA Page No. 1- 38.
Calcium and Magnesium fertilizers	Chemical Testing	Quantitative analysis of Water Soluble calcium from gypsum fertilizers (inorganic/organic, single/mixed, liquid/solid)	USDA Handbook 60, US Government Printing Office, Washington, D C. Technique: Titration
		Quantitative analysis of Water Soluble Calcium from Calcium containing fertilizers	Testing Methods for Fertilizers (2016). Incorporated Administrative Agency. Food and Agricultural Materials Inspection Center. Japan. 4.5.3.a
		Quantitative analysis of Acid Soluble Ca Mg from Calcium and Magnesium containing fertilizers	Official Methods of Analysis of AOAC International, 20th Edition, 2016, Method No. 2.6.01-C(a). (AOAC Official Method 965.09), Fertilizers Chapter 2, Sub Chapter-6. Page 29-30

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		Quantitative analysis of water Soluble Mg from Mg containing fertilizers	Testing Methods for Fertilizers (2016). Incorporated Administrative Agency. Food and Agricultural Materials Inspection Center Japan. Section 4.6.3.a.
Liquid Nutrient Supplement	Physical and Chemical Testing	i) Category single nutrient (%) ii) category multinutrient (%) iii) category chelated nutrients (%) (Single/Mixed/Solid/Liquid)	Pakistan Standard Specification for Liquid Nutrient Supplement PS No. 5469-2020. Chemical Division SDC/PSQCA Page No. 1-38.

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