PRODUCT MANUAL FOR ORTHOPHOSPHORIC ACID ACCORDING TO IS 798:2020

This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure coherence of practice and transparency in operation of certification under Scheme-I of Bureau of Indian Standards (Conformity Assessment) Regulations, 2018 for various products. The document may also be used by prospective applicants desirous of obtaining BIS certification licence/certificate.

1.	**Product**	:	IS 798: 2020
	Title	:	Orthophosphoric acid - Specification
	No. of Amendments	:	-
2.	**Sampling Guidelines:**		
a)	**Raw material**	:	NA
b)	**Grouping guidelines**	:	NA
c)	**Sample Size**	:	Minimum of 500 ml
3.	**List of Test Equipment**	:	Please refer ANNEX – A
4.	**Scheme of Inspection and Testing**	:	Please refer ANNEX – B
5.	**Possible tests in a day:**		
	All the tests mentioned in the IS are possible to be carried out in a day except for Silica.		
6.	**Scope of the Licence:**		
	"Licence is granted to use Standard Mark as per IS 798:1986 with the following scope:		
	Name of the product		Orthophosphoric acid
	Grade/Variety		As Applicable (Technical subgrade 1/ Technical subgrade 2/Analytical reagent)

ANNEX A

List of Test Equipment

Major test equipment required to test as per the Indian Standard

Sl. No.	Tests used in with Clause Reference		Test Equipment
	Test	**Clause**	
1. 2.	Relative density	Appendix A-2	Weighing balance (0-200 grams/0.1 mg) Distilled water Capillary stoppered relative density bottle chromic acid Concentrated Sulphuric Acid Alcohol Constant temperature Water bath Ether
2. 3.	Orthophosphoric acid, (H_3PO_4)	Appendix A-3	Weighing balance (0-200 grams/0.1 mg) Distilled water **Method A** Sodium hydroxide solution - 1 N Bromocresol green indicator Sodium dihydrogen phosphate solution pH meter **Method B** Mixed screened indicator Sodium hydroxide solution - 1 N Sodium chloride **Method C - Spectrophotometric method** Ammonium meta vanadate Nitric acid Ammonium molybdate Ammonia solution Potassium dihydrogen phosphate Burette 1 litre volumetric flasks Spectrophotometer with 10 mm cells
3. 4.	Iron (as Fe)	Appendix A-4	Weighing balance (0-200 grams/0.1 mg) Distilled water pH meter Spectrophotometer (or photometric colorimeter) with 10 mm cells Concentrated Hydrochloric Acid

			2,2'-Bipyridyl Solution Ammonium Acetate Hydroxylammonium Chloride Ferrous ammonium sulphate Sulphuric acid Water bath
4. 5.	Chlorides (as Cl)	Appendix A-5	Weighing balance (0-200 grams/0.1 mg) Distilled water Nessler Cylinders — 50 ml capacity Dilute Nitric Acid — 4 N Silver nitrate solution Sodium Chloride Solution
5. 6.	Sulphates (as SO_4)	Appendix A-6	Weighing balance (0-200 grams/0.1 mg) Distilled water **General Method** Nessler Cylinders — 50 ml capacity Dilute Hydrochloric Acid — 5 N Barium chloride Ignited sodium sulphate **Alternate Method** Spectrophotometer Standard sulphate solution Glycerine Concentrated Hydrochloric acid Sodium chloride Barium chloride crystals
6. 7.	Arsenic (as As_2O_3)	Appendix A-7	Weighing balance (0-200 grams/0.1 mg) Distilled water Concentrated Hydrochloric acid Hydrazinc Sulphatc Sodium Bromide Distillation setup Modified Gutzeit Apparatus/Spectrophotometer Lead Acetate Filter paper strips Absorbent Cotton Wool Mercuric Bromide ~~Solution~~ Paper Dilute Sulphuric Acid Potassium Iodide Stannous Chloride Zinc granules Arsenic trioxide Sodium hydroxide
7. 8,	Antimony (as Sb_2O_3)	Appendix A-8	Weighing balance (0-200 grams/0.1 mg) Distilled water

			Concentrated Hydrochloric acid Hydrazinc Sulphate Sodium Bromide Ammonium Hydroxide Auric Chloride Potassium antimonyl tartrate Mercuric Bromide Paper
8. 9.	Nitrates (as NO_3)	Appendix A-9	Weighing balance (0-200 grams/0.1 mg) Distilled water Spectrophotometer Brucine Sulphate Potassium nitrate Concentrated Sulphuric Acid Ice bath
9. 10.	Heavy metals (as Pb)	Appendix A-10	Weighing balance (0-200 grams/0.1 mg) Distilled water Nessler Cylinders — 50 ml capacity Ammonium Hydroxide Potassium Cyanide Solution Sodium Sulphide Lead nitrate Nitric Acid
10. 11.	Silica (as SiO_2)	Appendix A-11	Weighing balance (0-200 grams/0.1 mg) Distilled water
11. 12.	Calcium (as Ca) and Magnesium (as Mg)	Appendix A-12	Weighing balance (0-200 grams/0.1 mg) Distilled water Ammonium Hydroxide Ammonium Oxalate Water bath
12. 13.	Oxygen absorbed (as O)	Appendix A-13	Weighing balance (0-200 grams/0.1 mg) Distilled water Potassium Permanganate Water bath
13. 14.	Volatile acids	Appendix A-14	Weighing balance (0-200 grams/0.1 mg) Distilled water Phenolphthalein Indicator Sodium Hydroxide Distillation flask with a spray trap Carbon dioxide-free water
14. 15.	Manganese (as Mn)	Appendix A-15	Weighing balance (0-200 grams/0.1 mg) Distilled water Nessler Cylinders — 50 ml capacity Sodium Carbonate Manganous sulphate tetrahydrate or manganous sulphate monohydrate

			Sulphuric acid Sodium Bismuthate - free from manganese Platinum or silica crucible Water bath
15.	Molybdenum (as Mo)	Appendix A-16	Weighing balance (0-200 grams/0.1 mg) 500 ml volumetric flask Inductively Coupled Plasma Optical Emission Spectrometer
16.	**Mercury (as Hg)**	**Appendix A-17**	**Weighing balance (0-200 grams/0.1 mg)** **250 ml glass beaker** **1000 ml volumetric flask** **atomic absorption spectroscopy (AAS)**
17.	**Aluminium (as Al)**	**Appendix A-18**	**Weighing balance (0-200 grams/0.1 mg)** **250 ml glass beaker** **500 ml volumetric flask**
18.	**Ion chromatography (ic) for chlorides and sulphates**	**Appendix A-19**	**IC Apparatus and equipment as per A-19.2 and reagents as per A-19.3 and 19.4**
19.	**Determination of lead, iron, calcium, magnesium, manganese, arsenic, molybdenum, aluminium and mercury by inductively coupled plasma optical emission spectrometer (icp-oes) method**		**Inductively Coupled Plasma Optical Emission Spectrometer** **Reagents and Solutions as per A20.3**

The above list is indicative only and may not be treated as exhaustive.

ANNEX B

Scheme of Inspection and Testing

1. LABORATORY - A laboratory shall be maintained which shall be suitably equipped (as per the requirement given in column 2 of Table 1) and staffed, where different tests given in the specification shall be carried out in accordance with the methods given in the specification.

1.1 The manufacturer shall prepare a calibration plan for the test equipments.

2. TEST RECORDS – The manufacturer shall maintain test records for the tests carried out to establish conformity.

3. PACKING AND MARKING — The Standard Mark, as given in the Schedule of the licence, shall be marked on the container provided always that material so marked conform to requirements of the specification.

3.1 Packing and Marking shall be done as per the provisions of the Indian Standard. In addition, the following shall be incorporated on each container:

i)BIS Licence Number CM/L ……..….and

ii)BIS website details i.e. "For details of BIS certification please visit **www.bis.gov.in**".

5. CONTROL UNIT – For the purpose of this scheme, the entire quantity of the material produced in one day shall constitute a control unit.

6. LEVELS OF CONTROL - The tests as indicated in column 1 of Table 1 and the levels of control in column 3 of Table 1, shall be carried out on the whole production of the factory which is covered by this plan and appropriate records maintained in accordance with paragraph 2 above.

6.1 All the production which conforms to the Indian Standards and covered by the licence should be marked with Standard Mark.

7. REJECTIONS – Disposal of non-conforming product shall be done in such a way so as to ensure that there is no violation of provisions of BIS Act, 2016.

TABLE 1

(1)				(2)	(3)		
Test Details				**Test equipment requirement R: required (or) S: Sub-contracting permitted**	**Levels of Control**		
Cl.	**Requirement**	**Test Method**			**No. of Sample**	**Frequency**	**Remarks**
		Clause	**Reference**				
3.1	Description	3.1	IS 798	R	One	Every Control Unit	Visual
3.2, Table 1, Sl. No. (i)	Relative density at 27°C	Appendix A-2	-do-	R	-do-	-do-	-
3.2, Table 1, Sl. No. (ii)	Orthophosphoric acid, (H_3PO_4)	Appendix A-3	-do-	R	-do-	-do-	
3.2, Table 1, Sl. No. (iii)	Iron (as Fe)	Appendix A-4 **& A-20**	-do-	R	-do-	-do-	
3.2, Table 1, Sl. No. (iv)	Chlorides (as Cl)	Appendix A-5 **& A-19**	-do-	R	-do-	-do-	
3.2, Table 1, Sl. No. (v)	Sulphates (as SO_4)	Appendix A-6 **& A-19**	-do-	R	-do-	-do-	
3.2, Table 1, Sl. No. (vi)	Arsenic (as As_2O_3)	Appendix A-7 **& A-20**	-do-	S	One	Once in a month	
3.2, Table 1, Sl. No. (vii)	Antimony (as Sb_2O_3)	Appendix A-8	-do-	S	-do-	Once in a month	Applicable for Technical grade only
3.2, Table 1, Sl. No. (viii)	Nitrates (as NO_3)	Appendix A-9	-do-	R	-do-	Every Control Unit	Applicable for Analytical Reagent grade only
3.2, Table 1, Sl. No. (ix)	Lead (as Pb)	Appendix A-10 **& A-20**	-do-	R	-do-	-do-	Applicable for Analytical Reagent grade only

3.2, Table 1, Sl. No. (x)	Silica (as SiO_2)	Appendix A-11	-do-	R	-do-	-do-	Applicable for Analytical Reagent grade only
3.2, Table 1, Sl. No. (xi)	Calcium (as Ca) and Magnesium (as Mg)	Appendix A-12 **& A-20**	-do-	R	-do-	-do-	Applicable for Analytical Reagent grade only
3.2, Table 1, Sl. No. (xii)	Oxygen absorbed (as O)	Appendix A-13	-do-	R	One	-do-	Applicable for Analytical Reagent grade only
3.2, Table 1, Sl. No. (xiii)	Volatile acids	Appendix A-14	-do-	R	One	-do-	Applicable for Analytical Reagent grade only
3.2, Table 1, Sl. No. (xiv)	Manganese (as Mn)	Appendix A-15 **& A-20**	-do-	R	-do-	-do-	Applicable for Analytical Reagent grade only
3.2, Table 1, Sl. No. (xv)	**Molybdenum (as Mo), parts per million, *Max***	**Appendix A-16 and A-20**	**-do-**	**S**	**One**	**Once in a month**	**Applicable for Technical grade only**
3.2, Table 1, Sl. No. (xvi)	**Mercury (as Hg)**	**Appendix A-17 and A-20**	**-do-**	**S**	**-do-**	**-do-**	**-do-**
3.2, Table 1, Sl. No. (xvii)	**Aluminium (as Al)**	**Appendix A-17 and A-20**	**-do-**	**S**	**-do-**	**-do-**	**-do-**

Note-1: Whether test equipment is required or sub-contracting is permitted in column 2 shall be decided by the Bureau and shall be mandatory. Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empaneled by the Bureau.

Note-2: Levels of control given in column 3 are only recommendatory in nature. The manufacturer may define the control unit/batch/lot and submit his own levels of control in column 3 with proper justification and submit it for approval to BO Head.