



उत्पाद मानुयल
सिलिका जेल -विशिष्टि
3401: 2023 के अनुसार
**PRODUCT MANUAL FOR
SILICA GEL - SPECIFICATION
ACCORDING TO IS 3401: 2023**

विनियम 2018 की स्कीम-I के तहत यह उत्पाद मानुयल प्रमाणीकरणके प्रचलन मे रीति और पारदर्शिता के सुसंगता सुनिश्चित करने के लिए सभी क्षेत्रीय/शाखा कार्यालयों एवं लाइसेन्स धारियों द्वारा संदर्भ सामग्री के रूप मे उपयोग किया जाएगा। बीआईएस लाइसेन्स/प्रमाण पत्र प्राप्त करने के इच्छुक भावी आवेदकों द्वारा भी इस दस्तावेज़ का उपयोग किया जा सकता है।

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.	उत्पाद Product	:	IS 3401 : 2023
	शीर्षक Title	:	सिलिका जेल -विशिष्टि Silica Gel - Specification
	संशोधन संख्या No. of Amendments	:	Nil
2.	नमुनाकरण दिशा निर्देश Sampling Guidelines:		
a)	कच्चा माल Raw material	:	No specific requirement.
b)	समूहिकरण दिशा निर्देश Grouping guidelines	:	Samples of each type (Normal/Indicating) to be drawn separately for testing to cover in the scope of the licence.
c)	नमूनेका परिमाण Sample Size	:	Quantity - 1 kg for all tests + 1 kg (original pack) for keeping quality test as per clause 4.9
3.	परीक्षण उपकरणों की सूची List of Test Equipment	:	कृ पया Annex-A देखें Please see Annex – A
4.	निरीक्षण व परीक्षण स्कीम Scheme of Inspection and Testing	:	कृ पया Annex-B देखें Please see Annex – B

5.	एक दिन में संभावित परीक्षण Possible tests in a day :	
	1. Description (Cl. 4.1) 2. Particle Size (Cl. 4.2) 3. Bulk Density (Cl. 4.3) 4. Loss on drying (Cl. 4.4) 5. pH (Cl. 4.6) 6. Loss on attrition (Cl. 4.7) 7. Chloride as (NaCl) (Cl. 4.8) 8. Ammonium compounds (as NH ₃) (Cl. 4.8) 9. Sulphates (as Na ₂ SO ₄) (Cl. 4.8)	
6.	लाइसेन्स का कार्यक्षेत्र / Scope of the Licence:	
	IS 3401: 2023): के अनुसार मानक मुहर का उपयोग करने के लिए लाइसेन्स निम्नलिखित कार्यक्षेत्रके लिए प्रदान किया जाता है Licence is granted to use Standard Mark as per 3401 : 2023 with the following scope:	
	उत्पाद का नाम Name of the product	सिलिका जेल Silica Gel
	Type	Normal and/or Indicating

ANNEX A
TO THE PRODUCT MANUAL FOR
SILICA GEL - SPECIFICATION AS PER IS 3401 : 1992

LIST OF TEST EQUIPMENTS

Major Test Equipment required to test as per Indian Standard

Sr. No.	Tests used in with Clause Reference		Test equipment
	Tests	Cl. Ref.	
1.	Particle Size	4.2	(i) IS sieves
2.	Bulk Density	4.3	(i) Weighing Balance (ii) Arrangement for measurement of volume (iii) Any other established method
3.	Loss on drying	4.4	(i) Hot Air Oven (ii) Weighing balance (iii) Flat Bottomed Glass Dish with ground glass lid (iv) Dessiccator
4.	Adsorption capacity	4.5	(i) Weighing Balance (ii) Adsorption capacity determination apparatus as per Fig 1
5.	pH	4.6	(i) Boiling flask of chemically resistant glass fitted by means of ground glass joint with a reflex condenser of same material (ii) Weighing balance (iii) Heating mantle (iv) pH meter (v) Beakers (vi) Buffer solutions (vii) Water, free from ammonia and carbon dioxide
6.	Loss on attrition	4.7	(i) Weighing balance (ii) 850 micron IS sieve (iii) Apparatus with two steel cylinders as per D-1 (Cl 4.7)
7.	Solution preparation for chemical requirements	4.8, Annex E, E-2	(i) Weighing balance (ii) Heating mantle and boiling flask (iii) Filter funnel (iv) Beakers (v) 500 ml volumetric flask (vi) Distilled water

8.	Chlorides (as NaCL)	4.8 Table 1	i. Standard Silver Nitrate Solution – 0.1 N ii. Potassium Chromate Indicator Solution – 5 percent (m/v) iii. Dilute Acetic Acid - 10 percent (v/v) iv. Sodium Acetate Solution - 10 percent (m/v) v. Burette and burette stand <u>ION CHROMATOGRAPHY</u> (i) Anion Guard Column (ii) Anion Separator Column (iii) Anion Suppressor Device (iv) Conductivity detector (v) Distilled Water (vi) Standard solution (vii) Micromembrane Suppressor Solution (viii) Eluent — 1.7 mm sodium bicarbonate (ix) Distilled water (x) Glass or Polyethylene Sample Bottles
9.	Cobalt (as CoCl ₂) (for indicating type)	4.8 Table 1	(i) Dilute Hydrochloric Acid – 5 N (ii) α - Nitroso β – Naphthol solution (iii) Glacial Acetic acid (iv) Distilled water (v) Weighing balance (vi) Hot plate (vii) Stirrer (viii) Porcelain Crucible (ix) Whatman filter paper No 41 or equivalent (x) Bunsen burner with LPG gas cylinder (xi) Muffle Furnace (xii) Beakers, (xiii) Desiccator (xiv) filter paper
10.	Ammonium compounds (as NH ₃)	4.8 Table 1	(i) Sodium Hydroxide Solution – Approximately 5 N (ii) Potassium Iodide (iii) Saturated Mercuric Chloride Solution (iv) Potassium Hydroxide (v) Ammonia free water 200 ml (vi) Bottle closed with rubber stopper (vii) Standard Ammonium Chloride Solution (viii) Nessler cylinders, 50 ml capacity (ix) Weighing balance (x) Beakers and stirrer (xi) Pipette (xii) fitting rubber stopper

11.	Sulphates (as Na ₂ SO ₄)	4.8 Table 1	(i) Dilute Hydrochloric acid – approximately 5 N (ii) Barium Chloride Solution – approximately 12 percent (m/v) (iii) Whatman filter paper No. 42 (iv) Hot plate (v) Filter funnel (vi) Porcelain Crucible (vii) Concentrated Sulphuric Acid (viii) Bunsen burner with gas cylinder (ix) Desiccator <u>ION CHROMATOGRAPHY</u> (xi) Anion Guard Column (xii) Anion Separator Column (xiii) Anion Suppressor Device (xiv) Conductivity detector (xv) Distilled Water (xvi) Standard solution (xvii) Micromembrane Suppressor Solution (xviii) Eluent — 1.7 mm sodium bicarbonate (xix) Distilled water (xx) Glass or Polyethylene Sample Bottles
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The above list is indicative only and may not be treated as exhaustive

ANNEX -B
**TO THE PRODUCT MANUAL FOR
SILICA GEL - SPECIFICATION AS PER IS 3401 : 1992**

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 and implement 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 license shall be marked on each container of silica gel, provided always that the product thus marked conforms to every requirement of the specification.

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

i) Licence No. (CM/L)

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

4. CONTROL UNIT – Silica gel of same type produced from the same consignment of raw materials under similar condition of manufacturing in a day shall constitute a control unit.

5. 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.

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

6. 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 (Levels of Control)
(Para 5 of Scheme of Inspection and Testing)

(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				
4.1	Description	4.1	IS 3401	R	One	Firm to have adequate in-process controls to check compliance of this parameter. . However, appropriate records shall be maintained by the manufacturer for evidence of conformity	
4.2	Particle size	4.2	IS 3401	R	One	Each Control Unit	
4.3	Bulk Density	4.3	IS 3401	R	One	Each Control Unit	
4.4	Loss on drying	Annex A	IS 3401	R	One	Each Control Unit	
4.5	Adsorption capacity	Annex B	IS 3401	R	One	Every 5 th control unit	
4.6	pH	Annex C	IS 3401	R	One	Each Control Unit	
4.7	Loss on attrition	Annex D	IS 3401	R	One	Each Control Unit	
4.8	Chemical Requirements						
Table 1, Sl. No. i	Chlorides (as NaCl)	Annex E-3/7	IS 3401	R	One	Each Control Unit	
Table 1, Sl. No. ii	Cobalt (as CoCl ₂) (for indicating type)	Annex E-4	IS 3401	R	One	Each Control Unit	Applicable only for indicating Type
Table 1, Sl. No. iii	Ammonium compounds (as NH ₃)	Annex E-5	IS 3401	R	One	Each Control Unit	

Table 1, Sl. No. iv	Sulphates (as Na ₂ SO ₄)	Annex E-6/7	IS 3401	R	One	Each Control Unit	
4.9	Keeping quality	4.9	IS 3401	R	One	Once in six months for each type manufactured	

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 for approval by BO Head.