



**PRODUCT MANUAL FOR
PATHOLOGICAL MICROSCOPE
ACCORDING TO IS 4381: 1967**

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 4381 : 1967
	Title	:	Pathological Microscope
	No. of Amendments	:	3
2.	Sampling Guidelines:		
a)	Raw material	:	As per Clause 4 of IS 4381 : 1967
b)	Grouping guidelines	:	Not Applicable
c)	Sample Size	:	One Microscope
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 tests		
6.	Scope of the Licence :		
	Licence is granted to use Standard Mark as per IS 4381 : 1967 with the following scope:		
	Name of the product	Pathological Microscope	

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
1	Dimensions (Clause 3)	(i) Gauges (GO/ NOGO) (ii) Inside Micrometer (iii) Micrometer (iv) Travelling Microscope (v) Vernier Caliper
2	Mechanical Tests (Clause 6.1)	(i) Gauges (GO/ NOGO) (ii) Steel Scale (iii) Try Square
3	Resolving Power and Definition (Clause 6.2.1)	Test slide (distom) illuminated by a beam of nearly same numerical aperture
4	Star Test (Clause 6.2.2)	(i) Auxiliary Microscope (ii) Star object (Mercury globule on a piece of glass painted black)
5	Colour (Clause 6.2.3)	(i) Black and white test object (ii) White light illumination
6	Curvature of Field (Clause 6.2.4)	Micro-slide with 2mm divided into 200 parts or 1 mm divided into 100 parts
7	Distortion (Clause 6.2.5)	A counting chamber slide or a cross line grating
8	Condition of Optics (Clause 6.2.7)	(i) Aperture: Apertometer (ii) Corrosion test: Thermostatically controlled cabinet with chemicals as per clause 7.6 of IS 988 (iii) Definition chart (iv) Lens thickness: Eye piece micrometer (v) Lenses Focal Length: Standard focometer or alternate methods given in Appendix C of IS 988 (vi) Mirrors: Adherence: cellulose adhesive tape (vii) Radius of curvature: Caliper (viii) Temp. Test: Humidity Cabinet
9	Magnification and Numerical Aperture of Objective (Clause 6.2.8)	(i) Apertometer (ii) Micrometer eyepiece or travelling microscope (iii) Stage micrometer or graticule plate having two parallel lines of known separation

10	Eyepiece Magnification (Clause 6.2.9)	As per any of the methods given in Appendix C of IS 988 for determination of equivalent focal length of eyepieces then use formula to calculate magnification
11	Field Number of Eyepiece (Clause 6.2.10)	(i) Diffused light source (ii) Stage micrometer (iii) Travelling microscope
12	Vibration Test (Clause 6.3.1) (Optional test)	Vibrating table giving approximately 450 vibrations per minute with a maximum amplitude of 1.5 mm
13	Bump and Shock Test (Clause 6.3.2) (Optional test)	Bump and Shock Test Apparatus as per Clause 6.3.2.2 of IS 4381

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. LABELLING AND MARKING – As per the requirement of IS 4381: 1967.

4. 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.

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

5. 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				
4	General Requirements (except Materials and Optical Components)	4.1 to 4.10	IS 4381	R	Each Microscope		-
	Materials and Optical Components	4.1, 4.3	IS 4381	S	One	Each consignment	No further testing is required if received with test certificate or ISI marked
3	Dimensions	2	IS 3081	R	Each Microscope		Please see Note 1
5	Functional Requirements	5.1 to 5.11	IS 4381	R	Each Microscope		
6.1	Mechanical Tests	6.1.1 to 6.1.6	IS 4381	R	Each Microscope		
6.2	Optical Tests						
6.2.1	Resolving Power and Definition	6.2.1	IS 4381	R	Each Microscope		Please see Note 1
6.2.2	Star	6.2.2	IS 4381	R	Each Microscope		
6.2.3	Colour	6.2.3	IS 4381	R	Each Microscope		
6.2.4	Curvature of Field	6.2.4	IS 4381	R	Each Microscope		
6.2.5	Distortion	6.2.5	IS 4381	R	Each Microscope		
6.2.6	Clarity of the Field of View	6.2.6	IS 4381	R	Each Microscope		
6.2.7	Condition of Optics	-	IS 988	R	Each Microscope		
6.2.8	Magnification and Numerical Aperture of Objective	4.2.2, 4.2.3	IS 2754	R	Each Microscope		
6.2.9	Eyepiece Magnification	Appendix C 4.2.5	IS 988 IS 2754	R	Each Microscope		
6.2.10	Field Number of Eyepiece	6.2.10	IS 4381	R	Each Microscope		

6.3	Optional Tests					
6.3.1	Vibration Test	6.3.1	IS 4381	-	-	These tests may be conducted when agreed upon between the manufacturer and the purchaser
6.3.2	Bump and Shock Test	6.3.2	IS 4381	-	-	
8	Packing	8.1 to 8.11	IS 4381	R	Each Microscope	-

Note-1: In case of failure of microscope in any of the requirements, it shall be rectified till it meets the requirement otherwise the microscope shall be rejected.

Note-2: Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empanelled by the Bureau.

Note-3: 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.