



**PRODUCT MANUAL FOR
CAPACITORS FOR ELECTRIC FAN MOTORS
ACCORDING TO IS 1709:1984**

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 1709:1984
	Title	:	Capacitors for Electric Fan Motors
	No. of Amendments	:	3
2.	Sampling Guidelines:		
a)	Raw material	:	--
b)	Grouping guidelines	:	Please refer ANNEX –A
c)	Sample Size	:	As per Clause 7.1.3.1 and Table 1 of IS 1709:1984
3.	List of Test Equipment	:	Please refer ANNEX –B
4.	Scheme of Inspection and Testing	:	Please refer ANNEX –C
5.	Possible tests in a day:	:	Please refer ANNEX - D
6.	Scope of the Licence:		
	“Licence is granted to use Standard Mark as per IS 1709:1984 with the following scope:		
	Name of the product	Capacitors for Electric Fan Motors	
	Rating	___ μ F	
	Voltage	___ V	
	Frequency	50 Hz	
	Type	Self-healing/ Non-self-healing	
	Type of dielectric	Paper/ Polypropylene/ Metallized Polypropylene/ Mixed dielectric.	

ANNEX A

Grouping Guidelines

1. The parameters as given below shall be considered for grouping of “Capacitors for electric fan motors” as per IS 1709: 1984 for GOL/CSoL:

- (i) Rated Capacitance
- (ii) Rated Voltage
- (iii) Self-Healing Capacitor/ Non-Self-Healing Capacitor
- (iv) Type of Dielectric- P/PP/MPP/M

2. Capacitors with different rated capacitances shall be considered as one group, provided the rated voltage remains the same. Capacitors with the lowest, middle and highest capacitance in a group shall be tested for covering the entire range of capacitors in that group.

3. To cover all varieties in the scope of the Licence with respect to type of dielectric, at least one capacitor of each dielectric material shall be tested.

4. To cover all varieties in the scope of the Licence with respect to healing within a group, one capacitor of self- healing and non-self-healing type shall be tested.

5. The Firm shall declare the varieties of Capacitors they intend to cover in the Licence. The Scope of Licence may be restricted based on the Manufacturing capability and Testing facilities of the Manufacturer.

6. During the operation of the Licence, BO shall ensure that all the varieties covered in the Licence are tested in rotation to the extent possible.

ANNEX B**List of Test Equipment***Major test equipment required to test as per the Indian Standard*

Sl. No.	Test Equipment	Tests used in with Clause Reference
1	Vernier Calliper	Dimensions, Cl. 1.2
2	Voltage source Megohmmeter	Insulation Resistance, Cl. 7.3
3	High Voltage Tester (AC) High Voltage Tester (DC)	Voltage test, Cl. 7.4
4	LCR Meter	Capacitance measurement, Cl. 7.5
5	Schering Bridge	Tangent of loss angle, Cl. 7.6
6	Fixtures Weights	Test for robustness of termination, Cl 7.7
7	Fixtures for bending Weights	Test for flexibility of lead terminations, Cl 7.8, Test for flexibility of soldering tags, Cl 7.9
8	Provision for applying torque	Test for screw terminals, Cl 7.10
9	Arrangement for soldering test Soldering iron	Soldering test, Cl 7.11
10	Deep freezer Oven	Sealing test, Cl 7.12
11	Capacitor Charge and Discharge Tester	Capacitance, Cl. 7.13
12	Power source LCR Meter	Self-healing test, Cl 7.14
13	Humidity/Conditioning Chamber	Damp heat test, Cl. 7.15
14	Endurance Tester / Load Bank	Endurance test, Cl. 7.16
15	Hot air oven with temp. controller and hour meter	Destruction test, Cl. 7.17
16	Decade Capacitance Box	-
17	Stop watch	-
18	Digital Balance	-
19	Thermometer	-
20	Air Conditioner	-

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

ANNEX C

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 1709: 1984.

4. CONTROL UNIT – Fan capacitors of each type produced 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

(1)		(2)				(3)	
TEST DETAILS						Levels of control	
Clause	Requirement	Test Methods		Test equipment requirement R: required (or) S: Sub- contracting permitted	No. of Samples	Frequency	Remarks
		Clause	Reference				
1.2	Dimensions	5	IS 1709	R	4 Capacitors	Every Control Unit	
5	Material, Workmanship and Finish	5	IS 1709	R	Each Capacitor		
7.2	Visual Examination	7.2	IS 1709	R	Each Capacitor		
7.3	Insulation Resistance	7.3.1	IS 1709	R	Each Capacitor		
7.4	Voltage test between terminals (Routine test)	7.4.1.1, 7.4.1.2	IS 1709	R	Each Capacitor		
	Voltage test between terminals (Type test)	7.4.1, 7.4.1.2	IS 1709	R	2 Capacitors	Every Control Unit	
	Voltage test between terminals & Container (Routine test)	7.4.2, 7.4.2.1	IS 1709	R	Each Capacitor		
	Voltage test between terminals & Container (Type test)	7.4.2, 7.4.2.1	IS 1709	R	2 Capacitors	Every Control Unit	
7.5	Capacitance Measurement	7.5	IS 1709	R	Each Capacitor		
7.6	Measurement of tangent of loss angle	7.6	IS 1709	R	2 Capacitors	Every Control Unit	
7.7	Test for robustness of the termination	7.7	IS 1709	R	2 Capacitors	Every Control Unit	
7.8	Test for flexibility of lead terminations	7.8	IS 1709	R	2 Capacitors	Every Control Unit	
7.9	Test for flexibility of soldering tags	7.9	IS 1709	R	2 Capacitors	Every Control Unit	

7.10	Test for screw terminals	7.10	IS 1709	R	2 Capacitors	Every Control Unit	
7.11	Soldering test	7.11	IS 1709	R	2 Capacitors	Every Control Unit	
7.12	Sealing Test	7.12	IS 1709	R	2 Capacitors	Every Control Unit	
7.13	Capacitance as a function of temperature	7.13	IS 1709	S	When required by the purchaser		
7.14	Self-healing test	7.14	IS 1709	S	Once in three months for each type and rating		
7.15	Damp heat test	7.15	IS 1709	S	Once in six months for each type and rating		
7.16	Endurance test	7.16	IS 1709	S	Once in six months for each type and rating		
7.17	Destruction test	7.17	IS 1709	S	Once in three months for each type and rating		

Note- 1: Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empanelled 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.

ANNEX D

Possible tests in a day

- (a) Visual examination, Cl. 7.2
- (b) Insulation Resistance, Cl. 7.3
- (c) Voltage tests, Cl. 7.4
- (d) Capacitance Measurement, Cl. 7.5
- (e) Tangent of loss angle, Cl. 7.6
- (f) Test for robustness of termination, Cl. 7.7
- (g) Test for flexibility of lead terminations, Cl. 7.8
- (h) Test for flexibility of soldering tags, Cl. 7.9
- (i) Test for screw terminals, Cl. 7.10
- (j) Soldering test, Cl. 7.11
- (k) Sealing test, Cl. 7.12.1
- (l) Self-healing test, Cl. 7.14