

**PRODUCT MANUAL FOR
EXPLOSIVE ATMOSPHERES PART 1 – EQUIPMENT PROTECTION BY
FLAMEPROOF ENLCOSURES “d”
ACCORDING TO IS/IEC 60079 (PART 1): 2007**

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/IEC 60079 (PART 1): 2007
	Title	:	Explosive Atmospheres- Part 1 – Equipment Protection By Flameproof Enclosures “d”
	No. of Amendments	:	NIL
2.	Sampling Guidelines:		
a)	Raw material	:	-
b)	Grouping guidelines	:	Please refer ANNEX – A
c)	Sample Size	:	Please refer 2 & 3 of ANNEX – A
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 :		
	(i) Possible dimensions of the enclosure and compliance to approved drawings/ Test reports as per Cl. 4 to 13 & 17 to 19 of IS/IEC 60079-1		
	(ii) Routine overpressure test as per Cl. 15.1.3 & 16 of IS/IEC 60079-1		
	(iii) Tests for resistance to impact as per Cl. 26.4.2 of IS/IEC 60079-0		
	(iv) Drop Test as per Cl. 26.4.3 of IS/IEC 60079-0		
6.	Scope of the Licence :		
	“Licence is granted to use Standard Mark as per IS/IEC 60079 (Part 1): 2007 with the following scope:		
	Name/ Description of the product		
	Type designation		
	Gas Group		
	Test Certificate No., Date Drawing No, Lab’s Name		

ANNEX A

Grouping Guidelines

1. Each variety of Flameproof Enclosure is to be tested for the purpose of Grant of Licence/ Inclusion.
2. For grant of licence, if the firm submits complete test reports and approved drawings from a third party laboratory, containing all the details / declarations as required by the Standard, the product shall be verified in the factory for the design compliance with drawings/ test reports and the Standard. All the possible tests shall be conducted in the factory. One Verification sample shall be drawn for dimensions and over-pressure tests only.
3. Alternatively, if the firm submits the drawings/declarations of the product only, requisite number of samples as per Cl. 26 of IS/IEC 60079-0 shall be drawn and sent for all tests at a third party laboratory.
4. For inclusion of new variety, the firm shall submit test report and approved drawings from a third party laboratory, containing all the details / declarations as required by the Standard.
5. For considering grant of licence/ inclusion, Test report submitted shall not be more than six months old.
6. During the operation of the licence, samples may not be drawn for independent testing. Feedback from organized buyers maybe sought in lieu of Market samples.

ANNEX B**List Of Test Equipment**

Major test equipment essentially required to test as per the Indian Standard

S. No.	Tests used in with Clause Reference	Test Equipment
1.	Dimensions As per approved drawings & Cl. 4-13 & 17-19 of IS/IEC 60079-1	a) Vernier Callipers b) Scale c) Micrometer d) Thread Gauge e) Ring Gauge f) Plug Gauge g) Feeler Gauge
2.	Routine overpressure test as per Cl. 15.1.3 & 16 of IS/IEC 60079-1	a) Hydro Test Pump set arrangement with pressure indicator
3.	Tests for resistance to impact as per Cl. 26.4.2 of IS/IEC 60079-0	a) 1 kg test mass with impact head b) Measuring Tape/ Scale
4.	Drop Test as per Cl. 26.4.3 of IS/IEC 60079-0	a) Measuring Tape/ Scale

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 equipment.

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

3. LABELLING AND MARKING – In addition to the requirements of the Standard, the following shall be provided on the main part of the equipment either by ‘Raised lettering cast integrally with the body of the equipment’ or ‘attaching a plate having the details riveted to or otherwise permanently attached to the apparatus in a manner, which will not impair the flameproof nature of the enclosure’:

- a) Name of the manufacturer or his registered trade mark;
- b) Manufacturer’s type identification;
- c) Serial no. of the equipment assigned (for traceability of records);
- d) BIS Certification Marks licence number “CM/L”
- e) Markings required by the statutory authorities.

3.1 The information as given under clause 20 of IS/IEC 60079-1 and clause 29 & Annex A.4 of IS/ IEC 60079-0 shall also be provided on each equipment.

3.2 For small equipment & small Ex-components, where marking space is limited, marking shall be as per clause 29.6 of IS/IEC 60079-0.

3.3 Manufacturer shall issue certificate of conformity as per clause 28 of IS/IEC 60079-0.

4. CONTROL UNIT – Each of the samples taken for the tests shall satisfy the requirements of the specification.

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 Standard 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				Test equipment requirement R: required (or) S: Sub-contracting permitted	Levels of Control		
Cl.	Requirement	Test Methods			No. of Sample	Frequency	Remarks
		Clause	Reference				
7	Enclosure-Non Metallic	7	IS/IEC 60079-0	S	One	Sample from each lot of material received as one batch to be selected	Only the materials as per details listed in the Type Test Certificate shall be used. Testing is not necessary if each lot received is accompanied with the Material Test Certificate of the manufacturer of the incoming material. If any bought out Ex Components are used, the suitability of the same shall be checked with reference to its Type Test Certificate.
8	Enclosure-Metallic	8	IS/IEC 60079-0	S	One		
12	Cement and Sealing materials	12	IS/IEC 60079-0	S	One		
21.1	Light-transmitting parts-Glass	21.1, 26.4.2 & 26.5.2	IS/IEC 60079-0	S	One		
21.1	Light-transmitting parts-Non-metallic other than Glass	7, 21.1, 26.4.2, 26.8, 26.9 & 26.11	IS/IEC 60079-0	S	One		
9	Fasteners	9	IS/IEC 60079-0	S	One		
23	Cells and Batteries	23	IS/IEC 60079-0	S	One		
4 to 23 & 27	Construction and workmanship	4 to 23 & 27	IS/IEC 60079-0	R	Each equipment		Based on the approved/ certified drawings, detailed manufacturing drawings shall be prepared which shall contain all the applicable checks and requirements as per Clauses 4 to 23 & 27 of IS/IEC 60079-0
28.1 & 28.2	Certificate of Conformity	28.1 & 28.2	IS/IEC 60079-0	R	-do-		Please also see Clause 3 of SIT
26	Type Tests	26	IS/IEC 60079-0	S	One sample to be selected from each product group [*]		Type test to be carried out after 5 years of last type approval for any type/ size/ variety in that product group [**]

(1)				(2)	(3)		
Test Details				Test equipment requirement R: required (or) S: Sub-contracting permitted	Levels of Control		
Cl.	Requirement	Test Methods			No. of Sample	Frequency	Remarks
		Clause	Reference				
9	Light-transmitting parts- other than Glass	19	IS/IEC 60079-1	S	One	Sample from each lot of material received as one batch to be selected	Only the materials as per details listed in the Type Test Certificate shall be used. Testing is not necessary if each lot received is accompanied with the Material Test Certificate of the manufacturer of the incoming material. If any bought out Ex Components are used, the suitability of the same shall be checked with reference to its Type Test Certificate.
10	Crimped Ribbon and multiple screen elements	Annex A	IS/IEC 60079-1	S	One		
10	Sintered Metal, Pressed metal wire and metal foam elements	Annex B	IS/IEC 60079-1	S	One		
11	Fasteners	11 & Annex F	IS/IEC 60079-1	S	One		
4-13 & 17-19	Construction and workmanship	4-13 & 17-19	IS/IEC 60079-1	R	Each equipment	Based on the approved/ certified drawings, detailed manufacturing drawings shall be prepared which shall contain all the applicable checks and requirements as per Clauses 4 to 13 & 17 to 19 of IS/IEC 60079-1.	
15.1.3 & 16	Routine tests/ Over-pressure tests	15.1.3 & 16	IS/IEC 60079-1	R	-do-		
20	Marking	20	IS/IEC 60079-1	R	-do-	Please also see Clause 3 of SIT	
		29 & A4	IS/IEC 60079-0				
15	Type tests	15	IS/IEC 60079-1	S	One sample to be selected from each product group [*]	Type test to be carried out after 5 years of last type approval for any type/ size/ variety in that product group [**]	

*

FLPs can be classified into the following product groups:

- i. Luminaires (all types of lighting fittings including fittings with well glass, flat glass, tubular glass; bulk head; flood light; hand lamp; etc.)
- ii. Rotating Electric Machines (all types of rotating machines including motors, generators, etc.)
- iii. General purpose enclosures (all types of control stations; control panels; control gears; switchgears; junction boxes; terminal boxes; transformers; empty flameproof enclosures; etc.)
- iv. Others (not covered in the above groups like instruments; telephones; heaters)

**

- i. For a given product group, the period of 5 years for that product group may be counted from the date of grant/ the last inclusion which involves type-testing of that type/size/variety .
- ii. Over-pressure test in accordance with Cl. 15.1.3 of IS/IEC 60079-1 is to be carried out considering the explosion pressure determined at the time of prototype approval, hence, Explosion pressure or reference pressure need not be determined again. Over-pressure test need not be carried out for cases where it is done in the factory as a routine test.
- iii. Tests for Non-transmission of internal ignition shall be carried out on samples subjected to the Tests of enclosures in accordance with IS/IEC 60079-0

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 obligatory in nature.