



**PRODUCT MANUAL FOR
EXPLOSIVE ATMOSPHERES - PART 1 – EQUIPMENT PROTECTION
BY FLAMEPROOF ENCLOSURES “d”
ACCORDING TO IS/IEC 60079 (PART 1): 2014**

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): 2014
	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) Verification of flamepaths, gaps etc and constructional compliance of the enclosure to approved drawings/ Test reports as per IS/IEC 60079-1		
	(ii) Routine overpressure test as per Cl. 15.2.3 & 16 of IS/IEC 60079-1		
6.	Scope of the Licence :		
	“Licence is granted to use Standard Mark as per IS/IEC 60079 (Part 1): 2014 with the following scope:		
	Name/ Description of the product	<i>In terms of Product group as given in Annex A, Sl No 1 for products at 1(i) – 1(iv). For products falling under 1(v), product name shall be mentioned in the scope</i>	

ANNEX A

Grouping Guidelines

1. Flameproof enclosures are classified in following product groups:
 - i) Flameproof Luminaires
 - ii) Flameproof Rotating Electrical Machines
 - iii) Flameproof enclosure (Empty enclosure, Junction box, Switchgear & Control gear, process instrument etc)
 - iv) Ex Components (Cable glands/breathing and draining devices/blanking elements etc)
 - v) Other types of enclosures are to be treated product-wise, for example, telephone, heaters, etc.
2. Test reports and approved drawings of at least any one type designation of Flameproof Enclosure from each product group mentioned above is required for the purpose of Grant of Licence/ Change in Scope of Licence. Only product group shall be endorsed and no separate endorsement needs to be issued based on individual Test Certificates. However, an undertaking shall be obtained from the manufacturer to the effect that the enclosures with different type designations within that group will conform to the requirements of the ISS and that the firm, at the first instance of manufacturing these types and before applying the Standard Mark, shall get the enclosure tested at third party laboratory. Such test reports, in original, along with the approved drawings shall be produced to BIS for records through Manakonline. The Grant of Licence letter/ any subsequent endorsement with product group shall clearly mention the details regarding submission of independent test reports by the licensee on the first instance of manufacturing of a new variety in a product group as mentioned above.
3. 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.
4. 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 testing laboratory.
5. For considering grant of licence/ Change in Scope of licence, Test report submitted shall not be more than six months old. Revalidation reports issued by labs with reference to an old type test report are acceptable for Grant of Licence/Change in Scope of licence.
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. Sample shall be tested in factory during surveillance visits

ANNEX B**List Of Test Equipment***Major test equipment 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. 5-13 & 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. 15.2.3 & 16 of IS/IEC 60079-1	a) Hydro Test Pump set arrangement with pressure indicator

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 – The Standard Mark as given in the Schedule of the license shall be incorporated legibly and indelibly on each equipment, provided always that the product thus marked conforms to specifications of the standard.

3.1 In addition to the requirements as per Cl. 29 of IS/IEC 60079-0 and Cl. 20 of IS/IEC 60079-1, the following shall be indelibly marked on the equipment:

- a) BIS Certification Marks licence number “CM/L....”
- b) The statement “For details of BIS certification please visit www.bis.gov.in”
- c) Markings required by statutory authorities.

Note: In case the space is insufficient, b) may be printed on the instruction manual.

3.2 The manufacturer shall maintain documentation as per Cl. 24, Cl. 28.2 and Cl. 30 of IS/IEC 60079-0 for each product type designation.

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 Standard 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 Methods			No. of Sample	Frequency	Remarks (Please see Note 1 also)
		Clause	Reference				
5	Flameproof Joints	5.1 to 5.5	IS/IEC 60079-1	R	Each enclosure		
6	Sealed Joints	6.1, 6.2	IS/IEC 60079-1	R	Each enclosure		Tests as per 6.1.2 shall be carried out along with type tests (Please see Note 2)
7	Operating rods	7	IS/IEC 60079-1	R	Each enclosure		
8	Supplementary requirements for shafts & bearings	8.1, 8.2	IS/IEC 60079-1	R	Each enclosure		
9	Light-transmitting parts	9, 19	IS/IEC 60079-1	S	One	Every 5 years	Applicable at the time of type tests. (Please see Cl 15 of Table 1 of SIT)
10	Breathing & Draining devices which form part of a flameproof enclosure	10.1-10.7	IS/IEC 60079-1	R	Each enclosure		
		10.8		S	One	Every 5 years	Applicable at the time of type tests (Please see Note 2)
		10.9.3		S	One	Every 5 years	Type test to be carried out after 5 years of last type approval for any Breathing & Draining device. The period of 5 years may be counted from the date of grant/ the last inclusion which involves type-testing of a Breathing & Draining device. If any bought out Ex Components are used, further testing is not necessary if it is ISI marked or accompanied with a Test Certificate
11	Fasteners and openings	11	IS/IEC 60079-1	R	Each enclosure		
12	Materials	12	IS/IEC 60079-1	S	One	Each lot received	Test Certificate for each lot of raw material received, wherever applicable

(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 (Please see Note 1 also)
		Clause	Reference				
13	Entries for flameproof enclosures	13 (except Annex C.3)	IS/IEC 60079-1	R	One	Each enclosure	If any bought out Ex Components are used, further testing is not necessary if it is ISI marked or accompanied with a Test Certificate.
		Annex C.3		S	One	Every 5 years	Type test to be carried out after 5 years of last type approval for any cable entry. The period of 5 years may be counted from the date of grant/ the last inclusion which involves type-testing of a cable entry.
14	Verification and tests	14	IS/IEC 60079-1	S	One sample to be selected from each product group		Please see Note 2
		-	IS/IEC 60079-0				
15	Type Tests	15	IS/IEC 60079-1				
16	Routine tests	15.2.3, 16	IS/IEC 60079-1	R	Each enclosure		
17	Switchgear for Group I	17	IS/IEC 60079-1	R	Each enclosure		
18	Lamp-holders and lamp-caps	18	IS/IEC 60079-1	R	Each enclosure		
19	Non-metallic enclosures and non-metallic parts of enclosures	19	IS/IEC 60079-1	S	One	Every 5 years	Applicable at the time of type tests. (Please see Cl 15 of Table 1 of SIT)
20	Marking	20	IS/IEC 60079-1	-	Each enclosure		Please also see Cl 3 of SIT.
		29	IS/IEC 60079-0				

Note-1: All equipment shall be manufactured in accordance with the approved/ certified drawings. Only the materials as per details listed in the Type Test Certificate shall be used. Testing of bought out components/ raw materials is not required if the bought out components/ raw materials are ISI marked or accompanied with a Test Certificate.

Note-2: Type test to be carried out after 5 years of last type approval of any one type designation from each product group listed at SI No. 1 of Annex A. For products covered in SI No. 1(v) of Annex A, any two different products shall be tested in rotation. For a given product group, the period of 5 years for that product group may be counted from the date of Test Certificate which involves type-testing of that type/size/variety. Test sequence as per Cl 15.1 of IS/IEC 60079-1 shall be followed. Over-pressure test in accordance with Cl. 15.2.3 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.

Note-3: Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empanelled by the Bureau.

Note-4: Levels of control given in column 3 are obligatory in nature.