

इंटरनेट

मानक

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“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

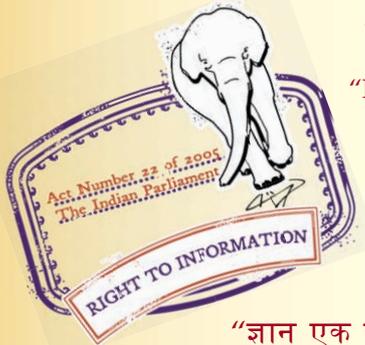
“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 14951 (2001): Fire Extinguisher--135 Litres Capacity  
Mechanical Foam Type--Specification. ICS 13.220.10



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”



IS 14951 : 2001

REAFFIRMED

भारतीय मानक

135 लिटर की क्षमता वाले यांत्रिक झाग वाले  
अग्नि शामक — विशिष्टि

*Indian Standard*

**FIRE EXTINGUISHER — 135 LITRES CAPACITY  
MECHANICAL FOAM TYPE — SPECIFICATION**

ICS 13.220.10

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**BUREAU OF INDIAN STANDARDS**  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 110002

#### FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Fire Fighting Sectional Committee had been approved by the Civil Engineering Division Council.

135 Litre capacity fire extinguisher, mechanical foam type, is one of the larger versions of the fire extinguishers. This type of extinguisher in which foam is expanded by means of pressure produced from compressed or liquified gas from pressure container filled onto the extinguisher, is suitable for fighting fires in non-polar flammable liquids.

The composition of technical committee responsible for the formulation of this standard is given at Annex C.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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**AMENDMENT NO. 2 FEBRUARY 2010  
TO  
IS 14951 : 2001 FIRE EXTINGUISHER — 135 LITRES  
CAPACITY MECHANICAL FOAM TYPE —  
SPECIFICATION**

*(Page 3, clause 10.1)* — Substitute the following for the existing:

“Each extinguisher body shall be painted either with epoxy powder coating or synthetic enamel paint. The shade shall be ‘Fire Red’ or ‘Post Office Red’ conforming to Shades No. 536 or 538 of IS 5.

NOTES

1 Whenever epoxy powder coating is applied on the external surface of mild steel body for anti-corrosive treatment, synthetic enamel paint coating is not required.

2 The body of extinguisher shall be of good finish, clear of all burrs and sharp edges.”

*(Page 3, clause 10.4)* — Delete.

(CED 22)

## *Indian Standard*

# FIRE EXTINGUISHER — 135 LITRES CAPACITY MECHANICAL FOAM TYPE — SPECIFICATION

### 1 SCOPE

This standard lays down the requirements regarding material, shape, construction, charge, anti-corrosion treatment and tests for 135 litres capacity mechanical foam fire extinguisher, mounted vertically on trolley wheels.

### 2 REFERENCES

The Indian Standards listed in Annex A contain provisions which, through reference in text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards given at Annex A.

### 3 CAPACITY

The total liquid capacity of the container when filled to the specified level, shall be 135 litres.

### 4 PRINCIPLE

The method of expulsion of liquid foam shall be by means of pressure produced from compressed or liquified gas from gas cylinder attached to body.

### 5 MATERIAL

The materials for construction are given in Table 1.

### 6 SHAPE

The shape of the body of the mechanical foam extinguisher shall be cylindrical and minimum thickness of sheet shall be as per the formula  $D/100$  where  $D$  is the diameter of the body in mm.

### 7 CONSTRUCTION (for illustration, see Fig. 1)

#### 7.1 General

The top dome and bottom dish of the body shall be without reverse of curvature and shall be dished outwards to a radius not exceeding the outside diameter of the body to which these are fixed or of which one of both form a part if solid drawn therewith.

7.1.1 Non-ferrous metal parts shall be mechanically tightened and soldered, if needed, or brazed to the body.

#### 7.2 Body

Circumferential and horizontal joints of the body shall be of welded type.

7.2.1 The welded construction be one of the types given below and shall conform to Indian Standard mentioned against each:

- a) Spot welding (for attachment of fittings only) shall conform to IS 819, and
- b) Metal arc welding shall conform to IS 9595.

#### 7.3 Carrying Handle

The carrying handle shall be made of mild steel rod or tube of not less than 25 mm diameter. If tube, the thickness of the sheet used shall be not less than 1.25 mm.

#### 7.4 Neck Ring

The neck ring shall provide a clear opening of not less than 75 mm diameter. It shall have parallel screw threads conforming to class A of IS 2643 (Part 1) for an effective length of not less than 20 mm. The neck ring shall be firmly screwed to the body by welding.

#### 7.5 Cap

The cap shall be threaded for not less than 20 mm effective length with parallel threads conforming to class A of IS 2643 (Part 1). At least four holes of not less than 2.5 mm diameter each shall be drilled through threads of the cap to form vents. The centre of the vent holes shall be minimum 6.5 mm from the face of the cap joint washer.

#### 7.6 Snifter Valve

A snifter valve (breathing device) shall be fitted to extinguishers for upright type and the design shall be such that when variation in atmospheric temperature is within  $\pm 10^\circ\text{C}$  there shall be no spouting of liquid through nozzle.

#### 7.7 Safety Pressure 'Release Valve'

The cap or body should have a safety pressure release valve mechanism by which if the pressure inside the container exceeds 25 kg/cm<sup>2</sup>, the safety pressure release valve will release the internal pressure automatically.

**7.8 Liquid Level Indicator**

The 135 litres level of the solution inside the body shall be indicated on the exterior of the body. It shall also be permanently indicated in the interior, or means shall be provided to demonstrate that the solution level is correct.

**7.9 Hose**

The discharge hose shall have a bore of not less than 19 mm and a length of not less than 6 m.

**7.10 Foam Making Branch and Other Discharge Fittings**

The design of the foam making branch and other discharge fittings shall be such that when the extinguisher is set in operation, it shall be capable of discharging foam as given in 11.1.

**7.11 Syphon Tube**

The syphon tube shall be fitted inside the body.

**7.12 Drain Plug**

At the bottom of the body a drain plug of size 25 mm with rubber washer shall be fitted.

**7.13 Wheeled Carriage**

The fire extinguisher shall be provided with wheeled carriage with rubber - tyred wheels of size 405 mm × 50 mm × 25 mm and axle of mild steel rod of 25 mm minimum diameter.

**7.14 The CO<sub>2</sub> gas cylinder of 1 kg capacity shall confirm to IS 7285.**

**8 CHARGE**

The charge shall consist of foam concentrate conforming to IS 4989 (Part 2) and quantity not less than 8 l (for 6 percent concentrate) or 4 l (for 3 percent concentrate) and balance quantity of water to make the foam water solution to 135 litres.

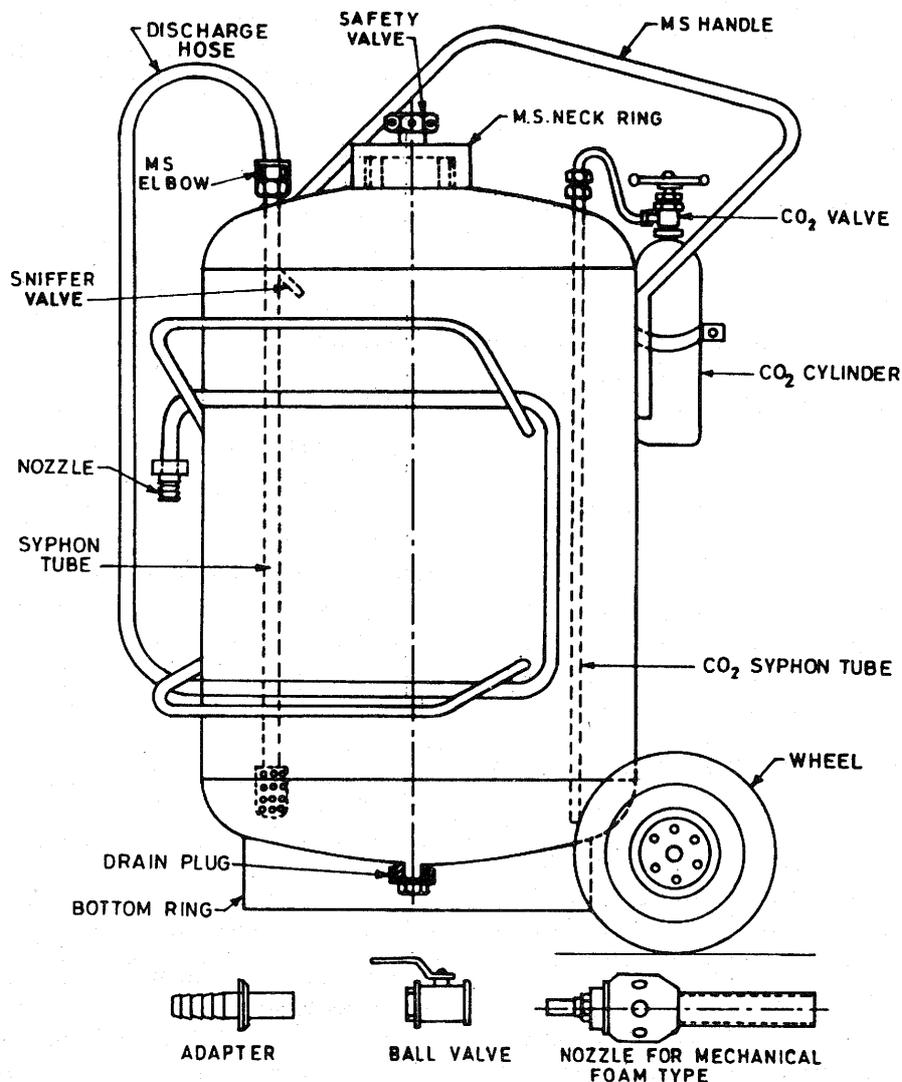


FIG. 1 135 LITRES CAPACITY MECHANICAL FOAM FIRE EXTINGUISHER

**Table 1 Materials for Construction of Various Parts of Fire Extinguisher**  
(Clause 5)

Sl No.	Component	Material	Requirements, Relevant IS
(1)	(2)	(3)	(4)
i)	Body	Mild steel sheet	Any grade of IS 1079
ii)	Neck ring	a) Leaded tin bronze	Grade LTB 2 of IS 318
		b) Mild steel pipe	IS 1239 (Part 1)
iii)	Cap	a) Leaded tin-bronze	Grade LTB 2 of IS 318
		b) Brass forging	Grade FLB of IS 6912
iv)	Cap washer	Rubber	Requirements in respect of hardness as applicable to Type 3 of IS 538 and also acid/ alkali resistant ( <i>see Note</i> )
v)	Safety valve	a) Brass	Type I of IS 319
		b) Leaded tin-bronze	Grade LTB 2 of IS 318
vi)	Spring	Spring steel	Grade 1 of IS 4454 (Part 1)
vii)	Siphon tube	a) Brass	Alloy No. 2 of IS 407
		b) HDPE	IS 4984
		c) Copper	IS 1545
		d) Mild steel	IS 3601
viii)	Discharge fittings	a) Leaded tin-bronze	Grade LTB 2 of IS 318
		b) Brass	Grade 2 of IS 291, Type 1 of IS 319
ix)	Foam making branch pipe	a) Aluminium alloy	Grade 4450 or 4425 of IS 617
		b) Leaded tin-bronze	Grade LTB 2 of IS 318
		c) Plastic	IS 7328
x)	Co <sub>2</sub> cylinder (1 kg capacity)		IS 2878 without discharge horn
xi)	Hose	a) Braided rubber	} Having bursting pressure of not less than 50 kg/cm <sup>2</sup>
		b) Plastic	
		c) Nylon braided PVC	
xii)	Snifter valve	a) Brass	Type 1 of IS 319
		b) Stainless steel	Grade 04Cr18Ni10 of IS 6603
		c) Leaded tin-bronze	Grade LTB 2 of IS 318
		d) Plastic	IS 7328

NOTE — When a piece of 2.5 cm cut from any portion is dipped in 20 percent sulphuric acid/5 percent sodium hydroxide solution for 10 min, there shall be no sign of corrosion or damage.

## 9 ANTI-CORROSIVE TREATMENT

9.1 All internal surfaces of the body be completely coated with lead-tin alloy (tin not less than 10 percent), applied by electrolytic process or by hot dipping process to a thickness of not less than 0.012 mm or epoxy powder coated to a thickness of not less than 0.050 mm. The thickness of the coating shall be measured as given in IS 3203. The external surface of the body and both surfaces of siphon tube shall also be subjected to this anti-corrosive treatment. There shall be no visible uncoated area both internally or externally.

9.1.1 Phosphating in accordance with the provisions of IS 3618 may be applied on the external surface of the body as an alternative to lead-tin alloy.

## 10 PAINTING

10.1 Each extinguisher shall be painted fire red conforming to shade No. 537 of IS 5.

10.2 A picture showing a man operating the extinguisher in the correct manner shall be shown on the body of the extinguisher.

10.3 Each extinguisher shall be marked with letter A and B indicating the suitability for class A and B as laid down in IS 2190. The letter A and B shall be of 2.5 cm size printed in black colour, centrally contained in square of 4 cm size. The square shall be coloured cream (lemon yellow conforming to shade No. 355 of IS 5).

10.4 The paint shall conform to IS 2932.

## 11 TEST REQUIREMENT

11.1 The extinguisher shall be capable of discharging not less than 90 percent by mass of the actual rated capacity of the extinguisher, when the extinguisher is set into operation under normal temperature conditions of  $27 \pm 5^\circ\text{C}$ , the foam solution shall be expelled in the form of a foam jet which will maintain a throw of not

less than 12 m for the minimum period of 60 s. The maximum period of discharge of minimum 90 percent of the liquid shall be 180 s. The test shall be carried out so that the stream is discharged in horizontal direction in still air conditions from a height of 12.5 m from the ground.

11.2 The foam produced shall have minimum expansion 6 and formation of film as per IS 4989 (Part 2).

11.3 The extinguisher body and the cap (without the safety release valve) shall be tested separately to an internal hydraulic pressure of 3.0 MN/m<sup>2</sup> (30 kgf/cm<sup>2</sup>) for a period of 2 min. During this test, it shall not show any sign of leakage.

11.4 In case of hydraulic burst failure test for body, the mechanical failure shall not occur at a pressure of less than 4.5 MN/m<sup>2</sup> (45 kgf/cm<sup>2</sup>).

## 12 MARKING

Each extinguisher shall be clearly and permanently marked with the following information :

- a) Indication of the source of manufacture,
- b) Method of operation in prominent letters,
- c) The word 'MECHANICAL FOAM FIRE

EXTINGUISHERS',

- d) The capacity of extinguisher in litres,
- e) The words 'After discharge the extinguisher must be washed out carefully with fresh water using at least two changes' in prominent letter,
- f) A declaration to the effect that the body of the extinguisher has been tested to pressure of 3.0 MN/m<sup>2</sup> (30 kgf/cm<sup>2</sup>), and
- g) Year of manufacture.

12.1.1 The extinguisher may also be marked with the Standard Mark.

12.1.2 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

## 13 SAMPLING AND CRITERIA FOR CONFORMITY

The details of sampling and criteria for conformity are given in Annex B.

## ANNEX A

(Clause 2)

### LIST OF REFERRED INDIAN STANDARDS

IS No.	Title	IS No.	Title
5 : 1994	Colours for ready mixed paints and enamels ( <i>fourth revision</i> )	1079 : 1994	steel Hot rolled carbon steel sheets and strips ( <i>fifth revision</i> )
291 : 1989	Naval brass rods and sections for machining purposes — Specification ( <i>third revision</i> )	1239 (Part 1) : 1990	Mild steel tubes, tubulars and other wrought steel fittings: Part 1 Mild steel tubes ( <i>fifth revision</i> )
318 : 1981	Leaded tin bronze ingots and castings ( <i>second revision</i> )	1545 : 1994	Solid drawn copper and copper alloy tubes for condenser and heat exchangers ( <i>third revision</i> )
319 : 1989	Free cutting brass bars, rods and sections ( <i>fourth revision</i> )	2190 : 1992	Code of practice of selection, installation and maintenance of portable first-aid fire extinguishers ( <i>second revision</i> )
407 : 1981	Brass tubes for general purposes ( <i>third revision</i> )	2643 (Part 1) : 1975	Dimensions for pipe threads fastening purposes: Part 1 Basic profile and dimensions ( <i>first revision</i> )
538 : 1968	Phenol (carbolic acid) ( <i>first revision</i> )	2878 : 1996	Specification for fire extinguisher,
617 : 1994	Aluminium and aluminium alloy ingots and castings for general engineering purposes ( <i>third revision</i> )		
819 : 1957	Code of practice for resistance spot welding for light assemblies in mild		

IS No.	Title	IS No.	Title
2932 : 1993	carbon dioxide type (portable and trolley mounted) ( <i>second revision</i> )	4984 : 1995	High density polyethylene pipes for water supply ( <i>fourth revision</i> )
3203 : 1982	Enamel, synthetic, exterior (a) under-coating, (b) finishing ( <i>second revision</i> )	4989 (Part 2) : 1984	Specification for foam concentrate for producing mechanical foam for fire fighting : Part 2 Aqueous film forming foam (AFFF)
3601 : 1984	Methods of testing local thickness of electroplated coatings ( <i>first revision</i> )	6603 : 1972	Stainless steel bars and flats
3618 : 1966	Steel tubes for mechanical and general engineering purposes ( <i>first revision</i> )	6912 : 1985	Copper and copper alloy forging stock and forgings ( <i>first revision</i> )
4454 (Part 1) : 1981	Phosphate treatment of iron and steel for protection against corrosion	7285 : 1988	Seamless steel cylinders for permanent and high pressure liquefiable gases ( <i>second revision</i> )
4947 : 1985	Steel wires for cold formed springs: Part 1 Patented and cold drawn steel wires — Unalloyed ( <i>first revision</i> )	7328 : 1992	High density polyethylene materials for moulding and extrusion ( <i>first revision</i> )
	Gas cartridges for use in fire extinguishers — Specification ( <i>second revision</i> )	9595 : 1996	Metal-arc welding of carbon and carbon manganese steels — Recommendations ( <i>first revision</i> )

## ANNEX B

(Clause 13)

### SAMPLING AND CRITERIA FOR CONFORMITY

#### B-0 GENERAL

**B-0.1** The risk involved in failure of a fire extinguisher to work when needed is extremely large. Fire extinguishers, therefore, ought to have a high degree of reliability of performance during the entire period of its service. It can be achieved only through adequate design and control at all stages of manufacture and assembly.

#### B-1 SAMPLING

##### B-1.1 Lot

All fire extinguishers of the same type, shape, design and capacity, produced by the same manufacturer from similar materials under almost identical conditions of manufacture shall be grouped together to constitute a lot.

**B-1.2** Each lot shall be considered individually for the purpose of evaluation of quality in accordance with this standard.

**B-1.2.1** The number of samples for testing to be taken

at random from a lot and the criteria for conformity shall be as given in **B-1.2.2** and **B-1.2.3**.

**B-1.2.2** From each lot a number of samples as indicated in col 2 of Table 2 shall be selected at random.

**B-1.2.3** They shall be examined visually, as far as possible, in respect of requirements specified in 4 to 7, 10 and 12 and then in respect of hydraulic pressure test (*see 11.3*) and corrosion test (*see 9*).

**B-1.2.3.1** All the samples tested shall pass these tests for the lot to be declared to conform to these requirements.

**B-1.2.4** In respect of performance test (*see 11.1*), one sample shall be tested for this property and the sample shall pass this test for the lot to be declared to conform to this requirements.

**B-1.2.5** In respect of bursting pressure (*see 11.4*) one type test shall be done and these should conform to the requirements laid down in the specification.

**B-1.2.6** In the absence of a certificate from a manufacturer about conformity of specifications for the various components (*see* 5) and the charge (*see* 8) from a sample fire extinguisher, such items shall be taken separately and examined individually in respect of the relevant requirements laid down in the standard. The lot shall be considered satisfactory if all the items satisfy the relevant requirements of this standard.

**Table 2 For Lots Produced Under Quality Control System**  
(Clause B-1.2.2)

No. of Items in the Lot	Sample Size
(1)	(2)
Up to 25	3
26 to 50	5
51 to 100	8
101 to 200	8 percent

## ANNEX C

### (Foreword)

#### COMMITTEE COMPOSITION

##### Fire Fighting Sectional Committee, CED 2

<i>Chairman</i>	<i>Representing</i>
SHRI OM PRAKASH	Ministry of Home Affairs, New Delhi
<i>Members</i>	
SHRI D. K. SHAMI	Ministry of Home Affairs, New Delhi
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SHRI H. S. KAPARWAN ( <i>Alternate</i> )	
ASSTT SECURITY COMMISSIONER (FIRE)	Railway Board, Delhi
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SHRI V. K. VERMA ( <i>Alternate</i> )	
SHRI S. K. DHERI	Delhi Fire Service, Delhi
SHRI SURINDER KUMAR ( <i>Alternate</i> )	
SHRI V. L. N. RAO	Controllerate of Quality Assurance, Pune
LT-COL S. K. MARKENDEY ( <i>Alternate</i> )	
SHRI P. A. DUBEY	Design & Consultancy, CME Campus, Pune
SHRI M. K. BANSAL	Engineer-in-Chief's Branch, New Delhi
SHRI S. K. KALIA ( <i>Alternate</i> )	
FIRE ADVISER	Defence Research and Development Organization, Delhi
SHRI S. C. RAY ( <i>Alternate</i> )	
SHRI J. N. VAKIL	Tariff Advisory Committee, Ahmedabad/Delhi
SHRI T. R. A. KRISHNAN ( <i>Alternate</i> )	
DIRECTOR	Home Department (Fire Service), Chennai
DEPUTY DIRECTOR ( <i>Alternate</i> )	
DR T. P. SHARMA	Central Building Research Institute (CSIR), Roorkee
DR A. K. GUPTA ( <i>Alternate</i> )	
SHRI B. PATHAK	West Bengal Fire Service, Calcutta
MANAGING DIRECTOR	Avon Services Pvt Ltd, Mumbai
TECHNICAL EXECUTIVE ( <i>Alternate</i> )	
SHRI R. C. SHARMA	Central Industrial Security Force, New Delhi
SHRI S. L. NAGARKAR ( <i>Alternate</i> )	
PRESIDENT	The Institution of Fire Engineers (India), Delhi
GENERAL SECRETARY ( <i>Alternate</i> )	
SHRI S. N. KUNDU	Fire and Safety Appliances Co, Calcutta

(Continued on page 7)

*(Continued from page 6)*

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SHRI S. M. DESAI SHRI G. B. MENON	Eureka Firetech Pvt Ltd, Mumbai
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*Member-Secretary*  
SHRI SANJEEV CHATURVEDI  
Joint Director (Civ Engg), BIS

