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मानक

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IS 302-2-8 (1994): Safety of household and similar electrical appliances, Part 2: Particular requirements, Section 8: Electric shavers, hair clippers and similar appliances [ETD 32: Electrical Appliances]



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Bhartihari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”



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IS 302 ( Part 2/Sec 8 ) : 1994

भारतीय मानक

# घरेलू और समान विद्युत उपकरणों की सुरक्षा

भाग 2 विवणात्मक अपेक्षाएँ

अनुभाग 8 बिजली के दाढ़ी बनाने व बाल काटने के यंत्र और समान उपकरण

*Indian Standard*

## SAFETY OF HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES

**PART 2 PARTICULAR REQUIREMENTS**

**Section 8 Electrical Shavers, Hair Clipper and Similar Appliances**

UDC 646.72 : 687.53.052 : 614.825

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

February 1994

Price Group 4

## FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Safety of Household and Similar Electrical Appliances Sectional Committee had been approved by the Electrotechnical Division Council.

The standard covers the general and safety requirements for electric shavers, hair clippers and similar appliances.

This standard does not cover the performance requirements. However, the performance requirements of mains operated electric shavers are covered under a separate composite standard IS 5159 : 1969 'Specification for mains-operated electric shavers'.

This standard is to be read in conjunction with IS 302-1 ( 1979 ), safety of household and similar electrical appliances: Part 1 General requirements ( *fifth revision* ). For the sake of convenience, the clauses of this standard correspond to those of IS 302-1 ( 1979 ) which are applicable ( which means that relevant provisions of the clause shall apply, or not applicable and the sub-clauses or portions thereof which are not applicable are indicated as under:

- a) In case of a clause where it is applicable or not applicable, the wording used in this clause of IS 302-1 ( 1979 ) is applicable/not applicable.
- b) In case of sub-clause or part thereof 'Not applicable'.

Wherever a sub-clause of IS 302-1 ( 1979 ) is to be replaced by a new test, it has been indicated as under:

Replacement — followed by the new text.

Any addition to the existing provisions of a sub-clause of IS 302-1 ( 1979 ) has been indicated as under:

Addition — followed by the text of the additional matter.

Clauses/tables which are additional to those of IS 302-1 ( 1979 ) are numbered starting from 101 and additional sub-clauses are numbered with the main clauses number followed by 101, 102, etc, for example, 7.101.

Additional annexes have been numbered starting from AA.

Should however any deviation exist between IS 302-1 ( 1979 ) and this standard, the provisions of the latter shall apply.

While preparing this standard, assistance has been derived from the following publications:

- IEC Pub 335-1 ( 1976 ) Safety of household and similar electrical appliances : Part 1 General requirements issued by the International Electrotechnical Commission.
- IEC Publication 335-2-8 ( 1987 ) Safety of household and similar electric appliances: Part 2 Particular requirements for electric shavers, hair clippers and similar appliances issued by the International Electrotechnical Commission.

The Indian Standards which are necessary adjuncts to this standard are given in Annex AA.

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.

**AMENDMENT NO. 1 APRIL 2002**  
**TO**  
**IS 302 (Part 2/Sec 8) :1994 SAFETY OF HOUSEHOLD**  
**AND SIMILAR ELECTRICAL APPLIANCES**  
**PART 2 PARTICULAR REQUIREMENTS**

**Section 8 Electrical Shavers, Hair Clipper and Similar Appliances**

*(Page 5, clause 101.1, lines 3 and 4)* — Substitute 'a sample' for 'two samples of the same type and rating'.

*(Page 5, clause 101.1.1, line 1)* — Substitute 'Sample' for 'Both samples'.

(ETD 32)

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Reprography Unit, BIS, New Delhi, India

*Indian Standard***SAFETY OF HOUSEHOLD AND SIMILAR  
ELECTRICAL APPLIANCES****PART 2 PARTICULAR REQUIREMENTS****Section 8 Electrical Shavers, Hair Clipper and Similar Appliances****1 SCOPE**

This clause of IS 302-1 ( 1979 ) is applicable except as follows:

**1.1 Replacement**

This standard applies to electric shavers, hair clippers and similar appliances intended for household and similar purposes, their rated voltage not exceeding 250 V ac or dc.

Examples of appliances similar to shavers and hair clippers are motor units used with accessories for massage manicure, pedicure and similar purposes.

Appliances not intended for normal household use, but which nevertheless may be a source of danger to the public, such as appliances intended to be used by laymen in shops and on farms, are within the scope of this standard. Examples of such appliances are appliances for hairdressers and hair clippers for animal shearing or clipping.

This standard does not take into account the special hazards which exist in nurseries and other places where there are young children or aged or infirm persons without supervision; in such cases, additional requirements may be necessary.

This standard does not apply to:

- appliances designed exclusively for industrial purposes;
- appliances intended to be used in locations where special conditions prevail, such as the presence of a corrosive or explosive atmosphere ( dust, vapour or gas );
- battery-powered shavers;
- massage appliance; and
- appliances for medical purposes.

For appliances intended to be used in vehicles or on board ships or aircraft, additional requirements may be necessary.

**2 TERMINOLOGY**

This clause of IS 302-1 ( 1979 ) is applicable except as follows:

**2.30 Replacement**

Normal load denotes the load obtained when the appliance, held by means of retort clamp, with its major axis and the major axis of the cutting head or other accessory in the horizontal plane, is operated in still air without further load.

The retort clamp is of light construction and must be so arranged that it has negligible effect on the heat transfer from the appliance.

Appliances provided with adjustable shearing or clipping heads are operated with the blades adjusted so that the input is equal to 0.8 times rated input or equal to 1.2 times the input obtained when any detachable part which may influence the load has been removed, whichever is the more unfavourable.

**3 GENERAL REQUIREMENT**

This clause of IS 302-1 ( 1979 ) is applicable.

**4 GENERAL NOTES ON TESTS**

This clause of IS 302-1 ( 1979 ) is applicable except as follows:

**4.2 Addition**

If the tests of clause 18 have to be repeated an additional sample is required.

4.8, 4.10 and 4.12 not applicable.

**Additional Sub-clause**

4.101 Before and during the tests, cutting heads are lubricated with a few drops of light oil.

The oil is applied to imitate the lubrication provided in normal use by the skin or hair.

**5 RATING**

This clause of IS 302-1 ( 1979 ) is applicable.

**6 CLASSIFICATION**

This clause of IS 302-1 ( 1979 ) is applicable.

NOTE — See also Sub-clause 22.1.

## 7 MARKING

This clause of IS 302-1 ( 1979 ) is applicable except as follows:

7.1 Para 3 and Note 1. Not applicable.

7.2 Not applicable.

Replacement, 7.3

If the appliance can be adjusted to suit different rated voltage ranges, the voltage setting may be indicated by a single value within the relevant ranges, provided the voltage ranges are clearly indicated in the manufacturer's instructions.

7.5 Para 3. Not applicable.

7.8 Not applicable.

7.12 Paras 1 to 3 and Notes 1 and 2.

### Replacement:

If it is necessary to take special precautions when using the appliance, details of these shall be given in an instruction sheet which accompanies the appliance.

7.14 Paras 1 to 6 Not applicable.

## 8 PROTECTION AGAINST ELECTRIC SHOCK

This clause of IS 302-1 ( 1979 ) is applicable except as follows:

8.4 Not applicable.

## 9 STARTING OF MOTOR-OPERATED APPLIANCES

This clause of IS 302-1 ( 1979 ) is applicable.

## 10 INPUT AND CURRENT

This clause of IS 302-1 ( 1979 ) is applicable except as follows:

10.3 Not applicable.

## 11 TEMPERATURE RISE

This clause of IS 302-1 ( 1979 ) is applicable except as follows:

11.2, 11.4 and 11.6 Not applicable.

### 11.5 Addition

For appliances provided with adjustable shearing as clipping heads, to force cleaning the blades is kept constant at the value determined for normal load.

### 11.7 Replacement

Appliances intended for household use only are operated continuously for 10 min.

Hair clippers for animal shearing or clipping are operated continuously until steady conditions are established.

Other appliances are operated for 10 min and then allowed to rest for 10 min; this cycle of operation is repeated until steady conditions are established.

## 11.8 After the Table Addition

The temperature rise of parts which, in normal use are in contact with skin or hair or are held in the hand, shall not exceed the limits specified for handles which, in normal use are continuously held. The temperature rise of such parts is determined for every accessory intended to be used with the appliance.

11.9 Not applicable.

## 12 OPERATION AND OVERLOAD CONDITIONS OF APPLIANCES WITH HEATING ELEMENTS

This clause of IS 302-1 ( 1979 ) is not applicable.

## 13 ELECTRICAL INSULATION AND LEAKAGE CURRENT AT OPERATING TEMPERATURE

This clause of IS 302-1 ( 1979 ) is applicable except as follows:

13.1 Paras. 1 to 6

### Replacement:

Compliance is checked by the test of Sub-clause 13.2, the appliance being operated under normal load and at a supply voltage equal to 1.06 times rated voltage.

13.3 Not applicable.

## 14 RADIO AND TELEVISION INTERFERENCE SUPPRESSION

This clause of IS 302-1 ( 1979 ) is applicable.

## 15 MOISURE RESISTANCE

This clause of IS 302-1 ( 1979 ) is applicable except as follows:

15.2.4.4 Note 3. Not applicable.

15.3 Not applicable.

## 16 INSULATION RESISTANCE AND ELECTRIC STRENGTH ( AFTER HUMIDITY TREATMENT )

This clause of IS 302-1 ( 1979 ) is applicable except as follows:

16.1 Para 2, lines 1 to 3

### Replacement

Compliance is checked by the tests of Sub-clauses of 16.3 and 16.4 which are made on the cold appliance.



**16.2** Not applicable.

## **17 OVERLOAD PROTECTION**

This clause of IS 302-1 ( 1979 ) is applicable

## **18 ENDURANCE**

Under Consideration.

## **19 ABNORMAL OPERATION**

This clause of IS 302-1 ( 1979 ) is applicable except as follows:

### **19.1 Paras 3 to 4 and 6 Replacement**

Compliance is checked by the tests of sub-clauses of **19.6**, **19.10** and **19.101** as applicable.

**19.2 to 19.5** Not applicable.

### **19.6 Paras. 1 to 5 Replacement**

Appliances having motors with a locked rotor torque smaller than the full load torque and appliances having motors to be started by hand, starting from cold, are switched on with the moving parts locked and at a supply voltage equal to rated voltage or to the upper limit of the rated voltage range, for a period:

#### **Addition**

If the motor has a capacitor not complying with IS 2993 : 1975 in the circuit of an auxiliary winding, the capacitor is short-circuited or open-circuited, whichever is the more unfavourable. If there are two or more capacitors, the capacitors are short-circuited or open-circuited one at a time.

### **Para 5. Note Replacement**

If the appliance incorporates more than one motor, the test is made for each motor separately.

Alternative tests for protected motor units are given in Annex D.

**19.7 to 19.9** Not applicable

### **19.10 Para 1. Replacement**

Appliances incorporating series motors are mounted and operated as described for normal load at a voltage equal to 1.3 times rated voltage, except that any detachable part which may influence the load is removed.

#### **Addition**

The lowest possible load is obtained when the appliance is mounted or described so for normal load, with any detachable part which may influence the load removed.

### **19.11 Para 1 and the Table. Replacement**

During the tests of **19.6**, **19.10** and **19.101** the appliance shall not emit molten metal,

enclosures shall not deform to such an extent as will impair compliance with this standard and the temperature rise of any part of the enclosure that may come into contact with combustible material, shall not exceed 150°C.

#### **Additional Sub-clause:**

**19.101** Hand-held appliances are laid, in the most unfavourable position, on a soft-wood board and are operated, at rated voltage or at the upper limit of the rated voltage range, until steady conditions are established.

## **20 STABILITY AND MECHANICAL HAZARDS**

This clause of IS 302-1 ( 1979 ) is applicable except as follows:

**20.1** Not applicable.

## **21 MECHANICAL STRENGTH**

This clause of IS 302-1 ( 1979 ) is applicable except as follows:

### **21.1 Para 13. Replacement**

The sample as a whole is rigidly supported and three blows are applied to every point of the enclosure.

Blows with an impact energy of 0.5 Nm are only applied to those parts that might hit the floor should the appliance be dropped. Three blows are also applied to every other part, except cutting heads, but with the hammer spring adjusted so that the product of the compression, in millimetres, and the force exerted, in newtons, equals 700, the compression being approximately 17 mm. With this adjustment, the impact energy is  $0.35 \pm 0.05$  Nm.

#### **Addition**

Blows are not applied to cutting heads.

**21.2 to 21.4** Not applicable.

## **22 CONSTRUCTION**

This clause of IS 302-1 ( 1979 ) is applicable except as follows:

### **22.1 Para 2. Replacement:**

Appliances shall be Class II or Class III.

### **22.4 Addition**

Shavers and hair clippers shall be designed so as to prevent the penetration of clippings into places where they might give rise to electrical or mechanical faults.

**22.11**, **22.17**, **22.24**, **22.26** to **22.29** and **22.31** Not applicable.

### 23 INTERNAL WIRING

This clause of IS 302-1 ( 1979 ) is applicable except as follows:

**23.4 Last para.** Not applicable.

**23.7** Not applicable.

### 24 COMPONENTS

This clause of IS 302-1 ( 1979 ) is applicable except as follows:

#### 24.1 Addition

Switches incorporated in hair clippers for hair dressers and in hair clippers for animal shearing or clipping shall be switches for frequent operation.

**24.3** Not applicable.

#### 24.9 Replacement

Hair clippers for animal shearing or clipping shall be fitted with a switch in their supply circuit.

### 25 SUPPLY CONNECTION AND EXTERNAL FLEXIBLE CABLES AND CORDS

This clause of IS 302-1 ( 1979 ) is applicable except as follows:

#### 25.1 Replacement

Appliances shall be provided with a power supply cord, or for appliances other than hair clippers for animal shearing or clipping, with an appliance inlet.

Appliances shall not be provided with more than one means of connection to the supply.

Compliance is checked by inspection.

Cord sets incorporating flat twin tinsel cord are only allowed for appliances provided with a miniature appliance inlet and shall conform to IS 3010 ( Part 2 ) : 1965.

**25.2 Paras 1 to 3.** Not applicable.

#### Para 5. Replacement

Drip-proof, splash-proof and watertight appliances, and ordinary hair clippers for animal shearing or clipping, shall not be provided with an appliance inlet.

#### 25.3 Addition

Appliance inlets of appliances other than those intended for household use only shall have a rated current of at least 1 A; unless the appliance is designed to be used with a cord set incorporating a flat twin tinsel cord, in which case the appliance shall be provided with a miniature appliance inlet.

#### 25.4 Para 1 line 6. Replacement

— type 2 attachment, for appliances intended for household use only. If the power supply cord to a flat twin tinsel cord, Type X and Type H attachment shall not be used.

#### 25.5 Addition

If the power supply cord is a flat twin tinsel cord, it shall be provided with a non-nominable plug.

#### 25.6 Paras 1 to 3. Replacement

Power supply cords shall be not lighter than:

- for appliances intended for household use only.
- if rubber insulated, ordinary tough rubber sheathed flexible cord as per IS 9968 ( Part 1 ) : 1988.
- If polyvinyl chloride insulated, flat, twin tinsel cord as per IS 694 : 1990.
- for other appliances:
- if rubber insulated, ordinary tough rubber sheathed flexible cord as per IS 9968 ( Part 1 ) : 1988.
- if polyvinyl chloride insulated, ordinary polyvinyl chloride sheathed flexible cord as per IS 694 : 1990.

#### Para 5. Replacement

Power supply cords, other than flat twin tinsel cord, shall have a nominal cross-sectional area not less than that shown in the following table:

#### Addition

For appliances for household use only having rated current not exceeding 3 A, a nominal cross-sectional area of 0.5 mm is allowed, provided the length of the power supply cord does not exceed 2 m measured between the point where the cord, or cord guard, enters the appliance and the entry to the plug, if provided with a plug or 2.05 m, if not provided with the plug.

Para after the table.

Power supply cords shall have a length of at least 1.7 m. If the power supply cord is a flat twin tinsel cord, its length shall not exceed 2 m.

The length of the cord is measured between the point where the cord, or cord guard, enters the appliance or connector, and the entry to the plug.

25.13 and 25.14. Not applicable.

## 26 TERMINALS FOR EXTERNAL CONDUCTORS

This clause of IS 302-1 ( 1979 ) is applicable.

## 27 PROVISION FOR EARTHING

This clause of IS 302-1 ( 1979 ) is applicable except as follows:

### 27.1 Replacement

The appliance shall have no provision for earthing.

Compliance is checked by inspection.

27.2 to 27.5 inclusive. Not applicable.

## 28 SCREWS AND CONNECTIONS

This clause of IS 302-1 ( 1979 ) is applicable except as follows:

### 28.1 Addition

Screws which are likely to be tightened by the user and have a nominal diameter less than 3 mm, and screws transmitting contact pressure, shall screw into metal, unless such screws serve for fixing a cover and need not be operated when replacing the power supply cord.

## 29 CREEPAGE DISTANCES, CLEARANCES AND DISTANCES THROUGH INSULATION

This clause of IS 302-1 ( 1979 ) is applicable except as follows:

29.3 Not applicable.

## 30 RESISTANCE TO HEAT, FIRE AND TRACKING

This clause of IS 302-1 ( 1979 ) is applicable.

## 31 RESISTANCE TO RUSTING

This clause of IS 302-1 ( 1979 ) is applicable.

## 32 RADIATION HAZARDS

This clause of IS 302-1 ( 1979 ) is not applicable.

## 101 TESTS

### 101.1 Type Tests

The tests specified in Table 101 shall constitute the type tests and shall be carried out on two samples of the same type and rating selected preferably at random from a regular production lot. Before commencement of the tests, the samples shall be visually examined and inspected for obvious visual defects in respect of components, parts and their assembly, construction, mechanical

hazards, markings, provision of suitable terminals for supply connections, earthing and the effectiveness of screws and connections. The external surface finish shall be even and free from finishing defects.

### 101.1.1 Criteria for Acceptance

Both samples shall successfully pass all the type tests for proving conformity with the requirements of the standard. If any of the samples fails in any of the type tests, the testing authority at its discretion, may call for fresh samples not exceeding twice the original number and subject them again to all tests or to the test(s) in which failure(s) had occurred. No failure should be permitted in the repeat test(s).

**Table 101 Schedule of Type Tests**  
( Clause 101.1 )

SI No.		Clause Reference
i)	Protection against electric shock	8
ii)	Starting of motor operated appliances	9
iii)	Input	10
iv)	Temperature rise	11
v)	Operation under overload conditions	12
vi)	Electrical insulation and leakage current at operating temperature	13
vii)	Radio and television interference suppression	14
viii)	Moisture resistance	15
ix)	Insulation resistance and electric strength ( after humidity treatment )	16
x)	Overload protection	17
xi)	Endurance ( under consideration )	18
xii)	Abnormal operation	19
xiii)	Stability and mechanical hazards	20
xiv)	Mechanical strength	21
xv)	Construction	22
xvi)	Internal wiring	23
xvii)	Components	24
xviii)	Supply correction and external flexible cables and cords	25
xix)	Terminals for external conductors	26
xx)	Provision for earthing	27
xxi)	Screws and connections	28
xxii)	Creepage distance and clearances	29
xxiii)	Resistance to heat, fire and tracking	30
xxiv)	Resistance to rusting	31
xxv)	Radiation hazards	32

**101.2 Acceptance Tests**

The following shall constitute the acceptance tests:

<i>Test</i>	<i>Clause Reference</i>
a) Protection against electric shock	8
b) Input	10
c) Temperature rise	11
d) Electrical insulation and leakage current at operating temperature	13
e) Moisture resistance	15
f) Insulation resistance and electric strength ( after humidity treatment )	16
g) Provision for earthing	27

NOTE -- For the purpose of acceptance tests, the humidity treatment shall be done for 24 hours while conducting the test for moisture resistance (15).

**101.2.1** A recommended sampling procedure for acceptance tests is given in Appendix B of IS 302-1 ( 1979 ).

**101.3 Routine Test**

The following shall constitute the routine tests:

<i>Test</i>	<i>Clause Reference</i>
a) Protection against electric shock	8
b) High voltage	13.3.2 of IS 302-1 ( 1979 )
c) Provision for earthing	27

**ANNEX A**

**TABLES OF TYPE TESTS**

This appendix of IS 302-1 ( 1979 ) is not applicable.

**ANNEX B**

**SAMPLING PROCEDURE FOR ACCEPTANCE TESTS**

This appendix of IS 302-1 ( 1979 ) is applicable.

**ANNEX C**

**ELECTRONIC CIRCUITS**

This appendix of IS 302-1 ( 1979 ) is applicable, if electronic circuits are used.

**ANNEX D**

**MEASUREMENT OF TEMPERATURE WITH THERMOMETER**

This appendix of IS 302-1 ( 1979 ) is applicable.

**ANNEX E**

**ALTERNATIVE TESTS FOR PROTECTED MOTOR UNITS**

This appendix of IS 302-2 ( 1979 ) is not applicable.

**ANNEX F**

**IMPACT TESTS APPARATUS**

This appendix of IS 302-1 ( 1979 ) is applicable.

**ANNEX G****THERMAL CONTROLS AND OVERLOAD RELEASES**

This appendix of IS 302-1 ( 1979 ) is applicable if thermal controls and overload releases are used.

**ANNEX H****MEASUREMENT OF CREEPAGE DISTANCES AND CLEARANCES**

This appendix of IS 302-1 ( 1979 ) is applicable.

**ANNEX J****TEST FOR FIRE RESISTING PROPERTIES**

This appendix of IS 302-1 ( 1979 ) is applicable.

**ANNEX K****BNF JET TEST FOR DETERMINATION OF THICKNESS OF  
COPPER AND NICKEL PLATING**

This appendix of IS 302-1 ( 1979 ) is not applicable.

**ANNEX L****APPROXIMATE MEASUREMENT OF THICKNESS OF CHROMIUM ON  
NICKEL, STEEL AND COPPER**

This appendix of IS 302-1 ( 1979 ) is not applicable.

**ANNEX AA****LIST OF REFERRED INDIAN STANDARDS**

The following Indian Standards are necessary adjuncts to this standard:

<i>IS No.</i>	<i>Title</i>
302-1 ( 1979 )	Safety of household and similar electrical appliances : Part 1 General requirements ( <i>fifth revision</i> )
694 : 1990	PVC insulated cable for working voltage up to and including 1 100 volts ( <i>third revision</i> )
2993 : 1975	Motor capacitors ( <i>first revision</i> )
3010 ( Part 2 ) : 1965	Appliances connectors and appliances inlets ( non-reversible three-pin type ) : Part 2 Appliances inlet
9968 ( Part 1 ) : 1988	Elastomer insulated cables : Part 1 For working voltages up to and including 1 100 volts ( <i>first revision</i> )

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### Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Handbook' and 'Standards Monthly Additions'.

This Indian Standard has been developed from Doc No. ETD 32 (3688).

### Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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