

**Commission of Electricity**

**Planning & studies Division**

**Baghdad –**

**IRAQ**

Specification NO.	<b>D-24</b>
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**Technical Specification  
For  
Porcelain Insulators**

Revision	Year 2001	
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### **33 & 11 KV PORCELAIN TYPE INSULATORS WITH ACCESSORIES**

#### **1- SCOPE OF THE TENDER:**

Tenderers are invited for the design manufacture testing and supply of the fitting and accessories for: -

- ❖ L.T shackles insulators.
- ❖ 12 kv brown glazed porcelain pin insulator with spindle.
- ❖ 12 kv disc insulator with tension string.
- ❖ 36 kv brown glazed porcelain pin insulator with spindle.

#### **2- GENERAL REQUIREMENTS:**

The equipment shall be of first class quality and designed for continuous satisfactory operation as continuity of supplies of prime importance.

The materials shall be suitable for the following climatic conditions prevailing at site.

##### **2-1 Ambient temperature:**

- |                                  |                               |
|----------------------------------|-------------------------------|
| - Highest maximum (in the shade) | 50 C° for about 6 hours a day |
| - Lowest minimum                 | - 10 C°                       |
| - Max. Yearly average            | + 30 C°                       |
| - Max. Daily average             | + 30 C°                       |

##### **2-2 Sun temperature:**

Black object under direct

attain a temperature of + 75 C°

Sun shin

##### **2-3 Air humidity:**

Maximum	92% at 40 C°
Minimum	12%
Yearly average	44%

##### **2-4 Altitudes:**

From sea level up to 1000 m

##### **2-5 Dust storms:**

The materials are subjected to strong & frequent dust storms.

## 11 & LOW TENSION INSULATORS AND ACCESSORIES SPECIFICATIONS

1.a 12 kv, 50 HZ brown glazes porcelain type insulators. The pin hole thread is of the cemented zinc thimble type. The top grooves of the insulator shall be suitable for bare conductor ACSR 120/20 mm<sup>2</sup>. Overall diameter (15.5) mm.

1.b Galvanized steel spindles for item 1.a.

The minimum height shall not be less than 125 mm & 18.5 mm in diameter.

Having tapered body and 75 mm threaded and out of 150-mm shank.

The spindles shall be supplied complete with spring washers & nuts. As it illustrated in table (1) attached.

2.a As for (1.a) but for 36 KV, 50 HZ & grooves for 210/35 mm<sup>2</sup>. Overall diameter (20.3) mm.

2.b As for (1.b) but for the 36 KV. Pin insulators. As it illustrated in table (2) attached.

3.a L.T (600 V) brown glazes shackle insulators having conductor groove of 15mm.

3.b D-bracket & accessories for item 3.a complete with all necessary bolts (16 x 120), nuts & washers.

3.c Hexagon head deck bolt. (16 x 180) to be used with item 3.b.

4. 12 KV discs insulator brown glazed porcelain ball & socket type coupling suitable combined mechanical & electrical strength.

The dimensions, electrical and mechanical withstand specification of (12 & 35) kv pin insulators, (0.6kv) shackle insulator and (12 kv) disc insulator is as stated her below in the table (No.3)

**Table (3)**  
Specifications of porcelain insulators according to BS & IEC standards

type of insulator			unit	pin insulator 11 kv	pin insulator 33 kv	disc insulator 11 kv	shackle insulator 0.4 kv
highest system voltage			kv	12	36	12	0.6
total high " H "			mm	135-160	203-250	145-170	65-100
total diameter " D "			mm	140-175	≥280	255-280	75-115
total creepage distance			mm	270-320	580-685	290-350	-
leakage distance			mm	-	-	-	66-75
protected creepage distance (90°)			mm	120-140	300-335	165-230	-
cantilever strength (min)			kn	10-12	10-12	-	-
combined Electro mechanical strength			kn	-	-	70-120	15-16
flashover voltage	one minute power frequency	dry	kv	70-80	110-130	75-80	20-35
		wet	kv	40-55	85-95	45-50	10-25
	impulse	+ ve	kvp	105-115	205-210	115-130	-
		- ve	kvp	110-140	225-250	120-135	-
withstand voltage	one minute power frequency	dry	kv	65-75	100-110	70-75	≥23
		wet	kv	35-50	80-90	40-45	≥10
	impulse	+ ve	kvp	95-105	180-200	110-120	-
		- ve	kvp	105-120	190-220	115-125	-
power frequency puncture voltage			kv	105-120	200-210	110-130	1.3×actual dry F.O.V
visible discharge voltage			kv	≥ 9	≥ 29	9-18	-
net weight ( approx.)			kg	1.8-2.5	7.5-9.5	5-8	0.6-1.0
ball and socket size			mm	-	-	16	-

## 5. Technical specification of disc insulator accessories

### 5.1 Ball eyes

The ball eye shall be manufactured from forging quality medium carbon and hot dip galvanized according to (BS-729) the ball dimension shall be (16mm) the minimum failing load shall be (75kn).

### 5.2 Socket eyes

The socket eye shall be manufactured from forging quality medium carbon steel and hot dip galvanized according to (BS-729) the socket dimension shall be suitable for (16mm) ball eye diameter the minimum failing load shall be (75kn). The security clip shall be of phosphor bronze material and the split pins shall be stainless steel.

### 5.3 Strain & suspension clamps

5.3.1 strain clamp U-bolted type suitable for (AAC & ACSR) conductors overall diameter (12.5-18.0) mm with aluminum tape. The material of clamp should be cast iron and galvanized according to (BS-729).

The connecting of conductor with clamp should be by (2-3) U-bolts and nuts manufactured from galvanized mild steel minimum ultimate strength (75kn). The conductor seating area shall be free from any roughness and burrs. The outer and inner edges shall be rounded of the avoid any damage on the conductor after assembly the slip strength of the clamp should be (95%) of the breaking load of conductor or (43kn).

5.3.2 strain clamp U-bolted type suitable for (ACSR) conductors overall diameter (15.5-23.0) mm with the same specification of item (5.3.1) above but the minimum ultimate strength (90kn). And slip strength of clamp (68kn).

5.3.3 suspension clamp U-bolted type suitable for (ACSR) conductors with overall diameter (15.5-23.0) mm. the material of clamp body and keepers are malleable iron hot dip galvanized according to (BS-729) cotter pins should be bronze. The connecting of conductor with clamp should be by (2) U-bolts and nuts manufactured of the hot dip galvanized mild steel the minimum ultimate strength of clamp (40kn). The conductor strength area shall be free from any roughness and burrs. The outer and inner edge shall be rounded of the avoid any damage on the conductor after assembly. The slip strength of the clamp should be (20%) of the breaking load of conductor or (15kn).

#### N. B:

1. All the insulators & accessories shall be in accordance with the latest IEC or equivalent standard which must be stated together with a copy of standard spec.
2. Samples are required with the offers.