



National Grid  
Technical  
Specification

**Post Insulators  
for Substations**

NGTS 3.2.9  
Issue 1  
May 1996

**CONTROLLED  
DISTRIBUTION**

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National Grid House  
Kirby Corner Road  
Coventry  
CV4 8JY**

**Registered in  
England and Wales  
No. 2366977**

**Published by:**

**The National Grid Company plc  
Burymead House  
Portsmouth Road  
Guildford, Surrey GU2 5BN**

## POST INSULATORS FOR SUBSTATIONS

### FOREWORD

This Document defines the requirements for high voltage post type insulators to be used on The National Grid Company plc's (NGC) system.

### 1 SCOPE

This Specification details the functional and performance requirements for cylindrical post insulators of ceramic material with external metal fittings for use on 145, 300 and 420 kV 50 Hz systems.

### 2 REFERENCES

#### 2.1 National/International Standards

This Specification makes reference to, and should be read in conjunction with the documents listed below. Where a British Standard (BS) is equivalent or identical to an International Electrotechnical Commission (IEC), both references are given.

IEC 273 (BS 3297)	Dimensions of indoor and outdoor post insulators and post insulator units for systems with nominal voltages greater than 1000 V.
IEC 815	Guide for the selection of insulators in respect of polluted conditions.
IEC 168	Tests on indoor and outdoor post insulators of ceramic material or glass for systems with nominal voltages greater than 1000 V.
IEC 437	Radio interference tests on high voltage insulators.

#### 2.2 National Grid Technical Specifications

The following NGTS documentation is relevant to Switchgear and should be read in conjunction with this document as appropriate:

NGTS 1	Overview, National Grid System.
NGTS 2.2	Switchgear for The National Grid System.

### 3 GENERAL REQUIREMENTS

3.1 All post insulators to be installed on the National Grid System shall satisfy NGTS 2.2 and the test requirements in IEC 168.

### 4 PERFORMANCE REQUIREMENTS

4.1 Post insulators shall conform with IEC 273 accommodating the minimum creepage distance and the pollution performance stated in NGTS 2.2.

4.2 For replacement in substations built in accordance with The Central Electricity Generating Board (CEGB) Transmission Plant Standards, or where extension of such substations in accordance with CEGB Transmission Plant Standards is specified, Appendix B shall apply unless otherwise agreed by NGC.

## **5 TESTING**

5.1 All testing shall be carried out in accordance with NGTS 1 Appendix B with the following additions:

5.1.1 All new designs of ceramic post insulators shall be subjected to type tests in accordance with IEC 168 Section 6.1 Type Tests.

5.1.2 All ceramic post insulators supplied for use by the National Grid Company plc, shall be subject to testing in accordance with NGTS 2.2 (Routine tests) and IEC 168 Section 6.2 (Sample Tests) and Section 6.2 (Routine Tests).

## **6 APPROVAL PROCEDURE**

The requirements for the approval of post insulators are detailed in NGTS 2.2 Appendix A, and shall be completed by the Supplier in support of approval.

## **7 SITE SPECIFIC DATA IN THE TENDER DOCUMENT**

- (i) Substation voltage.
- (ii) Any requirements for Appendix B insulators.

APPENDIX A

MANUFACTURER DESIGN, PRODUCTION PERIOD AND RATING

1	Manufacturer ceramic post		
2	Manufacturing period		
3	National Grid Approved dia number		
4	Overall length	mm	
5	Number of posts per unit		
6	Nominal creepage distance	mm	
7	Minimum creepage distance	mm	
8	Minimum mechanical failing load, cantilever	kN	
9	Minimum mechanical failing load, torsion	kN	
10	Minimum mechanical failing load, tension	kN	
11	Lightning impulse withstand voltage	kV	
12	Power frequency withstand voltage, dry	kV	
13	Power frequency withstand voltage, wet	kV	
14	Switching impulse withstand voltage, wet	kV	
15	Top cap hole size, and PCD	mm	
16	Base unit hole size and PCD	mm	
17	Total weight	kg	
18	Flange fixing material used		



APPENDIX B

**DIMENSIONAL/MECHANICAL REQUIREMENTS - INSULATORS WHERE SPECIFIED FOR USE IN SUBSTATIONS BUILT IN ACCORDANCE WITH CEGB TRANSMISSION PLANT STANDARDS**

	145 kV	300 kV	400 kV
Overall Length	1473 mm	2946 mm	3835 mm
Live End Fixings (tapped holes)	M16-127 mm PCD	M20-178 mm PCD	M20-178 mm PCD
Earth End Fixings (Clearance holes)	18 mm- 127 mm PCD	8 X 22 mm on 245 mm PCD.	(H/D) 8 X 22 mm on 356 mm PCD (M/D) 8 X 22 mm on 365 mm PCD (L/D) 8 X 22 mm on 254 mm PCD
Minimum cantilever failing load-Underhung	3.5 kN	9.0 kN	(H/D) 15.5 kN (M/D) 9.0 kN (L/D) 6.7 kN
Upright	4.5 kN	9 kN	(H/D) 15.5 kN (M/D) 10.0 kN (L/D) 6.7 kN
Routine cantilever test load Underhung	2.1 kN	3.2 kN (indoor) 5.4 kN (outdoor)	(H/D) 9.3 kN (M/D) 5.4 kN (L/D) 4.0 kN
Upright	4.5 kN	5.4 kN (indoor and outdoor)	(H/D) 9.3 kN (M/D) 6.0 kN (L/D) 4.0 kN
Minimum tensile failing load	65 kN	90 kN	(H/D) 150 kN (M/D) 90 kN (L/D) 90 kN
Minimum torsional failing load	4.5 kN	8.5 kN	(H/D) 8.5 kN (M/D) 8.5 kN (L/D) 8.5 kN
Sample torsional test load	2.7 kN	4.0 kN	(H/D) 4.0 kN (M/D) 4.0 kN (L/D) 4.0 kN

H/D = Heavy Duty.  
M/D = Medium Duty.  
L/D = Light Duty.

