

CONTENTS

FOREWORD.....	6
INTRODUCTION.....	8
1 Scope.....	9
2 Normative references	9
3 Terms and definitions	10
4 Classification, types of insulators and insulating materials	13
4.1 Insulator classes	13
4.2 Insulator types	14
4.3 Insulating materials.....	14
5 Identification of insulators.....	14
6 Classification of tests.....	14
6.1 Type tests	14
6.2 Sample tests	15
6.3 Routine tests.....	15
7 Cross-reference tables for tests to be performed	15
7.1 Pin insulators	15
7.2 Line post insulators.....	17
7.3 String insulator units	19
7.3.1 General	19
7.3.2 Specified type tests on string insulator units	20
7.4 Insulators for overhead electric traction lines	24
8 Procedures for type and sample tests	24
8.1 Insulator selection for type tests	24
8.2 Sampling rules and procedures for sample tests	24
8.3 Re-test procedure for sample tests	25
9 General requirements for electrical tests	25
10 Artificial rain parameters for wet tests.....	26
11 Mounting arrangements for electrical tests	26
12 Dry lightning impulse voltage tests	26
12.1 General.....	26
12.2 Test procedure.....	26
12.3 Acceptance criteria	26
13 Wet power frequency withstand voltage tests	27
13.1 Test procedure.....	27
13.2 Acceptance criteria	27
14 RIV test	27
14.1 Test procedure.....	27
14.2 Acceptance criteria	28
15 Puncture withstand test	28
15.1 General.....	28
15.2 Impulse puncture testing in air	28
15.3 Power frequency puncture withstand test	29
16 Routine electrical test	29
17 Verification of the dimensions	30
18 Electromechanical failing load test.....	30

18.1	Test procedure.....	30
18.2	Acceptance criteria	31
19	Mechanical failing load test.....	31
19.1	Test procedure for pin and line post insulators	31
19.2	Test procedure for string insulator units	31
19.3	Acceptance criteria for pin insulators	31
19.4	Acceptance criteria for string insulator units and line post insulators	31
20	Thermal-mechanical performance test	32
20.1	Test procedure.....	32
20.2	Acceptance criteria	33
21	Residual strength test.....	33
21.1	General.....	33
21.2	Previous tests	33
21.3	Preparation of the test pieces	33
21.4	Test procedure.....	34
21.5	Test results	34
21.6	Acceptance criteria	34
22	Verification of the axial, radial and angular displacements	34
22.1	Test procedure.....	34
22.2	Acceptance criteria	35
23	Verification of the locking system.....	36
23.1	General.....	36
23.2	Conformity of the locking device	36
23.3	Verification of locking.....	36
23.4	Position of the locking device	36
23.5	Procedure for the operation test.....	36
23.6	Acceptance criteria for the operation test	37
24	Temperature cycle test	37
24.1	Test procedure for ceramic or toughened glass material	37
24.2	Test procedure for of annealed glass	38
24.3	Special test procedure for insulators with thick sections or very large insulators	38
24.4	Complementary specifications.....	38
24.5	Acceptance criteria	38
25	Thermal shock test	39
25.1	Sample test.....	39
25.1.1	Test procedure	39
25.1.2	Acceptance criteria	39
25.2	Routine thermal shock test.....	39
25.2.1	Test procedure	39
25.2.2	Acceptance criteria	39
26	Porosity test	39
26.1	Test procedure.....	39
26.2	Acceptance criteria	39
27	Galvanizing test.....	40
27.1	General.....	40
27.2	Test procedure.....	40

27.2.2	Appearance	40
27.2.3	Determination of the coating mass by the magnetic test method	40
27.3	Acceptance criteria	40
27.3.1	Acceptance criteria for the appearance test	40
27.3.2	Acceptance criteria for the value of coating mass	41
28	Zinc sleeve test (if applicable)	41
28.1	General requirements concerning the zinc sleeve	41
28.2	Type test procedure	41
28.3	Sample test procedure	42
29	Routine visual inspection	42
29.1	General.....	42
29.2	Insulators with ceramic insulating parts	42
29.3	Insulators with glass insulating parts	43
30	Impact test	44
30.1	Test procedure.....	44
30.2	Acceptance criteria	44
31	Routine mechanical test	44
31.1	Routine mechanical test on line post insulators	44
31.2	Routine mechanical test on string insulator units	45
32	Mounting arrangements for tests on pin insulators	45
32.1	Standard mounting arrangement for electrical tests	45
32.2	Mounting arrangements for electrical tests reproducing service conditions	46
32.3	Mounting arrangement for the mechanical failing load test	46
33	Coefficients for statistical analysis of the test results on line post Insulators	46
33.1	Coefficient for type tests	46
33.2	Coefficients for sample tests	46
34	Mounting arrangements for tests on line post insulators	46
34.1	Standard mounting arrangement for electrical tests	46
34.2	Mounting arrangements for electrical tests reproducing service conditions	47
34.3	Mounting arrangement for the mechanical failing load test	47
35	Coefficients for statistical analysis of the test results on string insulator units	47
35.1	Coefficient for type tests	47
35.2	Coefficients for sample tests	48
36	Mounting arrangements for electrical tests on string insulator units	48
37	Mounting arrangements for electrical tests on Insulators for overhead electric traction lines	48
37.1	Standard mounting arrangement	48
37.2	Mounting arrangement representing service conditions	49
Annex A (informative)	Method of comparison of the results of electromechanical or mechanical type and sample tests	52
Annex B (informative)	Illustration of the mechanical and electromechanical test acceptance procedure for string insulator units and line post insulators	54
B.1	Flow charts	54
B.2	Calculated examples of acceptance and rejection	56
Annex C (informative)	Coatings on ceramic or glass insulators	59
C.1	General.....	59
C.2	Material fingerprinting and ageing performance.....	59
C.3	Type testing	59

C.4	Sample testing	60
C.5	Routine testing.....	60
C.6	Pollution performance	60
C.7	Acceptance criteria	60
Annex D (informative)	Impact test	62
Figure 1	– Schematic representation of the thermal-mechanical performance test	49
Figure 2	– Measurement of axial and radial displacements	50
Figure 3	– Measurement of angular displacement	50
Figure 4	– Greatest thickness of the insulator	51
Figure B.1	– Acceptance flow chart for mechanical or electromechanical type tests	54
Figure B.2	– Acceptance flow chart for mechanical or electromechanical sample tests	55
Figure B.3	– Flow chart of the comparison of type and sample tests	56
Figure C.1	– Example of thickness criteria based on current experience	60
Figure C.2	– Example of adherence test criteria.....	61
Figure D.1	– Example of equipment for impact testing	62
Table 1	– Cross-reference table for pin insulators	17
Table 2	– Cross-reference table for line post insulators	19
Table 3	– Cross-reference table for string insulator units – cap and pin	21
Table 4	– Cross-reference table for string insulator units – long rod	23
Table 5	– Sample sizes for sample tests	25
Table 6	– Acceptance criteria for impact test.....	44
Table 7	– Coefficients for sample tests (line post insulators).....	46
Table 8	– Coefficients for sample tests (string insulator units).....	48
Table A.1	– Values for constants a, b and c	52
Table A.2	– Values for constants a, b and c (re-test).....	53
Table B.1	– Examples for mechanical and electromechanical sample tests	57
Table B.2	– Blank form for calculation for mechanical and electromechanical sample tests	58