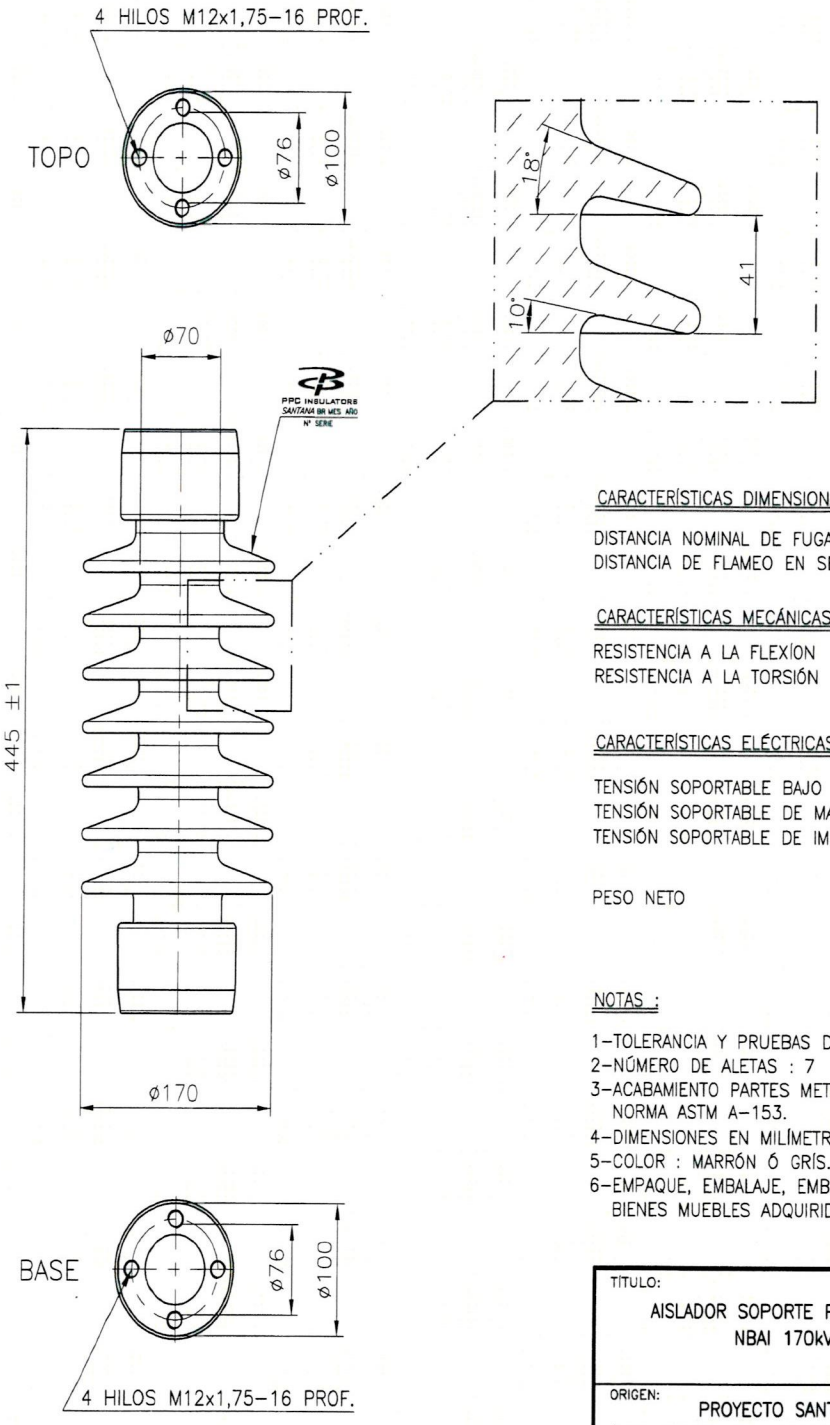
N.°	REVISIÓN	FECHA	AUT.



CFE
GERENCIA DE SUBESTACIONES

SE REVISÓ EN CUANTO A CARACTERÍSTICAS ELÉCTRICAS Y DIMENSIONES, SIN QUE ESTO EXIMA QUE DEBE CUMPLIR SATISFACTORIAMENTE CON LAS PRUEBAS DEL LAPEN, PARA SU APROBACIÓN FINAL

ATENTAMENTE

FECHA: 27 OCT 2016

GERENTE

CARACTERÍSTICAS DIMENSIONALES

DISTANCIA NOMINAL DE FUGA	mm	850
DISTANCIA DE FLAMEO EN SECO	mm	340

CARACTERÍSTICAS MECÁNICAS

RESISTENCIA A LA FLEXÍON	N	8000
RESISTENCIA A LA TORSIÓN	N.m	2000

CARACTERÍSTICAS ELÉCTRICAS

TENSIÓN SOPORTABLE BAJO LLUVIA	kV	70
TENSIÓN SOPORTABLE DE MANIOBRA	kV	–
TENSIÓN SOPORTABLE DE IMPULSO	kV	170
PESO NETO	kg	14

PPC SANTANA

NOTAS :

1–TOLERANCIA Y PRUEBAS DE ACUERDO CON LA NORMA IEC 60168/273.
2–NÚMERO DE ALETAS : 7
3–ACABAMIENTO PARTES METÁLICAS : GALVANIZADO A CALIENTE, DE ACUERDO CON LA NORMA ASTM A–153.
4–DIMENSIONES EN MILÍMETROS.
5–COLOR : MARRÓN Ó GRÍS.
6–EMPAQUE, EMBALAJE, EMBARQUE, TRANSPORTE, DESCARGA, RECEPCIÓN Y ALMACENAMIENTO DE BIENES MUEBLES ADQUIRIDOS POR CFE, DE ACUERDO A LA ESPECIFICACIÓN CFE–L1000–11.

TÍTULO: AISLADOR SOPORTE PORCELANA NBAI 170kV	PPC SANTANA		IDENTIFICACIÓN: REFERENCIA –
	ELAB./FECHA	VER./FECHA	APROV./FECHA
	13/09/16	13/09/16	13/09/16
			REVISIÓN –
ORIGEN: PROYECTO SANTANA (CFE 52810–32 – CORTA CP8–170–III)	CÓD. CAD: G:PROJ\UNI–02\STATION\A033		
	CÓD. 8.8172.65	TIPO– CAED	FOLHA – / ESCALA –

N.°	REVISIÓN	FECHA	AUT.

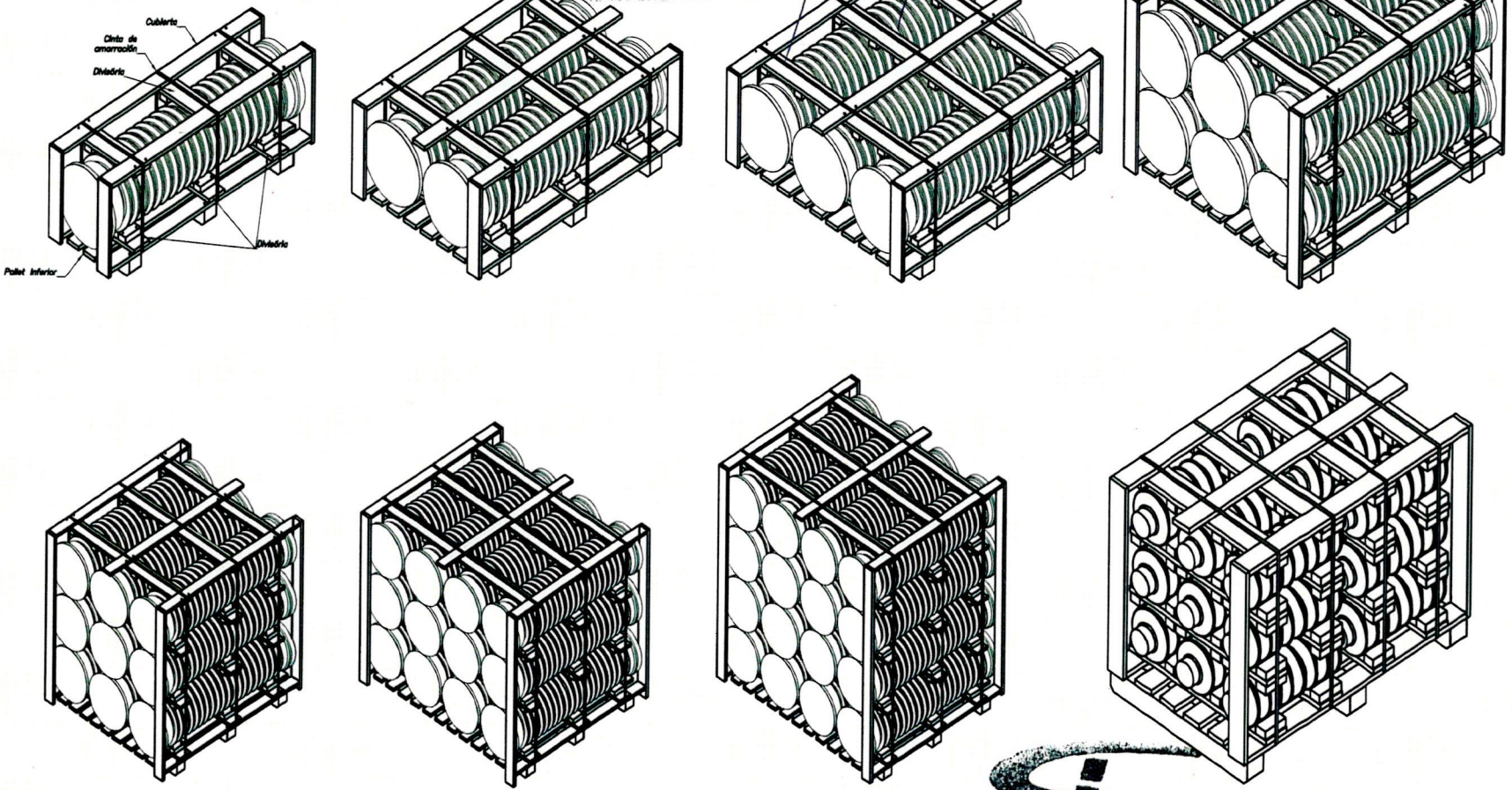
CFE
GERENCIA DE SUBESTACIONES

SE REVISÓ EN CUANTO A CARACTERÍSTICAS ELÉCTRICAS Y DIMENSIONES, SIN QUE ESTO EXIMA QUE DEBE CUMPLIR SATISFACTORIAMENTE CON LAS PRUEBAS DEL LAPEN, PARA SU APROBACIÓN FINAL.

ATENTAMENTE.

FECHA: 27 OCT 2016

GERENTE



NOTAS:

1– PLANOS MERAMENTE ILUSTRATIVOS.

2– LA COMPOSICIÓN DE LOS BULTOS PUEDEN VARIAR DE ACUERDO CON LAS DIMENSIONES DE LOS AISLADORES.

3– PLANOS MERAMENTE ILUSTRATIVOS.

4– UTILIZACIÓN PARA LOS AISLADORES MACIZOS.

5– EMPAQUE, EMBALAJE, EMBARQUE, TRANSPORTE, DESCARGA, RECEPCIÓN Y ALMACENAMIENTO DE BIENES MUEBLES ADQUIRIDOS POR CFE, DE ACUERDO A LA ESPECIFICACIÓN CFE–L1000–11.

PPC SANTANA

TÍTULO: EMBALAJE HORIZONTAL	PPC SANTANA		IDENTIFICACIÓN
	ELAB./FECHA 26/10/16	VER./FECHA 26/10/16	APROV./FECHA 26/10/16	REFERENCIA X212
ORIGEN: PROYECTO SANTANA	CÓD. CAD: G:PROJ\DIVERSOS\DVDVX210			REVISIÓN –
	CÓD. –	TIPO– DVDV		FOLHA – / ESCALA –

LACTEC

Instituto de Tecnologia para o Desenvolvimento

INSTITUTO DE TECNOLOGIA
PARA O DESENVOLVIMENTO

ADDRESS:
Centro Politécnico UFPR – P.O. Box 19067 - CEP 81531-980 – Curitiba – PR - Brazil
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REPORT	DOCUMENT Nº
	UTAT - 043 / 2004
ISSUED	PAGE
February 20, 2004	1 of 5

TITLE:

DRY LIGHTNING IMPULSE FLASHOVER VOLTAGE TEST
DRY LIGHTNING IMPULSE WITHSTAND VOLTAGE TEST
DRY POWER FREQUENCY FLASHOVER VOLTAGE TEST
DRY POWER FREQUENCY WITHSTAND VOLTAGE TEST
WET POWER FREQUENCY FLASHOVER VOLTAGE TEST
WET POWER FREQUENCY WITHSTAND VOLTAGE TEST
RADIO INFLUENCE VOLTAGE TEST
CORONA EXTINCTION VOLTAGE TEST
MECHANICAL STRENGTH TEST

SCOPE:

STATION POST INSULATOR – SOLID CORE
MANUFACTURER: SANTANA
TYPE: IEC 168 / 273 – CLASS C10 - 200 -II
BIL: 200 KV
DRAWING NUMBER: CODE 8.1022.65
NUMBER OF TEST SPECIMEN:
ELECTRICAL TESTS: 01
MECHANICAL TEST: 03

LACTEC

SERVICE ORDER:

CUSTOMER:

ISOLADORES SANTANA S. A.
RUA ANTONIO PEDRO, 645
13920-000 – PEDREIRA – SP - BRAZIL

NUMBER OF ANNEXES: 06

REPORT BY:

Carlos Y. Nakaguishi
Electrical Engineer - CREA 8547-D(PR)

CHECKED BY:

Carlos Y. Nakaguishi
Electrical Engineer - CREA 8547-D(PR)

APPROVED BY:

High Voltage Unit

"The results of this test report apply only to the items tested/analysed"

ADDRESS:
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Phone: +55 41 361-6200 Fax: +55 41 266-3582 E-mail: lactec@lactec.org.br

1. INTRODUCTION

1.1- Test(s) / Analysis(es) performed:

- DRY LIGHTNING IMPULSE FLASHOVER VOLTAGE TEST
- DRY LIGHTNING IMPULSE WITHSTAND VOLTAGE TEST
- DRY POWER FREQUENCY FLASHOVER VOLTAGE TEST
- DRY POWER FREQUENCY WITHSTAND VOLTAGE TEST
- WET POWER FREQUENCY FLASHOVER VOLTAGE TEST
- WET POWER FREQUENCY WITHSTAND VOLTAGE TEST
- RADIO INFLUENCE VOLTAGE TEST
- CORONA EXTINCTION VOLTAGE TEST
- MECHANICAL STRENGTH TEST

1.2- Test Equipment:

- VOLTAGE IMPULSE GENERATOR, HAEFELY, TYPE V3200/160
- DAMPED CAPACITIVE VOLTAGE DIVIDER, HAEFELY, TYPE CR 3200
- PEAK VOLTMETER, HAEFELY, TYPE SV64M, N° 080255-31-80
- DIGITAL OSCILLOSCOPE, TEKTRONIX, MODEL 744A, N° B040680
- MOTOR GENERATOR, 60 HZ, 6900 V, N° 57222
- TEST TRANSFORMER, ASEA, TYPE TMZ-17, N° 7219634
- SERIES RESONANT SYSTEM, HIPOTRONICS, TYPE 7300-750SR
- PEAK VOLTMETER, HAEFELY, TYPE SV64M, N° 080255-31-80
- ARTIFICIAL RAIN EQUIPMENT, MWB, TYPE R200, N° 772797
- COUPLING CAPACITOR, MICAFIL, 1000 PF, N° 0026119
- FIELD INTENSITY METER, SINGER, TYPE NM 17/27, N° 04072

1.3- Date of Test:

- November, 24-26, 2003
- December 15, 2003
- February, 10-11, 2004 (Mechanical Strength Test)

1.4- Place:

- LACTEC/DPEL -High Voltage Laboratory
- ISOLADORES SANTANA S/A – PEDREIRA - SP

1.5- Tested by:

- Celso Luis de Lima Martins
- Edson Pasqualim
- Carlos Eduardo Ribas
- Michel Lucio Garcia
- Nilson de Oliveira

1.6- Witnessed / Inspected by:

- Marcelo Acorsi (SANTANA)

2. REFERENCES

IEC 60168, "Tests on Indoor and Outdoor Post Insulators of Ceramic Material or Glass for Systems with Nominal Voltages Greater than 1000 V", IEC, Geneve

IEC 60273, "Characteristics of Indoor and Outdoor Post Insulators for Systems with Nominal Voltages Greater than 1000 V", IEC, Geneve

AS 1137, Part 3 - 1981, "Insulators – Porcelain and Glass Indoor and Outdoor Station Post Insulators (for voltages greater than 1000 Vac)", SAA, Sidney - Australia

3. TEST DESCRIPTION

3.1- Dry Lightning Impulse Flashover Voltage Test

In the test specimen, the voltage corresponding to a 50 percent disruptive discharge probability V50%, both polarity, was determined by the up-and-down method, with 30 applications.

The following results were obtained:

Test Specimen	V50% (+)	V50% (-)
# 01	248.3 kV	452.4 kV

A complete set of test results is enclosed in Annex 01.

3.2- Dry Lightning Impulse Withstand Voltage Test

Fifteen consecutive impulses of both polarity and peak voltage of 230 kV, with appropriate atmospheric corrections were applied to the test specimen.

No puncture or flashover was observed during the test.

A complete set of test results is enclosed in Annex 02.

3.3- Dry Power Frequency Flashover Voltage Test

In the test specimen, the dry power frequency flashover voltage was determined by averaging five flashover voltages.

The average flashover voltage was corrected to standard atmospheric conditions.

The following results were obtained:

Test Specimen	Average
# 01	157 kV

A complete set of test results is enclosed in Annex 03.

No puncture was observed during the test.

3.4- Dry Power Frequency Withstand Voltage Test

The rated dry power frequency withstand voltage of 135 kV, with appropriate atmospheric corrections was applied to the test specimen during 60 seconds.

A complete set of test results is enclosed in Annex 03.

No puncture or flashover was observed during the test.

3.5- Wet Power Frequency Flashover Voltage Test

In the test specimen, the wet power frequency flashover voltage was determined by averaging five flashover voltages.

The average flashover voltage was corrected to standard atmospheric conditions.

The following results were obtained:

Test Specimen	Average
# 01	85 kV

A complete set of test results is enclosed in Annex 04.

No puncture was observed during the test.

3.6- Wet Power Frequency Withstand Voltage Test

The rated dry power frequency withstand voltage of 75 kV, with appropriate atmospheric corrections was applied to the test specimen during 60 seconds.

A complete set of test results is enclosed in Annex 04.

No puncture or flashover was observed during the test.

3.7- Radio Influence Voltage Test

The test specimen was tested using a Field Intensity Meter at 1000 kHZ, with a measuring impedance of 150 Ω.

The radio interference voltage measured at 28.6 kV (phase-ground) test voltage was the following:

Test Specimen	RIV @ 28.6 kV (Zm=150 Ω, fm= 1000 kHz)
# 01	11.2 μV

A complete set of test results is enclosed in Annex 05.

ADDRESS:
Centro Politécnico UFPR – P.O. Box 19067 - CEP 81531-980 – Curitiba – PR - Brazil
Phone: +55 41 361-6200 Fax: +55 41 266-3582 E-mail: lactec@lactec.org.br

3.8- Corona-Extinction Voltage Test

The corona-extinction voltage of the test specimen was determined.

Test Specimen	Corona-Inception Voltage	Corona-Extinction Voltage
# 01	88 kV	82 kV

3.9- Mechanical Strength Test

Three test specimens were subjected to the mechanical strength test, comprising bending and torsion tests.

The following results were obtained:

A) Bending Test

Test Specimen	Bending Strength	Test	Result
# 01	10000 N	14800 N	Porcelain breakage
# 02	10000 N	13330 N	Porcelain breakage
# 03	10000 N	12940 N	Porcelain breakage

B) Torsion Test

Test Specimen	Torsional Strength	Test	Result
# 01	2500 N.m	2770 N.m	No breakage
# 02	2500 N.m	2810 N.m	No breakage
# 03	2500 N.m	2600 N.m	No breakage

4. DRAWING

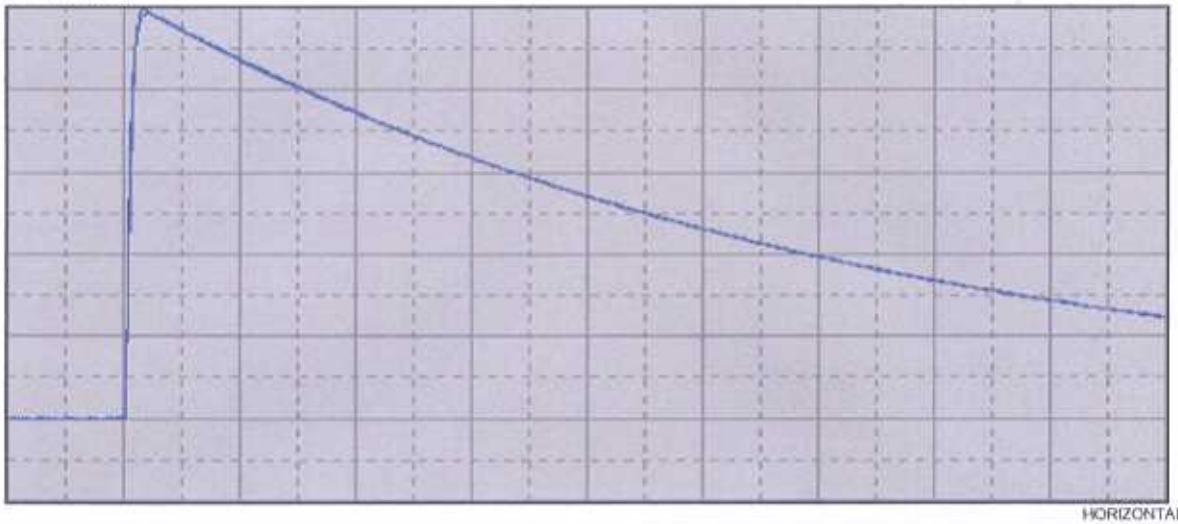
Drawing number CODE 8.1022.65, furnished by the customer, is enclosed in this report as Annex 06.

LACTEC	**INSTITUTO DE TECNOLOGIA PARA O DESENVOLVIMENTO**	REPORT: UTAT - 043/04 ANNEX / PAGE: Annex 01 / Page 01 of 02

DRY LIGHTNING IMPULSE FLASHOVER VOLTAGE TEST

CUSTOMER	MANUFACTURER	TYPE	NOMINAL VOLTAGE
SANTANA	SANTANA	8.1022.65	kV
SPECIMEN	**POLARITY**	**TEST TYPE**	**DRY ARCING DISTANCE**
# 01	(+)	☑ DRY ☐ WET	0.370 m
NUMBER OF STAGES (IMP. GEN.)	**VOLTAGE DIVIDER**	**SCALE FACTOR**	**WAVE FORM**
4s/1p	CR 3200	528.1	1.04 / 46.0
DRY-BULB THERMOMETER	**WET-BULB THERMOMETER**	**ATMOSPHERIC PRESSURE**	**CORRECTION FACTOR**
22.1 °C	19.6 °C	681.2 mmHg	0.930

VOLTAGE WAVE FORM



HORIZONTAL: 10 µs/div

APPLIC	CHARGING VOLTAGE (kV)	CREST VOLTAGE (kV)	PROSPEC VOLTAGE (kV)	CORRECTED VOLTAGE (kV)	TIME TO CHOPPING (µs)	APPLIC	CHARGING VOLTAGE (kV)	CREST VOLTAGE (kV)	PROSPEC VOLTAGE (kV)	CORRECTED VOLTAGE (kV)	TIME TO CHOPPING (µs)
1	62.0	232.3	232.3	249.8	9.9	21	62.0	232.0	232.0	249.5	9.1
2	60.1	224.7	224.7	241.6	-	22	60.1	224.8	224.8	241.7	9.8
3	62.0	231.9	231.9	249.4	-	23	58.2	217.4	217.4	233.8	-
4	63.9	239.5	239.5	257.5	7.4	24	60.1	225.1	225.1	242.0	-
5	62.0	231.8	231.8	249.2	-	25	62.0	232.3	232.3	249.8	8.5
6	63.9	239.5	239.5	257.5	-	26	60.1	224.8	224.8	241.7	10.4
7	65.8	246.2	246.2	264.7	6.6	27	58.2	218.0	218.0	234.4	-
8	63.9	239.5	239.5	257.5	8.0	28	60.1	225.0	225.0	241.9	-
9	62.0	231.8	231.8	249.2	-	29	62.0	232.5	232.5	250.0	-
10	63.9	239.5	239.5	257.5	7.8	30	63.9	239.6	239.6	257.6	8.6
11	62.0	231.9	231.9	249.4	7.9						
12	60.1	225.0	225.0	241.9	-						
13	62.0	232.3	232.3	249.8	9.8						
14	60.1	225.0	225.0	241.9	-						
15	62.0	232.2	232.2	249.7	9.8						
16	60.1	225.0	225.0	241.9	-						
17	62.0	232.3	232.3	249.8	-						
18	63.9	239.4	239.4	257.4	7.7						
19	62.0	232.4	232.4	249.9	7.9						
20	60.1	224.9	224.9	241.8	-						

50% DISRUPTIVE DISCHARGE VOLTAGE (V50 %)	WITHSTAND VOLTAGE EVALUATED FROM V50%
248.3 kV	238.6 kV

REMARKS

Curitiba, December 15, 2003

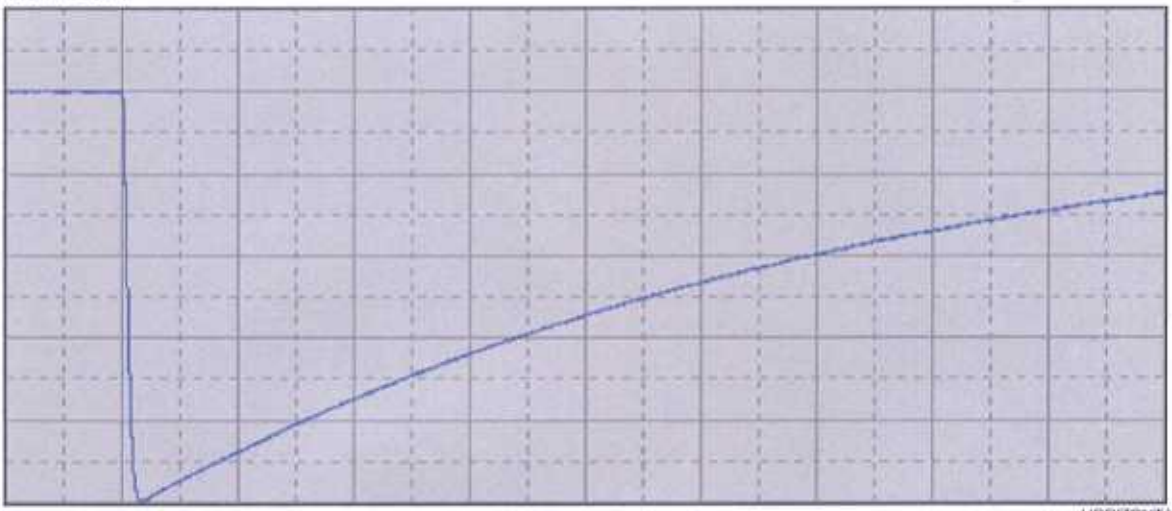
CHECKED BY

LACTEC	**INSTITUTO DE TECNOLOGIA PARA O DESENVOLVIMENTO**	REPORT: UTAT - 043/04 ANNEX / PAGE: Annex 01 / Page 02 of 02

DRY LIGHTNING IMPULSE FLASHOVER VOLTAGE TEST

CUSTOMER	MANUFACTURER	TYPE	NOMINAL VOLTAGE
SANTANA	SANTANA	8.1022.65	kV
SPECIMEN	**POLARITY**	**TEST TYPE**	**DRY ARCING DISTANCE**
# 01	(-)	☑ DRY ☐ WET	0.370 m
NUMBER OF STAGES (IMP. GEN.)	**VOLTAGE DIVIDER**	**SCALE FACTOR**	**WAVE FORM**
4s/1p	CR 3200	528.1	1.03 / 45.5
DRY-BULB THERMOMETER	**WET-BULB THERMOMETER**	**ATMOSPHERIC PRESSURE**	**CORRECTION FACTOR**
22.1 °C	19.7 °C	681.6 mmHg	0.890

VOLTAGE WAVE FORM



HORIZONTAL: 10 µs/div

APPLIC.	CHARGING VOLTAGE (kV)	CREST VOLTAGE (kV)	PROSPEC. VOLTAGE (kV)	CORRECTED VOLTAGE (kV)	TIME TO CHOPPING (µs)	APPLIC.	CHARGING VOLTAGE (kV)	CREST VOLTAGE (kV)	PROSPEC VOLTAGE (kV)	CORRECTED VOLTAGE (kV)	TIME TO CHOPPING (µs)
1	107.6	402.5	402.5	452.2	5.0	21	107.6	401.9	401.9	451.6	2.9
2	104.4	390.5	390.5	438.8	-	22	104.4	390.5	390.5	438.8	-
3	107.6	401.7	401.7	451.3	2.6	23	107.6	401.4	401.4	451.0	2.5
4	104.4	389.5	389.5	437.6	-	24	104.4	390.5	390.5	438.8	-
5	107.6	402.6	402.6	452.4	4.1	25	107.6	401.7	401.7	451.3	-
6	104.4	390.7	390.7	439.0	-	26	110.8	414.3	414.3	465.5	4.8
7	107.6	402.3	402.3	452.0	2.9	27	107.6	401.8	401.8	451.5	-
8	104.4	391.0	391.0	439.3	2.8	28	110.8	414.5	414.5	465.7	4.7
9	101.2	378.7	378.7	425.5	-	29	107.6	401.5	401.5	451.1	-
10	104.4	390.4	390.4	438.7	-	30	110.8	414.1	414.1	465.3	2.7
11	107.6	402.1	402.1	451.8	-						
12	110.8	414.5	414.5	465.7	3.3						
13	107.6	401.4	401.4	451.0	-						
14	110.8	414.5	414.5	465.7	3.1						
15	107.6	402.1	402.1	451.8	-						
16	110.8	414.9	414.9	466.2	-						
17	114.0	426.1	426.1	478.8	2.8						
18	110.8	414.4	414.4	465.6	3.4						
19	107.6	402.1	402.1	451.8	-						
20	110.8	414.7	414.7	466.0	3.9						

50% DISRUPTIVE DISCHARGE VOLTAGE (V50 %)	WITHSTAND VOLTAGE EVALUATED FROM V50%
452.4 kV	434.8 kV

REMARKS

Curitiba, December 15, 2003

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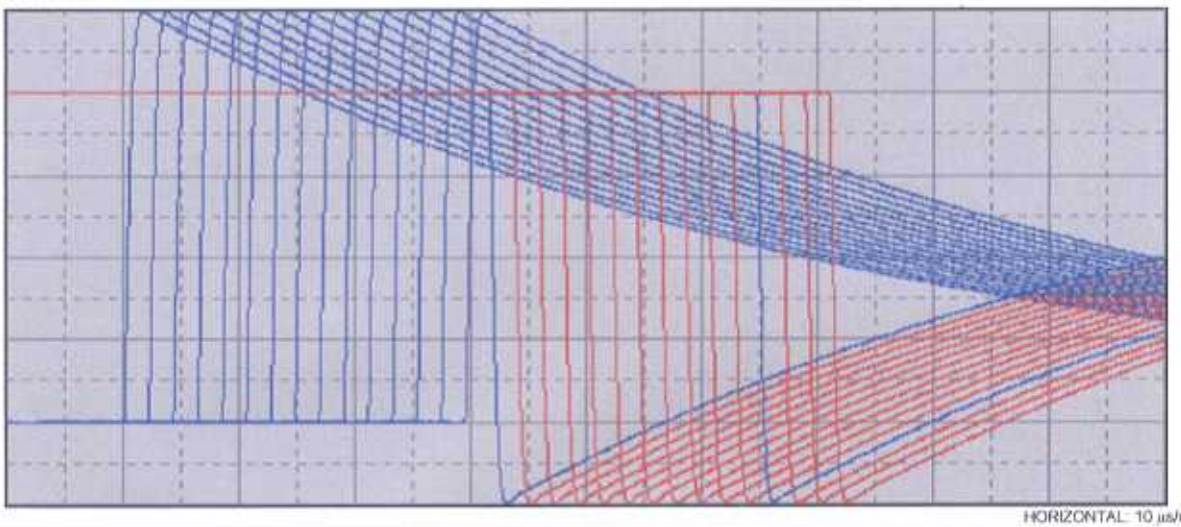
LACTEC	**INSTITUTO DE TECNOLOGIA PARA O DESENVOLVIMENTO**	REPORT: UTAT - 043/04 ANNEX / PAGE: Annex 02 / Page 01 of 01

DRY LIGHTNING IMPULSE WITHSTAND VOLTAGE TEST

CUSTOMER	MANUFACTURER	TYPE	NOMINAL VOLTAGE
SANTANA	SANTANA	8.1022.65	kV
SPECIMEN	**WITHSTAND VOLTAGE**	**TEST TYPE**	**DRY ARCING DISTANCE**
# 01	230 kV	☑ DRY ☐ WET	0.370 m
NUMBER OF STAGES (IMP. GEN.)	**VOLTAGE DIVIDER**	**SCALE FACTOR**	**WAVE FORM**
4s/1p	CR 3200	528.1	1.06 / 46.0
DRY-BULB THERMOMETER	**WET-BULB THERMOMETER**	**ATMOSPHERIC PRESSURE**	**CORRECTION FACTOR**
22.0 °C	19.7 °C	680.6 mmHg	0.917

VOLTAGE WAVE FORM



HORIZONTAL: 10 µs/div

POSITIVE POLARITY						*NEGATIVE POLARITY*					
APPLIC.	CHARGING VOLTAGE (kV)	CREST VOLTAGE (kV)	PROSPEC. VOLTAGE (kV)	CORRECTED VOLTAGE (kV)	TIME TO CHOPPING (µs)	APPLIC.	CHARGING VOLTAGE (kV)	CREST VOLTAGE (kV)	PROSPEC. VOLTAGE (kV)	CORRECTED VOLTAGE (kV)	TIME TO CHOPPING (µs)
1	57.0	213.5	213.5	232.8	-	1	57.0	211.0	211.0	230.1	-
2	57.0	211.0	211.0	230.1	-	2	57.0	211.4	211.4	230.5	-
3	57.0	211.2	211.2	230.3	-	3	57.0	211.5	211.5	230.6	-
4	57.0	213.9	213.9	233.3	-	4	57.0	211.0	211.0	230.1	-
5	57.0	211.2	211.2	230.3	-	5	57.0	211.1	211.1	230.2	-
6	57.0	210.9	210.9	230.0	-	6	57.0	211.1	211.1	230.2	-
7	57.0	211.0	211.0	230.1	-	7	57.0	211.5	211.5	230.6	-
8	57.0	210.9	210.9	230.0	-	8	57.0	214.2	214.2	233.6	-
9	57.0	211.1	211.1	230.2	-	9	57.0	211.6	211.6	230.8	-
10	57.0	211.0	211.0	230.1	-	10	57.0	214.9	214.9	234.4	-
11	57.0	214.1	214.1	233.5	-	11	57.0	214.9	214.9	234.4	-
12	57.0	210.8	210.8	229.9	-	12	57.0	215.0	215.0	234.5	-
13	57.0	214.1	214.1	233.5	-	13	57.0	214.4	214.4	233.8	-
14	57.0	213.9	213.9	233.3	-	14	57.0	215.0	215.0	234.5	-
15	57.0	214.1	214.1	233.5	-	15	57.0	214.6	214.6	234.0	-

REMARKS

Curitiba, December 15, 2003

CHECKED BY

LACTEC	INSTITUTO DE TECNOLOGIA PARA O DESENVOLVIMENTO	REPORT: UTAT - 043/04 ANNEX / PAGE: Annex 03 / Page 01 of 01

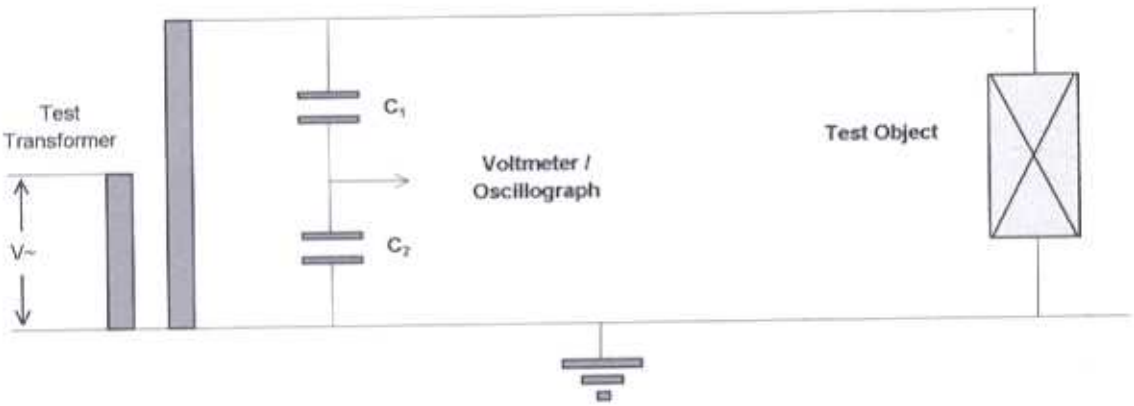
DRY POWER FREQUENCY VOLTAGE TEST

CUSTOMER	MANUFACTURER	TYPE
SANTANA	SANTANA	8.1022.65

DRY-BULB THERMOMETER	WET-BULB THERMOMETER	ATMOSPHERIC PRESSURE	ARCING DISTANCE
25.4 °C	17.5 °C	678.4 mmHg	0.370 m

CORRECTION FACTOR
0.914

TEST CIRCUIT



Specimen	DISRUPTIVE DISCHARGE (kV)							WITHSTAND VOLTAGE (kV)			
	Application 1	Application 2	Application 3	Application 4	Application 5	AVERAGE	CORRECTED VOLTAGE	NOMINAL VOLTAGE	CORRECTED VOLTAGE	TIME (S)	RESULT
# 01	147	143	143	141	144	144	157	135	123	60	OK

REMARKS

Curitiba, November 24, 2003

CHECKED BY

INSTITUTO DE TECNOLOGIA PARA O DESENVOLVIMENTO	REPORT: UTAT - 043/04
	ANNEX / PAGE: Annex 04 / Page 01 of 01

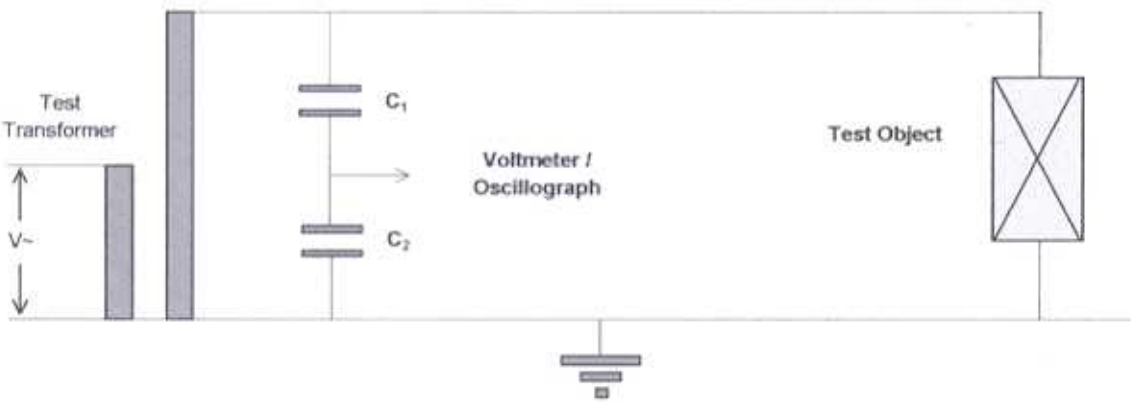
WET POWER FREQUENCY VOLTAGE TEST

CUSTOMER	MANUFACTURER	TYPE
SANTANA	SANTANA	8.1022.65

PRECIPITATION RATE (VERT. COMP.)	WATER RESISTIVITY	DRY-BULB THERMOMETER	WET-BULB THERMOMETER
3 mm/min	105 Ω m @ 20 °C	22.1 °C	18.5 °C

ARCING DISTANCE	ATMOSPHERIC PRESSURE	CORRECTION FACTOR
0.370 m	681.4 mmHg	0.991

TEST CIRCUIT



Specimen	DISRUPTIVE DISCHARGE (kV)							WITHSTAND VOLTAGE (kV)			
	Application 1	Application 2	Application 3	Application 4	Application 5	AVERAGE	CORRECTED VOLTAGE	NOMINAL VOLTAGE	CORRECTED VOLTAGE	TIME (S)	RESULT
# 01	83	85	84	82	88	84	85	75	74	60	OK

REMARKS

Curitiba, November 26, 2003

CHECKED BY

LACTEC	INSTITUTO DE TECNOLOGIA PARA O DESENVOLVIMENTO	REPORT: UTAT - 043/04 ANNEX / PAGE: Annex 05 / Page 01 of 02

RADIO INFLUENCE VOLTAGE TEST

CUSTOMER	TEST OBJECT	TYPE	MANUFACTURER
SANTANA	INSULATOR	8.1022.65	SANTANA

REFERENCE	MEASUREMENT FREQUENCY	DRY-BULB THERMOMETER	RELATIVE HUMIDITY
	1000 kHz	25.4 °C	46.9 %
		MEASUREMENT IMPEDANCE - Zm: 150 Ω	ATMOSPHERIC PRESSURE: 678.4 mmHg

CHARACTERISTICS OF THE RIV METER

MANUFACTURER: SINGER STODDART

TYPE: NM-17/27 N° 0146-04072

FREQUENCY RANGE: FROM 10 KHz TO 32 MHz

INSTRUMENT FACTOR 0dB = 1 μV

MEASUR. RANGE: FROM 0 TO 160 dB ABOVE 1μV

PRECISION: 3 dB (IMPULSIVE SIGNALS)

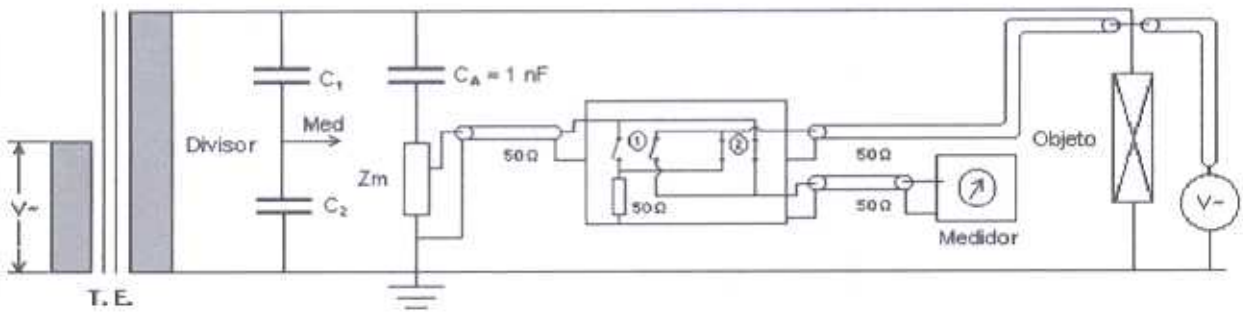
BANDWIDTH (6 dB): 10 KHz

INTERNAL IMPEDANCE: 50 Ω

QUASI-PEAK DETECTOR (tc = 1 ms and td = 600 ms)

DETERMINATION OF THE CORRECTION FACTOR

DIAGRAM



ARRANGEMENT	APPLIED V (A) Sw.1- clos. Sw.2- open	MEASURED V (B) Sw1-open Sw2- closed	CORRECTION FACTOR dB (A - B)	REMARKS
	120	109	11	
	110	100	10	Average = 10 dB @ 1 MHz
	100	90	10	

REMARKS

Curitiba, November 24, 2003

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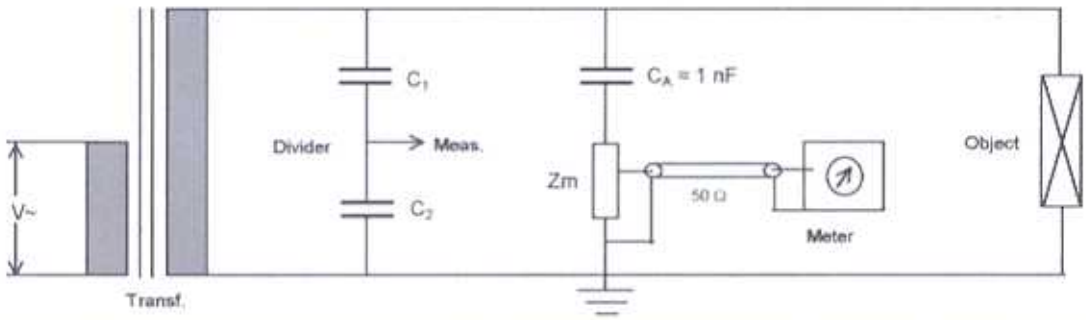
RADIO INTERFERENCE VOLTAGE TEST

CUSTOMER	TEST OBJECT	TYPE	MANUFACTURER
SANTANA	INSULATOR	8.1022.65	SANTANA

DRAWING	MEASUREMENT FREQUENCY	DRY-BULB THERMOMETER	RELATIVE HUMIDITY
	1000 kHz	25.4 °C	46.9 %

TEST SPECIMEN	MEASUREMENT IMPEDANCE - Zm	ATMOSPHERIC PRESSURE
#1	150 Ω	678.4 mmHg

TEST CIRCUIT



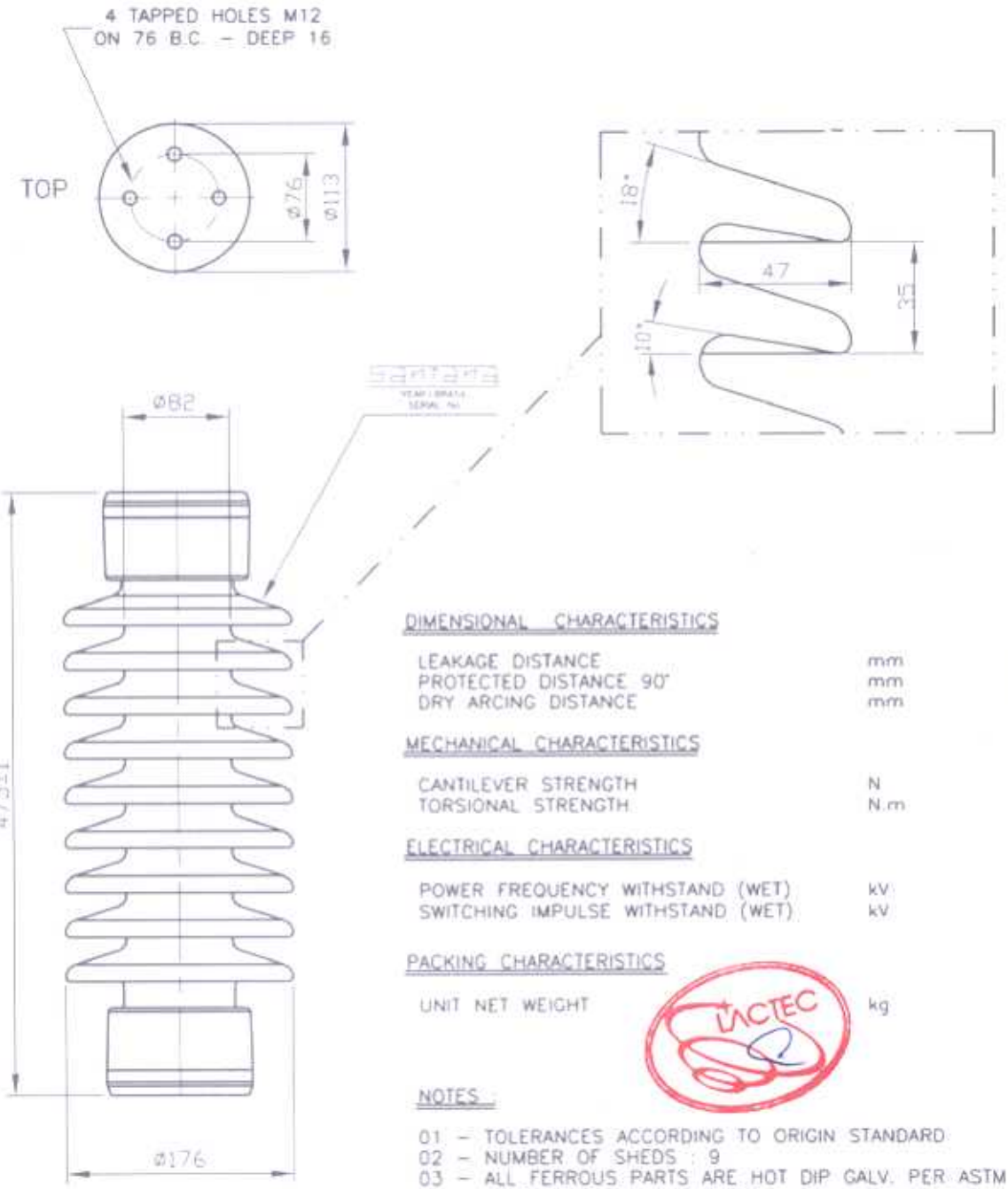
VOLTAGE (kV)	TEST SPECIMEN #1				II				III			
	MEAS. dB	C.F.	COR.dB	µV	MEAS. dB	C.F.	COR.dB	µV	MEAS. dB	C.F.	COR.dB	µV
28.6	11	10	21	11.2								
26.0	11	10	21	11.2								
23.4	11	10	21	11.2								
20.8	11	10	21	11.2								
18.2	11	10	21	11.2								
15.6	11	10	21	11.2								
18.2	11	10	21	11.2								
20.8	11	10	21	11.2								
23.4	11	10	21	11.2								
26.0	11	10	21	11.2								
28.6	11	10	21	11.2								
26.0	11	10	21	11.2								
23.4	11	10	21	11.2								
20.8	11	10	21	11.2								
18.2	11	10	21	11.2								
15.6	11	10	21	11.2								
0.0	11	10	21	11.2								

REMARKS

Curitiba, November 24, 2003

CHECKED BY

N.°	REVISION	DATE	AUT.
1	GENERAL	28-09-99	LUIS



DIMENSIONAL CHARACTERISTICS

LEAKAGE DISTANCE	mm	950
PROTECTED DISTANCE 90°	mm	400
DRY ARCING DISTANCE	mm	370

MECHANICAL CHARACTERISTICS

CANTILEVER STRENGTH	N	10000
TORSIONAL STRENGTH	N.m	2500

ELECTRICAL CHARACTERISTICS

POWER FREQUENCY WITHSTAND (WET)	kV	70
SWITCHING IMPULSE WITHSTAND (WET)	kV	–

PACKING CHARACTERISTICS

UNIT NET WEIGHT	kg	18

LACTEC

NOTES :

01 – TOLERANCES ACCORDING TO ORIGIN STANDARD
02 – NUMBER OF SHEDS : 9
03 – ALL FERROUS PARTS ARE HOT DIP GALV. PER ASTM A–153
04 – DIMENSIONS IN MILLIMETERS
05 – FOR ORDERING INFORMATION SEE TABLE BELOW.

PART No.	GLAZED COLOR
8.1022.65–70	ANSI GRAY 70
8.1022.65	BROWN

CÓPIA NÃO CONTROLADA
DPTO. PROJETOS
14/11/03
REPRODUZIDO VERSÃO ATUAL

TITTLE: STATION POST INSULATOR SOLID CORE – 200 kV (BIL)	Santana			IDENTIFICATION
				DRAWING –
	ELAB./DATE	VERIF./DATE	APPROV./DATE	TYPE–CAID
	LUIS 28-09-99	EVANDRO 28-09-99	ALDO 28-09-99	
ORIGIN: SANTANA DESIGN IEC 168/273–CLASS C10–200–II	CODE CAD	G:\PROJ\UNI-02\STATION\		REVISION
	CODE 8.1022.65	SCALE –		1