

TEST RECORD

NO. 2315.2100744.0352

THS Industria e Comercio Ltda.
Rua Ernesto Biester, 59
CEP 04777-120 - Sao Paulo
BRAZIL

CLIENT

THS Industria e Comercio Ltda.

MANUFACTURER

Fuse links

TEST OBJECT

Traction fuse CC1000D73L301.800I,
Traction fuse 6001000

TYPE

Test samples

SERIAL NO.

Rated voltage
Rated currents

1000 V DC
800 A
600 A

RATED
CHARACTERISTICS
GIVEN BY THE
CLIENT

Following to
ESPECIFICAÇÃO TÉCNICA DOS FUSÍVELS DE 600A-1000Vcc
EC-9.86.01.41/700-037 Rev. 01: 03.02.10
Sub-clause 5.7

NORMATIVE
DOCUMENT

Verification of the breaking capacity at 970 V DC and 100 kA

TEST PERFORMED

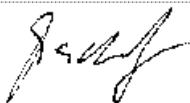
29 June 2010

DATE OF TEST

See Sub-clause 3

TEST RESULT

This test document comprises 18 sheets.



RAINER BORCHERT
Test engineer in charge
Berlin, 09 July 2010



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Independent test laboratory, accredited by Deutsche Akkreditierungsstelle Technik (DATech) e.V. in the fields of h.v. apparatus and switchgear, power cable and power cable accessories, l.v. apparatus and switchgear, installation equipment and switching and control equipment with DAR Record No. DAT-P-019/92.

Institut „Prüffeld für elektrische Hochleistungstechnik“ GmbH (IPH Berlin) is a subsidiary of CESI S.p.A, Milan.



DAT - P - 019/92

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1. Participants in the test

Mr. Borchert, Rainer IPH test engineer in charge

2. Test performed

Verification of the breaking capacity at 970 V DC and 100 kA

3. Test results

| Oscillogram No. | | 2102901 | 2102902 | 2102903 | 2102904 |
|-------------------------------------|----------------------------|---------|---------|---------|---------|
| No. of test object | | - | 3 | 5 | 8 |
| Rated current of fuse-link | A | - | 600 | 600 | 600 |
| Test voltage | V | 970 | 970 | 970 | 970 |
| Prospective peak current | kA | - | - | - | - |
| Prospective test current I_p | kA | 103 | 103 | 103 | 103 |
| Time constant | ms | 16.7 | 16.7 | 16.7 | 16.7 |
| Rate of current rise | kA/ms | 6.17 | 6.17 | 6.17 | 6.17 |
| Melting current i_s | A | - | 21.2 | 21.0 | 20.3 |
| Cut-off current | A | - | 21.7 | 21.6 | 21.2 |
| Melting time | ms | - | 3.68 | 3.54 | 3.46 |
| Arcing time | ms | - | 5.38 | 5.40 | 5.26 |
| Break time | ms | - | 9.06 | 8.94 | 8.72 |
| Melting integral | $10^3 \text{ A}^2\text{s}$ | - | 604 | 576 | 511 |
| Arcing integral | $10^3 \text{ A}^2\text{s}$ | - | 664 | 699 | 656 |
| Breaking integral | $10^3 \text{ A}^2\text{s}$ | - | 1259 | 1267 | 1159 |
| Arc energy | kVA _s | - | 61.7 | 62.3 | 59.0 |
| Switching voltage | V | - | 1660 | 1622 | 1676 |
| Recovery voltage | V | - | 973 | 972 | 973 |
| Resistance after test ¹⁾ | MΩ | | 0.51 | 0.55 | 0.58 |
| Notes | | Setting | - | - | - |
| Evaluation | | - | OK | OK | OK |

Notes:

- 1) Resistance was measured 10 minutes after the test.
 OK - The test object was able to break properly.

| Oscillogram No. | | 2102905 | 2102906 | 2102907 |
|-------------------------------------|----------------------------|---------|---------|---------|
| No. of test object: | | 21 | 22 | 23 |
| Rated current of fuse-link | A | 800 | 800 | 800 |
| Test voltage | V | 970 | 970 | 970 |
| Prospective peak current | kA | - | - | - |
| Prospective test current I_p | kA | 103 | 103 | 103 |
| Time constant | ms | 16.7 | 16.7 | 16.7 |
| Rate of current rise | kA/ms | 6.17 | 6.17 | 6.17 |
| Melting current i_s | A | 25.8 | 25.3 | 25.6 |
| Cut-off current | A | 26.5 | 25.7 | 26.2 |
| Melting time | ms | 4.78 | 4.68 | 4.72 |
| Arcing time | ms | 4.50 | 4.60 | 4.36 |
| Break time | ms | 9.28 | 9.28 | 9.08 |
| Melting integral | $10^3 \text{ A}^2\text{s}$ | 1223 | 1146 | 1190 |
| Arcing integral | $10^3 \text{ A}^2\text{s}$ | 1083 | 1006 | 1045 |
| Breaking integral | $10^3 \text{ A}^2\text{s}$ | 2293 | 2140 | 2221 |
| Arc energy | kVA _s | 84.3 | 81.4 | 82.0 |
| Switching voltage | V | 1848 | 1799 | 1866 |
| Recovery voltage | V | 974 | 973 | 975 |
| Resistance after test ¹⁾ | MΩ | 0.46 | 0.49 | 0.58 |
| Notes | | - | - | - |
| Evaluation | | OK | OK | OK |

Notes:

- 1) Resistance was measured 10 minutes after the test.
- OK - The test object was able to break properly.

4. Photographs



Photo 1: Test object No. 3 after test

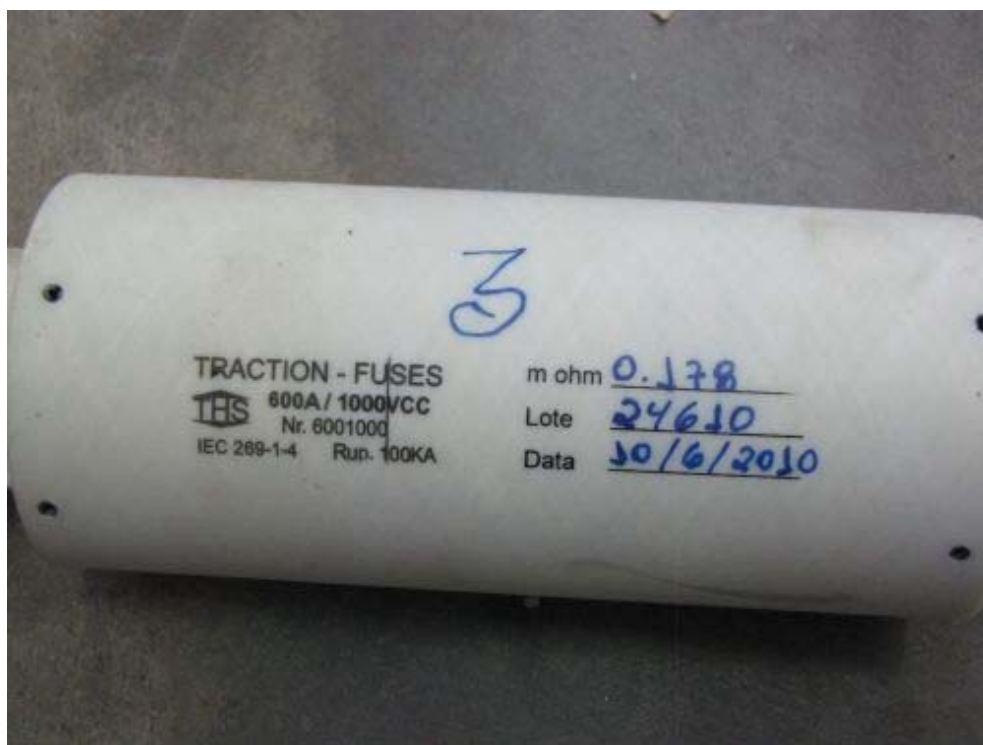


Photo 2: Test object No. 3 after test



Photo 3: Test object No. 5 after test

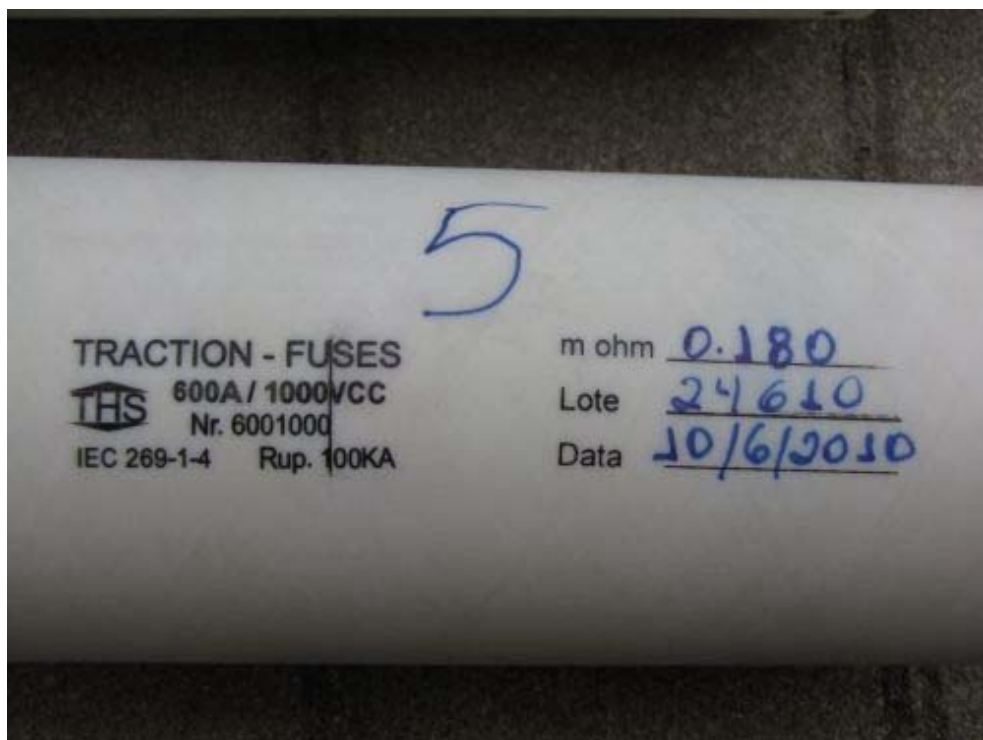


Photo 4: Test object No. 5 after test



Photo 5: Test object No. 8 after test

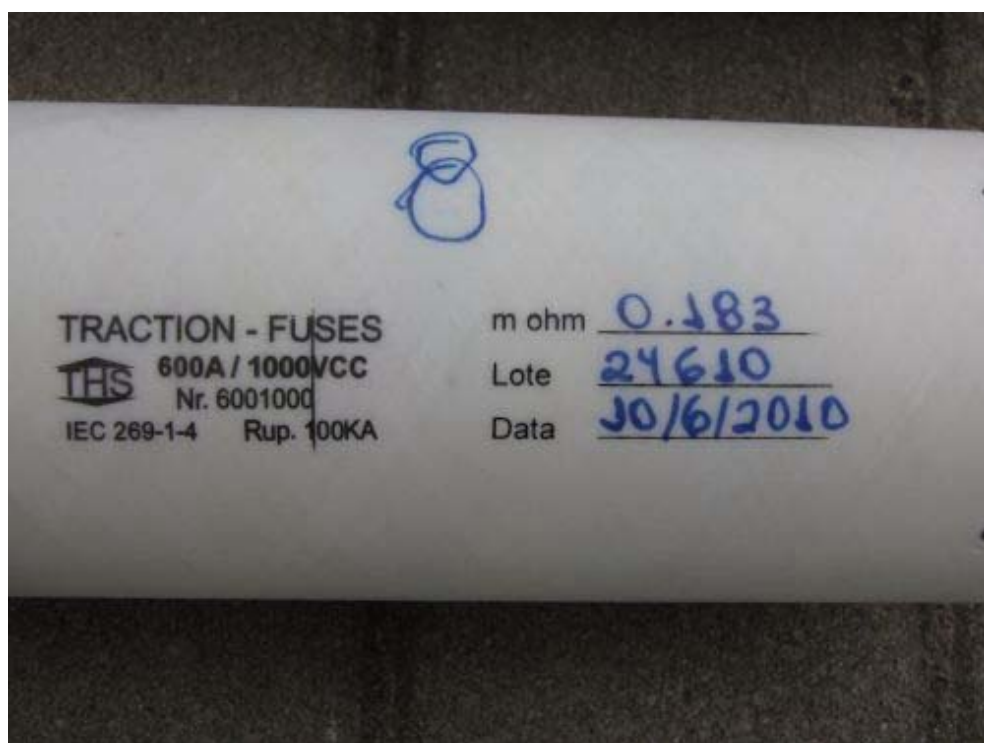


Photo 6: Test object No. 8 after test



Photo 7: Test object No. 21 after test

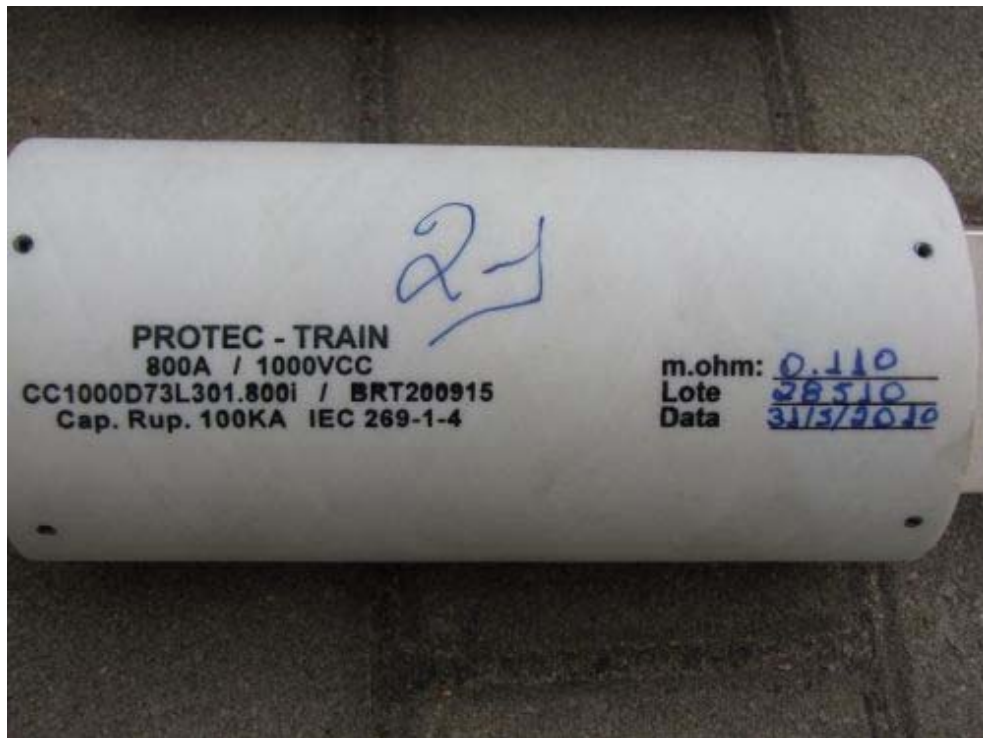


Photo 8: Test object No. 21 after test



Photo 9: Test object No. 22 after test



Photo 10: Test object No. 22 after test



Photo 11: Test object No. 23 after test

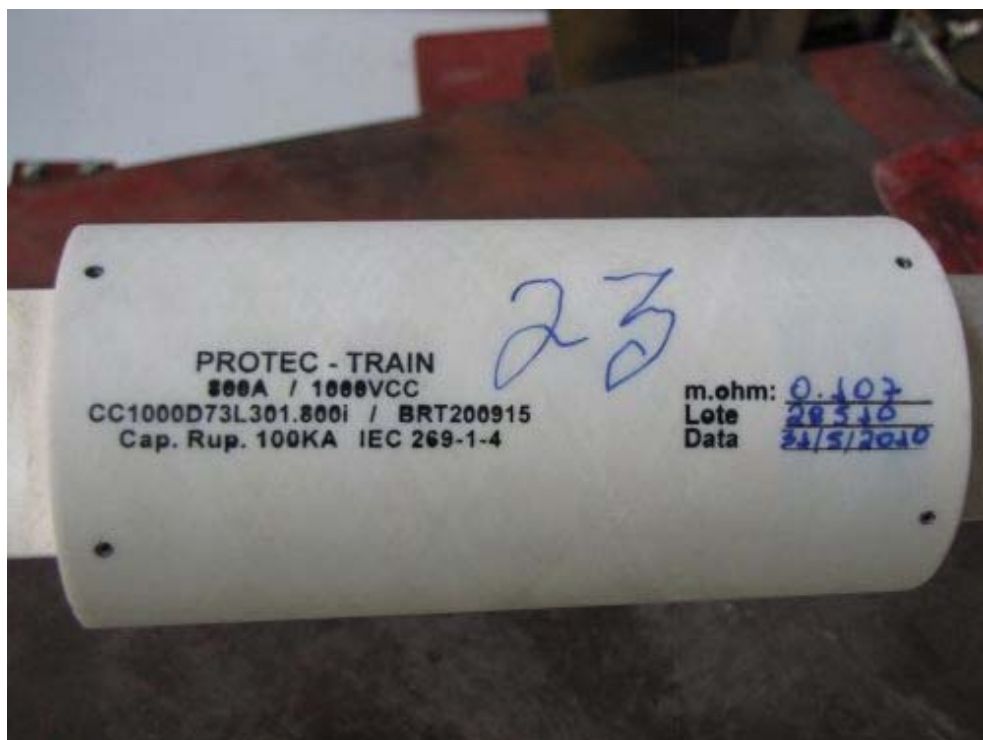
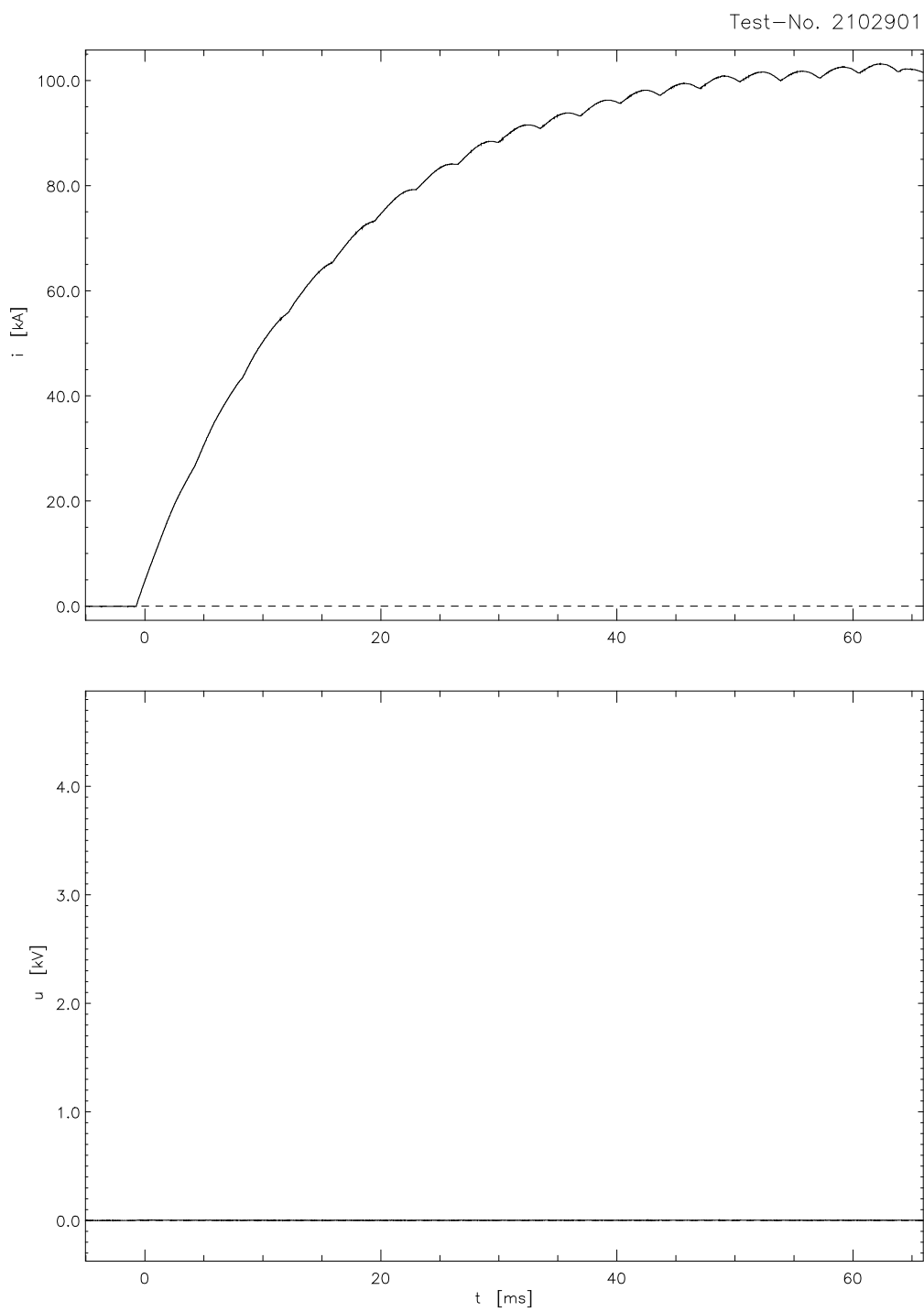
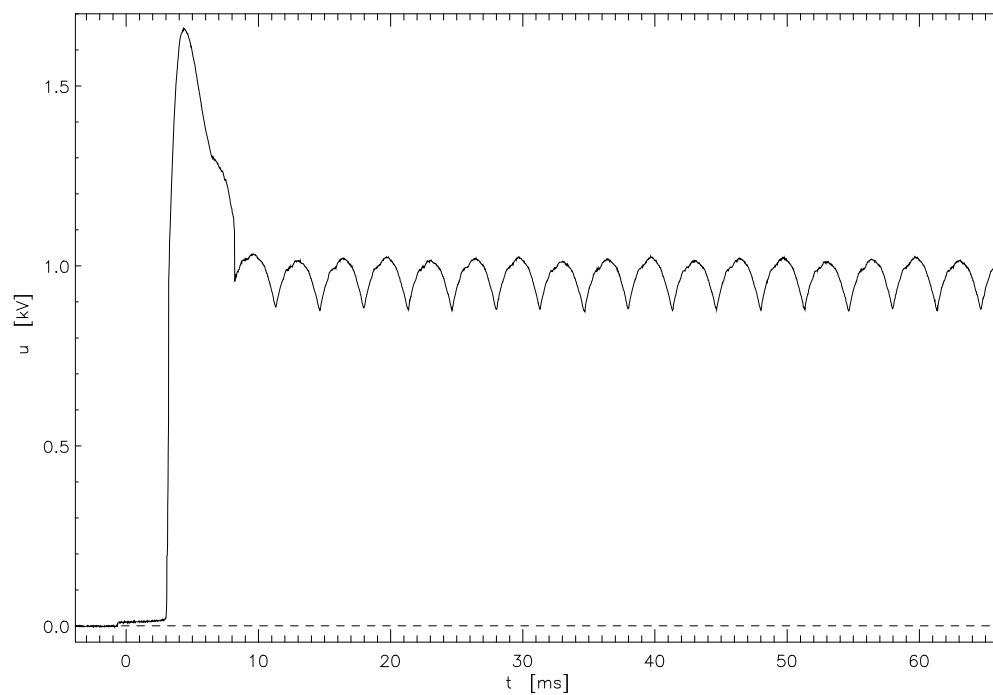
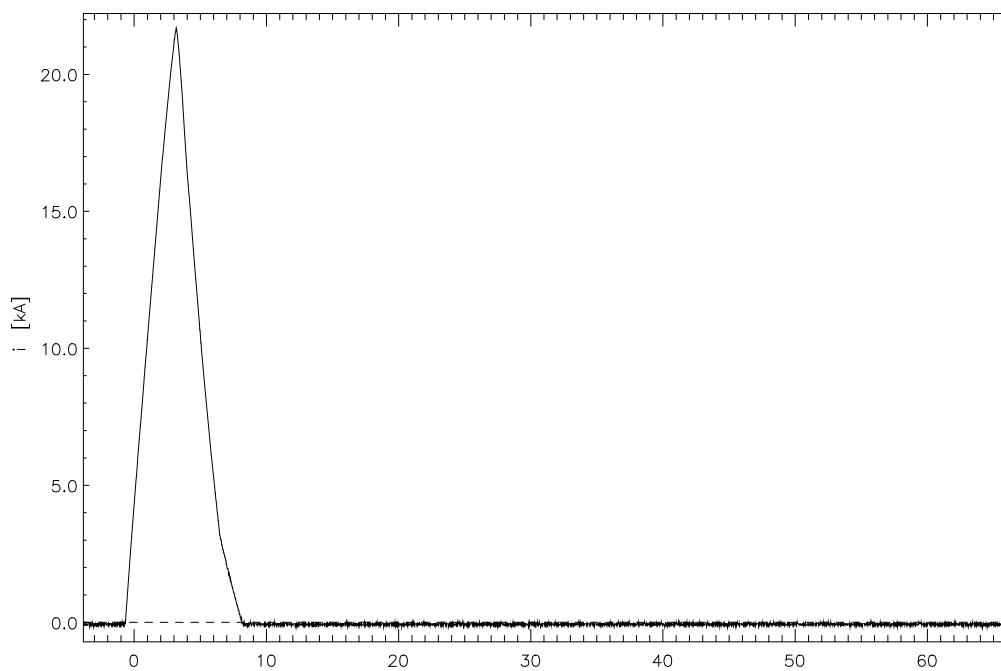


Photo 12: Test object No. 23 after test

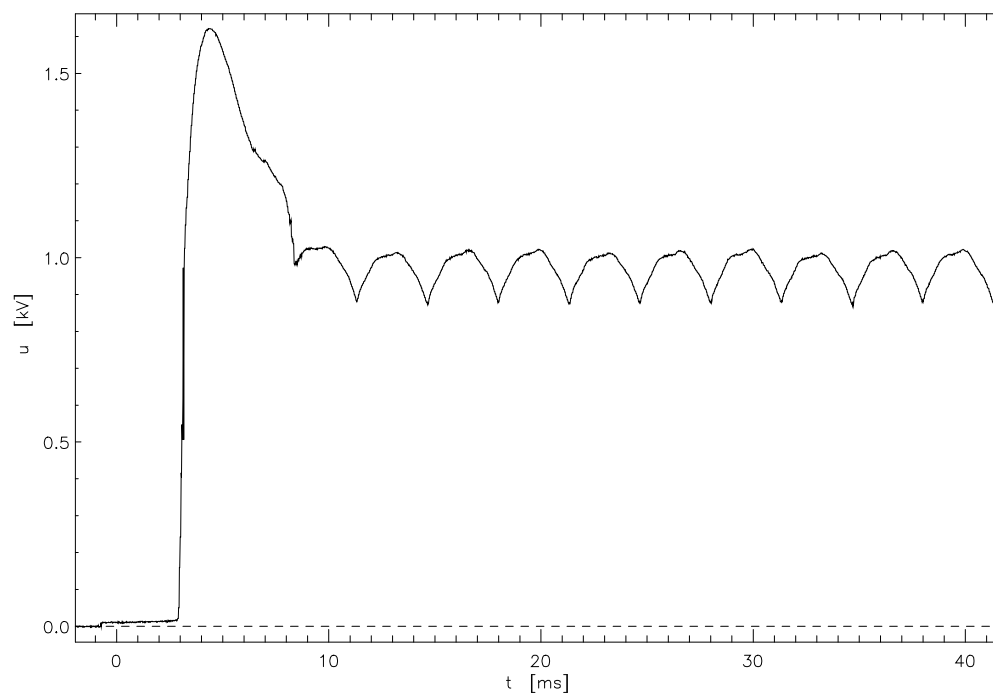
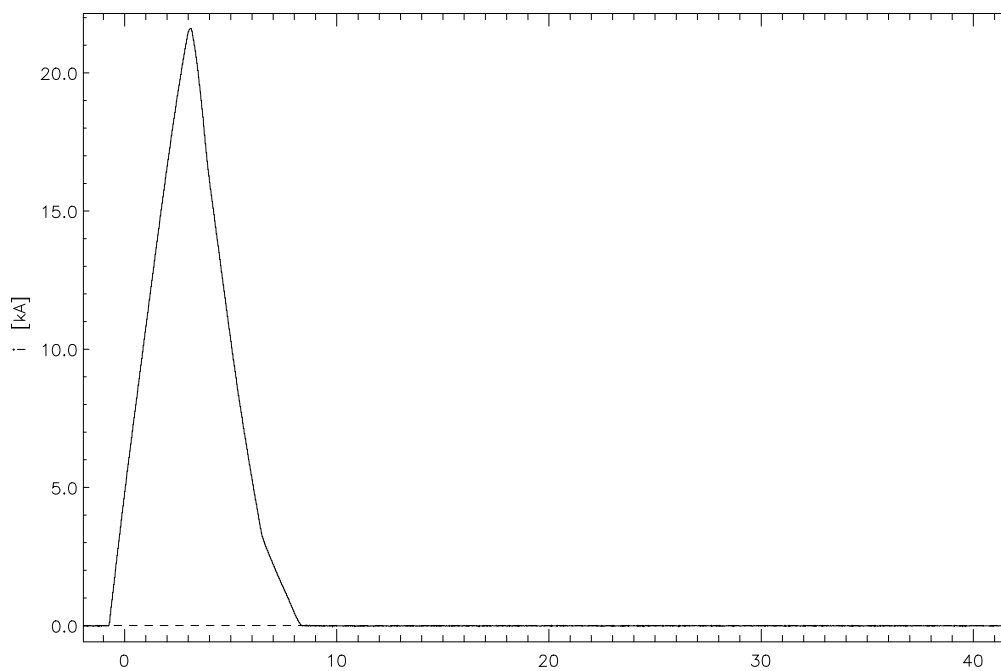
5. Oscillograms



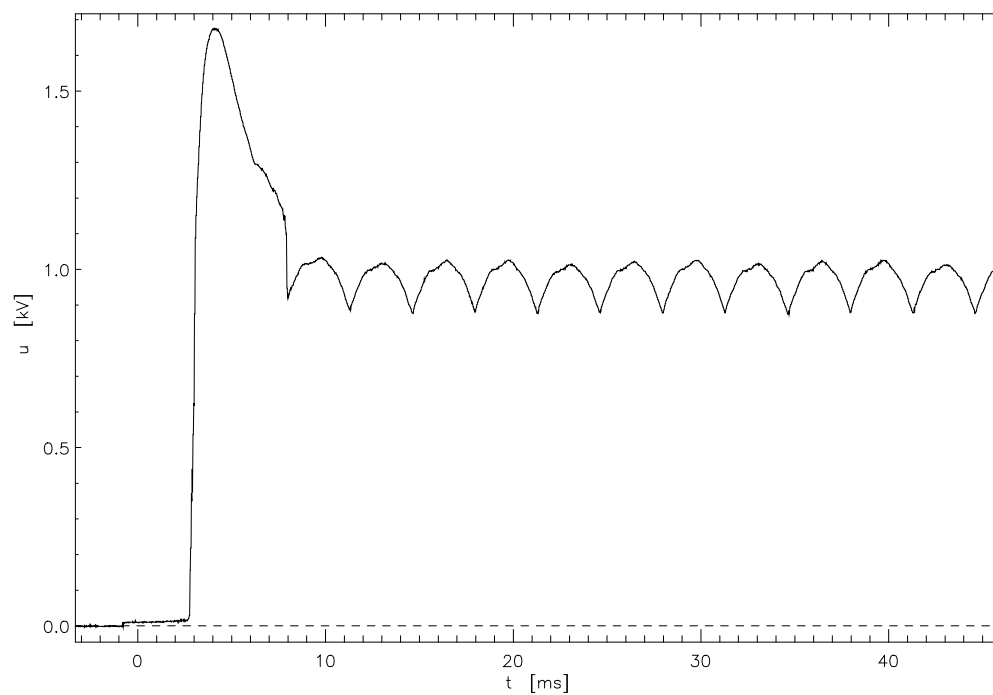
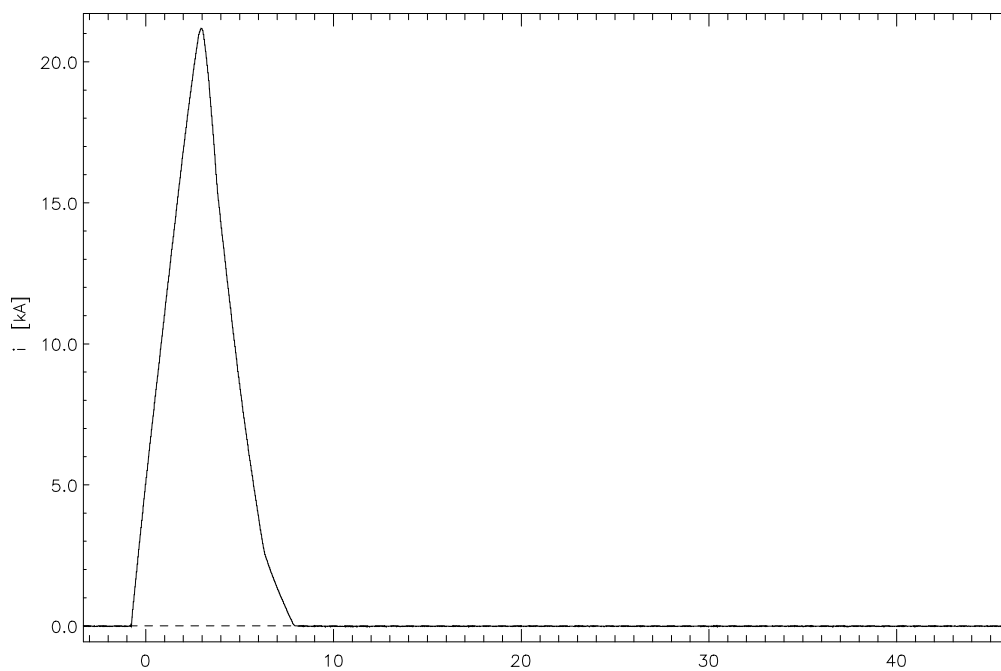
Test-No. 2102902



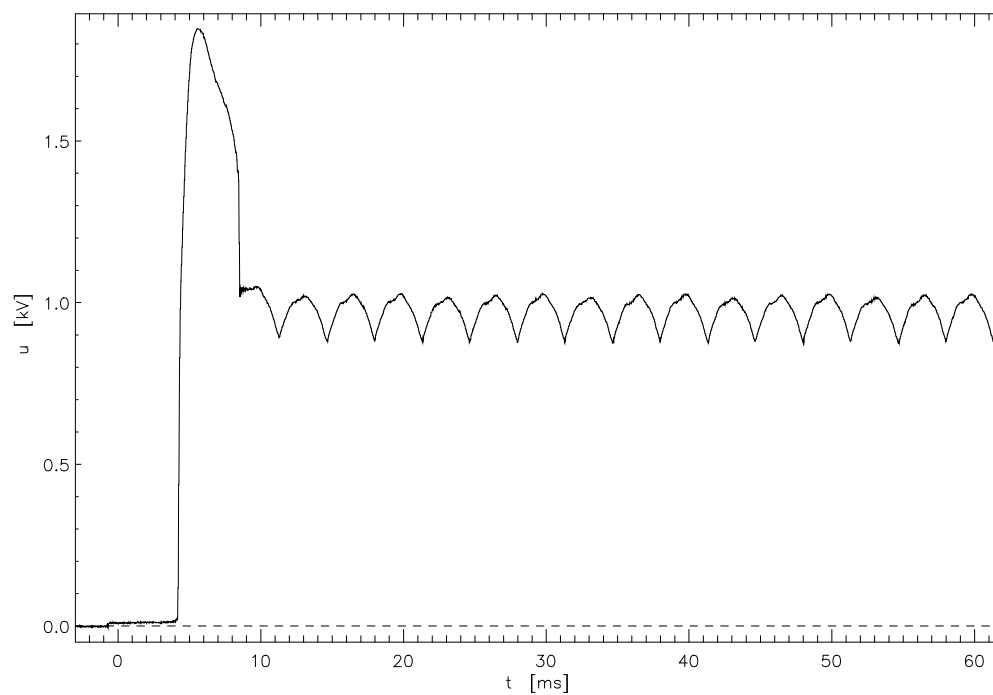
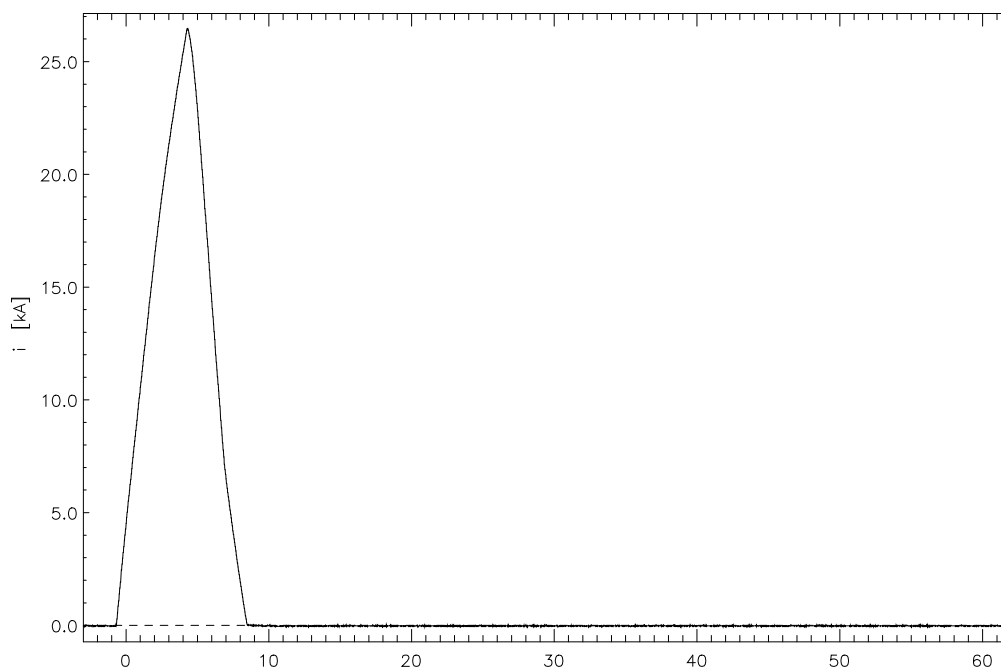
Test-No. 2102903



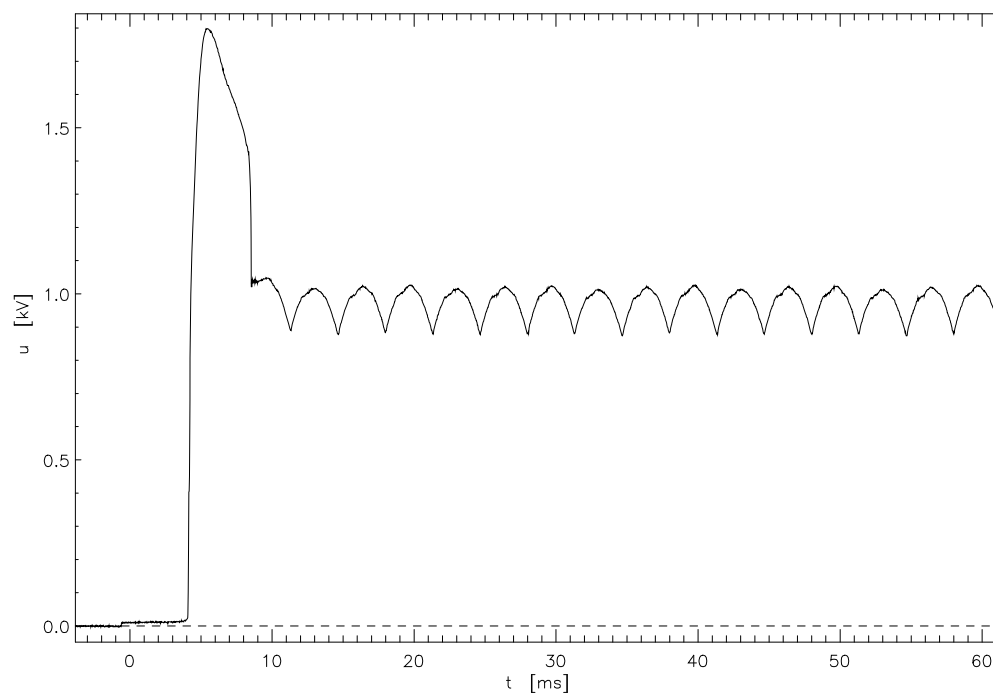
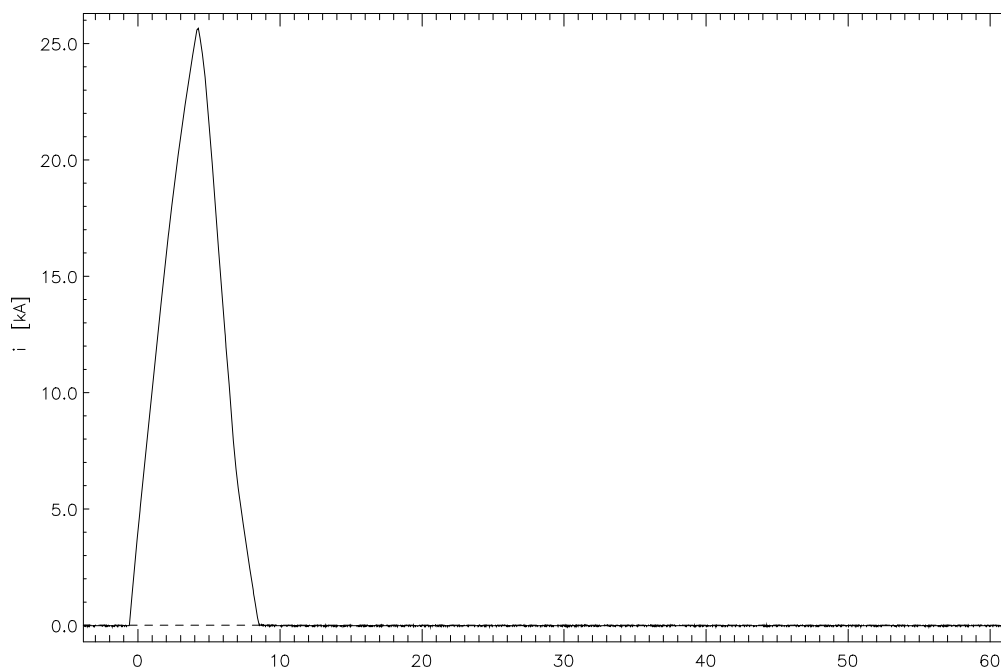
Test-No. 2102904



Test-No. 2102905



Test-No. 2102906



Test-No. 2102907

