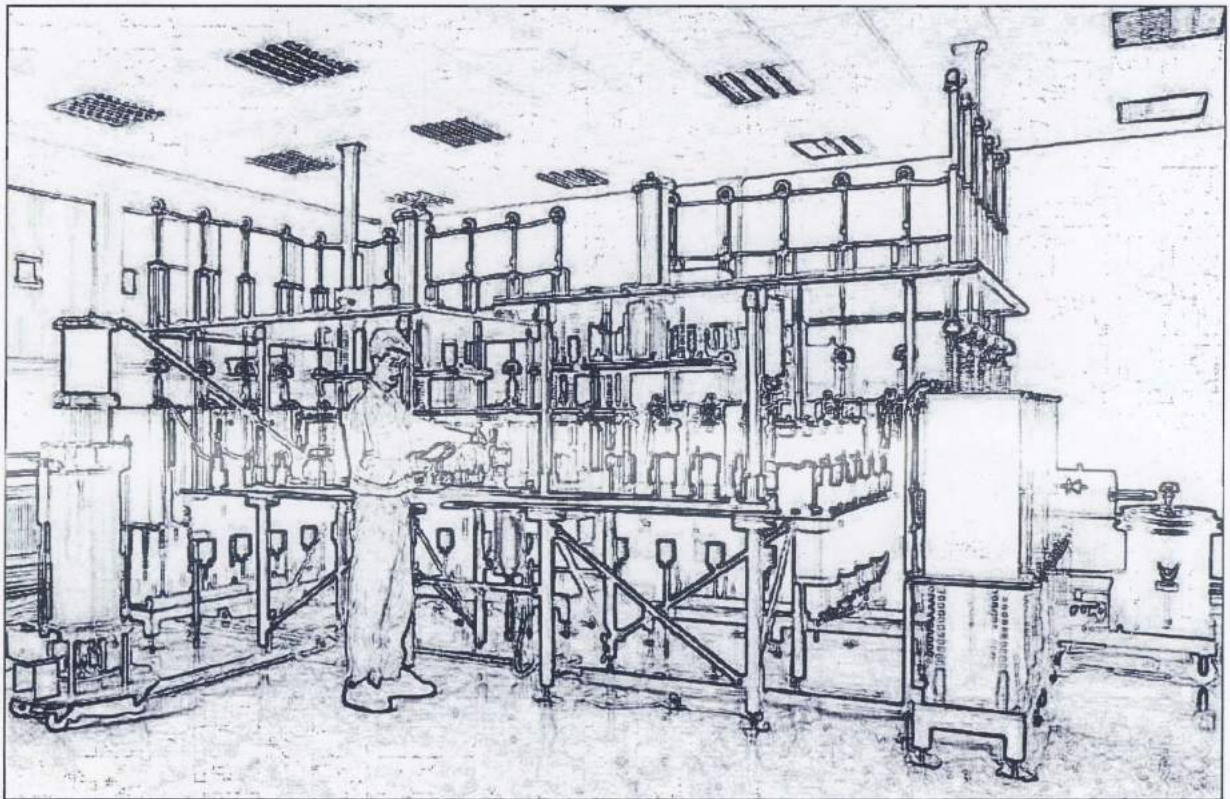


Test report



Report no.: BET/Schirtec 2-04-07-13

Date of test: 2004-06-21

Test engineer: Dipl.-Ing. M.Benzin

Customer: Schirtec Trading GmbH
Ignaz-Köck-Strasse 8 / Top 3
1210 Wien
Austria

1. Customer

Schirtec Trading GmbH
Ignaz-Köck-Strasse 8 / Top 3
1210 Wien
Austria

2. Device under test (DUT)

Name: Early Streamer Emission Lightning Conductor (ESELC)
type "Schirtec - DA"

Supplier: Schirtec Trading GmbH
Ignaz-Köck-Strasse 8 / Top 3
1210 Wien
Austria

Technical data: Weight: 3,7kg
Lenght: 700mm
Maximum outside diameter: 120mm

A Photo is given in annex A.

3. Demand of test

At this very moment there are not any european standards to test active lightning protection components as known as early streamer emission rods with lightning current impulses. But the device under test is used as an external lightning component and therefore the impulse current test in accordance to the EN 50164-1 (1999-09) § 6.3 "Electrical test" class H is tested.

4. Realisation of test

Three samples of the device under test are stressed with 3 current impulses with the peak value of 100kA. The time interval between the individual shots allows the arrangement to cool down close to ambient temperature. The impulse current is defined by its peak value (100kA $\pm 10\%$), its specific energy (2.5MJ/ Ω $\pm 20\%$) and its duration (≤ 2 ms).

For this test only the impulse current capability of the active part of the DUT is tested. The performance of the connection parts is neglected.

5. Measured results

Test name : Schirtec-040621			Date : 21.06.2004 12:00:26	
Counter	Sample	Peak Value	Specific Energy	Duration
10	2.1	102 kA	2.58 MA ² s	1,35ms
11	2.1	102 kA	2.51 MA ² s	1,35ms
12	2.1	102 kA	2.50 MA ² s	1,40ms
13	2.2	102 kA	2.51 MA ² s	1,35ms
14	2.2	102 kA	2.52 MA ² s	1,40ms
15	2.2	102 kA	2.45 MA ² s	1,40ms
16	2.3	102 kA	2.49 MA ² s	1,35ms
17	2.3	102 kA	2.52 MA ² s	1,35ms
18	2.3	102 kA	2.43 MA ² s	1,30ms

The oscillograms are given in annex B.

6. Test result

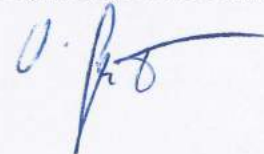
The active part of the device under test showed no visible damage due to the effects of the current impulses. During the impulse current test the sample 2.2 blew out plasma above and below the metal cage.

Photos of the test samples are shown in annex A.

The DUT has passed the impulse current test that is described in subclause 3 with 100kA in accordance to the EN 50164-1 (1999-09).

2004-07-13
 BET GmbH
 Fischkuhle 39
 D- 58710 Menden

Test engineer
 Dipl.-Ing. M.Benzin



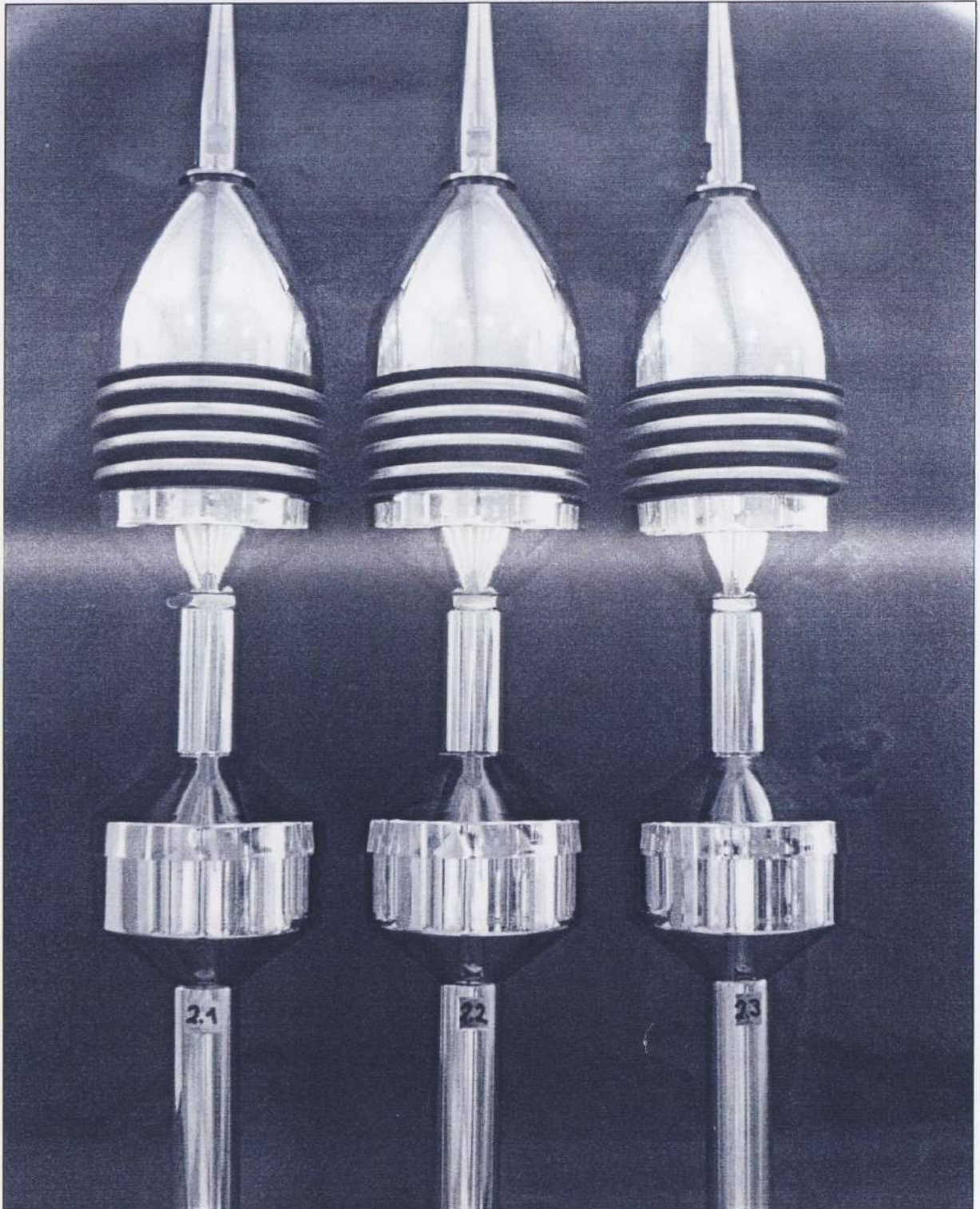
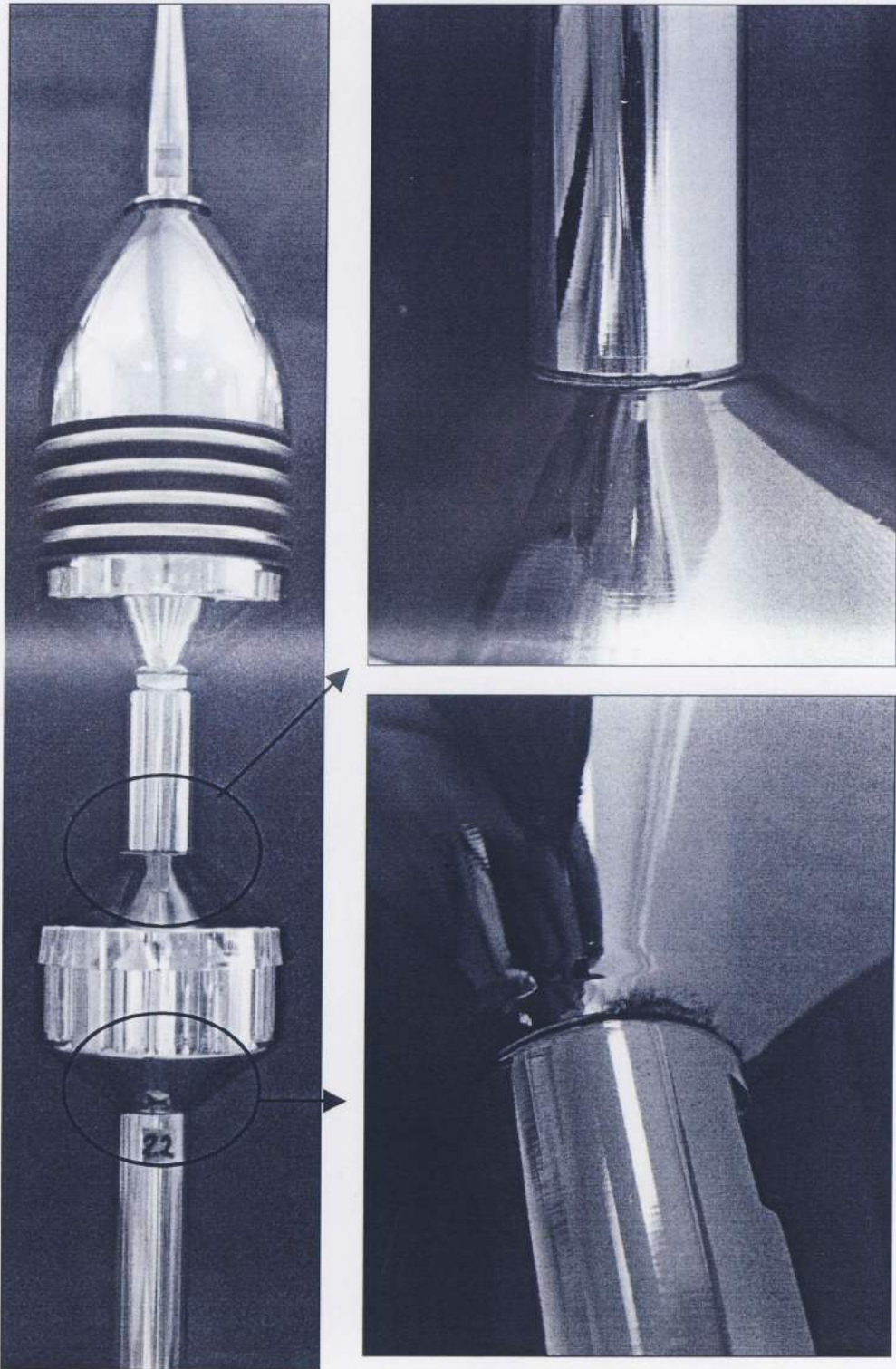


Figure 1: DUT after the impulse current test

This report only explains the samples submitted for test and does not produce evidence for the quality of standard fabrication. Publishing or copying is subject to prior permissions of BET GmbH.



Figures 2 - 4: test sample 2.2 after the impulse current test