



## Test report

**No.:** 04.07.09.179

**Version:** 1/2

Customer : Ofil Ltd.  
Israel  
74140 Nes Ziona

Test object : DayCor II camera

Type : -  
Manufacturer : Ofil  
Date of receipt : -

Date of test : 20.08.2004

Applied test regulations : NEMA Standards Publication No. 107-1987  
Methods of Measurement of Radio Influence Voltage (RIV) of High-Voltage Apparatus

Test carried out : Sensitivity test with a DayCor II camera in parallel to a RIV measurement at 1 MHz with a test voltage of 50 Hz.

Test result : With the DayCor II camera it is possible to detect from a distance of 10 m partial discharges on a needle on high voltage of 15 kV that will cause a RIV level of 15 dB $\mu$ V at 1 MHz.

Specialist testers : Mr. D. Borneburg, Mr. U. Amen, Mr. J. Reuter

Dortmund, 26.08.2004

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Mr. U. Amen  
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Report No. 04.07.09.179 contains 6 pages.

\*) Scope of accreditation and type of documentation see overleaf. Test results in this report are only valid for the tested objects.  
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## Summary

RWE Eurotest performed a Sensitivity test with a DayCor II camera in parallel to a RIV measurement at 1 MHz with a test voltage of 50 Hz.

With the DayCor II camera it is possible to detect from a distance of 10 m partial discharges on a needle on high voltage of 15 kV that will cause a RIV level of 15 dB $\mu$ V at 1 MHz.

August 26, 2004

comments by Dr.Dirk Borneburg

In the RIV measurement we measured the pd level before and after the test.

The apparent charge was about 4 pC.

We were not able to decrease this level like the previous time to 1.5 pC. However, if it is possible to detect 1.5 pC it's also possible to perform a RIV measurement leading to results below 15 dB $\mu$ V.

We estimated the minimum detectable RIV level with the DayCor II camera to be 6 dB $\mu$ V.

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**1. Applied test regulations**

**NEMA Standards Publication No. 107-1987**

Methods of Measurement of Radio Influence Voltage (RIV) of High-Voltage Apparatus

**2. Technical data of the test object**

DayCor II camera

Serial No.: SN 52

**3. Test and measuring equipment**

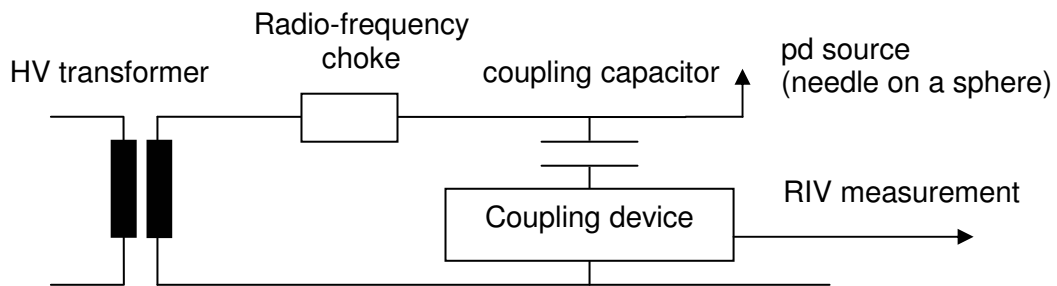
Equip.-No.	cal.	Equipment	Type	Manufacturer
617		DayCor II camera	UV camera	Ofil Ltd.
107		Testtransformer 1 350 kV	WOF	Fischer
113		Thoma-Regler 0-500 V 600 kVA	LT/R	Fischer
109		HF-Filter	B84299-G59	Siemens
429	*	Peak voltage measuring-system	div.	Haefely
523		Test receiver	ESS	Rhode & Schwarz
-		Coupling device	-	Self-construction
-		Radio-frequency choke 1 kΩ	-	Self-construction
-		Coupling capacitor 2000 nF	-	Self-construction

\*) Measuring equipment is calibrated based on national and international reference standards. Calibration certificates can be inspected on request.

*Table 1: Test and measuring equipment*

#### 4. Tests carried out and results

According to the specifications of the client a needle (hypodermic needle with a diameter of 2.0 mm) on high voltage potential is used as a source for partial discharges and observed in a distance of 10 m with the DayCor II camera. The ambient conditions during the observation are 22 °C, 1008 hpa and 62 % rel. humidity. Figure 1a shows a diagram and Figure 1b and 1c a photo of the Test setup.



a)



b)



c)

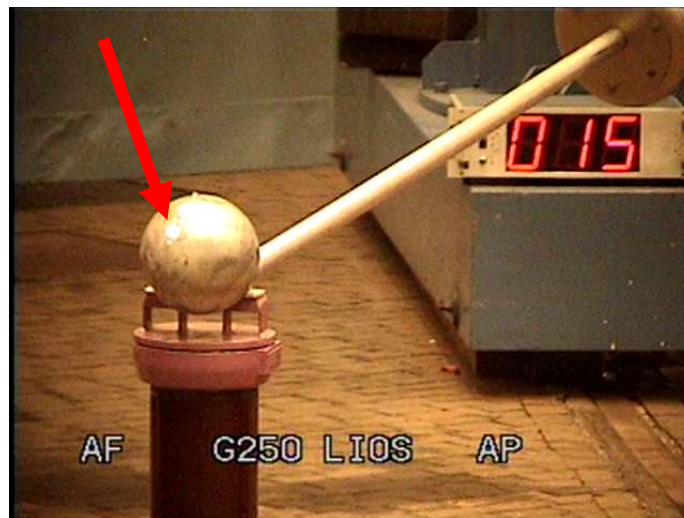
Figure 1: a) Diagram of the test setup.

b) Photo of the test setup.

c) Detailed Photo of the needle placed on a sphere (hypodermic needle with a diameter of 2.0 mm).

Before performing the sensitivity test the circuit is calibrated by applying between the coupling capacitor and earth the unmodulated sine wave output signal of the test receiver turned to the desired measuring frequency of 1 MHz. The output of this signal generator is set to a level of  $E_{ab} = 96 \text{ dB}\mu\text{V}$  while the ambient noise level is about  $2 \text{ dB}\mu\text{V}$ . The decoupled voltage  $E_{cd} = 38,21 \text{ dB}\mu\text{V}$  is measured at the test receiver. Both calibrating voltages ( $E_{ab}$  and  $E_{cd}$ ) are measured with the same instrument so that error is minimized. Detector function selector is set to quasi-peak detection. The coaxial cable of the length to be used for RIV measurements is in the circuit when the test calibration is made. The circuit RIV factor  $P = E_{cd}/E_{ab} = 0.40$  is above 0.25 at midband at 1 MHz according to the specifications of the NEMA standard.

For the sensitivity test the DayCor camera is placed in a distance of 10 m to the needle on high voltage. Camera settings are LI = 0 second and Gain = 250. At the inception voltage of 15 kV the measured voltage level is  $6 \text{ dB}\mu\text{V}$  and the source of partial discharge can be detected with the DayCor II camera, see figure 2. The corresponding RIV level is  $15 \text{ dB}\mu\text{V}$ .



*Figure 2: Single frame of the observed needle at high voltage with the camera setting LI = 0 second and Gain = 250. The applied voltage level in kV is recognizable on the display in the background.*

With the DayCor II camera it is possible to detect from a distance of 10 m partial discharges on a needle on high voltage of 15 kV that will cause a RIV level of  $15 \text{ dB}\mu\text{V}$  at 1 MHz.

**- End of test report -**