

**Type Test Certificate of** Complete type tests

**Apparatus** Oil-immersed power transformer

**Designation** PC21/11 – 630/30.AL  
Rated power 630 kVA ; Rated voltages 30/0,4 kV ; Rated frequency 50 Hz

**Manufacturer** SACEM Industries – Tunis - TUNISIA

**Tested for** SACEM Industries – Tunis - TUNISIA

**Date(s) of tests** **from** August 30, 2011 **to** September 30, 2011

**Tested by** CESI S.p.A. - Milan - ITALY

The apparatus, constructed in accordance with the description, drawings and photographs incorporated in the reference documents, identified in this certificate, has been subjected to the series of proving tests in accordance with

**IEC 60076-2 (2011)**  
**IEC 60076-3 (2000), clause 13**  
**IEC 60076-5 (2006)**

**This Type Test Certificate has been issued by CESI following exclusively the STL Guides.**

The results are shown in the record of Proving Tests and the oscillograms attached in the Test Reports. The values obtained and the general performance are considered to comply with the above Standards and to justify the ratings assigned by the Manufacturer as listed on page No.2.

The Certificate applies only to the apparatus tested. The responsibility for conformity of any apparatus having the same designations with that tested rests with the Manufacturer.

Only integral reproduction of this Certificate, or reproductions of this page accompanied by any pages on which are stated the endorsed ratings of the apparatus tested, are permitted without written permission from CESI.

<b>No. of pages</b>	3	<b>No. of pages annexed</b>	-
<b>Issue date</b>	October 21, 2011		
<b>Prepared</b>	PPR - Arneodo Giorgio <small>B1031638 2965 AUT</small>		
<b>Verified</b>	PPR - Vidori Mauro, TPI - Pizzi Franco <small>B1031638 1800809 VER B1031638 3019 VER</small>		
<b>Approved</b>	PMI - The Manager - Arcidiaco Lorenzo <small>B1031638 821814 APP</small>		

**CESI** s.p.a.  
Testing & Certification Division  
Testing Operations Area  
"Milan Platform"  
Manager

*Lorenzo Arcidiaco*

**1 - Ratings assigned by the Manufacturer as proved by the tests**

rated power	630 kVA
number of phases	3
rated voltage of the high-voltage winding (primary winding)	30 kV
rated voltage of the low-voltage winding (secondary winding)	400 V
rated current of the high-voltage winding (primary winding)	12,12 A
rated current of the low-voltage winding (secondary winding)	909,3 A
rated frequency	50 Hz
connection symbol	Dyn11
short-circuit impedance	5,95 %
load loss	5868 W
no-load current	0,31 %
no-load loss	1203 W
rated insulation level of the high-voltage winding (primary winding)	LI 170 AC 70
cooling method	ONAN

**2 – This Certificate also verifies**

Determination of sound levels.

**3 – Reference documents**

*The following reference documents are integral part of this Certificate*

No.	Description	CESI registration
1	CESI Test Report	B1026506
2	CESI Test Report	B1028774
3	CESI Test Report	B1028990
4	Manufacturer's drawings	B1030355 no. 1 to 12

**4 – Additional references**

The conformity of the product is attested with reference to the Standard mentioned in the front sheet and to the following documents

IEC 60076-1 (2011) clauses 11.2 to 11.5  
IEC 60076-3 (2000) clauses 11 and 12.2.1  
IEC 60076-10 (2001)

**5 – Record of proving tests**

The table below lists all the tests performed and the references to the relevant Test Reports containing the test values.

<b>No. Standard and clause</b>	<b>Description of tests</b>	<b>Reference documents</b>
IEC 60076-1 clause 11.2	Measurement of winding resistance	B1026506
IEC 60076-1 clause 11.3	Measurement of voltage ratio and check of phase displacement	B1026506
IEC 60076-1 clause 11.4	Measurement of short-circuit impedance and load loss	B1026506
IEC 60076-1 clause 11.5	Measurement of no-load loss and current	B1026506
IEC 60076-3 clause 11	Separate-source AC withstand voltage test	B1026506
IEC 60076-3 clause 12.2.1	Induced AC withstand voltage test	B1026506
IEC 60076-2	Temperature rise test	B1026506
IEC 60076-3 clause 13	Lightning impulse (LI) test	B1028990
IEC 60076-5 clause 4.2	Dynamic ability to withstand short circuit	B1028774
IEC 60076-10	Determination of sound levels	B1026506

**6 – Identification of the sample**

The Manufacturer guarantees that the tested object is manufactured according to the submitted drawings. CESI checked that these drawings adequately represent in shape and dimensions the essential details and the parts of the tested object.

These drawings identified by CESI and numbered B1030355 no. 1 to 12 have been returned to the Client.