economia

energia

ecologia

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Ao Sol - Energias Renováveis, S.A.

Porto Alto, Portugal

www.aosol.pt

João Correia de Oliveira
General Director

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Institutional Presentation

Agenda

- Purpose
- The Company
- The Markets
- The Products and Services

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Purpose

- Solar Keymark Workshop, Lisbon, 10th November 2006 Promoted by CIES 2006
- Ao Sol Certification experience

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The Company

- Shareholding Structure:
  - Enerpura S.A. 80%
  - De Viris S.A. 20%
- Share Capital € 2.000.000
- Founded 1998

Functional Organization

Board of Directors

Quality
Environment
Safety

Financial
Control

R&D

Engineering

Marketing and
Commercial

Production

•Industrial process and Market Focused

•Conceptual Solutions

•Market Focused

•Technology
•Competitiveness

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Accreditations

- **The Products - CPC Collectors and Compact Systems**
  - Certif / European Standards:
    - EN 12975 -1/2
    - EN 12976 -1/2
  - Solar Keymark /ESTIF
- **The Company** (under certification process)
  - ISO 9001: 2000
  - ISO 14001:2004

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Associated Member of

- ESTIF - European Solar Thermal Industrial Federation
- spes - Sociedade Portuguesa de Energia Solar
- APISOLAR - Associação Portuguesa da Indústria Solar

Company's Policy

- Market Oriented
- Technology Leadership
- Superior Quality
- Energy Rationalization / Environment Care as *"Paramounts"*
- Creating value for Customers

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The Markets

- Segments
  - Residential: Individual houses; Buildings.
  - Commercial: Hotel and resorts; Clinics; Schools;...
  - Special Projects: Industry; Shopping Malls;...
- Geography
  - Portugal and Spain;
  - EU;
  - USA.

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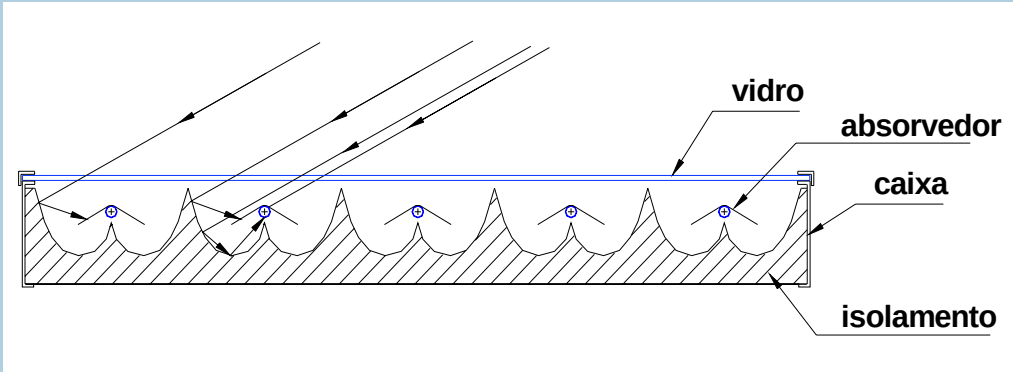
The Technology

- The CPC solar thermal collectors are the result of R&D long term programs;
- The CPC technology is a Portuguese, Ao Sol, patented, unique in the world.
- The technology is different by means of superior quality and higher efficiency.



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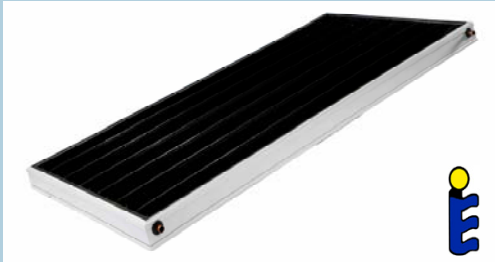
The Products Current

Hot water and space heating

- CPC
  Stationary Solar Thermal Collector
  (compound parabolic concentrator)



- KIT AO SOL190

- KIT AO SOL 350

The Products Future

- CPC Maxi
- 3E Series
- Innovative / Attractive Design Series

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The Services

- Conceptual Solutions - tailor made
- Feasibility Studies
- Integrated Solutions: water and energy consumption / efficiency
- Engineering and Financing Packages
- Turn-key Solutions

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Certification
Solar keymark
Our experience

Certifications of our products started in 2004

Solar Keymark:
For CPC AO SOL in 16/03/2005
For Compact systems in 11/09/2006!

Problems in Certification (EN12975-1/2) that should Be discuss and change:
-The way to measure the efficiency for flat plates collector are different then the CPC collectors (it have the concentrator Factor, the direct and diffuse radiation should be divide by the concentration);
-The test pressure shall be change to reduce the time request 15 min is to much time!! In industrial production process;

The forms of each lab should have the some structure With the some data information.

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Certification
Solar keymark
Our experience

certif
Rua José Afonso, 9 E – 2810-237 Almada – Portugal
Tel. 351. 21 258 69 40 – Fax 351. 21 258 69 59

LICENCE TO USE KEYMARK

LICENÇA PARA O USO DA KEYMARK

Annex to the Licence no. / *Anexo à Licença nº* **PSK - 002/2005** **Date:** / *Data:* 2005-03-16

Type / *Tipo*:	CPC
Dimentions / *Dimensões* :	
Absorber area / *Área do absorsor*	1,93 m^2
Aperture area / *Área de abertura*	1,98 m^2
Gross area / *Área total*	2,24 m^2
Working pressure / *Pressão de funcionamento*:	600 kPa (6 bar)
Transference fluid / *Fluído de transferência*:	Water + glycol propylene / *Água + propileno glicol*
Weight / *Peso*:	38 kg
Pressure drop / *Perda de carga* :	0,059 kgs^{-1} – 314 Pa
Stagnation temperature / *Temperatura de estagnação*:	151 ºC
Instantaneous efficiency / *Rendimento instantâneo (área de abertura)*:	

$$\eta_0 \quad - \quad 0,736$$

$$a_1 \ (W/^oC\,m^2) \quad - \quad 4,61$$

Time constant / *Constante de tempo*:	47 *s*
Thermal capacity / *Capacidade térmica*:	15,5 kJ / K
Incidance angle modifier (incidance angle of 50º) / *Modificador de ângulo (angulo de incidência de 50º)*:	0,93.

Note 1 / *Nota 1*: The freeze resistance test (clause 5.8 of EN 12975-2) was not carried out. The manufacturer declares that certified solar collector used with frost protection mixture can be used in frost exposed areas / *O ensaio de resistência ao congelamento (secção 5.8 da EN 12975-2) não foi efectuado. O fabricante declara que o colector solar térmico certificado, quando utilizado com mistura de fluido anti-congelante pode ser utilizado em ambientes com gelo.*

Note 2 / *Nota 2*: The impact resistance test (clause 5.10 of EN 12975-2) was not carried out. Optional test / *O ensaio de resistência ao impacto (secção 5.10 da EN 12975-2) não foi efectuado. Ensaio Opcional.*

Francisco Barroca
General Manager *Director Geral*

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DIN CERTCO
Gesellschaft für Konformitätsbewertung mbH

Summary of System Test Data – Solar KEYMARK

Registernummer: 011-7S015-A
(wird von DIN CERTCO eingetragen)

Anlage zum Zertifikat für
Solaranlagen zur Trinkwassererwärmung nach DIN EN 12976

Seite 1 von 2

Zertifikatsinhaber

Firma:	Solahart Europe
Straße:	Vlamovenweg 12
PLZ/Ort:	5708 JV Helmond, Niederlande

Produktbezeichnung:	302KF, 302KF Freeheat
Typ:	Thermosyhpon-Anlage

Prüflaboratorium:	Institut für Thermodynamik und Wärmetechnik (ITW)	**Prüfbericht:**	
Straße:	Pfaffenwaldring 6	Bericht-Nr.:	04SYS30
PLZ/Ort:	707550 Stuttgart	vom:	13.12.2004

Kollektor:

Typ:	Solahart Kollektor KF		Länge:	1936	mm
Bauart:	Flachkollektor		Breite:	1022	mm
Bruttofläche:	1,98	m²	Höhe:	80	mm
Aperturfläche:	1,86	m²	Zul. Wärmeträger:	Wasser-Glycol	
Gewicht:	42	kg	**Registernummer:**	011-7S013 F	

Speicher:

Typ:			Länge:	2310	mm
Bauart:	emaillierter Stahlspeicher (horizontal)		Durchmesser:	510	mm
Nenninhalt:	300	Liter	Zul. Betriebstemperatur:	90	°C
Wärmedämmung:	Polyurethan		Zul. Betriebsüberdruck:	8,0	bar
Wasserseitiger Korrosionsschutz:	Magnesium Anode		Wärmeübertrager:		
Elektrische Widerstandsheizung:	Nicht vorhanden	kW	▪ Kollektorkreis:	Mantelwärmeübertrager	
			▪ Nachheizkreis:	Nicht vorhanden	

Regler: **Wird nicht benötigt**

Hersteller:		Empfohlene Einstellwerte:	
Typ:		▪ Ein- / Ausschalttemperaturdifferenz Kollektorkreis:	K
Regelfunktionen:		▪ Solltemperatur / Hysterese Nachheizung.	°C
Zusatzfunktionen:		▪ Volumenstrom Kollektorkreis:	m³/h

Wärmeträgerfluid Solarkreislauf:

Art	Wasser-Glycol

DIN CERTCO • Alboinstraße 56 • D-12103 Berlin
Tel: +49 30 7562-1140 • Fax: +49 30 7562-1141 • E-Mail: zentrale@dincertco.de • www.dincertco.de

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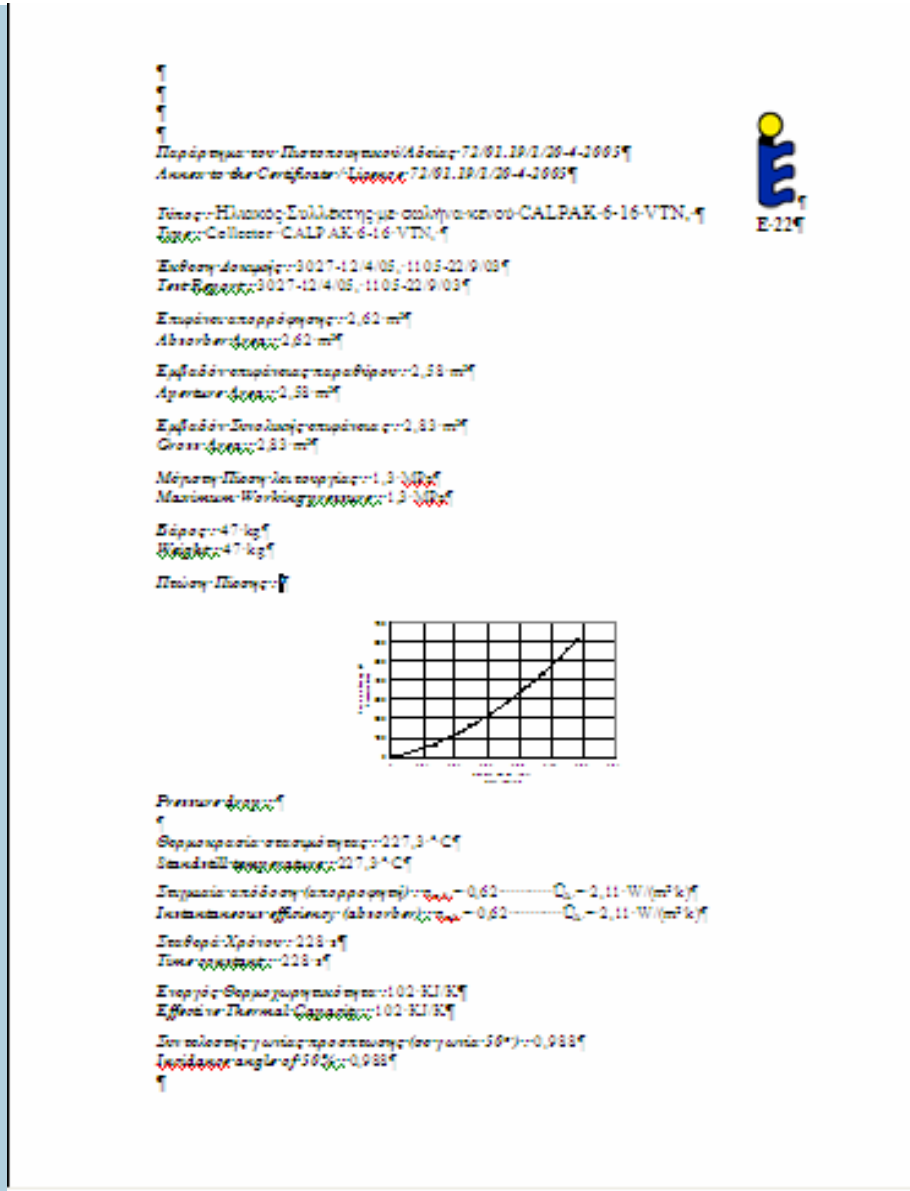

Παράρτημα του Πιστοποιητικού Αδείας 72/01.10/1/20-4-2005
Annex to the Certificate License 72/01.10/1/20-4-2005

Τύπος: Ηλιακός Συλλέκτης με σωλήνα κενού CALPAK-6-16-VTN,
Type: Collector CALPAK-6-16-VTN,

Ενδεικτικά δοκιμής: 3027-12/4/05, 1105-22/9/05
Test Results: 3027-12/4/05, 1105-22/9/05

Επιφάνεια απορρόφησης: 2,62 m²
Absorber Area: 2,62 m²

Εμβαδόν επιφάνειας παραθύρου: 2,58 m²
Aperture Area: 2,58 m²

Εμβαδόν Ακαθαρίστου επιφάνειας: 2,83 m²
Gross Area: 2,83 m²

Μέγιστη Πίεση Λειτουργίας: 1,3 MPa
Maximum Working Pressure: 1,3 MPa

Βάρος: 47 kg
Weight: 47 kg

Ποιότητα Πίεσης:

Pressure Drop:

Θερμοκρασία στασιμότητας: 227,3 °C
Standstill temperature: 227,3 °C

Συντελεστής απόδοσης (απορρόφησης): η_{abs} = 0,62 ---------- C_L = 2,11 W/(m² K)
Instantaneous efficiency (absorber): η_{abs} = 0,62 ---------- C_L = 2,11 W/(m² K)

Σταθερά Χρόνου: 228 s
Time constant: 228 s

Ενεργός Θερμοχωρητικότητα: 102 KJ/K
Effective Thermal Capacity: 102 KJ/K

Συντελεστής γωνίας προσπτώσης (για γωνία 50°): 0,988
Incidence angle of 50°: 0,988

E-22

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Final Statement

I - **“Ao Sol”** is ready to cooperate with other technology leaders to jointly offer combined and innovative solutions

II - **“Ao Sol”** keeps its R&D team and quality label as a key factor for market accreditation

III - **“Ao Sol”** Solar Thermal Energy for a sustainable future

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Obrigado

Thank “U”

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