



Certificate no. PSK – 008/2015
Certificado nº

Name and address of certificate holder:
Nome e morada do titular do certificado:

Ati di Mariani & c.s.n.c.
 Via Enrico Mattei, 461
 Zona Ind. 4 Torre del Moro
 47522 Cesena (FC)
 Italy

Product:
Produto:

Thermal solar system and components - Factory made system
Instalação solar térmica prefabricada e seus componentes

Type references:
Referências:

TOTEM

Trademark(s):
Marca(s) comercial(is):

Technical characteristics:
Características técnicas:

Summary of EN 12976 Test Results: Registration No. PSK-008/2015,
 (in annex)
*Resumo dos resultados dos ensaios realizados segundo a norma EN 12976:
 Registo Nº PSK-008/2015, (em anexo)*

This product is in conformity with:
Este produto está em conformidade com:

EN 12976-1:2006, EN 12976-2:2006

and with the Specific Keymark Scheme Rules for Solar Thermal Products
e com as Regras Particulares do CEN Keymark Scheme para Produtos Solares Térmicos.

Test report(s) ref. / Issued by:
Relatório(s) de ensaios nº(s) / Emitido(s) por:

12.v2/DER-LECS/2009 / INETI-LECS

Additional information (if any):
Informação adicional (se existir):

This certificate is valid until:
Este certificado é válido até:

2020-06-21

and supersedes certificate no:
e substitui o certificado nº:

Date of issue:
Data de emissão:

2015-06-22

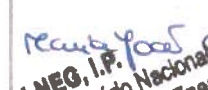


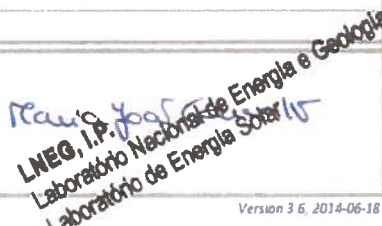
Francisco Barroca
 General Manager / *Diretor Geral*



This Certificate includes one Annex with 2 (two) pages
 Este Certificado é constituído por um Anexo com 2 (duas) páginas



Summary of	EN12976-2	SOLAR SYSTEM test results	Licence Number	PSK-008/2015						
Annex to Solar KEYMARK Certificate			Issued	2015-06-22						
Company	ATI di MARIANI & c. s.n.c.		Country	Italy						
Brand (optional)			Website	www.atimariani.it						
Street	Via Enrico Mattei, 461 - Zona ind. 4 Torre del Moro		E-mail	info@atimariani.it						
Postal Code	47522	CESENA (FC) - Itália	Tel. / Fax	+39 0547-609711 /609724						
System classification										
Application(s)			Hot water							
Solar loop, circulation principle			Other							
Direct solar loop / heat exchanger			Direct							
Open, vented or closed solar loop			Closed							
Drain back/down			Always filled (no drain)							
Store location			Int. collector-store							
Store orientation (of main axis)			Vertical							
Type of auxiliary heating (internal back-up heat)			None							
If other auxiliary/internal back-up heating, please specify:										
Solar+supplementary OR Solar-only / Solar pre-heat			Solar only / Solar preheat							
Collector(s)			Heat store(s)							
Company	ATI di MARIANI & c. s.n.c.		Company	ATI di MARIANI & c. s.n.c.						
Keymark lic.no. if available	---		Keymark lic.no. if available	---						
Collector name	Per module			Store name	Total nominal volume	Gross height	Gross width	Gross depth	Auxiliary heated volume	Electrical aux. heating power
	Gross Area (Ag)	Gross length	Gross width							
---	m ²	mm	mm	Totem	120	2174	300	300	---	---
Solar loop controller			Solar loop fluid							
Keymark lic.no. if available	---		Recommended/required	No recommend./requirements						
Company	---		Company	---						
Name	---		Name	---						
Solar loop pump - power range	---	W to --- W	Freezing point	--- °C						
System family overview										
Collector name	Number of collectors in each configuration for each store									
	Store name									
---	Totem									
	1									
Testing Laboratory										
			LNEG							
Website										
			www.lneg.pt							
Test report id. number										
			n.º12.V2/DER-LECS/2010							
Date of test report										
			2010-06-16							
Comments of test lab										
No comments.			 LNEG, I.P. Laboratório Nacional de Energia e Geologia Laboratório de Energia Solar							

Summary of	EN12976-2	test results	Certification No.	PSK-008/2015												
Annex to Solar KEYMARK Certificate			Issued	2015-06-22												
Company	ATI di MARIANI & c. s.n.c.		Country	Italy												
Brand (optional)			Website	www.atimariani.it												
Street	Via Enrico Mattei, 461 - Zona ind. 4 Torre del Moro		E-mail	info@atimariani.it												
Postal Code	47522	CESENA (FC) - Itália	Tel. / Fax	+39 0547-609711 /609724												
System family overview																
Collector name	For each storage and collector size, give number of collectors															
	Totem															
---	1															
Name of system configuration			Totem													
Collector name	---	No. Collectors	1	Storage name												
				Totem												
Calculated annual results for "solar-only / preheat system"																
Location	Qd,sh	Daily drawoff 80					Daily drawoff 110					Daily drawoff 140				
		Qd,hw	Ql	Qpar	fsol	Qd,hw	Ql	Qpar	fsol	Qd,hw	Ql	Qpar	fsol			
	MJ/y	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%			
Stockholm SE	---	4442	1148	---	26	6106	1462	---	24	7772	1552	---	20			
WürzburgDE	---	4255	1246	---	29	5854	1602	---	27	7448	1692	---	23			
Davos CH	---	4820	1572	---	33	6628	2012	---	30	8435	2124	---	30			
Athens GR	---	3305	1282	---	39	4540	1649	---	36	5782	1742	---	36			
Perf. indicators for the table above																
Qd,sh	MJ/y	Not relevant for solar domestic hot water system														
Qd	MJ/y	Annual heat demand for domestic hot water														
Ql	MJ/y	Annual heat energy delivered by the solar system														
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)														
$f_{sol} = Q_l / Q_d$	-	Solar fraction														
Ref. conditions		Stockholm SE	Würzburg DE	Davos CH	Athens GR											
	G	1 468	1 434	2 009	1 377	See Comment										
	T _{a,ave}	6.9	8.9	3.2	18.4											
	T _{c,ave}	8.5	10.0	5.4	17.8											
	± ΔT _c	6.4	3.0	0.8	7.4											
G	kWh/m ²	Annual irradiation South, 45°														
T _{a,ave}	°C	Annual average outdoor air temperature														
T _{c,ave}	°C	Annual average mains cold water temp.														
ΔT _c	K	Seasonal variation of T _c														
T _h	45 °C	Desired hot water temperature (mixing valve temperature).														
Max. operating press. - collector side		---	kPa	Max. operating press. - tank side		600	kPa									
Testing Laboratory		LNEG														
Website		www.lneg.pt														
Test report id. number		n.º12.V2/DER-LECS/2010														
Date of test report		2010-06-16														
Test method		ISO 9459-2 (CSTG)														
Comments of test lab		Performance indicators calculated with data generated for a vertical surface (azimuth equal to Solar Azimuth) taking into account the specific geometry of the system.										 Rui Paulo LNEG, I.P. Laboratório Nacional de Energia e Geologia Laboratório de Energia Solar				