



Summary of EN 12976 Test Results, annex to Solar KEYMARK Certificate Kurzfassung EN 12976 Test Ergebnisse, Anlage zum Solar KEYMARK-Zertifikat Synthèse des résultats d'essais selon EN 12976, Annexe au certificat Solar KEYMARK	Registration No.	SKM 9909/1
	Registernummer	
	Num. d'enregistrement	
	Date / Datum / Date	02/07/12

Company / Firma / Société	A.S.T. SOLAR INDUSTRY	Country/Land/Pays	Greece
Street / Straße / Rue	78, Str. G. KATSANDRI	Website	www.a-s-t.gr
Postal Code, Place / PLZ, Ort / Code postal, Place	13678 AXARNAI	E-mail	info@a-s-t.gr
		Tel. / Fax	+030 210 2443790 / 210 24771

System classification / G / F	
Flow principle / G / F	Thermosyphon / G / F
Direct / indirect / G / F	Indirect / G / F
Press. principle / G / F	Closed / G / F
Drain back/down / G / F	No drain (always filled) / G / F
Storage location / G / F	Int. collector-storage / G / F
Storage position / G / F	Vertical / G / F
Int. back-up / G / F	None / G / F
If other: / G / F	English / Deutsch / Francais
EN12976 type / G / F	Solar only / G / F

Collector(s) / Kollektor(en) / Capteur(s)					Storage(s) / Akkumulator(en) / F					
Company / Hersteller / Manufactuer A.S.T. SOLAR INDUSTRY					Company / Hersteller / Manufactuer A.S.T. SOLAR INDUSTRY					
Keymark reg. no. (optional)										
Model Bezeichnung Modèle	Per module / G / F				Model Bezeichnung Modèle	Total volume G F	Gross diameter/width Diam. / Breite (Außenmaß)	Höhe (Außenmaß) Diam. / Largeur hors Tout Höhe (Außenmaß) épaisseur hors tout	Back-up heated volume G F	El. back-up power G F
	Aperture area (Aa) Aperturfläche (Aa) Superficie d'entrée (Aa)	Gross length Länge (Außenmaß) Longueur Hors tout	Gross width Breite (Außenmaß) Largeur hors Tout	No. modules G F						
AST	1.77	0.98	1.979	1 - 1	AST	98	400	910	-	-
AST	2.15	1.179	1.979	1 - 1	AST	134	480	910	-	-

Controller / G / F			Fluid / G / F		
Company/Hersteller/Manufacteur none			Company/Hersteller/Manufacteur		
Model / Bezeichnung / Modèle none			Model / Bezeichnung / Modèle Ethylic Alcohol		
Functions	English		Freezing point		
G	Deutsch		G -60 °C		
F	Francais		F		

System family overview / G / F						
Collector G F	No. collectors / G / F					
	Storage / G / F					
	AST COMPACT 110	AST COMPACT 150	0	0	0	
AST COMPACT 110	1					
AST COMPACT 150		1				
0						
0						
0						

Testing Laboratory / Prüflaboratorium / Laboratoire d'essais	NCSR "DEMOKRITOS"- SOLAR & ENERGY SYSTEMS LAB
Website	www.solar.demokritos.gr
Test report id. number / Prüberichtnummer / F	4107DQ1, 6046DE1, 6048DE1
Date of test report / Datum G / date F	25/04/2012, 18/06/2012

Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire	 N.C.S.R "DEMOKRITOS" SOLAR ENERGY LABORATORY Head: Dr Vassilis Belessiotis Tel: +210 6503815 - Fax: +210 6544599 153 10 Ag. Paraskevi - Attiki - Greece
English	
Deutsch	
Francais	

Summary of EN 12976 Test Results, annex to Solar KEYMARK Certificate Kurzfassung EN 12976 Test Ergebnisse, Anlage zum Solar KEYMARK-Zertifikat Synthèse des résultats d'essais selon EN 12976, Annexe au certificat Solar KEYMARK	Registration No. Registernummer Num. d'enregistrement Date / Datum / Date	SKM 9909/1 02/07/12
---	---	-----------------------------------

Company / Firma / Société Street / Straße / Rue Postal Code, Place / PLZ, Ort / Code postal, Place	A.S.T. SOLAR INDUSTRY 78, Str. G. KATSANDRI 13678 AXARNAI	Country/Land/Pays Website E-mail Tel. / Fax	Greece www.a-s-t.gr info@a-s-t.gr +99 210 2443790 / 210 2477
---	--	--	---

System family overview / G / F												
Collector type G F	Number of collectors / G / F											
	Storage type / G / F											
	AST COMPACT 110	AST COMPACT 150										
AST COMPACT 110	1											
AST COMPACT 150		1										

Name of system konfiguration / G / F					AST COMPACT 110		
Collector type G F	AST COMPACT 110	No. collectors G F	1	Storage type G F	AST COMPACT 110		

Calculated annual results / G / F												
Location G F	Daily draw-off litres/day / G / F /											
	80	110	140	80	110	140	80	110	140	80	110	140
	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d	l/d
	Q _d kWh/y			Q _L kWh/y			f _{sol} %			Q _{par} kWh/y		
Stockholm, SE	1,244	1,708	2,172	624	691	716	50.3	40.5	33.0			
Würzburg, DE	1,191	1,638	2,085	638	731	764	53.6	44.6	36.7			
Davos, CH	1,349	1,848	2,356	929	1,016	1,042	69.0	55.0	44.4			
Athens, GR	929	1,270	1,621	772	929	1,042	83.5	73.2	64.2			

Perf. indicators G F	Q _d	Heat demand / G / F
	Q _L	System output / G / F
	f _{sol}	Q _L /Q _d ; solar fraction / G / F
	Q _{par}	Elec. for pumps/controllers / G / F

Ref. conditions G F	Stockholm					Würzburg DE					Davos CH					Athens GR					
	G	1,156					1,226					1,682					1,717				
	T _a	7.5					9.0					3.2					18.5				
	T _c	8.5					10.0					5.4					17.8				
	ΔT _c	2.1 - 14.9					7.0 - 13.0					4.6 - 6.2					10.4 - 25.2				

G	kWh/m ²	Annual irradiation South, 45° / G / F
T _a	°C	Annual mean air temp. / G / F
T _c	°C	Annual mean cold water temp. / G / F
ΔT _c	°C	Seasonal variation of T _c / G / F
T _h	45°C	Desired (mix. valve) temp. / G / F

Max. operating press. - collector side G F		kPa	Max. operating press. - tank side G F	1,000	kPa
--	--	-----	---	-------	-----

Testing Laboratory / Prüflaboratorium / Laboratoire d'essais	Demokritos
Website	www.solar.demokritos.gr
Test report id. number / Prüberichtnummer / F	4107DQ1, 6046DE1, 6048DE1
Date of test report / G / F	25/04/2012, 18/06/2012
Test method / G / F	ISO 9459-5 (DST)

Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire English Deutsch Français	 N.C.S.R. "DEMOKRITOS" SOLAR ENERGY LABORATORY Head: Dr Vassilis Belesiotis Tel: +210 6503815 - Fax: +210 6544599 153 10 Ag. Paraskevi - Attiki - Greece
--	---



Summary of EN 12976 Test Results, annex to Solar KEYMARK Certificate Kurzfassung EN 12976 Test Ergebnisse, Anlage zum Solar KEYMARK-Zertifikat Synthèse des résultats d'essais selon EN 12976, Annexe au certificat Solar KEYMARK	Registration No. Registernummer Num. d'enregistrement Date / Datum / Date	SKM 9909/1 02/07/12
---	---	-----------------------------------

Company / Firma / Société Street / Straße / Rue Postal Code, Place / PLZ, Ort / Code postal, Place	A.S.T. SOLAR INDUSTRY 78, Str. G. KATSANDRI 13678 AXARNAI	Country/Land/Pays Website E-mail Tel. / Fax	Greece www.a-s-t.gr info@a-s-t.gr +99 210 2443790 / 210 2477
---	--	--	---

System family overview / G / F									
Collector type	Number of collectors / G / F								
	Storage type / G / F								
G									
F									
AST COMPACT 110	1								
AST COMPACT 150		1							

Name of system konfiguration / G / F				AST COMPACT 150			
Collector type G F	AST COMPACT 150	No. collectors G F	1	Storage type G F	AST COMPACT 150		

Calculated annual results / G / F																		
Location	Daily draw-off litres/day / G / F /																	
	110			140			170			110			140			170		
G	l/d			l/d			l/d			l/d			l/d			l/d		
F	Qd kWh/y			Qd kWh/y			QL kWh/y			f _{sol} %			Q _{par} kWh/y					
Stockholm, SE	1,708	2,172	2,637	885	972	1,007	51.8	44.8	38.2									
Würzburg, DE	1,638	2,085	2,532	902	1,016	1,069	55.1	48.7	42.2									
Davos, CH	1,848	2,356	2,856	1,323	1,428	1,463	71.6	60.6	51.2									
Athens, GR	1,270	1,621	1,962	1,086	1,253	1,375	85.5	77.3	70.1									

Perf. indicators G F	Q_d	Heat demand / G / F
	Q_L	System output / G / F
	f_{sol}	Q_L/Q_d; solar fraction / G / F
	Q_{par}	Elec. for pumps/controllers / G / F

Ref. conditions G F		Stockholm	Würzburg DE	Davos CH	Athens GR			
	G	1,156	1,226	1,682	1,717			
	T _a	7.5	9.0	3,2	18.5			
	T _c	8.5	10.0	5.4	17.8			
	ΔT _c	2.1 - 14.9	7.0 - 13.0	4.6 - 6.2	10.4 - 25.2			

G	kWh/m ²	Annual irradiation South, 45° / G / F
T _a	°C	Annual mean air temp. / G / F
T _c	°C	Annual mean cold water temp. / G / F
ΔT _c	°C	Seasonal variation of T _c / G / F
T _h	45°C	Desired (mix. valve) temp. / G / F

Max. operating press. - collector side G F		kPa	Max. operating press. - tank side G F	1,000	kPa
---	--	-----	--	-------	-----

Testing Laboratory / Prüflaboratorium / Laboratoire d'essais Website Test report id. number / Prüberichtsnummer / F Date of test report / G / F Test method / G / F	Demokritos www.solar.demokritos.gr 4107DQ1, 6046DE1, 6048DE1 25/04/2012, 18/06/2012 ISO 9459-5 (DST)
--	---

Comments of test lab / Kommentare des laboratoriums / Commentaires du laboratoire English Deutsch Français	 N.C.S.R. "DEMOKRITOS" SOLAR ENERGY LABORATORY Head: Dr Vassilis Belessiotis Tel: +210 6503815 - Fax: +210 6544592 153 10 Ag. Paraskevi - Attiki - Greece
--	--