



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	Registration No. Registernummer Num. d'enregistrement	011-7S1705 A
	Date / Datum / Date	05.09.2011

Company / Firma / Société Street / Straße / Rue Postal Code, Place / PLZ, Ort / Code postal, Place	Biome Solar Industry Zone Industrielle Béja Nord 9000 Béja	Country/Land/Pays Website E-mail Tel.	Tunesie www.biomesolar.com ahmed.ernez@biomesolar.com 78440440-78440192
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System classification / G / F	
Flow principle / G / F	Thermosyphon / G / F
Direct / indirect / G / F	Direct / G / F
Press. principle / G / F	Open / G / F
Drain back/down / G / F	No drain (always filled) / G / F
Storage location / G / F	Outdoor / 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 Biome Solar Industry					Company / Hersteller / Manufactuer Biome Solar Industry					
Keymark reg. no. (optional)										
Model Bezeichnung Modèle	Per module / G / F				Model Bezeichnung Modèle	Total volume	Gross diameter/width Diam. / Breite (Außenmaß)	Höhe (Außenmaß) Diam. / Largeur hors Tout Höhe (Außenmaß)	Back-up heated volume	EI. back-up power
	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						
	m ²	m	m	min - max						
BIOME 3.0 Miro-AL	1.97	1.879	1.222	1 - 2	200 ouvert	185	550	1500	-	-
					300 ouvert	285	550	1870		

Controller / G / F			Fluid / G / F		
Company/Hersteller/Manufacteur	-		Company/Hersteller/Manufacteur	-	
Model / Bezeichnung / Modèle	-		Model / Bezeichnung / Modèle	-	
Functions	-		Freezing point	-	
G			G	°C	
F			F		

System family overview / G / F						
Collector G F	No. collectors / G / F					
	Storage / G / F					
	200 ouvert	300 ouvert	0	0	0	
BIOME 3.0 Miro-AL	1	2				

Testing Laboratory / Prüflaboratorium / Laboratoire d'essais	TZS, ITW University of Stuttgart
Website	www.tzs.uni-stuttgart.de
Test report id. number / Prüberichtnummer / F	09SYS78 + 09SYS79
Date of test report / Datum G / date F	23.03.2011

Comments of test lab / Kommentare des Laboratoriums / Commentaires du laboratoire	
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Street / Straße / Rue	Zone Industrielle Béja Nord	Website	www.biomesolar.com
Postal Code, Place / PLZ, Ort / Code postal, Place	9000 Béja	E-mail	ahmed.ernez@biomesolar.com
		Tel. / Fax	78440440-78440192

System family overview / G / F				
Collector type G F	Number of collectors / G / F			
	Storage type / G / F			
	200 ouvert	300 ouvert		
BIOME 3.0 Miro-AL	1	2		

Name of system configuration / G / F				
Collector type	BIOME 3.0 Miro-AL	No. collectors	1	Storage type
G		G		G
F		F		F
				200 ouvert

Calculated annual results / G / F												
Location G F	Daily draw-off litres/day / G / F /											
	110	140	200	110	140	200	110	140	200	110	140	200
	I/d	I/d	I/d	I/d	I/d	I/d	I/d	I/d	I/d	I/d	I/d	I/d
	Q _d MJ/a			Q _L MJ/a			f _{sol} %			Q _{par} MJ/a		
Stockholm, SE	6 107	7 772	11 103	2 992	3 381	3 775	49.0	43.5	34.0	0.0	0.0	0.0
Würzburg, DE	5 854	7 450	10 643	3 231	3 710	4 257	55.2	49.8	40.0	0.0	0.0	0.0
Davos, CH	6 628	8 435	12 050	4 692	5 238	5 784	70.8	62.1	48.0	0.0	0.0	0.0
Athens, GR	4 545	5 784	8 263	3 863	4 558	5 594	85.0	78.8	67.7	0.0	0.0	0.0

Perf. indicators G F	Q _d	Heat demand / G / F
	Q _L	System output / G / F
	f _{sol}	QL/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	1 157	1 230	1 684	1 718
	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	1 000 kPa	Max. operating press. - tank side	700 kPa
G		G	
F		F	

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Date of test report / G / F	23.03.2011
Test method / G / F	ISO 9459-5 (DST)

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System family overview / G / F

Collector type G F	Number of collectors / G / F											
	Storage type / G / F											
	200 ouvert				300 ouvert							
BIOME 3.0 Miro-AL	1				2							

Name of system configuration / G / F

Collector type	BIOME 3.0 Miro-AL	No. collectors	2	Storage type	300 ouvert
G		G		G	
F		F		F	

Calculated annual results / G / F

Location G F	Daily draw-off litres/day / G / F /																	
	200			300			400			200			300			400		
	l/d	l/d	l/d	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 MJ/a			Q _L MJ/a			f _{sol} %			Q _{par} MJ/a								
Stockholm, SE	11 103	16 655	22 206	5 951	7 178	7 572	53.6	43.1	34.1	0.0	0.0	0.0						
Würzburg, DE	10 643	15 965	21 286	6 333	7 918	8 514	59.5	49.6	40.0	0.0	0.0	0.0						
Davos, CH	12 050	18 075	24 100	9 399	11 188	11 664	78.0	61.9	48.4	0.0	0.0	0.0						
Athens, GR	8 263	12 395	16 526	7 404	9 692	11 188	89.6	78.2	67.7	0.0	0.0	0.0						

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

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T _a	°C	Annual mean air temp. / G / F
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ΔT _c	°C	Seasonal variation of T_c / G / F
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Max. operating press. - collector side	1 000 kPa	Max. operating press. - tank side	700 kPa
G		G	
F		F	

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