

<b>Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate</b>	<b>Certificate No.</b>	<b>011-7S 2082 F</b>
	Date of issue	10-06-2013

<b>Company</b>	Bosch Thermotechniek BV	<b>Country</b>	Netherlands
<b>Brand (optional)</b>	Nefit	<b>Website</b>	www.nefit.nl
<b>Street, number</b>	Zweedsestraat 1	<b>E-mail</b>	JdeBrie@nefit.nl
<b>Postal Code</b>	7400 AA	<b>Tel.</b>	+31 (0) 570 60 2860
<b>City</b>	Deventer	<b>Fax</b>	+31

<b>Collector Type</b> (flat plate / evacuate tubular / un-glazed)	Flat plate collector
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<b>Integration in the roof possible ?</b>	Yes
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Collector name	Aperture area (A <sub>a</sub> ) [m <sup>2</sup> ]	Gross length [mm]	Gross width [mm]	Gross height [mm]	Gross area (A <sub>G</sub> ) [m <sup>2</sup> ]	Power output per collector unit G = 1000 W/m <sup>2</sup> T <sub>m</sub> -T <sub>a</sub> :				
						0 K	10 K	30 K	50 K	70 K
						[W]	[W]	[W]	[W]	[W]
SMC3-v	2.426	2 170	1 175	87	2.550	1 926	1 829	1 617	1 379	1 116

<b>Collector efficiency parameters related to aperture area (A<sub>a</sub>)</b>	η <sub>0a</sub>	0.794	-
Type of fluid and flow rate see note 1	a <sub>1a</sub>	3.863	W/(m <sup>2</sup> K)
	a <sub>2a</sub>	0.013	W/(m <sup>2</sup> K <sup>2</sup> )

<b>Stagnation temperature</b> - Weather conditions see note 2	t <sub>stg</sub>	192	°C
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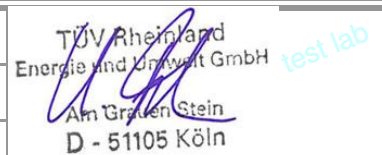
<b>Effective thermal capacity</b>	C <sub>eff</sub> = C/A <sub>a</sub>	5.43	kJ/(m <sup>2</sup> K)
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<b>Max. operation pressure</b> - see note 3	p <sub>max</sub>	1000	kPa
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Incidence angle modifiers K <sub>θ</sub> (θ)	G <sub>DIF</sub> /G <sub>TOT</sub>		θ <sub>T</sub> / θ <sub>L</sub>	50°	10°	20°	30°	40°	60°	70°
	min	max	K <sub>θ</sub> (θ <sub>T</sub> )	0.94	1.00	0.99	0.98	0.97	0.90	0.80
	0	0	K <sub>θ</sub> (θ <sub>L</sub> )	0.94	1.00	0.99	0.98	0.97	0.90	0.80
G <sub>DIF</sub> /G <sub>TOT</sub> : min&max - while measuring				<b>Optional values</b>						

<b>Testing Laboratory</b>	TÜV Energie und Umwelt GmbH
<b>Website</b>	www.eco-tuv.de
<b>Test report id. number</b>	21221193_EN_Nefit
<b>Date of test report</b>	03-06-2013
<b>Perf. test method</b>	EN 12975-2 6.1.5 (indoor)

**Comments of testing laboratory :**

Note 1	<b>Fluid</b>	Water	<b>Flow rate</b>	0.020	kg/s per m <sup>2</sup>	
Note 2	<b>Irradiance, G<sub>s</sub>=1000 W/m<sup>2</sup></b>					
Note 3	<b>Ambient temperature , T<sub>a</sub>=30 °C</b>					
Note 3	<b>Given by manufacturer</b>					



Annual collector output based on EN 12975 Test Results, annex to Solar KEYMARK Certificate	Certificate No.	<b>011-7S 2082 F</b>
	Issued	10-06-2013

Annual collector output kWh													
Collector name	Location and collector temperature (T <sub>m</sub> )												
	Athens			Davos			Stockholm			Würzburg			
	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	
SMC3-v	3 071	2 170	1 401	2 491	1 692	1 036	1 712	1 106	660	1 860	1 195	701	

Collector mounting: Fixed or tracking Fixed; slope = latitude - 15° (rounded to nearest 5°)

Overview of locations				
Location	Latitude °	G <sub>tot</sub> kWh/m <sup>2</sup>	T <sub>a</sub> °C	Collector orientation or tracking mode
Athens	38	1 765	18.5	South, 25°
Davos	47	1 714	3.2	South, 30°
Stockholm	59	1 166	7.5	South, 45°
Würzburg	50	1 244	9.0	South, 35°

G <sub>tot</sub>	Annual total irradiation on collector plane	kWh/m <sup>2</sup>
T <sub>a</sub>	Mean annual ambient air temperature	°C
T <sub>m</sub>	Constant collector operating temperature (mean of in- and outlet temperatures)	°C

Calculation of the annual collector performance is done by the official Solar Keymark spreadsheet tool. Hour by hour the collector output is calculated according to the efficiency parameters from the Keymark test using constant collector operating temperature (T<sub>m</sub>). Detailed description with all equations used is available from the Solar Keymark web site (direct link:<http://www.estif.org/solarkeymark/annexb1.php>)

<b>DIN CERTCO • Alboinstraße 56 • 12103 Berlin</b> Tel: +49 30 7562-1131 • Fax: +49 30 7562-1141 • E-Mail: info@dincertco.de • www.dincertco.de	Datasheet version: VERSION 3.5, 2012.01.13 Calculation program version: 3.07, October 2011 (SP)
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