Annex to Solar Keymark Certificate			Licence Number	011-7S1059F
Summary of EN 12975-2 Test Results			Issued	2015-10-15
Collector test standard	EN 12975-2			
Licence holder	eww ag		Country	Austria
Brand (optional)			Web	www.eww.at
Street, Number	Stelzhammerstrasse 27		E-mail	kurt.leeb@eww.at
Postcode, City	A-4600; Wels		Tel	+43 (0) 7242 350390 751

Collector Type	Flat plate collector, glazed

Collector name	Gross area (A_G)	Gross length	Gross width	Gross height	Power output per collector G = 1000 W/m² ϑm - ϑa: 0 K	10 K	30 K	50 K	70 K	142 K
	m²	mm	mm	mm	W	W	W	W	W	W
MEA Quattro	2,70	2150	1255	98	1.938	1.848	1.645	1.415	1.156	0
MEA Quattro WA	2,70	2150	1255	98	1.938	1.848	1.645	1.415	1.156	0
Power output per m² aperture area. For aperture area, see page 2					766	730	650	559	457	0

Performance parameters test method	Steady state - indoor								
Performance parameters (aperture area)	η0	a1	a2						
Units	-	W/(m²K)	W/(m²K²)						
Test results	0,766	3,434	0,014						

Incidence angle modifier test method		Steady state - outdoor								
Bi-directional incidence angle modifiers	No									
Incidence angle modifier	Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
Transversal	$K_{\theta T,coll}$	1,00	1,00	1,00	0,99	0,96	0,90	0,78	0,52	0,00
Longitudinal	$K_{\theta L,coll}$	1,00	1,00	1,00	0,99	0,96	0,90	0,78	0,52	0,00

Fluid for testing	Water		
Flow rate for testing (per Aa)	dm/dt	0,022	kg/(sm²)
Maximum temperature difference for thermal performance calculations	$(\vartheta_m-\vartheta_a)_{max}$	142	K
Standard stagnation temperature (G = 1000 W/m²; ϑ_a = 30 °C)	ϑ_{stg}	198,8	°C
Effective thermal capacity (per A_G)	C/m^2	7,295	kJ/(Km²)
Maximum operating temperature	ϑ_{max_op}	120	°C
Maximum operating pressure	$p_{max,op}$	1000	kPa

Testing laboratory	ASiC; Austria Solar Innovation Center	www.asic.at	
Test report(s)	P-200908006-OEM1	Dated	14.01.2010
	P-200912001-PC-OEM1		11.02.2010
	P-200908006-OEM1-K1		14.10.2015
	P-200912001-PC-OEM1-K1		14.10.2015

Comments of testing laboratory
P-200908006-OEM1-K1 and P-200908006-OEM1-K1 - just the address was changed

Stamp & signature of test lab

ASiC - Austria Solar Innovation Center
T: + 43 7242 9396-5560
office@asic.at, www.asic.at

Annex to Solar Keymark Certificate	Licence Number	011-7S1059F
Supplementary Information	Issued	2015-10-15

Annual collector output in kWh/collector at mean fluid temperature ϑm, based on EN 12975-2 Test

Standard Locations		Athens			Davos			Stockholm			Würzburg		
Collector name	ϑ_m	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C
MEA Quattro		3.344	2.421	1.603	2.564	1.794	1.139	1.882	1.247	762	2.046	1.351	812
MEA Quattro WA		3.344	2.421	1.603	2.564	1.794	1.139	1.882	1.247	762	2.046	1.351	812
Annual output per m² aperture area		1.322	957	634	1.013	709	450	744	493	301	809	534	321
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)											
Annual irradiation on collector plane		2609 kWh/m²			2386 kWh/m²			1634 kWh/m²			1625 kWh/m²		
Mean annual ambient air temperature		18,5°C			3,2°C			7,5°C			9,0°C		
Collector orientation or tracking mode		South, 25°			South, 30°			South, 45°			South, 35°		

The collector is operated at constant temperature ϑm (mean of in- and outlet temperatures). The calculation of the annual collector performance is performed with the official Solar Keymark spreadsheet tool Scenocalc Ver. 5.01 (DRAFT, March 2015). A detailed description of the calculations is available at www.solarkeymark.org/scenocalc

Additional Information

Collector heat transfer medium	Liquid	
Hybrid Thermal and Photo Voltaic collector	No	
The collector is deemed to be suitable for roof integration	No	
The collector was tested successfully according to EN 12975-2 under the following conditions:		
No valid climate reference class		
Positive Mechanical Load	1000	Pa
Negative Mechanical Load	1000	Pa
Hail resistance using steel ball (maximum drop height)	-	m

Energy Labelling Information

	Aperture Area A_{sol}
MEA Quattro	2,53
MEA Quattro WA	2,53

Data required for CDR (EU) No 811/2013		
Collector efficiency (η_{col})	60	%

Remark: Collector efficiency (η_{col}) is defined in CDR (EU) No 811/2013 as collector efficiency of the solar collector at a temperature difference between the solar collector and the surrounding air of 40 K and a global solar irradiance of 1000 W/m², expressed in % and rounded to the nearest integer. η_{col} is based on the aperture area.

Data required for CDR (EU) No 812/2013		
Zero-loss efficiency (η_0)	0,766	--
First-order coefficient (a_1)	3,43	W/(m²K)
Second-order coefficient (a_2)	0,014	W/(m²K²)
Incidence angle modifier IAM(50°)	0,96	--

Remark: The data given in this section are derived from data based on aperture area according to EN 12975-2.