

# AENOR

## Keymark Certificate Solar thermal energy



078/000146

AENOR certifies that the organization

### **BDR THERMEA GROUP B.V**

registered office MERCHANTSTRAAT, 55 7300 AA APELDOORN (Holanda - Países Bajos)

supplies Solar collectors

in compliance with UNE-EN 12975-1:2006 (EN 12975-1:2006)

Trade Mark REMEHA C250V  
Technical information Specified in Annexes to the Certificate

Production site CL MANGANÉS, 2 08755 CASTELLBISBAL (Barcelona - España)


Certification scheme In order to grant this Certificate, AENOR has tested the product and has verified the quality system implemented for its manufacture. AENOR performs these tasks periodically while the Certificate has not been cancelled, in accordance with Specific Rules RP 078.01.

This certificate supersedes 078/000146, dated 2017-07-24

First issued on 2012-07-24  
Modified on 2017-10-10  
Validity date 2022-07-24

Rafael GARCÍA MEIRO  
Chief Executive Officer



Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results					Licence Number		078/000146																	
					Date issued		2017-10-10																	
					Issued by																			
Licence holder		BDR THERMEA GROUP B.V.			Country		NETHERLANDS																	
Brand (optional)		Abrand			Web		http://www.bdrthermea.com																	
Street, Number		MARCHANSTRAAT 55			E-mail		oleguer.fuertes@baxi.es																	
Postcode, City		7300 AA, APPELDOORN			Tel		+34 902 89 80 00																	
Collector Type					Flat plate collector, glazed																			
Collector name					Gross area ( $A_G$ )		Gross length		Gross width		Gross height		Power output per collector $G_b = 850 \text{ W/m}^2$ ; $G_d = 150 \text{ W/m}^2$ $\vartheta_m - \vartheta_a$											
					m <sup>2</sup>		mm		mm		mm		0 K		10 K		30 K		50 K		70 K		90 K	
REMEHA C250V					2,51		2.187		1.147		87		1.925		1.838		1.639		1.406		1.139		837	
Power output per m <sup>2</sup> gross area					767		732		653		560		454		333									
Performance parameters test method					Steady state - indoor																			
Performance parameters (related to AG)					$\eta_{0,hem}$		a1		a2															
Units					-		W/(m <sup>2</sup> K)		W/(m <sup>2</sup> K <sup>2</sup> )															
Test results					0,767		3,287		0,017															
Incidence angle modifier test method					Quasi dynamic - outdoor																			
Bi-directional incidence angle modifiers					No																			
Incidence angle modifier					Angle		10°		20°		30°		40°		50°		60°		70°		80°		90°	
Transversal					$K_{GT, coll}$		1,00		0,99		0,97		0,95		0,91		0,83		0,67		-		0,00	
Longitudinal					$K_{GL, coll}$		1,00		0,99		0,97		0,95		0,91		0,83		0,67		-		0,00	
Heat transfer medium for testing					Water																			
Flow rate for testing (per gross area, $A_G$ )					dm/dt		0,019		kg/(sm <sup>2</sup> )															
Maximum temperature difference for thermal performance calculations					$(\vartheta_m - \vartheta_a)_{max}$		90		K															
Standard stagnation temperature ( $G = 1000 \text{ W/m}^2$ ; $\vartheta_a = 30 \text{ °C}$ )					$\vartheta_{stg}$		200		°C															
Effective thermal capacity, incl. fluid (per gross area, $A_G$ )					$C/m^2$		6,38		kJ/(Km <sup>2</sup> )															
Maximum operating temperature					$\vartheta_{max, op}$		n.n.		°C															
Maximum operating pressure					$p_{max, op}$		1000		kPa															
Testing laboratory					TÜV Rheinland Energy GmbH							http://www.tuv.com/st												
Test report(s)					21240494.002_SOL250H_R 21217926_EN_P_SOL250V							Dated		26/09/2017 04/06/2012										
Comments of testing laboratory					Datashet version: 5.01, 2016-03-01																			
*The initial thermal performance testing was not performed according to ISO 9806:2013, but EN 12975-2:2006. The steady state test evaluation was recalculated with gross area. The former values related to 2.372 m <sup>2</sup> aperture area had been: $\eta_{a0a}=0.812$ ; $a_{1a}=3.478$ ; $a_{2a}=0.018$ .					 <p><b>TÜVRheinland</b><sup>®</sup> Precisely Right.</p>																			
AENOR INTERNACIONAL, S.A.U. - Génova, 6. - 28004 - Madrid, España - Tel. 91 432 60 00 - www.aenor.com																								
Product certification body accredited by ENAC, number 01/C-PR002.078																								



Annex to Solar Keymark Certificate Supplementary Information	Licence Number	078/000146
	Issued	2017-10-10

**Annual collector output in kWh/collector at mean fluid temperature  $\vartheta_m$ , based on EN ISO 9806:2013 test results**

Collector name	Standard Locations $\vartheta_m$	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
REMEHA C250V		2.986	2.149	1.394	2.292	1.587	983	1.682	1.108	665	1.823	1.192	703
Annual output per m <sup>2</sup> gross area		1.190	856	555	913	632	392	670	442	265	726	475	280
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)											
Annual irradiation on collector plane		1765 kWh/m <sup>2</sup>			1714 kWh/m <sup>2</sup>			1166 kWh/m <sup>2</sup>			1244 kWh/m <sup>2</sup>		
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  $\vartheta_m$  (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 (March 2016). A detailed description of the calculations is available at [www.solarkeymark.org/scenocalc](http://www.solarkeymark.org/scenocalc)

**Additional Information**

Collector heat transfer medium	Water-Glycole
Hybrid Thermal and Photo Voltaic collector	No
The collector is deemed to be suitable for roof integration	Yes
The collector was tested successfully according to EN ISO 9806:2013 under the following conditions:	
Climate class (A, B or C)	A --
Maximum tested positive load	5400 Pa
Maximum tested negative load	3000 Pa
Hail resistance using ice balls (diameter)	35 mm

**Energy Labelling Information**

	Reference Area, $A_{sol}$ (m <sup>2</sup> )	Data required for CDR (EU) No 811/2013 - Reference Area $A_{sol}$	
REMEHA C250V	2,51	Collector efficiency ( $\eta_{col}$ )	61 %
		<i>Remark: Collector efficiency (<math>\eta_{col}</math>) 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/m<sup>2</sup>, expressed in % and rounded to the nearest integer. Deviating from the regulation <math>\eta_{col}</math> is based on reference area (<math>A_{sol}</math>) which is aperture area for values according to EN 12975-2 or gross area for ISO 9806:2013.</i>	
		Data required for CDR (EU) No 812/2013 - Reference Area $A_{sol}$	
		Zero-loss efficiency ( $\eta_0$ )	0,767 --
		First-order coefficient ( $a_1$ )	3,29 W/(m <sup>2</sup> K)
		Second-order coefficient ( $a_2$ )	0,017 W/(m <sup>2</sup> K <sup>2</sup> )
		Incidence angle modifier IAM (50°)	0,91 --
		<i>Remark: The data given in this section are related to collector reference area (<math>A_{sol}</math>) which is aperture area for values according to EN 12975-2 or gross area for ISO 9806. Consistent data sets for either aperture or gross area can be used in calculations like in the regulation 811 and 812 and simulation programs.</i>	