



## Keymark Certificate



078/000146

AENOR certifies that the organization

### BDR THERMEA GROUP B.V.

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

supplies **Solar collectors**

in compliance with UNE-EN 12975-1:2006+A1:2011 (EN 12975-1:2006+A1:2010)

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

Production site CL MANGANÈS, 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 2022-12-05

First issued on 2012-07-24  
Modified on 2023-06-12  
Validity 2027-07-24

Rafael GARCÍA MEIRO  
CEO





Annex to Solar Keymark Certificate					Licence Number		078/000146							
					Date issued		2023-06-12							
					Issued by		AENOR							
Licence holder		BDR THERMEA GROUP B.V.			Country		NETHERLANDS							
Brand (optional)		-			Web		http://www.bdrthermea.com							
Street, Number		MARCHANTSTRAAT, 55			E-mail		oscar.mongro@BDRThermea.com							
Postcode, City		7300 AA APELDOORN			Tel		+34 936828040							
Collector Type					Flat plate collector									
Collector name					Power output per collector									
					G <sub>b</sub> = 850 W/m <sup>2</sup> , G <sub>d</sub> = 150 W/m <sup>2</sup> & u = 1.3 m/s $\vartheta_m - \vartheta_a$									
					0 K	10 K	30 K	50 K	70 K	100 K				
					m <sup>2</sup>	mm	mm	mm	mm	mm	mm			
REMEHA C250V					2,51	2.187	1.147	87	1.914	1.821	1.615	1.383	1.125	689
					0	0	0	0	0	0	0	0	0	
Power output per m <sup>2</sup> gross area					763	725	643	551	448	275				
Performance parameters test method		Quasi dynamic												
Performance parameters (related to A <sub>G</sub> )		$\eta_0, b$	a1	a2	a3	a4	a5	a6	a7	a8	Kd			
Units		-	W/(m <sup>2</sup> K)	W/(m <sup>2</sup> K <sup>2</sup> )	J/(m <sup>3</sup> K)	-	J/(m <sup>2</sup> K)	s/m	W/(m <sup>2</sup> K <sup>4</sup> )	W/(m <sup>2</sup> K <sup>4</sup> )	-			
Test results		0,773	3,58	0,013	0,000	0,00	5.083	0,000	0,00	0,0E+00	0,91			
Incidence angle modifier test method		Quasi dynamic - outdoor												
Incidence angle modifier		Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°			
Transversal		K <sub>GT, coll</sub>	1,00	0,99	0,97	0,94	0,90	0,82	0,65	0,33	0,00			
Longitudinal		K <sub>GL, coll</sub>	1,00	0,99	0,97	0,94	0,90	0,82	0,65	0,33	0,00			
Heat transfer medium for testing					Water									
Flow rate for testing (per gross area, A <sub>G</sub> )					dm/dt	0,024	kg/(sm <sup>2</sup> )							
Maximum temperature difference during thermal performance test					( $\vartheta_m - \vartheta_a$ ) <sub>max</sub>	70	K							
Standard stagnation temperature (G = 1000 W/m <sup>2</sup> ; $\vartheta_a = 30$ °C)					$\vartheta_{stg}$	210	°C							
Maximum operating temperature					$\vartheta_{max, op}$	198	°C							
Maximum operating pressure					p <sub>max, op</sub>	1000	kPa							
Testing laboratory		TÜV Rheinland Solar GmbH					http://www.tuv.com/solar							
Test report(s)		300100662.001rev02 DE23MGF0.001					Dated		25/11/2022 10/05/2023					
Comments of testing laboratory					Ver. 6.2 (13.01.2022)									
none														
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 1/C-PR271														



<b>Annex to Solar Keymark Certificate Supplementary Information</b>	<b>Licence Number</b>	<b>078/000146</b>
	<b>Issued</b>	<b>2023-06-12</b>

<b>Gross Thermal Yield in kWh/collector at mean fluid temperature <math>\vartheta_m</math></b>													
Collector name	Standard Locations	Athens			Davos			Stockholm			Würzburg		
	$\vartheta_m$	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C
REMEHA C250V		3.002	2.130	1.381	2.275	1.562	972	1.675	1.091	656	1.823	1.177	696
Gross Thermal Yield per m <sup>2</sup> gross area													
Annual efficiency, $\eta_a$													
Fixed or tracking collector													
Annual irradiation on collector plane													
Mean annual ambient air temperature													
Collector orientation or tracking mode													

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. 6.2 (13.01.2022). A detailed description of the calculations is available at <http://www.estif.org/solarkeymarknew/>

<b>Additional Information</b>					
Collector heat transfer medium	Water-Glycole				
The collector is deemed to be suitable for roof integration	No				
The collector was tested successfully under the following conditions:					
Climate class (A+, A, B or C)				A	--
G (W/m <sup>2</sup> ) >	1000	$\vartheta_a$ (°C) >	20	$H_x$ (MJ/m <sup>2</sup> ) >	600
Maximum tested positive load				3500	Pa
Maximum tested negative load				2400	Pa
Hail resistance using ice balls (diameter)				35	mm

<b>Additional collector attribute(s)</b>			
Using external power source(s) for normal operation	No	Active or passive measure(s) for self-protection	No
Co-generating thermal and electrical power	No	Façade collector(s)	Yes

<b>Energy Labelling Information</b>		<b>Additional Informative Technical Data</b>	
	Reference Area, $A_{sol}$ (m <sup>2</sup> )	Hydraulic Designation Code	Aperture Area, $A_a$ (m <sup>2</sup> )
REMEHA C250V	2,51	1-H-1234S-A:7.2,22272-C:16.6,1100	2,35

<b>Data required for CDR (EU) No 811/2013 - Reference Area</b>		<b>Data required for CDR (EU) No 812/2013 - Reference Area <math>A_{sol}</math></b>	
Collector efficiency ( $\eta_{col}$ )	60%	Zero-loss efficiency ( $\eta_0$ )	0,76
Remark: Collector efficiency ( $\eta_{col}$ ) 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/m <sup>2</sup> , expressed in % and rounded to the nearest integer. Deviating from the regulation $\eta_{col}$ is based on reference area ( $A_{sol}$ ) which is aperture area for values according to EN 12975-2 or gross area for ISO 9806:2017.		First-order coefficient ( $a_1$ )	3,58
		Second-order coefficient ( $a_2$ )	0,013
		Incidence angle modifier IAM (50°)	0,89
		Remark: The data given in this section are related to collector reference area ( $A_{sol}$ ) 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.	