



Keymark Certificate



078/000107

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 CHAPEE SOL 200

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 078/000107, dated 2022-07-24

First issued on 2012-07-24

Modified on 2022-12-05

Validity date 2027-07-24

Rafael GARCÍA MEIRO
Chief Executive Officer





Annex to Solar Keymark Certificate					Licence Number		078/000107							
					Date issued		2022-12-05							
					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									
					Gb = 850 W/m ² , Gd = 150 W/m ² & u = 1.3 m/s $\vartheta_m - \vartheta_a$									
					0 K	10 K	30 K	50 K	70 K	100 K				
					m ²	mm	mm	mm	mm	mm	mm			
CHAPEE SOL 200					2,01	1.753	1.147	87	1.511	1.434	1.265	1.076	869	521
Power output per m² gross area					752	713	629	536	432	259				
Performance parameters test method		Quasi dynamic												
Performance parameters (related to A_G)		η_0, b	a1	a2	a3	a4	a5	a6	a7	a8	Kd			
Units		-	W/(m ² K)	W/(m ² K ²)	J/(m ³ K)	-	J/(m ² K)	s/m	W/(m ² K ⁴)	W/(m ² K ⁴)	-			
Test results		0,754	3,72	0,012	0,000	0,00	6.579	0,000	0,00	0,0E+00	0,98			
Incidence angle modifier test method		Quasi dynamic - outdoor												
Incidence angle modifier		Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°			
Transversal		K _{θT, coll}	1,00	0,99	0,98	0,96	0,92	0,86	0,74	0,37	0,00			
Longitudinal		K _{θL, coll}	1,00	0,99	0,98	0,96	0,92	0,86	0,74	0,37	0,00			
Heat transfer medium for testing					Water									
Flow rate for testing (per gross area, A_G)					dm/dt		0,025		kg/(sm²)					
Maximum temperature difference during thermal performance test					($\vartheta_m - \vartheta_a$)_{max}		70		K					
Standard stagnation temperature (G = 1000 W/m²; $\vartheta_a = 30$ °C)					ϑ_{stg}		210		°C					
Maximum operating temperature					$\vartheta_{max, op}$		197		°C					
Maximum operating pressure					p_{max, op}		1000		kPa					
Testing laboratory		TÜV Rheinland Solar GmbH					http://www.tuv.com/solar							
Test report(s)		300100662.001rev02 300100662.003rev02					Dated		25/11/2022 25/11/2022					
Comments of testing laboratory					Ver. 6.2 (13.01.2022)									
<p>AENOR INTERNACIONAL, S.A.U. - Génova, 6. - 28004 - Madrid, España - Tel. 91 432 60 00 - www.aenor.com</p> <p>Product certification body accredited by ENAC, number 1/C-PR271</p>														



Annex to Solar Keymark Certificate Supplementary Information	Licence Number	078/000107
	Issued	2022-12-05

Gross Thermal Yield in kWh/collector at mean fluid temperature ϑ_m													
Collector name	Standard Locations ϑ_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
CHAPEE SOL 200		2.440	1.722	1.109	1.837	1.250	769	1.356	874	518	1.484	950	554
Gross Thermal Yield per m ² gross area		1.214	857	552	914	622	383	675	435	258	738	472	275
Annual efficiency, η_a		69%	49%	31%	56%	38%	23%	58%	37%	22%	59%	38%	22%
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)											
Annual irradiation on collector plane		1765 kWh/m ²			1630 kWh/m ²			1166 kWh/m ²			1244 kWh/m ²		
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 ϑ_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/>

Additional Information					
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 ²) >	1100	ϑ_a (°C) >	40	H_x (MJ/m ²) >	700
Maximum tested positive load			3500	Pa	
Maximum tested negative load			2400	Pa	
Hail resistance using ice balls (diameter)			35	mm	

Additional collector attribute(s)			
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

Energy Labelling Information		Additional Informative Technical Data	
	Reference Area, A_{sol} (m ²)	Hydraulic Designation Code	Aperture Area, A_a (m ²)
CHAPEE SOL 200	2,01	1-H-1234S-A:9.2,16085-C:20.6,1100	1,89

Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}		Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}	
Collector efficiency (η_{col})	58%	Zero-loss efficiency (η_0)	0,75
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/m ² , expressed in % and rounded to the nearest integer. Deviating from the regulation η_{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)	3,72
		Second-order coefficient (a_2)	0,012
		Incidence angle modifier IAM (50°)	0,93
		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.	