Keymark Certificate

078/000216

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 Technical information	DE DIETRICH CH 250 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.
First issued on Last issued on Validity	2014-03-20 2024-03-20 2029-03-20

Rafael GARCÍA MEIRO
CEO

ENAC
CERTIFICACIÓN
ISO 17065
Nº1 / C-PR271

AENOR CONFÍA S.A.U.
Génova, 6. 28004 Madrid. España
Tel. 91 432 60 00.- www.aenor.com

AENOR

Annex to Solar Keymark Certificate		Licence Number	078/000216
		Date issued	2024-03-20
		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	Gross area (A_G)	Gross length	Gross width	Gross height	Power output per collector Gb = 850 W/m2, Gd = 150 W/m2 & u = 1.3 m/s $\vartheta_m - \vartheta_a$					
					0 K	10 K	30 K	50 K	70 K	100 K
	m²	mm	mm	mm	W	W	W	W	W	W
DE DIETRICH CH 250	2,51	2.187	1.147	87	1.825	1.728	1.525	1.310	1.083	722
Power output per m² gross area					727	689	608	522	432	288

Performance parameters test method	Quasi dynamic									
Performance parameters (related to A_G)	η0, b	a1	a2	a3	a4	a5	a6	a7	a8	Kd
Units	-	W/(m²K)	W/(m²K²)	J/(m³K)	-	J/(m²K)	s/m	W/(m²K⁴)	W/(m²K⁴)	-
Test results	0,735	3,82	0,006	0,000	0,00	5.871	0,000	0,00	0,0E+00	0,93

Incidence angle modifier test method		Quasi dynamic - outdoor								
Incidence angle modifier	Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
Transversal	$K_{\theta T,coll}$	1,00	0,99	0,98	0,96	0,92	0,86	0,72	0,36	0,00
Longitudinal	$K_{\theta L,coll}$	1,00	0,99	0,98	0,96	0,92	0,86	0,72	0,36	0,00

Heat transfer medium for testing		Water	
Flow rate for testing (per gross area, A_G)		dm/dt	0,020 kg/(sm²)
Maximum temperature difference during thermal performance test		$(\vartheta_m-\vartheta_a)_{max}$	70 K
Standard stagnation temperature (G = 1000 W/m²; ϑ_a = 30 °C)		ϑ_{stg}	220 °C
Maximum operating temperature		$\vartheta_{max\ op}$	198 °C
Maximum operating pressure		$p_{max,op}$	1000 kPa

Testing laboratory	TÜV Rheinland Solar GmbH	http://www.tuv.com/solar	
Test report(s)	DE23HSZ8 001	**Dated**	21/11/2023

Comments of testing laboratory	Ver. 6.2 (13.01.2022)
none	

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Supplementary Information	Issued	2024-03-20

Gross Thermal Yield in kWh/collector at mean fluid temperature ϑ_m

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
DE DIETRICH CH 250		2.903	2.032	1.336	2.174	1.495	962	1.603	1.037	638	1.749	1.121	679
Gross Thermal Yield per m² gross area		1.156	810	532	866	596	383	639	413	254	697	447	271
Annual efficiency, η_a		66%	46%	30%	53%	37%	24%	55%	35%	22%	56%	36%	22%
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)											
Annual irradiation on collector plane		1765 kWh/m²			1630 kWh/m²			1166 kWh/m²			1244 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. 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/m²) >	1100	ϑ_a (°C) >	40	H_x (MJ/m²) >	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

	Reference Area, A_{sol} (m²)
DE DIETRICH CH 250	2,51

Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}

Collector efficiency (η_{col})	57%

Remark: Collector efficiency (ηcol) 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. Deviating from the regulation ηcol is based on reference area (Asol) which is aperture area for values according to EN 12975-2 or gross area for ISO 9806:2017.

Additional Informative Technical Data

Hydraulic Designation Code	Aperture Area, A_a (m²)
10-H-1234S-A:7.3,2044-C:20.6,1277	2,35

Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}

Zero-loss efficiency (η_0)	0,73	--
First-order coefficient (a_1)	3,82	W/(m²K)
Second-order coefficient (a_2)	0,006	W/(m²K²)
Incidence angle modifier IAM (50°)	0,92	--

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.