



Annex to Solar Keymark Certificate					Licence Number		011-7S2400 F							
					Date issued		2024-11-13							
					Issued by		DIN CERTCO							
Licence holder		Riello S.p.A			Country		Italy							
Brand (optional)					Web		www.riello.com							
Street, Number		Via Ing. Pilade Riello, 7			E-mail		info@riello.it							
Postcode, City		IT 37045 Legnago (VR)			Tel		+99 123 456 789							
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	112 K				
					m ²	mm	mm	mm	mm	mm	mm			
CP20TSS					1.91	1'818	1'048	70	1'379	1'299	1'129	947	752	304
Power output per m ² gross area					722	680	591	496	394	159				
Performance parameters test method		Steady state - outdoor												
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		0.740	4.13	0.008	0.000	0.00	4'886	0.000	0.00	0.0E+00	0.84			
Incidence angle modifier test method		Steady state - 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	0.88	0.75	0.55	0.29	0.00			
Longitudinal		$K_{\theta L, coll}$	1.00	0.99	0.98	0.96	0.88	0.75	0.55	0.29	0.00			
Heat transfer medium for testing					Water-Glycole									
Flow rate for testing (per gross area, A _G)					dm/dt	0.020	kg/(sm ²)							
Maximum temperature difference during thermal performance test					$(\vartheta_m - \vartheta_a)_{max}$	82	K							
Standard stagnation temperature (G = 1000 W/m ² ; $\vartheta_a = 30^\circ\text{C}$)					ϑ_{stg}	190	°C							
Maximum operating temperature					$\vartheta_{max, op}$	100	°C							
Maximum operating pressure					$p_{max, op}$	1000	kPa							
Testing laboratory		SPF Institute for Solar Technology			www.spf.ch									
Test report(s)		C1955			Dated		13.11.2024							
Comments of testing laboratory					Draft Ver. 6.2 (22.09.2021)									
					 INSTITUT FÜR SOLARTECHNIK 									
DIN CERTCO • Alboinstraße 56 • 12103 Berlin, Germany Tel: +49 30 7562-1131 • Fax: +49 30 7562-1141 • E-Mail: info@dincertco.de • www.dincertco.de														

Annex to Solar Keymark Certificate Supplementary Information	Licence Number	011-7S2400 F
	Issued	2024-10-01

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
CP20TSS		2'094	1'396	858	1'542	1'013	607	1'135	699	405	1'236	750	424
Gross Thermal Yield per m ² gross area		1'096	731	449	807	531	318	594	366	212	647	393	222
Annual efficiency, η_a		62%	41%	25%	50%	33%	19%	51%	31%	18%	52%	32%	18%
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 Draft Ver. 6.2 (22.09.2021). 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) >	1000	ϑ_a (°C) >
		20
		H_x (MJ/m ²) >
		600
Maximum tested positive load	2400	Pa
Maximum tested negative load	2400	Pa
Hail resistance using steel ball (maximum drop height)	35	m

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)	No

Energy Labelling Information		Additional Informative Technical Data	
	Reference Area, A_{sol} (m ²)	Hydraulic Designation Code	Aperture Area, A_a (m ²)
CP20TSS	1.91	10-V-1234S-A:7.2,1800-C:20,1080-D	1.77

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})	54%	Zero-loss efficiency (η_0)	0.72
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)	4.13
		Second-order coefficient (a_2)	0.008
		Incidence angle modifier IAM (50°)	0.91
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		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.	