


Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results					Licence Number		011-7S2896 F							
					Date issued		2018-11-08							
					Issued by		DINCERTCO							
Licence holder		Fondital S.p.A.			Country		ITALY							
Brand (optional)		--			Web		http://www.fondital.com							
Street, Number		Via Cerreto, 40			E-mail		info@fondital.it							
Postcode, City		25079 VOBARNO (Brescia)			Tel		+39 0365 87831							
Collector Type					Flat plate collector, glazed									
Collector name					Power output per collector G _b = 850 W/m ² ; G _d = 150 W/m ² θ _m - θ _a									
					0 K	10 K	30 K	50 K	70 K	52 K				
					m ²	mm	mm	mm	W	W	W	W	W	W
Gross area (A _G)					Gross length	Gross width	Gross height							
HWF 20					2,06	2.020	1.019	90	1.551	1.483	1.333	1.163	973	1.145
HWF 26					2,62	2.022	1.295	90	1.973	1.887	1.696	1.479	1.238	1.456
Power output per m ² gross area									753	720	647	565	472	556
Performance parameters test method					Steady state - indoor									
Performance parameters (related to A _G)					η _{0,hem}	a1	a2							
Units					-	W/(m ² K)	W/(m ² K ²)							
Test results					0,753	3,168	0,012							
Incidence angle modifier test method					Steady state - outdoor									
Bi-directional incidence angle modifiers					No									
Incidence angle modifier					Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
Transversal					K _{θT,coil}					0,94				0,00
Longitudinal					K _{θL,coil}					0,94				0,00
Heat transfer medium for testing					Water									
Flow rate for testing (per gross area, A _G)					dm/dt	0,024								kg/(sm ²)
Maximum temperature difference for thermal performance calculations					(θ _m -θ _a) _{max}	52								K
Standard stagnation temperature (G = 1000 W/m ² ; θ _a = 30 °C)					θ _{stg}	201,2								°C
Effective thermal capacity, incl. fluid (per gross area, A _G)					C/m ²	4,243								kJ/(Km ²)
Maximum operating temperature					θ _{max,op}	250								°C
Maximum operating pressure					p _{max,op}	1000								kPa
Testing laboratory					Fundación CENER-CIEMAT, LEST				http://www.cener.com					
Test report(s)					30.3139.1-1-1 / 30.3139.1-2-1 30.3139.1-3-1 / 30.3139.2 30.3470.0				Dated 31/10/2017 11/12/2017 05/11/2018					
Comments of testing laboratory					Datasheet version 5.01, 2016-03-01									
The collectors models HWF 20 and HWF 26 are the same as the models KS 2100F TP AC and KS 2600F TP AC tested according to ISO 9806:2013.														
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Annual collector output in kWh/collector at mean fluid temperature ϑ_{m_f} , based on ISO 9806:2013 test results													
Collector name	Standard Locations ϑ_{m_f}	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
HWF 20		2.487	1.835	1.255	1.924	1.378	910	1.412	959	609	1.531	1.038	647
HWF 26		3.163	2.334	1.597	2.447	1.753	1.157	1.796	1.220	775	1.947	1.320	823
Annual output per m ² gross area		1.207	891	609	934	669	442	685	466	296	743	504	314
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)											
Annual irradiation on collector plane		1765 kWh/m ²			1714 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. 5.01 (March 2016). A detailed description of the calculations is available at 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	No	
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	2400	Pa
Maximum tested negative load	2400	Pa
Hail resistance using ice balls (diameter)	25	mm

Energy Labelling Information			
	Reference Area, A_{sol} (m ²)	Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}	
HWF 20	2,06	Collector efficiency (η_{col})	61 %
HWF 26	2,62	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 9806:2013.	
		Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}	
		Zero-loss efficiency (η_0)	0,753 --
		First-order coefficient (a_1)	3,17 W/(m ² K)
		Second-order coefficient (a_2)	0,012 W/(m ² K ²)
		Incidence angle modifier IAM (50°)	0,94 --
		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.	