


Annex to Solar Keymark Certificate					Licence Number		011-7S406 F							
					Date issued		2025-07-14							
					Issued by		DINCERTCO							
Licence holder		Vaillant GmbH			Country		Germany							
Brand (optional)					Web		www.vaillant.de							
Street, Number		Berghauser Straße 40			E-mail		info@vaillant.com							
Postcode, City		42859 Remscheid			Tel		+49 (0) 2191 18-0							
Collector Type					Flat plate collector									
Collector name					Gross area (A_G) m ²	Gross length mm	Gross width mm	Gross height mm	Power output per collector G _b = 850 W/m ² , G _d = 150 W/m ² & u = 1.3 m/s $\vartheta_m - \vartheta_a$					
									0 K	10 K	30 K	50 K	70 K	102 K
VFK 145/3 V					2.51	2 033	1 233	80	1 844	1 751	1 543	1 305	1 037	546
VFK 145/3 H					2.51	1 233	2 033	80	1 844	1 751	1 543	1 305	1 037	546
Power output per m² gross area					735	698	615	520	413	217				
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					0.737	3.54	0.015	0.000	0.00	10 580	0.000	0.00	0.0	0.98
Incidence angle modifier test method					Quasi dynamic - outdoor									
Incidence angle modifier					Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
Transversal					$K_{\theta T, coll}$	1.00	1.00	1.00	0.99	0.95	0.79	0.59	0.30	0.00
Longitudinal					$K_{\theta L, coll}$	1.00	1.00	1.00	0.99	0.95	0.79	0.59	0.30	0.00
Heat transfer medium for testing					Water									
Flow rate for testing (per gross area, A_G)					dm/dt		0.020		kg/(sm ²)					
Maximum temperature difference during thermal performance test					$(\vartheta_m - \vartheta_a)_{max}$		72		K					
Standard stagnation temperature (G = 1000 W/m²; ϑ_a = 30 °C)					ϑ_{stg}		200		°C					
Maximum operating temperature					$\vartheta_{max, op}$		200		°C					
Maximum operating pressure					$p_{max, op}$		1000		kPa					
Testing laboratory		Institut für Gebäudeenergetik, Thermotechnik und Energiespeicherung (IGTE)							http://www.igte.uni-stuttgart.de					
Test report(s)		20COL1579 20COL1579Q 20COL1580 20COL1580Q							Dated		10.11.2020 10.11.2020 10.11.2020 10.11.2020			
Comments of testing laboratory					Ver. 6.2 (13.01.2022)									
Thermal performance parameters are given from 20COL1579 (VFK 145/3 V). This data sheet replaces the data sheet dated 10 th of November 2020. Reason for replacement: Update of the SK data sheet version from 6.1 to 6.2 at the customer's request.					 Forschungs- und Testzentrum für Solaranlagen Institut für Thermodynamik und Wärmetechnik Universität Stuttgart Pfaffenwaldring 8, 70550 Stuttgart (Vaihingen)									
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Supplementary Information										Issued		2025-07-14			
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		
VFK 145/3 V		2 996	2 118	1 350	2 271	1 544	936	1 665	1 072	628	1 822	1 166	672		
VFK 145/3 H		2 996	2 118	1 350	2 271	1 544	936	1 665	1 072	628	1 822	1 166	672		
Gross Thermal Yield per m ² gross area		1 194	844	538	905	615	373	663	427	250	726	465	268		
Annual efficiency, η_a		68%	48%	30%	56%	38%	23%	57%	37%	21%	58%	37%	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) >		1000		ϑ_a (°C) >		20		H _x (MJ/m ²) >		600					
Maximum tested positive load										3000		Pa			
Maximum tested negative load										2500		Pa			
Hail resistance using steel ball (maximum drop height)										2		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															
		Reference Area, A _{sol} (m ²)		Hydraulic Designation Code				Aperture Area, A _a (m ²)							
VFK 145/3 V		2.51		1-H-1234S-A:9,20630-C16,1178-D				2.35							
VFK 145/3 H		2.51		1-H-1234S-A:9,18004-C16,1978-D				2.35							
Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}															
Collector efficiency (η_{col})		57%													
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.															
Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}															
Zero-loss efficiency (η_0)		0.73													
First-order coefficient (a_1)		3.54													
Second-order coefficient (a_2)		0.015													
Incidence angle modifier IAM (50°)		0.98													
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.															
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