

| Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate | | | | | | Licence Number | | 011-7S1323 F | | | | | | | |
|---|---|--------------------|------------------------|--------------------|-----------------------------------|---|---|------------------------------------|-----------------------|----------------------|------|--|-----|------|-----|
| | | | | | | Issued | | 2015-01-27 | | | | | | | |
| Company holding the licence | | | | | | GREENoneTEC Solarindustrie GmbH | | Country | | Austria | | | | | |
| Brand (optional) | | | | | | | | Website | | www.greenonetec.com | | | | | |
| Street, street number | | | | | | Industriepark St. Veit, Energieplatz 1 | | E-mail | | info@greenonetec.com | | | | | |
| Postal Code / City, province | | | | | | A-9300 | St. Veit | Tel/Fax | | 43 4212 28 136-0 | | | | | |
| Collector Type (flat plate glazed/un-glazed; evacuate tubular) | | | | | | Flat plate collector - glazed | | | | | | | | | |
| Thermal / photo voltaic hybrid collector? (PVT collector) | | | | | | No | | | | | | | | | |
| Integration in the roof possible? (manufacturers declaration) | | | | | | No | | | | | | | | | |
| Collector name | Aperture area (Aa) m ² | Gross length mm | Gross width mm | Gross height mm | Gross area (AG) m ² | Power output per collector module | | | | | | | | | |
| | | | | | | G = 1000 W/m ² | | | | | | | | | |
| | | | | | | Tm-Ta | | | | | | | | | |
| | | | | | | 0 K | 10 K | 30 K | 50 K | 70 K | | | | | |
| | | | | | | W | W | W | W | W | | | | | |
| FK 8203 N4A AI hs FL | 1,91 | 1.731 | 1.170 | 83 | 2,03 | 1.524 | 1.443 | 1.269 | 1.081 | 879 | | | | | |
| FK 8203 N4A AI hs BF | 1,84 | 1.730 | 1.169 | 84 | 2,02 | 1.498 | 1.421 | 1.252 | 1.064 | 856 | | | | | |
| FK 8203 N2A AI hs BF | 1,84 | 1.731 | 1.170 | 84 | 2,03 | 1.499 | 1.427 | 1.269 | 1.091 | 893 | | | | | |
| FK 8203 N2A AI hs FL | 1,93 | 1.729 | 1.170 | 84 | 2,02 | 1.529 | 1.447 | 1.274 | 1.088 | 890 | | | | | |
| FK 8233 N4A AI hs FL | 2,22 | 2.000 | 1.170 | 83 | 2,34 | 1.744 | 1.661 | 1.476 | 1.265 | 1.029 | | | | | |
| FK 8233 N2A AI hs FL | 2,22 | 2.000 | 1.170 | 83 | 2,34 | 1.744 | 1.661 | 1.476 | 1.265 | 1.029 | | | | | |
| FK 8253 N4A AI hs FL | 2,40 | 2.150 | 1.171 | 83 | 2,52 | 1.888 | 1.798 | 1.598 | 1.370 | 1.115 | | | | | |
| FK 8253 N2A AI hs FL | 2,40 | 2.150 | 1.170 | 84 | 2,52 | 1.874 | 1.795 | 1.608 | 1.384 | 1.124 | | | | | |
| FK 8253 N4A AI hs BF | 2,31 | 2.151 | 1.170 | 83 | 2,52 | 1.864 | 1.767 | 1.558 | 1.327 | 1.073 | | | | | |
| Performance test method | | | | | | Glazed liquid heating collector - steady state - indoor | | | | | | | | | |
| Performance parameters related to aperture area | | | | | | η ₀ | a ₁ | a ₂ | | | | | | | |
| Units | | | | | | - | W/(m ² K) | W/(m ² K ²) | | | | | | | |
| Test results - Flow rate and fluid see note 1 | | | | | | 0,785 | 3,594 | 0,014 | | | | | | | |
| Bi-directional incidence angle modifiers? | | | | | | No | K _θ values are obligatory for 50°. | | | | | | | | |
| Incidence angle modifiers K _θ (θ) | | | | | | Angle | 10° | 20° | 30° | 40° | 50° | 60° | 70° | 80° | 90° |
| | | | | | | K _θ (θ) | | | | | 0,93 | | | 0,00 | |
| Incidence angle modifier not bi-directional - leave fields blank | | | | | | | | | | | | | | | |
| Stagnation temperature - Weather conditions see note 2 | | | | | | T _{stg} | | 181 | °C | | | | | | |
| Effective thermal capacity | | | | | | c _{eff} = C/Ag | | 5,27 | kJ/(m ² K) | | | | | | |
| Max. intended operation temperature - see note 3 | | | | | | T _{max,op} | | - | °C | | | | | | |
| Max. operation pressure - see note 3 | | | | | | p _{max,op} | | 1000 | kPa | | | | | | |
| Pressure drop table - for a collector family, the values shall be for the module with highest ΔP per m ² aperture area | | | | | | | | | | | | | | | |
| Flow rate | kg/(s m ²) | | | | | | | | | | | | | | |
| Pressure drop, ΔP | Pa | | | | | | | | | | | | | | |
| Optional weather data | Location | | | | | | | | | Link | | | | | |
| Testing Laboratory | | | | | | AIT Austrian Institute of Technology GmbH | | | | | | | | | |
| Website | | | | | | www.ait.ac.at | | | | | | | | | |
| Test report id. number | | | | | | 2.04.00750.1.0-1a-LT / 2.04.00750.1.0-1-QT / 2.04.00750.1.0-2-LT / 2.04.00750.1.0-2-QT / 2.04.00750.1.0-3a-LT / 2.04.00750.1.0-3-QT / 2.04.00834.1.0-1-LT / 2.04.00834.1.0-1-QT / 2.04.00834.1.0-2-LT / 2.04.00834.1.0-2-QT / 2.04.00834.1.0-3-LT / 2.04.01038.1.0-LT / 2.04.01038.1.0-QT | | | Date of test report | | | 12.10.2011 / 9.7.2010 / 1.6.2010 / 9.7.2010 / 6.10.2011 / 9.7.2010 / 6.10.2011 / 6.10.2011 / 6.10.2011 / 6.10.2011 / 6.10.2011 / 7.9.2012 / 11.10.2012 | | | |
| During the test GDIF/GTOT was always between | | | | | | 0,06 | and | 0,2 | | | | | | | |
| Comments of testing laboratory: | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| Note 1 | Flow rate | 0,020 | kg/(s m ²) | Fluid | Water | AIT Austrian Institute of Technology GmbH Donau-City-Straße 1 1220 Wien, Austria T +43 (0) 50550 0 F +43 (0) 50550 0 office@ait.ac.at www.ait.ac.at | | | | | | | | | |
| Note 2 | Irradiance, G = 1000 W/m ² ; Ambient temperature, T _a = 30 °C | | | | | | | | | | | | | | |
| Note 3 | Given by manufacturer | | | | | | | | | | | | | | |
| Datasheet version: 4.06, 2014-01-15 | | | | | | | | | | | | | | | |
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|---|----------------|--------------|
| Annual collector output based on EN 12975 Test Results, annex to Solar KEYMARK Certificate | Licence Number | 011-7S1323 F |
| | Issued | 27.01.2015 |

| Annual collector output kWh/module | | | | | | | | | | | | | | |
|------------------------------------|--|-------|-------|-------|-------|------|-----------|-------|------|----------|-------|------|--|--|
| Collector name | Location and collector temperature (T _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 | | |
| FK 8203 N4A Al hs FL | 2.371 | 1.697 | 1.107 | 1.807 | 1.250 | 782 | 1.329 | 871 | 525 | 1.443 | 940 | 558 | | |
| FK 8203 N4A Al hs BF | 2.288 | 1.637 | 1.068 | 1.743 | 1.206 | 754 | 1.282 | 841 | 507 | 1.392 | 907 | 538 | | |
| FK 8203 N2A Al hs BF | 2.288 | 1.637 | 1.068 | 1.743 | 1.206 | 754 | 1.282 | 841 | 507 | 1.392 | 907 | 538 | | |
| FK 8203 N2A Al hs FL | 2.395 | 1.713 | 1.118 | 1.824 | 1.262 | 790 | 1.342 | 880 | 530 | 1.457 | 950 | 563 | | |
| FK 8233 N4A Al hs FL | 2.760 | 1.975 | 1.289 | 2.103 | 1.455 | 910 | 1.547 | 1.014 | 611 | 1.680 | 1.095 | 649 | | |
| FK 8233 N2A Al hs FL | 2.760 | 1.975 | 1.289 | 2.103 | 1.455 | 910 | 1.547 | 1.014 | 611 | 1.680 | 1.095 | 649 | | |
| FK 8253 N4A Al hs FL | 2.989 | 2.139 | 1.396 | 2.277 | 1.575 | 986 | 1.675 | 1.098 | 662 | 1.819 | 1.185 | 703 | | |
| FK 8253 N2A Al hs FL | 2.986 | 2.137 | 1.395 | 2.275 | 1.574 | 985 | 1.674 | 1.097 | 662 | 1.818 | 1.184 | 702 | | |
| FK 8253 N4A Al hs BF | 2.872 | 2.055 | 1.341 | 2.188 | 1.514 | 947 | 1.610 | 1.055 | 636 | 1.748 | 1.139 | 675 | | |
| | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | |
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|---------------------------------------|---|
| Collector mounting: Fixed or tracking | Fixed; slope = latitude - 15° (rounded to nearest 5°) |
|---------------------------------------|---|

| Overview of locations | | | | |
|-----------------------|------------|--|----------------------|--|
| Location | Latitude ° | G _{tot} kWh/m ² | T _a °C | Collector orientation or tracking mode |
| Athens | 38 | 1.765 | 18,5 | South, 25° |
| Davos | 47 | 1.714 | 3,2 | South, 30° |
| Stockholm | 59 | 1.166 | 7,5 | South, 45° |
| Würzburg | 50 | 1.244 | 9,0 | South, 35° |
| | | | | |
| | | | | |

| | | |
|------------------|--|--------------------|
| G _{tot} | Annual total irradiation on collector plane | kWh/m ² |
| T _a | Mean annual ambient air temperature | °C |
| T _m | Constant collector operating temperature (mean of in- and outlet temperatures) | °C |

The calculation of the annual collector performance is performed with the official Solar Keymark spreadsheet tool ScenoCalc. The collector output is calculated hour by hour according to the efficiency parameters from the Keymark test using constant collector operating temperature (T_m). A detailed description of the calculations is available at <http://www.sp.se/en/index/services/solar/ScenoCalc/Sidor/default.aspx>.