

Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate Kurzfassung EN 12975 Test Ergebnisse, Anlage zum Solar KEYMARK-Zertifikat Synthèse des résultats d'essais selon EN 12975, annexe au certificat Solar KEYMARK	Registration No. Registernummer Numéro d'enregistrement	011-7S1655 R
	Date / Datum / Date	11.07.2011

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Collector Type / Kollektorbauart / type de capteur Evacuated tube / Vakuumröhrenkollektor / Capteur à tube sous vide

To be roof integrated / im Dach eingegliedert zu sein / pour être intégré dans le toit No / nein / non

Product name Produktbezeichnung Modèle	Aperture area Aperturfläche Superficie d'entrée [m ²]	Gross length Länge(Außenmaß) Longueur hors tout [mm]	Gross width Breite (Außenmaß) largeur hors tout [mm]	Gross height Höhe (Außenmaß) epaisseur hors tout [mm]	Gross area Bruttofläche Superficie hors-tout [m ²]	Power output per collector unit Leistung je Kollektormodul Puissance fournie par le capteur {note 1} G = 1000 W/m ² Tm-Ta :				
						0 K	10 K	30 K	50 K	70 K
						[W]	[W]	[W]	[W]	[W]
WT-B58-30	2,83	2030	2490	180	5,05	1890	1836	1720	1595	1461
WT-B58-25	2,36	2030	2090	180	4,24	1575	1530	1433	1329	1218
WT-B58-24	2,26	2030	2010	180	4,08	1512	1469	1376	1276	1169
WT-B58-22	2,08	2030	1850	180	3,76	1386	1346	1261	1170	1072
WT-B58-20	1,89	2030	1690	180	3,43	1260	1224	1146	1063	974
WT-B58-18	1,70	2030	1530	180	3,11	1134	1101	1032	957	877
WT-B58-15	1,42	2030	1290	180	2,62	945	918	860	797	731
WT-B58-12	1,13	2030	1050	180	2,13	756	734	688	638	584
WT-B58-10	0,94	2030	890	180	1,81	630	612	573	532	487

Collector efficiency parameters related to aperture area Kollektorleistungsparameter bezogen auf die Aperturfläche (note 1) Paramètres de performances thermiques rapportées à la superficie d'entrée	η_{0a}	0,668	-
	a_{1a}	1,894	W/(m ² K)
	a_{2a}	0,0039	W/(m ² K ²)

Stagnation temperature / Stagnationstemperatur / Temperature de stagnation (note 2) t_{stg} 239 °C

Effective thermal capacity / Effektive Wärmekapazität / Capacité thermique effective $C_{eff} = C/A_a$ 27,87 kJ/(m²K)

Max. operation pressure / max. Betriebsdruck / pression d'opération de maximum (note 3) p_{max} 600 kPa

Incidence angle modifiers $K_{\theta}(\theta)$ Einfallswinkelkorrekturfaktoren $K_{\theta}(\theta)$ Facteur d'angle d'incidence $K_{\theta}(\theta)$	G_{DIF}/G_{TOT}		θ_T / θ_L	50°	10°	20°	30°	40°	60°	70°
	min	max								
	0,000	0,224	$K_{\theta}(\theta_L)$	1,42	1,00	1,00	0,99	0,96	0,84	0,69

Testing Laboratory / Prüflaboratorium / Laboratoire d'essais Fraunhofer ISE, TestLab Solar Thermal Systems

Website www.kollektortest.de

Test report id. number / Prüfberichtsnummer / numéro d'identification de rapport des essais ktb-2011-20-k; ktb-2011-22-k

Date of test report / Datum des Prüfberichts / date de rapport des essais 11.07.2011

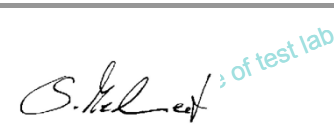
Perf. test method / Leistungstestmethode / méthode d'essai de performance EN 12975-2 6.1.4 (outdoor/außen/extérieur)

Comments of testing laboratory / Kommentare des Prüflaboratoriums / commentaires du laboratoire d'essais :

English: All information given within this data sheet are based on the measurement results of the collector WT-B58-30.

Deutsch: Die in diesem Datenblatt enthaltenen Angaben basieren auf den Messergebnissen des Kollektors WT-B58-30.

Français

Note 1 Test conditions Prüfbedingungen conditions d'essais	Fluid Flüssigkeit Liquide	Water Wasser Eau	Flow rate Durchfluss Débit	0,020	kg/s per m ²	 S. Kellner of test lab
Note 2 Irradiance / Bestrahlungsstärke / Irradiance $G_s=1000 \text{ W/m}^2$ Ambient temperature / Umgebungstemperatur / Temperature ambiante: $t_a=30 \text{ }^\circ\text{C}$						
Note 3 Given by manufacturer / Herstellerangaben / donnée par le fabricant						

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To your benefit. Worldwide.

Certification of Thermal Solar Products.

Solar KEYMARK – Quality for Europe. Solar thermal products contribute importantly to the conservation of fossil fuels. With high efficient solar thermal systems it is possible to cover up to 70 % of the annual need of primary energy required for hot water supply. Space heating systems can be supported efficiently by using solar energy. Thus, solar thermal systems with a high efficiency and environmental friendliness are a meaningful addition to traditional heating systems using fossil fuels.

It's the mark that shows the difference.

Besides the solar collector efficiency, for planner, installer and consumers also the usability, safety, and reliability are part of their product decision. Certificates and quality marks of an independent certification body can support the purchase decision, and provide confidence in having bought a quality product.

Even in the product marking, Europe grows together. The Solar KEYMARK – the European quality mark for product is the entry for international operating companies to the European markets. In combination with the certification mark "DIN-Geprüft" (= DIN-Tested), the certified quality products offer the competitive advantage to manufacturers and suppliers and distinguish them from the mass of products. It is now possible to market the products throughout Europe with one European quality mark.



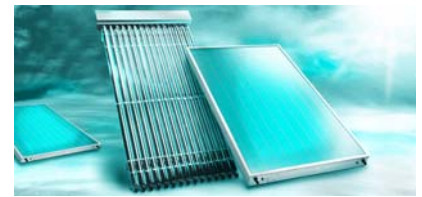
Foundations for the European Quality Mark.

With the participation of manufacturers, testing laboratories, certification bodies as well as the European Solar Thermal Industry, a European harmonized certification scheme has been drawn up for solar collectors and factory made solar thermal systems. The certification is based on the European product standards EN 12975, EN 12976, EN 12977 and EN ISO 9806.

It applies to the following products

- Solar collectors (flat-plate collectors, tube collectors, concentrated collectors, PVT collectors / hybrid collectors)
- Factory made and custom built systems
- Solar water heater stores (inclusive solar combistores)
- Control equipment for thermal solar systems

These European standards specify uniform quality and testing requirements concerning usability, safety and reliability as well as for the determination of the thermal efficiency of the products.



There are many good reasons for having a DIN Certification.

- Provides access to the EU market
- You are clearly distinguishable from your competitors
- Customer confidence is created by the mark that makes the difference
- Assistance in orienting and making decisions on the market by certified quality
- DIN CERTCO – as neutral third party – confirms your claim to quality by means of the internationally recognized Solar KEYMARK
- Basis for the granting of subsidies in the European countries
- Increases Sales Opportunities
- Reduced testing and administration costs

Criteria for the Certification.

Basis for granting the Solar KEYMARK is the harmonised European Mark System, which has been developed and established by CEN (European Committee for Standardization) and CENELEC (European Committee for Electrotechnical Standardization) for the KEYMARK certification for products based on European standards.

Within the Initial Type Test (ITT), the solar collectors and solar thermal systems are tested and assessed concerning their efficiency, usability, safety and reliability. The test samples for this Initial Type Test and the surveillance tests are taken out of the running production or the manufacturer's store.

The following quality criteria are for example subject to the testing of solar collectors

- Thermal efficiency
- Internal and external thermal shock resistance
- High temperature resistance
- Freeze resistance
- Internal pressure resistance
- Mechanical load (snow and wind loads)
- Impact resistance
- Exposure (simulation of operating conditions/outdoor exposure)
- Rain proof

For thermal solar systems the following characteristics are additionally tested

- Suitability for drinking water
- Freeze resistance over-temperature protection
- Reverse flow protection
- Pressure resistance
- Safety equipment

Occurring leaks, great deformation through thermal stress, technical relevant changes at plastic parts, at the absorber, or the thermal insulation result in the assessment "failed".

Furthermore, the manufacturer has to operate a quality system (product related factory production control, FPC) taking into account the elements of the EN ISO 9000 series.

Only those solar thermal products are certified with the Solar KEYMARK in combination with "DIN-Geprüft" which were successfully tested by a testing laboratory accredited and approved by DIN CERTCO, neutrally assessed and thus proofed their compliance with the EN standards.

The Solar KEYMARK certificate is valid for five years. It can be renewed for further 5 years if applied for, provided that the surveillance (annual factory inspection and physical inspection of the product at least every 2 years) shows that the preconditions are fulfilled.

Openness and transparency.

A daily updated list of all certificate holders and the technical data sheet for the certified product can be viewed on the homepage of DIN CERTCO. From here it is also possible to download all documents relevant to certification, such as the certification scheme and application.

Experts. On site.

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