

Solar Glass Certification PV Contract

1. **Concept**

Certification of solar glass, the glass used as a cover in thermal solar collectors, is intended to improve transparency within the market. On the one hand, the module manufacturer should have clear criteria available to choose the most suitable glass. On the other hand, malpractice in association with module testing should be made more difficult. The associated label will prevent high-quality glass, which was installed only for module testing purposes, from being replaced by lower-quality glass during production.

In addition to complete documentation of the glass performance, an advantage for the module manufacturer is that different suppliers or types of glass can be chosen. The cover in a tested module can be replaced with glass from the same performance class without significantly changing the system performance.

2. **Organisation, procedure**

The Institut für Solartechnik certifies glass types according to specified criteria (see Document 1).

The client supplies glass samples of each type to be certified. Each variation in the glass composition, the manufacturing procedure or the surface properties (structure, treatment such as etching or coating) results in a different glass type. Each glass type must be marked with a unique identification. The samples are to be taken from current production. The sample size is 260 x 200 mm. Two samples of each glass type are to be supplied. The samples can be partially tempered, but this is not a requirement.

3. **Rights and obligations of the glass manufacturer**

The glass manufacturer (sample supplier) commits himself not to make any changes to the glass type which could influence the relevant criteria for certification in any way (see Document 1), during the period of validity of the certificate.

The glass manufacturer (sample supplier) accepts, that the final certificate is published on the website of the certifying body (SPF) in any case.

If demanded by the certifying body (SPF), the glass manufacturer must supply current samples within a month or as agreed mutually for control testing.

Each glasspane must be marked by the appropriate solar glass labelling (see Document 1) in readable size.

4. Rights and obligations of the certifying body

The Institut für Solartechnik commits itself to carrying out the certification within the shortest time possible. With the exception of unforeseeable events, certification will be completed within a month of delivery of the glass samples. SPF accepts all measurements from other institutes, provided that they have demonstrated the comparability of their results within annual round-robin experiments.

Certification as such will be carried out exclusively by the Institut für Solartechnik. SPF reserves the right to take random samples from collectors.

The Institut publishes the current lists of certified glass types with suppliers' addresses and all relevant technical data in print and on the Internet (www.spf.ch).

SPF reserves the right to modify and improve the procedures.

5. Costs

The costs are divided into 2 categories:

Measurement and testing costs

The measurement and testing costs at the Institut für Solartechnik amount to € 3'380.00 per glass type (as of June 2012). As already stated above, all measurements and tests can also be carried out at other authorised institutes.

Certification costs

The certification costs including publication and organisation amount to € 1'100.00 per glass type.

6. Period of validity

The period of validity of the certificate is 3 years, starting from the certification date. Validity expires after this period and each glass type must be recertified.

7. Changes to the glass

Any changes to the certified glass type which affect one or more of the certification criteria must be reported to the certifying body (SPF) without delay. Depending on the type and effect of the change, the certifying body will decide whether and which measurements need to be repeated.

8. Cancellation of the certificate

The certificate will be cancelled for the following reasons:

- False or incomplete specifications in the label
- Changes in the glass type in comparison to the certified sample
- Negative deviation (≥ 0.5 % absolute) of the performance as determined during a later control test.

9. Use of the certificate for advertising purposes

Use of the certificate for advertising purposes is desired. However, the label must always be quoted completely (according to Document 1).

10. Liability and place of jurisdiction

All tests and evaluations are made according to the best of our knowledge. SPF assumes no legal liability or responsibility from the direct or indirect use of this certificate. Further, the general terms and conditions of SPF apply (Document 2).

The place of jurisdiction is Rapperswil.

11. Documents

| Doc. No.: | Title | Source |
|-----------|--|---|
| 1 | Certification of Solar Glass; Fundamentals | SPF, Internet: www.spf.ch |
| 2 | General Terms and Conditions SPF | SPF, Internet: www.spf.ch |

12. Signatures

The signatories accept all conditions without further limitations:

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| <p>SPF:</p> <p>Rapperswil, Stamp / Signature:</p> |
| <p>Customer :</p> <p>Glass, product name :</p> <p> thickness :</p> <p> structure of surfaces, outside: inside:.....</p> <p> AR coating (outside):</p> <p>Place and date: Stamp / Signature:</p> |