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**Gütegemeinschaft
Flachglas**

Standards and Regulations for TSG with heat-soak test at the European and national levels

Information on the RAL quality mark TSG-HF No. 1

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Standards and regulations for TSG with heat-soak test

With regard to the relevance of standards and their version status, attention must be paid to the difference between **"current normative"** and **"introduced by the national building authorities"** including the requirements for self-monitoring (factory production control) and external monitoring (third party control). This is particularly important in view of the current situation with toughened safety glass with heat-soak test.

Standards are national, European or international documents that control the requirements for products, services and processes in order to create common harmonised technical rules and regulations. In building construction there are standards for construction products, manufacturing and test methods, and for the design, construction and execution of works. They are developed using defined processes by standardisation bodies made up of specialists from industry and research. In Germany the standardisation processes are managed by the DIN Deutsches Institut für Normung e.V.

Application of the standards is in the first place voluntary. Standards only become mandatory if they are referred to in contracts or if the legislator stipulates obligatory compliance. Standards in the construction industry therefore acquire legal relevance when the supreme building supervisory authorities or the EU refer to them for the technical specification of statutory requirements. Only then do they count as being introduced by the national building authorities.

The EU Construction Products Regulation applies to the construction products trade throughout Europe. For this "harmonised product standards" (hEN) are drawn up that feature special mandatory characteristics: if a construction product falls within the scope of such an hEN, this standard becomes mandatory after a transition period (coexistence period). The manufacturer is obliged to provide a Declaration of Performance for the construction product and label it with the CE mark. This obligation distinguishes the standards under the EU Construction Products Regulation from other standards at national, European or international levels. Construction products falling under an hEN are not allowed to have any additional national requirements. For complete harmonisation, an hEN must be published in the Official Journal of the European Union.

In Germany the supreme building supervisory authorities of the federal states have compiled and introduced selected standards and technical regulations for the construction industry in the Technical Building Regulations. It is mandatory to observe the technical regulations for the construction products and construction techniques named there.



Figure: © Friedmann & Kirchner

Normative and national building authority situation for toughened safety glass with heat-soak test

The construction product "toughened safety glass with heat-soak test" is covered by a harmonised standard (hEN). The standard DIN EN 14179, Heat soaked thermally toughened soda lime silicate safety glass, consists of two parts. Only the second part is harmonised in Europe: the product standard is DIN EN 14179-2.

DIN EN 14179, Part 1, Details and description, presents details of the manufacturing process, the heat soaking process and the product characteristics, amongst other things. DIN EN 14179, Part 2, Evaluation of conformity/Product standard, explains the defined performance characteristics, the assessment and verification of the constancy of performance including provisions for factory production control, as well as marking and labelling.

Both parts of DIN EN 14179 were first published in 2005 and have now both been revised, unfortunately not both at the same time. For DIN EN 14179 Part 1 the **current normative status** is the December 2016 version. This is now complicated because the revision of Part 2 has come to a halt in the standardisation process. There is so far only a published draft from December 2017 which has still not come into force. So the first version of Part 2, DIN EN 14179-2:2005-08, continues to be normative as before.

This normative current product standard DIN EN 14179-2:2005-08 has been **introduced by the national building authorities** and must therefore be applied. However, it does not make reference to the latest normative version of Part 1, as this did not exist in 2005. Part 2 still refers to the original version of DIN EN 14179-1 from 2005 (strictly speaking, actually to its draft version prEN 14179-1:2001). However, what is stated in the product standard, i.e. in Part 2, is what is applicable according to the national building authorities. This means that the old Part 1 continues to be relevant to building authorisation as before, although this version has already been withdrawn as a standard.

This situation with TSG with heat-soak test regularly leads to confusion in the market, as the contents of the two version releases of DIN EN 14179-1 differ in places. The newer 2016 version demands e.g. a lower soak temperature than does the original version from 2005. The two versions also differ in their provisions for oven calibration. As, however, the newer version has not been introduced by the national building authorities, DIN EN 14179-1:2016-12 still cannot be used. This situation will continue for some time to come, although not only is there an urgent need for the revision of DIN EN 14179-2 to be completed but several other product standards for glass products also require revision. The reason for this long delay is the revision of the EU Construction Products Regulation and an associated fundamental changeover of the system for developing and assessing product standards. The amended Construction Products Regulation was published in the Official Journal of the European Union at the end of 2024. Subsequent to this, it will likely be years until all product standards for glass in building are revised. As things stand today, no change to the current standardisation situation is therefore expected before 2028.

	DIN EN 14179 Glass in Building – Heat soaked thermally toughened soda lime silicate safety glass	
	Current normative	Introduced by the national building authorities
DIN EN 14179 Part 1: Definition and description	2016-12 (2005-09 withdrawn)	2005-09 (prEN 14179-1:2001) 
DIN EN 14179 Part 2: Product standard	2005-08 (Draft 2017-12)	2005-08 Makes reference to

The safety level required in Germany

As though the situation for toughened safety glass with heat-soak test were not already complicated enough, added to this are special features which have their roots in the national history of the product. In earlier years, the German Building Inspectorate defined additional requirements for the heat soaking process of TSG in the Construction Products List A to ensure a specified safety level. The "TSG-H" thus defined as a national special characteristic, differed significantly from TSG with heat-soak test in accordance with DIN EN 14179 in two points: first due to the longer soak time (4 hours instead of the 2 hours specified in the European standard); second on account of mandatory third party control. Additional national requirements of this kind were then declared inadmissible by the European Court of Justice in its ruling C-100/13 of 16 October, 2014. As a result, the construction products lists had to be withdrawn.

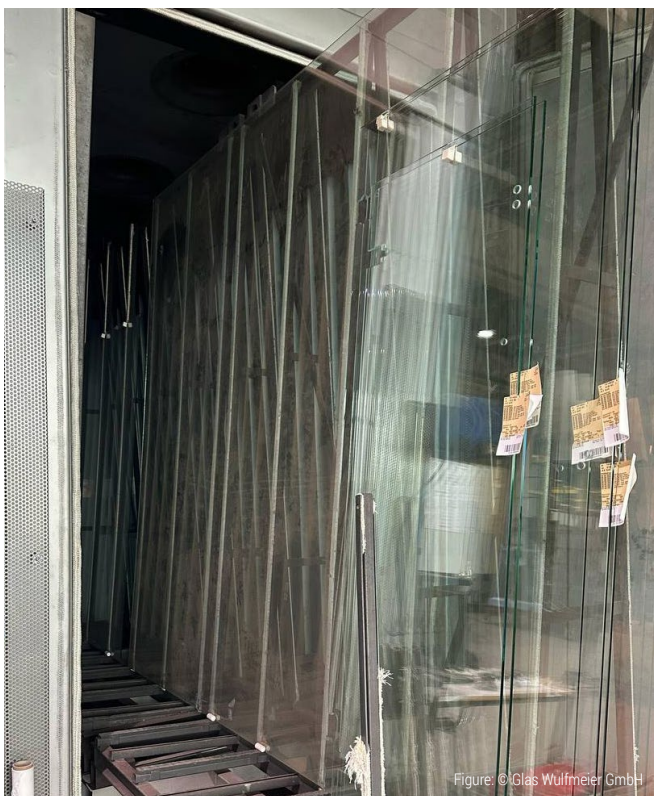


Figure: © Glas Wulfmeier GmbH

As far as the soak time is concerned, it is now generally recognised that the two-hour soak time required by DIN EN 14179-1, measured from the point at which the surface temperature reaches 280 °C for all types of glass, are adequate to trigger any potential spontaneous breakages. More recent thorough research has shown that the 4 hours required for TSG-H do not result in an improvement in the product. The soak time required for TSG-HF in accordance with RAL-GZ 525 is also therefore only two hours.

The mandatory third party control for maintaining the nationally required safety level for the installation of TSG with heat-soak test with an upper edge above 4 m will continue to be considered as indispensable. Since 2019 there have therefore been additional provisions for this construction technique (not for the construction product!) in the newly created Model Administrative Provisions - Technical Building Rules (MVV TB). In the 2024/1 current version in Annex 1.2.7/3 to DIN 18008-2 in the 3rd Clause this says:

"The minimum value of the reliability index for TSG with heat-soak test given in Clause 4.3 (NB: of DIN 18008-2) can be achieved by a calibration in accordance with E DIN EN 14179-1: 2002-03 for every heat soak oven repeated every two years, combined with an annual evaluation of the factory production control by a third party with adequate experience in the audit of the production control and calibration tests of heat soak oven. The third party can specify a different frequency than two years for the calibration, if suitable measuring devices and inspections by the manufacturer are in place.

The meaning of "Minimum value of the reliability index given in Clause 4.3" can be understood if the chain of references in this clause of DIN 18008-2:2020-05 is followed in detail to Annex C and subsequently to DIN EN 1990/NA:2010-12. The short version states: The use of toughened safety glass with heat-soak test without any restriction of the installation height is subject to a third party production control by a testing body.

This required procedure is fully complied with by the quality control in accordance with the RAL quality and inspection regulations for TSG with heat-soak test (TSG-HF) RAL-GZ 525.

The RAL quality mark for TSG with heat-soak test (TSG-HF), RAL-GZ 525

In order to ensure legal compliance both for the manufacturer and user of toughened safety glass with heat-soak test as regards its use with an upper edge above 4 m, the RAL Gütegemeinschaft Flachglas e.V. provides a harmonised solution via the RAL TSG-HF quality mark. Quality control in accordance with the RAL quality and inspection regulations for TSG with heat-soak test (TSG-HF) RAL-GZ 525 fully meets all the requirements set out by building inspection and standardisation bodies.

The quality and inspection regulations for TSG-HF were drawn up in cooperation with the test institutes that had already carried out third party control under the Construction Products List. These test institutes now also carry out the regular quality control for the RAL TSG-HF quality mark, RAL-GZ 525 in the companies.

The RAL TSG-HF quality mark indicates a clearly defined scope of third party control that can be checked by anyone in the quality and inspection regulations. Without the RAL quality mark the precise scope of third party control would only be apparent to a customer from the manufacturer's contract with the relevant institute, and can vary in some points from the quality and inspection regulations.

The RAL quality mark from the Gütegemeinschaft Flachglas e.V. is the visible expression of the joint efforts of the sector to provide a solution to the question of how the product can still be safely used after the end of the Construction Products List.



Note: The RAL quality and inspection regulations were released in March 2019. In anticipation of the revised Part 2 of the standard, they were already aligned to the draft standard DIN EN 14179-2:2017-12. Contrary to expectations at the time, however, as the 2005 versions of the standards are still relevant to the national building authorities, the TSG-HF Quality Committee has determined that the quality assurance is to be carried out in accordance with the currently valid version of DIN EN 14179. This is recorded in the document by the quality committee on questions of interpretation that is available to members on the internal area of the GGF website. Until there is a complete harmonisation of the current prEN 14179-2:2017 through publication of a final version in the Official Journal of the European Union, the higher soak temperature and the old provisions for calibration given in DIN EN 14179-1:2005 continue to apply.



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