

# 10. Norms and Standards

**GAJILEO™**  
Kreatives Bauen mit Sandwich

## 10.2 European standardisation for sandwich panels Changes for planners and building owners

### General

The growing harmonisation taking place in Europe is becoming increasingly evident in every sector. In the building industry, this has meant ever more standards and directives coming out that have been agreed at European level and worked on by eminent specialists from many of the Member States of the European Union.

Once they have been published by Brussels in the European official journal, they are valid in all the countries of the EU. There is then a transitional period during which individual Member States have to adopt the European standards as legally binding in their sovereign territory.

In many cases, especially when it comes to issues of stability, the individual Member States have the option of linking national regulations with the adoption of a new standard. There may be a different safety factor  $\lambda_F$ , for whatever reason, in different countries.

There are also historical reasons for this in many cases and/or a link with the interpretation of the national jurisdiction.

There will also be innovations in this regard for building with sandwich panels. After more than 10 years' work and numerous meetings, the draft of a European standard for sandwich panels is now ready:

**prEN 14509**

### **Self-supporting double skin metal-faced insulating panels – Factory made products – Specifications**

Exactly when this standard will be published is not yet known, but the assumption is that it will be available at the end of 2006 and come into force in 2007.



Fig. 10.2.1 Sandwich panels are being used increasingly by the building industry in Europe. The photo shows an electronic production building designed for COM 1 in Merignac, France (1992) – Architect: Luc Arsène Henry (DPLG Architects).

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### References for planners up to now

There are so-called “*approvals*” in a number of countries for sandwich panels which are used as load-bearing elements for building walls and roofs. The following are given by way of example:

So for the general use of sandwich panels in Germany the amount of planning legislation to be observed by planners is minimal. Only sandwich panels with general technical approval may be used for the external walls of buildings and their roofs.



**Deutschland**  
*Allgemeine bauaufsichtliche Zulassung Z-10.4-xxx*

The choice of make was dependent on five principal factors:

- Quality
- Architectural factors such as surface geometry, shades etc.
- The service offered by the manufacturer
- The manufacturer’s technical documentation
- The price



**Frankreich**  
*avis technique*

In rare cases, structural constraints were also decisive in the choice of make.

Under the rules of the general technical approval, sandwich panel manufacturers must carry out their own internal production control and be subject to independent external quality control. The product quality specified in the approval is documented and checked in this way.



**Schweden**  
*Typgodkännandebevis*

In addition, all the well-known manufacturers are members of the GBS (Gütegemeinschaft für Bauelemente aus Stahlblech, i.e. the Quality Association for Steel Plate Building Elements) and submit themselves as members of this association to further requirements as to the quality of the sandwich panels they produce.

These quality requirements, which go beyond those of the approval, are set out in the RAL-GZ 617 guidelines and are monitored both on the manufacturer’s premises and in an independent test centre.



**Polen**  
*Aprobata techniczna*

Fig. 10.2.2 a to d: Covers of national “*approvals*” for Germany, France, Sweden and Poland



Fig. 10.2.3 RAL – GZ 617 quality and inspection regulations

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This is documented by the requirement for sandwich panels to be marked with the letter U (U is the abbreviation for the German word for compliance) if they are to be used in sheeting. Panels made by GBS member companies must also have the GBS quality mark. For planners and building owners, as well as the building authorities responsible, the product can be identified as soon as it arrives on the building site as a product that complies with the general technical approval with specific quality features.



Fig. 10.2.4 The U marking must be shown clearly on packages or delivery papers.

The load-bearing capacity of sandwich panels that form the building elements of roofs or walls of the external cladding of a building must generally be documented. This usually takes the form of a static certificate for the object in question. The load-bearing capacity planner utilises for this purpose the technical approval for the panel that is intended for use and the certification procedure specified in this approval. This is done partly with the aid of the manufacturer's measurement tables.

### What will change

With the adoption of the standard for sandwich panels, there will no longer be any technical approvals. Approvals already granted will remain valid until their date of expiry, but no extensions or new approvals will be issued after that date. The standard will replace the approvals. Sandwich panels will be identified with the CE mark.

However, the CE mark does not indicate anything beyond the fact that the panels may be used. It does not specify the area of application or the possible application of marked products. The panel manufacturer is allowed to define its

product quality for itself - in other words, setting the characteristic values of materials. The standard stipulates the internal production control and documentation of results, but no external checking of these details is foreseen.

One exception to this is how the panels behave in the event of fire. This has to be checked and ascertained by an independent test centre. It is also stipulated that there must be regular external quality control by an independent centre.

Initially this procedure appears to be a disadvantage for the user. But now we can see the possibility of regulating safety factors nationally making its appearance.

The highest building authorities in some countries have already announced that they will react to this accordingly. So it could be, for example, that the safety factors for the materials or load may be set so high that they safely cover the worst, known or accepted product quality. In all probability, it will no longer be economically viable to use products to be handled in this way.

Increased responsibility now lies with the planner. How does this party know which products can be used in practice and which cannot? How can the planner check the manufacturer's information on the characteristic values of the materials in sandwich panels or transfer responsibility for stability to the supplier or manufacturer of the product?

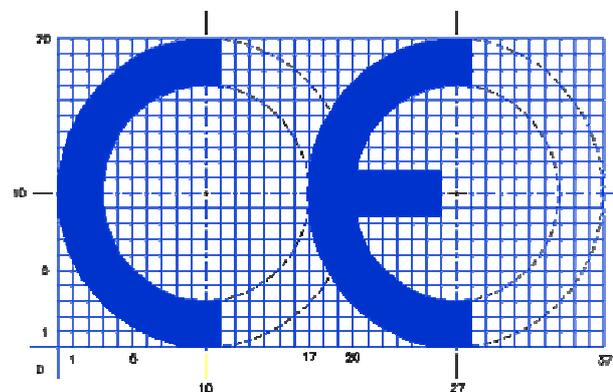


Fig. 10.2.5 CE mark. Source: [www.ce-zeichen.de](http://www.ce-zeichen.de)

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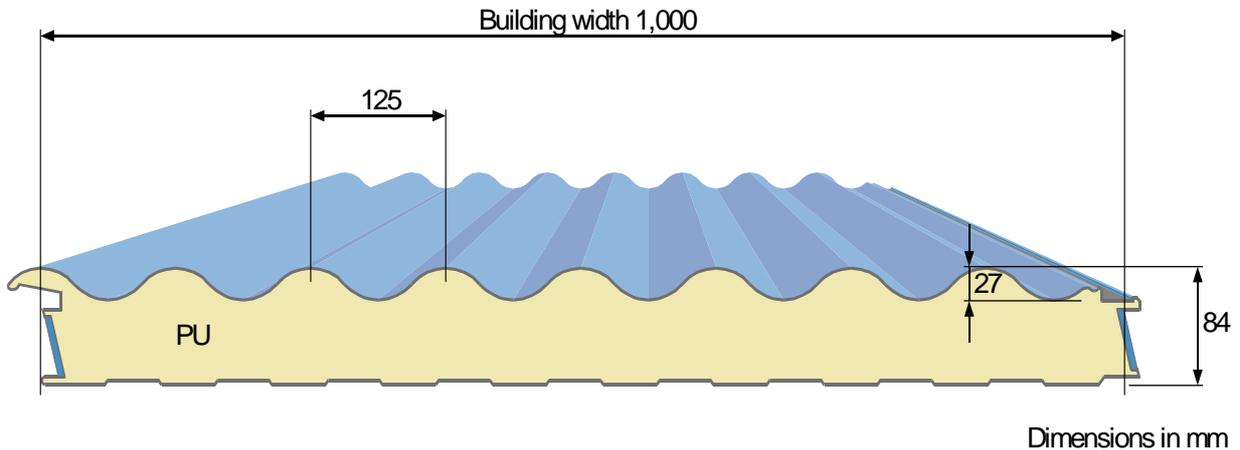


Fig. 10.2.6 The European draft standard prEN 14509 covers self-supporting sandwich panels with double-skin metal-faced insulation. The illustration shows a new-generation PU sandwich panel made by GALILEO member ThyssenKrupp Hoesch Bauelemente (Hoesch isowelle).

As this “*fault*” in the sandwich panel standard is known to all manufacturers, the main reputable manufacturers have already formed a European quality assurance association: EPAQ. A committee made up of representatives from the manufacturers and independent test centres has been integrated into this association. When the committee was set up, the intention was for committee members to come from as many different countries as possible in order to ensure a broad European consensus on this quality association.

The committee’s task was to prepare a set of rules for reconciling the quality of the panels and the previous requirements with the different national standards on stability. These rules have now been completed to a large extent and, as necessary, are currently being approved, or have already been approved, by the highest building authorities in each country.

All manufacturers that are EPAQ members are subject to a voluntary independent check on production quality by an external body. This check is attested by an inspection mark on products in a similar way to the current GBS procedure. The planner and customer can then see as soon as the product is delivered that these panels have been checked.

The previous U mark will be replaced by the CE marking and the GBS mark of quality by the EPAQ quality mark. EPAQ members from the manufac-

turers’ marketing departments are currently working on the design of this quality marking.

The advantage of this “*voluntary*” independent production check is that the highest national building authorities have agreed - or rather at least in Germany this is already the case - that virtually nothing will change as regards the current handling or that of the future standard in relation to the safety factors of products which are checked by EPAQ. The regulations of the standard are effective, with much higher safety factors beckoning for products that have not been subject to an external quality check by the EPAQ.



Fig. 10.2.7 Sandwich elements, due to their cost-effectiveness, are increasingly being used today, even for building private homes.

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### Important for planners, structural engineers and building owners

This means more responsibility in general for planners and structural engineers. With the adoption of the new standard, it is up to them to clarify initially according to which criteria the product on offer should be evaluated. Therefore, this is offered first and foremost to prevent problems with the application on the building site.

It is quite possible that building authorities or a building inspector could stop work on a building site if the level of safety required for the sandwich panel being used is not being met.

It is also possible that a building owner may subsequently demand compliance with a specific safety level for his or her building if the application of a specific product was not approved by him/her beforehand. Some insurance companies (less in Germany) have already stated that there will be different premiums for insuring buildings depending on the safety level of the panels applied.



Fig. 10.2.8 Marking a product with the EPAQ logo (mark of quality) is intended to give the user a guarantee in all the important issues to do with quality.



Fig. 10.2.9 Sandwich panels are produced in a continuous procedure on high-tech equipment such as the double belt machines shown above. Source: SHS Siempelkamp Handling Systeme.

### Conclusion

The introduction of a new standard for sandwich panels has many advantages, but also disadvantages.

We now have a standard set of rules for manufacturers and users of sandwich panels in Europe. Architects and stress analysts have an instrument with which they can work without having to worry about questions of approval or interpretation.

It will be simpler for manufacturers to ply their trade in the panels in general competition. They will now no longer be bound by national approvals or interpretations of application for the panels they produce. The scope of application and the application possibilities are clearly defined.

For the planner, the new standard also has disadvantages, at least initially. With the change from an approval to a standard, the planner initially has somewhat more responsibility, as he/she must first decide on evaluation of the product on offer or foreseen for the application.

When selecting products, the planner is aided by the fact that products inspected by EPAQ and marked with the EPAQ quality mark (see Figure 10.2.8) may be applied on the basis of the current safety level.

### Remark

The standard had been accepted by the time of going to press.

### Author

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