

Significance of Sandwich Panel Identification for the Insurer and Loss Prevention

EPAQ Conference 2012
Danzig / Poland

25. October 2012



AXA Germany

Part of a strong international Group



The AXA Group in figures 2011

| | |
|--|-------------------|
| Revenue: | EUR 86.1 bn |
| Group result (IFRS): | EUR 4.3 bn |
| Operating result (Underlying Earnings): | EUR 3.9 bn |
| Assets under management: | EUR 836 bn |
| No. of employees: | 114,500 worldwide |

AXA Germany in figures 2011

| | |
|--|-------------|
| Revenue: | EUR 10.6 bn |
| Group result (IFRS): | EUR 273 mil |
| Operating result (Underlying Earnings): | EUR 401 mil |
| Capital investments: | EUR 66 bn |
| No. of employees: | 10,898 |
| Exclusive distributors: | 4,611 |

- **Top 1 Comments on Construction Classes**
- **Top 2 Evaluation and Consequences for Insurer and Insured**
- **Top 3 Sandwich Panel Identification**
- **Top 4 Proposal by the GDV / German Insurance Association**

Contents



VdS 2244 : 2006-06 (01)

Top 1: Comments on Construction Classes

- Sandwich panels are widely used as components for the roof and exterior walls, especially for industrial and commercial buildings, such as in cold stores.
- Based on slight building constructions and the use of prefabricated components, quick and economic implementation is possible.

Top 1: Comments on Construction Classes

- However, some considerable fire safety risks are associated with sandwich panels. In European countries, a series of major fires have occurred.
- The extent of damage was also due to the use of sandwich panels.
- In most cases the claims made were for total losses.

Top 1: Comments on Construction Classes

- The national insurance associations of some countries throughout the world recommend how to classify buildings according to construction classes.
- One of the primary goals of underwriting for any property insurer is to determine the probability and severity of a fire for a given property risk.



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Top 1: Comments on Construction Classes

- One of the main considerations in making that determination is the assignment of the proper construction class :
 - What are the materials used for?
 - What percentage of the structure consists of which kind of material?
 - How much damage might the building sustain if exposed to fire?

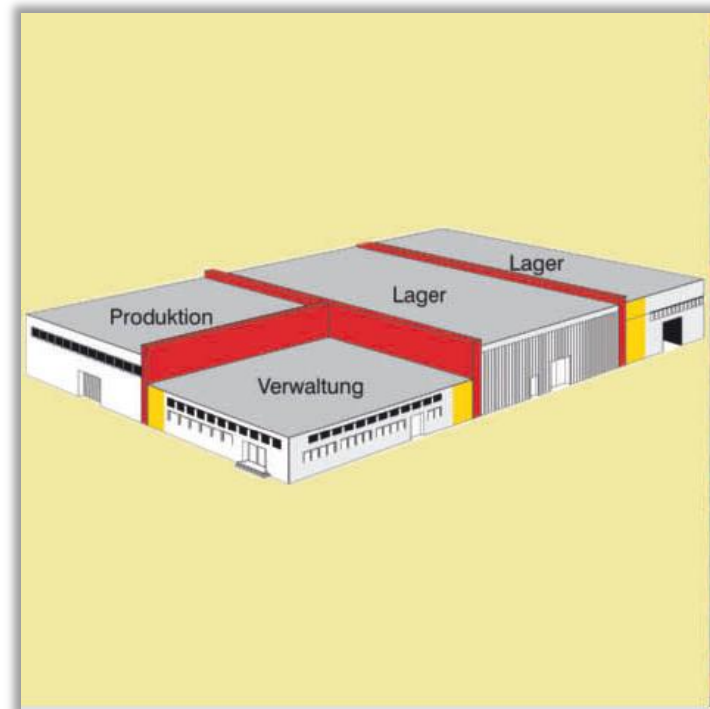
Top 1: Comments on Construction Classes

- Properly identifying the construction class can help the underwriter to rate the risk more accurately.
- The estimation of the building behaviour in the event of fire, based on fire resistance and the combustibility of the building materials used.



Top 1: Comments on Construction Classes

■ Passive Fire Protection:

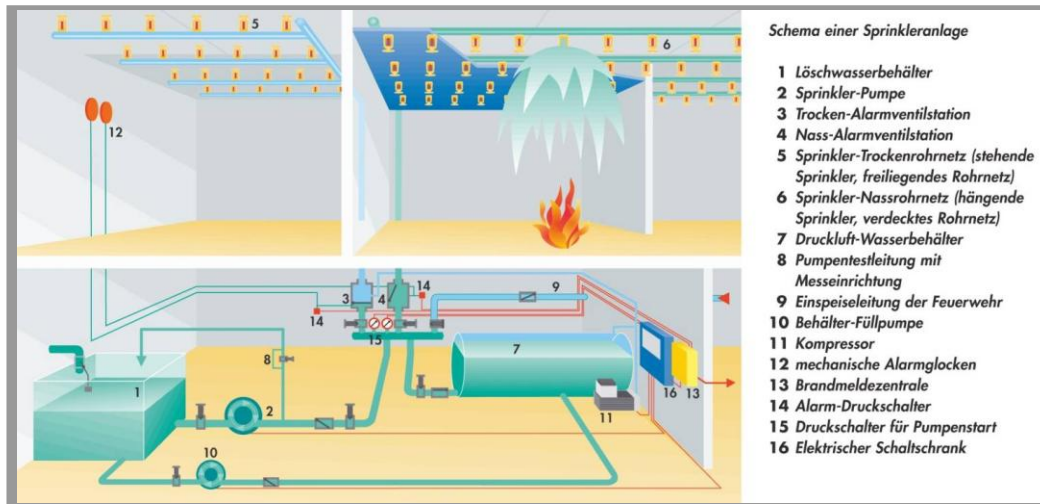


VdS 195 : 2007-03 (03)

Top 1: Comments on Construction Classes

■ Active Fire Protection:

- e.g. Automatic Sprinkler Installation



Tyco fire & security

Top 1: Comments on Construction Classes

■ e.g.: Industrial Tariff

- R (Positive - Credit class / is granted a discount e.g. 10% on the Insurance Premium):

- Pillars, column supports, interior and exterior load-bearing walls which are fire-resistant for at least 90 minutes and made of non-combustible materials.
- Roof girders which are fire-resistant for at least 30 minutes.
- Non-bearing exterior walls which are fire-resistant for at least 30 minutes or made of non-combustible materials

....

Top 1: Comments on Construction Classes

■ e.g.: Industrial Tariff

- R (Positive - Credit class / is granted a discount e.g. 10% on the Insurance Premium)

-Roof, not including roof girders, roof sheathing which is fire-resistant for at least 30 minutes and is made of non-combustible material without any combustible materials attached to the lower surface, hard roofing.

(= fire-resistant against sparks and radiating heat)

Top 1: Comments on Construction Classes

■ e.g.: Industrial Tariff

- R (Positive - Credit class / is granted a discount e.g. 10% on the Insurance Premium)



Top 1: Comments on Construction Classes

■ e.g.: Industrial Tariff

● N (Neutral class):

- Buildings which do not meet the specifications of construction class R as long as their load-bearing parts are fire resistant for at least 30 minutes or the buildings are predominately constructed of non-combustible materials, hard roofing.

Top 1: Comments on Construction Classes

■ e.g.: Industrial Tariff

- Z (Negative (Debit class) is assigned a loading of 10-20% on the Insurance Premium)
 - Buildings which do not meet the specifications of construction class N



Top 1: Comments on Construction Classes

- e.g.: ISO Properties, Inc.

| Class | Construction |
|--------------|----------------------------------|
| 1 | Frame |
| 2 | Joisted Masonry |
| 3 | Non-combustible |
| 4 | Masonry - Non-combustible |
| 5 | Modified Fire Resistive |
| 6 | Fire Resistive |

Top 2: Evaluation and Consequences for Insurer and Insured

- Insurers often no longer consider compliance with building regulations as being sufficient. Insurer requirements are frequently more stringent than the building regulations.
- The primary aim is property protection, ensuring that all elements of a construction, including roofs, shall not significantly contribute to the growth and spread of fire, either internally or externally.

Top 2: Evaluation and Consequences for Insurer and Insured

- Building regulations are seen very much as a minimum standard in terms of the requirements of the construction elements and internal fire protection of a building.
- Whilst architects may use building regulations to receive approval from the Construction Supervision Authorities, it is unlikely to receive the same degree of approbation from the future building's insurers.

Top 2: Evaluation and Consequences for Insurer and Insured

■ As a result:

Some building owners have found themselves in a situation where their building was compliant with all the regulations, but their insurer significantly increased the premium nevertheless.

Top 2: Evaluation and Consequences for Insurer and Insured

- The determination of insurance premiums and policy excess is a complex process and depends on a range of factors including:
 - Building construction materials
 - Contents, / Operations within the building
 - Fire suppression
 - Alarm systems
 - Arson risk
 - Levels of fire safety management etc.

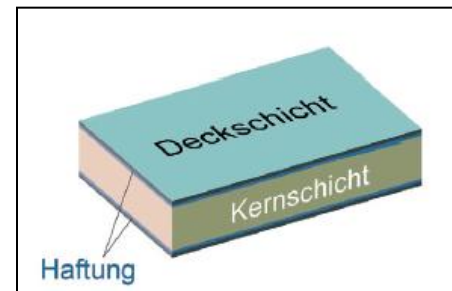
Top 2: Evaluation and Consequences for Insurer and Insured

- Over the last decade, significant losses have occurred associated with large fires involving sandwich panels.
- Many have related to risks within the food manufacturing sector.



Top 2: Evaluation and Consequences for Insurer and Insured

- Sandwich panels are a building product consisting of two metal faces positioned on either side of a core of thermally insulating material.
- They are firmly bonded together so that the three components act compositely when under load (wind-loading, access loads etc).



VdS 2244 : 2006-06 (01)

Top 2: Evaluation and Consequences for Insurer and Insured

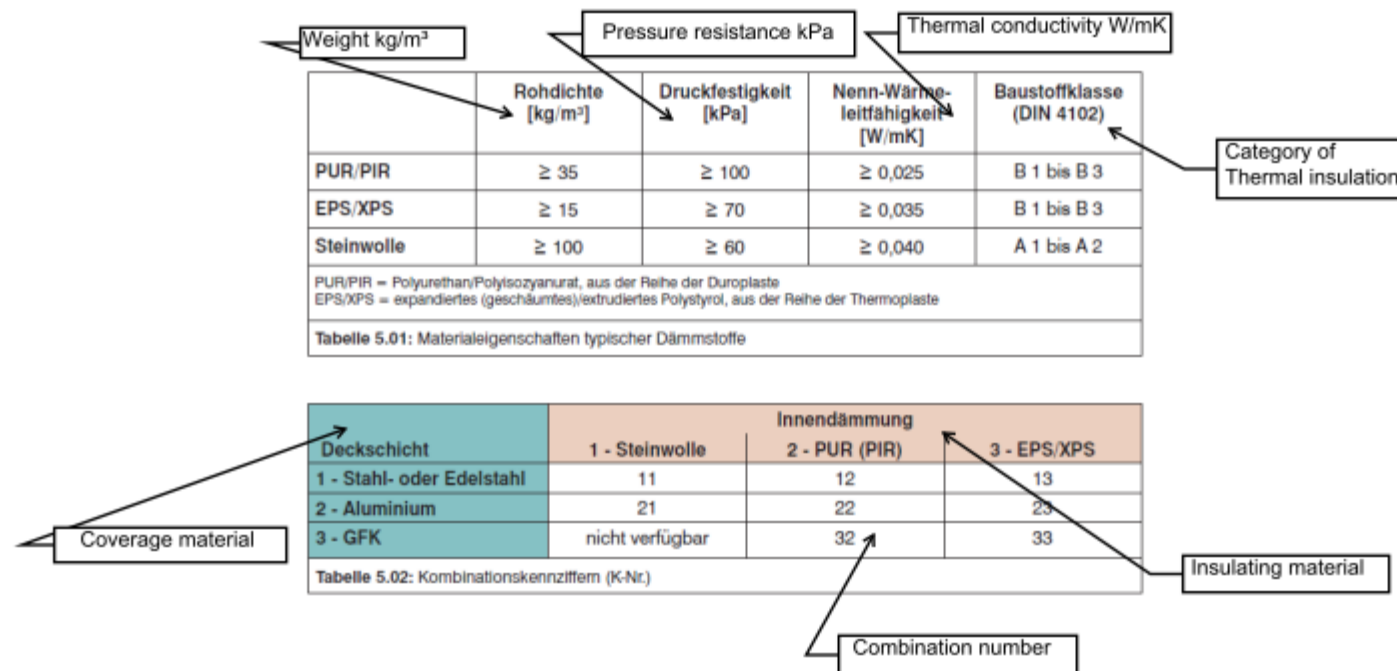
| | Rohdichte [kg/m ³] | Druckfestigkeit [kPa] | Nenn-Wärmeleitfähigkeit [W/mK] | Baustoffklasse (DIN 4102) |
|------------|--------------------------------|-----------------------|--------------------------------|---------------------------|
| PUR/PIR | ≥ 35 | ≥ 100 | ≥ 0,025 | B 1 bis B 3 |
| EPS/XPS | ≥ 15 | ≥ 70 | ≥ 0,035 | B 1 bis B 3 |
| Steinwolle | ≥ 100 | ≥ 60 | ≥ 0,040 | A 1 bis A 2 |

PUR/PIR = Polyurethan/Polyisocyanurat, aus der Reihe der Duroplaste
 EPS/XPS = expandiertes (geschäumtes)/extrudiertes Polystyrol, aus der Reihe der Thermoplaste

Tabelle 5.01: Materialeigenschaften typischer Dämmstoffe

| Deckschicht | Innendämmung | | |
|---------------------------|-----------------|---------------|-------------|
| | 1 - Steinwolle | 2 - PUR (PIR) | 3 - EPS/XPS |
| 1 - Stahl- oder Edelstahl | 11 | 12 | 13 |
| 2 - Aluminium | 21 | 22 | 23 |
| 3 - GFK | nicht verfügbar | 32 | 33 |

Tabelle 5.02: Kombinationskennziffern (K-Nr.)



Top 2: Evaluation and Consequences for Insurer and Insured

| K-Nr. | Baustoffklasse der Schichten | | | Gesamt-Bausstoffkl. ⁴⁾ | Brandlast (q ₀) kWh/m ² ×cm | Brennend abtropfend | Hinweise |
|-------|------------------------------|------|------|-----------------------------------|--|---------------------|--|
| | Deck | Kern | Deck | | | | |
| 11 | A | A | A | A4/B4 ⁴⁾ | gering | entfällt | Wandkonstruktionen bis F120 möglich |
| 21 | A | A | A | B ⁴⁾ | gering | entfällt | je nach Ausführung: Erweichungstemperatur ≥ 160 °C |
| 12 | A | B2 | A | B | 2,4 ¹⁾ | nein | so weit vollständig ausgeschäumt |
| 22 | A | B2 | A | B | 2,4 ¹⁾ | nein | siehe 21: dadurch früherer Sandwichverlust und Abbrand des Dämmstoffes |
| 32 | B2 | B2 | B2 | B | 52,3 ^{1) 2)} | nein | vollständig brennbar und für den Abbrand maßgebend |
| 13 | A | B1 | A | B | 2,2 ²⁾ | ja | Dämmstoff i. d. R. in Platten mit leichter Kantenentflammung |
| 23 | A | B1 | A | B | 2,2 ²⁾ | ja | siehe 13, 21 und 22 |
| 33 | B2 | B1 | B2 | B | 52,1 ^{2) 3)} | ja | besonders kritisches Abbrandverhalten, z. B. brennendes Abtropfen und intensive Rauchentwicklung |

¹⁾ bei einem Rohgewicht der Dämmung von 35 kg/m²
²⁾ bei einem Rohgewicht von 20 kg/m²
³⁾ mit einer Deckschichtdicke von mindestens 2 mm
⁴⁾ Die Baustoffklasse der Sandwichelemente gemäß DIN 4102 ist durch Brandprüfungen nachzuweisen. Zu beachten ist dabei insbesondere der Anteil der brennbaren Kleber. Eine europäische Klassifizierung wird nach der nationalen Einführung der harmonisierten Klassifizierungsnorm erforderlich.

Tabelle 5.03: Brandschutzkennwerte gebräuchlicher Sandwichelemente

Table:
Technical Data of
some composite
panels according
to VdS 2244

Source: VdS 2244

drip burning

Fire load

category of
building material
of the whole
composite panel

category of
building material
of single parts of a
composite panel

VdS 2244 : 2006-06 (01)

Top 2: Evaluation and Consequences for Insurer and Insured

- For some applications, including stand-alone cold stores, panel systems are used as external claddings in certain areas.
- Sandwich panels do not start fires on their own, and where these systems have been implicated in the spread of fire, the fire has often started in high risk areas such as cooking areas, particularly in the food industry.

Top 2: Evaluation and Consequences for Insurer and Insured

■ The spread of fire is influenced by:

- Fire safety management
- Fire compartment arrangements
- Sandwich panel system construction
- Combustibility and fire performance of panel core material
- Application of sandwich panel system.

Top 3: Sandwich Panel Identification

- From the aspect of fire protection, flammable materials basically have the disadvantage that in the event of fire they contribute to fires spreading and developing.
- The spread of fire within the top layers cannot be combatted by extinguishing systems and fire departments.



Top 3: Sandwich Panel Identification

- In addition, the combustible insulation in the core layer generates a significant amount of smoke.
- Basically, non-combustible insulation should be preferred, but combustible insulation used for the core layer is widely used and it generally complies with building regulations and meets with the approval of insurers in some cases.



Top 3: Sandwich Panel Identification

- However, after completion of buildings using sandwich panels, for example, as external walls, secure information specifying the construction and the insulation material used is no longer available.
- It is not possible to determine whether a combustible or a non-combustible insulation material was used.
- The same applies when the user or owner of a building changes....

Top 3: Sandwich Panel Identification

- The insurer must therefore start from the “worst case scenario” if there is no reliable and accessible information available to the insurer.
- There are actually several different possibilities to label sandwich elements to improve identification of the detailed construction and materials used for insulation:

Top 3: Sandwich Panel Identification

Invisible Marking

Invisible marking of panels allows insurance surveyors, architects, specifiers & building owners proof of specification

- Date and time of manufacture
- Core insulant specification



Top 3: Sandwich Panel Identification

- Clear and definitive labelling of the composite panels used:
 - Material used for core and skins
 - Type of joints (panels and substructure)



Übereinstimmungszeichen
(Ü-Zeichen)

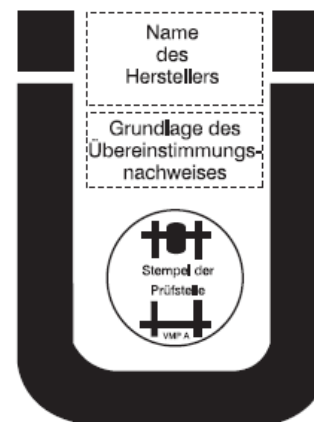


Bild 7.03: Ü-Zeichen (Muster)

Top 4: Proposal by the German Insurance Association (GDV)

- The GDV would prefer the implementation of an identification plaque, which does not require the use of electronic devices, in order to provide better support for surveyors, engineers and underwriters appointed by the insurance companies.
- In fact, the identification plaque could be similar to those required by the building authorities in Germany in order to identify the capacity and acceptance of fire doors.

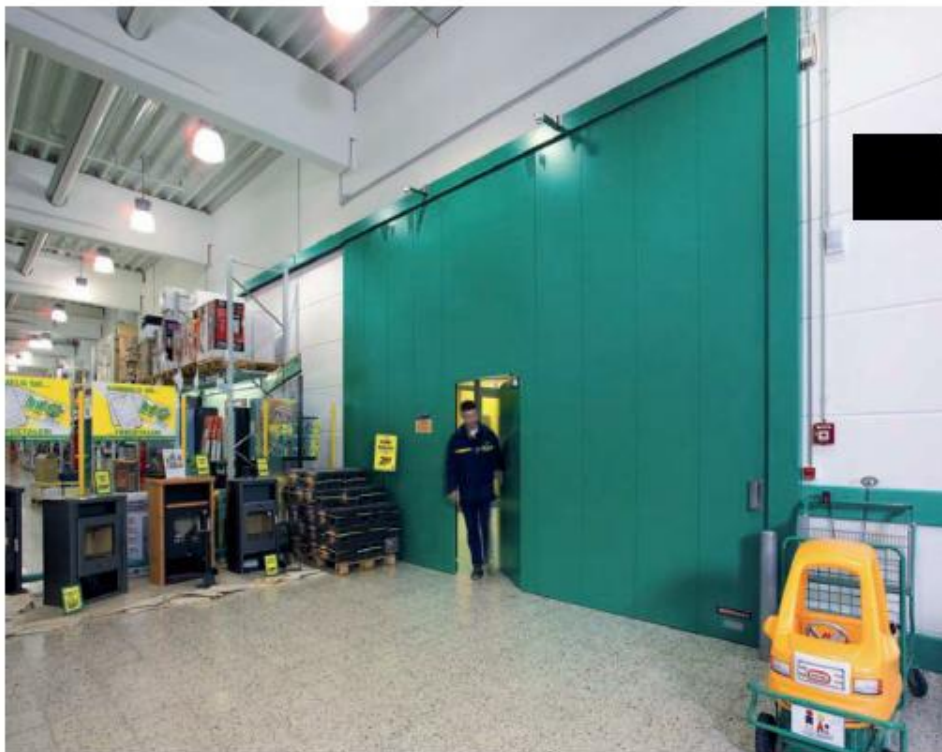
Top 4: Proposal by the German Insurance Association (GDV)

| | |
|---|---|
| <p>Bildzeichen oder Bezeichnung der fremd überwachen- den Stelle DIN 18082 Teil 3 Überwacht</p> | <p>Stahltür DIN 18082 T30-1-B</p> <p>Hersteller oder Herstellwerk Herstellungsjahr XXXX</p> |
|---|---|

Top 4: Proposal by the German Insurance Association (GDV)

- The identification plaque should be fixed close to the main entrance e.g. on the wall.
- The identification plaque should be easy to recognise for the surveyors.
- The material used for core and skins has to be identifiable as part of minimum information requirements.

Top 4: Proposal by the German Insurance Association (GDV)



SANDWICH PANEL
EPAQ 01 01 01 02 002
Wall Outside / Inside
Roof
Core: MW/PUR/PIR/PS
Skin: ST/AL/GFK
Date: 2012/00/00
www.epaq.eu

Top 4: Proposal by the German Insurance Association (GDV)

- In addition, the GDV recommends the provision of information concerning the EPAQ certification code.

Example: 01 - 01 - 01 - 02 - 0001

| | | | | |
|--------------|----------------|---------------|---------|----------------------|
| Country Code | Company Number | Product Group | Product | Certification number |
|--------------|----------------|---------------|---------|----------------------|



[EPAQ Certification Code]

| | |
|-------------------|------------------------------|
| Produkt: | Certification number: |
| 01 PUR - SE | Durchlaufend nummerierte |
| 02 MW - SE | Zertifikate |
| 03 EPS - SE | |
| 04 PF - SE | |
| 05 CG - SE | |

- After logging on to www.EPAQ.eu additional information is available for insurance companies and authorities.



**Thank you very much for your
attention.**

■ Sources:

- VdS 2234 Sandwich Panels
- VdS 0195 Technical Guideline for Industrial Insurances
- EPAQ Publications
- KINGSPAN UK Publications