

# 3. Fire Safety

Panels are produced and used according to Fire Safety Norms LCR 201 – 96 valid in Latvia. The fire safety of the panels is controlled according to prEN 14509 and EN 13501 – 1, as well as part 1 and 2 of LVS EN 1363 for requirements of fire-resistance tests; LVS EN 1364 – 1; 2 (wall and ceiling panels) and LVS EN 1365 – 2 (roof panels). Panels are classified according to LVS EN 13501 parts 1 to 3.

The main aim of the fire safety measures is to prevent the possibility of fire. The aim of building fire protection is to create safe conditions for people, who could be in the building during fire, as well as for the safety of rescue workers, and additionally to decrease the material losses caused by the fire as much as possible and to prevent catastrophic consequences of the fire.

In order to achieve these aims it is important to set the minimal required fire-resistance of the building and its structure, as well as the maximal allowable fire threat of the materials and structures of the building.

In correspondence with the requirements of LCR 201 – 96 the construction materials and building structures are classified according to their combustibility: incombustible, hardly combustible and combustible (table 3.1)

## 3.1. Classification of Construction Materials and Structures According to Their Combustibility

### Classification of construction materials and structures according to their combustibility in correspondence with requirements of LCR 201 – 96

Table 3.1

Combustibility group	Materiālu un konstrukciju raksturojums	
	Materiāli	Konstrukcijas
Incombustible	Does not ignite, smoulder or char under the influence of a source of ignition	Incombustible materials
Hardly combustible	Ignites, smoulders or chars under the influence of ignition source and continues to burn, smoulder or char in its presence, but stops burning, smouldering or charring after removal of ignition source	Hardly combustible materials or combustible materials protected from the influence of fire or high temperature by incombustible materials
Combustible	Ignites, smoulders or chars under the influence of ignition source and continues to burn, smoulder or char after removal of ignition source	Combustible materials

The classification of construction materials according to their reaction to fire in correspondence with requirements of EN 13501 – 1 is shown in table 3.2.

Classification of construction materials, except floors, according to their combustibility in correspondence with requirements of EN 13501 – 1

Table 3.2

Class	Requirements according to the standard	EN 13501- 1
A1	EN ISO 1182 EN ISO 1716	Materials in no way contributing to burning. Materials of this class automatically meet the requirements of all the lower classes.
A2	EN ISO 1182 vai EN ISO 1716 EN 13823	Meet the same requirements as class B materials. Additionally, in case of open flame, these materials do not considerably contribute to and the development and load of fire.
B	EN 13823 EN ISO 11925- 2	The same requirements as for class C, but satisfies stricter requirements.
C	EN 13823 EN ISO 11925- 2	Under the influence of a separate point of burning, the further spreading of fire is limited.
D	EN 13823 EN ISO 11925- 2	Materials meet the requirements of class E and are able to resist small flame for a longer period of time, not allowing to spread considerably. Additionally they can resist a separate heat source and sufficiently delay the spreading of heat.
E	EN ISO 11925- 2	Materials can resist small flame for a short period of time without considerable spreading of flames.
F		Materials having no standardised requirements for reaction to fire or which can not be included in any of the previous classes
Additional classification according to smoke emission		
s1	Stricter regulations as for s2	
s2	Total smoke emissions do not exceed the limited amount	
s3	Not limited	
Additional classification according to burning drips		
d0	No burning drips	
d1	Burning drips not exceeding the limit	
d2	Not limited	

The fire safety of building structures and materials is characterised by their fire-resistance limit and combustibility. The fire-resistance limit of building structures and materials is measured in time (minutes) from the beginning of fire-resistance test till the moment on of the following fire-resistance limiting states of building structures and materials is reached:

- 1) according to load carrying ability or stability – R
- 2) according to integrity (entirety) – E

3) according to heat insulation ability – I

4) according to reaching of critical temperature in tests without load – W

Fire-resistance limit is labelled in accordance with internationally accepted limiting state labels (R, E, I, W) and the number indicating the time when one of the limiting states occurs. For example, R 120 – 120-minute fire resistance limit according to load carrying ability or stability; REI 60 – 60-minute fire resistance limit, which is the lowest of the three tested limiting states. Several fire-resistance limits can be determined for the building structure according to the described method. For example, R 120; REI 60 – 120-minute fire resistance limit according to load carrying ability or stability and 60-minute according to integrity or heat insulation ability.

The letter R must always be included in labels for these kinds of fire resistance limits.

If the fire-resistance limits for building structure are labelled only with a number, this indicates the minimal fire resistance limiting state characteristic or required for this kind of building structure.

The fire resistance limits for building structures are set according to the standard ST SEV 1000 – 88.

In order for TENAX Sandwich Panels to be used for external non-load-bearing walls, internal non-load-bearing (partition) walls, hanging ceilings and composite roofs in buildings of certain fire safety level, they must ensure fire safety for an adequate period of time and must be incombustible, hardly combustible or combustible.

### Classification of panels

Table 3.3

TENAX Sandwich Panels with polystyrene foam heat insulation	20 - minute fire safety	hardly combustible
TENAX Sandwich Panels with stone wool heat insulation	60 - minute fire safety	incombustible

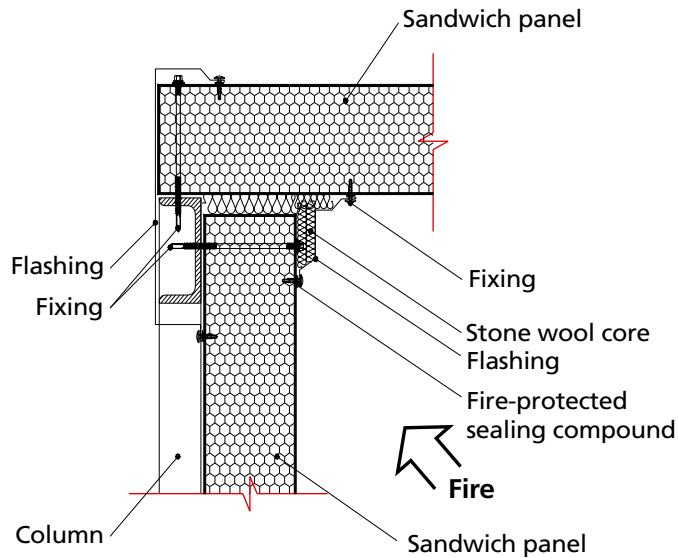


### 3. 2. Junctions with Increased Fire Safety

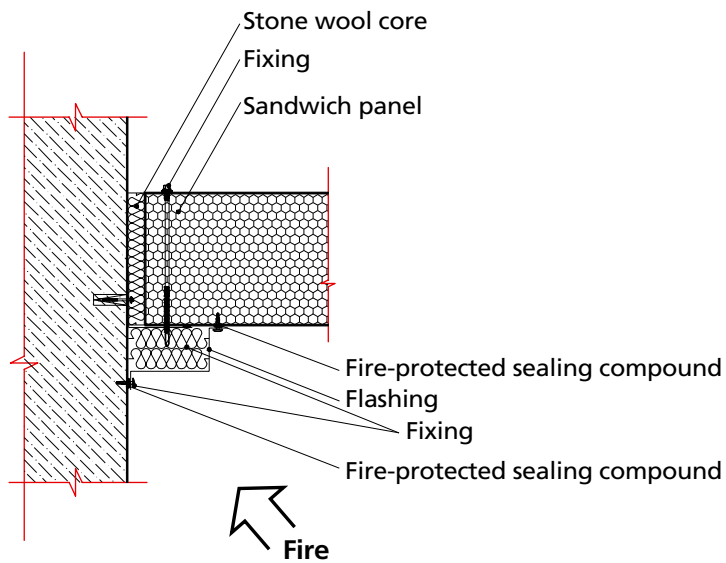
When designing fire-resistant buildings, not only the correct fire-resistant constructions should be used, but their junctions must also correspond to the fire-safety requirements.

In case of increased fire-resistance requirements, only steel fasteners can be used in panel joints.

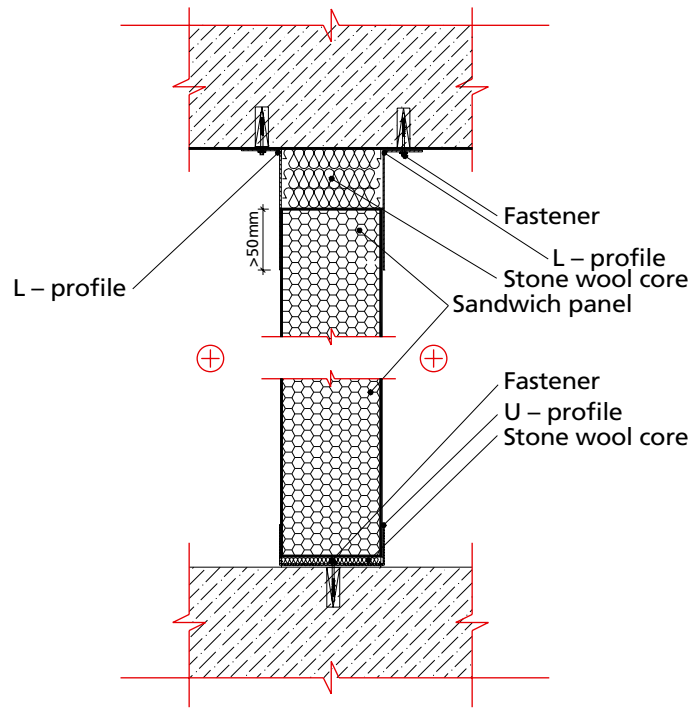
In fire-partitioning structures panel fixings have to be protected with stone wool.



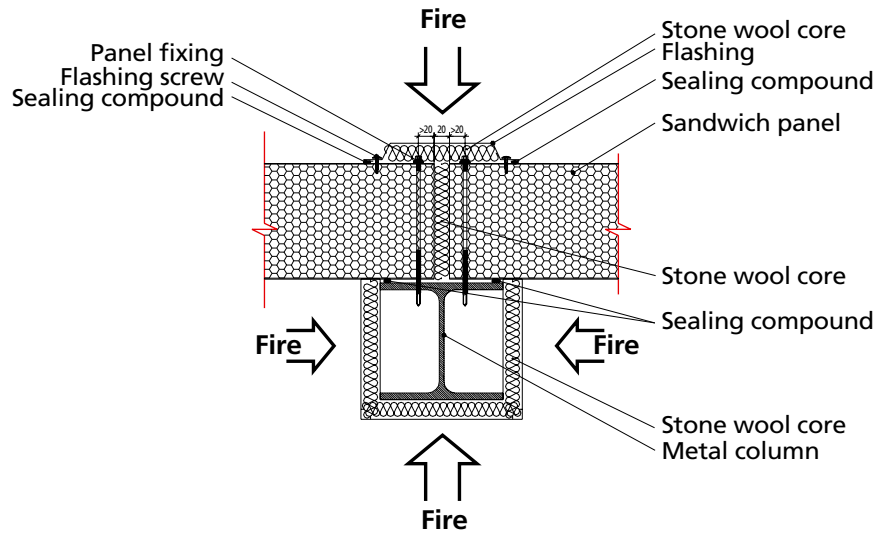
Pic.3.1 Fire-protected fastening of wall and roof panels



Pic. 3.2 Fire-protected fastening of ceiling and wall panels



Pic. 3.3 Fire-protected fastening of partition wall



Pic. 3.4 Fire-protected fastening of wall panels to a column