

E2 THE NATIONAL BUILDING CODE OF FINLAND

Fire safety of production and warehouse buildings

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FIRE HAZARD CLASS

2.1 Classes

Production and storage are divided into two fire hazard classes:

Fire hazard class 1

- operations associated with a minor or moderate fire hazard and

Fire hazard class 2

- operations associated with a considerable or large-scale fire hazard or where an explosion hazard may be present.

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LEVEL OF PROTECTION

Production and warehouse premises shall always be provided with equipment facilitating rescue and fire-fighting operations in accordance with the selected protection level.

The level of protection has an effect on the fire class of the building, on the largest permitted compartment size, on venting of smoke as well as on the fire class requirements for load-bearing and separating building elements.

The details of the protection are negotiated with the local rescue authorities.

Protection level 1

Normal first-aid extinguishing equipment and, if necessary, more extensive first-aid extinguishing equipment.

- Normal first-aid extinguishing equipment refers to equipment which can be operated by a single person and intended for extinguishing beginning fires, such as fire hydrants and portable fire extinguishers. This is applicable to the fire hazard class 1.
- More extensive first-aid extinguishing equipment refers to a fire hydrant network and heavy chemical extinguishers. This is used, if required, in the fire hazard class 2.

Protection level 2

A fire alarm which gives an automatic fire call locally and to an emergency response centre as well as first-aid extinguishing equipment in accordance with the protection level 1.

- An automatic fire alarm is suitable for sites where a sufficiently early and reliable call for fire-fighting power and the subsequent measures essentially increase personal safety and decrease damage to property. It should be possible to initiate effective fire-fighting operations no later than 10 minutes after a fire call. If this is not otherwise possible, it is generally also required that the site has its own trained fire-fighting crew or a works fire brigade.

Protection level 3

Automatic fire-extinguishing system and first-aid extinguishing equipment in accordance with the protection level 1.

- A sprinkler system lends itself to sites where water is suitable for fire-fighting and where personal safety, large property values, large fire compartments or the fire technical nature of a site require an effective automatic fire-extinguishing system.
- Foam equipment is suitable for extinguishing both flammable liquids and many solids. Other automatic fire-extinguishing systems may also be used in certain cases for the general protection of sites.

Local application extinguishing systems

Local application extinguishing system refers to protection of an individual site with fixed fire-extinguishing equipment which generally operates automatically. Local applications are used to protect individual production sites presenting a fire hazard, filters and silos in dust and sawdust extraction systems, transport lines and small spaces presenting a fire or explosion hazard.

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FIRE CLASSES OF BUILDINGS

3.1 Fire classes

3.1.1

The fire classes of buildings are **P1**, **P2** and **P3**.

Explanation

Load-bearing constructions in buildings of fire class P1 are assumed, as a rule, to withstand fire without collapsing. The size of the building and the number of occupants are not restricted.

The requirements concerning load-bearing constructions in buildings of fire class P2 may in a fire technical sense be inferior to those of the preceding class. A sufficient level of safety is obtained by prescribing requirements especially on the properties of surfaces of walls, ceilings and floors. In addition, the number of storeys and the number of occupants are restricted depending on the use of the building.

No special requirements concerning fire resistance are prescribed for load-bearing constructions in buildings of fire class P3. A sufficient level of safety is obtained by restricting the size of the buildings and the number of occupants depending on the use of the building.

FIRE CLASS OF A BUILDING

4.1 Buildings of Class P1

The number of storeys or the height of a building of Class P1 is not restricted. The building may accommodate operations in fire hazard classes 1 and 2.

A two-storey building is always made to meet the requirements of Class P1 if the operations it accommodates are in fire hazard class 2 or if more than 50 people are working in the building.

A building with more than two storeys is always made to meet the requirements of Class P1.

4.2 Buildings of Class P2

A building of Class P2 may have a single storey or two storeys. The height of a building with two storeys may not be more than 9 m; however, a single storey building may be higher than that (E1 Table 3.2.1).

A single storey building may accommodate operations in fire hazard classes 1 and 2.

A building with two storeys may only accommodate operations in fire hazard class 1. A maximum of 50 persons may work in the building.

4.3 Buildings of Class P3

A building of Class P3 may only have a single storey and it may not be more than 14 m high (E1 Table 3.2.1).

A building of Class P3 is mainly suitable for the fire hazard class 1. If the operations are of fire hazard class 2, the protection level of the building is 3.

4.4 Application of the number of floors

If a mainly single storey building has facilities in a small part of the building located on two storeys, the building may be considered in fire technical sense as being a single storey building provided that the facilities in the two storey part are essentially associated with the operations in the building. The floor area of the second floor may not be more than 15 % of the floor area in the entire building, however, not more than 200 k-m². The floor is fire-separated as its own fire compartment. This does not apply to spaces of not more than 50 k-m², located on the second floor.

TABLE 1 MAXIMUM PERMITTED SIZE OF FIRE COMPARTMENTS IN COMPARTMENTATION BY AREA

Column	P1			P2		P3
	1 storey	2-3 storeys	over 3 storeys	1 storey	2 storeys	1 storey
	1	2	3	4	5	6
Fire hazard class 1						
– protection level 1	6000 m ²	4000 m ²	3000 m ²	4000 m ²	2000 m ²	2000 m ²
– protection level 2	12000 m ²	6000 m ²	4500 m ²	6000 m ²	4000 m ²	4000 m ²
– protection level 3	at discretion	at discretion	at discretion	at discretion	12000 m ²	12000 m ²
Fire hazard class 2						
– protection level 1	2000 m ²	1000 m ²	750 m ²	1000 m ²	<i>not permitted</i>	<i>not permitted</i>
– protection level 2	4000 m ²	2000 m ²	1500 m ²	2000 m ²	<i>not permitted</i>	<i>not permitted</i>
– protection level 3	at discretion	at discretion	at discretion	at discretion	<i>not permitted</i>	2000 m ²
Note to the table:	Areas are calculated like floor areas. Compartmentation of cellars at discretion.					

1 Fire hazard classification

Fire hazard class 1

Operations associated with a minor or moderate fire hazard, such as

- operations where a fire hazard occurs to a minor extent when handling substances in a solid or molten state or machining using radiant heat, an electric arc or an open flame;
- operations where damp raw materials are handled or where the quantity of raw materials or semi-finished products handled at a time is small;
- operations with handling of substances where a limited fire hazard is empirically a part of the process or associated with experiences in use in connection with production or storage;
- operations where flammable liquids with a flash point of over 55 °C or vapours and dusts, which only to a limited extent are fire hazardous, are handled or stored industrially.

Examples

Agricultural production and storage

Breweries

Brick industry

Car repair shops and garages

Cement industry

Coal-fired power plants

Concrete industry

Dairies

Engineering workshops

Food industry

Hydroelectric power stations

Industrial handling or storage of flammable liquids (flash point over 55 °C)

Laundries

Leather industry

Metal industry

Moulded plastics industry

Oil power stations

Paper and cardboard industry

Printing houses

Pulp industry

Quarrying industry

Textile industry

Transformer stations

Fire hazard class 2

Operations associated with a considerable or great fire hazard or where an explosion hazard may occur, such as

- operations where, during production or storage, vapours or fine dusts are formed which, due to the nature of the processing or for any other reason, together with air may form an explosive or flammable mixture;
- operations where flammable and rapidly heat releasing raw materials, semi-finished or finished products are handled in relation to production or storage;
- operations where liquids, combustible to various degrees with a maximum flash point of 55 °C, the vapours of which may form an explosive mixture with air, are industrially handled or stored;
- operations where actual explosives or materials which under the influence of, for instance, water, air, heat due to friction or vibration may self ignite or explode, are handled.

Examples

Bitumen industry

Chipboard industry

Explosives factories

Foam plastics industry

Industrial handling or storage of flammable liquids (maximum flash point 55 °C)

Mechanical wood processing (seasoned wood)

Mills, animal feed stores

Oil refineries, certain parts

Peat-fired power stations and peat processing plants

Plywood industry

Refineries (combustible liquids)

Reinforced plastics industry

Roof felt industry

Sawmill industry

Surface finishing departments in paper and cardboard industry

Wadding industry