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# FIRE SERVICE REGULATIONS



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## 1 General

The aim of this overview is to provide information about the regulations that apply to the design, construction and fitting out of stands for exhibitions and trade fairs and the use of materials for these stands. It sets out the fire safety regulations that are generally applicable throughout the Netherlands. Additional requirements can be made by individual municipalities.

Responsibility for compliance with fire safety regulations is a matter for the management board of a convention centre or, as the case may be, the exhibition organisers. If a participant in an exhibition has doubts about what fire safety regulations must be complied with, he should first contact the exhibition organisers who can, if necessary, refer him to a representative of the local fire brigade.

A permit is necessary for the construction of grandstands, tiered seating and two-storey or multi-storey stands and for putting on demonstrations during an exhibition.

Application for an exemption for demonstrations that involve using a naked flame, compressed gases or flammable fats should be made to the municipal executive consisting of the Mayor and Aldermen (i.e. to the chief officer of the local fire brigade). The permit sets out the conditions that must be fulfilled. Application for a permit should be made to the Mayor and Aldermen (i.e. to the chief officer of the local fire brigade) no later than four weeks before the opening of the exhibition or on such earlier date as the exhibition organisers may specify.

Compliance with the fire safety regulations is checked by the local fire brigade. Any serious failure to comply with the rules can result in exclusion from participation in the exhibition. Any such decision is made in consultation with the exhibition organisers and possibly with other municipal services, for example the Building Control Department.

## 2 Unobstructed use of fire safety equipment and extinguishers

Building Regulations, article 6.3.2, use of equipment and extinguishers:

It is prohibited to place or keep objects or substances in such a way that they impede the immediate use and visibility of:

1. fire alarms and fire fighting equipment (i.e. manual alarms of the fire alarm system, smoke vents, hose reels and portable fire extinguishers);
2. facilities and equipment for the escape and rescue of persons and animals in the event of fire (i.e. aisles and passageways, emergency exits and fire extinguishing equipment on the outdoor site and access routes for the emergency services).

Nor may the position of a stand ever obstruct access to fire safety equipment and extinguishers.

## 3 Stand ingress and egress

Often stands are not closed off by a wall on at least one side, have a limited floor area and are not intersected by an aisle. In such a situation, no further requirements are made in respect of the egress signage. **In all other cases exhibitors must apply to the exhibition organisers for information about any further conditions that may apply.**

The further conditions may relate to:

- the use of white pictograms on a green background to mark exits, in accordance with the safety regulations as contained in NEN standard 3011:2004;
- the use of transparent signs with permanent interior lighting (pictograms or text) to mark escape routes;
- a separate emergency lighting system in the stand (either battery-powered or run off the emergency power supply of the Convention Centre).

## 4 General building and decorating regulations for stand construction

### 4.1 Classification of materials

The materials used for standbuilding must be rated in fire propagation class 1 or 2, in accordance with NEN standard 6065:1991/A1:1997.

The optical smoke density of these materials may not exceed 5.4m<sup>-1</sup>, in accordance with NEN standard 6066: 1991/A1:1997 in the case of fire propagation class 1.

The optical smoke density of these materials may not exceed 2.2 m<sup>-1</sup>, in

accordance with NEN standard 6066:1991/A1:1997 in the case of fire propagation class 2.

**Notes:**

- NEN 6065= the standard for determining the contribution of building materials to fire propagation.
- NEN 6066 = the standard for determining smoke production during fire.
- Class 1 = material can make a very weak contribution to fire propagation.
- Class 2 = material can make a weak contribution to fire propagation.
- Class 3 = material can make a moderate to strong contribution to fire propagation.
- A smoke number > 15 = corresponds with a moderate smoke density.

Various types of wood give a smoke density that can be classified as moderate. See page 30, point 16, where some materials and the permitted manner of application are indicated.

If the material which it is wished to apply does not appear on the list or if there is any doubt about the classification, it is advisable to contact the local fire brigade

When materials are submitted for testing to the local fire brigade, they should be accompanied by a test report issued by TNO (Netherlands Organisation for Applied Scientific Research) or a certified laboratory. A TNO test report can be obtained from the Fire Safety Centre of IBCTNO in Rijswijk.

#### 4.2 The flame-proofing (treatment) of combustible materials

The purpose of flame-proofing (treating) combustible material is to make it less easily flammable and thus enable it to be used in the fire safety class required for the exhibition.

The flame-proofing can be carried out in the following way:

- by finely spraying the material with a saline solution;
- in the case of certain materials by immersion in a saline solution for 2x24 hours in order to achieve the desired result;
- by coating the surface of the material with a special intumescent paint or varnish.

Flame-proofing should be carried out using a substance suitable for the material. If doubt exists about the possibility of flame-proofing, advice should be sought from a specialised firm which is able to test whether it is possible and whether these procedures can be applied.

#### 4.3 A certificate should be issued after treatment

The certificate should list the following data:

- description of the flame-proofed material (name, colour, etc.);
- date of treatment;
- firm stamp and name and signature of the operative

Names of recognised specialist firms can be obtained from both the exhibition organisers and the local fire brigade.

#### 4.4 Flameproofing (i.e. impregnation with flame-retardant substances) is not effective in the case of some combustible materials

These materials include:

- plastic foil and sheet materials;
- materials with plasticised surface coatings;
- compact or expanded plastics;
- natural and synthetic rubber;
- fabric made of 100% synthetic fibres;
- floor covering material made of synthetic fibres (whether or not with a rubber backing).

#### **Exception:**

Some materials can be treated during the production process in such a way that they can be classified in the requisite fire propagation class. Specialised suppliers of fabric, clothing and decorative materials which are classified in fire propagation classes 1 and 2 and therefore meet the fire service regulations can be found in the Netherlands.

### 5 Important

Even when a certificate can be produced, the local fire brigade has the right to ask the stand builder or the exhibitor for a sample of a material for testing. The party requested is then under an obligation to supply the sample. The flame-proofing substance (saline solution) can harm clothing materials (colour change and shrinkage) and corrode some metals.

#### 5.1 Load-bearing elements of stand construction

The load-bearing elements of the stand must be of stable construction and made of materials of fire propagation classes 1 or 2 (NEN standard 6065). In the case of certain stand types or methods of construction a municipal approval must have been granted on the basis of a strength calculation (in the case of a grandstand or two-storey stand) or construction method (in the case of steel strapping or wall anchors).

#### 5.2 Partition walls, decors and requisites

Walls, decors and requisites must be made of materials that are not easily flammable (classes 1 or 2, see NEN standard 6065). When engineered wood products (triplex and the like) are used and have a thickness of more than 3.5mm the material need not be flame-proofed; see also [article 19.4](#) in this document. Materials such as hardboard, softboard, cardboard and plastic foam board must have been treated and flame-proofed, regardless of the thickness of the material. If treated material is alleged to be no longer easily flammable this must be demonstrated by means of a test.

#### 5.3 Wall-covering materials

Wall-covering materials must have the properties of fire propagation classes 1 or 2 (NEN standard 6065). Even if the material does not meet the requirements of fire propagation classes 1 or 2, there are no strong objections to the use of unapproved materials (depending on the thickness of the material) provided they are glued to a base consisting of a material of fire propagation class 1 or 2 and non-flammable (water-based) adhesive is used. However, if unapproved material is used and not glued (i.e. other than as indicated above) consent will be given for its use only if the unapproved material covers a relatively small surface area of the wall. Unapproved material should be applied as an uninterrupted covering. Whether consent is obtained for the application of unapproved material depends on the assessment of the actual situation by the local fire brigade. Wall-covering materials, curtains and so forth that belong to fire propagation classes 1 or 2 may be draped in folds. Wall-coverings, decor and requisites must be kept free of possible ignition sources (spotlights, heat-producing equipment and so forth).

The following types of wall covering are not permitted, unless the material belongs to fire propagation classes 1 or 2 (NEN standard 6065) and the smoke density does not exceed the permitted levels (NEN standard 6066):

- floor covering: glued, stapled or free hanging;
- deep embossed plastic sheeting material;
- panels, sheets etc. made of expanded plastic material; applied, for example, as embossed sheets, advertising signs and decorative elements;
- soft cellulose chipboard.

#### 5.4 The use of curtains in relation to doors and passages

Subject to certain conditions, curtains may be hung in passages between stands on to which aisles emerge and which by virtue of their location form part of an escape route in a particular area. In order to close off the stand visually, a partition structure may be placed at a distance of not less than  $\frac{3}{4}$  of the width of the passage. To create the visual partition, strips of flannel with a width of 0.5m may be attached to a frieze and should have a floor clearance of 0.05m. If canvas, curtains or other furnishing materials are to be hung in front of emergency doors, they must be attached to the doors in such a way as not to obstruct free access.

This means that curtains and the like must be attached to the door in such a way that the unlocking mechanism (handle or push bar) is visible and can remain unobstructed. Canvas, curtains or other furnishing materials may be attached only in such a way that the prescribed markings and directional arrows, whether in the form of transparent light fittings or otherwise, remain clearly visible.

#### 5.5 Floor covering

The floor covering in stands and other areas accessible to the public must at least comply with NEN-EN standard 1775:2007 and NEN standard 1775/C2, classes 1 or 2. In the gangways, escape routes and stairwells, the floor covering must at least comply with fire propagation class 2, in accordance with NEN standard 6065. The floor and staircase covering must be laid in such a way that it cannot move or curl or roll up or expose visitors to the risk of slipping, tripping or falling.

#### 5.6 Types of paint and varnish

Only water-based paints or fire-retardant paints should be used in stand construction and for decorative objects, if this is necessary because materials listed under [article 19](#) in this document are to be used. See also [article 4.1](#) in this document.

## 5.7 Reflective and transparent materials

In the stands and other areas accessible to the public, glass mirrors may be used as wall covering if they are properly attached to a firm base. This means that the mirrors may not shatter even if subjected to considerable pressure. Vertical reflective surfaces consisting of taughtened plastic foil materials are permitted on condition that the material has been flameproofed during production and is of flame retardant quality.

Mirrors made of glass or foil may not adversely affect the sense of direction of visitors, particularly as regards the location of exits. Mirrors may not be put up in gangways or an escape routes, unless they are interrupted at eye height. Mirrors made of glass sheeting or taughtened foil material may never be used as part of the structure of a ceiling. Glass panels in external walls or partition walls of a stand may be used only if made of safety glass or reinforced glass (see also [article 19.6](#) in this document).

Depending, among other things, on the nature of the exhibition, it may be necessary for glass panels in the walls of the stand bordering the gangways to be protected from pressure by means of sufficiently heavy wooden or steel rim guards at a height of approximately 0.80 m on the gangway side. Such provisions can be made mandatory by the local fire brigade.

## 5.8 Stand furniture

### **Layout plans / Building Regulation art. 6.5.6**

If seating for more than 50 people is to be provided for in a stand or part of the stand that is fully or partly closed off, the exhibition organisers must be consulted about the layout of the stand.

### **Explanation**

When a stand is laid out, the following terms are used for the various seating configurations:

- **theatre configuration:** the chairs are arranged in rows;
- **restaurant configuration:** tables are placed in the area, each with a number of chairs arranged around it;
- **seating area plan:** the plan shows the seats and tables grouped together in a single area and indicates the aisles or spaces for walking;
- the width and number of aisles are dependent on the number of visitors;
- another requirement is that the number of persons present in an area may not exceed the number of available seats.

The following rules apply to a theatre configuration:

1. Where the seating is arranged in rows the free space between the rows must be at least 0.4 m, measured between the plumb lines at the point where the rows are closest together. If tables have been placed between seats in a row, the free space must continue at the point where the tables are placed.

2. Where each row contains more than four chairs and there are four or more consecutive rows, they must be fastened together or anchored to the floor in such a way that they cannot shift or tip over in the event of jostling. The chairs must be fastened in a manner that is to the satisfaction of the municipal authority.

3. A row of seats that opens directly on to an aisle or exit at only one end may not contain more than eight seats.

4. A row of seats that opens directly on to an aisle at both ends may not contain more than:

1. 16 seats if the space between the rows is less than 0.45 m;
2. 32 seats if the space between the rows exceeds 0.45 m;
3. 50 seats if the space between the rows exceeds 0.45 m and there is also an exit with a width of at least 1.10 m at both ends of every four rows.

5. The space taken up by furniture, furnishings and decorative objects that are on the floor (or at a height of less than 2.50 m above the floor) of an area in which people are present, when measured at right angles to the floor (the measurement being made of furniture when it is in use), must be such that at least:

1. 0.25 m<sup>2</sup> of floor area remains available for each person for whom no seat is available;
2. 0.30 m<sup>2</sup> of floor area remains available for each person for whom a seat is available which has been fastened or anchored in such a way that it cannot shift or tip over in the event of jostling;
3. 0.50 m<sup>2</sup> of floor area remains available for each person for whom a seat is available which has not been fastened or anchored in such a way that it cannot shift or tip over in the event of jostling.

6. Furniture, furnishings and decorative objects that are in an area in which persons are present must, if the free floor area is less than 0.50 m<sup>2</sup> per person, be fastened in such a way that they cannot shift or tip over in the event of jostling.

7. In the case of areas in which more than 50 people may be present simultaneously, a layout plan must be drawn up to the satisfaction of the municipal authority.

Example:

1. 72 persons,  $72/9 \times 0.10\text{m} = \text{aisle width of } 0.80\text{m}$ ;
2. 245 persons,  $245/9 = 27 + 0.1\text{m} + 0.1\text{m} = \text{aisle width of } 2.80\text{m}$ .

The following rules apply to a **restaurant configuration**:

Furniture (tables and chairs) and other objects may only take up such floor area that at least:

1. 0.25 m<sup>2</sup> of floor area remains available for every person for whom no seat is available;



2. 0.30 m<sup>2</sup> of floor area remains available for every person for whom a seat anchored to the floor is available;
3. 0.50 m<sup>2</sup> of floor area remains available for every person for whom an unattached seat is available.

8. If the free surface area is less than 0.50 m<sup>2</sup> per person, furniture (tables and chairs) and other objects must be arranged in such a way that they cannot shift or tip over in the event of jostling.

#### 5.9 Plants, flowers and shrubs as decorations

Plastic plants and shrubs and artificial flowers may be used for decorative purposes if they are classified in fire propagation class 2 in accordance with NEN standard 6065. If the greenery does not meet these requirements, it is permitted only to a very limited extent. This is a matter for assessment by the local fire brigade.

However, living plants, shrubs and flowers are permitted. It should be realised that the combustibility of cut flowers etc. will increase during the exhibition as the material becomes increasingly dry. This means that requirements may be made after all with regard to the flameproofing of decorative items. If plants are arranged in a bed of turf, this should be regularly moistened. The size and thickness of the turf bed should be of limited size and any spotlights in it should be mounted in such a way that they are firm and stable.

## 6 Stand ceiling

The stand ceiling may consist of stretch fabric products, various types of sheeting material or metal modular panels.

The following rules apply to the materials and construction method used for stand ceilings:

1. the material should at least comply with fire propagation class 2 in accordance with NEN standard 6065; moreover, in accordance with NEN standard 6066, the smoke density of these materials may not exceed 5.4 m<sup>-1</sup> in the case of a class 1 fire propagation rating and 2.2 m<sup>-1</sup> in the case of a class 2 fire propagation rating;
2. the material must also be of such a quality that it is not easily flammable or must have been flame-proofed to achieve the same effect;
3. where fabric is used for the ceiling, it must be hung by means of metal wires with a minimum thickness of 0.3 mm. that run in one direction and are at a minimum distance of 1 m from one another;
4. free-hanging decorations such as fishing nets, tarpaulins and so forth must be threaded with metal wires that run in one direction and are at a minimum distance of 1m from one another; the beginning and end of each wire should be properly fastened;
5. sheets of glass may never form part of a stand ceiling;
6. plastic foil may never be used for the ceiling of a stand;
7. if a sprinkler system in the exhibition area forms part of the stationary extinguisher system no more than 30% of the stand area may be covered by a

ceiling structure, unless it is fitted with a sprinkler-compatible ceiling material that meets the prescribed requirements.

## 7 Load-bearing structural elements of the stand

The load-bearing elements of the stand should be structurally stable and the materials used should comply with fire propagation classes 1 or 2 in accordance with NEN standard 6065.

In the case of certain stand types or methods of construction approval is required under government regulations (Building Decree and Building Bye-Law) for the strength calculation (in the case of grandstands, tiered seating or two-storey stands) or the method of construction (in the case of steel strapping or wall anchors).

## 8 Two-storey stands

A design for a two-storey (double-decker) stand requires a permit from the RAI's Permits Desk.

An application for a permit must meet the following criteria:

1. The application for the permit must be submitted in writing to the RAI's Permits Desk at least two weeks before the start of the stand construction in the Convention Centre. For contact particulars, see [Contact Data Annexe](#). The drawing of the stand should be submitted to the fire brigade to enable it to check compliance with the fire safety requirements.
2. At the start, structural drawings and calculations should be attached in triplicate.
3. The structural calculations in Dutch should be drawn up in accordance with Dutch standards on strength and stability of the structure and the point load on the floor of the building.

Reference is made to the most recent version of the Dutch standards:

1. NEN 6700/cl 'Technical Principles for Building Structure Calculations';
2. NEN 6702/c2 (TGB 1990) - **General**;
3. NEN 6770/c2 'Technical Principles for Building Structure Calculations';
4. NEN 6771 (TGB 1990) **Steel**;
5. NEN 7662/c2
6. NEN 6760/c2 'Technical Principles for Building Structure Calculations';
7. NPR 6761 (TGB 1990) **Wood**;
8. NEN 6710/cl 'Technical Principles for Building Structure Calculations' (TGB 1990) **Aluminium Structures**

When the area of the first floor of a stand exceeds 50 m<sup>2</sup>, a drawing of the stand layout should be submitted in duplicate to the local fire brigade for approval at least three weeks before the start of the exhibition build-up. In addition to the permit from RAI's Permits Desk, the consent of the exhibition organisers will have to be obtained for the construction of an extra floor. This is not permitted in all areas of the Convention Centre.

The check carried out by the RAI Permits Desk will focus on the following points:

1. the stability and load-bearing capacity of the structure;
2. the safety of the handrails (at least two horizontal bars for each banister);
3. the balustrades must be sufficiently strong and stiff;
4. the location and design of glass partitions (see also [Article 19.6](#) in this document);
5. the buttressing of the stand;
6. the design of various structures and the application of construction materials such as wood, iron, aluminium and plastic.

#### 8.1 Ingress and egress (two-storey stand)

The number of exits and staircases depends on the floor area of the first floor:

- where the area is less than 50 m<sup>2</sup> one exit and one straight staircase (each with a minimum width of 0.80m) are sufficient;
- where the area is 50 m<sup>2</sup> or more, the approval of the local fire brigade is needed for the layout of the entire stand (see [Article 8](#) in this document).

#### 8.2 Straight staircases (two-storey stand)

At the point where the staircase meets the upper deck the width of the deck must be at least equal to that of the stairs.

- The vertical distance between the upper deck and the floor of the hall may not exceed 4.50 m.
- The maximum stair riser height is 0.21 m.
- The minimum going (the depth of the stair tread) is 0.21 m.
- The minimum width of each step of the stairs, measured in the direction of climb at the front of the step) is 0.23 m.
- Twice the rise plus the going (2R+G) must be equal to 0.60 m (2 risers + 1 tread = 0.60 m).

#### 8.3 Spiral staircases (two-storey stand)

A spiral staircase is permitted as an escape route only if no more than 10 people need to make use of it. If such a staircase is permitted, the diameter of the spiral must be at least 0.70 m.

#### 8.4 Handrails (two-storey stand)

Stairs must be fitted on both sides with sound and firmly attached handrails and must be closed off at the side up to the height of the railing. If the width of the staircase is more than 2.20 m the staircase must be divided by one or more sound and firmly attached handrails. The ratio of the division must be 5:10:5.

### 9 Visitor area in the exhibition hall

One or more areas in an exhibition hall may be used as a pavement cafe, restaurant, cinema, demonstration area, concert hall or theatre with tiered seating, either as an

independent unit or as part of an exhibition.

Areas used for the above-mentioned purposes are subject to the rules specified in [Article 4](#) in this document: 'General stand construction and decoration regulations'. The configuration of the seating must be arranged with due care and recorded in a seating plan. For details see [Article 5.8](#) in this document.

A seating plan that relates to a floor area at exhibition hall level of more than 100 m<sup>2</sup> requires the approval of the chief officer of the local fire brigade. The seating plan must be submitted in duplicate for approval to the municipal fire brigade at least three weeks before the start of the exhibition build-up.

Two permits are always necessary for the construction of a grandstand/tiered seating.

- The structural aspects of the design must have been approved by the Building Control Department (afdeling Bouw- en Woningtoezicht). The application procedure is identical to that for the design of a two-storey stand ([Article 8](#) in this document).
- The grandstand/tiered seating must have been approved by the local chief fire officer
- The structural calculations for the design of the grandstand/tiered seating must be based on an even load of 500 kg/m<sup>2</sup>.
- When a pop group performs, additional requirements may be imposed. These measures are predominantly of an organisational nature and may relate to:
  - the compartmentalisation of visitor groups by the placing of railings and stage barriers positioned in relation to the emergency exits;
  - the preparation of a security plan;
  - the setting up of an organisation to keep order; the security officers should work for a security firm with an ND licence;
  - the security firm must comply with the NEN standard NTA 8020-30;
  - measures to optimise the means of communication in connection with the high noise level;
  - measures to regulate ticket sales; the maximum number of visitors to be admitted must be decided in advance and may not be exceeded during implementation.

## 10 Electrical systems and stand lighting

Only electric lighting may be used for a stand and the electrical system may be installed only by certified electricians. If the system does not meet the relevant conditions of EWN and NEN standard 1010, NEN-EN standard 50107, NEN standard 3140 (fire brigade, insurers), it may not be connected to the power grid.

Stand electrical cables should have a minimum core diameter of 2.5 mm<sup>2</sup> (live wire 2.5 mm<sup>2</sup> in tube is also permitted). The use of thinner cable is strictly forbidden, unless the electrician can show that it meets the requirements of NEN standard 1010.

### **Note on electrical systems and stand lighting:**

- The installation should be distributed over sufficient groups and each group should have the correct fuses. The maximum load per group is 3kW (16 amp). Lighting and power units with an output in excess of 3kW should be distributed over the phases.
- Electrical cables should be fitted at a sufficient distance from steam, water or gas pipes. Cables that are exposed to potential damage should be sufficiently protected.
- Motors should have a thermal safety switch. Motors with a power capacity larger than 3kW should also be fitted with a star-delta switch.
- Spliced joints should be made by means of wire connectors or terminal clamps. Spliced joints may not be hidden behind walls, under floors or in ceilings.
- Metal parts that could potentially become conductors of electricity (live wires) due to an electrical defect should be sufficiently earthed. Electrical cables should be sufficiently secured.
- Heat-emitting light fittings should be kept at least 0.10 m from any combustible material. In addition, no combustible material should be capable of being reached by reflected heat emission within 0.30 m of the edge of the reflector.
- Neon light fittings or systems should comply with NEN 1010.

Safety measures for neon light fittings and systems should comply with standard NEN-EN 50107.

Notwithstanding these rules of NEN standard 1010, the following implementation rules apply in the Convention Centre:

- a maximum of two neon light fittings that comply with NEN standard 1010, NEN-EN standard 50107, may be connected by means of a plug and socket connection that is within reach;
- several neon light fittings placed next to one another must be fitted with a single central fire safety switch;
- neon light fittings or systems must always be fitted with a central fire safety switch if the equipment is hard to reach and is part of the stand structure or does not comply with NEN standard 1010, NEN-EN standard 50107.

## 11 Gas cylinders

The presence and/or use of compressed or liquefied flammable gases in a convention centre is permitted only after written consent has been obtained from the chief officer of the local fire brigade. Such consent may be made conditional on compliance with one or more of the following provisions:

- no more than one propane or butane gas cylinder with a water volume not exceeding 26.2 litres may be present in the stand, unless provided otherwise in the permit;
- no more than one gas cylinder with a volume not exceeding 10 litres (acetylene, oxygen etc.) containing a compressed gas or any other liquefied gas may be present in the stand, unless recently provided otherwise in the permit;
- no stock of filled or empty gas cylinders may be present in a stand or in the convention centre other than in an area which has been specially fitted out for this purpose and meets the requirements for the storage of gas cylinders;

- the gas cylinders must be located in an area that is not accessible to the public; the area must also be adequately ventilated;
- no artificial lighting, electrical switching gear, fuse box or wall socket may be present in this area, unless they meet the requirements prescribed in NEN standard 1010;
- no heating equipment or naked flame is permitted in this area and smoking is also prohibited;
- gas cylinders must be stored in an upright position at a distance of 0.25 m from each other and should be secured to a stable object or the wall by means of an easy-to-open bracket or a chain in order to exclude the possibility that the cylinder may be knocked over or fall over; gas cylinders with a larger volume than indicated above should be placed on an easily movable trolley and once again secured by means of a chain or bracket to exclude the possibility of tipping;
- the hand wheel or spindle key must be present on the valve spindle of the gas cylinder;
- each day after the exhibition closes for visitors, the gas cylinder valve must be turned off;
- the pipe connecting the gas cylinder and the gas-fired appliance should be made of metal and have metal couplings; use may be made of a flexible hose connection which has a maximum length of 1.5m and meets NEN standard 5654-1980, NEN standard 2920 and NPR standard 2921;
- demonstrations using gas-fired appliances must always be conducted by or in the presence of an expert;
- in an emergency the gas cylinder should be turned off and, if possible, removed from the building;
- a fire extinguisher, for example a CO<sub>2</sub> (dry ice) extinguisher having a minimum capacity of 5 kg, a dry powder extinguisher with a minimum capacity of 7 kg or a foam extinguisher with a minimum capacity of 6 litres of water and 1 litre of foam should be present and visible in the stand and ready for immediate use;
- the permit issued by the chief officer of the local fire brigade should be present in the stand; this consent is valid only for the specified exhibition.

## 12 Liquid fire accelerants

The presence and/or use of (ignitable) liquid fire accelerants in a convention centre is permitted only after written consent has been obtained from the chief officer of the local fire brigade.

Such consent may be made conditional on one or more of the following provisions:

- accelerants include domestic fuel oil, diesel oil etc;
- a limited stock of not more than 80 litres of the fuel needed for the system concerned may be kept, but only if it is stored outside in properly sealed metal containers; the convention centre safety officer will designate the appropriate place for storage;
- a receptacle with a capacity of 120% of the fuel stock must be placed under the metal container;
- a fire extinguisher (e.g. a CO<sub>2</sub> dry ice extinguisher with a minimum capacity of 5 kg, a dry powder extinguisher with a minimum capacity of 7 kg or a foam extinguisher with a minimum capacity of 6 litres of water and 1 litre of foam) ready for immediate use must be kept in the stand in a visible place;

- the permit issued by the chief officer of the local fire brigade should be present in the stand during the exhibition; the permit is valid only for the specified exhibition.

## 12.1 Vehicles and vessels with diesel or petrol engines

- Petrol-engined vehicles and vessels may be exhibited in the Convention Centre if the fuel tank is virtually empty (maximum of 5 litres per tank); the fuel tank must be properly and permanently locked.
- Diesel-engined vehicles and vessels may be exhibited in the Convention Centre without the fuel tank being emptied, on condition that the fuel system is designed in such a way that it cannot leak; the fuel tank must be properly and permanently locked.
- Vehicles fitted with an LPG system may be exhibited in the Convention Centre on certain conditions. The system, including the tank, should be fitted in accordance with the existing regulations and the tank should not be filled to the permitted 80% level since, owing to the expansion coefficient of LPG, it is possible that temperature in the halls could cause the pressure to rise and activate the safety valve.
- The cable clamps on the battery terminals should be disconnected.

## 13 Exhibiting toxic substances

Exhibiting toxic substances, whether or not in their original packaging, is in principle prohibited unless:

- a permit has been granted and contains the safety provisions specified by the Ministry of Infrastructure and the Environment (formerly known as the Ministry of Housing, Spatial Planning and the Environment/VROM);
- an expert designated by the exhibition organisers is present during the exhibition and is competent to act in the event of an accident or emergency;
- the fire brigade is informed by the exhibition organisers of the presence of toxic substances in the Convention Centre as fire brigade personnel may have to be deployed in the event of an accident or emergency.

## 14 Substances and equipment that emit ionising radiation

Substances and equipment that emit ionising radiation (i.e. radioactive substances or x-ray equipment) are covered by the Nuclear Energy Act. Without a permit the possession and/or use of these substances or equipment is prohibited.

- The Ministry of Infrastructure and the Environment (formerly known as the Ministry of Housing, Spatial Planning and the Environment / VROM), Radiation Protection Division, Permits Desk, is responsible for issuing the requisite permit for demonstrations of equipment during an exhibition.
- Often, a permit application is submitted collectively by the exhibition organisers after they have been notified of a proposed demonstration. The exhibition

organisers also notify the local fire brigade of the proposed demonstration. The conditions imposed by the local fire brigade are mainly of an organisational nature

- Where an individual application is submitted by an exhibitor, a request to hold the demonstration must be submitted to the Ministry of Infrastructure and the Environment no less than four months before the start of the build-up of the exhibition, in accordance with the current regulations.
- The demonstration must be notified to the chief officer of the local fire brigade at least one month before the start of the build-up of the exhibition in the Convention Centre.
- The check on compliance with the conditions specified in the permit is carried out by the fire brigade, the Labour Inspectorate, the Radiation Protection Department of the Ministry of Social Affairs and Employment and the Nuclear Energy Supervision Department of the Ministry of Infrastructure and the Environment.

## 15 Laser light

The use of laser light must always be notified to the exhibition organisers. The issue of a permit may always be made conditional, depending on the nature of the laser (wavelengths, energy, pulsed or non-pulsed). Often the consent of the local fire brigade is also required.

The check on compliance with the conditions specified in the permit is carried out by the Ministry of Social Affairs and Employment and/or the Labour Inspectorate.

### **Class 1 - Safe sources of radiation**

These include lasers and laser systems that cannot cause radiation injury even when used incorrectly. These may be used by everyone and in all normal business situations without further measures

### **Class 2 - Sources of radiation that are not entirely safe**

These include lasers that emit visible light (wavelengths between 400nm and 700nm) of sufficiently low output (< 1mW). Generally speaking, the eye is safeguarded by the fact that the eyelid closes briefly as a natural reaction to pain or blinding (reaction time is about 0.25s). A beam that unexpectedly hits the eye for a short time is therefore not harmful. Injury can occur only by looking directly into the beam and suppressing the blink reflex.

### **Class 3 - Dangerous sources of radiation**

These include sources of radiation that can cause injury if pointed directly into the eyes. This class is subdivided into the following:

- Class 3A

These are lasers that emit visible light (wavelengths between 400nm and 700nm) of a rather higher output than class 2. The intensity of the beam is nonetheless so low (e.g. because of the diffusion of the beam) that anyone with an unprotected eyes will still not suffer injury if the beam hits the eye by chance. However, such lasers may be a hazard to health if a person deliberately looks into the beam or if the intensity is increased by optical means.

- Class 3B

These are lasers which have a higher output than those in the previous classes



and cause injury if the eye is hit by a direct beam or reflected beam, but not by a diffuse reflection.

#### **Class 4 - Very dangerous sources of radiation**

These include lasers that have such a high output that a direct beam and reflected beam as well as a diffuse reflected beam can cause eye injury. They can also burn the skin or cause fires.

Lasers of classes 3B and especially 4 pose the most serious danger.

#### 16 Operating welding equipment, combustion engines etc.

All combustion engines, welding equipment, equipment that involves naked flames and so forth which is demonstrated in the Convention Centre must be notified to the exhibition organisers. Without exception, a permit (exemption) from the chief officer of the local fire brigade is required for these forms of demonstration.

#### 17 Demonstrations

All demonstrations of equipment in the Convention Centre should be notified to the exhibition organisers. Not all forms of demonstration are permitted by exhibition organisers. For many forms of demonstration conditions will be imposed by the local fire brigade in a permit (exemption). Applicants for such a permit should apply early so as to ensure that when they receive the permit they still have sufficient time in which to satisfy the conditions and are thus not barred from giving demonstrations in the days before the conditions are met.

#### 18 Storage of packaging

Exhibitors are never permitted to store packaging material etc. behind or next to the stand. This is because such material is easily flammable. Packaging may, however, be stored in an unused part of the Convention Centre if appropriate safety measures have been taken in consultation with the exhibition organisers and the local fire brigade, for example:

- a complete ban on smoking in the area where the packaging is stored;
- the placement of extra fire extinguishers';
- the area must not be accessible to the public;
- permanent surveillance by fire watchmen;
- the packaging may not block access to escape routes.

Permission may be given for a day's supply in consultation with the fire brigade. In the permit (exemption) issued by the local fire brigade, restrictive conditions may be imposed as regards the size of the supply.

#### 19 Stand construction materials and the permitted manner of application

##### **Stand construction material**

**Stand construction material****Manner of use**

## 1. Softboard

The material must be coated on all sides (surfaces) with a fire-retardant paint or varnish.

## 2. Hardboard

The material must be coated on at least one side with a fire-retardant paint or varnish (on both sides if the stand is not adjacent to another stand).

## 3. Wood or fibreboard thinner than 3.5 mm

The material must be coated on at least one side with a fire-retardant paint or varnish (on both sides if the stand is not adjacent to another stand).

## 4. Wood or fibreboard thicker than 3.5 mm

The material may be applied without special treatment.

## 5. Glass used vertically

Safety glass or glass with embedded crosswire reinforcement with a maximum mesh width of 16 mm in a wooden or metal frame with a minimum depth of 15 mm.

## 6. Glass used horizontally

Safety glass or glass with embedded crosswire reinforcement with a maximum mesh width of 16 mm in a wooden or metal frame with a minimum depth of 15 mm.

## 7. Plastic sheeting made of expanded plastic and plastic rubbers

The material must be of a quality that is not easily flammable and should comply with NEN standard 6065, fire propagation class 1 or 2, see [article 5.3](#) in this document. The material may not emit large quantities of smoke and/or gases or vapours that are harmful to health in accordance with NEN 6066, see [article 4.1](#) in this document. The material may not drip when heated.

## 8. Foil material (metal)

The material may not be used without special treatment.

## 9. Plastic foil material

The material must have been flame-proofed in the production process and should comply with NEN standard 6065, fire propagation class 1 or 2.

The foil may never be used as a cover or ceiling for a stand.

Combustible foil may be used only if it is affixed (using a non-flammable water-based adhesive) to a base of non-flammable material or to one of the materials referred to under article 5.3 in this document.

## 10. Paper products such as crepe paper, wallpaper, decorations and so forth

The material must be flame-proofed and comply with NEN standard 6065, fire propagation class 1 or 2.

## 11. Straw bales, cardboard, rushes, straw, mats, raffia, hay and so forth

The material must be flame-proofed and comply with NEN standard 6065, fire propagation class 1 or 2.

**Note:**

The material must be immersed in a fire-retardant agent for at least 2 x 24 hours in

order to meet the requirements

12. Fabric made of natural fibres such as cotton, linen, jute, wool and so forth

This material must have been flame-proofed and should comply with NEN standard NEN 6065, class 1 or 2.

- NEN-EN-ISO 6940
- NEN-EN-ISO 6941

13. Fabric made of synthetic fibres

The material must have been flame-proofed during the production process and should comply with NEN standard 6065, class 1 or 2.

- NEN-EN-ISO 6940
- NEN-EN-ISO 6941

The material may not emit large quantities of smoke and/or gases or vapours that are harmful to health in accordance with NEN 6066, see [article 4.1](#) in this document.

The material may not drip when heated.

**Note:**

Combustible fabric made of synthetic fibres will seldom fulfil the class requirements as a result of flame-proofing.

14. Fabrics used vertically such as tarpaulins, stand ceiling cover and so forth

The material may be used only in the manner indicated in the conditions referred to in article 19.12 and 19.13 in this document and the fabric must be taughened using metal wires with a thickness of 0.3 mm; the wires must run in one direction and be at a minimum distance of 1m from one another.

15. Carpeting as wall covering

The material must have been flame-proofed during the production process and should comply with NEN standard 6065, class 1 or 2.

The material may not emit large quantities of smoke and/or gases or vapours that are harmful to health in accordance with NEN 6066, see [article 4.1](#) in this document.

## 20 Specific fire service regulations on tents/marquees

A tent or marquee may not be erected in such a way that the fire brigade cannot gain immediate access to fire hydrants and other water supplies. The structure and erection of the tent or marquee must be to the satisfaction of the Building Control Department of the urban district and in keeping with the Building Decree. For the placement of a tent or marquee an 'object' permit is required (for applications, see [Annex 5: Permits Handbook](#)).

Load-bearing structures, floors and so forth may not be made of materials that emit large quantities of smoke or gases harmful to health immediately after a fire breaks out. The layout of the tent or marquee must be to the satisfaction of the fire brigade in terms of fire safety.

Where the seating is arranged in rows the free space between the rows must be at least 0.4 m, measured between the plumb lines at the point where the rows are closest together. If tables have been placed between seats in a row, the free space must continue at the point where the tables are placed.

- Where the rows have more than four chairs and there are four or more consecutive rows, they must be fastened together or anchored to the floor in such a way that they cannot shift or tip over in the event of jostling.
- A row of seats that opens directly on to an aisle or exit at only one end may not contain more than eight seats
- A row of seats that opens directly on to an aisle at both ends may not contain more than:
  - 16 seats if the space between the rows is less than 0.45m;
  - 32 seats if the space between the rows exceeds 0.45m;
  - 50 seats if the space between the rows exceeds 0.45m and there is also an exit with a width of at least 1.10m at both ends of every four rows.

Doors in emergency exits must open in the direction of the escape route and, if they are closed, must be capable of being opened by one simple hand action. If curtains, net curtains or other furnishing materials have been hung in front of exits or emergency exits, these must be attached in such a way that they do not obstruct escape routes. The entrances, passageways, exits and so forth must be kept free of obstacles across their full width at all times.

If there is a difference in height of more than 40 cm between the floor of the tent or marquee and the level of the surrounding terrain, ramp elements with a non-slip surface should be placed in order to bridge the gap. These should be at least 50 cm wider than the width of the exit.

The electrical installations in the tent or marquee must comply with the provisions of NEN standard 1010 and with any local connection conditions. An electrical emergency and transparent lighting system must have been installed in the tent or marquee and powered by a power source separate from the normal power supply. The power source(s) of the emergency and transparent lighting system must be such that the light fittings can emit light at full strength for 30 minutes and the light strength measured at floor level is 1 lux.

While members of the public are in the tent or marquee the transparent light fittings must be on at all times. Emergency lighting, transparent light fittings and other escape route markings must remain properly visible at all times.

Portable fire extinguishers must be present in the tent or marquee in what the fire brigade considers to be sufficient numbers. The fire extinguishers must be positioned so that they are easily visible and ready and accessible for immediate use. The position of the fire extinguishers must also be indicated by pictograms.

Any materials used for furnishing, decoration and so forth in the tent or marquee must not be easily flammable or must have been flame-proofed. Ceiling decorations must be hung at a height of at least 2.5 m above the floor, and curtains and other furnishings that hang vertically should be kept at least 0.10 m clear of the floor. Decorations, furnishings and so forth should be kept clear of spotlights and other heat-emitting equipment to ensure that the material cannot catch fire.

Floor covering should be laid in such a way that it cannot move or curl or roll up or expose those present in the tent or marquee to the risk of slipping, tripping or falling.

The tent or marquee must be clean and in good condition. Rubbish, packaging and so forth must be put into lockable containers made of non-combustible material.

If a tent is erected as a smoking area with the express written consent of the Permits Desk, only self-extinguishing ashtrays or sand buckets may be placed. These should then be regularly emptied, in any event daily, and the contents deposited in lockable ash containers made of non-combustible material.

The following may not be present in a tent or marquee:

- portable electric heaters;
- equipment that operates on gas, liquid or liquid gas;
- flammable liquids and compressed or liquefied gases.

## 21 Specific fire service regulations on barbecues

An organiser or exhibitor is not permitted to hold a barbecue in or near the RAI building. However, RAI Catering may be able to arrange a barbecue subject to the following conditions:

- the barbecue must be positioned at least 10m from any structure;
- the barbecue must be set up in such a way that it is stable and does not constitute a fire risk;
- the fuel used for the barbecue may not be ignited using flammable substances such as white spirit;
- if third parties are inconvenienced by smoke from the barbecue it must be stopped immediately;
- sufficient fire extinguishers (e.g. buckets containing water and CO<sub>2</sub> (dry ice) extinguishers with a capacity of at least 6kg) must be available for immediate use in the vicinity of the barbecue;
- after the finish of the barbecue the hot coals should be doused and covered with a layer of sand or earth.

## 22 Sources

Statutory regulations and standards:

- unobstructed use of fire safety equipment and fire extinguishers; Building Regulation article 6.3.2;
- pictograms showing exits should comply with NEN-EN standard 61310 and NEN standard 3011 (partly replaced);
- determination of the contribution of building materials (and combinations of materials) to fire propagation, NEN standard 6065, class 1 or 2;
- British Standaard 6807;
- determination of smoke production by fire in building materials (and combination of materials), NEN standard 6066;

- stand furniture. Lay-out plans. Building Regulation article 6.5.6;
- NEN standard 6700/cl Technical Principles for Building Structure Calculations;
- NEN standard 6702/c2 (TGB 1990) - General;
- NEN standard 6770/c2 Technical Principles for Building Structure Calculations;
- NEN standard 6771 (TGB 1990) Steel;
- NEN standard 7662.c2;
- NEN standard 6760/c2 Technical Principles for Building Structure Calculations;
- NPR standard 6761, (TGB 1990) Wood;
- NEN standard 6710/cl Technical Principles for Building Structure Calculations (TGB 1990) Aluminium structures;
- Bilding Decree & Regulations: article 5 – requirements for a staircase;
- standards for electrical installations and stand lighting: NEN 1010, NEN-EN 61310, NEN 3140, NEN-EN 50107 (neon fittings);
- standards for connections, hoses and positioning of gas cylinders and gas-fired appliances: NEN 5654, NEN 2920, NPR 2921.

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