FIRE PREVENTION FOR ENCLOSED SPACES IN LARGE HALLS

1. GENERAL

The large halls, for example the experimental and assembly halls, whether at the surface or underground, contain varying and sometimes large quantities of combustible materials.

In the event of fire in a large hall where both open floors and galleries are used to house enclosed spaces (barracks, clean rooms, different kinds of closed laboratory, etc.), smoke and fumes will spread rapidly and encircle the enclosed premises before their occupants realize the fact. It is therefore essential for individuals in this situation to be aware of the break out of a fire in a hall so that they have time to escape.

The provisions of this Safety Note are applicable to all enclosed spaces built or installed in such halls.

The storing and use of flammable gases or liquids in enclosed spaces of this type are prohibited.

2. PREVENTION OF FIRES

2.1. Building materials

Building materials used for enclosed spaces (internal and external walls, false floors and so forth) and their infrastructure as well as barracks of wooden construction must have been selected or brought into line with the provisions of IS 41\(^1\), i.e. basically they must not contain halogens or sulphur and their fire contribution must be minimal or weak. They must belong to fire reaction classes M0 or M1, (France), VI or V (Switzerland) or their equivalents in other countries (see Annex: Classification of fire resistance of building materials in various countries Table 3 of IS41\(^1\)).

\(^1\) CERN Safety Instruction IS 41: The Use of Plastics and other Non-Metallic Materials at CERN with respect to Fire Safety and Radiation Resistance.
2.2. Fire detection

For the protection of occupants of enclosed spaces, given the risks inherent in activities carried on in a given zone, TIS Division can require the installation of a fire detection system in the large halls, with evacuation alarm sirens in enclosed spaces. To conform to CERN's Code E (Fire Protection Code), such evacuation sirens must be automatically triggered by the fire-detection system and must also allow manual activation by push-button controls that are easily accessible and visible in the zone where the enclosed space in question is located.

The division using the enclosed space may decide to install a fire detection system inside it, in particular to protect the property it contains.

The alarms (fire detection alarms and evacuation sirens in the enclosed spaces), defined as "Level 3 Alarms"\(^2\), must be connected to the Fire and Rescue Services control room.

2.3. Extinguisher systems

One or more portable extinguishers of a type authorized by TIS/GS/PI and clearly marked (see paragraph 4 below) must be placed near but inside each exit door in an enclosed space.

3. EVACUATION

3.1. Enclosed spaces more than 15 m long installed at ground level

Such spaces must have two marked exit doors, one at each end. They must always be easy to open from inside.

3.2. Raised spaces installed in surface buildings or underground areas

If an enclosed space installed in a surface building is 15 m long or more, the second door required in paragraph 3.1 above must open onto a second staircase leading to firm ground. No point of any enclosed space shall be further than 30 m from a staircase.

For enclosed spaces installed in open areas underground, the above distances of 15 m (30 m) shall be reduced to 10 m (20 m). The foot of a staircase at ground level must be less than 20 m from an exit to the outside.

4. EMERGENCY LIGHTING AND SAFETY SIGNS

Emergency lighting systems must be provided at points recommended by TIS/GS/PI.

Standard safety signs and direction boards must be placed at strategic spots or on dangerous equipment inside and outside the barracks (see Safety Code A3\(^3\)).

\(^2\) CERN Safety Instruction IS 37 - Alarms and alarm systems.
\(^3\) CERN Safety Code A3, Safety Colours and Safety Signs.
5. INSTALLATIONS AND SAFETY INSPECTION

The installation of an enclosed space inside a hall must be approved by the Divisional Safety Officer (DSO) after consultation with TIS Division.

In collaboration with TIS Division and the Territorial Safety Officer (TSO) concerned, the DSO or Group Leader in Matters of Safety (GLIMOS) must organize a safety inspection before equipment installed in an enclosed space can go into operation.

Annex: Table 3 of CERN Safety Instruction IS 41: "Classification of fire resistance of building materials in various countries".
Classification of fire resistance of building materials in various countries

(Taken from the "International Plastics Flammability Handbook" J. Troitzsch, Hanser Publishers - Munich, 1990)

<table>
<thead>
<tr>
<th>Fire contribution of building material</th>
<th>A</th>
<th>CH</th>
<th>D</th>
<th>DK 1)</th>
<th>F</th>
<th>GB</th>
<th>I</th>
<th>N</th>
<th>NL</th>
<th>S</th>
<th>USA 2)</th>
<th>B</th>
<th>CZ</th>
<th>E</th>
<th>H</th>
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<tr>
<td>Minimal</td>
<td>A</td>
<td>VIq</td>
<td>A 1, 2</td>
<td>nc*</td>
<td>M0</td>
<td>0</td>
<td>0</td>
<td>nc*</td>
<td>nc*</td>
<td>nc*</td>
<td>nc*</td>
<td>A0</td>
<td>A</td>
<td>M0</td>
<td>nc*</td>
<td>nc*</td>
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<tr>
<td>Low</td>
<td>B 1</td>
<td>V</td>
<td>B 1</td>
<td>A (1)</td>
<td>M1, 2</td>
<td>1</td>
<td>1</td>
<td>A 20</td>
<td>1</td>
<td>1</td>
<td>A (I)</td>
<td>A1, 2</td>
<td>B</td>
<td>M1, 2</td>
<td>lc*</td>
<td>1 (I)</td>
</tr>
<tr>
<td>Normal</td>
<td>B 2</td>
<td>IV</td>
<td>B 2</td>
<td>(2)</td>
<td>M3</td>
<td>2</td>
<td>2</td>
<td>A 30</td>
<td>2</td>
<td>3</td>
<td>B (II)</td>
<td>C (III)</td>
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<tr>
<td>High</td>
<td>B 3</td>
<td>III</td>
<td>B 3</td>
<td></td>
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<td>5</td>
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<td>C3</td>
<td>M4</td>
<td>hc*</td>
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</tr>
</tbody>
</table>

- See Safety Instruction IS 41: The Use of Plastics and other Non-Metallic Materials at CERN with respect to Fire Safety and Radiation Resistance.

1) Classes 1, 2 for linings.
2) Classes A, B, C or I, II, III for linings depending on the Model Building Code.

* nc = non combustible, lc = low combustibility, mc = moderately combustible, hc = highly combustible, the words used in the codes.