**Data Rooms according to EN 1047-2: Preventive Fire Protection**

Advantages of data rooms according to EN 1047-2 compared to conventional security rooms

**Fires in data centers are not uncommon. Inevitably, this is accompanied by a partly devastating data loss. Total losses of the IT systems can lead to the industrial death of enterprises even within a few days. Data rooms minimize this risk, but not every data room provides the same degree of security. The most important difference - and thus the lowest risk - is the level of resistance to fire. Conventionally built data rooms are often only component-tested. Correspondingly, differently assessed components from different manufacturers are usually combined. In the event of a disaster, effectiveness cannot be guaranteed. Data rooms, however, are generally type-tested according to strictly stipulated specifications of the EN 1047-2. This makes the European standard a reliable quality feature for data rooms.**

The standard EN 1047-2 describes an extensive test method for external fire exposure. It determines the protection of temperature- and moisture-sensitive data carriers and hardware systems in data rooms as well as containers. For certification, the entire room of a manufacturer is tested in a fire oven. The test specimen has a floor space of 12 m² and a height of 3 m and includes, among other things, doors, feedthroughs for cables and pipes, supporting structures for the ceiling, openings for pressure reduction and air-conditioning. Since, in particular, the connections of the elements are to be regarded as critical, only a complete system test can examine all the interactions among one another. In addition, the standard contains an additional test method: the so-called impact test, tests components and objects, even outside the data room, for their fire-related failure. EN 1047-2 therefore offers additional certified protection against collapsing components.

Of the tested dimensions, manufacturers can deviate in series to predetermined tolerances. For example, 15% may be deviated from the type-tested size of the bulkheads. The data protection areas themselves, on the other hand, can be extended indefinitely in terms of length and width. As the volume is increased, which heats up in the event of a fire, compliance with the limit values ​​becomes less critical. The height may be increased by +50%. Again, the larger volume has a positive effect on the temperature values. Accordingly, it is possible for manufacturers to realize room heights of around 4.2 m at the customer's request without violating standards or certification requirements.

**No Margin of Discretion**

The constantly adapted limits ​​and obstacles to certification according to EN 1047-2 are not made at the discretion, but are based on professional expertise. The test methods are developed by independent experts from the national standardization institutes throughout Europe. The draft consensus is passed to the national standardization organizations and submitted to a public survey at the same time. This gives the individual European countries the opportunity to comment critically on the draft. Authorized criticisms are then integrated into the standard by the European Standards Committee. As a certification body, the European Certification Body GmbH is actively involved in the preparation of the EN 1047-2 standard and can directly implement such changes in standards. For the fire test, the ECB only selects institutes with the necessary experience to test such products.

Prior to the tests of the individual data rooms, the certification body receives, among other things, detailed documentation, assembly instructions or material samples. As a result, the manufacturer is already strictly controlled and monitored during the planning and execution of the fire test. In series, monitoring is repeated at least annually during the production of the individual room modules. A building site audit is carried out twice a year during assembly of the room systems. In the event of deviations, the number of audits can be increased accordingly. Material changes, e.g. to reduce costs, are only possible for manufacturers on request and, if necessary, require a re-examination of the entire room within room system. This provides a complete and manufacturer-independent guarantee of the full availability which is not given during the assembly of only component-tested parts.

**Higher Effort means Highest Protection**

The standards and limits for certification of the data rooms to EN 1047-2 are the most stringent in Europe. For example, the temperatures in the event of a fire may only increase by a maximum of 50 K after one hour. This corresponds to a room temperature of at most 70-75 ° C. The relative humidity must also remain below 85% in the event of a fire. By contrast, temperature increases of 140-180 K are permitted for component tests, for example according to DIN 4102 or the new standard series EN 1363 or EN 13501. Temperatures can thus be up to 200 ° C. The humidity is not measured at all in such tests. In addition, individual components not tested in accordance with EN 1047-2 generally consist of gypsum, concrete or sand-lime brick. These materials contain much crystallin bound water. Even with relatively small fires, water vapor is released from the materials on the fire side. Water vapor means 100 ° C temperature and 100% humidity. The latter condenses and accumulates as water in the data center, which gives the IT systems the rest.

As a rule, manufacturers also undergo further protective tests. Examples are additional burglary tests and a test for watertightness. Furthermore, good data rooms are modular, can be dismantled and removed. Data center operators thus have a higher level of investment security as they can take their safety cell with them if they change locations. Another advantage of these modular and pre-produced solutions is the fast availability and assembly.

**Decreasing Costs are Increasing Risks**

Certainly, data protection room operators can also implement non-EN 1047-2 type-tested and thus more favorable solutions. For example, the concrete walls or masonry structures, which are endangered by fire loads, can be clad with fire-protection materials such as gypsum plasterboard. This is basically possible to increase the fire protection rating from EI 90 to EI 180. However, components such as doors, bulkheads or air conditioning openings remain unreinforced. Moreover, this does not solve the problem of the far too high temperature limits on common building standards. Finally, there is no solution against the penetration of water vapor. Even, sealing the walls with a film did not offer a detectable vapor-tight alternative yet. Data rooms according to EN 1047-2, on the other hand, often consist of sandwich panels. Special fire and rubber coatings are integrated into the wall, providing the required fire protection and water vapor protection.

The interplay of the detailed certification procedure and the extensive testing of the data rooms as well as their components minimizes the risk of fire-related data loss and ensures the highest possible security.

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Firing System according to EN 1047-2

**Photo:** RZ-Products GmbH

**Background ESSA**

**ESSA – The International Security Association** based in Frankfurt/Main is the leading international association of the security industry. At present, the ESSA has 136 members from 39 countries.