

Room integrity tests and registration of the actual situation regarding the fire protection and holding times in fire compartments in Greece

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ABSTRACT

The need of maximum airtightness is essential in order to ensure that the fire compartment can maintain the required concentration of suppression gas for a specified duration and effectively suppress or extinguish a fire. In Greece there are many facilities with requirements for a high-level protection, but until today, most (if not all) of them have not any integrity test certification. They are complacent by the certifications of the materials applied and the only way to confirm the effectiveness of the room's integrity is when a fire will take place. A number of integrity tests have been made since 2022 and the registration of the results still takes place in various companies and institutions in Greece by the FUV research team. The main purpose of this registration is to complete a list of results regarding the holding time in each room and public the findings. The secondary purpose is to expand the knowledge regarding the existence of this kind of testing. The conclusion is that in most cases the holding time is minor than the ISO 14520 defines and there is a need for annual integrity tests is to confirm the reaction of each room.

KEYWORDS

Air Permeability, Data Center, Fire protection, EN 15004:2019

1 INTRODUCTION

In companies and public services with installed Data Centers, air tightness tests were performed to confirm their adequacy and to determine the Hold time according to the EN 15004:2019 standard. During the audits, it was found that in most cases, the spaces used as Data Centers are small storage rooms, without proper planning and paying attention to the selection of materials and their application.

2 MEASUREMENTS

In all measurements, the EN 15004:2019 standard was applied, and a second measurement was made for the field check calibration. Beside the insufficient envelope, the presence of flammable materials was observed in the spaces inside the premises, such as polystyrene encased in the ceilings.

Table 1: Measuring Hold Time

	Measured hold time (min.)	Requested hold time (min.)
Room 1	2,30	10,00
Room 2	7,90	10,00
Room 3	3,40	10,00
Room 4	9,80	10,00
Room 5	15,60	10,00
Room 6	24,30	10,00
Room 7	4,80	10,00
Room 8	3,90	10,00
Room 9	12,50	10,00
Room 10	1,90	10,00
Room 11	8,90	10,00

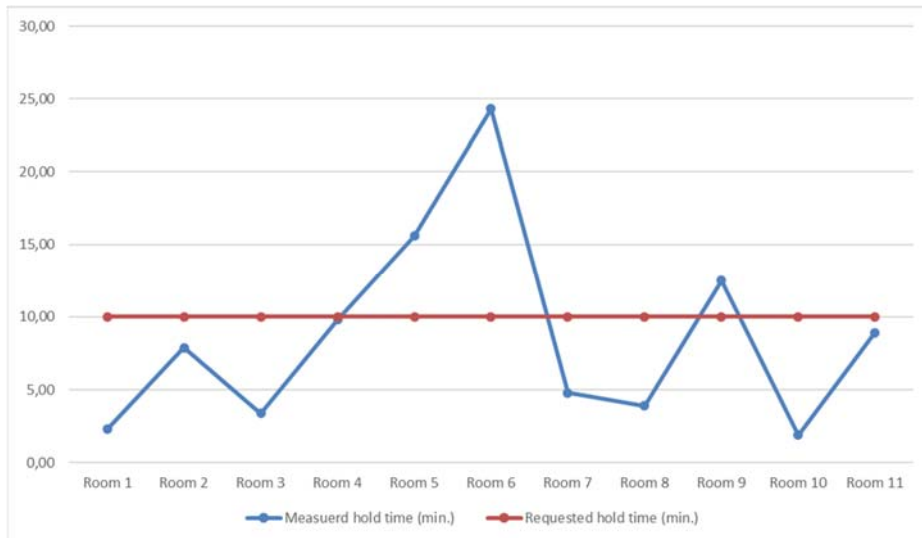


Figure 1: Hold Time comparing to the standard

Table 2: Room area comparing to Leakage Area

	Volume (m ³)	Leakage area (cm ²)
Room 1	185	344
Room 2	263	533
Room 3	185	378
Room 4	491	506
Room 5	203	136
Room 6	154	192
Room 7	492	982
Room 8	492	475
Room 9	239	371
Room 10	64	298
Room 11	100	510

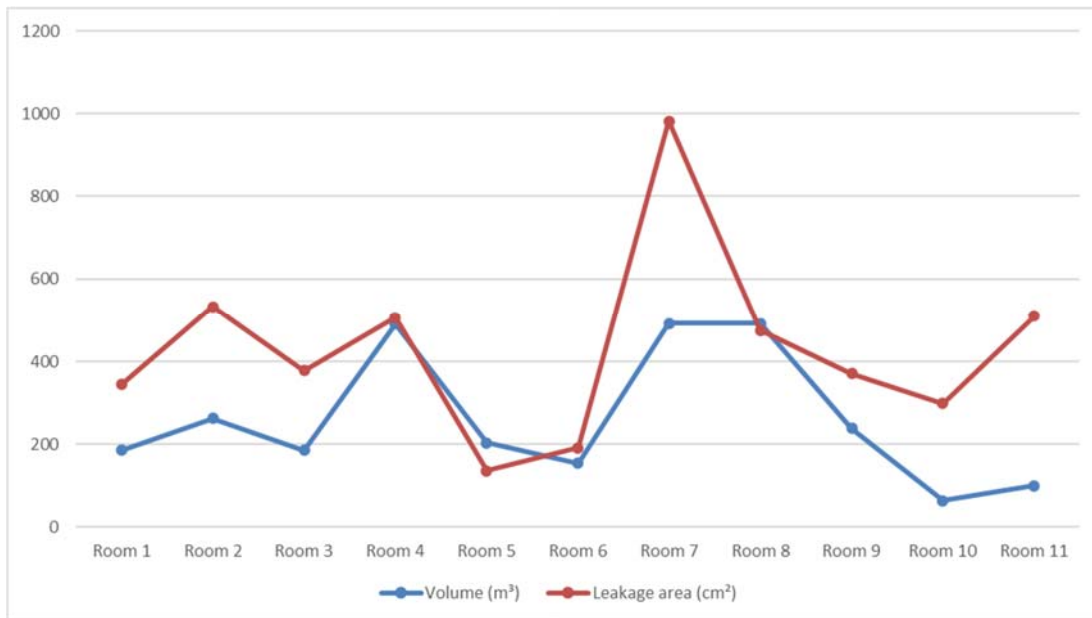


Figure 2: Room area comparing to leakage area

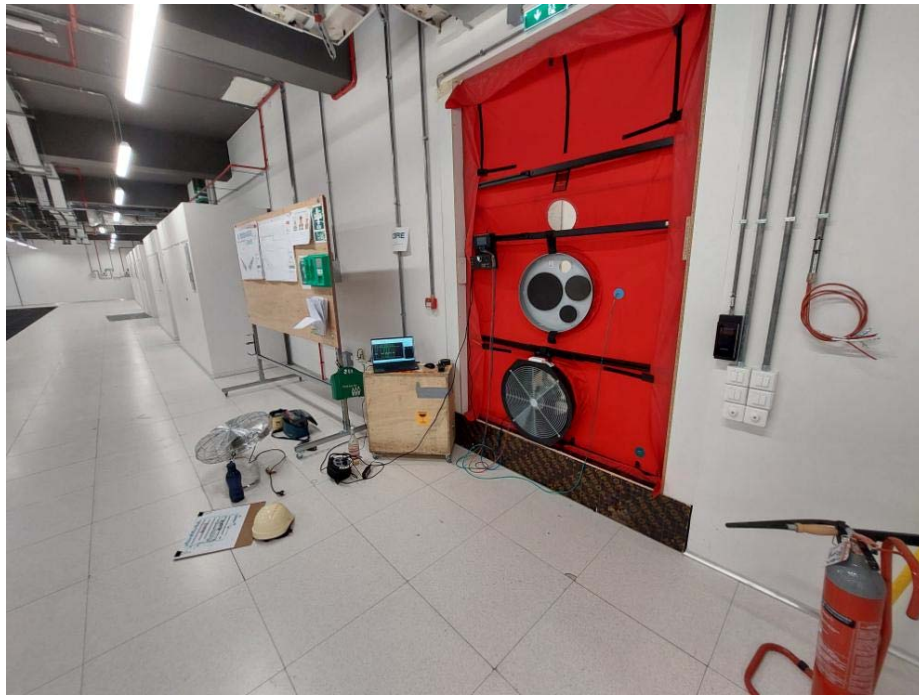


Figure 3: Example of a large data center testing

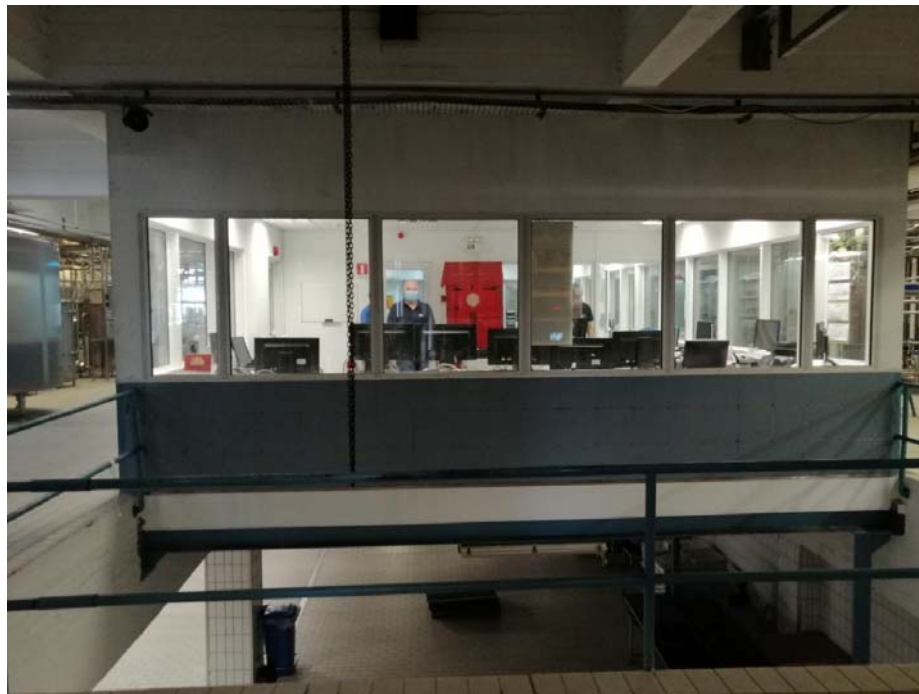


Figure 4: Example of a small data center inside a large food factory

3 CONCLUSIONS

The conclusion is that investors aim for the best results, but construction are not familiar with good manufacturing and quality control techniques. Although large sums of money are invested in technologies and the requirements are high, only three out of eleven Data Centers meet the requirements of the standard.

4 REFERENCES

EN 15004:2019

ISO 14520