JVP
Raised access floor
Pavimento **sopraelevato** accessibile

EN 12825, standard introductory note.

The **EN 12825** Standard also defines the load bearing capacity classification of raised access floor systems.

The load baring capacity of a raised access floor is a most important parameter for the future use of the system and should be related to the type of activity managed within the building where it is installed.

Nevertheless, consideration for use of most commercial working space needs a balance between technical performance and consequent costs.
In fact, the ergonomics of a building is directly related to the proper use of each single component's performance criteria.

Within **EN 12825** the use of a specific class of load bearing capacity for the final application is not clearly stated while within the more consolidated specification format **K41** based on PSA/MOB from the United Kingdom the general indication of load bearing capacity versus environment use is considered.

Specifically **K41** gives details of the concentrated loads applicable on each raised access floor system to produce a maximum elastic deflection that the system has to sustain for general commercial use: Considering the maximum allowable deflection (elastic temporary deformation of the system components under load) of 2.50 mm **K41** is giving an idea of the type of application suitable for the load requirements.

Within **K41** there are four classes b(Grades) of load bearing capacity with their final use indications:

Light Grade

Standard application for office space equipped with filing cabinets, standard office equipment with average density of occupancy, without the need of application of heavy machinery and or archive storage, generally defined as normal use private office space without heavy volume of pedestrian foot traffic.

1.50 kN concentrated load (25 mm square) with deflection below **2.50mm**
The above data corresponds with **Class 1** and **2** of **EN 12825**

Medium Grade

Standard application for commercial office space equipped with filing cabinets, general office equipment with average density of occupancy including flexibility for the future changes in application. Normally used for private and public commercial offices, Banks, Retail Shops, Libraries, etc.

Generally defined as heavy volume foot traffic circulation and medium machinery equipment and/or heavy filing/archive storage.

3.00 kN concentrated load (25 mm square) with deflection below **2.50mm**
The above data corresponds with **Class 3** and **4** of **EN 12825**

JVP SrL Registered address: Via dell'industria 16/20 35028 Piove di Sacco (PD) **Phone:** +39.049.5840597.
Fax: +39.049.5817319 **email**: jvp@jvph.net **web site**: www.jvph.net –V.A.T. IT 02405330289-
CCIAA N° 227873 –Reg.Soc.Trib.PD. 36258-Cap.Soc. €.37.680,00 i.v.

Heavy Grade

Specific use of technical spaces like electrical cabinet, server room, telephone exchanger cabinets, industrial laboratory, light industrial production.
Generally defined as space where the loading of machinery is and will be higher than general offices.

4.50 kN concentrated load (25 mm square) with deflection below **2.50mm**
The above data do correspond with **Class 5** and **6** of **EN 12825**

Extra Heavy Grade

Normally used for heavy plant rooms and or particularly heavy machinery and or extreme heavy rolling loads (car showrooms).
EN 12825 does not have a classification corresponding with Extra Heavy Grade.

A further element considered by the K41 is Uniformly Distributed Load (UDL) capacity which is not mentioned or considered by EN 12825.

The UDL it is not an important element to qualify a raised access floor performance, because the limit of the performance of a raised access floor is the performance of the concrete slab of the building, which is normally limited to the UDL range of 2 to 8 kN per square metre. This value is considerably lower than the load bearing capacity of a raised access floor light grade performance.

Following **an** analysis of the considerations of **EN 12825** we underline the **maximum and minimum limit of performance**:

According to **EN 12825** the best achievable result of a system is : **6/2/A/1**
Failure load class **6**, safety factor time **2**, deflection class **A,** size tolerance class **1**

According to **EN 12825** the minimum achievable result of a system is: **1/3/C/2**
Failure load class **1**, safety factor time **3**, deflection class **C,** size tolerance class **2**

Article 4.1 – chart of failure load on the weakest point of the system

Limit kN	>4	>6	>8	>9	>10	>12
Class	1	2	3	4	5	6

The general class of the system is determined by the failure load on the weakest point of the panel and then compared by deflection at the maximum allowed load of each class.

For example, a failure load of 9.18 kN anywhere on the panel will be classified at class 4, a failure load of 4.82 kN anywhere on the panel will be classified at class 1. To be sufficiently verifiable the test should be done on at least three points of the panel i.e. centre of panel, centre of edge and on the corner diagonal and the higher the declared class the better the performance of the system.

To omit some of the results or use only the more improved ones gives incomplete information and results that cannot be relied upon!

Article 4.2.2 – Safety Factor

Safety Factor	2.0	3.0

The limit load of each class divided by the safety factor will determine the minimum value in kN that the panel has to sustain on its weakest point with a specific acceptable deflection.

For example, a failure load of 9 kN of class 4 divided by the safety factor 3 determines a minimum load of 3.0 kN in order to generate a stated limit deflection on the weakest point of the panel.

To be sufficiently verifiable the test should be done on at least three points of the panel i.e. centre of panel, centre of edge and on the corner diagonal.

The adopted safety factor cannot improve, in any case, the original general class which is linked in principal to the failure load.

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Article 4.2.2 - Class of deflection on the weakest point

Limit mm	2.5	3.0	4.0
Class	A	B	C

The load limit of each class divided by the safety factor will determine the minimum value in kN that the panel has to sustain on its weakest point with a specific acceptable deflection.

i.e.: the class of deflection A of a panel of class 4 with a safety factor 3.0 require a minimum load bearing capacity on the weakest point of 3.0 kN with the same load a class B require a maximum deflection of 3,00mm and the class C will allow a deflection of 4,00 mm. To be sufficiently verifiable the test should be done on at least three points on the panel i.e. centre of panel, centre of edge and on the corner diagonal.

The higher the deflection, the lower the class of load bearing capacity of the panel, the declaration of class B or C is the clear confirmation of lower performance panels.

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Article 4.4 – Dimensional tolerances of the panels +/- in mm

Class of tolerances	class 1	class 2
Side dimension	0.2	0.4
Squareness	0.3	0.5
Side straightness	0.3	0.5
Thickness of bare or faced panels	0.3	0.5
Twist	max 0.5	max 0.7
Concavity convexity	max 0.3	max 0.6
Height difference within edge of panels	0.3	0.4

The tolerances class determine the dimensional allowed tolerances of thickness, squareness, planarity convexity etc of the panels.

i.e.:
Class 1 on the side dimension allows a tolerance of 0.2 mm,
Class 2 on the side dimension allows a tolerance of 0.4 mm

The higher is the dimensional tolerance class and more irregular and inconsistent are the panels, the installation of a non-consistent product will strongly affect many aspects of the performance of the floor in a negative manner; creating difficulties in accessibility, noise attenuation and safety in use.

To omit some of the results or use only the more improved ones gives incomplete information and results that cannot be relied upon!

We hope that the information contained on this document is useful and of interest and should you require further clarification, please let us know.

Lorenza Corazza

p.p.v. Carlo Valerio Segno sas