

SENOR 

CEILING NAVAL BASE ROTA SERRATED PROFILE "PLADUR" WITH PL-25 //PL 50



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Project proposal

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Proposal number: 101



EXECUTIVE SUMMARY

The customer requests advice and calculations in developing a technical ceiling against induced noise in cinema halls "GIBRALTAR". The customer ease us the development of the constructive solution, **SENOR** only determines the modulation distance of the anti-vibration system + Reference of the indicated product according to loads.

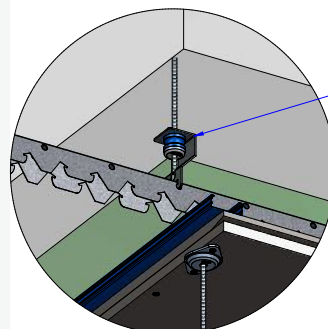

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Analysis:

Safety and dynamic performance analysis for a technical ceiling using "SENOR" Ref. **PL-25 A**.

SANDWICH. Consisting of a double layer of plasterboard of 15 mm thick / Density 800Kg./m³ + 100 mm thick sound-absorbing material inside the cavity with density of 50Kg./m³.

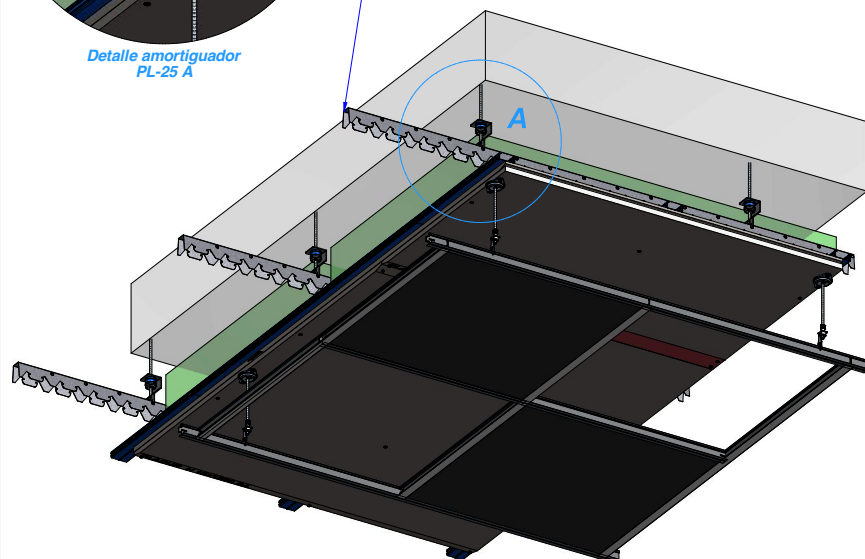
The grid to be used will be double, made of galvanised steel of 0,6 mm thick. Primary profile, profile type **PH-45**, secondary profile, profile type **TC-47**. The chosen hanger will be the one which best adapts to the working and performance conditions of the constructive system. **Ref-SE-PL25 A //PL 50 A**



Detalle amortiguador
PL-25 A

AMORTIGUADOR TECHO
Ref. SE-PL-50 A

PERFIL PH-45
PLADUR



Sound-absorbing ceiling :

We will fix the second ceiling using the SUELA R6. This sole will allow suspending the system with higher safety and performance. We recommend using the hanger TRN-70 for suspending the grid of the ceiling 2. This hanger has a rotary sleeve which allows breaking the thermal bridge, which improves the quality of the system.

Weights:

Nº 1-Rock wool (Density 50Kg./m³ - Thickness:100 mm) = **5kg./mm.**

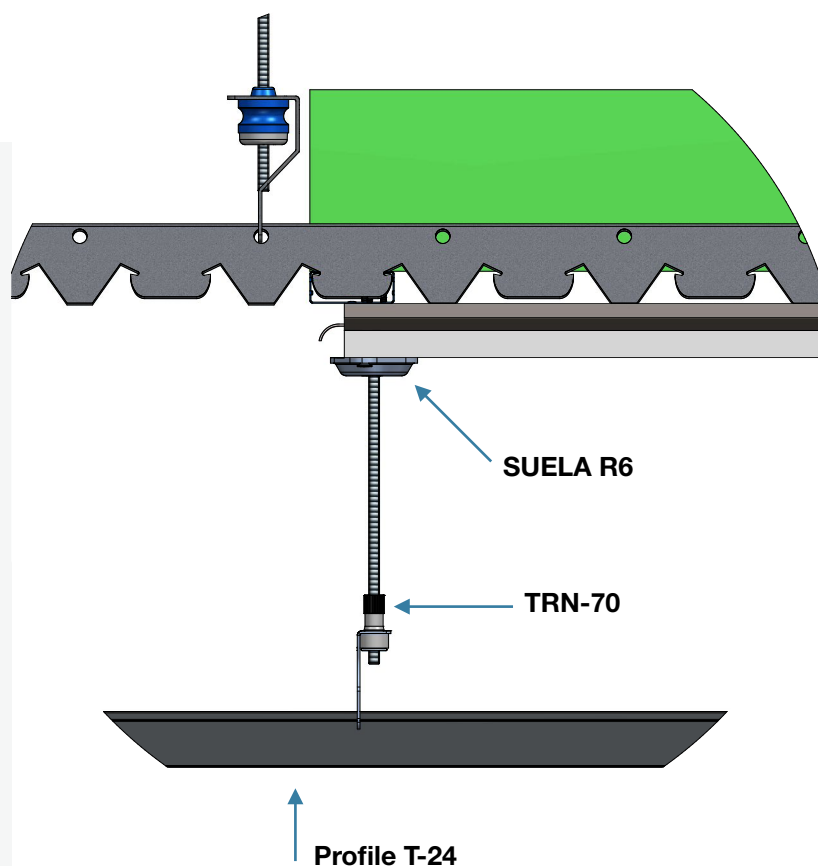
Nº 2 - Double plasterboard of 15 mm (density 800 Kg./m³ - Thickness 30 mm) = **24Kg./2**

Nº 3- Galvanised steel grid = **4,5Kg./m²**

Nº 4- Sound-absorbing ceiling + installations = 3,5 + 6 = **9,5Kg./m²**

Total= 5 + 24 + 4,5 + 9,5 = **43 Kg./m²** (static load)

we calculate a dynamic coefficient 1,2 = 43 x 1,2 = **51,6Kg./m²** (dynamic load).



Modulation:

The layout of hangers **PL-25A** has been:

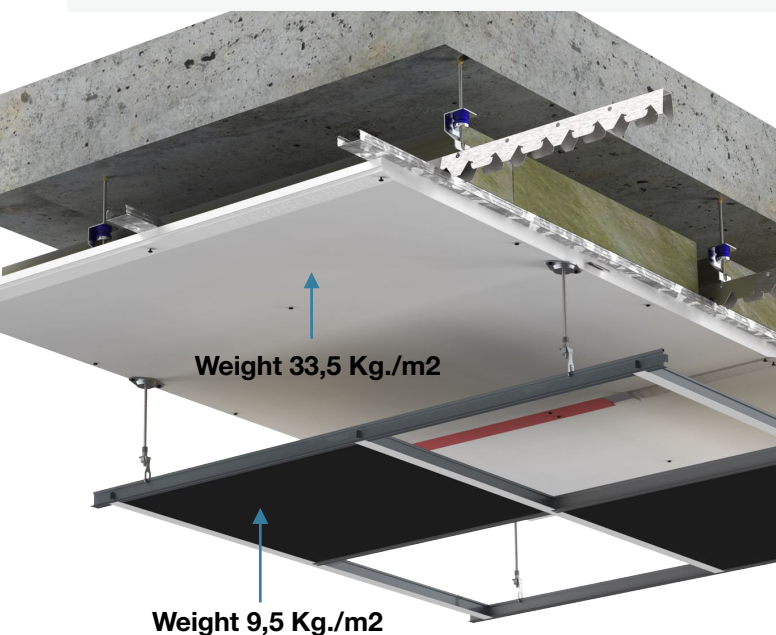
- 0,8 meters in the X axis
- 0,8 meters in the Z axis

With this modulation, the obtained grid is **0,64 m²**. Thus, the impact per m² is: 1/0,64 = **1,56 hangers M²**

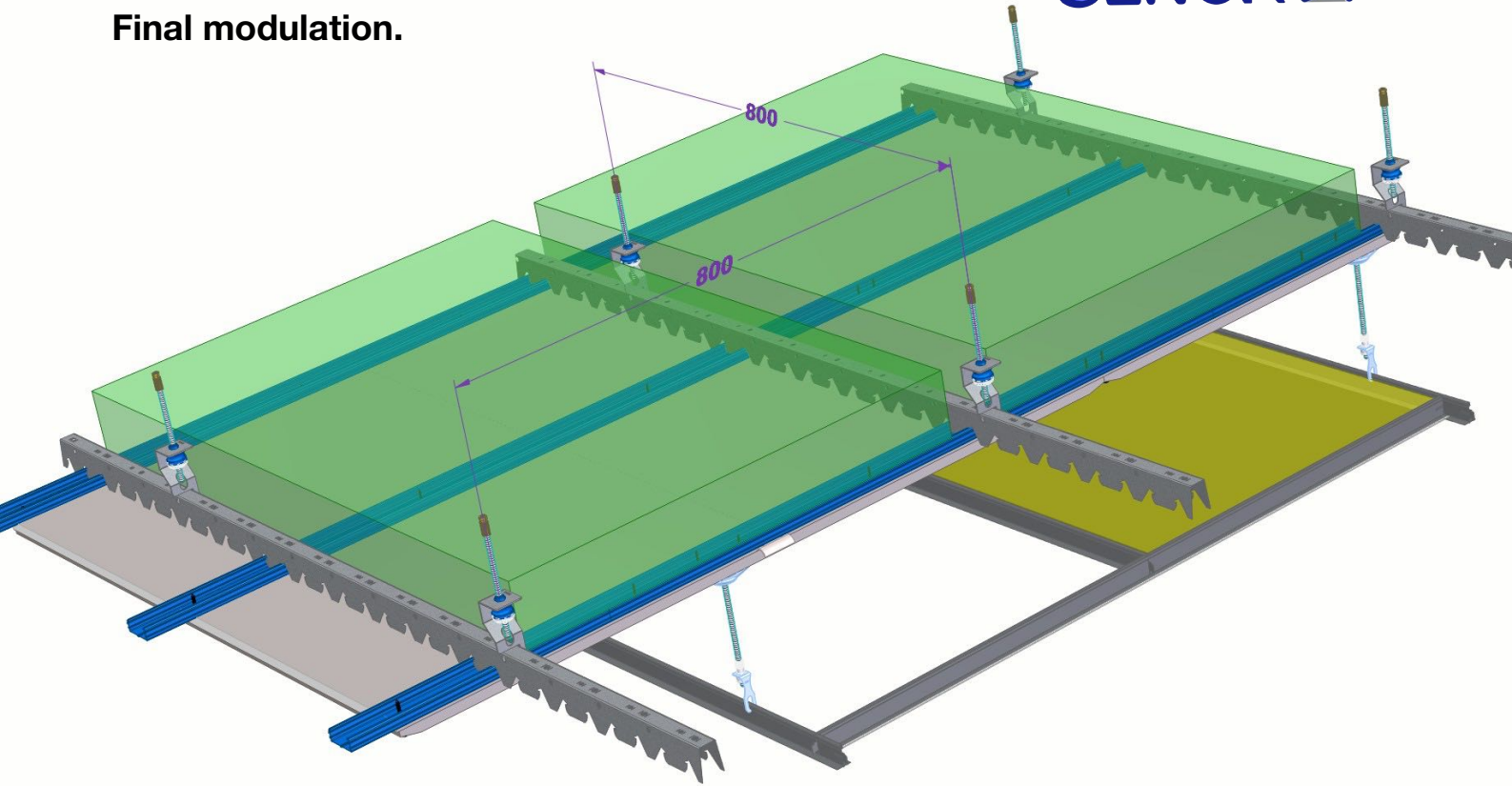
Load per hanger:

43Kg./m² (static load) - 51,6Kg./m² (dynamic load). By dividing the obtained load by the total number of hangers, we get the response expressed in load per hanger:

- 43 Kg./m² divided by 1,56 = 27 Kg. Min.
- 51,60 Kg./m² divided by 1,56 = 33 Kg. Max.



Final modulation.

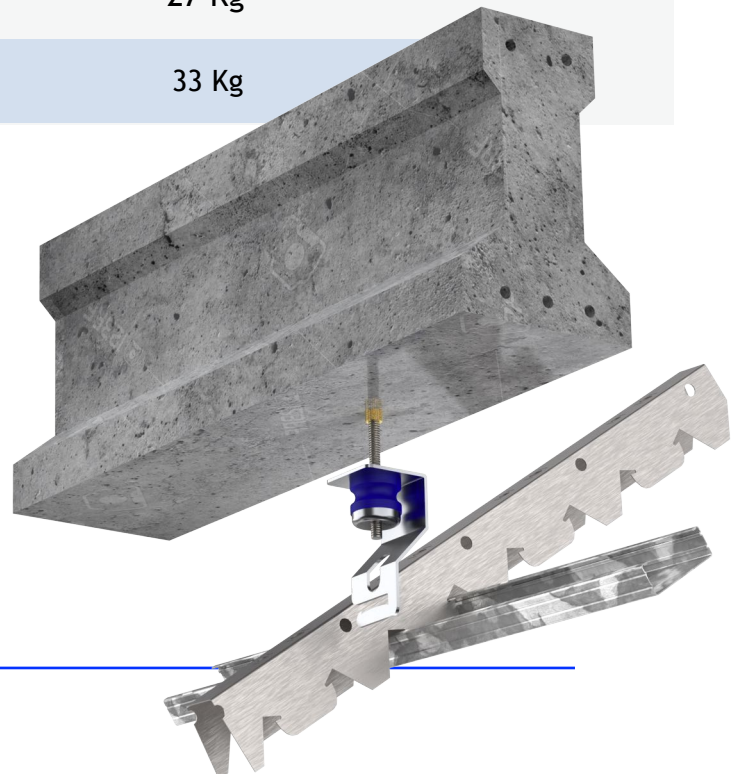


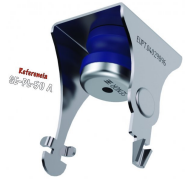
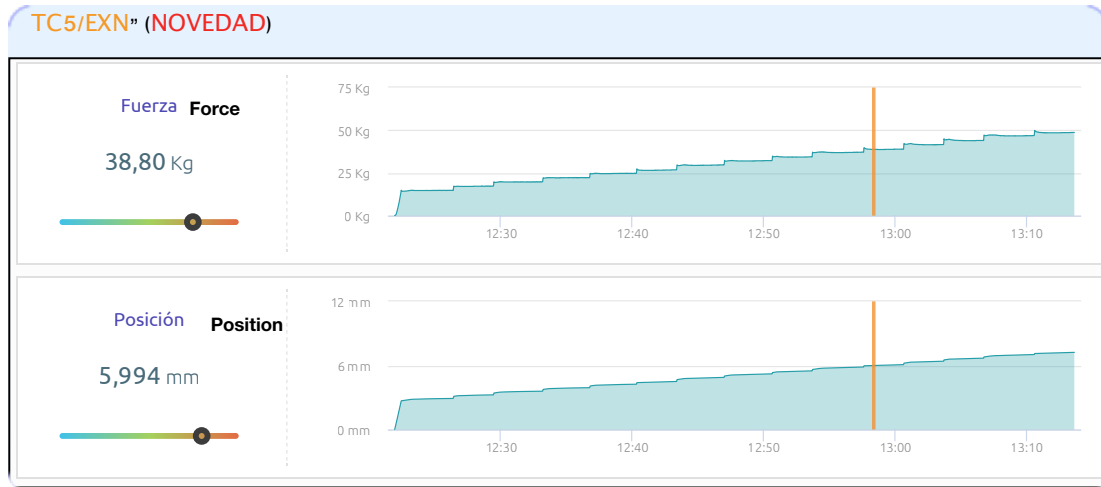
Dynamic response:

With the adopted modulation and the load per support reaction, we get the following dynamic response and deformation results:

Load reaction: Fixed point

| | | | |
|---------|-------|---|-------|
| Minimum | Value | 1 | 27 Kg |
| Maximum | Value | 2 | 33 Kg |





| SE-PL-50 A | RESULTS WITH 27 Kg. |
|---|----------------------|
| W "Emitted frequency" Hz | 50 |
| W₀ "Natural frequency" Hz | 10,90 |
| Deflection (mm) | 4,63 mm |
| RO | 4,5871559633 |
| FT | 0,0498952205 |
| %FT | 4,9895220457 |
| % ISOLATION | 95,0104779543 |

| SE-PL 50 A | RESULTS WITH 33 Kg. |
|---|----------------------|
| W "Emitted frequency" Hz | 50 |
| W₀ "Natural frequency" Hz | 8,16 |
| Deflection (mm) | 5,9000000000 |
| RO | 6,1274509804 |
| FT | 0,0273630336 |
| %FT | 2,7363033604 |
| % ISOLATION | 97,2636966396 |