DOS : Vibration damping

Number of participants: 7

💬   **1.** **What are the sources (internal/external) of damping in civil engineering structures ?**

<div align="right">

0 correct answer
out of 7 respondents

</div>

Isolation

joints

Joints

Joints

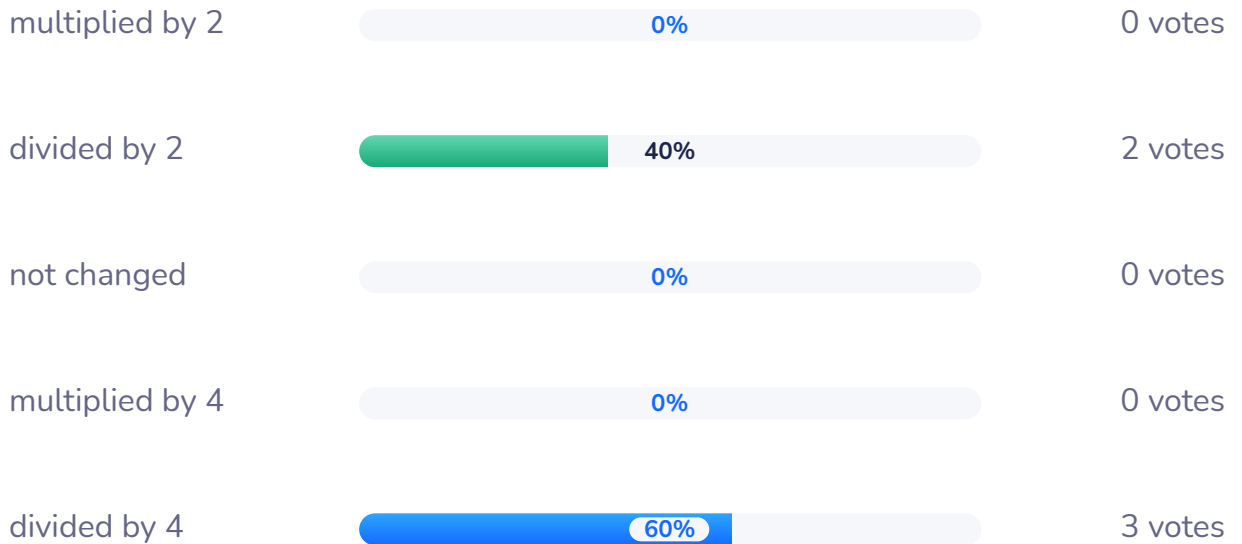Material damping

Material

Matériel

Correct answer

Material damping, damping in connections, damping from soil, flow interaction
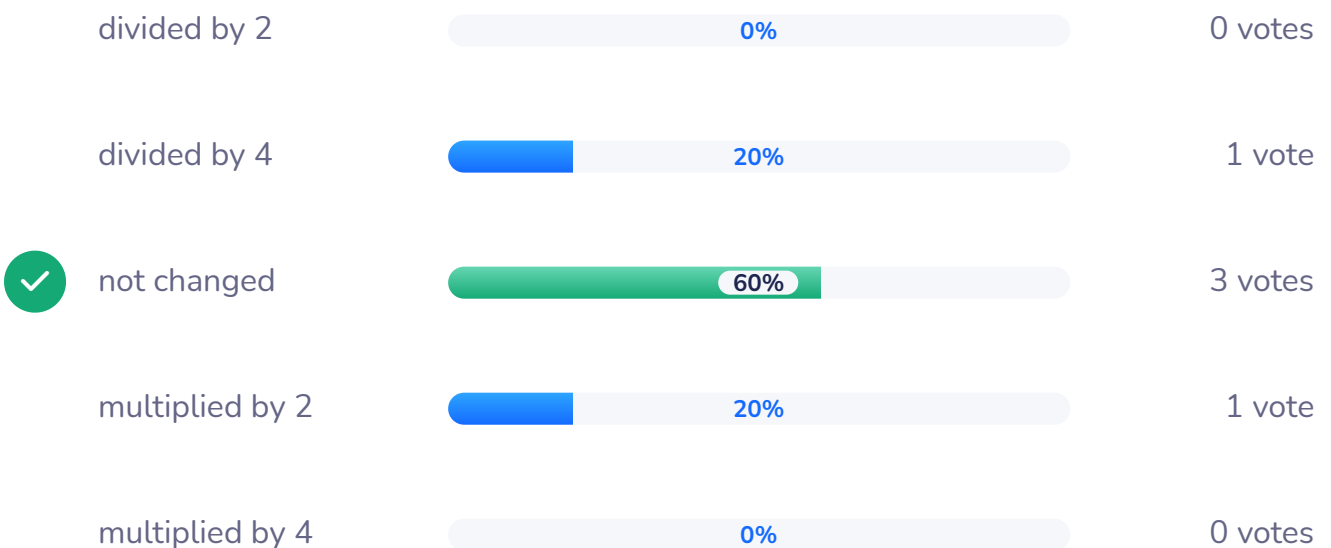
2. **If the damping in a structure is doubled, the level of vibration when it is excited at resonance is**

2 correct answers
out of 5 respondents

|		
multiplied by 2	0%	0 votes
✓ divided by 2	40%	2 votes
not changed	0%	0 votes
multiplied by 4	0%	0 votes
divided by 4	60%	3 votes

3. **If the damping of a structure is doubled, the level of vibrations when the structured is excited away from the resonances is**
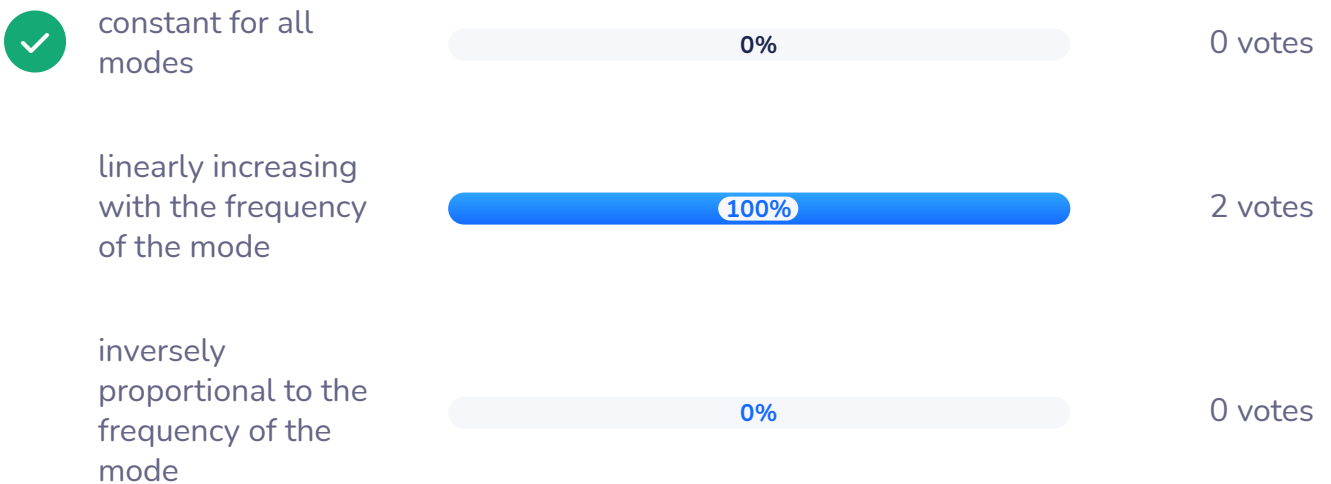
3 correct answers
out of 5 respondents

divided by 2	0%	0 votes
divided by 4	20%	1 vote
✓ not changed	60%	3 votes
multiplied by 2	20%	1 vote
multiplied by 4	0%	0 votes

4. **In civil and mechanical engineering, a typical value of global damping factors for structures is**

4 correct answers
out of 5 respondents

✓ 0.01   80%   4 votes

0.001   0%   0 votes

0.1   20%   1 vote

1   0%   0 votes
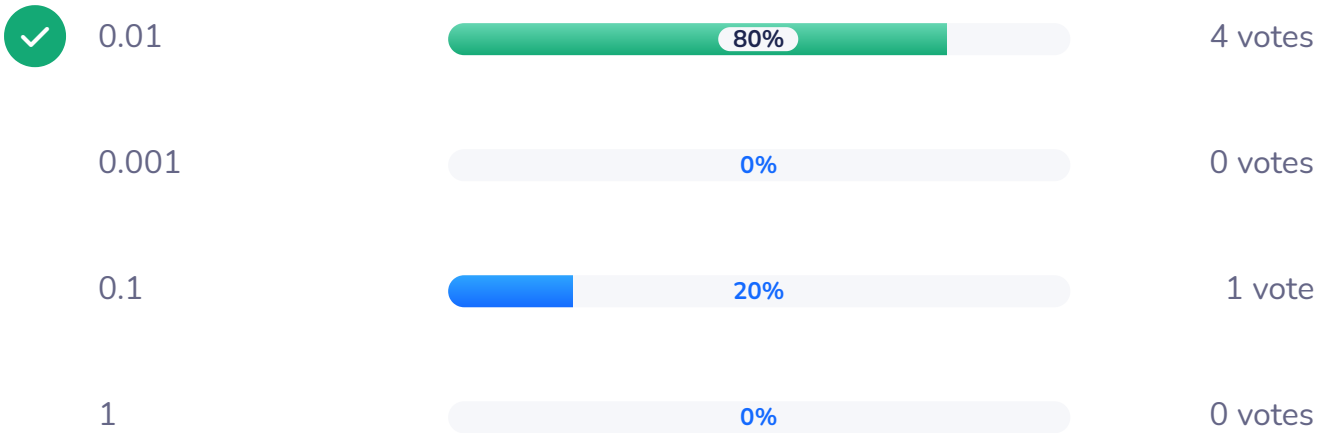
5. **When using a loss factor for the materials to represent damping in a structure made of a single material, the damping coefficient is**

0 correct answer
out of 2 respondents

✓ constant for all modes   0%   0 votes

linearly increasing with the frequency of the mode   100%   2 votes

inversely proportional to the frequency of the mode   0%   0 votes

💬 **6.** **Cite two methods which allow to determine the damping of the first mode of a structure. Which one can be used to estimate the damping of higher modes as well ?**

1 correct answer
out of 2 respondents

logarithmic decrement method

Logarithmic method Bandwidth method

Correct answer

Logarithmic decrement method

💬 **7.** **What is the difference between constrained and unconstrained layer damping treatment ?**
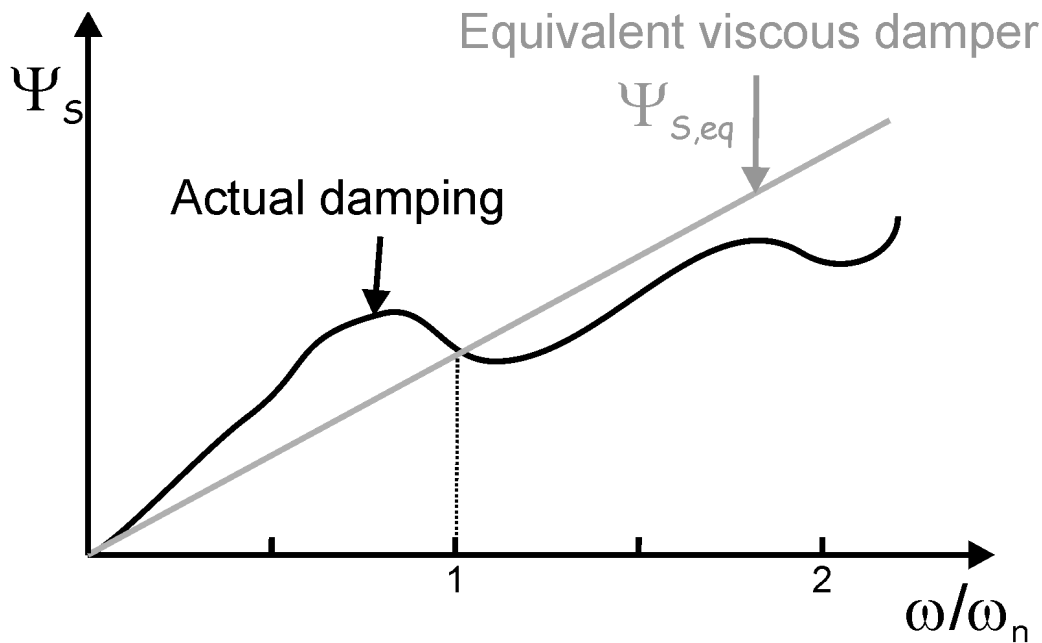
0 correct answer
out of 1 respondent

The presence of a constraining layer or not

Correct answer

Unconstrained layer damping uses the material to damp in extensional mode only, while constraining with an upper layer makes the material also dissipate energy due to shear strains.

💬 **8.** **Explain why the grey line crosses the black curve exactly at w/wn=1 ?**

0 correct answer
out of 0 respondent

Ψ_S

Equivalent viscous damper

$\Psi_{S,eq}$

Actual damping

1   2 ω/ω_n

No answers in this question

Correct answer

Because as the damping is only making a difference around the natural frequency of the system, it is only important that the equivalent curve matches the real one around these frequencies