

VIB2021: Tuned Vibration Absorbers

Number of participants: 19

1

A tuned mass damper is

A viscoelastic damping layer added to a system



7%

1 vote

A hydraulic damper used to dissipate energy in a system



0%

0 votes

✓ An auxiliary dynamic system designed to absorb the energy in a narrow frequency band around the natural frequency of the primary system



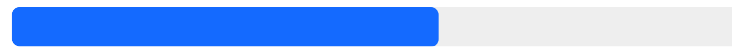
93%

14 votes

2

Tuning of a TMD consists in

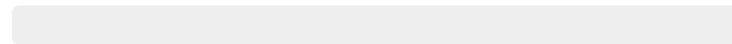
✓ Finding the optimal values of its parameter to minimize the frequency response function of the primary system



58%

7 votes

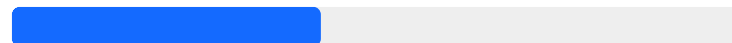
Finding the optimal values of its parameters to minimize the frequency response function of the TMD



0%

0 votes

All of the above


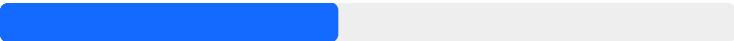
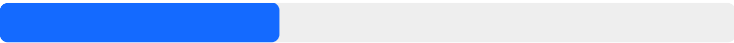


42%

5 votes

3

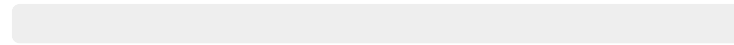
Adding an undamped TMD to a structure introduces an anti-resonance

✓ At the natural frequency of the TMD		31%	4 votes
At the natural frequency of the structure		46%	6 votes
✓ At the natural frequency of both if these frequencies are equal		38%	5 votes

4

In order to tune the frequency of a pendulum TMD, one needs to change

its mass



0%

0 votes

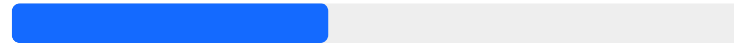
✓ its length



57%

8 votes

all of the above



43%

6 votes

5

The figures represent the FRF of a structure to which a damped TMD is attached, where the natural frequency of the TMD is exactly tuned to the natural frequency of the structure. Is this an optimal tuning ? Why ?

Optimal only if height of P= height of Q

Yes, since the initial resonance is gone and there aren't high resonances added afterwards

No the optimal tuning is for P and Q at the same height

It's not quite an optimal tuning as P and Q are not at the same height so the response is not minimal

No, P and Q are not the same height.

6

What is the procedure to make an optimal tuning of a TMD for any given structure ?

Find μ , that is fixed, than u , so κ and the damping ξ . Finally $b=2\xi(km)^{1/2}$

Know the natural frequency of the structure

Calculate/measure the resonant frequency of the structure and change damping of the TMD to achieve optimal tuning

Find the maximum mass, tune the frequency, compute the stiffness and then compute the optimal damping

Determine mass

Tune freq

Compute stiffness k

Calculate optimal damping

