IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 8, June 2022
Impact Factor: 6.252

Vibration Analysis of Canopies Using Elastic Damping Technique

Mr. D. A. Mahajan[1], Mr. Akash Bagul[2], Mr. Kunal Chaudhari[3], Mr. Nirav Dolasiya[4], Mr. Shyam Pawar[5]

Assistant Professor, Mechanical Engineering, NBNSSOE, Pune, India[1]
UG Student, Mechanical Engineering, NBNSSOE, Pune, India[2,3,4,5]

Abstract: *The sheet metal structures (Canopy) used in DG sets are mostly susceptible to the various static and dynamic loads during their oscillation cycles. Due to this, they encountered resonance conditions at various operating frequencies. Resonance leads to harmonic excitation which further introduces the deformation and stresses leading to the failures of sheet metal structures. Reframing of sheet metal structure with the help of elastic material such as rubber, foam, bitumen, NBR latex etc. changes the stiffness of structure. Thus, stiffness alternation leads to change in dynamic characteristics like natural frequency, mode shapes, and harmonic response. Optimum distributions of damping material in shell structures subject to impact loads by topology optimization. The optimization aims at reducing the residual vibration responses after the application of impact loads. In particular, the dependence of both structural forced vibration and residual vibration on the damping layer distribution is considered by the transient dynamic responses-based optimization approach. Until now, optimum distributions of damping material are always carried out based on frequency domain responses or structural dynamic characteristics. Modal and Harmonic analysis will be simulated using FEA (Ansys Workbench). In experimentation, Impact hammer test and FFT analyzer will be used for the validation purpose. Natural frequencies for sheet metal structure with and without reinforcement will be calculated. Results and conclusions will be drawn by comparing analytical and experimental values. Suitable material will be suggested by analyzing the data along with future scope.*

Keywords: Catia V5, FFT, Model Analysis, Hammer Test, etc.

REFERENCES

[1] "Design Manufacturing and Vibration Analysis of Worm and Worm Wheel Gear Box" by Prof. R.K. Nanwatkar2 Sushmita Kamble1, IJRASET, volume, Issue 11, 2019/11.
[2] Distribution optimization of constrained damping materials covering on typical panels under random vibration by shuangyan liu, yihang xu, xiaopeng Shi, qiong deng and yulong li.
[3] Augmented constrained layer damping in plates through the optimal design of a 0-3 viscoelastic composite layer ambesh kumar, satyajit panda, vivek narsaria and ashish kumar.
[4] Tuning dynamic vibration absorbers by using ant colony optimization by felipe antonio chegury viana, giovanni iamin kotinda, domingos alves rade, valder steffen jr.
[5] Study of various parameters in diesel-generator sets by kolli surya sreevathsanath the experimental study on viscoelastic material dampers and the formulation of analytical model by mitsuo asano, higashino masahiko and masashi yamamot**o.**
[6] Dynamic vibration absorbers for vibration control within a frequency band by cheng yang, deyuli, licheng.
[7] A new design of vibration absorber for periodic excitation by shyh-chin huang and kao-an lin.
[8] Modeling and simulation technology of dynamic vibration absorber for sheet metal parts by ya-hui. Zhang.
[9] Detection of structural vibration-induced noises with modal analysis in diesel generators by uğur ölmez,

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 8, June 2022
Impact Factor: 6.252

nevra bayhan, hakan doğan, murat uysal. an optimization in vibration reduction of viscoelastic materials by using testing hypothesis sagar pitambar sonawane, e.r. deore.