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RESUMEN DE CONGRESO

Análisis por elementos finitos de la pluma de una grúa pescante con diferentes tipos de aceros

Finite element analysis of a jib crane jib with different types of steels

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RESUMEN

Introducción: las grúas son equipos que se utilizan en la industria, construcción, manufacturera y mantenimiento, en la actualidad son muy demandadas por la industria, debido a que permite izar y trasladar cargas en su rango de alcance, Objetivo: Determinar la relación entre el tipo de acero que se utilizan en la fabricación de las plumas de grúas pescantes y las frecuencias naturales de vibración. Metodología: Se realizó una investigación de tipo cuantitativa, tuvo un diseño preexperimental, se empleó 7 calidades de aceros al carbono con diferentes propiedades mecánicas, mediante el análisis modal con el software ANSYS se hallaron sus respuestas dinámicas. Resultados: Se encontró que el modo de vibración más importante es el número 2, la frecuencia natural es de 19,63 Hz; comparando los otros valores de los diferentes materiales varían en aproximadamente 1 %. Conclusiones: Esta investigación tuvo como propósito evaluar los tipos de comportamiento estático y dinámico de una grúa de siete distintas calidades de acero, las propiedades mecánicas como el esfuerzo de fluencia, esfuerzo a la tracción, no influyen en las frecuencias naturales de la estructura, es decir, solo influye si se varia la masa (densidad del material) y/o la geometría.

Palabras clave: Grúa Pescante; Análisis Por Elementos Finitos; Análisis Modal; ANSYS; Acero.

ABSTRACT

Introduction: cranes are equipment used in industry, construction, manufacturing and maintenance, currently they are in high demand by the industry, because they allow lifting and moving loads within their range, Objective: Determine the relationship between the type of steel used in the manufacture of jib crane jibs and the natural frequencies of vibration. Methodology: A quantitative investigation was carried out, it had a pre-experimental design, 7 qualities of carbon steels with different mechanical properties were used, through modal analysis with the ANSYS software their dynamic responses were found. Results: It was found that the most important vibration mode is number 2, the natural frequency is 19,63 Hz; comparing the other values of the different materials vary by approximately 1 %. Conclusions: The purpose of this investigation was to evaluate the types of static

and dynamic behavior of a crane of seven different qualities of steel, the mechanical properties such as yield stress, tensile stress, do not influence the natural frequencies of the structure, it is in other words, it only influences if the mass (density of the material) and/or the geometry is varied.

Keywords: Jib Crane; Finite Element Analysis; Modal Analysis; ANSYS; Steel.

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