International J.of Multidispl.Research & Advcs. in Engg.(IJMRAE),
ISSN 0975-7074, Vol. 7, No. III (July 2015), pp. 47-57

DESIGN OPTIMIZATION REVIEW AND MANUFACTURING OF SCREW JACK SQUARE THREADS WITH CONSIDERING DIFFERENT HELIX ANGLE TO ENHANCE THE PERFORMANCE

RASIKA N. SHELAR[1], VILAS B. SHINDE[2], GANESH B. KOLEKAR[3]
[1]Assistant Professor, Shivajirao S. Jondhale College of Engineering, Dombivali, Thane.
[2]Director, AMITY University, Panvel.
[3]Assistant Professor, Shivajirao S. Jondhale College of Engineering, Dombivali, Thane..

Abstract

Power screws are very important equipments used for converting the rotary motion into the translatory motion. The perfect design of a common screw jack with different types of screw threads reduces the amount of torque required by the user to drive the mechanism. Screw jack is an example of power screw in which by applying torque it will raise or lowered the particular amount of load on horizontal as well as on an inclined surface. In this paper selection of EN-31 steel material for square threaded nut as well as for bolt. The design improvement in screw jack threads to enhance the performance with considering different design calculations of helix angle from the review and manufacturing of square threaded nut and bolt with different helix angle for actual experimental purpose. All dimensions of screw jack parts are manufactured with one third dimensions of the actual dimension. The research has been done to quantify the effect on actual manufacturing with varying helix angle compared to design calculation to enhance the performance. This paper gives some background of designing of screw jack threads with mathematical modelling as well as selection of material for better performance and concluded with comparison between design calculations and manufacturing experimental results.

Keywords : Mechanical screw jack, Manufacturing, Square threads, Varying Helix Angle, Material selection.