

ABSTRACT

Shaft that rotates at a certain speed can occur highest deflection or critical rotation. This research was conducted to obtain the optimum value by analyzing the effect of changes in shaft on the critical rotation speed of the shaft. How big is a shaft that rotates with a certain speed experiencing deflection. The shaft is loaded so that a critical speed occurs which is caused by bending to the shaft. This can cause the shaft to bend when rotating which is limited by two central bearing lines. Tests using a critical shaft rotation test on an S45C steel material rod with a diameter size of 12 mm and 16 mm with a length of 1000 mm. Testing is done by linear regression method on 3 types of variations, the first test used a load mass of 0.4 kg with a shaft diameter of 16 mm. The second test using a change in load mass of 0.9 kg with a fixed shaft diameter of 16 mm. The third test uses a fixed load mass with a shaft diameter of 16 mm. Based on the results of the four tests obtained each optimum and safe operating speed value to be used as a guide to the use of the shaft.

Keywords: *critical rotation, deflection, shaft, variation, optimum.*

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