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Modeling and Analysis of Driven Shaft with Composite Materials

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Abstract: This study deals with the review of the optimization of drive shafts using ANSYS. The substitution of composite material over regular steel material for the drive shaft has expanded the upsides of the outline because of its high particular firmness and quality. The drive shaft is the primary part of the drive arrangement of a vehicle. The utilization of traditional steel for assembling drive shafts has many impediments, for example, low particular firmness and quality. Regular drive shaft is made up of two sections to build its major common twisting recurrence. A two-piece drive shaft expands the heaviness of the drive shaft which is not alluring in the present market. Numerous strategies are accessible at display for the plan advancement of basic frameworks and these strategies are in view of scientific programming procedures including slope look and direct inquiry. These techniques expect that the plan factors are persistent. Be that as it may, in useful basic building improvement, all the plan factors are discrete. This is because of the accessibility of segments in standard sizes and imperatives because of development and assembling rehearses. This paper talks about the past work done on composite drive shafts utilizing ANSYS

Keywords: Parts, Assembly, Drawing, Gray Cast Iron, Epoxy E-Glass UD

REFERENCES

[1] Ravi Sekhar, T.P. Singh Mechanisms in turning of metal matrix composites: a review. J mater res techno l. 4(2) (2015) 197–207

[2] Court brown CM, Mc birnie J. The epidemiology of tibial fractures. J Bone Joint Surg Br 1995;77B:417-21

[3] S. J. Watson and J. Xiang, "Real-time condition monitoring of offshore wind turbines," in Proc. EWEC 2006, Paper #BL-3.

[4] Akhand Rai, S.H. Upadhyay, A review on signal processing techniques utilized in the fault diagnosis of rolling element bearings. Tribology International. Volume 96, April 2016, Pages 289-306.

[5] Sreenivasan R, Goel A, Bourell DL. Sustainability issues in laser-based additive manufacturing. Phys. Procedia. 2010;5:81-90

[6] Gummadi Sanjay Akula Jagadeesh Kumar "Optimum Design and Analysis of a Composite Drive Shaft for an Automobile", ISRN: BTH-AMT-EX--2007/D-09SE.

[7] John. W.et. al. Engineers Guide to Composite Materials, American Society for Metals, 1986

[8] D. Gay, S. V. Hoa, S. W. Tsai. Composite materials: design and application, CRC press, 2004.

[9] Bauchau O A, Krafchack T M, Hayes J F, (1986) "Torsional Buckling Analysis and Damage Tolerance of Graphite/Epoxy Shafts", Journal of Comp Mat, vol; 17, pp 259-269.

[10] Khalkhali, A., Narimanzadeh, N., Khakshournia, S. and Amiri, S., "Optimal design of sandwich panels using multi-objective genetic algorithm and finite element method", International Journal of Engineering-Transactions C: Aspects, Vol. 27, No. 3, (2013), 395-402.

[11] Chandrashekar R A, and Venkatesh T.K, "Optimal Design and Analysis of Automotive Composite Drive Shaft," in International Symposium of Research Students on Materials Science and Engineering, December 2002-04.

[12] O. Montagnier, C. Hochard, Experimental investigation of dynamic in stability of supercritical driveshafts due to internal damping, in: Pro ceedings of the 7th IF ToMM– Conference on Rotor Dynamics, Vienna, Austria, 2006.



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[13] Zindel, D. (2009). Mechanical Modeling of Filament Wound Flexible Matrix Composites. Master thesis, The Pennsylvania State University and Swiss Federal Institute of Technology, Zurich, ZH

[14] Shaw D, Simitses DJ, Sheinman I. Imperfection sensitivity of laminated cylindrical shells in torsion and axial compression. Compos Struct 1985;4(3):35-60

[15] D.J Bieryla , M.W Trethewey , C.J Lissenden , M.S Lebold , K.P Maynard , "Shaft Crack Monitoring via Torsional Vibration Analysis; Part 1 – Laboratory Tests", 23nd International Modal Analysis Conference, Orlando, Florida, USA, January 31-February 3, 2004.

[16] Ruddy BL, Dowson D, Economou PN. Are view of studies of piston ring lubrication. Proceedings of 9th Leeds-Lyon Symposium on Tribology: Tribology of Reciprocating Engines. Paper V(i). 1982, p. 109–21.

[17] Pawn kumar Patel, Prof. Ranjeet Kumar, Dr. R. S. Sikarwar, "Design Optimization of a Spur Gear Used in Lathe Machines." International Journal for Scientific Research and Development Vol.-9, Issue-1, 2021.

[18] D. Capanidis, Tribological testing of polyoxymethylene (POM) Tarn form sliding composites, in: TRIBOLOGIA Magazine, issue 3, 2004, 25–33.

[19] D. Rendell, S. R. Shaw, P. J. Pool, C. Oberlin-Harris, Thirty year operational experience of the JET ywheelgenerators, Fu sionEngineering and Design 98-99 (2015) 11401143.//doi.org/10.1016/j.fusengdes.2015.06.049.URL http://www.sciencedirect.com/science/article/pii/S092037961530079.

[20] A. A. Khodadoost Arani, B. Zaker, G. B. Gharehpetian, Induction machine-based ywheel energy storage system modeling and control for 36 frequency regulation after micro-grid islanding, International Transactions on Electrical Energy Systems 27 (9) (2017). doi:10.1002/etep.2356



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