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Proceedings of

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Volume I Sep 2025

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ISBN: 978-81-992034-1-9

Published by and copies can be had from:

Imaginex Inks Publication

2/158, Kurinji Nagar First St, Ponnann Nagar, Irumbuliyur, Vandalur,

Chennai 600048, Tamil Nadu, India.

Phone: 9750663871, 9962991057

e-mail: imaginexinks@gmail.com



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**International Conference on Recent Trends in
Mechanical Engineering
(ICRTME -2025)**



24th and 25th September 2025

Organized by

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ICRTME25-137

**Design and Development Model of Spiral Bevel Gear
with Minimized Weight***John Milken A1**, *Jojo Gangan1**, *Rajesh Kannan1*, *Ashif Shaikh1*, *S. Arunkumar2**Department of Mechanical Engineering, Vels Institute of Science, Technology & Advanced
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ABSTRACT

Gears are used in most types of machinery and vehicles for the transmission of power. Bevel gears are widely used because of their sustainability towards transferring power between non-parallel shaft at almost any angle or speed. Drilling machines are used to cut woodwork pieces for the purpose of making furniture, Casting patterns, wooden seat designs, and wood prototyping, among other applications. In that machine, a set of spiral bevel gears is used for power transmission from the motor to the tool. The handheld tool's weight and continuous vibrations make it difficult to operate the machine for extended periods. Additionally, the power consumption per unit cut is very high, and vibrations lead to inaccuracy in cutting and errors in profile shape. Thus, the methodology used in the study involves carrying out tests on three sets of bevel plain gears: (i) no weight reduction, (ii) weight reduction achieved by providing recesses on the gear face, and (iii) weight reduction achieved by providing equi-spaced holes on the face—comparative performance analysis of the gears by load to derive the optimal performance of the gears. The optimization of spiral bevel gears can reduce weight, material usage, process time, and production costs.

Keywords: Weight reduction, Face recess, Face holes, and Vibration analysis

978-81-992034-1-9

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