

## EFFECT OF VORTEX TECHNIQUE ON THE MICROSTRUCTURE AND THE MECHANICAL PROPERTIES OF THIN WALL DUCTILE IRON

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### ABSTRACT

The needs of lighter automotive components have enhanced the application of thin wall casting technology on ductile iron which is known as Thin Wall Ductile Iron (TWDI). In the current research, TWDI was produced using vortex technique with different thicknesses of 5, 10 and 15mm. Vortex technique is a modern method for producing high quality ductile iron. This aims at producing TWDI with high nodularity and high mechanical properties. The shape of cast samples had a dimension of 154mm x 120mm for each plate with different thicknesses of 5, 10 and 15mm. They cut into pieces for determining the mechanical properties such as tensile, hardness and wear resistance as well as microstructures of these casted alloys. The results show that the microstructures of the three casted samples were composed of pearlite, ferrite and nodular graphite. Maximum hardness of 300 HB was obtained for 5mm thickness sample and the minimum one of 250 HB was for 15mm thickness sample. Maximum tensile strength and wear resistance were obtained for 5mm thickness sample due to existing of high amount of pearlite and the minimum values were resulted for 15 mm thickness sample. Therefore, TWDI can be considered as substitutional material of steel sheets and can produce spare parts which save cost and 10% in weight as compared to steels. [Copyright information to be updated in production process]

**KEYWORDS:** TWDI, Thin Wall Casting, Vortex Technique, Light Castings Products, Ductile Iron

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