



Centrifugal Pump Stress analysis with Optimization

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Abstract: The pump castings are manufactured in isotropic nature materials. In high head, high temperature pumps the pressure acting on the surface is very high. The designer should check whether the materials withstand that much pressure. Design procedures and drawing are done in manually; this is laborious and time consuming process. In competitive environment time factor is important is bring out design to manufacture stage. The only way to overcome the problem is approaching design process by computer aided and computer aided engineering the present work attempts to automate process of hydraulic design of centrifugal casting and generation of 3D geometrical model. CATIA software can be used for generation of geometrical model. The hydraulic design will based mean velocity method. The volute plane profile can be determined at each incremental angle of 45degree; geometrical model of the casing to be generated in CATIA environment using the profile generated. The stress analysis can be carried out in ANSYS platform. Pressure distribution of 20% skew and 50% skew to be analysed for selecting value of thickness. The thickness of the model can be optimized using stress analysis techniques.

Keywords: optimization, suction, pump geometry & process automation

