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Design and Finite Element Analysis of Clamp Cylinder for Capacity Augmentation of Injection Moulding Machine

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Abstract : The Injection Moulding is one of the principle methods of conversions of plastics into various end products using a very wide range of plastics materials from commodity plastics to specialty engineering plastics. Injection Moulding Machines are rated as per the tonnage force applied. The work present includes Design & Finite Element Analysis of a structure component of injection moulding machine i.e. clamp cylinder. The work of the project is to upgrade the 1300T clamp cylinder to 1500T clamp cylinder for injection moulding machine. The design of existing clamp cylinder of 1300T is checked. Finite Element analysis is carried out for 1300T clamp cylinder in ANSYS Workbench, and the stress values are compared with acceptance criteria and theoretical calculation. The relation between the clamp cylinder diameter and the tonnage capacity has been derived and verified for 1300T clamp cylinder. The same correlation is used to find out the thickness for 1500T clamp cylinder. The detailed design of 1500T cylinder is carried out based on calculated thickness.

Keywords : clamp cylinder, fatigue analysis, finite element analysis, injection moulding machines
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