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Cycle time reduction in injection moulding cover pad of model (BA) through external cooling

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Cycle time of a part in injection molding process is very important as the rate of production and the quality of the parts produced depend on it, whereas the cycle time of a part can be reduced by reducing the cooling time which can be achieved by external cooling of the molded part which helps in quick dissipation of heat.This external cooling minimizes the cycle time of the process significantly, thus increasing part productivity.

YIELD IMPROVEMENT IN NI-RESIST PISTON INSERT

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Ni-resist piston inserts are found near the top of a piston, where piston rings (compression rings) are located. The incorporation of a Ni -resist austenitic cast iron material in the ring groove protects the aluminum alloy of the piston from the high stresses due to the pressure and inertial forces applied to the groove by the piston ring. This ring will resist the wear in the piston due to its linear motion. Therefore this insert should able to withstand high load and good wear resistance. The main elements present in the Ni-resist insert are nickel & copper (about 13 % & 6%) and hence the cost of the insert material is high, so the lean manufacturing techniques are to be adopted. The main objective of this project is to improve the yield for Ni-resist piston insert. This project is aimed towards the reduction in material optimization. So considering these factors, yield is improved by decreasing the diameter of the centrifugal die from the nominal value and also decreasing the spacer width of the magazine. Accordingly the yield is improved by 9.4%.

FEA AND EXPERIMENTAL ANALYSIS OF GLASS FIBER REINFORCED PLASTIC WITH ALUMINIUM IN AUTOMOTIVE APPLICATION

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GLASS FIBER REINFORCED PLASTIC plays an important role in automotive applications. The aim of our project is to improve the strength of the bumper by employing it with aluminium alloy. Fiber metal laminates are good candidates for advanced aerospace structural applications due to their high specific mechanical properties especially fatigue resistance. The specimens were prepared with the glass fiber epoxy laminates with aluminium alloy. The most important factor in manufacturing of these laminates is the adhesive bonding between aluminium and FRP layers. The specimens were undergoing for mechanical testing as per ASTM standard by Universal testing machine and Impact testing machine. These results were compared with and without orientation. It was observed that the damage size is greater in laminates with poor interfacial adhesion compared to that of laminates with strong adhesion between aluminum and glass layers.

REMODELLING OF HEAT EXCHANGER SOAKING PIT

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The aim of this project is to optimize the heat exchanger soaking pit by re-modelling its existing structure. In Chennai Petroleum Corporation Limited (CPCL) soaking pit is used to remove the hydrocarbon deposits on heat exchanger. But it faces various problem which leads to the inefficient removal of impurities and waste of time. The issues is faced by the soaking pit are damage of heating coils at the one side of the soaking pit shell, maintaining constant temperature inside the pit, effective removal of impurities and heat loss due to evaporation and improper insulation. The heating coil damage is avoided by placing it inside the L-Angle, constant temperature is maintained with the help of temperature sensor at the steam inlet, by giving rock wool as the insulation material heat loss will be reduced and effective removal of impurities is done by providing tapered base and a manual door at the side of the soaking pit. Also we provide heat sump by placing the heating coils on both sides of the soaking pit with proper clearance for increasing thermal efficiency. These are the modifications done to rectify the problems faced by the soaking pit.

COUPLES FIELS TANSIENT THERMO STRUCTURAL ANALYSIS OF SIS PROCESS USING ANSYS

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Selective Inhibition Sintering (SIS) process is that rapid prototyping process where various prototypes are produced in a 3D printer. Here in this process, the models are produced by the application of gradual heat transfer over a thermoplastic material kept initially in powdered form, surrounded by an inhibitor material where the former and latter are non-reactive. Thus, for this process to be carried out, the material properties of the corresponding polymer material play a significant role. So, by considering these properties we have performed thermo-structural analysis occurring in the sintering process, by ANSYS, so that a conclusion may be brought for the best optimum temperature to be applied over the materials.