

Cleanability and Paintability Study of Cast Aluminum in the Paint Shop

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Aluminum casting is being widely adopted in automotive industries as large cast structure components. By integrating numerous different parts into a single casting, this approach can simplify the manufacturing process and reduce the assembly and surface treatment costs. In the automotive paint shop, mixed metals used in the car such as hot dipped galvanized (HDG) steel, cold-rolled steel, aluminum sheet and extrusion, are processed together. The pretreatment process has been optimized to achieve the desired corrosion and coating performance for these existing materials. Therefore, integrating a new material into the current process may require chemical or process modifications to ensure proper surface treatment across all materials. This work investigates the feasibility of processing cast aluminum alloys through the pretreatment process in the paintshop. The chemical reactions of cast aluminum in the degreasing process and in the pretreatment process are investigated in terms of microstructure. Furthermore, the cleaning of the die release lubricant residues and their potential impacts on the corrosion performance were also studied.