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**Powder Forged Iron-
Phosphorous Alloys**
Corrosion Behavior



Powder Forged Iron-Phosphorous Alloys

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Hot powder forging technique was used to make Fe-P binary, Fe-P-Cr, Fe-P-C ternary, Fe-P-Cr-Si quaternary as well as Fe-P based Fe-P-Si-Ni-Mo-Cu, Fe-P-Si-Ni-Mo-Cu-C and Fe-P-Si-Ni-Mo-Cu-C-Al alloys. In this process mild steel encapsulated hot powders (blend of Fe powder, ferro-phosphorus powder, ferro-silicon powder, ferro-molybdenum powder, ferro-chromium powder, copper powder, nickel powder, aluminum powder & graphite powder) were forged into slabs. Mild steel encapsulation was removed after homogenization of these slabs by machining. The slabs were hot rolled to obtain sheets which were annealed to relieve the residual stresses. Use of fine powder and high temperature processing in the presence of hydrogen atmosphere ensures higher densification. Hydrogen is used for cleaning the powder surfaces before forging. These alloys were characterized in terms of microstructure (optical & electron microscopy) and rate of corrosion. Microstructures of these alloys consisted of single phase ferrite only.

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