The development of protective coatings on materials that operate at high temperatures is an important challenge in the present technology. Al, Si or Si/Al or multilayer is an interesting system from the point of view of protection as to corrosion and for mechanical resistance. The generation of these layers by CVD-FBR (Chemical Vapour Deposition by Fluidized bed) technique is possible with a good yield and low cost, and a temperatures lower than another coating methods, such as pack cementation. This technology represent an interesting alternative to the ferritic steels, since the most of the diffusion coatings can be done at temperature below 600ºC. These protective coatings have been developed for a stainless steel AISI 304 and for some ferritic steels such as P91, P92 and HCM12. These protective coatings were made by Al, Si or Al/Si co-deposition followed of Al deposition or the Si deposition to generate the multilayer system. The obtained results are discussed.