Development of high performance corrosion resistant coatings using Graphene

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Graphene based high performance coatings have been developed using a graphene powder prepared in our lab using a new pressure based exfoliation method. Three kinds of coatings were made: (i) pre-treatment coatings on steel substrates using a new patented method of functionalizing graphene. The thin five micron coating has excellent adherence and very low permeability. (ii) graphene dispersed epoxy primer whose properties appear superior than a epoxy zinc rich coating or inorganic zinc rich coating and (iii) a graphene based polyurethane top coat with superior UV blocking properties. Combining all the individual coatings as conversion coating, primer and top coat, it becomes an excellent high performance coating with very high corrosion resistance, mechanical properties and weathering resistant. Each individual coating has its independent application for example pre-treated graphene can be an excellent replacement for electrolytic coating for automobile bodies and graphene dispersed epoxy can be a good replacement for epoxy based zinc rich coating or inorganic zinc rich primers.