PC-ProTec
A novel, highly effective zinc free anticorrosive additive easily dispersible in priming paints

PC-ProTec is a new technology uniquely positioned as a safer alternative to replace toxic anticorrosive additives, mainly zinc and its compounds, typically used in paint formulations to protect metal structures. The novel zinc-free anticorrosive pigment, which is applied in very low concentrations (0.3-1.5 wt %), is based on poly(alkyl thiophene acetate)s. This technology meets the new environmental regulations that restrict the use of zinc. Partners to further develop the technology and/or to establish commercial agreements along with technical cooperation are sought.

The Challenge
Nowadays, corrosion inhibitors based on inorganic or metal compounds, like chromates and zinc derivatives are widely employed in the industry of paints and varnishes. Nevertheless, they are carcinogenic, poisonous and environmentally hazardous, and they are not able to meet with new future environmental regulations that will restrict the use of zinc. Poly(alkyl thiophene acetate)s are organic electroactive polymers able to substitute traditional toxic corrosion inhibitors. The PC-ProTec technology gives regulatory compliance and marketing advantages for paint companies as it uses poly(alkyl thiophene acetate)s as environmentally friendly anticorrosive pigment.

The Technology
PC-ProTec technology is based on the use of poly(alkyl thiophene acetate)s dispersed in a convenient solvent and added to epoxy and alkyd resins inside the paint fabrication process. In order to avoid non-homogenous dispersions, the electroactive polymer must be conveniently prepared and purified before adding to the liquid paint system. The poly(alkyl thiophene acetate)s are electroactive polymers ease to synthesize and to purify. The key for a good performance is achieved with PC-ProTec technology, developed exclusively for this kind of compounds. With this new technology a very low concentration is required to provide efficient protection and it can be easily dispersed in solvent-borne epoxy and alkyd primers.

Innovative advantages
- High efficiency anticorrosive protection of steel
- Effectiveness in a very low concentration (less than 1.5 wt.% in the paint formulation)
- Easily dispersed in solvent-borne epoxy and alkyd primers.
- Enables paint companies to be in compliance with American and Europe regulations
  - Eliminate zinc and its compounds from paint
  - Eliminate the use of avoiding penalizing labels (R51 and R53)

Current stage of development
The new PC-ProTec technology, based on the use of poly(alkyl thiophene acetates) as anticorrosive pigments, has been tested with a number of epoxy and alkyd formulations. The anticorrosive additive and the paints modified with PC-ProTec technology were fully characterized and corrosion assays were also performed following standard methods (ASTM B117, ASTM D1654, ASTM D714, UNE-EN-ISO 4624).

Applications and Target Market
New business opportunity for polymer manufacturers to fabricate and commercialize an innovative additive for important industrial sectors, like paints and varnishes manufacturers. It can be an excellent additive for marine medium and industrial environment, because it substantially improves the adherence, blistering and resistance to corrosion of the steel in these circumstances.