



UV Coatings: Basics, Recent Developments and New Applications

By Reinhold Schwalm

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Since UV curing (light induced polymerisation of multifunctional oligomers) is a very ecoefficient and energy saving curing method, the growth rates of UV curable coatings are in the range of 10% per year. The typical UV coatings are solvent free (100% solids), thus helping the industry and the environment to reduce significantly VOC (volatile organic compounds). Recently, the automotive industry has discovered that UV cured coatings are very scratch resistant, which stimulated very extensive work into the development of UV coatings for automotive applications. Since UV curing is very universal, also other systems besides the 100% solid (typical) UV coatings are developed, like waterbased UV- , UV powder and Dual cure (UV and thermal) systems.

UV Coatings contains an overview of the technology, the curing process including the equipment necessary, the raw materials (resins, diluents, photoinitiators) used, the advantages and drawbacks of this fast emerging technology, as well as proposed technical solutions to tackle the disadvantages. Structure-property relationships will be given, especially regarding the mechanical properties of coatings as well as scratch resistance, mainly dealing with automotive performance criteria.

The main part of the book will deal with new developments, like water-based UV coatings, UV powder coatings and dual cure systems, cured by UV and thermal energy, which have been developed to cure the coating on three dimensional substrates in shadow areas. The main applications of UV Coatings will be described, starting with the classical ones on temperature sensitive substrates, like wood, paper and plastics, where the UV curable coatings are already well established.

- * Looking at UV curing as a key to scratch resistant automotive clear coats
- * Ecoefficiency of UV Coatings
- * Comprehensive overview of the technology, materials and markets

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