

Fumed Metal Oxides for Non-Impact Printing Applications (NIP)

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Abstract

Metal oxides like titanium, alumina and silica are key ingredients of dry based electrophotographic toners and ink jet paper coatings. Solid state parameters, like crystal structure, particle size, morphology and porosity favor their use in these applications. However, a variety of further requirements like tribochargeability, and stability, particle surface charge, in terms of powder toner applications and ink jet coatings, have to be fulfilled. As a consequence new surface chemistries of the metal oxides are required.

This presentation will focus on how metal oxides can be tailored for NIP applications. Special focus is given to synthetic amorphous silicas (SAS). The impact of selected physical-chemical features like particle size (primary, aggregate, agglomerate), surface chemistry (silylation), porosity (e.g. mesoporous for fumed metal oxides), particle surface charge (e.g. anionic or cationic), and their correlation to relevant application properties, for powder toners, like tribocharge and stability, flow, transfer efficiency, and cleaning, and for ink jet coatings, like adsorption and absorption capacity, gloss, waterfastness, and bleeding is discussed.

Newer technologies like chemically prepared toner (CPT) or photoglossy papers and their impact on metal oxides for NIP are considered.

In addition, EH&S aspects of SAS and an update on chemical legislation will be covered.

References

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Author Biography

Dr. Mario Heinemann, Wacker Chemie AG, Division Silicones, is Global Manager Imaging Systems and head of product stewardship HDK, pyrogenic silica, with more than 15 years of experience in toner surface additives. He received his Ph.D. in Chemistry in 1982 at Heidelberg University, and has written numerous publications and patents. He is a member of the Society for Imaging Science and Technology.