

5th AFERA Technical Seminar (Brussels, April 13 - 15, 2011)



“Happy times are back again”. After a crisis-struck period in international tape and label industry which also bore upon seminar participation AFERA events are returning to their former path of success boasting with pre-recession figures such like close to one hundred participants from thirteen countries.

Following, we shall present excerpts from a number of contributions that appeared particularly noteworthy, which by no means should be regarded as a ranking order in terms of importance or a discrimination of such that are not mentioned here.

R. Zeeman of Arizona Chemicals elaborated on “Terpene Resins and their Comparative Performance in Adhesive Applications”. Pine oil from natural sources constitute an important source of terpenes which on polymerization render powerful tackifier resins in particular if combined with such chemical moieties like styrene and phenol. Several examples were presented impressively demonstrating the strong tackifying potential of such polymers e.g. in solvent based acrylic adhesive formulations. Adhesion properties turn out to result from a quite subtle balance between the respective polymer components carefully to be tailored within elaborated testing programmes (cohesion vs. adhesion, loop tack and SAFT measurement, cost vs. performance optimisation). – “Overview and New Trends in Non-Silicon Release Coatings” was M. Cerra’s (Ichemco) presentation topic. As a matter of fact, beyond the well known silicon chemistry a number of other product classes can be found exhibiting noteworthy release properties, such as carbamates, acrylic copolymers, styrene-butadiene compounds, and fluoro chemicals. All of those clearly maintain their position within the vast field of self adhesive material applications defending there respective individual role in relation to the very bunch of requirements (packaging tapes, protective films, masking tapes, medical tapes, cold seal). Categories of performance to be evaluated are e.g. required release force, printability, eco-friendliness, drying behaviour.

D. Robeling’s (Herbert Olbrich) contribution was dedicated to an “Update for the Coating and Drying Process, a Subjective Overview”. Product trends such as reduced solvent content and residues in the finished film, transparent optical products, and thinner films need to be “translated” into machine design and engineering requirements. In-depth study of governing parameters, e.g. measurement of temperature profiles within the drying unit, dwell times, design of coating equipment (roller, comma bar, slot die) all need to be individually assessed

within the intended coating process in order to guarantee optimum result. – In R. Buerger's (Nordson Engineering) presentation on "Foam Technology – Use with Thermoplastic Adhesives" word was made about a "design" of adhesive films attracting increasing attention now also in the hotmelt PSA field. Important advantages justify such focus, among which are high adhesion due to bubble surface of applied film, improved wetting properties on porous surface, longer open combined with faster set time on compression, high flexibility of adhesive layer, and last not least, adhesive savings (minimum 30%). There are, however, limitations to this approach, such as constricted lower end in layer thickness (abt. 100 μ), immediate cooling after application to ensure sufficient closing of bubbles, sensitivity to water content of substrate.



(Partial) substitution of mechanical joints in automotive industry by (pressure sensitive) adhesives is an area of overwhelming importance which P.L. Geiß (University of Kaiserslautern) impressively highlighted within his speech on "Pressure Sensitive Adhesives in Structural Hybrid Joints". PSA joining offers a number of advantages in automotive assembly operations, such as

quick fix properties, easy roll-on dispensing, high level of impact resistance as well as noise and vibration dampening due to viscoelastic properties of the adhesive set-up. In particular combination of self adhesive tapes with riveting operations offers a number of important advantages such as favourable energy dissipation and fixation during thermal curing process, which promises excellent future prospects for PSA hybrid joining in multi-material lightweight structures. – K. van Wijk (Henkel) reported on "Reactive Solution Acrylic PSAs – Special Adhesive Properties by newly Designed Reactive Polymers". Focus of the development outlined was on a class of acrylic adhesives with high temperature resistance, high shear stability, and the possibility of tailoring the adhesion built-up over time. This quite ambitious goal was reached by employing a combination of different functional monomers in a one part system reacting with each other under conditions of a newly developed and patented polymerization technology. The resulting reactive resistant polymers (RRP) tend to crosslink during drying process thus forming the highly cohesive and heat resistant structures comparable to "normal" two-component systems, however, with applications advantages of the one-part species.

With "Accelerated Aging of PSA Tapes – Possibilities and Working Strategies" T. Kowalik (Fraunhofer Institute for Manufacturing Technologies and Advanced Materials) touched a field of essential importance hardly to be overestimated. According to the underlying hypothesis before the experimental notice of peel strength decrease due to ageing influence changes in chemical or physical state should occur. The verification and elaboration of this idea is the essential basis of a respective project carried forward together with a number of well-known PSA producers within a 2 years project still in revision. Ultimate targets are to develop easy and fast testing tools, find trajectories along which adhesive formulations could

be (better) tailored towards requested properties, and to avoid time consuming long term stability tests. – K. Alavi, finally, demonstrated the importance of non-polymer components on the properties of adhesive formulations within his paper on “The Effect of Mineral Oils on the Physical Properties and Adhesive Characteristics of Packaging Tape Adhesives”. Two classes of refined products, i.e. naphthenic as well as paraffinic base oils are comparatively evaluated with respect to their effect on adhesive formulation properties (plastification effect, application temperature, resin quantity reduction, emulsion stability). Results obtained point at naphthenic oils forming close interaction with mid blocks in tri-block copolymers without softening the styrene end block thus fostering good adhesion and improved cohesive strength. Furthermore, higher density of naphthenic oils through the resulting lower free volume tends to increase intermolecular forces again resulting in improved strength of adhesive.

Concluding, the 5th AFERA Technical Seminar indeed tellingly underlined the status of this event as a platform for know-how exchange among the members of the universe of pressure sensitive adhesives industry, and – in the words of C. Donker, Chairman of AFERA’s Technical Committee – “thus representing a truly dynamic learning opportunity yielding positive and continuing benefit to every participant”.