

5th Afera Tape College (Brussels, April 18 - 20, 2012)



With some one hundred attendants from abt. 16 different countries this year's Afera Tape College again reflects the shape of international PSA industry which is not all too bad for the time being.

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

T. Jensen of Jensen & Associates as one of tape industry's true war horses within two of the overall four sessions stepped into the arena, on one hand giving a general "Tape Overview", on the other lecturing about "Tape Backings". Drawing from more than half a century of broadest expertise he started on definitions and general build-up of adhesive tapes, then extensively elaborating on chemistry involved (backings and adhesive polymers, chemical classes, physical properties), finally ending up with methods of tape engineering and application equipment. In his second contribution Mr Jensen elaborated on adhesive tape backings, starting from their key characteristics such like materials, colour, stress-strain behaviour, cost. Explanations on typical film properties and in particular on polypropylene as a backing material rounded off the colourful picture.

Within her presentation “An Introduction to Acrylic Pressure Sensitive Adhesives” I. Uhl of The Dow Chemical Company gave a broad introduction into this particularly versatile class of backbone polymers. Starting from the chemical basics of acrylic structure Mrs Uhl developed into an outline of applications and typical benefits among which excellent high and low temperature properties, chemical, colour, and UV resistance are the most noteworthy. A broadly tailorable range of glass transition temperatures makes acrylics useful for many fields even aside from pressure sensitive adhesives. The polymer class can be employed in organic solvents (e.g. alcohols, esters, hydrocarbons), as aqueous dispersion, or as a hot-melt. Cross-linking reaction opens up a further field of properties with e.g. shear adhesion increasing and peel adhesion running through a maximum with increasing crosslink density. Furthermore, details of different tackifier effects on acrylics were presented.

“Selection of the Right Release Liner” was J. Pomorin’s (Evonik Industries) topic. In the beginning impressive market data were presented: The global market of paper and film release liners adds up to abt. 35 billion m², practically equally shared among

North America, Europe, and Asia Pacific and only very limited amounts for South America and Rest of the World. In this picture filmic liners account for roughly 15% of total. The proper selection of release liner for a given application is a multi-faceted problem, depending on such parameters like type of adhesive involved, desired release level, kind of manufacturing process involved (e.g. in line / off line), cost, etc. In doing so there is a broad choice of material classes available, beside the ubiquitous silicones also such species like waxes, carbamates, Teflon, etc. Among silicones the options are e.g. solvent based or solvent free thermally curing systems, emulsions, radiation curing silicone acrylics or epoxies, which in turn might be cured following a cationic or a free radical mechanism. Elaborated test methods, such as evaluation of coverage, release performance, cure, amount of extractables are concluding the exercise thus suggesting whether the “design” of the release liner was adequate to the requirements involved.

Proper preparation of surface is an indispensable prerequisite for ensuring sufficient bond to a substrate. Consequently, importance of A. Gross’ (Fraunhofer IFAM) contribution titled “Modern Surface Treatment Methods” could hardly be overrated. In a first part surface preparation through aggressive gases such as being employed by fluorination and oxyfluorination were introduced. This method may boast with its simplicity, reproducibility, and cost effectiveness, especially when applied to parts with complicated geometry composed of comparatively robust polymers, such as PP, PE, PBT. However, the technique fails in case of polymers sensitive to hydrolysis, metal, glass, or ceramic surface. Furthermore, fluorine is a substance classified as hazardous which requires particular precautions to be taken during handling. An interesting alternative is offered by low or atmospheric pressure plasma surface cleaning involving an activated gas containing charged particles. By such means effective, uniform, mild pre-treatment may be accomplished, the effect being moreover independent of the geometry of the treated part. Furthermore, functional groups such as alcohols, acids, halogens, amines, etc. may be introduced on top of the surface by adapting the nature of the gas the plasma is generated from thus allowing for tailoring surface properties in a wide range. These could effect such useful features like scratch resistance, corrosion protection, hydrophobicity, water penetration behaviour of fabrics.

In a quite imaginative manner L. Rodenburg of Eastman Chemical entertained the audience with his contribution "Political Molecules in Practice". REACH was the topic, the current status, future evolution and potential shortcoming of this most ambitious compilation of chemical substances regulation. Even a rather superficial look at the mere size of REACH shows a "magnum opus" that has grown beyond any proportions: 150,000 substances have been recorded in 1.7 million pre-registrations, by this exceeding any forecast by a factor of 6 to 10. The eagerness of producers or importers of substances to meticulously follow the legal instruction derives its reasoning from the fact that without pre-registration marketing of products or formulations is strictly prohibited ("no pre-registration = no market"). Since due to cost and other reasons by far not all pre-registered substances will be registered later, re-formulation might be the tedious and sometimes horrible name of the game binding valuable corporate resources no more available for futable business development. Furthermore, the author gave a quick overview how the Classification, Labelling and Packaging Regulation (CLP) will change labelling with introduction of risk and safety phrases, new pictograms and signal words. All in all, there might be a future to come where industry simply would feel completely overburdened by a bureaucracy going wild.

C. Derail of IPREM-EPCP Université de Pau gave a complex and mathematically quite demanding account with his "Introduction to the Rheology of Pressure Sensitive Adhesives." Starting from rheology as the key factor in understanding the effect of PSA formulation components, ways of measuring of rheological behaviour was outlined, e.g. by means of spectromechanical analysis. Rheological properties may serve as a tool to improve performance of so-called soft adhesives. Some examples like homopolymer model formulations and such based on EVA or SIS copolymers impressively demonstrate the versatility of the rheology approach.

Concluding, the 5th Afera Tape College joined its predecessor events in a most worthy way. Presentation outlines and contents turned out to give indeed much more than what C. Donker, Afera Technical Committee Chairman in his inauguration address with understatement epitomized as "a biennial going back to school".