8th Joint CORNET Call for Transnational Collective Research Proposals

--- Project Idea ---

Subject:	**"linerless labels" by bond and de-bond on command, INDUGLUE**
Coordinator: Other applicant(s):	PTS, Germany AIDIMA, IFAM, ICP LY
Sector/target group:	Paper and board industry, label converters and printers, wineries, electromagnetic inductive heating devices, mechanical engineering.
Proposal summary:	The objective of this project is to develop linerless adhesive labels, by means of an induction-activated adhesive layer. Induction activated labels combine the economic advantages of linerless labels and the efficient energy transfer of induction technology thus allowing the development of linerless labels which would be ecologically sound alternatives compared to current self-adhesive labels. The modified adhesive layers that are manufactured must meet a variety of adhesive-related requirements. When the label is transferred from the dispenser to the container to be labelled, there must be adequate "initial tack" to ensure smooth labelling. In addition, the adhesive state of the labels must be attained as quickly as possible to avoid long pre-heating zones. This is desirable both from the mechanical engineering considerations as well as from an energy efficiency perspective. It is decisive that the adhesives achieve an adequate final adhesion level to meet the requirements placed on label adherence. Instead of heat transport from outside, the adhesives are induction-heated directly in the adhesive layer in the presence of the superparamagnetic nanoparticles without having to heat up any other workpieces or temperature-sensitive substrates prior to or during the process. The heat is merely transported out of the adhesive layer. Hot spot formation does not occur. The use of inductively activated adhesive layers for self-adhesive labels can eliminate the release paper without suffering from the drawbacks of past solutions. The project task is divided up in four parts: Formulation of glue (IFAM): ▪ Adhesive level as a function of concentration of the superparamagnetic particles ▪ Shape and type of the superparamagnetic particles ▪ Heating rate, kinetics of glue layer ▪ Rheology of glue Coating technology (PTS): ▪ Application technology (blade, rod or curtain coating)

	▪ Layer thickness ▪ multiple-layer concept for enhanced product performance Implementation of induction coils to labelling machines (AIDIMA and possible partner): ▪ thermal conductivity and thermal capacity values of the substrates and the adhesive, ▪ the adhesive efficiency and performance ▪ the modification of the label application equipment for the new labels ▪ the output, frequency and geometry of the induction coil itself as well as the distance from and orientation relative to the parts or layers to be bonded Selective label removal and recyclability of the labels (ICP LY) ▪ Process parameters for effective label removal from bottles and other packages ▪ Repulpability of the labels and possible recovery of superparamagnetic particles
Advantages for trade and industry:	New technology to provide adhesive labels having no release liner. → Economical benefits, include lower material costs for the labels and lower waste disposal costs for the liner material.
Dissemination concepts:	The strategies for distributing the project results are geared towards the following potential users: ▪ Users of labels on bottles (brewers, wineries...) The increase in flexibility is mainly beneficial to SMEs, ▪ Paper industry, ▪ Paper labels producers, mainly SMEs ▪ Mechanical industry, ▪ Glue suppliers ▪ Measurement engineering manufacturers, ▪ Consulting and training service providers (mainly SMEs).
Profile of additional partners:	AIDIMA IFAM ICP LY
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