Chemsultants International

Why Solvent-Based Pressure Sensitive Adhesives Continue to be Valuable Today

Chemsultants International is a recognized leader in the field of specialty coatings. Our custom coating capabilities have been proven over time as well as being lab and field tested.

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Why Solvent-Based Pressure Sensitive Adhesives Continue to be Valuable Today

Chemsultants International is a recognized leader in the field of specialty coatings. Our custom coating capabilities have been proven over time as well as being lab and field tested. Our expertise in specialty coatings includes both technologies and applications. With a wide variety of coating types, Chemsultants has proven to the industry that we can deliver the best solution for your most demanding applications.

We use four basic adhesive technologies to manufacture pressure sensitive adhesive tapes and labels: solvent, emulsion, hot melt and radiation-cure. Over the years, the industry has continued to work toward improving the performance of the more eco-friendly technologies, trying to move away from solvents.

Unfortunately, while many applications are now served with emulsion, hot melt product, or radiation-cure adhesives, the current state-of-the-art has not been able to replace all of the solvent products for applications that use low surface energy materials such as PE, PP, Silicone, PTFE, PVA, PS and EVA.

Pressure sensitive adhesives are developed using 3 basic polymer systems: rubber, acrylic and silicone. Each system can be modified using additional ingredients such as tackifying agents, cross-linkers, plasiticizers, and fillers, depending on the end-use performance requirements and cost.

Solvent

In solvent-based systems, the adhesive ingredients (polymers, tackifiers, etc.) are dissolved in the solvent solution and applied to a web of material. After coating, the solvent is thermally dried, leaving the adhesive residue. The solvents are captured during the process and delivered to a thermal oxidizer where they are decomposed at very high temperatures prior to being safely released to the atmosphere. Today this process is 95% efficient in treating these effluents.

Emulsion:

In emulsion systems, the adhesive ingredients are emulsified in water, applied to a web and then thermally dried. They require higher heat loads to drive off the water in the system than solvent-based systems, which evolve more rapidly. However, they do not need to be passed through a thermal oxidizer unless they contain toxic additives that may need treatment.

Hot Melt:

Hot melt adhesives are typically thermoplastic rubber systems that include tackifiers and oils so that they can be coated onto webs while hot (300˚F). Hot melt adhesives do not require any solvent or water. The downside of these systems is that they are usually more susceptible to high temperatures and lack the resistance that is required for certain applications.

Radiation-Cure:

Radiation-curable (UV) systems typically require the use of heat to deliver them to the web and include acrylic monomers and photo-initiators, which need to be controlled/ventilated due to their toxicity. They do not require water or solvent.

	Cylinders	Line-speed		Clean Room			Coating Width				Ten-sions	Viscosity				Coating Type	Back-Up Roll Duro-meter	Drying	Curing	4" OD Chrome Tolls	Various Rod Sizes	Gap Adjustable
	360th to 24th	2-35fpm	6-75fpm	Class 100	Class 1,000	Class 10,000	4"-14"	4"-24"	4"-24.5"	4"-25"	.25-5 pli	100-1200 Cp	500-10000 Cp	20-800 Cp	2000-25000 Cp	Solvent & Water Based	75 - 85	Air Flotation Ovens	UV Cure Adaptability	Pattern Bar Cut Per Job	0 Rod to 90 Rod	2mil - 100mil
TPC1 Coater Specs																						
Gravure	•		•			•			•		•	•				•	•	30 ft.	•			
(Direct, Reverse, Offset)																						
Roll									•		•		•			•		30 ft.	•	•		
(Pattern Bar)																						
Mayer Rod			•			•		•			•			•		•		30 ft.	•		•	
Rod Rotation (With, Against, None)																						
Knife Over Roll		•				•			•		•				•	•		30 ft.	•			•
(With Back Dam, No Back Dam)																						
TPC2 Coater Specs																						
Gravure	•				•		•				•	•		•		*•	•	10 ft.				
(Direct, Reverse, Offset)																						
Die					•		•				•		•	•		*•		10 ft.				
(Hot Melt, Solvent, Emulsion)																						
Knife Over Roll		•		•	•					•	•				•	*•		10 ft.				•
(With Back Dam, No Back Dam)																*•Class 10,000 Only						

Performance is a key when deciding which system to pursue for your application. Solvent –based systems are fully dissolved and form one homogenous layer. They can be formulated to provide excellent adhesion and shear resistance for many low surface energy materials (LSE). These adhesives are being used in numerous products including automobiles, appliances, packaging, medical, and electronic devices.

Emulsion systems, especially acrylics, exhibit better outdoor weather-ability and chemical resistance but typically fall short for adhesion to the LSE materials.

Radiation curable systems are gaining ground in the industry, but have some of their own concerns with controlling monomers and photo-initiators. They also require investments in the radiation process technology, but have the benefit of a smaller footprint (space conservation) and no need for expensive drying ovens.

Chemsultants Capabilities

Choosing the best adhesive system can be critical in developing your pressure sensitive adhesive. Chemsultants has successfully partnered with companies in the medical, electronic, construction, marine, packaging, safety, and graphics industry, as well as many other niche markets. Our experts have experience coating for many applications that can assist you with speed-to-market.

For more information or assistance with analytical testing of pressure sensitive adhesives, please contact our Laboratory Services Group at:

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Click here to Request a Quote on Testing and Product Development