

GLUABILITY OF AQUEOUS COATINGS

Aqueous coatings, first commercialized in the mid-1970's, have now been in use for almost 20 years. Each passing year has brought increased volume growth along with an advancing technology which continues to capture new, more challenging applications.

Some market/product applications require an ability to glue a surface that has seen an aqueous coating applied. One of these applications is the folding carton, many of which by design see the fabrication of a rigid construction utilizing glue bonds. While there are a few unique carton designs that may be formed without the need for glue seams the vast majority of folding cartons rely upon one or more glue bonds. Commercial printing also produces a number of constructed products that require gluing.

Folding cartons, regardless of the printing/coating technique employed, may be aqueous coated overall (as in flood coating) or pattern coated. Depending on the type of coating equipment in place, pattern coating may be achieved with ease or only with some difficulty. Nevertheless, pattern coating is done routinely by many with glue flaps devoid of coating, thereby eliminating the question of gluing an aqueous coated surface. Another factor to be considered is the economizing or saving of the expense of coating where it is not needed. On the other hand, many cartons are produced with an overall aqueous coating application so that glue functionality is an absolute necessity.

Factually, the mature aqueous coating industry has seen many millions of pounds of coating consumed annually with very few gluability problems reported. Yes, there has been a learning curve. Yes, there have been problems in the past and yes, there will be problems in the future. Realistically though, most aqueous coating formulations are glueable. Further, all glue manufacturers are able to make reliable recommendations based on a history of many successful experiences.

Some aqueous coatings will not glue effectively. These will be coatings that contain high percentages of waxes, especially PTFE ("Teflon") wax, and/or silicones, additives which are usually used to provide very good slip, low slide angles and low coefficient of friction (COF). Other aqueous coatings that are challenging to glue effectively are those one and two part systems that are catalyzed or cross-linked and produce a tough hard cured coating surface that offers few bond sites for gluing.

Beyond aqueous coatings one must consider the other elements that impact gluability such as ink, if it's in the glue area, substrate and in the case of paper board, board mill clay coatings. Then there are vinyl laminated board, foil board, poly (PE) board, etc.

Excessive use of spray powder can also be detrimental to gluing so minimum amounts should be present. Substrate temperature has also been found to be important, with room temperature stock easier to glue than colder stock.

Two types of adhesives or glues are in common use. These are cold white glues and hot melts. Wheel-glue pot and high speed extrusion gluing dominate folding carton production while hot-melt accounts for the majority of carton sealing on product filling lines.

Cold glues applied by the wheel-glue pot method are transferred by means of a concave wheel surface that can vary application by viscosity and solids. High speed electronic adhesive extrusion equipment, very precisely controls the application of low viscosity cold adhesives at very high line speeds, laying down a narrow, controlled volume of adhesive. Sometimes it is necessary to compensate by changing to a larger extrusion orifice so that more adhesive volume is laid down in a wider band. It pays to remember that, too little glue = premature setting = poor bonds! Compared to the wheel-glue pot, adhesive extrusion equipment cleans up far faster and also holds the seam under pressure longer while the glue sets.

Cold white glues/adhesives set and dry as water is evaporated or absorbed and the film is said to break or form. Some substrates or coatings limit absorption and inhibit glue/adhesive setting and drying.

Hot melt adhesives have also been effective producing acceptable seals to aqueous coatings. With these, heat can be an advantage in that aqueous coatings are thermoplastic and will soften to allow excellent adhesion.

Today with the almost twenty years of aqueous coating history and experience it can be said that most aqueous coatings are glueable with most cold white glues and hot melts.

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Naturally, there are always the exceptions considering the many special application aqueous coatings that are requested and formulated. In addition, no substrates are exactly the same creating another set of variables. Glue line equipment must also be looked at for the limitations and variables that it represents.

In conclusion, when facing a gluability question, request answers and recommendations from not only the adhesive/glue supplier, but also the substrate, ink and aqueous coating supplier and test.

When in doubt ask the adhesive manufacturer for a co-polymer white cold glue that is formulated to adhere to foil or PVC - these glues should stick to all but the few very high wax and silicone containing aqueous coatings.

LOOK TO CORK!..... for your coating and varnish needs, for both aqueous & UV/EB coatings/ and varnishes.