



## Glycol Ethers for Architectural Coatings

**Solvent-Based** Solvent requirements for coating systems used in architectural applications vary widely. Most architectural (trade sale) coatings, whether primer or topcoat, are heavily pigmented. The solvent must dissolve the resin and assist in pigment dispersion. The solvent should have a low surface tension so that it can thoroughly wet the pigment and the substrate, maximizing the adhesive properties of the cured coating.

DOW glycol ether products are incorporated into many high quality architectural formulations due to their low surface tension. DOW glycol ether products are also used due to their broad range of evaporation rates. Architectural coatings are applied at widely varying temperatures and relative humidities, which imposes special constraints on the coating's drying characteristics. If the overall evaporation rate of the solvent is too fast, the coating may be ruined by moisture blush, cracking, popping, or poor flow and leveling. The medium to slow evaporation rates of DOW glycol ether products (Table 4) let the formulator match the coating to the application environment.

Glycol ethers and acetates are also used to improve flowout and leveling characteristics and lengthen the wet edge of the paint to provide smoother lapping and eliminate brush marks. In addition, they improve bonding by softening primer undercoats.

DOWANOL<sup>®</sup> PM, DPM, PMA, DPMA, DPnP, DPnB, Butyl CELLOSOLVE<sup>™</sup>, Butyl CARBITOL<sup>™</sup>, Butyl CELLOSOLVE acetate, Butyl CARBITOL acetate, and Methyl CARBITOL<sup>™</sup> are used in many architectural applications of solvent-based coatings.

**Water-Borne** Seventy percent or more of all architectural paints are latex- or waterborne systems; this is due to the following advantages:

- Ease of handling.
- Ease of application and clean-up.
- Fast drying.
- Good performance.
- Low cost.

In order for latex paints to have good adhesion, good scrubability, and high gloss, they must contain a coalescing agent to help film formation. DOW glycol ethers offer the formulator a wide range of coalescents from which to choose to meet specific customer paint system needs.

DOW glycol ethers and acetates that find use as coalescing agents are PnB, DPnB, DPnP, DPMA, PPh, Butyl CELLOSOLVE, Butyl CARBITOL, EPh, or DALPAD A. Generally speaking, coalescent efficiency increases BuCs<BuCb<DPMA<PnB<DPnP<DPnB<pPh=EPh=DALPAD A, with PPh, EPh, and DALPAD A being the most effective coalescing agents. (See Figure 13.)

The wide range of evaporation rates of DOW glycol ethers and acetates allows application of water-borne paint under varying atmospheric conditions. The evaporation rate range moves from the relatively fast PnB to the relatively slow EPh.