

## What is the interrelationship between PVC, PSC and the particle size of the pigment?

Computation of PVC of a coating is not influenced by the particle size of the pigment. However, PSC is very much dependant on the particle size of the pigment in the dispersed state. As the particle size decreases, the surface area increases exponentially. Moreover, the higher the PVC, the higher will be the PSC for a given particle size of the pigment. Thus, PSC is a direct function of PVC and inverse function of the particle size.

The following graph depicts how the PVC of a coating will change with the particle size keeping PSC constant (i.e. Interfacial area is kept constant).

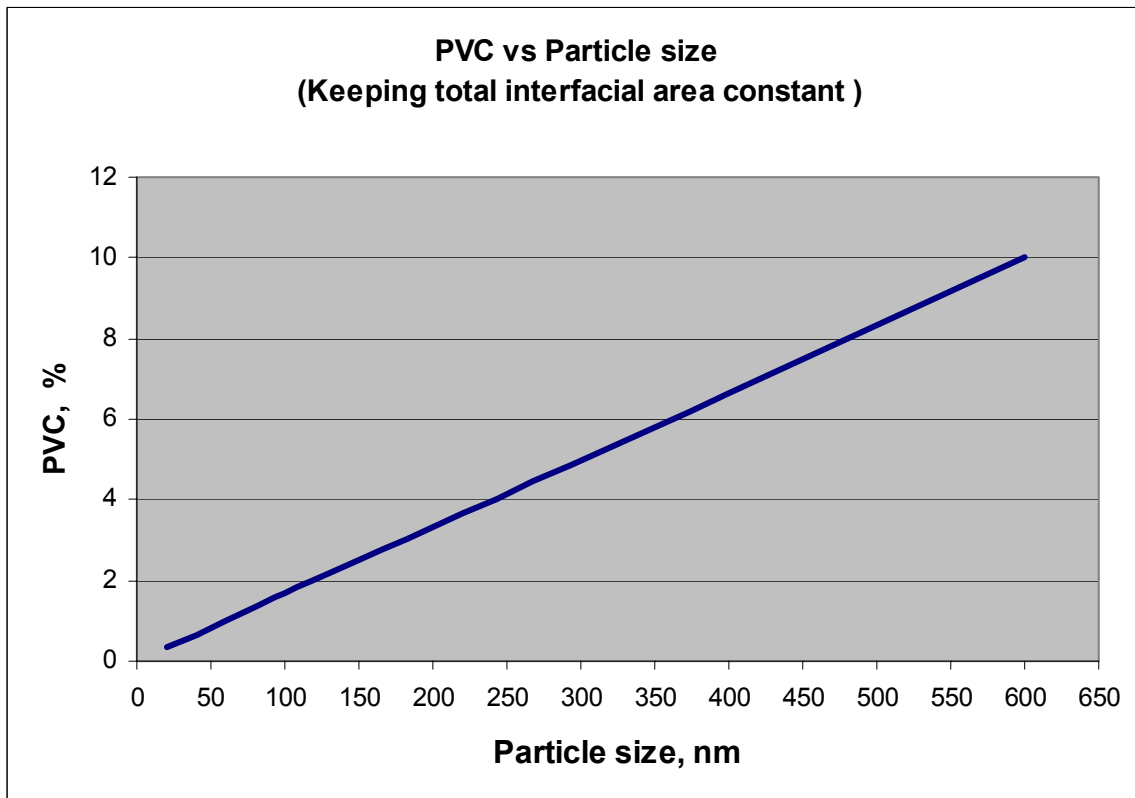


Figure: PVC variation with Particle size keeping PSC constant

The above Figure clearly shows that with the nanoscale pigments the coatings can be formulated at very low PVC to get interfacial area equal to the coating at high PVC with micron scale pigments.

About 1% PVC of 50 nm pigment will provide the same surface area as 10 % PVC of 600 nm (0.6 micron) filler.

This interrelationship has following practical significance:

- Very low dosage of nanofillers is adequate to alter the properties of the coatings compared to the micron size fillers.
- Interparticle distance decreases linearly with the decrease in particle size at a given PVC. Lower the interparticle distance, the greater is nanophase formation in the interstitial binder.

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