

Wanhua Low VOC 2K WB PU Flooring Coatings – by Eric Oude Spraakste

Based on the development trend of the construction industry in recent years, higher requirements are put forward for the performance, construction efficiency and environmental protection of floor paint. In addition to this, we are increasingly challenged by environmental regulations to cut down VOC. The new two-component waterborne polyurethane technology fully meets the needs of the market development.

Different from the homogeneous system of solvent based polyurethane coating, the polyisocyanate component and polyol component will form a three-phase system in the mixing process of the two-component waterborne polyurethane. That is: water (continuous phase), hydroxyl resin dispersed phase (including part of polyisocyanate entering hydroxyl resin dispersed phase under shear force) and polyisocyanate dispersed phase. As mentioned before, a small part of NCO on the surface of small droplets of polyisocyanate dispersed phase will react with water to form polyurea film. This polyurea film plays a protective role, so NCO inside the droplets will not react with water at this stage, so as to ensure that the coating has enough operable time.

The paint film formed by the chemical cross-linking reaction has properties comparable to those of traditional solvent-based polyurethane coatings. Such as: excellent chemical resistance, scratch resistance, wear resistance and weather resistance. Whilst the content of volatile organic compounds is greatly reduced.

Performance characteristics of the two-component waterborne polyurethane floor paint:

- **Aliphatic system** → weather resistant and UV resistant:
- **Polyurethane structure** → hard & flexibility (even at low temperature)
- **Low viscosity hydrophilic modified polyisocyanate** → easy to mix by hand
- **Low co-solvent need** → low VOC & low odor
- **Medium hydrophilic** → excellent stain resistance and easy cleaning
- **Crosslinking** → easy cleaning, chemical resistance and wear resistance
 - **Medium crosslinking density** → balance film respiration, excellent scratch resistance
 - **High crosslinking density** → hot tire resistance

To enable formulator's freedom to develop sustainable flooring coatings with lowest VOC that meet highest industrial standards, Wanhua developed 2 new hydroxyl functional acrylic polymers. The two polymers can be used as sole binder but can go in any mixing ratio to enable formulator's maximum freedom to develop complete range of gloss levels.

Arcsol® 8563 and Archsol® 8573 can be mixed with Wanhua's polyisocyanates to create highest gloss using Aquolin® 270 Plus or even matt finishes by using Aquolin® 278 Plus.