Floor Polish Formulating Suggestions

Gloss

Gloss is primarily a subjective, qualitative property. Objective techniques can be utilized for gloss readings, but in the final analysis, appearance on the specific substrate involved is the main concern. With any given formulation, visual gloss varies with substrate porosity, color, and viewing angle. Porous substrates (e.g. vinyl composition tile, old linoleum) exhibit less "hold out" than nonporous (e.g. vinyl) substrates, and for equal quantities of formulation, the porous tiles will have lower gloss. Dark colored substrates usually appear glossier than their light-colored counterparts.

To improve gloss:

1 - Choose a polymer that offers high gloss, such as Duraplus 3 or Primal E-2483.

2 - Increase formulation solids

3 - Check quality and compatibility of the wax emulsion

4 - Review alkali soluble resin content and type. While modified rosin esters generally contribute to a high gloss, they tend to give a yellowish appearance. Primal E-1531B gives good gloss without any color.

5 - Make sure that the coalescent type and level is properly chosen for the polymer and provides a good film formation.

Leveling

This is a measure of a formulation's spreading and wetting properties. A polish with poor leveling properties usually looks poorest on dark, non-porous substrates. A properly cleaned and thorougly rinsed floor is essential for best leveling performance.

To improve leveling:

1 - Choose a polymer with good basic leveling tendencies.

2 - Review the alkali soluble resin content and type.

(a) Replace styrene/maleic anhydride resin with Primal E-1531B.

(b) Increase the alkali soluble resin content.

3 -Increase the level of Tributoxyethyl phosphate. However, this will permanently plasticize the film.

4 - Increase the wetting agent (fluorocarbon surfactant) level. However, a large excess can lead to foam problems.

5 - Decrease polish viscosity

(a) Lower solids concentration

(b) Check stability; make sure the recommended ingredients are used and added in the order suggested.

Color

Floor polish color shows up mainly on light-colored floors. Today's ingredients allow the formulation of colorless polish films. The following still used raw materials may contribute to polish color:

1 - Certain alkali soluble resins (such as rosin ester derivatives). Replace with colorless Primal E-1531B.

2 - Certain waxes (such as oxidized polyethylenes, natural waxes like Carnauba).

3 - Certain wax emulsifiers. Check with your wax emulsion supplier for a colorless alternative.

Water Resistance

This is a measure of the sensitivity of a polish film to water. Both "wet" (observation while water is in contact with the polish film) and "dry" (after "recovery", that is observation made after the water spot is removed and the film has dried again) appearance are pertinent. Ageing period and conditions of ageing of the polish film are are important, since certain water-sensitive materials or the formulation are relatively volatile.

To improve water resistance:

1 - Choose a polymer having good inherent water resistance.

2 - Check individual components - ensure that excess emulsifiers or excess alkaline materials of low volatility were not used in preparing the wax emulsion, the alkali soluble resin or the formulation.

3 - Check low temperature film formation and increase coalescents and/or plasticizers if necessary.

4 - Review alkali soluble resin type and content.

Detergent Resistance

The detergent resistance of polishes is primarily dependent on the choice of polymer. In general, polymers with better detergent resistance compromise removability to some extent. A marginal detergent resistance may also find its cause by a poor rinse of the (alkali containing) stripper prior to polish application.

To improve detergent resitance:

1 - Use a polymer designed to give more resistance to detergents. Primal B-336AFK, Primal E-2483, Duraplus 3, Primal NT-6035 and Primal NT-2624 give maximized detergent resitant.

2 - Decrease alkali soluble resin content.

3 - Restrict the use of permanent water-sensitive materials, such as surfactants, glycols and bases of low volatility.

Recoatability

This is a function or the condition of a film at the time of application of a second coat. Both chemical and physical aspects of the initial film and the time interval between the coats, as well as ambient conditions (temperature / relative humidity) can play an important role.

To improve recoatability:

1 - Choice of the polymer is critical. In general, highly detergent resistant polymers give the best recoatability.

2 - Reduce the level of highly efficient coalescents / plasticizers and rather increase the level of less aggressive analogs.

3 - Reduce the pH of the final polish.

4 - Reduce the alkali soluble resin content.

5 - Consider reducing polish solids.

Removability

This property relates to the redispersibility characteristics of a polish film under the attack of an alkaline, ammonia or amine containing stripper, which also contains some water miscible solvent. The ageing period and conditions of the polish film may influence the removability of certain polishes.

To improve removability:

1 - Use a more removable polymer such as Primal B-924ER or Primal NT-6035.

2 - Review the alkali soluble resin type and level

(a) Increase the level of ASR.

(b) Change ASR type.

Slip Resistance

Various methods exist for measuring slip resistance. None of these are representative of the real conditions that occur when a person walks over a floor. Also, slip resistance is perceived differently in various regions. We consider the "paper-under-foot" qualitative evaluation of slip resistance the most reliable one. A floor polish is compared side-by-side with a control that is reputed to be slip resistant.

To improve slip resistance:

1 - Use a polymer that has inherently good slip resistance (Duraplus 2 or Duraplus 3).

2 - Increase the amount of a soft wax and reduce the amount of hard wax or use a high melting point wax with inherent slip resistance (type PED 371 or Epolene E-43).

3 - Increase plasticizer level (watch wear resistance).

Black Heel Mark Resistance

Black mark resistance is an inherent property in the polymer. Duraplus 2 and Duraplus 3 have an outstanding black heel mark resistance; even if marks occur, they will wipe off very easily.

To improve black heel mark resistance:

1 - Choose a polymer with inherent black heel mark resistance.

2 - Use a harder wax component.

3 - Ensure good film formation, but keep the level of plasticizer to a minimum.

4 - Consider increasing the level of alkali soluble resin or change the ASR to Primal E-1531B.

Scuff Resistance

Scuffing is a disruption of the floor polish surface, often caused by a relatively soft film.

To improve scuff resistance:

1 - Decrease the wax content of the system.

2 - Use harder waxes, either alone or in combination with soft waxes.

3 - Use minimum levels of plasticizers, but sufficient to achieve a good film formation.

Storage Stability

Rohm and Haas suggested formulations show a good long term stability at room temperature, and for 30 days at 50°C.

To improve storage stability:

1 - Reduce the polish solids.

2 - Choose a wax emulsion compatible with the polymer.

3 - Add a stabilizing surfactant, e.g. Abex 18S.

4 - Reduce the alkali soluble resin content.

5 - Review the pH. Certain polish formulations are pH sensitive. Depending upon the polymer, a pH adjustment is recommended, while others may not tolerate any pH adjustment.

6 - Use a preservative that remains efficient over a long time period, in order to prevent bacteria contamination.

Foaming

Frequently, polishes do not need any defoamer. At increased solids (>20%), a defoamer may be required. The best, long lasting defoamers are silicone emulsions, but an excessive amount may rapidly lead to the formation of "fish-eyes". Most defoamers on a mineral oil base are satisfactory in floor polishes; they may, however, loose their efficiency within several months of storage.