

HIGH COLOR BLACKS FOR ALKYD ENAMELS

Application Description

Alkyd resin is an excellent choice for formulators who are interested in minimizing dispersion time, dispersant loading and other processing difficulties. Alkyd is an excellent grinding resin for hard to disperse pigments. Finished alkyd enamels offer exceptional color performance at a reasonable cost.

Cabot high color carbon blacks are an excellent choice for use in these coatings because they enable excellent masstone jetness and blue undertone in the final film.

Alkyd Enamels that Can Use High Color Blacks include:

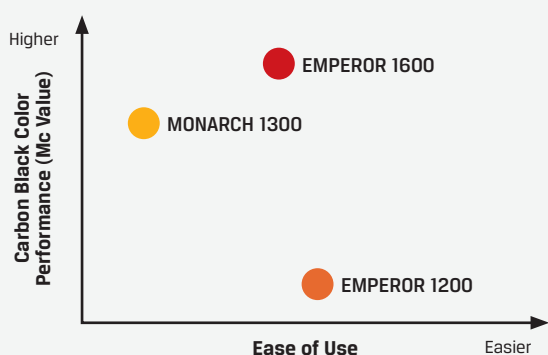


CABOT PRODUCT OFFERING

Carbon Black Product	Jetness	Typical Surface Area (N ₂ SA) m ² /gram	Typical Structure (OAN/DBP) cc/100 grams	Product Characteristics
EMPEROR® 1600	Highest	N/A Surface treated	N/A Surface treated	A high jetness carbon black for solvent-based formulations that is very easy to disperse. Surface treated for ease of dispersion.
MONARCH® 1300		560	100	A high jetness oxidized carbon black for solvent-based or nonpolar coatings formulations.
EMPEROR 1200	Lowest	N/A Surface treated	N/A Surface treated	Extremely easy to disperse with good blue undertone. Surface treated for ease of dispersion.

The data in the table above are typical test values intended as guidance only, and are not product specifications. Product specifications are available from your Cabot representative.

PRODUCT PERFORMANCE



Formulators of high color black coatings typically balance the color performance of the coating with stability and ease of dispersion.

Color: The darkness and undertone of the pigment is typically measured with Hunter L-a-b values. An ideal masstone coating (high MC value) has a low L-value, indicating dark color, and a low b-value, signifying blue undertone.

Ease of Use: The dispersion time, dispersant loading, the type of milling equipment required and compatibility with other coating components determine the ease of use of a carbon black.

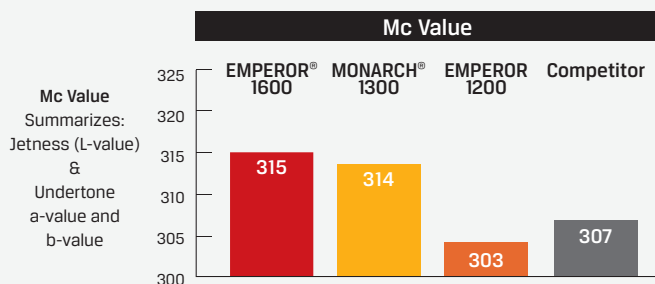
Cabot also offers two products designed for water-based formulations, EMEROR 2000 and EMEROR 1800 carbon blacks. Contact your Cabot representative for more information.

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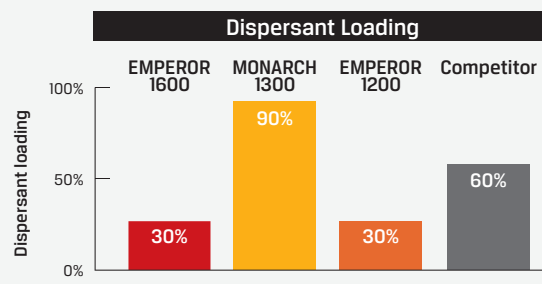
APPLICATION GUIDE

PRODUCT PERFORMANCE

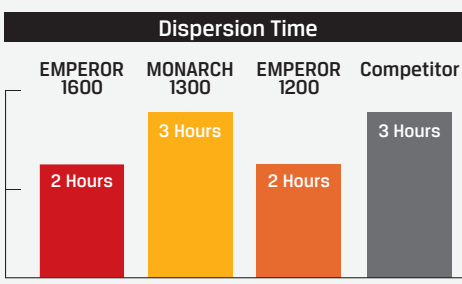
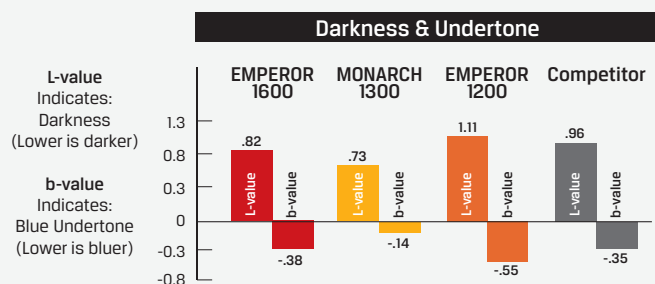
Color Performance of Carbon Blacks



Ease of Use of Carbon Blacks



Measured as a ratio of dispersing agent to carbon black loading to achieve optimal color performance (highest Mc value).



Measured as the amount of time required to disperse the pigment to its best color in this formulation.

The Mc Value and Darkness & Undertone data above were obtained using the model formulation that follows. Only the carbon black was changed.

MODEL FORMULATION (Optimized for EMPEROR 1600 carbon black)

Millbase		
Product Name	Description	Amount (%)
Beckosol™ 12-054	Resin	42.5
DisperBYK® 163	Dispersant	5.0
Xylene	Solvent	25.00
PGMEA	Solvent	20.00
Carbon Black	Pigment	7.5
Total		100.00

Millbase Procedure:

- Premix DisperBYK 163 dispersant, Xylene, and PGMEA together.
- Post-add carbon black to the above under good agitation and soak for 5 minutes.
- Add Beckosol resin to the premix under good agitation.
- Mix for another 5 minutes at 4,000 RPM.
- Re-circulate through Eiger Horizontal mill at 10 m/s tip speed.
- Discharge then measure millbase viscosity.

Millbase Constants	
Carbon black loading, (%)	7.50
Total solids, (%)	31.00
Pigment/Dispersant ratio	1.00/0.30

Masterbatch Letdown		
Product Name	Description	Amount (%)
Beckosol 12-054	Resin	63.84
Xylene	Solvent	19.31
Cymel™ 325	Resin	11.38
BYK-346	Wetting Agent	0.61
PGMEA	Solvent	4.86
Total		100.00

Masterbatch Letdown Procedure:

- Premix Cymel 325 resin and BYK-346 wetting agent together.
- Post-add the premix slowly and mix together under good agitation then mix for another 15 minutes.
- Discharge then proceed to finish formulation.

Masterbatch Letdown Constants	
Total solids, (%)	42.69

Finish Formulation	
Component	Amount (%)
Masterbatch letdown	82.27
Millbase	17.73
Total	100.00

Finish Formulation Procedure:

- Add the millbase to the masterbatch letdown under good agitation.
- Mix for 20 minutes then discharge.

Application Procedure:

- Cast out the film on cold roll steel and BYKO™ chart using .002 inch cast out bar.
- Air dry for 10 minutes at room temperature.
- Cure at 60 °C for 10 minutes.
- Cast on a clear coat using .005 cast out bar.
- Air dry for 10 minutes at room temperature follow by 138 °C for 30 minutes.

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