CABOT

SPECIALTY CARBON BLACKS

APPLICATION GUIDE

HIGH COLOR BLACKS
FOR POLYESTER CAB BLEND COATINGS

ELECTRONICS COATINGS

AUTOMOTIVE REFINISH

Application description

Polyester and cellulose acetate butyrate (CAB) resin blends offer rapid drying at a wide temperature range with excellent color performance and exceptional film forming properties. These polyester and CAB resin blends are often used in formulations that are air dried at room temperature, including automotive refinish applications.

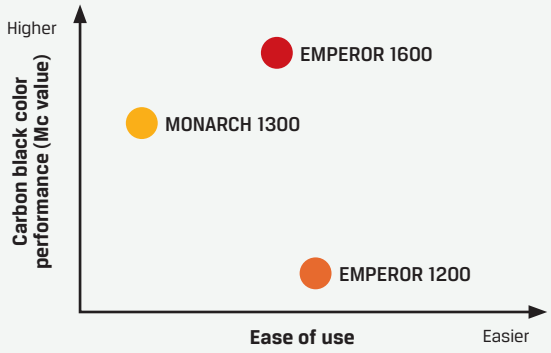
High color blacks are typically used in these high end coatings because they offer excellent color performance. Selecting the appropriate high color carbon black enables the formulator to achieve excellent masstone jetness and blue undertone in the final film.

CABOT PRODUCT OFFERING

Carbon black product	Jetness	Typical surface area (N_2SA) 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. Surface treated for ease of dispersion.
MONARCH® 1300		560	100	A high jetness oxidized carbon black for a wide range of polar and nonpolar coatings formulations.
EMPEROR 1200	Lowest	N/A Surface treated	N/A Surface treated	Extremely easy to disperse in solvent-based formulations due to surface treatment, with good blue undertone.

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 dispersion ease and formulation stability.

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, type of milling equipment required and compatibility with other formulation components determine the ease of use of a carbon black.

*We also offer two products designed for waterbased formulations, **EMPEROR 2000** and **EMPEROR 1800** carbon blacks. Contact your Cabot representative for more information.*

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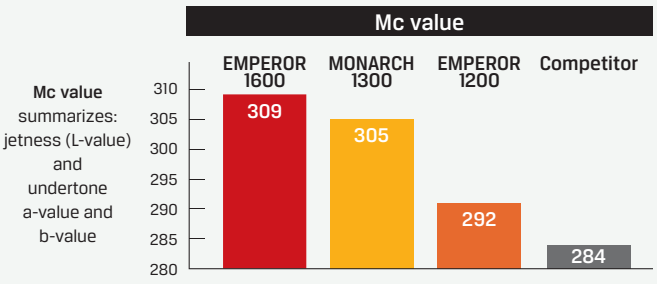
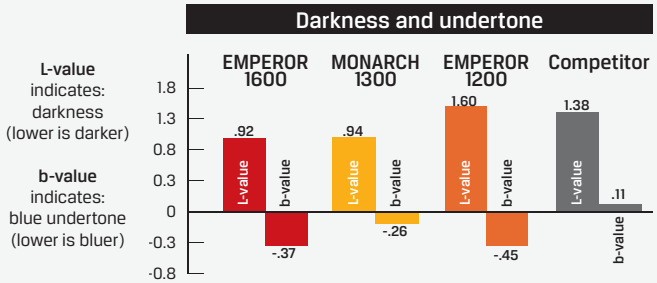
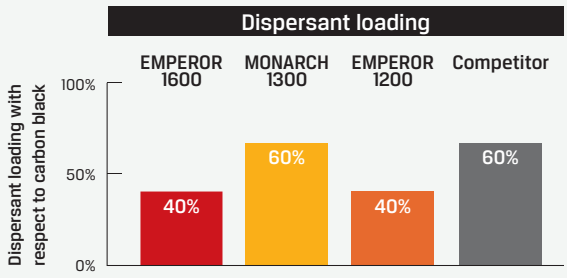
PRODUCT PERFORMANCE

Color performance of carbon black products

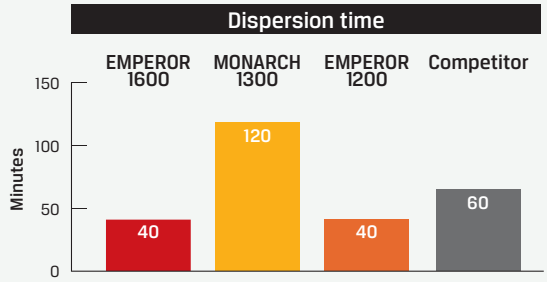




Ease of use of carbon black products



EMPEROR 1600 and 1200 carbon blacks use up to 33% less dispersant than the competitive grade to achieve optimal color performance.



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

The Mc value and darkness and undertone data below 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 (%)
Setal™ 189SS65	Resin	30.77
Efka™ PX4310	Dispersant	8.00
Butyl acetate	Solvent	25.61
PGMEA	Solvent	25.62
Carbon black	Pigment	10.00
Total		**100.00**

Millbase procedure:

- Premix Efka PX4310 dispersant, Butyl acetate, and PGMEA together.
- Post-add carbon black to mixture under good agitation and soak for 5 minutes.
- Add Setal 189SS65 resin to the above under good agitation.
- Mix for another 5 minutes at 4,000 RPM.
- Re-circulate through Eiger mill at 10 m/s tip speed.
- Discharge then measure millbase viscosity.

Millbase constants

Carbon black loading, (%)	10.0
Total solids, (%)	34.00
Pigment/dispersant ratio	1.00/0.40

Masterbatch letdown

Product name	Description	Amount (%)
Setal 189SS65	Resin	48.11
CAB551-0.01 (30% Butyl Acetate)	Resin	29.88
Cymel™ 325	Resin	2.79
BYK®-346	Wetting agent	0.45
Butyl acetate/PGMEA	Solvent	18.77
Total		**100.00**

Masterbatch letdown procedure:

- Premix CAB, Cymel 325 resin, BYK346 wetting agent, solvent blend together.
- Post-add the premix slowly into the Setal 189SS65 resin 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	89.5
Millbase	10.5
Total	**100.00**

Finish formulation procedure:

- Post 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 .003 inch cast out bar.
- Air dry for 10 minutes at room temperature.
- Cure at 66 °C for 10 minutes.
- Cast on the clear coat using .005 inch cast out bar.
- Air dry for 24 hours at room temperature.
- Measure hiding and color performance.

CABOT

cabotcorp.com

Technical Support
North America: +1 800 462 2313
South America: +55 11 2144 6400
Europe: +371 6705 0700
Asia Pacific: +86 21 5175 8800