CABOT

SPECIALTY CARBON BLACKS

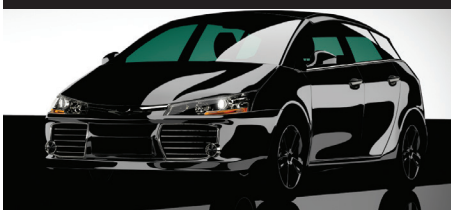
APPLICATION GUIDE

HIGH COLOR BLACKS
FOR ACRYLIC POLYESTER BLEND COATINGS

WOOD COATINGS

ELECTRONIC COATINGS

AUTOMOTIVE BASECOATS



Application description

Formulators of premium coatings demand excellent aesthetic performance and durability. A common approach to achieving this combination of durability and aesthetic performance is through the use of resin blends. Polyester is an excellent grinding resin, enabling the use of high color pigments, and acrylic offers excellent exterior durability. Blending the two resins together provide formulators with the opportunity to leverage the strengths of both resins.

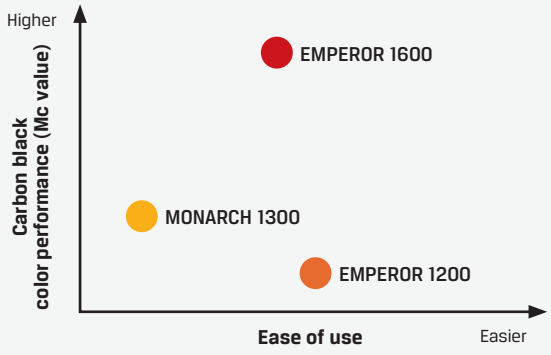
Our high color blacks can provide excellent color performance in these high end coatings. The selection of the appropriate high color black enables excellent masstone jetness and blue undertone of the final film.

CABOT PRODUCT OFFERING

Carbon black products	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	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 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 coatings components determine the ease of use of a carbon black.

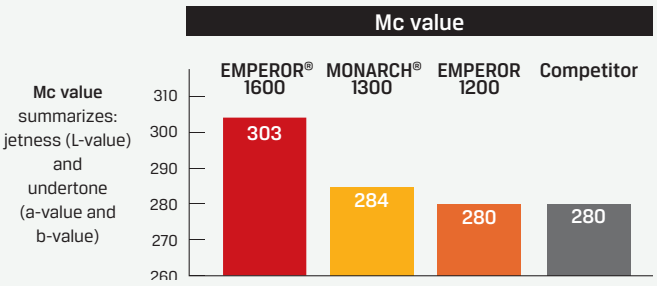
*We also offer two products designed for water-based formulations, **EMPEROR 2000** and **EMPEROR 1800** carbon blacks. Contact your Cabot representative for more information.*

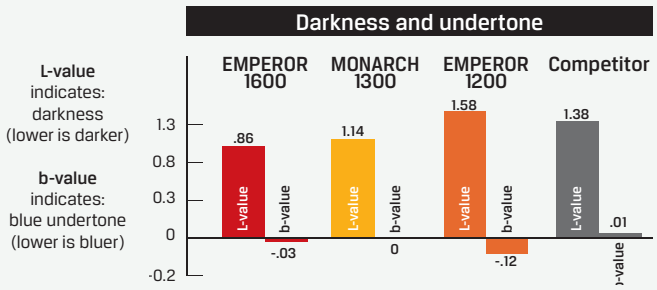
HIGH COLOR BLACKS
FOR ACRYLIC POLYESTER BLEND COATINGS

APPLICATION GUIDE

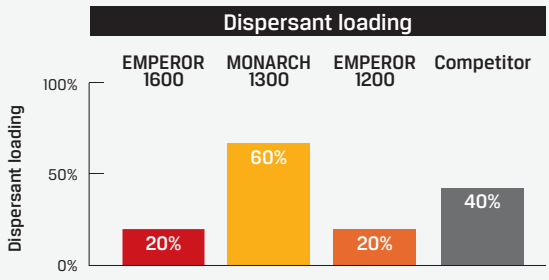
PRODUCT PERFORMANCE

Color performance of carbon blacks

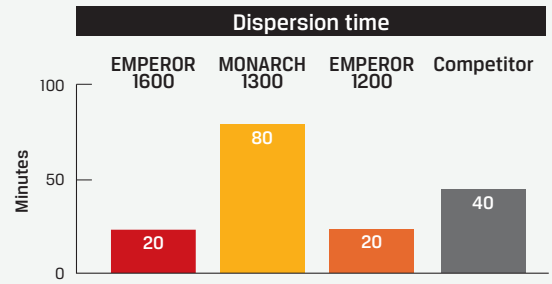




Ease of use of carbon blacks



EMPEROR 1600 and 1200 carbon blacks required 50% less dispersant than the leading competitive grade to achieve optimal color performance in a model formulation.



Measured as the amount of time required to disperse the pigment to its best 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™ 1715VX74	Resin	40.5
Zephrym® PD7000	Dispersant	3.0
Butyl acetate	Solvent	20.75
PGMEA	Solvent	20.75
Carbon black	Pigment	15
Total		**100.00**

Masterbatch letdown

Product name	Description	Amount (%)
Setalux™ 1184SS51	Resin	18.27
Setal 1715VX74	Resin	50.25
Cymel™ 325	Resin	20.27
BYK®-346	Wetting agent	0.83
Butyl acetate/PGMEA	Solvent	10.38
Total		**100.00**

Finish formulation

Component	Amount (%)
Masterbatch letdown	92.15
Millbase	7.85
Total	**100.00**

Millbase procedure:

- Premix Zephrym PD7000 dispersant, Butyl acetate, and PGMEA together.
- Post-add carbon black to mixture under good agitation and soak for 5 minutes.
- Add Setal 1715VX74 resin to the above under good agitation.
- Mix for another 5 minutes at 4,000 RPM.
- Re-circulate through Eiger Horizontal mill at 10 m/s tips peed.
- Discharge then measure millbase viscosity.

Masterbatch letdown procedure:

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

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 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 inch cast out bar.
- Air dry for 10 minutes at room temperature follow by 138 °C for 30 minutes.

Millbase constants

Carbon black loading,%	15.0
Total solids, %	47.97
Pigment/dispersant ratio	1.00/0.20

Masterbatch letdown constants

Total solids, %	63.13

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