



**ECOLAR 50 POWDER -
OUR NEW SPECIALTY CARBON BLACK
FOR COATING SYSTEMS BASED ON
PURE BIO- CIRCULAR FEEDSTOCK**

Technical Information 1491

INTRODUCTION

Orion S.A. (Orion) is a leading global manufacturer of specialty carbon blacks for various applications. Production sites and applied technology centers are located in all regions of the world.

Our market is observing an increasing demand for sustainable products in various industries.

Nowadays the “ecologic” aspect due to higher public awareness and the shrinking fossil resources causes a revival of interest in these raw materials.

Orion has developed a specialty carbon black based on bio-circular feedstock that is not in competition with the food chain but with origin as a side product from other industries.

ECOLAR 50 POWDER provides 100% biogenic content proven by ^{14}C analysis and is a groundbreaking approach to deliver sustainable solutions for coating applications to our customers.

Environmentally friendly solutions have always been the focus of the coatings industry. Good examples are the development of water-borne systems or the usage of powder coatings instead of the classical solvent-borne systems. Although these are steps in the right direction for environmentally friendly formulations, it does not meet the needs of sustainability. ECOLAR 50 POWDER allows formulators of coatings to develop truly sustainable products in all different kinds of coating applications. The coloristic properties of ECOLAR 50 POWDER provide medium jetness in mass tone applications and good tinting strength.

ADVANTAGES OF ECOLAR 50

ECOLAR 50 POWDER offers a broad range of compatibility to commonly used coatings systems. It supports customers formulating more sustainable coatings and shows comparable application properties to regularly produced specialty carbon blacks.

Advantages at a glance:

- Based completely on bio-circular feedstock not in competition with the food chain.
- Bio-renewable content 100% (^{14}C - analysis available).
- Low PAH level.
- Broad compatibility with commonly used coating systems.
- Application properties meet the high requirements of currently used specialty carbon blacks.



COLORIMETRIC PERFORMANCE OF ECOLAR 50 POWDER

It is well-known that coloristic performance strongly depends on the binder system and the overall formulation. Therefore, we have evaluated ECOLAR 50 POWDER in two of our standard formulations in comparison to a selection of our most commonly used and regularly produced specialty carbon blacks for tinting applications.

1. ECOLAR 50 POWDER in solvent-borne alkyd/melamine stoving enamel system

The colorimetric properties of ECOLAR 50 POWDER in mass tone were tested at a total specialty carbon black concentration of 2.2% in a solvent-borne alkyd/melamine stoving enamel system. The formulation for the mass tone is given in table 1.

Table 1

Solvent-borne alkyd/melamine stoving enamel system formulation

MILLBASE		LETDOWN	
Setal® F 310 SN, 60% (Allnex)	50.8 g	Millbase	2.9 g
Shellsol® (Kremer)	17.0 g	Setal® F 310 SN, 60% (Allnex)	8.4 g
Carbon black	12.2 g	Maprenal® MF 800/55IB, 55% (Preferre Resins)	4.8 g
Total	80.0 g	EB-Thinner	3.9 g
Carbon black concentration	15.3%	Total	20.0 g
Carbon black concentration on binder solid	40%	Carbon black concentration	2.2%

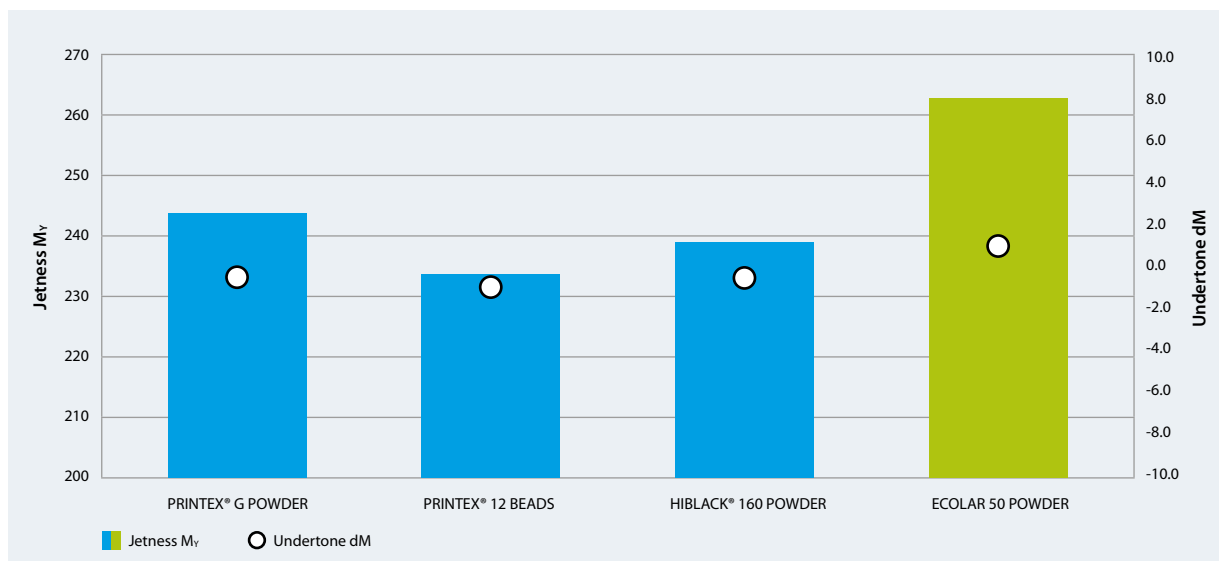
To check coloristic properties in mass tone, we apply in our lab coatings regularly on glass plates and measure through glass. Doing so, we can avoid having influences of surface appearance and clear coats being applied on the coating.

In figure 1 we see that ECOLAR 50 POWDER achieves a medium jetness on a higher level compared to the other tested regular specialty carbon blacks with a comparable neutral undertone.



Figure 1

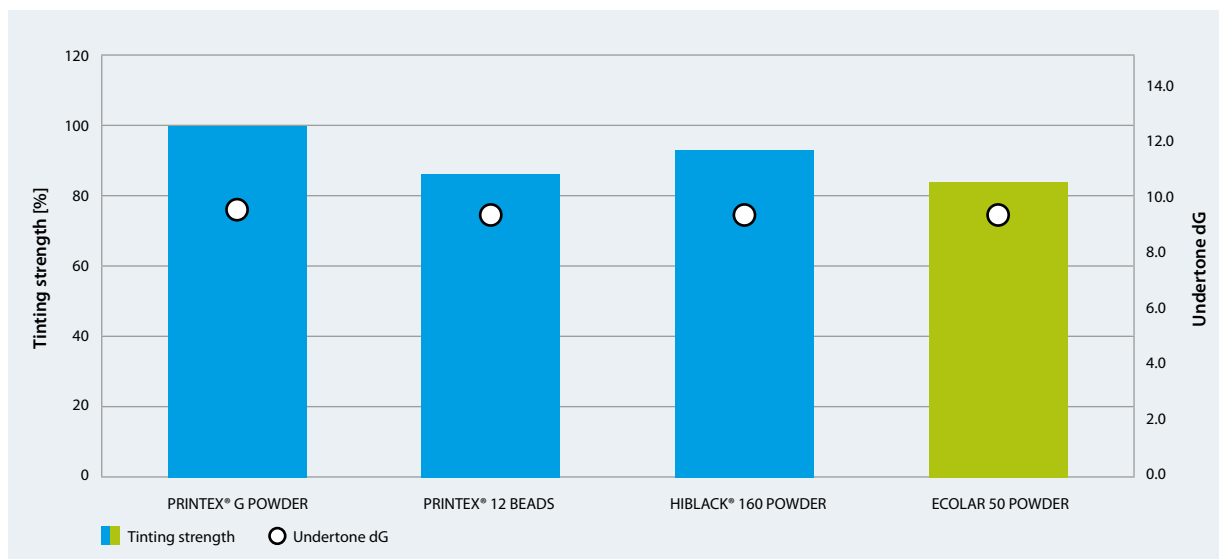
Blackness and undertone through glass in the solvent-borne alkyd/melamine stoving enamel system, with 2.2% carbon black concentration



For evaluation of coloristic performance in grey coatings the specialty carbon blacks have been mixed with titanium dioxide in a ratio of 100 : 5 (TiO_2 : CB). After application on glass plates the tinting strength and the undertone of the coatings were measured on the paint side. Figure 2 shows that ECOLAR 50 POWDER achieves comparable good tinting strength to the other regularly produced non-after treated specialty carbon blacks in combination with a comparable bluish undertone in grey.

Figure 2

Tinting strength and undertone in the solvent-borne alkyd/melamine stoving enamel system, grey coating



2. ECOLAR 50 POWDER in water-borne 1K PU coating system

The colorimetric properties of ECOLAR 50 POWDER in mass tone were also tested in a water-borne 1K PU coating system. The specialty carbon blacks were dispersed in a binder free mill base and let down at a total specialty carbon black concentration of 1.5% in in the final formulation. The formulation for the mass tone is given in table 2.



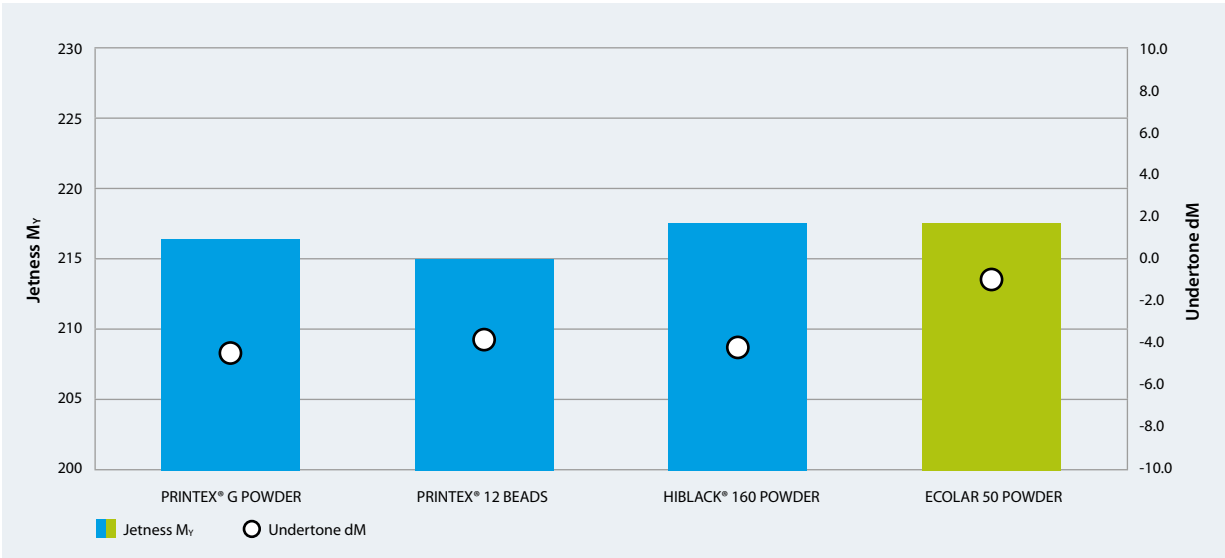
Table 2
Water-borne 1K PU coating system formulation

MILLBASE	
Demin.-Water	48.4 g
TEGO® Dispers 760W, 35% (Evonik)	20.8 g
TEGO® FOAMEX 830 (Evonik)	0.3 g
DMEA	0.1 g
Carbon black	10.4 g
Total	80.0 g
Carbon black concentration	13%
Dipersant solid on carbon black	70%

LETDOWN	
Millbase	2.3 g
1K PUR clearcoat	17.7 g
Total	20.0 g
Carbon black concentration	1,5%

Figure 3 shows that ECOLAR 50 POWDER achieves a jetness comparable to the other tested regular specialty carbon blacks with a more neutral undertone.

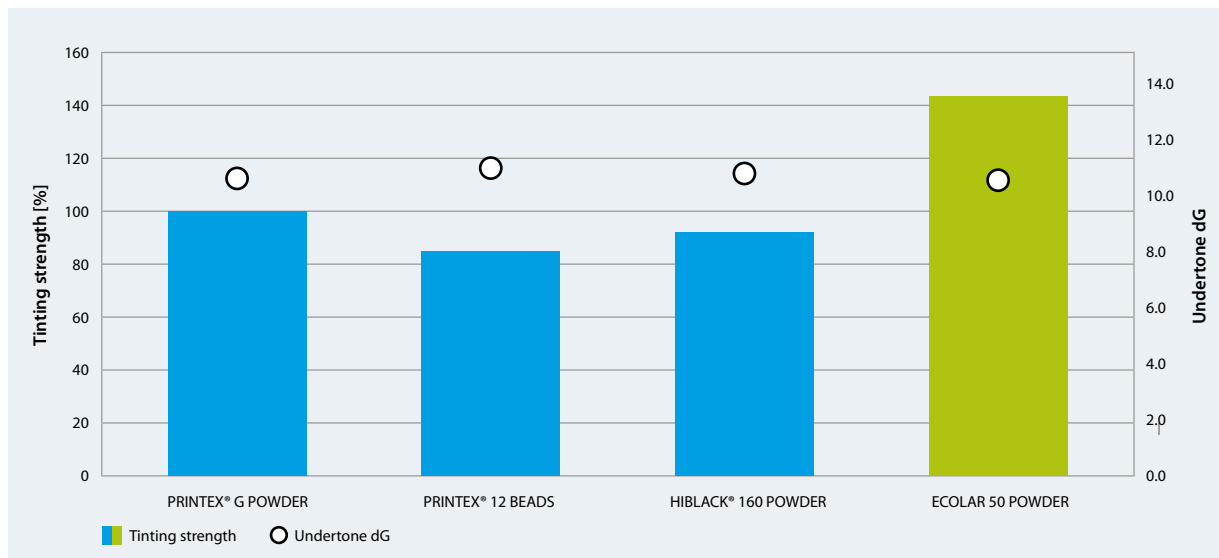
Figure 3
Blackness and undertone through glass, with 1.5% carbon black concentration in the water-borne 1K PU coating system



For evaluation of coloristic performance in the grey water-borne coating the specialty carbon blacks have been mixed with titanium dioxide in a ratio of 100 : 5 (TiO₂ : CB). Figure 4 shows that ECOLAR 50 POWDER achieves higher tinting strength compared to the other regularly produced non-after treated specialty carbon blacks in combination with a comparable bluish undertone in grey.

Figure 4

Tinting strength and undertone in the water-borne 1K PU coating system, grey coating



SUMMARY

With ECOLAR 50 POWDER, Orion offers a low to medium color furnace black to the coatings industry that helps formulating sustainable formulations. It is completely based on bio-circular feedstock not in competition with the food chain. Compared to traditionally produced low color furnace blacks it shows comparable wetting and dispersion properties and provides comparable coloristic performance for both full-tone and tinting applications. Start stepping into a more sustainable future by ordering a sample from your contacts at Orion today.



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