

# Specialty carbon black for food packaging approved corrugated cardboard printing inks

Technical Information 1473



## Introduction

The safety of food is vital to all consumers and regulations governing the actual food products and packaging materials are well established and enforced. However, it was only in the last 20 years that any regulations relating to carbon black pigments used for food packaging were issued – and initially only for plastics.

In the printing ink market, in the past, we have seen a very high growth rate for printed products for convenience foods and especially for the flexible packaging. Although this is good news for the printing ink manufacturers, more and more are aware that some of the components of their inks are not suitable for food packaging. Due to this many ink manufacturers are working on special ink formulations suitable for food packaging.

Due to a broader view on the complete process chain of food packaging, these investigations are nowadays also moving towards absorptive, corrugated substrate applications where dominantly water based printing inks are utilized. This does require the availability of technically suitable carbon black pigments to support this trend.

Orion Engineered Carbons produces specialty carbon black by means of several process technologies: Furnace black, gas black according to the Degussa gas black process, lamp black and thermal black processes. With our technical capabilities and expertise, we are able to provide the market with functional specialty carbon black having suitable chemical and physical properties. We can offer several furnace black products which are particularly recommended for indirect contact for food packaging because they are fulfilling the requirements of relevant regulations.

## Product recommendation

Figure 1

Product recommendations for water based flexo inks for food packaging applications:

Recommended SCB Ink key properties	PRINTEX® 3 powder	PRINTEX® 30 powder	PRINTEX® zeta A	PRINTEX® 60 powder/beads	PRINTEX® Nature powder/beads
Good holdout	++	+	+	++	+
High jetness	+	+	+	++	+
High pigment loading	+	++	++	+	++
Powder grades for easier dispersion	•	•		•	•
Beaded grades for improved handling			•	•	•
Food packaging compliance <sup>1</sup>	•	•	•	•	•
Made from renewable raw material					•

++ very effective + effective • applicable

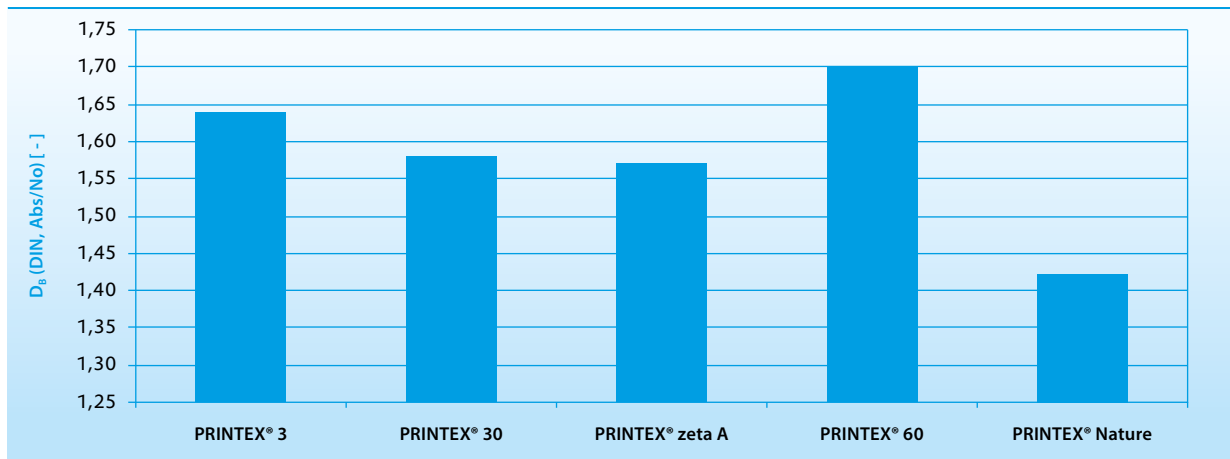
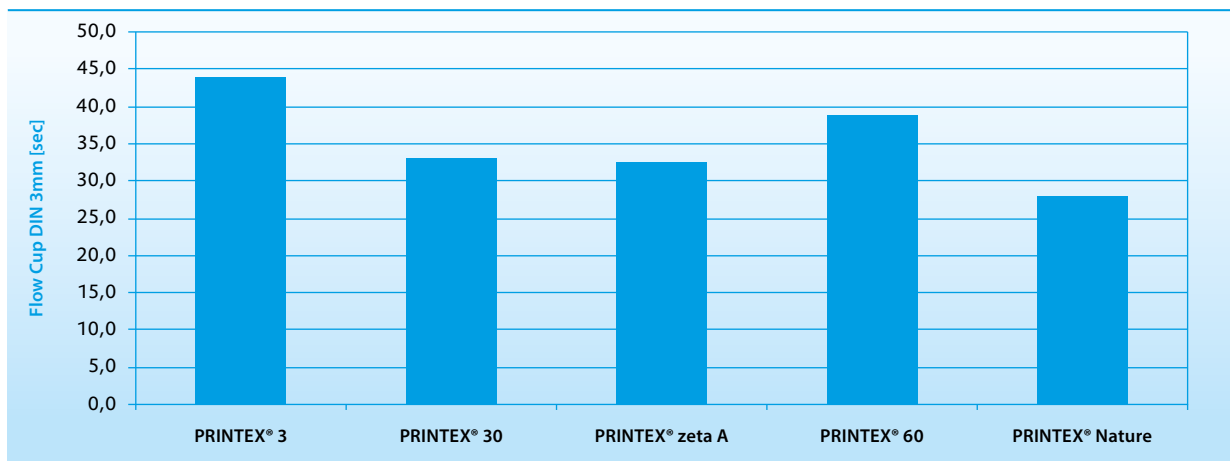
<sup>1</sup> Recommended for indirect food contact. Our mentioned products are in compliance with the regulations given in chapter regulatory compliance and quality standards. Additional product safety information documents for all products are available on request.

The range of corrugated and uncoated paper substrates does require specialty carbon black that provide a good holdout, to avoid a too strong penetration of the printing ink into the pores of the printing substrate. Orion Engineered Carbons is offering several products that are suitable due to their tailored particle morphology in form of relatively large aggregates of medium sized primary particles. Out of this range, the most suitable product for the particular needs and formulation conditions of the ink maker should be selected, by prioritizing the following key properties of the various recommended products:

In general, beaded products are preferable for easier handling and a dust free processing. Powder grades have the benefit of an easier dispersion.

- PRINTEX® 3 should be used for an excellent holdout.
- PRINTEX® 30 does have a lower impact on the viscosity and could enable higher pigment loadings in the milling base.
- PRINTEX® zeta A is combining the benefits of PRINTEX® 30 with the dust free handling of a beaded product.
- PRINTEX® 60 should be used to achieve highest jetness levels.
- PRINTEX® Nature does have the unique property of being made from renewable plant oil. Therefore it should be the first choice for manufacturing of sustainable inks that consists mainly out of renewable raw materials.

An application test comparison of the various grades is shown in figures 2 and 3. A comparison regarding their analytical figures is shown in figure 4.

**Figure 2****Optical density of 6 µm drawdowns on absorptive substrates:****Figure 3****Viscosity comparison with 3 mm flow cup:****Figure 4****Typical values of the recommended specialty carbon black:**

Parameter	Method	Unit	PRINTEX® 3 powder	PRINTEX® 30 powder	PRINTEX® zeta A	PRINTEX® 60 powder/beads	PRINTEX® Nature powder/beads
BET Surface area	ASTM D 6556	m <sup>2</sup> /g	80	80	77	115	90
OAN*	ASTM D 2414	ml/100g	128	108	99	118/102	68
Blackness value	DIN 55979	M <sub>v</sub>	239	240	239	244	235
Volatile matters at 950°C	DIN 53552	%	0.9	0.7	0.7	1/0.5	0.9
pH value	ISO 787-9		9.5	9.5	9	10	9

\* Oil absorption number

## Regulatory compliance and quality standards

The mentioned specialty carbon black from Orion Engineered Carbons comply with most global regulatory requirements including EFSA, CONEG, REACH, EUPIA guideline, Avis Seance etc. Rigorous quality standards are followed during the production, handling and storage of these grades to ensure that the product consistently meets the requirements for printing applications. The products are supported by an extensive and competent sales, technical and customer support staff around the world.

Further information concerning food packaging could be found in our Technical Information 1453. Additional product safety information documents are available for each particular product. Please contact us in case you require this info and if you need to verify the compliance with specific regulations.

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