



PIGMENTS & DISPERSIONS

Chris Twigg, Ad van Oorschot MBA and Patricia Geelen PhD, Black Bear Carbon, discuss the company's breakthrough technology to 'upcycle' carbon black, oil and gas from waste tyres

New breakthrough in ink raw materials: the sustainably produced carbon black pigment range, NEPtune, is ultra-dispersible

Worldwide, approximately 14Mt of carbon black is produced each year, causing emissions of 35-40Mt CO₂. Approximately 60% of carbon black is used in tyres. Globally about 1-1.5bn waste tyres are dumped, landfilled or burned and with them around 4.5Mt of carbon black is wasted. Black Bear has developed breakthrough technology to 'upcycle' carbon black, oil and gas from waste tyres at consistent, high quality for many applications in coatings, plastics, rubbers, tyres and inks. For various ink applications Black Bear manufactures two grades: NEPtune i120 and NEPtune i100.

■ ULTRA-DISPERSIBLE

The NEPtune (Net Energy Positive) pigments are ultra-dispersible in aqueous- and solvent-based systems, while maintaining good stability. The two grades, NEPtune i120 (highest jetness/optical density) and NEPtune i100 (medium optical density) need very low amounts of dispersant and economic formulations are possible in waterborne ink. The pigments are pre-milled to achieve easy and low-energy dispersion properties. Due to the hyper-dispersible form NEPtune i120 and NEPtune i100 are easy to handle and provide for Newtonian viscosity behaviour in both solventborne and waterborne systems.

NEPtune i120 and NEPtune i100 are able to replace furnace and gas black grades one-to-one. The colouristic behaviour of the pigments is comparable with standard/ medium colour furnace- and gas-black grades. The Black Bear pigments are suitable for various ink applications with high gloss, low viscosity/ high loadings applications and require no or

only limited formulation changes. Black Bear guarantees consistent colour performance through strict quality control at every step of the process. Carefully pre-selected feedstock and fully automated, state-of-the-art production facilities create high quality pigments to precise specifications.



■ CRADLE-TO-CRADLE LIFE CYCLE

Creating a turning point in current Black Carbon thinking, NEPtune i120 and NEPtune i100 contribute to sustainable Inks manufacturing. Black Bear 'de-constructs' end-of-life tyres into upcycled carbon black. The process produces 40% carbonaceous char and 60% volatiles; condensable oil (around 80%) and non-condensable gas (around 20%). The latter supplies the process directly through producing green electricity. Black Bear's responsible value chain creates a Cradle-to-Cradle life cycle providing for the most sustainable solution for carbon black pigment, having an enormous positive environmental impact on the CO₂ footprint of manufacturers.

As well as being the easiest dispersible carbon black pigments, NEPtune i120 and NEPtune i100 also present unique improvements in carbon black safety. The mentioned hyper-

Vital statistics of NEPtune i120 and NEPtune i100

Property	Unit	NEPtune i120	NEPtune i100
BET	m ² /g	84-88	76-80
STSA	m ² /g	68-70	62-64
OAN	cm ³ /100g	84-88	78-82
Mean primary particle size	nm	30-35	33-38
SiO ₂ content	%	5-7	24-26
PAH content (according to FDA method 63)	ppm	< 5	< 5



dispersible form creates very low dusting making handling much easier and cleaner. At the same time no toxic ingredients are used or added during the process cycle, contributing to an extremely low PAH content (<5ppm) – the lowest in the market!

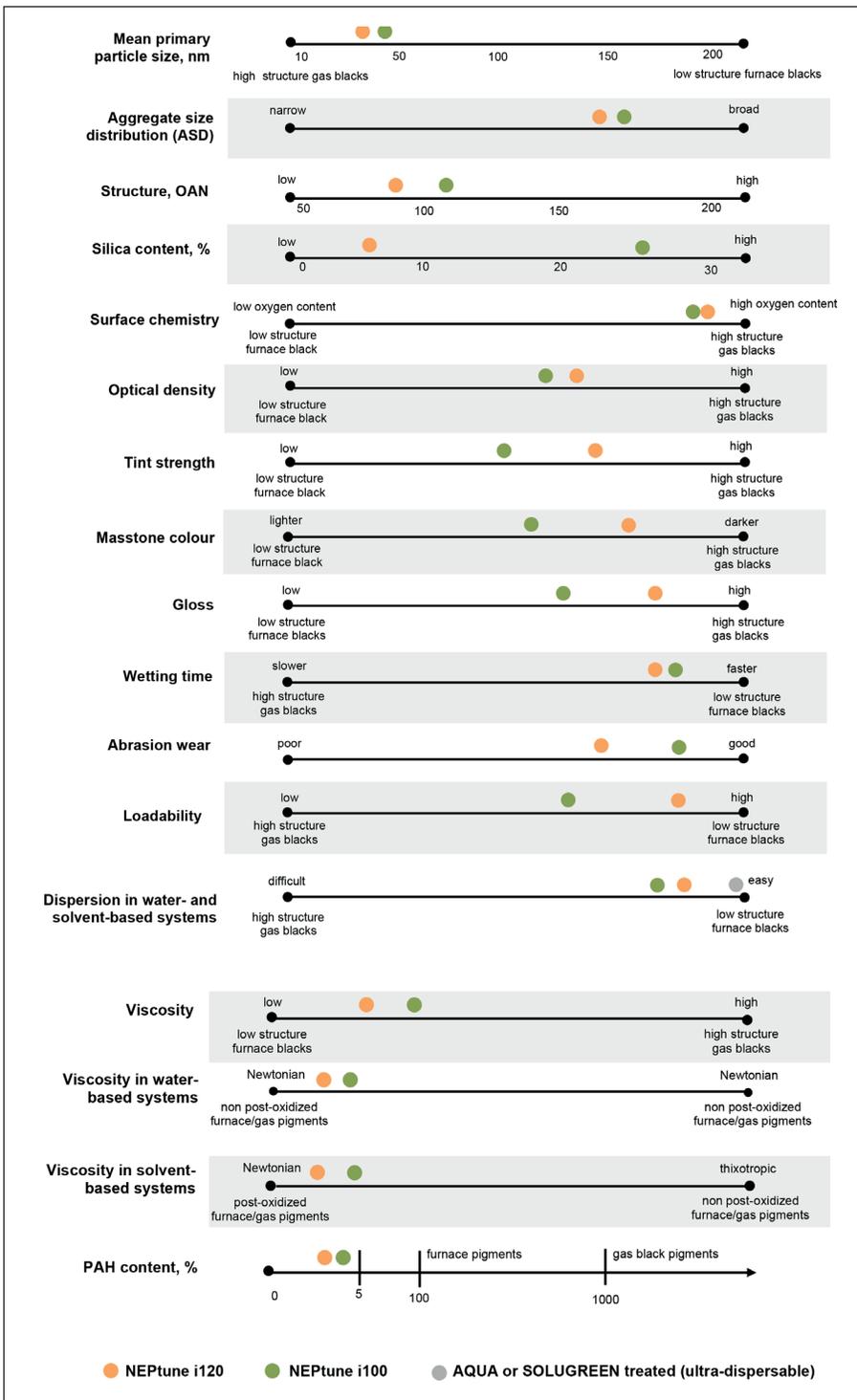
GREEN CARBON BLACK MANUFACTURER

Black Bear Carbon (BBC) is a green, sustainable carbon black manufacturer. The Dutch technology company was founded in 2010 by two experienced visionaries with significant experience in the waste management industry. They came up with the idea of producing high quality CB, oil and gas from shredded ELT instead of retracting oil only. Black Bear started developing the process in 2011, testing and improving the process steps from 2011 to 2015 and has now opened its first plant, developed in partnership with a large Dutch tyre collector.

Compared to the conventional ‘furnace black’ process the Black Bear process reduces CO₂ emissions by about five tons for each ton of Black Bear CB produced. This means that even if Black Bear, as a young, innovative organisation in a conservative industry, substitutes only 5% of furnace CBs with its products global CO₂ emissions can be reduced by around 3Mt/yr. This is why Black Bear adds value from both a technical and environmental perspective.

Black Bear targets the specialities (coatings, inks and plastics), technical rubber goods and tyre market segments using its green label combined with high product quality as a competitive advantage.

Managed by a team of experienced entrepreneurs, with relevant backgrounds in rubber, chemical engineering, construction, sales and marketing and finance, Black Bear chooses to change the industry with breakthrough technology and with passionate people; because the company truly believes that if there will be no action, the world will be left with an even bigger global environmental problem.



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