

PET BLACK MASTERBATCH for Blow Molding

Nano Carbon Black Masterbatch for PET Bottles, Containers & Thermoformed Packaging

FDA-compliant, dye-free and non-migrating jet-black color solutions engineered for PET packaging. From transparent smoke-grey to high-gloss optical black, our nano carbon black masterbatches deliver premium aesthetics, long-term chemical resistance and full compatibility with food-contact and personal-care applications.

FDA Compliant

Dye-Free
Non-Migrating

300 nm
Nano Particle

pH 3–9
Chemical Resist.



Dongguan Denson New Materials Co., Ltd. · Dongguan Henvastness Import & Export Co., Ltd.

Product Portfolio

Two complementary grades cover the full spectrum of black PET packaging — from translucent smoke-grey tinting to deep, high-gloss optical black. Both are based on nano-scale furnace carbon black dispersed in a PET-compatible carrier, are free of acid dyes and heavy metals, and are suitable for direct food-contact applications.



PET-1000 — Nano Carbon Black Masterbatch

Transparent / translucent smoke-grey tint for PET bottles and film

FDA COMPLIANT · FOOD-CONTACT GRADE

- **High transparency** — delivers a uniform smoke-grey tint while preserving light transmission
- **Acid-dye-free** — eliminates dye migration and plate-out on molds and preforms
- **Weather-resistant** — stable outdoors; no fading or chalk-out under UV exposure
- **Versatile processing** — blow molding, injection molding, blown film and fiber spinning
- **Recommended dosage:** 4% let-down ratio (LDR)



PET-5000 — Blow Molding Carbon Black Masterbatch

Deep optical black with premium gloss for cosmetic and personal-care PET

FDA COMPLIANT · 300 nm NANO BLACK

- **300 nm ultra-fine particle size** — maximum jetness (My) with blue undertone
- **Superior blackness & gloss** — high-gloss, mirror-like finish for premium shelf appeal
- **Dye-free, anti-migration** — no bloom, no rub-off, no staining of contents or closures
- **Solvent & chemical resistant** — stable against alcohol, oils and surfactants
- **Recommended dosage:** 4% let-down ratio (LDR)

Technical Comparison

Property	PET-1000	PET-5000
Appearance	Black pellets	Black pellets
Carbon black grade	Nano furnace black	Nano furnace black, 300 nm
Optical character	Translucent smoke-grey	High-opacity jet black
Carrier resin	PET-compatible polymer	PET-compatible polymer
Dye content	None (dye-free)	None (dye-free)
Migration / plate-out	None	None
Recommended LDR	4%	4%
Typical processes	Blow molding, injection, blown film, fiber	ISBM / EBM blow molding, injection
Food-contact status	FDA compliant	FDA compliant

Performance & Regulatory Compliance

PET black masterbatch is not merely a colorant — it is a functional component of the packaging system. Our grades are engineered to remain stable across the full PET conversion and end-use environment, protecting both the package and its contents.

Dye-Free & Non-Migrating

Formulated with pigment-only coloration. No acid dyes means no migration into contents, no plate-out on preforms or molds, and no surface bloom over shelf life.

n-Hexane & Oil Resistance

Withstands fatty and oily contents including edible oils, essential oils and lipid-based cosmetics without color bleed or loss of blackness.

No Exudate / Precipitation

The carrier and dispersant package is fully bound in the PET matrix; no specks, streaks or deposits appear during processing or after filling.

Long-Term Alcohol Resistance

Stable in prolonged contact with ethanol-based products — sanitizers, perfumes, colognes and alcohol-containing personal-care formulations.

Acid & Alkali Resistance (pH 3–9)

Performs across acidic beverages (pH 3) through alkaline cleaners and soaps (pH 9), covering the complete personal-care and household-chemical range.

Weather & UV Resistance

Carbon black itself provides inherent UV screening, extending the shelf life of light-sensitive contents while maintaining color outdoors.

Regulatory Compliance

Both grades are formulated to meet the regulatory requirements of major global markets. They contain no azo dyes, no heavy-metal pigments (cadmium, lead, mercury, chromium VI) and are suitable for food-contact applications under the following frameworks:

USA — FDA	Compliant with FDA 21 CFR regulations for food-contact packaging materials.
European Union	Suitable for food contact under EU Regulation 10/2011 (plastic food-contact materials).
EU REACH	Free of SVHC candidate-list substances above 0.1% thresholds.
RoHS	Compliant with the Restriction of Hazardous Substances directive.
Heavy-metal free	No cadmium, lead, mercury or chromium(VI) pigments.
Azo-dye free	No banned azo colorants that could release carcinogenic amines.

Applications — Packaging & Market Segments

From a packaging-engineering perspective, black PET serves three functions simultaneously: **brand aesthetics** (premium, high-gloss appearance), **light protection** (UV and visible-light blocking for photosensitive contents), and **regulatory assurance** (non-migrating, food-contact-safe colorant). The following segments represent the principal applications across global brand owners and contract packers.

Food & Beverage

- Carbonated soft drink (CSD) bottles and multi-serve containers
- Still and sparkling water bottles, including premium black-label brands
- Juice, cold-brew coffee, tea and energy-drink bottles
- Edible oil, vinegar, soy sauce and culinary-oil bottles (oil-resistant)
- Beer and cider bottles — full UV block prevents light-struck (skunky) flavor
- Sauces, dressings, condiments and nutraceutical shot bottles (acidic, pH 3–4)

Carbon black blocks UV and visible light, preventing photo-oxidation of oils, light-struck off-notes in beer, and vitamin degradation in juice.

Personal Care & Cosmetics

- Shampoo, conditioner and body-wash bottles (surfactant- and alcohol-resistant)
- Shower gel, liquid soap and hand-sanitizer bottles
- Lotion, cream and serum pump bottles and jars
- Perfume, cologne, eau de toilette and room-spray bottles (long-term alcohol contact)
- Hair-color, styling-product and men's grooming containers
- Cosmetic jars, compact cases and closure systems

PET-5000's high-gloss jet black and blue undertone deliver the premium, masculine or luxury aesthetic demanded by fragrance and men's-grooming brands.

Household, Industrial & Chemical

- Laundry detergent, fabric softener and hard-surface cleaner bottles
- Dishwashing liquid and dishwasher-detergent containers
- Automotive chemicals: windshield fluid, degreasers, additives
- Agrochemicals: fertilizers, pesticides and garden-care bottles
- Lubricants, adhesives and industrial-chemical containers
- Pet-care and veterinary product bottles

Resistance to n-hexane, oils and pH 3–9 chemicals ensures color integrity even with aggressive solvent- and surfactant-based formulations.

Pharmaceutical, Nutraceutical & Light-Sensitive Products

- Prescription and OTC medicine bottles and pill containers
- Nutraceutical, vitamin and supplement bottles
- CBD, essential-oil and aromatherapy bottles (UV-critical)
- Diagnostic and laboratory reagent containers
- Light-sensitive food supplements: fish oil, probiotics, tinctures

Opaque black PET provides a near-total light barrier, extending shelf life of photodegradable actives without an aluminum or EVOH layer.

Engineering & Processing Guide

From a plastics-engineering perspective, a black masterbatch must disperse completely, preserve intrinsic viscosity (IV), avoid nucleation defects, and run cleanly through high-cavity tooling at commercial cycle times. The notes below summarize the key considerations for processors and molders.

Compatible Conversion Processes

Process	Typical Products	Grade
Injection Stretch Blow Molding (ISBM)	CSD, water, juice, personal-care bottles	PET-5000 / PET-1000
Extrusion Blow Molding (EBM)	Multi-serve containers, industrial bottles	PET-5000
Injection Molding	Jars, caps, closures, thick-wall parts	PET-5000 / PET-1000
Sheet Extrusion & Thermoforming	Trays, clamshells, blister packs, cups	PET-1000
Blown / Cast Film	Flexible packaging, labels, lidding film	PET-1000
Fiber Spinning	Industrial fibers, monofilaments, nonwovens	PET-1000

Key Processing Parameters

- **Drying:** Predry masterbatch at 65–80 °C for 4–6 hours (dehumidifying dryer, < 50 ppm moisture) to prevent IV loss via hydrolytic degradation during processing.
- **Let-down ratio:** 4% by weight is the standard starting point. Adjust between 2–6% to target the desired opacity or smoke tint; PET-1000 at lower LDR yields a translucent grey, while PET-5000 at 4% gives full optical black.
- **Melt temperature:** Process within 260–285 °C. Avoid prolonged residence above 290 °C to minimize acetaldehyde (AA) generation and IV drop.
- **Intrinsic viscosity (IV):** The PET-compatible carrier is formulated to minimize IV depression; typical IV loss is < 0.02 dL/g under standard ISBM conditions.
- **Dispersion quality:** 300 nm primary particle size and a high-performance dispersant package ensure low filter-pressure value (FPV), no specking and no filter-screen blockage in high-cavity preform tools.
- **Regrind / rPET compatibility:** Both grades are compatible with bottle-to-bottle regrind and food-grade rPET streams; the carbon black remains fully dispersed through reprocessing without re-agglomeration.

Why Nano Carbon Black Matters

Conventional carbon black masterbatches with micron-scale agglomerates cause specking, filter blockage, reduced gloss and weak spots in thin bottle walls. Our 300 nm nano-grade carbon black is fully de-agglomerated during compounding, yielding:

- Higher jetness (lower My value) at equal loading — deeper black with less pigment
- Higher gloss and distinctness of image (DOI) on the bottle surface
- Finer, more uniform dispersion — fewer gel/speck rejects in thin-wall ISBM bottles
- Better UV screening per unit weight due to higher specific surface area
- Lower filter pressure value (FPV) — longer production runs between screen changes

Sustainability & Recyclability

Black PET has historically faced sortation challenges in NIR (near-infrared) recycling systems because conventional carbon black absorbs NIR signal. Our grades are formulated to support mono-material PET design and are compatible with mechanical recycling streams. For brands targeting recyclability, we recommend discussing NIR-detectable black options with our technical team. The carrier system is free of halogenated compounds and does not interfere with PET depolymerization or wash processes.

Partner with Us

DENSON Functional Materials specializes in high-performance colorants for engineering plastics and packaging. Our in-house R&D team supports customers with color matching, application testing, regulatory documentation and on-site process optimization. We welcome inquiries from brand owners, blow molders, preform injectors and contract packagers worldwide.

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HIGH-PERFORMANCE, ENVIRONMENTALLY FRIENDLY COLORING MATERIALS

Empowering intelligent packaging with quality