

APPLICATION	PRODUCT TYPE	FUNCTIONALITY	PERFORMANCE Optimum Appropriate	BENEFITS
OTHER COMPONENTS Brakes & clutches 	Carbon blacks	Friction modifier & color	BLACK PEARLS/MONARCH 570 BLACK PEARLS/MONARCH 430 BLACK PEARLS/MONARCH 280 BLACK PEARLS/MONARCH 120	Thermal conductivity /Wear resistance: • Friction stability • Heat dissipation • Uniform color • Increased wear resistance (increases life of the friction material) • Improved noise reduction (increases internal porosity of friction material)
Lead acid batteries As electrochemical component of lead acid battery expansion materials 	Carbon blacks	Purify, high conductivity, pigmentation (visual differentiation between panels)	BLACK PEARLS/MONARCH 570 BLACK PEARLS/MONARCH 460 BLACK PEARLS/MONARCH 430 BLACK PEARLS/MONARCH 280 BLACK PEARLS/MONARCH 120 VULCAN XC72R	Battery and energy storage market, benefits of carbon black: • Increase of pigmentation, better contact area (improvement between Pb and electrolyte) and electric conductivity • Low-color carbon blacks for lead acid battery and carbon brush applications, (required: analytical and physical uniformity) • Intense pigmentation for tinting visual differentiation between panels • Conductive or highly conductive blacks for batteries and fuel cells (required: chemical cleanliness)
	CAB-O-SIL additives & CAB-O-SPERSE dispersions	Thickening of gel batteries	CAB-O-SIL M5 CAB-O-SIL M7D CAB-O-SIL HP 60 CAB-O-SPERSE 2012 CAB-O-SPERSE 2020K CAB-O-SPERSE 1030K CAB-O-SPERSE 4012K	Thickening control • Easy incorporation and dispersion • CAB-O-SPERSE dispersions that are KOH stabilized
Electrical brushes	Carbon blacks	Source of carbon in the manufacture of graphitic carbon	BLACK PEARLS 280 CSX 691	Insulation of electrical furnaces • Thickening control • Optimized carbon black dispersion and color
Steering wheel 	Carbon blacks	Pigmentation	ELFTEX 570 ELFTEX 460 ELFTEX 430	
Thermal insulation 	NANOGEI aerogel	Insulation: exhaust, fuel tanks (cryogenic applications)	NANOGEI particles Thermal Wrap™ blanket	• Conductivity, 2-4 times lower than traditional materials • Higher thermal efficiency at the same thickness • Significantly reduced insulation profile • Performance improves under mechanical compression, making it ideal for loadbearing applications • Durability; permanent, completely hydrophobic and won't absorb water like many insulation materials
Tires & industrial rubbers 	Carbon blacks	Reinforcement, conductivity, etc	Large portfolio of grades: BLACK PEARLS, REGAL, REGAL SRF, SPHERON®, STERLING®, VULCAN	• Reinforcement • Abrasion resistance • Other mechanical and physical properties

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Black pigments & additives for automotive materials



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APPLICATION	PRODUCT TYPE	FUNCTIONALITY	PERFORMANCE Optimum Appropriate	BENEFITS
COATINGS EXTERIOR				
Metal pre-treatment	CAB-O-SPERSE® dispersions	Environmentally friendly formulation enhancing corrosion protection	CAB-O-SPERSE 1015A CAB-O-SPERSE 1020K CAB-O-SPERSE 1030K CAB-O-SPERSE 2012A	<ul style="list-style-type: none"> Enhancing adhesion to metal Adhesion promotion metal pre-treatment Surface treatment polishing of metals and optical glass
Primers & underbody coatings	CAB-O-SIL® additives	Rheology control, anti-settling, body build and enhanced corrosion resistance	CAB-O-SIL® CT-1206 CAB-O-SIL® M-5	<ul style="list-style-type: none"> Anti-settling Sag resistance Viscosity control Used for providing high tint strengths/stades Low conductivity Low conductivity to enable charging Rosetivity Color and tint Easy to disperse Highest conductivity carbon black grades High tinting strength
e-Coats (electro-deposition, OEM)	Carbon blacks	UV protection, conductivity & tinting	MONARCH®/BLACK PEARLS® 280 MONARCH 280 MONARCH 120	<ul style="list-style-type: none"> Low conductivity Rosetivity Color and tint Easy to disperse Highest conductivity carbon black grades High tinting strength
Conductive primers	Carbon blacks	Conductivity for primers	VULCAN® XC72 VULCAN XC72R VULCAN XG605	<ul style="list-style-type: none"> High massstone color strength Deep blue undertone and outstanding jetness Excellent dispersability Excellent stability
Waterborne basecoats	Carbon blacks	Jetness & blue tone	EMPEROR® 2000 EMPEROR 1800 MONARCH 1300	<ul style="list-style-type: none"> Deep blue undertone and outstanding jetness Excellent dispersability Excellent stability
	Carbon blacks	Jetness & blue tone	MONARCH 1500 MONARCH 1300	<ul style="list-style-type: none"> Deep blue undertone and outstanding jetness Excellent dispersability Excellent stability
Clear coats	CAB-O-SIL additives	Rheology control & abrasion resistance	CAB-O-SIL TS-530 CAB-O-SIL TS-610 CAB-O-SIL M-5 CAB-O-SIL EH-5 CAB-O-SIL CT-1206	<ul style="list-style-type: none"> High gloss, sag resistance, leveling, rheology control for solvent-borne coatings
Powder coating, Corona charging, fluidization	CAB-O-SIL additives SpectraI® fumed alumina additives	Tribo-charge control, powder flow improvement	CAB-O-SIL CT-1221 CAB-O-SIL CT-1111G CAB-O-SIL TS-530 CAB-O-SIL M-5 CAB-O-SIL H-5 CAB-O-SIL HS-5 CAB-O-SIL EH-51 SpectraI 100	<ul style="list-style-type: none"> CT-1111G has the ability to 'post add' this material (after the grind step) Excellent fluidization in corona charging applications Fumed alumina can be used in both tribo and corona charging applications Anti-caking and stability
Tribo charging (Teflon, nylon tubes)	SpectraI fumed alumina additives	Fluidization (free flow), surface smoothness, stability and transfer efficiency at low %	SpectraI 100	<ul style="list-style-type: none"> Excellent fluidization and tribo-charging in both polyester-TGIC Epoxy-Polyester (level of SpectraI fumed alumina in powder coating formulations is typically 0.1 – 0.3 wt. %) Surface quality, orange peel reduction, anti-caking, gloss and stability
COATINGS INTERIOR				
Dashboard/other components	CAB-O-SIL additives	Rheology control, abrasion resistance, anti-settling, matting effect	CAB-O-SIL TS-382	<ul style="list-style-type: none"> Improved viscosity control & anti-settling thickness and appearance. TS-382 provides good balance between sag resistance, flow and leveling. Allowing control of film thickness and appearance.
	MANOGEL® aerogel	Matting effect	MANOGEL aerogel TLD201	<ul style="list-style-type: none"> Exceptional matting effect for non-shrinking coating systems like 100% UV coatings Other benefits: scratch resistance, resistance to water and corrosion, weatherability, reduced haziness and sedimentation, and increased formulation flexibility Can be used in aqueous, 100% solids and solvent-based formulations without special equipment or altering standard manufacturing processes Easily blended with other silica-based matting agents or waxes to suit certain formulations
PU foam applications	Carbon blacks	Tinting & UV protection	ELFTEX® 415 MONARCH 570 MONARCH 580 MONARCH 800 MONARCH 900	<ul style="list-style-type: none"> Color and tinting Easy to disperse
Fibers	Carbon blacks	Staple fiber, monofilament, textile filament, industrial filament, bulk continuous fiber/ carpet	BLACK PEARLS 5560 BLACK PEARLS 4560i BLACK PEARLS 120 ELFTEX 570 VULCAN 9A32	Superior results in the five key performance criteria: <ul style="list-style-type: none"> Color strength Filterability/spinability Blue tone Masterbatch dilutability Dispersability
Natural/artificial leather	Carbon blacks	Pigmentation & UV protection	Medium color: BLACK PEARLS/MONARCH 900 BLACK PEARLS/MONARCH 880 BLACK PEARLS/MONARCH 800 BLACK PEARLS/MONARCH 700 REGAL® 660 REGAL 660R Regular color: BLACK PEARLS/MONARCH 580 BLACK PEARLS/MONARCH 470 BLACK PEARLS/MONARCH 460 BLACK PEARLS/MONARCH 430 BLACK PEARLS/MONARCH 280	<ul style="list-style-type: none"> Balanced morphology to attain optimal level of dispersability, color and UV protection Improved thermal and UV absorption
PLASTICS				
Interior plastics parts: ABS, PP, PC/ABS, POM	Carbon blacks	Superior color performance	BLACK PEARLS 900 BLACK PEARLS 800 BLACK PEARLS 4840	<ul style="list-style-type: none"> Improved UV protection and color performance BLACK PEARLS 900: highest color strength, especially in PA6 and regardless of the pigment % BLACK PEARLS 800: good balance between color strength and blue tone BLACK PEARLS 800 and 4840: have similar performance in ABS BLACK PEARLS 4840: good blue tone and ease of dispersion
Exterior plastics parts: PP, ABS, PC/ABS, PA	Masterbatches	Superior color performance	PLASBLAK® UN2014 PLASBLAK SA3176 PLASBLAK EG3807	<ul style="list-style-type: none"> Improved color strength and surface appearance, optimal dispersion
Fuel systems	CABELEC® conductive compounds	Permanent reduction of electrostatic hazard	CABELEC XSG114 CABELEC XSG115 CABELEC CA6132 CABELEC CA3178 CABELEC CA3899	<ul style="list-style-type: none"> Optimal mechanical properties Highest level of electrical conductivity
Housing	CABELEC conductive compounds	Protection of electronic components	CABELEC CA3899 CABELEC CA3842 CABELEC CA4743	<ul style="list-style-type: none"> Optimal mechanical properties Electrical conductivity of housings for protection of electronic components
Under bonnet	Carbon blacks	Intense pigmentation	ELFTEX 570 ELFTEX TP VULCAN 9A32	<ul style="list-style-type: none"> Improved color Balance between easy dispersion, UV protection and color
	Masterbatches	Intense pigmentation	PLASBLAK UN2014 PLASBLAK UN2016 PLASBLAK PA3785 PLASBLAK PP3585	<ul style="list-style-type: none"> Improved color Balance between easy dispersion, UV protection and color
CAR CABLES				
Conductive cables (low voltage cable)	Carbon blacks	Electrical conductivity	VULCAN XC 605 VULCAN 305 VULCAN XC 72R VULCAN XC 72	<ul style="list-style-type: none"> Optimized carbon black dispersion Purity and conductive properties Used in silicon conductive cables
Cable jacketing (low voltage cable)	Carbon blacks	UV protection, mechanical reinforcement	BLACK PEARLS L ELFTEX TP ELFTEX 570 ELFTEX 460 ELFTEX 430 ELFTEX 254 ELFTEX 120 VULCAN 9A32	<ul style="list-style-type: none"> Specialty pigment: designed to provide high gloss and high jetness in PVC compounds, such as consumer electronics cable jacketing UV protection and good dispersability Low voltage cable jacketing
Masterbatches	Carbon blacks	UV protection, mechanical reinforcement	PLASBLAK LL2590 PLASBLAK PE1371	<ul style="list-style-type: none"> PLASBLAK LL2590 is designed for use in cold potable water pipe and cable sheathing applications. It contains a small particle size carbon black together with an antioxidant PLASBLAK PE1371 is designed for maximum protection against UV light degradation in cable sheathing applications. It can also be used in general extrusion and molding
ADHESIVES & SEALANTS				
Windshield adhesives, automotive polyurethane	Carbon blacks	Rheology control, UV protection, mechanical reinforcement	MONARCH 570 MONARCH 490 MONARCH 580	<ul style="list-style-type: none"> Particles for rheology control (see structural adhesives) Improved thixotropy, sag resistance, extrusion rate Low moisture control UV absorption
Automotive polyurethane	CAB-O-SIL additives	Rheology control in (DGX) polyurethane	CAB-O-SIL TS-720 CAB-O-SIL TS-382	<ul style="list-style-type: none"> TS-720: surface modified fumed silica with polydimethylsiloxane Balanced thixotropy, sag resistance, extrusion rate Low moisture control Very effective, stable rheology control additive for polar systems Improved thixotropy, sag resistance Increased viscosity, sag resistance during application and curing shear thins at high shear for gunning application
Structural adhesives	CAB-O-SIL additives	Rheology control in polyurethane, epoxy, Silyl modified polymer	CAB-O-SIL TS-720 CAB-O-SIL TS-382 CAB-O-SIL TS-382D CAB-O-SIL M-5	<ul style="list-style-type: none"> Improved thixotropy, sag resistance Increased viscosity, sag resistance during application and curing shear thins at high shear for gunning application
Composites (thermoset resins), Laminating resin, gel coating, bonding paste	CAB-O-SIL rheological additives	Rheology control in vinyl-ester, epoxy, poly-ester systems	CAB-O-SIL TS-720 CAB-O-SIL TS-610 CAB-O-SIL HP-60 CAB-O-SIL M-5 CAB-O-SIL PTG CAB-O-SIL H-5 CAB-O-SIL HS-5 CAB-O-SIL H-300 CAB-O-SIL EH-5	<ul style="list-style-type: none"> Optimal particles for rheological control to produce fibers, thermoset resin based on composites Optimal particles for rheological control to produce gel coating and bonding paste
Silicone elastomers	CAB-O-SIL reinforcement additives	Reinforcement (liquid silicone rubber & silicone sealants) & rheology control	CAB-O-SIL LM150 CAB-O-SIL LM150D CAB-O-SIL M-5 CAB-O-SIL M-7D CAB-O-SIL MS-55 CAB-O-SIL MS-75D CAB-O-SIL H-300 CAB-O-SIL H-5 CAB-O-SIL S-17D CAB-O-SIL TS-720 CAB-O-SIL TS-610 CAB-O-SIL TS-530 CAB-O-SIL TS-240 CAB-O-SIL TS-340 CAB-O-SIL TS-622 CAB-O-SIL TS-630	<ul style="list-style-type: none"> Dispersability Effective rheology control Reinforcement Surface quality Transparency
