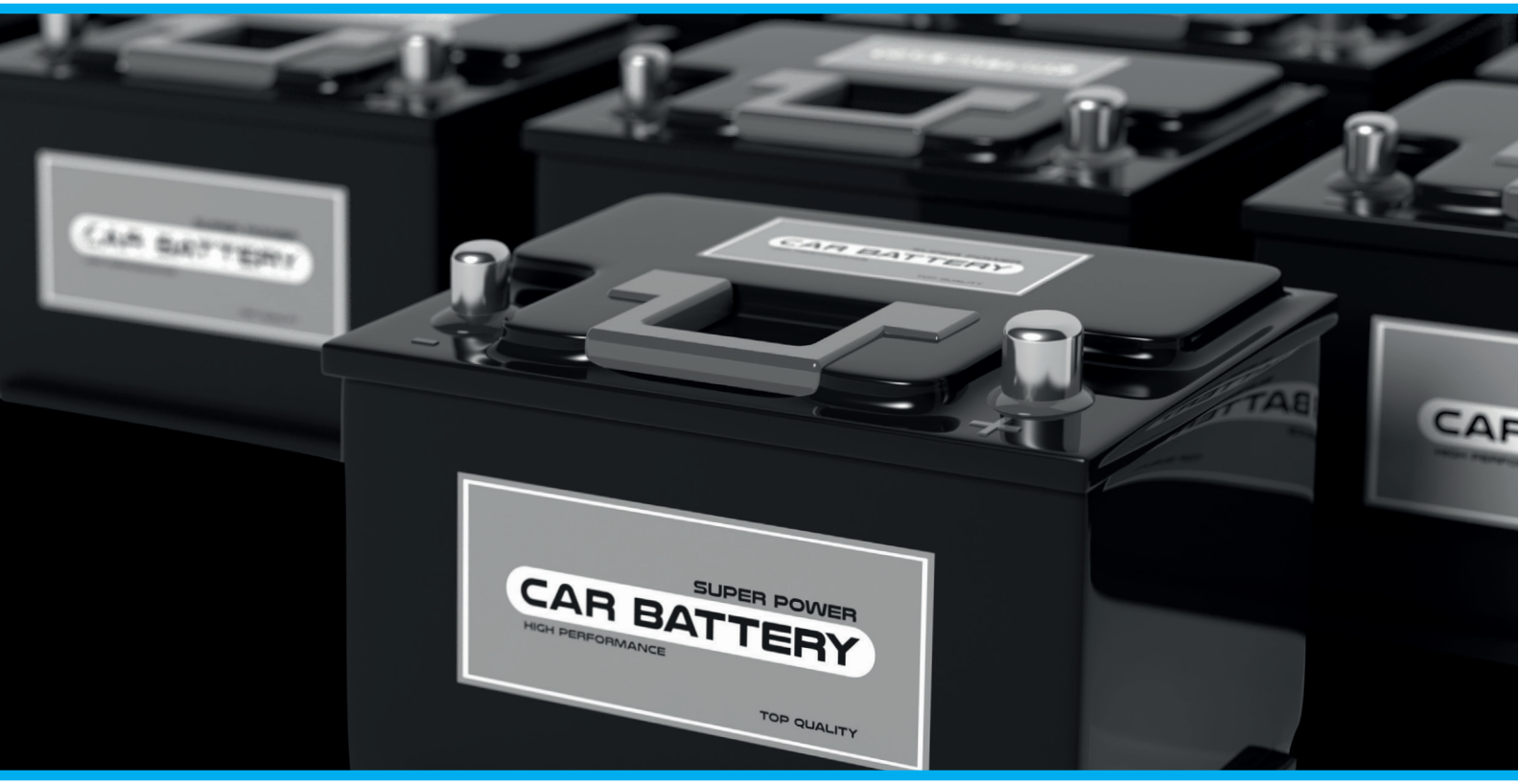
Specialty carbon blacks for advanced lead-acid batteries

Technical Information 1482



orion ENGINEERED CARBONS

Focused. Innovative. Responsive.

Who we are - Orion Engineered Carbons

Orion Engineered Carbons (OEC) is one of the world's leading suppliers of carbon black. We offer standard and high-performance specialty carbon black for coatings, printing inks, polymers, rubber and batteries. Our high-quality gas blacks, furnace blacks and lamp blacks enhance the performance of lead-acid batteries. Orion has served the global lead-acid battery industry with high quality specialty carbon black since the 1970s. With this extensive experience, OEC has developed a broad product portfolio to support global lead-acid battery manufacturers.

With 1,427 employees worldwide, Orion Engineered Carbons runs 13 global production sites and four applied technology centers, focusing on quality supply and collaborative partnerships with customers. Common shares of Orion are traded on the New York Stock Exchange under the symbol OEC.

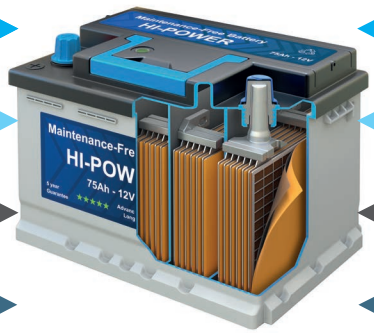
Carbon black for advanced lead-acid batteries

Carbon black as a conductive additive has been used in negative active mass (NAM) electrodes of automotive batteries and industrial batteries for several decades. In standard lead-acid batteries, carbon black can improve the electrical conductivity of the electrode, increase the formation efficiency and reduce the residual sulfate level. It also improves the electrical conductivity at the end of discharge, when the content of isolated $PbSO_4$ crystals in NAM increases substantially.

In the 21st century, advanced lead-acid battery technology has been developed to meet the significantly increased requirements for emerging start-stop/hybrid electric vehicles and stationary energy-storage application, which include high dynamic charge acceptance (DCA) and long cycle life during micro-cycling at partial state of charge. The main feature of this technology is to use a conductive carbon enhanced negative electrode. Our novel PRINTEX® kappa family of products is dedicated for advanced lead-acid battery technology, to enable the batteries to achieve high DCA performance and maintain acceptable water loss.

New demands for batteries

- Fast charging for e.g. regenerative breaking
- Idle-start-stop functionality
- Maintenance free and long-life due to low-water consumption
- Higher endurance for multiple tasks in hybrid vehicles



Battery performance parameters needing to be enhanced

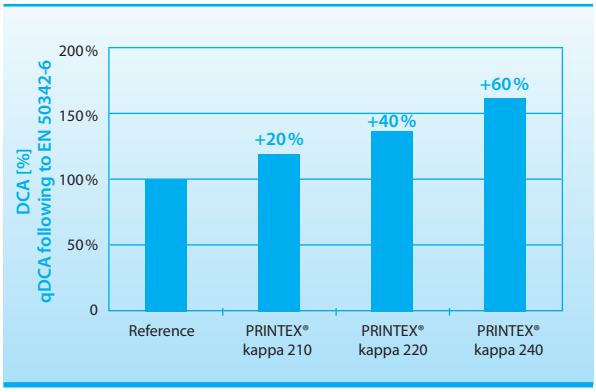
- Dynamic charge acceptance (DCA)
- Cold cranking
- Water loss
- Long cycle life

Portfolio of lead-acid battery grades

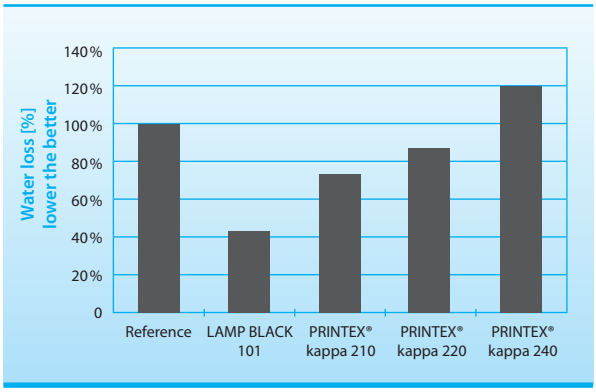
Orion offers a wide range of specialty carbon blacks designed to meet the demands and improve the performance of standard and advanced lead-acid batteries.

Product	Type			Dosage to NAM	Application
	SLI	EFB	AGM	wt%	
Products for advanced lead-acid batteries					
PRINTEX® kappa 210		●	●	~0.4 - 1.0	PRINTEX® kappa grades are optimized for high DCA and controllable water loss to meet even the highest demands for **advanced lead-acid batteries** (automotive, stationary, motive, and 2-wheeler).
PRINTEX® kappa 220		●	●	~0.4 - 1.0	
PRINTEX® kappa 240		●	◑	~0.4 - 1.0	
XPB 646	◑	●	◑	~0.4 - 1.0	
Product for standard/advanced lead-acid batteries					
LAMP BLACK 101	●	●	●	~0.1 - 1	Orion LAMP BLACK 101 has exceptional purity and unique broad particle size distribution for easy processing and low water loss. Suitable for **both standard and advanced lead-acid batteries.**
Products for standard lead-acid batteries					
PRINTEX® G	●		●	~0.1 - 0.2	Orion PRINTEX® grades have excellent purity and quality, proven over decades in multiple applications including automotive, motive, 2-wheeler and uninterruptable power supply.
PRINTEX® MV	●			~0.1 - 0.2	
PRINTEX® 300	●			~0.1 - 0.2	

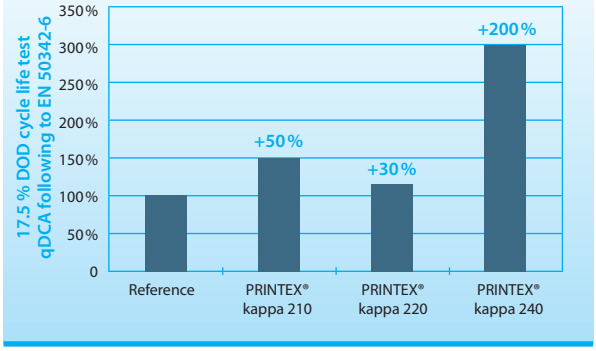
Improves dynamic charge acceptance by up to 60 %.



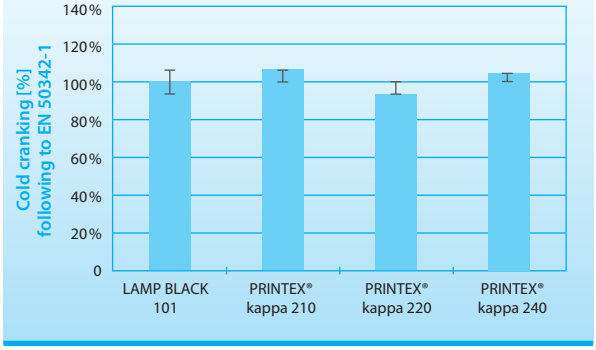
Optimizes water loss without sacrificing charge acceptance.



PRINTEX® kappa series improves 17.5 % DOD cycle life from 30 % up to 200 %.



Reliable high cold cranking for frequent start-stop operations.



Orion Engineered Carbons has a dedicated global Energy Systems team with the expertise to engage in joint development activities with our customers and provide technical product support. For more information please contact us.

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