

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 Blacks 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 Engineered Carbons has served the global lead-acid battery industry with high quality Specialty Carbon Blacks 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 4 Applied Technology Centers, focusing on quality supply and collaborative partnerships with customers. Common shares of Orion Engineered Carbons are traded on the New York Stock Exchange under the symbol OEC.



Orion Carbon Blacks 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 Braking

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

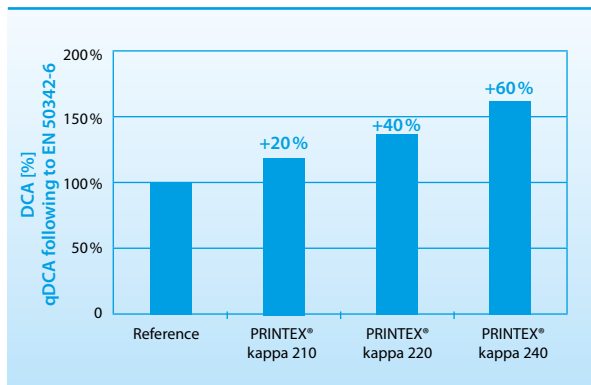
Long Cycle Life

Portfolio of Lead-Acid Battery Grades

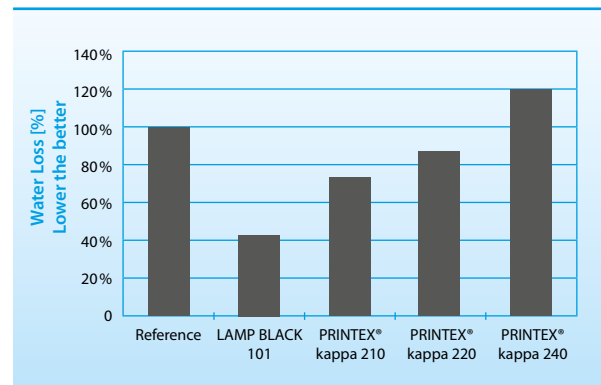
Orion offers a wide range of Specialty Carbon Blacks designed to meet the demands and improve the performance of Standard and Advanced Lead-Acid Batteries.

Product	Type			Dosage to NAM wt%	Application
	SLI	EFB	AGM		
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	

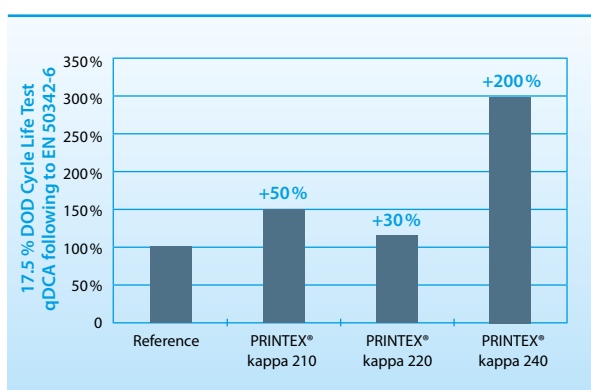
Improves Dynamic Charge Acceptance by up to 60%.



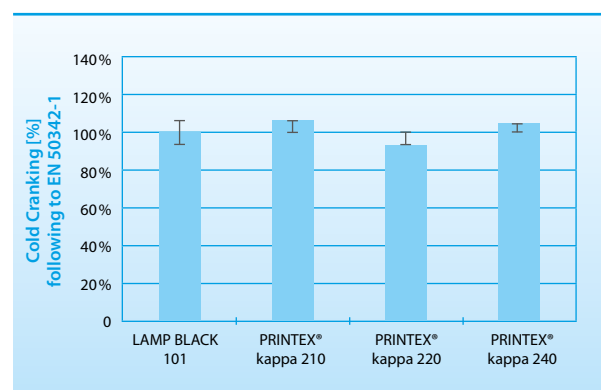
Optimizes Water Loss without sacrificing Charge Acceptance



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.



The Americas

Orion Engineered Carbons LLC
4501 Magnolia Cove Drive, Suite 106
Kingwood, TX 77345
USA
Phone +1 832 445 3300

AMERICAS@orioncarbons.com

Europe/ Middle East/ Africa

Orion Engineered Carbons GmbH
Hahnstraße 49
60528 Frankfurt am Main
Germany
Phone +49 69 36 50 54 100

EMEA@orioncarbons.com

Asia Pacific

Orion Engineered Carbons Trading (Shanghai) Co., Ltd.
BM Intercontinental Business Centre, Room 3701-3702
100 Yutong Road
200070 Shanghai, China
Phone +86 21 6107 0966

APAC@orioncarbons.com

Global Corporate Headquarters

Orion Engineered Carbons S.A., 6 Route de Trèves, L-2633 Senningerberg, Luxembourg, Phone +352 27 04 80 60

www.orioncarbons.com

All information and statements contained herein are believed to be accurate, however Orion Engineered Carbons GmbH (as well as all other Orion Engineered Carbons group companies including Orion Engineered Carbons SA), its agents and/or affiliates give no warranty with respect thereto, including but not limited to any results to be obtained or the non-infringement of any proprietary right. Use or application of such information or statements or the material or systems described herein is at user's sole discretion and risk, and consequently user acknowledges that Orion Engineered Carbons GmbH (as well as all other Orion Engineered Carbons group companies including Orion Engineered Carbons SA), its agents and/or affiliates shall bear no responsibility or liability for same. Nothing herein shall be construed as a license of or recommendation for use, especially with concern to the potential infringement of any proprietary right. All sales are subject to the respective Standard Terms & Conditions of Sale issued by Orion Engineered Carbons GmbH or - as the case may be - another Orion Engineered Carbons group company, including but not limited to the Limited Warranty clauses contained therein.

© 2018 Orion Engineered Carbons GmbH

OEC-TI 1482-08/2018