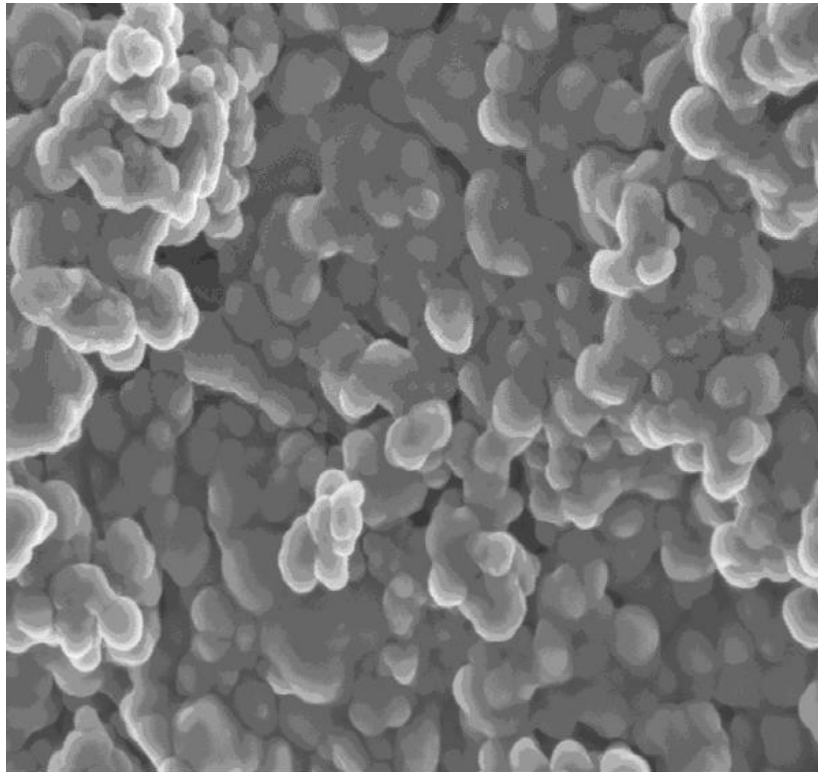
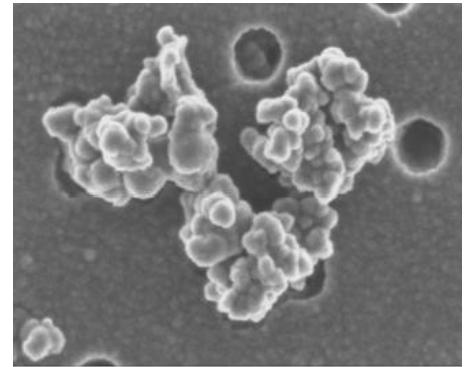


PHOENIX BLACK®

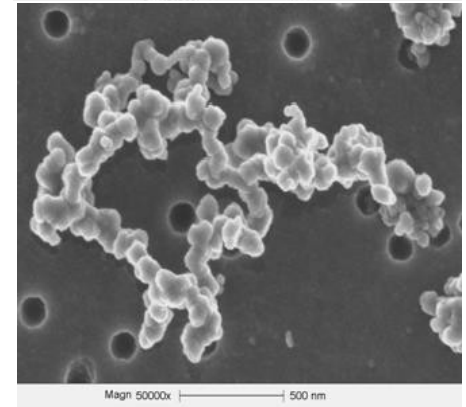
Premier Reinforcing Material
Product Data Sheet



Magn 50000x | 500 nm



Magn 100000x | 200 nm



Magn 50000x | 500 nm

Delta-Energy recovers **PHOENIX BLACK® E700**, a medium reinforcing recovered carbon black, from used tire rubber. Delta-Energy's unique low temperature recovery process and proprietary finishing steps preserve the key properties that allow Phoenix Black to replace or supplement traditional carbon blacks used in rubber products. The product behaves similarly in processing to traditional carbon blacks in both natural and synthetic rubber compounds.

Companies utilizing **PHOENIX BLACK** in their products can take credit for the recycled raw material aspect for their products with their customers. This is an especially important benefit for suppliers to the automotive industry and those doing business in Europe. For many ISO 14001 certified companies the use of recovered products, like **PHOENIX BLACK®**, provide a means of meeting their environmental strategic sustainability commitments regarding product life cycle.

Delta-Energy, as a commercial enterprise, is especially proud of the environmental impact our process has in a number of areas. First, our high value utilization of scrap tires has an initial, direct impact on environmental improvement and community disease control by reducing the number of tires in dumps and landfills. Secondly our process contributes to the preservation of the world's limited petroleum resources by recovering petroleum derived materials for direct reuse and reduction of greenhouse gas emissions.

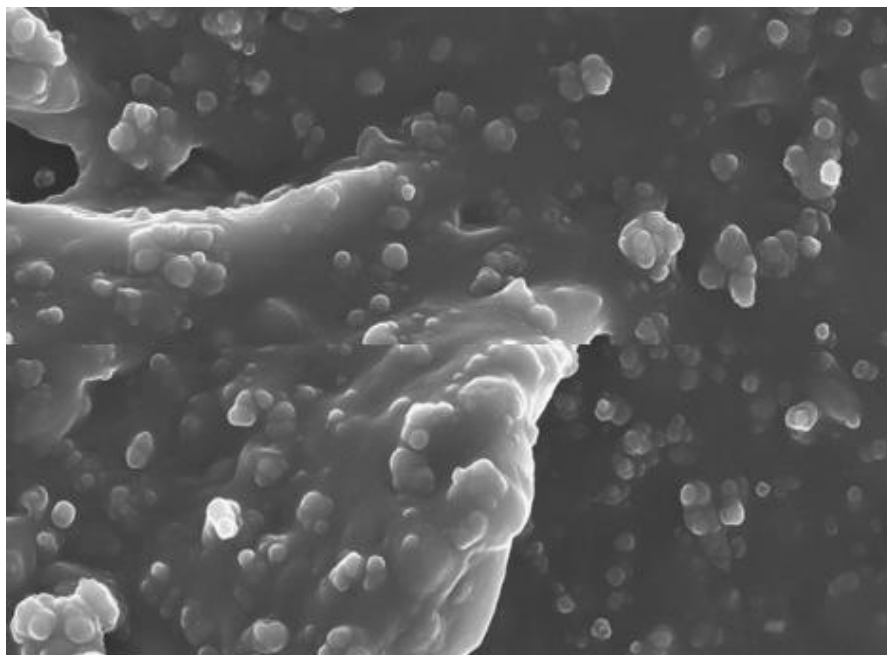
Typical Physical Properties

Product Attribute	Phoenix Black® E700
Product form	Powder or Pellet
Bulk density – powder	0.22 g/cc
Bulk density – pellet	0.50 g/cc
Specific gravity	1.9 ± 0.1
<u>Aggregate size</u>	
Mean	5 µm
Maximum	20 µm
Particle size	48 ± 25 nm
pH	7.2
Surface area – BET	63m ² /g
Iodine absorption	93 g/kg
Dibutylphthalate	86 mL/100g
Moisture Content	1.5 % Maximum
Tint Strength	57-67%
Ash Content	20% Maximum

Example Rubber Properties

Polymer	Reinforcing material	Black Conc. (phr)	Peak stress (psi)	Peak strain (%)	300% modulus	Scorch time (min)	Hardness Shore A
SBR	Phoenix Black® E700	50	3283	638	1060	3.46	61
SBR	N762	50	3194	503	1605	3.58	60

The values presented are typical. Lot analyses will be provided upon request.



Rubber reinforced with PHOENIX BLACK®

Contact us about your specific shipping and packaging requirements

For questions or to request a sample, please contact:

*Joel R. Karczewski II
 216-213-2105*

jkarczewski@deltaenergy.com

All product names are registered trademarks.

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