

TECHNICAL DATASHEET

SLI, Engine Starting Expanders PENOX PE110 & PE110HCA*

Main Battery Applications:

Engine starting for Automotive, Lawn and Garden Equipment, Recreational and Marine Vehicles.

Description:

PENOX Expander mixes are homogenous powder mixes of high purity raw materials which are added to the negative paste mix by the battery producer to improve the performance of the negative active material.

The selection of each single component of a PENOX Expander mix is intended to improve the lifetime performance of batteries. In addition to our standard grades we are able to produce tailor-made compositions upon customer's request.

PENOX Expander Mixes:

PE110 & PE110HCA*: recommended addition rate 1% of the lead oxide weight.

***HCA**: (designed for improved) **High Charge Acceptance**

Physical/Chemical Data:

Appearance: homogenous dry grey/black powder.

Ash content	
PE110	45-50%
PE110HCA	51-55%

Impurities, ICP	
Iron	< 50 ppm
Manganese	< 20 ppm
Copper	< 50 ppm
Nickel	< 5 ppm

All tests are carried out using DIN ISO methods.

Packaging:

In plastic bags, weight upon request depending on the negative paste mix recipe.

PE110

PE110
HCA*

Customer
Recipe

Battery
Additives

TECHNICAL DATASHEET

Advanced Battery Expanders PENOX PE210

Main Battery Applications:

EFB, AGM and GEL batteries for automotive use (Stop-Start, Micro Hybrids).

Description:

PENOX Expander mixes are homogenous powder mixes of high purity raw materials which are added to the negative paste mix by the battery producer to improve the performance of the negative active material.

The selection of each single component of a PENOX Expander mix is intended to improve the lifetime performance of batteries. In addition to our standard grades we are able to produce tailor-made compositions upon customer's request.

PENOX Expander Mixes:

PE210: recommended addition rate 1% of the lead oxide weight.

Physical/Chemical Data:

Appearance: homogenous dry grey/black powder.

Ash content	
PE210	65 - 70%

Impurities, ICP	
Iron	< 50 ppm
Manganese	< 20 ppm
Copper	< 50 ppm
Nickel	< 5 ppm

All tests are carried out using DIN ISO methods.

Packaging:

In plastic bags, weight upon request depending on the negative paste mix recipe.

PE210

Customer
Recipe

Battery
Additives

TECHNICAL DATASHEET

Standby Power Expanders PENOX PE300 & PE310

Main Battery Applications:

Telecom, Energy storage, Uninterruptible Power Supply (UPS), Submarines.

Description:

PENOX Expander mixes are homogenous powder mixes of high purity raw materials which are added to the negative paste mix by the battery producer to improve the performance of the negative active material.

The selection of each single component of a PENOX Expander mix is intended to improve the lifetime performance of batteries. In addition to our standard grades we are able to produce tailor-made compositions upon customer's request.

PENOX Expander Mixes:

PE300 & PE310: recommended addition rate 1% of the lead oxide weight.

Physical/Chemical Data:

Appearance: homogenous dry grey/black powder.

Ash content	
PE300	83-85%
PE310	78-80%

Impurities, ICP	
Iron	< 50 ppm
Manganese	< 20 ppm
Copper	< 50 ppm
Nickel	< 5 ppm

All tests are carried out using DIN ISO methods.

Packaging:

In plastic bags, weight upon request depending on the negative paste mix recipe.

PE300

PE310

Customer
Recipe

Battery
Additives

TECHNICAL DATASHEET

Motive Power Expanders PENOX PE410

Main Battery Applications:

Traction, Forklift, Golf cart, Mining vehicles.

Description:

PENOX Expander mixes are homogenous powder mixes of high purity raw materials which are added to the negative paste mix by the battery producer to improve the performance of the negative active material.

The selection of each single component of a PENOX Expander mix is intended to improve the lifetime performance of batteries. In addition to our standard grades we are able to produce tailor-made compositions upon customer's request.

PENOX Expander Mixes:

PE410: recommended addition rate 1% of the lead oxide weight.

Physical/Chemical Data:

Appearance: homogenous dry grey/black powder.

Ash content	
PE410	71-73%

Impurities, ICP	
Iron	< 50 ppm
Manganese	< 20 ppm
Copper	< 50 ppm
Nickel	< 5 ppm

All tests are carried out using DIN ISO methods.

Packaging:

In plastic bags, weight upon request depending on the negative paste mix recipe.

PE410

Customer
Recipe

Battery
Additives