

# DARAK<sup>®</sup> 2003

Separators for  
**INDUSTRIAL BATTERIES**

**DAR**AMIC<sup>®</sup>

# DARAK® 2003

## Product description

For more than 50 years DARAMIC, LLC separators have been meeting all market requirements.

DARAK® 2003 is a microporous duroplastic separator. Due to its high temperature stability, mechanical strength, low electrical resistance, high porosity and very low acid displacement the DARAK® 2003 separator is especially suitable for applications in batteries with gelled electrolyte or in conventional high performance batteries.

In batteries, which are subjected to particular vibration or strain, DARAK® 2003 with glass mat is preferentially used.

The DARAK® 2003 separator consists of a modified phenolic resin and an integrated polyester mat for reinforcement. Owing to its small average pore diameter, this separator prevents penetration shorts.

DARAK® 2003 separators have a typical backweb thickness of 0.35 mm and integrated ribs, which consist of the same material as the backweb.

Due to the good inherent stability of the DARAK® 2003 separator in the battery, no harmful substances are generated. No chlorine is released to the electrolyte because DARAK® 2003 contains no PVC. Furthermore, the DARAK® 2003 separator is stable against additives e.g. phosphoric acid, which is sometimes added into gelled batteries for additional cycle life. The unique combination of all these excellent properties makes the DARAK® 2003 separator the best choice for industrial cells and gelled cells.

## Quality characteristics

### Separator dimensions

#### DARAK® 2003

	Unit	Value	Test Method
Height	mm	87 - 1250	BS-TE-2015
Width	mm	65 - 800	BS-TE-2015
Thickness	mm	0.65 – 3.10	BS-TE-2005

#### DARAK® 2003 with glass mat

	Unit	Value	Test Method
Glass mat type		04      06	
Height	mm	87 - 1250      87 - 1250	BS-TE-2015
Width	mm	65 - 800      65 - 800	BS-TE-2015
Thickness	mm	1.20 – 3.35      1.40 – 3.55	BS-TE-2005
Special dimensions available upon request			

## Quality characteristics

### Electrical resistance

	Unit	Typical Value*	Test Method
1. DARAK® 2003 Separators	$\Omega \text{ cm}^2$	0.08	BS-TE-2002/2000
2. DARAK® 2003 with glass mat 04	$\Omega \text{ cm}^2$	0.11	BS-TE-2002/2000
3. DARAK® 2003 with glass mat 06	$\Omega \text{ cm}^2$	0.12	BS-TE-2002/2000

### Physical and chemical properties (DARAK® 2003)

	Unit	Typical Value*	Test Method
1. Wettability	s	3	BS-TE-2061
2. Acid weight loss	%	3	BS-TE-2063
3. Trace elements			
Iron	ppm	5	BS-TE-2075
Manganese	ppm	0.1	BS-TE-2075
Nickel	ppm	0.1	BS-TE-2075
Cobalt	ppm	0.1	BS-TE-2075
Copper	ppm	0.1	BS-TE-2075
Chloride	ppm	20	BS-TE-2076
4. Acid displacement	$\text{ml/m}^2$	140	BS-TE-2060
5. Porosity	%	70	BS-TE-2060
6. Average pore size	$\mu\text{m}$	0.4	BS-TE-2085
7. Maximum pore diameter	$\mu\text{m}$	<1	BS-TE-2086

\* depending on profile and thickness

## Product description

DARAK® 2003 separators can be supplied in the following versions:

### Positive ribs:

rib slope of 10°, called "diagonal ribs"

rib spacing:  
- typically 12 mm

with glass mat on positive ribs

### Negative ribs:

Vertical:  
rib spacing:  
- typically 3 mm

diagonal:  
rib spacing:  
- typically 12 mm

Other rib configurations are available upon request.

For special requests we kindly ask you to contact us.

The present data sheet supersedes all prior published communications, drawings and other product relevant information.

We reserve the right of product modifications, which are in the interest of technical progress.

The information given is based on our current knowledge and experience. However, due to the diversity of potential influences in processing and application of our products, this information cannot absolve the customer from his own testing and evaluation.

No legally binding assurance with regard to any properties not listed or to suitability for a special application can be derived from this information.

Quality System certified according to ISO 9001.

Environmental System certified according to ISO 14001.

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