



Our powerful Battery Separator Foils

A high level of innovation and experience make Dr. Dietrich Müller GmbH a specialist for battery separator films in the field of electrotechnical applications.

High Technology I MADE IN GERMANY

ENERGY STORAGE



Dr. Dietrich Müller GmbH, based in Ahlhorn (Lower Saxony), has long proven to be a successful service provider for the manufacturing industry. The focus is on the development and implementation of individually tailored solutions for the manufacturing processes of the respective partners.

Today, Dr. Dietrich Müller GmbH is one of the world's largest suppliers of electrical insulation materials, gaskets and heat conducting products.

The company is certified for quality management according to ISO 9001 and listed as a recognized repackager by UL. This means that all UL-approved materials retain their approval



Solutions for motors and generators

We design, manufacture and supply flexible and rigid electrical insulation materials for motors and generators using materials from world leading manufacturers. All insulating parts can be supplied by us.

Solutions for air and oil cooled transformers

The insulation system is decisive for the life and functionality of oil transformers and dry-type transformers. We supply ready-to-install individual parts and kits.

Solutions for electronic products

In addition to electrical insulation materials for electrical insulation, we develop, manufacture and supply products and systems for cooling electronics, especially in the medical technology and aerospace sectors.

Solutions for mechanical engineering and vehicle construction

Composite materials are becoming increasingly widespread in mechanical engineering and vehicle construction. We provide support in the development and production of ready-to-install parts and systems.

Solutions for batteries and accumulators

We supply insulating films, battery separator films and thermally conductive materials.

Support for research, development and universities

With the variety of manufacturing processes and available materials, we are the right partner for the solution of your challenge.

We process UL-approved materials from leading manufacturers.



New in our assortment

With the acquisition of Lofo High Tech Film GmbH, Dr. Dietrich Müller GmbH expands its product portfolio with technically high-quality and optical films for special applications in the fields of displays, 3D glasses, pharmaceuticals, electronics and security technology. Well-known brand names include "Aryphan", "Pokalon", "Sonophan" and "Tacphan". Thus Dr. Dietrich Müller GmbH offers you a wide range of products for your applications.







Field of application and requirements

Whether cell phones, laptop computers, battery-powered tools or electric vehicle systems, the field of application for lithium-ion batteries is versatile. Lithium-ion accumulators have a high specific energy and contain reactive materials. Battery separator foils must therefore meet the highest standards of reliability, safety and efficiency, and this with constantly increasing demands on performance.

High heat resistance, excellent flame retardancy, very good tensile and compressive strength are outstanding properties of the special polymers of Dr. Dietrich Müller GmbH. The property profile of the materials can be adapted to your requirements. With customized battery separator films of the highest reliability, Dr. Dietrich Müller GmbH helps you to implement customized solutions for batteries. A high degree of innovation and many years of experience in the field of polymers form the basis for providing companies with new technologies for current market requirements. High-quality battery separator films are indispensable for the reliable function, service life and safety of high-performance accumulators.

For more than 40 years, the Ahlhorn site of Dr. Dietrich Müller GmbH has been processing a wide variety of materials for electrical engineering applications into ready-to-install parts. Dr. Dietrich Müller GmbH is certified according to DIN EN ISO 9001:2015 as well as UL recognized Repacker E341377.





Proven for years the company Dr. Dietrich Müller GmbH stands for high production efficiency and quality

Whether battery systems for mobile devices or applications in the automotive sector, accumulate energy efficiently thanks to battery separator films from Dr. Dietrich Müller GmbH.





Efficient solutions for your products

Various materials and chemicals are used in the construction of lithium-ion batteries. The spectrum ranges from lithium cobalt dioxide, lithium manganese dioxide, lithium iron phosphate batteries to systems based on lithium titanate and tin-sulfur-lithium. During production, process parameters can be adapted to different requirement profiles.





Latest technology for your applications

The battery industry is characterized by enormous growth. The market for portable systems with rechargeable batteries, but also the automotive sector offers a high potential for new technologies. High performance and a flexible design characterize modern battery systems. With our battery separator films we support you with customized solutions for the implementation of your product.

Perfect fit and high performance

The spectrum of lithium-ion batteries ranges from portable systems such as digital assistants (PDAs), cell phones, tablets, notebooks, digital cameras, camcorders, flashlights and power tools to pedelecs, modern electric wheelchairs, hybrid and electric vehicles, battery storage power plants and military equipment.



Our battery separator films for lithium-ion batteries can be adapted to different designs and different chemicals to suit specific applications. Decades of experience in the fields of technical films, coating processes and polymers form the basis of our know-how.



Our high-performance battery separator films at a glance

Dr. Dietrich Müller GmbH is one of the leading manufacturers of polyethylene based separator films. Primary applications are lithium batteries and accumulators. Microporous membranes with ultra-fine, interconnected pore structures form the core element of our technology and allow an optimal ion passage.

Features

- Good mechanical properties
- Chemical inactivity
- High melting temperature





Characteristic values for our battery separator films

Dr. Dietrich Müller GmbH offers customized solutions for battery separator films with different porosity and layer thickness for different applications.

Parameters	Tecfilm BSF TC 02064	Tecfilm BSF TC 02063	Tecfilm BSF TC 02062				
Average thickness in µm	20	16	12				
Basis weight in g/m²	10,5	8,4	5,5				
Porosity in %	43	47	54				
Air permeability in sec.	300	150	65				
Tensile strength (MD) in MPa	>98	>98	~98				
Tensile strength (TD) in MPa	~73	~68	~78				
Tensile elongation (MD) at break in %	90	80	90				
Tensile elongation (TD) at break in %	300	250	230				
Puncture resistance in g	550	430	300				
Thermal shrinkage (MD) at 120°C, 1 hour in %	<10	<10	<12				
Thermal shrinkage (TD) at 120°C, 1 hour in %	<3	<4	<7				
Nominal porosity in %	42-44	46-48	53-57				
Available thicknesses in µm	7, 9, 12, 16 and 20						
Fields of application	Used in secondary lithium batteries for portable electronic devices such as laptops, tablets, cell phones and digital cameras, but also military equipment.	Used in secondary lithium batteries with high discharge and charging speed for portable electronic devices, such as cordless power tools, garden tools, RC vehicles and antenna systems.	e Use in secondary lithium batteries with extremely low impedances for special applications such as drones.				

Legend:

MD: longitudinal direction TD: cross direction

Note:

This data sheet contains typical property values. We recommend that tests be performed in advance to determine the final suitability for your application. The application areas shown are expressly intended as recommendations; no express or implied performance guarantee is given.



Our new innovation in the field of Battery Separator Foils

Our new technology for battery separator films is based on an electrochemically stable, highly heat-resistant polymer resin. Features of the innovation are:

- High resistance to slow piercing of foreign bodies in the cell
- Very high thermal stability, without heat transfer up to 200°C
- Excellent flame retardance (conformity with UL-testing)
- Good metal adhesion
- Very high dimensional stability up to 200°C (safety)
- Tunable, wide range of permeability and resistance (power density)
- Improved electrolyte wetting (cell production & lifetime)
- Small narrow pore size of 10-35 nm (safety)
- High compressive strength (safety)
- Relatively low tensile strength (safety)
- Compatibility and excellent wettability with ionic liquids (Next-Gen-Electrolytes)

High dimensional stability, good wettability, small pore size and low basis weight are outstanding properties of our battery separator films.





An overview of the innovation characteristics

Parameters	Customary market requirements	Dr. D. Müller Separator	Polyolefins	Ceramic-coated polyolefins	Ceramic composite material	Fleece dust
Thickness in µm	<25	15-25	20	20	28	17
Area in g/m²	<15	6-11	11	16	40	15
Air permeability in g/m²	20-200	15-1600	570	310	22	11
Average constructive pore size in mm	50-50	15-1600	570	310	22	11
Bubble point in µm	<0,2	<0,05	<0,05	<0,05	0,07	2,1
Mixture through- urgency N	>600	300-875	530	370	1100	400
Tensile strength in longitudinal direction in MPa	>30	15-20	200	140	27	19
Stiffness in longitudinal direction in MPa	>350	450-550	2300	1750	1950	1750
Dimensional accuracy in °C	>200	>200	<150	~150	>200	>200
Wettability of electrolytes	fast	fast	fast	slow	fast	fast
Chemical stability	stable	stable	stable	stable	stable	stable
Electrochemical stability	stable at 0 to 5V	stable	stable	stable	stable	stable



Tailor-made service is our passion

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