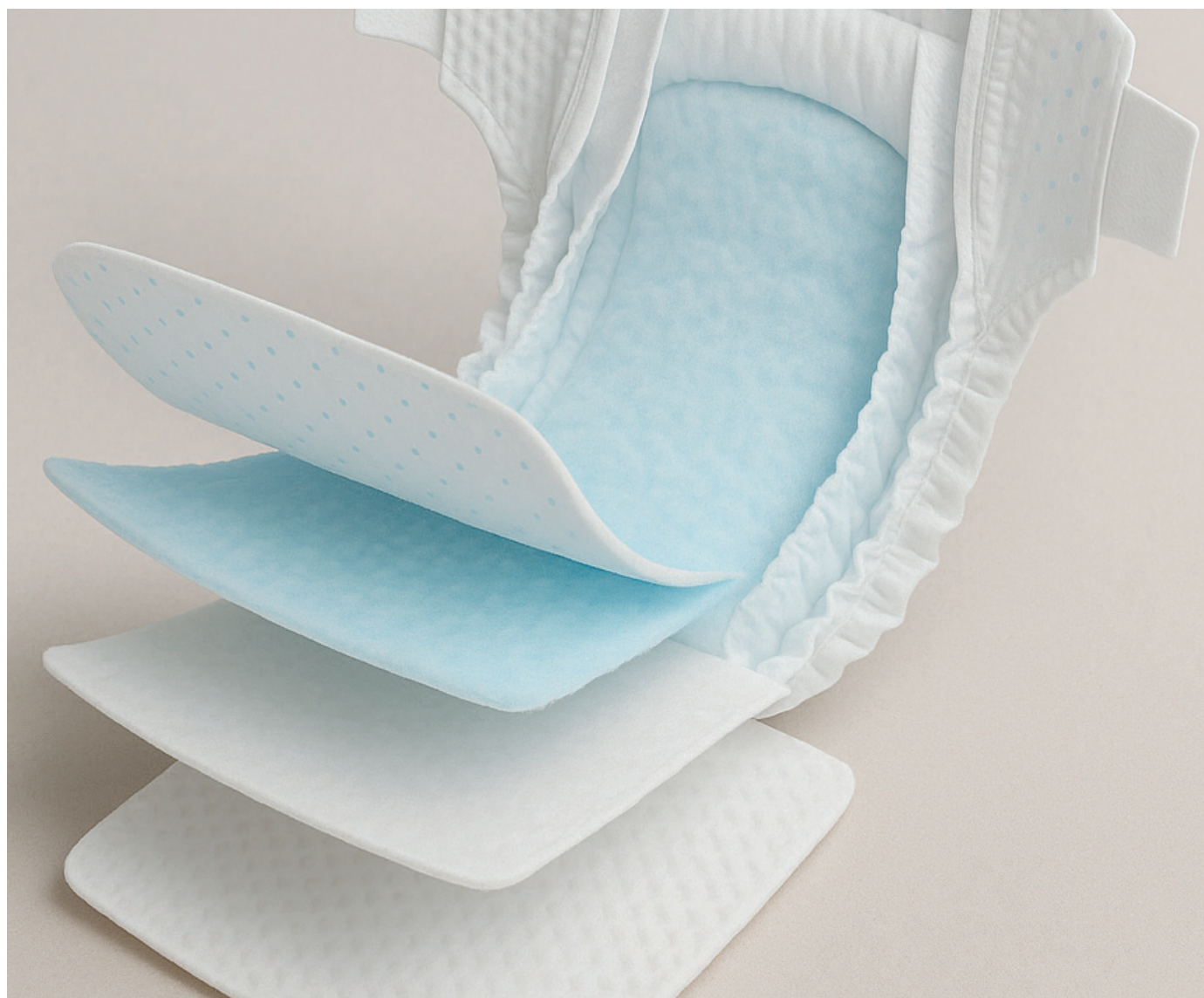


FLEXIBLE POLYMERS

LUCOFIN[®] COMPOUNDS: ENGINEERED FOR
BREATHABLE FILM PERFORMANCE



... we make better polymers

LUCOFIN®: THE CORE OF HIGH-PERFORMANCE BREATHABLE FILMS

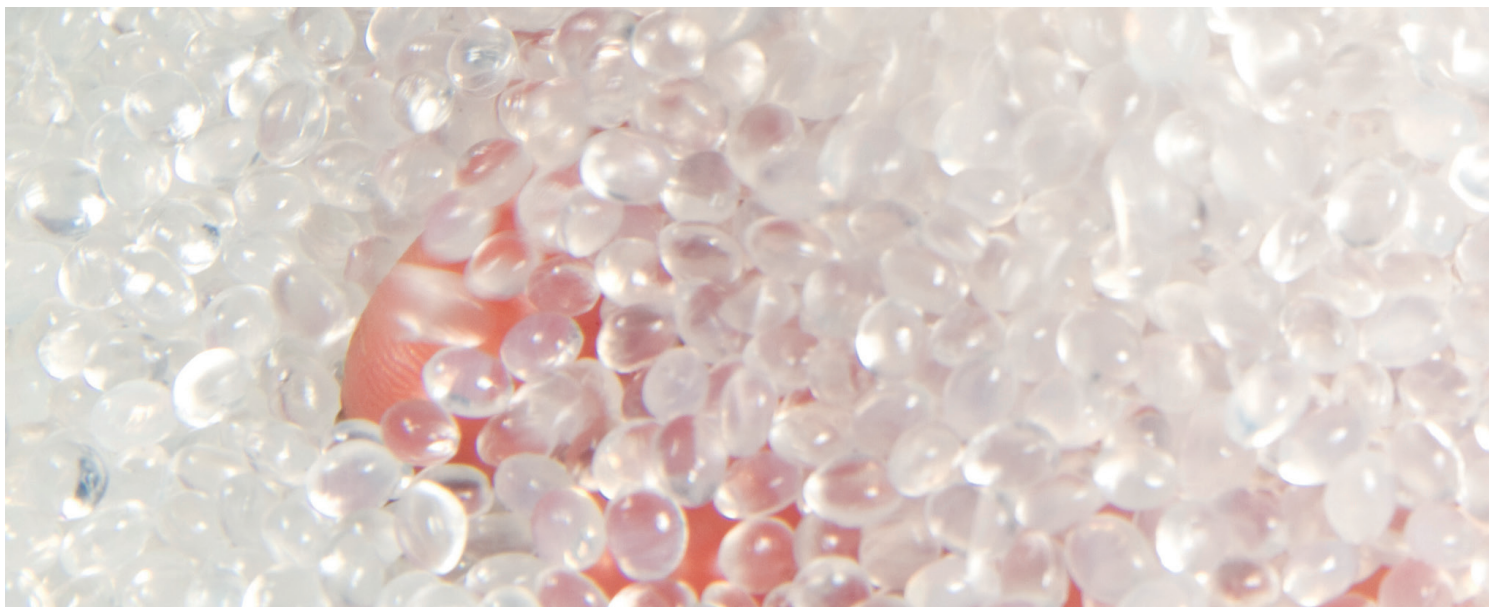
Breathable masterbatches are typically based on LLDPE or PP and filled with up to 70% calcium carbonate (CaCO_3). In the conversion process, approximately 30% LLDPE is added to the masterbatch before the film is blown. This results in a final film composition containing around 49–50% CaCO_3 .

The blown film is then subjected to machine direction orientation (MDO), where it is stretched up to five times its original length. This process creates micro-pores within the film, enabling breathability.

However, the MDO stretching process places significant mechanical stress on the film. As a result, any agglomerates, black spots, or other dispersion-related defects can serve as failure initiation points, potentially leading to film breakage. Therefore, achieving excellent dispersion quality is crucial.

Typically, the film is initially produced with a wall thickness of around 40 microns and then drawn down to approximately 15 microns during the orientation process.

IMPROVED LUCOBIT SOLUTION	STATE OF THE ART
Masterbatch with up to 80% CaCO_3	Masterbatch with up to 70% CaCO_3
Films with 70%, 60%, 50% CaCO_3	Films with 50% max 55% CaCO_3
Grammage 15 and down to 6-10 gsm	Grammage 15 and down to 10 gsm
OD Stretching 2-3 sufficient	OD Stretch up to 5 or 6 Times
WVTR Blown film without OD Stretch 500 g/m/d	NO significant WVTR without OD Stretch
WVTR Cast film without OD Stretch 1800 g/m/d	WTR after OD Stretch 4000 g/m/d
WTR OD Stretched 2000—12000 g/m/d	
Cast and Blown Film grades	Cast and Blown Film grades



BREATHABLE DIAPER FILMS MADE EASY WITH LUCOFIN® COMPOUNDS

The breathable film – essential for modern hygiene applications – relies heavily on the right polymer-filler combination.

Lucofin® Compounds, based on EBA (Ethylene Butyl Acrylate Co-polymers), offer outstanding dispersion, process reliability, and

mechanical integrity, even under the demanding conditions of MDO stretching with high CaCO_3 loads. This makes them ideal for producing thin, durable, and highly breathable backsheet films for diapers and other personal care products.

LAYERS OF A DIAPER FILM

1 Hydrophilic Nonwoven

- Skin contact layer
- Transports liquid quickly to the core
- Soft and gentle for maximum comfort

2 Absorbent Diaper Core

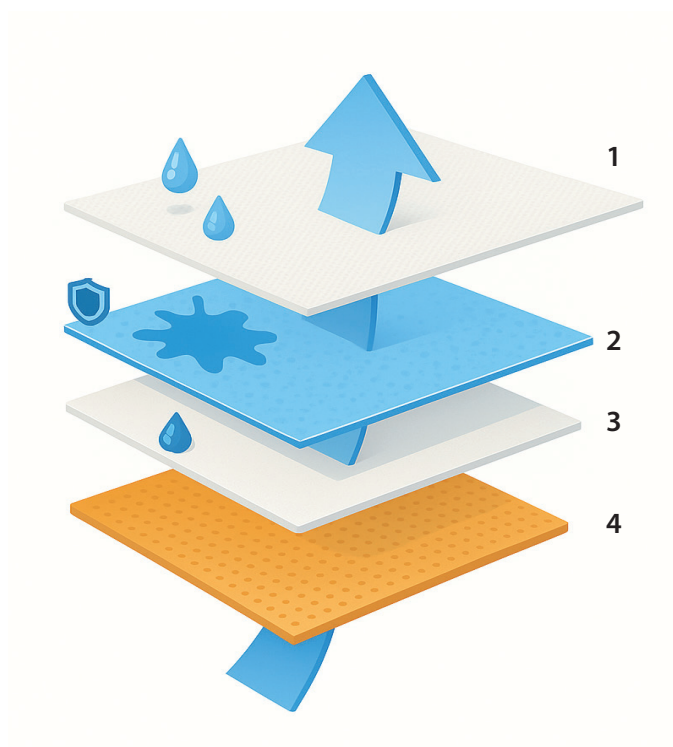
- Superabsorbent polymers (SAP) and fluff pulp
- Stores and distributes liquid
- Keeps moisture away from the skin

3 Waterproof Breathable Film (with Lucofin®)

- Breathable yet liquid-tight
- Produced with LLDPE & 50% CaCO_3
- Printable & stretchable via MDO
- Enables excellent air-permeability

4 PP Nonwoven Backing

- Protective and structural support
- Printable for branding and patterns
- Ensures flexibility and durability



LUCOFIN® SETS NEW STANDARDS IN BREATHABLE FILM PERFORMANCE

Lucofin® compounds offer a highly efficient and advanced solution for the production of breathable films, outperforming conventional technologies in several key areas. Unlike standard systems, which typically rely on masterbatches with up to 70% calcium carbonate (CaCO_3) and limit film formulations to around 50–55% filler content, Lucofin® allows for masterbatches with **up to 80% CaCO_3** and film formulations with 70%, 60%, or 50% filler content. This enables broader formulation flexibility and improved cost-efficiency.

Furthermore, Lucofin® enables the production of films with very low grammage – as low as 6–10 gsm – compared to the industry standard minimum of around 10 gsm. This reduction in material usage contributes to sustainability and lightweight product design.

A major differentiator is the behavior during orientation. While conventional films often require an OD stretching ratio of 5 to 6 times to achieve sufficient breathability, Lucofin®-based

films require only 2 to 3 times stretching. This not only reduces energy consumption and mechanical stress on the film but also minimizes the risk of breakage during processing.

Importantly, Lucofin® films show a significant Water Vapor Transmission Rate (WVTR) even without stretching: up to 500 g/m²/d for blown films and up to 1800 g/m²/d for cast films. After OD stretching, WVTR values of 2000 to 12,000 g/m²/d can be achieved – well above the typical 4000 g/m²/d limit of standard formulations. This high level of breathability contributes directly to product performance and user comfort in hygiene and medical applications.

Finally, Lucofin® compounds are suitable for both cast and blown film production, giving manufacturers maximum flexibility. Combined with better processability, higher whiteness, and softness after stretching, Lucofin® sets a new benchmark for breathable film technology.

WVTR TEST METHOD FOR BREATHABLE FILM USING LUCOFIN® COMPOUNDS

This **WVTR test setup** allows for precise, repeatable, and industry-compliant analysis of breathable film properties. It is a critical quality control step in developing and benchmarking Lucofin®-based compounds, ensuring their suitability for high-performance hygiene and medical applications.

To evaluate the breathability of films produced with Lucofin® compounds, the Water Vapor Transmission Rate (WVTR) is measured using a precise and industry-standard testing procedure.

Test Equipment & Standard:

- Instrument: MOCON Permatran-W Model 101K
- Standard: Testing is performed in accordance with ASTM D6701, which is widely accepted for evaluating the water vapor permeability of flexible barrier materials.

Test Conditions:

- Temperature: 37.8 °C (close to skin temperature, relevant for hygiene applications)
- Relative Humidity: 100% – simulating extreme moisture conditions
- Carrier Gas: Nitrogen (N_2), which transports the permeated water vapor from the sample to the detection unit
- These settings mimic real-world conditions in which breathable films are expected to perform, such as in diapers or medical dressings.

Calibration and Accuracy:

- The system is calibrated daily to ensure precise readings.
- The method is highly sensitive to environmental fluctuations, even in climate-controlled rooms, which underlines the need for consistent calibration practices.



UP TO 70% CaCO₃ IN FINAL FILM AND STILL OUTSTANDING



Lucofin®-based breathable film compounds enable a new generation of CaCO₃-filled masterbatches for both breathable and non-breathable applications. Compared to the conventional industry standard of 50% filler content in the final film, Lucofin® formulations allow for significantly higher calcium carbonate loading – up to 60% or even 70% – without compromising performance.

The water vapor permeability (WVTR) of standard OD-stretched films typically reaches around 1,500 g/m²/day. In contrast, films produced using Lucofin® Breathable masterbatches can easily achieve WVTR values of 2,000 g/m²/day, with MOCON-measured performance levels reaching up to 12,000 g/m²/day under optimized conditions.

What is particularly remarkable about these results is that they come despite the higher CaCO₃ content, which traditionally would be expected to reduce mechanical integrity. In fact, Lucofin®-based films maintain – and in some cases improve –

mechanical strength and flexibility, offering a unique combination of breathability and durability.

Another important metric is the water column test, which measures a film's resistance to water penetration under pressure. While standard breathable films typically reach 230 mm, films based on Lucofin® achieve 240 mm, demonstrating strong barrier properties even at higher filler loads.

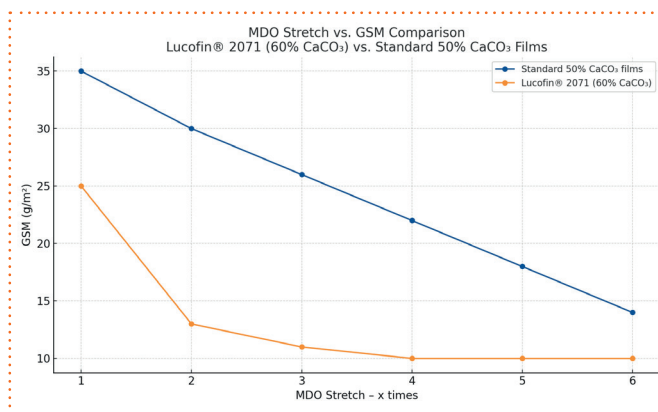
From a sensory perspective, the haptic quality of Lucofin® films is also enhanced – they feel soft and fine, with a cloth-like texture that improves user comfort in hygiene applications.

Finally, even with a moderate stretch ratio of just 1:1.6, Lucofin® compounds deliver exceptional results in WVTR and film thickness (GSM) – proving that efficient performance does not have to come at the cost of material complexity or excessive stretching.

THIN, STRONG, BREATHABLE – MADE EASY WITH LUCOFIN®

This comparison highlights the efficiency and ease of processing of Lucofin® 2071 compounds. Even with a high filler load (60% CaCO₃), Lucofin® films stretch quickly, reach lower grammage faster, and maintain their structure — making them ideal for lightweight, breathable applications.

The bold message “Easy to stretch!” at the bottom reinforces the practical benefit for converters: less effort, faster throughput, and thinner films with consistent quality.



TECHNICAL DATA

Gauge	Film thickness – unstretched	32 µm
	Film thickness / film weight – stretched	12 gsm / 14 µm
Membrane	WVTR – Lyssy / Mocon	2000 / 8000 g/m ² /day
Hydrohead – water column	Textest FX 3000	240 mbar
Mechanics MD	Tensile Strength at Break	59 N/mm ²
Force at Break MD		12 N
Elongation at Break MD		60%
Mechanics CD		
Tensile Strength at Break CD		5 N/mm ²
Force at Break CD		1.5 N
Elongation at Break CD		500%



Product Data Sheet

Lucofin® 7182

1. Product description

Lucofin® 7182 is a compound based on a polar ethylene copolymer and n-butyl acrylate with low crystallinity, enriched with high amounts of CaCO_3 . Due to its chemical structure, Lucofin® 7182 is softer and more flexible than other compounds based on ethylene copolymers/homopolymers of comparable density. Lucofin® 7182 is supplied as uncolored granules.

2. Product properties

Lucofin® 7182 is used as a concentrate for the production of breathable films (e.g. backsheets for diapers / hygiene articles). Lucofin® 7182 is a concentrate that can be processed into blown films with up to 70% CaCO_3 . Compared to conventional breathable films, the films have a higher water vapor permeability than conventional films even when unstretched. It has excellent low-temperature impact strength and outstanding weldability. Lucofin® 7182 films can be easily extruded to a thickness of 10-12 μm or stretched to a basis weight of less than 10-15 GSM.

The material can be used as a filler Calcium Carbonate Masterbatch for diverse Polymers like Polyolefine PP, PE, PVC, Polyamid (with improvement of impact resistance).

3. Applications

- High filling level of CaCO_3 , homogeneously dispersed
- High thermal stability for processing at higher melt temperatures (no corrosive by-products)
- Films with low wall thickness can be extruded using the blow molding process
- Films with up to 70% CaCO_3 can be produced
- Even unstretched films have a higher breathability than comparable PE-based films
- Suitable for highly filled, microcellular foams

4. Processing

Lucofin® 7182 breathable is suitable for conventional standard processing machines. A high extruder L/D ratio has a positive effect on dispersion. We recommend the following barrel temperatures for extrusion:

Blown film: approx. 180° -205°C

5. Packaging

Granules in 1200kg Oktabin.

6. Storage and handling

Lucofin® 7182 must be stored dry and below 50°C. Otherwise, processing problems and/or odor/discoloration may occur due to material degradation.

Disclaimer: The product mentioned here is not intended for medical and pharmaceutical applications, nor are such applications supported by us. This product has been developed for healthcare applications where there is no direct body contact. For direct contact with the body, suitable tests must be carried out by the manufacturer of the applications. The information contained herein is correct and reliable to the best of our knowledge at the time of publication, but we assume no liability for the accuracy and completeness of this information. LUCOBIT AG makes no warranty of merchantability or fitness for a particular purpose. It is the customer's responsibility to check and test our products and to satisfy himself as to the suitability of the products for a particular purpose. The customer is responsible for the safe and legal use, processing and handling of our products. The information contained herein relates solely to our products when not used in conjunction with the other materials. Liability in relation to the use of our products together with other materials is excluded.

Product Data Sheet

Lucofin® 7182

Technical data

	Standard	Unit	Standard value*
MFR (190°C / 10 kg)	DIN EN ISO 1133-1	g/10 min	2,5
Ash content (500°C / 30min.)	ISO 3451-1	%	80

*These standard values are typical values and should not be regarded as specifications.

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03.2025

Lucofin® 7182

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Safety Information

Lucofin®7182/8182

1. Identification of substance

Trade name: **Lucofin® 7182/8182**

Manufacturer/Supplier:

LUCOBIT AG

Brühler Str. 60 • B100

D-50389 Wesseling, Tel.: +49 (0) 22 36/3 78 59 0

Emergency information: Basell Fire Brigade Wesseling
Tel.: +49 (0) 22 36/72-25 55

2. Hazards identification

This product is regarded as formulation and is, according to EEC directives 1999/45, 67/548, as well to regulation 1272/2008/EC (CPL) and following amendments, not classified as hazardous.

This product abides to REACH requirements and does not contain any of the Annex 14 candidate chemicals proposed to be SVHCi above the 0,1% threshold as stated in REACH, (1907/2006/ EC, art. 57).

For this product a Safety Data Sheet acc. REACH Regulation 1907/2006 Article 31 is not required.

3. Chemical characterization

Description: not applicable

Dangerous components: None

Additional information: None

4. First aid measures

At room temperature the product is neither an irritant nor gives off hazardous vapors.

The measures listed below apply to critical situations (Fire, in-correct process conditions).

After inhalation: In case of inhalation of fumes move the person to fresh air.
Call for medical help.

After skin contact: After contact with the molten product, cool rapidly with cold water.
Do not pull solidified product away from skin. Seek immediate medical attention

After eye contact Rinse eye for at least 15 minutes with water.

5. Firefighting measures

Suitable extinguishing agents:

Water vapor, Foam, Chemical powder

Unsuitable extinguishing agents:

Water jet

In case of fire it can release:

Water, carbon dioxide, carbon monoxide (CO)

Protective equipment:

Use a mask with universal filter. Use self-contained breathing apparatus within confined spaces.

6. Accidental release measures

Particular danger of slipping on leaked/spilled product.

7. Handling and storage

Electrostatic charge may build during conveying or handling. Equipment handling polymer should be conductive and grounded (earthed) and bonded. Metal containers involved in the transfer of this material should be grounded and bonded.

All electrical equipment should conform to applicable electric codes and regulatory requirements for areas handling combustible dusts.

After handling, always wash hands thoroughly with soap and water.

Requirements to be met during storage:

- Take precautionary measures to prevent the formation of static electricity.
- Do not smoke.
- Ground equipment
- No open flames

Protect from heat and direct sunlight. Store container in a well-ventilated place. Store under dry conditions.

Safety Information

Lucofin®7182/8182

8. Exposure controls and personal protection

No components with maximum exposure limits that require monitoring at the workplace. Ensure ventilation of work areas and extraction of dust or vapors likely to be given off during processing operations.

However, common dust limits of dust have to be met

inhalable dust	10 mg/m ³	E-dust	TRGS 900
respirable dust	1,25 mg/m ³	A-dust	TRGS 900

9. Physical and chemical properties

Form:	Pellets
Color:	white
Odor:	nearly odorless
Melting range:	50 – 180°C
Density (23°C):	no data
Solubility in Water:	Insoluble

10. Stability and reactivity

The product is stable when handled and stored under normal conditions. Decomposes above 350°C.

11. Toxicological information

The product is not toxic. When used and handled according to specifications, the product does not exhibit any harmful effects according to our experience and the information provided to us.

12. Ecological information

The product is not biodegradable, small particles can have physical effects on water and soil organisms.

13. Disposal considerations

Reuse or recycle if possible. Dispose material through controlled incineration or via an authorized waste disposal site. Disposal must be conducted according to official local regulations.

14. Transport information

According to national and international guidelines, which regulate the road-, rail-, air- and sea transport, this product is classified as not dangerous.

15. Regulatory information

Designation according to EC guidelines: not classified.

16. Other information

The information above is believed to be accurate and represents the best information currently available to LUCOBIT AG. However, we give no warranty of merchantability or any other warranty - expressed or implied - with respect to such information and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes

ⁱ SVHC – Substances with very high concern

Product Data Sheet

Lucofin® 8182

1. Product description

Lucofin® 8182 is a compound based on a polar ethylene copolymer and n-butyl acrylate with low crystallinity, enriched with high amounts of CaCO_3 . Due to its chemical structure, Lucofin® 8182 is softer and more flexible than other compounds based on ethylene copolymers/homopolymers of comparable density. Lucofin® 8182 is supplied as uncolored granules.

2. Product properties

Lucofin® 8182 is used as a concentrate for the production of breathable films (e.g. backsheets for diapers / hygiene articles). Lucofin® 8182 is a concentrate that can be processed into films with up to 70% CaCO_3 in the casting process. Compared to conventional breathable films, the films have a high water vapor permeability even when unstretched. It has excellent low-temperature impact strength and outstanding perspiration resistance. Lucofin® 8182 films can be easily extruded to a thickness of 10-12 μm or stretched to a basis weight of less than 10-15 GSM.

The material can be used as a filler Calcium Carbonate Masterbatch for diverse Polymers like Polyolefine PP, PE, PVC, Polyamid (with improvement of impact resistance).

4. Processing

Lucofin® 8182 breathable is suitable for conventional standard processing machines. A high extruder L/D ratio has a positive effect on dispersion. We recommend the following barrel temperatures for extrusion:

Cast film / cast film: approx. 180° - 220°C

5. Packaging

Granules in 1200kg Oktabin.

6. Storage and handling

Lucofin® 8182 must be stored dry and below 50°C. Otherwise processing problems and / or odor formation / discoloration due to material degradation may occur.

3. Applications

- High filling level of CaCO_3 , homogeneously dispersed
- High thermal stability for processing at higher melt temperatures (no corrosive by-products)
- Films with low wall thickness can be extruded using the casting process
- Films with up to 70% CaCO_3 can be produced
- Films already exhibit high breathability when unstretched
- Suitable for highly filled, microcellular foams

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Product Data Sheet

Lucofin® 8182

Technical data

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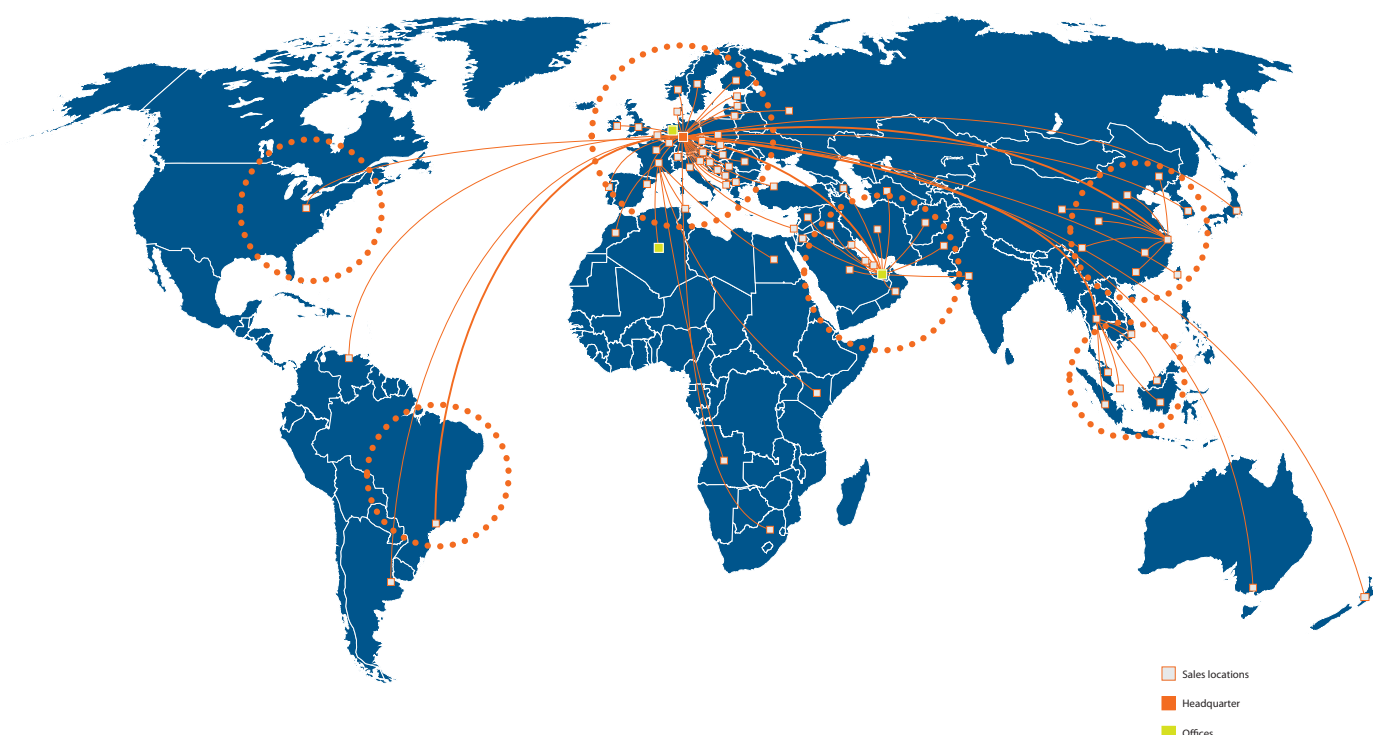
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03.2025

Lucofin® 8182

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LOCATIONS



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Note

The information provided in this document is based on our product tests and present technical knowledge. It does not release purchasers from the responsibility of carrying out their receiving inspections. Neither does it imply any binding assurance of suitability of our products for a particular purpose. As LUCOBIT cannot anticipate or control the many different conditions under which this product may be processed and used this information does not relieve processors from their own tests and investigations. Any proprietary rights as well as existing legislation shall be observed.