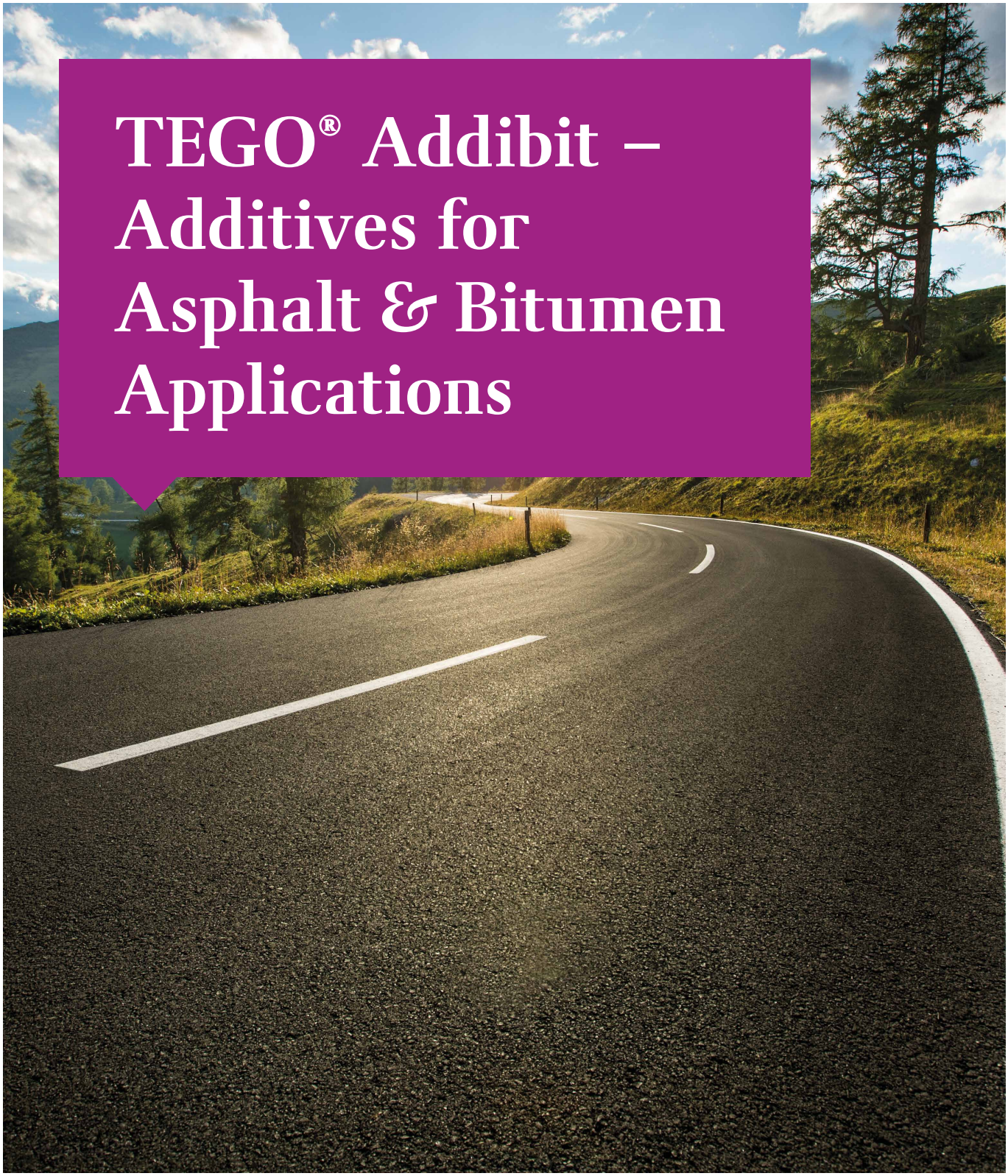
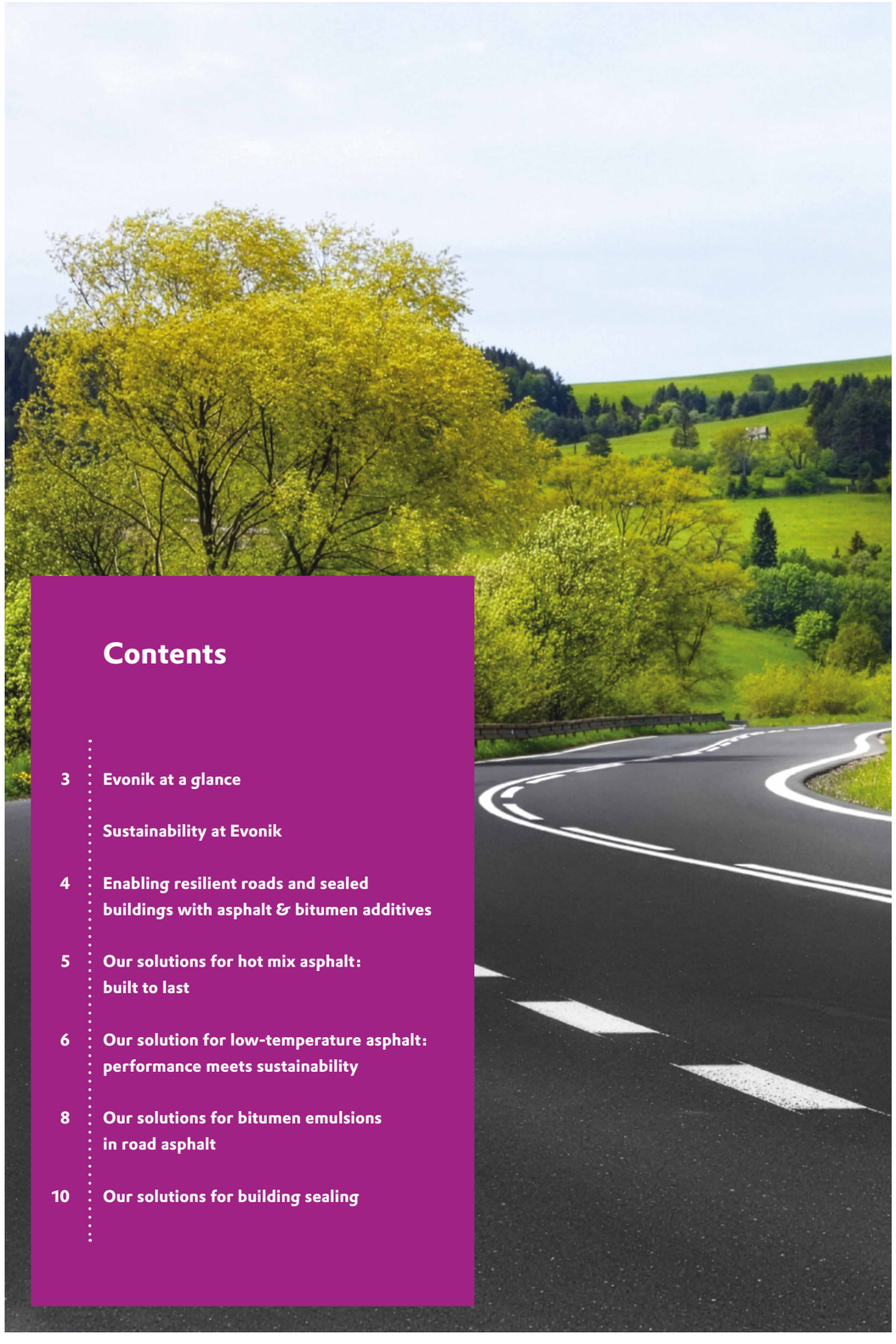


# TEGO® Addibit – Additives for Asphalt & Bitumen Applications

EVONIK
Leading Beyond Chemistry



## Contents


3 Evonik at a glance

Sustainability at Evonik

4 Enabling resilient roads and sealed buildings with asphalt & bitumen additives

5 Our solutions for hot mix asphalt: built to last

6 Our solution for low-temperature asphalt: performance meets sustainability

8 Our solutions for bitumen emulsions in road asphalt

10 Our solutions for building sealing




# Evonik at a glance

Evonik is one of the world's leading chemicals companies, with operations in more than 100 countries. We do not make car tires or mattresses, tablets or animal feed. Yet there is a bit of Evonik in all these products – and many more as well. Often it is the small amounts of our products that make a real difference.

Because Evonik makes tires more fuel-efficient, mattresses more comfortable, tablets more effective, and animal feed more healthy. We go far beyond chemistry to create innovative, profitable and sustainable solutions for customers. Around 31,000 employees work together for a common purpose:
We want to improve life, today and tomorrow.

## SUSTAINABILITY AT EVONIK

At Evonik, we have set ourselves the goal of creating a better life for current and future generations. This ambition is reflected in projects developed in cooperation with renowned partners from industry. Examples include the Power Purchasing Agreement with EnBW for green electricity from the He Dreiht offshore wind farm, as well as the commissioning of a pilot electrolysis project developed in cooperation with Siemens Energy. These initiatives underscore Evonik's commitment to advancing green energy solutions. Furthermore, Evonik is a founding member of the chemical industry initiative "Together for Sustainability" and has received a platinum rating for its achievements in sustainability by rating agency EcoVadis. Our commitment is also reflected in our ambitious sustainability goals.

## ENABLING RESILIENT ROADS AND SEALED BUILDINGS WITH ASPHALT & BITUMEN ADDITIVES

As global infrastructure evolves, the demands on construction materials are intensifying. Urbanization, climate change, and sustainability goals are transforming how we build roads and protect buildings. In this context, asphalt and bitumen remain indispensable, offering proven performance, adaptability, and innovation across a wide range of applications – from asphalt roads to advanced building sealing solutions. This brochure is your gateway to understanding the diverse applications of asphalt and bitumen, and how Evonik can elevate your projects with cutting-edge additive solutions. Whether you are enhancing durability, optimizing performance, or meeting sustainability targets, our portfolio of high-performance additives is designed to help you achieve superior results across every layer of your infrastructure.

### ASPHALT ROADS: SMARTER PAVING FOR A CHANGING WORLD

Asphalt is the backbone of road construction, valued for its strength, flexibility, and recyclability. While **Hot Mix Asphalt (HMA)** continues to be a trusted solution for high-performance pavements, the industry is increasingly embracing **Warm Mix Asphalt (WMA)** for its environmental and operational advantages. In addition, **bitumen emulsions** are gaining attention as a sustainable and practical alternative for specific applications.

### BUILDING SEALING: LONG-LASTING PROTECTION FROM THE ELEMENTS

Bitumen-based sealing systems are critical for protecting buildings from water ingress, structural movement, and environmental stress. From **foundations and basements** to **roofs and expansion joints,** bitumen offers reliable waterproofing, flexibility, and chemical resistance.

- **Sustainabiliy:** Enables warm mix technologies with a lower carbon footprint
- **Durability:** Enhances resistance to moisture and stripping
- **Versatility:** Adapts to cold and remote applications
- **Efficiency:** Reduces energy consumption and improves workability



## OUR SOLUTIONS FOR HOT MIX ASPHALT: BUILT TO LAST

**TEGO® Addibit antistripping agents** are designed to ensure reliable performance in hot asphalt applications, even under demanding conditions. These additives offer outstanding wetting of aggregates and provide long-lasting protection against moisture-induced damage, helping to preserve the integrity of asphalt mixtures. Their exceptional thermal stability ensures consistent performance during high-temperature processing, making them well suited for modern paving techniques. By strengthening the bond between bitumen and aggregates, TEGO® Addibit antistripping agents contribute to enhanced durability, reduced stripping, and extended pavement life.

Quartzite reference sample

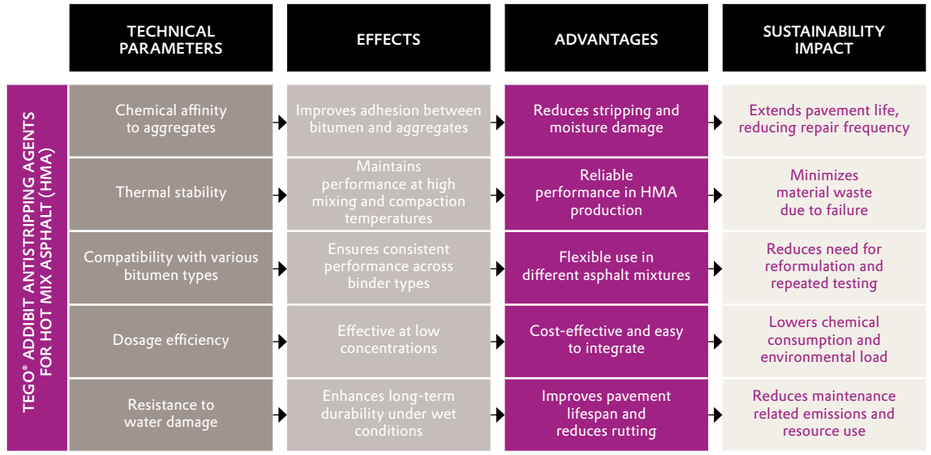
Quartzite + B50/70 + TEGO® Addibit L 300 N

**Our antistripping agents for hot mix asphalt**

| PRODUCT NAME | PHYSICAL FORM | ACTIVE CONTENT | HEAT STABILITY | REMARK |
|---|---|---|---|---|
| TEGO® Addibit F4 HB | flaky | 100% | up to 280 °C | Significantly reduces wheel tracking |
| TEGO® Addibit L 300 N | liquid | 100% | up to 180 °C | Improved temperature stability |

### OUR CONTRIBUTION TO HOT MIX ASPHALT WITH ANTISTRIPPING AGENTS

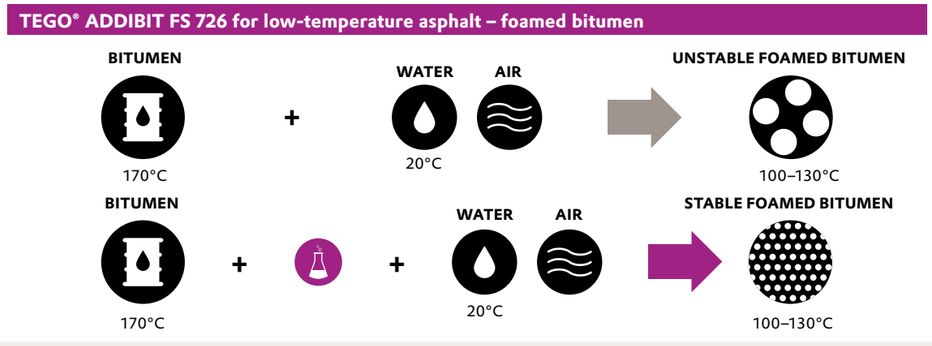
- **Enhance pavement durability,** extending service life and reducing maintenance requirements
- **Improve adhesion,** modifying the surface of aggregates, particularly for hydrophilic aggregates like granite and quartz
- **Reduce rutting and cracking,** by improving load distribution and minimizing deformation and cracking over time
- **Enable cost-effective maintenance** by reducing the need for early repairs caused by moisture damage




## OUR SOLUTION FOR LOW-TEMPERATURE ASPHALT: PERFORMANCE MEETS SUSTAINABILITY

Low-temperature technologies (LTE) offer compelling advantages over conventional hot-mix processes. By reducing production temperatures by 30–40 °C, LTEs help lower fuel consumption and greenhouse gas emissions, improve worker safety, and extend paving windows. Among the different LTEs, foamed bitumen stands out as an effective and proven solution. It is created by forcing a controlled physical mixture of liquid bitumen, water, and air under high pressure and high temperature. This process significantly reduces the viscosity of the bitumen and increases its volume, enabling improved coating, easier mixing with aggregates, and enhanced workability.

**TEGO® Addibit FS 726** was specially developed to support foamed bitumen technologies. It enhances the wetting of rock grains and improves foam stability, enabling better processability of recycled asphalt and ensuring consistent performance in LTE applications. By reducing the droplet size of foamed bitumen, **TEGO® Addibit FS 726** increases the effective surface area of the binder. This ensures that more aggregate and filler particles are bound and wetted, improving mixing stability between foamed bitumen and aggregate/filler leading to a high-quality, durable WMA foamed bitumen.



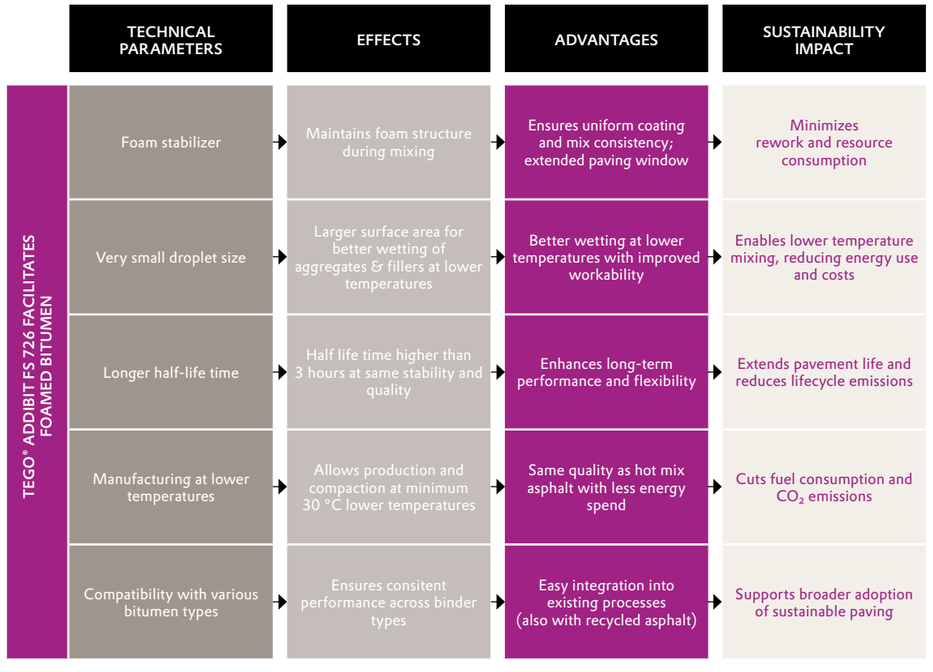



**Our foam stabiliser for foamed bitumen in road asphalt**

| PRODUCT NAME | PHYSICAL FORM | ACTIVE CONTENT | FOAM STABILITY | REMARK |
|---|---|---|---|---|
| TEGO® Addibit FS 726 | liquid | 30% | >3 hours | Suitable for all common bitumen grades |

**TEGO® ADDIBIT FS 726 offers a smart solution for both performance and sustainability**

- Consistent foam control for reliable aggregate coating and mix quality
- Extended processing and paving time: Longer working windows give paving teams greater flexibility during transport and placement, helping to optimize jobsite efficiency
- Improved workability and compaction, even with high reclaimed asphalt content
- Proven performance: more than 30% increase in Marshall stability for stronger, longer-lasting pavements
- Compatible with all bitumen types
- Highly effective even at low dosage: 0.05% – 0.15% w/w binder
- Environmental and safety advantages: Lower mixing and compaction temperatures decreases energy cost and $CO_2$ emissions, while also improving worker safety by minimizing exposure to heat and fumes. Water hazardous class 1



# OUR SOLUTIONS FOR BITUMEN EMULSIONS IN ROAD ASPHALT

**TEGO® Addibit emulsifiers** are specially developed to support the production of high-performance bitumen emulsions for asphalt applications. These additives enable the transformation of bitumen into stable emulsions that can be mixed and applied at ambient temperatures, making them ideal for bitumen emulsions for asphalt applications technologies. By improving emulsification, workability, and aggregate coating, TEGO® Addibit emulsifiers ensure consistent performance and durability in cold-applied road construction . At the same time, they contribute to energy savings and reduced emissions by enabling lower processing and application temperatures.

Evonik's portfolio includes both cationic and amphoteric emulsifiers. Amphoteric emulsifiers are a special type of surfactant containing both positively and negatively charged functional groups. Depending on the pH level, they change their ionic character. At low pH it behaves cationically, while at higher pH it becomes anionic or neutral. This unique behavior makes amphoteric emulsifiers highly versatile and compatible with emulsions across a broad pH range from 2 to 14, enabling the formation of stable, robust emulsions under a wide variety of formulation and application conditions.

**Our solutions for bitumen emulsions in road asphalt**

| | | | | Properties | | | Emulsion types | | | Setting type | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PRODUCT NAME | FUNCTION | PHYSICAL FORM | ACTIVE CONTENT | ANIONIC | CATIONIC | NON-IONIC | CRS | CMS | CSS |
| TEGO® Addibit DF* | Emulsifier | liquid | 30% | • | • | • | • | • | • |
| TEGO® Addibit EK 50* | Emulsifier | liquid | 38% | • | • | • | • | • | |
| TEGO® Addibit F4 HB | Adhesion agent / Emulsifier | flaky | 100% | | • | | • | | |
| TEGO® Addibit F4 HB SZ 10 | Emulsifier | flaky | 100% | | • | | • | | |
| TEGO® Addibit L 300 N | Adhesion agent / Emulsifier | liquid | 100% | | • | | • | • | • |
| TEGO® Antifoam 1488 | Defoamer | liquid | 18–22% | • | • | • | • | • | • |
| SITREN AirVoid® 100 | Defoamer | liquid | 14–16% | • | • | • | • | • | • |

*Products not available in US, MX, and CA

CRS: Cationic Rapid Setting
CSS: Cationic Slow Setting
CMS: Cationic Medium Setting

TEGO® Antifoam **Defoamers** further optimize the production and application of bitumen emulsions. Foam formation during processing can negatively affect emulsion stability, film formation, and surface uniformity, ultimately compromising performance. TEGO® Antifoam 1488 and SITREN AirVoid® 100 effectively suppresses unwanted foam, ensuring smoother manufacturing processes and more consistent sealing performance in bitumen-based systems.

## OUR CONTRIBUTION TO BITUMEN EMULSIONS IN ROAD ASPHALT

- Facilitate asphalt emulsification, creating stable emulsions that can be mixed and applied at ambient temperatures
- Improve workability, enhancing ease of handling, mixing, and placement
- Enable cold application, reducing energy demand consumption and supporting lower emissions
- Enhance adhesion and aggregate coating, ensuring effective coating of aggregates, that is critical for long-term pavement durability
- Control breaking and curing behavior, essential for proper compaction and reliable strength development

| | TECHNICAL PARAMETERS | EFFECTS | ADVANTAGES | SUSTAINABILITY IMPACT |
|---|---|---|---|---|
| TEGO® ADDIBIT FOR BITUMEN EMULSIONS | Amphoteric emulsifiers lead to very small droplets | Creates a stable emulsion at ambient temperatures | Reliable cold mix production and storage; better workability | Reduces energy use and material waste, and thus costs |
| | Amphoteric emulsifiers | Applicable between pH 2-14 | Higher flexibility and universal application | Minimizes rework and resource consumption |
| | Special chemistry and targeted dosage provides breaking and curing control | Regulates setting time for optimal use (CSS, CMS, and CRS) | Reliable cold mix production and storage; better workability | Reduces rework and improves resource efficiency |
| | Amino functionalized groups lead to excellent adhesion and wetting | Ensures uniform coating of aggregates | Enhanced pavement durability and performance | Extends pavement life, reducing maintenance |

# OUR SOLUTIONS FOR BUILDING SEALING

Evonik's additive technologies for bitumen emulsions and roofing systems help formulators create high-performance sealing products that deliver durability, ease of application, and long-term protection – even under extreme conditions.

**TEGO® Addibit emulsifiers** play a vital role in enabling reliable bitumen emulsion formulations. These specialty additives enhance the physical stability and adhesion properties of the emulsion, ensuring effective sealing performance across a wide range of substrates. Their compatibility with different bitumen grades and emulsification methods allows for cold application, improved handling, and long-term protection against moisture and environmental stress.

**TOMAMINE® PA 14 A** is used in asphalt cutbacks for roof coatings and repair applications. The surfactant helps to evenly suspend the added clay in the bitumen, resulting in an easy-to-apply, gel-like material. Our hydrophobizing additives **SITREN® 596** and **TEGOSIVIN® HL 101** are used to coat roofing granules and provide adhesion properties to the granules. **TEGO® Antifoam 1488** further optimizes the production and application of bitumen emulsions used in building sealing systems. Foam formation during processing can negatively affect stability, film formation, and surface uniformity. By suppressing unwanted foam, the defoamer ensures smoother manufacturing processes and more consistent sealing performance.

## Our solutions for building sealing

| | | | | Properties | | Emulsion types | | | Applications | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PRODUCT NAME | FUNCTION | PHYSICAL FORM | ACTIVE CONTENT | ANIONIC | CATIONIC | NON-IONIC | BITUMEN PRIMER (EMULSIONS) | BITUMEN COATINGS | BITUMEN ROOF COATING | ROOFING GRANULES | BITUMINOUS ROOFING MEMBRANES |
| TEGO® Addibit DF* | Emulsifier | liquid | 30% | • | • | • | • | • | | | |
| TEGO® Addibit EK 50* | Emulsifier | liquid | 38% | • | • | • | • | • | | | |
| TEGO® Addibit F4 HB | Adhesion agent | flaky | 100% | | • | | | • | • | | • |
| TEGO® Addibit L300 N | Adhesion agent | liquid | 100% | | • | | | • | | | • |
| TOMAMINE® PA 14 A | Surfactant | liquid | 100% | | • | | | | • | | |
| SITREN® 596 | Hydrophobizing agent | liquid | 55% | | | | | • | | • | |
| TEGOSIVIN® HL 101 | Hydrophobizing agent | liquid | 100% | | | | | • | | • | |
| TEGO® Antifoam 1488 | Defoamer | liquid | 18–22% | • | • | • | • | | | | |

*Products not available in US, MX, and CA

## OUR CONTRIBUTION TO BITUMEN EMULSIONS FOR BUILDING SEALING

- Enable cold application of sealing systems, reducing energy use and simplifying logistics
- Enhance spreadability and penetration into porous substrates for effective sealing
- Improve adhesion to a wide range of substrates, ensuring long-lasting waterproofing
- Support uniform film formation, resulting in consistent sealing performance
- Allow controlled setting times for greater application flexibility and optimized performance



| EVONIK EMULSIFIERS FOR BUILDING SEALING | TECHNICAL PARAMETERS | EFFECTS | ADVANTAGES | SUSTAINABILITY IMPACT |
|---|---|---|---|---|
| | Amphoteric structure lead to smaller droplets | Stable emulsion at low dosages | Reliable storage time; better workability; sprayable systems | Reduces energy use and material waste |
| | Amphoteric emulsifier | Applicable between pH 2–14 | Higher flexibility and universal applicationa | Minimizes rework and resource consumption |
| | Breaking and curing control | Stable emulsion during application | Long lasting stability in filled emulsions (fillers and clay) | Reduces rework and improves resource efficiency |
| | Early water resistance | Fast setting during application (drying phase) | Surface protection against re-emulsification once in contact with water | Minimizes material waste due to failure |

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**ADDITIVES FOR ASPHALT & BITUMEN APPLICATIONS BY EVONIK**

Visit our website to learn more

**www.evonik.click/asphalt**

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