Cargill™ Anova® Rheology Modifier

Improving bitumen performance. Anova® gets you there.

Enhance low quality bitumen by improving durability.

Our bio-based Rheology Modifiers increase the “useful temperature interval” (UTI) of bitumen from many different crude sources. Through higher softening rates at lower temperatures, Cargill’s Anova® Rheology Modifiers limit high temperature grade loss.

The unique performance of our Rheology Modifiers is backed by more than 60 years of technical expertise in bio-based chemistry.

Working with Cargill means we are with you every step of the way: *from testing your materials and tailoring dosages, to supporting you on-site and collaborating on solutions that work for you.*

Cargill™ Anova® advantages

Improving performance

- Efficiently improve low temperature performance grade while expanding the useful temperature interval
- Ideal for modifying penetration for emulsion bases
- Improve polymer modified bitumen (PMB) compatibility and workability
- High additive aging resistance and thermal stability
- Improves asphalt ΔTc with extended aging

Creating economic value

- Highest dosage efficiency compared to other performance grade modifiers
- Enable optimization of PMB formulation and cost
- Enhance polymer blending efficiency
- Optimize plant logistics and cost by storing only one bitumen grade

Reducing environmental impact

- Made from bio-based chemistries
- Low VOC’s and low volatile mass loss (as measured by the Rolling Thin Film Oven)
- High flash point

Enriching communities

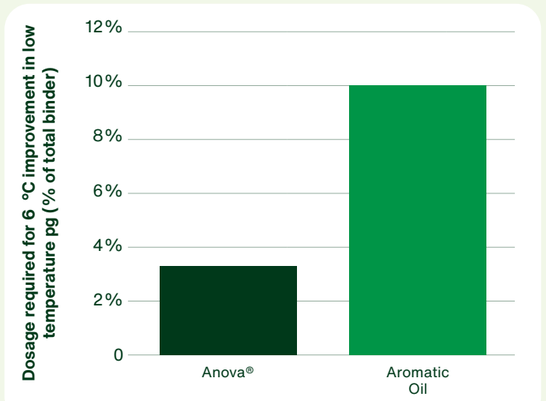
- Innovative technologies can enable efficient infrastructure investments
- Renewable raw materials help support farmer livelihood, rural communities and agriculture industry growth
- Working with farmers, government, industry groups, customers and consumers to make the future of industrial solutions more sustainable

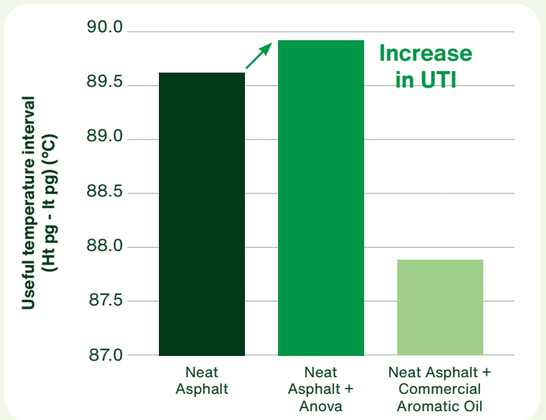
State-of-the-art technology. High dosage efficiency.

The performance of Cargil™ Anova® Rheology Modifiers has been proven many times over. To demonstrate the performance, ASTM D6648 has been performed and shows that Anova Rheology Modifiers soften up to three times more efficiently than petroleum-based products, in terms of improving the low temperature PG.

Anova Rheology Modifiers also show an improvement in UTI compared to commercial aromatic oils, as shown in the results from AASHTO M320.

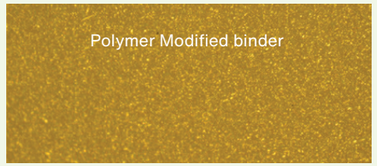
Rheology Modifier:





Increase polymer compatibility and reduce blending time.

For many formulations, Cargill Anova Rheology Modifiers enable better elastomer (SBS) utilization in asphalt formulations and improve PMB workability without significant loss of elastic recovery.



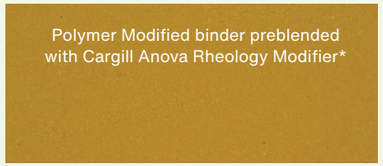


*Image taken after 2 hrs of SBS blending

Our unique solutions. Unmatched performance.

Cargill Anova Rheology Modifiers are produced using a patented proprietary chemical modification and stabilization process, resulting in unique performance, aging resistance, and compatibility properties. Unlike commodity vegetable oils and many petroleum-based additives, our Rheology Modifiers are created to perfectly fit the purpose and to enhance the properties of asphalt. This means that Anova Rheology Modifiers deliver performance that equals—and in some ways, exceeds that of virgin asphalt.

Criteria	Useful temperature span	Low temperature grade	High temperature grade	Polymer compatibility	Durability and aging	Safety and handling advantages
Cargill Anova Rheology Modifier	◆◆◆	◆◆◆	◆	◆◆◆	◆◆◆	◆◆◆
Commodity Vegetable Oils	-	◆◆	-	◆	▼	◆◆◆
Soft Asphalt / Flux	▼▼	◆	▼	◆	▼	▼
Modified Tall Oil-based	▼	◆◆	▼	-	▼▼	◆◆◆
Tall Oil-based	▼▼	◆	▼	-	▼▼▼	▼
Aromatic Oils	▼▼	◆	▼	◆◆	▼▼	▼▼
Paraffinic Oils / REOB	◆◆	-	▼	▼▼▼	▼▼▼	▼▼

◆ Positive Impact ▼ Negative Impact – No Impact

Cargill™ Anova® products

Category/ Product Name	Description	Typical viscosity, CP at 25 °C	Open cup, flash point, °C	Compaction aid	Warm mix (temperature reduction)	Adhesion promoter
Warm Mix						
Anova® 1501 additive (NA and LATAM)	High performance, bio-based*, non-hazardous[1], and low-odor liquid warm mix additive, compaction aid, and adhesion promoter, that enhances asphalt mixture workability allowing for lower temperature compaction and the production of smokeless asphalt.	210	211	♦♦♦	♦♦♦	♦♦
Anova® 1503 additive (EU and APAC)	High performance, bio-based*, non-hazardous[1], and low-odor liquid warm mix additive, compaction aid, and adhesion promoter, that enhances asphalt mixture workability allowing for lower temperature compaction and the production of smokeless asphalt.	210	211	♦♦♦	♦♦♦	♦♦
Anova® 1599 additive	High performance, bio-based*, non-hazardous[1], and low-odor liquid warm mix additive, compaction aid, with significantly enhanced adhesion promoter properties, asphalt mixture workability, and lower temperature compaction and the production of smokeless asphalt.	1,500	289	♦♦♦	♦♦♦	♦♦♦

Category/ Product Name	Description	Typical viscosity, CP at 25 °C	Open cup, flash point, °C	Rheology modifier
Modifiers				
Anova® 1000 modifier (EU and APAC)	Basic high quality bio-based* rheology modifier, ideal for modifying low temperature Performance Grade (PG), reducing viscosity, and increasing penetration grades in paving grade and emulsified asphalt binders.	51	290	♦♦
Anova® 1005 modifier	High performance bio-based* rheology modifier with enhanced Useful Temperature Interval (UTI), long term stability, and polymer compatibilization. Ideal for modifying low temperature Performance Grade (PG), reducing viscosity, and increasing penetration grades in paving grade and emulsified asphalt binders.	61	290	♦♦♦
Anova® 1006 modifier (NA and LATAM)	High performance bio-based* rheology modifier with enhanced Useful Temperature Interval (UTI), long term stability, and polymer compatibilization. Ideal for modifying low temperature Performance Grade (PG), reducing viscosity, and increasing penetration grades in paving grade and emulsified asphalt binders.	63	213	♦♦♦

Category/ Product Name	Description	Typical viscosity, CP at 25 °C	Open cup, flash point, °C	Adhesion promoter
Anti-Strips				
Anova® 1440 adhesion promoter	High-performance, low-odor, bio-based* liquid anti-strip additive that significantly enhances asphalt-aggregate adhesion. The additive is non-corrosive[1], non-amine based, and non-acidic for ideal use and handling.	420	303	♦♦♦

[1]According to regulation (EC) No. 1272/2008 and 29 CFR 1910.1200

*Bio-based according to ASTM D6866

Additional marks equals enhanced feature: ♦

Category/ Product Name	Description	Typical viscosity, CP at 25 °C	Open cup, flash point, °C	Compaction aid	Rejuvenator
Rejuvenators					
Anova® 1815 rejuvenator (NA and LATAM)	High-performance rejuvenator, supporting high levels of recycled content. Enhances durability and aging resistance, while improving compaction and workability.	100	300	♦	♦♦♦
Anova® 1817 rejuvenator (EU and APAC)	High-performance rejuvenator, supporting high levels of recycled content. Enhances durability and aging resistance, while improving compaction and workability.	100	300	♦	♦♦♦
Anova® 1825 rejuvenator	Basic high quality rejuvenator, supporting medium levels of recycled content. Enhances durability, while improving workability. *Limited availability.	60	277	–	♦♦
Anova® 1845 rejuvenator	Highest performance rejuvenator and compatibilizer for highly aged recycled binder. Enhances durability, significantly enhances aging resistance, while improving compaction and workability.	470	265	♦♦	♦♦♦

Category/ Product Name	Description	Typical viscosity, CP at 25 °C	Open cup, flash point, °C	Adhesion promoter	Rejuvenator	Rheology modifier
Cold Mix Modifiers						
Anova® 1300 rejuvenating cold mix modifier	High-performance, low VOC**, high flashpoint cold mix and cold patch additive that can be used with both virgin and 100% RAP mixtures.	12	180	–	♦♦♦	♦♦♦
Anova® 1310 rejuvenating cold mix modifier (NA and LATAM)	High-performance, low VOC**, high flashpoint cold mix and cold patch additive that can be used with both virgin and 100% RAP mixtures. Formulated for improved coating and moisture resistance.	14	175	♦♦	♦♦♦	♦♦♦
Anova® 1312 rejuvenating cold mix modifier (EU and APAC)	High-performance, low VOC**, high flashpoint cold mix and cold patch additive that can be used with both virgin and 100% RAP mixtures. Formulated for improved coating and moisture resistance.	14	175	♦♦	♦♦♦	♦♦♦

Category/ Product Name	Description	Typical viscosity, CP at 25 °C	Emulsion stabilizer
Emulsion Stabilizer			
Anova® 1701 emulsion stabilizer	Additive that stabilizes both anionic and cationic bituminous emulsions, significantly extending both short term and long term storage stability and improve homogeneity in emulsions with oil phase floatation or settlement issues due to density differences.	Water Soluble Powder	♦♦♦

[1]According to regulation (EC) No. 1272/2008 and 29 CFR 1910.1200

*Bio-based according to ASTM D6866

**Low VOC compared to typical asphalt cut-back

Additional marks equals enhanced feature: ♦

Proven performance. The Cargill way.

A partnership with Cargill™ provides your business an undeniable advantage. We offer you a proven record of support from our state-of-the-art asphalt applications lab. Cargill's unique support system starts with materials evaluation, trial assistance, plant implementation and integration and continues through quality assurance and ongoing support, meaning you can count on us to provide the expertise and chemistries required to meet your toughest challenges.

State of the art research

Bio-based chemisty

in-depth binder analysis

On-site support

Proven global technology

Find more information at **cargill.com/anova**