



Odor Free Anti-Strip & Warm Mix Technology

ZycoTherm is an organosilane based liquid anti-strip (LAS) additive which provides the additional benefit of traditional warm mix asphalt (WMA). ZycoTherm allows for the complete chemical bonding of asphalt binder to aggregates at significantly lower dosage rates compared to similar LAS products. The typical dosage rate of ZycoTherm is between 0.05% and 0.1%. It is compatible with all aggregate types and provides for improved adhesion of the binder to the aggregate. ZycoTherm enables temperature reductions up to 60°F (30°C) during mix production and field compaction, and provides the benefits of chemical bonding, complete coating, and consistent compaction.



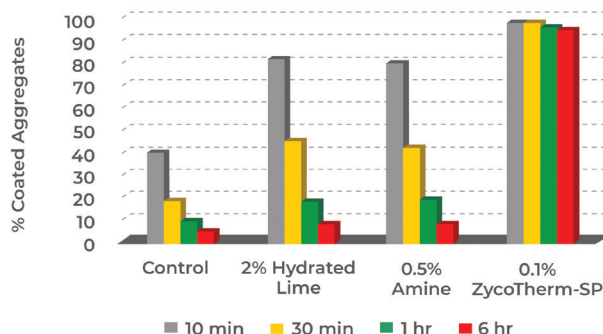
Odor Free Anti-Strip & Warm Mix Technology

- ✓ Dual functionality as a Liquid Anti-Strip and WMA Additive
- ✓ Advanced formula reduces the percentage of additive required
- ✓ Lower dosage improves economic performance
- ✓ Promotes adhesion on the most challenging aggregates
- ✓ Water soluble product allows for flexible applications
- ✓ Non-toxic and odorless formulation improves worker and public safety
- ✓ Environmentally friendly solution compared to traditional products
- ✓ Provides great compaction with high RAP mix designs
- ✓ Does not affect PG grade of the binder
- ✓ Improved TSR, Hamburg Wheel Tracking, IFIT, Ideal CT and Boil Test results
- ✓ Compatible with standard modifiers, including PPA, SBS, and CRMB

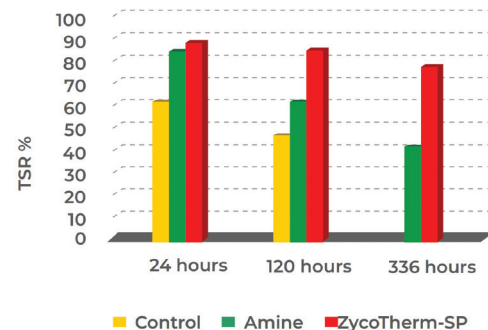
Moisture Resistance Through Chemical Bonding

Unlike conventional liquid anti-strips which form physical bonds between the aggregate and bitumen, ZycoTherm forms a permanent chemical bond between the aggregate and the asphalt. Due to this permanent chemical bond there are significant improvements with respect to moisture resistance, durability, and overall life cycle costs of the pavement. ZycoTherm is compatible with all aggregate types, works at significantly lower dosages, is environmentally friendly, non-corrosive and odor free.

ASTM D 3625 BOIL TEST



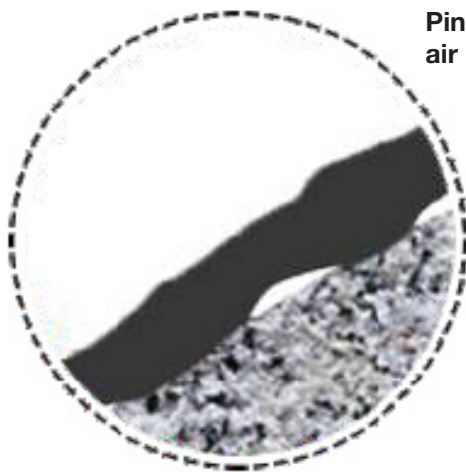
**EXTENDED CONDITIONING
TSR COMPARISON**





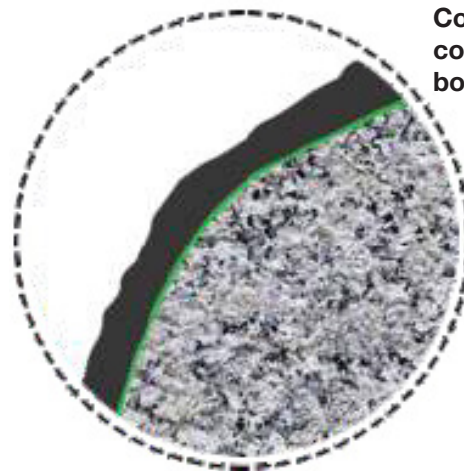
Complete Coating

ZycoTherm modified bitumen coats the aggregate surface significantly faster and more efficiently as compared to conventional LAS additives. The superior coating and wetting attributes of ZycoTherm ensure complete coverage of fines, faster reaction times with RAP and produces a jet-black appearance of the mix. The complete coating of aggregate by ZycoTherm leads to mixes free of pinhole air-pockets and significantly reduces stripping and oxidation.



Pinhole
air pockets

Without ZycoTherm

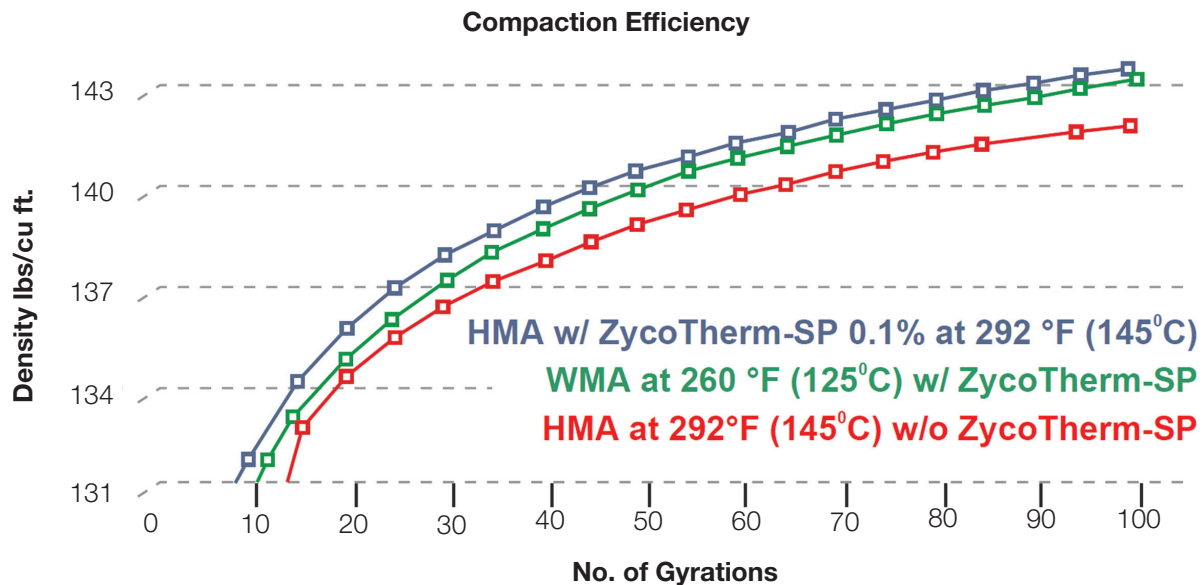


Complete surface
coverage and
bonded

With ZycoTherm

Consistent Compaction

ZycoTherm provides excellent warm mix asphalt benefits and reduces production temperatures to as low as 275°F (135°C). Consistency and ease of compaction can be achieved up to temperatures of 210°F (98°C) thereby enabling longer hauls and cold climate paving.





Dosage

The typical dosage range for ZycoTherm is 0.03% to 0.1% by weight of the bitumen binder. If aggregate type and characteristics are known, refer to the table below for indicative dosages. Adjust the same based on mix testing for maximum performance. It is critical that the ZycoTherm be thoroughly mixed into the bitumen to ensure homogenous distribution of the additive in the binder.

ZycoTherm-SP Dosage for Anti-Strip Benefits			Aggregate Type	ZycoTherm-SP Dosage for Anti-Strip and Warm Mix Benefits		
Aggregate Water Absorption %				Aggregate Water Absorption %		
0.5-0.8	0.9-1.4	1.5-2.0		0.5-0.8	0.9-1.4	1.5-2.0
0.03	0.03	0.05	Limestone, Dolomite	0.07	0.07	0.07
0.03	0.03	0.05	Basalt, Cabbro	0.07	0.07	0.10
0.03	0.05	0.05	Granite, Granodiorite, Rhyolite	0.07	0.07	0.10
0.03	0.05	0.10	Quartzite	0.10	0.10	0.10
0.03	0.07	0.10	Greywacke, Andesite, Sandstone	0.10	0.10	0.10

Advantages

Paving
<ul style="list-style-type: none"> • Reduced odor • Improved workability and compaction efficiency • Improved mix flow & cleaner equipment • Elimination of mix segregation • Dark black look • Extended paving season

Manufacturing
<ul style="list-style-type: none"> • Reduced odor • Cleaner tanks, coils & elevators • Cleaner flights of the mixing chamber • Lower mix temperature & fuel economy • Higher RAP/RAS capability

Health and Environment
<ul style="list-style-type: none"> • Non-corrosive • Odor free • Health rating of 1 • TSCA Compliant • REACH Compliant • DSL Compliant

Storage and Shelf Life

Store ZycoTherm between 41°F-113°F (5°C-45°C) in shady dry areas away from direct sunlight, heat, spark sources, rain or standing water. Fasten the container lid securely after use. Shelf life is 48 months. Should the product freeze, allow it to thaw before use.

About Zydex

ZycoTherm is a product of Zydex Industries. All States Materials Group is a licensed distributor of ZycoTherm and other Zydex pavement products. Established in 1997, Zydex is a specialty chemicals company with the purpose of innovating for sustainability. Beyond pavement products, Zydex offers a diverse set of chemical technologies for the textile, agricultural, and civil construction industries.

Sustainable Green Chemistry

Zydex is deeply committed to sustainable chemistries that ensure a greener future for everyone. This commitment has made Zydex a pioneer in introducing non-polluting and non-hazardous technologies that conserve, protect and enhance the environment. Zydex technologies have been recognized by the International Road Federation (IRF) and have been globally adopted.