UNITED STATES DISTRICT COURT
THE DISTRICT OF DELAWARE

A.L.M. HOLDING COMPANY and ERGON ASPHALT & EMULSIONS, INC.	)	
Plaintiffs,	)	
v.	)	C. A. No.
ZYDEX INDUSTRIES PRIVATE LIMITED and ZYDEX INC.,	)	**JURY TRIAL DEMANDED**
Defendants.	)	

COMPLAINT

Plaintiffs A.L.M. Holding Company ("A.L.M") and Ergon Asphalt & Emulsions, Inc. ("Ergon") (collectively "Plaintiffs"), for their Complaint against Zydex Industries Private Limited, and Zydex Inc. (collectively "Zydex"), allege as follows:

NATURE OF ACTION

1. This is an action for patent infringement under the patent laws of the United States, 35. U.S.C. § 100 et seq., including 35 U.S.C. § 271, arising from Defendants' actions, including making, using, selling, and/or offering for sale one or more products or methods in violation of U.S. Patent Nos. 10,214,646, 7,815,725 B2, 9,394,652 B2, 7,981,466 B2, 8,734,581 B2, and 9,175,446 B2.

2. Certain of the asserted patents claim paving compositions and methods using "warm mix" paving compositions that are produced and compacted at reduced temperatures compared to the production and compaction temperatures required for conventional "hot mix" paving compositions. Because warm mix paving compositions are produced, laid down, and

compacted at significantly lower temperatures than hot mix paving compositions, the inventive warm mix paving compositions have several advantages over hot mix paving compositions. These advantages include reduced energy consumption, reduced emissions and odors, safer working conditions, quicker reopening of new and repaired roadways, reduced thermal aging of the asphalt binder, and improved pavement life. The inventive warm mix technology has revolutionized the asphalt paving industry.

3. Other of the asserted patents claim paving compositions and methods using additives that permit the paving and compaction of said compositions at or around warm mix paving temperatures, while further claiming the production of such compositions at or around hot mix temperatures, facilitating longer transit times and paving in colder climates where a larger decrease in temperature between mixing and paving may be desirable.

4. Defendants make, import, distribute, advertise, offer to sell, and sell additives specifically designed and marketed to be used to make infringing warm mix paving compositions and induce their infringing uses.

THE PARTIES

5. A.L.M. is a Wisconsin corporation with a principal place of business at 920 10th Avenue North, Onalaska, Wisconsin 54650. A.L.M. is a holding company of various businesses, including Mathy Construction Company, which is a family-owned asphalt contractor and major supplier of aggregates used for road construction asphalt highway and construction projects throughout the Midwest. A.L.M. is a national leader in industry research and development of sustainable products and green technologies, including intellectual property co-owned by A.L.M. and Ergon.

6. Ergon is a Mississippi corporation with a principal place of business at 2829 Lakeland Drive, Jackson, Mississippi 39232, and is part of a family of businesses within Ergon, Inc., which is a family-owned business focused on petroleum products, transportation, and construction. Ergon makes and markets asphalt products and has become the largest asphalt marketer in North America. Ergon is also a national leader in asphalt industry research and development, including intellectual property co-owned by A.L.M. and Ergon.

7. Zydex Industries Private Limited is a foreign company based in India, with a principal place of business at Zydex House, 61, Gotri – Sevasi Road, Vadodara – 390021, Gujarat, India ("Zydex Industries"). Upon information and belief, it is a manufacturer of chemical products, including the infringing products sold in the United States through a network of authorized distributors.

8. Zydex Inc. is a North Carolina corporation with a principal place of business at 106 Kitty Hawk Drive, Morrisville, NC 27560 ("Zydex Inc."). Upon information and belief, it is a U.S. subsidiary that imports and distributes chemical products, including the infringing products made by defendant Zydex Industries Private Limited. Zydex Industries and Zydex Inc. are collectively referred to as "Zydex".

JURISDICTION AND VENUE

9. This is an action for infringement of U.S. Patent No. 7,815,725 B2 (the "'725 Patent"), U.S. Patent No. 7,981,466 B2 (the "'466 Patent"), U.S. Patent No. 9,394,652 B2 (the "'652 Patent"), U.S. Patent No. 10,214,646 (the "'646 Patent"), U.S. Patent No. 8,734,581 B2 (the "'581 Patent"), and U.S. Patent No. 9,175,446 B2 (the "'446 Patent").

10. This action arises under the patent laws of the United States, 35 U.S.C. § 1 *et seq*.

11. This Court has jurisdiction over the subject matter of this action pursuant to 28 U.S.C. §§ 1331 and 1338(a).

12. The Court has personal jurisdiction over Zydex Industries because it is a foreign corporation that sells infringing products into this country and thus has availed itself of the jurisdiction of this court. The Court also has personal jurisdiction over Zydex Industries because it has contractually consented to the jurisdiction of this court.

13. The Court has personal jurisdiction over Zydex Inc. because, on information and belief, it does business in this judicial district and has committed acts of infringement in this district as described herein. The Court also has personal jurisdiction over Zydex Inc. because it has contractually consented to the jurisdiction of this court. Moreover, both Zydex entities have admitted that personal jurisdiction exists here for an action brought by ALM and Ergon regarding the Asserted Patents.

14. Venue is proper in this district because all parties to this lawsuit have contractually consented to venue here. Moreover, both Zydex entities have admitted that venue is proper here.

BACKGROUND

Asserted Warm Mix Patents - U.S. Patent Nos. 7,815,725, 7,981,466, 9,394,652, and 10,214,646

15. On October 19, 2010, the United States Patent and Trademark Office ("USPTO") duly and legally issued U.S. Patent No. 7,815,725 B2 (the "'725 Patent") entitled "Warm Asphalt Binder Compositions Containing Lubricating Agents."

16. On July 19, 2011, the USPTO duly and legally issued U.S. Patent No. 7,981,466 B2 (the "'466 Patent") entitled "Warm Mix Asphalt Binder Compositions Containing Lubricating Additives."

17. On July 19, 2016, the USPTO duly and legally issued U.S. Patent No. 9,394,652 B2 (the "'652 Patent") entitled "Warm Mix Asphalt Binder Compositions Containing Lubricating Additives."

18. On February 26, 2019, the USPTO duly and legally issued U.S. Patent No. 10,214,646 B2 (the "'646 Patent") entitled "Warm Mix Paving Composition w/ Lubricating Antistrip Additive."

19. A.L.M. and Ergon are joint owners of all rights, title, and interest in and to the '725, '466, '652, and '646 Patents, collectively referred to as the "Asserted Warm Mix Patents."

20. The '725 Patent relates to and claims asphalt paving compositions containing a lubricating additive. Among other things, the claimed compositions are produced at and are at a warm mix temperature at least 30° F lower than a comparison temperature needed to produce a comparison paving composition containing binder-coated aggregate without the lubricating additive.

21. The '466 Patent is a divisional of the '725 Patent and relates to and claims methods of making bituminous (*viz.,* asphalt) paving containing a lubricating additive, methods of making warm mix paving compositions containing a lubricating additive, methods of forming a paved surface using a warm mix paving composition containing a lubricating additive, and a paving process using a warm mix paving composition containing a lubricating additive. Among other things, the claimed compositions are produced or mixed at warm mix temperatures as further defined in the '466 Patent claims.

22. The '652 Patent is a continuation of patents stemming from the '466 and ultimately '725 Patents and relates to and claims warm mix asphalt paving compositions containing recycled asphalt pavement.

23. The ’646 Patent is a continuation of patents stemming from the ’466 and ultimately ’725 Patents and relates to and claims warm mix asphalt paving compositions containing a lubricating antistrip additive.

24. Prior to the invention of the Asserted Warm Mix Patents, attempts to achieve warm mix asphalt had numerous drawbacks and deficiencies. Such methods and compositions required the step of foaming with water and/or the addition of viscosity reducing additives such as wax at 1.5% or higher, water-containing materials such as zeolites, wet sand or other substances, which were added to the aggregate asphalt binder mixture. The use of these substances had limited use in cold weather and long-haul time applications. Moreover, such prior methods and additives required significant modification to the asphalt mix plant, and further undesirably altered the temperature grade of the asphalt binder itself.

25. The claimed inventions solved these drawbacks by offering improved ease of use and temperature reduction, thereby allowing for an extended paving season, reduced energy, and cost savings. The Asserted Warm Mix Patents disclose that the claimed lubricating additives allow coating of aggregate and compaction of asphalt compositions at 30 °F or more lower (*viz*., 16.7 °C or more lower) than similar mixtures that do not have the additive, and increase the ease of coating and compaction. Use of the claimed chemical additive to create a warm mix asphalt composition in a functionally dry, essentially water-free, non-foamed asphalt binder, according to the patented inventions, also avoids the need for costly modifications at the asphalt mix plant, such as those required by prior methods of attempting warm mix asphalt. Lubricating surfactants according to the claimed invention also do not alter the temperature grade of the asphalt binder, in contrast to wax-based warm mix technologies.

26. The claimed processes and compositions were breakthrough technology in the industry when they were first disclosed in late 2007. The technology embodied in the Asserted Warm Mix Patents continues to represent the most efficient and effective technology for warm mix asphalt today.

27. On April 1, 2013, and following examination by the USPTO in two consolidated *ex parte* reexaminations which had been separately filed by third-party requestors ArrMaz Custom Chemicals ("ArrMaz") and Sasol Wax GmbH, the USPTO affirmed the patentability of claims 1-18 of the '725 Patent (as amended), determined the patentability of claims 19-52 (as newly added), and issued Ex Parte Reexamination Certificate US 7,815,725 C1 for the '725 Patent.

28. On March 3, 2015, and following examination by the USPTO in an additional *ex parte* reexamination filed by third-party requestor Akzo Nobel Surface Chemistry, LLC ("Akzo"), the USPTO affirmed the patentability of claims 1-52 of the '725 Patent and issued Ex Parte Reexamination Certificate US 7,815,725 C2 for the '725 Patent.

29. Copies of the '725 Patent and its US 7,815,725 C1 and US 7,815,725 C2 Reexamination Certificates are attached hereto as Exhibit A.

30. On February 19, 2015, and following examination by the USPTO in an *ex parte* reexamination request filed by third-party requestor Akzo, the USPTO affirmed the patentability of claims 1-26 of the '466 Patent and issued Ex Parte Reexamination Certificate US 7,781,466 C1 for the '466 Patent.

31. Copies of the '466 Patent, its Certificate of Correction and its US 7,781,466 C1 Reexamination Certificate are attached hereto as Exhibit B.

32. The '725 Patent is valid and enforceable and has been successfully litigated as discussed below.

33. The ’466 Patent is valid and enforceable and has been successfully litigated as discussed below.

34. The ’652 Patent is valid and enforceable, and a copy is attached hereto as Exhibit X.

35. The ’646 Patent is valid and enforceable, and a copy is attached hereto as Exhibit C.

Asserted Hot Mix / Warm Laid Patents – U.S. Patent Nos. 8,734,581 and 9,175,446

36. On May 27, 2014, the USPTO duly and legally issued U.S. Patent No. 8,734,581 B2, entitled “Processing Bituminous Mixtures for Paving at Reduced Temperatures.”

37. A copy of the ’581 Patent is attached hereto as Exhibit D.

38. The ’581 Patent relates to and claims a bituminous (*viz.*, asphalt) paving process which comprises mixing an asphalt binder, aggregate, and a lubricating additive at a temperature greater than 160°C to form a bituminous mix and compacting the bituminous mix at a second temperature less than 130°C.

39. On November 3, 2015, the USPTO duly and legally issued U.S. Patent No. 9,175,446 B2, entitled “Processing Bituminous Mixtures for Paving at Reduced Temperatures.”

40. A copy of the ’446 Patent is attached hereto as Exhibit E.

41. The ’446 Patent relates to and claims a bituminous (*viz.*, asphalt) paving process which comprises mixing an asphalt binder, aggregate, and a lubricating additive at a temperature greater than 160°C to form a bituminous mix, hauling the bituminous mix to a paving site, and compacting the bituminous mix at a second temperature less than 130°C.

42. As described in the ’581 and ’446 Patents (the “Asserted Hot Mix Warm Laid Patents”), in certain instances it may be desirable to prepare bituminous paving materials at, near,

or in excess of temperatures used for hot mix asphalt, but to pave and compact the paving mixture at lower temperatures, for a number of reasons. For example, such a process can broaden the range of paving and production conditions, allow for increased transportation times, longer working times, or a greater range of application temperatures, and thereby provide improvements in production and paving processes compared to other hot and warm mix processes.

43. A.L.M. and Ergon are joint owners of all rights, title, and interest in and to the ’581 and ’446 Patents.

44. The ’581 Patent is valid and enforceable.

45. The ’446 Patent is valid and enforceable.

46. As used herein, the Asserted Hot Mix Warm Laid Patents and Asserted Warm Mix Patents will collectively be referred to as the “Asserted Patents.”

The Original License to Ingevity

47. Effective January 1, 2008, A.L.M. and Ergon granted a royalty-bearing, worldwide license under and to several patent families (including the patent family that resulted in the Asserted Warm Mix Patents, and by later agreement of the parties under the Improvement Patent Rights provisions in the license, the patent family that resulted in the Asserted Hot Mix Warm Laid Patents), to MeadWestvaco Corporation (“MWV”). MWV was a manufacturer and seller of asphalt additives, including its Evotherm® line of warm mix additives which were made and sold under the license. The MWV license was exclusive subject to certain rights reserved by A.L.M. and Ergon. The MWV license provided various rights to MWV under and to the patents-in-suit, including but not limited to the right to grant sublicenses to third parties, and the right to assign or otherwise transfer MWV’s license to a third party in connection with certain transfers of MWV’s assets or voting stock, or in connection with MWV’s merger, consolidation or reorganization.

48. In 2015, MWV formed WestRock Company ("WestRock") in a merger of MWV with RockTenn Company. In 2016, WestRock formed Ingevity Corporation ("Ingevity") as a spinoff standalone company involved in the specialty chemicals businesses, including asphalt additives, formerly handled by MWV and WestRock. Due to the above-mentioned transfer provision, Ingevity replaced MWV as the exclusive licensee of the patented technology, with, among other rights, the right to grant sublicenses. Ingevity continues to market and sell Evotherm® additives throughout the world.

49. Under the terms of this license, the license grant included, among other things, the right to make, use, sell, offer for sale, and/or import the inventions claimed in each of the Asserted Patents.

50. Ingevity makes and sells warm mix additive products that compete with the Zydex products discussed herein in the same and/or overlapping markets for the same and/or overlapping end-user customers.

The Prior Litigation

51. In 2013, A.L.M., Ergon and MWV sued Akzo for infringement of the '725 and '466 Patents in the United States District Court for the District of Delaware, Civil Action No. 13-CV-1069-GMS.

52. In 2013, A.L.M., Ergon, and MWV also sued ArrMaz for infringement of the '725 and '466 Patents in the United States District Court for the District of Delaware, Civil Action No. 13-CV-1070-GMS.

53. The two lawsuits were consolidated for pre-trial purposes, including claim construction.

54. After extensive claim construction briefing and argument, in an order dated and filed on November 5, 2014, U.S. District Court Judge Gregory M. Sleet construed the disputed claim terms of the '725 and '466 Patents.

55. In August 2015, and prior to trial, defendant ArrMaz agreed to take a royalty bearing sublicense from MWV under the 7,815,725 B2, 7,981,466 B2, 8,734,581 B2, and 9,175,446 B2 Patents (or the applications ultimately resulting in said patents).

56. In October 2015, and prior to trial, defendant Akzo agreed to take a royalty bearing sublicense from MWV under the same patents or applications.

57. On information and belief, the licensed asphalt additives sold by Ingevity, ArrMaz Products Inc. (a successor to ArrMaz now owned by Arkema), and Nouryon (a successor to Akzo) collectively represent the largest-selling warm mix additives in the U.S.

58. On July 21, 2023, A.L.M. and Ergon sued Zydex and one of its distributors – Hi-Tech Asphalt Solutions, Inc ("HTAS") – for infringement of the '725 and '466 Patents in the United States District Court for the Eastern District of Virginia, Civil Action No. 23-CV-467 (the "E.D.Va. lawsuit").

59. Zydex was voluntarily dismissed from the E.D.Va. lawsuit.

60. On January 23, 2024, the parties stipulated to dismissal of the entire lawsuit, ***without*** prejudice, premised upon Zydex's consent to personal jurisdiction and venue in the District of Delaware.

61. On March 21, Plaintiffs sued Zydex in the District of Delaware. That matter was dismissed, without prejudice, due to the Court's determination that Plaintiffs did not possess standing to sue under the license agreement that was in place at that time, with the Court noting that standing must exist as of the date the lawsuit was filed.

The Amendment License Agreement

62. On January 13, 2025, an amendment to the license agreement with Ingevity was entered, modifying the original license agreement discussed above (the "Amendment Agreement").

63. Pursuant to the Amendment Agreement, Ingevity's license was modified such that, within the United States, Canada, and Mexico ("NAFTA"), Ingevity was no longer the holder of an exclusive license to the Asserted Patents, but rather a ***non-exclusive*** license. Plaintiffs ALM and Ergon also obtained and retained the right to "grant to any unlicensed third parties a nonexclusive license or sublicense within NAFTA", the terms of which "will be determined by Licensors [ALM and Ergon]." Pursuant to the Amendment Agreement, ALM and Ergon are the only entities with the right to grant licenses or sublicenses to the Asserted Patents within NAFTA. Ingevity has no right to sublicense within NAFTA.

64. Moreover, pursuant to the Amendment Agreement, Ingevity transferred, and ALM and Ergon obtained, the "full extent of Ingevity's current rights under the [original] Agreement, all of Ingevity's rights to enforce all or any portion of the Patent Rights against any unlicensed third parties, including the rights to sue, collect, and pursue past damages for any infringement of such Patent Rights by such unlicensed third parties."

65. Thus, Plaintiffs possess all necessary rights to confer Constitutional standing to sue for infringement of the Asserted Patents.

Defendants' Business and Use of its ZycoTherm Products

66. Zydex claims to be a specialty chemicals company offering an array of chemical technologies for the textile, agriculture, pavement, and construction industries.[1]

[1] https://zydexgroup.com/us

67. According to Zydex, engineers around the world are "looking to adopt technologies that can help realize perpetual pavements at an economical cost" and that in furtherance of that effort, Zydex provides technology that allows road asphalt mixtures to be used in extreme climatic conditions.[2]

68. As part of these offerings, Zydex advertises, or has advertised, at least five products as part of its ZycoTherm line of products – ZycoTherm, ZycoTherm SP, ZycoTherm SP2, Zycotherm EZ, Zycotherm LS (collectively with any other products used or advertised in a substantially similar manner "the ZycoTherm line of products" or the "ZycoTherm additives")..

69. Zydex's ZycoTherm line of products are advertised as warm mix additives, which have "been used to produce upwards of 50 million tons of asphalt."[3]

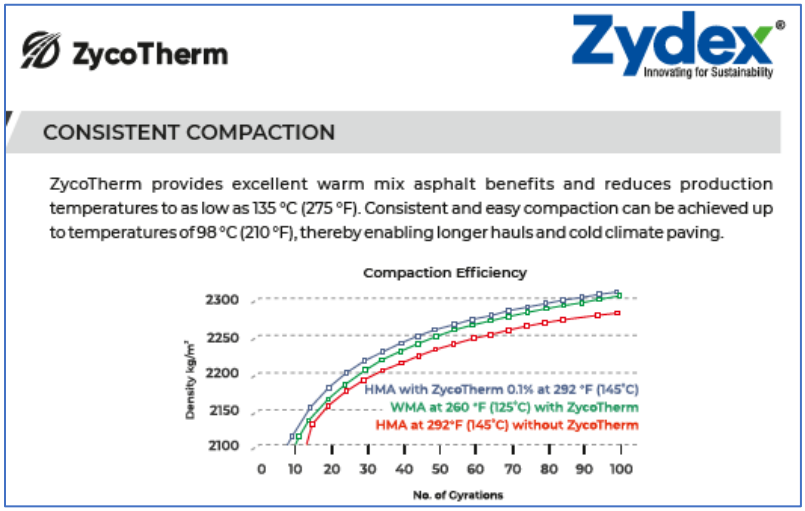
70. According to Zydex, the ZycoTherm additives enable "lower production and compaction temperatures during paving," and the ZycoTherm SP and SP2 additives "allow a reduction in mixing temperature (up to 30°C) and compaction temperatures (by 30-40°C)," making them "an environmentally friendly warm-mix additive."[4] On information and belief, the remainder of the ZycoTherm line of products are similarly advertised and so functional.

71. Elsewhere, Zydex advertises its ZycoTherm line of products as enabling "temperature reduction up to 30°C (60°F), during mix production and field compaction", which it states is because "ZycoTherm forms a permanent chemical bond with the aggregate and improved adhesion to bitumen", as opposed to the "weak physical bond between the aggregate and bitumen" formed by "conventional antistrips".[5] These statements are repeated through ZycoTherm

[2] https://zydexgroup.com/us/perpetual-pavement/
[3] https://zydexgroup.com/us/bitumen-additive/
[4] https://zydexgroup.com/us/bitumen-additive/
[5] Exhibit F, Zydex – Odor Free Antistrip and Warm Mix Technology, accessed at https://zydexgroup.com/wp-content/uploads/2023/06/120623-Zycotherm-Brochure.pdf

promotional materials, including in YouTube videos advertising ZycoTherm's ability to enable said "temperature reduction up to 30°C (60°F), during mix production and field compaction," and that "[c]onsistent and easy compaction can be achieved up to temperatures of 98°C (210°F), thereby enabling longer hauls and cold climate paving.[6]

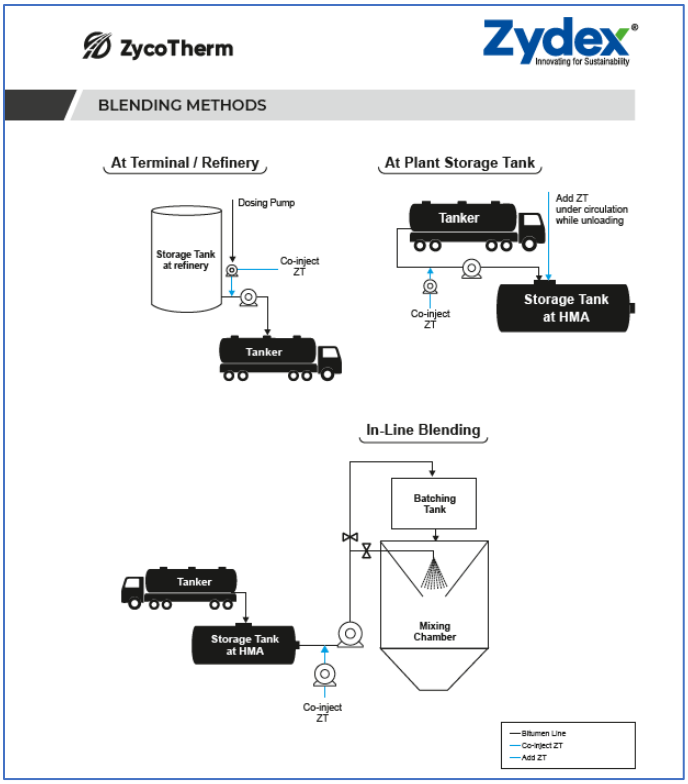
72. According to Zydex, this results in production temperatures "to as low as 135 °C (275 °F)", "consistent and easy compaction can be achieved up to temperatures of 98 °C (210 °F), thereby enabling longer hauls and cold climate paving," as seen in the Zydex promotional material shown below:



and in Exhibit F.

73. Zydex specifically advertises these products for their ease of use, noting that they can "easily be added either at the terminal, in the storage tanks, or blended in-line at the hot mix plant" and that they provide for "EXCELLENT COMPACTION IN COLD CLIMATES".[7] A diagram provided by Zydex depicting blending methods for adding its ZycoTherm line of additives to asphalt mixtures is shown below:

[6] https://m.youtube.com/watch?feature=shared&v=ZUgqmbTitiQ
[7] https://zydexgroup.com/us/bitumen-additive/



and in Exhibit F.

74. According to the Zydex website, "ZycoTherm is a next generation antistrip additive with the additional benefit of warm mix asphalt (WMA)", providing "superior coating and wetting attributes" and "excellent warm mix asphalt benefits", with the above-mentioned production temperatures "as low as 135 °C (275 °F)", and "Consistent and easy compaction" "up to temperatures of 98 °C (210 °F)".[8]

75. ZycoTherm consequently is what is referred to in the asphalt industry as an "antistrip" or "antistripping" agent or additive, and also is what is referred to in the industry as a "warm mix additive".

[8] Exhibit F, Zydex – Odor Free Antistrip and Warm Mix Technology, accessed at https://zydexgroup.com/wp-content/uploads/2023/06/120623-Zycotherm-Brochure.pdf

76. On information and belief, Zydex personnel have also stated that "ZycoTherm-SP is a great anti-strip and a good WMA" and that ZycoTherm SP2 "is a whole other animal in terms of performance, not only as a LASA, but as a WMA", with the term "LASA" referring to liquid antistrip additives.

77. ZycoTherm SP and SP2 are consequently both what is referred to in the asphalt industry as "antistrip" or "antistripping" agents or additives, and also what is referred to in that industry as "warm mix additives".

78. On information and belief, Zycotherm LS and Zycotherm EZ are functionally similar to Zycotherm, Zycotherm SP, and Zycotherm SP2, and each product within the ZycoTherm line of products has been marketed in a similar manner as a warm mix additive. Zycotherm LS was recently approved as a warm mix additive by the Colorado Department of Transportation.[9] According to Zydex marketing materials, Zycotherm EZ "allows lower mixing temperatures (by 10-15 °C) and lower compaction temperatures (by 30-40 °C), making ZT-EZ an environment friendly warm mix, warm compaction additive."

79. According to a Zydex "ZycoTherm™ Material Safety Data Sheet" (MSDS) dated April 23, 2013, ZycoTherm contains "hydroxyalkylalkylsilyl compounds 65-70%, benzyl alcohol (CAS # 100-51- 6) 25-27%, and ethylene glycol (CAS # 107-21-1) 3-5%".[10] Also, according to a Zydex "ZycoTherm-SP™ Safety Data Sheet" (SDS) dated 6/2018, ZycoTherm SP contains "alkoxyalkylsilyl compounds 39-41%, benzyl alcohol (CAS # 100-51-6) 58-60%, and ethylene glycol (CAS # 107- 21-1) 1-2%".[11] On information and belief, Zydex personnel have said that SP

[9] https://www.codot.gov/business/apl/documents/non-standard-asphalt-mix-approvals/2024/martin-marietta-zycotherm-sp-sp2-ls-approval-05-16-2024.pdf
[10] Exhibit S, Zydex Material Safety Data Sheet, ZycoTherm, April 23, 2013
[11] Exhibit T, Zydex Material Safety Data Sheet, ZycoTherm SP, June 20, 2018

"and other blends of ZycoTherm have all utilized the same silane chemistry and components. The ratios have been modified over the years to help make the product more user friendly in both the field and the lab," and that ZycoTherm SP2 "is still a silane, but the molecules along with the carriers have been modified. In essence, its basically ZycoTherm-SP on steroids."

80. On information and belief, Zydex sells its ZycoTherm additives through its own subsidiaries as well as through a network of authorized distributors in the United States. These subsidiaries and distributors, in turn, then contract with third parties to provide paving services utilizing warm-mix asphalt compositions containing the ZycoTherm additives. Such third-party paving services are used for, among other things, state department of transportation projects and residential and commercial paving services, in accordance with Zydex promotional guidelines and state DOT criteria. On information and belief, this network of distributors includes at least Hi-Tech Asphalt Solutions, Western Infrastructure, KLP Commercial, LLC, and others, providing the ZycoTherm line of additives for the production and use of warm mix asphalt in at least Colorado, South Carolina, Kansas, Illinois, Oregon, Florida, North Carolina, New York, Arizona, California, Texas, Pennsylvania, and Virginia.

81. These distributors tout the benefits of the ZycoTherm line of products as warm mix additives, demonstrating that they intend the additives to be used as such, as a direct result of Zydex's direction and instruction as stated in at least its advertising and promotional statements. For example, Hi-Tech Asphalt Solutions, a distributor of Zydex's ZycoTherm line of products in the United States, and in particular in Virginia, New York, and Texas, states on its website that ZycoTherm "Eliminates stripping", "Reduces stickiness on trucks and compaction rollers up to 194°F", "Improves field compaction up to 194 °F" and "Improves coating up to 248 °F."[12]

[12] https://www.htas.com/zycotherm

Western Infrastructure also promotes its company as using Zydex's products as warm-mix additives, noting that the products perform well when used in accordance with the Colorado Department of Transportation's Warm Mix Asphalt procedure.

82. On information and belief, state departments of transportation are key end users of Zydex's ZycoTherm line of additives, utilizing them as a warm-mix additive in hundreds of thousands of tons of warm mix asphalt produced and placed on state DOT highways. To be utilized by these state DOT's, additives must be specifically approved as warm mix additives, and must meet defined criteria, including prior use and temperature criteria set forth by those state agencies.

83. Zydex's ZycoTherm line of products have been approved as warm mix asphalt additives in numerous states, including at least Colorado, South Carolina, Kansas, Illinois, Oregon, Florida, North Carolina, New York, Arizona, California, Pennsylvania, Texas, and Virginia, and have been utilized for the production of warm mix asphalt at temperatures at least 30°F lower than that permitted by asphalt mixtures not containing said additives, including temperatures of 280°F or lower.

84. In some instances, it is Zydex's exclusive distributors who petition state departments of transportation to designate and accept the ZycoTherm line of products as approved warm-mix additives, encouraged by and in reliance on Zydex's marketing statements and promotional activity.

85. For example, the Colorado Department of Transportation authorized Zydex's ZycoTherm product as an additive that may be used for warm-mix asphalt, listing the key contact for the technology and submission as Matt Elam, owner of Western Infrastructure, Inc.

86. The Western Infrastructure website says that Western Infrastructure is "the exclusive distributor for Zydex Industries line of road construction chemicals in Colorado, Utah,

Wyoming and New Mexico. These products include asphalt anti-strips & warm mix, emulsion additives, dust palliatives and water proofing agents."[13]

Exemplary Claims of Infringement – '646 Patent

87. Independent claim 1 of the '646 Patent recites:

> 1. An asphalt paving composition comprising functionally dry, essentially water-free, non-foamed asphalt binder containing lubricating antistrip additive mixed with uncompacted aggregate to provide a warm mix paving composition of the aggregate adequately coated with the functionally dry, essentially water-free, non-foamed asphalt binder and lubricating antistrip additive, wherein the lubricating antistrip additive reduces the mixing and compaction temperature of the warm mix paving composition such that the paving composition is produced at and is at a temperature of 280°F. or lower and can be compacted at a temperature of 260°F. or lower, and if the warm mix paving composition also comprises a lubricating wax, then the lubricating wax is 0.5 weight percent or less of the asphalt binder weight.

88. The making, using, importation, offering for sale, and/or sale by Zydex of its ZycoTherm line of products, and resale and/or use by its customers and distributors in accordance with the information provided by Zydex represents induced and/or contributory infringement of at least claim 1 of the '646 Patent, for reasons discussed above and in more detail below.

89. Zydex has admitted that its ZycoTherm, ZycoTherm SP, and ZycoTherm SP2 products are lubricating antistrip additives. Zydex's marketing materials state that "ZycoTherm is a next generation antistrip additive with the additional benefit of warm mix asphalt."[14] Moreover, on information and belief, Zydex personnel have also stated that "ZycoTherm-SP is a great anti-strip and a good WMA" and that ZycoTherm SP2 "is a whole other animal in terms of performance, not only as a LASA, but as a WMA", with the term "LASA" referring to liquid

[13] https://better-asphalt.com/
[14] Exhibit F, Zydex – Odor Free Antistrip and Warm Mix Technology, accessed at https://zydexgroup.com/wp-content/uploads/2023/06/120623-Zycotherm-Brochure.pdf

antistrip additives. Moreover, according to the Zydex document LTP-RD-ZT-001-01 entitled "Zydex® Laboratory Test Protocol ZycoTherm Mixing Protocol" dated November 2, 2012, "ZycoTherm has a positive effect on mixing, workability and compaction of warm mix asphalt (WMA). Its superior aggregate wetting and coating properties, ensures uniform [binder] film thickness and better lubrication of the warm mix."[15] ZycoTherm ZT, ZycoTherm SP, and ZycoTherm SP2 are thus, as noted above, each lubricating antistrip additives, in addition to being warm mix additives. On information and belief, ZycoTherm EZ and LS, as well as any other substantially similar products, are functionally the same.

90. Governmental agencies differentiate between approval of the ZycoTherm line of products solely as an antistrip agent, and as a warm-mix additive in addition to antistrip properties, based on the concentration of ZycoTherm included in the mix. For example, the Virginia Department of Transportation certifies the use for which additives may be included in asphalt mix used in state projects.[16] According to Virginia approval regulations, ZycoTherm may be used as a warm mix additive, provided that it is included in the mixture at a concentration no less than 0.07%. ZycoTherm SP2 is also approved as a warm-mix additive, in concentrations no less than 0.05%. In contrast, the Virginia Department of Transportation has approved both products for inclusion in asphalt mixtures as antistrip agents, with a minimum concentration of 0.03%.[17] Thus, the ZycoTherm line of products not only constitute antistrip agents but have been utilized in sufficient quantities to qualify as such when used as a warm-mix additive, as discussed in more detail below.

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[15] Exhibit U, Zydex® Laboratory Test Protocol ZycoTherm Mixing Protocol, November 2, 2012.
[16] Exhibit G, Virginia DOT Materials Approval List at 44-46, 179, assessed at https://www.vdot.virginia.gov/media/vdotvirginiagov/doing-business/technical-guidance-and-support/materials/Approved-List-2023-01-04_Eric-Test.pdf
[17] Exhibit G, Virginia DOT Materials Approval List at 44-46, 179, assessed at https://www.vdot.virginia.gov/media/vdotvirginiagov/doing-business/technical-guidance-and-support/materials/Approved-List-2023-01-04_Eric-Test.pdf

91. S.L. Williamson, an asphalt paving contractor in Virginia and customer of Zydex's infringing products, has admitted that it has added ZycoTherm to asphalt as an antistrip agent.

92. When used in accordance with the video at https://www.htas.com/zycotherm and the Zydex brochure entitled *"R_Zycotherm-Flyer_ENG_2018_1.0"*,[18] ZycoTherm ZT, ZycoTherm SP, and ZycoTherm SP2 are each added to a functionally dry, essentially water-free, non-foamed asphalt binder, and are also mixed with uncompacted aggregate.

93. On information and belief, Zydex's ZycoTherm line of additives do not comprise a lubricating wax. The material data safety sheets for ZycoTherm and ZycoTherm SP fail to indicate the presence of any wax.[19] And on information and belief, Zydex personnel have stated that "other blends of ZycoTherm," which would include ZycoTherm SP2, "have all utilized the same . . . components." The Zydex website further differentiates its chemical additives from "organic additives such as waxes."[20]

94. Zydex's ZycoTherm products are used as warm-mix additives within the scope of '646 Patent claim 1.

95. Zydex's ZycoTherm products are advertised to be, are intended to be, and have been utilized in warm mix asphalt paving compositions produced at and at warm mix temperatures at or below 280°F and can be compacted at temperatures of 260°F or lower.

96. By way of a non-limiting example, ZycoTherm SP and ZycoTherm SP2 are each approved as warm mix asphalt additive technologies by the Arizona State Department of Transportation.[21] According to the Arizona DOT criteria, "warm mix asphalt" is defined as

[18] Exhibit V, Zydex Brochure, R_Zycotherm-Flyer_ENG_2018_1.0.
[19] Exhibit S, T.
[20] https://zydexgroup.com/warm-mix-asphalt-technologies/
[21] Exhibit H, Arizona DOT Approved Technologies, accessed at https://azdot.gov/sites/default/files/2023-06/approved_wma_technologies_list_june2023_0.pdf

asphaltic concrete that is produced within the temperature range of 215 to 275°F."[22] And in order to be approved as warm mix additives, the additives "must be a recognized WMA technology with successful projects constructed nationally, with production of at least 100,000 tons of WMA produced and placed on State DOT highways."[23] Thus, the inclusion of ZycoTherm SP and ZycoTherm SP2 as approved warm mix technologies for projects with the Arizona DOT demonstrates that each has been used to produce at least a hundred thousand tons of WMA – asphalt produced at or below 275°F – within the scope of claim 1.

97. ZycoTherm SP is also listed by the Illinois Department of Transportation as an approved technology "for production of warm mix asphalt (WMA).[24] As in Arizona, asphalt mixes are only classified as warm mix asphalt, or WMA, by the Illinois DOT if produced at a temperature no greater than 275°F.[25] And to be placed on the approved technology list, the applicant must demonstrate that at least 2000 tons of WMA were successfully produced and placed (i.e., used for paving) including said additive.[26] Thus, ZycoTherm SP has been used to produced WMA – asphalt at or below a temperature of 275°F – within the scope of claim 1.

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[22] Exhibit I, Arizona DOT Policy and Procedures Directive, accessed at https://apps.azdot.gov/files/materials-manuals/Policy-Procedure-Directives/ppd23.pdf

[23] Exhibit H, Arizona DOT Approved Technologies, accessed at https://azdot.gov/sites/default/files/2023-06/approved_wma_technologies_list_june2023_0.pdf

[24] Exhibit J, Illinois DOT Technologies for Production of Warm Mix Asphalt, accessed at https://idot.illinois.gov/content/dam/soi/en/web/idot/documents/doing-business/specialty-lists/highways/materials/materials---physical-research/hot-mix-asphalt/warmmixasphalttechnologies.pdf

[25] Exhibit K, Illinois DOT Warm Mix Asphalt BDE, accessed at https://apps.dot.illinois.gov/eplan/desenv/110813/DistrictStandardsForWebsite/District%204/D4SpecialProvisions/BDE%20Specials_with%20Designer%20Notes/Individual%20BDE's/z40600.pdf

[26] Exhibit J, Illinois DOT Technologies for Production of Warm Mix Asphalt, accessed at https://idot.illinois.gov/content/dam/soi/en/web/idot/documents/doing-business/specialty-lists/highways/materials/materials---physical-research/hot-mix-asphalt/warmmixasphalttechnologies.pdf

98. On information and belief, other states contain similar requirements for approval, providing additional evidence of infringement.

99. ZycoTherm, ZycoTherm SP, and ZycoTherm SP2 can each also be used as additives for asphalt that can be compacted at a temperature of 260°F or lower. By way of a non-limiting example, Zydex markets its ZycoTherm product as allowing for "easy compaction" at temperatures of 210°F, "thereby enabling longer hauls and cold climate paving."[27] Similarly, Zydex advertises its products as allowing for a reduction of compaction temperatures by 30-40°C, which is consistent with temperatures below 260°F.[28, 29]

100. The Zydex website further explains that "Warm mix asphalt" – which it advertises its ZycoTherm line of products as enabling – is asphalt that can "be put down at about 180 degrees Fahrenheit without cooling," demonstrating not only Zydex's intent that its products be used for asphalt laid at these temperatures, but also its knowledge that such use has occurred.[30]

101. Moreover, the clear evidence of significant quantities of WMA ***produced*** at temperatures at or below 275°F, as discussed above, provides a reasonable inference that the onsite compaction of said mixes has actually occurred at or below 260°F given the natural loss of heat during transportation and lay-down.

102. Documents submitted by one of Zydex's customers, S.L. Williamson Company, Inc., to the Virginia Department of Transportation further demonstrate that said customer requested, and was granted, dozens of project approvals for the use of Zydex's ZycoTherm line of products in concentrations defined by the state as for use as a warm-mix additive, including

[27] Exhibit F, Zydex – Odor Free Antistrip and Warm Mix Technology, accessed at https://zydexgroup.com/wp-content/uploads/2023/06/120623-Zycotherm-Brochure.pdf
[28] https://zydexgroup.com/bitumen-additive/
[29] See also, https://www.forconstructionpros.com/asphalt/product/12061757/zydex-inc-zycotherm-from-zydex
[30] https://zydexgroup.com/hot-mix-asphalt-vs-warm-mix-asphalt/

projects specifically seeking approval for lay-down temperatures as low as 200°F.

103. Additional evidence of infringement includes sales of ZycoTherm products that have been used in construction projects in Virginia, including jobs performed by Colony Construction, Inc. of Powhatan, Virginia, in projects for the Virginia Department of Transportation ("Virginia DOT"), including but not limited to Virginia DOT project number HSIP-006-662, N501, which lists a recorded field temperature of 256°F.

104. On information and belief, including based on Zydex's marketing and promotional statements, Zydex is aware of, intends, and encourages the infringing uses described above.

105. For at least the foregoing reasons, Zydex indirectly and/or contributorily infringes at least the aforementioned claims of the '646 Patent.

Exemplary Claims of Infringement – '725 Patent

106. Independent claim 1 of the '725 Patent recites:

> 1. A warm mix asphalt paving composition comprising i) functionally dry, essentially water-free, non-foamed asphalt binder containing ii) lubricating additive comprising lubricating surfactant, lubricating non-surfactant, lubricating acid or combination thereof, mixed with iii) uncompacted aggregate to provide aggregate coated with binder and lubricating additive; wherein the warm mix asphalt paving composition is produced at and is at a warm mix temperature at least 30° F. lower than a comparison temperature needed to produce a comparison paving composition containing binder-coated aggregate without the lubricating additive, and if the lubricating additive comprises a lubricating wax, the wax is 0.5 weight percent or less of the asphalt binder weight.

107. Dependent claim 20 of the '725 Patent depends from claim 1 and recites:

> 20. A warm mix, asphalt paving composition according to claim 1 at a warm mix temperature of 280°F or lower.

108. Independent claim 25 of the '725 Patent recites:

> 25. A warm mix asphalt paving composition comprising i) functionally dry, essentially water-free, non-foamed asphalt binder

> containing ii) lubricating additive selected from the group consisting of lubricating surfactant, lubricating non-surfactant other than non-surfactant additives based on wax chemistry, lubricating acid or combination thereof, mixed with iii) uncompacted aggregate to provide aggregate coated with binder and lubricating additive, wherein the warm mix asphalt paving composition is produced at and is at a warm mix temperature at least 30° F lower than a comparison temperature needed to produce a comparison paving composition containing binder-coated aggregate without the lubricating additive.

109. Dependent claim 44 of the ’725 Patent depends from claim 25 and recites:

> 44. A warm mix, asphalt paving composition according to claim 25 at a warm mix temperature of 280°F or lower.

110. The making, using, importation, offering for sale, and/or sale by Zydex of its ZycoTherm line of products, and resale and/or use by its customers and distributors in accordance with the information provided by Zydex represents induced and/or contributory infringement of at least claims 1, 20, 25, and 44 of the ’725 Patent, for reasons discussed above and in more detail below.

111. ZycoTherm, ZycoTherm SP and ZycoTherm SP2 are each “lubricating additives” to the extent claimed in the ’725 Patent. Moreover, according to the Zydex document LTP-RD-ZT-001-01 entitled “Zydex® Laboratory Test Protocol ZycoTherm Mixing Protocol” dated November 2, 2012 (emphasis added), “ZycoTherm has a positive effect on mixing, workability and compaction of warm mix asphalt (WMA). Its superior aggregate wetting and coating properties, ensures uniform [binder] film thickness and better lubrication of the warm mix.” On information and belief, the same applies to ZycoTherm EZ and LS.

112. ZycoTherm, ZycoTherm SP and ZycoTherm SP2 products are also each a “lubricating surfactant” to the extent claimed in the ’725 Patent. On information and belief, the Zydex website initially said that ZycoTherm was a “surfactant”, but that statement has been removed from the website. A paper by Hasan et al., titled Performance Characterizations of

Asphalt Binders and Mixtures Incorporating Silane Additive ZycoTherm, also identifies ZycoTherm as being a "surfactant-based silane additive."[31] On information and belief, and because as noted above ZycoTherm SP2 "uses the same silane chemistry" as ZycoTherm SP and other blends of ZycoTherm, ZycoTherm SP and SP2 would also be determined be a surfactant. This is also supported by a comparison of the materials present in each product, as reflected in the various Materials Safety Data Sheets.[32] Consequently, ZycoTherm, ZycoTherm SP and ZycoTherm SP2 are each a "lubricating additive comprising a lubricating surfactant" as called for in the '725 Patent. On information and belief, the same applies to ZycoTherm EZ and LS.

113. When used in accordance with the video at https://www.htas.com/zycotherm and the Zydex brochure entitled *"R_Zycotherm-Flyer_ENG_2018_1.0"*, ZycoTherm, ZycoTherm SP and ZycoTherm SP2 are each added to a functionally dry, essentially water-free, non-foamed asphalt binder, and are also mixed with the uncompacted aggregate. On information and belief, the same applies to ZycoTherm EZ and LS.

114. On information and belief, Zydex's ZycoTherm line of additives do not comprise a lubricating wax, and thus meet the additional limitation of Claim 1. The materials data safety sheets for ZycoTherm and ZycoTherm SP fail to indicate the presence of any wax.[33] And on information and belief, Zydex personnel have stated that "other blends of ZycoTherm," which would include ZycoTherm SP, SP2, EZ, and LS, "have all utilized the same . . . components." The Zydex website further differentiates its chemical additives from less beneficial technologies, "such as waxes."[34]

115. Zydex's ZycoTherm line of products are also used as warm-mix additives within

[31] Exhibit W, Hasan et al, Performance Characterizations of Asphalt Binders and Mixtures Incorporating Silane Additive ZycoTherm, AIP Conference Proceedings, (October 2017), at p. 1.
[32] Exhibits S, T.
[33] Exhibits S, T.
[34] https://zydexgroup.com/warm-mix-asphalt-technologies/

the scope of '725 Patent Claims 20 and 44, because they are advertised to be, and indeed have been, utilized in warm mix asphalt paving compositions produced at and at warm mix temperatures at or below 280°F, and provide for asphalt mixture that can be compacted at temperatures of 260°F or lower.

116. By way of a non-limiting example, ZycoTherm SP and ZycoTherm SP2 are each approved as warm mix asphalt additive technologies by the Arizona State Department of Transportation.[35] According to the Arizona DOT criteria, "warm mix asphalt" is defined as asphaltic concrete that is produced within the temperature range of 215 to 275°F."[36] And in order to be approved as warm mix additives, the additives "must be a recognized WMA technology with successful projects constructed nationally, with production of at least 100,000 tons of WMA produced and placed on State DOT highways."[37] Thus, the inclusion of ZycoTherm SP and ZycoTherm SP2 as approved warm mix technologies for projects with the Arizona DOT demonstrates that each has been used to produce at least a hundred thousand tons of WMA – asphalt produced at or below 275°F. Moreover, such temperatures are typically considered to be at least 30°F lower than corresponding hot-mix temperatures – i.e., comparison temperatures needed to produce a comparison paving composition containing binder-coated aggregate without the lubricating additive.

117. ZycoTherm SP is listed by the Illinois Department of Transportation as an approved

[35] Exhibit H, Arizona DOT Approved Technologies, accessed at https://azdot.gov/sites/default/files/2023-06/approved_wma_technologies_list_june2023_0.pdf
[36] Exhibit I, Arizona DOT Policy and Procedures Directive, accessed at https://apps.azdot.gov/files/materials-manuals/Policy-Procedure-Directives/ppd23.pdf
[37] Exhibit H, Arizona DOT Approved Technologies, accessed at https://azdot.gov/sites/default/files/2023-06/approved_wma_technologies_list_june2023_0.pdf

technology "for production of warm mix asphalt (WMA)".[38] As in Arizona, asphalt mixes are only classified as warm mix asphalt, or WMA, by the Illinois DOT if produced at a temperature no greater than 275°F.[39] And to be placed on the approved technology list, the applicant must demonstrate that at least 2000 tons of WMA were successfully produced and placed (i.e., used for paving) including said additive.[40]

118. On information and belief, other states contain similar requirements for approval, providing additional evidence of infringement.

119. Additional evidence of infringement includes sales of ZycoTherm products that have been used in construction projects in Virginia, including jobs performed by Colony Construction, Inc. of Powhatan, Virginia, in projects for the Virginia Department of Transportation ("Virginia DOT"), including but not limited to Virginia DOT project number HSIP-006-662, N501, which lists a recorded field temperature of 256°F.

120. Thus, ZycoTherm, ZycoTherm SP, ZycoTherm SP2, ZycoTherm EZ, and ZycoTherm LS meet the temperature limitations of claims 1, 20, 25, and 44.

121. On information and belief, including based on Zydex's marketing and promotional statements, Zydex is aware of, intends, and encourages the infringing uses described above.

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[38] Exhibit J, Illinois DOT Technologies for Production of Warm Mix Asphalt, accessed at https://idot.illinois.gov/content/dam/soi/en/web/idot/documents/doing-business/specialty-lists/highways/materials/materials---physical-research/hot-mix-asphalt/warmmixasphalttechnologies.pdf

[39] Exhibit K, Illinois DOT Warm Mix Asphalt BDE, accessed at https://apps.dot.illinois.gov/eplan/desenv/110813/DistrictStandardsForWebsite/District%204/D4SpecialProvisions/BDE%20Specials_with%20Designer%20Notes/Individual%20BDE's/z40600.pdf

[40] Exhibit J, Illinois DOT Technologies for Production of Warm Mix Asphalt, accessed at https://idot.illinois.gov/content/dam/soi/en/web/idot/documents/doing-business/specialty-lists/highways/materials/materials---physical-research/hot-mix-asphalt/warmmixasphalttechnologies.pdf

122. For at least the foregoing reasons, Zydex indirectly and/or contributorily infringes at least the aforementioned claims of the '725 Patent.

Exemplary Claims of Infringement – '652 Patent

123. Independent claim 1 of the '652 Patent recites:

> 1. A paving process comprising:
> (a) adding a lubricating additive comprising lubricating surfactant, lubricating non-surfactant, lubricating acid or combination thereof to functionally dry, essentially water-free, non-foamed asphalt binder containing less than 5 wt. % water and heated to a warm mix temperature to create a functionally dry warm mix lubricated asphalt binder composition, and if the lubricating additive in the warm mix lubricated asphalt binder composition comprises a lubricating wax, then the lubricating wax is 0.5 wt. % or less of the asphalt binder weight;
> (b) combining the warm mix lubricated asphalt binder composition with aggregate and recycled asphalt pavement at a warm mix temperature that is lower than a comparison temperature needed to produce a comparison paving material without the lubricating additive;
> (c) mixing to coat the aggregate and recycled asphalt pavement with the lubricated asphalt binder composition to form a warm mix paving material at the warm mix temperature;
> (d) transferring the warm mix paving material to a paving machine;
> (e) applying the warm mix paving material with the paving machine to a prepared surface at a warm mix paving temperature; and then
> (f) compacting the applied paving material to form a paved surface.

124. Dependent claim 2 of the '652 Patent recites:

> 2. A paving process according to claim 1 wherein the warm mix paving material is at a warm mix temperature of 280° F. or lower in step (c).

125. Dependent claim 5 of the '652 Patent recites:

> 5. A paving process according to claim 1 wherein the warm mix paving material is paved at a warm mix temperature at least 30° F. lower than a comparison paving temperature needed for proper paving of the comparison paving composition.

126. The making, using, importation, offering for sale, and/or sale by Zydex of its ZycoTherm line of products, and resale and/or use by its customers and distributors in accordance with the information provided by Zydex represents induced and/or contributory infringement of at least claim 1 of the '652 Patent, for reasons discussed above and in more detail below.

127. ZycoTherm, ZycoTherm SP and ZycoTherm SP2 are each "lubricating additives" to the extent claimed in the '652 Patent. Moreover, according to the Zydex document LTP-RD-ZT-001-01 entitled "Zydex® Laboratory Test Protocol ZycoTherm Mixing Protocol" dated November 2, 2012 (emphasis added), "ZycoTherm has a positive effect on mixing, workability and compaction of warm mix asphalt (WMA). Its superior aggregate wetting and coating properties, ensures uniform [binder] film thickness and better lubrication of the warm mix." On information and belief, the same applies to ZycoTherm EZ and LS.

128. ZycoTherm, ZycoTherm SP and ZycoTherm SP2 products are also each a "lubricating surfactant" to the extent claimed in the '652 Patent. On information and belief, the Zydex website initially said that ZycoTherm was a "surfactant", but that statement has been removed from the website. A paper by Hasan et al., titled Performance Characterizations of Asphalt Binders and Mixtures Incorporating Silane Additive ZycoTherm, also identifies ZycoTherm as being a "surfactant-based silane additive."[41] On information and belief, and because as noted above ZycoTherm SP2 "uses the same silane chemistry" as ZycoTherm SP and other blends of ZycoTherm, ZycoTherm SP and SP2 would also be determined be a surfactant. This is also supported by a comparison of the materials present in each product, as reflected in the various

[41] Exhibit W, Hasan et al, Performance Characterizations of Asphalt Binders and Mixtures Incorporating Silane Additive ZycoTherm, AIP Conference Proceedings, (October 2017), at p. 1.

Materials Safety Data Sheets.[42] Consequently, ZycoTherm, ZycoTherm SP and ZycoTherm SP2 are each a "lubricating additive comprising a lubricating surfactant" as called for in the '725 Patent. On information and belief, the same applies to ZycoTherm EZ and LS.

129. When used in accordance with the video at https://www.htas.com/zycotherm and the Zydex brochure entitled *"R_Zycotherm-Flyer_ENG_2018_1.0"*, ZycoTherm, ZycoTherm SP and ZycoTherm SP2 are each added to a functionally dry, essentially water-free, non-foamed asphalt binder, and are also mixed with the uncompacted aggregate. On information and belief, the same applies to ZycoTherm EZ and LS.

130. On information and belief, Zydex's ZycoTherm line of additives do not comprise a lubricating wax, and thus meet the additional limitation of Claim 1. The materials data safety sheets for ZycoTherm and ZycoTherm SP fail to indicate the presence of any wax.[43] And on information and belief, Zydex personnel have stated that "other blends of ZycoTherm," which would include ZycoTherm SP2, "have all utilized the same . . . components." The Zydex website further differentiates its chemical additives from less beneficial technologies, "such as waxes."[44]

131. Zydex's ZycoTherm line of products are also used as warm-mix additives within the scope of '652 Patent claims, because they are advertised to be, and indeed have been, utilized in warm mix asphalt paving compositions produced at and at warm mix temperatures at or below 280°F, and provide for asphalt mixture that can be prepared at a temperature at least 30°F lower than a comparison paving temperature needed for proper paving of the comparison paving composition.

132. By way of a non-limiting example, ZycoTherm SP and ZycoTherm SP2 are each

[42] Exhibits S, T.
[43] Exhibits S, T.
[44] https://zydexgroup.com/warm-mix-asphalt-technologies/

approved as warm mix asphalt additive technologies by the Arizona State Department of Transportation.[45] According to the Arizona DOT criteria, "warm mix asphalt" is defined as asphaltic concrete that is produced within the temperature range of 215 to 275°F."[46] And in order to be approved as warm mix additives, the additives "must be a recognized WMA technology with successful projects constructed nationally, with production of at least 100,000 tons of WMA produced and placed on State DOT highways."[47] Thus, the inclusion of ZycoTherm SP and ZycoTherm SP2 as approved warm mix technologies for projects with the Arizona DOT demonstrates that each has been used to produce at least a hundred thousand tons of WMA – asphalt produced at or below 275°F. Moreover, such temperatures are typically considered to be at least 30°F lower than corresponding hot-mix temperatures – i.e., comparison temperatures needed to produce a comparison paving composition containing binder-coated aggregate without the lubricating additive. Indeed, Zydex's marketing materials consistently advertise its infringing line of products as allowing for a reduction of mixing temperature of "up to 30°C (60°F)."[48,49]. And other Zydex marketing materials advertise a reduction of mixing temperature of 35°C.[50]

133. ZycoTherm SP is listed by the Illinois Department of Transportation as an approved technology "for production of warm mix asphalt (WMA)".[51] As in Arizona, asphalt mixes are only

[45] Exhibit H, Arizona DOT Approved Technologies, accessed at https://azdot.gov/sites/default/files/2023-06/approved_wma_technologies_list_june2023_0.pdf
[46] Exhibit I, Arizona DOT Policy and Procedures Directive, accessed at https://apps.azdot.gov/files/materials-manuals/Policy-Procedure-Directives/ppd23.pdf
[47] Exhibit H, Arizona DOT Approved Technologies, accessed at https://azdot.gov/sites/default/files/2023-06/approved_wma_technologies_list_june2023_0.pdf
[48] https://zydexgroup.com/us/bitumen-additive/
[49] Exhibit F, Zydex – Odor Free Antistrip and Warm Mix Technology, accessed at https://zydexgroup.com/wp-content/uploads/2023/06/120623-Zycotherm-Brochure.pdf
[50] Exhibit Y, ZycoTherm Promotional Document.
[51] Exhibit J, Illinois DOT Technologies for Production of Warm Mix Asphalt, accessed at https://idot.illinois.gov/content/dam/soi/en/web/idot/documents/doing-business/specialty-

classified as warm mix asphalt, or WMA, by the Illinois DOT if produced at a temperature no greater than 275°F.[52] And to be placed on the approved technology list, the applicant must demonstrate that at least 2000 tons of WMA were successfully produced and placed (i.e., used for paving) including said additive.[53]

134. On information and belief, other states contain similar requirements for approval, providing additional evidence of infringement.

135. Additional evidence of infringement includes sales of ZycoTherm products and advertising materials described throughout this Complaint, which is expressly incorporated herein.

136. Thus, ZycoTherm, ZycoTherm SP, ZycoTherm SP2, ZycoTherm EZ, and ZycoTherm LS meet the temperature limitations of at least claims 1-3.

137. Zydex's infringing products are intended to, and indeed have been utilized in a paving process in which they are combined with aggregate, mixed to coat the aggregate to form a warm mix paving material at the warm mix temperature, transferred to a paving machine, applied to a prepared surface at a warm mix paving temperature, and compacted to form a paved surface.

138. Moreover, Zydex's infringing products are intended to, and on information and belief have been, utilized in the aforementioned process in which the asphalt binder composition is mixed not only with aggregate but also with recycled asphalt pavement. By way of non-limiting

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lists/highways/materials/materials---physical-research/hot-mix-asphalt/warmmixasphalttechnologies.pdf

[52] Exhibit K, Illinois DOT Warm Mix Asphalt BDE, accessed at https://apps.dot.illinois.gov/eplan/desenv/110813/DistrictStandardsForWebsite/District%204/D4SpecialProvisions/BDE%20Specials_with%20Designer%20Notes/Individual%20BDE's/z40600.pdf

[53] Exhibit J, Illinois DOT Technologies for Production of Warm Mix Asphalt, accessed at https://idot.illinois.gov/content/dam/soi/en/web/idot/documents/doing-business/specialty-lists/highways/materials/materials---physical-research/hot-mix-asphalt/warmmixasphalttechnologies.pdf

example, a Zydex marking document explains that ZycoTherm improves melting and mixing of hardened asphalt from "RAP/RAS."[54] Another Zydex marketing document states that ZycoTherm improves "the heat transfer to RAP and mixing of virgin binder with oxidized hardened RAP binder."[55] In the paving industry, RAP is used as short hand for "recycled asphalt pavement."

139. Thus, ZycoTherm, ZycoTherm SP, and ZycoTherm SP2 meet the additional limitations of at least claims 1-3. On information and belief, the same applies to ZycoTherm EZ and LS.

140. On information and belief, including based on Zydex's marketing and promotional statements, Zydex is aware of, intends, and encourages the infringing uses described above.

141. For at least the foregoing reasons, Zydex indirectly and/or contributorily infringes at least the aforementioned claims of the '652 Patent.

Exemplary Claims of Infringement – '466 Patent

142. Independent claim 1 of the '466 Patent recites:

> 1. A method of making bituminous paving comprising the steps of:
> (a) mixing a non-foamed asphalt binder composition and lubricating additive selected from the group consisting of a lubricating surfactant, lubricating acid, viscosity modifier, dispersant viscosity modifier, additive containing viscosity modifier or dispersant modifier, extrusion and molding production processing aid, polyolefin, sulfur and combinations thereof, with aggregate at a temperature of 280° F. or lower, to coat the aggregate and produce a heated paving material at a warm mix temperature at least 30-100° F. lower than a comparison production temperature needed to produce a comparison paving composition containing binder-coated aggregate without the lubricating additive;
> (b) applying the heated paving material to a surface to be paved to provide an applied paving material, and
> (c) compacting the applied paving material at a temperature of 260° F. or lower to form a paved surface.

[54] Exhibit Y, ZycoTherm Promotional Document.
[55] https://www.scribd.com/document/392262647/Zydex-Nano-Technology

143. Independent claim 12 of the ’466 Patent recites:

> 12. A method of making a warm mix paving composition comprising the steps of:
> (a) adding a lubricating additive selected from the group consisting of a lubricating surfactant, lubricating acid, viscosity modifier, dispersant viscosity modifier, additive containing viscosity modifier or dispersant viscosity modifier, extrusion and molding production processing aid, polyolefin, sulfur and combinations thereof, to an asphalt binder composition, and
> (b) mixing the asphalt binder composition with aggregate to coat the aggregate and produce a functionally dry, essentially water-free, non- foamed warm mix paving composition and at a warm mix temperature which is at least 30° F. lower than a comparison production temperature needed to produce a comparison paving composition containing binder- coated aggregate without the lubricating additive.

144. Independent claim 17 of the ’466 Patent recites:

> 17. A method of forming a paved surface comprising the steps of:
> (a) mixing aggregate with a functionally dry, essentially water-free, non- foamed asphalt binder composition comprising an asphalt binder and a lubricating additive selected from the group consisting of a lubricating surfactant, a lubricating acid, viscosity modifier, dispersant viscosity modifier, additive containing viscosity modifier or dispersant viscosity modifier, extrusion and molding production processing aid, polyolefin, sulfur and combinations thereof to coat the aggregate and produce a warm mix paving composition at a warm mix temperature at least 30-100° F. lower than a comparison production temperature needed to produce a comparison paving composition containing binder-coated aggregate without the lubricating additive;
> (b) supplying the warm mix paving composition to a paving machine at a site to be paved;
> (c) applying the warm mix paving composition to the site to be paved; and
> (d) compacting the applied warm mix paving composition to form a paved surface.

145. Independent claim 20 of the ’466 Patent recites:

> 20. A paving process comprising:
> (a) adding a lubricating substance consisting of an antistripping

> agent to a
> non-foamed asphalt binder heated to within a warm mix temperature range to create a warm mix lubricated asphalt binder composition;
> (b) combining the warm mix lubricated asphalt binder composition with a suitable aggregate;
> (c) mixing to coat the aggregate with the lubricated asphalt binder composition to form a warm mix paving material;
> (d) transferring the warm mix paving material to a paving machine;
> (e) applying the warm mix paving material with the paving machine to a prepared surface at a warm mix paving temperature; and then
> (f) compacting the applied paving material to form a paved surface.

146. The making, using, importation, offering for sale, and/or sale by Zydex of its ZycoTherm, ZycoTherm SP, ZycoTherm SP 2, ZycoTherm EZ, and ZycoTherm LS products represents induced and/or contributory infringement of at least independent claims 1, 12, 17 and 20 of the ’466 Patent, for reasons like those discussed above in connection with the ’466 and ’725 Patents.

147. As previously stated, and which is incorporated as if fully restated herein, Zydex’s ZycoTherm, ZycoTherm SP, and ZycoTherm SP2 products are each “lubricating additives” and a “lubricating surfactant” to the extent claimed in the ’466 Patent, and when used in accordance with Zydex and its distributors’ product literature and advertising materials, are added to an asphalt binder, and are also mixed with aggregate to produce a warm mix asphalt paving composition at a temperature which is at least 30° F lower than a comparison paving composition containing binder-coated aggregate without the lubricating additive, and in particular, at temperatures at or below 280°F. As discussed above, Zydex’s ZycoTherm products have been used in such a manner at least with respect to various state department of transportation paving projects. On information and belief, the same applies to ZycoTherm EZ and LS.

148. Zydex also advertises, and its distributors have used, the ZycoTherm line of

products, in conjunction with warm mix asphalt mixtures compacted at or below 260°F.

149. Moreover, on information and belief, Zydex, with the assistance of its regional distribution partners, has commissioned testing demonstrating the compaction temperatures of the ZycoTherm line of products, using Ingevity's licensed Evotherm® products as a benchmark.

150. Moreover, per the Arizona DOT requirements to be listed as warm mix additives, and as discussed above, the ZycoTherm line of products have also been used in an infringing manner in at least 100,000 tons of warm mix asphalt around the country.

151. Additional evidence of infringement includes sales of ZycoTherm products that have been used in construction projects in Virginia, including jobs performed by Colony Construction, Inc. of Powhatan, Virginia, in projects for the Virginia Department of Transportation ("Virginia DOT"), including but not limited to Virginia DOT project number HSIP-006-662, N501, which lists a recorded field temperature of 256°F.

152. Upon information and belief, this is a just a small sample of the numerous acts of infringement committed by Zydex and its distributors and customers in Virginia and elsewhere.

153. The ZycoTherm products therefore have been and continue to be used to infringe the claims of the '466 Patent, including at least independent claims 1, 12, 17 and 20.

154. On information and belief, including based on Zydex's marketing and promotional statements, Zydex is aware of, intends, and encourages the infringing uses described above.

155. For at least the foregoing reasons, Zydex indirectly and/or contributorily infringes at least the aforementioned claims of the '466 Patent.

Exemplary Claims of Infringement – '581 Patent

156. Independent claim 1 of the '581 Patent recites:

1. A bituminous paving process, which process comprises:

> (a) mixing an asphalt binder, aggregate and 0.1-1.0 wt % lubricating additive based on the asphalt binder weight at a first temperature greater than 160° C. to form a bituminous mix consisting essentially of aggregate coated with asphalt binder and lubricating additive, wherein the lubricating additive comprises lubricating non-aqueous surfactants, non-surfactant additives, acids or combinations thereof, and wherein a blend of the asphalt binder and lubricating additive has a measured maximum normal force no more than about 5.5 Newtons at 90° C. using a dynamic shear rheometer with a 50 μm gap, and;
>
> (b) compacting the bituminous mix at a second temperature less than 130° C. and at least about 55° C. below the first temperature to provide bituminous pavement having field density values of less than 10% in place air voids for the compacted bituminous mix.

157. Independent claim 16 of the ’581 Patent recites:

16. A bituminous paving process, which process comprises:

> (a) mixing an asphalt binder, aggregate and 0.1-1.0 wt % lubricating additive based on the asphalt binder weight at a first temperature greater than 160° C. to form a bituminous mix consisting essentially of aggregate coated with asphalt binder and lubricating additive, wherein the lubricating additive comprises lubricating non-aqueous surfactants, non-surfactant additives, acids or combinations thereof, wherein the asphalt binder, aggregate and lubricating additive are essentially water free, and wherein a blend of the asphalt binder and lubricating additive has a measured maximum normal force no more than about 5.5 Newtons at 90° C. using a dynamic shear rheometer with a 50 μm gap, and
>
> (b) compacting the bituminous mix at a second temperature less than 130° C. and at least about 20° C. below the first temperature to provide bituminous pavement having field density values greater than 90% of the maximum theoretical density for the compacted bituminous mix.

158. The making, using, importation, offering for sale, and/or sale by Zydex of Zydex’s ZycoTherm, ZycoTherm SP, ZycoTherm SP2, ZycoTherm EZ, and ZycoTherm LS products represents induced and/or contributory infringement of at least independent claims 1 and 16 of the ’581 Patent, for reasons like those discussed above in connection with the ’646, ’725, and ’466 Patents, the explanation for which is expressly incorporated herein.

159. For example, ZycoTherm, ZycoTherm SP and ZycoTherm SP2 are each "lubricating additives" to the extent claimed in the '581 patent. When used in accordance with Zydex marketing materials, including those hosted at Zydex's distribution partners' websites such as https://www.htas.com/zycotherm, ZycoTherm, ZycoTherm SP and ZycoTherm SP2 are each added to an asphalt binder. On information and belief, the same applies to ZycoTherm EZ and LS.

160. Zydex marketing materials advertise the ZycoTherm line of products as having typical dosage ranges of 0.02 to 0.1% by weight of the bitumen binder, with dosages including 0.125% being recommended for certain uses, demonstrating Zydex's knowledge of and intent that its ZycoTherm products are used within the claimed dosage range.[56] This is consistent with the various departments of transportation approvals, including those from the New York Department of Transportation, (a state that has transitioned from hot mix to warm mix asphalt, and which has specifically approved ZycoTherm SP for use therewith)[57, 58] which notes that ZycoTherm SP should be used in dosages ranging from 0.05% to 0.125%[59], the Missouri Department of Transportation which has approved ZycoTherm SP at dosages ranging from 0.08% to 0.125%[60], and the Pennsylvania Turnpike Commission, which has mandated that ZycoTherm SP2 be the exclusive anti-strip agent used in turnpike construction projects, with dosage ranges of 0.1% when used as a warm mix additive.

[56] Exhibit F, Zydex – Odor Free Antistrip and Warm Mix Technology, accessed at https://zydexgroup.com/wp-content/uploads/2023/06/120623-Zycotherm-Brochure.pdf
[57] Exhibit L, NY DOT Approved Materials List
[58] Exhibit M, NY DOT Comprehensive Pavement Design Manual
[59] Exhibit N, NY DOT Reference Document Regarding Compaction Details, accessed at https://www.dot.ny.gov/divisions/engineering/technical-services/technical-services-repository/details/zycotherm.pdf
[60] Exhibit O, Mississippi DOT Approved Product Report, accessed at https://mdot.ms.gov/applications/mpl/Home/ViewPDF

161. S.L. Williamson, an asphalt paving contractor in Virginia and customer of Zydex's infringing products has also admitted that at times it may use ZycoTherm to "allow[] asphalt to be ***laid*** at lower temperatures" (emphasis added), yet it declined to admit that such projects were mixed at warm mix temperatures. On information and belief, some of said mixtures were therefore mixed at hot mix temperatures and laid at warm mix temperatures, in accordance with the claims of the '581 Patent. Zydex also advertises its products as allowing for a lowered mix temperature "OR Helps in longer hauls OR Allows paving in cold conditions 0-5°C," indicating that Zydex intends, at least in some instances, for its products to be used in asphalt paving compositions prepared at hot-mix temperatures under scenarios where a greater degree of cooling will take place before paving is complete (e.g., longer hauls or extreme cold conditions), and thus constituting hot mixed but warm laid pavement.[61]

162. As discussed above, the ZycoTherm line of products also can be, are advertised to be, and indeed have been used to create asphalt mixtures that are laid at temperatures less than 130°C (266°F), and at least 55°C below the mix temperature. For example, Zydex advertises that its additives enable "Consistent and easy compaction can be achieved up to temperatures of 98 °C (210 °F)",[62] which is both less than 130°C and more than 55°C (99°F) lower than the claimed first temperature of at least 160°C.

163. ZycoTherm, ZycoTherm SP and ZycoTherm SP2 also each have a maximum normal force no more than about 5.5 Newtons at 90°C, in accordance with the claims of the '581 Patent. On information and belief, the same applies to ZycoTherm EZ and LS.

[61] Exhibit Y, Zydex Promotional Document.
[62] Exhibit F, Zydex – Odor Free Antistrip and Warm Mix Technology, accessed at https://zydexgroup.com/wp-content/uploads/2023/06/120623-Zycotherm-Brochure.pdf

164. Asphalt pavement compositions containing the ZycoTherm line of additives, and mixed and laid in accordance with Zydex advertising and state Department of Transportation guidelines also contain less than 10% in place air voids as called for in '581 Patent claim 1 (viz., field density values greater than 90% of the maximum theoretical density for the compacted bituminous mix as called for in '581 Patent claim 16). Certain of the states for which the ZycoTherm line of products are approved include maximum air void content restrictions, setting the limit below the claimed limitation, and demonstrating infringement by each project utilizing the ZycoTherm line of additives therein. For example, the Texas DOT requires compaction to between 3.8% and 8.5% in place air voids for products mixed at hot mix temperatures.[63]

165. The aforementioned ZycoTherm products are consequently used, and intended to be used, to infringe the claims of the '581 Patent, including at least independent claims 1 and 16.

166. For at least the foregoing reasons, Zydex indirectly and/or contributorily infringes at least the aforementioned claims of the '581 Patent.

Exemplary Claims of Infringement – '446 Patent

167. Independent claim 1 of the '446 Patent recites.

> 1. A bituminous paving process, which process comprises:
>
> (a) mixing an asphalt binder, aggregate and lubricating additive at a first temperature greater than 160° C. to form a bituminous mix comprising aggregate coated with asphalt binder and lubricating additive, wherein the lubricating additive comprises a lubricating non-aqueous surfactant, non-surfactant additive, acid, or combinations thereof;
> (b) hauling the bituminous mix to a paving site; and
> (c) compacting the bituminous mix at a second temperature less than 130°C., to provide bituminous pavement having field density values greater than 90% of the maximum theoretical density for the compacted bituminous mix.

[63] Exhibit P, Texas DOT Item 340, accessed at https://ftp.txdot.gov/pub/txdot-info/cmd/cserve/specs/2014/standard/s340.pdf

168. The making, using, importation, offering for sale, and/or sale of Zydex's ZycoTherm, ZycoTherm SP, ZycoTherm SP2, ZycoTherm EZ, and ZycoTherm LS products represents induced and/or contributory infringement of at least independent claim 1 of the '446 Patent, for reasons like those discussed above in connection with the '646, '725, '466, and '581 Patents, the explanation for which is expressly incorporated herein.

169. For example, ZycoTherm, ZycoTherm SP and ZycoTherm SP2 are each "lubricating additives" and lubricating surfactants to the extent claimed in the '446 patent, for the reasons discussed above. Each are also formulated using non-aqueous solvents, and therefore are themselves non-aqueous. When used in accordance with Zydex marketing materials, including those hosted at Zydex's distribution partners' websites such as https://www.htas.com/zycotherm, ZycoTherm, ZycoTherm SP and ZycoTherm SP2 are each added to an asphalt binder. On information and belief, the same applies to ZycoTherm EZ and LS.

170. S.L. Williamson, an asphalt paving contractor in Virginia and customer of Zydex's infringing products has also admitted that at times it may use ZycoTherm to "allow[] asphalt to be ***laid*** at lower temperatures" (emphasis added), yet it declined to admit that such projects were mixed at warm mix temperatures. On information and belief, some of said mixtures were therefore mixed at hot mix temperatures and laid at warm mix temperatures, in accordance with the claims of the '446 Patent.

171. As discussed above, the ZycoTherm line of products also can be, are advertised to be, and indeed have been used to create asphalt mixtures that are laid at temperatures less than 130°C (266°F), and at least 55°C below the mix temperature. For example, Zydex advertises that its additives enable "Consistent and easy compaction can be achieved up to temperatures of 98 °C

(210 °F)",[64] which is both less than 130°C and more than 55°C (99°F) lower than the claimed first temperature of at least 160°C.

172. Asphalt pavement compositions containing the ZycoTherm line of additives, and mixed and laid in accordance with Zydex advertising and state Department of Transportation guidelines are also compacted to provide bituminous pavement having field density values greater than 90% of the maximum theoretical density for the compacted bituminous mix. Certain of the states for which the ZycoTherm line of products are approved include maximum air void content restrictions, requiring the mix to comprise less than 10% air voids. For example, the Texas DOT requires compaction to between 3.8% and 8.5% in place air voids for products mixed at hot mix temperatures.[65]

173. The aforementioned ZycoTherm products are consequently used, and intended to be used, to infringe the claims of the '446 Patent, including at least independent claim 1.

174. For at least the foregoing reasons, Zydex indirectly and/or contributorily infringes at least the aforementioned claims of the '446 Patent.

Zydex's Willful Infringement

175. In September 2017, Plaintiffs sent a letter to Zydex concerning their marketing of ZycoTherm and two other products (ZycoTherm-EZ and Zycosoil). The letter identified seven US patents including the '466 and '725 Patents, as well as their Reexamination Certificates, that, based upon available information, Zydex likely required a license to in order to sell the subject products. Plaintiffs' letter stated that:

[64] Exhibit F, Zydex – Odor Free Antistrip and Warm Mix Technology, accessed at https://zydexgroup.com/wp-content/uploads/2023/06/120623-Zycotherm-Brochure.pdf
[65] Exhibit P, Texas DOT Item 340, accessed at https://ftp.txdot.gov/pub/txdot-info/cmd/cserve/specs/2014/standard/s340.pdf

> Based on the claims made in your marketing literature and our understanding of the products ZycoTherm, ZycoTherm-EZ and Zycosoil, we believe a license under the portfolio may be needed to import, manufacture, sell, offer for sale or use one or more of those products in the U.S. and other countries listed in the portfolio. Ergon and ALM have exclusively licensed the portfolio to Ingevity. Ingevity has the ability to grant sublicenses, has done so for two significant sellers of warm mix additives, and may be willing to do so in your case. We would be happy to put you in touch with the proper personnel at Ingevity for further discussions.

176. A signed copy of Plaintiffs' September 2017 letter is not presently available to Plaintiffs, but the Word version of the unsigned letter is on information and belief a true copy and is attached hereto as **Exhibit Q**.

177. Zydex replied to Plaintiffs' letter in an October 2017 letter attached hereto as **Exhibit R**. Zydex requested "specific details concerning why Ergon believes Zydex may need a license under Ergon's portfolio in order for Zydex to import, manufacture, sell, offer to sell or use in the U.S. one or more of Zydex's products" and contact information for Ingevity.

178. Zydex has since then launched its ZycoTherm SP and ZycoTherm SP2 products. The ZycoTherm SP2 product is in particular an improved warm mix additive, and on information and belief now has substantial sales. As discussed above, ZycoTherm SP2 has on information and belief been described by Zydex's personnel as "basically ZycoTherm-SP on steroids" and "a whole other animal in terms of performance, not only as a LASA, but as a WMA."

COUNT I
INFRINGEMENT OF THE '646 PATENT

179. Plaintiffs repeat the allegations of paragraphs 1 through 178 above as fully set forth herein.

180. Plaintiffs are the owners of the ’646 Patent. Plaintiffs possess the right to enforce the ’646 Patent and the right to recover for infringement thereof, including damages for any infringement.

181. Defendants have indirectly infringed and continue to indirectly infringe one or more claims of the ’646 Patent, literally or under the doctrine of equivalents, by importing, offering for sale, and/or selling products, including but not limited to the ZycoTherm, ZycoTherm SP, ZycoTherm SP2, Zycotherm EZ, and Zycotherm LS products described herein, to be used in warm mix asphalt paving compositions that embody the patented invention. The ZycoTherm products listed herein within each count are merely exemplary, and the allegations of this Complaint are directed to all past, present, and future products that are or may be functionally similar and advertised and used in a manner substantially similar to the ZycoTherm products listed herein (collectively, the “Accused Products”).

182. Defendants contributorily infringe one or more claims of the ’646 Patent by importing, selling, and offering to sell lubricating additives, including but not limited to the ZycoTherm, ZycoTherm SP, ZycoTherm SP2, Zycotherm EZ, and Zycotherm LS products described herein, that are material to making the compositions claimed in the ’646 Patent, that Defendants know to be especially made, or adapted for use in making those compositions, and are not a staple article or commodity of commerce suitable for substantial non-infringing use, as well as any other Accused Products.

183. Defendants have indirectly infringed and continue to indirectly infringe one of more claims of the ’646 Patent by inducing third parties to infringe the ’646 Patent and by contributorily infringing the ’646 Patent. Specifically, Defendants have actively encouraged and instructed other prospective buyers to use Zydex’s lubricating additives in a manner that infringes the ’646 Patent.

184. Defendants' infringement of the '646 Patent is willful.

185. Defendants will continue to infringe the '646 Patent unless enjoined by this Court.

186. Plaintiffs have been and continue to be damaged by Defendants' infringement of the '646 Patent in an amount to be determined at trial.

187. Plaintiffs have suffered irreparable injury for which there is no adequate remedy at law and will continue to suffer such irreparable injury unless Defendants' infringement of the '646 Patent is enjoined by this Court.

188. Defendants' conduct makes this an exceptional case; Plaintiffs should therefore be awarded enhanced damages and its reasonable attorney's fees pursuant to 35 U.S.C. §§ 284 and 285 and other applicable rules, statutes, and law.

COUNT II
INFRINGEMENT OF THE '725 PATENT

189. Plaintiffs repeat the allegations of paragraphs 1 through 188 above as fully set forth herein.

190. Plaintiffs are the owners of the '725 Patent. Plaintiffs possess the right to enforce the '725 Patent and the right to recover for infringement thereof, including damages for any infringement.

191. Defendants have indirectly infringed and continue to indirectly infringe one or more claims of the '725 Patent, literally or under the doctrine of equivalents, by importing, offering for sale, and/or selling products, including but not limited to the ZycoTherm, ZycoTherm SP, ZycoTherm SP2, Zycotherm EZ, and Zycotherm LS products described herein, to be used in warm mix asphalt paving compositions that embody the patented invention, as well as any other Accused Products.

192. Defendants contributorily infringe one or more claims of the ’725 Patent by importing, selling, and offering to sell lubricating additives, including the ZycoTherm, ZycoTherm SP, ZycoTherm SP2, Zycotherm EZ, and Zycotherm LS products described herein, that are material to making the compositions claimed in the ’725 Patent, that Defendants know to be especially made, or adapted for use in making those compositions, and are not a staple article or commodity of commerce suitable for substantial non-infringing use, as well as any other Accused Products.

193. Defendants have indirectly infringed and continue to indirectly infringe one of more claims of the ’725 Patent by inducing third parties to infringe the ’725 Patent and by contributorily infringing the ’725 Patent. Specifically, Defendants have actively encouraged and instructed other prospective buyers to use Zydex’s lubricating additives in a manner that infringes the ’725 Patent.

194. Defendants’ infringement of the ’725 Patent is willful.

195. Defendants will continue to infringe the ’725 Patent unless enjoined by this Court.

196. Plaintiffs have been and continue to be damaged by Defendants’ infringement of the ’725 Patent in an amount to be determined at trial.

197. Plaintiffs have suffered irreparable injury for which there is no adequate remedy at law and will continue to suffer such irreparable injury unless Defendants’ infringement of the ’725 Patent is enjoined by this Court.

198. Defendants’ conduct makes this an exceptional case; Plaintiffs should therefore be awarded enhanced damages and its reasonable attorney’s fees pursuant to 35 U.S.C. §§ 284 and 285 and other applicable rules, statutes, and law.

COUNT III
INFRINGEMENT OF THE ’652 PATENT

199. Plaintiffs repeat the allegations of paragraphs 1 through 198 above as fully set forth herein.

200. Plaintiffs are the owners of the ’652 Patent. Plaintiffs possess the right to enforce the ’652 Patent and the right to recover for infringement thereof, including damages for any infringement.

201. Defendants have indirectly infringed and continue to indirectly infringe one or more claims of the ’652 Patent, literally or under the doctrine of equivalents, by importing, offering for sale, and/or selling products, including but not limited to the ZycoTherm, ZycoTherm SP, ZycoTherm SP2, Zycotherm EZ, and Zycotherm LS products described herein, to be used in warm mix asphalt paving compositions that embody the patented invention, as well as any other Accused Products.

202. Defendants contributorily infringe one or more claims of the ’652 Patent by importing, selling, and offering to sell lubricating additives, including but not limited to the ZycoTherm, ZycoTherm SP, ZycoTherm SP2, Zycotherm EZ, and Zycotherm LS products described herein, that are material to making the compositions claimed in the ’652 Patent, that Defendants know to be especially made, or adapted for use in making those compositions, and are not a staple article or commodity of commerce suitable for substantial non-infringing use, as well as any other Accused Products.

203. Defendants have indirectly infringed and continue to indirectly infringe one of more claims of the ’652 Patent by inducing third parties to infringe the ’652 Patent and by contributorily infringing the ’652 Patent. Specifically, Defendants have actively encouraged and instructed other prospective buyers to use Zydex’s lubricating additives in a manner that infringes the ’652 Patent.

204. Defendants’ infringement of the ’652 Patent is willful.

205. Defendants will continue to infringe the ’652 Patent unless enjoined by this Court.

206. Plaintiffs have been and continue to be damaged by Defendants’ infringement of the ’652 Patent in an amount to be determined at trial.

207. Plaintiffs have suffered irreparable injury for which there is no adequate remedy at law and will continue to suffer such irreparable injury unless Defendants’ infringement of the ’652 Patent is enjoined by this Court.

208. Defendants’ conduct makes this an exceptional case; Plaintiffs should therefore be awarded enhanced damages and its reasonable attorney’s fees pursuant to 35 U.S.C. §§ 284 and 285 and other applicable rules, statutes, and law.

COUNT IV
INFRINGEMENT OF THE ’466 PATENT

209. Plaintiffs repeat the allegations of paragraphs 1 through 208 above as fully set forth herein.

210. Plaintiffs are the owners of the ’466 Patent. Plaintiffs possess the right to enforce the ’466 Patent and the right to recover for infringement thereof, including damages for any infringement.

211. Defendants have indirectly infringed and continue to indirectly infringe one or more claims of the ’466 Patent, literally or under the doctrine of equivalents, by importing, offering for sale, and/or selling products, including but not limited to the ZycoTherm, ZycoTherm SP, ZycoTherm SP2, Zycotherm EZ, and Zycotherm LS products described herein, to be used in warm mix asphalt paving compositions that embody the patented invention, as well as any other Accused Products.

212. Defendants contributorily infringe one or more claims of the ’466 Patent by importing, selling, and offering to sell lubricating additives, including but not limited to the

ZycoTherm, ZycoTherm SP, ZycoTherm SP2, Zycotherm EZ, and Zycotherm LS products described herein, that are material to making the compositions claimed in the '466 Patent, that Defendants know to be especially made, or adapted for use in making those compositions, and are not a staple article or commodity of commerce suitable for substantial non-infringing use, as well as any other Accused Products.

213. Defendants have indirectly infringed and continue to indirectly infringe one of more claims of the '466 Patent by inducing third parties to infringe the '466 Patent and by contributorily infringing the '466 Patent. Specifically, Defendants have actively encouraged and instructed other prospective buyers to use Zydex's lubricating additives in a manner that infringes the '466 Patent.

214. Defendants' infringement of the '466 Patent is willful.

215. Defendants will continue to infringe the '466 Patent unless enjoined by this Court.

216. Plaintiffs have been and continue to be damaged by Defendants' infringement of the '466 Patent in an amount to be determined at trial.

217. Plaintiffs have suffered irreparable injury for which there is no adequate remedy at law and will continue to suffer such irreparable injury unless Defendants' infringement of the '466 Patent is enjoined by this Court.

218. Defendants' conduct makes this an exceptional case; Plaintiffs should therefore be awarded enhanced damages and its reasonable attorney's fees pursuant to 35 U.S.C. §§ 284 and 285 and other applicable rules, statutes, and law.

COUNT V
INFRINGEMENT OF THE '581 PATENT

219. Plaintiffs repeat the allegations of paragraphs 1 through 218 above as fully set forth herein.

220. Plaintiffs are the owners of the ’581 Patent. Plaintiffs possess the right to enforce the ’581 Patent and the right to recover for infringement thereof, including damages for any infringement.

221. Defendants have indirectly infringed and continue to indirectly infringe one or more claims of the ’581 Patent, literally or under the doctrine of equivalents, by importing, offering for sale, and/or selling products, including but not limited to the ZycoTherm, ZycoTherm SP, ZycoTherm SP2, Zycotherm EZ, and Zycotherm LS products described herein, to be used in warm mix asphalt paving compositions that embody the patented invention, as well as any other Accused Products.

222. Defendants contributorily infringe one or more claims of the ’581 Patent by importing, selling, and offering to sell lubricating additives, including but not limited to the ZycoTherm, ZycoTherm SP, ZycoTherm SP2, Zycotherm EZ, and Zycotherm LS products described herein, that are material to making the compositions claimed in the ’581 Patent, that Defendants know to be especially made, or adapted for use in making those compositions, and are not a staple article or commodity of commerce suitable for substantial non-infringing use, as well as any other Accused Products.

223. Defendants have indirectly infringed and continue to indirectly infringe one of more claims of the ’581 Patent by inducing third parties to infringe the ’581 Patent and by contributorily infringing the ’581 Patent. Specifically, Defendants have actively encouraged and instructed other prospective buyers to use Zydex’s accused products in a manner that infringes the ’581 Patent.

224. Defendants’ infringement of the ’581 Patent is willful.

225. Defendants will continue to infringe the ’581 Patent unless enjoined by this Court.

226. Plaintiffs have been and continue to be damaged by Defendants' infringement of the '581 Patent in an amount to be determined at trial.

227. Plaintiffs have suffered irreparable injury for which there is no adequate remedy at law and will continue to suffer such irreparable injury unless Defendants' infringement of the '581 Patent is enjoined by this Court.

228. Defendants' conduct makes this an exceptional case; Plaintiffs should therefore be awarded enhanced damages and its reasonable attorney's fees pursuant to 35 U.S.C. §§ 284 and 285 and other applicable rules, statutes, and law.

COUNT VI
INFRINGEMENT OF THE '446 PATENT

229. Plaintiffs repeat the allegations of paragraphs 1 through 228 above as fully set forth herein.

230. Plaintiffs are the owners of the '446 Patent. Plaintiffs possess the right to enforce the '446 Patent and the right to recover for infringement thereof, including damages for any infringement.

231. Defendants have indirectly infringed and continue to indirectly infringe one or more claims of the '446 Patent, literally or under the doctrine of equivalents, by importing, offering for sale, and/or selling products, including but not limited to the ZycoTherm, ZycoTherm SP, ZycoTherm SP2, Zycotherm EZ, and Zycotherm LS products described herein, to be used in warm mix asphalt paving compositions that embody the patented invention, as well as any other Accused Products.

232. Defendants contributorily infringe one or more claims of the '446 Patent by importing, selling, and offering to sell lubricating additives, including but not limited to the ZycoTherm, ZycoTherm SP, ZycoTherm SP2, Zycotherm EZ, and Zycotherm LS products

described herein, that are material to making the compositions claimed in the '446 Patent, that Defendants know to be especially made, or adapted for use in making those compositions, and are not a staple article or commodity of commerce suitable for substantial non-infringing use, as well as any other Accused Products.

233. Defendants have indirectly infringed and continue to indirectly infringe one of more claims of the '446 Patent by inducing third parties to infringe the '446 Patent and by contributorily infringing the '446 Patent. Specifically, Defendants have actively encouraged and instructed other prospective buyers to use Zydex's accused products in a manner that infringes the '446 Patent.

234. Defendants' infringement of the '446 Patent is willful.

235. Defendants will continue to infringe the '446 Patent unless enjoined by this Court.

236. Plaintiffs have been and continue to be damaged by Defendants' infringement of the '446 Patent in an amount to be determined at trial.

237. Plaintiffs have suffered irreparable injury for which there is no adequate remedy at law and will continue to suffer such irreparable injury unless Defendants' infringement of the '446 Patent is enjoined by this Court.

238. Defendants' conduct makes this an exceptional case; Plaintiffs should therefore be awarded enhanced damages and its reasonable attorney's fees pursuant to 35 U.S.C. §§ 284 and 285 and other applicable rules, statutes, and law.

PRAYER FOR RELIEF

WHEREFORE, Plaintiffs request the following:

a. A judgment that United States Patent No. 10,214,646 was duly and legally issued, is valid, and enforceable;

b. A judgment that United States Patent No. 7,815,725 B2 was duly and legally issued,

is valid, and enforceable;

c. A judgment that United States Patent No. 9,394,652 B2 was duly and legally issued, is valid, and enforceable;

d. A judgment that United States Patent No. 7,981,466 B2 was duly and legally issued, is valid, and enforceable;

e. A judgment that United States Patent No. 8,734,581 B2 was duly and legally issued, is valid, and enforceable;

f. A judgment that United States Patent No. 9,175,446 B2 was duly and legally issued, is valid, and enforceable;

g. A judgment that Defendants have infringed one or more claims of the ’646 Patent and that such infringement has been willful;

h. A judgment that Defendants have infringed one or more claims of the ’725 Patent and that such infringement has been willful;

i. A judgment that Defendants have infringed one or more claims of the ’652 Patent and that such infringement has been willful;

j. A judgment that Defendants have infringed one or more claims of the ’466 Patent and that such infringement has been willful;

k. A judgment that Defendants have infringed one or more claims of the ’581 Patent and that such infringement has been willful;

l. A judgment that Defendants have infringed one or more claims of the ’446 Patent and that such infringement has been willful;

m. An injunction enjoining and restraining Defendants, their officers, directors, agents, servants, employees, attorneys, and all others acting under or through them from directly or

indirectly infringing the ’646, ’725, ’652, ’466, ’581, and ’446 Patents;

n. An injunction enjoining and restraining Defendants, their officers, directors, agents, servants, employees, attorneys, and all others acting under or through them from seeking approval from any governmental or administrative agency authorizing ZycoTherm, ZycoTherm SP, ZycoTherm SP2, ZycoTherm EZ, ZycoTherm LS, or any other substantially similar product from being used in an infringing manner, including but not limited to their use as warm mix additives;

o. A judgment and order requiring Defendants to pay all damages arising from their infringement of the ’646, ’725, ’652, ’466, ’581, and ’446 Patents, including treble damages for willful infringement pursuant to 35 U.S.C. § 284, with interest;

p. A determination that this is an exceptional case pursuant to 35 U.S.C. § 285;

q. A judgment and order directing Defendants to pay the costs and expenses of this action and attorneys’ fees pursuant to 35 U.S.C. § 285 and other applicable law, with interest; and

r. Such further relief as the Court deems just and equitable.

JURY DEMAND

Pursuant to Federal Rule of Civil Procedure 38(b), Plaintiffs hereby assert their right to, and hereby demand, a trial by jury of all issues so triable.

Date: February 7, 2025

Respectfully submitted,

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