

Filed on behalf of: Henkel Corporation

By: Anthony A. Tridico

Finnegan, Henderson, Farabow, Garrett & Dunner, LLP

901 New York Avenue, NW

Washington, D.C. 20001-4413

Telephone: 202.408.4000

Facsimile: 202.408.4400

anthony.tridico@finnegan.com

**UNITED STATES PATENT AND TRADEMARK OFFICE**

---

**BEFORE THE PATENT AND TRIAL AND APPEAL BOARD**

---

HENKEL CORPORATION

Petitioner

v.

H.B. FULLER COMPANY

Patent Owner

U.S. Patent No. 6,833,404

---

Case IPR: Unassigned

---

**PETITION FOR *INTER PARTES* REVIEW OF  
U.S. PATENT NO. 6,833,404 UNDER 35 U.S.C. § 311**

## TABLE OF CONTENTS

### Table of Authorities

I.	Introduction.....	1
II.	Mandatory Notices Under 37 C.F.R. § 42.8.....	1
	A. Real Party-In-Interest .....	1
	B. Related Matters.....	1
	C. Lead and Back-Up Counsel.....	1
	D. Service Information .....	2
III.	Payment of Fees Under 37 C.F.R. §§ 42.15(a) and 42.103.....	2
IV.	Requirements Under 37 C.F.R. § 42.104 .....	2
	A. Grounds for Standing .....	2
	B. Identification of Challenge.....	3
V.	The '404 Patent.....	5
	A. Overview of the '404 Patent.....	5
	B. Technical Background and State of the Art .....	6
	C. Person of Ordinary Skill in the Art .....	9
	D. Claim Construction.....	10
VI.	Detailed Explanation of Grounds for Unpatentability .....	13
	A. Ground 1: Claims 22, 23, 25, 28, 31, and 32 Are Anticipated by the Eastotac Brochure.....	13
	1. Claim 22 .....	13
	a. The Eastotac Brochure's Amorphous Polyolefin Composition.....	14

b.	The Eastotac Brochure’s EVA Composition.....	16
2.	Claims 23, 25, and 31 .....	17
3.	Claim 28.....	20
a.	The Eastotac Brochure’s Amorphous Polyolefin Composition.....	21
a.	The Eastotac Brochure’s EVA Composition.....	23
4.	Claim 32.....	24
5.	Claim Chart for Ground 1 .....	25
B.	Ground 2: Claims 22-25 and 28 Are Anticipated by the Exxon Reference.....	29
1.	Claim 22.....	29
2.	Claims 23-25.....	31
3.	Claim 28.....	34
4.	Claim Chart for Ground 2 .....	36
C.	Ground 3: Claim 26 is Obvious over the Eastotac Brochure and the Exxon Reference, in View of the ’717 Patent.....	38
1.	Claim Chart for Ground 3 .....	40
D.	Ground 4: Claim 27 Is Obvious over the Eastotac Brochure and the Exxon Reference, in View of Litz.....	40
1.	Claim Chart for Ground 4 .....	43
E.	Ground 5: Claims 22-25, 28, 31, and 32 Are Obvious over the Eastotac Brochure and the Exxon Reference .....	43
1.	Claims 22-25 and 31 .....	44
2.	Claims 28 and 32.....	46
3.	Claim Chart for Ground 5 .....	49

VII. Conclusion .....	54
-----------------------	----

Appendix 1: List of Exhibits

Certificate of Service

## **TABLE OF AUTHORITIES**

### **Cases**

<i>Phillips v. AWH Corp.</i> , 415 F.3d 1303 (Fed. Cir. 2005) (en banc) .....	8
--	---

### **Federal Statutes**

35 U.S.C. § 102 .....	3
35 U.S.C. § 311 .....	1

### **Regulations**

37 C.F.R. § 42.8 .....	1
37 C.F.R. § 42.15 .....	2
37 C.F.R. § 42.100 .....	8
37 C.F.R. § 42.103 .....	2
37 C.F.R. § 42.104 .....	2

## **I. INTRODUCTION**

Pursuant to 35 U.S.C. § 311, Henkel Corporation (“Petitioner”) requests *inter partes* review of claims 22-28, 31, and 32 of U.S. Patent No. 6,833,404 (“the ’404 patent”) (Ex. 1001), which issued on December 21, 2004, and is assigned to H.B. Fuller Company (“Patent Owner”). This Petition shows that there is a reasonable likelihood that Petitioner will prevail on these claims based on printed publications that the Office did not have before it during prosecution, and that anticipate or render obvious the claims. Claims 22-28, 31, and 32 of the ’404 patent should be canceled as unpatentable.

## **II. MANDATORY NOTICES UNDER 37 C.F.R. § 42.8**

### **A. Real Party-In-Interest**

Petitioner Henkel Corporation is the real party-in-interest.

### **B. Related Matters**

H.B. Fuller Company has asserted the ’404 patent against the Petitioner in *H.B. Fuller Co. v. Henkel Corp.*, No. 0:13-cv-2980, which is pending in the U.S. District Court for the District of Minnesota. Petitioner was served with the Complaint in that case on Feb. 24, 2014. Petitioner is not aware of any pending prosecution concerning the ’404 patent.

### **C. Lead and Back-Up Counsel**

Petitioner identifies the following lead and back-up counsel:

Lead Counsel	Back-Up Counsel
Anthony C. Tridico (Reg. No. 45,958)  Finnegan, Henderson, Farabow, Garrett & Dunner, LLP  901 New York Avenue, NW  Washington, D.C. 20001-4413  Tel: 202.408.4000, Fax: 202.408.4400  anthony.tridico@finnegan.com	Michele Bosch (Reg. No. 40,524)  Finnegan, Henderson, Farabow, Garrett & Dunner, LLP  901 New York Avenue, NW  Washington, DC 20001-4413  Tel: 202.408.4000, Fax: 202.408.4400  michele.bosch@finnegan.com

**D. Service Information**

Please direct all correspondence regarding this Petition to lead counsel at the address provided above in Section II.C of this Petition. Petitioner consents to service by electronic mail at anthony.tridico@finnegan.com.

**III. PAYMENT OF FEES UNDER 37 C.F.R. §§ 42.15(A) AND 42.103**

Petitioner authorizes the Office to charge Deposit Account No. 06-0916 for the required fees for this Petition and any additional fees that may be required during this *inter partes* review proceeding.

**IV. REQUIREMENTS UNDER 37 C.F.R. § 42.104**

**A. Grounds for Standing**

Petitioner certifies that the '404 patent is available for *inter partes* review, and that Petitioner is not barred or estopped from requesting an *inter partes* review

of claims 22-28, 31, and 32 of the '404 patent on the grounds identified in this Petition.

**B. Identification of Challenge**

Petitioner challenges claims 22-28, 31, and 32 of the '404 patent and requests that these claims be canceled as unpatentable in view of the following printed publications, which anticipate and/or render obvious these claims.

<b>Exhibit No.</b>	<b>Description</b>	<b>Publication/Issue Date</b>
1002	Eastotac Hydrocarbon Resins Brochure by the Eastman Company (“the Eastotac Brochure”)	Aug. 1992
1003	Specialty Polymers for Adhesives and Sealants by the Exxon Chemical Company (“the Exxon Reference”)	Oct. 1990
1004	U.S. Patent No. 5,256,717 (“the '717 patent”)	Oct. 26, 1993
1005	Litz, R.J., <i>Developments in Ethylene-Based Hot Melt Adhesives</i> , Adhesives Age 17(8):35-38 (1974) (“Litz”)	Aug. 1974

The '404 patent is entitled to a priority date of June 30, 1998, the filing date of U.S. Provisional Application No. 60/091,231. The Eastotac Brochure, the

Exxon Reference, the '717 patent, and Litz are thus at least prior art under 35 U.S.C. § 102(b).

The Eastotac Brochure, the Exxon Reference, the '717 patent, and Litz are not redundant. For example, the Eastotac Brochure teaches a composition with an amorphous polyalphaolefin thermoplastic base polymer, as recited in independent claims 22 and 28, while the Exxon Reference does not have this express teaching. The Eastotac Brochure also teaches a composition wherein the tackifying resin concentration is less than the thermoplastic base polymer concentration, as recited in dependent claims 31 and 32. The Exxon Reference teaches a tackifying resin (known as Escorez® 5340) that is *admitted* in the '404 patent (col. 9, ll. 3-9) to have greater than 80 wt-% of its total unit derived from dicyclopentadiene, as recited in claim 24, while the Eastotac Brochure does not teach a tackifying resin that is admitted in the '404 patent to have greater than 80 wt-% of its total unit derived from dicyclopentadiene. The '717 patent is not redundant as it teaches compositions containing up to about 40% by weight of a solid benzoate plasticizer, as recited in dependent claim 26. Litz is not redundant as it teaches a routine modification of the hot melt adhesive compositions to obtain peel values of greater than about 70 °C, as recited in dependent claim 27.

Petitioner requests that claims 22-28, 31, and 32 of the '404 patent be canceled as unpatentable over the Eastotac Brochure, the Exxon Reference,

the '717 patent, and Litz on the grounds set forth in the following table.

Sections V.D and VI below set forth claim constructions, detailed explanations of the grounds, and where each claim element is found in the printed publications relied upon.

Ground	Claims	Description
1	22, 23, 25, 28, 31, and 32	Anticipated by the Eastotac Brochure
2	22-25, 28	Anticipated by the Exxon Reference
3	26	Obvious over the Eastotac Brochure and the Exxon Reference, in view of the '717 patent
4	27	Obvious over the Eastotac Brochure and the Exxon Reference, in view of Litz
5	22-25, 28, 31, and 32	Obvious over the Eastotac Brochure and the Exxon Reference

## **V. THE '404 PATENT**

### **A. Overview of the '404 Patent**

The '404 patent issued on December 21, 2004, from U.S. Application No. 09/300,544, which was filed on April 27, 1999. Provisional Application No. 60/091,231 was filed on June 30, 1998. According to the '404 patent, it

“relates to hot melt adhesive compositions utilizing a hydrogenated substantially aliphatic tackifying resin having a high glass transition temperature.” (’404 patent (Ex. 1001), col. 1, ll. 12-15.) Each of the challenged claims is directed to a hot melt adhesive composition, with claim 22 being an independent claim from which claims 23-27, and 31 depend, and claim 28 being an independent claim from which claim 32 depends.

### **B. Technical Background and State of the Art**

Hot melt adhesives “are 100 [%] solid thermoplastic materials that flow when heated” and “can bond wide possible ranges of paper stock.” (Declaration of Shaw Ling Hsu, Ph.D. (“the Hsu Declaration”) (Ex. 1015) at ¶ 15 (citing Clark, T., Bookbinding with Adhesives (3<sup>rd</sup> ed. McGraw-Hill, UK 1994) (“Clark”) (Ex. 1006) at 2).) As compared to other adhesives, hot melt adhesives “have the distinct advantages of being capable of extremely high tack with medium to very fast setting speeds.” (*Id.* (quoting Clark (Ex. 1006) at 2).) “By June 1998, it was known that ‘[h]ot melt adhesives generally comprise a thermoplastic polymeric component, a tackifying resin component and either a wax component, plasticizing component or a combination thereof.’” (*Id.* at ¶ 16 (quoting ’404 patent (Ex. 1001), col. 1, ll. 21-24).)

First, hot melt adhesives were known to generally comprise a thermoplastic polymeric component. (*Id.*) This component was chosen “based on a number of

factors and by June 1998, was a routine aspect of designing a hot melt adhesive.” (*Id.* at ¶ 24.) Known examples of thermoplastic polymeric components that were low in cost and readily available included copolymers and terpolymers of ethylene, such as ethylene-vinyl acetate (EVA) polymers (the copolymer of ethylene and vinyl acetate) (*id.* (citing ’404 patent (Ex. 1001), col. 6, l. 61; col. 7, ll. 16-17)), and amorphous polyalphaolefin polymers (often referred to interchangeably as amorphous polyolefins) (*id.* at ¶ 25 (citing ’404 patent (Ex. 1001), col. 7, ll. 61-63; U.S. Patent No. 5,397,843 (issued Mar. 14, 1995) (“the ’843 patent”) (Ex. 1011), col. 1, ll. 45-48)).

Second, hot melt adhesives were known to generally comprise a tackifying resin. (*Id.* at ¶ 16.) “The tackifying resin [was] known to provide specific adhesion and to increase peel values which translates into heat resistance.” (*Id.* at ¶ 17 (quoting ’404 patent (Ex. 1001), col. 1, ll. 26-28) (alteration in original).) Another property of tackifying resins is “[t]he temperature at which [a] polymer undergoes [a] transformation from a rubber to a glass,” referred to as “the glass transition temperature, Tg.” (*Id.* at ¶ 18 (quoting Young, R.J. & Lovell, P.A., Introduction to Polymers (2nd ed., Chapman & Hall, New York 1991) (“Young”) (Ex. 1010) at 292).)

“Petroleum based hydrocarbon resins [were] popularly used in the adhesives industry due to availability and economics.” (*Id.* at ¶ 17 (quoting ’404 patent

(Ex. 1001), col. 2, ll. 4-5) (alteration in original).) “Dicyclopentadiene (DCPD) based resins are an example of such a hydrocarbon resin.” (*Id.* (citing ’404 patent (Ex. 1001), col. 1, ll. 9-11; Alger, M.S., Polymer Science Dictionary (Elsevier Applied Science, New York, 1989) (Ex. 1007) (“Alger”) at 115).) “By June 1998, dicyclopentadiene was readily available and low in cost and was thus used to form tackifiers (interchangeably referred to as tackifying resins).” (*Id.* (citing Lee, S.M., Dictionary of Composite Materials Technology (CRC Press, Technology & Engineering 1995) (“Lee”) (Ex. 1008) at 43; U.S. Patent No. 4,233,432 (issued Nov. 11, 1980) (“the ’432 patent”) (Ex. 1009), col. 1, ll. 29-30).) “Hydrocarbon resins, including those that are dicyclopentadiene-based, may be aliphatic, meaning that they are non-aromatic compounds composed of carbon and hydrogen.” (*Id.* (citing ’404 patent (Ex. 1001), col. 10, l. 65 to col. 11, l. 1).)

“Aliphatic, hydrocarbon resins, including dicyclopentadiene-based resins, with glass transition temperatures (T<sub>g</sub>) of greater than about 65 °C were known and commercially-available by June 1998, including Eastotac® H-142 by Eastman Chemical Co. and Escorez® 5340 by Exxon Chemical Co.” (*Id.* at ¶ 18 (citing ’404 patent (Ex. 1001), col. 6, ll. 14-29).) Eastotac® H-142 “was known to be ‘a substantially aliphatic (i.e., cycloaliphatic) hydrocarbon resin having a T<sub>g</sub> at onset of about 82 °C.’” (*Id.* at ¶ 43 (quoting ’404 patent (Ex. 1001), col. 6, ll. 27-29).) Escorez® 5340 “was known to be ‘a substantially aliphatic hydrocarbon resin

having a Tg at onset of about 76 °C.” (*Id.* at ¶ 48 (quoting ’404 patent (Ex. 1001), col. 6, ll. 21-24).)

“By June 1998, it was known that the use of tackifiers in a hot melt adhesive would increase the use temperature of the adhesive, and particularly, using higher Tg tackifiers would increase the overall mechanical strength of the adhesive, and therefore increase the peel value and heat resistance of the adhesive.” (*Id.* at ¶ 22 (citing Kraus et al., *Tack and Viscoelasticity of Block Copolymer Based Adhesives*, J. Adhesion 10:221-36 (1979) (“Kraus”) (Ex. 1018), Figure 1).) “An adhesive with a higher Tg tackifier was thus known to deform at higher temperature, which was preferable in certain applications.” (*Id.*)

Third, hot melt adhesives were known to generally comprise a wax component, a plasticizing component, or a combination thereof. (*Id.* at ¶ 16.) For example, the addition of plasticizers like solid benzoate plasticizers was well known and routine in the art. (*Id.* at ¶ 26 (citing ’717 patent (Ex. 1004), col. 1, ll. 59-64).)

### **C. Person of Ordinary Skill in the Art**

Based on “the education level of active workers in the field, the types of problems encountered in the art, the prior art solutions to these problems, the rapidity with which innovations are made, and the sophistication of the technology,” “[a] person of ordinary skill in the art to whom the ’404 patent is

directed would have a graduate-level degree in polymer science, engineering, chemistry, physics, or a related field, as well as at least two years of experience in the field of polymer science and engineering.” (*Id.* at ¶ 27.) “These are also the qualifications that a person of ordinary skill in the art would have had as of June 30, 1998 . . . .” (*Id.*)

#### **D. Claim Construction**

A claim subject to *inter partes* review receives the “broadest reasonable construction in light of the specification of the patent in which it appears.” 37 C.F.R. § 42.100(b). Claim terms are given their ordinary and accustomed meaning as would be understood by one of ordinary skill in the art. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-13 (Fed. Cir. 2005) (en banc). The claim terms of the ’404 patent should be given their plain and ordinary meaning in light of the specification, where each claim term is expressly defined.

“Hydrocarbon tackifying resin” (claim 22) should thus be construed as “a chemical compound consisting of hydrogen and carbon that is used in adhesives to increase the tack, and which may be aliphatic, aromatic, or a mixture of both, and which may be, for example, the resins known as Eastotac® H-142 and Escorez® 5340.” (*See* ’404 patent (Ex. 1001), col. 1, ll. 21-24; col. 3, ll. 4-6; col. 6, ll. 21, 27-29; col. 10, l. 65 to col. 11, l. 1.) The claim term “derived, at least in part, from dicyclopentadiene” (claim 22) should be construed as “resins where at

least part of the total unit is derived from dicyclopentadiene, such as, for example, the resins known as Eastotac® H-142 and Escorez® 5340.” (*See id.* at col. 2, ll. 9-11; col. 4, ll. 29-30; col. 5, ll. 16-28; col. 9, ll. 2-8.) “Greater than about 80 wt-% of the total resin unit is derived from dicyclopentadiene” (claim 24) should be construed as “resins where at least 80 percent by weight of the total unit is derived from dicyclopentadiene, such as, for example, the resin known as Escorez® 5340.” (*See id.* at col. 9, ll. 2-8.)

The claim term “aliphatic tackifying resin” (claim 28) should be construed as “a chemical compound that is used in adhesives to increase the tack and that may be linear aliphatic or cycloaliphatic in character.” (*See id.* at col. 1, ll. 21-24; col. 5, ll. 7-9.) “Hydrogenated” (claim 25) should be construed as “resins having double bonds reduced to single bonds, as measured by bromine number where as the bromine number decreases, the level of hydrogenation increases and the tackifying resin becomes lighter in color as measured on the molten Gardner Scale.” (*See id.* at col. 5, ll. 45-56; col. 11, ll. 1-4.) The claim term “peel values” (claim 27) should be construed as “the temperature at which an adhesive fails using a 100-gram weight and ramping the temperature up from 25 °C to 100 °C at 25 °C per hour.” (*See id.* at col. 13, ll. 36-50.) “Glass transition temperature” (claims 22, 28) or “Tg” (claims 23, 28) should be construed as “the onset temperature as determined using Dynamic Mechanical Analysis.” (*See id.* at col. 4, ll. 12-14.)

“Thermoplastic base polymer” (claims 22, 28) should be construed as “a polymer that is used in adhesives that becomes moldable above a specific temperature, such as, for example, copolymers of ethylene, and amorphous polyalphaolefin.” (*See id.* at col. 1, ll. 21-24; col. 3, ll. 6-8; col. 6, ll. 44-47.)

“Copolymers and terpolymers of ethylene” (claims 22, 28) should be construed as “polymers having at least one comonomer selected from the group consisting of vinyl esters of a saturated carboxylic acid wherein the acid moiety has up to four carbon atoms, unsaturated mono- or dicarboxylic acids of three to five carbon atoms, a salt of the unsaturated acid, esters of the unsaturated acid derived from an alcohol having one to eight carbon atoms, and mixtures thereof, such as, for example, the copolymer of ethylene and vinyl acetate, which is known as ethylene-vinyl acetate (EVA), and the ethylene n-butyl acrylate copolymers known as Escorene®.” (*See id.* at col. 3, ll. 6-8; col. 6, l. 61 to col. 7, l. 2, 15-16, 30-32.)

“Amorphous polyalphaolefins” (claims 22, 28) should be construed as “homopolymers, copolymers, and terpolymers of C<sub>2</sub>-C<sub>8</sub> alphaolefins, and meaning the same thing as amorphous polyolefins.” (*See id.* at col. 3, ll. 6-8, col. 7, ll. 61-63.)

## **VI. DETAILED EXPLANATION OF GROUNDS FOR UNPATENTABILITY**

Claims 22-28, 31, and 32 are invalid on multiple grounds. The Eastotac Brochure, the Exxon Reference, the '717 patent, and Litz provide disclosures that the Office believed to be absent in the prior art during prosecution, and are thus not cumulative of the art that was considered by the Office during prosecution. These references, and the corresponding grounds for unpatentability set forth herein, are also not cumulative to one other given the different disclosures of the publications, as discussed above in Section IV.A. A reasonable examiner would consider these references to be important in deciding whether the claims are patentable, and this Petition demonstrates a reasonable likelihood that each of claims 22-28, 31, and 32 of the '404 patent should be canceled as unpatentable.

### **A. Ground 1: Claims 22, 23, 25, 28, 31, and 32 Are Anticipated by the Eastotac Brochure**

“Each and every element of claims 22, 23, 25, 28, 31, and 32 is disclosed in the Eastotac Brochure such that one of ordinary skill in the art could have made and used the claimed inventions without undue experimentation in light of the general knowledge available in the art.” (Hsu Declaration (Ex. 1015) at ¶ 51.)

#### **1. Claim 22**

Regarding claim 22, “[t]he Eastotac Brochure discloses ‘[a] hot melt adhesive composition comprising: a) about 10% by weight to about 50% by

weight of at least one hydrocarbon tackifying resin derived, at least in part, from dicyclopentadiene and having a glass transition temperature of greater than about 65 °C; b) about 10% by weight to about 80% by weight of at least one thermoplastic base polymer selected from the group consisting of copolymers and terpolymers of ethylene; amorphous polyalphaolefins, homogenous ethylene/ $\alpha$ -olefin interpolymer, and mixtures thereof” (referred to herein as ‘the Claim 22 Composition’).” (*Id.* at ¶ 52 (citing ’404 patent (Ex. 1001), col. 21, ll. 4-14).)

**a. The Eastotac Brochure’s Amorphous Polyolefin Composition**

“Specifically, the Eastotac Brochure discloses a hot melt adhesive composition comprising 30 to 50% by weight of Eastotac® hydrocarbon tackifying resin and 50 to 70% by weight of amorphous polyolefin or amorphous polyalphaolefin (referred to herein as ‘the Amorphous Polyolefin Composition’).” (*Id.* at ¶ 53 (citing Eastotac Brochure (Ex. 1002), Table 3).) With regard to the hydrocarbon tackifying resin, “[t]he Eastotac Brochure lists Eastotac® H-142 as one of four specific examples.” (*Id.* at ¶ 54 (citing Eastotac Brochure (Ex. 1002), Table 1).) Notably, “Eastotac® H-142 is listed in the ’404 patent as an example of a tackifying resin for use in the invention.” (*Id.* (citing ’404 patent (Ex. 1001), col. 6, ll. 14-29).) As explained in the ’404 patent, Eastotac® H-142 is a hydrocarbon tackifying resin that is derived, at least in part, from

dicyclopentadiene, and that has an onset glass transition temperature ( $T_g(\text{onset})$ ) of about 82 °C. (*Id.* (citing '404 patent (Ex. 1001), col. 5, ll. 25-28; col. 6, ll. 27-29).) “A  $T_g$  of about 82 °C is greater than a  $T_g$  of about 65 °C.” (*Id.*) “Therefore, the Eastotac Brochure’s Amorphous Polyolefin Composition comprises 30-50% by weight of at least one hydrocarbon tackifying resin derived, at least in part, from dicyclopentadiene and having a glass transition temperature of greater than about 65 °C, as recited by claim 22 . . . .” (*Id.*)

The Eastotac Brochure’s Amorphous Polyolefin Composition also comprises “50 to 70% by weight of amorphous polyolefin or amorphous polyalphaolefin” as a “thermoplastic base polymer.” (*Id.* at ¶ 53 (citing Eastotac Brochure (Ex. 1002), Table 3).) (As discussed above in Section V.B, “the terms ‘amorphous polyolefins’ and ‘amorphous polyalphaolefins’ are often used interchangeably, and this was also true in June 1998.” (*See id.* at ¶ 25 (citing '404 patent (Ex. 1001), col. 7, ll. 61-63; '843 patent (Ex. 1011), col. 1, ll. 45-48).)) “Therefore, the Amorphous Polyolefin Composition disclosed in the Eastotac Brochure is a hot melt adhesive composition comprising: a) 30-50% by weight of a hydrocarbon tackifying resin derived, at least in part, from dicyclopentadiene and having a glass transition temperature of greater than about 65 °C; and b) 50-70% by weight of amorphous polyalphaolefin as a thermoplastic base polymer.” (*Id.* at ¶ 55.) The Eastotac Brochure’s Amorphous Polyolefin Composition thus anticipates claim 22.

**b. The Eastotac Brochure's EVA Composition**

“The Eastotac Brochure also discloses a hot melt adhesive composition comprising 30 to 60% by weight of Eastotac® hydrocarbon tackifying resin and 30 to 50% by weight of ethylene-vinyl acetate copolymer (referred to herein as ‘the EVA Composition’).” (*Id.* at ¶ 53 (citing Eastotac Brochure (Ex. 1002), Table 3).)

With regard to the hydrocarbon tackifying resin, as discussed above in Section VI.A.1.a, “[t]he Eastotac Brochure lists Eastotac® H-142 as one of four specific examples.” (*Id.* at ¶ 54 (citing Eastotac Brochure (Ex. 1002), Table 1).) Notably, “Eastotac® H-142 is listed in the ’404 patent as an example of a tackifying resin for use in the invention.” (*Id.* (citing ’404 patent (Ex. 1001), col. 6, ll. 14-29).) As explained in the ’404 patent, Eastotac® H-142 is a hydrocarbon tackifying resin that is derived, at least in part, from dicyclopentadiene, and that has an onset glass transition temperature (T<sub>g</sub>(onset)) of about 82 °C. (*Id.* (citing ’404 patent (Ex. 1001), col. 5, ll. 25-28; col. 6, ll. 27-29).) “A T<sub>g</sub> of about 82 °C is greater than a T<sub>g</sub> of about 65 °C.” (*Id.*) “Therefore, the Eastotac Brochure’s . . . EVA Composition comprises 30-60% by weight of at least one hydrocarbon tackifying resin derived, at least in part, from dicyclopentadiene and having a glass transition temperature of greater than about 65 °C, as recited by claim 22.” (*Id.*)

The Eastotac Brochure's EVA Composition also comprises "30 to 50% by weight of ethylene-vinyl acetate copolymer" as a "thermoplastic base polymer." (*Id.* at ¶ 53 (citing Eastotac Brochure (Ex. 1002), Table 3).) As discussed above in Section V.B, ethylene-vinyl acetate is a copolymer of ethylene and vinyl acetate. (*See id.* at ¶ 24 (citing '404 patent (Ex. 1001), col. 6, l. 61; col. 7, ll. 16-17).) Therefore, "[t]he EVA Composition disclosed in the Eastotac Brochure is a hot melt adhesive composition comprising: a) 30-60% by weight of a hydrocarbon tackifying resin derived, at least in part, from dicyclopentadiene and having a glass transition temperature of greater than about 65 °C; and b) 30-50% by weight of a copolymer of ethylene as a thermoplastic base polymer." (*Id.* at ¶ 55.) The Eastotac Brochure's EVA Composition thus anticipates claim 22.

## **2. Claims 23, 25, and 31**

As discussed above in Section VI.A.1, "the Eastotac Brochure discloses '[a] hot melt adhesive composition comprising: a) about 10% by weight to about 50% by weight of at least one hydrocarbon tackifying resin derived, at least in part, from dicyclopentadiene and having a glass transition temperature of greater than about 65 °C; b) about 10% by weight to about 80% by weight of at least one thermoplastic base polymer selected from the group consisting of copolymers and terpolymers of ethylene; amorphous polyalphaolefins, homogenous ethylene/ $\alpha$ -olefin interpolymer, and mixtures thereof" (referred to herein as 'the Claim 22

Composition’).” (*Id.* at ¶ 52 (citing ’404 patent (Ex. 1001), col. 21, ll. 4-14); *see also id.* at ¶ 56.)

“Regarding claim 23, the Eastotac Brochure discloses the Claim 22 Composition ‘wherein said tackifying resin has a Tg of greater than about 68 °C (about 155 °F).’” (*Id.* at ¶ 57 (citing ’404 patent (Ex. 1001), col. 21, ll. 15-16).) Specifically, as stated in the ’404 patent itself, the Eastotac® H-142 hydrocarbon tackifying resin that is used in the Eastotac Brochure’s Amorphous Polyolefin Composition and its EVA Composition, “[has] an onset glass transition temperature (Tg(onset)) of about 82 °C.” (*Id.* (citing ’404 patent (Ex. 1001), col. 6, ll. 27-29).) “A Tg of about 82 °C is greater than a Tg of about 68 °C.” (*Id.*) “Therefore, the Eastotac Brochure discloses a hot melt adhesive composition comprising: a) about 10% by weight to about 50% by weight of at least one hydrocarbon tackifying resin derived, at least in part, from dicyclopentadiene and having a glass transition temperature of greater than about 65 °C; b) about 10% by weight to about 80% by weight of at least one thermoplastic base polymer selected from the group consisting of copolymers and terpolymers of ethylene; amorphous polyalphaolefins, homogenous ethylene/ $\alpha$ -olefin interpolymers, and mixtures thereof, wherein said tackifying resin has a Tg of greater than about 68 °C.” (*Id.*) The Eastotac Brochure thus anticipates claim 23.

“Regarding claim 25, the Eastotac Brochure discloses the Claim 22 Composition ‘wherein the tackifying resin is hydrogenated.’” (*Id.* at ¶ 58 (citing ’404 patent (Ex. 1001), col. 21, ll. 20-21).) “Specifically, . . . the low bromine number and low molten Gardner Color of Eastotac® H-142 (the hydrocarbon tackifying resin used in the Eastotac Brochure’s Amorphous Polyolefin Composition and its EVA Composition) indicate that it is hydrogenated.” (*Id.* (citing ’404 patent (Ex. 1001), col. 5, ll. 54-67).) “Therefore, the Eastotac Brochure discloses a hot melt adhesive composition comprising: a) about 10% by weight to about 50% by weight of at least one hydrocarbon tackifying resin derived, at least in part, from dicyclopentadiene and having a glass transition temperature of greater than about 65 °C; b) about 10% by weight to about 80% by weight of at least one thermoplastic base polymer selected from the group consisting of copolymers and terpolymers of ethylene; amorphous polyalphaolefins, homogenous ethylene/ $\alpha$ -olefin interpolymers, and mixtures thereof, wherein the tackifying resin is hydrogenated.” (*Id.*) The Eastotac Brochure thus anticipates claim 25.

“Regarding claim 31, the Eastotac Brochure discloses the Claim 22 Composition ‘wherein said tackifying resin concentration is less than said thermoplastic base polymer concentration.’” (*Id.* at ¶ 59 (citing ’404 patent (Ex. 1001), col. 22, ll. 22-24).) “Specifically, . . . the Eastotac Brochure’s

Amorphous Polyolefin Composition is a hot melt adhesive composition comprising: a) 30-50% by weight of a hydrocarbon tackifying resin derived, at least in part, from dicyclopentadiene and having a glass transition temperature of greater than about 65 °C; and b) 50-70% of amorphous polyalphaolefin as a thermoplastic base polymer.” (*Id.*) “The tackifying resin concentration of 30-50% is less than the thermoplastic base polymer concentration of 50-70%.” (*Id.*) “Therefore, the Eastotac Brochure discloses a hot melt adhesive composition comprising: a) about 10% by weight to about 50% by weight of at least one hydrocarbon tackifying resin derived, at least in part, from dicyclopentadiene and having a glass transition temperature of greater than about 65 °C; b) about 10% by weight to about 80% by weight of at least one thermoplastic base polymer selected from the group consisting of copolymers and terpolymers of ethylene; amorphous polyalphaolefins, homogenous ethylene/ $\alpha$ -olefin interpolymers, and mixtures thereof, wherein said tackifying resin concentration is less than said thermoplastic base polymer concentration.” (*Id.*) The Eastotac Brochure thus anticipates claim 31.

### 3. Claim 28

“Regarding claim 28, the Eastotac Brochure discloses ‘[a] hot melt adhesive comprising: a) from about 10% by weight to about 80% by weight of at least one aliphatic tackifying resin having a glass transition temperature ( $T_g$ ) of greater than

about 65 °C; and b) from about 10% by weight to about 80% by weight of at least one thermoplastic base polymer selected from the group consisting of copolymers and terpolymers of ethylene; amorphous polyalphaolefins, homogenous ethylene/ $\alpha$ -olefin interpolymer, and mixtures thereof’ (referred to herein as ‘the Claim 28 Composition’).” (*Id.* at ¶ 60 (citing ’404 patent (Ex. 1001), col. 21, l. 27 to col. 22, l. 5).)

**a. The Eastotac Brochure’s Amorphous Polyolefin Composition**

“Specifically, . . . the Eastotac Brochure discloses the Amorphous Polyolefin Composition, which is a hot melt adhesive composition comprising 30 to 50% by weight of Eastotac® aliphatic tackifying resin and 50 to 70% by weight of amorphous polyolefin or amorphous polyalphaolefin as a thermoplastic base polymer.” (*Id.* at ¶ 61 (citing Eastotac Brochure (Ex. 1002), Table 3.)

With regard to the hydrocarbon tackifying resin, “the Eastotac Brochure lists Eastotac® H-142 as one of four specific examples.” (*Id.* at ¶ 62 (citing Eastotac Brochure (Ex. 1002), Table 1).) Notably, “Eastotac® H-142 is listed in the ’404 patent as an example of a tackifying resin for use in the invention.” (*Id.* (citing ’404 patent (Ex. 1001), col. 6, ll. 14-29).) As explained in the ’404 patent, “Eastotac® H-142 is an aliphatic tackifying resin having an onset glass transition temperature ( $T_g(\text{onset})$ ) of about 82 °C.” (*Id.* (citing ’404 patent (Ex. 1001),

col. 6, ll. 27-29).) “A Tg of about 82 °C is greater than a Tg of about 65 °C.” (*Id.*) “Therefore, the Eastotac Brochure’s Amorphous Polyolefin Composition comprises 30-50% by weight of at least one aliphatic tackifying resin having a glass transition temperature (Tg) of greater than about 65 °C, as recited by claim 28 . . . .” (*Id.*)

The Eastotac Brochure’s Amorphous Polyolefin Composition also comprises “50 to 70% by weight of amorphous polyolefin or amorphous polyalphaolefin as a thermoplastic base polymer.” (*Id.* at ¶ 61 (citing Eastotac Brochure (Ex. 1002), Table 3.) (As discussed above in Section V.B, “the terms ‘amorphous polyolefins’ and ‘amorphous polyalphaolefins’ are often used interchangeably, and this was also true in June 1998.” (*See id.* at ¶ 25 (citing ’404 patent (Ex. 1001), col. 7, ll. 61-63; ’843 patent (Ex. 1011), col. 1, ll. 45-48).)) “Therefore, the Amorphous Polyolefin Composition disclosed in the Eastotac Brochure is a hot melt adhesive composition comprising: a) 30-50% by weight of an aliphatic tackifying resin having a glass transition temperature (Tg) of greater than about 65 °C; and b) 50-70% by weight of amorphous polyalphaolefin as a thermoplastic base polymer.” (*Id.* at ¶ 57.) The Eastotac Brochure’s Amorphous Polyolefin Composition thus anticipates claim 28.

**a. The Eastotac Brochure's EVA Composition**

“The Eastotac Brochure also discloses the EVA Composition, which is a hot melt adhesive composition comprising 30 to 60% by weight of Eastotac® aliphatic tackifying resin and 30 to 50% by weight of ethylene-vinyl acetate copolymer as a thermoplastic base polymer.” (*Id.* at ¶ 61 (citing Eastotac Brochure (Ex. 1002), Table 3).)

With regard to the hydrocarbon tackifying resin, “[t]he Eastotac Brochure lists Eastotac® H-142 as one of four specific examples.” (*Id.* at ¶ 62 (citing Eastotac Brochure (Ex. 1002), Table 1).) Notably, “Eastotac® H-142 is listed in the ’404 patent as an example of a tackifying resin for use in the invention.” (*Id.* (citing ’404 patent (Ex. 1001), col. 6, ll. 14-29).) As explained in the ’404 patent, “Eastotac® H-142 is an aliphatic tackifying resin having an onset glass transition temperature (Tg(onset)) of about 82 °C. (*Id.* (citing ’404 patent (Ex. 1001), col. 6, ll. 27-29).) “A Tg of about 82 °C is greater than a Tg of about 65 °C.” (*Id.*) “Therefore, the Eastotac Brochure’s . . . EVA Composition comprises 30-60% by weight of at least one aliphatic tackifying resin having a glass transition temperature (Tg) of greater than about 65 °C, as recited by claim 28.” (*Id.*)

The Eastotac Brochure’s EVA Composition also comprises “30 to 50% by weight of ethylene-vinyl acetate copolymer as a thermoplastic base polymer.” (*Id.* at ¶ 61 (citing Eastotac Brochure (Ex. 1002), Table 3).) As discussed above in

Section V.B, ethylene-vinyl acetate is a copolymer of ethylene and vinyl acetate. (*See id.* at ¶ 24 (citing '404 patent (Ex. 1001), col. 6, l. 61; col. 7, ll. 16-17).) Therefore, “[t]he EVA Composition disclosed in the Eastotac Brochure is a hot melt adhesive composition comprising: a) 30-60% by weight of an aliphatic tackifying resin having a glass transition temperature (T<sub>g</sub>) of greater than about 65 °C; and b) 50-70% by weight of a copolymer of ethylene as a thermoplastic base polymer.” (*Id.* at ¶ 63.) The Eastotac Brochure’s EVA Composition thus anticipates claim 28.

#### **4. Claim 32**

As discussed above in Section VI.A.3, the Eastotac Brochure discloses “[a] hot melt adhesive comprising: a) from about 10% by weight to about 80% by weight of at least one aliphatic tackifying resin having a glass transition temperature (T<sub>g</sub>) of greater than about 65 °C; and b) from about 10% by weight to about 80% by weight of at least one thermoplastic base polymer selected from the group consisting of copolymers and terpolymers of ethylene; amorphous polyalphaolefins, homogenous ethylene/ $\alpha$ -olefin interpolymers, and mixtures thereof” (referred to herein as ‘the Claim 28 Composition’).” (*Id.* at ¶ 60 (citing '404 patent (Ex. 1001), col. 21, l. 27 to col. 22, l. 5); *see also id.* at ¶ 64.)

“Regarding claim 32, the Eastotac Brochure discloses the Claim 28 Composition ‘wherein said tackifying resin concentration is less than said

thermoplastic base polymer concentration.” (*Id.* at ¶ 65 (citing ’404 patent (Ex. 1001), col. 22, ll. 25-27).) “Specifically, . . . the Eastotac Brochure’s Amorphous Polyolefin Composition is a hot melt adhesive composition comprising: a) 30-50% by weight of an hydrocarbon tackifying resin derived, at least in part, from dicyclopentadiene and having a glass transition temperature (T<sub>g</sub>) of greater than about 65 °C; and b) 50-70% of amorphous polyalphaolefin as a thermoplastic base polymer.” (*Id.*) “The tackifying resin concentration of 30-50% is less than the thermoplastic base polymer concentration of 50-70%.” (*Id.*) “Therefore, the Eastotac Brochure discloses a hot melt adhesive comprising: a) from about 10% by weight to about 80% by weight of at least one aliphatic tackifying resin having a glass transition temperature (T<sub>g</sub>) of greater than about 65 °C; and b) from about 10% by weight to about 80% by weight of at least one thermoplastic base polymer selected from the group consisting of copolymers and terpolymers of ethylene; amorphous polyalphaolefins, homogenous ethylene/α-olefin interpolymers, and mixtures thereof wherein said tackifying resin concentration is less than said thermoplastic base polymer concentration.” (*Id.*) The Eastotac Brochure thus anticipates claim 32.

## 5. Claim Chart for Ground 1

The tables below show how each limitation of claims 22, 23, 25, 28, 31, and 32 is taught by the Eastotac Brochure.

Claim 22 of the '404 Patent	Eastotac Brochure	
	Amorphous Polyolefin Composition	EVA Composition
A hot melt adhesive composition comprising:	A hot melt adhesive composition comprising (Eastotac Brochure at Table 3):	A hot melt adhesive composition comprising (Eastotac Brochure at Table 3):
a) about 10% by weight to about 50% by weight of at least one hydrocarbon tackifying resin derived, at least in part, from dicyclopentadiene and having a glass transition temperature of greater than about 65 °C;	a) 30-50% by weight of Eastotac® H-142 hydrocarbon tackifying resin, which is derived, at least in part, from dicyclopentadiene and has a glass transition temperature of 82 °C (Eastotac Brochure at Table 1, Table 3; '404 patent, col. 5, ll. 21-23, 25-28; col. 6, ll. 27-29);	a) 30-60% by weight of Eastotac® H-142 hydrocarbon tackifying resin, which is derived, at least in part, from dicyclopentadiene and has a glass transition temperature of 82 °C (Eastotac Brochure at Table 1, Table 3; '404 patent, col. 5, ll. 21-23, 25-28; col. 6, ll. 27-29);
b) about 10% by weight to about 80% by weight of at least one thermoplastic base polymer selected from the group consisting of copolymers and terpolymers of ethylene; amorphous polyalphaolefins, homogenous ethylene/ $\alpha$ -olefin interpolymer, and mixtures thereof.	b) 50-70% by weight of amorphous polyolefin thermoplastic base polymer (Eastotac Brochure at Table 3; '404 patent, col. 7, ll. 61-63).	b) 30-50% by weight of ethylene-vinyl acetate thermoplastic base polymer (Eastotac Brochure at Table 3; '404 patent, col. 3, ll. 6-8; col. 6, l. 61 to col. 7, l. 2, 15-16, 30-32).

<b>Claim 23 of the '404 Patent</b>	<b>Eastotac Brochure</b>	
	<b>Amorphous Polyolefin Composition</b>	<b>EVA Composition</b>
The adhesive of claim 22	The adhesive of claim 22 (see above)	The adhesive of claim 22 (see above)
wherein said tackifying resin has a Tg of greater than about 68 °C (about 155 °F).	wherein said tackifying resin has a Tg of 82 °C (Eastotac Brochure at Table 1, Table 3; '404 patent, col. 5, ll. 21-23, 25-28; col. 6, ll. 27-29).	wherein said tackifying resin has a Tg of 82 °C (Eastotac Brochure at Table 1, Table 3; '404 patent, col. 5, ll. 21-23, 25-28; col. 6, ll. 27-29).

<b>Claim 25 of the '404 Patent</b>	<b>Eastotac Brochure</b>	
	<b>Amorphous Polyolefin Composition</b>	<b>EVA Composition</b>
The adhesive of claim 22	The adhesive of claim 22 (see above)	The adhesive of claim 22 (see above)
wherein said tackifying resin is hydrogenated.	wherein said tackifying resin is hydrogenated (Eastotac Brochure at Table 1, Table 3; '404 patent, col. 5, ll. 54-67).	wherein said tackifying resin is hydrogenated (Eastotac Brochure at Table 1, Table 3; '404 patent, col. 5, ll. 54-67).

Claim 28 of the '404 Patent	Eastotac Brochure	
	Amorphous Polyolefin Composition	EVA Composition
A hot melt adhesive comprising:	A hot melt adhesive composition comprising (Eastotac Brochure at Table 3):	A hot melt adhesive composition comprising (Eastotac Brochure at Table 3):
a) from about 10% by weight to about 80% by weight of at least one aliphatic tackifying resin having a glass transition temperature (T <sub>g</sub> ) of greater than 65 °C; and	a) 30-50% Eastotac® H-142 tackifying resin, which is aliphatic and has a glass transition temperature of 82 °C (Eastotac Brochure at Table 1, Table 3; '404 patent, col. 5, ll. 21-23, 25-28; col. 6, ll. 27-29);	a) 30-60% Eastotac® H-142 tackifying resin, which is aliphatic and has a glass transition temperature of 82 °C (Eastotac Brochure at Table 1, Table 3; '404 patent, col. 5, ll. 21-23, 25-28; col. 6, ll. 27-29);
b) from about 10% by weight to about 80% by weight of at least one thermoplastic base polymer selected from the group consisting of copolymers and terpolymers of ethylene; amorphous polyalphaolefins, homogenous ethylene/ $\alpha$ -olefin interpolymer, and mixtures thereof.	b) 50-70% by weight of amorphous polyolefin thermoplastic base polymer (Eastotac Brochure at Table 3; '404 patent, col. 7, ll. 61-63).	b) 30-50% by weight of ethylene-vinyl acetate thermoplastic base polymer (Eastotac Brochure at Table 3; '404 patent, col. 3, ll. 6-8; col. 6, l. 61 to col. 7, l. 2, 15-16, 30-32).

Claim 31 of the '404 Patent	Eastotac Brochure Amorphous Polyolefin Composition
The adhesive composition of claim 22	The adhesive composition of claim 22

	(see above)
wherein said tackifying resin concentration is less than said thermoplastic base polymer concentration.	wherein said tackifying resin concentration of 30-50% is less than said thermoplastic base polymer concentration of 50-70% (Eastotac Brochure at Table 1, Table 3).

<b>Claim 32 of the '404 Patent</b>	<b>Eastotac Brochure Amorphous Polyolefin Composition</b>
The adhesive of claim 28	The adhesive of claim 28 (see above)
wherein said tackifying resin concentration is less than said thermoplastic base polymer concentration.	wherein said tackifying resin concentration of 30-50% is less than said thermoplastic base polymer concentration of 50-70% (Eastotac Brochure at Table 1, Table 3).

**B. Ground 2: Claims 22-25 and 28 Are Anticipated by the Exxon Reference**

“Each and every element of claims 22-25 and 28 is disclosed in the Exxon Reference such that one of ordinary skill in the art could have made and used the claimed inventions without undue experimentation in light of the general knowledge available in the art.” (Hsu Declaration (Ex. 1015) at ¶ 66.)

**1. Claim 22**

“With respect to claim 22, the Exxon Reference discloses ‘[a] hot melt adhesive composition comprising: a) about 10% by weight to about 50% by weight of at least one hydrocarbon tackifying resin derived, at least in part, from dicyclopentadiene and having a glass transition temperature of greater than about 65 °C; b) about 10% by weight to about 80% by weight of at least one

thermoplastic base polymer selected from the group consisting of copolymers and terpolymers of ethylene; amorphous polyalphaolefins, homogenous ethylene/ $\alpha$ -olefin interpolymer, and mixtures thereof” (i.e., the Claim 22 Composition).” (*Id.* at ¶ 67 (citing ’404 patent (Ex. 1001), col. 21, ll. 4-14).) “Specifically, the Exxon Reference discloses a hot melt composition comprising 40% by weight of a hydrocarbon tackifying resin, 20% by weight of Escorene UL 7750 as a thermoplastic base polymer, and 40% by weight of 158 °F MP paraffin wax.” (*Id.* at ¶ 68 (citing Exxon Reference (Ex. 1003) at 2, FN 1).)

With regard to the hydrocarbon tackifying resin, “[t]he Exxon Reference lists Escorez® 5340 as one of four specific examples of the 5000-series of Escorez® tackifier resin.” (*Id.* at ¶ 69 (citing Exxon Reference (Ex. 1003) at 2).) Notably, “Escorez® 5340 is listed in the ’404 patent as an example of a resin for use in the invention.” (*Id.* (citing ’404 patent (Ex. 1001), col. 6, ll. 14-29).) As explained in the ’404 patent, Escorez® 5340 is a hydrocarbon tackifying resin that is derived, at least in part, from dicyclopentadiene, and that has an onset glass transition temperature (Tg(onset)) of about 76 °C. (*Id.* (citing ’404 patent (Ex. 1001), col. 6, ll. 21-22; col. 9, ll. 6-9).) “A Tg of about 76 °C is greater than a Tg of about 65 °C.” (*Id.*) “Therefore, the Exxon Reference discloses a composition comprising 40% by weight of at least one hydrocarbon tackifying

resin derived, at least in part, from dicyclopentadiene and having a glass transition temperature of greater than about 65 °C, as recited by claim 22.” (*Id.*)

The composition disclosed in the Exxon Reference also comprises “20% by weight of Escorene UL 7750 as a thermoplastic base polymer.” (*Id.* at ¶68 (citing Exxon Reference (Ex. 1003) at 2, FN 1).) “The Escorene UL 7750 in the composition disclosed in the Exxon Reference is an ethylene vinyl acetate copolymer, which means that it is a copolymer of ethylene as recited in claim 22.” (*Id.* at ¶ 70 (citing Publication No. WO 97/09393 (published Mar.13, 1997) (“the ’393 publication”) (Ex. 1013) at 15).) “Therefore, the composition disclosed in the Exxon Reference is a hot melt adhesive composition comprising: a) 40% by weight of a hydrocarbon tackifying resin derived, at least in part, from dicyclopentadiene and having a glass transition temperature of greater than about 65 °C; and b) 20% of ethylene vinyl acetate as a thermoplastic base polymer.” (*Id.* at ¶ 71.) The Exxon Reference thus anticipates claim 22.

## **2. Claims 23-25**

As discussed above in Section VI.B.1, “the Exxon Reference discloses “[a] hot melt adhesive composition comprising: a) about 10% by weight to about 50% by weight of at least one hydrocarbon tackifying resin derived, at least in part, from dicyclopentadiene and having a glass transition temperature of greater than about 65 °C; b) about 10% by weight to about 80% by weight of at least one

thermoplastic base polymer selected from the group consisting of copolymers and terpolymers of ethylene; amorphous polyalphaolefins, homogenous ethylene/ $\alpha$ -olefin interpolymer, and mixtures thereof” (i.e., the Claim 22 Composition).” (*Id.* at ¶ 67 (citing ’404 patent (Ex. 1001), col. 21, ll. 4-14); *see also id.* at ¶ 72.)

“Regarding claim 23, the Exxon Reference discloses the Claim 22 Composition ‘wherein said tackifying resin has a Tg of greater than about 68 °C (about 155 °F).’” (*Id.* at ¶ 73 (citing ’404 patent (Ex. 1001), col. 21, ll. 15-16).) “Specifically, the ’404 patent states that Escorez® 5340 is a hydrocarbon resin having an onset glass transition temperature (Tg(onset)) of about 76 °C.” (*Id.* (citing ’404 patent (Ex. 1001), col. 6, ll. 21-22; col. 9, ll. 6-9).) “A Tg of about 76 °C is greater than a Tg of about 68 °C.” (*Id.*) “Therefore, the Exxon Reference discloses a hot melt adhesive composition comprising: a) about 10% by weight to about 50% by weight of at least one hydrocarbon tackifying resin derived, at least in part, from dicyclopentadiene and having a glass transition temperature of greater than about 65 °C; b) about 10% by weight to about 80% by weight of at least one thermoplastic base polymer selected from the group consisting of copolymers and terpolymers of ethylene; amorphous polyalphaolefins, homogenous ethylene/ $\alpha$ -olefin interpolymer, and mixtures thereof, wherein said tackifying resin has a Tg of greater than about 68 °C.” (*Id.*) The Exxon Reference thus anticipates claim 23.

“Regarding claim 24, the Exxon Reference discloses the Claim 22 Composition ‘wherein greater than about 80 wt-% of the total resin unit is derived from dicyclopentadiene.’” (*Id.* at ¶ 74 (citing ’404 patent (Ex. 1001), col. 21, ll. 17-19).) Specifically, “[t]he ’404 patent teaches that Escorez® 5340 is a dicyclopentadiene based hydrocarbon tackifying resin with greater than 80 wt-% of its total unit derived from dicyclopentadiene.” (*Id.* (citing ’404 patent (Ex. 1001), col. 9, ll. 3-9).) “Therefore, the Exxon Reference discloses a hot melt adhesive composition comprising: a) about 10% by weight to about 50% by weight of at least one hydrocarbon tackifying resin derived, at least in part, from dicyclopentadiene and having a glass transition temperature of greater than about 65 °C; b) about 10% by weight to about 80% by weight of at least one thermoplastic base polymer selected from the group consisting of copolymers and terpolymers of ethylene; amorphous polyalphaolefins, homogenous ethylene/ $\alpha$ -olefin interpolymers, and mixtures thereof, wherein greater than about 80 wt-% of the total resin unit is derived from dicyclopentadiene.” (*Id.*) The Exxon Reference thus anticipates claim 24.

“Regarding claim 25, the Exxon Reference discloses the Claim 22 Composition ‘wherein the tackifying resin is hydrogenated.’” (*Id.* at ¶ 75 (citing ’404 patent (Ex. 1001), col. 21, ll. 20-21).) “Specifically, the low molten Gardner Color ( $\ll 1$ ) indicates that Escorez® 5340 is hydrogenated . . . .” (*Id.* (citing

Exxon Reference (Ex. 1003) at 2; '404 patent (Ex. 1001), col. 5, ll. 54-67).)

“Therefore, the Exxon Reference discloses a hot melt adhesive composition comprising: a) about 10% by weight to about 50% by weight of at least one hydrocarbon tackifying resin derived, at least in part, from dicyclopentadiene and having a glass transition temperature of greater than about 65 °C; b) about 10% by weight to about 80% by weight of at least one thermoplastic base polymer selected from the group consisting of copolymers and terpolymers of ethylene; amorphous polyalphaolefins, homogenous ethylene/ $\alpha$ -olefin interpolymers, and mixtures thereof, wherein the tackifying resin is hydrogenated.” (*Id.*) The Exxon Reference thus anticipates claim 25.

### 3. Claim 28

“Regarding claim 28, the Exxon Reference discloses ‘[a] hot melt adhesive comprising: a) from about 10% by weight to about 80% by weight of at least one aliphatic tackifying resin having a glass transition temperature (T<sub>g</sub>) of greater than about 65 °C; and b) from about 10% by weight to about 80% by weight of at least one thermoplastic base polymer selected from the group consisting of copolymers and terpolymers of ethylene; amorphous polyalphaolefins, homogenous ethylene/ $\alpha$ -olefin interpolymers, and mixtures thereof’ (i.e., the Claim 28 Composition).” (*Id.* at ¶ 76 (citing '404 patent, col. 21, l. 27 to col. 22, l. 5).)

“Specifically, the Exxon Reference discloses a hot melt composition comprising

40% by weight of an aliphatic tackifying resin, 20% by weight of Escorene UL 7750 as a thermoplastic base polymer, and 40% by weight of 158 °F MP paraffin wax.” (*Id.* at ¶ 77 (citing Exxon Reference (Ex. 1003) at 2, FN 1).)

With regard to the hydrocarbon tackifying resin, “[t]he Exxon Reference lists Escorez® 5340 as one of four specific examples of the 5000-series of Escorez® tackifier resin.” (*Id.* at ¶ 72 (citing Exxon Reference (Ex. 1003) at 2).) Notably, “Escorez® 5340 is listed in the ’404 patent as an example of a resin for use in the invention.” (*Id.* (citing ’404 patent (Ex. 1001), col. 6, ll. 14-29).) As explained in the ’404 patent, “Escorez® 5340 is an aliphatic tackifying resin having an onset glass transition temperature (Tg(onset)) of about 76 °C.” (*Id.* (citing ’404 patent (Ex. 1001), col. 6, ll. 21-22).) “A Tg of about 76 °C is greater than a Tg of about 65 °C.” (*Id.*) “Therefore, the Exxon Reference discloses a composition comprising 40% by weight of at least one aliphatic tackifying resin having a glass transition temperature (Tg) of greater than about 65 °C, as recited by claim 28.” (*Id.*)

The composition disclosed in the Exxon Reference also comprises “20% by weight of Escorene UL 7750 as a thermoplastic base polymer.” (*Id.* at ¶77 (citing Exxon Reference (Ex. 1003) at 2, FN 1).) “The Escorene UL 7750 in the composition disclosed in the Exxon Reference is an ethylene vinyl acetate copolymer, which means that it is a copolymer of ethylene as recited in claim 28.”

(*Id.* at ¶ 79 (citing '393 publication (Ex. 1013) at 15, ll. 12-16).) “Therefore, the composition disclosed in the Exxon Reference is a hot melt adhesive composition comprising: a) 40% by weight of an aliphatic tackifying resin having a glass transition temperature (T<sub>g</sub>) of greater than about 65 °C; and b) 20% of ethylene vinyl acetate as a thermoplastic base polymer.” (*Id.* at ¶ 80.) The Exxon Reference thus anticipates claim 28.

#### 4. Claim Chart for Ground 2

The table below shows how each limitation of claims 22-25 and 28 is taught by the Exxon Reference.

Claim 22 of the '404 Patent	Exxon Reference
A hot melt adhesive composition comprising:	A hot melt adhesive composition comprising (Exxon Reference at 2, FN 1):
a) about 10% by weight to about 50% by weight of at least one hydrocarbon tackifying resin derived, at least in part, from dicyclopentadiene and having a glass transition temperature of greater than about 65 °C;	a) 40% Escorez® 5340 hydrocarbon tackifying resin, which is derived, at least in part, from dicyclopentadiene and has a glass transition temperature of 76 °C (Exxon Reference at 2, FN 1; '404 patent, col. 6, ll. 14-29; col. 9, ll. 6-9);
b) about 10% by weight to about 80% by weight of at least one thermoplastic base polymer selected from the group consisting of copolymers and terpolymers of ethylene; amorphous polyalphaolefins, homogenous ethylene/ $\alpha$ -olefin interpolymer, and mixtures thereof.	b) 20% by weight of Escorene UL 7750, which is a copolymer of ethylene, as a thermoplastic base polymer (Exxon Reference at 2, FN 1; '404 patent, col. 3, ll. 6-8; col. 6, l. 61 to col. 7, l. 2, 15-16, 30-32).

<b>Claim 23 of the '404 Patent</b>	<b>Exxon Reference</b>
The adhesive of claim 22	The adhesive of claim 22 (see above)
wherein said tackifying resin has a Tg of greater than about 68 °C (about 155 °F).	wherein said Escorez® 5340 tackifying resin has a Tg of 76 °C (Exxon Reference at 2, FN 1; '404 patent, col. 6, ll. 21-22).

<b>Claim 24 of the '404 Patent</b>	<b>Exxon Reference</b>
The adhesive of claim 22	The adhesive of claim 22 (see above)
wherein greater than about 80 wt-% of the total resin unit is derived from dicyclopentadiene.	wherein greater than about 80 wt-% of the total Escorez® 5340 tackifying resin unit is derived from dicyclopentadiene (Exxon Reference at 2, FN 1; '404 patent, col. 9, ll. 1-10).

<b>Claim 25 of the '404 Patent</b>	<b>Exxon Reference</b>
The adhesive of claim 22	The adhesive of claim 22 (see above)
wherein the tackifying resin is hydrogenated.	wherein the tackifying resin is hydrogenated (Exxon Reference at 2, FN 1; '404 patent, col. 5, ll. 54-67).

<b>Claim 28 of the '404 Patent</b>	<b>Exxon Reference</b>
A hot melt adhesive comprising:	A hot melt adhesive composition comprising (Exxon Reference at 2, FN 1):
a) from about 10% by weight to about 80% by weight of at least one aliphatic tackifying resin having a glass transition temperature (Tg) of greater than 65 °C; and	a) 40% Escorez® 5340 tackifying resin, which is aliphatic and has a glass transition temperature of 76 °C (Exxon Reference at 2, FN 1; '404 patent, col. 6, ll. 14-29; col. 9, ll. 6-9);
b) from about 10% by weight to about 80% by weight of at least one thermoplastic base polymer selected from the group consisting of copolymers and terpolymers of ethylene; amorphous	b) 20% by weight of Escorene UL 7750, which is a copolymer of ethylene, as a thermoplastic base polymer (Exxon Reference at 2, FN 1; '404 patent, col. 3, ll. 6-8; col. 6, l. 61 to col. 7, l. 2, 15-16,

polyalphaolefins, homogenous ethylene/ $\alpha$ -olefin interpolymer, and mixtures thereof.	30-32).
---	---------

**C. Ground 3: Claim 26 is Obvious over the Eastotac Brochure and the Exxon Reference, in View of the '717 Patent**

“Claim 26 depends from claim 22 and ‘further compris[es] up to about 40% by weight of a solid benzoate plasticizer.’” (Hsu Declaration (Ex.1015) at ¶ 81 (citing '404 patent (Ex. 1001), col. 21, ll. 22-23) (alteration in original).) As discussed above in Sections VI.A.1 and VI.B.1, respectively, the Eastotac Brochure and the Exxon Reference disclose “[a] hot melt adhesive composition comprising: a) about 10% by weight to about 50% by weight of at least one hydrocarbon tackifying resin derived, at least in part, from dicyclopentadiene and having a glass transition temperature of greater than about 65 °C; b) about 10% by weight to about 80% by weight of at least one thermoplastic base polymer selected from the group consisting of copolymers and terpolymers of ethylene; amorphous polyalphaolefins, homogenous ethylene/ $\alpha$ -olefin interpolymer, and mixtures thereof” (referred to herein as ‘the Claim 22 Composition’).” (*Id.* at ¶¶ 52, 67 (citing '404 patent (Ex. 1001), col. 21, ll. 4-14); *see also id.* at ¶ 81.)

“And there was nothing nonobvious or new about the additional claim limitation of claim 26.” (*Id.* at ¶ 81.) “The use of a solid benzoate plasticizer as an additional ingredient in hot melt adhesives was well known and routine for one of

skill in the art, as was using such a plasticizer at up to about 40% by weight . . . .” (*Id.* (citing ’717 patent (Ex. 1004)); *see also id.* at ¶¶ 26, 49.) For example, “[t]he ’717 patent discloses a hot melt adhesive composition about 5 to 50% by weight of a thermoplastic base polymer; about 3 to 65% by weight of a solid benzoate plasticizer; about 10 to 90% by weight of a tackifier; and about 0 to 2% by weight of an antioxidant.” (*Id.* at ¶ 82 (citing ’717 patent (Ex. 1004), col. 1, l. 65 to col. 2, l. 9).) “The motivation to use a benzoate plasticizer was because it helped to increase the open time while maintaining high crystallinity.” (*Id.* (citing ’717 patent (Ex. 1004), col. 3, ll. 1-4).) “One of skill in the art would have routinely taken the hot melt compositions of the Eastotac Brochure and the Exxon reference and added an additional solid benzoate plasticizer with an expectation of success since the benzoate plasticizers were compatible with hot melt adhesive compositions.” (*Id.* (citing ’717 patent (Ex. 1004), col. 2, ll. 67-68).) “This is shown from the examples of the ’717 patent.” (*Id.*) “A number of example hot melt adhesives provided in Tables 1 and 3 of the ’717 patent combine an aliphatic hydrocarbon tackifier (with the Escorez® 5000 series and Eastotac® H-100 series of tackifiers being listed as examples, a polybutylene thermoplastic polymer (which is a copolymer of polybutene-1 and ethylene and which is very similar to copolymers of ethylene used as thermoplastic base polymers in the ’404 patent), and up to about 40% by weight of a solid benzoate plasticizer, including

Benzoflex® 352, which is a solid benzoate plasticizer used in examples of the '404 patent.” (*Id.* (citing '717 patent (Ex. 1004), col. 3, ll. 40-49; col. 5, l. 1 to col. 6, l. 32; '404 patent (Ex. 1001), col. 17, Tables III, IV).)

### 1. Claim Chart for Ground 3

The table below shows how each limitation of claim 26 is taught by the Eastotac Brochure or the Exxon Reference, in view of the '717 patent.

Claim 26 of the '404 Patent	The Eastotac Brochure or the Exxon Reference in View of the '717 Patent
The adhesive of claim 22	The Eastotac Brochure and the Exxon Reference disclose the Claim 22 Composition. (See charts above; Hsu Declaration (Ex. 1015) at ¶¶ 52, 67, 81.)
further comprising up to about 40% by weight of a solid benzoate plasticizer.	A person of ordinary skill in the art would have been motivated to use an adhesive composition further comprising up to about 40% by weight of a solid benzoate plasticizer, and would have had a reasonable expectation of success in doing so. (Hsu Declaration (Ex. 1015) at ¶¶ 81-82; '717 patent (Ex. 1004), col. 1, l. 65 to col. 2, l. 9; col. 2, ll. 67-68; col. 3, ll. 1-4, 40-49; col. 5, l. 1 to col. 6, l. 32; '404 patent (Ex. 1001), col. 17, Tables III, IV.)

### D. Ground 4: Claim 27 Is Obvious over the Eastotac Brochure and the Exxon Reference, in View of Litz

“Claim 27 depends from claim 22 and further requires ‘peel values . . . greater than about 70 °C.’” (*Id.* at ¶ 83 (citing '404 patent (Ex. 1001),

col. 21, ll. 25-26).) As discussed above in Sections VI.A.1 and VI.B.1, respectively, the Eastotac Brochure and the Exxon Reference disclose “[a] hot melt adhesive composition comprising: a) about 10% by weight to about 50% by weight of at least one hydrocarbon tackifying resin derived, at least in part, from dicyclopentadiene and having a glass transition temperature of greater than about 65 °C; b) about 10% by weight to about 80% by weight of at least one thermoplastic base polymer selected from the group consisting of copolymers and terpolymers of ethylene; amorphous polyalphaolefins, homogenous ethylene/ $\alpha$ -olefin interpolymer, and mixtures thereof” (referred to herein as ‘the Claim 22 Composition’).” (Hsu Declaration (Ex. 1015) at ¶¶ 52, 67 (citing ’404 patent (Ex. 1001), col. 21, ll. 4-14); *see also id.* at ¶ 83.)

“And obtaining such a composition wherein the peel values are greater than about 70 °C would have been obvious and routine for one of skill in the art.” (*Id.* at ¶ 83 (citing Litz (Ex. 1005) at 36, 2<sup>nd</sup> column).) As explained in the ’404 patent, “[t]he tackifying resin [was] known to provide specific adhesion and to increase peel values which translates into heat resistance.” (*Id.* at ¶ 84 (quoting ’404 patent (Ex. 1001), col. 1, ll. 25-30) (alterations in original).) “Specifically, by June 1998, it was known that the use of a higher Tg tackifier in a hot melt adhesive would increase the overall mechanical strength of the adhesive, and therefore increase the peel value and heat resistance of the adhesive . . . .” (*Id.*) “This meant that an

adhesive with a higher Tg tackifier would deform at higher temperature, which was preferable in certain applications.” (*Id.*) “In addition to increasing peel value by using a high Tg tackifier, it is routine in the art to increase peel value by varying the thermoplastic polymer and adding wax.” (*Id.* (citing Handbook of Adhesives (ed. Irving Skeist 1977) (“Skeist”) (Ex. 1014))).)

“One of skill in the art would have been motivated to prepare a hot melt adhesive with a peel value of greater than about 70 °C, and there would have been a reasonable expectation of success based on what was known in the art at the time regarding tackifying resins.” (*Id.* at ¶ 85.) “Litz, for example, is a review article published in 1974 that discusses the developments in ethylene-based hot melt adhesives.” (*Id.* (citing Litz (Ex. 1005) at 35-38).) “Litz explains that ‘one of the most important reasons for the impressive growth of hot melts has been the ability of the formulators to meet the demanding requirements of diverse adhesive applications.’” (*Id.* (citing Litz (Ex. 1005) at 36, 2<sup>nd</sup> column).) “One of these requirements is Rule 41 of the Uniform Freight Classification Committee, ‘which governs the packaging requirements of all materials shipped by rail.’” (*Id.* (quoting Litz (Ex. 1005) at 36, 2<sup>nd</sup> column).) “Rule 41 requires that the hot melts maintain a bond (i.e., peel value) in temperatures between -20 °F and +165 °F (-29 °C and 74 °C).” (*Id.* (citing Litz (Ex. 1005) at 36, 2<sup>nd</sup> column).) “Therefore, Litz suggested the routine modification of the compositions of the Eastotac

Brochure and the Exxon Reference to obtain a peel value of greater than about 70 °C, as recited in claim 27 of the '404 patent.” (*Id.*)

### 1. Claim Chart for Ground 4

The table below shows how each limitation of claim 27 is taught by the Eastotac Brochure or the Exxon Reference, in view of Litz.

Claim 27 of the '404 Patent	The Eastotac Brochure or the Exxon Reference in View of Litz
The adhesive of claim 22	The Eastotac Brochure and the Exxon Reference disclose the Claim 22 Composition. (See charts above; Hsu Declaration (Ex. 1015) at ¶¶ 52, 67, 81.)
wherein the peel values are greater than about 70 °C.	A person of ordinary skill in the art would have been motivated to use an adhesive composition with a peel value of greater than about 70 °C, and would have had a reasonable expectation of success in doing so. (Hsu Declaration (Ex. 1015) at ¶¶ 83-86; Litz (Ex. 1005) at 36, 2 <sup>nd</sup> column; '404 patent (Ex.1001), col. 1, ll. 25-30; Skeist (Ex. 1014).)

### E. Ground 5: Claims 22-25, 28, 31, and 32 Are Obvious over the Eastotac Brochure and the Exxon Reference

As discussed above in Sections VI.A and VI.B, respectively, the Eastotac Brochure discloses each and every element of claims 22, 23, 25, 28, 31, and 32 of the '404 patent, and the Exxon Reference discloses each and every element of claims 22-25 and 28. If, however, the Board determines that the Eastotac Brochure or the Exxon Reference does not anticipate these claims, the Eastotac Brochure and

the Exxon Reference nonetheless render claims 22-25, 28, 31, and 32 obvious, because the claimed inventions would have been obvious to one of ordinary skill in the art in light of the art and the general knowledge in the field.

### **1. Claims 22-25 and 31**

As discussed above in Sections VI.A.1 and VI.B.1, respectively, the Eastotac Brochure and the Exxon Reference disclose “[a] hot melt adhesive composition comprising: a) about 10% by weight to about 50% by weight of at least one hydrocarbon tackifying resin derived, at least in part, from dicyclopentadiene and having a glass transition temperature of greater than about 65 °C; b) about 10% by weight to about 80% by weight of at least one thermoplastic base polymer selected from the group consisting of copolymers and terpolymers of ethylene; amorphous polyalphaolefins, homogenous ethylene/ $\alpha$ -olefin interpolymer, and mixtures thereof” (referred to herein as ‘the Claim 22 Composition’).” (Hsu Declaration (Ex. 1015) at ¶¶ 52, 68 (citing ’404 patent (Ex. 1001), col. 21, ll. 4-14).)

“One of skill in the art would have been motivated to choose the Eastotac Brochure compositions containing Eastotac® H-142 resin for use in many applications, such as those requiring a high peel value and heat resistance, because Eastotac® H-142 has the highest T<sub>g</sub> of the Eastotac® resins in the Eastotac Brochure.” (*Id.* at ¶ 54 (citing Eastotac Brochure (Ex. 1002).) Specifically, “[b]y

June 1998, it was known that the use of tackifiers in a hot melt adhesive would increase the use temperature of the adhesive, and particularly, using higher Tg tackifiers would increase the overall mechanical strength of the adhesive, and therefore increase the peel value and heat resistance of the adhesive.” (*Id.* at ¶ 22 (citing Kraus (Ex. 1018), Figure 1); *see also id.* at ¶¶ 54, 69.) “An adhesive with a higher Tg tackifier was thus known to deform at higher temperature, which was preferable in certain applications.” (*Id.* at ¶ 22.)

“Tg is also related to softening point,” which is “the temperature at which a sample deforms or can deform under a specific heating and force.” (*Id.* at ¶ 19 (citing American Society for Testing and Materials, *Standard Test Method for Softening Point by Ring-and-Ball Apparatus*, E-67, from Annual Book of ASTM Standards (1967) (“ASTM E-28”) (Ex. 1017)).) “Because there is a direct correlation between the Tg and softening point within the same series of tackifying resins, as Tg increases for the resins, the resins are also more resistant to heat.” (*Id.*; *see also id.* at ¶¶ 20-21.) Thus, “[o]ne of skill in the art would have been motivated to choose the Exxon Reference compositions containing Escorez® 5340 resin for use in many applications, such as those requiring a high peel value and heat resistance, because Escorez® 5340 has the highest Tg of the Escorez® resins in the Exxon Reference.” (*Id.* at ¶ 69 (citing Exxon Reference (Ex. 1003).))

Therefore, even if the Board determines that the Eastotac Brochure or the Exxon Reference does not disclose each and every element of claim 22, the Eastotac Brochure and the Exxon Reference nonetheless render this claim obvious, because the claimed invention would have been obvious to one of ordinary skill in the art in light of the art and the general knowledge in the field. The additional limitations of claims 23-25 and 31 also would have been obvious, because it would have been obvious to use: a tackifying resin with a Tg of greater than about 68 °C (claim 23), an adhesive where greater than about 80 wt-% of the total resin unit is derived from dicyclopentadiene (claim 24), a hydrogenated tackifying resin (claim 25), and an adhesive where the tackifying resin concentration was less than the thermoplastic base polymer concentration (claim 31) since all of these elements are expressly disclosed in the Eastotac Brochure or the Exxon Reference, and as explained above one of skill in the art would have been motivated to choose these higher Tg tackifiers.

## **2. Claims 28 and 32**

As discussed above in Sections VI.A.3 and VI.B.3, respectively, the Eastotac Brochure and the Exxon Reference disclose “[a] hot melt adhesive comprising: a) from about 10% by weight to about 80% by weight of at least one aliphatic tackifying resin having a glass transition temperature (Tg) of greater than about 65 °C; and b) from about 10% by weight to about 80% by weight of at least

one thermoplastic base polymer selected from the group consisting of copolymers and terpolymers of ethylene; amorphous polyalphaolefins, homogenous ethylene/ $\alpha$ -olefin interpolymers, and mixtures thereof” (referred to herein as ‘the Claim 28 Composition’).” (*Id.* at ¶¶ 60, 76 (citing ’404 patent (Ex. 1001), col. 21, l. 27 to col. 22, l. 5).)

“One of skill in the art would have been motivated to choose the Eastotac Brochure compositions containing Eastotac® H-142 resin for use in many applications, such as those requiring a high peel value and heat resistance, because Eastotac® H-142 has the highest Tg of the Eastotac® resins in the Eastotac Brochure.” (*Id.* at ¶ 62 (citing Eastotac Brochure (Ex. 1002).) Specifically, “[b]y June 1998, it was known that the use of tackifiers in a hot melt adhesive would increase the use temperature of the adhesive, and particularly, using higher Tg tackifiers would increase the overall mechanical strength of the adhesive, and therefore increase the peel value and heat resistance of the adhesive.” (*Id.* at ¶ 22 (citing Kraus (Ex. 1018), Figure 1); *see also id.* at ¶¶ 62, 78.) “An adhesive with a higher Tg tackifier was thus known to deform at higher temperature, which was preferable in certain applications.” (*Id.* at ¶ 22.)

“Tg is also related to softening point,” which is “the temperature at which a sample deforms or can deform under a specific heating and force.” (*Id.* at ¶ 19 (citing ASTM E-28 (Ex. 1017)).) “Because there is a direct correlation between

the Tg and softening point within the same series of tackifying resins, as Tg increases for the resins, the resins are also more resistant to heat.” (*Id.*; *see also id.* at ¶¶ 20-21.) Thus, “[o]ne of skill in the art would have been motivated to choose the Exxon Reference compositions containing Escorez® 5340 resin for use in many applications, such as those requiring a high peel value and heat resistance, because Escorez® 5340 has the highest Tg of the Escorez® resins in the Exxon Reference.” (*Id.* at ¶ 78 (citing Exxon Reference (Ex. 1003).))

Moreover, “[t]he choice of the thermoplastic polymeric component was based on a number of factors and by June 1998, was a routine aspect of designing a hot melt adhesive.” (*Id.* at ¶ 24.) Well-known examples of such components as of June 1998 included copolymers and terpolymers of ethylene (e.g., ethylene-vinyl acetate (EVA)), as well as amorphous polyalphaolefin polymers. (*Id.* at ¶¶ 24-25 (citing ’404 patent (Ex. 1001), col. 6, l. 61; col. 7, ll. 16-17, 61-63).) “The stable ethylene portion of EVA polymers provides crystallization, and the vinyl acetate portion provides interaction with substrates.” (*Id.*)

Therefore, even if the Board determines that the Eastotac Brochure or the Exxon Reference does not disclose each and every element of claim 28, the Eastotac Brochure and the Exxon Reference nonetheless render this claim obvious, because the claimed invention would have been obvious to one of ordinary skill in the art in light of the art and the general knowledge in the field. The additional

limitations of claim 32 also would have been obvious, because it would have been obvious to use an adhesive where the tackifying resin concentration was less than the thermoplastic base polymer concentration since such a composition is expressly disclosed in the prior art.

### 3. Claim Chart for Ground 5

The table below shows how each limitation of claims 22-25, 28, 31, and 32 is taught by the Eastotac Brochure and the Exxon Reference.

Claim 22 of the '404 Patent	The Eastotac Brochure and the Exxon Reference
A hot melt adhesive composition comprising:	The Eastotac Brochure and the Exxon Reference disclose a hot melt adhesive composition. (See charts above; Hsu Declaration (Ex. 1015) at ¶¶ 52, 68.)
a) about 10% by weight to about 50% by weight of at least one hydrocarbon tackifying resin derived, at least in part, from dicyclopentadiene and having a glass transition temperature of greater than about 65 °C;	The Eastotac Brochure and the Exxon Reference disclose a) about 10% by weight to about 50% by weight of at least one hydrocarbon tackifying resin derived, at least in part, from dicyclopentadiene and having a glass transition temperature of greater than about 65 °C. (See charts above; Hsu Declaration (Ex. 1015) at ¶¶ 52, 68.) Moreover, a person of ordinary skill in the art would have been motivated to use about 10% by weight to about 50% by weight of at least one hydrocarbon tackifying resin derived, at least in part, from dicyclopentadiene and having a glass transition temperature of greater than about 65 °C, and would have had a reasonable expectation of success in doing so. (Hsu Declaration (Ex. 1015))

	at ¶¶ 20-23, 52, 54, 68-69; Kraus (Ex. 1018); ASTM E-28 (Ex. 1017); '033 patent (Ex. 1019).)
b) about 10% by weight to about 80% by weight of at least one thermoplastic base polymer selected from the group consisting of copolymers and terpolymers of ethylene; amorphous polyalphaolefins, homogenous ethylene/ $\alpha$ -olefin interpolymers, and mixtures thereof.	The Eastotac Brochure and the Exxon Reference disclose b) about 10% by weight to about 80% by weight of at least one thermoplastic base polymer selected from the group consisting of copolymers and terpolymers of ethylene; amorphous polyalphaolefins, homogenous ethylene/ $\alpha$ -olefin interpolymers, and mixtures thereof. (See charts above; Hsu Declaration (Ex. 1015) at ¶¶ 52, 68.) Moreover, a person of ordinary skill in the art would have been motivated to use about 10% by weight to about 80% by weight of at least one thermoplastic base polymer selected from the group consisting of copolymers and terpolymers of ethylene; amorphous polyalphaolefins, homogenous ethylene/ $\alpha$ -olefin interpolymers, and mixtures thereof, and would have had a reasonable expectation of success in doing so. (Hsu Declaration (Ex. 1015) at ¶¶ 24-25, 52, 68; '404 patent (Ex. 1001).)

<b>Claim 23 of the '404 Patent</b>	<b>Eastotac Brochure and/or Exxon Reference</b>
The adhesive of claim 22	The Eastotac Brochure and the Exxon Reference disclose the Claim 22 Composition. (See charts above; Hsu Declaration (Ex. 1015) at ¶¶ 52, 68.)
wherein said tackifying resin has a Tg of greater than about 68 °C (about 155 °F).	The Eastotac Brochure and the Exxon Reference disclose the Claim 22 Composition wherein said tackifying resin has a Tg of greater than about 68

	<p>°C (about 155 °F). (See charts above; Hsu Declaration (Ex. 1015) at ¶¶ 57, 73.) Moreover, a person of ordinary skill in the art would have been motivated to use a tackifying resin having a Tg of greater than about 68 °C (about 155 °F), and would have had a reasonable expectation of success in doing so. (Hsu Declaration (Ex. 1015) at ¶¶ 57, 73.)</p>
--	---

<b>Claim 24 of the '404 Patent</b>	<b>Eastotac Brochure and/or Exxon Reference</b>
The adhesive of claim 22	The Eastotac Brochure and the Exxon Reference disclose the Claim 22 Composition. (See charts above; Hsu Declaration (Ex. 1015) at ¶¶ 52, 68.)
wherein greater than about 80 wt-% of the total resin unit is derived from dicyclopentadiene.	<p>The Exxon Reference discloses the Claim 22 Composition wherein greater than about 80 wt-% of the total resin unit is derived from dicyclopentadiene. (Hsu Declaration (Ex. 1015) at ¶ 74.) Moreover, a person of ordinary skill in the art would have been motivated to use greater than about 80 wt-% of the total resin unit derived from dicyclopentadiene, and would have had a reasonable expectation of success in doing so. (Hsu Declaration (Ex. 1015) at ¶ 74.)</p>

<b>Claim 25 of the '404 Patent</b>	<b>Eastotac Brochure and/or Exxon Reference</b>
The adhesive of claim 22	The Eastotac Brochure and the Exxon Reference disclose the Claim 22 Composition. (See charts above; Hsu Declaration (Ex. 1015) at ¶¶ 52, 68.)

wherein the tackifying resin is hydrogenated.	The Eastotac Brochure and the Exxon Reference disclose the Claim 22 Composition wherein the tackifying resin is hydrogenated. (Hsu Declaration (Ex. 1015) at ¶¶ 58, 75.) Moreover, a person of ordinary skill in the art would have been motivated to use a hydrogenated tackifying resin, and would have had a reasonable expectation of success in doing so. (Hsu Declaration (Ex. 1015) at ¶¶ 58, 75.)
---	---

<b>Claim 28 of the '404 Patent</b>	<b>Eastotac Brochure and/or Exxon Reference</b>
A hot melt adhesive comprising:	The Eastotac Brochure and the Exxon Reference disclose a hot melt adhesive composition. (See charts above; Hsu Declaration (Ex. 1015) at ¶¶ 60, 76.)
a) from about 10% by weight to about 80% by weight of at least one aliphatic tackifying resin having a glass transition temperature (T <sub>g</sub> ) of greater than 65 °C; and	The Eastotac Brochure and the Exxon Reference disclose a) from about 10% by weight to about 80% by weight of at least one aliphatic tackifying resin having a glass transition temperature (T <sub>g</sub> ) of greater than 65 °C. (See charts above; Hsu Declaration (Ex. 1015) at ¶¶ 60, 76.) Moreover, a person of ordinary skill in the art would have been motivated to use from about 10% by weight to about 80% by weight of at least one aliphatic tackifying resin having a glass transition temperature (T <sub>g</sub> ) of greater than 65 °C, and would have had a reasonable expectation of success in doing so. (Hsu Declaration (Ex. 1015) at ¶¶ 20-23, 54, 60, 69, 76; Kraus (Ex. 1018); ASTM E-28 (Ex. 1017); '033 patent (Ex. 1019).)

<p>b) from about 10% by weight to about 80% by weight of at least one thermoplastic base polymer selected from the group consisting of copolymers and terpolymers of ethylene; amorphous polyalphaolefins, homogenous ethylene/<math>\alpha</math>-olefin interpolymer, and mixtures thereof.</p>	<p>The Eastotac Brochure and the Exxon Reference disclose b) from about 10% by weight to about 80% by weight of at least one thermoplastic base polymer selected from the group consisting of copolymers and terpolymers of ethylene; amorphous polyalphaolefins, homogenous ethylene/<math>\alpha</math>-olefin interpolymer, and mixtures thereof. (See charts above; Hsu Declaration (Ex. 1015) at ¶¶ 60, 76.) Moreover, a person of ordinary skill in the art would have been motivated to use from about 10% by weight to about 80% by weight of at least one thermoplastic base polymer selected from the group consisting of copolymers and terpolymers of ethylene; amorphous polyalphaolefins, homogenous ethylene/<math>\alpha</math>-olefin interpolymer, and mixtures thereof, and would have had a reasonable expectation of success in doing so. (Hsu Declaration (Ex. 1015) at ¶¶ 24-25, 60, 76; '404 patent (Ex. 1001).)</p>
---	--

Claim 31 of the '404 Patent	Eastotac Brochure and/or Exxon Reference
The adhesive composition of claim 22	The Eastotac Brochure and the Exxon Reference disclose the Claim 22 Composition. (See charts above; Hsu Declaration (Ex. 1015) at ¶¶ 52, 68.)
wherein said tackifying resin concentration is less than said thermoplastic base polymer concentration.	The Eastotac Brochure discloses the Claim 22 Composition wherein said tackifying resin concentration is less than said thermoplastic base polymer concentration. (See charts above; Hsu Declaration (Ex. 1015) at ¶ 59.)

	Moreover, a person of ordinary skill in the art would have been motivated to use a tackifying resin concentration less than the thermoplastic base polymer concentration, and would have had a reasonable expectation of success in doing so. (Hsu Declaration (Ex. 1015) at ¶ 59.)
--	---

Claim 32 of the '404 Patent	Eastotac Brochure and/or Exxon Reference
The adhesive of claim 28	The Eastotac Brochure and the Exxon Reference disclose the Claim 28 Composition. (See charts above; Hsu Declaration (Ex. 1015) at ¶¶ 60, 76.)
wherein said tackifying resin concentration is less than said thermoplastic base polymer concentration.	The Eastotac Brochure discloses the Claim 28 Composition wherein said tackifying resin concentration is less than said thermoplastic base polymer concentration. (See charts above; Hsu Declaration (Ex. 1015) at ¶ 65.) Moreover, a person of ordinary skill in the art would have been motivated to use a tackifying resin concentration less than the thermoplastic base polymer concentration, and would have had a reasonable expectation of success in doing so. (Hsu Declaration (Ex. 1015) at ¶ 65.)

## VII. CONCLUSION

For the reasons set forth herein, Petitioner has established a reasonable likelihood that it will prevail on claims 22-28, 31, and 32 of the '404 patent. This Petition should thus be granted, *inter partes* review should be instituted, and

claims 22-28, 31, and 32 of the '404 patent should be found canceled as unpatentable.

Dated: April 10, 2014

Respectfully submitted,

/Anthony C. Tridico/  
Anthony A. Tridico (Reg. No. 45,958)  
Finnegan, Henderson, Farabow,  
Garrett & Dunner, LLP  
(202) 408.4000

***Counsel for Petitioner Henkel  
Corporation***

**APPENDIX 1: LIST OF EXHIBITS**

<b>Exhibit No.</b>	<b>Description</b>
1001	U.S. Patent No. 6,833,404 (“the ’404 patent”)
1002	Eastotac Hydrocarbon Resins Brochure by the Eastman Company (Aug. 1992) (“the Eastotac Brochure”)
1003	Specialty Polymers for Adhesives and Sealants by the Exxon Chemical Company (Oct. 1990) (“the Exxon Reference”)
1004	U.S. Patent No. 5,256,717 (issued Oct. 26, 1993) (“the ’717 patent”)
1005	Litz, R.J., <i>Developments in Ethylene-Based Hot Melt Adhesives</i> , Adhesives Age 17(8):35-38 (1974) (“Litz”)
1006	Clark, T., <u>Bookbinding with Adhesives</u> (3rd ed. McGraw-Hill, UK 1994) (“Clark”), p. 1
1007	Alger, M.S., <u>Polymer Science Dictionary</u> (Elsevier Applied Science, New York 1989) (“Alger”), p. 115
1008	Lee, S.M., <u>Dictionary of Composite Materials Technology</u> (CRC Press, Technology & Engineering 1995) (“Lee”), p. 43
1009	U.S. Patent No. 4,233,432 (issued Nov. 11, 1980) (“the ’432 patent”)
1010	Young, R.J. & Lovell, P.A., <u>Introduction to Polymers</u> (2nd ed., Chapman & Hall, New York 1991) (“Young”), pp. 10-11, 292
1011	U.S. Patent No. 5,397,843 (issued Mar. 14, 1994) (“the ’843 patent”)
1012	U.S. Patent No. 5,171,628 (issued Dec. 15, 1992) (“the ’628 patent”)
1013	Publication No. WO 97/09393 (published Mar. 13, 1997) (“the ’393 publication”)
1014	<u>Handbook of Adhesives</u> (ed. Irving Skeist, Van Nostrand Reinhold Co. 1977) (“Skeist”), pp. 495-98
1015	Declaration of Shaw Ling Hsu, Ph.D. (“the Hsu Declaration”)
1016	Curriculum Vitae of Shaw Ling Hsu, Ph.D. (“Hsu CV”)
1017	American Society for Testing and Materials, <i>Standard Test Method for Softening Point by Ring-and-Ball Apparatus</i> , E-67, from <u>Annual Book of ASTM Standards</u> (1967) (“ASTM E-28”)
1018	Kraus et al., <i>Tack and Viscoelasticity of Block Copolymer Based Adhesives</i> , J. Adhesion 10:221-36 (1979) (“Kraus”)
1019	U.S. Patent No. 5,331,033 (issued Jul. 19, 1994) (“the ’033 patent”)

## **CERTIFICATE OF SERVICE**

Pursuant to 37 C.F.R. § 42.6(e) and 42.105(a), I hereby certify that a true and correct copy of the foregoing Petition for *Inter Partes* Review of U.S. Patent No. 6,833,404 and accompanying Exhibits 1001-1019 were served on April 10, 2014, via the U.S. Postal Service on Patent Owner at the correspondence address of the Patent Owner as follows:

James Lilly (Reg. No. 27,817)  
H.B. Fuller Company  
H.B. Fuller Patent Department  
1200 Willow Lake Blvd.  
P.O. Box 64683  
St. Paul, Minnesota 55164-0683

Kirsten Stone  
H.B. Fuller Company  
H.B. Fuller Patent Department  
1200 Willow Lake Blvd.  
P.O. Box 64683  
St. Paul, Minnesota 55164-0683

Dated: April 10, 2014

/Anthony C. Tridico/  
Anthony A. Tridico (Reg. No. 45,958)

***Counsel for Petitioner Henkel  
Corporation***