

**Patent Owner's  
Demonstrative Exhibits**

June 10, 2015  
Case IPR2014-00606  
Patent No. 6,833,404

**Henkel Corporation,  
Petitioner  
v.  
H.B. Fuller Company,  
Patent Owner**

**FAEGRE BAKER  
DANIELS**

# Anticipation

# "Hot Melt Adhesive"

# '404 Patent

“This invention relates to improved **hot melt adhesive** compositions utilizing a hydrogenated substantially aliphatic tackifying resin having a **high glass transition temperature**. The adhesive compositions have surprisingly high heat resistance combined with good cold temperature flexibility, light color and excellent color stability.”

# Claim 22

**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, homogeneous ethylene/ $\alpha$ -olefin interpolymers, and mixtures thereof.

# Claim 28

**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, homogeneous ethylene/ $\alpha$ -olefin interpolymers, and mixtures thereof.

# Henkel's Petition

Inter Partes Review of U.S. Patent No. 6,833,404  
Case IPR: Unassigned  
Petition under 35 U.S.C. § 311

(*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 ( $T_g$ ) 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 interpolymers, 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).

# Henkel's Petition

- “Hot melt adhesives ‘are 100[%] solid thermoplastic materials that flow when heated’ and ‘can bond wide possible ranges of paper stock.’”

(Paper 2 at 6 (quoting declaration of Dr. Hsu ¶15); Paper 4 at 6.)

- “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.’”

(Paper 2 at 6 (quoting declaration of Dr. Hsu ¶15); Paper 4 at 6.)

# Dr. Hsu's Declaration

“15. Hot melt adhesives (interchangeably referred to as hot melts) ‘are 100[%] solid thermoplastic materials that flow when heated; the final bond is gained when the temperature has fallen to the ambient one, i.e., that of the material to be glued.’ Hot melts can bond wide possible ranges of paper stock and ‘consist of polymers, tackifying resins, and waxes.’ Hot melts ‘have the distinct advantages of being capable of extremely high tack with medium to very fast setting speeds.’”

# Henkel's Reply Brief

“In this case, both parties agree that a hot melt adhesive is broadly defined as a solid material that flows when heated and forms a bond when cooled to ambient temperature, and it was accepted in the art that a hot melt adhesive generally comprised a tackifier, polymer and optionally a wax.”

# '404 Patent & Wax

“At higher wax levels, bondability of the adhesive system may be affected. At lower levels, the adhesive may set too slowly or heat resistance may adversely be affected. In a preferred embodiment, all synthetic high melting point wax is utilized. When the thermoplastic polymer is an **ethylene copolymer**, it is preferable to use from about 10% by weight to about 30% by weight of the composition. When the thermoplastic polymer is a **homopolymer or copolymer of propylene** it may be preferable to use less wax, for example, less than about 10 wt-%, or no wax at all, as it changes the compatibility of the system.”

(Ex. 1001 at 9:52-64; see *also* Paper 23 at 8-9, 35-36; Ex. 1039 at 240, 252.)

# Dr. Hsu's Testimony Is Not Entitled to Any Weight

# Dr. Hsu's Testimony Is Not Entitled To Any Weight

1. Dr. Hsu did not require a person of ordinary skill in the art to have experience working with hot melt adhesives.
2. Dr. Hsu does not have any experience working with hot melt adhesives.
3. Dr. Hsu has an established relationship with Henkel.

# Dr. Hsu's Testimony

Q: And in forming your opinions in this case, you did not require the person of ordinary skill – the person of ordinary skill in the art to have any experience working with hot melt adhesives. Correct?

**A: That is correct.**

Q: And, sir, as of today, is it fair to say that you do not have any experience working with an actual hot melt adhesive?

**A: Correct.**

(Ex. 1039 at 48:14-22; see *also* Paper 23 at 20-21.)

# Dr. Hsu's Testimony

Q: So have you ever **made** a hot melt adhesive?

A: **No.**

Q: Have you ever **personally formulated** a hot melt adhesive?

A: **No.**

Q: Have you ever – at the University of Massachusetts Amherst, have you ever analyzed a hot melt adhesive? Have you **personally analyzed** a hot melt adhesive?

A: **No.**

Q: During the course of your career, have you ever **done any testing** on a hot melt adhesive?

A: **No.**

Q: Have you ever **done any experiments of any kind** on an actual hot melt adhesive?

A: **No.**

(Ex. 1039 at 34:9-21, 36:1-3 (emphasis added); see *a/so* Paper 23 at 21.)

# No Anticipation By *Eastotac* Brochure

# No Anticipation By *Eastotac* Brochure

1. Eastotac Brochure does not disclose a specific hot melt adhesive with H-142R resin.
2. Henkel's "picking, choosing, and combining" argument is improper and insufficient to prove anticipation.
3. Henkel's own evidence undermines its anticipation argument.

# *Eastotac* Brochure (Ex. 1002)

## Introduction

*Eastotac* resins are hydrogenated, C<sub>8</sub> aliphatic hydrocarbon tackifying resins. They are characterized by low odor, good solubility, excellent heat stability, and low color. These products also exhibit good tackifying characteristics and broad compatibility with numerous elastomers, polymers, and other resins.

*Eastotac* hydrocarbon resins are produced from petroleum feedstock by polymerization followed by hydrogenation. Production of the resin with the desired softening point is obtained by controlling the polymerization process. These hydrocarbon resins are essentially fully saturated. As a result, they have good color, heat stability, and aging properties that can carry through to the final product in which they are used.

*Eastotac* resins are available in four color levels with varying softening points which allow the selection of the resin most suitable for a particular application. Typical physical properties and color grades of these resins are listed in Table 1. Solubility characteristics are shown in Table 2 and

*Eastotac* resins are available in four color levels with varying softening points which allow the selection of the resin most suitable for a particular application. Typical physical

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# *Eastotac* Brochure: “Applications”

- pressure sensitive adhesives
- hot melt adhesives
- caulks
- sealants
- rubber systems
- inks
- paints
- varnishes
- dry-cleaning solutions
- investment casting and highway marking

# Eastotac Brochure: Table 1

Table 1  
Typical Properties of *Easitac* Hydrocarbon Resins\*

PROPERTY	H-100E	H-100R	H-100L	H-100W	H-115E	H-115R	H-115L	H-115W	H-130E	H-130R	H-130L	H-130W	H-142R
Ring & Ball Softening Point, °C (°F)	100 (212)	100 (212)	100 (212)	100 (212)	115 (239)	115	115	115	130	130	130	130	142
Physical Form	Flake	Flake	Flake	Flake	Flake	Flake	Flake	Flake	Flake	Flake	Flake	Flake	Flake
Gardner Color (Molten)	8	4	2	<1	8	4	2	<1	8	4	2	<1	4
Gardner Color (in 50% Toluene)	6	2	<1	<1	6	2	<1	<1	6	2	<1	<1	2
Acid Number	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Density	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Viscosity, Brookfield Thermoseal, 190°C (374°F), cP	200	200	200	200	400	400	400	400	1200	1200	1200	1200	3000
Bromine Number	15	5	3	1	15	5	3	1	15	5	3	1	5
Chlorides, total, ppm	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Ash, %	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001
Flash Point, Cleveland Open Cup, °C (°F)	242 (468)	242 (468)	242 (468)	242 (468)	257 (495)	257 (495)	257 (495)	257 (495)	299 (570)	299 (570)	299 (570)	299 (570)	321 (610)
Fire Point, Cleveland Open Cup, °C (°F)	266 (510)	266 (510)	266 (510)	266 (510)	283 (542)	283 (542)	283 (542)	283 (542)	325 (617)	325 (617)	325 (617)	325 (617)	335 (635)


\*Reported for information only. Eastman makes no representation that the material in any particular shipment will conform exactly to the values given.

# Eastotac Brochure: Table 3

**Table 3**  
**General Composition Ranges for *Eastotac* Resins**  
**in Hot Melt Adhesives**

Materials	Compositions, % by Weight		
	PE Base	APP Base	EVA Base
<i>Eastotac</i> resin	10–40	30–50	30–60
Low-molecular-weight polyethylene wax	60–90	0–20	—
Amorphous polyolefin	—	50–70	—
Ethylene-vinyl acetate copolymer	—	—	30–50
Petroleum wax or Fischer-Tropsch wax	—	—	0–20
Antioxidant	0.25–0.5	0.25–0.5	0.25–0.5

# The '033 Patent (Ex. 1019)

 US005331033A																																																	
<b>United States Patent</b> [19] <b>Stauffer et al.</b>	[11] <b>Patent Number:</b> 5,331,033 [45] <b>Date of Patent:</b> Jul. 19, 1993																																																
<p>[54] <b>HOT MELT ADHESIVE</b></p> <p>[75] <b>Inventors:</b> Daniel Stauffer, Kane, Pa.; Paul P. Paletti, Pittstown, N.J.; Thomas F. Kauffman, Easton, Pa.</p> <p>[73] <b>Assignee:</b> National Starch and Chemical Investment Holding Corporation, Wilmington, Del.</p> <p>[21] <b>Appl. No.:</b> 21,148</p> <p>[22] <b>Filed:</b> Feb. 23, 1993</p> <p>[51] <b>Int. Cl.:</b> C08L 91/06</p> <p>[52] <b>U.S. Cl.:</b> 524/481; 524/484; 524/487; 524/489</p> <p>[58] <b>Field of Search:</b> 524/270, 272, 275, 277, 524/487, 489</p> <p>[56] <b>References Cited</b></p> <p><b>U.S. PATENT DOCUMENTS</b></p> <table border="0"> <tr> <td>3,884,786</td> <td>5/1975</td> <td>Domine et al.</td> <td>204/159.14</td> </tr> <tr> <td>4,146,521</td> <td>3/1979</td> <td>Godfrey</td> <td>260/27 R</td> </tr> <tr> <td>4,167,433</td> <td>9/1979</td> <td>Lakshmanan</td> <td>156/322</td> </tr> <tr> <td>4,404,299</td> <td>9/1983</td> <td>Decroix</td> <td>524/77</td> </tr> <tr> <td>4,434,261</td> <td>2/1984</td> <td>Brugel et al.</td> <td>524/109</td> </tr> <tr> <td>4,460,728</td> <td>7/1984</td> <td>Schmidt et al.</td> <td>524/489</td> </tr> <tr> <td>4,471,086</td> <td>9/1984</td> <td>Foster</td> <td>524/489</td> </tr> <tr> <td>4,500,661</td> <td>2/1985</td> <td>Lakshmanan</td> <td>524/77</td> </tr> <tr> <td>4,567,223</td> <td>1/1986</td> <td>Ames</td> <td>524/489</td> </tr> <tr> <td>4,631,308</td> <td>12/1986</td> <td>Graham et al.</td> <td>524/272</td> </tr> <tr> <td>4,752,634</td> <td>6/1988</td> <td>Gross</td> <td>524/271</td> </tr> <tr> <td>4,816,306</td> <td>3/1989</td> <td>Brady et al.</td> <td>428/36.92</td> </tr> </table> <p>18 Claims, No Drawings</p>		3,884,786	5/1975	Domine et al.	204/159.14	4,146,521	3/1979	Godfrey	260/27 R	4,167,433	9/1979	Lakshmanan	156/322	4,404,299	9/1983	Decroix	524/77	4,434,261	2/1984	Brugel et al.	524/109	4,460,728	7/1984	Schmidt et al.	524/489	4,471,086	9/1984	Foster	524/489	4,500,661	2/1985	Lakshmanan	524/77	4,567,223	1/1986	Ames	524/489	4,631,308	12/1986	Graham et al.	524/272	4,752,634	6/1988	Gross	524/271	4,816,306	3/1989	Brady et al.	428/36.92
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HENKEL Exhibit 1019

**[54] HOT MELT ADHESIVE**

**[22] Filed: Feb. 23, 1993**

**National Starch and Chemical Investment Holding Corporation,**

# The '033 Patent (Ex. 1019)

United States Patent [19]  
Stauffer et al.

[11] Patent Number: 5,331,033  
[45] Date of Patent: Jul. 19, 1994



US00531033A

[54] HOT MELT ADHESIVE

[75] Inventors: Daniel Stauffer, Kane, Pa.; Paul P. Puletti, Pittstown, N.J.; Thomas F. Kauffman, Easton, Pa.

[73] Assignee: National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

[21] Appl. No.: 21,148

[22] Filed: Feb. 23, 1993

[51] Int. Cl.: C08L 91/06

[52] U.S. Cl.: 524/481; 524/484; 524/487; 524/489

[58] Field of Search: 524/270, 272, 275, 277, 524/487, 489

[56] References Cited

U.S. PATENT DOCUMENTS

3,884,786 5/1975 Domine et al. 204/159.14  
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4,167,433 9/1979 Lakshmanan 156/322  
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4,434,261 2/1984 Brugel et al. 524/109  
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4,500,661 2/1985 Lakshmanan 524/77  
4,567,223 1/1986 Ames 524/489  
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4,752,634 6/1988 Gross 524/271  
4,816,306 3/1989 Brady et al. 428/36.92

4,874,804 10/1989 Brady et al. 524/100

OTHER PUBLICATIONS

"Ethylene-n-butyl Acrylate Resins for Adhesive Formulating", Preliminary Information Report, U.S.I. Chemicals.

"Hot melts in recycled packaging", E. M. Wise, Editorial, Tappi Journal, Sep. 1990.

Primary Examiner—Paul R. Michl

Assistant Examiner—LisVonda R. DeWitt

Attorney, Agent, or Firm—Ellen T. Dec

[57] ABSTRACT

Hot melt packaging adhesive compositions consisting essentially of 20 to 50% by weight of an ethylene n-butyl acrylate copolymer containing 25-45% by weight, preferably 30 to 40% n-butyl acrylate and having a melt index of at least 10; 30 to 60% of an aliphatic or cycloaliphatic hydrocarbon resin or hydrogenated derivative thereof or a hydrogenated aromatic hydrocarbon resin; and 10 to 30% by weight of a high melting synthetic wax provide adhesives characterized by an excellent balance of high and low temperature performance without sacrifice to machinability or thermal stability. Further, the adhesive is characterized by a low density and consequently is readily filterable in recycling systems.

18 Claims, No Drawings

## Dr. Hsu's Testimony

"For example, U.S. Patent 5,331,033 (issued Jul. 19, 1994) ('the '033 patent') (Ex. 1019) is directed to **high heat resistant hot melt adhesives.**"

(Ex. 1015 ¶ 23 (emphasis added);  
see also Paper 23 at 29-30.)

# The '033 Patent (Ex. 1019)

5,331,033

an aliphatic, aromatic hydrocarbon resin from Good-year Chemicals; Escorex S300, a partially hydrogenated cycloaliphatic petroleum hydrocarbon resin from Exxon Chemical Company; and Eastman Resin H 100 and/or H 130, partially hydrogenated cycloaliphatic petroleum hydrocarbon resins. These resins are utilized in amounts of 30-60% by weight of the adhesive composition.

The wax used herein is a high melting (above about 100° C.) synthetic wax such as synthetic, high density, low molecular weight polyethylene waxes or "Fischer-Tropsch" wax. Suitable waxes include Bareco C-4040, a low molecular weight polyethylene wax from Petro-lite, Escomer H-101 a modified polyethylene from Exxon Chemical and Polywax 1000, or 2000, and Marcus 300 low molecular weight polyethylene waxes from Petro-lite and Marcus Chemical respectively. Paraffint H-1, a Sasol-SA from Moore & Munger is preferred. The wax component is utilized at levels of 10 to 30% by weight of the adhesive.

The adhesives of the invention preferably also contain a stabilizer or antioxidant. Among the applicable stabilizers or antioxidants included herein are high molecular weight hinderedphenols and multifunctional phenols such as sulfur and phosphorus-containing phenol. Hindered phenols are well known to those skilled in the art and may be characterized as phenolic compounds which also contain sterically bulky radicals in close proximity to the phenolic oxygen.

In particular, tertiary butylated onto the benzene positions relative to the presence of these substituents in the vicinity of the stretching frequency; this steric hindrance compound with its steric hindered phenol (3,5-di-tert-butyl-4-rythryl tetrakis: propionate; n-octadecyl-3-(3,5-di-tert-butyl-4-hydroxyphenyl)-propionate; 4,4'-methylenebis(2,6-tert-butyl-phenol); 4,4'-diethylbis(6-tert-butyl-o-cresol); 2,6-di-tert-butylphenol; 6-(4-hydroxyphenoxy)-2,4-bis(n-octylthio)-1,3,5-triazine; di-n-octylthioethyl 3,5-di-tert-butyl-4-hydroxy-benzoate; and sorbitol hexa[3-(3,5-di-tert-butyl-4-hydroxyphenyl)-propionate].

The performance of these antioxidants may be further enhanced by utilizing, in conjunction therewith known synergists such, for example, as thiodipropionate esters and phosphites, particularly useful is distearylthiodipropionate. These stabilizers, if used, are generally present in amounts of about 0.1 to 1.5 weight percent, preferably 0.25 to 1.0%. Other additives such as plasticizers, pigments, dyestuffs conventionally added to hot melt adhesives for various end uses contemplated may also be incorporated in minor amounts into the formulations of the present invention.

The adhesive compositions are prepared by blending the components in the melt at a temperature of about 130°-200° C. until a homogeneous blend is obtained, approximately 2 hours. Various methods of blending are known to the art and any method that produces a homogeneous blend is satisfactory.

The resulting adhesives are characterized by viscosity of less than 8000 cps at 175° C., fiber tearing bonds from Kraft paper within the complete temperature range of -18° C. to +70° C., a Ring and Ball softening

point of 100°-130° C., a cloud point less than 140° C. and clarity at 175° C. Moreover, the adhesives possess excellent heat stability as characterized by the 144 hour 350° F. thermal stability test, with no signs of char, skinning or gel formation, and a density of less than about 0.98. As such the adhesives find particular use as packaging adhesives, for example, for sealing cases and cartons which are to be exposed to extreme temperature conditions. In contrast, similar adhesive compositions which use ethylene vinyl acetate as the copolymer produce a cloudy, poor flowing, thermally less stable product not suitable for high speed, rapid-fire hot melt application systems now in commercial use.

## EXAMPLES

In the following examples which are provided for illustrative purposes only, all parts are by weight and all temperatures in degrees Celsius unless otherwise noted.

In the examples, all adhesive formulations were prepared in single blade mixer heated to 170° C. by blending the components until homogeneous.

The adhesives were then subjected to various tests simulating the properties needed for successful commercial applications.

Melt viscosities of the hot melt adhesives were determined on a Brookfield Model RVT Thermosel viscometer using a number 27 spindle.

Test specimens for determining elevated temperature

## Eastman Resin H 100 and/or H 130

increments from 30° C. the specimens remained at a given temperature for 15 minutes for conditioning. The heating cycle was run until the final bond failed. Each peel and shear specimen was prepared and tested in duplicate. The elevated peel and shear value shown is the average temperature of failure for the two bonds.

Adhesion at 71° C., room temperature (22° C.), 4.4° C., -6° C., -17.8° C. and -28.0° C., where applicable, was determined by applying a 1/8 inch wide bead of adhesive at 175° C. widthwise to a 2 inch by 3 inch piece of corrugated board and immediately bringing a second piece of board with flutes in the opposite direction into contact. A 200 gram weight was immediately placed on the boardstock was 275 pound burst strength corrugated board. The bond specimens were placed in an oven at 71° C. and freezers at 4.4° C., -6.7° C., -17.8° C., and -28.9° C. The bonds were separated by hand and a determination made as to the type of failure. Fiber tearing (FT) and non-fiber tearing bonds (NFT) were noted.

The adhesive set time (open time) was determined in the following manner using 50 pound Kraft paper and an adhesive tester that simulates a case sealing line: single flute corrugated 2 inches by 4 inches were placed in the grips of the tester. The bottom specimen was moved forward at a constant speed under the melt nozzle applicator for the application of the adhesive bead and was stopped directly under the top specimen. The

# No Anticipation By Exxon Reference

# No Anticipation By Exxon Reference

1. Exxon reference does not suggest footnote 1 composition is a “hot melt adhesive.”
2. Henkel offers no evidence showing footnote 1 composition is a “hot melt adhesive.”
3. 40% wax in footnote 1 composition is inconsistent with teachings of '404 patent.

# Exxon Brochure (Ex. 1003)

# Specialty Polymers for Adhesives & Sealants

## TYPICAL PROPERTIES

		RING & BALL SOFTENING POINT, °C	MOLTEN GARDNER COLOR	MOLTEN GARDNER COLOR STABILITY, 16h/150°C	T <sub>g</sub> (MIDPOINT) by DSC, °C	GPC MOLECULAR WEIGHT, M <sub>w</sub>	POLYDISPERSITY, M <sub>w</sub> /M <sub>n</sub>	VISCOSITY at 177°C, cps	WAX CLOUD POINT, °C <sup>(1)</sup>	
ESCORENE <sup>®</sup> TACKIFIERS	1000 SERIES	1102	100	7	16	51	2400	3.3	625	155
		1304	100	6	14	51	1640	2.3	475	115
		1310LC	93	5	12	46	1460	2.1	300	95
		1315	115	7	14	65	2570	3.0	1800	155
		1504	100	5	10	51	1850	2.3	450	120
		1580	80	6	15	34	1065	1.9	100	80
	2000 SERIES	2101	93	10	12	44	1130	2.4	175	70
		2393	93	7	9	45	995	2.3	160	70
		2520	20	3	10	-16	380	1.5	-	70
		2596	96	4	10	48	2105	2.6	500	110
	7000 SERIES	7105	112	12	>18	63	765	2.1	475	70
		7312	112	8	11	63	720	2.1	500	70
	5000 SERIES	5380	85	<<1	2	36	360	2.4	100	70
		5300	105	<<1	2	50	400	2.5	300	70
		5320	125	<<1	2	66	400	2.5	1500	70
		5340	140	<<1	2	85	425	2.3	5000	70
	9000 SERIES EMULSIONS <sup>(2)</sup>		SOLIDS, wt%	T <sub>g</sub> (MIDPOINT) by DSC, °C	PARTICLE SIZE, microns	VISCOSITY, cps	RESIN TYPE <sup>(3)</sup>	(1) 40% TACKIFIER 20% ESCORENE UL 775 40% 158°F MP PARAFFIN WAX		
		9191	56	46	0.30	350	A	(2) A ALIPHATIC M AROMATIC MODIFIED ALIPHATIC		
		9241	56	-1	0.32	300	M	(3) ANIONIC; 7.0 pH		
		9271	56	28	0.32	300	M			

EXXON CHEMICAL COMPANY

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**EXXON** EXXON CHEMICAL COMPANY  
P.O. Box 3272, Houston, TX 77253-3272  
**CHEMICAL**

(1) 40% TACKIFIER  
20% ESCORENE UL 7750  
40% 158°F MP  
PARAFFIN WAX

**FAEGRE BAKER  
DANIELS**

(Ex. 1003 at 2; see also Paper 23 at 17, 30-38.)

H.B. Fuller Exhibit 2007  
Henkel Corp. v. H.B. Fuller Co.  
Case No. IPR2014-00606

# '404 Patent & Wax

“At higher wax levels, bondability of the adhesive system may be affected. At lower levels, the adhesive may set too slowly or heat resistance may adversely be affected. In a preferred embodiment, all synthetic high melting point wax is utilized. When the thermoplastic polymer is an ethylene copolymer, it is preferable to use from **about 10% by weight to about 30% by weight** of the composition. When the thermoplastic polymer is a homopolymer or copolymer of propylene it may be preferable to use less wax, for example, less than about 10 wt-%, or no wax at all, as it changes the compatibility of the system.”

(Ex. 1001 at 9:52-64; see *also* Paper 23 at 8-9, 35-36; Ex. 1039 at 240, 252.)

# Dr. Hsu's Testimony

Q: So in forming your opinions in this case, you never made a composition that had 40 percent of Escorez 5340, 20 percent Escorene UL 7750, and 40 percent 158 degree F MP paraffin wax. Correct?

**A: Correct.** (Ex. 1039 at 220:16-20; see *also* Paper 23 at 33, 37.)

Q: And in forming your opinions in this case, you didn't do any tests of any kind on the Footnote 1 composition for 5340?

**A: That is correct.** (Ex. 1039 at 221:7-10; see *also* Paper 23 at 33, 37.)

Q: And you did not do any type of testing to see how the bondability of this Footnote 1 composition for 5340 in the Exxon reference, Exhibit 1003, was affected by having 40 percent of the paraffin wax in it. Correct?

**A: Correct.** (Ex. 1039 at 255:14-19; see *also* Paper 23 at 37.)

Q: And similarly, you didn't do any type of experimentation in forming your opinions to show how the adhesive properties of the Footnote 1 composition for 5340 in the Exxon reference would be affected by changing the wax concentration. Correct?

**A: Correct.** (Ex. 1039 at 256:16-21; see *also* Paper 23 at 37.)