

Deposition of
Steven B. MacLean
June 20, 2024

Omega Liner
VS.
Buergofol, GmbH [IPR2023-01372]



www.aptusCR.com | 866.999.8310

1 UNITED STATES PATENT AND TRADEMARK OFFICE
2 BEFORE THE PATENT TRIAL AND APPEAL BOARD
3 - - - - - X
4 OMEGA LINER COMPANY, INC., :
5 Petitioner, : IPR2023-01372
6 v. : U.S. Patent
7 BUERGOFOL GmbH, : 9,657,882 B2
8 Patent Owner. :
9 - - - - - X
10 Remote Deposition
11 Thursday, June 20, 2024
12 Deposition via Zoom of STEVEN B. MacLEAN,
13 a witness herein, called for examination by counsel
14 for the Patent Owner in the above-entitled matter,
15 pursuant to notice, the witness being duly sworn by
16 Desirae S. Jura, a Notary Public in and for the
17 Commonwealth of Virginia, all parties appearing
18 remotely, at 9:09 a.m., ET, Thursday, June 20, 2024,
19 and the proceedings being taken down by Stenotype by
20 Desirae S. Jura, RPR, and transcribed under her
21 direction.
22 Job No. 10144397

1 APPEARANCES:

2

3 On behalf of the Petitioner:

4 MONTE M. BOND, ESQ.

5 MICHAEL S. NEUSTEL, ESQ.

6 Neustel Law Offices, Ltd

7 2534 South University Drive, #4

8 Fargo, North Dakota 58103

9 (701) 281-8822

10 monte@neustel.com

11 michael@neustel.com

12 -and-

13 SCOTT A. McKEOWN, ESQ.

14 Wolf, Greenfield & Sacks, P.C.

15 601 Massachusetts Avenue, NW

16 Washington, DC 20001

17 (202) 389-6025

18 Scott.McKeown@WolfGreenfield.com

19

20

21

22

1 APPEARANCES (Continued):

2

3 On behalf of the Patent Owner:

4 PATRICK A. DOODY, ESQ.

5 Pillsbury Winthrop Shaw Pittman, LLP

6 1650 Tysons Boulevard

7 McLean, Virginia 22102

8 (703) 770-7900

9 patrick.doody@pillsburylaw.com

10 -and-

11 T. LESTER WALLACE, ESQ.

12 DARIEN WALLACE, ESQ.

13 Imperium Patent Works, LLP

14 315 Ray Street

15 Pleasanton, California 94566

16 (925) 331-8099

17 Lester@ImperiumPW.com

18 Darien Wallace@ImperiumPW.com

19

20

21

22

C O N T E N T S

WITNESS EXAMINATION BY COUNSEL FOR
STEVEN B. MacLEAN PATENT OWNER
BY MR. DOODY 5

E X H I B I T S

MacLEAN EXHIBIT NO.	PAGE
Exhibit 1003 - Declaration of Dr. Steven B. MacLean, Ph.D., P.E.	15
Exhibit 1001 - United States Patent Stark et al., Patent Number U.S. 9,657,882 B2	18
Exhibit 1012 - United States Patent Wood, 4,009,063	24
Exhibit 1024 - Encyclopedia of Polymer Science and Technology, Third Edition, Herman F. Mark	27
Exhibit 1005 - Translator Certification, with attached patent	61
Exhibit 1007 - Translator Certification, with attached patent	91

1 P R O C E E D I N G S

2 Whereupon,

3 STEVEN B. MacLEAN,

4 having been duly sworn by the Notary Public, was
5 examined and testified as follows:

6 EXAMINATION BY COUNSEL FOR THE PATENT OWNER

7 BY MR. DOODY:

8 Q. Good morning, Dr. McLean. Have you had 09:09:39
9 your deposition taken before? 09:09:41

10 A. I have. 09:09:43

11 Q. Okay, great. Can you please state your 09:09:45
12 name and address for the record? 09:09:47

13 A. Steven MacLean, S-T-E-V-E-N, 09:09:49
14 M-A-C-L-E-A-N. Do you want the address that I'm 09:10:00
15 currently sitting at? 09:10:05

16 Q. No, your home address. 09:10:06

17 A. I live in Pittsford, New York, 09:10:13
18 P-I-T-T-S-F-O-R-D, New York. 09:10:17

19 Q. Thank you. I notice you spelled your name 09:10:22
20 with a V, but I think it appears as a P-H in some of 09:10:24
21 the documents. Is the V correct? 09:10:28

22 A. The V is correct. 09:10:30

6	If you have the need to take a break for	09:10:46
7	whatever reason, please ask me. And we'll take a	09:10:50
8	break. Assuming that there's not a question pending.	09:10:53
9	I will just ask you to answer the question before we	09:10:56
0	take a break, and I'm happy to accommodate your break	09:10:58
1	schedule, should you need one. And when you do take	09:11:02
2	a break, you will understand that when you come back	09:11:06
3	you are still under oath, correct?	09:11:08

15	Q. Great. So I just want to get this out of	09:11:12
16	the way first. You live in Pittsford, and your	09:11:16
17	education was all RPI, U of R, RIT. You must be from	09:11:21
18	there, and I am from there, so I know the area.	09:11:27

20	A. Yes, so I didn't grow up in Western New	09:11:31
21	York, but I've been out there for the past 26 years.	09:11:35
22	I hail from the greater Boston area.	09:11:38

5	A. I do.	09:11:55
---	----------	----------

10	A. My experience with CIPP has been a failure	09:12:13
11	analysis investigation with respect to an issue in	09:12:18
12	the field, looking at the composition and the	09:12:21
13	construction, defects in the pipe, issues from	09:12:27
14	installation, et cetera.	09:12:29

16	A. At least one investigation. I've been	09:12:34
17	doing that type of work for about 13 years. I do a	09:12:37
18	lot of pipe investigations beyond just CIPP.	09:12:48

21 A. Just at least that one. 09:12:54

22	Q. Okay. Do you have any experience making	09:12:59
----	--	----------

1 the films that are used for that technology? 09:13:01

2 A. Certainly making finished goods out of 09:13:08

3 polymers, films, extruded films, sure. 09:13:11

4 Q. For that particular use, though? 09:13:13

5 A. Across all uses. It wouldn't just be 09:13:15

6 specific to CIPP. Those films are pretty ubiquitous. 09:13:20

7 They can be used in a number of different 09:13:24

8 applications, so it wouldn't be isolated to that one 09:13:26

9 particular market. 09:13:29

10 Q. Have you ever been retained as an expert 09:13:33

11 to provide testimony regarding a patent's validity? 09:13:36

12 A. Yes. 09:13:39

13 Q. And what case was that, or how many? 09:13:54

14 A. I would need to look at my testimony list 09:13:58

15 to give you a number. 09:14:05

16 Q. All right. I don't need you to do that 09:14:07

17 now. I just wanted to know if you've done it before, 09:14:09

18 and if you have, in what context. Was it a district 09:14:13

19 court case? Was it a proceeding like this one, an 09:14:16

20 inter partes review? 09:14:22

21 A. I can tell you, in terms of just my 09:14:23

22 intellectual property experience, I've done 09:14:25

1 arbitration matters, I've done ITC matters, I've done 09:14:27

2 IPR matters, and I've done district litigation. 09:14:31

3 Q. Okay. Have you been published in peer 09:14:39

4 review journals? 09:14:43

5 A. I have. 09:14:44

6 Q. And how many? I didn't notice any on your 09:14:46

7 CV. There seem to be publications for conferences. 09:14:51

8 A. Many of them are. They are conference 09:14:59

9 proceedings, but they would have been peer reviewed. 09:15:02

10 Q. Are there any issued patents or pending 09:15:07

11 patent applications in which you're listed as an 09:15:09

12 inventor? 09:15:13

13 A. Not pending. I filed a few back in my GE 09:15:14

14 days. I believe the ones that come to mind were 09:15:17

15 ultimately abandoned. 09:15:21

16 Q. So as far as you're aware, none of them 09:15:24

17 have issued? 09:15:26

18 A. As far as I'm aware. 09:15:27

19 Q. Now, did you participate at all, back when 09:15:29

20 you were at GE, in the patent prosecution process? 09:15:33

21 And when I say, prosecution, do you know what I mean? 09:15:36

22 A. I do. That was typically handled by 09:15:39

1 in-house counsel with consultation from the 09:15:42
2 inventors. 09:15:46

3 Q. So back to CIPP. Can you explain the 09:16:02
4 differences in the film requirements for a CIPP film 09:16:09
5 using a thermal curable resin, and the difference 09:16:18
6 between that and one using a UV curable resin? 09:16:23

7 A. I think the answer is largely in your 09:16:26
8 question. The carrier resin between the two films 09:16:32
9 ultimately is a thermal setting resin. You achieve 09:16:36
10 curing of that thermal setting resin through either 09:16:40
11 heat or UV exposure. 09:16:43

12 And depending on what type of energy you 09:16:44
13 are imparting on the overall system, you'll get 09:16:48
14 curing, depending on, like I said, if you use a UV 09:16:50
15 source or a heat source. 09:16:54

16 Q. So the actual -- the carrier films, not 09:16:56
17 the resin itself, but the other parts of the system, 09:16:59
18 are there any differences in those parts of the 09:17:06
19 system between a UV curable system and a thermal 09:17:09
20 curable system? 09:17:14

21 A. Every CIPP might have a different bill of 09:17:18
22 materials, different versions of materials. But if 09:17:21

1 you're talking about the curing mechanism, I just 09:17:24

2 stand by my last answer. 09:17:27

3 Q. No, I'm just talking about the polymer 09:17:30

4 properties of the polymers used in the film. 09:17:32

5 A. I guess you'll need to be more specific or 09:17:36

6 reask your question. 09:17:40

7 Q. All right, thank you. Can the same film, 09:17:42

8 inner tubular film used for a thermal curable system, 09:17:53

9 also be used in a UV curable system? 09:17:58

10 A. I think it depends. It depends if the 09:18:00

11 inner film permits UV light to go through it, so you 09:18:08

12 can actually induce curing. So I think it's depends. 09:18:14

13 Q. Let's assume it does permit UV radiation 09:18:19

14 transmission. Could you use it? 09:18:23

15 A. I think I would need to know more 09:18:26

16 information. When you're going to cure these resins, 09:18:51

17 there can be an exothermic reaction in the curing 09:18:56

18 process that will generate some heat. So I think you 09:18:58

19 really need to know the parameter of that entire 09:19:00

20 material system before you go ahead and specify which 09:19:03

21 type of line of material you would use. 09:19:06

22 Q. All right, thank you. So when you're 09:19:09

1 installing these CIPP systems, there are two 09:19:12
2 essential ways of getting the material into the pipe. 09:19:18
3 One is either an inversion or eversion technique, 09:19:24
4 where it splits it apart and it goes in. And the 09:19:27
5 other is what they refer to as pull-through. Is that 09:19:30
6 your understanding? 09:19:34

7 A. That is my general understanding, yes. 09:19:35

8 Q. Okay. Now, for that inversion or eversion 09:19:37
9 technique, do you know if you could use that 09:19:41
10 technique in a UV curable system? 09:19:43

11 MR. BOND: Just to let you know, Patrick, 09:20:22
12 I didn't hear from you until last night, so we just 09:20:24
13 have all of the exhibits to his declaration in a 09:20:27
14 binder. So I think that's what he's looking at in 09:20:31
15 his binder. 09:20:35

16 MR. DOODY: That's fine. And I apologize 09:20:37
17 for that. I actually forgot completely, and it 09:20:52
18 wasn't until whenever it was, 9:00 last night, that I 09:20:55
19 remembered. 09:20:59

20 MR. BOND: No problem. 09:21:00

21 MR. DOODY: I would have thought I would 09:21:04
22 have got an email like, hey, dude, where are the 09:21:05

1 exhibits? 09:21:09

2 MR. BOND: I think I forgot, too. 09:21:10

3 (Side discussion.) 09:22:14

4 MR. DOODY: To move this along, why don't 09:22:14

5 I just strike that last question and I'll ask another 09:22:16

6 one. 09:22:19

7 MR. BOND: Sure. 09:22:19

8 BY MR. DOODY: 09:22:20

9 Q. Is it fair to say that you don't know the 09:22:21

10 answer to the question that I just asked, off the top 09:22:25

11 of your head? 09:22:29

12 A. No, that's not necessarily true. I just 09:22:30

13 want to confirm my thinking with some references that 09:22:36

14 I had in front of me. 09:22:38

15 Q. And you spent a fair amount of time, but 09:22:42

16 haven't been able to confirm it? 09:22:44

17 A. No, I was looking at some of the eversion 09:22:47

18 and inversions patents to see if there's any specific 09:22:49

19 references to UV, and I haven't gone through that 09:22:52

20 exercise yet. 09:22:56

21 Q. Just off the top of your head, can you do 09:22:59

22 it? 09:23:01

1 A. Can you repeat the question? 09:23:02

2 **Q. Can you use the inversion insertion** 09:23:04

3 **technique in a UV curable CIPP system?** 09:23:08

4 A. If the system has, ultimately, an internal 09:23:11

5 liner that is UV transparent or allows UV light to 09:23:17

6 pass through it, then you could do it. 09:23:21

7 **Q. And let's assume that it does. Can you do** 09:23:23

8 **it?** 09:23:26

9 A. I think I just said, yes, it does. If it 09:23:27

10 has an inside liner that has the ability for UV light 09:23:36

11 to pass through it, then you would, in theory, be 09:23:39

12 able to carry it through a UV light source. 09:23:42

13 **Q. Okay, thank you. Sorry for the** 09:23:45

14 **run-around.** 09:23:47

15 **If you are reading a technical publication** 09:23:50

16 **or a patent and you read the following, "a film** 09:23:52

17 **having a coating on its external surface," just in** 09:23:56

18 **your general knowledge, what do you think the meaning** 09:24:02

19 **of "coating" is?** 09:24:06

20 A. Repeat that question? 09:24:07

21 **Q. So if you're just reading a technical** 09:24:11

22 **journal, you're reading a patent, you're reading** 09:24:14

1 something scientific, and you come across a sentence 09:24:16
2 that says, "a film having a coating on its external 09:24:19
3 surface," what comes to mind, in your mind, as to 09:24:23
4 what that writer means by "coating"? 09:24:27
5 A. I would say a relatively thin layer of 09:24:30
6 material on top of a substrate. 09:24:36
7 Q. So would a handful of molecules of a 09:24:47
8 material on the surface be considered a coating? 09:24:50
9 MR. BOND: Objection to form. 09:24:55
10 THE WITNESS: It might, depending on what 09:25:29
11 the objective of the coating is. 09:25:31
12 (MacLean Exhibit No. 1003 was 09:29:43
13 identified for the record.) 09:25:32
14 BY MR. DOODY: 09:25:32
15 Q. All right, thank you. 09:25:33
16 So I believe you have in front of you 09:25:34
17 Exhibit 1003, which is the declaration that you 09:25:35
18 submitted in these proceedings. If you can turn to 09:25:42
19 that, please. 09:25:45
20 Do you have that in front of you, 09:26:02
21 Dr. MacLean? 09:26:04
22 A. I do. 09:26:04

1 Q. Thank you. I am going to turn to 09:26:06
2 paragraphs 21 through -- I think it's 23, which begin 09:26:13
3 on page of the exhibit pages -- so it begins on page 09:26:17
4 16 of the exhibit. And that's where there is a 09:26:22
5 discussion on the topic, person of ordinary skill in 09:26:25
6 the art. 09:26:29

7 A. One more time on the paragraph or page? 09:26:39

8 Q. So it's paragraph 21, and it's page 16 of 09:26:41
9 the exhibit. 09:26:46

10 A. I have it. 09:26:48

11 Q. Okay, great. And here we are talking 09:26:49
12 about a person of ordinary skill in the art. Do you 09:26:52
13 see that? 09:26:56

14 A. I do. 09:26:56

15 Q. Great. So would a person of ordinary 09:26:58
16 skill in the art, which we sometimes use the acronym 09:27:02
17 POSITA, P-O-S-I-T-A, would a person of ordinary skill 09:27:07
18 in the art have some knowledge or experience in the 09:27:14
19 field in which the patent at issue is concerned, in 09:27:17
20 this case, the '882 patent? 09:27:22

21 A. I think a person of ordinary -- one 09:27:25
22 skilled in the art here would be someone that has the 09:27:42

1 background, knowledge, and experience to read the 09:27:47
2 patent and understand it, and apply it if need be, 09:27:49
3 looking at the subject matter that's inside of the 09:27:53
4 patents. 09:27:55

5 And so when I look at the subject matter 09:27:56
6 that's inside of that particular patent of the 09:27:58
7 specification for '882, it is largely dominated by 09:28:01
8 polymer science and polymer engineering, and relative 09:28:05
9 to what's taught or disclosed relative to the CIPP 09:28:10
10 technology. So that's how I read it. That's what I 09:28:14
11 think a POSITA would need to possess to understand 09:28:20
12 the teachings of it, would be someone who has a 09:28:24
13 polymer science and adhering background. 09:28:27

14 Q. So they wouldn't have to know anything 09:28:31
15 about CIPP technology, right? 09:28:33

16 A. I think they could have some background 09:28:35
17 knowledge on it. But if you look at what the 09:28:38
18 specification is teaching, it's all about raw 09:28:40
19 materials, it's about organic materials, inorganic 09:28:43
20 materials, raw ingredients making up polymer 09:28:46
21 compositions. It's layers interacting with other 09:28:50
22 layers. 09:28:53

1 And the patent itself is not specifically 09:28:54
2 designed for CIPP. The patent itself actually 09:28:57
3 teaches it can be used in a number of different 09:29:00
4 applications, not just CIPP. It's ultimately a film 09:29:03
5 patent. One such use is CIPP. 09:29:06

6 (MacLean Exhibit No. 1001 was 09:29:43
7 identified for the record.) 09:29:43

8 BY MR. DOODY: 09:29:43

9 Q. So let's refer to Exhibit 1001, which is 09:29:13
10 U.S. Patent Number 9,657,882. 09:29:25

11 A. I have it. 09:29:34

12 Q. Great. So I want you to turn to page 13 09:29:35
13 of the exhibit, claim 1, column 20. 09:29:39

14 A. Yes. 09:29:52

15 Q. So the very first sentence of claim 1 09:29:53
16 reads as follows, "an insertion tube for use in 09:29:56
17 trenchless sewage pipe renovation." Do you see that? 09:30:01

18 A. Correct, I do. 09:30:07

19 Q. So is it your opinion, your testimony, 09:30:10
20 that a person of ordinary skill in the art would not 09:30:14
21 need to know anything about trenchless sewage pipe 09:30:17
22 renovation to know and understand this invention? 09:30:20

1 A. I think if they had a basic background of 09:30:22
2 it, they would be completely able to read this patent 09:30:27
3 and understand it and practice it, if they needed to. 09:30:30

4 **Q. What would be a basic background?** 09:30:35

5 A. Maybe having analyzed one in the past, 09:30:37
6 maybe having read the prior art. Maybe having pipe 09:30:43
7 background, in general, pipe that gets installed 09:30:47
8 underground. 09:30:50

9 And all those skills are translatable, in 09:30:50
10 terms of piping placed in the ground, having surface 09:30:53
11 conditions, defects, flaws, some of the things that 09:30:57
12 the patent teaches in terms of remedying those issues 09:31:01
13 in the field. They'd have a pipe background, some 09:31:03
14 CIPP background, understood the background of the 09:31:06
15 prior art. And if you had polymer science 09:31:09
16 backgrounds, these claims are straightforward. 09:31:12

17 **Q. Okay. So you need to know a little bit** 09:31:15
18 **about it, right?** 09:31:17

19 A. I think you need to know how they are 09:31:20
20 constructed relative to using the film. 09:31:24

21 **Q. Do you need to know what properties are** 09:31:27
22 **needed? Are they to be strong, weak, melt at 30** 09:31:29

1 degrees C? Can you use a film that's used for a 09:31:35
2 candy wrapper in there? 09:31:38

3 A. Well, sure. But as a mechanical engineer 09:31:40
4 and a polymer scientist, you know, if you give me 09:31:45
5 those requirements, whether it be for a pipe, 09:31:48
6 automotive components, a widget, anything like that, 09:31:52
7 if you give me, hey, I need to have a certain stress 09:31:54
8 level to survive in the field, a certain amount of 09:31:57
9 tear strength, that all translates. That's not 09:32:00
10 isolated to just CIPP. That could be any application 09:32:02
11 that you choose to use a polymeric material with. So 09:32:06
12 none of that is unique to CIPP. 09:32:10

13 Q. But how would you know what those 09:32:12
14 parameters are? So if someone comes to you and says, 09:32:15
15 make me a film that has these properties, and you can 09:32:19
16 make it, no doubt about it, any expert in polymer 09:32:22
17 chemistry can make it. But does that expert in 09:32:27
18 polymer chemistry know why those properties are 09:32:27
19 needed? Why do you need them? 09:32:32

20 A. Sure. Well, if you're talking 09:32:33
21 specifically about me, again, I have two degrees in 09:32:35
22 mechanical engineering. I'm a licensed mechanical 09:32:38

1 engineer. I think all of that dovetails into knowing 09:32:41
2 what service conditions are in the field for a pipe, 09:32:44
3 how to translate those to what physical properties or 09:32:47
4 chemical properties you need from your materials of 09:32:51
5 construction. 09:32:53

6 Q. Okay. So let's go back to your 09:32:58
7 declaration, I'm sorry, Exhibit 1003. Back to where 09:33:05
8 we left off. It's on page 16, starts at paragraph 09:33:08
9 21, and it goes through paragraph 23. 09:33:16

10 A. I'm there. 09:33:25

11 Q. So there's three paragraphs of description 09:33:25
12 of what a person of ordinary skill in the art is. Is 09:33:27
13 there anything in any of those paragraphs that 09:33:31
14 mentions trenchless sewage pipe repair or CIPP? 09:33:35

15 A. Page 17, in that paragraph, it states 09:33:41
16 specifically, "and end-use performance of polymeric 09:33:53
17 film and sheet products." 09:33:57

18 Q. How many end-use performances are there 09:34:03
19 for polymeric sheets, a couple hundred million? 09:34:05

20 A. I don't know a number. I don't have an 09:34:09
21 exact number on that. 09:34:11

22 Q. So that's not specific to CIPP, is it? 09:34:13

1 A. It can be if that's the end product that's 09:34:17
2 in question. It could be others, it could be other 09:34:20
3 products, in terms of having the background in film 09:34:23
4 and using films in the field. Like I mentioned 09:34:27
5 earlier, those skills would translate to CIPP. 09:34:29

6 Q. So we went to the claim, and the claim 09:34:48
7 says, "trenchless sewage pipe renovation." Back to 09:34:51
8 your -- and our discussion so far has been on CIPP. 09:34:55
9 Are they the same thing? Is CIPP the same thing as 09:34:59
10 trenchless sewage pipe repair? 09:35:03

11 A. CIPP can be used for trenchless pipe 09:35:10
12 repair. 09:35:15

13 Q. What else could it be used for? I Googled 09:35:19
14 it last night, and I know Wikipedia is a completely 09:35:52
15 unreliable source, but it says, "sewer, gas, water, 09:35:55
16 chemical, and heating pipes." So it's not limited to 09:35:59
17 sewage pipes, right? 09:36:01

18 A. If that's what Google told you. 09:36:02

19 Q. And we have to agree, Google is always 09:36:09
20 right. 09:36:11

21 Okay. But claim 1 of the '882 patent is a 09:36:13
22 more limited area of application than just 09:36:20

1 generically CIPP, correct? 09:36:24

2 A. Correct. The preamble states, "trenchless 09:36:31

3 sewage pipe renovation." 09:36:38

4 Q. Okay, thank you. Now I am going to -- off 09:36:44

5 the top of your head, can you tell me what the 09:36:59

6 Phillips standard is for claim construction? 09:37:01

7 A. I believe it's plain and ordinary. 09:37:05

8 Q. Very good. I didn't think you would know 09:37:09

9 that, but you cited it in your expert declaration, 09:37:14

10 which I thought was odd. Very good, that was great. 09:37:18

11 All right. So now I'm going to turn to 09:37:22

12 the technology background portion of the report, 09:37:24

13 which begins on page 26 of the Exhibit 1003, 09:37:27

14 paragraph 48. 09:37:33

15 A. Okay, I am there. 09:37:41

16 Q. Great. So this first paragraph, paragraph 09:37:42

17 48, going into the background of CIPP -- I've got to 09:37:50

18 find where it is. Here it is. 09:38:05

19 So the very last sentence of paragraph 48, 09:38:06

20 in reference to a document -- a patent to Wood, 09:38:11

21 W-O-O-D, which is labeled as Exhibit 1012. That last 09:38:16

22 sentence says, "The inner membrane may either become 09:38:24

1 'firmly bonded' to the cured resin impregnated 09:38:28
2 nonwoven felt, or it may be easily removable, 09:38:32
3 depending on the materials used for the inner 09:38:34
4 membrane and curable resin." 09:38:37
5 Do you see that? 09:38:39
6 A. I do. 09:38:40
7 (MacLean Exhibit No. 1012 was 09:29:43
8 identified for the record.) 09:29:43
9 BY MR. DOODY: 09:29:43
10 Q. And the citation is to Wood at page 9, 09:38:41
11 which would be column 5, lines 51 through 56. So I 09:38:47
12 want you to go there to Wood, which is Exhibit 1012, 09:38:51
13 page 9, lines 51 through -- or column 9, I believe. 09:38:58
14 MR. BOND: Column 9, correct? 09:39:20
15 MR. DOODY: I've got to go back. Page 9, 09:39:24
16 column 5, sorry. 09:39:25
17 MR. BOND: Okay. 09:39:27
18 MR. DOODY: It always gets me messed up. 09:39:28
19 MR. BOND: I know. 09:39:31
20 BY MR. DOODY: 09:39:32
21 Q. So page 9 of Exhibit 1012, column 5, lines 09:39:32
22 51 through something -- 56. Are you at that portion 09:39:38

1 of Exhibit 1012, Dr. McLean? 09:39:49

2 A. I am. 09:39:52

3 Q. Okay. And then as I am reading this 09:39:54

4 paragraph, which is just one sentence, it does say 09:39:59

5 that "the inner tube may be of a material which is or 09:40:02

6 becomes firmly bonded to the resin carrier by felt, 09:40:06

7 or alternatively, after curing, it may be capable of 09:40:11

8 removal from the cured resin." Do you see that? 09:40:16

9 A. I do. 09:40:20

10 Q. But in your declaration, it says it's 09:40:23

11 easily removable. Capable of removal doesn't mean 09:40:26

12 it's easily, does it? 09:40:36

13 A. It certainly says capable of that passage. 09:40:38

14 I'm just not sure if there's some other reference 09:42:38

15 somewhere else in the patent that might use the term 09:42:40

16 "easily removable." So that's what I was looking 09:42:43

17 for. 09:42:49

18 Without reading the patent from top to 09:42:50

19 bottom, I couldn't tell you if that exists or not. 09:42:52

20 Q. Okay. Just in general, something that's 09:42:55

21 capable of being removed doesn't mean that it's easy 09:42:57

22 to remove it, does it? 09:43:01

22	A. Okay, I am there.	09:45:13
----	----------------------	----------

1 Q. All right, great. So here in the first 09:45:16
2 sentence, "classes of additives known to migrate to 09:45:21
3 the surface of the polymer over time include internal 09:45:26
4 and external release agents such as lubricants, 09:45:30
5 waxes, slip agents, and antiblocks." 09:45:34

6 And there is a citation to Exhibit 1024, 09:45:38
7 and specifically page 54, so I want you to turn to 09:45:42
8 that. Mark, I think, is the name of the author. 09:45:47

9 (MacLean Exhibit No. 1024 was 09:45:54
10 identified for the record.) 09:45:57

11 BY MR. DOODY: 09:45:57

12 Q. So it would be page 54 of Mark, of Exhibit 09:45:58
13 1024, which will not be page 54 of Mark. 09:46:02

14 A. Correct. 09:46:14

15 Q. I think it's page 115. 09:46:18

16 MR. BOND: So page 54 is in reference to 09:46:20
17 the record, Patrick? 09:46:23

18 MR. DOODY: What's that? 09:46:24

19 MR. BOND: Page 54 of the exhibit record? 09:46:25

20 MR. DOODY: That's correct. 09:46:29

21 MR. BOND: Okay. 09:46:31

22 BY MR. DOODY: 09:46:34

Page 28

3	Q. And I didn't read the entire sentence.	09:48:12
4	It's the fourth sentence of that first paragraph on	09:48:14
5	page 54 of Exhibit 1024.	09:48:17

8	Q. "They are known by a variety of terms	09:48:23
9	descriptive of their effect."	09:48:26

11	Q. So this is a list of what the author here	09:48:30
12	believes are release agents, correct?	09:48:36

14	Q. Okay. And waxes aren't mentioned in that	09:48:42
15	list, are they?	09:48:45

18	Q. So some of the terms in there might	09:49:20
19	encompass a wax. Is that your testimony?	09:49:22

21	Q. So the next sentence states, "expectedly,	09:49:28
22	release agents are usually applied directly to	09:49:32

1 surfaces." Do you see that? 09:49:34

2 A. I do. 09:49:38

3 Q. So what does that mean? 09:49:39

4 MR. BOND: Objection, form. 09:49:50

5 THE WITNESS: It can mean a number of 09:49:52

6 different things, but I think one good example is if 09:49:55

7 you were doing some sort of injection molding or 09:49:58

8 something with a mold cavity, you would sometimes 09:50:01

9 spray an external release on the mold itself, almost 09:50:04

10 like a Pam cooking spray. 09:50:08

11 And then when I'm injecting the next wave 09:50:10

12 of resin into that mold cavity after the polymer 09:50:12

13 solidifies and forms its shape, you still have that 09:50:16

14 residue of spray on the mold that facilitates the 09:50:20

15 release of the part from the mold during injection. 09:50:24

16 So that would be one example of a release agent like 09:50:28

17 that. 09:50:31

18 BY MR. DOODY: 09:50:32

19 Q. Okay. The next sentence on page 54 of 09:50:33

20 Exhibit 1024 reads, "however, it is sometimes 09:50:45

21 possible to incorporate them into the bulk of the 09:50:49

22 material being treated. Such processing aids are 09:50:52

1 known as internal release agents." 09:50:57

2 Do you see that? 09:50:59

3 A. I do. 09:51:00

4 Q. So what would an internal release agent be 09:51:03

5 used for that would be sometimes incorporated into 09:51:06

6 the bulk of the polymer? 09:51:10

7 A. I think a good example is an antiblocking 09:51:11

8 agent, where you put a particular molecule or 09:51:16

9 compound into the resin when you're -- during the 09:51:20

10 manufacturing process. 09:51:24

11 It kind of performs two duties. It can 09:51:26

12 give you some reduced viscosity in the material for 09:51:28

13 processing assistance. And as the process moves 09:51:32

14 along and the material solidifies, that wax then 09:51:34

15 ultimately moves to the external surface and reduces 09:51:38

16 the coefficient of friction on the external surface 09:51:41

17 of the extruded or molded part. 09:51:44

18 Q. Okay. And moving to the external surface, 09:51:50

19 what benefit does that have? 09:51:54

20 A. Like I just mentioned, it would reduce the 09:51:56

21 coefficient of friction or the frictional forces that 09:52:01

22 may exist at the surfaces of the part. 09:52:04

1 Q. So if the part being -- well, how about 09:52:07

2 the machinery processing the polymer -- 09:52:11

3 A. What about it? 09:52:19

4 Q. -- possibly made of metal? So if it 09:52:20

5 migrates to the surface during processing while it's 09:52:23

6 in the molten state, does it have any benefit when 09:52:26

7 it's a metal surface, like an extruder? 09:52:35

8 A. There could be some additional benefit 09:52:41

9 there. If the compound winds up on the outside 09:52:43

10 surface in some capacity, it will reduce the friction 09:52:46

11 with whatever it's in contact with. 09:52:49

12 Q. Make it easier to flow through, make it 09:52:51

13 easier to pop out of the mold, et cetera, correct? 09:52:54

14 A. That is one such benefit, yes. 09:52:57

15 Q. Okay. So the last sentence of that first 09:53:00

16 paragraph reads, "likewise, materials intended as 09:53:14

17 internal lubricants may also exhibit release 09:53:18

18 characteristics, particularly when used at high 09:53:20

19 concentration, if some of the material finds its way 09:53:23

20 to the exterior." 09:53:27

21 Do you see that? 09:53:29

22 A. I do. 09:53:31

1 Q. So we were just talking about if some of 09:53:34
2 it might migrate to the surface. Is that what is 09:53:36
3 being discussed here in this last sentence? 09:53:40

4 A. I think, generally speaking, yes, that's 09:53:42
5 what this is discussing. 09:53:45

6 Q. There are two qualifiers in that sentence, 09:53:49
7 aren't there? "Particularly when used at high 09:53:52
8 concentration" is one. And then the second is "if 09:53:56
9 some of the material finds its way," correct? 09:54:01

10 A. Correct. That's what it says. 09:54:05

11 Q. So not all of the material will migrate to 09:54:10
12 the surface. 09:54:14

13 A. Not necessarily. It's going to be very, 09:54:15
14 I'll say material system dependent. 09:54:20

15 Q. Okay. Now let's go back up to the fourth 09:54:23
16 sentence of page 54 of Exhibit 1024, where there's 09:54:27
17 the list of the different types of materials, and you 09:54:33
18 had mentioned earlier that the classes of materials 09:54:37
19 could include waxes. 09:54:40

20 Do all of these substances that are listed 09:54:43
21 here migrate to the surface if they were incorporated 09:54:47
22 into the bulk of a polymer during processing? 09:54:51

4	Q. Would you have to select one that you	09:55:07
5	already know migrates to the surface?	09:55:09

8	Q. Okay, so let's say, for example, you could	09:55:23
9	care less about it being on the surface. All you	09:55:25
10	want is an internal lubricant that makes it easier to	09:55:29
11	mix the material during processing, reduce the	09:55:33
12	coefficient of friction amongst polymers while	09:55:36
13	they're being mixed. Would you select an agent that	09:55:39
14	migrates to the surface in that instance?	09:55:45

15	A. If you only wanted it to stay internally,	09:55:49
16	then you would -- again, you would make an informed	09:55:51
17	decision, you would use your skills as one skilled in	09:55:54
18	the art, you might talk to vendors of these materials	09:55:58
19	to get some more insight as to how these materials	09:56:01
20	interact with one another. I think it's a very	09:56:05
21	application-specific analysis.	09:56:08

22 Q. Okay. So is it fair to say that it 09:56:13

1 depends on what the additive is being used for as to 09:56:15
2 whether it would migrate to the surface? 09:56:21
3 A. I think it depends on what your intent is, 09:56:23
4 and what your selection is after knowing the intent. 09:56:28
5 Q. Let's go back to your declaration, Exhibit 09:56:59
6 1003, and we are going to go to paragraph 65 on page 09:57:03
7 36. Are you there? 09:57:15
8 A. I am. 09:57:31
9 Q. Okay, great. So the second sentence 09:57:32
10 reads, "these migrating compounds are miscible with 09:57:35
11 the polymer when melted, but during solidification, 09:57:38
12 the additive phase separates and forms a thin coating 09:57:42
13 on the surface." 09:57:46
14 Do you see that? 09:57:47
15 A. I do. 09:57:48
16 Q. Do you consider that phase separation 09:57:51
17 process to be migration? 09:57:54
18 MR. BOND: Objection to form. 09:57:58
19 THE WITNESS: If you have a phase 09:58:00
20 separation occurrence, then it certainly means that 09:58:44
21 that particular compound is motile, has movement 09:58:47
22 within that polymer matrix. 09:58:51

1 BY MR. DOODY: 09:58:54

2 Q. So does that mean it migrates? 09:59:03

3 A. I think it could be viewed as a step in 09:59:06

4 migration, sure. You're going from a material that 09:59:09

5 is maybe at the very onset dispersed in your polymer 09:59:12

6 right out of manufacturing. But then if it's going 09:59:15

7 from a dispersed phase to some sort of agglomerated 09:59:19

8 separate phase, then there would have been movement 09:59:22

9 of those molecules to create that phase. 09:59:24

10 Q. A very simple example is an oil and water 09:59:27

11 emulsion -- or water and oil, I don't know, whatever 09:59:30

12 one you want to use -- shake it up, and then they 09:59:33

13 separate out. Are those molecules migrating within 09:59:36

14 each other? Is that how a person of ordinary skill 09:59:39

15 in the art would use the term migration? 09:59:42

16 A. I think you would just call that phase 09:59:45

17 separation. Two different phases, like oil and 09:59:51

18 water, those molecules will -- of each type will 09:59:55

19 attract one another and they will repel from the 09:59:59

20 opposing molecule. It's more of a phase separation 10:00:03

21 mechanism. I don't know if you would ascribe the 10:00:05

22 term migration to that, per se. 10:00:07

1 Q. Okay, fair enough. Thank you. 10:00:09

2 I see that it's 10:00. I don't know if 10:00:20

3 you want to take a ten-minute break. I'm happy to do 10:00:23

4 so. 10:00:25

5 MR. BOND: Sure, let's do a break. 10:00:28

6 MR. DOODY: All right, great. See you in 10:00:30

7 ten minutes. 10:00:32

8 (Recess.) 10:00:33

9 BY MR. DOODY: 10:14:32

10 Q. Okay, so let's turn to paragraph 66 of 10:14:33

11 your declaration, Exhibit 1003. It starts on page 10:14:36

12 36. 10:14:43

13 A. Okay, I'm there. 10:14:48

14 Q. So the first sentence reads, "for example, 10:14:51

15 external release agents can be incorporated into the 10:14:54

16 bulk polymer during processing, but migrate to the 10:14:57

17 surface to provide an external release effect." 10:15:00

18 Do you see that? 10:15:04

19 A. I do. 10:15:05

20 Q. And then you reference in the same Exhibit 10:15:06

21 1024 to Mark at page 54. So I wanted to turn to that 10:15:08

22 paragraph that we have beat to death already of 10:15:19

1 Exhibit 1024, page 54. 10:15:26

2 A. Okay, I'm there. 10:15:33

3 Q. So in this first paragraph, there is a 10:15:37

4 discussion of -- the second to last sentence, "they 10:15:40

5 act by migration to the surface and consequently also 10:15:45

6 have an inevitable, internal lubricant effect." And 10:15:49

7 then in the last sentence, it mentions that they "may 10:15:53

8 also exhibit release characteristics," correct? 10:15:56

9 A. Correct. 10:16:03

10 Q. The sentence before that, so this would be 10:16:06

11 the third to last sentence reads, "such processing 10:16:10

12 aids are known as internal release agents." Do you 10:16:15

13 see that? 10:16:19

14 A. I do. 10:16:20

15 Q. But your declaration, first sentence of 10:16:23

16 paragraph 66 on page 36 of 1003 says "external 10:16:28

17 release agents can be incorporated." Does Exhibit 10:16:33

18 1024 refer to them as external release agents? 10:16:39

19 A. I think there's just some semantics here 10:16:43

20 that we're probably splitting hairs over. In my 10:18:23

21 passage in my report I'm talking about an agent that 10:18:25

22 ultimately gets to be a release agent that's to the 10:18:27

1 exterior of the part, but it first started from the 10:18:30
2 interior. 10:18:34

3 So it's really just taking, I would say, 10:18:35
4 the mechanisms that are described from the reference, 10:18:37
5 and I just put them in my own words here, just 10:18:41
6 talking about the fact that if you could start off 10:18:43
7 with an internal release agent, if it does indeed 10:18:46
8 migrate to the outside surface, it becomes an 10:18:52
9 external release agent. So I think this is just a 10:18:55
10 semantic difference, if anything. 10:18:57

11 **Q. Okay. That's actually what I was trying** 10:18:59
12 **to get at, is what was the difference between an** 10:19:02
13 **external release agent and an internal release agent.** 10:19:05

14 A. We talked earlier about, I'll say, classic 10:19:11
15 external release agents, the Pam cooking spray, for 10:19:15
16 example. This is what I'm referring to here, is you 10:19:18
17 can actually put release agents into the material as 10:19:20
18 an internal lubricant or an agent, and then, 10:19:23
19 depending on the choices, that may migrate to the 10:19:27
20 external surface and become a so-called external 10:19:30
21 release agent. 10:19:33

22 **Q. Correct. Okay. And I think that's what** 10:19:34

1 you're saying in the next sentence is, material -- 10:19:37

2 A. Probably. 10:19:40

3 Q. The next sentence of paragraph 66, and 10:19:44

4 this now is on page 37 of Exhibit 1003. It reads, 10:19:47

5 "additionally, materials incorporated into the 10:19:52

6 polymer that are intended specifically as internal 10:19:54

7 lubricants also have external release characteristics 10:19:57

8 as some of the material migrates to the exterior." 10:20:02

9 A. Correct. 10:20:06

10 Q. And again citing Exhibit 1024, page 54. 10:20:08

11 And if we went to 1024, page 54, that migration to 10:20:14

12 the surface is mentioned in the last sentence of that 10:20:22

13 first paragraph under the Introduction. It states, 10:20:25

14 "likewise, materials intended as internal lubricants 10:20:32

15 may also exhibit release characteristics, 10:20:35

16 particularly when used at high concentration, if some 10:20:39

17 of the material finds its way to the exterior." 10:20:44

18 Do you see that? 10:20:46

19 A. I do. That's what it says. 10:20:47

20 Q. Correct. But your sentence in paragraph 10:20:49

21 66 uses the word "as," as if it's always just going 10:20:52

22 to migrate to the surface. The second sentence of 10:20:58

1 paragraph 66, did I read that correctly? The "as" 10:21:03

2 should probably be replaced with "if," right? 10:21:17

3 A. Well, not necessarily, because I put -- I 10:21:20

4 rearranged the sentences a little or the words in the 10:21:26

5 sentence a little, right? "Also have external 10:21:29

6 release characteristics." Well, the only way you're 10:21:31

7 going to have it is not as an "if," it's a "when." 10:21:33

8 It's a predetermined outcome at that point. That's 10:21:37

9 why I chose the word "as." 10:21:40

10 Again, I think this is just semantics, in 10:21:43

11 terms of sentence structure. I just said, hey, look, 10:21:45

12 if you have an external release characteristic, you 10:21:47

13 would have had to have some of that compound be to 10:21:50

14 the outside. 10:21:54

15 Q. But if it didn't migrate to the surface, 10:21:55

16 then it wouldn't have an external release 10:21:59

17 characteristic, correct? 10:22:02

18 A. Not necessarily. 10:22:04

19 Q. How would it have an external release 10:22:16

20 characteristic if it was all internal? 10:22:20

21 A. Well, that's the key. You're saying it's 10:22:23

22 all internal, but the reality is that when these 10:22:24

1 materials and these compounds are mixed together, if 10:22:28
2 they're mixed properly, it would be a homogeneous 10:22:31
3 mixing process. 10:22:34

4 So you could, just based on processing 10:22:35
5 alone, get some degree of these compounds to the 10:22:38
6 exterior surface. And then over time, depending on 10:22:41
7 the material chemistry, you might get additional 10:22:45
8 material movement to the exterior. 10:22:49

9 **Q. But you might not, correct?** 10:22:50

10 A. But you might not get additional, correct. 10:22:52
11 Again, it comes down to choice. 10:22:56

12 **Q. What if you used one part per million of** 10:23:00
13 **an additive, how much of that would be on the** 10:23:03
14 **exterior surface, even if it were homogeneously** 10:23:05
15 **dispersed?** 10:23:10

16 MR. BOND: Objection to form. 10:23:11

17 THE WITNESS: I will first start off by 10:23:13
18 saying, I've been doing this type of work for 25 10:23:15
19 years. I've never come across a formulation like you 10:23:17
20 just described in practice. I think in the 10:23:21
21 theoretical, I guess it would depend on where that 10:23:24
22 one PPM wound up during the mixing process. 10:23:28

1 BY MR. DOODY: 10:23:32

2 Q. All right, what about 100 parts per 10:23:33

3 million? 10:23:35

4 MR. BOND: Objection to form. 10:23:36

5 THE WITNESS: I think if you really wanted 10:23:38

6 that answer, you would have to test for it. 10:23:40

7 BY MR. DOODY: 10:23:42

8 Q. So you're not going to know. It could 10:23:43

9 have six molecules on the surface, but you're not 10:23:45

10 going to know if it has a release effect unless you 10:23:48

11 test for it, correct? 10:23:52

12 A. It depends on what your release effect is 10:23:52

13 that you're desiring. 10:23:54

14 Q. What would be some that you would have to 10:23:57

15 test for? 10:23:59

16 A. When I said test, counsel, I was talking 10:24:00

17 about the dispersion that you were mentioning. I 10:24:05

18 wasn't talking about necessarily the net result of 10:24:09

19 release. You were asking me how these molecules 10:24:12

20 might arrange. I'm just saying hypothetical 10:24:13

21 examples. But when I said test, I simply meant the 10:24:15

22 arrangement of those molecules under the 100 PPM 10:24:18

1 example that you gave. 10:24:22

2 Q. Right, but I asked if they would have a 10:24:27

3 release effect. That's when you said you'd have to 10:24:28

4 test to see if they had the release effect. At least 10:24:37

5 that's what I thought you were saying. Maybe I'm 10:24:41

6 wrong. 10:24:41

7 A. Maybe we talked over each other. Maybe 10:24:43

8 you can start a clean record and ask me again. 10:24:46

9 Q. So if you have a small amount of internal 10:24:49

10 lubricant added to a polymer, you mix it up 10:24:52

11 homogeneously, a tiny, tiny amount makes it to the 10:24:56

12 surface. Is that going to have an external release 10:24:59

13 characteristic? 10:25:02

14 A. I think it depends on what function you're 10:25:03

15 trying to achieve. I don't think that's an absolute 10:25:08

16 yes or no answer. It really depends on what type of 10:25:11

17 release effect you're looking for. 10:25:14

18 Q. And how would you know that? 10:25:16

19 A. How would I know what? 10:25:17

20 Q. You said it depends on what release effect 10:25:24

21 you're looking for. 10:25:26

22 A. In the abstract, somebody might tell me a 10:25:29

1 threshold number or something. 10:25:31

2 Q. But if you're looking at a document in 10:25:36

3 front of you and it says add 100 parts per million of 10:25:38

4 a wax or polymer, are you going to immediately know 10:25:43

5 that enough is going to get to the surface to form 10:25:49

6 whatever the effect is that's described in that 10:25:54

7 document? 10:25:56

8 A. I think there are guidelines set up by all 10:25:57

9 of these manufacturers of these compounds that give 10:26:03

10 you kind of ranges, in terms of typical effects. If 10:26:06

11 you're looking for an antiblock agent, for example, 10:26:09

12 there might be a certain range within that 10:26:12

13 particular, say, EBS wax or antiblock agent that 10:26:14

14 you're going to select that's going to give you a 10:26:19

15 known or understood amount of antiblock release. So 10:26:22

16 there's parameters in the industry that would guide 10:26:25

17 your selection. 10:26:28

18 Q. Okay, let's go to the third sentence of 10:26:35

19 paragraph 66 of your declaration, Exhibit 1003, page 10:26:37

20 37. The third sentence reads, "lubricants and waxes 10:26:42

21 of various types are specific examples of internal 10:26:49

22 release agents that act 'internally' between polymer 10:26:53

1 chains and 'externally' by serving as a coating on 10:26:57
2 the polymer surface." 10:27:01
3 Do you see that? 10:27:02
4 A. I missed that. What paragraph are you in? 10:27:03
5 Q. 66, third sentence, page 37 of Exhibit 10:27:13
6 1003. It's the third sentence. I just read the 10:27:17
7 sentence. 10:27:30
8 A. I have it. I'm with you. 10:27:30
9 Q. Okay. The last part of the sentence says, 10:27:33
10 "serve as a coating." Do you see that? 10:27:35
11 A. I do. 10:27:37
12 Q. And the citation is to Exhibit 1024, page 10:27:38
13 15. 10:27:42
14 A. Okay. 10:27:43
15 Q. Let's go to 1024, page 15. It might take 10:27:44
16 you a minute to get there. Are you on page 15? 10:27:54
17 A. I am, yes. 10:28:17
18 Q. Okay. So can you tell me where in this 10:28:18
19 exhibit there's a discussion of a coating on the 10:28:24
20 polymer surface? I can direct you to the first 10:28:37
21 sentence, the first paragraph under Processing Aids, 10:29:00
22 Lubricants, the third sentence, page 15 of Exhibit 10:29:05

1 1024, "these additives act either 'internally.'" Do 10:29:11

2 you see that? 10:29:18

3 A. I do. 10:29:19

4 Q. And then "or 'externally' by coating or 10:29:21

5 treating the metal surfaces of the processing 10:29:27

6 equipment." Do you see that? 10:29:29

7 A. I do. 10:29:31

8 Q. So does that form a coating on the polymer 10:29:36

9 surface? 10:29:39

10 A. Well, it's going to form a coating between 10:29:39

11 the polymer surface and the metal of the equipment, 10:29:43

12 between those two boundaries, if you will. 10:29:48

13 Q. But Exhibit 1024 says the coating is on 10:29:50

14 the metal surface, correct? 10:29:53

15 A. I just explained to you what it means. 10:29:55

16 You've got a coating that develops between the 10:29:59

17 polymer itself and the metal equipment. So it just 10:30:02

18 depends on your frame of reference. 10:30:05

19 Q. How about when the polymer exits the 10:30:13

20 processing equipment, is it going to form a coating 10:30:17

21 on the surface of the polymer then, or will that 10:30:23

22 coating remain on the metal surface? 10:30:27

6	Q. All right. So that's migrating from	10:30:50
7	internally. I'm just talking about externally, it's	10:30:52
8	coated on the metal, you're processing it. It then	10:30:55
9	comes through the extruder formed into a film. Is	10:30:59
10	the surface of the film going to have that coating?	10:31:04

17	But if you're talking about just after the	10:31:25
18	process, we've got this coating that's talked about	10:31:27
19	in my reference, I would expect that some of it would	10:31:30
20	stay with the metal, some of it would stay with the	10:31:34
21	plastic.	10:31:36

22 Q. All right. We already talked about that. 10:31:52

1 Sorry, I was speaking out loud, I was reading my 10:31:57
2 notes. 10:31:59

3 Let's turn back to your declaration, 10:32:00
4 Exhibit 1003, in the discussion of the '882 patent, 10:32:05
5 and I'm going to go to paragraph 78, which is on page 10:32:14
6 44 of your exhibit. Are you there? 10:32:24

7 A. I am there, yes. 10:33:08

8 Q. So I am going to refer to the first 10:33:10
9 sentence. The first sentence reads, "the '882 patent 10:33:12
10 states that the coating used to achieve the disclosed 10:33:16
11 release effect may comprise a coating of polysiloxane 10:33:19
12 on an exterior side of the film, a migrating compound 10:33:25
13 contained within an external layer of the film, or a 10:33:29
14 coating containing a migrating compound applied on an 10:33:32
15 exterior side of the film." 10:33:37

16 Do you see that? 10:33:38

17 A. I do. 10:33:39

18 Q. So there are three possibilities here, 10:33:41
19 correct, a coating on the external surface with a 10:33:47
20 polysiloxane, a coating on the external surface with 10:33:52
21 a migrating compound, or a migrating compound 10:33:56
22 contained within the external layer of the film, 10:34:01

1 correct? 10:34:04

2 MR. BOND: Object. I think that 10:34:05

3 mischaracterizes what it actually says. 10:34:06

4 MR. DOODY: I reversed -- switched the 10:34:09

5 second and third. 10:34:11

6 MR. BOND: The objection stands. I think 10:34:22

7 it speaks for itself. So ask your question. 10:34:23

8 BY MR. DOODY: 10:36:18

9 Q. So a migrating compound contained within 10:34:26

10 an external film, I notice that you didn't use the 10:34:29

11 word "coating" there. 10:34:33

12 MR. BOND: The same objection. It doesn't 10:34:35

13 say external films, it says external layer of the 10:34:37

14 film. 10:34:40

15 MR. DOODY: Sorry. 10:34:41

16 BY MR. DOODY: 10:36:18

17 Q. The portion of that sentence that says, "a 10:34:43

18 migrating compound contained within an external layer 10:34:45

19 of the film." You don't use the word "coating" 10:34:48

20 there, do you? 10:34:50

21 Is the word "coating" present in that 10:35:29

22 clause of your first sentence of paragraph 78, "a 10:35:32

1 migrating compound contained within an external layer 10:35:34
2 of the film"? 10:35:38
3 MR. BOND: Objection, the document speaks 10:35:45
4 for itself. 10:35:47
5 THE WITNESS: In the words that you just 10:35:49
6 read, there is no word "coating," in that last 10:35:50
7 sentence -- sentence fragment you just mentioned. 10:35:54
8 BY MR. DOODY: 10:36:18
9 Q. Correct. And all my question is, is was 10:35:58
10 that intentional? 10:36:00
11 MR. BOND: Objection, form. 10:36:14
12 MR. DOODY: Let me rephrase the question. 10:36:15
13 BY MR. DOODY: 10:36:18
14 Q. Would you consider a migrating compound 10:36:19
15 contained within an external layer of the film to be 10:36:21
16 a coating? 10:36:25
17 A. No, I would not. 10:36:29
18 Q. Okay. Would you consider it a covering? 10:39:22
19 Why don't I strike that question, please, 10:41:09
20 and we'll move on and come back to it. 10:41:11
21 A. Sure. 10:41:14
22 Q. Maybe reading more of the patent might 10:41:15

1 help shed light on that. So I am going to turn to 10:41:18
2 your declaration, Exhibit 1003, paragraph 79, on page 10:41:23
3 44. I am sorry, page 45 of Exhibit 1003. 10:41:29
4 A. Okay. 10:41:46
5 Q. So paragraph 79, the second sentence 10:41:48
6 reads, "the '882 patent further describes that for a 10:41:56
7 coating, the film thickness of the applied coating is 10:41:59
8 more preferably between 0.1 and 3 microns, while for 10:42:03
9 a covering, the film thickness formed from the 10:42:08
10 migrated migrating compound is more preferably 10:42:13
11 between 5 nanometers and 3 microns." 10:42:15
12 Do you see that? 10:42:19
13 A. I do. 10:42:20
14 Q. So the first part of that sentence is 10:42:27
15 talking about for a coating, and that has a certain 10:42:28
16 thickness. The second part of the sentence talks 10:42:31
17 about a covering, and that has a smaller thickness, 10:42:34
18 at least on the lower end, right? 10:42:38
19 A. Preferably, yes. 10:42:41
20 Q. Okay. And that last part of the second 10:42:43
21 sentence qualifies covering that is "formed from the 10:42:48
22 migrated migrating compound." Do you see that? 10:42:54

1 A. I do. 10:42:58

2 **Q. So would a migrating compound contained** 10:42:59

3 **within an external layer of the film be considered a** 10:43:05

4 **covering and not a coating?** 10:43:11

5 A. I think the only difference here that's 10:43:13

6 taught is the difference in thickness, how much is 10:43:24

7 migrated. 10:43:26

8 **Q. But the first part doesn't say anything** 10:43:26

9 **about migration, right, for a coating? I think you** 10:43:30

10 **testified previously that a migrating compound** 10:43:49

11 **contained within an external layer of the film would** 10:43:52

12 **not be a coating.** 10:43:55

13 MR. BOND: Objection, mischaracterizes the 10:43:59

14 testimony. 10:44:02

15 THE WITNESS: Is there a question pending? 10:44:14

16 BY MR. DOODY: 10:44:16

17 **Q. The question was, is a migrating compound** 10:44:17

18 **contained within the external layer of the film a** 10:44:19

19 **covering?** 10:44:23

20 A. Not if the migrating compound is still 10:44:25

21 within the layer. 10:44:44

22 **Q. But this sentence says if it's a covering,** 10:44:47

1 it's formed from the migrated migrating compound. So 10:44:50
2 it already has migrated. I'm on paragraph 79, page 10:44:53
3 45 of Exhibit 1003. 10:45:02

4 A. Counsel, your question was different. 10:45:02
5 Your question was asking me about the migrating 10:45:05
6 compound being within the layer, and you're asking 10:45:07
7 me -- I think you asked me if that was a coating, if 10:45:10
8 the migrating compound is just in the layer. I said 10:45:14
9 no. 10:45:17

10 Now you're jumping to covering and the act 10:45:22
11 of migration. So I just want to make sure that we're 10:45:26
12 not talking past one another. 10:45:29

13 Q. But all of this was premised on the first 10:45:31
14 sentence of paragraph 78, do you remember? We're 10:45:34
15 back on that. Let's go to that first sentence again 10:45:36
16 on page 44 of Exhibit 1003, paragraph 78. There's 10:45:42
17 three things stated. Let me read the sentence again. 10:45:46

18 "The '882 patent states that the coating 10:45:49
19 used to achieve the disclosed release effect may 10:45:52
20 comprise a coating of polysiloxane on an exterior 10:45:57
21 side of the film, a migrating compound contained 10:46:03
22 within an external layer of the film, or a coating 10:46:08

1 containing a migrating compound applied on an 10:46:13

2 exterior side of the film." 10:46:16

3 And in that sentence, the migrating 10:46:25

4 compound contained within an external layer of the 10:46:27

5 film is not referenced as a coating, correct? 10:46:30

6 A. I think it just really depends on how you 10:46:37

7 read that sentence. You're talking about achieving a 10:47:34

8 coating by a migrating compound, so the act of 10:47:37

9 migrating is in that part of the sentence. So, 10:47:40

10 again, I think this is just semantics here. 10:47:43

11 Q. So you're achieving a release effect. 10:47:49

12 MR. BOND: Objection, misstates the 10:47:54

13 sentence. 10:47:56

14 BY MR. DOODY: 10:47:58

15 Q. The sentence says that "the '882 patent 10:47:59

16 states that the coating used to achieve the disclosed 10:48:03

17 release effect." 10:48:05

18 MR. BOND: Right, it mentions coating, 10:48:07

19 part of the same sentence. That's my point. 10:48:09

20 MR. DOODY: It doesn't say it achieves a 10:48:11

21 coating. It says it achieves a release effect. 10:48:14

22 MR. BOND: I think that's a misstatement 10:48:17

1 of the sentence. 10:48:19

2 MR. DOODY: No, it's not. 10:48:20

3 MR. BOND: We disagree, counsel. I've 10:48:22

4 lodged my objection. We disagree. 10:48:25

5 MR. DOODY: I can have the reporter read 10:48:27

6 it back, but it's not worth it. 10:48:29

7 BY MR. DOODY: 10:48:33

8 Q. Dr. MacLean, is there a difference in the 10:48:34

9 '882 patent between a coating and a covering? 10:48:38

10 A. Just the thickness difference, based on 10:48:42

11 the teachings of the spec. 10:48:47

12 Q. Are there any other portions that disclose 10:48:51

13 a difference? 10:48:55

14 A. Not that I recall. 10:48:56

15 Q. Would it surprise you to know that in the 10:49:09

16 '882 patent, where they're discussing the migrating 10:49:13

17 compound and it's referenced in -- I'm not exactly 10:49:19

18 sure, but we'll get there in a minute -- but there is 10:49:24

19 a translation error, and the translator translated 10:49:27

20 the word "covering" into "coating"? Would that 10:49:31

21 surprise you? 10:49:35

22 A. You would have to orient me, counsel. 10:49:35

1 Where are you in the patent? Where is that 10:49:37
2 transcription error? 10:49:40

3 Q. It's on column 5 -- I'll find it in a 10:49:43
4 second. It's Exhibit 1001 -- page 6 of Exhibit 1001, 10:49:46
5 column 5, lines 23 through 34. 10:49:58

6 A. You said 23 through 34? 10:50:15

7 MR. BOND: Counsel, you're in column 5? 10:50:18

8 MR. DOODY: Column 5 of the '882 patent, 10:50:21
9 which is on page 6 of Exhibit 1001, starting at line 10:50:25
10 23. 10:50:30

11 MR. BOND: I don't see a translation 10:50:41
12 error. Is there something -- you're referring to a 10:50:42
13 translation error? 10:50:45

14 MR. DOODY: Yes. So in that first 10:50:46
15 sentence, it says, "in the coating alternative with a 10:50:47
16 migrating compound." 10:50:50

17 MR. BOND: No. Is there something in the 10:50:51
18 record regarding a translation, is what I'm asking, 10:50:53
19 counsel, not what you're claiming. 10:50:55

20 MR. DOODY: There is not. That's why I'm 10:50:57
21 asking if the witness would be surprised to know if 10:50:59
22 there were one. 10:51:02

1 MR. BOND: Whoa, time out. Stop. I'm 10:51:03
2 trying to understand your line of questioning. What 10:51:07
3 I'm asking is, you're saying there's a translation 10:51:09
4 error in column 5. I don't see any indication there 10:51:11
5 is a translation error. Is there something in the 10:51:14
6 record -- 10:51:17
7 MR. DOODY: There is not. 10:51:18
8 MR. BOND: -- that states there is a 10:51:19
9 translation error in the patent? 10:51:21
10 MR. DOODY: Not yet. 10:51:24
11 MR. BOND: Not yet. I don't know what 10:51:25
12 that means. Are you claiming now for the first time 10:51:28
13 that there is a translation error in the patent? 10:51:33
14 MR. DOODY: I believe there is. I'm not 10:51:38
15 positive, but the application was filed originally in 10:51:40
16 the United States in German. 10:51:43
17 MR. BOND: I understand that. But I'm 10:51:47
18 trying to identify whether or not there is something 10:51:49
19 in the prosecution history -- 10:51:51
20 MR. DOODY: There isn't. 10:51:53
21 MR. BOND: -- that -- an error correction 10:51:54
22 or something? No? 10:51:56

1 MR. DOODY: Nothing, that's correct. 10:51:58

2 Well, I'm not going to get into it, because it's not 10:52:03

3 of record, so it's not worth t. 10:52:07

4 MR. BOND: That's confusing, I'm sorry, I 10:52:09

5 just didn't understand. 10:52:11

6 MR. DOODY: I get it. I understand. 10:52:12

7 BY MR. DOODY: 10:52:15

8 Q. So other than the thickness of the 10:52:24

9 material, is there any other difference between a 10:52:28

10 coating and a covering? 10:52:31

11 A. Again, not that I recall. If you want to 10:52:32

12 orient me to something else in the specification, I 10:52:36

13 would be happy to read it. 10:52:39

14 Q. Let me see. No, not that's coming to 10:53:10

15 mind. There are things, but not anything for 10:53:12

16 Dr. MacLean to get into. 10:53:14

17 Let's go back to your declaration, Exhibit 10:53:21

18 1003, and I am jumping ahead to ground 1. And that 10:53:24

19 begins, I believe, on page 60 of Exhibit 1003, 10:53:40

20 section (a), anticipation by Hummel or obviousness by 10:53:54

21 Hummel. Do you see that? 10:53:57

22 A. Yes, I'm there. 10:53:59

1 Q. Okay. So I'm going to focus more on one 10:54:00
2 part of the claim, and that I am sure is no shock to 10:54:07
3 any of you on this call, specifically paragraph 128, 10:54:12
4 which is on pages 66 and 67 of your Declaration. 10:54:20
5 A. Okay. 10:54:20
6 Q. Do you see that? 10:54:33
7 So on page 66 -- we can just go up to get 10:54:34
8 context. The very first item on page 66 has a letter 10:54:38
9 (f) with a parentheses, claim 1(e). Do you see that? 10:54:49
10 MR. BOND: Top of page 66? 10:54:59
11 MR. DOODY: Top of page 66, correct. 10:55:02
12 THE WITNESS: Yes. 10:55:06
13 BY MR. DOODY: 10:55:07
14 Q. This is just the context. So what we're 10:55:08
15 talking about here is claim element 1(e), correct? 10:55:10
16 A. Correct. 10:55:15
17 Q. And that claim element reads, "a coating 10:55:19
18 of at least one of (1) a coating with a polysiloxane; 10:55:21
19 or (2) a coating or covering with at least one 10:55:28
20 migrating compound; and," right? 10:55:34
21 A. Yes, that's what it states. 10:55:39
22 Q. Okay. And this section of your 10:55:41

1 declaration concerns anticipation in view of Hummel. 10:55:47

2 Is that your understanding? 10:55:50

3 A. It is. 10:55:55

4 Q. Okay. So on paragraph 128, which starts 10:55:55

5 at the bottom of page 66 and goes to page 67, there 10:55:58

6 is a quote or an excerpt from the reference that's 10:56:12

7 referred to as Hummel, H-U-M-M-E-L, which is Exhibit 10:56:16

8 1005. That's the English translation of it. 10:56:21

9 (MacLean Exhibit No. 1005 was 09:29:43

10 identified for the record.) 10:52:15

11 BY MR. DOODY: 10:52:15

12 Q. Do you see that? 10:56:27

13 A. I do. 10:56:28

14 Q. Okay. And so in that excerpted paragraph, 10:56:30

15 it states that layers (a), (c), (e), (b), and (d) of 10:56:43

16 the multilayer film," referencing Hummel. So that's 10:56:51

17 one of five layers, correct? 10:56:56

18 A. Yes. 10:56:57

19 Q. Those layers? "can, if necessary, in each 10:56:58

20 case" can be treated with additives. And then 10:57:02

21 there's a list of additives, correct? 10:57:06

22 A. Yes. 10:57:09

Page 62

1 tear, et cetera. 10:59:06

2 So there's this combination of removing 10:59:07

3 this film without tearing, and this teaching of 10:59:11

4 specifically putting in antiblock agents which we 10:59:14

5 knows goes to the surface. Those two things comport 10:59:18

6 into giving you an embodiment that would -- a 10:59:21

7 migrating compound that would facilitate release of 10:59:26

8 the film. 10:59:29

9 Q. Where does Hummel say you want release 10:59:32

10 without tear? 10:59:35

11 A. A couple places. 10:59:36

12 Q. Doesn't Hummel just say it achieves 10:59:41

13 release without tear? 10:59:44

14 A. Yeah, I think -- I mean, we can go find 10:59:46

15 the exact -- I think there's at least a couple of 10:59:53

16 quotes in there, but I think you and I are saying 10:59:55

17 basically the same thing. 10:59:57

18 Q. That if Hummel says you can withdraw the 10:59:58

19 inner film without tearing or being torn, then that 11:00:10

20 means you would want the inner film to be withdrawn 11:00:12

21 without tearing or torn, correct? 11:00:17

22 A. I'm not sure I follow that question. 11:00:19

20	So it's teaching you there's options. And	11:05:54
21	this is where these additives come into play, because	11:05:58
22	if you want the alternative, which is to take it off	11:06:01

1 and take it off readily, or whatever terms that he 11:06:04
2 uses, you would need to put some of these additives 11:06:07
3 in relative to the starting point where you're going 11:06:10
4 to leave it on, and you don't need those additives. 11:06:12
5 So I think there's flexibility in the patent to do 11:06:15
6 both. 11:06:19
7 BY MR. DOODY: 11:06:19
8 Q. Does Hummel say you need those additives? 11:06:20
9 A. I think he -- well, I think the -- I don't 11:06:23
10 want to think anything. I'll just find the excerpt. 11:06:30
11 Q. The excerpt from Hummel is on page 67 of 11:06:37
12 your declaration, Exhibit 1003, if that helps. 11:06:40
13 A. What page did you just reference? 11:07:05
14 Q. 67, paragraph 128, page 67 of Exhibit 11:07:08
15 1003. This is the excerpt of the quote from Hummel, 11:07:14
16 where Hummel is talking about the additives. 11:07:17
17 A. He says, "if necessary." 11:07:25
18 Q. Okay. Would you reasonably expect the 11:07:27
19 examples, the inventive examples of Hummel to achieve 11:07:33
20 the desired effect that Hummel is trying to achieve? 11:07:37
21 A. I would say those would be one embodiment. 11:07:40
22 Q. Correct. Do any of them include any of 11:07:59

1 those additives? Examples can be found on pages 26 11:08:02

2 and 27 of Exhibit 1005. 11:08:24

3 A. Do you have the formulations for the 11:09:10

4 external layers, layers (a) and (e)? 11:09:12

5 Q. Well, they're listed there, Lupolen and 11:09:16

6 Exceed. I believe they're both polymers. 11:09:19

7 A. They are. I'm asking you, do you have the 11:09:21

8 ingredients of what's in Lupolen 2420? 11:09:23

9 Q. No. 11:09:28

10 A. So then I can't answer that. 11:09:28

11 Q. Okay. What is Hummel's invention? 11:09:31

12 MR. BOND: Objection to form. 11:09:38

13 THE WITNESS: I think the abstract lays it 11:09:40

14 out pretty well. I can read it into the record if it 11:09:52

15 helps. Otherwise, it's on page 2 of 71. "The 11:09:57

16 invention relates to a liquid-tight multi-layer film, 11:10:04

17 preferably in the form of a tubular film, which is at 11:10:07

18 least partially permeable to UV radiation, comprising 11:10:10

19 a sequence of layers composed of a layer (a) on the 11:10:15

20 basis of at least one thermoplastic olefin 11:10:19

21 homopolymer or copolymer as one of the outside 11:10:23

22 layers, an adhesion promoter layer (b), an interior 11:10:26

1 layer (c) on the basis of at least one homopolyamide 11:10:32
2 and/or copolyamide, an adhesion promoter layer (d), 11:10:39
3 and a layer (e) on the basis of at least one 11:10:45
4 homopolyamide or copolyamide as one of the outside 11:10:51
5 layers," dot, dot, dot. 11:10:56
6 BY MR. DOODY: 11:06:19
7 Q. The dot, dot, dot is pretty important 11:10:58
8 here. 11:11:00
9 A. Okay, I'll keep going. 11:11:00
10 Q. No, I'll finish. 11:11:02
11 A. Sure. 11:11:03
12 Q. "Wherein the thermoplastic olefin 11:11:05
13 homopolymer or copolymer of layer (a)" -- I don't 11:11:07
14 know if it's "VICAT" or "VEECAT" -- "has a VICAT 11:11:11
15 softening temperature of at least 100 degrees C." 11:11:16
16 Do you see that? 11:11:20
17 A. I do. 11:11:21
18 Q. So Hummel is describing an improvement 11:11:23
19 over prior art film that you had used a different 11:11:26
20 type of layer (a) that had a much lower VICAT, and it 11:11:30
21 wasn't good. So Hummel solved the problem by using a 11:11:35
22 higher VICAT softening temperature polymer in layer 11:11:40

1 **(a). Is that your understanding?** 11:11:46

2 MR. BOND: Object to the form. 11:11:48

3 THE WITNESS: I don't know if I would 11:11:50

4 frame it that way. But it certainly is stating that 11:11:51

5 the purported invention has a VICAT -- has layer (a) 11:11:56

6 with a VICAT of at least 100C. 11:12:00

7 BY MR. DOODY: 11:12:04

8 **Q. Now, would that layer be stronger than a** 11:12:04

9 **layer with a much lower VICAT?** 11:12:07

10 MR. BOND: Objection to form. 11:12:10

11 THE WITNESS: It depends under what 11:12:13

12 conditions. 11:12:15

13 BY MR. DOODY: 11:12:16

14 **Q. Conditions normally encountered in a** 11:12:17

15 **multi-layer film partially permeable to UV radiation.** 11:12:19

16 MR. BOND: Objection to form. 11:12:25

17 THE WITNESS: It doesn't mention anything 11:12:33

18 about strength there, counselor. It just says it has 11:12:56

19 a VICAT softening temperature of at least 100C. 11:12:58

20 BY MR. DOODY: 11:12:16

21 **Q. Correct. I was just asking if, in your** 11:13:02

22 **polymer expertise, do those polymers tend to be a** 11:13:03

1 little stronger than lower VICATs? 11:13:07

2 MR. BOND: Objection, goes outside the 11:13:10

3 scope of the deposition. 11:13:12

4 THE WITNESS: It really depends. Strength 11:13:14

5 and temperature of some of these things have inverse 11:13:17

6 relationship, up and down relationship. You have to 11:13:21

7 be very specific with the material to make that call. 11:13:21

8 BY MR. DOODY: 11:13:28

9 Q. Does Hummel say there's some problem with 11:13:28

10 its film in releasing -- being withdrawn from the 11:13:33

11 system after it's been cured? Let me rephrase that. 11:13:42

12 A. Sure. 11:14:05

13 Q. So we've mentioned a few times that Hummel 11:14:05

14 discloses the ability to withdraw the film without 11:14:10

15 tearing or being torn, correct? 11:14:15

16 A. Yes. 11:14:18

17 Q. So by disclosing that, you, as a person of 11:14:21

18 ordinary skill in the art, would you expect there to 11:14:25

19 be a problem with Hummel's film in withdrawing it, or 11:14:28

20 would you have expected it to be certainly capable of 11:14:34

21 just pulling out without tearing or torn, as Hummel 11:14:38

22 says? 11:14:42

1 MR. BOND: Objection to form. 11:14:43

2 THE WITNESS: I think you're attempting to 11:14:45

3 achieve clean release of the film. As taught in the 11:15:09

4 patent, as mentioned in the patent, there are 11:15:15

5 embodiments based in the four corners of the patent 11:15:17

6 that you can come up with to achieve that. 11:15:22

7 BY MR. DOODY: 11:15:25

8 Q. Right, and Hummel does it, correct? 11:15:25

9 MR. BOND: Objection to form. 11:15:28

10 THE WITNESS: And Hummel does what? 11:15:29

11 BY MR. DOODY: 11:15:32

12 Q. Achieves that effect. 11:15:33

13 MR. BOND: Object to form. 11:15:34

14 THE WITNESS: Hummel has the ability to 11:15:37

15 achieve a release film that does not tear upon 11:15:55

16 removal. 11:15:58

17 BY MR. DOODY: 11:16:20

18 Q. All right. Back to your declaration, 11:16:22

19 paragraph 28 of Exhibit 1003. This is the listing of 11:16:24

20 the additives. 11:16:31

21 A. Okay. 11:16:38

22 Q. So in order to use a migrating compound as 11:16:38

1 one of Hummel's additives, you would have to select 11:16:45

2 one from a pretty long list here, right? 11:16:50

3 A. I guess long is relative. But, I mean, 11:16:53

4 there are certainly -- there are clearly some 11:17:11

5 additives listed there that would give you a 11:17:14

6 migrating compound that would go to the surface. 11:17:17

7 Q. How many additives are listed here, 11:17:23

8 ballpark figure? Because it doesn't list any, 11:17:26

9 specifically. It lists generic classes of additives. 11:17:28

10 Would you say over a thousand? 11:17:38

11 MR. BOND: Objection to form. 11:17:40

12 THE WITNESS: A thousand? Are we on the 11:17:42

13 same paragraph? I'm at the top of page 67. 11:17:44

14 BY MR. DOODY: 11:17:47

15 Q. Yeah. 11:17:48

16 A. I don't see a thousand additives, generic 11:17:50

17 additives listed. 11:17:52

18 Q. How many antistatic agents are there? 11:17:54

19 MR. BOND: Objection to form. Outside the 11:17:57

20 scope of the deposition. 11:18:00

21 THE WITNESS: I don't know. Are you 11:18:05

22 talking about the whole universe of them? I don't 11:18:06

1 know the universe of that. 11:18:08

2 BY MR. DOODY: 11:18:10

3 Q. Yes, because all Hummel says is an 11:18:10

4 antistatic agent. It doesn't tell you which one. 11:18:12

5 How about antioxidants? 11:18:14

6 MR. BOND: Objection to form. 11:18:17

7 THE WITNESS: There's several 11:18:22

8 antioxidants, sure. 11:18:24

9 BY MR. DOODY: 11:18:25

10 Q. Correct. So that's where the thousand 11:18:26

11 comes from. Each one of these -- 11:18:27

12 MR. BOND: Objection to form. 11:18:27

13 Mischaracterizes the witness's testimony. 11:18:32

14 THE WITNESS: Is there a question pending? 11:18:57

15 MR. DOODY: Yeah. 11:19:01

16 THE WITNESS: Could you repeat it? 11:19:03

17 BY MR. DOODY: 11:19:03

18 Q. Can you ballpark a figure for me for the 11:19:03

19 number of agents that are listed in this paragraph 11:19:06

20 upon which a person of ordinary skill in the art can 11:19:09

21 select? 11:19:12

22 MR. BOND: Objection to form. 11:19:15

1 THE WITNESS: I can't give you a 11:19:19
2 definitive number, but I can tell you one skilled in 11:19:20
3 the art -- again, I talked about the material system 11:19:23
4 here and the types of polymers, the base polymers. 11:19:25
5 One skilled in the art would know how to select these 11:19:28
6 things with relative ease, depending on what type of 11:19:31
7 function you want out of the material. 11:19:34
8 BY MR. DOODY: 11:19:03
9 Q. Correct. But you wouldn't necessarily 11:19:42
10 always select a migrating compound, would you? 11:19:46
11 MR. BOND: Objection to form. 11:19:51
12 THE WITNESS: Again, it depends on what 11:19:53
13 I'm trying to achieve. If I'm trying to achieve some 11:19:54
14 sort of release effect on the surface, I go back to 11:19:58
15 the conversation we had over an hour ago, I would be 11:20:02
16 picking from release agents that are going to be in 11:20:04
17 tune with the base polymer of that particular layer. 11:20:08
18 You make a selection based on the 11:20:11
19 additional guidance you might get from these material 11:20:14
20 suppliers. I mean, there are ways to do this that 11:20:16
21 are very, very straightforward, depending on the 11:20:19
22 desired effect. 11:20:21

1 BY MR. DOODY: 11:20:22

2 Q. Right, so you're premising it all on your 11:20:23

3 desire to have a release effect. 11:20:25

4 MR. BOND: Objection to form. 11:20:27

5 Mischaracterizes the witness's testimony. 11:20:29

6 BY MR. DOODY: 11:20:38

7 Q. You premised it all on a certain desire. 11:20:38

8 MR. BOND: Objection to form. 11:20:43

9 Mischaracterizes the witness's testimony. 11:20:45

10 BY MR. DOODY: 11:20:48

11 Q. Does Hummel describe a desire to achieve a 11:20:49

12 release effect through the use of an additive? 11:20:52

13 A. It is taught, yes. 11:21:03

14 Q. So there's something in Hummel that says, 11:21:06

15 if you want to achieve a release effect, use an 11:21:09

16 additive? 11:21:12

17 MR. BOND: Objection to form. 11:21:14

18 THE WITNESS: You're not distinguishing 11:21:15

19 between expressly disclosed and taught. When I say 11:21:17

20 taught, I look at the patent as a whole, I look at 11:21:23

21 all of its teachings, all of its disclosures, I pull 11:21:26

22 that together. And I can tell that you can come up 11:21:29

1 with an embodiment that gives you the release that 11:21:32
2 would incorporate one of these release agents. 11:21:36
3 BY MR. DOODY: 11:21:39
4 Q. Okay. And you can come up with an 11:21:40
5 embodiment that doesn't, right? 11:21:42
6 MR. BOND: Objection to form. 11:21:44
7 THE WITNESS: You could, because Hummel 11:21:45
8 also teaches that there's a preferable configuration 11:21:47
9 where you do not take the internal liner out. 11:21:51
10 BY MR. DOODY: 11:21:54
11 Q. So you have to make a choice, right? 11:22:01
12 A. The patent gives you the flexibility to 11:22:03
13 make the choice. 11:22:05
14 Q. Okay. Fair enough. 11:22:06
15 MR. DOODY: Why don't we take a break. 11:22:11
16 (Recess.) 11:22:14
17 BY MR. DOODY: 11:19:03
18 Q. We were talking about Hummel when we went 11:35:44
19 on break. Let's go to paragraph 134 of your 11:35:47
20 declaration, Exhibit 1003. And that's on page 69. 11:35:50
21 MR. BOND: Before we move on, I want to 11:35:59
22 confirm with the court reporter, there's nobody else 11:36:01

1 on the line except those that have been already 11:36:04
2 identified? 11:36:07

3 THE COURT REPORTER: Just those that have 11:36:07
4 already been identified. Nobody else has joined. 11:36:07

5 MR. BOND: Thank you. 11:36:07

6 BY MR. DOODY: 11:36:24

7 Q. So paragraph 134. Are you there, 11:36:24
8 Dr. MacLean? 11:36:28

9 A. I am. 11:36:29

10 Q. Okay. And so I'm only going to look at 11:36:29
11 the second sentence. It says, "Since it is required 11:36:32
12 that the inner film can be removed 'without tearing 11:36:36
13 or seizing,' or 'without being torn,' an outer facing 11:36:39
14 external side of the inner tubular film that is 11:36:45
15 treated with one of the disclosed migrating compounds 11:36:48
16 would necessarily result in a coating." 11:36:52

17 Do you see that? 11:36:56

18 A. I do. 11:36:56

19 Q. Why would it necessarily result in a 11:37:00
20 coating? 11:37:03

21 A. Because that's how those migrating 11:37:04
22 compounds work. The ones that I pointed out in that 11:37:44

1 longer list of additives, take antiblocking agent as 11:37:48
2 an example, that's what they do. They move to the 11:37:50
3 surface and they create some form of a coating to 11:37:53
4 reduce the coefficient of friction or the frictional 11:37:59
5 forces on the top of the surface of the extrusion. 11:38:02
6 What's really -- that's how those 11:38:08
7 migrating compounds work, the ones that I think you 11:38:09
8 underlined or highlighted in the previous passage. 11:38:12
9 **Q. Correct. But we had discussed quite a bit 11:38:15**
10 **earlier about the amount that's needed to form a 11:38:22**
11 **coating. 11:38:27**
12 **MR. BOND: Objection to form. 11:38:31**
13 **BY MR. DOODY: 11:38:35**
14 **Q. Let me ask this question. Wouldn't you 11:38:36**
15 **have to use a certain amount of migrating compound so 11:38:39**
16 **that it does migrate to the surface and result in a 11:38:43**
17 **coating? 11:38:47**
18 **A. I'm not so sure I understand your 11:39:09**
19 **question. At some point in time after the process, 11:39:12**
20 **like we talked about, you're going to get these -- 11:39:14**
21 **again, we'll use antiblocking agent as an example -- 11:39:16**
22 **those molecules to go to the surface. You're going 11:39:20**

1 to have molecules on top of the surface that are 11:39:22

2 going to create some coating. 11:39:25

3 Q. What if they migrated to the other side of 11:39:29

4 the layer? Can't they migrate each way? 11:39:32

5 A. It depends on how you design your entire 11:39:40

6 layer system. I mean, I forget which patent off the 11:39:44

7 top of my head, but there's some teachings in one of 11:39:47

8 them that talk about one-sided and making sure you 11:39:50

9 can drive the migration in one direction. 11:39:54

10 But it doesn't matter. The migration can 11:39:55

11 take place in both directions. As a matter of fact, 11:39:58

12 all things being equal, I would expect some of that. 11:40:00

13 But some of the subsequent interior layers could have 11:40:03

14 an influence on what direction some of these 11:40:07

15 molecules move in. 11:40:09

16 Q. But just to be clear, that's only going to 11:40:19

17 happen if you select from that list of additives a 11:40:24

18 migrating compound, correct? 11:40:28

19 MR. BOND: Objection to form. 11:40:43

20 THE WITNESS: If you want to form a 11:42:27

21 coating, as we described within the materials we just 11:42:29

22 talked about, then, yes, you would want to pick a 11:42:31

1 migrating compound to ultimately get those molecules 11:42:34

2 to the surface. 11:42:37

3 BY MR. DOODY: 11:42:39

4 Q. Okay. Let's move on now to what's 11:42:39

5 referred to as ground -- I think it's 3. This starts 11:42:46

6 on paragraph 171, page 81 of Exhibit 1003. 11:42:51

7 A. Okay, I think I'm there. 11:43:13

8 Q. Okay. And the heading for this section is 11:43:15

9 Obviousness by Hummel in View of Schuhmann, right? 11:43:19

10 A. Correct. 11:43:29

11 Q. So here we're talking about the Hummel 11:43:30

12 reference that we've just been talking about, and now 11:43:33

13 there's a new one called Schuhmann, and that is 11:43:35

14 Exhibit 10 -- at least the English translation is 11:43:39

15 1007, I believe. Yes. So we'll refer to that in a 11:43:46

16 minute. 11:43:53

17 But, first, why would a person of ordinary 11:43:54

18 skill in the art have thought that Schuhmann's 11:43:59

19 release adhesive would be relevant or even useful in 11:44:03

20 Hummel? 11:44:09

21 A. Well, this is in the alternative. If 11:44:09

22 someone argues -- or if someone believes that Hummel 11:44:16

1 doesn't teach migrating compound, then you just have 11:44:20
2 a film, right? So if I just have a film and I'm 11:44:24
3 looking for a desired release effect, I need to look 11:44:27
4 at a secondary reference or another piece of prior 11:44:31
5 art that would possibly give me that functionality. 11:44:34

6 Q. And, again, the desired release effect, 11:44:40
7 where does that come from? 11:44:44

8 MR. BOND: Objection to form. 11:44:50

9 THE WITNESS: Well, that's what the '882 11:45:30
10 is purportedly seeking, is a film that has release, 11:45:32
11 right? So I'm not sure I understand your question. 11:45:36

12 BY MR. DOODY: 11:45:39

13 Q. Well, you can't consider the '882 patent 11:45:39
14 when you're looking at whether the claims would have 11:45:42
15 been obvious at the time of the invention, because it 11:45:44
16 didn't exist at that point. 11:45:47

17 A. Understood. I'm not suggesting hindsight 11:45:49
18 here. I'm just saying if I'm an inventor and I've 11:45:52
19 got a film, and I want to have it release, release 11:45:55
20 readily, I would be looking for technologies that I 11:46:00
21 could apply that would give me that effect. 11:46:03

22 Q. Okay. So where is there a disclosure 11:46:07

1 prior to the '882 patent that there was any need or 11:46:14
2 desire for that release effect? 11:46:19

3 A. It's partially -- it's in Hummel, right? 11:46:21
4 Hummel talks about wanting a film that can be 11:46:33
5 released without being torn. 11:46:37

6 Q. I don't think Hummel says that. I think 11:46:39
7 Hummel says Hummel's film can be released without 11:46:44
8 being torn. 11:46:48

9 MR. BOND: Objection, mischaracterizes the 11:46:49
10 prior art. 11:46:52

11 BY MR. DOODY: 11:46:58

12 Q. Hummel already does it. 11:46:59

13 MR. BOND: Objection to form. 11:47:04

14 MR. DOODY: Why don't we strike that last 11:50:57
15 question. 11:50:59

16 BY MR. DOODY: 11:51:02

17 Q. Let's go to Hummel, Exhibit 1005, page 7. 11:51:02

18 A. Okay, I'm there. 11:51:34

19 Q. Okay, the very first paragraph on the top 11:51:36
20 begins with "Surprisingly." Do you see that? 11:51:41

21 A. I do. 11:51:45

22 Q. Okay. The second sentence begins with, 11:51:50

1 "It was also surprisingly found that the multilayer 11:52:01
2 film, according to the invention, in particular in 11:52:06
3 the form of a multilayer tubular film, but also as a 11:52:10
4 multilayer film sealed to form a tube, is 11:52:15
5 characterized by very good mechanical properties, in 11:52:19
6 particular by very good elasticity, so that it 11:52:23
7 withstands the stresses occurring during the repair 11:52:27
8 of underground pipes, in particular during inflation 11:52:31
9 in the pipe system, during the preceding transport, 11:52:33
10 the preceding storage and the insertion into the pipe 11:52:37
11 to be repaired, and furthermore, after the resin has 11:52:40
12 cured, can be peeled off from it without being torn, 11:52:46
13 torn in or torn off." 11:52:51
14 Do you see that? 11:52:54
15 A. I do. 11:52:56
16 Q. Is it fair to say that Hummel is 11:53:01
17 disclosing that its film can be peeled off after 11:53:04
18 curing without being torn? 11:53:09
19 A. So, counsel, I still am trying to get the 11:53:14
20 point across that I am looking at Hummel in the 11:55:49
21 alternative, which is if you take the position that 11:55:52
22 Hummel doesn't teach a coating or doesn't achieve a 11:55:58

1 coating with its formulation, then that might be the 11:56:03
2 instance of a preferable embodiment where the film 11:56:06
3 stays put. 11:56:10

4 But if you're taking that position that 11:56:11
5 that's where the starting point is in Hummel, then 11:56:12
6 you still need to add some other element to Hummel to 11:56:15
7 get the desired release effect. 11:56:19

8 Q. So is it your testimony that this 11:56:22
9 statement in Hummel that it can be peeled off from it 11:56:28
10 without being torn, torn in, or torn off only can 11:56:32
11 happen if you have some kind of coating on that 11:56:38
12 surface? 11:56:41

13 A. I think that's what the patent teaches 11:56:42
14 you, that if you put those migrating compounds into 11:57:06
15 the formulation, it facilitates that release. 11:57:08

16 Q. Let's go back to your declaration, Exhibit 11:57:30
17 1003, paragraph 171, beginning on page 81, but I'm 11:57:37
18 going to move to page 82 and look at the last 11:57:44
19 sentence of paragraph 171. Do you see that? 11:57:51

20 A. I do. 11:58:02

21 Q. Okay. So this sentence reads, "in short, 11:58:06
22 these references provide interrelated teachings, and 11:58:10

1 a POSITA would have looked to the concepts in 11:58:14
2 Schuhmann and Hummel when seeking to solve the 11:58:18
3 problems purportedly addressed by the '882 patent." 11:58:22
4 Do you see that? 11:58:26
5 MR. BOND: He's at the last sentence of 11:58:38
6 171, paragraph 170. You're on the right page. 11:58:40
7 THE WITNESS: Got it. I'm there, yes. 11:58:44
8 BY MR. DOODY: 11:58:47
9 Q. Okay. So at the time of the filing of the 11:58:47
10 '882 patent, the problems purportedly addressed by 11:58:54
11 the '882 patent aren't disclosed, are they? 11:59:04
12 MR. BOND: Objection to form. 11:59:16
13 THE WITNESS: Ask me the question again? 11:59:19
14 BY MR. DOODY: 11:59:36
15 Q. This sentence, I'm going to read it again, 11:59:38
16 "in short, these references provide interrelated 11:59:41
17 teachings, and a POSITA would have looked to the 11:59:44
18 concepts in Schuhmann and Hummel when seeking to 11:59:47
19 solve the problems purportedly addressed by the '882 11:59:51
20 patent." 11:59:56
21 A. Okay. 11:59:56
22 Q. Why? 11:59:58

1 A. Well, if you're looking to develop this 12:00:02
2 type of film that has these type of capabilities, 12:00:16
3 Hummel and Schuhmann are already out there in the 12:00:23
4 prior art. So if I'm sitting down and saying, okay, 12:00:25
5 I want a film that has a release from carrier resin, 12:00:28
6 et cetera, what is out there? Prior to me trying to 12:00:34
7 develop a patent or invention, I would sit down and 12:00:37
8 say, what's in the field of art right now? I'm not 12:00:40
9 sure how else I can answer that question. 12:00:43

10 **Q. That's a good answer. The issue, though,** 12:00:46
11 **is when you're assessing obviousness, you don't know** 12:00:49
12 **the problems that were facing the '882 patent unless** 12:00:58
13 **they're somewhere disclosed in the prior art, right?** 12:01:02
14 **In other words -- let me rephrase.** 12:01:05

15 **An inventor can discover a problem that** 12:01:13
16 **didn't previously exist, right?** 12:01:15

17 A. I'm not sure how to answer that. 12:01:18

18 **Q. And sometimes once you know the problem,** 12:01:32
19 **the solution to it may not be all that difficult,** 12:01:34
20 **right?** 12:01:38

21 A. In the abstract, sure. I mean, there can 12:01:39
22 be simple solutions to problems. 12:01:45

4	A. Correct.	12:01:57
---	-------------	----------

8 MR. BOND: Objection, form. 12:02:14

16	So Im just saying if that's your starting	12:02:38
17	point from Hummel, you would need to add some sort of	12:02:40
18	release layer to improve it. And I talk about this	12:02:43
19	-- just to be clear, I talked about this motivation	12:02:46
20	in paragraph 191.	12:03:33

21	Q. Okay, let's go to paragraph 191. Read	12:03:51
22	that first sentence. "A POSITA would have found it	12:03:55

1 obvious to include the 'coating or covering based on 12:03:59
2 at least one lipophilic compound' from Schuhmann to 12:04:05
3 the external side facing the carrier material of the 12:04:08
4 inner tubular film of Hummel to provide the desired 12:04:12
5 release effect between the inner tubular film and the 12:04:16
6 carrier material," correct? 12:04:20

7 A. Correct. 12:04:22

8 Q. But Hummel already has that desired 12:04:24
9 release effect, doesn't it? 12:04:26

10 A. I disagree that all the embodiments are of 12:04:28
11 that style. 12:04:35

12 Q. Does Hummel disclose anywhere that there 12:04:39
13 is an embodiment in there that doesn't peel off 12:04:46
14 without being torn? 12:04:50

15 A. There's embodiments that are mentioned 12:04:53
16 where the film does not get removed. 12:04:57

17 Q. Okay. When the film does get removed, 12:04:59
18 does Hummel disclose anywhere that you can't -- you 12:05:04
19 absolutely have to have something on the outer layer 12:05:11
20 to remove it? 12:05:14

21 MR. BOND: Objection, form, asked and 12:05:19
22 answered. 12:05:21

1 THE WITNESS: I don't think I understand 12:05:24
2 your question. 12:05:25
3 BY MR. DOODY: 12:05:27
4 Q. Let me ask it another way. Depending on 12:05:28
5 the type of polymer used for that external layer and 12:05:30
6 the type of resin being used, could you just peel off 12:05:33
7 that polymer after curing of the resin without 12:05:40
8 tearing? 12:05:44
9 MR. BOND: Objection to form. 12:05:51
10 THE WITNESS: I'm not following your 12:05:53
11 hypothetical, counselor. 12:05:55
12 BY MR. DOODY: 12:05:56
13 Q. Do you have to have something at that 12:05:57
14 interface for it to peel, or could it just peel off 12:05:59
15 because there's no adhesion there? 12:06:03
16 MR. BOND: Objection to form. 12:06:06
17 THE WITNESS: Why would there be no 12:06:07
18 adhesion there with the thermal setting resin on the 12:06:10
19 interior of that film? 12:06:15
20 BY MR. DOODY: 12:06:16
21 Q. I don't know. I don't see anything in the 12:06:17
22 record that says there always is. 12:06:20

1 MR. BOND: Objection to form. Is there a 12:06:25
2 question pending? 12:06:28
3 BY MR. DOODY: 12:06:30
4 Q. Would a person of ordinary skill in the 12:06:31
5 art know that? 12:06:33
6 MR. BOND: Objection, form. 12:06:38
7 MR. DOODY: I'm sorry, I keep interrupting 12:06:39
8 you and I really apologize. 12:06:41
9 BY MR. DOODY: 12:06:44
10 Q. Would a person of ordinary skill in the 12:06:44
11 art know that a UV curable resin adjacent to a 12:06:46
12 polymer film always is going to form some type of 12:06:51
13 adhesion with that film? 12:06:54
14 A. I think within the confines of this 12:06:55
15 technology, yes, you're going to get adhesion, yes. 12:07:02
16 Q. Okay. If Hummel discloses that its 12:07:07
17 embodiments are suitable to withdraw the material 12:07:28
18 without tearing, why wouldn't you go extra steps and 12:07:33
19 modify Hummel even more with Schuhmann or any other 12:07:39
20 reference to do the same thing? 12:07:43
21 MR. BOND: Objection to form. 12:07:47
22 THE WITNESS: I think we just went through 12:07:49

1 a version of that same exact question for the last 15 12:07:50
2 minutes. I'm not sure if I'm picking up on a 12:07:53
3 difference. 12:07:56
4 BY MR. DOODY: 12:07:56
5 Q. There is. Why would you do it? Why would 12:07:57
6 you modify something that is already perfectly fine? 12:07:59
7 MR. BOND: Objection to form. 12:08:02
8 THE WITNESS: I'm saying if you take the 12:08:03
9 position that you don't get -- certain embodiments, 12:08:04
10 you don't get release, a good release from Hummel 12:08:08
11 would be inclined to add something like Schuhmann. 12:08:13
12 BY MR. DOODY: 12:08:17
13 Q. Okay, so where is it in Hummel that Hummel 12:08:18
14 discloses any embodiment where you don't get good 12:08:21
15 release, other than when it stays in the pipe? 12:08:24
16 MR. BOND: Objection to form. 12:08:28
17 THE WITNESS: I don't recall a specific 12:08:30
18 example without going back and reading the patents. 12:08:35
19 BY MR. DOODY: 12:08:35
20 Q. Okay, I don't want you to read it. We 12:08:39
21 don't need to do that. 12:08:42
22 Let's turn to Schuhmann, Exhibit 1007. 12:08:50

1 (MacLean Exhibit No. 1007 was 12:08:58
2 identified for the record.) 12:09:01
3 BY MR. DOODY: 12:09:01
4 Q. That's the English translation of this 12:09:01
5 document. 12:09:04
6 A. I have it. 12:09:07
7 Q. Okay. And I'm going to go to -- let's go 12:09:08
8 down to page 23 -- pages 23 and 24. It's at the 12:09:15
9 bottom of 23 of Exhibit 1007. 12:09:24
10 A. Okay. 12:09:39
11 Q. So these are the examples that are 12:09:39
12 comparative examples. And just above the table 12:09:44
13 that's at the bottom of page 23 of 1007 is the 12:09:49
14 statement that these are comparative examples 1a, 12:09:54
15 which is referenced as V1a, and 1b referenced as V1b, 12:09:58
16 and example B1. Do you see that? 12:10:06
17 A. I do. 12:10:09
18 Q. So do you understand this to mean that 12:10:11
19 example B1 is the invention of Schuhmann, and 12:10:13
20 examples V1a and V1b are comparative examples? 12:10:18
21 Strike the question. 12:11:20
22 A. No, I'm just trying to synthesize the 12:11:22

1 chart, counselor. Just give me a second, unless you 12:11:24
2 want to withdraw it. 12:11:28

3 Q. I'm going to withdraw it. It says what it 12:11:29
4 says. I don't need you to repeat it. 12:11:32

5 Let's just go up a little bit on that 12:11:34
6 page, just for reference, a little bit up page 23 of 12:11:36
7 1007. At the very top, there is abbreviations and 12:11:42
8 then the material. 12:11:47

9 So the last one is LV1. Do you see that? 12:11:48

10 A. I do. 12:11:51

11 Q. And that material is Constab PE-SA 270, 12:11:53
12 correct? 12:11:59

13 A. Correct. 12:11:59

14 Q. And then it says, "(based on 12:12:01
15 ethylene-bis-stearylamide (EBS))," correct? 12:12:03

16 MR. BOND: I think, Pat, did somebody just 12:12:11
17 join the call? We heard a bell here. 12:12:14

18 MR. DOODY: I think it looks like Darien 12:12:18
19 Wallace, at least that's what shows on my screen. 12:12:21

20 MR. D. WALLACE: Yes, Darien Wallace 12:12:27
21 joined, but I will mute myself. 12:12:29

22 MR. BOND: Okay. Just make sure his 12:12:31

1 appearance is on the record. 12:12:33

2 MR. DOODY: Okay. 12:12:35

3 BY MR. DOODY: 12:12:36

4 Q. All right, so LV1 is EBS wax, correct? 12:12:39

5 A. Correct. 12:12:45

6 Q. Okay. And so if we go down to the table 12:12:46

7 at the bottom, V1a has three layers, there's a 12:12:50

8 three-layer structure, layer 1 is 100% PP, which is 12:12:58

9 polypropylene, layer 2 is 100% PP, and layer 3 is 12:13:04

10 100% PP. Do you see that? 12:13:10

11 A. I do. 12:13:12

12 Q. Okay. And then V1b, you can read those 12:13:13

13 layers, but layer 1 is 96% PP and 4% LVI, which we 12:13:18

14 just said was EBS wax. Layer 2 is 100% PPP, and 12:13:25

15 layer 3 is 96% PP and 4% wax. 12:13:32

16 A. I see that. 12:13:41

17 Q. All right. And then B1, the last one, 12:13:41

18 that has the same layer arrangement as V1b, doesn't 12:13:45

19 it? 12:13:51

20 A. It appears to, but this corresponds to 12:13:51

21 layer (a) text. It's throwing me off a little bit 12:14:19

22 but there's not one-to-one correspondence between the 12:14:24

1 V1b column and the B1. Do you see that? 12:14:28

2 Q. Yes. 12:14:29

3 A. But putting that aside, the rest of the 12:14:30

4 composition seems to be the same. 12:14:41

5 Q. Okay. So let's go down to the next row. 12:14:43

6 The next row on the left side says, one-sided 12:14:49

7 embossed structure. Do you see that? 12:14:53

8 A. I do. 12:14:55

9 Q. Okay. And for V1b, it says "no," which 12:14:56

10 means it's not embossed and it's smooth, correct? 12:15:01

11 A. That's what it says. 12:15:04

12 Q. And for B1, it says, "yes," which means it 12:15:06

13 is embossed? 12:15:10

14 A. Correct. 12:15:12

15 Q. Okay. And now we have to turn to the next 12:15:13

16 page. Go down to page 24 of Exhibit 1007. And this 12:15:18

17 is where the separation force is disclosed? 12:15:23

18 A. That's what it says, correct. 12:15:35

19 Q. So the separation force for V1b is 203 and 12:15:37

20 the separation force for B1 is 44, right? 12:15:44

21 A. Correct. 12:15:50

22 Q. So what does that tell you as a person of 12:15:56

1 ordinary skill in the art? 12:15:59

2 MR. BOND: Objection to form. 12:16:04

3 BY MR. DOODY: 12:17:52

4 Q. All right, let me rephrase that. 12:17:52

5 Going back to page 24, we saw that V1b had 12:17:54

6 a separation force of 203, B1 had a separation of 44. 12:18:00

7 By virtue of B1 having a much lower separation force, 12:18:06

8 does that mean that B1 peeled off more easily than 12:18:10

9 V1b? 12:18:17

10 A. It does, but I think another interesting 12:18:18

11 comparative would be V1a to B1. 12:19:03

12 Q. Okay. 12:19:11

13 A. When I add the lipophilic compound going 12:19:20

14 from V1a to B1, I get a reduction in separation 12:19:23

15 force. 12:19:29

16 Q. Right, but if you add the lipophilic 12:19:30

17 compound without embossing, you don't get an improved 12:19:33

18 separation force, do you? 12:19:37

19 A. There could be. With this data set, there 12:19:39

20 could be showing some synergistic action between 12:19:42

21 embossing and lipophilic compound. It doesn't negate 12:19:45

22 the fact that if I just look at the simple comparison 12:19:49

1 between V1a and B1, that there is a net positive -- 12:19:50
2 let me make sure this is clear -- there is a notable 12:19:55
3 decrease in release film force required to release it 12:19:59
4 when you add the lipophilic compound. 12:20:03

5 **Q. Is it your understanding that Schuhmann 12:20:11**
6 **requires the external release layer to be embossed? 12:20:13**

7 A. I would have to go back and look at the 12:20:21
8 that on a claim-by-claim basis. I don't recall off 12:20:31
9 the top of my head. 12:20:35

10 **Q. Would the title help you, page 1 of 12:20:37**
11 **Exhibit 1007? Actually, I'm sorry, page 2 of Exhibit 12:20:42**
12 **1007. The title is Adhesive Products Having an 12:20:49**
13 **Embossed Release Film. 12:20:53**

14 A. It doesn't help me all the way. There 12:20:58
15 could be an embodiment that talks about something 12:21:00
16 other than adding or just having the lipophilic top 12:21:03
17 on, and not having the embossment. Without rereading 12:21:07
18 the patent, I just don't know. 12:21:11

19 And then in your original question, you 12:21:13
20 asked me a requirement which I was, you know, 12:21:15
21 thinking about that being a limitation in an actual 12:21:20
22 claim. 12:21:23

4	A. It does, but so does the lipophilic	12:21:48
5	compound.	12:21:52

8	THE WITNESS: It's a release film for a	12:22:09
9	number of different applications, packaging, and I	12:22:16
0	think there's some other markets that are mentioned	12:22:20
1	there. I don't recall them off the top of my head,	12:22:22
2	but release film.	12:22:25

```
17 | already formed adhesive? 12:22:36
```

22 B, to get the adhesive, would you consider 12:22:59

1 Schuhmann's release film to be useful as a release 12:23:02

2 film when it's adjacent to liquid A and liquid B? 12:23:07

3 MR. BOND: Objection to form. 12:23:17

4 MR. DOODY: That have not yet formed. 12:23:19

5 MR. BOND: Sorry. Now objection to form. 12:23:22

6 THE WITNESS: I don't think it matters. I 12:23:24

7 don't think it matters. Ultimately, you're going to 12:23:26

8 create a tacky substrate, substance there, and that's 12:23:29

9 what the adhesive film is going to be up against. 12:23:33

10 BY MR. DOODY: 12:23:37

11 Q. Okay. Would a person of ordinary skill in 12:23:37

12 the art, if they were to have combined Hummel and 12:23:55

13 Schuhmann as you suggested, ignore Schuhmann's 12:24:00

14 embossing? 12:24:06

15 MR. BOND: Objection to form. 12:24:09

16 THE WITNESS: I don't know if you have -- 12:24:10

17 I don't know if ignore is the right word. There are 12:24:20

18 certain teachings from Schuhmann that you can apply 12:24:23

19 to the combination. I don't think you have to 12:24:28

20 necessarily take the embossment with you. 12:24:30

21 BY MR. DOODY: 12:24:33

22 Q. Okay. All right, let's move to ground 4. 12:24:34

1 That is -- let's go -- 200s. All right, so that 12:24:41
2 begins on page 104 of Exhibit 1003. 12:25:00

3 A. I have it. 12:25:07

4 Q. And the heading is C, Obviousness by 12:25:07
5 Hummel in View of Nagai, correct? 12:25:12

6 A. Correct. 12:25:16

7 Q. Okay. And in paragraph 226 of your 12:25:17
8 declaration, Exhibit 1003, and I'm now on the next 12:25:38
9 page 104, the second full sentence on page 105 of 12:25:41
10 Exhibit 1003 reads, "it would have been obvious for a 12:25:52
11 POSITA to consider and combine Hummel and Nagai 12:25:59
12 because these patents are directed to the same field 12:26:03
13 of art." 12:26:06

14 Do you see that? 12:26:08

15 A. I do. 12:26:09

16 Q. Is Nagai's inner tubular film used for UV 12:26:24
17 or thermal curing? 12:26:36

18 A. It is with hot water. 12:26:38

19 Q. And how is that material of Nagai inserted 12:26:56
20 into the pipe to be repaired? 12:27:02

21 A. It's through an inversion process. 12:27:04

22 Q. And they use water in that process; is 12:27:10

1 **that correct?** 12:27:13

2 A. I believe there's a two-stage watering 12:27:13

3 process, one for the inversion and one for the 12:27:18

4 curing. 12:27:21

5 Q. Okay. And then Hummel, which we've looked 12:27:21

6 at quite a bit, Hummel is disclosing a system that's 12:27:26

7 used in a UV curable system where the material to 12:27:31

8 repair the pipe is pulled in as opposed to inverted, 12:27:37

9 correct? 12:27:41

10 A. On a skim-through, counselor, I'm not 12:27:42

11 seeing any language that talks about limiting it to 12:30:04

12 just one type of inflation method or another. So if 12:30:07

13 you want to orient me to something, I would be happy 12:30:11

14 to read it, but I've just tried to skim through right 12:30:13

15 now to see if I can tease that out. 12:30:16

16 Q. No, that's fine. Let's go to paragraph 12:30:26

17 235, page 108. 12:30:28

18 A. Okay. 12:30:43

19 Q. Are you there? Okay. So that last 12:30:44

20 sentence of paragraph 235 reads, "Nagai teaches both 12:30:47

21 a coating with polysiloxane and a coating with at 12:30:52

22 least one migrating compound, stating:" 12:30:57

1 And then you quote from Nagai, correct? 12:30:59

2 A. Did you say paragraph 235? 12:31:04

3 Q. Yes. So it's on page -- it starts on 107, 12:31:08

4 but it goes to 108. 12:31:11

5 A. Okay. And did you pick up somewhere else 12:31:13

6 besides the beginning of 235? 12:31:15

7 Q. Yeah, I said it was at the end of page 12:31:18

8 235. 12:31:21

9 A. I got it. 12:31:22

10 Q. It's that last sentence with the quote. 12:31:24

11 Are you there? 12:31:38

12 A. I am, yes. 12:31:39

13 Q. Okay. Is it your understanding that this 12:31:40

14 disclosure of Nagai is a disclosure of applying a 12:31:45

15 coating over the external surface of the film? 12:31:50

16 A. Okay, counsel. Sorry, I had to get 12:31:54

17 oriented with some of the figures. Can you repeat 12:34:30

18 your question? 12:34:33

19 Q. In the sentence that we were just 12:34:37

20 referencing -- 12:34:39

21 A. Yeah. 12:34:40

22 Q. -- 235, which includes the quote from 12:34:42

Page 102

1 MR. DOODY: Let me rephrase it so that it 12:37:05
2 makes perhaps a little more sense. 12:37:08
3 BY MR. DOODY: 12:37:11
4 Q. Nagai's not describing the use of 12:37:12
5 compounds here that are added to the bulk polymer and 12:37:14
6 then migrate to the surface, is he? 12:37:18
7 MR. BOND: Objection to form. 12:37:22
8 THE WITNESS: He is disclosing an applied 12:37:26
9 coating to the film. 12:37:30
10 BY MR. DOODY: 12:37:33
11 Q. Fair enough. All right, go to paragraph 12:37:33
12 238 on page 109. Are you there? 12:37:45
13 A. I am there, yes. 12:38:03
14 Q. Okay. Second sentence, "Further, both 12:38:04
15 Nagai and Hummel discuss the need for easy release 12:38:10
16 between the inner tubular film and the resin carrier 12:38:15
17 material of the CIPP liner." 12:38:18
18 Do you see that? 12:38:21
19 A. Yes. 12:38:22
20 Q. Where does Hummel disclose the need for 12:38:24
21 easy release? 12:38:27
22 A. I think that's my descriptive language. 12:38:29

1 If you're going to remove the film, you don't want it 12:38:41
2 to -- I think you used the term seize or hesitate or 12:38:44
3 tear, et cetera. But that's just my interpretation 12:38:47
4 of how they stated the film removal from the Hummel. 12:38:51
5 Q. Okay. And let me go back to a question 12:38:57
6 we've asked and explored quite a bit with Hummel in 12:39:00
7 view of Schuhmann, and I'm going to ask this 12:39:04
8 question. If Hummel informs a person skilled in the 12:39:08
9 art that its film can be withdrawn without tearing, 12:39:12
10 why would you apply the coating of Nagai to Hummel? 12:39:17
11 MR. BOND: Objection to form. 12:39:25
12 THE WITNESS: Again, it's to improve 12:40:52
13 release for those embodiments of Hummel that don't 12:40:54
14 give you the requisite release that you're seeking. 12:40:58
15 MR. DOODY: All right. I have no further 12:41:01
16 questions. 12:41:15
17 MR. BOND: Let's take a little break. 12:41:18
18 We'll let you know if there is any redirect. Ten 12:41:19
19 minutes? 12:41:23
20 MR. DOODY: Sure. 12:41:24
21 (Recess.) 12:41:26
22 MR. BOND: We are not going to have any 12:51:34

1 redirect.

12:51:37

2 (Whereupon, at 12:51 p.m., the instant
3 deposition ceased.)
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22

1 CERTIFICATE OF REPORTER

2

3 UNITED STATES OF AMERICA) ss:

4 COMMONWEALTH OF VIRGINIA)

5 I, Desirae S. Jura, RPR, the officer before whom

6 the foregoing proceedings were taken, do hereby

7 certify that the foregoing transcript is a true and

8 correct record of the proceedings; that said

9 proceedings were taken by me stenographically to the

10 best of my ability and thereafter reduced to

11 typewriting under my supervision; and that I am

12 neither counsel for, related to, nor employed by any

13 parties to this case and have no interest, financial

14 or otherwise, in its outcome.

15 Dated: 06/24/2024

16

17



18

Notary Public in and for the

19

Commonwealth of Virginia

20

21

22 My commission expires: 11/30/2027

DECLARATION UNDER PENALTY OF PERJURY

Case Name: Omega Liner vs. Buergofol, GmbH [IPR2023-01372]

Date of Deposition: 06/20/2024

Job No.: 10144397

I, STEVEN B. MACLEAN, hereby certify
under penalty of perjury under the laws of the State of
Texas that the foregoing is true and correct.

Executed this 26th day of
June, 2024, at Brownwood, Texas.



STEVEN B. MACLEAN

NOTARIZATION (If Required)

State of _____

County of _____

Subscribed and sworn to (or affirmed) before me on
this ____ day of _____, 20__,
by _____, proved to me on the
basis of satisfactory evidence to be the person
who appeared before me.

Signature: _____ (Seal)

1 DEPOSITION ERRATA SHEET

2 Case Name: Omega Liner vs. Buergofol, GmbH [IPR2023-01372]

3 Name of Witness: Steven B. MacLean

4 Date of Deposition: 06/20/2024

5 Job No.: 10144397

6 Reason Codes: 1. To clarify the record.

7 2. To conform to the facts.

8 3. To correct transcription errors.

9 Page 5 Line 8 Reason 3

10 From McLean to MacLean

11 Page 17 Line 13 Reason 3

12 From adhering to engineering

13 Page 25 Line 1 Reason 3

14 From McLean to MacLean

15 Page Line Reason

16 From to

17 Page Line Reason

18 From to

19 Page Line Reason

20 From to

21 Page Line Reason

22 From to

23 Page Line Reason

24 From to

25 Page Line Reason

From to

Page Line Reason

From to

1 DEPOSITION ERRATA SHEET

2 Page _____ Line _____ Reason _____

3 From _____ to _____

4 Page _____ Line _____ Reason _____

5 From _____ to _____

6 Page _____ Line _____ Reason _____

7 From _____ to _____

8 Page _____ Line _____ Reason _____

9 From _____ to _____

10 Page _____ Line _____ Reason _____

11 From _____ to _____

12 Page _____ Line _____ Reason _____

13 From _____ to _____

14 Page _____ Line _____ Reason _____

15 From _____ to _____

16 Page _____ Line _____ Reason _____

17 From _____ to _____

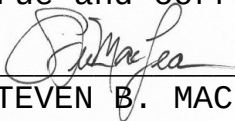
18 Page _____ Line _____ Reason _____

19 From _____ to _____

20 Page _____ Line _____ Reason _____

21 From _____ to _____

22 X Subject to the above changes, I certify that the
transcript is true and correct
23 No changes have been made. I certify that the
transcript is true and correct.

24 
25 _____
STEVEN B. MACLEAN

	1007 79:15 90:22 91:1,9,13 92:7 94:16 96:11,12	102:10,13	45 52:3 54:3
(		20 18:13	48 23:14,17,19
(1) 60:18	100C 68:6,19	200s 99:1	
(2) 60:19	1012 23:21 24:7,12, 21 25:1	203 94:19 95:6	5
(a) 59:20 61:15 66:4, 19 67:13,20 68:1,5 93:21	1024 27:6,9,13 29:5 30:20 33:16 37:21 38:1,18 40:10,11 46:12,15 47:1,13	21 16:2,8 21:9	5 24:11,16,21 52:11 57:3,5,7,8 58:4
(b) 61:15 66:22		226 99:7	51 24:11,13,22
(c) 61:15 67:1		23 16:2 21:9 57:5,6, 10 91:8,9,13 92:6	54 27:7,12,13,16,19 28:2 29:5 30:19 33:16 37:21 38:1 40:10,11
(d) 61:15 67:2	104 99:2,9	235 100:17,20 101:2, 6,8,22	56 24:11,22
(e) 61:15 66:4 67:3	105 99:9	238 103:12	
(f) 60:9	107 101:3	24 91:8 94:16 95:5	
	108 100:17 101:4	2420 66:8	6
0	109 103:12	25 42:18	6 57:4,9
0.1 52:8	10:00 37:2	26 6:21 23:13 66:1	60 59:19
	115 27:15	27 66:2	65 26:19,21 35:6
1	128 60:3 61:4 65:14	270 92:11	66 37:10 38:16 40:3, 21 41:1 45:19 46:5 60:4,7,8,10,11 61:5
1 18:13,15 22:21 59:18 93:8,13 96:10 102:11,12	129 62:6	28 70:19	67 60:4 61:5 62:6 65:11,14 71:13
1(e) 60:9,15	12:51 105:2	3	69 75:20
10 79:14	13 7:17 18:12	3 52:8,11 79:5 93:9, 15	
100 29:2 43:2,22 45:3 67:15	134 75:19 76:7	30 19:22	7
100% 93:8,9,10,14	15 46:13,15,16,22 64:15 90:1	34 57:5,6	7 81:17
1001 18:6,9 57:4,9	16 16:4,8 21:8	36 26:21 35:7 37:12 38:16	71 66:15
1003 15:12,17 21:7 23:13 26:20 35:6 37:11 38:16 40:4 45:19 46:6 49:4 52:2,3 54:3,16 59:18,19 62:5 65:12, 15 70:19 75:20 79:6 83:17 99:2,8,10	17 21:15	37 40:4 45:20 46:5	78 49:5 50:22 54:14, 16
1005 61:8,9 64:15 66:2 81:17	170 84:6	4	79 52:2,5 54:2
	171 79:6 83:17,19 84:6	4 98:22	8
	191 86:20,21	4% 93:13,15	81 79:6 83:17
	1a 91:14	44 49:6 52:3 54:16 94:20 95:6	82 83:18
	1b 91:15		
	2		
	2 66:15 93:9,14 96:11		

882 16:20 17:7 22:21 49:4,9 52:6 54:18 55:15 56:9,16 57:8 80:9,13 81:1 84:3, 10,11,19 85:12	achieving 55:7,11	18 39:15,17 45:22 48:13 62:8 63:4 71:18 72:19 73:16 75:2	apart 12:4
89 28:2	action 95:20	agglomerated 36:7	apologize 12:16 89:8
9	actual 10:16 96:21	ago 48:12 73:15	appearance 93:1
9 24:10,13,14,15,21	add 45:3 83:6 86:17 90:11 95:13,16 96:4	agree 22:19	appears 5:20 26:20 93:20
9,657,882 18:10	added 44:10 103:5	ahead 11:20 59:18	application 20:10 22:22 58:15
96% 93:13,15	adding 96:16	aids 30:22 38:12 46:21	application-specific 34:21
9:00 12:18	additional 32:8 42:7, 10 48:4,15 73:19	allows 14:5	applications 8:8 9:11 18:4 97:9
A	additionally 40:5	alternative 57:15 64:22 79:21 82:21 86:13	applied 29:22 49:14 52:7 55:1 102:2,17 103:8
abandoned 9:15	additive 34:2 35:1,12 42:13 74:12,16	alternatively 25:7	apply 17:2 80:21 98:18 104:10
abbreviations 92:7	additives 27:2 47:1 61:20,21 62:1,6,21 64:3,11,21 65:2,4,8, 16 66:1 70:20 71:1, 5,7,9,16,17 77:1 78:17	amount 13:15 20:8 44:9,11 45:15 77:10, 15	applying 101:14
abherents 28:19	address 5:12,14,16	analysis 7:11 34:21	arbitration 9:1
abhesives 28:19	addressed 84:3,10, 19	analyzed 19:5	area 6:18,22 22:22
ability 14:10 69:14 70:14	adhering 17:13	and/or 67:2	argues 79:22
able 13:16 14:12 19:2	adhesion 66:22 67:2 88:15,18 89:13,15	answer 6:9 10:7 11:2 13:10 43:6 44:16 62:15 66:10 85:9,10, 17	arrange 43:20
absolute 44:15	adhesive 79:19 96:12 97:14,16,17,21,22 98:9	answered 48:11 87:22	arrangement 43:22 93:18
absolutely 87:19	adjacent 89:11 98:2	antiblock 28:20 45:11,13,15 63:4	art 16:6,12,16,18,22 18:20 19:6,15 21:12 34:18 36:15 67:19 69:18 72:20 73:3,5 79:18 80:5 81:10 85:4,8,13 89:5,11 95:1 98:12 99:13 104:9
absorbent 102:11,12	agent 30:16 31:4,8 34:13 38:21,22 39:7, 9,13,18,21 45:11,13 72:4 77:1,21	antiblocking 31:7 62:8 77:1,21	ascibe 36:21
abstract 44:22 66:13 85:21	agents 27:4,5 28:5,9, 16,20,21 29:12,22 31:1 37:15 38:12,17,	antiblocks 27:5	aside 94:3
accommodate 6:10		anticipation 59:20 61:1	asked 13:10 44:2 54:7 87:21 96:20 104:6
accomplish 34:7		antioxidants 72:5,8	asking 43:19 54:5,6 57:18,21 58:3 66:7
achieve 10:9 44:15 49:10 54:19 55:16 64:1,9 65:19,20 70:3,6,15 73:13 74:11,15 82:22		antistatic 71:18 72:4	
achieves 55:20,21 63:12 70:12		antistick 28:20	

68:21	beat 37:22	bonded 24:1 25:6	35:20 62:14 68:4 69:20 71:4
assessing 85:11	beginning 83:17 101:6	Boston 6:22	cetera 7:14 28:20 32:13 63:1 85:6 104:3
assistance 31:13	begins 16:3 23:13 59:19 81:20,22 99:2	bottom 25:19 61:5 91:9,13 93:7	chains 46:1
assume 11:13 14:7	believe 9:14 15:16 23:7 24:13 28:12,17 58:14 59:19 66:6 79:15 100:2	boundaries 47:12	characteristic 41:12, 17,20 44:13
Assuming 6:8	believes 29:12 79:22	break 6:6,8,10,12 37:3,5 75:15,19 104:17	characteristics 32:18 38:8 40:7,15 41:6 97:3
attempting 70:2	bell 92:17	bulk 30:21 31:6 33:22 37:16 103:5	characterized 82:5
attract 36:19	benefit 31:19 32:6,8, 14	C	chart 92:1
author 27:8 29:11	beyond 7:18	call 36:16 60:3 69:7 92:17	chemical 21:4 22:16
automotive 20:6	bill 10:21	called 79:13	chemistry 20:17,18 42:7
aware 9:16,18	binder 12:14,15	Canandaigua 7:3	choice 42:11 75:11, 13
B	bit 7:7 19:17 77:9 92:5,6 93:21 100:6 104:6	candy 20:2	choices 39:19
B1 91:16,19 93:17 94:1,12,20 95:6,7,8, 11,14 96:1	bond 7:2 12:11,20 13:2,7 15:9 24:14, 17,19 27:16,19,21 28:2,5 30:4 35:18 37:5 42:16 43:4 50:2,6,12 51:3,11 53:13 55:12,18,22 56:3 57:7,11,17 58:1,8,11,17,21 59:4 60:10 66:12 68:2,10, 16 69:2 70:1,9,13 71:11,19 72:6,12,22 73:11 74:4,8,17 75:6,21 76:5 77:12 78:19 80:8 81:9,13 84:5,12 86:8 87:21 88:9,16 89:1,6,21 90:7,16 92:16,22 95:2 97:7 98:3,5,15 102:4,21 103:7 104:11,17,22	capabilities 85:2	choose 20:11
back 6:12 9:13,19 10:3 21:6,7 22:7 24:15 33:15 35:5 49:3 51:20 54:15 56:6 59:17 64:7,8 70:18 73:14 83:16 90:18 95:5 96:7 104:5	background 7:6 17:1, 13,16 19:1,4,7,13,14 22:3 23:12,17	capability 26:16	chose 41:9
background 7:6 17:1, 13,16 19:1,4,7,13,14 22:3 23:12,17	backgrounds 19:16	capable 25:7,11,13, 21 26:2,8,14 69:20	CIPP 7:8,9,10,18,20 8:6 10:3,4,21 12:1 14:3 17:9,15 18:2,4, 5 19:14 20:10,12 21:14,22 22:5,8,9,11 23:1,17 103:17
ballpark 71:8 72:18	base 73:4,17	capacity 32:10	circumferential 102:10
based 42:4 56:10 70:5 73:18 87:1 92:14	basically 63:17	care 34:9	citation 24:10 27:6 46:12
basic 19:1,4	basis 66:20 67:1,3 96:8	careful 102:5	cited 23:9 26:13
		carrier 10:8,16 25:6 85:5 87:3,6 103:16	citing 40:10
		carry 14:12	claim 18:13,15 22:6, 21 23:6 60:2,9,15,17 96:22
		case 8:13,19 16:20 61:20	claim-by-claim 96:8
		cavity 30:8,12	
		ceased 105:3	
		certain 20:7,8 45:12 52:15 74:7 77:15 90:9 98:18	
		certainly 8:2 25:13	

claiming 57:19 58:12	70:6 74:22 75:4 80:7 86:2	concepts 84:1,18	corners 70:5
claims 19:16 80:14		concerned 16:19	correct 5:21,22 6:13, 14 18:18 23:1,2 24:14 26:11 27:14, 20 28:3,7 29:12,13, 20 32:13 33:9,10 38:8,9 39:22 40:9,20 41:17 42:9,10 43:11 47:14 49:19 50:1 51:9 55:5 59:1 60:11,15,16 61:17, 21 62:10,11,16 63:21 65:22 68:21 69:15 70:8 72:10 73:9 77:9 78:18 79:10 86:1,4 87:6,7 92:12,13,15 93:4,5 94:10,14,18,21 97:14,15 99:5,6 100:1,9 101:1 102:18
clarify 6:4	comes 15:3 20:14 42:11 48:9 72:11	concerns 61:1	
classes 27:2 33:18 71:9	coming 59:14	conditions 19:11 21:2 68:12,14	
classic 39:14	comparative 91:12, 14,20 95:11	conference 9:8	
clause 50:22	comparison 26:13 95:22	conferences 9:7	
clean 44:8 70:3	completely 12:17 19:2 22:14	configuration 75:8	
clear 78:16 86:19 96:2	components 20:6	confines 89:14	
clearly 71:4 86:11	comport 63:5	confirm 13:13,16 26:18 75:22	
coated 48:8 102:16	composed 66:19	confusing 59:4	
coating 14:17,19 15:2,4,8,11 35:12 46:1,10,19 47:4,8, 10,13,16,20,22 48:10,18 49:10,11, 14,19,20 50:11,19, 21 51:6,16 52:7,15 53:4,9,12 54:7,18, 20,22 55:5,8,16,18, 21 56:9,20 57:15 59:10 60:17,18,19 76:16,20 77:3,11,17 78:2,21 82:22 83:1, 11 86:12 87:1 100:21 101:15 102:2 103:9 104:10	composition 7:12 94:4	consequently 38:5	
	compositions 17:21	consider 35:16 51:14,18 80:13 97:22 99:11	
	compound 31:9 32:9 35:21 41:13 49:12, 14,21 50:9,18 51:1, 14 52:10,22 53:2,10, 17,20 54:1,6,8,21 55:1,4,8 56:17 57:16 60:20 62:13 63:7 70:22 71:6 73:10 77:15 78:18 79:1 80:1 95:13,17,21 96:4 97:5 100:22	considered 15:8 53:3 62:7	
	compound' 87:2	Constab 92:11	correction 58:21
	compounds 35:10 42:1,5 45:9 62:2,9, 20 76:15,22 77:7 83:14 102:19,20 103:5	constructed 19:20	correctly 41:1
		construction 7:13 21:5 23:6	correspondence 93:22
		consultation 10:1	corresponds 93:20
		contact 32:11	counsel 5:6 10:1 43:16 54:4 56:3,22 57:7,19 64:5 82:19 101:16
		contained 49:13,22 50:9,18 51:1,15 53:2,11,18 54:21 55:4	counselor 68:18 88:11 92:1 100:10
		containing 49:14 55:1	couple 21:19 63:11, 15
		context 8:18 60:8,14	court 8:19 75:22 76:3
		conversation 73:15	covering 51:18 52:9, 17,21 53:4,19,22 54:10 56:9,20 59:10 60:19 87:1
		cooking 30:10 39:15	
		copolyamide 67:2,4	
		copolymer 66:21 67:13	create 36:9 77:3 78:2 98:8
coefficient 31:16,21 34:12 77:4			
column 18:13 24:11, 13,14,16,21 57:3,5, 7,8 58:4 94:1			
combination 63:2 98:19			
combine 99:11			
combined 98:12			
come 6:12 9:14 15:1 42:19 51:20 64:21			

curable 10:5,6,19,20 11:8,9 12:10 14:3 24:4 89:11 100:7 cure 11:16 cured 24:1 25:8 69:11 82:12 cured-in-place-pipe 7:8 curing 10:10,14 11:1, 12,17 25:7 64:15 82:18 88:7 99:17 100:4 currently 5:15 cut 102:22 CV 9:7	degrees 20:1,21 67:15 depend 42:21 dependency 48:15 dependent 33:14 depending 10:12,14 15:10 24:3 39:19 42:6 48:3 73:6,21 88:4 depends 11:10,12 34:6 35:1,3 43:12 44:14,16,20 47:18 55:6 68:11 69:4 73:12 78:5 deposition 5:9 6:2 69:3 71:20 105:3 describe 74:11 described 39:4 42:20 45:6 78:21 describes 52:6 describing 67:18 103:4 description 21:11 descriptive 28:18 29:9 103:22 design 78:5 designed 18:2 Desirae 64:7 desire 62:13 74:3,7, 11 81:2 desired 65:20 73:22 80:3,6 83:7 87:4,8 desiring 43:13 develop 85:1,7 develops 47:16 difference 10:5 26:14 39:10,12 53:5,6	56:8,10,13 59:9 90:3 differences 10:4,18 different 8:7 10:21,22 18:3 30:6 33:17 36:17 54:4 67:19 97:9 difficult 85:19 direct 46:20 directed 99:12 direction 78:9,14 directions 78:11 directly 29:22 disagree 56:3,4 87:10 disclose 56:12 87:12, 18 103:20 disclosed 17:9 49:10 54:19 55:16 74:19 76:15 84:11 85:13 94:17 discloses 69:14 89:16 90:14 disclosing 69:17 82:17 100:6 102:1 103:8 disclosure 80:22 101:14 disclosures 74:21 discover 85:15 discuss 103:15 discussed 33:3 77:9 discussing 33:5 56:16 discussion 13:3 16:5 22:8 38:4 46:19 49:4 dispersed 36:5,7 42:15	dispersion 43:17 distinguishing 74:18 district 8:18 9:2 document 23:20 45:2,7 51:3 91:5 documents 5:21 doing 7:17 30:7 42:18 dominated 17:7 DOODY 5:7 12:16,21 13:4,8 15:14 18:8 24:9,15,18,20 27:11, 18,20,22 28:3,7,8 30:18 36:1 37:6,9 43:1,7 50:4,8,15,16 51:8,12,13 53:16 55:14,20 56:2,5,7 57:8,14,20 58:7,10, 14,20 59:1,6,7 60:11,13 61:11 64:7 65:7 67:6 68:7,13,20 69:8 70:7,11,17 71:14 72:2,9,15,17 73:8 74:1,6,10 75:3, 10,15,17 76:6 77:13 79:3 80:12 81:11,14, 16 84:8,14 88:3,12, 20 89:3,7,9 90:4,12, 19 91:3 92:18 93:2,3 95:3 97:13 98:4,10, 21 102:15 103:1,3, 10 104:15,20 dot 67:5,7 doubt 20:16 dovetails 21:1 Dr 5:8 15:21 25:1 56:8 59:16 76:8 drive 78:9 dude 12:22 duly 5:4
D			
Darien 92:18,20 data 95:19 days 9:14 dealing 34:3 death 37:22 decision 34:2,17 declaration 12:13 15:17 21:7 23:9 25:10 26:10,20 35:5 37:11 38:15 45:19 49:3 52:2 59:17 60:4 61:1 62:5 65:12 70:18 75:20 83:16 99:8 decrease 96:3 defects 7:13 19:11 definitive 73:2 degree 26:1,16,17 42:5			

duties 31:11	embossing 95:17,21 97:2 98:14	examples 43:21 45:21 65:19 66:1 91:11,12,14,20 97:1	23:9
E	embossment 96:17 98:20	Exceed 66:6	expertise 68:22
earlier 22:5 33:18 39:14 77:10	emulsion 36:11	excerpt 61:6 65:10, 11,15	explain 10:3
ease 26:17 73:6	encompass 29:19	excerpted 61:14	explained 47:15
easier 32:12,13 34:10	encountered 68:14	exercise 13:20	explored 104:6
easily 24:2 25:11,12, 16 26:8,10,14 95:8	end-use 21:16,18	exhibit 15:12,17 16:3, 4,9 18:6,9,13 21:7 23:13,21 24:7,12,21 25:1 26:20 27:6,9, 12,19 29:5 30:20 32:17 33:16 35:5 37:11,20 38:1,8,17 40:4,10,15 45:19 46:5,12,19,22 47:13 49:4,6 52:2,3 54:3, 16 57:4,9 59:17,19 61:7,9 62:5 64:15 65:12,14 66:2 70:19 75:20 79:6,14 81:17 83:16 90:22 91:1,9 94:16 96:11 99:2,8, 10	expressly 62:14 74:19
easy 25:21 26:4,7 103:15,21	energy 10:12		exterior 32:20 39:1 40:8,17 42:6,8,14 49:12,15 54:20 55:2
EBS 45:13 92:15 93:4,14	engineer 20:3 21:1		external 14:17 15:2 27:4 30:9 31:15,16, 18 37:15,17 38:16, 18 39:9,13,15,20 40:7 41:5,12,16,19 44:12 48:5 49:13,19, 20,22 50:10,13,18 51:1,15 53:3,11,18 54:22 55:4 66:4 76:14 87:3 88:5 96:6 101:15 102:6
education 6:17	engineering 17:8 20:22		externally 46:1 47:4 48:7
effect 28:19 29:9 37:17 38:6 43:10,12 44:3,4,17,20 45:6 49:11 54:19 55:11, 17,21 64:1,9 65:20 70:12 73:14,22 74:3, 12,15 80:3,6,21 81:2 83:7 86:13 87:5,9	entire 11:19 29:3 78:5	exhibits 12:13 13:1	extra 89:18
effects 45:10	equal 78:12	exist 31:22 80:16 85:16	extruded 8:3 31:17
either 10:10 12:3 23:22 47:1	equipment 47:6,11, 17,20	exists 25:19	extruder 32:7 48:9
elasticity 82:6	error 56:19 57:2,12, 13 58:4,5,9,13,21	exits 47:19	extrusion 77:5
element 60:15,17 83:6	essential 12:2	exothermic 11:17	F
email 12:22	et 7:14 28:20 32:13 63:1 85:6 104:3	expect 48:19 65:18 69:18 78:12	facilitate 63:7
embodiment 63:6 65:21 75:1,5 83:2 86:14 87:13 90:14 96:15	ethylene-bis- stearylamine 92:15	expected 69:20	facilitates 30:14 83:15
embodiments 70:5 87:10,15 89:17 90:9 104:13	eversion 12:3,8 13:17	expectedly 29:21	facing 76:13 85:12 87:3
embossed 94:7,10,13 96:6,13	exact 21:21 63:15 90:1	experience 7:7,10,22 8:22 16:18 17:1	fact 39:6 62:19 78:11 95:22
	exactly 56:17	experiences 7:9	
	EXAMINATION 5:6	expert 8:10 20:16,17	
	examined 5:5		
	example 30:6,16 31:7 34:8 36:10 37:14 39:16 44:1 45:11 77:2,21 90:18 91:16, 19		

failure 7:10	finds 32:19 33:9 40:17	80:8 81:13 82:3,4 84:12 86:8 87:21 88:9,16 89:1,6,12,21 90:7,16 95:2 97:7 98:3,5,15 102:4,11 103:7 104:11	GE 9:13,20
fair 13:9,15 26:5 34:22 37:1 75:14 82:16 103:11	fine 12:16 90:6 100:16	formed 48:9 52:9,21 54:1 97:17 98:4	general 12:7 14:18 19:7 25:20
far 9:16,18 22:8	finish 67:10	forms 30:13 35:12	generally 33:4
farming 7:2	finished 8:2	formulation 42:19 83:1,15	generate 11:18
feel 6:4	firmly 24:1 25:6	formulations 66:3	generic 71:9,16
felt 24:2 25:6	first 6:16 18:15 23:16 27:1 28:10,15 29:4,6 32:15 37:14 38:3,15 39:1 40:13 42:17 46:20,21 49:8,9 50:22 52:14 53:8 54:13,15 57:14 58:12 60:8 79:17 81:19 86:2,22	found 28:1 64:5 66:1 82:1 86:22	generically 23:1
field 7:12 16:19 19:13 20:8 21:2 22:4 85:8 99:12	five 29:6 61:17	four 70:5	German 58:16
figure 71:8 72:18	flaws 19:11	fourth 28:11,17 29:4 33:15	getting 12:2 86:15
figures 101:17	flexibility 65:5 75:12	fragment 51:7	give 8:15 20:4,7 29:6 31:12 45:9,14 71:5 73:1 80:5,21 92:1 97:20 104:14
filed 9:13 58:15	flow 32:12	frame 47:18 68:4	gives 75:1,12
filing 84:9	focus 60:1	free 6:4	giving 63:6
film 10:4 11:4,7,8,11 14:16 15:2 18:4 19:20 20:1,15 21:17 22:3 48:9,10 49:12, 13,15,22 50:10,14, 19 51:2,15 52:7,9 53:3,11,18 54:21,22 55:2,5 61:16 62:22 63:3,8,19,20 64:16, 17 66:16,17 67:19 68:15 69:10,14,19 70:3,15 76:12,14 80:2,10,19 81:4,7 82:2,3,4,17 83:2 85:2,5 86:5,14 87:4, 5,16,17 88:19 89:12, 13 96:3,13 97:8,12 98:1,2,9 99:16 101:15 102:3,10,13 103:9,16 104:1,4,9	follow 63:22	friction 31:16,21 32:10 34:12 77:4	go 11:11,20 21:6 24:12,15 33:15 35:5, 6 45:18 46:15 49:5 54:15 59:17 60:7 63:14 71:6 73:14 75:19 77:22 81:17 83:16 86:21 89:18 91:7 92:5 93:6 94:5, 16 96:7 99:1 100:16 103:11 104:5
films 8:1,3,6 10:8,16 22:4 50:13	following 14:16 88:10	frictional 31:21 77:4	goes 12:4 21:9 61:5 63:5 69:2 101:4
find 23:18 28:10 57:3 63:14 65:10	follows 5:5 18:16 64:8	front 13:14 15:16,20 45:3	going 11:16 16:1 23:4,11,17 26:12 33:13 35:6 36:4,6 40:21 41:7 43:8,10 44:12 45:4,5,14 47:10,20 48:10,13 49:5,8 52:1 59:2 60:1 65:3 67:9 73:16 76:10 77:20,22 78:2, 16 83:18 84:15 89:12,15 90:18 91:7 92:3 95:5,13 98:7,9 104:1,7,22
	force 94:17,19,20 95:6,7,15,18 96:3	full 99:9	
	forces 31:21 77:5	fully 6:3	
	forget 78:6	function 44:14 73:7	
	forgot 12:17 13:2	functionality 80:5	
	form 15:9 30:4 35:18 42:16 43:4 45:5 47:8,10,20 51:11 64:17 66:12,17 68:2, 10,16 70:1,9,13 71:11,19 72:6,12,22 73:11 74:4,8,17 75:6 77:3,10,12 78:19,20	further 52:6 103:14 104:15	
		furthermore 82:11	
		G	
		gas 22:15	

good 5:8 23:8,10 30:6 31:7 67:21 82:5,6 85:10 90:10,14	heard 92:17	Hummel's 66:11 69:19 71:1 81:7	inevitable 38:6
goods 8:2	heat 10:11,15 11:18	hundred 21:19	inflation 82:8 100:12
Google 22:18,19	heating 22:16	hypothetical 43:20 88:11 97:20	influence 78:14
Googled 22:13	help 52:1 96:10,14		information 11:16
great 5:11 6:15 7:6 16:11,15 18:12 23:10,16 27:1 35:9 37:6	helps 65:12 66:15	I	informed 34:2,16
greater 6:22	hesitate 104:2		informs 104:8
grew 7:2	hey 12:22 20:7 41:11	identified 15:13 18:7 24:8 27:10 61:10 76:2,4 91:2	ingredients 17:20 66:8
ground 19:10 59:18 79:5 98:22	high 32:18 33:7 40:16	identify 58:18	injecting 30:11
grow 6:19,20	higher 67:22	ignore 98:13,17	injection 30:7,15
guess 11:5 34:6 42:21 71:3	highlighted 77:8	Im 86:16	inner 11:8,11 23:22 24:3 25:5 26:6 63:19,20 64:18 76:12,14 87:4,5 99:16 103:16
guidance 73:19	hindsight 80:17	immediately 45:4	inorganic 17:19
guide 45:16	history 58:19	imparting 10:13	inserted 99:19
guidelines 45:8	home 5:16	important 67:7	insertion 14:2 18:16 82:10
	homogeneous 42:2	impregnated 24:1	inside 14:10 17:3,6
	homogeneously 42:14 44:11	improve 86:18 97:2 104:12	insight 34:19
	homopolyamide 67:1,4	improved 95:17	installation 7:14
	homopolymer 66:21 67:13	improvement 67:18	installed 19:7
H	hot 99:18	in-house 10:1	installing 12:1
	hour 73:15	inclined 90:11	instance 34:14 83:2
H-U-M-M-E-L 61:7	Hummel 59:20,21 61:1,7,16 62:7,12, 19,21 63:9,12,18 64:1,9,14 65:8,11, 15,16,19,20 67:18, 21 69:9,13,21 70:8, 10,14 72:3 74:11,14 75:7,18 79:9,11,20, 22 81:3,4,6,7,12,17 82:16,20,22 83:5,6,9 84:2,18 85:3 86:5,7, 10,17 87:4,8,12,18 89:16,19 90:10,13 98:12 99:5,11 100:5, 6 103:15,20 104:4,6, 8,10,13	include 27:3 33:19 65:22 87:1	instant 105:2
hail 6:22		includes 101:22	intellectual 8:22
hairs 38:20		including 28:19	intended 32:16 40:6, 14
handful 15:7		incorporate 30:21 75:2	intent 35:3,4
handled 9:22		incorporated 31:5 33:21 37:15 38:17 40:5	intentional 51:10
happen 78:17 83:11		indication 58:4	inter 8:20
happy 6:4,10 37:3 59:13 100:13		induce 11:12	interact 34:20
head 13:11,21 23:5 78:7 96:9 97:11		industry 45:16	interacting 17:21
heading 28:5 79:8 99:4			
hear 12:12			

interesting 95:10	isolated 8:8 20:10	known 27:2 28:18 29:8 31:1 38:12 45:15	licensed 20:22
interface 88:14	issue 7:11 16:19 85:10	knows 63:5	light 11:11 14:5,10,12 52:1
interior 39:2 66:22 78:13 88:19	issued 9:10,17		likewise 32:16 40:14
internal 14:4 27:3 31:1,4 32:17 34:10 38:6,12 39:7,13,18 40:6,14 41:20,22 44:9 45:21 48:12 75:9	issues 7:13 19:12	L	limit 26:13
internally 34:15 45:22 48:7	ITC 9:1	labeled 23:21	limitation 96:21
internally.' 47:1	item 60:8	Lake 7:3	limited 22:16,22 97:19
interpretation 104:3	J	language 100:11 103:22	limiting 100:11
interrelated 83:22 84:16	join 92:17	largely 10:7 17:7	line 11:21 57:9 58:2 76:1
interrupting 89:7	joined 76:4 92:21	layer 15:5 49:13,22 50:13,18 51:1,15 53:3,11,18,21 54:6, 8,22 55:4 66:19,22 67:1,2,3,13,20,22 68:5,8,9 73:17 78:4, 6 86:18 87:19 88:5 93:8,9,13,14,15,18, 21 96:6 102:12	liner 14:5,10 75:9 103:17
Introduction 28:6,10 40:13	journal 14:22	layers 17:21,22 61:15,17,19 66:4,19, 22 67:5 78:13 93:7, 13	lines 24:11,13,21 57:5
invention 18:22 64:16 66:11,16 68:5 80:15 82:2 85:7 91:19 97:18	journals 9:4	lays 66:13	lipophilic 87:2 95:13, 16,21 96:4,16 97:4
inventive 65:19	jumping 54:10 59:18	leave 65:4	liquid 98:2
inventor 9:12 80:18 85:15	K	left 21:8 94:6	liquid-tight 66:16
inventors 10:2	keep 67:9 89:7	let's 11:13 14:7 18:9 21:6 26:19 33:15 34:8 35:5 37:5,10 45:18 46:15 49:3 54:15 59:17 75:19 79:4 81:17 83:16 86:21 90:22 91:7 92:5 94:5 98:22 99:1 100:16 104:17	liquids 97:21
inverse 69:5	key 41:21	letter 60:8	list 8:14 29:11,15,16, 17 33:17 61:21 62:1, 21 71:2,8 77:1 78:17
inversion 12:3,8 14:2 99:21 100:3 102:7	kind 31:11 45:10 83:11	level 20:8	listed 9:11 33:20 62:7 64:3,11 66:5 71:5,7, 17 72:19
inversions 13:18	know 6:2,18 7:3,19 8:17 9:21 11:15,19 12:9,11 13:9 17:14 18:21,22 19:17,19, 21 20:4,13,18 21:20 22:14 23:8 24:19 34:5 36:11,21 37:2 43:8,10 44:18,19 45:4 56:15 57:21 58:11 67:14 68:3 71:21 72:1 73:5 85:11,18 86:1 88:21 89:5,11 96:18,20 98:16,17 104:18		listing 62:20 70:19
inverted 100:8	knowing 21:1 35:4		lists 71:9
investigation 7:11, 15,16	knowledge 14:18 16:18 17:1,17		litigation 9:2
investigations 7:18, 19			little 7:7 19:17 41:4,5 69:1 92:5,6 93:21 103:2 104:17
IPR 9:2			live 5:17 6:16
			living 7:4
			located 102:14
			lodged 56:4

long 71:2,3	manufacturing 31:10	mechanism 11:1	83:14 100:22
longer 77:1	36:6	36:21	102:19,20
look 8:14 17:5,17	Mark 27:8,12,13	mechanisms 39:4	migration 35:17 36:4,
41:11 62:4,18 74:20	37:21	melt 19:22	15,22 38:5 40:11
76:10 80:3 83:18	market 8:9	melted 35:11	53:9 54:11 78:9,10
86:9 95:22 96:7	markets 97:10	membrane 23:22	million 21:19 42:12
looked 84:1,17 100:5	material 11:20,21	24:4 26:7	43:3 45:3
looking 7:12 12:14	12:2 15:6,8 20:11	mention 68:17	mind 9:14 15:3 59:15
13:17 17:3 25:16	25:5 30:22 31:12,14	mentioned 22:4	minute 46:16 56:18
44:17,21 45:2,11	32:19 33:9,11,14	29:14 31:20 33:18	79:16
80:3,14,20 82:20	34:11 36:4 39:17	40:12 51:7 69:13	minutes 37:7 90:2
85:1	40:1,8,17 42:7,8	70:4 87:15 97:10	104:19
looks 92:18	48:3,4 59:9 69:7	mentioning 43:17	mischaracterizes
lot 7:18 102:18	73:3,7,19 87:3,6	mentions 21:14 38:7	50:3 53:13 72:13
loud 49:1	89:17 92:8,11 99:19	55:18	74:5,9 81:9
lower 52:18 67:20	100:7 102:11,12	messed 24:18	miscible 35:10
68:9 69:1 95:7	103:17	metal 32:4,7 47:5,11,	missed 46:4
lubricant 34:10 38:6	materials 10:22	14,17,22 48:2,8,20	misstatement 55:22
39:18 44:10	17:19,20 21:4 24:3	method 100:12	misstates 55:12
lubricants 27:4 28:21	32:16 33:17,18	microns 52:8,11	mix 34:11 44:10
32:17 40:7,14 45:20	34:18,19 40:5,14	migrate 27:2 33:2,11,	mixed 34:13 42:1,2
46:22 62:8	42:1 78:21 102:2	21 35:2 37:16 39:8,	mixing 42:3,22 97:21
Lupolen 66:5,8	matrix 35:22	19 40:22 41:15	modify 89:19 90:6
LV1 92:9 93:4	matter 17:3,5 26:1	48:13 77:16 78:4	mold 30:8,9,12,14,15
LVI 93:13	78:10,11	103:6	32:13
	matters 9:1,2 98:6,7	migrated 52:10,22	molded 31:17
	McLean 5:8 25:1	53:7 54:1,2 78:3	molding 30:7
	mean 9:21 25:11,21	migrates 32:5 34:5,	molecule 31:8 36:20
	30:3,5 36:2 63:14	14 36:2 40:8	molecules 15:7 36:9,
	71:3 73:20 78:6	migrating 35:10	13,18 43:9,19,22
	85:21 91:18 95:8	36:13 48:6 49:12,14,	77:22 78:1,15 79:1
	102:21	21 50:9,18 51:1,14	molten 32:6
	meaning 14:18	52:10,22 53:2,10,17,	morning 5:8
	means 15:4 35:20	20 54:1,5,8,21 55:1,	motile 35:21
	47:15 58:12 63:20	3,8,9 56:16 57:16	motivation 86:19
	94:10,12	60:20 62:2,9,13,20	
	meant 43:21	63:7 70:22 71:6	
	mechanical 20:3,22	73:10 76:15,21 77:7,	
	82:5	15 78:18 79:1 80:1	
M			
M-A-C-L-E-A-N 5:14			
machinery 32:2			
maclean 5:3,13			
15:12,21 18:6 24:7			
27:9 56:8 59:16 61:9			
76:8 91:1			
making 7:22 8:2			
17:20 78:8			
manufacturers 45:9			

move 13:4 51:20 75:21 77:2 78:15 79:4 83:18 98:22	net 43:18 96:1	79:9 85:11 99:4	order 70:22
movement 35:21 36:8 42:8 48:16	never 42:19	occurrence 35:20	ordinary 16:5,12,15, 17,21 18:20 21:12 23:7 36:14 69:18 72:20 79:17 89:4,10 95:1 98:11
moves 31:13,15	new 5:17,18 6:19,20 7:2 79:13	occurring 82:7	
moving 31:18 48:4	night 12:12,18 22:14	odd 23:10	
multi-layer 66:16 68:15	nonwoven 24:2	oil 36:10,11,17	organic 17:19
multilayer 61:16 64:16 82:1,3,4	normally 68:14	okay 5:11 7:1,22 9:3 12:8 14:13 16:11 19:17 21:6 22:21 23:4,15 24:17 25:3, 20 26:19,22 27:21 28:15 29:14 30:19 31:18 32:15 33:15 34:8,22 35:9 37:1, 10,13 38:2 39:11,22 45:18 46:9,14,18 51:18 52:4,20 60:1, 5,22 61:4,14 62:4,12 64:5 65:18 66:11 67:9 70:21 75:4,14 76:10 79:4,7,8 80:22 81:18,19,22 83:21 84:9,21 85:4 86:21 87:17 89:16 90:13, 20 91:7,10 92:22 93:2,6,12 94:5,9,15 95:12 97:1 98:11,22 99:7 100:5,18,19 101:5,13,16 103:14 104:5	orient 56:22 59:12 100:13
mute 92:21	notable 96:2		oriented 101:17
	Notary 5:4		original 96:19
N	notes 49:2		originally 58:15
	notice 5:19 9:6 50:10		outcome 41:8
Nagai 99:5,11,19 100:20 101:1,14 102:1 103:15 104:10	number 8:7,15 18:3, 10 21:20,21 28:16 30:5 45:1 72:19 73:2 97:9		outcomes 64:14
			outer 76:13 87:19 102:2,6,10
Nagai's 99:16 102:19 103:4	O		outside 32:9 39:8 41:14 66:21 67:4 69:2 71:19
name 5:12,19 27:8	oath 6:13		overall 10:13
nanometers 52:11	Object 50:2 68:2 70:13		OWNER 5:6
near 7:3	objection 15:9 30:4 35:18 42:16 43:4 50:6,12 51:3,11 53:13 55:12 56:4 66:12 68:10,16 69:2 70:1,9 71:11,19 72:6,12,22 73:11 74:4,8,17 75:6 77:12 78:19 80:8 81:9,13 84:12 86:8 87:21 88:9,16 89:1,6,21 90:7,16 95:2 97:7 98:3,5,15 102:4,21 103:7 104:11	olefin 66:20 67:12	
necessarily 13:12 33:13 41:3,18 43:18 73:9 76:16,19 98:20	needed 19:3,22 20:19 77:10	once 85:18	P
necessary 61:19 65:17	need 6:6,11 8:14,16 11:5,15,19 17:2,11 18:21 19:17,19,21 20:7,19 21:4 65:2,4, 8 80:3 81:1 83:6 86:17 90:21 92:4 102:5 103:15,20	one-sided 78:8 94:6	P-H 5:20
needed 19:3,22 20:19 77:10	negate 95:21	one-to-one 93:22	P-I-T-T-S-F-O-R-D 5:18
		ones 9:14 76:22 77:7	P-O-S-I-T-A 16:17
		onset 36:5	p.m. 105:2
		opinion 18:19	packaging 97:9
		opposed 100:8	page 16:3,7,8 18:12 21:8,15 23:13 24:10, 13,15,21 26:20 27:7, 12,13,15,16,19 28:2 29:5 30:19 33:16 35:6 37:11,21 38:1, 16 40:4,10,11 45:19 46:5,12,15,16,22
		opposing 36:20	
		options 64:20	
	obviousness 59:20		

49:5 52:2,3 54:2,16 57:4,9 59:19 60:7,8, 10,11 61:5 62:6 64:15 65:11,13,14 66:15 71:13 75:20 79:6 81:17 83:17,18 84:6 91:8,13 92:6 94:16 95:5 96:10,11 99:2,9 100:17 101:3, 7 103:12 pages 16:3 60:4 66:1 91:8 pair 34:2 Pam 30:10 39:15 paragraph 16:7,8 21:8,9,15 23:14,16, 19 25:4 26:19,21 28:10,16 29:4 32:16 35:6 37:10,22 38:3, 16 40:3,13,20 41:1 45:19 46:4,21 49:5 50:22 52:2,5 54:2, 14,16 60:3 61:4,14 62:5,6 64:4,12 65:14 70:19 71:13 72:19 75:19 76:7 79:6 81:19 83:17,19 84:6 86:20,21 99:7 100:16,20 101:2 103:11 paragraphs 16:2 21:11,13 parameter 11:19 parameters 20:14 45:16 parentheses 60:9 part 30:15 31:17,22 32:1 39:1 42:12 46:9 52:14,16,20 53:8 55:9,19 60:2 partes 8:20	partially 66:18 68:15 81:3 participate 9:19 particular 8:4,9 17:6 31:8 35:21 45:13 73:17 82:2,6,8 particularly 32:18 33:7 40:16 parts 10:17,18 43:2 45:3 pass 14:6,11 passage 25:13 26:8, 9,15 38:21 77:8 Pat 92:16 patent 5:6 9:11,20 14:16,22 16:19,20 17:2,6 18:1,2,5,10 19:2,12 22:21 23:20 25:15,18 49:4,9 51:22 52:6 54:18 55:15 56:9,16 57:1,8 58:9,13 62:18 64:13 65:5 70:4,5 74:20 75:12 78:6 80:13 81:1 83:13 84:3,10, 11,20 85:7,12 96:18 patent's 8:11 patents 9:10 13:18 17:4 90:18 99:12 Patrick 12:11 27:17 PE-SA 92:11 peel 87:13 88:6,14 peeled 82:12,17 83:9 95:8 peeling 86:6 peer 9:3,9 pending 6:8 9:10,13 53:15 72:14 89:2	percent 29:2 perfectly 90:6 performance 21:16 performances 21:18 performs 31:11 permeable 66:18 68:15 permit 11:13 permits 11:11 person 16:5,12,15, 17,21 18:20 21:12 36:14 69:17 72:20 79:17 89:4,10 94:22 98:11 104:8 phase 35:12,16,19 36:7,8,9,16,20 phases 36:17 Phillips 23:6 physical 21:3 pick 78:22 101:5 picking 73:16 90:2 piece 80:4 pipe 7:13,18 12:2 18:17,21 19:6,7,13 20:5 21:2,14 22:7, 10,11 23:3 64:19 82:9,10 90:15 99:20 100:8 pipes 22:16,17 82:8 piping 19:10 Pittsford 5:17 6:16 7:4 place 78:11 86:12 placed 19:10 places 63:11 plain 23:7	plastic 48:21 play 64:21 please 5:11 6:3,7 15:19 51:19 point 41:8 55:19 65:3 77:19 80:16 82:20 83:5 86:17 pointed 76:22 polymer 11:3 17:8, 13,20 19:15 20:4,16, 18 27:3 30:12 31:6 32:2 33:22 34:2 35:11,22 36:5 37:16 40:6 44:10 45:4,22 46:2,20 47:8,11,17, 19,21 48:3 67:22 68:22 73:17 88:5,7 89:12 103:5 polymeric 20:11 21:16,19 polymers 8:3 11:4 34:12 66:6 68:22 73:4 polypropylene 93:9 polysiloxane 49:11, 20 54:20 60:18 100:21 pop 32:13 portion 23:12 24:22 26:5 50:17 portions 56:12 POSITA 16:17 17:11 62:7 84:1,17 86:22 99:11 position 82:21 83:4 86:11 90:9 positive 58:15 96:1 possess 17:11
--	---	--	--

possibilities 49:18	process 9:20 11:18 31:10,13 35:17 42:3, 22 48:16,18 77:19 99:21,22 100:3	Q	reading 14:15,21,22 25:3,18 49:1 51:22 90:18
possible 30:21		qualifiers 33:6	reads 18:16 30:20 32:16 35:10 37:14 38:11 40:4 45:20 49:9 52:6 60:17 83:21 99:10 100:20
possibly 32:4 80:5	processing 30:22 31:13 32:2,5 33:22 34:11 37:16 38:11 42:4 46:21 47:5,20 48:8	qualifies 52:21	reality 41:22
potential 62:21	product 22:1 97:14	question 6:3,8,9 10:8 11:6 13:5,10 14:1,20 22:2 50:7 51:9,12,19 53:15,17 54:4,5 63:22 64:6,9 72:14 77:14,19 80:11 81:15 84:13 85:9 88:2 89:2 90:1 91:21 96:19 101:18 102:1 104:5,8	really 11:19 39:3 43:5 44:16 55:6 69:4 77:6 89:8
PP 93:8,9,10,13,15	products 21:17 22:3 96:12	questioning 58:2	rearranged 41:4
PPM 42:22 43:22	promoter 66:22 67:2	questions 104:16	reask 11:6
PPP 93:14	properly 42:2	quite 77:9 100:6 104:6	reason 6:7 28:13
practice 19:3 42:20	properties 11:4 19:21 20:15,18 21:3,4 82:5	quote 61:6 65:15 101:1,10,22 102:9	reasonably 65:18
preamble 23:2	property 8:22	quotes 63:16	recall 56:14 59:11 90:17 96:8 97:11
preceding 82:9,10	prosecution 9:20,21 58:19	R	Recess 37:8 75:16 104:21
predetermined 41:8	provide 8:11 37:17 83:22 84:16 87:4	radiation 11:13 66:18 68:15	record 5:12 15:13 18:7 24:8 27:10,17, 19 44:8 57:18 58:6 59:3 61:10 66:14 88:22 91:2 93:1
preferable 75:8 83:2	Public 5:4	range 45:12	redirect 104:18 105:1
preferably 52:8,10,19 64:17,18 66:17	publication 14:15	ranges 45:10	reduce 31:20 32:10 34:11 77:4
premised 54:13 74:7	publications 9:7	raw 17:18,20	reduced 31:12
premising 74:2	published 9:3	reaction 11:17	reduces 31:15
present 50:21	pull 74:21	read 14:16 17:1,10 19:2,6 26:17 29:3 41:1 46:6 51:6 54:17 55:7 56:5 59:13 64:7,8 66:14 84:15 86:21 90:20 93:12 100:14	reduction 95:14
pretty 8:6 66:14 67:7 71:2	pull-through 12:5	readily 65:1 80:20	refer 12:5 18:9 38:18 49:8 79:15
previous 77:8	pulled 64:18 100:8		reference 23:20 25:14 27:16 37:20 39:4 47:18 48:19 61:6 65:13 79:12 80:4 89:20 92:6
previously 53:10 85:16	pulling 69:21		
prior 19:6,15 67:19 80:4 81:1,10 85:4,6, 13	purported 68:5		
probably 38:20 40:2 41:2	purportedly 80:10 84:3,10,19		
problem 12:20 67:21 69:9,19 85:15,18 86:2,7	purpose 97:6		
problems 84:3,10,19 85:12,22	put 31:8 39:5,17 41:3 65:2 83:3,14		
proceeding 8:19	putting 63:4 94:3		
proceedings 9:9 15:18			

referenced 55:5 56:17 91:15	remedying 19:12	residue 30:14 48:1	saying 40:1 41:21 42:18 43:20 44:5 58:3 63:16 80:18 85:4 86:16 90:8
references 13:13,19 64:5 83:22 84:16 102:6	remember 54:14	resin 10:5,6,8,9,10,17 24:1,4 25:6,8 30:12 31:9 82:11 85:5 88:6,7,18 89:11 102:11,12 103:16	says 15:2 20:14 22:7, 15 23:22 25:10,13 26:8,10 28:17 33:10 38:16 40:19 45:3 46:9 47:13 50:3,13, 17 53:22 55:15,21 57:15 63:18 64:15 65:17 68:18 69:22 72:3 74:14 76:11 81:6,7 86:5 88:22 92:3,4,14 94:6,9,11, 12,18 102:9,17
referencing 61:16 101:20	removable 24:2 25:11,16 26:7,11	resins 11:16	schedule 6:11
referred 7:8 61:7 79:5	removal 25:8,11 70:16 104:4	respect 7:11	Schuhmann 79:9,13 84:2,18 85:3 87:2 89:19 90:11,22 91:19 96:5 97:2,6 98:13,18 104:7
referring 39:16 57:12	remove 25:22 87:20 104:1	rest 94:3	Schuhmann's 79:18 98:1,13
regarding 8:11 57:18	removed 25:21 26:3 76:12 86:15 87:16, 17	result 43:18 76:16,19 77:16	science 17:8,13 19:15
relates 66:16	removing 63:2	retained 8:10	scientific 15:1
relationship 69:6	renovation 18:17,22 22:7 23:3	reversed 50:4	scientist 20:4
relative 17:8,9 19:20 65:3 71:3 73:6	repair 21:14 22:10,12 82:7 100:8	review 8:20 9:4	scope 69:3 71:20
relatively 15:5	repaired 64:19 82:11 99:20	reviewed 9:9	screen 92:19
release 27:4 28:5,9, 16 29:12,22 30:9,15, 16 31:1,4 32:17 37:15,17 38:8,12,17, 18,22 39:7,9,13,15, 17,21 40:7,15 41:6, 12,16,19 43:10,12, 19 44:3,4,12,17,20 45:15,22 48:13 49:11 54:19 55:11, 17,21 62:22 63:7,9, 13 70:3,15 73:14,16 74:3,12,15 75:1,2 79:19 80:3,6,10,19 81:2 83:7,15 85:5 86:13,18 87:5,9 90:10,15 96:3,6,13 97:2,8,12 98:1 102:11 103:15,21 104:13,14	right 6:1 7:1,6 8:16 11:7,22 15:15 17:15 19:18 22:17,20 23:11 27:1 28:13 29:6 36:6 37:6 41:2, 5 43:2 44:2 48:6,22 52:18 53:9 55:18 60:20 70:8,18 71:2 74:2 75:5,11 79:9 80:2,11 81:3 84:6 85:8,13,16,20 86:2 93:4,17 94:20 95:4, 16 97:20 98:17,22 99:1 100:14 103:11 104:15	se 36:22	sealed 82:4
released 81:5,7	repeat 14:1,20 64:6 72:16 92:4 101:17	RIT 6:17	second 33:8 35:9 38:4 40:22 48:12 50:5 52:5,16,20 57:4 76:11 81:22 92:1 99:9 103:14
releasing 69:10	repel 36:19	row 94:5,6	secondary 80:4
relevant 79:19	rephrase 51:12 69:11 85:14 95:4 103:1	RPI 6:17	section 59:20 60:22 79:8
remain 47:22	replaced 41:2	run-around 14:14	
	report 23:12 38:21	S	
	reporter 56:5 64:8 75:22 76:3	S-T-E-V-E-N 5:13	
	required 76:11 96:3 97:21	saw 95:5	
	requirement 96:20		
	requirements 10:4 20:5		
	requires 96:6		
	requisite 104:14		
	rereading 96:17		

see 13:18 16:13 18:17 24:5 25:8 28:22 30:1 31:2 32:21 35:14 37:2,6, 18 38:13 40:18 44:4 46:3,10 47:2,6 49:16 52:12,22 57:11 58:4 59:14,21 60:6,9 61:12 67:16 71:16 76:17 81:20 82:14 83:19 84:4 88:21 91:16 92:9 93:10,16 94:1,7 97:1,18 99:14 100:15 103:18	81:22 83:19,21 84:5, 15 86:22 99:9 100:20 101:10,19 103:14	sit 85:7	speaking 33:4 49:1
seeing 100:11	sentences 41:4	sitting 5:15 85:4	speaks 50:7 51:3
seeking 80:10 84:2, 18 104:14	separate 36:8,13	six 43:9	spec 56:11
seize 104:2	separates 35:12	skill 16:5,12,16,17 18:20 21:12 36:14 69:18 72:20 79:18 89:4,10 95:1 98:11	specific 8:6 11:5 13:18 21:22 45:21 69:7 90:17
seizing,' 76:13	separation 35:16,20 36:17,20 94:17,19, 20 95:6,7,14,18	skilled 16:22 34:17 73:2,5 104:8	specifically 18:1 20:21 21:16 26:16 27:7 40:6 60:3 63:4 71:9
select 34:4,13 45:14 71:1 72:21 73:5,10 78:17	sequence 66:19	skills 19:9 22:5 34:17	specification 17:7,18 59:12
selection 35:4 45:17 73:18	serve 46:10	skim 100:14	specify 11:20
semantic 39:10	service 21:2	skim-through 100:10	spelled 5:19
semantics 38:19 41:10 55:10	serving 46:1	slip 27:5 28:21	spent 13:15
sense 103:2	set 45:8 95:19	small 44:9	splits 12:4
sentence 15:1 18:15 23:19,22 25:4 27:2 28:11,17 29:3,4,7,21 30:19 32:15 33:3,6, 16 35:9 37:14 38:4, 7,10,11,15 40:1,3, 12,20,22 41:5,11 45:18,20 46:5,6,7,9, 21,22 49:9 50:17,22 51:7 52:5,14,16,21 53:22 54:14,15,17 55:3,7,9,13,15,19 56:1 57:15 76:11	setting 10:9,10 88:18	smaller 52:17	splitting 38:20
	sewage 18:17,21 21:14 22:7,10,17 23:3	smooth 94:10	spot 28:14
	sewer 22:15 64:19	so-called 39:20	spray 30:9,10,14 39:15
	shake 36:12	softening 67:15,22 68:19	stand 11:2
	shape 30:13	solidification 35:11	standard 23:6
	shed 52:1	solidifies 30:13 31:14	stands 50:6
	sheet 21:17	solution 85:19 86:3	start 39:6 42:17 44:8
	sheets 21:19	solutions 85:22	started 39:1
	shock 60:2	solve 84:2,19	starting 57:9 65:3 83:5 86:16
	short 83:21 84:16	solved 67:21	starts 21:8 37:11 61:4 79:5 101:3
	showing 95:20	somebody 44:22 92:16	state 5:11 32:6 62:6, 12
	shows 92:19	sorry 14:13 21:7 24:16 49:1 50:15 52:3 59:4 89:7 96:11 98:5 101:16	stated 54:17 104:4
	side 13:3 49:12,15 54:21 55:2 76:14 78:3 87:3 94:6	sort 30:7 36:7 73:14 86:17	statement 26:6,10 83:9 91:14
	simple 36:10 85:22 95:22	source 10:15 14:12 22:15	states 21:15 23:2 29:21 40:13 49:10
	simply 43:21		

54:18 55:16 58:8,16 60:21 61:15 stating 68:4 100:22 stay 34:15 48:20 stays 83:3 90:15 step 36:3 steps 89:18 Steven 5:3,13 stick 48:2 Stop 58:1 storage 82:10 straightforward 19:16 73:21 strength 20:9 68:18 69:4 stress 20:7 stresses 82:7 stretch 26:3 strike 13:5 51:19 81:14 91:21 strong 19:22 stronger 68:8 69:1 structure 41:11 93:8 94:7 stuck 86:14 style 87:11 subject 17:3,5 submitted 15:18 subsequent 78:13 substance 98:8 substances 33:20 substrate 15:6 98:8 suggested 98:13 suggesting 80:17	suitable 89:17 suppliers 73:20 support 26:6,9 sure 7:3 8:3 13:7 20:3,20 25:14 26:2 36:4 37:5 51:21 54:11 56:18 60:2 63:22 67:11 69:12 72:8 77:18 78:8 80:11 85:9,17,21 90:2 92:22 96:2 102:7 104:20 surface 14:17 15:3,8 19:10 27:3 28:21 31:15,16,18 32:5,7, 10 33:2,12,21 34:5, 9,14 35:2,13 37:17 38:5 39:8,20 40:12, 22 41:15 42:6,14 43:9 44:12 45:5 46:2,20 47:9,11,14, 21,22 48:2,10,14 49:19,20 63:5 71:6 73:14 77:3,5,16,22 78:1 79:2 83:12 101:15 102:3,10 103:6 surfaces 30:1 31:22 47:5 48:5 surfactants 62:9 surprise 56:15,21 surprised 57:21 surprisingly 81:20 82:1 survive 20:8 switched 50:4 sworn 5:4 synergistic 95:20 synthesize 91:22	system 10:13,17,19, 20 11:8,9,20 12:10 14:3,4 33:14 48:4 69:11 73:3 78:6 82:9 86:12 100:6,7 systems 12:1 T table 91:12 93:6 tacky 98:8 take 6:6,7,10,11 37:3 46:15 64:22 65:1 75:9,15 77:1 78:11 82:21 86:11 90:8 98:20 104:17 taken 5:9 6:2 talk 34:18 78:8 86:18 talked 39:14 44:7 48:18,22 73:3 77:20 78:22 86:19 102:18 talking 11:1,3 16:11 20:20 33:1 38:21 39:6 43:16,18 48:7, 12,17 52:15 54:12 55:7 60:15 65:16 71:22 75:18 79:11, 12 102:8,19 talks 26:15 52:16 81:4 96:15 100:11 taught 17:9 53:6 62:14,15,17 70:3 74:13,19,20 teach 80:1 82:22 teaches 18:3 19:12 62:22 64:13 75:8 83:13 100:20 teaching 17:18 63:3 64:20	teachings 17:12 56:11 74:21 78:7 83:22 84:17 98:18 tear 20:9 63:1,10,13 70:15 104:3 tearing 63:3,19,21 64:2,10 69:15,21 76:12 86:6 88:8 89:18 104:9 tease 100:15 technical 14:15,21 technique 12:3,9,10 14:3 technologies 80:20 technology 8:1 17:10,15 23:12 89:15 teeth 26:2 tell 8:21 23:5 25:19 44:22 46:18 72:4 73:2 74:22 94:22 102:9 temperature 67:15,22 68:19 69:5 ten 37:7 104:18 ten-minute 37:3 tend 68:22 term 25:15 29:16 36:15,22 104:2 terms 8:21 19:10,12 22:3 28:18 29:8,18 41:11 45:10 65:1 test 43:6,11,15,16,21 44:4 testified 5:5 53:10 testimony 8:11,14 18:19 29:19 53:14 72:13 74:5,9 83:8
--	--	--	---

text 93:21	46:5,6,22 50:5	9,13 61:8 79:14 91:4	typical 45:10
thank 5:19 6:1 11:7, 22 14:13 15:15 16:1 23:4 28:7 37:1 76:5	thought 7:1 12:21 23:10 44:5 79:18	translator 56:19	typically 9:22
theoretical 42:21	thousand 71:10,12, 16 72:10	transmission 11:14	U
theory 14:11	three 21:11 49:18 54:17 93:7	transparent 14:5	U.S. 18:10
thermal 10:5,9,10,19 11:8 88:18 99:17	three-layer 93:8	transport 82:9	ubiquitous 8:6
thermoplastic 66:20 67:12	threshold 45:1	treated 30:22 61:20 76:15	ultimately 9:15 10:9 14:4 18:4 31:15 38:22 79:1 98:7
They'd 19:13	throwing 93:21	treating 47:5	underground 19:8 82:8
thickness 52:7,9,16, 17 53:6 56:10 59:8	time 13:15 16:7 27:3 29:1 42:6 48:5,14 58:1,12 77:19 80:15 84:9	trenchless 18:17,21 21:14 22:7,10,11 23:2	underlined 77:8
thin 15:5 35:12 102:10,13	times 69:13	tried 100:14	underneath 28:9
thing 22:9 26:18 63:17 89:20	tiny 44:11	true 13:12	understand 6:3,12 17:2,11 18:22 19:3 58:2,17 59:5,6 77:18 80:11 88:1 91:18
things 19:11 30:6 54:17 59:15 63:5 69:5 73:6 78:12	title 28:9 96:10,12	trying 34:6 39:11 44:15 58:2,18 65:20 73:13 82:19 85:6 91:22	understanding 12:6, 7 61:2 68:1 96:5 101:13
think 5:20 10:7 11:10, 12,15,18 12:14 13:2 14:9,18 16:2,21 17:11,16 19:1,19 21:1 23:8 26:1,3,12 27:8,15 29:1 30:6 31:7 33:4 34:20 35:3 36:3,16 38:19 39:9, 22 41:10 42:20 43:5 44:14,15 45:8 48:1, 11 50:2,6 53:5,9 54:7 55:6,10,22 63:14,15,16 65:5,9, 10 66:13 70:2 77:7 79:5,7 81:6 83:13 88:1 89:14,22 92:16, 18 95:10 97:10 98:6, 7,19 103:22 104:2	told 22:18	tube 18:16 25:5 64:18 82:4	understood 19:14 45:15 80:17
	top 13:10,21 15:6 23:5 25:18 60:10,11 71:13 77:5 78:1,7 81:19 92:7 96:9,16 97:11	tubular 11:8 64:17 66:17 76:14 82:3 87:4,5 99:16 103:16	unique 20:12
	topic 16:5	tune 73:17	United 58:16
	torn 63:19,21 64:2,10 69:15,21 76:13 81:5, 8 82:12,13,18 83:10 86:6 87:14	turn 15:18 16:1 18:12 23:11 26:19 27:7 37:10,21 49:3 52:1 90:22 94:15	universe 71:22 72:1
	totality 86:10	two 7:15 10:8 12:1 20:21 31:11 33:6 36:17 47:12 63:5 97:21	unreliable 22:15
	tracked 29:1	two-stage 100:2	Upstate 7:2
	transcription 57:2	type 7:17 10:12 11:21 36:18 42:18 44:16 67:20 73:6 85:2 88:5,6 89:12 100:12	use 8:4 10:14 11:14, 21 12:9 14:2 16:16 18:5,16 20:1,11 25:15 34:17 36:12, 15 50:10,19 62:13 70:22 74:12,15 77:15,21 99:22 103:4
	translatable 19:9	types 33:17 45:21 73:4	useful 79:19 98:1
	translate 21:3 22:5		uses 8:5 40:21 65:2
	translated 56:19		
	translates 20:9		
	translation 56:19 57:11,13,18 58:3,5,		

usually 29:22	63:9,20 64:22 65:10	Wikipedia 22:14	wrapper 20:2
UV 10:6,11,14,19	73:7 74:15 75:21	winds 32:9	writer 15:4
11:9,11,13 12:10	78:20,22 80:19 85:5	wisdom 26:2	wrong 44:6
13:19 14:3,5,10,12	90:20 92:2 100:13	withdraw 63:18 69:14	
66:18 68:15 89:11	102:7 104:1	89:17 92:2,3	
99:16 100:7	wanted 8:17 34:15	withdrawing 64:2,10	Y
	37:21 43:5	69:19	
V	wanting 81:4	withdrawn 63:20	Yeah 48:11 63:14
	wasn't 12:18 43:18	69:10 86:5 104:9	71:15 72:15 101:7,
V1a 91:15,20 93:7	67:21	withstands 82:7	21
95:11,14 96:1	water 22:15 36:10,11,	witness 15:10 28:4	years 6:21 7:17 42:19
V1b 91:15,20 93:12,	18 99:18,22	30:5 35:19 42:17	York 5:17,18 6:19,21
18 94:1,9,19 95:5,9	watering 100:2	43:5 51:5 53:15	7:2
validity 8:11	wave 30:11	57:21 60:12 64:13	
variety 28:18 29:8	wax 29:16,19 31:14	66:13 68:3,11,17	
various 45:21	45:4,13 93:4,14,15	69:4 70:2,10,14	
VEECAT 67:14	waxes 27:5 29:14,17	71:12,21 72:7,14,16	
vendors 34:18	33:19 45:20 62:8	73:1,12 74:18 75:7	
version 90:1	way 6:16 28:11 32:19	78:20 80:9 84:7,13	
versions 10:22	33:9 40:17 41:6 68:4	86:9 88:1,10,17	
VICAT 67:14,20,22	78:4 88:4 96:14	89:22 90:8,17 97:8	
68:5,6,9,19	ways 12:2 73:20	98:6,16 102:5 103:8	
VICATS 69:1	we'll 6:7 51:20 56:18	104:12	
view 61:1 79:9 99:5	77:21 79:15 104:18	witness's 72:13 74:5,	
104:7	we're 38:20 48:12	9	
viewed 36:3	54:11,14 60:14	Wood 23:20 24:10,12	
virtue 95:7	79:11 102:8	26:6	
viscosity 31:12	we've 48:18 69:13	word 40:21 41:9	
	79:12 100:5 102:18	50:11,19,21 51:6	
	104:6	56:20 98:17	
W	weak 19:22	words 29:6 39:5 41:4	
	well-known 62:9	51:5 85:14	
W-O-O-D 23:21	went 22:6 40:11	work 7:17 42:18	
Wallace 92:19,20	62:19 75:18 89:22	76:22 77:7	
want 5:14 6:15 13:13	Western 6:20 7:2	worth 56:6 59:3	
18:12 24:12 27:7	Whoa 58:1	wouldn't 8:5,8 17:14	
34:10 36:12 37:3	widget 20:6	41:16 73:9 77:14	
54:11 59:11 62:22		89:18	
		wound 42:22	