UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

CLEARCORRECT OPERATING, LLC,	)
	) IPR2025-00818
Petitioner,	) IPR2025-00819
	) IPR2025-00820
vs.	) IPR2025-00821
	)
ALIGN TECHNOLOGY, INC.,	)
	)
Patent Owner.	)
	)

VIDEOCONFERENCE DEPOSITION OF DR. TIM A. OSSWALD

February 4, 2026

Taken Remotely Via Zoom

Reporter: Teri Simons, CCR, RMR, CRR

ALIGN - EXHIBIT 2017
ClearCorrect Operating, LLC. v. Align Technology, Inc.
IPR2025-00820

APPEARANCES

ALL PARTIES APPEARING VIA ZOOM

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EXAMINATION INDEX

EXAMINATION BY: PAGE NO.
MR. ARGENTI 4

EXHIBIT INDEX

EXHIBIT NO. DESCRIPTION PAGE NO.
(No exhibits marked for identification.)

BE IT REMEMBERED that on Wednesday, February 4, 2026, at 6:34 A.M., before Terilynn Simons, Certified Court Reporter, CCR, RMR, CRR, CLR, appeared DR. TIM A. OSSWALD, the witness herein;

WHEREUPON, the following proceedings were had, to wit:

<<<<<< >>>>>>

DR. TIM A. OSSWALD, having been first duly sworn by the Certified Court Reporter, testified as follows:

EXAMINATION

BY MR. ARGENTI: 06:34:17

Q Good morning, Dr. Osswald. 06:34:17

A Good morning. 06:34:19

Q Could you please state your name for the record? 06:34:21

A Yeah. It's Tim Andreas, Osswald. 06:34:23

Q Where are you currently located? 06:34:26

A Right now I'm in D.C. at the Finnegan offices. 06:34:28

Q Is there anyone in the room with you today? 06:34:32

A Yes, the three attorneys that were mentioned before. 06:34:35

Q And just since we're on the record now, could you mention their names, please? 06:34:39 06:34:42

A Yeah, Kyle Howarth, Charles Collins-Chase, and Pier DeRoo. 06:34:44 06:34:52

Q And we also talked about this a little bit before, but 06:34:53

now that we're on the record, it is my understanding you have printed hard copies of your declarations and cited exhibits available to you; is that correct? 06:34:58 06:35:00 06:35:04

A I do, yes. 06:35:06

Q And as we discussed, if at any point there's a need to track something additional down, just let me know, and we can take the time to do that, okay? 06:35:10 06:35:13 06:35:16

A Yes. 06:35:17

Q And I will also be trying, as we go, to load soft copies of the exhibits into the chat system for this deposition, just so that they're available-- primarily so they're available for the reporter for her reference, but it will be my understanding that you're referring to the hard copies primarily throughout the day, okay? 06:35:18 06:35:22 06:35:27 06:35:30 06:35:34 06:35:37 06:35:39

A All right. 06:35:40

Q Okay. Are those hard copies that you have, are they clean, without any notes on them? 06:35:40 06:35:47

A Yes, they are. 06:35:49

Q Have you ever had your deposition taken before today? 06:35:50

A Yes, I have. 06:35:53

Q About how many times? 06:35:55

A I don't know how many, somewhere between 50 and 100. I don't know. 06:35:57 06:36:02

Q How many in the last year, would you say? 06:36:02

A Maybe three or four. 06:36:07
Q And are all of those depositions in the context of 06:36:08
expert witness work? 06:36:11
A Yes. 06:36:13
Q Have you been an expert witness in an IPR before this? 06:36:15
A Yes, I have. 06:36:22
Q So you are probably familiar with the way these work, 06:36:24
but I'm going to run through the ground rules just for 06:36:29
the record so we are on the same page. 06:36:31
Do you understand that you are providing testimony 06:36:33
under oath and you are expected to tell the truth? 06:36:35
A Yes. 06:36:37
Q Is there any reason you cannot provide complete and 06:36:38
accurate testimony today? 06:36:41
A No. 06:36:42
Q Hopefully my questions will be clear. If you don't 06:36:43
understand any question, you need to let me know that 06:36:48
you don't understand it. 06:36:51
Under the guidelines for this proceeding, you can 06:36:53
ask me for clarification. 06:36:55
If you don't tell me otherwise, I will assume that 06:36:58
you understand the question, okay? 06:37:00
A Okay. 06:37:01
Q Please provide verbal answers rather than nodding your 06:37:02
head, for the benefit of the record. 06:37:06

1 We can take a break at any time that you'd like 06:37:09
2 one, as long as there isn't a question pending. 06:37:11
3 If there is a question pending, I need you to 06:37:14
4 answer it before we take that break, okay? 06:37:16
5 A Okay. 06:37:17
6 Q My plan will be to take breaks every hour or so, 06:37:18
7 approximately, but if you'd like to take one sooner 06:37:23
8 than that, just let me know, all right? 06:37:26
9 A Sounds good. 06:37:28
10 Q Is it your understanding that you are here to testify 06:37:29
11 today regarding your declarations in four inter partes 06:37:33
12 reviews? 06:37:37
13 A Yes. 06:37:39
14 Q Please turn to a copy of Exhibit No. 1007 from IPR 06:37:40
15 2025-00818. 06:37:45
16 A Which exhibit? Sorry. 06:37:56
17 Q That's Exhibit No. 1007. 06:37:58
18 That's your declaration in the IPR that ends in 06:38:00
19 '818? 06:38:04
20 A Yes. 06:38:10
21 Q This declaration was submitted in support of 06:38:10
22 ClearCorrect's petition for IPR of U.S. Patent 06:38:17
23 No. 10,973,613, right? 06:38:23
24 A Yes. 06:38:26
25 Q If I refer to that patent as the '613 patent today, 06:38:27

1 will you understand what I'm referring to? 06:38:32
2 A Yes. 06:38:34
3 Q And I may also refer to this declaration as the '613 06:38:34
4 declaration, since you have four of them. 06:38:38
5 Will you understand that as well? 06:38:40
6 A Yes. 06:38:42
7 Q Okay. Can you turn to the last page of the '613 06:38:42
8 declaration, please-- actually, not quite the last 06:38:51
9 page. It's marked 143 of 150 at the bottom of the 06:38:54
10 page. 06:38:58
11 A Yes. 06:39:06
12 Q Is that your signature? 06:39:06
13 A It is. 06:39:07
14 Q Did you add that signature yourself to that document? 06:39:07
15 A Yes. 06:39:10
16 Q Did you do it by handwriting or electronically? 06:39:11
17 A This one was by handwriting. 06:39:15
18 Q Okay. Did you sign this declaration on April 13th, 06:39:17
19 2025? 06:39:24
20 A Yes. 06:39:24
21 Q Who wrote this '613 declaration? 06:39:25
22 A I did, together with the attorneys. 06:39:29
23 Q Does that mean you actually typed it? 06:39:33
24 A I typed some parts, but the whole assembly of it was 06:39:35
25 done by the attorneys. 06:39:40

1 Q Do you have copies of your other three declarations 06:39:41
2 available to you? 06:39:47
3 A I do. 06:39:48
4 Q And I'm going to ask you a few questions. 06:39:48
5 I think I won't drop these into the chat, but 06:39:54
6 maybe I can circle back and load them in later. 06:39:58
7 One of those declarations is the declaration in 06:40:00
8 IPR 2025-00819, regarding U.S. Patent No. 11,154,384, 06:40:03
9 correct? 06:40:17
10 A Yes. 06:40:17
11 Q And if I refer to those as the '384 declaration and the 06:40:17
12 '384 patent, will you understand what I'm talking 06:40:26
13 about? 06:40:28
14 A Yes. 06:40:28
15 Q Your third declaration was submitted in IPR 2025-00820, 06:40:29
16 right? 06:40:43
17 A Yes. 06:40:43
18 Q And that regards U.S. Patent No. 11,648,090, right? 06:40:44
19 A Yes. 06:40:51
20 Q And if I refer to those as the '090 declaration and the 06:40:52
21 '090 patent, will you understand what I'm referring to? 06:40:59
22 A Yes. 06:41:00
23 Q And I bet you can guess where I'm going. 06:41:01
24 Let's take a look at your fourth declaration. 06:41:07
25 Your fourth declaration was submitted in IPR 06:41:11

2025-00821, right? 06:41:14
A Yes. 06:41:17
Q And that involves U.S. Patent No. 11,648,091, correct? 06:41:17
A Yes. 06:41:25
Q So if I refer to those as the '091 patent and the '091 declaration, you'll understand what I'm talking about? 06:41:26 06:41:31
A Yes, I will. 06:41:34
Q Is there anything today about any of your four declarations that you would like to modify or correct? 06:41:35 06:41:44
A No. 06:41:46
Q When were you first retained as an expert in this matter? 06:41:47 06:41:52
A I think sometime in 2022, late-- I don't remember exactly, but, yeah, that sounds right-- no, this matter-- no, much later, yeah. 06:41:52 06:42:02 06:42:14
Maybe the beginning-- somewhere in the beginning of 2025 or late 2024, that's correct. 06:42:21 06:42:23
Q You are being compensated for your testimony in these IPRs at a rate of $650 an hour; is that right? 06:42:26 06:42:31
A That's right. 06:42:35
Q Who is providing that compensation? 06:42:36
A I receive the checks from Finnegan, or the deposits. 06:42:40
Q Is it your understanding that ClearCorrect Operating LLC is the company that ultimately is responsible for your payment? 06:42:48 06:42:52 06:42:55

MR. COLLINS-CHASE: Objection; form. 06:42:56
THE WITNESS: Yeah, I don't know who 06:42:58
ultimately is. 06:42:59
I signed an agreement with Finnegan, so I don't 06:43:00
know how that works. 06:43:04
Q (By Mr. Argenti) Do you know who Finnegan bills for 06:43:04
your work? 06:43:06
MR. COLLINS-CHASE: Objection; form. 06:43:08
THE WITNESS: I don't. 06:43:09
Q (By Mr. Argenti) How much have you billed to date for 06:43:10
your work in these four IPRs? 06:43:15
A I don't remember. I don't know. 06:43:17
Q Was it more than $50,000? 06:43:22
A Probably, yes, but I don't know. I'm not sure. 06:43:24
Q Do you think it's more than $100,000? 06:43:30
A I don't know. 06:43:33
Q Other than these IPRs, do you have any affiliation with 06:43:33
ClearCorrect Operating LLC? 06:43:42
A No. 06:43:44
Q Do you have any financial interest in ClearCorrect? 06:43:44
A No. 06:43:54
Q Prior to these IPRs have you ever worked for or with 06:43:54
ClearCorrect? 06:43:58
A No. 06:43:58
Q Are you aware of the company Straumann USA LLC? 06:43:59

A I'm not sure. No, I don't think so. 06:44:08
Q How about Institut Straumann AG? 06:44:11
A I can't remember. I don't think so, yeah. 06:44:15
Q So then you don't have any association with either of 06:44:19
those Straumann entities? 06:44:25
A No. No. 06:44:27
Q To your knowledge you have never worked for either of 06:44:28
those Straumann entities? 06:44:34
A That's correct, to my knowledge I don't remember that, 06:44:35
no. 06:44:38
Q Are you aware of the company Bay Materials? 06:44:39
A Yes. 06:44:42
Q In what way are you aware of Bay Materials? 06:44:43
A That's a case I worked on a few years back in a lawsuit 06:44:47
between Bay Materials and 3M. 06:44:55
Q Were you working for one of those parties? 06:44:57
A Yes. I was working also with Finnegan on the side of 06:45:01
Bay Materials. 06:45:08
Q About what year was that? Do you remember? 06:45:08
A I don't remember exactly, between 2021 and maybe late-- 06:45:14
and early 2024. I'm not sure. I don't remember the 06:45:22
exact dates. 06:45:25
Q And do you recall whether that was in federal court or 06:45:25
at the IPR or somewhere else-- sorry, "at the IPR"-- at 06:45:31
the PTAB? 06:45:34

A You know, I don't remember. 06:45:37
I haven't-- I haven't looked back at those 06:45:40
documents. I don't remember exactly the-- all it was. 06:45:43
Q Are you aware of a company called Alliedstar Medical 06:45:48
Equipment? 06:45:58
A It rings a bell, but no, I'm not sure. I'm not sure. 06:45:59
Maybe I'm thinking of AlliedSignal. I'm not sure. 06:46:08
Q Going back to that Bay Materials and 3M litigation you 06:46:13
were involved in, was that a patent litigation? 06:46:17
A Yes. 06:46:19
Q What was the subject matter of those patents? 06:46:19
A Dental aligners. 06:46:22
Q Did you do anything to prepare for this deposition? 06:46:28
A Yes. 06:46:33
Q What did you do? 06:46:35
A I had meetings with the attorneys. 06:46:36
Q That's the Finnegan attorneys? 06:46:40
A Yes. 06:46:42
Q Any Finnegan attorneys, other than the ones you listed 06:46:43
at the beginning of the deposition? 06:46:47
A Not any other Finnegan attorneys, no. 06:46:49
Q When did those meetings take place? 06:46:54
A Some of them took place online, maybe in December and 06:46:56
January, and there were meetings here in D.C. 06:47:01
Q About how many meetings total? 06:47:05

A Online, I believe it was maybe three meetings. 06:47:08
I don't remember exactly. 06:47:14
Q And then how about in-person in D.C.? 06:47:15
A In-person in D.C., two days. 06:47:18
I think there was another attorney from Finnegan 06:47:23
in one of the online meetings. 06:47:26
Q When were those in-person meetings? 06:47:29
A The in-person meetings were Monday and Tuesday of this 06:47:33
week. 06:47:40
Q So altogether about how many hours have you spent 06:47:40
preparing for your deposition? 06:47:43
A I don't know. 06:47:44
Whatever Monday and Tuesday was and the other 06:47:52
meetings and waiting and preparing for those meetings 06:47:56
and reviewing documents. 06:48:00
I can't tell you an exact number. 06:48:01
Q What documents did you review to prepare for your 06:48:04
deposition? 06:48:06
A All the documents in my own declarations and the 06:48:06
references. 06:48:11
Q Did you cite any documents that are not cited in your 06:48:12
declarations-- sorry, strike that. I think I asked if 06:48:16
you "cited any." 06:48:20
In preparing for your deposition, did you review 06:48:22
any documents that are not cited in your declarations? 06:48:24

A No. No. 06:48:27
Q So then do I understand correctly you have not reviewed 06:48:29
Align's preliminary responses in any of these four 06:48:33
IPRs? 06:48:39
A No. No. 06:48:40
Q Have you reviewed the PTAB's institution decisions in 06:48:40
any of these four IPRs? 06:48:45
A I don't remember. 06:48:49
If they are not mentioned in my references, I 06:48:50
probably have not. 06:48:54
Q Have you reviewed Align's requests for director review 06:48:55
of the institution decisions in any of these four IPRs? 06:49:01
A No. No. 06:49:05
Q We are going to take a look now at Exhibit No. 1001 in 06:49:06
the '818 IPR. 06:49:16
A Yes. 06:49:32
Q Bear with me one second. 06:49:32
Do you recognize this document? 06:49:54
A I do. 06:49:55
Q This is the '613 patent, correct? 06:49:55
A Yes. 06:50:00
Q And when forming your opinions in this IPR, did you 06:50:00
read this document in its entirety? 06:50:03
A Yes. 06:50:05
Q How about the '384, '090 and '091 patents, did you 06:50:09

1 review those as well when preparing your declarations? 06:50:14
2 A Yes. 06:50:18
3 Q Do you know what is meant by the specification of a 06:50:18
4 patent? 06:50:25
5 A Yes. 06:50:25
6 Q Did you review the specifications of all four patents 06:50:26
7 that we've been discussing? 06:50:31
8 A Yes. 06:50:33
9 Q The '613, the '384, the '090, and the '091 patents have 06:50:33
10 the same specifications except for the claims, right? 06:50:43
11 A Correct. 06:50:47
12 Q So did you review each of the patents in their entirety 06:50:47
13 or did you read the figures-- review the figures and 06:50:52
14 written description of one of them and then look at the 06:50:57
15 claims of the others? 06:50:59
16 A I reviewed the patents in their entirety, yes. 06:51:00
17 Q We are going to go back to your declaration in the '818 06:51:03
18 IPR, please. 06:51:23
19 A Okay. 06:51:24
20 Q If it helps organize your materials, most of my 06:51:24
21 questions today are going to be about the documents 06:51:29
22 from the '818 IPR, since there's a lot of overlap in 06:51:31
23 terms of the exhibits and stuff. I've been focusing on 06:51:37
24 the set from the '818 IPR, so that might be the set you 06:51:40
25 want to keep close at hand. 06:51:43

A Okay. 06:51:44
Q So if we look at your declaration in the '818 IPR, if 06:51:45
we turn to Page 5, the page that's labeled Page 5 of 06:51:53
150 at the bottom, you have a section under 06:51:57
"Qualifications and experience," correct? 06:52:02
A Yes. 06:52:04
Q You have bachelor's, master's, and Ph.D. degrees in 06:52:04
mechanical engineering; is that right? 06:52:11
A Yes. 06:52:12
Q Do you have any degrees in dentistry? 06:52:13
A No. 06:52:15
Q Do you have any degrees in orthodontics? 06:52:15
A I don't. 06:52:20
Q Do you have any training in the fields of dentistry or 06:52:21
orthodontics? 06:52:26
A No. 06:52:27
I mean, I've done some research in that field, but 06:52:28
I don't have any official courses that I took in that 06:52:32
area. 06:52:35
Q What type of research have you done in those fields? 06:52:36
A It's a work that I did with a couple of dental students 06:52:39
regarding dental appliances. 06:52:47
Q Were those aligner appliances? 06:52:50
A No. 06:52:59
Q Were you serving as a faculty advisor or more actively 06:53:00

1 involved in the research? 06:53:04
2 A Well, I mean, as a faculty advisor I'm actively 06:53:06
3 involved in the research, and it was also with a 06:53:11
4 graduate student. 06:53:14
5 Q What type of dental appliance was it, if not an 06:53:15
6 aligner? 06:53:18
7 A These were mouthguards. 06:53:19
8 Q Do you have any knowledge of the parameters needed for 06:53:21
9 safe and successful movement of teeth during 06:53:32
10 orthodontic treatment? 06:53:35
11 MR. COLLINS-CHASE: Objection to 06:53:36
12 form. 06:53:38
13 THE WITNESS: Well, I mean, I looked 06:53:38
14 at the patents, and the patents talked about-- and the 06:53:40
15 references talk about movement of teeth by applying 06:53:45
16 force to the teeth, so I do. 06:53:52
17 Q (By Mr. Argenti) And it would be based on the review 06:53:54
18 of the exhibits in these IPRs? 06:53:57
19 A And the previous work that I've done in this field. 06:53:59
20 Q That was the involvement in the Bay Materials 06:54:02
21 litigation; is that right? 06:54:06
22 A Yes. 06:54:07
23 Q Anything else you want to bring to my attention in 06:54:07
24 terms of your knowledge of parameters needed for safe 06:54:16
25 and successful movement of teeth during orthodontic 06:54:18

1 treatment? 06:54:19
2 A Not that I can think of right now. 06:54:20
3 Q When forming your opinions in this case, did you 06:54:23
4 consult with a dentist or orthodontist? 06:54:27
5 A I did not. 06:54:29
6 Q In Paragraph No. 5 of your '818 declaration, on Page 6, 06:54:31
7 you say that you have research and teaching experience 06:54:55
8 in various areas of polymer science. 06:54:58
9 Do you see that? 06:55:01
10 A Yes, I see that. 06:55:03
11 Q Can you describe that experience for me? 06:55:04
12 A Yeah. I mean, it's the field of polymer science, 06:55:08
13 polymer engineering. It's a wide, wide field. 06:55:15
14 I have experience in polymer material science, 06:55:19
15 polymer processing, engineering design with polymers, 06:55:24
16 and I've done-- and polymers and composites, and I've 06:55:29
17 done research in many, many areas in that bigger field. 06:55:34
18 Q Let's look at Paragraph No. 15 of your declaration, 06:55:39
19 please. 06:56:18
20 In this paragraph you say, "A person of ordinary 06:56:25
21 skill in the art with respect to the '613 patent would 06:56:28
22 have had at least a four-year undergraduate degree in 06:56:31
23 materials science, mechanical engineering, chemical 06:56:34
24 engineering, or a closely related field, and at least 06:56:37
25 two years of experience in the field of polymer 06:56:40

1 science, combined with at least two years of experience 06:56:42
2 in the field of design, manufacture, and processing of 06:56:45
3 thermoformable polymer sheets for use in various 06:56:49
4 applications, such as in orthodontic and dental 06:56:53
5 appliances." 06:56:57
6 Did I read that right? 06:56:59
7 A Yes. 06:57:00
8 Q And does this description of the POSITA's level of 06:57:00
9 skill also apply in the '384, '090, and '091 patents as 06:57:08
10 well? 06:57:14
11 A Yes. 06:57:14
12 Q At the end of your description of the POSITA in this 06:57:15
13 paragraph, you say, "Two years of experience in the 06:57:21
14 field of design, manufacture, and processing of 06:57:24
15 thermoformable polymer sheets for use in various 06:57:28
16 applications, such as in orthodontic and dental 06:57:33
17 appliances." 06:57:36
18 Have you designed, manufactured, and processed 06:57:37
19 thermoformable plastic polymer sheets that were used in 06:57:40
20 orthodontic and dental appliances? 06:57:43
21 A Other than the project that I worked with the dental 06:57:45
22 students, which involved, actually, thermoforming 06:57:55
23 sheets and comparing them to 3D printed appliances, I 06:58:00
24 have not, but it also says additional education could 06:58:08
25 substitute for professional experience and vice versa. 06:58:14

Q What was the thermoformed material in that project that you mentioned? 06:58:18 06:58:23
A I think it was a softer material. I believe it was an EVA. 06:58:24 06:58:29
I don't remember exactly. I would have to go back and look at the notes and the write-ups for the project. 06:58:30 06:58:31 06:58:35
Q And that project-- strike that. 06:58:35
We are going to look at Exhibit No. 1003, please. 06:58:41
This is the Tadros reference that you discuss in your declarations, right? 06:58:50 06:59:06
A Yes. 06:59:08
Q Did you review this document in its entirety when preparing your opinions? 06:59:08 06:59:14
A I did. 06:59:15
Q Let's turn to Paragraph No. 22 of Tadros. Let me know when you're there. 06:59:16 06:59:32
A I'm there. 06:59:33
Q The first sentence of Paragraph No. 22 reads, "The appliance 100 of Figure 3 preferably contains at least one layer manufactured from a sheet of a polymeric mixture," right? 06:59:33 06:59:36 06:59:41 06:59:46
A Yes. 06:59:46
Q And then at the bottom of the page of Paragraph 22, the bottom of the first column, it begins listing what it 06:59:54 06:59:57

1 calls suitable examples of thermoplastic polymers, 07:00:01
2 right? 07:00:06
3 A Yes. 07:00:07
4 Q Going on to the top of the next column, still in 07:00:07
5 Paragraph No. 22, starting in the second line, that 07:00:16
6 list of suitable examples include polymers such as PET, 07:00:18
7 PBT, PCCD, PIT, PETG, and some others, right? 07:00:25
8 MR. COLLINS-CHASE: Objection to 07:00:35
9 form. 07:00:37
10 THE WITNESS: Yeah, they are. 07:00:38
11 I mean there's a whole list of materials there, 07:00:39
12 yes, also nylon and others. 07:00:41
13 Q (By Mr. Argenti) Can you read the last sentence of 07:00:46
14 Paragraph No. 22 for me, please? 07:00:47
15 A "Preferred polymeric mixtures are those derived from a 07:00:50
16 polycarbonate, polyesters such as cycloaliphatic 07:00:57
17 polyesters and polyarylates, and 07:01:02
18 polycarbonate-polydimethylsiloxane copolymers." 07:01:06
19 Q What is a cycloaliphatic polyester? 07:01:11
20 A It is a copolyester. It is a material that is used-- 07:01:14
21 it's a type of polyester. 07:01:23
22 Q Is it your understanding that all cycloaliphatic 07:01:25
23 polyesters are copolyesters? 07:01:29
24 A To my knowledge, yes. 07:01:33
25 Q Is there an agreed upon definition of "cycloaliphatic 07:01:34

1 polyester" in the art? 07:01:44
2 A I'd have to go back and look. 07:01:46
3 I mean, I don't know where-- if you point me in my 07:01:48
4 report or my reports where I wrote about it, I can 07:01:52
5 expand on it. 07:01:56
6 Q Well, why don't we take a look at Paragraph No. 45 of 07:01:57
7 Tadros now. 07:02:03
8 When you're there, can you read the last sentence 07:02:15
9 of that paragraph for me, please? 07:02:17
10 A It says, "When a mixture of isomers or more than one 07:02:20
11 diacid is used, a copolyester or a mixture of two 07:02:32
12 polyesters may be used as the cycloaliphatic polyester 07:02:38
13 resin." 07:02:44
14 Q That sentence seems to indicate that a copolyester is 07:02:46
15 one type of cycloaliphatic polyester, right? 07:02:49
16 MR. COLLINS-CHASE: Objection to 07:02:56
17 form. 07:02:57
18 THE WITNESS: Well, I mean, if you 07:02:57
19 point me where I write about it, I think it's also 07:03:04
20 clear what type of copolyesters were used by Tadros in 07:03:07
21 his mixtures with polycarbonate. 07:03:12
22 If you point me to that, I would be happy to 07:03:15
23 answer-- look at that in my report. 07:03:18
24 Q (By Mr. Argenti) When you say it's clear what type of 07:03:21
25 copolyesters were used in Tadros, are you referring to 07:03:23

the specific examples from Tadros that you cite in your report? 07:03:27 07:03:31

A Yes. 07:03:32

Q Would you agree that not all cycloaliphatic polyesters are copolyesters? 07:03:33 07:03:47

A Well, I would have to go back and look at that. 07:03:50

What I do know is Tadros's mixtures do contain polycarbonate and copolyesters. 07:03:56 07:04:00

Q When preparing your opinions in your declarations, did you consider whether all cycloaliphatic polyesters are copolyesters? 07:04:03 07:04:11 07:04:17

A If it's not in my report, I likely did not consider that. 07:04:19 07:04:22

Q Let's look at Paragraph No. 50 of Tadros now. 07:04:23

A Okay. 07:04:34

Q So this paragraph reads, "A preferred cycloaliphatic polyester is PCCD having recurring units of formula (VIII)," and the "8" is a Roman Numeral VIII, right? 07:04:34 07:04:38 07:04:44

A Yes. 07:04:48

Q And then do you see formula VIII at the top of the next column, right above Paragraph No. 51? 07:04:52 07:04:55

A I see that. 07:04:58

Q So that is the PCCD formula referred to in the text of Paragraph No. 50, right? 07:04:59 07:05:04

A Yes. 07:05:06

Q Formula VIII depicts a monomer, right? 07:05:06
A No. It depicts a polymer. 07:05:13
Q Can you explain that for me? 07:05:17
A Yeah. It's one of the repeat units of the polymer. 07:05:23
Q And it's your opinion that that formula does not depict a monomer? 07:05:26 07:05:33
A Correct. 07:05:34
Q Does formula VIII show multiple monomers? 07:05:37
A No. I mean, I think for a monomer it would have to have a double bond somewhere to be able to polymerize into a polymer. 07:05:51 07:05:55 07:05:59
Q Okay. Let's take a look now at the Wen reference. 07:06:03
Hold on. Sorry, bear with me. 07:06:31
Do you have that-- and this exhibit was submitted in multiple parts, right? 07:07:19 07:07:22
Do you have a complete copy of Exhibit No. 1008 in front of you? 07:07:24 07:07:28
A Yes. 07:07:28
Q Do you have any idea why the exhibit was submitted in the IPR as three parts, three different documents? 07:07:34 07:07:37
A I don't know. 07:07:40
I had a whole document here. 07:07:43
Q Okay. And when preparing your opinions, did you review the whole document or one? 07:07:45 07:07:48
A I reviewed the whole document, yeah. 07:07:52

Q Can we turn to Page 47, please? 07:07:54
And that is Page 47, according to the ClearCorrect 07:08:09
labeling at the bottom of the page where it says, "Page 07:08:12
47 of 123." 07:08:16
A Yes. 07:08:18
Q Paragraphs 205 through 207 of Wen talk about forming a 07:08:19
multi-layer aligner, right? 07:08:28
A Yes. 07:08:31
Q Paragraph No. 205 describes forming the first aligner 07:08:32
layer by heating a sheet of material and then holding 07:08:39
it against physical tooth models to form it, right? 07:08:43
A Yes. 07:08:46
Q And it says that a vacuum pump creates suction that 07:08:51
causes the first sheet of material to conform to the 07:08:54
physical tooth models, correct? 07:08:57
A Correct. 07:08:59
Q And in the last sentence it says the first sheet is 07:09:00
then cooled and hardened, right? 07:09:04
MR. COLLINS-CHASE: Objection to 07:09:08
form. 07:09:08
THE WITNESS: The last sentence? 07:09:09
Q (By Mr. Argenti) The last sentence of Paragraph 07:09:13
No. 205 where it says the sheet is then cooled and 07:09:16
hardened, right? 07:09:21
A Yes. 07:09:22

Q And then in Paragraph No. 206 Wen explained that a 07:09:22
second dental aligner layer may be formed on top of the 07:09:32
first layer using the same process, right? 07:09:35
A That's what it says, correct. 07:09:37
Q So a sheet of the second material is vacuum formed to 07:09:42
cause it to conform to the surface of the first layer 07:09:46
that's on the physical tooth models, right? 07:09:48
A That's what that embodiment talks about, yes. 07:09:51
Q So the aligner in these paragraphs is built up one 07:09:55
layer of material at a time using vacuum forming, 07:09:58
right? 07:10:01
A In that description, yes. 07:10:01
Q Now let's look at Paragraph No. 212 of Wen on the next 07:10:06
page. 07:10:10
This Paragraph, in the second sentence, says, 07:10:20
"Rather than forming a dental aligner by a thick layer 07:10:24
of the same aligner-making material, the aligner is 07:10:26
formed by a plurality of thinner layers of 07:10:30
aligner-making material using vacuum forming." 07:10:34
Do you see that? 07:10:37
A I see that. 07:10:38
Q And it goes on to say, "The thinner layers can be more 07:10:39
easily conformed to the physical tooth models than a 07:10:43
single thick layer," right? 07:10:46
A That's what it says there, yes. 07:10:48

Q This paragraph is describing a process similar to what 07:10:50
we saw in Paragraphs 205 and 206, where the multiple 07:10:54
layers are vacuum formed over the physical tooth model 07:10:59
one after the other, right? 07:11:03
MR. COLLINS-CHASE: Objection; 07:11:05
foundation. 07:11:05
THE WITNESS: That embodiment, 07:11:06
that's what it talks about. 07:11:09
Q (By Mr. Argenti) Let's look at the next paragraph of 07:11:14
Wen, which is Paragraph 213. 07:11:17
That paragraph starts by saying, "Further, a wider 07:11:24
array of polymers may be utilized where thinner layers 07:11:28
are used to form an appliance." 07:11:33
Do you see that? 07:11:35
A Yes. 07:11:35
Q And it goes on to say, "Polymers of disparate 07:11:36
properties may delaminate from one another where 07:11:41
thicker films are used," right? 07:11:43
A That's what it says. 07:11:46
Q And then it says, "Thinner films allow more intimate 07:11:47
contact between polymer sheets and therefore help bond 07:11:52
the films to one another." 07:11:55
Did I read that right? 07:11:56
A You did. 07:12:00
Q So, again, this is talking about sequentially laying 07:12:01

the films one on top of the other on top of the 07:12:04
physical tooth model, as in Paragraph No. 212 and 07:12:08
consistent with Paragraphs 205 and 206, right? 07:12:11
A Well, yeah, but it also-- Wen also refers to using 07:12:15
adhesives later on, and I don't remember which 07:12:22
paragraph, so-- to adhere the layers of materials that 07:12:25
have different properties, have disparate properties. 07:12:34
Q But in this particular paragraph it's talking about 07:12:38
building the layers one on top of another in separate 07:12:45
vacuum-forming steps on the physical model of the 07:12:52
tooth, right? 07:12:56
MR. COLLINS-CHASE: Objection to 07:12:57
form. 07:12:58
THE WITNESS: Not necessarily. 07:12:58
I mean, I think that applies to a wider array of 07:12:59
polymers maybe utilized the thinner layers-- are used 07:13:03
to form an appliance that applies also for the sheets 07:13:04
being bonded together with an adhesive before-- before 07:13:08
thermoforming. 07:13:14
I don't think that necessarily applies to only 07:13:14
doing it sequentially in thermoforming. 07:13:17
Q (By Mr. Argenti) Paragraph No. 213 is not referring to 07:13:23
combining the layers into a multilayer sheet prior to 07:13:25
forming over the tooth model, right? 07:13:26
MR. COLLINS-CHASE: Objection to 07:13:29

form. 07:13:30
THE WITNESS: Well, it's talking 07:13:30
about polymers of disparate properties, that they may 07:13:32
delaminate from one another, so one uses thinner 07:13:38
layers, and so later in the patent, Wen also discusses 07:13:42
using adhesives, which will help adhering disparate 07:13:47
properties, and you wouldn't use the adhesives in a 07:13:54
thermoforming process, like the one you just mentioned, 07:13:59
but rather you would use it before thermoforming, 07:14:02
assembling the multilayered system before the process. 07:14:07
Q (By Mr. Argenti) But if we look in the context of what 07:14:15
Paragraph No. 213 is specifically talking about, it 07:14:16
wouldn't make sense to pre-form the thinner layers into 07:14:19
a multilayer sheet because a preformed combined 07:14:24
multilayer sheet would already be in intimate contact 07:14:28
with each of the layers, one flat sheet on top of the 07:14:32
other, right? 07:14:36
MR. COLLINS-CHASE: Objection to 07:14:39
form. 07:14:39
THE WITNESS: I mean, the Paragraph 07:14:39
213 is relatively simple to understand. 07:14:42
Thinner layers help with the adhesion between the 07:14:47
layers, and later Wen then discusses and says, "Well, 07:14:52
the nice thing of using adhesives is that you can 07:14:58
adhere materials that are similar to one another or 07:15:02

materials that are very different to one another," and 07:15:05
you wouldn't do that by using-- during a thermoforming 07:15:09
process. You would use it before to create the 07:15:16
multilayered system with thinner layers. 07:15:19
Q (By Mr. Argenti) But looking at the last sentence of 07:15:26
Paragraph No. 213, when it says, "Thinner films allow 07:15:26
more intimate contact between polymer sheets," if the 07:15:29
first and second layers were being combined as a sheet, 07:15:33
before being vacuum formed over the tooth model, they 07:15:38
would already be fully in contact with each other even 07:15:42
without making a layer thinner, right? 07:15:45
A Well, I'm not sure what you're asking. 07:15:49
Yeah, thinner films allow more intimate contact 07:15:51
between polymer sheets and therefore help bond the 07:15:54
films to one another, yeah. That applies also to a 07:15:59
multilayered sheet where they have been bonded together 07:16:04
using adhesives, which he discusses later too. 07:16:06
Q So, again, how does that apply to a multilayer sheet, 07:16:10
when the layers of the multilayer sheet are in intimate 07:16:18
contact with each other, regardless of thickness? 07:16:21
A Well, I think Wen is clear by saying that thin layers, 07:16:24
thinner films, create a better contact and help with 07:16:31
the adhesion and avoids delamination. 07:16:35
He even further goes later and says, "Look, and 07:16:41
you can also use adhesives, and the adhesives will help 07:16:45

in the adhesion between the layers," and that obviously 07:16:51
is done before thermoforming. 07:16:55
I mean, it's a very long patent, and he gives a 07:16:57
lot of different examples, but a person of ordinary 07:17:00
skill in the art reading Wen would understand that yes, 07:17:04
using thinner films would help in conforming the teeth 07:17:08
but would also help with the adhesion, and particularly 07:17:17
if you use an adhesive to join the layers. 07:17:20
That's not done during thermoforming. That's done 07:17:23
before thermoforming. 07:17:27
Sure, I don't disagree there is an embodiment in 07:17:27
Wen that talks about thermoforming, but there's also 07:17:30
embodiments that point to thermoforming a composite, a 07:17:33
multilayered sheet, where the thin layers help in the 07:17:37
adhesion process, and that makes sense. 07:17:41
Q Let's take these sentences in Paragraph No. 213 one at 07:17:43
a time, Dr. Osswald. 07:17:57
The first sentence, where it says, "Further, a 07:17:59
wider array of polymers may be utilized where thinner 07:18:02
layers are used to form an appliance," that doesn't say 07:18:05
anything about the reason to do that, right? 07:18:09
MR. COLLINS-CHASE: Objection to 07:18:13
form. 07:18:14
THE WITNESS: I mean, it says what 07:18:14
it says, but it explains later why thinner layers work, 07:18:16

and so thinner layers avoid delamination during 07:18:20
forming. 07:18:28
Q (By Mr. Argenti) Right. 07:18:28
So the second sentence says that delamination can 07:18:29
be a problem where thicker films are used, right? So 07:18:34
that identifies the problem. 07:18:37
Do you agree? 07:18:38
MR. COLLINS-CHASE: Objection to 07:18:43
form. 07:18:44
THE WITNESS: Well, you can read 07:18:44
that-- I mean, why would delamination occur during 07:18:46
thermoforming? 07:18:51
Delamination would really only occur when you 07:18:53
already have a finished sheet that will delaminate. 07:18:56
I am not sure about your question. 07:19:00
So I understand that, and Wen confirms that later 07:19:02
by using adhesives, but a person of ordinary skill in 07:19:07
the art would understand, "Okay. We use adhesives. We 07:19:12
can bond layers that have similar properties and layers 07:19:16
that have different properties, and if the layers are 07:19:19
thinner, they won't delaminate during the thermoforming 07:19:22
process." 07:19:26
Q (By Mr. Argenti) Is it your understanding that a 07:19:31
multilayered dental aligner produced, as described in 07:19:34
Paragraph No. 205 and 206, cannot have a delamination 07:19:38

1 problem? 07:19:44
2 A Well, there, they are separate films that are 07:19:44
3 thermoformed onto one another, and so they wouldn't 07:19:52
4 delaminate during the process. 07:19:56
5 They may not have a perfect adherence to 07:19:57
6 themselves, and that's why Wen later goes and says, 07:20:00
7 "Look, glue them together, use an adhesive, use thinner 07:20:04
8 layers, and you get a better product that won't 07:20:06
9 delaminate." 07:20:08
10 Yeah, during thermoforming you will get 07:20:09
11 delamination. 07:20:12
12 Q What about after the process? What about delamination 07:20:13
13 after the thermoforming process? 07:20:17
14 MR. COLLINS-CHASE: Objection to 07:20:20
15 form. 07:20:21
16 THE WITNESS: I don't know how-- I 07:20:21
17 mean, I am reading those sentences, and yes, I don't 07:20:23
18 dispute. 07:20:27
19 Wen does talk about thermoforming separate sheets, 07:20:29
20 but he also talks about thermoforming composite 07:20:33
21 multilayered film, and that composite multilayered 07:20:38
22 film, as he explains it quite clearly, is bonded 07:20:44
23 together with adhesives. 07:20:47
24 It is an adhesive lamination process-- 07:20:49
25 Q (By Mr. Argenti) Okay. I want to turn back-- 07:20:51

A Sorry. 07:20:53
Q I didn't mean to cut you off. 07:20:53
A I said "before thermoforming." 07:20:55
Q I want to go back to Paragraph No. 213. 07:20:58
We looked at the first two sentences. 07:21:02
Now I want to look at the third sentence where it 07:21:04
says that the reason to use thinner films is to help 07:21:07
with adhesive bonding. 07:21:14
That's your understanding, right? 07:21:16
MR. COLLINS-CHASE: Objection to 07:21:17
form. 07:21:18
THE WITNESS: It's to conform better 07:21:18
to each layer. 07:21:21
I mean, there are different reasons for that. 07:21:23
One of them is obviously thinner films will 07:21:25
conform to the shape of the teeth better later, but 07:21:28
also it will have a more intimate contact between the 07:21:31
films. 07:21:34
Even when you do that-- when you do adhesive 07:21:35
lamination, films are thin. You will get a better 07:21:41
adhesion between layers as well. 07:21:44
Q (By Mr. Argenti) So the reason it says thinner layers 07:21:51
improve adhesive bonding is because they allow more 07:21:54
intimate contact between polymer sheets. 07:21:58
Do you agree? 07:22:01

A That's one of the reasons, yes, I agree. 07:22:01
Q Does that paragraph identify any other reasons? 07:22:06
A No. That paragraph itself does not identify another 07:22:08
thing, but we have to go later into the patent where he 07:22:18
talks about joining those layers using adhesives, so it 07:22:21
fits. 07:22:27
A person of ordinary skill in the art would know 07:22:28
exactly what to do to make that sheet, and so-- by 07:22:31
using adhesives, and you join different sheets 07:22:34
together, and having thinner films would help in the 07:22:39
adhesion process and would help also-- and he talks 07:22:42
about that it helps in the conformation of the teeth. 07:22:47
Q So my question is: 07:22:50
Considering the sole reason for using thinner 07:22:52
layers, that is identified in Paragraph No. 213, how 07:22:54
would using thinner layers in a pre-formed multilayer 07:22:57
sheet allow more intimate contact between those sheets? 07:23:02
MR. COLLINS-CHASE: Objection to 07:23:07
form. 07:23:08
THE WITNESS: Well, there's always 07:23:08
certain roughness and shape to sheets and materials, 07:23:14
and the thinner the materials are-- if you are going to 07:23:17
join thick plates, yeah, there could be gaps and things 07:23:19
between them. 07:23:24
A very thin-- the thinner the material, the more 07:23:24

1 intimate contact you will have between the two things 07:23:29
2 that you are assembling. 07:23:31
3 Q (By Mr. Argenti) And that's even if the sheets are 07:23:32
4 flat planes in full contact with each other? 07:23:37
5 A Well, yeah. I mean, that's what Wen explains here. 07:23:39
6 A person of ordinary skill in the art would read 07:23:43
7 Wen and understand that. 07:23:46
8 Q Let's turn back to your '613 declaration-- yeah, '613 07:23:50
9 declaration, please. 07:24:09
10 A Okay. 07:24:13
11 Q And we'll go to Page 30. 07:24:13
12 A Yes. 07:24:22
13 Q And on Page 30 you have a heading that says, "It was 07:24:23
14 well known that using several thinner layers of a 07:24:27
15 polymer could improve functionality of multilayer 07:24:29
16 appliances." 07:24:33
17 Do you see that? 07:24:34
18 A Sorry, which paragraph? 07:24:35
19 Q It's above Paragraph No. 51 of your '613 declaration. 07:24:41
20 I was referring to the heading that says, "It was 07:24:47
21 well known that using several thinner layers of a 07:24:50
22 polymer could improve functionality of multilayer 07:24:52
23 appliances." 07:24:57
24 A Yes. 07:24:58
25 Q And in the second paragraph under that heading, which 07:24:58

is Paragraph No. 52 in this declaration, you say, 07:25:02
"First, it was well known that using thinner layers 07:25:07
improves the conformity of each layer to the tooth 07:25:09
model. Put another way, using thinner layers results 07:25:12
in a more detailed and precise dental aligner because 07:25:16
the layers can more easily form into the fine contours 07:25:19
of a model of a patient's teeth." 07:25:24
Do you see that? 07:25:28
A I see that. 07:25:29
Q And you say that this content was known in the art, and 07:25:30
in addition to the Wen reference that we just looked 07:25:34
at, you cite Bedard, right? 07:25:38
A Yes. 07:25:41
Q Is it your understanding that Bedard teaches that using 07:25:41
thinner layers improves conformity to a model of the 07:25:45
patient's teeth? 07:25:48
A I would have to go back and look at Bedard and remember 07:25:50
what Bedard actually discusses. 07:25:54
Q Okay. Why don't we do that. 07:25:57
Let's take out Exhibit No. 1051. 07:25:58
Let me know when you have that out. 07:26:28
A I have Bedard here, Column 3. 07:26:35
Q Okay. Yeah, in your declaration you cite Column 3, 07:28:12
Lines 55 to 67, so that's where I was going to direct 07:28:16
your attention. 07:28:19

1 You can review that paragraph if you need a chance 07:28:23
2 to. 07:28:25
3 A Yes, I see that. 07:28:57
4 Q Can you point me to where in this paragraph Bedard says 07:28:58
5 anything about improved conformity to a tooth model? 07:29:04
6 A It does talk about improving the functionality of it, 07:29:08
7 so-- I mean, it talks about using "Multiple thinner 07:29:22
8 layers of strengthening material(s) which together form 07:29:30
9 a strengthening layer equivalent; or multiple thinner 07:29:34
10 layers of soft material(s) which together form a soft 07:29:38
11 material layer equivalent; or groups of multiple 07:29:40
12 thinner layers"-- so it talks about the improvement by 07:29:43
13 using thinner layers. 07:29:46
14 Q Where does it talk about improvement? 07:29:49
15 It says that it can form an equivalent to a 07:29:51
16 thicker layer. 07:29:55
17 A Well, it is an improvement, so what would the 07:29:56
18 improvement be then otherwise? 07:30:00
19 I mean-- 07:30:01
20 Q That's my question to you, sir. 07:30:03
21 A Yeah, well, Wen explains that. 07:30:04
22 A person of ordinary skill in the art would look 07:30:08
23 at Wen and say, "Okay. You have thinner layers that 07:30:11
24 help with the conformity." 07:30:14
25 Q But looking at Bedard itself, in particular the portion 07:30:16

that you cite in your declaration, it only says that 07:30:19
multiple thinner layers of material can form an 07:30:21
equivalent of a single thicker layer, right? 07:30:24
MR. COLLINS-CHASE: Objection to 07:30:34
form. 07:30:34
THE WITNESS: Yeah, that's what it 07:30:36
says there, but it does, according to Wen, when we look 07:30:37
at Wen-- obviously Bedard wouldn't be there in a 07:30:43
vacuum, wouldn't be there-- a single reference. 07:30:48
A person of ordinary skill in the art would see 07:30:53
Bedard and would see Wen and would know why. 07:30:54
Certainly Bedard is dividing them into thinner 07:30:59
layers. 07:31:01
Why would Bedard make it more difficult if he can 07:31:02
have equivalent thicker layers, and equivalent thicker 07:31:06
layers are easier to manufacture? So why replace it 07:31:10
with a thinner layer? 07:31:12
So there is an improvement in the strength and the 07:31:13
properties and the adhesion, and a person of ordinary 07:31:16
skill in the art would also know then-- the conformity 07:31:22
of the teeth, because they would see that in Wen. 07:31:25
Q So it is your understanding that this paragraph of 07:31:27
Bedard describes an improvement using thinner layers, 07:31:34
and that was part of the basis of your understanding 07:31:39
for your opinions laid out in your declaration; is that 07:31:42

right? 07:31:45
MR. COLLINS-CHASE: Objection to 07:31:49
form. 07:31:50
THE WITNESS: Well, I mean, it says 07:31:50
that inventors recognize that the laminate of the 07:31:50
present invention, dental appliance, could ultimately, 07:31:54
alternatively, include multiple thinner layers, and so 07:31:57
yeah, that means improving it. 07:32:03
A person of ordinary skill in the art would look 07:32:08
at the existing prior art, and it would say, "Of course 07:32:10
Wen does explain that. Wen tells us why there is an 07:32:14
improvement in adhesion and in other aspects." 07:32:18
MR. ARGENTI: We have been going 07:32:33
about an hour. I think it's probably a good time for a 07:32:34
short break. 07:32:37
THE WITNESS: Sounds good. 07:32:41
(Recess 7:32 to 7:47 a.m.) 07:47:15
Q (By Mr. Argenti) Okay. So before we took a break, 07:47:15
we'd been looking at Paragraph No. 52 of your '613 07:47:21
declaration. 07:47:24
We can turn back to that declaration and look at 07:47:25
the next paragraph, 53. 07:47:29
A Yes. 07:47:36
Q In that declaration you say-- in that paragraph you 07:47:36
say, "Second, using thinner layers improves interlayer 07:47:39

bonding, particularly between materials with disparate 07:47:46
properties, lowering the degree of adhesion required to 07:47:51
achieve mutual layer reinforcement. This concept was 07:47:54
also recognized in the art." 07:47:59
Do you see that? 07:48:01
A Yes. 07:48:02
Q And you cite Wen and the Schrenk reference, which is 07:48:02
Exhibit No. 1019, correct? 07:48:07
A Yes. 07:48:08
Q For Wen, you cite Paragraph No. 231. 07:48:08
If you could take a look at that paragraph of Wen, 07:48:13
and let me know when you think that paragraph actually 07:48:19
stands for that proposition. 07:48:24
A I think that may be the wrong paragraph. 07:48:51
Q Is it possible that you meant to say "Paragraph 07:48:53
No. 213" there? 07:48:56
A Possibly, or the one-- the paragraph that refers to the 07:48:57
adhesion of disparate layers-- disparate layers. 07:49:19
Q And which paragraph is that you're referring to? 07:49:26
A I'd have to look for it. I'd have to find it. 07:49:30
I can't find it right now, but there is a section 07:50:59
in this section of Wen that discusses using adhesives 07:51:02
to be able to bond similar, dissimilar materials. 07:51:12
I can't find it right now. 07:51:18
I mean, I can continue looking for it. 07:51:20

Q I am just doing a search for "disparate," the word 07:51:31
"disparate" in Wen, which you had mentioned in your 07:51:35
earlier answer, and the only hit I get is in Paragraph 07:51:38
No. 213. 07:51:42
I look for "dissimilar," and I don't find any use 07:51:42
of "dissimilar" in Wen. I could be wrong about that, 07:51:47
but-- 07:51:54
A "Adhesive"? 07:51:57
Q Well, we can probably move on. 07:52:57
If ClearCorrect's counsel wants to direct your 07:52:59
attention to another aspect of Wen, I am sure they'll 07:53:02
do that when they get the chance, but for now you think 07:53:05
that instead of Paragraph 231 of Wen, you meant to 07:53:09
refer to at least Paragraph No. 213. 07:53:10
Do I have that right? 07:53:15
MR. COLLINS-CHASE: Objection to 07:53:16
form. 07:53:16
THE WITNESS: I don't know. 07:53:17
I would have to find the other paragraph that 07:53:17
talks about adhesives. 07:53:20
Q (By Mr. Argenti) Okay. So in addition-- in addition 07:53:22
to Wen in your declaration in Paragraph No. 503 in the 07:53:25
'613 declaration, you also cite to the Schrenk 07:53:31
reference, Exhibit No. 1019. 07:53:34
Can you take that out, please? 07:53:39

Do you have that exhibit? 07:54:42
A I do. 07:54:43
Q Looking at the first page, it appears this is an 07:54:44
excerpt of a book on polymer blends from 1978. 07:54:50
Does that sound right? 07:54:56
A Yes. 07:54:57
Q Is this something that you had in your own files or 07:54:58
your own library? 07:55:04
A I have seen-- we have it in the library at the 07:55:05
university, and when I worked on blends, that's one of 07:55:11
the books that I-- but I don't own my own copy. 07:55:14
Q Okay. In that paragraph of your declaration you cite 07:55:18
Pages 155 and 166 of Schrenk, correct? 07:55:22
A Yes. 07:55:30
Q And you cite those pages as recognizing that using 07:55:35
thinner layers improves interlayer bonding, right? 07:55:39
A Yes. 07:55:42
Q If we look at those pages, 155 and 166 of Schrenk, in 07:55:42
your declaration are you referring to the last sentence 07:55:52
on Page 155 that carries over to 156? 07:55:55
MR. COLLINS-CHASE: Objection to 07:56:02
form. 07:56:03
THE WITNESS: Yeah, I mean, it's a 07:56:03
whole concept of using-- of bonding a hard layer to a 07:56:13
softer layer, an improvement of the properties, and 07:56:17

then it's saying that thinner layers, the lower-- "The lower will be the degree of adhesion required in order for one layer to influence the response to its neighbor," yeah. 07:56:22 07:56:25 07:56:30 07:56:34

Q (By Mr. Argenti) And after that sentence that you just read, Schrenk goes on to provide more detail about that proposition in the next sentence, explaining that "Thus, in micro-layer film with hundreds of very thin layers, interlayer interactions can be anticipated even with very poorly adhering components," right? 07:56:38 07:56:41 07:56:44 07:56:48 07:56:52 07:56:56

A Well, yeah, and it goes hand in hand with what Wen says, that thinner layers adhere better to each other. 07:56:59 07:57:07

Q What is a micro-layer film? 07:57:11

A It's a film in the micrometers order of thickness and not millimeter. 07:57:14 07:57:25

Q Is that a term that a POSITA would have been familiar with as of the priority date? 07:57:26 07:57:29

A Yes. 07:57:31

Q And the portion of Schrenk here that you cite as demonstrating that using thinner layers improves interlayer bonding is specifically talking about micro-layer films with hundreds of very thin layers, right? 07:57:31 07:57:37 07:57:39 07:57:41 07:57:44

MR. COLLINS-CHASE: Objection to form. 07:57:44 07:57:45

THE WITNESS: Well, I mean, if-- it goes to second-- to my Paragraph No. 54. I say, "Second, using thinner layers improves interlayer bonding, particularly between materials with disparate properties." 07:57:45 07:57:49 07:57:53 07:57:56 07:58:00

Yeah, so it does, and Schrenk there is talking about bonding the brittle material with a ductile material, but brittle material that has a high strength and ductile material that has a low strength, and as a composite making a material that has both a high strength and that is ductile. 07:58:01 07:58:04 07:58:11 07:58:15 07:58:19 07:58:23

Then he-- then Schrenk even goes further and says, well, thinner layers-- if you go all the way down to micrometer scales, you would have-- you would have even better adhesion. 07:58:26 07:58:30 07:58:33 07:58:41

So it goes-- it's a good reference as something that a person of ordinary skill in the art would have known at the time of the invention. 07:58:42 07:58:49 07:58:53

Wen says the same. Wen confirms it, or Schrenk confirms what Wen says. 07:58:55 07:58:59

Q (By Mr. Argenti) This paragraph of Schrenk doesn't say anything about, for example, splitting one layer up into two layers, does it? 07:59:01 07:59:03 07:59:06

MR. COLLINS-CHASE: Objection to form. 07:59:09 07:59:10

THE WITNESS: Well, if you replace one layer with several smaller layers, that means splitting them, but Wen does that. 07:59:10 07:59:14 07:59:17

Wen discusses the splitting of the layers. 07:59:20

Q (By Mr. Argenti) So does that mean you agree with me that Schrenk is not talking about splitting one layer up into two layers, he's talking about using hundreds of micro-layers? 07:59:26 07:59:29 07:59:32 07:59:35

MR. COLLINS-CHASE: Objection to form. 07:59:36 07:59:37

THE WITNESS: Well, if you replace a thicker players with hundreds of micro-layers, you are splitting a thicker layer into hundreds of micro-layers. 07:59:37 07:59:38 07:59:42 07:59:45

That's how a person of ordinary skill in the art would read it. That's what Schrenk means there, so he is splitting. 07:59:46 07:59:49 07:59:52

He is replacing something. 07:59:52

If you replace something with a single layer with a bunch of layers that are thinner, you are splitting the layer. 07:59:53 07:59:56 07:59:59

I am not sure I understand your question. 08:00:02

Q (By Mr. Argenti) My question goes to what you are splitting the single layer into. 08:00:07 08:00:10

Schrenk is talking about hundreds of layers, 08:00:12

1 correct? 08:00:15
2 MR. COLLINS-CHASE: Objection to 08:00:15
3 form. 08:00:16
4 THE WITNESS: Sure, you can go from 08:00:16
5 a single layer or a couple of disparate layers to 08:00:18
6 layers that are-- that you split, and so splitting the 08:00:25
7 layers. 08:00:30
8 That's what Schrenk is saying, he goes from 08:00:30
9 thicker layers to thinner layers-- 08:00:33
10 Q (By Mr. Argenti) Hundreds of thinner layers? 08:00:36
11 A Yeah, as far down as hundreds. 08:00:37
12 Q Turn back to your '613 declaration, please, and let's 08:00:40
13 go to Page 23. 08:01:18
14 A Yes. 08:01:32
15 Q In Paragraph No. 40 you address adhesive lamination, 08:01:33
16 right? 08:01:37
17 A Yes. 08:01:38
18 Q And you say that "Adhesive lamination, or adhesive 08:01:39
19 bonding, is considered a 'basic industrial process,'" 08:01:44
20 right? 08:01:49
21 A Yes. 08:01:49
22 Q You go on to say that "Adhesive lamination consists of 08:01:49
23 joining materials, including plastics, by use of an 08:01:55
24 adhesive material," correct? 08:01:58
25 A Yes. 08:02:00

Q And then in the last sentence you say that the adhesive 08:02:01
material can be used to bind together the layers of the 08:02:06
actual laminate structure, referred to as a tie layer 08:02:10
or glue layer, right? 08:02:17
A Yes. 08:02:19
Q So the adhesive there is the tie layer or glue layer, 08:02:24
correct? 08:02:28
A Yes. 08:02:28
Q And again you cite a couple of references in support of 08:02:28
that opinion, including Schrenk, correct? 08:02:33
A Yes. 08:02:36
Q So let's look at the page of Schrenk that you cite. 08:02:39
Turning back to Exhibit No. 1019, and let's look 08:02:44
at Page 140. 08:02:48
A Yes. 08:03:16
Q In the middle of the text on Page 140 of Schrenk, it 08:03:17
says, "A glue layer polymer, which adheres to both of 08:03:20
the other nonadhering polymers, may be co-extruded as 08:03:25
an intermediate layer." 08:03:30
Do you see that? 08:03:32
A Yes. 08:03:33
Q Is that the glue layer discussion that you cite in your 08:03:33
declaration? 08:03:37
MR. COLLINS-CHASE: Objection to 08:03:38
form. 08:03:38

THE WITNESS: That's one example. 08:03:39
Q (By Mr. Argenti) So the adhesive glue layer that 08:03:42
Schrenk describes here is a polymer; is that right? 08:03:44
A Yes. They're usually polymers. 08:03:47
Q And Schrenk explains that the adhesive or glue is an 08:03:51
intermediate layer between the two nonadhering 08:03:56
polymers, right? 08:04:01
A Yes. 08:04:02
Q Now let's jump ahead a few pages in Schrenk to Page 08:04:02
150. 08:04:12
A Yes. 08:04:24
Q This section is entitled, "Use of 'glue layer' polymers 08:04:25
in co-extrusion," right? 08:04:32
A Yes. 08:04:34
Q And in the first paragraph of that section, Schrenk 08:04:34
says sometimes a multilayer sheet or film has poor 08:04:39
adhesion between adjacent layers, right? 08:04:45
A Yes. 08:04:47
Q Schrenk then explains that a glue layer is a thin layer 08:04:51
of polymer that shows good adhesion to both of the 08:04:55
materials in question, correct? 08:04:59
A Yes. 08:05:00
Q Do you agree that that's what a glue layer is? 08:05:01
A Yeah, a glue-- an adhesive or glue layer, both in 08:05:05
co-extrusion processes and in lamination processes help 08:05:11

in the adhesion of the layers. 08:05:15
Q So an adhesive lamination, a glue layer, is a layer of 08:05:18
polymer binding two adjacent layers together; is that 08:05:23
right? 08:05:26
MR. COLLINS-CHASE: Objection to 08:05:27
form. 08:05:28
THE WITNESS: Can you repeat that 08:05:28
question, please? 08:05:29
Q (By Mr. Argenti) In adhesive lamination, a glue layer 08:05:31
is a layer of polymer binding two adjacent layers 08:05:33
together; is that right? 08:05:36
MR. COLLINS-CHASE: Objection to 08:05:37
form. 08:05:38
THE WITNESS: Yeah, it's a very thin 08:05:38
layer. 08:05:41
It's a tie layer, so it's understood to be a very, 08:05:41
very small layer that-- of material, a coating that is 08:05:44
used to adhere two sheets together. 08:05:49
Q (By Mr. Argenti) You just mentioned that term "tie 08:05:55
layer," which you also use in paragraph No. 40 of your 08:05:58
declaration on the '613 patent. 08:06:02
I can't find the term "tie layer" in either of the 08:06:04
references you cite, Exhibit No. 1042 or 1019, so my 08:06:09
question is: 08:06:13
Where does that term come from? 08:06:13

A It is a term that a person of ordinary skill in the 08:06:15
art, in the field of laminates or multilayer sheets, 08:06:23
understands as being something that helps in adhesion, 08:06:27
tying the layers between different materials. 08:06:32
It may not be the word found in those references, 08:06:37
but it's something that a person of ordinary skill in 08:06:39
the art would understand what it is. 08:06:41
Q Are you able to point me to any use of that term in any 08:06:43
of the exhibits that you cited? 08:06:48
A I don't know. 08:06:50
I cited a lot of exhibits. 08:06:53
The word "tie layer" is something that is known in 08:06:59
the art. 08:07:02
Q Can we take out Exhibit No. 1006 now, please? 08:07:04
This is the Porter reference, right? 08:07:36
A Yes. 08:07:39
Q Do you know who identified Porter as a relevant prior 08:07:39
art reference for this case? 08:07:46
A I don't know who identified it for this case, but I am 08:07:47
very familiar with the Porter reference from the time 08:07:52
that it was published. 08:07:55
I received, at that time, the paper version of 08:07:56
Plastics Technology and all the other journals. 08:07:59
It's a known reference in the field. 08:08:05
Q Do you remember the Porter article in particular from 08:08:08

when it came out? 08:08:11
A If I-- when I saw it, I remembered it. 08:08:12
Yes, I did, because at the time the industry, the 08:08:17
polymer technology industry, was hungry for replacement 08:08:21
of polycarbonate because of the BPA issues, so I was 08:08:25
teaching, and I taught my class engineering design with 08:08:30
polymers at the time, and starting in the late '90s or 08:08:34
before that I was talking about different issues with 08:08:39
different polymers and polycarbonate. While it has 08:08:41
amazing properties, the optical properties, et cetera, 08:08:45
it had the issue of BPA, and I was teaching it to my 08:08:49
students early on. 08:08:52
In fact, even my kids who grew up in the '90s 08:08:53
didn't use polycarbonate bottles because I knew of that 08:08:56
and I taught that in class. 08:09:02
I wasn't the only one. This was something known 08:09:03
in the industry. 08:09:07
People were looking for a solution, and I have a 08:09:09
bunch of other references. 08:09:13
Yes, the Porter reference especially coming out in 08:09:14
Plastics Technology-- there may have even been an 08:09:19
article in Plastics Engineering, which is an SPE 08:09:23
magazine. This Porter publication from Eastman was 08:09:26
welcomed in the polymer plastic design industry. 08:09:33
So a person of ordinary skill in the art would 08:09:39

1 have been looking for a solution, and Eastman brought 08:09:42
2 that solution in the form of Tritan. 08:09:48
3 Q The title of the Porter article is, "Dishwasher safe," 08:09:52
4 "New clear copolyester is tougher, more heat-resistant, 08:09:57
5 and processes easier too," right? 08:10:02
6 A Yes. 08:10:06
7 Q And the first line of the article says, "Crystal 08:10:07
8 clarity, toughness, and ability to withstand hundreds 08:10:11
9 of home or commercial dishwasher cycles without 08:10:14
10 cracking or crazing are major attractions of Eastman's 08:10:18
11 new Tritan copolyester." 08:10:23
12 Do you see that? 08:10:26
13 MR. COLLINS-CHASE: Objection to 08:10:27
14 form. 08:10:27
15 THE WITNESS: I do see that, yes. 08:10:28
16 I read the article. 08:10:29
17 Q (By Mr. Argenti) It looks like the two authors of this 08:10:31
18 article are employees of Eastman Chemical Company. 08:10:33
19 Does that sound right? 08:10:36
20 A Yes. 08:10:37
21 Q Do you have any reason to dispute their 08:10:38
22 characterization of the major attractions of this new 08:10:43
23 Tritan copolyester? 08:10:46
24 MR. COLLINS-CHASE: Objection to 08:10:48
25 form. 08:10:48

THE WITNESS: Well, I mean, you have 08:10:49
to read the article in the context of the times that it 08:10:50
came out. 08:10:55
While everybody knew and people-- there were 08:11:00
publications about BPA. 08:11:03
The chemical industry, and particularly the 08:11:05
manufacturers of polycarbonate, were very adverse to 08:11:09
talking about BPA. That was something that they didn't 08:11:16
talk-- that the industry knew. 08:11:20
People knew about BPA issues. Everybody making 08:11:22
bottles, making anything knew about it. 08:11:27
I don't know what Porter and Beavers were thinking 08:11:29
at the time, but to make a publication really strong in 08:11:32
the plastics industry, making something dishwasher 08:11:36
resistant, is-- it was an important aspect. 08:11:41
It was avoiding environmental stress cracking, 08:11:46
which was also a problem that was being solved, but 08:11:49
that it was-- the new material was also replacing BPA 08:11:52
in mouthguards and bottles, et cetera. 08:11:59
That goes without saying at the time that 08:12:03
conventional wisdom was, "Look, we need to find 08:12:06
something to get rid of polycarbonate." 08:12:09
This article came at the right time. 08:12:13
Soon after people did switch. Soon after Nalgene 08:12:16
switched their bottles from polycarbonate to Tritan and 08:12:22

other-- I mean, even dental aligner examples at the 08:12:27
time also suggested Tritan. 08:12:34
It was not just something that was dishwasher 08:12:38
safe. It is code for saying, "Look, this can withstand 08:12:42
the most strong chemical attack on the polymer, which 08:12:46
is the dishwasher." 08:12:51
It's the soaps. Polymers hate soaps and both-- 08:12:53
hate acids and other things. 08:12:59
Q (By Mr. Argenti) So it sounds like you agree that 08:13:00
developing a material that performs well in dishwashers 08:13:03
was a major design goal in the development of Tritan, 08:13:06
right? 08:13:09
MR. COLLINS-CHASE: Objection to 08:13:09
form. 08:13:10
THE WITNESS: No, it wasn't-- that's 08:13:10
not what I said. 08:13:12
It was the material that is environmental stress 08:13:13
crack resistant. 08:13:17
The dental aligner also undergoes a lot of 08:13:18
chemical attack in the mouth with whatever foods and 08:13:22
acids it comes in contact with, and saliva, so chemical 08:13:27
attack is not a problem only coming from the 08:13:31
dishwasher. 08:13:35
I mean, environmental stress crack is something 08:13:36
that was known in the field, and anybody designing 08:13:38

parts, including dental aligners, would have been aware 08:13:43
of environmental stress cracking. 08:13:46
That's just a basic polymer engineering-- design 08:13:47
with polymers, as a problem. 08:13:53
They figured, you know, our strongest case here is 08:13:56
to show that this is really dishwasher safe. 08:13:59
It's a catch line. It's code for "Look, 08:14:02
environmental stress cracking has been solved. Many 08:14:05
problems in environmental stress cracking have been 08:14:10
solved with this new material that performs like 08:14:12
polycarbonate." 08:14:15
Everybody knew polycarbonate was chemically-- 08:14:16
would be attacked from most chemicals. It had low 08:14:21
environmental stress crack resistance. 08:14:24
Everybody also knew that polycarbonate had BPA, 08:14:26
leached out BPA. 08:14:31
Q (By Mr. Argenti) Dr. Osswald, do you disagree that 08:14:34
developing a material that performed well in 08:14:36
dishwashers was a major design goal, during the 08:14:39
development, to Tritan? 08:14:41
MR. COLLINS-CHASE: Objection; asked 08:14:43
and answered. 08:14:45
THE WITNESS: I think the title of 08:14:46
the article, "Dishwasher safe," as I said, it was a 08:14:50
catchy article because it covers-- if something will 08:14:54

1 resist a dishwasher, it can resist any environmental 08:14:57
2 stress cracking condition. 08:15:02
3 I think Tritan was developed to replace 08:15:03
4 polycarbonate for several problems that polycarbonate 08:15:06
5 rendered, and one of them that was well known in the 08:15:12
6 field, well known-- even just a person picking up 08:15:16
7 newspapers at the time, they knew BPA was in 08:15:20
8 polycarbonate, not even a person of ordinary skill in 08:15:25
9 the art. 08:15:29
10 This was popular knowledge. This was conventional 08:15:29
11 wisdom. 08:15:33
12 That's one problem. 08:15:33
13 Another problem is sure, polycarbonate was not 08:15:34
14 environmental stress crack resistant, so Porter writes 08:15:39
15 this article, and they figure having a big title 08:15:41
16 saying, "Dishwasher safe" would catch people's 08:15:46
17 attention because you read that as environmental stress 08:15:50
18 crack resistant. 08:15:53
19 Q (By Mr. Argenti) It's not just the title, is it, 08:15:55
20 Dr. Osswald? 08:15:57
21 It's the entire article? 08:15:58
22 MR. COLLINS-CHASE: Objection to 08:16:01
23 form. 08:16:01
24 THE WITNESS: Well, the article goes 08:16:01
25 into other properties and shows that there are other 08:16:02

1 properties, but, yeah, environmental stress crack 08:16:07
2 resistant was a big issue. 08:16:10
3 Now, the BPA aspect was a whole other issue. 08:16:12
4 Q (By Mr. Argenti) When is the last time you read 08:16:16
5 Tritan, Dr. Osswald? 08:16:18
6 MR. COLLINS-CHASE: Objection to 08:16:20
7 form. 08:16:21
8 THE WITNESS: When is the last time 08:16:21
9 I what? 08:16:22
10 Q (By Mr. Argenti) When is the last time you read this 08:16:23
11 exhibit? 08:16:25
12 A Oh, this exhibit? I looked at it during this case. 08:16:25
13 Q Did you review Porter when preparing for your 08:16:37
14 deposition? 08:16:39
15 A I probably looked at material data tables, yes, I did. 08:16:39
16 I looked at it. 08:16:43
17 I didn't read the whole article. 08:16:43
18 Q Did you-- so when is the last time that you read the 08:16:45
19 whole article? 08:16:51
20 A Probably a few months back. 08:16:52
21 Q Why don't you turn to Page 6 of 9 of Porter, please. 08:16:54
22 You see that full paragraph in the middle column 08:17:09
23 that starts, "Dishwashers in homes"? 08:17:12
24 A I see that, yes. 08:17:14
25 Q Can you read that paragraph for me, please? 08:17:16

A It says, "Dishwashers in homes and professional 08:17:19
kitchens expose kitchenware to a harsh combination of 08:17:22
heat, hydrolytic, and chemical attack, and applied 08:17:26
stress." 08:17:31
In other words, as I said before, if it's 08:17:32
dishwasher safe, it's going to resist a lot of 08:17:35
different chemicals. 08:17:38
Even putting a dental aligner in the mouth, 08:17:39
there's also issues with environmental stress cracking 08:17:43
there, so-- 08:17:46
Q Could you continue reading, please, the whole 08:17:47
paragraph? 08:17:52
A "In some cases kitchenware is exposed to the dishwasher 08:17:53
dozens of times per week. Withstanding these 08:17:55
environmental conditions was a major design goal in the 08:17:58
development of Tritan." 08:18:01
I see that, yeah. 08:18:05
Q So I'm going to ask my question again. 08:18:06
Do you disagree that developing a material that 08:18:08
performed well in dishwashers was a major design goal, 08:18:10
during development, of Tritan? 08:18:14
MR. COLLINS-CHASE: Objection to 08:18:16
form. 08:18:16
THE WITNESS: I think having a 08:18:20
material that performed mechanically and optically, as 08:18:21

1 well as polycarbonate, without the issues that 08:18:24
2 polycarbonate had, was a goal. 08:18:28
3 Yeah, environmental stress cracking was a major 08:18:31
4 issue. 08:18:33
5 BPA was also a major issue, and maintaining the 08:18:34
6 actual properties was the goal for that, and they came 08:18:40
7 up with a solution. 08:18:43
8 Q (By Mr. Argenti) Do you have any reason to dispute 08:18:48
9 this explicit statement of a "major design goal" during 08:18:50
10 Tritan's development in Porter? 08:18:55
11 MR. COLLINS-CHASE: Objection to 08:18:56
12 form. 08:18:56
13 THE WITNESS: It's one design goal. 08:18:57
14 It was-- environmental stress crack resistance has 08:18:58
15 always been a major problem with polycarbonate. 08:19:03
16 I taught that to my students. 08:19:06
17 I taught to my students two major things about 08:19:07
18 polycarbonate: Great properties, a go-to material, a 08:19:12
19 tough material, unless the chemical environment is 08:19:16
20 corrosive and unless you're going to have it in contact 08:19:18
21 with your body, particularly swallowing it, like 08:19:21
22 bottles and other things. 08:19:24
23 Yeah, it probably was a major issue, but as I 08:19:26
24 said, "dishwasher safe" reads "environmental stress 08:19:31
25 crack resistance." 08:19:38

Q (By Mr. Argenti) And the particular issue they flag as 08:19:44
the major consideration during development of Tritan 08:19:46
was a dishwasher application, right? 08:19:48
MR. COLLINS-CHASE: Objection to 08:19:51
form. 08:19:52
THE WITNESS: I don't think that's 08:19:52
the major thing they flagged. 08:19:54
I think, as I mentioned earlier, if a material 08:19:55
resists the dishwasher environment-- and they list the 08:20:00
environments there: temperature, chemicals, soaps, 08:20:04
et cetera. If a material resists that, it's going to 08:20:08
be relatively safe in all kinds of environments where 08:20:12
environmental stress cracking is an issue, and 08:20:19
environmental stress cracking was an issue. 08:20:22
There were all kinds of other applications for 08:20:23
polycarbonate -- bottles, all kinds of things, lenses, 08:20:31
glazing for automobiles, et cetera -- and environmental 08:20:38
stress cracking is always a concern. 08:20:43
While the article-- sure, as I said, it's catchy, 08:20:45
"Dishwasher safe." Okay, that's catchy, and you 08:20:49
benchmark something can be at high temperature or be 08:20:56
at-- whatever you're trying to benchmark for a material 08:21:02
to resist. 08:21:04
In the case of polycarbonate, well, the toughest 08:21:05
benchmark is "Will this material respond well in a 08:21:08

dishwasher," so I don't disagree that a dishwasher is a great experimental venue for testing a material. In fact, it's a great one. 08:21:14 08:21:19 08:21:26

That's really what comes across in that article. 08:21:27

It doesn't come across like, "Oh, we can now have dishwasher safe materials." 08:21:30 08:21:33

It really comes out it's environmental stress crack resistant, and they talk about that in the article. 08:21:35 08:21:38 08:21:41

Sure, that sentence itself may make an attorney or somebody believe that that's the only thing that was-- but at the time you have to put it into context of a person of ordinary skill in the art, in this case here, with the dental aligners-- and there were problems. 08:21:41 08:21:46 08:21:51 08:21:53 08:21:58

One of them was also environmental stress crack resistance, and the other one was BPA. 08:22:02 08:22:05

That goes-- there's no dispute on that. 08:22:07

That's the conventional wisdom at the time. 08:22:10

Even newspaper articles came out about all of those. 08:22:12 08:22:15

Q (By Mr. Argenti) What is the basis for your understanding that environmental stress cracking was an issue in dental aligners at the time? 08:22:16 08:22:17 08:22:19

A It would be. 08:22:21

I mean, I think the layer that is exposed-- the 08:22:23

1 polycarbonate layer exposed and under stress in a 08:22:28
2 dental aligner would likely be problematic in 08:22:32
3 environmental stress. 08:22:39
4 Environmental stress cracking is always a concern, 08:22:40
5 especially-- and particularly with polycarbonate. 08:22:45
6 Even the article-- and I don't remember where it 08:22:48
7 came out, but there was an article when Nalgene 08:22:52
8 switched to polycarbonates, so it was really the first 08:22:59
9 article that came out that says, "Oh, there is this 08:23:01
10 amazing Tritan material," that when Canada banned 08:23:04
11 polycarbonate from drinking bottles, it didn't talk 08:23:08
12 about that it was dishwasher safe. It talked about 08:23:11
13 that really it was BPA free. That was the reason why. 08:23:15
14 Nalgene didn't switch to Tritan because of the 08:23:20
15 dishwasher resistance or environmental stress crack 08:23:22
16 resistance, but they switched because it was BPA free 08:23:27
17 The article was welcomed. Everybody saw the 08:23:29
18 article. 08:23:32
19 It was welcomed in the industry, but a person of 08:23:33
20 ordinary skill in the art would understand that it was 08:23:35
21 more than just dishwasher safe. 08:23:37
22 Q When we look at the first sentence of that paragraph on 08:23:39
23 Page 6 of Porter, where it says, "Dishwashers in homes 08:23:45
24 and professional kitchens expose kitchenware to a harsh 08:23:51
25 combination of heat, hydrolytic, and chemical attack, 08:23:54

and applied stress," the chemicals that Porter is 08:23:56
referring to there are detergents used in dishwashers, 08:24:00
right? 08:24:08
MR. COLLINS-CHASE: Objection to 08:24:09
form. 08:24:09
THE WITNESS: Among other things, 08:24:09
yes, but detergents and soaps are the worst enemies of 08:24:11
polymers. 08:24:16
Yes, those are the chemicals they're referring to 08:24:16
there. 08:24:19
Q (By Mr. Argenti) Those are not chemicals you would 08:24:20
expect to find inside the mouth of a dental aligner 08:24:22
patient, would you? 08:24:25
MR. COLLINS-CHASE: Objection to 08:24:25
form. 08:24:26
THE WITNESS: Well, a mouth and a 08:24:26
dental aligner would have other chemicals. 08:24:32
Soaps are really the worst-case scenario for many 08:24:34
polymers because it lowers the surface energy of the 08:24:38
material and it leads to environmental stress cracking. 08:24:43
There are other chemicals, acids, and other 08:24:46
alcohol that could interfere with materials like 08:24:50
polycarbonate, and particularly under stress, which is 08:24:54
in dental aligners they're under stress. 08:24:57
That whole sentence just-- it's read by an 08:25:03

engineer not like, "Oh great, we have now a dishwasher 08:25:07
safe material," but "We have something that will resist 08:25:10
this very, very tough condition, which is the 08:25:13
dishwasher." 08:25:16
In other words, that was their benchmark, but they 08:25:18
were solving more than just dishwasher safe, making a 08:25:20
dishwasher safe product. 08:25:25
Q (By Mr. Argenti) What is your understanding of the 08:25:27
harshness of the chemicals that a mouth of a dental 08:25:28
patient might be exposed to relative to the chemicals 08:25:34
that are being discussed in Porter? 08:25:37
MR. COLLINS-CHASE: Objection to 08:25:39
form. 08:25:40
THE WITNESS: Well, I mean, there 08:25:40
are all kinds of foods with different pHs that people 08:25:46
consume that could affect a polymer, and if there's any 08:25:49
polymer that it would affect, it's polycarbonate. 08:25:54
There's a whole publication of chemical resistance 08:25:57
of polymers that even contained orange juice as one of 08:26:05
the materials, so any food, anything is a chemical, I 08:26:09
mean, in the sense when you design a product. 08:26:13
Anything can come in contact with a dental aligner 08:26:17
through food or whatever base. 08:26:21
Some people may have even cleaned them in the 08:26:23
dishwasher. I don't know. 08:26:26

Q (By Mr. Argenti) Do you know whether dentists advised 08:26:30
their patients to clean dental aligners in the 08:26:32
dishwasher? 08:26:35
A I don't know. 08:26:35
Q Do you know what the typical operating temperature 08:26:36
inside a dishwasher is? 08:26:44
A It depends. 08:26:45
I mean, it's pretty high. 08:26:46
Again, this was their benchmark. 08:26:48
The dishwasher reflects the worst conditions. 08:26:53
I am not disputing that the article mentions 08:26:56
"dishwasher safe," but I also as an engineer read that 08:26:59
article, and everybody read that article, by saying, 08:27:03
"Oh, okay. This material is relatively environmental 08:27:08
stress crack resistant," and they talk about it. They 08:27:12
say, "Environmental stress cracking." 08:27:16
They don't point to just "dishwasher safe." They 08:27:19
say, "Environment stress cracking" in the article. 08:27:22
I don't remember where, but it does talk about it. 08:27:22
Q Based on your review of Porter many months ago, do you 08:27:24
remember whether it sets out the typical operating 08:27:27
temperature inside a dishwasher? 08:27:31
MR. COLLINS-CHASE: Objection to 08:27:33
form. 08:27:34
THE WITNESS: I don't remember. 08:27:34

Q (By Mr. Argenti) Why don't we take a look at Page 8 of Porter and the paragraph at the top of the middle column. 08:27:36 08:27:39 08:27:45

A Okay. 08:27:50

Q Would you agree that Porter explains that the typical operating temperatures of dishwashers are up to 70 degrees Celsius for residential or around 70 degrees Celsius and about 85 degrees Celsius for commercial? 08:27:51 08:27:54 08:27:59 08:28:04

A Yeah, I see that. Yeah. 08:28:08

Q How do those temperatures compare to the temperature inside the mouth? 08:28:10 08:28:13

MR. COLLINS-CHASE: Objection to form. 08:28:15 08:28:15

THE WITNESS: Again, the Porter article doesn't say that Tritan was invented so it can resist those temperatures. 08:28:15 08:28:18 08:28:25

It is-- they use dishwashers, as I said, as a benchmark. Those are the very strict conditions of testing. 08:28:26 08:28:31 08:28:38

Sure, he had-- I can see that here, and I can see why he has a temperature. 08:28:38 08:28:41

If he has a benchmark, he should also give what temperatures, and that is dishwasher safe. 08:28:43 08:28:47

Again, this article didn't come out because people were so excited to have something that is dishwasher 08:28:50 08:28:55

safe. They were very excited because it was 08:29:01
something-- it was a replacement that was BPA free. 08:29:04
It's not just this article. There's other 08:29:09
articles that I reference in my writings that they say 08:29:12
you know, "Look, to find a replacement that was BPA 08:29:16
free really"-- Eastman was really the only solution-- 08:29:20
Tritan is really the only solution for that. 08:29:29
Now, it had also the added benefit that it was 08:29:31
environmental stress crack resistant. 08:29:40
Q (By Mr. Argenti) Dr. Osswald, my question was: 08:29:41
How did those temperatures that Porter describes 08:29:43
compare to the temperature inside a mouth? 08:29:47
A Well, those temperatures are high. 08:29:48
As I said-- and are higher than probably anything 08:29:56
a person would drink, but the article simply states 08:29:59
that even with soaps and those high temperatures, it 08:30:03
would resist those conditions, which means it's a very 08:30:08
good environmental stress crack resistant material, has 08:30:11
the added benefit that it's optically equivalent to 08:30:17
polycarbonate, it has similar strength, stiffness 08:30:24
properties, and that it-- and that it is BPA free, 08:30:32
which is really-- that was the major issue. 08:30:37
Everybody knew that at the time. 08:30:40
I mean, the temperature, as I say, it's the 08:30:42
benchmark that they used. 08:30:45

Q Starting at this page, Page 8 of Porter, the article 08:30:48
gives three examples of Tritan applications in the real 08:30:54
world, right? 08:30:57
A Yes. 08:30:58
Q And one of those is a line of injection stretch blow 08:31:05
molded water bottles, correct? 08:31:10
A Yes. 08:31:12
Q Porter says that CamelBack turned to Tritan when 08:31:13
looking for a material able to withstand dishwasher 08:31:17
cleaning, right? 08:31:20
A That's what they say there. 08:31:21
Q Another real world application that Porter describes is 08:31:25
Vitamix blender containers, correct? 08:31:28
A Yes. 08:31:31
Q Porter explains that "Tritan copolyester is able to 08:31:31
stand up to the riggers of the blending process and 08:31:37
washing," right? 08:31:40
A Yes. 08:31:41
Q And the third real world application is a thick-walled 08:31:41
soup bowl, correct? 08:31:47
A That's what he writes. 08:31:48
Q Porter mentions that an important criterion for that 08:31:49
product is the ability to be washed several times per 08:31:52
day in a commercial dishwasher, correct? 08:31:56
A That's what Porter writes and that's what the article 08:31:59

1 states, but in those examples it needs to be read as 08:32:03
2 these are something that would come in contact with 08:32:09
3 food or something-- or something to drink. 08:32:12
4 At the same time, in 2008, when Nalgene switched 08:32:16
5 to Tritan, they didn't say it's because it's a great 08:32:22
6 material-- or it's a great material to resist 08:32:31
7 dishwashers. They clear out said, "This is BPA free." 08:32:34
8 I don't know why-- I probably understand why a 08:32:41
9 chemical company, when they publish an article, would 08:32:46
10 want to not discuss the BPA aspect of it. 08:32:50
11 Everybody knew Tritan was BPA free, was a 08:33:01
12 copolyester, and that was-- when that article came out, 08:33:06
13 it was a sigh of relief for many people, or when 08:33:12
14 Eastman came out with Tritan, it was a sigh of relief 08:33:15
15 of anybody making anything that would come in contact 08:33:19
16 with the mouth. 08:33:22
17 That would be soup bowls or bottles or dental 08:33:23
18 aligners. 08:33:27
19 I discuss that in my BPA discussion in my report. 08:33:28
20 Porter is just one single reference, but it's an 08:33:32
21 important reference because it's something important in 08:33:36
22 the art at the time. 08:33:40
23 It was an inflection point. 08:33:43
24 It was, "Okay. Now we have a material," and the 08:33:47
25 Porter article was a splash in the industry. 08:33:52

Sure, they wrote it, "Dishwasher safe," whatever, 08:33:56
that Porter wanted to convey. 08:34:01
One of the things Porter was very interested in 08:34:04
was that environmental stress cracking was very 08:34:07
important, more important-- and environmental stress 08:34:12
cracking with polycarbonate does not dispute-- it's 08:34:16
important. 08:34:23
Yeah, 85 degrees is simply a benchmark. 08:34:24
Q Dr. Osswald, each of the three examples of real world 08:34:28
applications that Porter provides explicitly mentions 08:34:32
dishwasher durability as an important consideration, 08:34:36
correct? 08:34:39
A Yes, it does. That is not disputed, but the article 08:34:39
itself, when it came out, came out at a time when the 08:34:47
world was looking-- and the world is people that-- a 08:34:51
lot of engineers that were making things with food 08:34:56
contact or with-- or that came in contact with the 08:34:59
body, and they were looking for something that was BPA 08:35:02
free, that was known at the time. 08:35:05
Particularly when this article came out, that 08:35:07
was-- it was a sigh of relief. 08:35:11
I was there at the time. I know that. 08:35:13
A person of ordinary skill in the art making the 08:35:15
soup bowls or whatever, they knew it wasn't just the 08:35:20
soup bowl. They knew it was also BPA. 08:35:24

1 Sure, it's now a material that is BPA free, goes 08:35:26
2 without saying, but it's also environmental stress 08:35:31
3 crack resistant. 08:35:33
4 I think that's-- I don't know what they were 08:35:34
5 thinking when they wrote that article, but it came 08:35:37
6 across-- people thought, "Okay. Here is a solution 08:35:40
7 that is better than polycarbonate, and it doesn't have 08:35:42
8 BPA." 08:35:47
9 What better way to show that it's better than 08:35:49
10 polycarbonate is that it solves the problem that 08:35:52
11 existed at the time, one of the problems, which was 08:35:55
12 environmental stress crack resistance, that 08:35:58
13 polycarbonate performed poorly at. 08:36:02
14 Q Porter does not describe any applications or potential 08:36:05
15 uses in orthodontics, right? 08:36:07
16 MR. COLLINS-CHASE: Objection to 08:36:12
17 form. 08:36:13
18 THE WITNESS: Porter gives some 08:36:13
19 examples. 08:36:15
20 I think whatever he left out doesn't mean that the 08:36:16
21 people making those products were not hungry to have a 08:36:19
22 replacement that was BPA free. 08:36:26
23 Q (By Mr. Argenti) I am going to ask again. 08:36:36
24 I don't think you answered my question. 08:36:37
25 Porter doesn't describe any applications or 08:36:38

1 potential uses in orthodontics, does it? 08:36:41
2 MR. COLLINS-CHASE: Object to the 08:36:43
3 form. 08:36:44
4 THE WITNESS: It presents a material 08:36:44
5 that can be used for orthodontics, and the people in 08:36:48
6 the orthodontics world saw that as a welcoming 08:36:51
7 invention. 08:36:57
8 He may not have mentioned it there, but the people 08:36:59
9 in the orthodontics-- people in that field were looking 08:37:01
10 for a solution, were looking for something that was BPA 08:37:06
11 free. 08:37:13
12 Q (By Mr. Argenti) Porter doesn't mention anything about 08:37:14
13 dentistry, right? 08:37:16
14 A He doesn't mention anything about dentistry itself, but 08:37:18
15 that's just one example. 08:37:25
16 He just gives a few examples, and his article was 08:37:26
17 directed to dishwasher materials, but it's not that he 08:37:31
18 made this great invention that is dishwasher safe. He 08:37:35
19 made this great invention that it was environmental 08:37:37
20 stress crack resistant. 08:37:41
21 That was the point of the article at the time 08:37:42
22 where everybody knew that a replacement for 08:37:48
23 polycarbonate would be BPA free. 08:37:50
24 Q When you say that the people in the orthodontics field 08:37:54
25 were looking for a solution, for something that was BPA 08:37:58

1 free, how do you know? 08:38:01
2 You yourself were not in the orthodontics field, 08:38:03
3 correct? 08:38:06
4 A But there are references in the prior art that suggest 08:38:06
5 using Tritan to replace polycarbonate, and also there 08:38:13
6 are press releases of people making orthodontic 08:38:18
7 aligners or something that specifically state that 08:38:23
8 they're no longer using polycarbonate, that they're 08:38:31
9 using other materials other than polycarbonate. 08:38:33
10 Because the BPA issue was an issue at the time, 08:38:37
11 that goes-- everybody knew that. 08:38:40
12 A person of ordinary skill in the art in the field 08:38:41
13 of orthodontics would have known that too. 08:38:44
14 Newspapers articles were coming out about BPA. 08:38:47
15 Q Which prior art references were you just referring to? 08:38:51
16 A I believe there is a prior art reference that is called 08:38:58
17 Rafih. 08:39:06
18 Q Okay. We'll get to that one. 08:39:07
19 Porter doesn't discuss the suitability of Tritan 08:39:10
20 copolyester for applying tooth-moving forces, does it? 08:39:13
21 MR. COLLINS-CHASE: Objection to 08:39:18
22 form. 08:39:19
23 THE WITNESS: I mean, this is an 08:39:24
24 article in a technical magazine, but it obviously is 08:39:25
25 not-- it's not an article about designing components 08:39:32

and designing things. 08:39:37
It's simply an article that came out to replace 08:39:38
polycarbonate. 08:39:46
The way they did that, they use the catchy title, 08:39:49
"Dishwasher safe," but at the time, as I mentioned 08:39:54
earlier, everybody knew that it was-- this was a great 08:39:57
replacement for polycarbonate. 08:40:02
People were using polycarbonate at the time in the 08:40:03
dental aligner industry, and they would have looked at 08:40:06
Porter and said, "Ahh, here is a solution." 08:40:10
Q (By Mr. Argenti) Sounds like you agree with me that 08:40:17
Porter does not discuss the suitability of copolyester 08:40:19
for applying tooth-moving forces, right? 08:40:23
MR. COLLINS-CHASE: Objection to 08:40:26
form. 08:40:26
THE WITNESS: Well, it's more than 08:40:27
that. 08:40:28
A person of ordinary skill in the art would have 08:40:28
looked at what properties are here. 08:40:35
While the tooth-moving forces are not explicitly 08:40:36
mentioned in this article, they certainly mention the 08:40:40
tensile modulus, the flexural modulus, and they would 08:40:45
have said, "Oh, wow, these are comparable or very 08:40:52
similar to the ones we use for polycarbonate, with the 08:40:53
added feature it's environmental stress crack 08:41:00

resistant, the added feature that it's optically nice, 08:41:03
it has great optical properties," and so the person of 08:41:07
ordinary skill in the art would have had this article 08:41:10
in their hands, and they would have seen the solution 08:41:14
that not only had the same performance but also 08:41:16
eliminated the big problem of BPA in polycarbonate. 08:41:18
Q (By Mr. Argenti) Is it your understanding that a 08:41:24
person of ordinary skill in the art would have been 08:41:26
someone working in the orthodontics field? 08:41:28
MR. COLLINS-CHASE: Objection to 08:41:31
form. 08:41:32
THE WITNESS: Well, a person-- I 08:41:32
define that person of ordinary skill in the art in my 08:41:35
report, my reports. 08:41:40
Q (By Mr. Argenti) Right. Feel free to refer to that 08:41:43
definition. 08:41:45
I don't think it requires that the person of 08:41:46
ordinary skill in the art be someone working in the 08:41:48
orthodontics field, does it? 08:41:51
A It's someone doing-- I can read it. I can read it to 08:41:53
you. 08:41:57
So it's someone who has or had at least a 08:42:17
four-year undergraduate degree in material science, 08:42:23
mechanical engineering, chemical engineering, or a 08:42:25
closely related field, and at least two years of 08:42:29

experience in the field of polymer science, combined 08:42:31
with at least two years of experience in the field of 08:42:35
design, manufacture, and processing of thermoformable 08:42:38
polymer sheets for use in various applications, such as 08:42:43
orthodontic and dental appliances. 08:42:46
So someone designing a dental appliance, the 08:42:48
design and manufacturing process, would fall under this 08:42:54
"person of ordinary skill in the art" definition. 08:42:59
Q Right. 08:43:02
But it doesn't require that "such as orthodontic 08:43:02
and dental appliances" is what you said, right? 08:43:09
I think earlier you said that the POSITA could 08:43:12
have been the person designing the soup bowl that 08:43:14
Porter talks about, right? 08:43:15
MR. COLLINS-CHASE: Objection to 08:43:17
form. 08:43:17
THE WITNESS: No, that's not what I 08:43:17
said. 08:43:19
I said in the field, an unrelated field, if a 08:43:19
patent were to apply to a soup bowl, a POSITA would 08:43:25
have been a soup bowl designer. 08:43:28
I didn't say that a person in orthodontics would 08:43:30
design soup bowls or bottles. 08:43:34
Q (By Mr. Argenti) I want to get this very clear then. 08:43:37
Is it your opinion that the POSITA, as defined in 08:43:38

your declaration, would have been someone working in the orthodontic and dental appliances field? 08:43:44 08:43:47

MR. COLLINS-CHASE: Objection; asked and answered. 08:43:51 08:43:53

THE WITNESS: I mean, it sat there-- I read it to you. 08:43:53 08:43:56

It's someone in the field of manufacture and processing of thermoformable polymer sheets for use in various applications, such as orthodontic and dental appliances. 08:43:56 08:44:00 08:44:04 08:44:07

Q (By Mr. Argenti) But did they have to be orthodontic and dental appliances? 08:44:11 08:44:12

A Well, that's the art in these patents. 08:44:14

Q Right. 08:44:20

I am trying to get what I think should be a pretty clear issue resolved, and that's whether you think that the POSITA needs to be someone working in the orthodontic and dental appliance field. 08:44:21 08:44:26 08:44:29 08:44:32

I am not hearing an answer, Dr. Osswald. 08:44:35

A Well, thermoforming was not invented by people in the field of orthodontic or dental appliance business. 08:44:38 08:44:42

They use thermoforming. That's the heart of the manufacturing process. 08:44:45 08:44:50

So yeah, thermoforming is key to manufacturing this-- these products, but the heart of it is the 08:44:51 08:44:58

1 thermoforming of these multilayered sheets, the 08:45:05
2 thermoforming of the sheets, which is a bigger 08:45:11
3 industry, such as-- it includes orthodontic and dental 08:45:16
4 appliances. 08:45:21
5 I am not an attorney, so I actually don't 08:45:21
6 understand what you're asking me. 08:45:24
7 Q So I guess when you say this person would have two 08:45:25
8 years of experience in the field of design, 08:45:27
9 manufacture, and processing of thermoformable polymer 08:45:30
10 sheets for use in various applications, do those 08:45:33
11 polymer sheets need to be used for orthodontic and 08:45:38
12 dental appliances? 08:45:41
13 Would a POSITA need to have experience designing 08:45:46
14 and manufacturing thermoformed polymer sheets for 08:45:48
15 orthodontic and dental appliances? 08:45:54
16 A Well, the knowledge is the knowledge in this 08:45:56
17 thermoforming of the products and designing a product 08:46:02
18 with certain strength or whatever conditions, such as 08:46:05
19 the ones that did design and manufacture-- the design 08:46:07
20 means strength, stiffness, et cetera, such as people 08:46:12
21 designing these products in the orthodontic and dental 08:46:16
22 appliances. 08:46:20
23 It's that whole-- the multilayered sheet, the 08:46:20
24 thermoforming, et cetera. 08:46:24
25 It's what it says there. 08:46:25

1 I think it covers that whole territory. 08:46:26
2 Yeah, it does include the orthodontic and dental 08:46:28
3 appliance. 08:46:32
4 Q But does it require it? 08:46:32
5 That's the question I keep asking. 08:46:34
6 If someone had the educational background that you 08:46:37
7 set out in Figure-- in Paragraph No. 15, "Combined with 08:46:40
8 two years of experience designing, manufacturing, and 08:46:44
9 processing of thermoformable polymer sheets for use in 08:46:48
10 various applications," and those applications were 08:46:51
11 limited to the CamelBack water bottles and the soup 08:46:55
12 bowls that Porter described, would they be a POSITA, in 08:46:59
13 your view? 08:47:03
14 A Well, if the soup bowl is designed by thermoforming and 08:47:03
15 requires some strength, has design-- I'm not sure. 08:47:08
16 I also say that additional education could 08:47:12
17 substitute for professional experience and vice versa. 08:47:19
18 It's quite clear. I think what it is, is a 08:47:24
19 combine of two years of experience in the field of 08:47:30
20 design, manufacture, and processing of thermoformable 08:47:33
21 polymer sheets for use in various applications, such as 08:47:37
22 orthodontic and dental appliances. 08:47:42
23 Q All due respect, Dr. Osswald, it is anything but clear. 08:47:44
24 We were talking about Porter, and you said that 08:47:48
25 the POSITA would have knowledge of the orthodontic 08:47:53

industry. 08:47:56
I don't think that's required by your Paragraph 08:47:56
No. 15 definition. 08:47:58
MR. COLLINS-CHASE: Objection to 08:48:01
form. 08:48:02
THE WITNESS: But a POSITA, in my 08:48:02
definition, be it a person-- be it the person that is 08:48:06
in the orthodontic and dental appliances making 08:48:12
thermoformable products, would be aware of the Porter 08:48:16
article and would be aware of BPA, et cetera, and all 08:48:21
the issues that occurred-- existed with polycarbonate. 08:48:25
Q (By Mr. Argenti) How do you presume that that POSITA 08:48:31
would be in the orthodontic and dental appliances 08:48:34
field? 08:48:36
MR. COLLINS-CHASE: Objection to 08:48:36
form. 08:48:37
THE WITNESS: I think there were 08:48:37
many different-- I would say every engineer dealing 08:48:51
with plastics and designing plastics, particularly 08:48:54
designing plastics for something that would be to use 08:48:56
with food and with drinks, et cetera, or including to 08:49:02
put in the mouth, would have been aware of all those 08:49:05
issues and would have been-- and the Porter article 08:49:09
would have been-- they would have been aware of that. 08:49:14
That includes the POSITA that is defined in my 08:49:17

reports. 08:49:24
Q (By Mr. Argenti) But that too seems to apply a level 08:49:25
of skill that's not required or set forth in your 08:49:27
definition. 08:49:29
Your definition doesn't say anything about 08:49:30
designing products to go in the mouth. 08:49:33
It doesn't say anything about designing products 08:49:38
to be used in contact with food, right? 08:49:40
MR. COLLINS-CHASE: Objection to 08:49:40
form. 08:49:40
THE WITNESS: It is a general 08:49:48
description. 08:49:48
I mean, it's thermoformable polymer sheets, which 08:49:49
include-- which include dental appliances, so-- as I 08:49:52
said, such as in orthodontic and dental appliances. 08:50:04
Q (By Mr. Argenti) So you are saying that if the POSITA 08:50:08
was working in the orthodontic field or was working on 08:50:11
products to go in the mouth or be in contact with food, 08:50:15
then they would have been aware of these issues that 08:50:18
you've raised; is that right? 08:50:20
MR. COLLINS-CHASE: Objection to 08:50:22
form. 08:50:22
THE WITNESS: No. As I said, even 08:50:22
newspapers articles were coming out at the time that 08:50:26
discussed the issues with BPA in polycarbonate, so even 08:50:29

regular people, not engineers, would have been aware of 08:50:34
that, certainly a person defined in my-- as a person of 08:50:38
ordinary skill in the art. 08:50:45
I stand with my definition of it. 08:50:47
The person with ordinary skill in the art, as 08:50:49
defined in my reports, would have been aware of that 08:50:53
issue. 08:50:59
Q (By Mr. Argenti) Let's turn back to Tritan. 08:51:02
Wen describes its test results, and I think you 08:51:07
said when you were preparing for your deposition, you 08:51:11
reviewed the test results that Tritan gives, right? 08:51:15
MR. COLLINS-CHASE: Objection to 08:51:17
form. 08:51:18
THE WITNESS: I looked at the table 08:51:18
that describes the properties-- 08:51:19
Q (By Mr. Argenti) Okay. And when describing the 08:51:24
properties and test results of Tritan compared to other 08:51:26
materials like polycarbonate, Porter specifically talks 08:51:30
about Tritan TX1000, right? 08:51:33
A Correct. 08:51:36
Q Does Porter mention any other specific versions of 08:51:39
Tritan? 08:51:42
A No. I think this was an early-on-- obviously it was an 08:51:42
early article, but also in my report I compare 08:51:50
properties of different Tritan materials at the time. 08:51:54

Q Porter does not describe combining Tritan with other materials in layers, right? 08:51:59 08:52:03
A No. The Porter reference is a reference where one-- a person of ordinary skill in the art would know that if I have something in layers and I'm using polycarbonate, Tritan would be the perfect replacement for it. 08:52:05 08:52:17 08:52:20 08:52:24
Q But there's no discussion of anything multilayered in Porter, is there? 08:52:26 08:52:31
MR. COLLINS-CHASE: Objection to form. 08:52:32 08:52:33
THE WITNESS: Well, Porter's article was part of the art at the time. They are a reference in the art. A POSITA would have been aware of Porter. 08:52:33 08:52:40 08:52:43
They also would have been aware of the multilayered structures referenced in Tadros and Kalili and in Wen. 08:52:47 08:52:51 08:53:01
None of those individual references is there in a vacuum. They are all part of the knowledge of a POSITA at the time of the invention. 08:53:02 08:53:08 08:53:13
While Porter does not discuss multilayered films, it solved a big problem with multilayered films, namely replacing polycarbonate with something that was BPA free. 08:53:14 08:53:19 08:53:26 08:53:28
Q (By Mr. Argenti) There are no discussions of layered composite materials in Porter, right? 08:53:31 08:53:34

1 MR. COLLINS-CHASE: Objection; asked 08:53:36
2 and answered. 08:53:38
3 THE WITNESS: I think I answered 08:53:38
4 that question. 08:53:39
5 Porter was not there in a vacuum. There were 08:53:39
6 other references that the POSITA would have looked at 08:53:43
7 that had that. 08:53:47
8 Porter complements those references by finding a 08:53:48
9 solution to replace one of the materials in the 08:53:52
10 multilayered arrangement. 08:53:56
11 MR. ARGENTI: Okay. It's been over 08:54:00
12 an hour. I think we are due for a break. 08:54:01
13 Should we come back at five past the hour? 08:54:07
14 MR. COLLINS-CHASE: Maybe we should 08:54:12
15 have lunch. 08:54:14
16 MR. ARGENTI: We can go off the 08:54:15
17 record. 08:54:16
18 (Lunch recess 8:54 to 9:32 a.m.) 08:54:17
19 Q (By Mr. Argenti) Dr. Osswald, let's turn back to your 09:32:30
20 '613 declaration, please, and in particular let's go to 09:32:33
21 Paragraph No. 99. It's on Page 57. 09:32:35
22 A Yes. 09:32:53
23 Q Okay. At the beginning of this paragraph you say, 09:32:54
24 "Tritan's wide acceptance as a BPA-free alternative to 09:32:57
25 polycarbonate also included uses in the dental 09:33:01

1 industry." 09:33:04
2 Do you see that? 09:33:05
3 A Yes. 09:33:06
4 Q The next sentence you cite the RAFIH exhibit as 09:33:07
5 describing "An oral appliance with 'a channel adapted 09:33:19
6 to accept teeth from one of a lower jaw and an upper 09:33:23
7 jaw of the mouth.'" 09:33:27
8 You say that it is "Made of a 'softenable 09:33:29
9 material,' which is formed over a frame made of a 09:33:33
10 Tritan copolyester," right? 09:33:35
11 A Yes. 09:33:38
12 Q At the end of that paragraph you testify that "Although 09:33:38
13 the patent allows for the use of any Tritan copolyester 09:33:47
14 (see, e.g., Claim 10) because Tritan copolyesters are 09:33:52
15 BPA-free, Rafih specifically discloses Tritan EX401 as 09:33:57
16 an exemplary material, with a stiffness of 1500 MPa," 09:34:03
17 and that's "megapascals," right? 09:34:13
18 A Yes. 09:34:15
19 Q Did I read that sentence correctly? 09:34:15
20 A Yes, you did. 09:34:19
21 Q Given that Rafih discusses Tritan EX401, whereas Porter 09:34:20
22 describes Tritan TX1000, wouldn't a POSITA have 09:34:30
23 expected different Tritan copolyesters to perform 09:34:36
24 differently? 09:34:37
25 MR. COLLINS-CHASE: Objection to 09:34:37

form. 09:34:38
THE WITNESS: Well, I mean, I think 09:34:38
what I'm trying to say here is that Tritan was widely 09:34:44
accepted, including in the dental industry, and yes, 09:34:51
they used EX401 and the Porter reference uses a 09:34:55
different one, but a person of ordinary skill in the 09:35:02
art at the time would have had a different list of 09:35:05
Tritan materials available to them with some slight 09:35:09
differences between each other. 09:35:12
Q (By Mr. Argenti) So is it your view that a person of 09:35:23
ordinary scale in the art at the time would have 09:35:27
expected only slight differences between the different 09:35:29
Tritan materials? 09:35:32
MR. COLLINS-CHASE: Objection to 09:35:33
form. 09:35:34
THE WITNESS: Well, further down I 09:35:34
mention a table-- I have a table, which was assembled 09:35:36
with data from different Tritans that existed at the 09:35:42
time, so-- and you can see that for the purpose of 09:35:46
performance, such as stiffness, they're all very 09:35:54
similar, and they're all BPA-free. 09:36:02
Q (By Mr. Argenti) So you think that a POSITA would have 09:36:08
expected different Tritan copolyesters to perform 09:36:11
comparably? 09:36:16
MR. COLLINS-CHASE: Objection to 09:36:18

form. 09:36:18
THE WITNESS: Well, a POSITA would 09:36:18
have had, on hand, data sheets similar with data 09:36:21
similar to what I have in the table later in my report 09:36:24
that present properties and some variations between 09:36:28
them but not significantly. 09:36:35
Q (By Mr. Argenti) And that applies to Tritan materials 09:36:40
generally as a category; is that right? 09:36:43
MR. COLLINS-CHASE: Objection to 09:36:45
form. 09:36:46
THE WITNESS: Well, here we are 09:36:46
talking about Tritan as a replacement for 09:36:48
BPA-containing polycarbonate. 09:36:51
Q (By Mr. Argenti) Right. 09:36:57
Is it your understanding that a POSITA would have 09:36:57
understood that the various Tritan materials performed 09:37:01
roughly comparably as a replacement for a BPA material? 09:37:03
MR. COLLINS-CHASE: Objection to 09:37:08
form. 09:37:09
THE WITNESS: Yeah, already Porter 09:37:09
says that, that the performance of Tritan is comparable 09:37:14
to polycarbonate. 09:37:22
Q (By Mr. Argenti) And Tritan, again, is referring to 09:37:30
Tritan TX1000, whereas Rafih is referring to Tritan 09:37:33
EX401, right? 09:37:38

1 You are saying the POSITA would have the same 09:37:40
2 understanding of both of those materials as Tritan 09:37:42
3 materials? 09:37:44
4 MR. COLLINS-CHASE: Objection to 09:37:47
5 form. 09:37:48
6 THE WITNESS: Well, a POSITA would 09:37:48
7 have had a list of different Tritan materials, and 09:37:50
8 according to whatever design they would be doing, they 09:37:54
9 would pick the Tritan that they would choose-- I mean, 09:37:58
10 Rafih talks about a stiffness of 1500 megapascals, so a 09:38:02
11 POSITA would have been looking at something similar-- a 09:38:10
12 POSITA would have been looking at whatever properties-- 09:38:14
13 for example, if we look at the Tadros reference, Tadros 09:38:17
14 has compared change to polycarbonate by adding a 09:38:26
15 polyester to the polycarbonate and still have similar 09:38:36
16 stiffness properties, so a POSITA would have been 09:38:41
17 looking to replace that polycarbonate or the 09:38:43
18 polycarbonate used in them-- in Kalili, and Porter 09:38:50
19 would have pointed to, "Look, there is actually 09:38:54
20 something that will have similar properties to 09:38:56
21 polycarbonate or similar performance, and Tritan is one 09:38:59
22 of them," and then they would have gone and looked at 09:39:03
23 the data sheets. 09:39:05
24 I mean, at the time, or any time, a POSITA would 09:39:08
25 look at the different material properties of Tritan if 09:39:12

they were to choose Tritan and pick one of them. 09:39:18
Q (By Mr. Argenti) To be clear, you mentioned "Tadros." 09:39:27
Tadros doesn't mention anything about Tritan, 09:39:29
right? 09:39:31
A Tadros has a mixture of polycarbonate with a 09:39:32
copolyester, and he has a similar mechanical 09:39:35
performance, but he lowers-- he brings the glass 09:39:44
transition temperature down without affecting the 09:39:51
mechanical performance, and he uses that material as 09:39:55
one of the layers, as a hard layer, so Tadros-- so at 09:39:58
the time of the invention, a person of ordinary skill 09:40:04
in the art would have known that TADROS has a 09:40:07
polycarbonate in their mixture, and they would have 09:40:14
been motivated, because of the BPA-containing aspects 09:40:21
of polycarbonate, to switch to Tritan, which Porter, 09:40:24
the Porter reference, points them to. 09:40:29
Tadros does not mention Tritan, but it does 09:40:34
mention the different process conditions that are more 09:40:40
amiable to thermoform the sheets, and mainly having a 09:40:44
lower glass transition temperature, and the Tritan 09:40:49
material brings that effect, including also BPA-free. 09:40:55
Q Okay. So setting aside Tadros, which doesn't mention 09:41:01
Tritan, as you just said, would the physical 09:41:06
characteristics of different Tritan copolyesters have 09:41:11
been expected to be similar by a POSITA? 09:41:17

MR. COLLINS-CHASE: Objection to form. 09:41:19 09:41:20

THE WITNESS: Well, a POSITA would have had, at their fingertips, the different-- at the time of the invention would have had the different Tritans available, and as I show on my table, the stiffness of properties, for example, which is one of the aspects, are very similar from one to the other one. 09:41:20 09:41:22 09:41:26 09:41:29 09:41:35 09:41:37 09:41:43

Q (By Mr. Argenti) And a POSITA would have understood the similarities between those physical characteristics of different versions of Tritan; is that your understanding? 09:41:43 09:41:44 09:41:49 09:41:51

A Yeah, a person of ordinary skill in the art at the time would have had the different Tritan materials at their fingertips, yes, and would have understood that there are some slight differences between one or the other. 09:41:51 09:41:54 09:41:58 09:42:01

Q Let's take out the Rafih exhibit now, Exhibit No. 104. 09:42:03

Dr. Osswald, as you say in your declaration in that paragraph that we just saw, Rafih describes an oral appliance used to align the upper and lower jaws, such as a mouthguard. 09:43:03 09:43:05 09:43:09 09:43:15

It's intended to improve balance and strength, right? 09:43:17 09:43:20

A Yes. 09:43:20

Q If we look in Column 1 at the summary of the invention, 09:43:22
starting at Line 30, Rafih says that the appliance 09:43:39
includes a channel that is deformable to conform to the 09:43:41
shape of the teeth upon heating of the channel, right? 09:43:45
MR. COLLINS-CHASE: Objection to 09:43:47
form. 09:43:48
THE WITNESS: I would have to look 09:43:48
at it. 09:44:05
MR. ARGENTI: Sure. 09:44:07
THE WITNESS: Can you read the 09:44:07
question again? 09:44:08
Q (By Mr. Argenti) First, if you want to review Rafih 09:44:09
Lines 30 to 34 in Column 1, then let me know when 09:44:12
you've done that. 09:44:27
A Yes, I see it. 09:44:32
Q So Rafih says that its appliance includes a channel 09:44:33
that is deformable to conform to the shape of the teeth 09:44:37
upon heating of the channel, right? 09:44:40
MR. COLLINS-CHASE: Objection to 09:44:42
form. 09:44:43
THE WITNESS: Yeah, it says the 09:44:43
channel is deformable to at least partially conform to 09:44:54
a shape of the accepted teeth upon heating of the 09:44:59
channel. 09:45:03
Q (By Mr. Argenti) And if we look down to Line No. 50 in 09:45:08

Column 1, there Rafih says that the oral appliance also 09:45:11
includes a frame under the channel, right? 09:45:16
A It comprises a frame. 09:45:20
Q And that frame is what can be made of Tritan 09:45:27
copolyester, right? 09:45:35
A It says that, yes. 09:45:36
Q Let's turn to Column 5 of Rafih. 09:45:44
We are going look at the paragraph that starts at 09:45:55
Line No. 30. 09:45:58
Let me know when you're there. 09:45:58
A I'm there. 09:46:00
Q As we see at the beginning of that paragraph, this 09:46:00
describes the appliance seen in Figure 1A, correct? 09:46:03
A Yes. 09:46:07
Q And again down around Lines 57 through 59, it says that 09:46:10
the frame 150 can be made of Tritan EX401, right? 09:46:19
A Yep, it says that. 09:46:24
Q If we turn to Figures 1A and 1B of Rafih, do you see 09:46:28
Frame 150 in both of those figures? 09:46:43
A No, I don't. 09:46:46
Q In Figure 1A-- do you have Figure 1A in front of you? 09:46:56
A Yeah, Figure 1A. 09:47:01
Q In the lower-- 09:47:02
A Yes, I see it. 09:47:04
Correct. Yes. 09:47:05

Q You see No. 150 there-- 09:47:05
A Yes. 09:47:08
Q --pointing to the frame? 09:47:09
And then similarly on the next page, Figure 1B, in 09:47:10
the middle part, it shows 150. I think the entire 09:47:14
middle third of the figure is the frame. 09:47:20
Do you have the same understanding? 09:47:22
A Yes, I see it. 09:47:23
Q Frame 150 does not have any holes to receive the teeth, 09:47:25
does it? 09:47:32
A Well, Frame 150 is part of a dental system that is made 09:47:32
out of Tritan for the fact that it is a BPA-free 09:47:41
material. 09:47:47
All that states is-- it states that, "Look, 09:47:47
already in the dental appliance industry a person with 09:47:50
ordinary skill in the art would have been aware of 09:47:57
Tritan and its BPA-free attributes." 09:47:59
That's all I'm saying in Paragraph No. 99. 09:48:05
Q So if we look at 150-- Figure 1B. 09:48:08
A Yes. 09:48:16
Q The Frame 150 there in the middle of that figure, 09:48:17
that's what is made of the Tritan material, right? 09:48:21
A Correct, yeah. 09:48:23
Q Is the element 101 at the top third of Figure 1B, is 09:48:24
that also made of Tritan, to your understanding? 09:48:31

A I don't recall. 09:48:33
It may have been made out of EVA, but I don't 09:48:40
recall. 09:48:44
Q Do you know which aspect in Figure 1B of the appliance 09:48:44
that Rafih describes is the part that receives the 09:48:56
teeth? 09:49:00
A I am not sure. 09:49:00
I think I have to go back and look. 09:49:05
I think it's the one-- the aspect 101, the Part 09:49:07
101, but I would have to go back and look to make sure. 09:49:13
Q Frame 150 in Rafih is not used to apply orthodontic 09:49:16
tooth-moving forces, is it? 09:49:41
MR. COLLINS-CHASE: Objection to 09:49:43
form. 09:49:44
THE WITNESS: Frame 150 is part of a 09:49:44
dental appliance, so it is in the field of dental 09:49:47
appliances, and it's lauded-- it's made out of Tritan, 09:49:51
and it's lauded because it is BPA-free. 09:49:57
It simply demonstrates that a person with ordinary 09:50:01
skill in the art was switching from polycarbonate or 09:50:04
from harder materials to Tritan, from polycarbonate as 09:50:10
a material, because it's BPA-- in fact, Rafih says they 09:50:15
use Tritan because it is BPA-free. 09:50:22
Q (By Mr. Argenti) So you are not trying to offer the 09:50:25
opinion that Frame 150 is used to apply orthodontic 09:50:27

tooth-moving forces, are you? 09:50:30
A No. 09:50:32
My opinion is stated in-- if I can read Paragraph 09:50:33
No. 99, I can tell you again what my opinion there is, 09:50:36
but I don't think I'm saying there that Rafih is-- I 09:50:40
can say, "According to Rafih's disclosure, the purpose 09:50:50
of the frame is to 'provide rigidity' to the 09:50:53
over-molded thermoplastic channel by 'having sufficient 09:50:59
stiffness to resist excessively and/or permanently 09:51:03
deforming when placed in the mouth of the user.'" 09:51:07
That's all it is. 09:51:11
It states that-- so that's stated in Rafih, and 09:51:11
then it goes on, and it says, "Look, Rafih says that 09:51:14
you can use them-- you should use them because Tritan 09:51:20
copolyesters or-- Tritan copolymers, which are BPA 09:51:23
free. 09:51:28
He specifically discloses a type of Tritan. 09:51:28
He uses it because it's BPA-free. That's-- he 09:51:32
pointed out that simply to show that a person with 09:51:36
ordinary skill in the art had even a reference there 09:51:41
and was aware of the BPA content in polycarbonate, and 09:51:43
there was a motivation to switch from polycarbonate, 09:51:49
for that rigid material, to a material that was BPA 09:51:51
free. 09:51:56
That's all I'm saying in the article. 09:51:56

1 I am not saying that they-- this is to straighten 09:51:58
2 the teeth. This is a mouthpiece or mouthguard system. 09:52:04
3 Q At this time were there other BPA-free alternatives to 09:52:08
4 Tritan available? 09:52:17
5 MR. COLLINS-CHASE: Objection to 09:52:22
6 form. 09:52:22
7 THE WITNESS: I don't understand 09:52:23
8 your question. 09:52:23
9 Q (By Mr. Argenti) When you say that Rafih is using 09:52:25
10 Tritan instead of polycarbonate because it's BPA-free, 09:52:28
11 were there other BPA-free materials to choose from as 09:52:32
12 alternatives to polycarbonate? 09:52:35
13 A Well, in a dental appliance field, a material of choice 09:52:37
14 was always polycarbonate, but as it turned out, 09:52:41
15 polycarbonate had BPA in it, and so it was a motivation 09:52:44
16 to get rid of polycarbonate, and not until Tritan came 09:52:47
17 out there was one that could replace it. 09:52:53
18 Tritan copolyester replaced polycarbonate. 09:52:54
19 As you can see, Rafih did that, but there's all 09:52:58
20 kinds of other things pointing in the literature that 09:53:02
21 at the time people were looking for a BPA-free 09:53:05
22 alternative to polycarbonate. 09:53:11
23 Q Yeah, you just said "not until Tritan came out was 09:53:14
24 there an alternative." 09:53:18
25 Was that your understanding, that Tritan was the 09:53:19

first and only BPA-free alternative to polycarbonate as 09:53:22
of the relevant timeframe? 09:53:27
MR. COLLINS-CHASE: Objection to 09:53:29
form. 09:53:29
THE WITNESS: Well, at the time 09:53:29
people were using polycarbonate, and if you look at-- 09:53:32
if you look at Porter and you look at the properties 09:53:37
that were important from polycarbonate, a person with 09:53:41
ordinary skill in the art would have known that 09:53:47
switching from polycarbonate to this copolyester would 09:53:50
have a successfully-- a high success rate, because it 09:53:57
had the same-- because Porter stated that. It was very 09:54:03
clear. 09:54:07
Were there other polymers that were BPA-free? 09:54:07
Yes, but switching that would have entered a domain of 09:54:12
unpredictability, so you wouldn't have known what 09:54:22
properties are important, how does it thermoform, so it 09:54:24
would have involved a lot of experimentation. 09:54:29
The polycarbonate, the way-- in fact, a 09:54:31
polycarbonate of Tadros, which is a mixture, 09:54:35
thermoforms at lower temperatures, that's clear, yet it 09:54:39
does have BPA, so there is that issue, and so a person 09:54:43
with ordinary skill in the art would have said, "Oh, 09:54:46
okay. So Tadros likes the lower processability 09:54:49
temperature but likes these properties." 09:54:54

Porter tells us that properties are really very similar to polycarbonate and the processability is, and so they would have been motivated to switch to that. 09:54:57 09:55:00 09:55:04

There is no motivation to switch to other materials that are unknown and would introduce unpredictable results. 09:55:04 09:55:06 09:55:11

Q (By Mr. Argenti) So it's your understanding then that Tritan provided a predictable BPA-free alternative to polycarbonate? 09:55:13 09:55:17 09:55:21

MR. COLLINS-CHASE: Objection to form. 09:55:23 09:55:23

THE WITNESS: Tritan did present a predictable alternative. 09:55:23 09:55:28

If you look and see Tadros, Tadros had a successful appliance. Kalili had a successful appliance. 09:55:30 09:55:36 09:55:42

Porter solved the problem of having one of the materials that was problematic-- presented an alternative with predictable results. 09:55:43 09:55:45 09:55:50

Yes, there was predictable results by switching to Tritan. 09:55:52 09:55:56

Q (By Mr. Argenti) Can we turn to Page 82 of your '613 declaration, please? 09:56:03 09:56:06

A Yes. 09:56:07

Q Do you see the heading, "Claim construction"? 09:56:20

A Yes. 09:56:22
Q Under that heading you say, "I have read all claim 09:56:23
terms as having their ordinary meaning as understood by 09:56:28
a POSITA," right? 09:56:33
A Yes. 09:56:34
Q Feel free to confirm, if you'd like, but in the other 09:56:35
three declarations, you say the same thing in each 09:56:40
claim construction section, right? 09:56:43
A Yes. 09:56:44
Q So do I understand correctly that you are applying a 09:56:45
plain and ordinary meaning of all claim terms? 09:56:49
MR. COLLINS-CHASE: Objection to 09:56:53
form. 09:56:54
THE WITNESS: Yes, and how a POSITA 09:56:54
would have understood those claim terms at the time of 09:57:03
the alleged-- 09:57:06
Q (By Mr. Argenti) You are not proposing any special 09:57:10
definitions of any claim terms based on how they're 09:57:11
used in the claims or the specification of the 09:57:14
challenged patents; is that right? 09:57:16
MR. COLLINS-CHASE: Objection to 09:57:19
form. 09:57:20
THE WITNESS: I am not an attorney, 09:57:20
so I would give technical advice to the attorneys when 09:57:22
they decide that they would do a claim construction or 09:57:26

1 something, if that's necessary. 09:57:31
2 Again, I am not an attorney. I am just a 09:57:32
3 technical expert. 09:57:34
4 Q (By Mr. Argenti) Can we turn back to Exhibit No. 1001 09:57:37
5 in the '613 IPR, which is the '613 patent? 09:57:39
6 A I have it. 09:57:43
7 Q And we will look at Claim No. 1 in Column 9. 09:57:51
8 A Yes. 09:58:07
9 Q Starting in Line No. 10 do you see that claim one 09:58:08
10 recites, "A sheet comprising three or more polymer 09:58:10
11 layers"? 09:58:14
12 A Yes. 09:58:15
13 Q What is a polymer? 09:58:17
14 MR. COLLINS-CHASE: Objection to 09:58:20
15 form. 09:58:21
16 THE WITNESS: A polymer is a 09:58:21
17 material that is composed of long chains and large 09:58:25
18 molecules, macromolecules. 09:58:30
19 Q (By Mr. Argenti) Are all materials that are composed 09:58:34
20 of long chains of macromolecules considered polymers? 09:58:37
21 A I mean, a person of ordinary skill in the art would 09:58:42
22 have understood what a polymer is at the time. 09:58:52
23 Q Right, and that is the understanding that I'm asking 09:58:54
24 you to explain. 09:58:58
25 A All polymers have macromolecules. 09:59:03

Q But does the presence of macromolecules make something a polymer? 09:59:06 09:59:10

MR. COLLINS-CHASE: Objection to form. 09:59:10 09:59:11

THE WITNESS: Well, if you mix a polymer with something else, you have a plastic, but, again, I'm reading this here as a polymer layer, so-- 09:59:11 09:59:13 09:59:16

Q (By Mr. Argenti) What determines whether something is or is not a polymer? 09:59:21 09:59:22

A A "polymer" is a general term used. 09:59:23

Sometimes in the industry people use the word "plastic." 09:59:31 09:59:34

Q So a polymer is a plastic; is that right? 09:59:35

MR. COLLINS-CHASE: Objection to form. 09:59:38 09:59:38

THE WITNESS: I mean, those definitions have been disputed. 09:59:39 09:59:43

What is not disputed is what a polymer is. 09:59:45

Q (By Mr. Argenti) I don't know if the definitions are disputed, and if they are, that's not what I'm asking you about. 09:59:49 09:59:50 09:59:53

You say you are applying a plain and ordinary meaning of the word "polymer," and I'm just asking what that is. 09:59:53 09:59:56 09:59:59

A A polymer is a large molecule system. 10:00:00

Q I'm sorry, was that a "large molecule system"? 10:00:07
A Yeah. 10:00:10
Q If we read the next line down in claim one, it recites, 10:00:11
"A hard polymer layer comprising a copolyester." 10:00:24
Do you see that? 10:00:29
A I see it, yes. 10:00:30
Q What is a polyester? 10:00:31
A A polyester is a type of polymer. 10:00:40
Q Again, what makes something a polyester? 10:00:41
A I would have to go back and look at the definitions, 10:00:44
but I think it's not defined within the patent-- 10:00:46
Q Right. 10:00:50
You actually said that you don't think there is a 10:00:50
special definition in the patent, so what's the plain 10:00:53
and ordinary meaning of a polyester? 10:00:55
MR. COLLINS-CHASE: Objection to 10:00:57
form. 10:00:58
THE WITNESS: There are different 10:00:58
polyesters. 10:01:01
There's like, for example, polyethylene 10:01:01
terephthalate, that's a polyester. Polybutylene 10:01:01
terephthalate, that's a polyester. 10:01:04
A copolyester is one that is made of different 10:01:09
monomers. It's polymerized with different monomers. 10:01:14
Q (By Mr. Argenti) You saw where I was going. That was 10:01:19

1 going to be my next question. 10:01:20
2 What is a copolyester? 10:01:20
3 Did you say a copolyester is a polyester that's 10:01:22
4 made of different monomers? 10:01:25
5 A Yes. 10:01:27
6 Q So then would you agree that not all polyesters are 10:01:28
7 copolyesters? 10:01:35
8 A That's correct, yes. 10:01:35
9 Q And the way that one would determine whether a 10:01:40
10 polyester is a copolyester is looking for the presence 10:01:45
11 of different monomers. 10:01:49
12 Do I have that right? 10:01:50
13 MR. COLLINS-CHASE: Objection to 10:01:51
14 form. 10:01:52
15 THE WITNESS: It's that the 10:01:52
16 molecular structure is more complex than just a single 10:01:56
17 type of molecule. 10:02:00
18 MR. ARGENTI: Okay. Why don't we 10:02:01
19 take another short break. 10:02:14
20 I know it hasn't been an hour, but I think I'm 10:02:15
21 coming up to the end of my questions. I just want to 10:02:18
22 go back over my notes. 10:02:21
23 Sound good? 10:02:26
24 MR. COLLINS-CHASE: That's fine. 10:02:28
25 MR. ARGENTI: We can come back at 10:02:29

ten past the hour. 10:02:31
(Recess 10:02 to 10:13 a.m.) 10:02:34
Q (By Mr. Argenti) Dr. Osswald, during any of the breaks 10:13:22
today did you discuss your testimony or my questions 10:13:24
with the Finnegan counsel team? 10:13:26
A No. 10:13:30
MR. ARGENTI: That's all my 10:13:30
questions, barring any followup after redirect. 10:13:31
Thank you. 10:13:34
MR. COLLINS-CHASE: I have no 10:13:34
redirect. Thanks. 10:13:35
COURT REPORTER: Mr. Argenti, are 10:13:57
you ordering the transcript today? 10:14:02
MR. ARGENTI: We should have an 10:14:03
order on file already, but if we don't, then yeah. We 10:14:04
need a rough, please, and we need a rush as soon as 10:14:08
possible. 10:14:14
COURT REPORTER: You can get it 10:14:15
tomorrow if you want it, or today. 10:14:17
MR. ARGENTI: I want to give you 10:14:20
long enough-- enough time to put out a good product, so 10:14:21
tomorrow, I think, would be great, if that works on 10:14:26
your end and if it doesn't cause any concern about 10:14:29
whatever kind of quality control you are used to doing. 10:14:32
COURT REPORTER: Mr. Collins-Chase? 10:14:44

MR. COLLINS-CHASE: We'll do 10:14:46
whatever they're doing, and we'll just do the same 10:14:46
thing. 10:14:48
(Deposition concluded at 10:14 a.m.)
(Signature reserved.)

C E R T I F I C A T E

STATE OF WASHINGTON)
) ss.
COUNTY OF KING)

I, the undersigned Washington Certified Court Reporter, pursuant to RCW 5.28.010, authorized to administer oaths and affirmations in and for the State of Washington, do hereby certify: That the foregoing deposition of the witness named herein was taken stenographically before me and reduced to a typed format under my direction;

That, according to CR 30(e), the witness was given the opportunity to examine, read, and sign the deposition after same was transcribed, unless indicated in the record that the review was waived;

That I am not a relative or employee of any attorney or counsel of participant and that I am not financially or otherwise interested in the action or the outcome herein;

That the deposition as transcribed is a full, true and correct transcript of the testimony, including questions and answers and all objections, motions, and examinations, and said transcript was prepared pursuant to the Washington Administrative Code 308-14-135 preparation guidelines.

TERILYNN SIMONS, CCR, RPR, RMR, CRR
State of Washington CCR #2047
My CCR certification expires on 7/7/26

Reference No.: 14118447

Case: ClearCorrect Operating vs Align Technology

DECLARATION UNDER PENALTY OF PERJURY

I declare under penalty of perjury that I have read the entire transcript of my Deposition taken in the captioned matter or the same has been read to me, and the same is true and accurate, save and except for changes and/or corrections, if any, as indicated by me on the DEPOSITION ERRATA SHEET hereof, with the understanding that I offer these changes as if still under oath.

_____

Dr. Tim A. Osswald

NOTARIZATION OF CHANGES

(If Required)

Subscribed and sworn to on the _____ day of

_____, 20____ before me,

(Notary Sign)_____

(Print Name) Notary Public,

in and for the State of _____

Reference No.: 14118447
Case: ClearCorrect Operating vs Align Technology

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SIGNATURE:_____DATE:_____
Dr. Tim A. Osswald