

BELDEN INC.,)
)
Plaintiff,)
)
v.) Civil Action No. 22-783-RGA
)
COMMSCOPE, INC., COMMSCOPE, INC. OF)
NORTH CAROLINA, and COMMSCOPE)
TECHNOLOGIES LLC)
)
Defendants.)
)

**CommScope
Exhibit 2010
(3-1-24)**
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I. INTRODUCTION AND QUALIFICATIONS

1. My name is Kenneth Cornelison, and I have been retained by Defendants CommScope, Inc., CommScope, Inc. of North Carolina and CommScope Technologies LLC (collectively, “Defendants”) as an expert witness in the above captioned proceeding to opine on claim construction related to U.S. Patent Nos. 6,570,095 (the “’095 Patent”) and 6,998,537 (the “’537 Patent”), and 9,991,030 (the “’030 Patent”) and 10,832,833 (the “’833 Patent”) (collectively the “Patents-in-Suit”).

2. My opinions provided herein are based on my years of education, research and experience, as well as my review of the materials identified below and throughout this report. I set forth my education, experience, and qualifications in my resume, attached as Appendix A to this Declaration. This resume includes a listing of the cases for which I have provided deposition or trial testimony in the past four years. I also provide a summary of my background and experience below.

3. I have 40+ years of experience in the wire and cable industry. My experience includes the design, development and testing of high-speed data cables. I obtained my BSEE in 1974 and I started working in the wire and cable industry in 1976. Through the late 1970s through the 2000s, I worked in the design, manufacturing and testing of wires and cables for companies including Anaconda, Alcatel, Belden and General Cable. My roles included being manager of product development and customer engineering, process development manager, and VP of Technology – Data Communications. Since leaving General Cable, I have consulted in the wire and cable industry, published several papers, given technical training and been actively involved in the International Wire and Cable Symposium (IWCS). The IWCS promotes, initiates, and coordinates the exchanging of technical information on wire, cable and fiber optics

within industry and the government, through an annual IWCS Symposium. I have been an instructor (or co-instructor) at the annual Symposiums held in 2013, 2014, 2015, 2016, 2018, 2019, 2022, and 2023. I am a named inventor on more than 15 US patents.

4. The opinions and their factual support are true to the best of my knowledge and, if called to testify, I could and would testify competently as to them.

5. My analysis of the relevant materials is ongoing, and I will continue to review any new material as it is provided. This Declaration represents only those opinions that I have formed to date. I reserve the right to revise, supplement, or amend my opinions below based on new information (including any additional expert testimony submitted by the Plaintiff) and on my continuing analysis of the materials already provided.

6. I am being compensated on a per-hour basis for my time spent working on issues in this case at an hourly rate of \$175 per hour. My compensation does not depend on the outcome of this matter or the opinions I express.

7. In preparing this Declaration, I reviewed, among other things, the Patents-in-Suit and other materials discussed in this Declaration.

II. SCOPE OF OPINION

8. I have been asked to provide my opinions regarding the meaning and interpretation of certain claim terms from the Patents-in-Suit. I understand that the parties will submit additional arguments and evidence related to claim construction. I may provide additional opinions on this topic upon my review of those materials.

III. LEGAL PRINCIPLES

9. The legal principles set forth in this Declaration were provided to me by Defendants' lawyers. I understand that the purpose of claim construction is to determine the

meaning and scope of patent claims asserted to be infringed. I understand that patent claims are generally given the meaning that the terms would have to a person of ordinary skill in the art (“POSITA”) in question as of the earliest claimed priority date who is deemed to have read the intrinsic record.

10. For the purpose of this Declaration, I have been asked to assume the earliest claimed priority date for the ’095 Patent and the ’537 Patent is Feb. 25, 1999 and that the earliest claimed priority date for the ’030 Patent and ’833 Patent is Oct. 23, 2013. I have therefore analyzed the claim constructions and knowledge of a POSITA for the Patents-in-Suit at around those dates. If the relevant dates were slightly earlier or slightly later for any of the patents, that would not change my opinions set forth in this declaration. Should there be a determination that any of the Patents-in-Suit have a different priority date, I reserve the right to consider my opinions in view of that different date.

11. I understand that claim construction is considered from the perspective of a POSITA. I understand that to determine the appropriate level of skill in the art, the following factors may be considered: (a) the types of problems encountered by those working in the field and prior art solutions thereto; (b) the sophistication of the technology in question and the rapidity with which inventions occur in the field; (c) the education level of active workers in the field; and (d) the education level of the inventor. Applying these considerations, it is my opinion that the relevant POSITA for the Patents-in-Suit would have had a bachelor’s degree in electrical engineering and a minimum of 3-4 years of industry experience in connection with designing, manufacturing, and testing of twisted-pair data cables. An individual with a master’s degree in electrical engineering would require less industry experience (e.g., 1-2 years). I was at least a person of ordinary skill in this art in the relevant time periods. My opinions regarding claim

construction set forth in this Declaration would not change if the POSITA is found to have a higher or lower level of experience and education.

12. As stated above, I understand that for claim construction a POSITA is deemed to read the claim terms not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification, and the patent's prosecution history. When construing the claims of a patent, the principal considerations are the plain language of the claim (including the surrounding claim language and context), the patent specification and the prosecution history, which are called, collectively, the "intrinsic evidence."

13. I understand that as part of claim construction, certain claims may be found to be indefinite. I understand that a patent claim is indefinite if, when read in light of the specification and prosecution history, it fails to inform with reasonable certainty those skilled in the art about the scope of the invention.

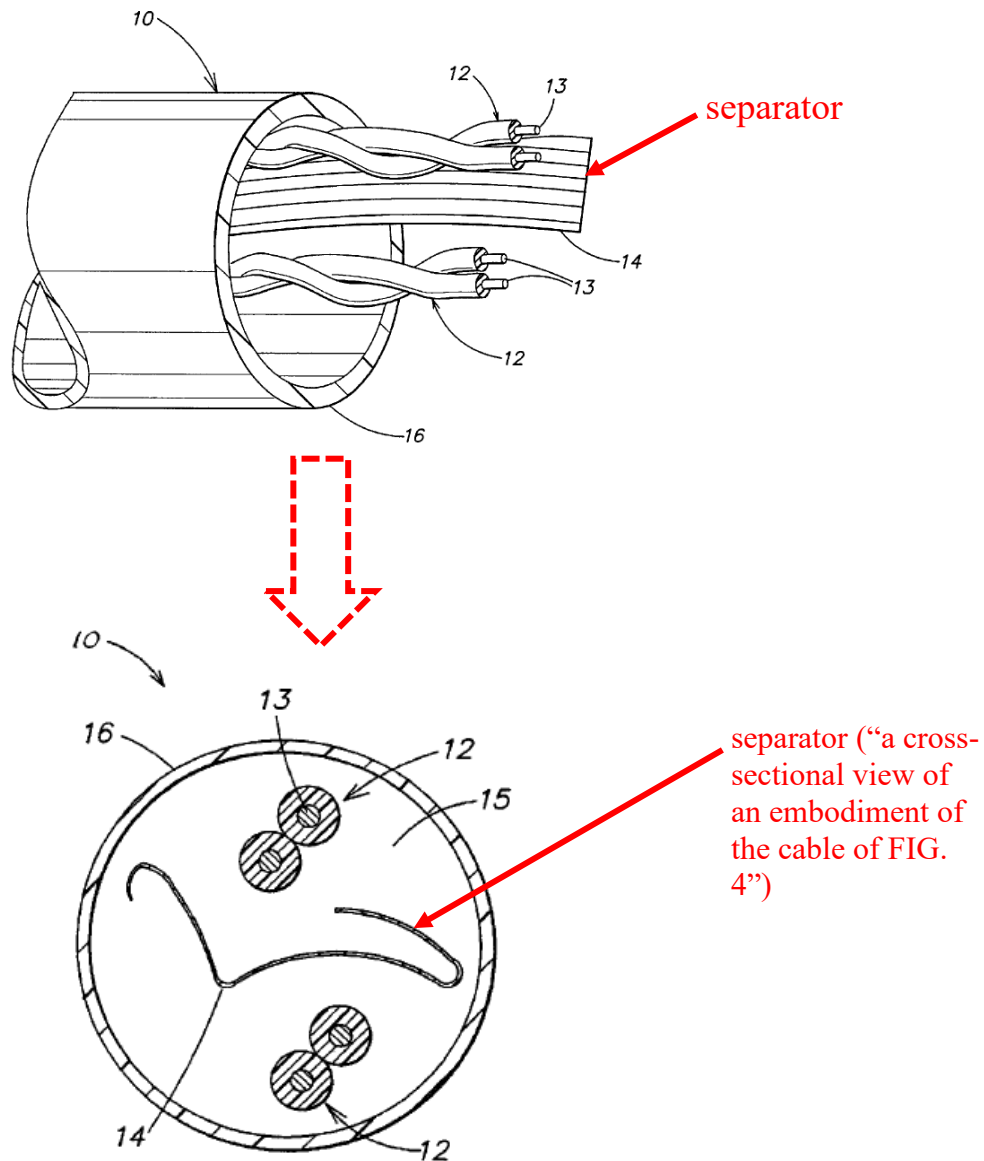
IV. CLAIM CONSTRUCTION OPINIONS

1. Term 3: "substantially flat" ('095 Patent, Claims 27-33; '537 Patent, Claim 19)

Plaintiff's Proposed Construction	Defendants' Proposed Construction
Not indefinite. "substantially uniform in thickness and having an overall profile that is substantially straight"	Indefinite. Alternatively, if not indefinite, then "substantially flat prior to being formed into the cable assembly; the term does not require that the separator be substantially flat in the finished cable"

14. I have been told that Belden contends that Figure 4 of the '095 and '537 Patents shows an example of a "substantially flat" separator. JX-A at 6-7; DX-32 at BDC_CAT023471-472. The specification of the '095 and '537 Patents teaches that Figures 4 and 5 show a single

embodiment of a cable. '095 Patent at 5:1-2¹ ("FIG. 5 depicts a cross-sectional view of an embodiment of the cable of FIG. 4."). I have reproduced Figures 4 and 5 of the '095 and '537 Patents below with annotations identifying the separator.



'095 Patent at Figs. 4 and 5 (annotated in red).

¹ The '095 Patent and '537 Patent share a common specification. For efficiency, I have elected to cite portions of from the '095 Patent unless I indicate otherwise.

15. If Figures 4 and 5 are an example of a “substantially flat” separator as I understand Belden contends, a POSITA would not have reasonable certainty regarding how flat “substantially flat” must be, in the context of the ’095 and the ’537 patents.

16. A POSITA would not consider the separator shown in Figure 5 to be “substantially flat” or “substantially straight” as required by Plaintiff’s construction. The specification does not describe the separator as being flat but rather as “configured” to have “grooves.” ’095 Patent at 5:2-7, Figs. 4-5. If such a separator can be considered substantially flat, there are no reasonable objective boundaries to the term “substantially flat.”

17. The specification and figures provide no further guidance as to the boundaries of “substantially flat” if the cross-section shown in Figure 5 can be considered “substantially flat.” None of the figures disclose a separator that a POSITA would consider to be “substantially flat” or “substantially straight” in a cross section of the finished cable. *See* ’095 Patent at Figs. 5-13. The specification only uses the term “substantially flat” in describing the cable and the jacket assembly of Figure 10—not the separator. ’095 Patent at 8:24-28.

2. **Term 5: “the configurable dielectric pair separator is arranged to provide a sufficient spacing between the [‘first twisted pair of insulated conductors and the second twisted pair of insulated conductors’/‘at least two twisted pairs of insulated conductors’] so as to provide a desired crosstalk isolation between the [‘first twisted pair of insulated conductors and the second twisted pair of insulated conductors’/‘at least two twisted pairs of insulated conductors’]” (Plaintiff) / “arranged to provide sufficient spacing . . . so as to provide a desired crosstalk isolation” (Defendants) (’095 Patent, Claims 28, 32)**

Plaintiff’s Proposed Construction	Defendants’ Proposed Construction
Not indefinite. “the configurable dielectric pair separator is arranged between at least two twisted pairs of insulated conductors so as to create space to increase resultant cross talk isolation between the pairs”	Indefinite

18. A POSITA would not understand with reasonable certainty what would be “sufficient spacing” to provide a “desired” crosstalk isolation.

19. A “desired” crosstalk isolation is subjective to a POSITA. A “desired” crosstalk isolation could and would depend on what the POSITA desires, which varies based on the circumstance and the POSITA. For example, what is “desired” by one POSITA in one circumstance may not be “desired” by another POSITA in that same circumstance. The specification of the ’095 Patent mentions a “desired crosstalk” on several occasions but does not teach a POSITA what a desired level of crosstalk isolation is. *See, e.g.*, ’095 Patent at Abstract; 2:60-64; 3:13-26; 6:42-43; 9:27-29.

20. I note that the independent claims 27 and 31 already require a separator between the pairs, so “sufficient spacing” that creates the “desired” crosstalk isolation must be something more than just the spacing created by putting a separator between pairs. It is just not at all clear to a POSITA what that “sufficient spacing” or “desired” crosstalk isolation is.

3. Terms 6 and 7: “twisted pair[s]”/“twisted pair[s] of insulated conductors” (’095 Patent, Claims 27-28, 31-33; ’537 Patent, Claim 19) and “twisted pair of insulated conductors” (’030 Patent, Claims 1, 9, 16, and 18)

Plaintiff’s Proposed Construction	Defendants’ Proposed Construction
“two conductors, separately insulated by a dielectric material, and twisted together in a helix”	No construction necessary, but if construed, then: “pair of conductors, each covered by insulation, where the pair of conductors is arranged in a twisted fashion; the conductors need not be twisted together in a helix”

21. I understand that Dr. Eldering has asserted that a POSITA would understand that the term “twisted pair” means that the wires are “separately insulated” and “twisted together in a helix.” *E.g.*, PX-8, ¶30. I disagree.

22. A POSITA would not understand the term “twisted pair” to be necessarily limited to pairs that are twisted specifically “in a helix.”

23. Dr. Eldering cites discussion of “twisted pairs” in the ’030 patent. PX-8, ¶28 (citing ’030 Patent Abstract, 1:39-44, 2:11-16, 2:22-33, 2:59-3:1, 3:11-16, 3:20-34, 3:53-58, 3:6-4:9, 5:38-42, 6:20-24, 11:7-13, Figs. 1, 2D, 2E). However, none of these citations says that the pairs must be twisted “in a helix.” In fact, they do not even mention “helix” or “helical” at all. And certainly the claims do not mention “helix” or “helical.”

24. Dr. Eldering also cites the ’030 patent at 6:39-45, where it describes examples of degrees of “twist or lay” for the conductors in each pair. PX-8, ¶29. But again, this does not tell a POSITA that pairs must be twisted specifically “in a helix.”

25. Dr. Eldering also cites two patents that were cited during the prosecution of the ’030 patent – Clark ‘478 at [0004], [0010], [0019], Fig. 1A (PX-4) and Blouin at 1:21-24, 5:20-24, Fig. 4. (PX-5). But again, neither of these indicate to a POSITA that a twisted pair in the art necessarily requires the pair to be twisted in a helix. Instead, a POSITA would understand them as examples of twisted pairs. A pair twisted in a helix is an example of a twisted pair. But a POSITA would not understand that to mean that any “twisted pair” *must* be twisted specifically “in a helix.”

26. There is nothing I see in the patents that would tell a POSITA that when the claims use “twisted pair,” they mean that the pair must be specifically twisted “in a helix.”

27. Dictionaries also confirm that a POSITA would not have understood the meaning of “twisted pair” to be as limited as Dr. Eldering proposes. Examples include:

- Penguin Dictionary of Electronics 3d Ed. (DX-60 at “pair”) (“two conductors are twisted around each other”);

- McGraw Hill Electronics Dictionary 6th Ed. (1997) (DX-59 at 490) (“A cable composed of two, thin, separately insulated conductors twisted together.”)
- New Oxford American Dictionary 3d Ed. (2010) (DX-61 at 1870) (“Electronics cable consisting of two wires twisted around each other, used esp. for telephone or computer applications.”)

28. Dr. Eldering cites two dictionary definitions. However, only one (PX-1) mentions “helix.” The other says that the two insulated conductors are “twisted together” and “hav[e] no common warp.” PX-2. Dr. Eldering states—without any explanation, that a POSITA would understand that “no common warp” indicates that “the conductors that are twisted together must necessarily cross over each other.” PX-8, ¶32. In my 40+ years of experience, I have not heard or used the term “warp” or the phrase “no common warp” in connection with “twisted pairs.” Also, even assuming this means that conductors are twisted together and “must cross over each other,” that does not mean that the conductors must be twisted together “in a helix.”

29. Dr. Eldering also contends that “from an engineering perspective” the twisting of the pairs specifically “in a helix” is what results in the containment of the electromagnetic fields surrounding each wire. PX-8, ¶33. Dr. Eldering’s opinion is overly narrow. While twisting specifically in a helix does help contain the electromagnetic field, the twisting does not have to be specifically and strictly “helical” or create a perfect “helix” to obtain benefits such as field containment and reduction in emission.

30. Dr. Eldering contends that a POSITA would understand that cables with wire pairs not twisted “in a helix” supposedly “would not be able to meet the engineering requirements of” the US TIA/EIA 568 and ISO/IEC 11801 standards. Dr. Eldering does not offer any support or explanation for this assertion. And ANSI/TIA-568-C.2-2009 (Balanced Twisted-Pair

Telecommunications Cabling and Components Standards) includes no requirement that twisted pairs be twisted “in a helix.” DX-75.

31. Dr. Eldering also cites an 1881 Alexander Graham Bell patent that shows twisted pairs. PX-8, ¶35-36 (citing PX-3). The Bell patent, while showing that twisted pairs is a very old idea, does not mean that twisted pairs in the art generally meant twisted specifically “in a helix.” The Bell patent does not use the term helix or helical at all. Dr. Eldering notes that the Bell patent distinguishes between two wires “laid side by side” or “twisted.” PX-8, ¶35-36 (citing PX-3, 1:45-49). This just shows that a twisted pair must be arranged in a twisted fashion (rather than laid side-by-side), not that the twist must be specifically helical.

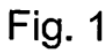
4. Term 8: “the conductive material of the barrier tape extending to each lateral edge of the two layers of the dielectric material” (’030 Patent, Claims 1 & 18)

Plaintiff’s Proposed Construction	Defendants’ Proposed Construction
Not indefinite. “the conductive material of the barrier tape extends to each edge running along the sides of the tape parallel to the longitudinal direction of the two layers of the dielectric material”	Indefinite; tape has four edges, and the “lateral edge” depends upon orientation of the tape, either one of the edges extending longitudinally (or along the longitudinal direction) or one of the edges extending laterally (along the lateral direction)

32. The ’030 Patent does not use the term “lateral edge” anywhere except in the claims.

33. Paragraphs 41 and 42 of the Dr. Eldering Declaration include annotated FIGS. 3A, 3C and 3E of the ’030 Patent, which have labels pointing to certain edges of tape as being a “Lateral Edge.” However, the ’030 Patent does not identify any of those edges as being a “lateral edge.” The ’030 Patent simply calls those edges “edges.”

their longitudinal edges, is provided below:



DX-69 at 3:22-47 (identifying “longitudinal edges 6” and “longitudinal edges 7”), FIGS. 1-3.

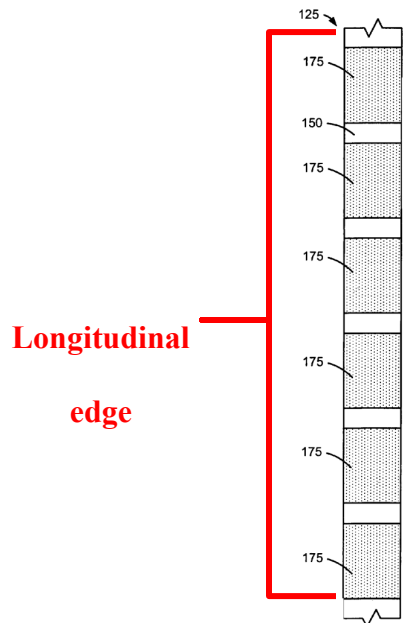


Fig. 2A

DX-70 at 5:46-55 (referring to the edges along length of tape as “longitudinal edges”), FIG. 2A.

35. In my opinion and based on my background, a POSITA would refer to the edges along the length of the tape as being longitudinal edges. This is consistent with the art that I identified above. The “lateral edges” of the tape would be the edges of the tape perpendicular to the longitudinal edges.

5. Term 10: “a seam of the barrier tape is positioned above a terminal portion of an arm of the filler” (’030 Patent, Claim 11)

Plaintiff’s Proposed Construction	Defendants’ Proposed Construction
No construction necessary, but if construed then: “a seam of the barrier tape is located above a terminal portion of an arm of the filler at various (but not necessarily all) positions along the longitudinal length of the filler”	“a seam of the barrier tape is located above a terminal portion of an arm of the filler at all positions along the longitudinal length of the filler”

36. A POSITA would understand this phrase to require that, like in the '030 Patent's disclosed fixed tape control (FTC) process, the seam be positioned above a terminal portion of an arm of the filler along the entire longitudinal length of the cable, instead of at only some particular points (or "various points") along the length of the cable.

37. First, a POSITA understands the "seam" of the barrier tape has a length. The seam is formed from the edges of the barrier tape. Figure 3E shows edges (306a, 306b) of the barrier tape (yellow):

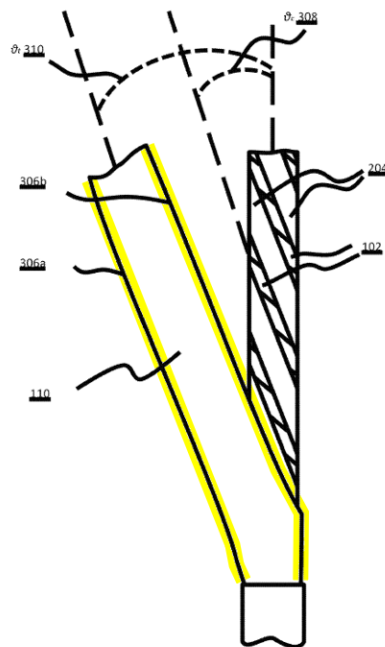
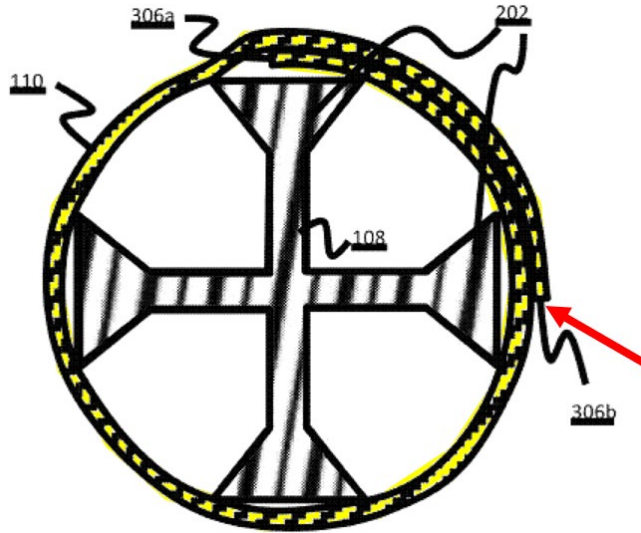


FIG. 3E

'030 patent at Fig. 3E. As the barrier tape wraps around the cable, the edges of the barrier tape overlap creating a seam. Figure 3C shows a cross-section of this overlap:



To be clear, this is just a cross-section. The tape and resulting seam continue down the length of the cable (as does the filler).

38. Second, a POSITA reading the claim would understand that the claim is referring to the seam itself, not a portion of the seam. The claim does not refer to a “portion” of the seam. Rather, the claim only uses the term “portion” to describe the arm, not the seam. Claim 11 (“a seam of the barrier tape is positioned above a terminal portion of an arm of the filler”).

39. Third, a POSITA reading the claim in view of the specification, would notice several points. A POSITA would notice that the specification uses the claim language to describe the fixed tape control (FTC) method. The specification states:

In one aspect, the present disclosure is directed to a fixed tape control high performance data cable. The cable includes a plurality of twisted pairs of insulated conductors, and a filler comprising a plurality of arms separating each twisted pair of insulated conductors, each arm having a terminal portion. The cable also includes a conductive barrier tape surrounding the filler and plurality of twisted pairs of insulated conductors. In some implementations, the cable further includes a jacket surrounding the conductive barrier tape. The filler is configured in a helical twist at a first angle, the conductive barrier tape is configured in a helical twist at the first angle, and a seam of the conductive barrier tape is positioned above a terminal portion of an arm of the filler.

'030 patent at 2:59-3:5. In this teaching, where the specification uses the express claim language, it is the seam itself, not a portion of the seam, that is positioned above the arm. FTC operates to “maintain” the edge over the filler. '030 patent at Abstract (“In FTC, tape application angle and edge placement are controlled to maintain position of the tape edges over a base of nonconductive filler in the cable.” (emphasis added)). By the term “maintain,” a POSITA understands that this statement is true for “all positions” as CommScope proposes. A POSITA would also notice that the specification does not use claim language to describe the OTC method. Rather, the specification refers to a position that “varies” between a “first” and a “second” position: “In still other implementations of the cable, a position of a first seam of the conductive barrier tape varies from a first position above a first channel formed by two adjacent arms and corresponding terminal portions of the filler, to a second position over a terminal portion of a first arm of said adjacent arms.” '030 patent at 3:41-46 (emphasis added). But I note that the claim does not use this language about a position that “varies” or a “first” or “second” position. Thus, a POSITA would understand that the claim language parallels the description of FTC, not OTC.

40. Fourth, a POSITA reading the claim in view of the specification, would notice an additional point. The specification distinguishes the allegedly inventive tape application methodologies (i.e., FTC and OTC) from “typical helical, spiral, or longitudinal tape application methodologies.” '030 Patent at 2:37-46. The specification compares test results of cables wrapped with FTC and OTC tape application methodologies with test results of cables wrapped with longitudinal, helical and spiral tape application methodologies, and concludes that FTC and OTC methodologies “result in significant improvements of ANEXT and RL” and are better than typical tape application methodologies. *E.g.*, '030 Patent at 9:64-10:44, 11:1-8, FIGS. 4-8. The

specification also contrasts conventional longitudinal wrapping with FTC and OTC wrapping: “Unlike either the FTC or OTC implementations . . . , edges of longitudinal barrier tape do not rotate around the cable, even as the pairs (and filler, in some implementations) rotate within the cable. Accordingly, tape edges frequently and periodically cross conductor pairs” ’030 Patent at 10:4-10. A POSITA would understand this to mean that the tape edges of the longitudinal barrier tape also frequently and periodically cross the filler arms (when the cable has a filler). Thus, a POSITA would understand the alleged invention in the specification is supposedly different compared to these techniques. Belden’s proposed claim construction, however, creates a counterintuitive result given these teachings. By broadening the claim to cover a seam that is positioned above the terminal portion of an arm of the filler at “various” points, Belden’s construction would cover conventionally applied longitudinal barrier tape—which is never taught to be the invention—because conventionally applied longitudinal barrier tape also would periodically cross the terminal portions of filler arms of a cable having a filler. Nothing in the specification indicates that the claims should be read to cover conventionally applied longitudinal barrier tape.

41. For the foregoing reasons, a POSITA would understand that “a seam of the barrier tape is positioned above a terminal portion of an arm of the filler” requires the seam, and not just a portion of the seam, be positioned above the filler arm for the entire longitudinal length of the cable.

6. **Term 11: “wherein the [non-conductive filler member / filler portion / filler means] and the [multi-layer barrier tape / barrier portion / barrier means] are configured to reduce electromagnetic [interference / cross-talk] between the first and second [pairs of conductors / conductor pairs] of the cable by non-conductively shielding the first and second [pairs of conductors / conductor pairs] from being electrically coupled to each other” (’833 Patent, Claims 10, 22, 36)**

Plaintiff’s Proposed Construction	Defendants’ Proposed Construction
Not indefinite “the physical configuration of the [non-conductive filler member / filler portion / filler means] and the [multi-layer barrier tape / barrier portion / barrier means] within the cable provides shielding that impacts electrical coupling and reduces the electromagnetic interference between the first and second [pairs of conductors / conductor pairs]”	Indefinite If not indefinite then Plaintiff’s proposed construction should be rejected in favor of: “each of the [non-conductive filler member / filler portion / filler means] and the [multi-layer barrier tape / barrier portion / barrier means] reduce electromagnetic [interference / cross-talk] between the first and second [pairs of conductors / conductor pairs], and the reduction is due to shielding the first and second [pairs of conductors / conductor pairs] from electrically coupling with each other. The shielding must be “non-conductive,” meaning that neither the [non-conductive filler member / filler portion / filler means] nor the [multi-layer barrier tape / barrier portion / barrier means] include a continuous layer of conductive material”

42. The ’833 patent is directed to a cable that has a barrier tape that is applied with an allegedly inventive method that reduces the alien cross-talk and return loss of the cable. Alien cross-talk refers to the electromagnetic interference (or cross-talk) between two different cables. This is different from internal cross-talk, which refers to the cross-talk between twisted conductor pairs within the same cable. These are distinct concepts, and cable structure added to address alien cross-talk might negatively affect internal cross-talk (and vice-versa). To give one example, adding a barrier tape with a conductive layer around conductor pairs to a cable previously lacking any such tape may positively address alien cross-talk but will typically

negatively affect internal cross-talk. With respect to improving cross-talk, the '833 patent is directed only to improving alien cross-talk. For example, Figures 4-8 all disclose alien cross-talk measurements. Also, here are just some quotes from the patent:

- a. “The present disclosure describes methods of manufacture and implementations of unshielded twisted pair (UTP) cables with a barrier tape, which may be conductive or partially conductive, with reduced alien crosstalk and return loss” '833 Patent at 2:28-34;
- b. “The present disclosure addresses problems of cable to cable or ‘alien’ crosstalk (ANEXT)” '833 Patent at 5:33-37;
- c. “The FTC and OTC application methods result in significant improvements of ANEXT. . . .” '833 Patent at 10:4-7;
- d. “Accordingly, the fixed and oscillating tape control cable application methods discussed herein and the geometry of the filler allow for significant reduction in ANEXT. . . .” '833 Patent at 11:7-13.

43. The '833 patent does not teach anything about the impact that the barrier tape has (or doesn't have) on the internal cross-talk between conductor pairs within the cable. The '833 patent does not identify or describe any configurations as reducing internal cross-talk. Nor does the '833 patent provide any data or discussion of internal cross-talk being reduced by wrapping cables differently. Thus, there is a disconnect between the subject of the claim term (reducing internal cross-talk) and the patent disclosure about reducing alien cross-talk.

44. The first allegedly inventive disclosed method in the '833 patent is called fixed tape control (FTC). With the FTC method, the barrier tape is wrapped around the filler and twisted pairs at an application angle that matches the twist angle of the cable, and with the edges

of the barrier tape precisely positioned above the terminal portions of the filler arms along the entire length of the cable. '833 Patent at Abstract, 2:43-53, 2:65-3:10. I discuss this above in connection with Term 10.

45. The second allegedly inventive disclosed method in the '833 patent is called oscillating tape control (OTC). With this OTC method, barrier tape is wrapped around the filler and twisted pairs at an application angle that is continually varied across a range along the length of the cable. With this method, the location of the barrier tape seam varies between a first position over a filler arm and a second position above the different conductor pairs. With this method, the barrier tape seam (or edge) is not consistently proximate to any one conductor pair. '833 Patent at 2:56-58, 3:44-56

46. A POSITA would not understand what is meant by the language in claims 10, 22 and 36 of the '833 Patent, which says that the filler member (or filler portion or filler means) and the barrier tape (or barrier portion or barrier means) are “configured to reduce . . .” electromagnetic interference (or crosstalk) between conductor pairs of the cable. To do a comparison, a POSITA would need objective guidance on

- a. what the comparator is (e.g., compared to what?),
- b. which method of measurement to use (e.g., measure near end or far end cross-talk, and how many times to perform the measurement)
 - i. I note that there is additional information a POSITA would need to know, such as the length of the cable to be measured, the operating range of frequencies to be measured, and the mode being measured (common or differential)
- c. which criteria to use to assess the results, e.g.

- i. compare average cross-talk values at all frequencies, or
- ii. compare peak cross-talk values at all frequencies, or
- iii. compare average cross-talk values at some frequencies (in which case, which ones), or
- iv. compare peak cross-talk values at some frequencies (in which case, which ones)

47. The '833 Patent does not provide guidance on any of these.

48. First, it does not identify what the comparison is between. For example, the patent does not describe whether the claimed configuration reduces as compared to, e.g.

- a. all (or any particular subset of) prior art cables, or
- b. cables in all other ways the same but having the barrier wrapped with prior art techniques (e.g., wrapped longitudinally), or
- c. a hypothetical cable made (i) without the filler, (ii) without the barrier, or (iii) without the barrier and the filler, or
- d. a hypothetical cable made (i) with a different filler, (ii) with a different barrier, or (iii) with a different filler and barrier.

49. Second, the patent does not provide any guidance on what measurement to use.

There are multiple known methods of measurement. For example, a POSITA knows that internal cross-talk can be measured in different ways (e.g., near end cross-talk (NEXT) or far end cross-talk (FEXT)) but the patent does not provide any guidance on which method to use. A POSITA would understand that NEXT and FEXT measure cross-talk at different locations and typically yield different measurement values.

50. Third, the patent does not provide any guidance on which criteria to use to assess the results in order to determine if there has been a reducing. For example, a POSITA would understand that the amount of cross-talk measured (regardless of near end or far end) varies at different frequencies throughout a frequency range. This is shown, for example, with the alien cross-talk measurements provided in Figures 4A and 4B. Has cross-talk been reduced if the measurement at a single frequency is reduced (and if so, what frequency)? Or is the measurement at all frequencies required to be reduced? Or has cross-talk been reduced if the average cross-talk measurement value has been reduced across a particular frequency range (and if so, what range)? And has cross-talk been reduced even if, for example, some measurement values at some frequencies are increased? The patent provides no guidance in this regard.

51. A POSITA would also not understand what is meant by the language of claims 10, 22 and 36 of the '833 patent which says that the filler member (or portion or means) and the barrier tape (or portion or means) reduce crosstalk "by non-conductively shielding" the conductor pairs within the cable from electrically coupling with each other. A POSITA would understand that a shield is a structure having a metallic layer (or surface) which is conductive such as, for example, aluminum or copper, and thus shielding refers to the use of the conductive metal layer (or surface). Therefore, a POSITA would consider the phrase "non-conductively shielding" to be a conflict in terms and concepts, especially when used in reference to a barrier tape having a conductive layer (as separately recited in the claims). A POSITA would not understand that a shield, which is conductive, is configured to be "non-conductively" shielding. And a POSITA would understand that a barrier tape with a conductive layer would not be a barrier tape that "non-conductively" shields.

7. **Term 12: “wherein the non-conductive filler member is configured to extend along a longitudinal portion of the cable so as to non-conductively shield the first and second pairs of conductors along the longitudinal portion of the cable” (’030 Patent, Claim 17)**

Plaintiff’s Proposed Construction	Defendants’ Proposed Construction
Not indefinite. “the physical configuration of the non-conductive filler member extends along a longitudinal portion of the cable and separates the first pair of conductors from the second pair of conductors along the longitudinal portion of the cable”	Indefinite

52. This term uses the phrase “non-conductively shield.” For the reasons discussed in connection with Term 11, a POSITA would understand this phrase to be a conflict in terms and concepts, and thus indefinite.

8. **Term 14: “barrier portion configured to encircle the filler portion and the first and second conductor pairs so as to non-conductively shield the first and second conductor pairs and reduce electromagnetic cross-talk between the first and second conductor pairs during operation of the cable” (’833 Patent, Claim 22)**

Plaintiff’s Proposed Construction	Defendants’ Proposed Construction
Not indefinite “the physical configuration of the barrier portion, which encircles the filler portion and separates a first conductor pair from a second conductor pair, provides shielding that reduces electromagnetic cross-talk between the pairs during operation of the cable”	Indefinite If not indefinite then Plaintiff’s proposed construction should be rejected in favor of: “the barrier portion is physically configured to reduce electromagnetic cross-talk between the first and second conductor pairs during operation of the cable as compared to the electromagnetic crosstalk between the first and second conductor pairs of a cable being the same except lacking the barrier portion, and the reduction is due to shielding the first and second conductor pairs from each other. The shielding must be “non-conductive,” meaning that the barrier portion does [not] provide any

	shielding with a continuous layer of conductive material”
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53. This term uses the phrases “non-conductively shield” and “reduce electromagnetic cross-talk” These terms are indefinite for the reasons discussed in connection with Term 11.

9. **Term 15: “wherein the multi-layer barrier tape [“barrier portion”/”barrier means”] comprises a conductive layer positioned between a first non-conductive layer and a second non-conductive layer” (’833 Patent, Claims 10, 22, 36)**

Plaintiff’s Proposed Construction	Defendants’ Proposed Construction
Not indefinite No construction necessary.	Indefinite as to meaning of “layer.” A “conductive layer” should be construed as including “a layer having a sub-layer of conductive material attached to a sub-layer of non-conductive material”

54. The prosecution history makes it unclear as to the scope of the term, and particularly the scope of the phrase “comprises a conductive layer positioned between a first non-conductive layer and a second non-conductive layer” as recited.

55. During patent prosecution, the Patent Examiner originally rejected claims 10, 22 and 36 based on the Nordin reference (DX-30). DX-27 at BDC_CAT003126-132. Among other things, the Examiner stated that Nordin disclosed a tape having the conductive layer positioned between the non-conductive layers as recited.

56. I am a named inventor on the Nordin reference and am familiar with it.

57. A fragmentary plan view of the Nordin reference’s barrier tape (42) is provided below:

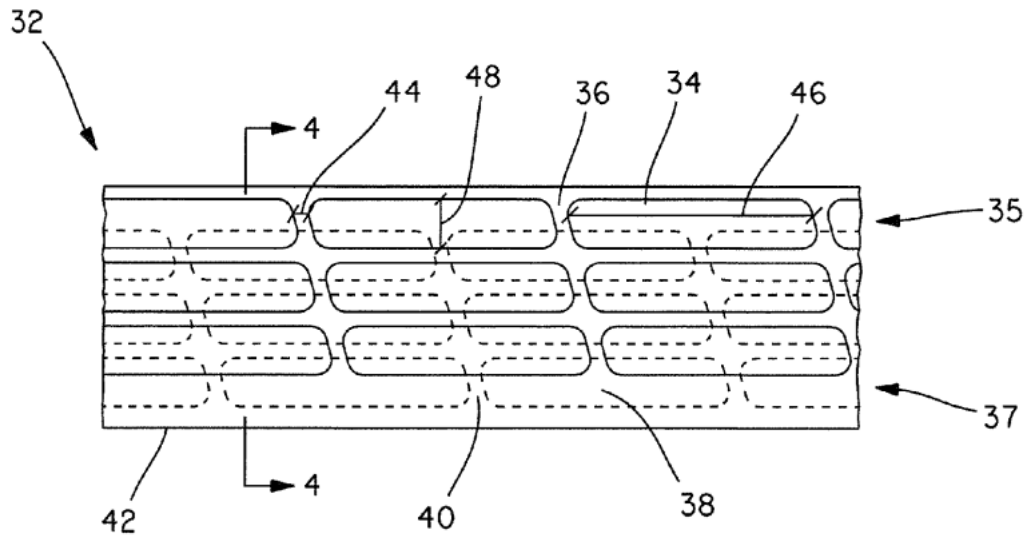
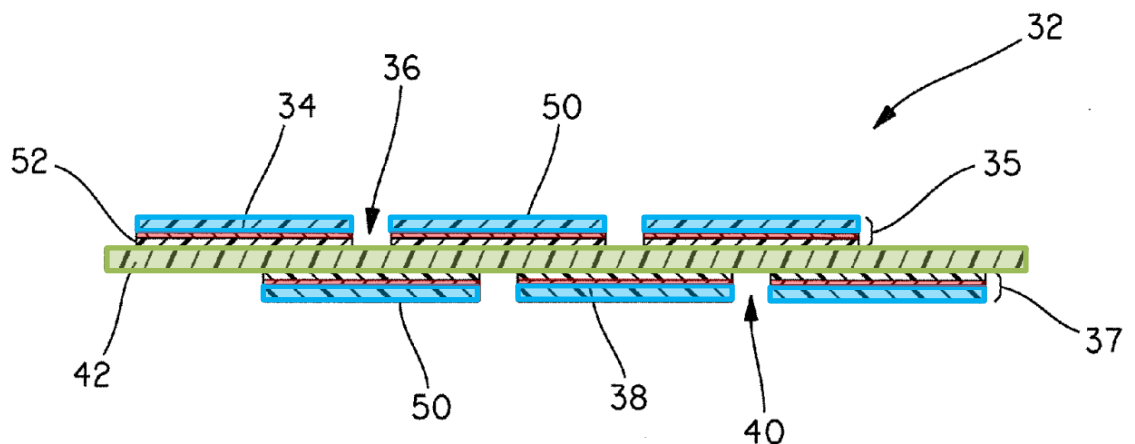


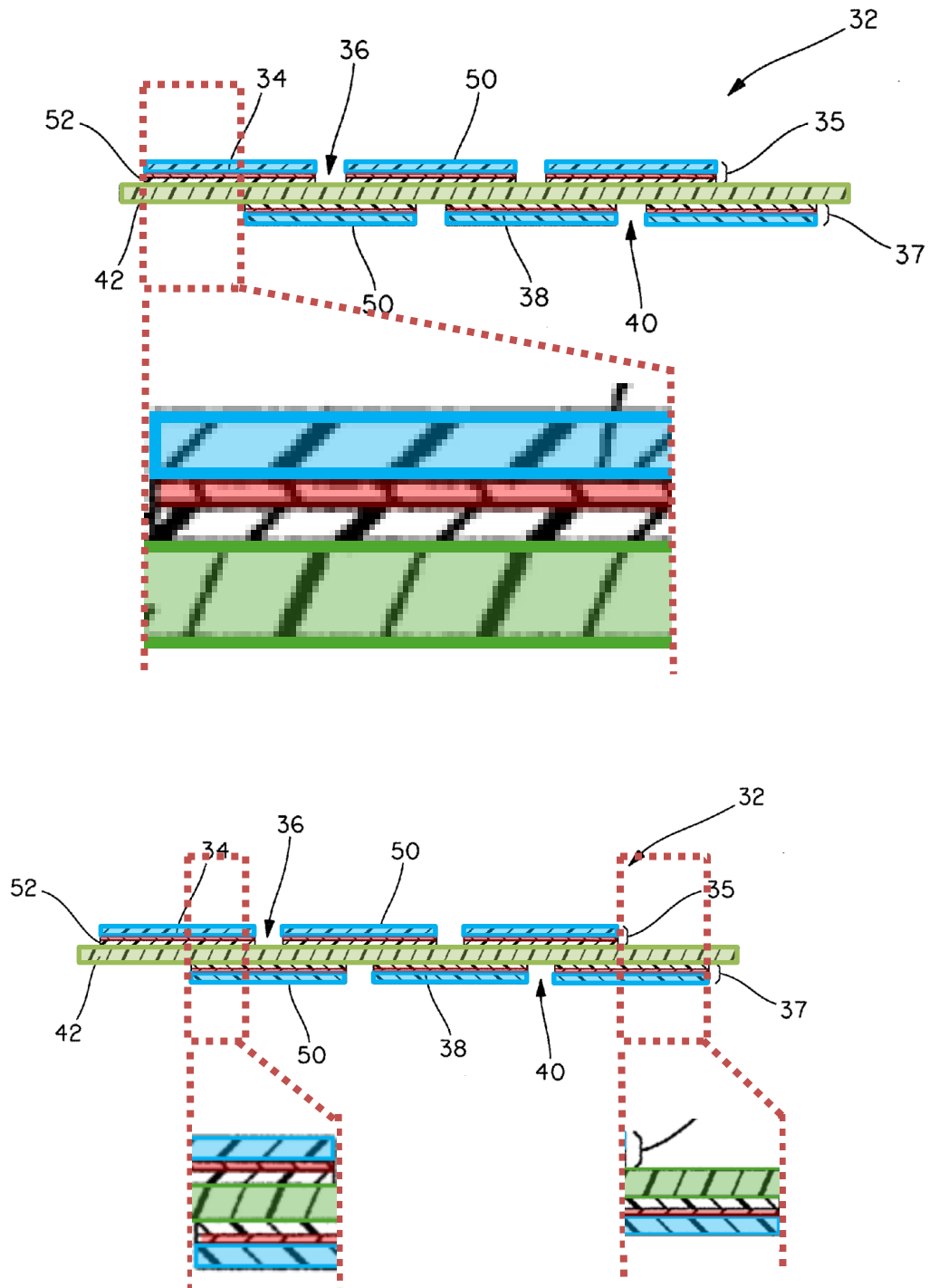
FIG. 3

58. The Nordin reference's barrier tape (a cross-section of which is illustrated below) includes what the reference calls "barrier layers" (35, 37) on opposite sides of a non-conductive substrate layer (42). Each "barrier layer" includes discontinuous conductive segments (34, 38 highlighted in red) on a non-conductive substrate (50 highlighted in blue), and is attached to one side of the non-conductive layer (42 highlighted in green) with a glue layer (52 in white).



DX-30 at FIG. 4, ¶¶15, 17, 22-24.

59. Cross-sectional views at different locations are illustrated below:



60. In all of those locations, the tape has a conductive layer (in **red**) positioned between first and second non-conductive layers (**blue, green**). This is like what is disclosed in FIG. 3A of the '833 Patent, as illustrated below (with layers similarly shaded):

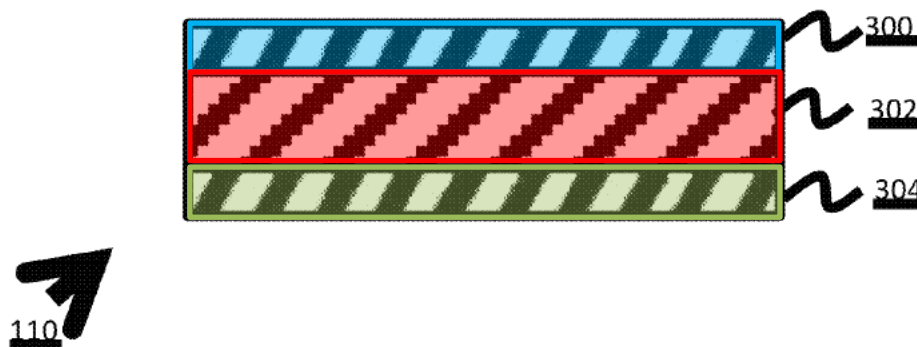


FIG. 3A

The Nordin reference's tape's conductive layers (red) are attached to the (green) non-conductive layer with a glue layer 52, which is consistent with the '833 Patent's disclosure of the conductive layer (302, red) positioned between non-conductive layers (300/304, blue/green) and being attached via "intermediate adhesive layers." '833 Patent at 7:48-52.

61. The patent applicant argued that Nordin did not disclose the recited claim term, but instead disclosed a tape having a non-conductive layer between two conductive layers. DX-28 at BDC_CAT003109-110. The Patent Office accepted this argument and dropped the rejection. DX-29.

62. In light of the above, the scope of this claim term is not clear to a POSITA. A POSITA would understand that the Nordin reference's tape includes a conductive layer positioned between two non-conductive layers. But per the prosecution history, a barrier tape having a layer of conductive material (e.g., Nordin's conductive segments 34) positioned between two

non-conductive layers (e.g., Nordin's non-conductive layers 42, 50) does not meet the claim language.

I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true.

Dated: Feb 10, 2024

Kenneth Cornelison
Kenneth Cornelison

Appendix A

Kenneth Cornelison

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SUMMARY

My experience provides capabilities as a senior level technical manager with product and equipment development expertise for a wide range of copper and fiber cable products. Significant accomplishments were implemented using a team oriented approach to development activities. I have developed strong technical leadership skills and a proven track record of innovations, patents, cost reductions, and intellectual property development.

PROFESSIONAL EXPERIENCE

Publications (Author or Co-Author)

2010 IWCS - High Speed Laser Gages for Lay Length Measurement and FFT Analysis for Assessment of Process Stability (available at www.IWCS.org)

2012 IWCS - Shielding Performance Tests for Twisted Pair Communications Cables (available at www.IWCS.org)

2016 IWCS - RF Immunity of Category 6A Cables (available at www.IWCS.org)

2017 IWCS- Performance Comparison of Reduced Diameter Category 6A Cables (available at www.IWCS.org)

2018 IWCS - CW and EFT Noise Coupling to Category Cables and the Effect on 1Gb/s Ethernet Traffic (available at www.IWCS.org)

Instructor (or Co-Instructor)

IWCS Symposium 2013, 2014, 2015, 2018, 2023

CU202: COPPER CABLING TECHNOLOGY – ADVANCED TRANSMISSION LINE THEORY AND MEASUREMENTS

IWCS Symposium 2016, 2019, 2022

CU207: FUNDAMENTALS OF SIGNAL INTEGRITY (An Introduction to noise and measurements for cable and connectivity engineers)

Testimony

Declaration of Kenneth Cornelison in Support of *Inter Partes* Review IPR2023-01056 submitted on June 11, 2023.

Declaration of Kenneth Cornelison in Support of *Inter Partes* Review IPR2023-01058 submitted on June 11, 2023.

Declaration of Kenneth Cornelison in Support of *Inter Partes* Review IPR2023-01061 submitted on June 13, 2023.

Declaration of Kenneth Cornelison in Support of *Inter Partes* Review IPR2023-01062 submitted on June 13, 2023.

Patents (Inventor or Co-Inventor)

2022 - US-11257610-B2 - Multiple conduits bundled together in a combination conduit configuration

2020 - US-10825578-B1 2019 Multiple conduits bundled together in a combination conduit configuration

2019 - US-10170220-B2 Extended frequency range balanced twisted pair transmission line or communication cable

2015 - US-9159471-B2 Communication cable with improved crosstalk attenuation

2015 - US-9024193-B2 Communication cable with improved crosstalk attenuation

2015 - US-8946555-B2 Communication cable with improved crosstalk attenuation

2015 - US-8927866-B2 Communication cable with improved crosstalk attenuation

2013 - US-8467073-B2 Lay length and ratio measuring device for electrical cable

2013 - US-8354590-B2 Communication cable with improved crosstalk attenuation

2012 - US-8217267-B2 Communication cable with improved crosstalk attenuation

2012 - US-8183462-B2 Communication cable with improved crosstalk attenuation

1990 - US-4964691-A Optical fiber cable having optical fibers with various lengths

1990 - US-4944570-A Fiber optic cable having an extended elongation window

1988 - US-4792422-A Method of making an optical fiber cable

1988 - US-4786137-A Optical cable with filling compound and parallel fibers

1988 - US-4757675-A Process and apparatus for making fiber optic cable

1988 - US-4741684-A Optical cable with filling compound and parallel fibers

Marmon IEI Attleboro, MA Contract Services 2022-Present

- Support development projects for Category cable processes, products, and testing. Evaluate process control equipment.

Hitachi Cable Systems Manchester, NH Contract Services 2011-2021

- Support development projects for Category cable processes by providing design and test support for new and updated products. Supported activity in the TIA industry forum to develop new and updated Category cable standards.

NDC/Beta Lasermike Dayton, Oh Contract Services 2009 to 2022

- Supported development of new lay length measurement technology with reduced component dimensions
- Developed Layscan technology and prototypes, in partnership with BetaLasermike, then provided technical assistance for the development of the final production version hardware.
- Developing a series of on-line training modules for use by BetaLasermike personnel for hardware and customer application training. Modules include training material as well as structured assessments to measure progress.

General Cable Highland Heights, KY 2005 to 2009

VP Intellectual Property

- Developed IP processes, including inventor new recognition policy, initiated IP reviews with technology groups, and created first company specific training package for engineers
- Key legal resource for technical litigation with strong interaction with internal and outside counsel.

VP Technology – Data Communications

- Developed copper communications cables with unique and market leading cable technology for the emerging 10Gbit Ethernet protocol, resulting in significantly improved electrical performance..
- Developed new cable designs for high end Category 6 product line and developed technologies and materials for lower cost products.
- Develop and qualify new thermoplastic materials for improved flame performance, lower cost, and improved electrical properties.

Belden Wire and Cable Richmond, IN 1992 to 2005

Process Development Manager

- Responsible for manufacturing equipment development, materials compounding technology and automated manufacturing process technology.
- Key technical advances in equipment resulted in changes that improved performance in areas such as SRL (structural return loss) and cable attenuation.
- Cable jacket and component compound development and updates for product performance improvement.

Product Development Manager

- Responsible for development activity for a wide range of electronic cable product lines.
- Established a new “Design for Manufacturing” system used for the implementation of all new major product introductions to reduce startup cost and transfer time to the plants. Improved quality of key attributes and substantially reduced first time failure rates..

Alcatel Cable Systems 1988-1992

Production Superintendent

- Implemented significant cost and volume improvements, managed and expanded the operations staff, and implemented process improvements that reduced scrap by 50%

Manager – Product Development and Customer Engineering

- Developed new loose tube and uni-tube outside plant fiber optic cable designs. Also developed and supported outside plant copper cables and a line of accessories for optical fiber cable connections.

Anaconda; Anaconda-Ericsson 1976-1988

Manager – Product Development

- Developed outside plant optical fiber cables and connectors, including loose tube and optical ground wire products. Developed novel and patented cable and manufacturing processes for new products

Development Engineer – Power Cables

- Developed medium voltage power cables for mining, industrial, and utility applications and conducted qualification tests for materials and new cable designs.

Square D 1974-1976

- involved in technical marketing for 600 volt switch gear