

# Comtran Cable: the tale of a Navy cable approval

## The trek took 2-years, 5 companies and a lot of cooperation

On Aug. 18, Comtran Cable LLC was told by Navy Sea Systems Command (NAVSEA) that its MIL-DTL-24643/59 cables were qualified for use on all U.S. Navy vessels. That effort took more than two years and effort from five Marmon Group companies—Marmon EWC Innovation & Technology Group (I&T), Comtran Cable, RSCC, RSCC Aerospace & Defense and Gendon Polymers—two NRTL testing labs and countless hours of trial and product development. *WJI* asked about the process; below are the collective Marmon responses from Bruce Sinnott, Director of Business Development, Communication Products, Comtran Cable.

*WJI: What specific cable types does this Navy qualification cover?*

**Sinnott:** These cables are copper network communications cables which meet the requirements of TIA 568 Cat. 5e, but are much different than commercial category cables due to the requirements for used on a Navy vessel. The primary insulation, jacket, fillers and tapes are all Low Smoke Zero Halogen (LSZH). The cable contains an overall shielding system consisting of both foil and braided shields. The jacket is a specialty polymer that is thermoset, and resistant to many lubricants and fuels that would be found on Navy vessels. The cables must continue to perform at high temperatures and during extended immersion times.

*WJI: How did this product come about?*

**Sinnott:** Most of the team members and many of the Marmon Group managers were familiar with the market and recognized the opportunity and the need for this product in the market. The project was justified by recognizing Comtran's data cable development capabilities along with the Marmon Group's materials science expertise to fill a need for a specific and demanding customer, the U.S. Navy. Producing a cable that can meet both extreme physical/mechanical/chemical criteria while meeting or exceeding commercial high frequency electrical standards makes for a very challenging project requiring commitment of team members and effective management oversight.



Some of the Marmon Group staffers involved in the Navy cable project included (l-r): Bruce Lamoureux, Comtran; Bob Konnik, Marmon I&T; Joe Barry, Comtran; Bruce Sinnott, Comtran; and Kris Nippani, Comtran.

that was required; Bob Konnik and Dan Mazakowski, both of Marmon I&T; Kevin Coderre, RSCC Aerospace and Defense, who assisted in jacket selection, irradiation requirements, process engineering and testing; and Joe Barry, Comtran general manager, who provided the unwavering leadership required for this multi-tiered approach to product development.

*WJI: What was the timeline for this cable, from first need to final okay? Did it take longer than expected?*

**Sinnott:** We kicked the project off in March 2013. We received qualification in August 2015. Timeline included cable design and material selection, sample production, sample testing and evaluation. These steps were repeated several times in order to meet the NAVSEA specification.

The project took about a year longer than expected. There were several key materials and processing issues that had to be addressed and designed into the cable before getting the desired results.

*WJI: How is it that five companies were involved in the development process? How unusual is this, and how many people in total were involved in some way?*

*WJI: Who were the key project people?*

**Sinnott:** The process required key decision-making by the team members from all divisions including, Bruce Lamoureux, a Comtran cable product engineer and U.S. Navy veteran who directed and coordinated the design and testing work

**Sinnott:** In the wire and cable industry, it is very unusual to have so many independent companies working collectively toward a desired goal. As the Marmon Engineered Wire and Cable Group has businesses--Comtran for data cable, Gendon for specialty polymers, RSCC A&D for EMP designs, the I&T group for processing and chemical formulations and RSCC for irradiation expertise--that specialize in multiple arenas required for this project, it provided the ability to pull in expertise across all disciplines. In all, more than 20 people contributed significantly toward the project and many more provided specific information or performed a specific task.

*WJI: How challenging were the logistics?*

**Sinnott:** The logistics between the companies was fairly smooth. Joe Barry had discussed the project with the leaders of the other divisions, letting them know what was needed and when, and they did their best to help us out. We also had the support of the EWC leadership as well. The Innovation Center provided both the materials expertise and the ability to evaluate the product in house before formal testing takes place. Since the I&T folks were kept informed of our progress, they would know when cables would be arriving for testing and what testing needed to be performed. We did not have any significant que time delays. Most of the time at I&T was the prep time and the actual testing. More common logistics issues were material lead times, processing delays and evaluation of test data.

*WJI: For a product like this, do you start with an existing cable product and adapt?*

**Sinnott:** Although this product is unique in many ways, there is commonality across a large spectrum of cables manufactured by Marmon Group companies. For example, Comtran has expertise in copper data communications cables but not in specialty polymers and irradiation, so we started with a standard Cat 5e cable as the backbone and built around it to achieve all the other requirements using the expertise of the other divisions.

*WJI: What was the hardest part of this process?*

**Sinnott:** The hardest part and the most frustrating part was due to materials and process parameters that we were sure were the right choices but were not capable of meeting the specification as a whole. This required multiple repeated sample production and testing. This repetitive process was very time consuming and at times felt like our goal was continuously eluding us. But with each cycle of material and processing decisions, we were able to learn which combination would give us the best combined test results. That same approach helped us with our sample production and testing, and eventually this led to the right formulation and to a very robust product. These NAVSEA cables are more challenging to develop and manufacture than any commercial cables we are familiar with. In comparison to other harsh environments, such as underground rail transit, these cables

## Innovation & Technology Center Fact Sheet

Dennis Chalk, president of Marmon Engineered Wire & Cable, LLC, oversees the company's Innovation & Technology Center in East Granby, Connecticut. Below, he provided a brief bullet point list of facts. For more details, go to [www.marmonewc.com](http://www.marmonewc.com) and click on "Innovation Center." Also, see p. 34 for related story.

- Since the opening in November 2013, over 100 R&D projects have either been completed or are ongoing at the 16,000-sq-ft Innovation & Technology Center. These projects have involved products for seven of the 14 companies in our Wire Division.
- With 14 individual companies that have a wide array of capabilities, Marmon EWC can draw from each member company's expertise in design, manufacturing capability, material processing and technologies. Staffers from five companies took part in the above-described project.
- The 13 full-time material, electrical and mechanical engineers based at the innovation center have in excess of 200 years of experience. Five of these engineers are graduates of the Marmon Engineering intern program.
- New products that result from the Innovation & Technology Center result in annual revenues from \$30 million to \$40 million a year. Equally important is that the time it takes a cable to go from concept to design and commercialization has been reduced by approximately 50% because of the resources of the center.



*Marmon EWC President Dennis Chalk.*

- The I&T Center enables Marmon Group companies to create prototype samples, pilot compounding and extrusion capabilities. It houses flame, smoke and toxicity test chambers as well as extensive mechanical testing capability and an analytical lab. To the best of our knowledge, no other company in the U.S. can match its capabilities, especially for products targeting harsh environments.



are a degree of difficulty higher than even those environments which have their own unique requirements.

*WJI: What was this project straightforward science, or is there also an “art” element?*

**Sinnott:** You start with straightforward material science and established processing methods. The art comes in when you tweak each component and process to result in a product that meets or exceeds all requirements. Many modifications will have a positive effect on one parameter, only to have a negative effect on several others. That’s the balancing act that only experience and expertise can solve.

*WJI: How many new cable products might Comtran decide to pursue?*

**Sinnott:** For the ship-board market we are currently working on three more designs. Typically, we target a communication cable niche in a particular market in which the market is usually magnitudes larger than the niche we are looking to fill. For example, we are qualified to produce telecom cables for New York City Transit subway system in accordance with its telecom cable specifications. There is a huge amount of power, signal and fiber optic cable that is installed in underground infrastructure. By targeting the specific niche of copper communications cables, we are able to focus our efforts to supply the absolute best design and quality that is available to NYCT. At any one particular time, we will have approximately 10 samples in some stage of production for our weekly product development review.

*WJI: Can this product be marketed for other marine applications, or is it that the value-added specs make it too pricey for most other less-demanding cable specs?*

**Sinnott:** This is an extremely robust cable that can be used in other markets which would perform well in exposure to a maritime environment (offshore oil and gas), areas where EMP resistance and superior shielding effectiveness is needed, where a wide range of fluid resistance is important, or where just a physically tough cable is needed. In many of these applications, price is second to performance. Each application has its own set of requirements and approvals i.e. commercial shipping requires ABS and/or DNV approvals. Meeting the requirements of the application and obtaining required approvals frequently require a variation to the cable design.

Development of additional NAVSEA communication cables has already begun and they are expected to be launched in 2016.

*WJI: Has going through this process led to any knowledge that will help in future projects?*

**Sinnott:** The biggest lesson learned to all of us was perseverance and commitment. It would have been very easy to throw in the towel at several different milestones in this project. All of the core project team members knew we could succeed and despite numerous obstacles and setbacks we were able to reach our goal. Our leadership provided critical support that kept our momentum going and we learned that if projects are set up correctly and have top down support that things will work out in our favor.



*Displaying samples of the approved cable are Comtran staffers (l-r) Bruce Lamoureux, Joe Barry and Bruce Sinnott.*

*WJI: Was there a particular customer or influential member outside of your company that had an invested interest in your success?*

**Sinnott:** One industry specialist we know who is a valuable source of information for our development projects told us that there was a pot at the end of the rainbow for Comtran once the project was completed. Before and after the success of the project, he was adamant that an additional source was needed for supply to the U.S. Navy and was in a position to secure a significant amount of business.

*WJI Was there a particular person or people who stood out among the team?*

**Sinnott:** Bruce Lamoureux, our product engineer and U.S. Navy veteran, had both his heart and his mind into this project. He did all of the design work, sample evaluation, test schedule coordination and evaluation, and organization of the entire project. If there was just one MVP, it would be Bruce. Also, Joe Barry provided guidance at pivotal times and more important provided support and encouragement when the chips were down.

*WJI What are the next steps Comtran is pursuing related to this success?*

**Sinnott:** Our current goal is for Comtran to become the supplier of choice for all copper communications cables for the U.S. Navy. This is a common goal for Comtran across all specialty application markets including, rail transit, fire safety, power generation and data centers. There are many different established and future specifications that we will pursue in these environments. Comtran is emerging as the manufacturer of choice for data cables used in unique applications where performance is the deciding factor. It’s an exciting time to be part of this company.